HM Government

T-LEVELS

T Level Technical Qualification in Agriculture, Land Management and Production

Occupational Specialism in Land-based Engineering

Guide Standard Exemplification Material Distinction – Sample 2023

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City & Guilds

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Introduction

The sample evidence within this document refer to the Occupational Specialism in Land-based Engineering assignment. The aim of these materials is to provide centres with examples of knowledge, skills and understanding that attest to a distinction grade. In this document all exemplar evidence attests as examples of performance at the distinction grade boundary.

The evidence presented here has been developed to reflect a distinction grade within each task but is not necessarily intended to reflect the work of a single candidate. It is important to note that in live assessments a candidate's performance is very likely to exhibit a spikey profile and the standard of performance will vary across tasks. The Guide Standard Exemplification Material (GSEM) illustrates linear performance across all pieces of evidence at the grade. A distinction grade will be based on a synoptic mark across all tasks.

The evidence in this GSEM is separated into the sections as described below. Evidence is presented against tasks from the assignment. Assessors using the GSEM may find it helpful to review this document along with the sample assessment materials.

Task
This section details the evidence to be submitted for marking and any additional evidence required including any photo/video evidence. Also referenced in this section are the performance outcomes and assessment themes the evidence will be marked against when completing the tasks within it. In addition, evidence that has been included or not been included in this GSEM has been identified within this section.

In this GSEM there is evidence from:

- Task 1
- Task 2
- Task 3
- Task 4

Evidence
This section includes exemplars of evidence, photos/video recordings of the evidence in production (or completed) and assessor observation records of the assessment completed by centre assessors. This will be exemplar evidence that was captured as part of the assessment and then internally marked by the centre assessor.

The items of evidence included in the GSEMs are designed to illustrate the grade at evidence level. They are not intended to reflect the performance of a single candidate across the assignment. Not all items of evidence are included in the GSEM, however a representative sample of evidence from across the assignment has been included to sufficiently illustrate the standard of performance expected for each type of evidence.

Commentary

This section includes detailed comments to demonstrate how the evidence attests to the standard of distinction.

It is important to note that the commentary section is not part of the evidence or assessment but are evaluative statements on how and why that piece of evidence meets a particular standard.

Grade descriptors

To achieve a distinction, a candidate will be able to:

Demonstrate excellent level of performance that fully meets the requirements of a brief, demonstrating strong technical skills and techniques to safely carry out work to high quality standards and efficiently within time constraints.

Methodically identify and work within all applicable legislation and regulations, with excellent identification of potential risks prior to commencing tasks and application of comprehensive control measures.

Undertake excellent preparation of the working area and select appropriate tools and equipment to safely carry out the work to manufacturer's standards.

Carry out practical tasks to a high standard, applying excellent knowledge and understanding of components, systems, machinery, and equipment.

Undertake comprehensive assessment of the machinery and equipment to establish symptoms. Interpret technical information to diagnose all causes and undertake rectification work based on a diagnosis, working systematically, logically, and efficiently.

Present excellent, relevant information in appropriate records, such as job cards and handover records.

Consistently use technical terminology accurately.

Task 1 – Maintain land-based machinery and equipment

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

Evidence contributes to the following:

Performance outcome	Assessment themes
PO2 Maintain land-based machinery and equipment	Maintenance preparation
	Information & factors influencing maintenance
	Carry out maintenance

Evidence	Assessment themes	Candidate producing	Assessor producing	Included in this GSEM
risk assessment	PO2: Maintenance preparation	√		√
job card	PO2: Information and factors influencing maintenance PO2: Carry out maintenance	√		√
assessor observation, including Q&A	PO2: Maintenance preparation PO2: Information and factors influencing maintenance PO2: Carry out maintenance		√	√
photos			√	√
video			√	√

Candidate evidence – risk assessment

Candidate's name	Sample Candidate	Enrolment number	CG12345
Task/Activity	1a) Maintain taper roller bearings in a 4WD front axle	Location	Centre training area
Assessor's name	Sample Assessor	Date	23/03/2023

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)
1	Unclean and untidy working area.	Myself and others in the workshop. Slips, Trips & Falls, Crushing and entrapment by moving vehicles.	Workshop protocols eg marked work bays and walkways, tool & equipment storage areas. Spill kits, workshop cleaning equipment. Fume extraction equipment.	Medium	Store tools, equipment and removed parts and components appropriately. Ensure wheels are stored safely after removal. Work within allocated area. Clean any spillages straight away. Use extraction if required. Warn others when moving tractor.	Myself, prior to, and during the job.	Low
2	Moving heavy objects eg wheels, jacking and supporting equipment.	Myself. Personal injury from items dropping, back injury from lifting.	Manual Handling training received. Wheel removal equipment. PPE (non-slip protective footwear, coveralls).	Medium	Help may be needed from other persons if it is heavy and unstable and wheel removal is needed.	Myself, prior to starting the job.	Low
3	Preparation of hand tools and equipment needed for the	Myself, injury as a result of using incorrect, faulty tools or equipment.	Equipment safety checks and storage protocols, eg Jacks and support stands.	Low	Check condition of equipment, safety boots, overalls, eye protection, hand protection against irritants.	Myself, prior to starting the job.	Low

