T-LEVELS | Institute for Apprenticeships & Technical Education

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

Practical Assignment
Assessor Pack (Sample)

September 2023 Version 2.1

City & Guilds

Contents

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

The assessment for this component consists of a practical assignment that includes an assignment brief and then a number of tasks for the candidate to complete. Tasks are assessed by assessment themes that cover a range of knowledge and skills from the performance outcomes in the qualification specification. They are designed to allow judgement of the candidate to be made across different categories of performance.

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%

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.

Candidates 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 andfactors 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**

2. 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 & 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.

3. Tasks (guidance for centres)

General task guidance

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

Ensure you have read the following guidance before you undertake the assessment of candidates:

- *T level technical qualifications – marking*
- *T level technical qualifications – moderation (updated annually)*
- *T level technical qualifications – teaching, learning and assessment*
- *Technical qualification guides on marking and moderation*
- *Assessor Observation forms*
- *Marking grids following the tasks below*
- *Feedback guidance for assessors.*

All work carried out should be to industry standards, undertaken in a safe manner and compliant with relevant regulations. If a candidate fails to carry out the activities in a safe manner, the assessment should be stopped. Further guidance for assessors can be found in the centre guidance section under health and safety.

Photos and videos must be used to support the qualitative statements captured on the Assessor Observation form and must be taken by the assessor. Details of specific photo/video requirements are outlined in the task information below. Photos/videos must have the date, the candidate's name and their candidate number attached so that they can be differentiated. The candidate does not need to be in the photo/video, the purpose of the photo/video is to demonstrate the quality and standard of work of the specific activities and of the work throughout various stages of the assignment.

Where audio recordings must be made of the candidates' response(s) to questions during the task, the assessor must only ask the questions provided in the task specific guidance below. The recording must start with the date, the candidate's name and their candidate number. Notes about the responses must also be made in the appropriate Assessor Observation form.

All work submitted must be securely saved in an appropriate format as dictated by the evidence requirements. It is important that assessors can access copies of submitted materials to provide to candidates in subsequent tasks as instructed in the task specific guidance.

Time

The time allocated for the completion of the tasks and production of evidence for this assessment is 24 hours. Timings for completion of specific tasks are outlined below.

- Task 1 – 7 hours
- Task 2 – 5 hours
- Task 3 – 5 hours
- Task 4 – 7 hours

There may be sub tasks within each of the above tasks. Assessors should ensure that the duration for each sub task is adhered too.

There may be additional resources that are required for a task/sub task. These will be provided by the assessor and listed within the task instructions within the candidate pack and task specific guidance. These resources must only be administered to the candidate as per the task specific guidance.

Scheduling assessment sessions

It is the centre's responsibility to arrange how time is managed to fit with timetables and meet the times allocated for each task during the assessment window. Assessment windows are specified in the key date schedule.

The tasks/sub tasks must be issued by centres in the order specified in the task specific guidance, one at a time to candidates and within in the scheduled assessment times. Candidates are able refer to the brief and scenario during all of the scheduled assessment time. Candidates are not permitted to return to tasks/sub tasks after the assessment time for the task has ended and the next task/sub task has begun. Candidates must not move on to the next task/sub task within the assessment session until instructed to do so by the assessor. It is the assessor's responsibility to ensure that all evidence for a task/sub task has been submitted before administering the next task/sub task. Candidates are not required to have formal reading time for the scenario and brief, this is included within the duration for Task 1.

When working under supervised conditions for longer sessions, breaks can be facilitated outside of the controlled conditions, ensuring the room is locked and all candidates have vacated once the break begins. All materials must be kept securely during the break.

Centres should aim to schedule tasks in the fewest amount of assessment sessions but ensure that the durations dictated for each task/sub task are covered. However, to aid deliverability and manageability of assessment, sessions can be split where there is a requirement – for example where timetabling of an appropriate location for six hours is not possible eg where centre's access to computer resources is limited, or where candidates are not available for six consecutive hours (eg due to work placement commitments). Where this is necessary, sessions must be timetabled over consecutive days and in as few sessions as possible. All assessment evidence must be stored securely and access to assessment materials and their work only given to candidates during the formal assessment times. All candidates are required to complete a declaration of authenticity along with their evidence submission, and the arrangements must support the assessor in being confident in confirming authenticity.

Where assessments need to be completed in a number of assessment sessions or over consecutive days all practical work areas and any evidence produced must be kept secure and must only be accessed by the assessor. Information and notices should be used to inform other users of the facility that no access will be granted when assessment sessions are in progress. Practical work areas, tools, equipment and systems for the assessment must not be reset until a candidate has completed the full assessment.

Internet access

Where internet access is allowed as part of a task (eg for research purposes) candidates must be advised that this is the case and reminded of the importance of submitting their own work and the seriousness of plagiarism, malpractice and collusion. Candidates should be advised that their browser history can be monitored and checked. Depending on the type of task candidates may be requested to submit their internet search history to be considered as part of the submission of evidence, in order to confirm the authenticity of submitted evidence.

Where candidates are allowed the use of computer equipment, but not the use of the internet for a task, equipment should be provided with internet capability disabled (Wi-Fi disabled and machine disconnected from network).

Resources

Candidates must have access to a suitable range of resources as outlined in the task specific guidance to carry out the tasks and, where appropriate, to have the opportunity to choose materials, tools and equipment that demonstrate their ability to select from a range of appropriate resources.

Where candidates need access to evidence that has been submitted as part of a previous task, this will be provided as a copy of the original evidence and will be given at the start of the relevant task.

Task specific guidance for centres

Tasks 1, 2, 3 and 4 can be issued in any order, and can be completed at different times by different candidates. The sub tasks of tasks 1, 2 and 3 can be issued in any order. The sub tasks of task 4 **must** be issued to candidates in order.

Assessors should familiarise themselves with the tasks as well as this guidance for centres.

Templates must be provided in printed and digital format; candidates can choose to complete templates by hand or digitally.

Task 1 – Maintain land-based machinery and equipment

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

Assessor guidance

- Candidates must carry out the task independently, under controlled conditions.
- Machinery to be set-up for each candidate as described in the resources section below.
- Candidates must be given a copy of the relevant service manual containing the hub and swivel bearing settings.
- Internet access is **not** permitted for this task.
- The time allocated for the task is **4 hours:**
    - the timing allows for questioning during the assessment.
- Ratio of candidates to assessor:
    - up to 3:1 depending on availability of machinery, equipment and workspace

Additional evidence

Assessor observation

- Detailed, accurate and differentiating notes must be captured on the Assessor Observation form:
    - working safely
    - selection and use of tools and equipment
    - preparation of work area
    - preparation of the machinery to be worked on, including safe jacking
    - remove the wheel
    - clean and inspect condition of hub bearings, Universal joints and seals
    - assess the bearing preload as specified by the manufacturer
    - adjust bearing preload to meet manufacturer's procedures
    - verify conformity
    - lubricate bearings
    - replace wheel
    - classification and disposal of waste.

Photo/video evidence

- This task must be photographed by the assessor to support the marking and moderation process, as a minimum:
    - condition of bearings and seals: before and after candidate cleans and checks.

- This task must be videoed by the assessor to support the marking and moderation process, as a minimum:
    - candidate making adjustments to comply with service manual manufacturer's settings: candidate checking the preload (typically 2–3 minutes).

Question and answer session

- Assessors should ask all the questions as provided at the natural point during and/or at the end of the assessment, ensuring it is safe to do so.
- Assessors must make notes of responses from the questioning on the Assessor Observation form.
- Assessors must make an audio recording of the responses for moderation purposes.
- Questions:
    - What are the reasons for possible failures of bearings and seals?
    - Why adjust a bearing?
    - State **three** observations that indicate a bearing requires replacement.
    - Why are nuts/studs torqued to the correct setting?
    - Why is it important to replace locking devices?

Resources

- Machinery with a 4WD front axle:
    - With loose, serviceable hub **and** swivel taper roller bearing assemblies on one side of the axle.
    - This assessment must be on a piece of machinery rather than a rig.
    - Assessor to reset the faults for each candidate.
    - No requirement to replace the bearings as part of the assessment.
    - Machinery to be cleaned prior to any assessment.
- Suitable workshop with access to appropriate tools and equipment as listed in the specification eg selection of spanners, sockets, measuring equipment etc.
- Additional/specialist tools and resources required in addition to the standard tools supplied:
    - hydraulic jack
    - axle stands
    - wheel chocks
    - wheel removal trolley
    - pry bars
    - copper hide hammer
    - aluminium drift
    - bearing pullers
    - rolling torque gauge
    - spring balance
    - torque wrench
    - degreaser (eg brake cleaner)
    - cleaning equipment
    - grease
    - oil
    - PPE
    - service manual, including wheel bearing set-up procedure and settings.
- *Risk assessment template (Figure 1).*

- *Job card template (Figure 2).*
- Computer for completing templates digitally (**no** internet access).
- Camera, video and audio recording equipment for assessor.

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

Assessor guidance

- Candidates must carry out the task independently, under controlled conditions.
- Candidates must be given a copy of the manufacturer's procedure for preparing the machinery for post season storage.
- The machinery must not require maintenance.
- Internet access is **not** permitted for this task.
- The time allocated for the task is **3 hours.**
- Ratio of candidates to assessor:
    - up to 3:1 depending on availability of machinery, equipment and workspace

Additional evidence

Assessor observation

- Detailed, accurate and differentiating notes must be captured on the Assessor Observation form:
    - working safely
    - selection and use of tools and equipment
    - preparation of work area
    - preparation of the machinery to be worked on, including cleaning
    - safe immobilisation
    - inspection and preparation to comply with manufacturer's specifications
    - apply protective coatings
    - classification and disposal of waste.

Photo/video evidence

- This task must be photographed by the assessor to support the marking and moderation process, as a minimum:
    - applying protective coating
    - lubrication levels of mower or crop sprayer (if self-propelled)
    - replaced/serviced parts, if applicable, eg blade on mower, filters on the sprayer
    - sprayer – keeping small parts safe (eg nozzles).

Question and answer session

- n/a

Resources

- Pedestrian-controlled mower (used for cutting grass) and mounted crop sprayer (simulate chemical contamination):
    - Crop sprayer already mounted onto a tractor (so that the crop sprayer can be operated for checking and cleaning).
    - The machinery must be set up in the same way for each candidate, ensuring that they are required to clean the machinery and apply a protective coating.
- Suitable workshop with access to appropriate tools and equipment as listed in the specification eg selection of spanners, sockets, measuring equipment etc.
- Additional/specialist tools and resources required in addition to the standard tools supplied:
    - torque wrench

    - strap wrench
    - degreaser (eg brake cleaner)
    - cleaning equipment including air line, pressure washer
    - drip trays
    - receptacles for collection and temporary storage of chemical contaminants from crop sprayer (simulated contamination)
    - grease
    - engine oil
    - lubricating oil
    - rust inhibitive coating
    - antifreeze (if required by the manufacturer's procedure for the crop sprayer)
    - chemical pesticide (for simulated contaminant) and protective coating product safety labels
    - a selection of spare parts appropriate to the mower and crop sprayer
    - PPE
    - service manual, including manufacturer's procedure for preparing the machinery for out of season storage.
- *Risk assessment template (Figure 1).*
- *Job card template (Figure 2).*
- Computer for completing templates digitally (**no** internet access).
- Camera equipment for assessor.

Task 2 – Diagnose land-based machinery and equipment faults

2a) Diagnose machinery with ineffective hydraulics

Assessor guidance

- Candidates must carry out the task independently, under controlled conditions.
- Candidates must be given a copy of the relevant service manual.
- Machinery to be set-up for each candidate as described in the resources section below.
- Internet access is **not** permitted for this task.
- The time allocated for this task is **2 hours:**
  - the timing allows for questioning during the assessment.
- Ratio of candidates to assessor:
  - up to 3:1 depending on availability of machinery, equipment and workspace

Additional evidence

Assessor observation

- Detailed, accurate and differentiating notes must be captured on the Assessor Observation form:
  - working safely
  - selection of the appropriate test method and equipment
  - selection and use of tools and equipment
  - preparation of the work area and the tractor to be worked on
  - sequence of work:
    - checking oil level and condition
    - connection to test equipment
    - checking oil temperature
    - undertaking the pressure and flow test.

Photo/video evidence

- This task must be photographed by the assessor to support the marking and moderation process, as a minimum:
  - connecting the tractor to the test equipment.
- This task must be videoed by the assessor to support the marking and moderation process, as a minimum:
  - undertaking the pressure and flow test: showing the readings during the test (typically 1 minute).

Question and answer session

- Assessors should ask all the questions as provided at the natural point during and/or at the end of the assessment, ensuring it is safe to do so.
- Assessors must make notes of responses from the questioning on the Assessor Observation form.
- Assessors must make an audio recording of the responses for moderation purposes.
- Questions:
  - What could cause contamination during testing?
  - Why is the temperature of the oil important for the test?
  - What would be the logical sequence of further actions?