	maintenance activity.		Training received to remove large wheels safely. Ensure correct PPE is obtained and worn (hand protection).				
4	Spilt liquid that may occur or residue that may leak from the transmission.	Myself, injury from slips, trips & falls.	Should a spillage occur ensure correct procedures are followed to clean up, using cloths and absorbent granules.	Low	Dispose of waste correctly.	Myself, during and after the job.	Low
5	Other persons starting the tractor whilst the maintenance is being carried out.	Myself, injury as a result of tractor moving and jacks and supports failing.	Machine isolation procedures.	High	Ensure tractor isolation procedures are carried out (key removal) prior to starting the maintenance.	Myself, during the job.	Low
6	Supporting the tractor front axle whilst checking/ adjusting the hub swivel taper roller bearings.	Myself, serious injury as a result of tractor falling from its supports.	Training received on 'jacking & supporting'. Hydraulic jack that is rated to lift the weight of the tractor. Support stands that are strong enough to support the weight of the tractor. Floor surface capable of supporting the lifting & supporting.	High	Visually check the condition of the jacking & supporting equipment for damage. Check the inspection date of the lifting and supporting equipment to ensure they are within specification.	Myself, during the job.	Low

Date of assessment: 23/03/2023	Risk assessment carried out by: Sample Candidate

Commentary

The candidate completed a comprehensive risk assessment as part of their **maintenance preparation,** showing an excellent understanding of the requirements of health and safety legislation, for example, referring to manual handling training and PPE. The candidate considered the full process for the maintenance task, identifying a comprehensive range of hazards, and demonstrating an excellent understanding of the risks that might occur.

The candidate demonstrated understanding of the difference between hazards, risks, and control measures, providing a range of detailed precautions to minimise risk to themselves and others. The candidate made clear links between the risks and suitable precautions, eg requiring a suitable floor surface for the task. They correctly categorised risk ratings and included additional control measures to reduce the risk ratings.

Candidate evidence – job card

Candidate's name	Sample Candidate	Enrolment number	CG12345
Task/Activity	1a) Maintain taper roller bearings in a 4WD front axle	Location	Centre training area
Assessor's name	Sample Assessor	Date	23/03/2023

Job Card	**Notes and comments**
Customer name	Guild Hire Ltd (contact name)
Machinery/equipment details: Make Model Registration Chassis/serial no. Odometer/hours	 Guilds Supplies (note: make and model are fictional for purposes of GSEM) 1234 AB AB01 CDE 98765432 8,290
Location of work	BLE Engineering Company
Date	23/03/2023
Specialist tools and equipment:	Bottle Jack (within test specification) Axle Stand (within test specification) Torque wrench (calibrated) Workshop manual & appropriate service updates Bearing preload gauge.
Work to be carried out	Check condition of and adjust, if necessary, the 4wd front axle hub swivel taper roller bearings.
Symptoms/diagnostic data	Excessive movement/shake in the front wheel. Unusual tyre wear on the front wheel and customer reports there is sometimes a 'knocking noise' when the machine starts and stops moving.
Diagnosis	I jacked the front axle of the tractor and supported it. I could feel slight movement in the 'near-side' hub swivel taper roller bearings when I pushed and pulled the front wheel. Visual inspection suggested the bearings had not been regularly lubricated.

Job Card	Notes and comments
Work carried out	• I followed the workshop risk assessment, taking particular attention to jacking and supporting hazards. • I jacked up and supported the tractor front axle so the near-side hub bearings could be checked. • After manual push & pull testing, it was clear the near-side hub bearings needed adjustment and lubrication. • I removed the near-side front wheel to get access to the hub bearings. • Visual and physical inspection of the Universal joint on the drive shaft – serviceable. • Visual inspection of axle drive shaft oil seals – no leaks. • I followed the workshop manual procedure: cleaned and removed 2 (0.5mm) shims from the upper hub bearing carrier. • I checked the hub bearing preload setting as recommended in the workshop manual. • I lubricated grease points. • Refitted the wheel, torqued all wheel nuts. • Returned tools and equipment and cleaned work area. • Completed job report and checked risk assessment.
Materials	One cartridge of grease, approx. 25ml used. Cleaning sundries.
Time taken	3hrs
Further action required/ recommendations	Remind customer of lubrication schedules and ensure they are aware of the front axle grease points.

Commentary

The candidate completed a comprehensive job card, showing an excellent understanding of how to present **maintenance information**, using technical terminology accurately throughout eg ‘shims’ rather than ‘spacers,’ and ‘preload’ rather than ‘freeplay.’

The symptoms and initial assessment were accurately recorded in detail, including the symptoms reported by the customer, with note of additional symptoms identified by the candidate eg tyre wear.

The diagnosis includes a detailed record of what the candidate found, with note of their consideration of **influencing factors** (‘not regularly lubricated’), logically leading to their later recommendation to the customer.

The candidate provided a detailed record of the **maintenance work carried out**, including both the action taken and outcome where appropriate (‘visual and physical inspection of the Universal joint on the drive shaft – serviceable, visual inspection of axle drive shaft oil seals – no leaks’). The record includes the detail of the size of the shim needed to achieve the correct adjustment.