Resources

- Tractor with auxiliary hydraulic services: the oil should be serviceable for the test, and the correct level for the test.
- Suitable workshop with access to appropriate tools and equipment as listed in the specification eg selection of spanners, sockets, measuring equipment etc.
- Additional/specialist tools and resources required in addition to the standard tools supplied:
    - hydraulic pressure and flow test tool (this must be calibrated and have an internal oil temperature gauge)
    - drip trays
    - spill kit
    - cleaning equipment
    - fume extraction facilities
    - PPE
    - service manual with manufacturer's specification for the hydraulic system testing.
- *Risk assessment template (Figure 1).*
- *Job card template (Figure 2).*
- Computer for completing templates digitally (**no** internet access).
- Camera, video and audio recording equipment for assessor.

2b) Diagnose machinery in limp mode

Assessor guidance

- Candidates must carry out the task independently, under controlled conditions.
- Part i)
  - Candidates must be given a copy of the relevant service manual and told what machinery they will be working on before selection of tools and equipment.
  - The time allocated for part i) of this task is **1 hour.**
  - The candidate will travel to the location of part ii) outside the allocated time for the task.
  - Internet access is permitted for part i) of this task solely to enable software updates as required.
  - Ratio of candidates to assessor for part i):
    - up to 4:1 depending on availability of machinery, equipment and workspace
- Part ii)
  - This part of the task must be undertaken in a farm workshop setting to reflect the brief; it must be a different workspace to that used for other assessments, this could be a barn or an open space within walking distance of the workshop in part i) so that there is no requirement to transport the candidate.
  - The assessor must provide the correct tools and equipment at the farm workshop setting, even if the candidate has made incorrect/ insufficient selections in part i).
  - Machinery to be set-up for each candidate as described in the resources section below.
  - Internet access is **not** permitted for part ii) of this task.
  - The time allocated for part ii) of this task is **2 hours:**
    - the timing allows for questioning during the assessment.
  - Ratio of candidates to assessor for part ii):
    - up to 4:1 depending on availability of machinery, equipment, and workspace

Additional evidence

Assessor observation

- Detailed, accurate and differentiating notes must be captured on the Assessor Observation form:
  - working safely
  - selection of the appropriate test method and equipment in part i)
  - checking for a software update, updating as required
  - selection, preparation and use of tools and equipment
  - preparation of the work area and machinery to be worked on, carrying out basic checks
  - sequence of work:
    - carry out basic checks on the machinery
    - connection to test equipment
    - undertaking the electrical diagnostic
    - record fault/diagnostic codes on the job card
    - clear fault/diagnostic codes
    - restart the machinery
    - retest the machinery
    - read and record fault/diagnostic codes.

Photo/video evidence

- This task must be photographed by the assessor to support the marking and moderation process, as a minimum:
  - selection of the appropriate test method and equipment in part i)
  - connection to test equipment: candidate connecting the machinery to the test equipment
  - fault/diagnostic codes: the codes diagnosed on the test equipment.

Question and answer session

- Assessors should ask all the questions as provided at the natural point during and/or at the end of the assessment, ensuring it is safe to do so.
- Assessors must make notes of responses from the questioning on the Assessor Observation form.
- Assessors must make an audio recording of the responses for moderation purposes.
- Questions:

  Part ii):
  - Why is it important to ensure software is up to date?
  - Why clear the fault/diagnostic codes and retest the vehicle?
  - What would be the logical sequence of further actions?

Resources

- Machinery/equipment which has been set to a limp mode: Land-based vehicle with a realistic fault introduced on an electronically controlled system eg a feedback loop (crank sensor, speed sensor, gearbox), disconnect pressure sensor on fuel pressure common rail, alter position of sensors to impair operation.
- Suitable workshop with access to appropriate tools and equipment as listed in the specification eg selection of spanners, sockets, measuring equipment etc.
- Additional/specialist tools and resources required in addition to the standard tools supplied:
  - multimeter
  - appropriate electronic diagnostic tool for the tractor eg scanner, Electronic Service Tool (EST) with internet access for checking for updates
  - PPE
  - service manual with the fault/diagnostic codes.
- *Risk assessment template (Figure 1).*
- *Job card template (Figure 2).*
- Computer for completing templates digitally (**no** internet access).
- Camera and audio recording equipment for assessor.

Task 3 – Repair land-based machinery and equipment

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

Assessor guidance

- **For safety reasons, sub task 3a is a simulation: the hydraulic cylinder is removed from the machine and the same cylinder is refitted.**
- **The assessor must confirm that the hydraulic cylinder has been refitted safely and correctly before the candidate can verify functionality:**
    - Visual check by assessor: pins and pipes correctly located and secure.
- Candidates must carry out the task independently, under controlled conditions.
- Centre staff can provide physical assistance if requested by the candidate eg taking the weight of the hydraulic cylinder whilst the candidate removes and refits the hydraulic cylinder.
- Candidates must be given a copy of the relevant service manual.
- Machinery to be set-up for each candidate as described in the resources section below.
- Internet access is **not** permitted for this task.
- The time allocated for this task is **2 hours.**
- Ratio of candidates to assessor:
    - up to 3:1 depending on availability of machinery, equipment and workspace

Additional evidence

Assessor observation

- Detailed, accurate and differentiating notes must be captured on the Assessor Observation form:
    - remove and refit a double-acting hydraulic cylinder:
        - working safely, including managing the risk of stored energy
        - selection and use of tools and equipment
        - prepare the work area
        - preparation and immobilisation of the machinery to be worked on
        - removing the correct hydraulic cylinder after checking the system pressure has been released
        - collecting the oil in an appropriate container
        - refit the hydraulic cylinder
        - **assessor to check the refit before the functionality test:**
            - if the refit is incorrect, the assessor must:
                - note what is incorrect on the PO form
                - take a photograph of the incorrect fitting
                - correct the fitting before the next candidate starts the task.
        - verify functionality
        - appropriate classification and disposal of waste.

Photo/video evidence

- This task must be photographed by the assessor to support the marking and moderation process, as a minimum:
    - preparation and immobilisation of the machinery: the machinery once prepared and immobilised.

Question and answer session

- n/a

Resources

- Tractor with front-end loader or telescopic handler or 360 excavator or dumper truck with:
  - attachment fitted which puts weight on the hydraulic system
  - double-acting hydraulic cylinder; oil leak simulated.
- Suitable workshop with access to appropriate tools and equipment as listed in the specification eg selection of spanners, sockets, measuring equipment etc.
- Additional/specialist tools and resources required in addition to the standard tools supplied:
  - lifting sling
  - engine hoist
  - copper hide hammer
  - aluminium drift
  - a set of drifts
  - lubricating oil
  - cleaning equipment
  - pry bars
  - drip trays
  - receptacle for collecting and temporary storage of hydraulic oil waste
  - spill kit
  - hydraulic system oil (depending on the machinery used)
  - parts for refitting the hydraulic cylinder eg securing devices
  - PPE
  - service manual.
- *Risk assessment template (Figure 1).*
- *Job card template (Figure 2).*
- Computer for completing template digitally (**no** internet access).
- Camera equipment for assessor.

3b) Repair a double-acting hydraulic cylinder

Assessor guidance

- **For safety reasons, sub task 3b is undertaken on a separate hydraulic cylinder to the one removed and refitted in sub task 3a.**
- Candidates must carry out the task independently, under controlled conditions.
- Candidates must be given a copy of the relevant service manual.
- Machinery to be set-up for each candidate as described in the resources section below.
- Internet access is **not** permitted for this task.
- The time allocated for this task is **3 hours:**
    - the timing allows for questioning during the assessment.
- Ratio of candidates to assessor:
    - up to 3:1 depending on availability of machinery, equipment and workspace

Additional evidence

Assessor observation

- Detailed, accurate and differentiating notes must be captured on the Assessor Observation form:
    - repair and reseal a double-acting hydraulic cylinder:
        - working safely
        - selection and use of tools and equipment
        - prepare the work area
        - sequence of work:
            - strip and inspect the hydraulic cylinder (and its parts)
            - repair and reseal the hydraulic cylinder.
        - appropriate classification and disposal of waste.

Photo/video evidence

- This task must be photographed by the assessor to support the marking and moderation process, as a minimum:
    - strip and inspect the hydraulic cylinder: stripped cylinder **before** repair.

Question and answer session

- Assessors should ask all the questions as provided at the natural point during and/or at the end of the assessment, ensuring it is safe to do so.
- Assessors must make notes of responses from the questioning on the Assessor Observation form.
- Assessors must make an audio recording of the responses for moderation purposes.
- Questions:
    - What would influence whether to replace or repair individual parts?
    - What is cavitation in a hydraulic system?
        - What causes it?

Resources

- Double-acting hydraulic cylinder and selection of seal kits per candidate (separate hydraulic cylinder from the machine in 3a):

    - The hydraulic cylinder must have a fault such as damaged seal or rod which is resulting in an oil leak; parts for repair to be available.
- Suitable workshop with access to appropriate tools and equipment as listed in the specification eg selection of spanners, sockets, measuring equipment etc.
- Additional/specialist tools and resources required in addition to the standard tools supplied:
    - lubricating oil
    - work bench with vice
    - appropriate C spanner
    - cleaning equipment
    - drip trays
    - receptacle for collecting and temporary storage of hydraulic oil waste
    - spill kit
    - hydraulic cylinder service kit
    - PPE
    - service manual.
- *Risk assessment template (Figure 1).*
- *Job card template (Figure 2).*
- Computer for completing template digitally (**no** internet access).
- Camera and audio recording equipment for assessor.

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

4a) Prepare for a customer handover

Assessor guidance

- **Sub tasks 4b and 4c must not be given to the candidate until sub task 4a is completed.**
- Candidates must carry out the task independently, under controlled conditions.
- Candidates must be given a copy of the relevant service manual, operation and maintenance requirements, and warranty conditions of the vehicle.
- Internet access is **not** permitted for this task.
- The time allocated for this task is **3 hours.**
- Ratio of candidates to assessor:
    - group invigilation

Additional evidence

Assessor observation

- n/a

Photo/video evidence

- n/a

Question and answer session

- n/a

Resources

- Computer with software for producing the notes digitally (**no** internet access).
- New or second-hand highway-compliant all-terrain/utility vehicle.
- Operator handbook.
- Service manual.
- Maintenance requirements.
- Warranty conditions.

4b) Pre delivery inspection

Assessor guidance

- **Sub task 4c must not be given to the candidate until sub task 4b is completed.**
- Candidates must carry out the task independently, under controlled conditions.
- Vehicle to be set-up for each candidate as described in the resources section below.
- Candidates can start the vehicle as part of this sub task.
- Candidates must be given a copy of their notes from sub task 4a (for reference only).
- Internet access is **not** permitted for this task.
- The time allocated for this task is **3 hours.**
- Ratio of candidates to assessor:
    - up to 4:1 depending on availability of machinery, equipment and workspace

Additional evidence

Assessor observation

- Detailed, accurate and differentiating notes must be captured on the Assessor Observation form:
    - working safely
    - selection and use of tools and equipment
    - preparation of the work area and vehicle to be worked on
    - carry out checks and adjustments as stipulated in the PDI checklist
    - identification of faults and undertake adjustments to comply with manufacturer's specifications.

Photo/video evidence

- This task must be photographed by the assessor to support the marking and moderation process, as a minimum:
    - using the torque wrench – showing hand, wrench and wheel
    - the torque wrench setting and manufacturer's specification.

Question and answer session

- n/a

Resources

- The same highway-compliant all-terrain/utility vehicle as sub task 4a with low pressure in one tyre and a loose wheel nut.
- Suitable workshop with access to appropriate tools and equipment as listed in the specification eg selection of spanners, sockets, measuring equipment etc.
- Additional/specialist tools and resources required in addition to the standard tools supplied:
    - hydraulic jack
    - axle stands
    - wheel chocks
    - hydrometer/ refractometer
    - torque wrench
    - degreaser (eg brake cleaner)
    - cleaning equipment

    - drip trays
    - spill kit
    - grease
    - engine oil
    - transmission oil
    - fluids
    - compressed air facilities
    - electronic diagnostic tool
    - PPE
    - operator handbook
    - service manual.
- *Risk assessment template (Figure 1).*
- *Pre delivery inspection checklist template (Figure 3).*
- Computer for completing templates digitally (**no** internet access).
- Camera equipment for assessor.
- Candidates must be given a copy of their notes from sub task 4a (for reference only).

4c) Customer handover

Assessor guidance

- Candidates must carry out the task independently, under controlled conditions.
- Sub task 4c must be undertaken in a farm workshop setting.
- The assessor acts as the machinery operator at the customer (Guild Hire Ltd).
- Any rectifications to the vehicle must be made by the assessor prior to this task commencing.
- Candidates must be given a copy of their notes from sub task 4a and a copy of their pre delivery inspection record from sub task 4b (for reference only).
- Internet access is **not** permitted for this task.
- The time allocated for this task is **1 hour:**
    - risk assessment: 15 minutes
    - handover: 45 minutes
    - the timing allows for questioning during the assessment.
- Ratio of candidates to assessor:
    - risk assessment: group invigilation
    - handover to customer (assessor): 1:1

Additional evidence

Assessor observation

- Detailed, accurate and differentiating notes must be captured on the Assessor Observation form:
    - working safely
    - explaining the vehicle and covering all the points on the handover checklist
        - how to operate the vehicle (no practical demonstration/starting required)
        - the safety procedures and features
        - explaining the vehicle's highway compliance
        - the importance of the operator handbook
        - the meaning of warning and safety symbols in the operator handbook and on the equipment
        - maintenance and warranty requirements
        - the importance of serial numbers.