The time taken is appropriate to the task and speed of work expected for distinction standard, reflecting the candidate’s wider considerations (the recommendation). The candidate included the materials used, so the job card accurately reflects the resources (costs) of completing the task.

Assessor evidence – assessor observation, Q&A, photos and video

Task	Assessment component number
1a) Maintain taper roller bearings in a 4WD front axle	8717-402
Candidate name	**Candidate number**
Sample Candidate	CG12345
Centre name	**Assessment themes**
Sample Centre	PO2: Maintenance preparation PO2: Information and factors influencing maintenance 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 safe jacking.	The candidate followed their risk assessment and kept the work area clean and tidy throughout the task. Hazards were identified and controlled eg safe jacking, supporting and manual handling, and they safely stored the removed wheel. Appropriate tools and equipment were selected to carry out the maintenance, quickly finding the correct socket size on all occasions. Comprehensive specialist tools were selected: • Bottle Jack (within test specification) • axle stand (within test specification) • torque wrench (calibrated) • workshop manual & appropriate service updates • bearing preload gauge. Used appropriate PPE as per their risk assessment, including hand protection due to the lubricants. Prepared the machine for safe working and removed the ignition key. They considered a wide range of potential hazards and employed control measures such as vehicle isolation, appropriate storage with strapping for the wheel, appropriate lifting equipment (correctly rated hydraulic jack,

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.*
	checking test date of lifting sling, photo 1) and limiting trip hazards by storing tools and equipment appropriately during the task. Safely supported the machine using axle stands. They checked the axle stands were within specification before use.
• 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.	Checked the front wheel and identified excessive movement in the near-side front bearings. Safely removed the wheel using the correct equipment, taking care not to damage the threads on the wheel studs. They stored the wheel nuts/studs in a tray and secured the wheel whilst carrying out the task. Photo 2 before cleaning. They visually checked the axle and hub oil seals for leaks (photo 3; no leakage found) and checked the oil levels (photos 4 and 5), and the Universal joint for damage (photo 3). Completed a physical check on the Universal joint by manually rocking the hub and recorded their findings on the job card. After cleaning off dirt and debris, they visually assessed the condition of the hub bearing (photo 6, no damage or excessive wear identified). Accurately followed the manufacturer's procedure to adjust the preload: • removed all shims (photo 7) • measured the gap with a feeler gauge (photo 8) • set a micrometer to zero (photo 9) • measured the shims with the micrometer (photo 10) • removed two 0.5mm shims from the hub bearing carrier (photo 11), noting this information on the Job Card • rechecked the preload and found it was within the specification (video). Checked the lubrication specification and lubricated the hub bearings as per manufacturer's specification. Safely replaced the wheel, taking care not to damage the threads on the wheel studs.

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.*
	Installed all the wheel nuts, and then applied the correct torque, and rechecked them. They slackened the torque wrench before storing it. Left the work area clean and tidy, and appropriately disposed of the used shims and contaminated absorbent materials.

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?	Lack of lubrication or incorrect grade of lubrication. Dirt and dust ingress causing excess friction. Incorrect adjustments or poor maintenance. Additional weight overloading the front end of the machine, eg front end loader, weight box. Working in arduous environmental conditions.
• Why adjust a bearing?	To remove movement and extend the life of the bearings and seals. To prevent further damage to other components, which could lead to more downtime for the machine.
• State **three** observations that indicate a bearing requires replacement.	Excessive vibration/movement of shafts. Excessive noise when under load. Excessive heat symptoms.
• Why are nuts/studs torqued to the correct setting?	To avoid under and over tightening that would lead to damage to studs and wheel centres.
• Why is it important to replace locking devices?	Used locking devices are weakened or damaged.

Assessor signature	**Date**
Sample Assessor	23/03/2023

Photo/video evidence

- Photos:
    - condition of bearings and seals: before and after candidate cleans and checks
- Video:
    - candidate making adjustments to comply with service manual manufacturer's settings: candidate checking the preload (typically 2-3 minutes).
      Video is a separate file: Task 1a assessor video - checking preload (D).mp4

Photo 1 Checking safety of lifting equipment

Photo 2 Condition of bearings and seals: before cleaned

Photo 3 Condition of seals: candidate check after cleaning

Photo 4 Checking hub oil level

Photo 5 Checking axle oil level

Photo 6 Condition of bearing: candidate check

Photo 7 Removal of shim

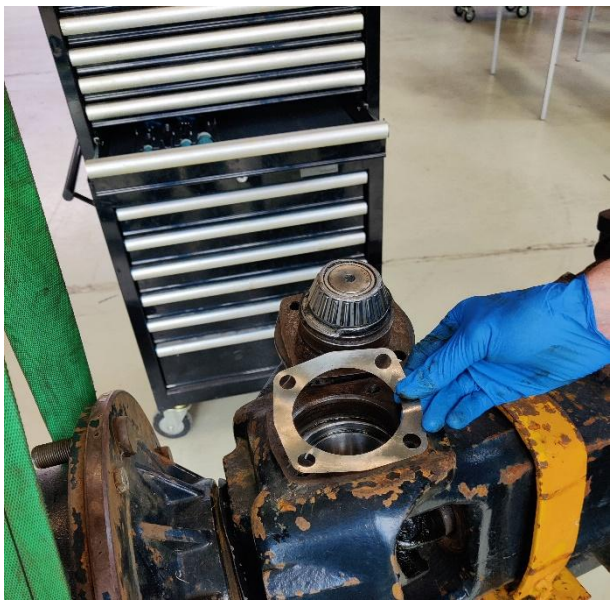


Photo 8 Measuring gap

Photo 9 Setting micrometer

Photo 10 Measuring shims

Photo 11 Shims after adjustment

Commentary

The candidate demonstrated an excellent level of performance to **carry out maintenance** safely and efficiently to high quality standards within the time given.