Photo/video evidence

- n/a (see below for audio recording of the question and answers)

Question and answer session

- Assessors should ask questions as provided at the natural point during and/or at the end of the assessment, ensuring it is safe to do so.
- Assessors must make notes of responses from the questioning on the Assessor Observation form.
- Assessors must make an audio recording of the responses for moderation purposes.
- The assessor acts as the customer and asks the questions as though they are the operator (customer):
    - Where could I get a training course for this vehicle?
    - What are the legal requirements to drive this on the highway?

Resources

- The same highway-compliant all-terrain/utility vehicle as in sub tasks 4a and 4b, with the rectifications made by the assessor following sub task 4b if they haven't already been made by the candidate.
- Operator handbook.
- Service manual.
- *Risk assessment template (Figure 1).*
- *Handover checklist template (Figure 4).*
- Computer for completing Risk assessment template digitally (**no** internet access).
- Audio recording equipment for assessor.
- Candidates must be given a copy of their notes from sub task 4a and a copy of their pre delivery inspection record from sub task 4b (for reference only).

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.

Candidates 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.

Conditions of assessment

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

Controlled conditions

- Candidates 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.
- Candidates must not share or discuss their work with other candidates.
- Candidates 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.

Candidates must:

- safely prepare and complete out of season storage tasks for a 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' specification
    - complete a job card using the *Job card template (Figure 2)* provided by the assessor
    - classify and dispose of waste appropriately.

Conditions of assessment

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

Controlled conditions

- Candidates 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.
- Candidates must not share or discuss their work with other candidates.
- Candidates 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.

Candidates 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 work area and the tractor
  - 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.

Conditions of assessment

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

Controlled conditions

- Candidates 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.
- Candidates must not share or discuss their work with other candidates.
- Candidates 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
- 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.

Candidates must:

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

- the assessor will tell the candidate 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 the candidate has 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.

Conditions of assessment

- The time allocated for this task is **3 hours**:
    i) 1 hour
    ii) 2 hours.
- Candidates must carry out the task on their 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

- Candidates 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.
- Candidates must not share or discuss their work with other candidates.
- Candidates 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.

Candidates 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.

Conditions of assessment

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

Controlled conditions

- Candidates 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.
- Candidates must not share or discuss their work with other candidates.
- Candidates 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

The candidate has been given a double-acting hydraulic cylinder to repair.

Candidates 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.

Conditions of assessment

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

Controlled conditions

- Candidates 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.
- Candidates must not share or discuss their work with other candidates.
- Candidates 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.

Candidates must:

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

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

Conditions of assessment

- The time allocated for this task is **3 hours.**
- Candidates must carry out the task on their own, under **controlled conditions.**
- Candidates 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

- Candidates 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.
- Candidates must not share or discuss their work with other candidates.
- Candidates 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).

Candidates must:

- complete a risk assessment for the inspection using the *Risk assessment template (Figure 1)* provided by the assessor
- safely undertake 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.

Conditions of assessment

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

Controlled conditions

- Candidates 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.
- Candidates must not share or discuss their work with other candidates.
- Candidates 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.

Candidates 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 handbook
    - the meaning of warning and safety symbols in the operator 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.

Conditions of assessment

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

Controlled conditions

- Candidates 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.
- Candidates must not share or discuss their work with other candidates.
- Candidates are not permitted to bring any additional materials into the assessment session.

What must be produced for marking

- Risk assessment
- Handover checklist

Additional evidence for this task

- Assessor observation
- Responses to questions, including audio recording

5. Centre guidance

Guidance provided in this document supports the administration of this assessment.

The following documents, available on the City & Guilds website, provide essential generic guidance for centres delivering T Level technical qualifications and **must** be referred to alongside this guidance:

- *T level technical qualifications – marking*
- *T level technical qualifications – moderation (updated annually)*
- *T level technical qualifications – teaching, learning and assessment.*

This assessment is designed to require the candidate to make use of their core knowledge, understanding and the practical skills they have built up over the course of their learning to tackle tasks/problems/challenges.

This approach to assessment emphasises to candidates the importance and applicability of the full range of their learning to practice in their industry area and supports them in learning to take responsibility for transferring their knowledge, understanding and skills to the practical situation, fostering independence, autonomy and confidence.

Candidates are provided with an assignment brief. They then have to draw on their knowledge and skills and independently select the correct processes, tools, equipment, materials and approaches to take, to complete the brief.

During the learning programme, it is expected that tutors will have taken the opportunity to set shorter, formative tasks that allow candidates to be supported to independently use the learning they have so far covered, drawing this together in a similar way, so they are familiar with the format, conditions and expectations of the assessment.

Candidates should be made aware during learning what the assessment themes are and how they are implemented in marking the assignment, so they will understand the level of performance that will achieve them high marks.

Candidates should not be entered for the assessment until the end of the course of learning for the qualification, so they are in a position to complete the assignment successfully.

Health and safety

Candidates must not be entered for assessment without being clear of the importance of working safely and having attended sufficient practical training to be able to work safely. The assessor must immediately stop an assessment if a candidate works unsafely. At the discretion of the assessor, depending on the severity of the incident, the candidate may be given a warning. If they continue to work unsafely, risking the safety of themselves or others, their assessment must be ended for that specific task. Candidates are permitted to progress to the other tasks/sub tasks in the assessment. The candidates will only be awarded marks based on the evidence they produced within the task and any subsequent tasks which link to the assessment theme. If a candidate does not gain enough marks from other tasks then the candidate will have the opportunity to retake another version of the Occupational Specialism (OS) assessment in a future series. Any warnings issued to a candidate must be considered as part of the marking process and recorded on the candidate record form (CRF). Any actions that have led to that warning must be detailed on the CRF so they can be considered along with the other evidence when applying the descriptors in the mark scheme.

Compliance with timings

Due to the nature of this assessment, the maximum time allowances provided must be adhered to. They refer directly to assessment time, not any additional setting up times the centre needs to create an appropriate assessment environment.

It is the centre's responsibility to plan sufficient assessment sessions as stated in each of the tasks, under the appropriate conditions, within the assignment window, to allow candidates the opportunity to compete the assessment tasks.

Where candidates are required to plan their work, they should have their plans confirmed for appropriateness in relation to the time allocated for each task, to ensure their planning has not left them with too short a time to complete the tasks safely. Any planning that is not appropriate must be recorded on the candidate record form (CRF) as part of the marking process.

Candidates should be allowed sufficient time to fully demonstrate the range of their skills, however this also needs to be reasonable and practicable. Candidates should be allowed to overrun their own planned timings in order for evidence of a range of their skills to be captured. If, however, the time required exceeds the maximum time allowance for the task, the centre must stop the assessment and base the marking on the evidence up to that point.

Any guidance or feedback relating to timings/planning should follow the guidance provided in the section *Guidance and feedback* below.

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.

Assessor candidate ratios

The number of candidates an assessor will be able to observe at one time will vary depending on local conditions relating to:

- monitoring and maintaining safety during assessment
    - any specific hazards related to the task that pose a risk of harm in relation to the competence of the learners
    - availability of supervisory staff to support the assessor.
- the practicalities of collecting evidence
    - the complexity of evidence collection for the task
    - whether there are any peak times where there is a lot of evidence to collect that will need additional support or any that are quieter which may be eased through staggered starts etc.
    - local conditions eg
        - layout of the assessment environment and sufficient assessor line of sight to task activity throughout the assessment period
        - amount of additional support available (eg to capture image/video evidence)
        - availability of suitable workspaces/bays or of shared resources and equipment.

Centres are advised to trial the planned arrangements during formative assessment, reviewing the quality of evidence captured and manageability. It is expected that for straight forward observations, with favourable local conditions and support, (and unless otherwise specified) no more than six candidates will be observed by a single assessor at one time, and the number will usually be fewer than this maximum. The key factors to consider are the logistics of collecting sufficient evidence and remain working safely in the assessment environment. A timetable of assessments and layout of the workspaces, detailing:

- the candidates being assessed at each workstation,
- the assessor(s) and
- support staff present

must be available for the moderator on request.

Observation evidence

Observation notes form part of the candidate's evidence and must capture evidence of candidate performance during the practical tasks describing how well the activity has been carried out, rather than stating the steps/actions, the candidate has taken. The notes must be very descriptive and focus on the quality of the performance in relation to the quality indicators in the marking grid. They must provide sufficient, appropriate evidence that can be used by the assessor (and moderator) to mark the performance using the marking grid. These descriptions will be used, along with eg photo and video evidence to choose the relevant marking band and mark within the band so that candidates can be reliably and validly differentiated based on their performance. Evidence captured in the observation form must give the necessary information to enable the final assessment of the task at a later date. This is to allow a holistic judgement to be carried out after all evidence for the task is available, at which point full consideration of how the candidate has applied both their skills and their knowledge during the practical can be given.

Identifying what it is about the performances that is different between candidates can clarify the qualities that are important to record. Each candidate is likely to carry out the same steps, so a checklist of this information would not help differentiate between them. However, qualitative comments on how well they do it, and quantitative records of accuracy and tolerances would.

The assessor should refer to the marking grid to ensure appropriate aspects of performance are recorded. These notes will be used for marking and moderation purposes and so must be detailed, accurate and differentiating.

Assessors should refer to The *T Level technical qualifications guides on marking and moderation* and the *Guide Standard Exemplification Materials* to support with the collection of evidence through observation.

Assessors should ensure that any required additional supporting evidence including eg photos or video can be easily matched to the correct candidate, are clear, well-lit and show the areas of particular interest in sufficient detail and clarity for assessment (ie taken at appropriate points in production, showing accuracy of measurements where appropriate).

Assessor marking and justification is completed on a separate form (CRF) to differentiate this evidence from the judgement, since in some cases the observation form will provide evidence relating to the judgement for more than one assessment theme.

As far as possible candidates must not be distracted, or their performance affected by the process of observation and evidence collection.

The T Level technical qualifications guides on marking and moderation are essential guidance documents and are available on the City & Guilds website. These provide further information on preparing for assessment, evidence gathering, standardisation, marking and moderation, and must be referred to when planning and carrying out assessment.

Video and photo evidence in T Level Technical qualifications

The assessment materials for each assignment identify the minimum candidate and assessor evidence requirements to support marking and moderation. Where ephemeral evidence (eg areas of candidate performance that may be hard to capture with photos and assessor notes alone) plays a significant part of the practical assessment, City & Guilds will prescribe the type/capture where the use of video is necessary for practical assessment components (eg specifying exactly which elements of the practical must be videoed, or photographed), and any technical specifications for these forms of evidence (eg length of videos, maximum file sizes etc) will also be supplied. Photo and video evidence will be submitted along with the written candidate evidence and assessor evidence (AO forms) as described in the additional evidence section of the task.

If this is the case then the video evidence must meet these minimum requirements, in order to be considered by moderators:

- as per the guidance in section 2.3.2 of the *Marking and Moderation Guide for Centres*, assessors must ensure that this evidence can be easily matched to the correct candidate and task, is clearly shot, well-lit and shows the areas of particular interest in sufficient detail and clarity for assessment (ie filmed at appropriate points in production, showing accuracy of measurements where appropriate)
- the qualitative written evidence provided by assessors must
    - clearly identify the parts of the video that are being referred to, when used as supporting evidence. Using a timecode for this is recommended.
    - include their judgement on the performance being demonstrated.
- Section 6.5 of the *Centre Manual* also contains general information about the requirements for video evidence submission.

Please note that centres must ensure that video evidence is clear and meets the minimum requirements. The ability of the moderators to take this evidence into account may be impaired and delay the moderation process if the requirements are not met.

Minimum evidence requirements for marking and moderation

The sections in the assignment:

- **What must be produced for marking,** and
- **Additional evidence for this task**

These list the minimum requirements of evidence to be submitted for marking and the moderation sample.

Evidence produced during assessment above and beyond this may be submitted, as long as it provides useful information for marking and moderation and has been produced under appropriate conditions.

While technological methods which support the capturing or creating of evidence can be helpful, eg pin board style websites for creating mood boards, the final evidence must be converted to a suitable format for marking and moderation which cannot be lost/deleted or amended after the end of the assessment period (eg screen prints, pdf files). Considerations around tracking authenticity

and potential loss of material hosted on such platforms during assessment is the centre's responsibility.

Note: Combining candidates' individual pieces of evidence into single files or zip files may make evidence management during internal marking more efficient and will greatly simplify the uploading of the moderation sample.

Where the minimum requirements have not been submitted for the moderation sample by the final moderation deadline, or the quality of evidence is insufficient to make a judgement, the moderation, and therefore any subsequent adjustment, will be based on the evidence that has been submitted. Where this is insufficient to provide a mark on moderation, a mark of zero must be given.

File names for evidence

All electronic files submitted must be given a clear file name to support the moderation process, that allows the candidate work to be identified.

Evidence must have a file name that clearly indicates the content of the document including: City & Guilds enrolment number/candidate name/qualification number/task/type of evidence.