The candidate's **maintenance preparation** was excellent: immobilizing the machinery, preparing the work area in line with their risk assessment (appropriate tool storage and isolation measures), and selecting a comprehensive and appropriate range of specialist tools, that all resulted in efficient working.

Workshop tools and equipment were used safely in line with the candidate's risk assessment, with comprehensive controls applied eg correctly rated hydraulic jack, checking the axle stands and lifting sling were within specification, and strapping the wheel for storage.

The candidate applied their excellent understanding to undertake a detailed assessment (both visual and physical checks throughout) to gather **information** to diagnose the cause of the symptoms. The candidate's responses to the questions showed a depth of understanding of **carrying out maintenance** and **factors influencing maintenance** eg reasons for possible bearing failures, and the benefit of adjusting a bearing (preventing further damage).

The candidate worked systematically to undertake the correct adjustment to the bearings including assessing the preload against the manufacturer's specification, recording the thickness of the shims that were removed, and lubricating the bearing as per manufacturer's specification before replacing the wheel. The candidate correctly disposed of the waste.

The candidate considered the detailed requirements of the task, such as storing the wheel nuts in a tray so that they were easy to find when needed, taking care not to damage the wheel stud threads when replacing the wheel, rechecking the torque, and slackening the torque wrench before storage.

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

Evidence contributes to the following:

Performance outcome	Assessment themes
PO2 Maintain land-based machinery and equipment	Maintenance preparation
	Carry out maintenance

Evidence	Assessment themes	Candidate producing	Assessor producing	Included in this GSEM
risk assessment	PO2: Maintenance preparation	√		√
job card	PO2: Carry out maintenance	√		√
assessor observation	PO2: Maintenance preparation		√	√
photos	PO2: Carry out maintenance		√	√

Candidate evidence – risk assessment

Candidate's name	Sample Candidate	Enrolment number	CG12345
Task/Activity	1b) Prepare machinery and equipment for out of season storage	Location	Centre training area
Assessor's name	Sample Assessor	Date	23/03/2023

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)
1	Unclean and unsafe working area.	Myself and others in the workshop. Chemical contamination. Slips, trips & falls.	Ensure no equipment or tools are on the floor and that walkways are clear. Ensure area is clean and tidy throughout preparation, cleaning and upon completion. Designated work area.	Medium	Analyse working area before commencing task. Ensure any contaminated liquids are collected and stored safely. Work in well-ventilated area.	Myself, throughout the task.	Low
2	Manual handling of tools, equipment and machinery needed to carry out cleaning activity.	Myself. Personal injury from items dropping, back injury from lifting.	Ensure correct training has been received including following maximum lifting limits.	Medium	Check weight, size, shape of tools, equipment, and components before lifting to reduce risk of personal injury.	Myself, throughout.	Low
3	Use of tools and equipment needed for the cleaning activity.	Myself. Minor injuries: cuts, abrasions. Chemical contamination.	Ensure correct selection and use of tools for the activity. Ensure proper use of tools and equipment. Ensure correct PPE is obtained and worn. (dusk mask for air line use, gloves, face mask) Portable appliance testing (PAT) procedures. Use a circuit breaker (RCB).	Low	Monitor condition of PPE and replace as required. Check PAT is in date.	Myself, ongoing.	Low

4	Contaminated Sprayer.	Myself and others. Chemical contamination, irritation.	Ensure correct PPE is worn (face mask, pesticide approved gauntlets). Store removed nozzles and filters in secure trays/containers.	Medium	Review chemical data sheets and product labels to ensure correct PPE is worn.	Myself, ongoing.	Low
5	Dilute chemicals from cleaning.	Myself and others. Chemical contamination, irritation.	Ensure correct PPE is worn (face mask, pesticide approved gauntlets, coveralls, wellingtons). Dilute washings collection procedure.	High	Review chemical data sheets and product labels to ensure correct PPE is worn. Collect dilute chemical and washings in designated sump or containers. Ensure dilute chemical and washing are collected by waste disposal company.	Myself, ongoing.	Low
6	Lubricants and protective coatings when undertaking cleaning operation.	Myself. Chemical contamination, irritation.	PPE at all times, including face mask and gloves when spraying protective coatings.	Medium	Review chemical data sheets. Monitor condition of PPE as required.	Myself, ongoing.	Low

Date of assessment: 23/03/2023	Risk assessment carried out by: Sample Candidate

Commentary

The candidate completed a comprehensive risk assessment as part of their **maintenance preparation,** showing an excellent understanding of the requirements of health and safety legislation. For example, referring to pesticide approved gauntlets. The candidate considered the full process for the maintenance task, identifying a comprehensive range of hazards, and demonstrating an excellent understanding of the risks that might occur, and the appropriate control measures.

The candidate demonstrated understanding of the difference between hazards, risks, and control measures, providing a range of detailed precautions to minimise risk to themselves and others. The candidate made clear links between the risks and suitable precautions eg handling hazardous chemicals. They correctly categorised risk ratings and included additional control measures to reduce the risk ratings.

Candidate evidence – job card

Candidate's name	Sample Candidate	Enrolment number	CG12345
Task/Activity	1b) Prepare machinery and equipment for out of season storage	Location	Centre training area
Assessor's name	Sample Assessor	Date	23/03/2023

Job Card	**Notes and comments**	
Customer name	Guild Hire Ltd (contact name)	
Machinery/equipment details:	**Pedestrian-controlled mower (petrol)**	**Mounted crop sprayer**
Make	Guilds Supplies	Guilds Supplies
	(Note: make and models are fictional for purposes of GSEM)	
Model	1234 AB	4321 BA
Registration	n/a	n/a
Chassis/serial no.	AB98765432	AB1234567
Odometer/hours	n/a	n/a
Location of work	BLE Engineering Company	
Date	23/03/2023	
Specialist tools and equipment	Hot wash cleaning equipment, including power washer, tank cleaning fluid. Air line. Container for collecting waste from crop sprayer. Rust inhibiting coating (pressurised spray). Antifreeze. Workshop manual & appropriate service updates. Product safety data sheet (cleaning products, rust inhibiting coating).	
Work to be carried out	Prepare and complete out of season storage consistent with the manufacturer's specifications, with consideration of environmental requirements.	
Symptoms/diagnostic data	None reported. They have both been out on hire throughout the summer and have had a lot of use.	

Job Card	Notes and comments
Diagnosis	Visual inspection showed that the cutting blade and housing were thickly covered in old grass clippings. The condition of the blade was unknown. The crop sprayer had residual spray fluid in it, probably a pesticide. An initial visual inspection did not identify any problems.
Work carried out	• The mower needed to be cleaned and checked against the manufacturer's specification. • The crop sprayer needed to be cleaned, checked against the manufacturer's specification, and a rust inhibiting coating applied. • I followed the workshop risk assessment, taking particular attention to the hazards of interaction with chemicals (emptying the crop sprayer, cleaning, lubrication and protection). **Mower:** • I supported the mower on its side and removed the spark plug caps. • I took the following actions: o cleaned down the mower with a brush - the collection box, underside, blade, chute, chassis and wheels/rollers, collecting the residue in a tray for later disposal o power washed to remove the final residue o visually inspected the following components: ▪ checked the blade for damage – needs sharpening ▪ fuel tank for leaks – none identified, level sufficient for testing ▪ oil level – low, but usable. o started the engine – no issues identified, running as expected, no vibrations o checked control mechanisms and safe stop for correct operation – no issues identified o emptied the fuel from the tank – to avoid fuel deterioration over the winter o applied rust inhibiting coating with a pressurised spray as directed by the manufacturer's procedure. • Returned tools and equipment to store and cleaned work area. • Completed job card, noting any further actions, and checked Risk Assessment. • Disposed of hazardous fluids and cleaning materials as per workshop procedure. **Crop Sprayer:**

Job Card	Notes and comments
	• The sprayer was already mounted on the tractor, so it was stable for working on. • The sprayer was already in the designated washing area so that run-off would be safely collected into the hazardous liquid waste sump. • I visually inspected oil level in the pump – acceptable for testing the sprayer. • I ran the PTO shaft: flushed through the crop sprayer with water and the designated tank cleaning fluid (referred to chemical data sheet) – cleaning the circulation system, including pump and booms – no blockages or leaks, some nozzle misalignment. • The outside of the sprayer was washed down with a power washer and cleaning chemicals. • Safe working practices were observed for the collection and disposal of the hazardous fluid: PPE. • I visually inspected the following components: o hoses, fittings, and tanks for leaks – none identified o electrical wire connections – no damage. • I took the following actions: o removed and cleaned the filters, removed the nozzles – all stored safely – allows the sprayer to drain, reducing risk of frost damage o added antifreeze as directed by the manufacturer's procedure o applied rust inhibiting coating as directed by the manufacturer's procedure. • Returned tools and equipment and cleaned work area. • Completed job card, noting any further actions and checked Risk Assessment.
Materials	Lubrication - one cartridge of grease. Rust inhibiting coating – 1 can. Antifreeze – 1 litre. Cleaning sundries.
Time taken	2.5hrs
Further action required/ recommendations	Schedule pre-season service with hire company. Mower: pre-season service, including check/replace air filter, fuel filter, spark plugs. Add fuel, top-up oil level, sharpen blade. Store under cover over winter. Crop sprayer: pre-season service including refit nozzles and filters (noted that some nozzle filters will need replacement). Store under cover over winter.

Commentary

The candidate completed a comprehensive job card for the **maintenance work carried out**, showing an excellent understanding of how to present maintenance information, and using technical terminology accurately throughout eg rust inhibiting, fuel deterioration, and blockages.

The symptoms and initial assessment were accurately recorded in detail, including note of the considerable use of the equipment due to being out on hire all summer.