We strongly recommend the following file name convention style:

- XYZ1234_Firstname_Surname_0123-012_Task_1a_Assessor_observation_form
- XYZ1234_Firstname_Surname_0123-012_Task_1b_Written_report

Centres must include the candidate's name and enrolment number in the filename as above. This helps the moderator reconcile the evidence.

File names should be consistent throughout the cohort, with each candidate's evidence using the same file naming convention.

Preparation of candidates

Candidates should be aware of which aspects of their performance will give them good marks in assessment. This is best carried out through routinely pointing out good or poor performance during the learning period, and through formative assessment. Although candidates will not have access to the marking grids during the assessment, candidates should be made aware of what they need to do to achieve a pass or distinction by referring to and being formatively assessed against grade descriptors as part of their formal learning programme.

During the learning programme, direct tutor instruction in how to approach tasks through modelling, support, guidance and feedback are critical. However, gradual removal of this support is necessary in preparation for summative assessment. This supported approach is not valid for summative assessment.

The purpose of summative assessment is to confirm the standard the candidate has reached as a result of participating in the learning process. Candidates should be encouraged to do the best they can and be made aware of the difference between these summative assessments and any formative assessments they have been subject to. Candidates will not have access to the marking grids. Refer to the *T Level Technical qualifications – teaching, learning and assessment* centre guidance document, available on the City & Guilds website for further information on preparing candidates for Technical qualification assessment.

Guidance on assessment conditions

The assessment conditions that are in place for this assignment are to:

- ensure the rigour of the assessment process
- provide fairness for candidates
- give confidence in the outcome.

They can be thought of as the rules that ensure that all candidates who take an assessment are being treated fairly, equally and in a manner that ensures their result reflects their true ability.

Conditions outlined within the tasks in this assignment do not affect any formative assessment work that takes place, although it is advised that candidates are prepared for the conditions they will need to work under during summative assessment.

The evidence for the tasks that make up this assignment must be completed under the specified conditions. This is to ensure authenticity and prevent malpractice as well as to assess and record candidate performance for assessment in the practical tasks. It is the centre's responsibility to ensure that local administration and oversight gives the assessor sufficient confidence to be able to confirm the authenticity of the candidate's work.

Security and authentication of candidate work

Candidate evidence must be kept secure to prevent unsupervised access by the candidate or others. Where evidence is produced over a number of sessions, the assessor must ensure learners and others cannot access the evidence without supervision. This might include storing written work or artefacts in locked cupboards and collecting memory sticks of evidence produced electronically at the end of each session.

Candidates are required to sign declarations of authenticity, as is the assessor. The relevant form is included in this assignment pack and must be signed after the production of all evidence.

Where the candidate or assessor is unable to or does not confirm authenticity through signing the declaration form, the work will not be accepted at moderation and a mark of zero will be given. If any question of authenticity arises eg at moderation, the centre may be contacted for justification of authentication.

Accessibility and fairness

Where a candidate has special requirements, assessors should refer to the *Access arrangements and reasonable adjustments* section of the City & Guilds website.

Assessors can support access where necessary by providing clarification to any candidate on the requirements or timings of any aspect of this assignment. Assessors should not provide more guidance than the candidate needs as this may impact on the candidate's grade, see the guidance and feedback section below.

All candidates must be provided with an environment, time frame and resources that allows them reasonable access to the full range of marks available.

Where candidates have worked in groups to complete one or more tasks for this assessment, the assessor must ensure that no candidate is disadvantaged as a result of the performance of any other team member. If a team member is distracting or preventing another team member from fully demonstrating their skills or knowledge, the assessor must intervene.

Guidance and feedback

Guidance must only support access to the assignment brief and must not provide feedback for improvement. The level and frequency of clarification and guidance must be

- recorded fully on the candidate record form (CRF)
- taken into account along with the candidate's final evidence during marking
- made available for moderation.

Assessors must not provide feedback on the quality of the performance or how the quality of evidence can be improved. This would be classed as malpractice. However, this does not apply if the assessor asks questions as part of the assessment process. Such requirements will be specifically stated within task centre guidance.

Assessors should however provide general reminders to candidates throughout the assessment period to check their work thoroughly before submitting it, and to be sure that they are happy with their final evidence as it may not be worked on further after submission.

Candidates can rework any evidence that has been produced for each task during the time allowed.

Assessors should check and be aware of the candidates' plans to ensure management of time and resources is appropriate, and so any allowed intervention can take place at an appropriate time.

The information on the guidance given and captured on the CRF is part of the evidence that must be taken into account along with the other evidence for the task when marking. It is up to the assessor to decide if the guidance the candidate has required suggests they are lacking in any performance outcome and consider the severity of the issue when applying the marking criteria. The assessor must record where and how guidance has had an impact on the marks given, so this is available should queries arise at moderation or appeal.

What is, and is not, an appropriate level of guidance

- The assessor should intervene with caution if a candidate has taken a course of action that will result in them not being able to submit the full range of evidence for assessment. However, this should only take place once the assessor has prompted the candidate to check that they have covered all the requirements. Where the assessor has to be explicit as to what the issue is, this is likely to demonstrate a lack of understanding on the part of the candidate rather than a simple error, and full details should be recorded on the CRF.
- The assessor should not provide guidance if the candidate is thought to be able to correct the issue without it, and a prompt would suffice. In other words, only the minimum support the candidate actually needs should be given, since the more assessor guidance provided, the less of the candidate's own performance is being demonstrated and therefore the larger the impact on the marks awarded.
- The assessor must not provide guidance that the candidate's work is not at the required standard or how to improve their work. In this way, candidates are given the chance to identify and correct any errors on their own, providing valid evidence of knowledge and skills that will be credited during marking.
- The assessor must not produce any templates, pro-formas, work logs etc. If templates are provided by City & Guilds as part of the assignment, these should not be adapted but can be provided to candidates either electronically or on paper. Compliance with this requirement will be checked at moderation.

All specific prompts and details of the nature of any further guidance must be recorded on the relevant form and reviewed during marking and moderation.

6. Marking

Guidance on marking

Please refer to the *T Level Technical qualifications – marking and moderation* centre guidance documents for further information on gathering evidence suitable for marking and moderation, and on using the marking grid and forms.

The Candidate Record Form (CRF) is used to record:

- details of any guidance or the level of prompting the candidate has received during the assessment period
- rough notes bringing together relevant evidence from across tasks during marking
- summary justifications when holistically coming to an overall judgement of the mark for each assessment objective and overall
- if an assessment has to be stopped on the grounds of Health and Safety or if a candidate has been working in an unsafe manner.

The Assessor Observation form is used to record:

- descriptive information and evidence of candidate performance during an observation.

Carrying out marking using assessment themes

The process of marking each assessment theme is iterative and should follow the process below which will become more embedded over time as the descriptors become familiar. It is recommended to refer back to these frequently however, so the standard does not unintentionally drift over the marking period.

The indicative content gives an indication of the expected content parameters the responses are likely to cover, and which aspects of the evidence are relevant. It is not exhaustive, and an acceptable answer may concentrate more on depth rather than fully cover the range indicated or deviate into relevant topics not listed.

The specific task evidence listed within the assessor guide and marking grid must be used to make a judgement on performance in relation the specific assessment theme.

The assessment tasks guide the production of valid evidence under appropriate conditions for assessment. Candidate evidence from a range of tasks may contribute to the marking of a single assessment theme, or from a single task to more than one assessment theme. In this case different aspects of the evidence are being considered for each theme and need to be judged against the marking descriptors specified in the assessment themes independently of each other.

In some cases, the quality indicators looked for in the judgement may naturally be more strongly evidenced in one piece of evidence than another. For instance, more formulaic/prescriptive forms of evidence may not be able to generate evidence of higher levels of performance, so this evidence would need to be looked for in the other forms of evidence. This means that where a range of evidence is to be assessed, it should be treated as a single package of evidence for the purposes of marking even if generated through different tasks.

Timing of marking

As some assessment themes require the triangulation of a number of pieces of evidence, marking cannot take place until after all of these are available. This does not however mean that all marking

needs to take place after all candidates have completed the whole assessment. Assessors can start marking against an assessment theme once all contributing evidence has been collected for that assessment theme.

Also, it is possible to begin recording the notes that will justify the marking for some assessment themes as evidence is produced, with the final mark only being decided once the complete array of evidence is available. This is particularly the case if later evidence is more confirmatory, and the earlier evidence is sufficiently informative for the qualities being assessed to make this a useful exercise.

Through planning, it should be possible to identify any evidence that can start being reviewed earlier, and the assessment themes which could be scheduled for earlier completion of marking eg while observation evidence is fresh in the mind should this be helpful. Care must of course be taken to ensure any evidence required by candidates to progress with another task are available for that task to take place. In addition, a sense check must take place across marking for each assessment theme, and across assessors, at the end to ensure marking has not drifted during the period. This may take the form of comparing candidate work to check that the ranking of quality of evidence matches the ranking of marks – where there are discrepancies marking should be checked for accuracy. These checks should be the responsibility of the Internal Quality Assurer and undertaken as part of the centre's Internal Quality Assurance strategy.

Process for each assessment theme:

- Select the range of evidence relevant for making the judgement – this is indicated in the mark scheme for each assessment theme.
- Scan/read the candidate evidence, any notes on the CRF eg regarding level of support/guidance recorded, evidence captured by the assessor and the indicative content and band descriptors in the mark scheme.
    - Note: for any warnings given during the assessment, the actions that have led to that warning must be detailed on the CRF so they can be considered along with the other evidence when applying the descriptors in the mark scheme.
    - Note: the evidence contained on the CRF must be considered and a judgement made on the level of performance the candidate has independently demonstrated – this will vary depending on the level of support detailed on the CRF – ie consider all relevant evidence and then judge the appropriate mark following the process below.
- Make an initial assessment of the required evidence as a whole (acknowledging uneven performance across evidence), considering each band in turn and considering the level of performance described in the context of the knowledge and skills in the indicative content to make a balanced judgement of the best band to use as a starting point.
- Read the evidence and review it against the band descriptor in more detail,
    - deciding if the response is securely sitting within the band, ie all quality characteristics described by the band descriptor are seen, and strongly meets the level of performance described by the descriptor holistically (ie across the range of relevant evidence):
        - check the descriptor for the level above
        - if the evidence clearly shows some of the characteristics of the higher band, select a suitable mark at the bottom of that band
        - if *not* showing characteristics of the higher band revert to the original band, select a mark at the higher end of that mark range.
    - If the response is not securely in the band, but *is partially* showing the characteristics of the band,
        - check the descriptor of the level below

        - decide on a suitable mark either at the bottom of the original band as some characteristics shown, or top of the lower band if it better describes the quality of the characteristics being shown.
    - If the response is largely meeting the band, with only a few concerns, and is not showing characteristics aligning with the higher or lower bands, the appropriate mark is likely to be in the middle range.
    - If there is no alignment with the descriptor, reassess the starting band, and begin again.
- Based on the level of alignment with the descriptor, confirm the final mark within the band, bearing in mind that the available marks form an *evenly distributed scale*:
    - if the quality of response fully aligns with the performance described by the descriptor – assign a high mark within the band
    - if the quality of the response partially aligns with the performance described by the descriptor – assign a low to medium mark within the band
    - consider the quality compared to a range of similar responses (eg relevant annotated training material exemplars, responses reviewed during standardisation, and through experience) choose a mark on the point on the scale that would give an appropriate ranking for the assessed piece of evidence in relation to this information and in comparison with that of the rest of the cohort for that assessment theme.

7. Marking grids

There is a marking grid for each assessment theme that must be assessed within each Performance Outcome as part of this occupational specialism assessment.

Performance Outcome 2 – Maintain land-based machinery and equipment

Assessment theme – Maintenance preparation

Guidance for markers

The following evidence must be used to assess performance against this assessment theme, within the context of the performance outcome:

Task 1a:

- Risk assessment
- Assessor Observation form: assessor observation

Task 1b:

- Risk assessment
- Assessor Observation form: assessor observation

Note: where there is insufficient evidence to award a mark, a zero mark may be given.

Indicative content

Typical evidence for Task 1a may include:

Risk assessment

- Risk assessment completed, including the following:
  - identify hazards, risks and control measures, such as:
    - tools, equipment and machinery, slips, trips and falls, cuts and abrasions, manual handling, irritants, crushing and malfunction, work area suitable for jacking, dealing with a spillage (4WD axle), PPE, equipment/machinery fit for purpose, clean working environment.

- decide who might be harmed and how
- evaluate the risks and take action to prevent them
- record findings correctly on the form.

Assessor observation

- Select and prepare appropriate work area eg:
  - clean area
  - set a drip tray with absorbent granules
  - tools eg engineer's pliers, sockets, spanners
  - equipment eg jacking equipment, stands.
- Machinery prepared:
  - cleaned
  - immobilised eg key removed/battery disconnected.

Typical evidence for Task 1b may include:

Risk assessment

- Risk assessment completed, including the following:
  - identify hazards, risks and control measures such as:
    - tools, equipment and machinery, slips, trips and falls, cuts and abrasions, manual handling, irritants, crushing and malfunction, air-line, cleaning chemicals, PPE, equipment/machinery fit for purpose, clean working environment.
  - decide who might be harmed and how
  - evaluate the risks and take action to prevent them
  - record findings correctly on the form.