The candidate provided a detailed record of the maintenance work carried out, including both the action taken and outcome where appropriate, logically leading to their noted further actions/recommendations. The candidate included the materials used, so the job card accurately reflects the resources (costs) of completing the task. The time taken is appropriate to the task and speed of work expected for distinction standard.

Assessor evidence – assessor observation and photos

Task	Assessment component number
1b) Prepare machinery and equipment for out of season storage	8717-402
Candidate name	**Candidate number**
Sample Candidate	CG12345
Centre name	**Assessment themes**
Sample Centre	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.	The candidate followed their risk assessment and kept the work area clean and tidy when carrying out the task. Hazards were identified and considered, eg supporting the machines, safe manual handling, and storage of hazardous materials. Appropriate tools and equipment were selected to carry out the work, and everything was to hand, including comprehensive specialist tools: • hot wash cleaning equipment, including power washer, tank cleaning fluid • air line • container for collecting waste from crop sprayer • rust inhibiting coating, with pressurised spray gun • antifreeze • workshop manual & appropriate service updates • product safety data sheet (cleaning products, rust inhibiting coating). Considered a wide range of potential hazards and employed control measures such as limiting trip hazards by storing tools and equipment appropriately during the task, and wearing appropriate PPE as per their risk assessment, including gloves (pesticide approved gauntlets) and face mask due to the hazardous chemicals, coveralls and wellingtons (when working in the designated washing area).
• Preparation of the machinery to be	**Mower** They prepared the mower for safe working by supporting it on its side with an axle stand (positioned to minimise fuel and/or oil leakage;

worked on, including cleaning. • Safe immobilisation. • Inspection and preparation to comply with manufacturer's specifications. • Apply protective coatings. • Classification and disposal of waste.	photo 1) and immobilised the engine (inc. removing spark plug caps). The mower was thickly covered with old grass clippings. Cleaned down the mower with a soft brush and clean water, including the collection box, underside, blade, chute, chassis, and wheels/rollers. They collected the residue in a tray. Power washed the mower, being careful to thoroughly remove all residues and reduce splash back. Completed a visual inspection, as specified in the manufacturer's specification, correctly identifying the status of each: • checked the blade for damage • fuel tank for leaks • lubricant level (photo 2). Applied rust inhibiting coating thoroughly as per the manufacturer's procedure, using a pressurised spray (photo 1). Ran the mower and checked the control mechanisms for correct operation. Safely emptied the fuel from the tank by removing the inlet pipe, collecting the fuel in an appropriate container. Cleaned and returned tools and equipment to the store and cleaned the work area. Completed job card accurately and re-checked the risk assessment. Disposed of hazardous fluids and cleaning materials as per workshop procedure. **Crop sprayer** Visually inspected oil level in the pump. Flushed through the crop sprayer with water and the correct tank cleaning fluid, and then power washed the outside of the sprayer. Visually inspected the hoses, fittings, and tanks for leaks and electrical wire connections for damage. Removed and cleaned the filters. Removed the nozzles (photo 3) – all stored safely in water (photo 4); noted damage to some nozzle filters (photo 5). Added antifreeze as directed by the manufacturer's procedure.

	Applied rust inhibiting coating with a pressurized spray as directed by the manufacturer's procedure. Safe working practices were observed for the collection of hazardous fluids: PPE, reference to the chemical data sheets (cleaning, rust inhibiter), working in the designated washing area. Cleaned and returned tools and equipment and cleaned the work area. Completed job card accurately and re-checked the risk assessment. Disposed of contaminated fluids and cleaning materials as per workshop procedure.

Assessor signature	**Date**
Sample Assessor	23/03/2023

Photo/video evidence

- Photos:
  - 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).

Photo 1 Applying protective coating to mower (and supported for safe working)