Assessor observation

- Select and prepare appropriate work area eg:
  - clean area
  - tools eg sockets, spanners, strap wrench
  - equipment eg hot wash and chemicals for cleaning.
- Machinery prepared:

- cleaned
- immobilised.

Assessment theme: Maintenance preparation	**Band 1 descriptor**	**Band 2 descriptor**	**Band 3 descriptor**	**Total marks per sub-theme**	**Total marks for assessment theme**
Marks per band	**1–3**	**4–6**	**7–9**	**n/a**	**9**
	Risk assessment covers a **limited** range of hazards and risks with limited control measures. Work area prepared with a **limited** range of workshop tools, equipment and consumables, resulting in inefficient working (almost completed the task/potential damage to machinery). **Basic** preparation of machinery/equipment resulting in machinery which is safe to work on with minimal safety controls applied.	Risk assessment covers a **good** range of hazards and risks with appropriate control measures. Work area prepared with a **good** range of workshop tools, equipment and consumables, resulting in acceptable efficiency of working (able to complete the task/not always the most appropriate tools). **Good** preparation of machinery/equipment resulting in machinery which is clean and safe to work on with	Risk assessment covers a **comprehensive** range of hazards and risks, with comprehensive control measures. Work area prepared with a **comprehensive** range of workshop tools, equipment and consumables, resulting in excellent efficiency of working (task completed using appropriate tools). **Comprehensive** preparation of machinery/equipment resulting in machinery which is clean and		

		good safety controls applied.	safe to work on, with comprehensive safety controls applied.		

Assessment theme – Information and factors influencing maintenance

Guidance for markers

The following evidence must be used to assess performance against this assessment theme, within the context of the performance outcome:

Task 1a:

- Assessor Observation form: assessor observation, responses to questions (with audio recording)
- Job card

Note: where there is insufficient evidence to award a mark, a zero mark may be given.

Indicative content

Typical evidence for Task 1a may include:

Assessor observation

- Clean and inspect condition of hub bearings, Universal joints and seals eg
  - wipe oil/grease off, checking for contaminants
  - check if seal compromised, any leaks (consequence of a worn seal).
- Assess the bearing preload as specified by the manufacturer.

Responses to questions

- What are the reasons for possible failures of bearings and seals? Influencing factors: Working and environmental conditions during operation, ingress of dirt/dust, lack of oil/grease, overloading, physical damage, excessive free play, incorrect lubrication specification, excessive or lost oil level, blocked axle breather.
- Why adjust a bearing? Remove free play, extend life, reduce risk of greater damage to the axle.
- State **three** observations that indicate a bearing requires replacement. Physical damage to race or bearing eg scoring, pitting, missing components, discolouration, damaged bearing cages, excessive noise, shaft it is supporting has excessive movement/vibration, oil leak due to damaged seal.

Job card

- Enters initial assessment on the job card eg assessment of the free play of the bearings, condition of the bearings and seals, diagnosis of faults to be rectified ('symptoms/diagnostic data' and 'diagnosis' fields).

Assessment theme: Information and factors influencing maintenance	**Band 1 descriptor**	**Band 2 descriptor**	**Band 3 descriptor**	**Total marks per sub-theme**	**Total marks for assessment theme**
Marks per band	**1–2**	**3–4**	**5–6**	**n/a**	**6**
	Limited assessment and recording of machinery/equipment for potential failure(s)/defect(s). **Limited** use of information and consideration of influencing factors to identify required maintenance activities resulting in missing relevant information/factors.	**Good** assessment and recording of machinery/equipment for potential failure(s)/defect(s). **Good** use of information and consideration of influencing factors to identify required maintenance activities resulting in a sound assessment based on relevant information/factors.	**Comprehensive** assessment and recording of machinery/equipment for potential failure(s)/defect(s). **Comprehensive** use of information and consideration of influencing factors to identify required maintenance activities resulting in a detailed assessment based on all relevant information/factors.		

Assessment theme – Carry out maintenance

Guidance for markers

The following evidence must be used to assess performance against this assessment theme, within the context of the performance outcome:

Task 1a:

- Assessor Observation form: assessor observation, responses to questions (with audio recording)
- Photo and video evidence
- Job card

Task 1b:

- Assessor Observation form: assessor observation
- Photo evidence
- Job card

Note: where there is insufficient evidence to award a mark, a zero mark may be given.

Indicative content

Typical evidence for Task 1a may include:

Assessor observation

- Maintains a clean work area and employs measures to avoid contamination.
- Safely jack and use axle stands (LOLER).
- Remove the wheel (note: 'clean and inspect' is in previous AT).
- Layout parts in logical order eg wheel, wheel nuts.
- Make adjustments to the hub bearing preload, safely and effectively using appropriate tools and equipment to meet the manufacturer's standards/settings.
- Verify conformity with manufacturer's settings: preload.
- Check and adjust, if necessary, the hub maximum swivel stops.

- Lubricate bearings as per manufacturer's specifications.
- Replace the wheel following manufacturer's specification, safely and effectively using appropriate tools and equipment eg torque setting.
- Appropriate classification and disposal of waste eg soil/dirt from the axle, lubricants, contaminated absorbent materials, used seals.

Photo and video evidence

- This task must be photographed by the assessor to support the marking and moderation process, as a minimum:
  - condition of bearings and seals: before and after candidate cleans and checks.
- This task must be videoed by the assessor to support the marking and moderation process, as a minimum:
  - candidate making adjustments to comply with service manual manufacturer's settings: candidate checking the preload (typically 2–3 minutes).

Responses to questions

- Why are nuts/studs torqued to the correct setting? To stop snapping or coming loose, to ensure threads are not damaged/stripped.
- Why is it important to replace locking devices? To ensure they work, old ones are weakened.

Job card

- Record information on job card eg machinery details, condition of bearing, work carried out, replaced parts, time taken.

Typical evidence for Task 1b may include:

Assessor observation

- Note: Preparation should be appropriate to the machinery and equipment provided.
- Protection of electronic components.
- Safe use of cleaning equipment eg water, air line, chemicals.
- Support machinery safely.
- Immobilise.
- Inspect machinery consistent with the manufacturer's procedure eg:
  - power unit

- drive unit
- filters, nozzles, pipes etc (crop sprayer)
- cutting devices (mower)
- body/frame
- safety devices.

- Prepare for storage consistent with the manufacturer's procedure eg:
  - mower: cleaning, safely and effectively applying protective coating using appropriate tools and equipment as required
  - crop sprayer: decontaminate, safely and effectively apply protective coating to bare metal using appropriate tools and equipment, take nozzles out and filters, drain pump, depressurise.
- Appropriate classification, collection and storage for disposal of waste materials eg waste fluid from the crop sprayer, excess coating.

Photo evidence

- This task must be photographed by the assessor to support the marking and moderation process, as a minimum:
  - applying protective coating
  - lubrication levels of mower or crop sprayer (if self-propelled)
  - replaced/serviced parts, if applicable eg blade on mower, filters on the sprayer
  - sprayer - keeping small parts safe (eg nozzles).

Job card

- Job card has machinery details and report on work done, recommendations for further work eg new cutting devices required in future, worn vibration mounts.

Assessment theme: Carry out maintenance	**Band 1 descriptor**	**Band 2 descriptor**	**Band 3 descriptor**	**Total marks per sub-theme**	**Total marks for assessment theme**
Marks per band	**1–4**	**5–8**	**9–12**	**n/a**	**12**
	Workshop tools and equipment used safely, but with **limited**	Workshop tools and equipment used safely. **Good** effectiveness	Workshop tools and equipment used safely. **Excellent**		

	effectiveness and avoidance of component contamination when removing and replacing service items. Results in inefficient working (almost completed the maintenance/potential contamination/damage to machinery). **Limited** compliance with the manufacturer's procedure and appropriate disposal of waste, resulting in incomplete maintenance task. **Limited** range of checks are completed against specification to return to work/storage, including calibration as required. **Basic** record keeping with several technical inaccuracies/missing relevant information.	and avoidance of component contamination when removing and replacing service items. Results in acceptable efficiency of working (able to complete the maintenance/not always the most appropriate tools). **Good** compliance with the manufacturer's procedure and appropriate disposal of waste, resulting in completion of maintenance task to an acceptable standard, with some omissions. **Good** range of checks are completed against specification to return to work/storage, including calibration as required. **Good** record keeping which is detailed and mostly technically accurate.	effectiveness and avoidance of component contamination when removing and replacing service items. Results in excellent efficiency of working (maintenance completed using appropriate tools). **Comprehensive** compliance with the manufacturer's procedure and appropriate disposal of waste, resulting in completion of maintenance task to an excellent standard with no omissions. **Comprehensive** range of checks are completed against specification to return to work/storage, including calibration as required. **Comprehensive** record keeping which is highly detailed and technically accurate.		

Performance Outcome 3 – Repair land-based machinery and equipment

Assessment theme – Information and factors influencing repairs

Guidance for markers

The following evidence must be used to assess performance against this assessment theme, within the context of the performance outcome:

Task 3b:

- Assessor Observation form: assessor observation, response to question (with audio recording)
- Job card

Note: where there is insufficient evidence to award a mark, a zero mark may be given.

Indicative content

Typical evidence for Task 3b may include:

Assessor observation

- Inspect the condition of the stripped hydraulic cylinder eg check if seal compromised, checking for contaminants.
- Enter machinery details and initial assessment on the job card.

Response to question

- What would influence whether to replace or repair individual parts? Eg depends on how quickly need the machinery working, possibility of a temporary fix, economics (costs of materials and labour), warranty requirements, parts availability, internally damaged hydraulic cylinder barrels are not repairable necessitating change.

Job card

- Job card completed eg a report on the condition of the hydraulic cylinder **including possible causes** for any faults found, such as the operating conditions of machinery.

Assessment theme: Information and factors influencing repairs	**Band 1 descriptor**	**Band 2 descriptor**	**Band 3 descriptor**	**Total marks per sub-theme**	**Total marks for assessment theme**
Marks per band	**1–3**	**4–6**	**7–9**	**n/a**	**9**
	Limited consideration of factors influencing repair requirements. **Limited** use of information to identify a cause of component failure and identify a suitable repair; some information is not relevant. Limited potential cause(s) identified, resulting in limited rectification of cause(s). **Limited** understanding of warranty/legal/ regulatory implications on components (what can be repaired and what must be replaced), resulting in consideration of basic implications.	**Good** consideration of factors influencing repair requirements. **Good** use of relevant information to identify potential cause(s) of component failure and identify suitable repair option(s), resulting in rectification of main cause(s). **Good** understanding of warranty/legal/ regulatory implications on components (what can be repaired and what must be replaced), resulting in consideration of most implications.	**Comprehensive** consideration of factors influencing repair requirements. **Excellent** use of relevant information to identify potential causes of component failure and identify appropriate repair(s), resulting in comprehensive rectification of cause(s). **Excellent** understanding of warranty/legal/ regulatory implications on components (what can be repaired and what must be replaced), resulting in comprehensive consideration of implications.		

Assessment theme – Repair processes

Guidance for markers

This assessment theme is split into sub-themes. The following evidence must be used to assess performance against this assessment theme, within the context of the performance outcome:

Sub-theme: Dismantle machinery and equipment
Task 3a:

- Risk assessment
- Assessor Observation form: assessor observation
- Photo evidence

Task 3b:

- Risk assessment
- Assessor Observation form: assessor observation

Sub-theme: Component repair methods
Task 3b:

- Assessor Observation form: assessor observation
- Photo evidence

Sub-theme: Reassemble machinery and equipment
Task 3a:

- Assessor Observation form: assessor observation
- Job card

Task 3b:

- Assessor Observation form: assessor observation, response to question (with audio recording)

Note: where there is insufficient evidence to award a mark, a zero mark may be given.

Indicative content: Sub-theme: Dismantle machinery and equipment

Typical evidence for Task 3a may include:

Risk assessment

- Risk assessment completed, including the following:
  - identify hazards, risks and control measures such as:
    - tools, equipment and machinery, slips, trips and falls, cuts and abrasions, manual handling, irritants, burns, flying debris, entanglement in moving parts, crushing and malfunction, work area suitable for jacking, high pressure hot oil, dealing with a spillage, PPE, equipment/machinery fit for purpose, clean working environment.
  - decide who might be harmed and how
  - evaluate the risks and take action to prevent them
  - record findings correctly on the form.

Assessor observation

- Select suitable workshop tools and equipment, prepare the work area eg:
  - something to minimise oil spillage eg drip tray, absorbent granules, absorbent cloth
  - spanners, sockets, hammer, punches, engineer's pliers.
- Immobilise the machine eg remove key/isolate battery, using axle stands/props.
- Safely release stored energy.
- Safely and efficiently remove the correct hydraulic cylinder using appropriate tools, equipment and techniques: sequence of work: check system pressure has been released, disconnect one ram fixing, capturing the oil, logical order of work.

Photo evidence

- This task must be photographed by the assessor to support the marking and moderation process, as a minimum:
  - part a) preparation and immobilisation of the machinery: the machinery once prepared and immobilised.