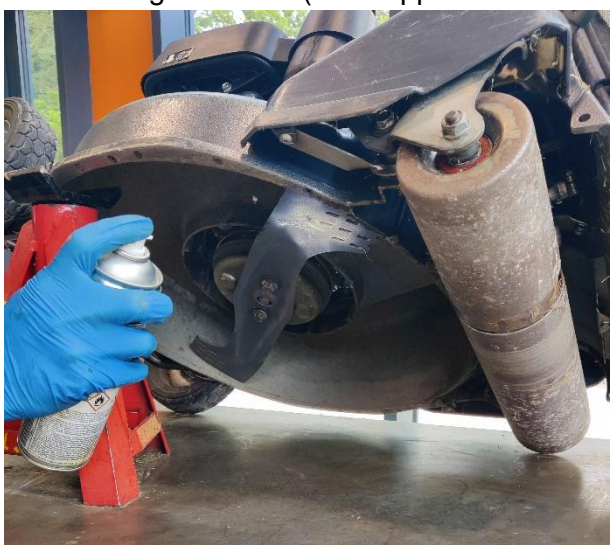


Photo 2 Lubrication level of mower

Photo 3 Serviced parts: removed nozzles

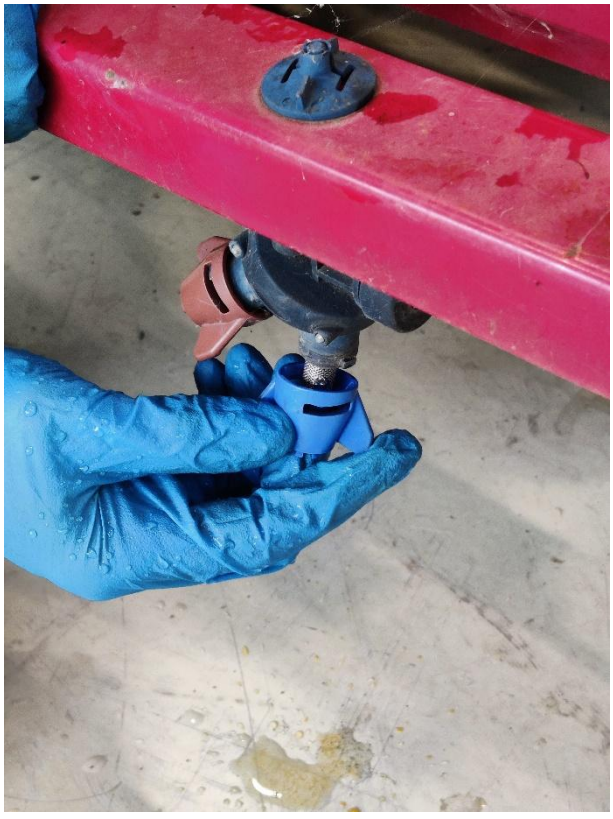


Photo 4 Sprayer: keeping nozzles safe

Photo 5 Possible nozzle filter damage

Commentary

The candidate demonstrated an excellent level of performance to **carry out maintenance** safely and efficiently to high quality standards within the time given.

The candidate's **maintenance preparation** was excellent: preparing the work area in line with their risk assessment (checking data sheets, wearing required PPE), and selecting a comprehensive and appropriate range of tools, that all resulted in efficient working.

Workshop tools and equipment were used safely in line with the candidate's risk assessment, with comprehensive controls applied eg supporting the mower with an axle stand and working in the designated washing area when cleaning and flushing the sprayer.

The candidate applied their excellent skills and understanding of the task to safely use appropriate tools and techniques to prepare the equipment for seasonal storage. The candidate worked methodically through the manufacturer's procedure, considering the detailed requirements of the task, such as using a soft brush to clean the mower and reduce the risk of damage to the paint, adding antifreeze to the system, and using a spray so that they could apply the protective coating to all the surfaces.

Task 2 – Diagnose land-based machinery and equipment faults

Task 2a) Diagnose machinery with ineffective hydraulics

Evidence contributes to the following:

Performance outcome	Assessment themes
PO4 Diagnose land-based machinery and equipment faults	Preparation for diagnosis
	Carry out diagnosis
	Interpret information

Evidence	Assessment themes	Candidate producing	Assessor producing	Included in this GSEM
risk assessment	PO4: Preparation for diagnosis	√		√
job card	PO4: Preparation for diagnosis PO4: Carry out diagnosis PO4: Interpret information	√		√
assessor observation, including Q&A	PO4: Preparation for diagnosis PO4: Carry out diagnosis PO4: Interpret information		√	√
photo			√	√
video			√	√

Candidate evidence – risk assessment

Candidate's name	Sample Candidate	Enrolment number	CG12345
Task/Activity	2a) Diagnose machinery with ineffective hydraulics	Location	Centre training area
Assessor's name	Sample Assessor	Date	23/03/2023

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)
1	Moving vehicles (Moving the tractor before the task, and other vehicles in the workshop being moved).	Self & colleagues. Crushing and entrapment.	Safe walkways marked for pedestrians. Vehicle speed limits. Flashing beacons/lights used. Audible warning before moving off.	Low	Continued following of safe procedures.	Self and others. Before, during and after the activity.	Low
2	Carrying out the testing procedure.	Self. Minor injuries such as cuts and abrasions, dermatitis from irritants, or particles in the eye.	Wear PPE (eye protection, overalls, safety boots, ear protection, gloves). Awareness of First Aid Provision. Emergency First Aid Training.	Medium	Check condition and commission dates of all PPE equipment. Replace PPE as required during the task eg nitrile gloves.	Self. Before and during the activity.	Medium
3	Fire in or around work area.	Self & colleagues. Burns, inhalation of smoke, explosion. Potentially fatal injuries.	Awareness of Evacuation Procedures and signage. Awareness of 'Fire Marshals' duties. Fire extinguishers.	Low	Continue to monitor for possibility of fire. Check existing mitigation procedures, eg check fire extinguisher is in place.	Self. Before and during the activity.	Low
4	Unclean and unsafe working area.	Self & colleagues. Physical injury caused by slips,	Tidy uncluttered work area. 'Oil Spill Kit' available.	Low	Check provision is readily available.	Self.	Low