Typical evidence for Task 3b may include:

Risk assessment

- Risk assessment completed, including the following:

- identify hazards, risks and control measures such as:
  - tools, equipment and machinery, slips, trips and falls, cuts and abrasions, manual handling, irritants, burns, flying debris, entanglement in moving parts, crushing and malfunction, high pressure hot oil, dealing with a spillage, PPE, equipment/machinery fit for purpose, clean working environment.
- decide who might be harmed and how
- evaluate the risks and take action to prevent them
- record findings correctly on the form.

Assessor observation

- Select suitable tools and equipment, prepare the work area eg:
  - something to minimise oil spillage eg drip tray, absorbent granules or absorbent cloth
  - spanners, sockets, hammer, punches, engineer's pliers, C spanner, chisel, chain wrench/strap, pipe wrench.
- Safely and efficiently disassemble the hydraulic cylinder using appropriate tools, equipment and techniques; logical sequence of work: drain and collect as much hydraulic fluid as possible before remove cylinder cap (manipulating the rod to assist this if possible), remove the cap, drain and collect the rest of the hydraulic fluid, remove cylinder rod and piston, clean parts.

Assessment theme: Repair processes	**Band 1 descriptor**	**Band 2 descriptor**	**Band 3 descriptor**	**Total marks per sub-theme**	**Total marks for assessment theme**
Marks per band	**1–4**	**5–8**	**9–12**	**12**	**36**
Sub-theme: Dismantle machinery and equipment	Risk assessment covers a **limited** range of hazards and risks with limited control measures. **Limited** selection and use of resources, tools and techniques to safely dismantle	Risk assessment covers a **good** range of hazards and risks, with good control measures. **Good** selection and use of appropriate resources, tools and techniques to safely dismantle	Risk assessment covers a **comprehensive** range of hazards and risks, with comprehensive control measures. **Excellent** selection and use of appropriate		

	component(s), resulting in inefficient working (almost completed the dismantling/potential damage to machinery). **Limited** knowledge and understanding applied when removing component(s), resulting in significant damage/wastage. **Limited** cleaning of the components(s), resulting in significant potential contamination/ additional damage.	component(s), resulting in acceptable efficiency of working (able to complete the dismantling/not always the most appropriate tools). **Good** knowledge and understanding applied when removing component(s), resulting in minimal damage/wastage. **Good** cleaning of the components(s), resulting in minimal potential contamination/ additional damage.	resources, tools and techniques to safely dismantle component(s), resulting in excellent efficiency of working (dismantling completed using appropriate tools). **Excellent** knowledge and understanding applied when removing component(s), resulting in no damage/wastage. **Comprehensive** cleaning of the components(s), resulting in no potential contamination/ additional damage.		

Indicative content **Sub-theme: Component repair methods**

Typical evidence for Task 3b may include:

Assessor observation

- Sequence task: identify component, inspect, fault identified, rectify, rebuild, confirm to standard.
- Strip and inspect the hydraulic cylinder eg demonstrate physical dexterity with appropriate force.
- Select appropriate parts and materials eg seals, piston rod, end bushes, cylinder housing.
- Safely and effectively repair and reseal the hydraulic cylinder as required (using appropriate tools, equipment and techniques) eg
  - replace rods and/or seal(s) (piston and cap) as required
  - seal fitting protection devices
  - reassemble, test for operation.
- Appropriate classification and disposal of waste eg fluids, contaminated absorbent materials, used parts and seals.

Photo evidence

- This task must be photographed by the assessor to support the marking and moderation process, as a minimum:
  - part b) strip and inspect the hydraulic cylinder: stripped cylinder **before** repair.

Assessment theme: Repair processes	**Band 1 descriptor**	**Band 2 descriptor**	**Band 3 descriptor**	**Total marks per sub-theme**	**Total marks for assessment theme**
Marks per band	**1–4**	**5–8**	**9–12**	**12**	**36**
Sub-theme: Component repair methods	Workshop tools and equipment used safely but with **limited** effectiveness when repairing component(s), resulting in inefficient working (almost	Workshop tools and equipment used safely with **good** effectiveness when repairing component(s), resulting in acceptable efficiency	Workshop tools and equipment used safely with **excellent** effectiveness when repairing component(s), resulting in excellent efficiency of working		

	completed the repair/damage to machinery). **Limited** knowledge and understanding applied in disassembly and inspection, resulting in error/omission in fault identification. **Limited** knowledge and understanding applied in selecting parts/material(s) appropriate to the repair/refurbishment. **Limited** knowledge and understanding applied in component repair/refurbishment technique(s), sequencing and re-assembly, resulting in an acceptable component.	of working (able to complete the repair/not always the most appropriate tools). **Good** knowledge and understanding applied in disassembly and inspection, resulting in sound fault identification. **Good** knowledge and understanding applied in selecting parts/material(s) appropriate to the repair/refurbishment. **Good** knowledge and understanding applied in component repair/refurbishment technique(s), sequencing and re-assembly, resulting in a good component.	(repair completed using appropriate tools). **Excellent** knowledge and understanding applied in disassembly and inspection, resulting in comprehensive fault identification. **Excellent** knowledge and understanding applied in selecting parts/material(s) appropriate to the repair/refurbishment. **Excellent** knowledge and understanding applied in component repair/refurbishment technique(s), sequencing and re-assembly, resulting in a precise component.		

Indicative content **Sub-theme: Reassemble machinery and equipment**

Typical evidence for Task 3a may include:

Assessor observation

- Safely and efficiently refit the hydraulic cylinder on the machine using appropriate tools/equipment, technique and procedure:
  - attachment points are correct
  - careful not to cross-thread fittings
  - demonstrate physical dexterity with appropriate force
  - remove jacks/supports used.
- Verify the functionality of the hydraulic cylinder is correct once refitted to the machine (assessor must confirm the connection prior to the candidate checking the functionality) eg:
  - smoothness and speed of operation, observation for leaks
  - recheck hydraulic system fluid level; top up if required.

Job card

- Information on job card eg work carried out, time taken, consumables used (eg roll pin, split pin, linch pin, sealing washers).

Typical evidence for Task 3b may include:

Response to question

- What is cavitation in a hydraulic system? Noise/knocking when operating, slow or juddery movement.
  - What causes it? Air trapped in the oil, lack of oil, air ingress on suction side of hydraulic pump, partially blocked suction filter.

Assessment theme: Repair processes	**Band 1 descriptor**	**Band 2 descriptor**	**Band 3 descriptor**	**Total marks per sub-theme**	**Total marks for assessment theme**
Marks per band	**1–4**	**5–8**	**9–12**	**12**	**36**

Sub-theme: Reassemble machinery and equipment	**Limited** use of tools, techniques and procedure to safely reassemble machinery/equipment, resulting in inefficient working (almost completed the task/potential damage to machinery). **Limited** dexterity resulting in inefficient reassembly/significant potential damage to machinery. **Basic** record keeping with several technical inaccuracies/missing relevant information. **Limited** application of/verification against manufacturer's specification during reassembly.	**Good** use of calibrated tools, techniques and procedure to safely reassemble machinery/equipment, resulting in acceptable efficiency of working (able to complete the task/not always the most appropriate tools). **Good** dexterity resulting in acceptable efficiency of reassembly/minimal potential damage to machinery. **Good** record keeping which is detailed and mostly technically accurate. **Good** application of/verification against manufacturer's specification during reassembly.	**Excellent** use of calibrated tools, techniques and procedure to safely reassemble machinery/equipment, resulting in excellent efficiency of working (task completed using appropriate tools). **Excellent** dexterity resulting in excellent efficiency during reassembly/no potential damage to machinery. **Comprehensive** record keeping which is highly detailed and technically accurate. **Precise** application of/verification against manufacturer's specification during reassembly.		

Performance Outcome 4 – Diagnose land-based machinery and equipment faults

Assessment theme – Preparation for diagnosis

Guidance for markers

The following evidence must be used to assess performance against this assessment theme, within the context of the performance outcome:

Task 2a:

- Risk assessment
- Assessor Observation form: assessor observation
- Job card

Task 2b:

- Risk assessment
- Assessor Observation form: assessor observation
- Photo evidence
- Job card

Note: where there is insufficient evidence to award a mark, a zero mark may be given.

Indicative content

Typical evidence for Task 2a may include:

Risk assessment

- Risk assessment completed, including the following:
  - identify hazards, risks and control measures such as:
    - tools, equipment and machinery, slips, trips and falls, cuts and abrasions, manual handling, irritants, burns, entanglement in moving parts, crushing and malfunction, work area suitable for jacking, noise, high pressure hot oil, dealing with a spillage, ejection (eg oil escaping, components failing), hydraulic fluid injection, contamination of

environment (eg soil, concrete, water), inhalation of fumes, fume extraction system, PPE, equipment/machinery fit for purpose, clean working environment.
    - decide who might be harmed and how
    - evaluate the risks and take action to prevent them
    - record findings correctly on the form.

Assessor observation

- Uses information to identify the appropriate diagnostic: pressure and flow test.
- Selects and prepares appropriate tools, equipment and work area eg:
    - clean area
    - set a drip tray and absorbent granules
    - workshop tools eg spanners, screwdrivers
    - pressure and flow testing equipment with relevant connection pipes and fittings
    - consumables.
- Machinery preparation:
    - key removed (during checking and preparation), out of gear, handbrake on
    - check oil level to ensure sufficient oil in the hydraulic system
    - visual check of the oil condition to ensure suitable for the test.

Job card

- Noted that the oil is serviceable and the correct level.

Typical evidence for Task 2b may include:

Risk assessment

- Risk assessment completed, including the following:
    - identify hazards, risks and control measures such as:
        - tools, equipment and machinery, slips, trips and falls, cuts and abrasions, manual handling, entanglement in moving parts, crushing and malfunction, noise, PPE, equipment/machinery fit for purpose, clean working environment.
    - decide who might be harmed and how
    - evaluate the risks and take action to prevent them

- record findings correctly on the form.

Assessor observation

- Uses information to identify the appropriate diagnostic: electronic diagnostic.
- Selects and prepares appropriate tools, equipment and work area eg:
  - workshop tools eg spanners, screwdrivers
  - electronic diagnostic tool with relevant diagnostic plugs and fittings
  - checking for a software update; update as required.
- Prepare work area.
- Machinery preparation:
  - key removed, out of gear, handbrake on.

Photo evidence

- This task must be photographed by the assessor to support the marking and moderation process, as a minimum:
  - selection of the appropriate test method and equipment in part i).

Job card

- Correctly completed.

Assessment theme: Preparation for diagnosis	**Band 1 descriptor**	**Band 2 descriptor**	**Band 3 descriptor**	**Total marks per sub-theme**	**Total marks for assessment theme**
Marks per band	**1–4**	**5–8**	**9–12**	**n/a**	**12**
	Risk assessment covers a **limited** range of hazards and risks, with limited control measures.	Risk assessment covers a **good** range of hazards and risks, with good control measures.	Risk assessment covers a **comprehensive** range of hazards and risks, with		

	Limited gathering/use of information to identify approach to diagnostic activity; may not be fully appropriate to the situation. **Limited** work area preparation with diagnostic tools and equipment/software, resulting in limited anticipation of potential needs. **Basic** preparation of machinery/equipment, resulting in machinery which is safe to work on with minimal safety controls applied.	**Good** gathering/use of appropriate information to identify approach to diagnostic activity; may not be the most effective approach. **Good** work area preparation with calibrated diagnostic tools and equipment/software, resulting in good anticipation of potential needs. **Good** preparation of machinery/equipment, resulting in machinery which is clean and safe to work on with good safety controls applied.	comprehensive control measures. **Comprehensive** gathering/use of appropriate information to identify approach to diagnostic activity; most effective approach selected. **Comprehensive** work area preparation with calibrated diagnostic tools and equipment/software, resulting in excellent anticipation of potential needs. **Comprehensive** preparation of machinery/equipment resulting in machinery which is clean and save and to work on, with comprehensive safety controls applied.		

Assessment theme – Carry out diagnosis

Guidance for markers

The following evidence must be used to assess performance against this assessment theme, within the context of the performance outcome:

Task 2a:

- Assessor Observation form: assessor observation, responses to questions (with audio recording)
- Photo and video evidence
- Job card

Task 2b:

- Assessor Observation form: assessor observation, responses to questions (with audio recording)
- Photo evidence
- Job card

Note: where there is insufficient evidence to award a mark, a zero mark may be given.

Indicative content

Typical evidence for Task 2a may include:

Assessor observation

- Safely undertake a pressure and flow test using appropriate equipment and techniques to verify whether the tractor's auxiliary hydraulic system is operating to the manufacturer's specification – sequence of work:
  - correct connection of hydraulic test equipment to the tractor and employs measures to avoid contamination
  - checking oil temperature
  - run engine at required speed
  - pressure and flow test undertaken according to manufacturer's procedures.

Photo and video evidence

- This task must be photographed by the assessor to support the marking and moderation process, as a minimum:
  - candidate connecting the tractor to the test equipment.
- This task must be videoed by the assessor to support the marking and moderation process, as a minimum:
  - undertaking the pressure and flow test: showing the readings during the test (typically 1 minute).

Responses to questions

- What could cause contamination during testing? Connection of pipes, cross contamination of oil (from pipes/hoses).
- Why is the temperature of the oil important for the test? So that it has the correct viscosity to give the correct pressure and flow readings.

Job card

- Record data and information on job card eg symptoms, details of test conditions (oil condition, oil temperature), data from diagnostic testing.

Typical evidence for Task 2b may include:

Assessor observation

- Safely undertake an electronic diagnostic using appropriate equipment and techniques to verify the fault – sequence of work:
  - carry out basic checks on the machine
  - checking for a software update; update as required
  - connect the diagnostic equipment
  - run the diagnostic test
  - record fault/diagnostic codes on the job card
  - clear fault/diagnostic codes
  - restart the vehicle, then retest to see if the fault has cleared/rectified (carry out relevant starting and stopping cycling; fault code priority)
  - read fault/diagnostic codes.

Photo evidence

- This task must be photographed by the assessor to support the marking and moderation process, as a minimum:
  - connection to test equipment: candidate connecting the machinery to the test equipment

- fault/diagnostic codes: the codes diagnosed on the test equipment.

Responses to questions

- Why is it important to ensure software is up to date? To make sure latest version of software and fixes are used.
- Why clear the fault/diagnostic codes and retest the vehicle? To confirm the fault is still occurring, confirm priority level of the fault code (may need to cycle the machine for a minor fault to register again).

Job card

- Record data and information on job card, including any issues found eg symptoms, test equipment software checked for updates, data from diagnostic testing, process followed.

Assessment theme: Carry out diagnosis	**Band 1 descriptor**	**Band 2 descriptor**	**Band 3 descriptor**	**Total marks per sub-theme**	**Total marks for assessment theme**
Marks per band	**1–4**	**5–8**	**9–12**	**n/a**	**12**
	Limited use of equipment/techniques to calibrate and test machinery/equipment, taking a limited range of samples if required. Applies **limited** precautions to prevent contamination affecting the results of the diagnostic process, resulting in a negative impact on	**Good** use of equipment/techniques to calibrate and test machinery/equipment, taking a good range of samples if required. Applies **adequate** precautions to prevent contamination affecting the results of the diagnostic process, ensuring minimal impact on the	**Excellent** use of equipment/techniques to calibrate and test machinery/equipment, taking a comprehensive range of samples if required. Applies **comprehensive** precautions to prevent contamination affecting the results of the diagnostic process, ensuring no impact on		

	the reliability of the results. **Limited** compliance with the diagnostic sequence and limited prioritisation of tasks when following manufacturer's diagnostic procedure, resulting in missing relevant information/data, gathering irrelevant information/data. **Basic** record keeping with several technical inaccuracies/missing relevant information.	reliability of the results. **Good** compliance with the diagnostic sequence and prioritises tasks when following manufacturer's diagnostic procedure, resulting in gathering an acceptable level of relevant information/data. **Good** record keeping which is detailed and mostly technically accurate.	the reliability of the results. **Comprehensive** compliance with the diagnostic sequence and prioritises tasks when following manufacturer's diagnostic procedure, resulting in gathering all relevant information/data. **Comprehensive** record keeping which is highly detailed and technically accurate.		

Assessment theme – Interpret information

Guidance for markers

The following evidence must be used to assess performance against this assessment theme, within the context of the performance outcome:

Task 2a:

- Job card
- Assessor Observation form: assessor observation, response to question (with audio recording)

Task 2b:

- Job card
- Assessor Observation form: assessor observation, response to question (with audio recording)

Note: where there is insufficient evidence to award a mark, a zero mark may be given.

Indicative content

Typical evidence for Task 2a may include:

Assessor observation

- Analyse and compare test data to the manufacturer's specification.

Response to question

- What would be the logical sequence of further actions?
  - Could retest the tractor's hydraulics.
  - Visual inspection of the potato harvester's connectors, control valves and motor.
  - Check the correct operation of the control valve using a pressure and flow test.
  - Check the correct operation of the hydraulic motor using a pressure and flow test.

Job card

- Record data and information on a job card, including:
  - outcome of the test: state that the pressure and flow data for the tractor meets manufacturer's specification, therefore no fault found
  - explaining of the possible cause(s) of the fault: fault could lie within the hydraulic system of the potato harvester's elevator drive system (which includes the connection between the tractor and the potato harvester).

Typical evidence for Task 2b may include:

Assessor observation

- Compare test data to the manufacturer's specification.
  - Interpret the results correctly.
  - Analyse the fault/diagnostic code(s) to make a diagnosis (findings must match the cause set by the assessor).

Response to question

- What would be the logical sequence of further actions? Confirm fault, report to owner (hire company), test components, replace parts, retest.

Job card

- Record data and information on job card eg outcome of the test, diagnosis.
- Recommended rectification would resolve the fault effectively and efficiently.

Assessment theme: Interpret information	**Band 1 descriptor**	**Band 2 descriptor**	**Band 3 descriptor**	**Total marks per sub-theme**	**Total marks for assessment theme**
Marks per band	**1–4**	**5–8**	**9–12**	**n/a**	**12**
	Limited comparison and analysis of diagnostic data to manufacturer's	**Good** comparison and analysis of diagnostic data to manufacturer's	**Comprehensive** comparison and analysis of diagnostic data to		

	information to confirm that there is a fault. **Limited** use of data and applied understanding of system/ component(s) to identify potential fault(s), resulting in limited identification of potential cause(s). **Limited** identification of further investigation required and/or suitable repair option(s). **Basic** record keeping with several technical inaccuracies/missing relevant information.	information to confirm that there is a fault. **Good** use of data and applied understanding of system/ component(s) to identify potential fault(s), resulting in good identification of potential cause(s). **Good** identification of further investigation required and/or suitable repair option(s). **Good** record keeping which is detailed and mostly technically accurate.	manufacturer's information to confirm that there is a fault. **Excellent** use of data and applied understanding of system/ component(s) to identify potential fault(s), resulting in comprehensive identification of potential cause(s). **Comprehensive** identification of further investigation required and/or suitable repair option(s). **Comprehensive** record keeping which is highly detailed and technically accurate.		

Performance Outcome 5 – Handover land-based machinery and equipment

Assessment theme – Handover

Guidance for markers

The following evidence must be used to assess performance against this assessment theme, within the context of the performance outcome:

Task 4a:

- Preparation notes

Task 4b:

- Risk assessment
- Assessor Observation form: assessor observation
- Photo evidence
- Pre delivery inspection checklist

Task 4c:

- Risk assessment
- Assessor Observation form: assessor observation, responses to questions (with audio recording)
- Handover checklist

Note: where there is insufficient evidence to award a mark, a zero mark may be given.

Indicative content

Typical evidence for Task 4a may include:

Preparation notes

- For handover of the vehicle at the customer's site, including:
  - breakdown of the handover time with the customer
  - familiarising the customer with:

- key features
- operator handbook
- safety procedures and features
- how the vehicle is highway compliant eg mirrors, lights, road tax
- meaning of warning and safety symbols in the operator handbook and on the vehicle
- warranty conditions
- maintenance and warranty requirements.

Typical evidence for Task 4b may include:

Risk assessment

- Risk assessment completed for the PDI, including the following:
  - identify hazards, risks and control measures such as:
    - tools, equipment and machinery, slips, trips and falls, cuts and abrasions, manual handling, irritants, burns, entanglement in moving parts, crushing and malfunction, noise, dealing with a spillage, PPE, equipment/machinery fit for purpose, clean working environment.
  - decide who might be harmed and how
  - evaluate the risks and take action to prevent them
  - record findings correctly on the form.

Assessor observation

- Pre delivery inspection of the vehicle.
  - Working safely.
  - Selection and use of tools and equipment, prepare work area eg:
    - clean area
    - set a drip tray and absorbent granules
    - workshop tools eg spanners, screwdrivers.
  - Preparation of the vehicle to be worked on eg key removed (during checking and preparation), out of gear, handbrake on.
  - Carry out checks and adjustments as stipulated in the PDI checklist so that the vehicle complies with the manufacturer's specifications.
  - Identify faults and undertake rectification work: increase tyre pressure, tighten wheel nut to correct torque.

Photo evidence

- This task must be photographed by the assessor to support the marking and moderation process, as a minimum:
  - using the torque wrench – showing hand, wrench and wheel
  - the torque wrench setting and manufacturer's specification.

PDI checklist

- Completed checklist.

Typical evidence for Task 4c may include:

Risk assessment

- Risk assessment for handover completed on arrival at the Guild Hire Ltd site, including the following:
  - identify hazards, risks and control measures such as:
    - environmental conditions, others on site, tools, equipment and machinery, slips, trips and falls, cuts and abrasions, manual handling, irritants, crushing and malfunction, dealing with a spillage, PPE, equipment/machinery fit for purpose, clean working environment.
  - decide who might be harmed and how
  - evaluate the risks and take action to prevent them
  - record findings correctly on the form.

Assessor observation

- Handover of equipment to the customer (assessor) includes:
  - explanations of operation and safe use of the equipment:
    - the safety procedures and features
    - highway compliance
    - the importance of the operator handbook
    - the meaning of warning and safety symbols in the operator handbook and on the vehicle.
  - correct maintenance and warranty information
  - the importance of serial numbers.

- **Note:** no practical demonstrations are required. Typically 30 minutes to 1 hour for the handover, plus risk assessment and customer questioning.
- Communicate to the customer clearly and logically.
- Use accurate language and terminology.

Responses to questions

- Where could I get a training course for this vehicle? eg local/national recognised training organisations.
- What are the legal requirements to drive this on the highway? Eg road tax, lights, mirrors, driver's licence, seat belt, helmet (recommended).

Handover checklist

- Completed handover checklist, including the customer's signature.

Assessment theme: Handover	**Band 1 descriptor**	**Band 2 descriptor**	**Band 3 descriptor**	**Total marks per sub-theme**	**Total marks for assessment theme**
Marks per band	**1–4**	**5–8**	**9–12**	**n/a**	**12**
	Risk assessments cover a **limited** range of hazards and risks, with limited control measures. Planning and preparation for the machinery/equipment handover covers a **limited** range of requirements, resulting in	Risk assessments cover a **good** range of hazards and risks, with good control measures. Planning and preparation for the machinery/equipment handover covers a **good** range of requirements, resulting in	Risk assessments cover a **comprehensive** range of hazards and risks, with comprehensive control measures. Planning and preparation for the machinery/equipment handover covers a **comprehensive**		

	communication of a basic level of information. **Basic** completion of pre delivery inspection and preparation of machinery/equipment, with errors/omission so machinery is safe/legal but not fit for purpose. Handover to customer covers a **limited** range of requirements, resulting in limited customer knowledge.	communication of a good level of information. **Good** completion of the pre delivery inspection and preparation of machinery/equipment, with minimal errors/omissions so machinery/equipment is safe/legal and fit for purpose. Handover to customer covers a **good** range of requirements, resulting in mostly complete customer knowledge.	range of requirements, resulting in communication of an excellent level of information. **Comprehensive** completion of the pre delivery inspection and preparation of safe/legal machinery/equipment, with no errors/omissions. Handover to customer covers a **comprehensive** range of requirements, resulting in comprehensive customer knowledge.		

8. Links to Maths, English and Digital Skills

The table below indicates where each of the General Maths, English and Digital Competencies have been integrated into the assignment tasks.

Task	Skills
1 Maintain land-based machinery and equipment	EC1, EC2, EC3, EC4, EC5 MC1, MC2, MC4, MC5
2 Diagnose land-based machinery and equipment faults	EC1, EC2, EC3, EC4, EC5 MC1, MC2, MC4, MC5, MC8 DC1, DC6
3 Repair land-based machinery and equipment	EC1, EC2, EC3, EC4, EC5 MC1, MC2
4 Land-based machinery and equipment: customer handover	EC1, EC2, EC4, EC5, EC6 MC1, MC2

9. Declaration of authenticity

Assessment ID	Qualification number
Candidate name	**Candidate number**
Centre name	**Centre number**

Additional Support

Has the candidate received any additional support in the production of this work?

No □ **Yes** □ (Please tick appropriate)

If yes, give details below (and on a separate sheet if necessary).

Candidate:

I confirm that all work submitted is my own, and that I have acknowledged all sources I have used.

Candidate signature	Date

Assessor:

I confirm that all work was conducted under conditions designed to assure the authenticity of the candidate's work, and am satisfied that, to the best of my knowledge, the work produced is solely that of the candidate.

Assessor signature	Date

Note: Where the candidate and/or assessor is unable to or does not confirm authenticity through signing this declaration form, the work will be returned to the centre, and this will delay the moderation process. If any question of authenticity arises, the assessor may be contacted for justification of authentication.

10. Candidate Record Form (CRF)

T Level Technical Qualifications

T Level Technical Qualification – Land-based Engineering Occupational Specialism

Candidate name	Candidate number
Centre name	**Centre number**

Marker Notes *– please always refer to the relevant marking grid for guidance on allocating marks and make notes which describe the quality of the evidence and justification of marks.*

Please record any guidance, intervention (including Health and Safety) or feedback that is given to a candidate.

Expand fields as required.

PO2 Maintain land-based machinery and equipment									
Maintenance preparation									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Mark	Notes and justification								
Information and factors influencing maintenance									
	1	**2**	**3**	**4**	**5**	**6**			
Mark	Notes and justification								
Carry out maintenance									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Mark	Notes and justification											

PO3 Repair land-based machinery and equipment									
Information and factors influencing repairs									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**

Mark	Notes and justification

Repair processes – Dismantle machinery and equipment											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Mark	Notes and justification											

Repair processes – Component repair methods											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Mark	Notes and justification											

Repair processes – Reassemble machinery and equipment											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Mark	Notes and justification											

PO4 Diagnose land-based machinery and equipment faults											
Preparation for diagnosis											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Mark	Notes and justification											

Carry out diagnosis											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Mark	Notes and justification											

Interpret information											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Mark	Notes and justification											

PO5 Handover land-based machinery and equipment											
Handover											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**

Mark	Notes and justification

Internal assessor signature	Date

Total

11. Assessor observation forms

Assessor Observation Form (1a Maintain taper roller bearings in a 4WD front axle)

Task	Assessment component number
1a) Maintain taper roller bearings in a 4WD front axle	8717-402
Candidate name	**Candidate number**
Centre name	**Assessment themes**
	PO2: Maintenance preparation PO2: Information & factors influencing maintenance PO2: Carry out maintenance

Complete the tables below referring to the relevant marking grid, found in the assessment pack. Do not allocate marks at this stage.

Assessor observation	Notes – *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
• Working safely. • Selection and use of tools and equipment. • Preparation of work area. • Preparation of the machinery to be worked on, including safe jacking. • Remove the wheel. • Clean and inspect condition of hub bearings, Universal joints and seals. • Assess the bearing preload as specified by the manufacturer. • Adjust bearing preload to meet manufacturer's procedures. • Verify conformity. • Lubricate bearings. • Replace wheel. • Classification and disposal of waste.	

Responses to questions	Notes – *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
• What are the reasons for possible failures of bearings and seals? • Why adjust a bearing? • State **three** observations that indicate a bearing requires replacement. • Why are nuts/studs torqued to the correct setting? • Why is it important to replace locking devices?	Assessors must make an audio recording of the responses for moderation purposes.

Assessor signature	Date

Assessor Observation Form (1b Prepare machinery and equipment for out of season storage)

Task	Assessment component number
1b) Prepare machinery and equipment for out of season storage	8717-402
Candidate name	**Candidate number**
Centre name	**Assessment themes**
	PO2: Maintenance preparation PO2: Carry out maintenance

Complete the table below referring to the relevant marking grid, found in the assessment pack. Do not allocate marks at this stage.

Assessor observation	Notes – *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
• Working safely. • Selection and use of tools and equipment. • Preparation of work area. • Preparation of the machinery to be worked on, including cleaning. • Safe immobilisation. • Inspection and preparation to comply with manufacturer's specifications. • Apply protective coatings. • Classification and disposal of waste.	

Assessor signature	Date

Assessor Observation Form (2a Diagnose machinery with ineffective hydraulics)

Task	Assessment component number
2a) Diagnose machinery with ineffective hydraulics	8717-402
Candidate name	**Candidate number**
Centre name	**Assessment themes**
	PO4: Preparation for diagnosis PO4: Carry out diagnosis PO4: Interpret information

Complete the tables below referring to the relevant marking grid, found in the assessment pack. Do not allocate marks at this stage.

Assessor observation	**Notes –** *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*

• Working safely.
• Selection of the appropriate test method and equipment.
• Selection and use of tools and equipment.
• Preparation of the work area and the tractor to be worked on.
• Sequence of work:
  ○ checking oil level and condition
  ○ connection to test equipment
  ○ checking oil temperature
  ○ undertaking the pressure and flow test.	

Responses to questions	**Notes –** *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
• What could cause contamination during testing? • Why is the temperature of the oil important for the test? • What would be the logical sequence of further actions?	Assessors must make an audio recording of the responses for moderation purposes.

Assessor signature	**Date**

Assessor Observation Form (2b Diagnose machinery in limp mode)

Task	Assessment component number
2b) Diagnose machinery in limp mode	8717-402
Candidate name	**Candidate number**
Centre name	**Assessment themes**
	PO4: Preparation for diagnosis PO4: Carry out diagnosis PO4: Interpret information

Complete the tables below referring to the relevant marking grid, found in the assessment pack. Do not allocate marks at this stage.

Assessor observation	Notes – *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*

• Working safely.
• Selection of the appropriate test method and equipment in part i).
• Checking for a software update, updating as required.
• Selection, preparation and use of tools and equipment.
• Preparation of the work area and machinery to be worked on, carrying out basic checks.
• Sequence of work:
  ○ carry out basic checks on the machinery
  ○ connection to test equipment
  ○ undertaking the electrical diagnostic
  ○ record fault/diagnostic codes on the job card
  ○ clear fault/diagnostic codes
  ○ restart the machinery
  ○ retest the machinery	

Assessor observation	**Notes –** *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
○ read and record fault/diagnostic codes.	

Responses to questions	**Notes –** *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
• Why is it important to ensure software is up to date? • Why clear the fault/diagnostic codes and retest the vehicle? • What would be the logical sequence of further actions?	Assessors must make an audio recording of the responses for moderation purposes.

Assessor signature	**Date**

Assessor Observation Form (3a Remove and refit a double-acting hydraulic cylinder)

Task	Assessment component number
3a) Remove and refit a double-acting hydraulic cylinder	8717-402
Candidate name	**Candidate number**
Centre name	**Assessment themes**
	PO3: Repair processes (Dismantle machinery & equipment) PO3: Repair processes (Reassemble machinery & equipment)

Complete the tables below referring to the relevant marking grid, found in the assessment pack. Do not allocate marks at this stage.

Assessor observation	Notes – *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
• Working safely, including managing the risk of stored energy. • Selection and use of tools and equipment. • Prepare the work area. • Preparation and immobilisation of the machinery to be worked on. Remove and refit a double-acting hydraulic cylinder: • removing the correct hydraulic cylinder after checking the system pressure has been released • collecting the oil in an appropriate container • refit the hydraulic cylinder • **assessor to check the refit before the functionality test** • verify functionality	The assessor must confirm that the hydraulic cylinder has been refitted safely and correctly before the candidate can verify functionality: Visual check by assessor – pins and pipes correctly located and secure.

• appropriate classification and disposal of waste.	

Assessor signature	Date

Assessor Observation Form (3b Repair a double-acting hydraulic cylinder)

Task	Assessment component number
3b) Repair a double-acting hydraulic cylinder	8717-402
Candidate name	**Candidate number**
Centre name	**Assessment themes**
	PO3: Information & factors influencing repairs PO3: Repair processes (Dismantle machinery & equipment) PO3: Repair processes (Component repair methods) PO3: Repair processes (Reassemble machinery & equipment)

Complete the tables below referring to the relevant marking grid, found in the assessment pack. Do not allocate marks at this stage.

Assessor observation	Notes – *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
• Working safely. • Selection and use of tools and equipment. • Prepare the work area. Repair and reseal a double-acting hydraulic cylinder: • sequence of work • strip and inspect the hydraulic cylinder (and its parts) • repair and reseal the hydraulic cylinder • appropriate classification and disposal of waste.	

Responses to questions	Notes – *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
• What would influence whether to replace or repair individual parts? • What is cavitation in a hydraulic system? ○ What causes it?	Assessors must make an audio recording of the responses for moderation purposes.

Assessor signature	Date

Assessor Observation Form (4b Pre delivery inspection)

Task	Assessment component number
4b) Pre delivery inspection	8717-402
Candidate name	**Candidate number**
Centre name	**Assessment themes**
	PO5: Handover

Complete the table below referring to the relevant marking grid, found in the assessment pack. Do not allocate marks at this stage.

Assessor observation	Notes – *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
• Working safely. • Selection and use of tools and equipment. • Preparation of the work area and vehicle to be worked on. • Carry out checks and adjustments as stipulated in the PDI checklist. • Identification of faults and undertake adjustments to comply with manufacturer's specifications.	

Assessor signature	Date

Assessor Observation Form (4c Customer handover)

Task	Assessment component number
4c) Customer handover	8717-402
Candidate name	**Candidate number**
Centre name	**Assessment themes**
	PO5: Handover

Complete the tables below referring to the relevant marking grid, found in the assessment pack. Do not allocate marks at this stage.

Assessor observation	**Notes –** *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*

• Working safely.
• Explaining the vehicle and covering all the points on the handover checklist:
  ○ How to operate the vehicle (no practical demonstration/starting required).
  ○ The safety procedures and features.
  ○ Explaining the vehicle's highway compliance.
  ○ The importance of the operator handbook.
  ○ The meaning of warning and safety symbols in the operator handbook and on the vehicle.
  ○ Maintenance and warranty requirements.
  ○ The importance of serial numbers.	

Responses to questions	**Notes –** *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
• Where could I get a training course for this vehicle? • What are the legal requirements to drive this on the highway?	Assessors must make an audio recording of the responses for moderation purposes.

Assessor signature	**Date**

12. Annex

Risk assessment template (Figure 1)
To be issued to the candidate with sub tasks 1a, 1b, 2a, 2b, 3a, 3b, 4b, 4c

Job card template (Figure 2)
To be issued to the candidate with sub tasks 1a, 1b, 2a, 2b, 3a, 3b

Pre delivery inspection checklist template (Figure 3)
To be issued to the candidate with sub task 4b

Handover checklist template (Figure 4)
To be issued to the candidate with sub task 4c

Risk assessment template (Figure 1)

This template may only be modified by adding item rows.

Candidate's name		**Enrolment number**	
Task		Location	
Assessor's name		Date of assessment	

Item no.	What are the hazards?	Who might be harmed and how?	What precautions are already in place?	Risk rating (High/Medium/Low)	What further action is necessary?	Action by who and when?	Residual risk rating (High/Medium/Low/Trivial)

Date of assessment:	Risk assessment carried out by:

Job card template (Figure 2)

Candidate's name		**Enrolment number**	
Task		Location	
Assessor's name		Date of assessment	

Job card	**Notes and comments**
Customer name	
Machinery/equipment details: Make Model Registration Chassis/serial no. Odometer/hours	
Location of work	
Date	
Specialist tools and equipment	

Job card	Notes and comments
Work to be carried out	
Symptoms/diagnostic data	
Diagnosis	

Job card	Notes and comments
Work carried out	
Materials	
Time taken	
Further action required/ recommendations	

Pre delivery inspection checklist template (Figure 3)

Candidate's name		**Enrolment number**	
Task	4b Pre delivery inspection	Location	
Assessor's name		Date of assessment	

The technician must check all inspection items below:

Complete the checklist by ticking the box when successfully achieved or n/a if not applicable

Inspection requirement	**Tick when checked**	**Comments**
Machinery/equipment details: Make Model Registration Chassis/serial no. Odometer/hours		
Operator handbook/instructions available		
Bodywork condition		
Function and operation of the machinery/equipment		
Function of all controls and switches		
Safety guards and devices		
Vision		
Wipers		
Mirrors		
Wheels and tyres		

Inspection requirement	Tick when checked	Comments
Tyre condition and pressure		
Wheel nuts/bolts		
Wheel bearings		
Wheel rim fixings		
Grease points		
Brake connections		
Mechanical couplings		
Superstructure		
Frame, body		
Hitch		
Trailer bed		
Suspension axle and fixings		
Lights		
Safety decals		
Function decals		
Oil levels		

Date	
Technician Name	
Signature	
Company	

Handover checklist template (Figure 4)

Candidate's name		**Enrolment number**	
Task	4c Customer handover	Location	
Assessor's name		Date of assessment	

Upon handing over, the technician must introduce the customer into the safe handling and maintenance of the machinery and equipment.
This process is used to prove that machinery familiarisation and installation has taken place.
This is required to meet the areas of compliance set out in Provision and Use of Work Equipment Regulation 1998 (PUWER) and The Health and Safety at Work Act 1974 (HSWA) which all supplier of machinery must adhere to.
To do this, the technician must explain the following to the customer:

Complete the checklist by ticking the box when successfully achieved or n/a if not applicable

Handover requirement	**Checklist**	**Comment**
Machinery/equipment details: Make Model Registration Chassis/serial no. Odometer/hours		
Serial numbers		
Function and operation of the machinery/equipment		
Function and operation of all controls and switches		
Safety procedures		
Function of all safety devices (including guards, warning devices, lights, interlocks/lockouts)		

Handover requirement	Checklist	Comment
Meaning of safety decals		
Pre-start checks		
Vibrations and noise levels		
Operator handbook/instructions		
Universal symbols		
Maintenance intervals		
Warranty requirements		

Operator name: _____ has received installation/familiarisation on the above machine.

Comments:

I have received installation/familiarisation on the machine detailed above. All relevant points have been fully explained to me and I have understood them. I have access to and know how to use the operator handbook.

Operator name	
Signature	
Date	
Company	

Technician's name	
Signature	
Date	
Company	

The T Level is a qualification approved and managed by the Institute for Apprenticeships and Technical Education.