		trips & falls at ground level.	Non-slip protective footwear worn.			Before, during and after the activity.	
5	Tools & Equipment, 'not fit for purpose'.	Self. Physical injury caused by faulty equipment.	Tool & Equipment: checking procedures followed. Awareness of equipment calibration procedures. Safety certificate for tools and equipment.	Low	Visual inspection prior to use.	Self. Before the activity starts.	Low
6	Tractor able to be started by others.	Self. Physical injury such as crushing or entanglement.	Key removal procedures in place. Stop unauthorised access to the tractor cab (physical barriers, safety/warning signage).	Medium	Follow procedures.	Self. Before the diagnostic test is started.	Low
7	Entry and exit of the tractor.	Self. Physical injury from a fall when accessing and egressing the cab.	Tractor cab access & egress procedures. Cleaning and checking security of steps and handholds.	Low	Follow procedures and ensure three points of physical contact.	Self. Before and during the activity.	Low
8	Engine Fumes.	Self & colleagues. Inhalation of toxic fumes, carbon monoxide poisoning, asphyxiation.	Workshop fume extraction facilities.	Medium	Check the effectiveness of extraction facilities. Check currency of safety certificate.	Self. Effectiveness: Before starting the task and monitor when the tractor is running. Safety certificate: Before starting the task.	Low
9	Noise exceeding safety levels (decibels and/or duration).	Self & colleagues. Damage to hearing from running the	Use of ear protectors during hydraulic test.	Low	Check condition and expiry date of ear protectors.	Self and others. Before starting the tractor engine,	Low

		tractor engine for the test.				and during the test.	
10	Oil under pressure escaping during test.	Self. Physical injury such as hydraulic fluid injection into soft tissue or bloodstream.	Tool & equipment checks. PPE: gloves, full face mask, eye protection, overalls.	Low	Check test equipment connections. Replace PPE as required during the task eg nitrile gloves.	Self. Before and during the testing.	Low
11	Oil spillages.	Self & colleagues. Contamination of environment due to spilt oil.	Awareness of premise's 'watercourse protection' facilities. Data sheets available for oil identification. Oil spill kit available.	Low	Awareness of actions to take to activate premises 'watercourse protection' facilities.	Self. Before starting the activity.	Low

Date of assessment: 23/03/2023	Risk assessment carried out by: Sample Candidate

Commentary

The candidate completed a comprehensive risk assessment as part of their **preparation for diagnosis**, showing an excellent understanding of the requirements of health and safety legislation, for example ear protection, and evacuation signage. The candidate considered the logical order of the diagnostic process to identify a comprehensive range of hazards, demonstrating an excellent understanding of the risks relevant to this workshop-based pressure test diagnostic task, and the appropriate control measures.

The candidate demonstrated understanding of the difference between hazards, risks, and control measures, providing a range of detailed precautions to minimise risk to themselves and others. The candidate made clear links between the risks and suitable precautions eg actions that should be taken as part of their continual safe working, such as continual monitoring of the exhaust fume extraction, and refreshing PPE as required. They correctly categorised risk ratings and included additional control measures to reduce the risk ratings.

Candidate evidence – job card

Candidate's name	Sample Candidate	Enrolment number	CG12345
Task/Activity	2a) Diagnose machinery with ineffective hydraulics	Location	Centre training area
Assessor's name	Sample Assessor	Date	23/03/2023

Job Card	**Notes and comments**
Customer name	Guild Hire Ltd (contact name)
Machinery/equipment details Make: Model: Registration Chassis/serial no/ Odometer/hours	**Tractor** Guilds Supplies (note: make and model are fictional for purposes of GSEM) 1234 AB AB01 CDE 98765432 8,290
Location of work	BLE Engineering Company
Date	23/03/2023
Specialist tools and equipment	Hydraulic pressure & flow meter. Oil 'spill kit'. 'Fume extraction' equipment. Service Manual – hard copy. Diagnostic database - electronic.
Work to be carried out	Undertake an appropriate test on the tractor's auxiliary hydraulic system to explore if there is a fault within it that is the cause of the slow moving unloading elevator on the customer's potato harvester.
Symptoms/diagnostic data	Slow moving unloading elevator on the customers potato harvester. I have not been able to speak to the customer to determine the history of the symptoms of the reported slow moving unloading elevator of the potato harvester.

Job Card	Notes and comments
Diagnosis	The tractor's auxiliary system meets the performance specifications of the manufacturer. A pressure and flow test was completed with the oil at recommended temperature and engine running at recommended speed (RPM). Both test results met the specified manufacturer's data.
Work carried out	• I checked I had all the recommended PPE, and it was all within its 'fit for purpose' specifications. • Prepared the tractor for test. Checked all fluid levels (hydraulic oil, engine oil, coolant), checked oil condition, hydraulic system control operation, engine RPM limits (against RPM from manual) and tractor fault warning system (all OK). • Attached the fume extraction system. Turned on the system to check it prior to starting the tractor engine. • Checked the recommendations made in the risk assessment. Completed the actions made in the risk assessment's 'further action required' column and isolated access to the tractor cab. • Attached the hydraulic test kit. Checked the connections were clean and the hydraulic test kit was within its recommended calibration period and had no visible damage. • Switched on the fume extraction system, started the tractor and engaged the hydraulic system. I partially restricted the oil flow with the test kit until the oil had reached its recommended test temperature. • I carried out the test following the manufacturer's instructions. When the oil had reached its recommended temperature (as per manufacturer's data: above *x* degrees and viscosity), I set the engine RPM to the recommended speed (against RPM from manual) for the test. • I first did the maximum pressure test. This checks the system's pressure relief valve, pump and if there are any internal system leaks. The test data met the manufacturers specified maximum pressure figure. I noted the pressure figure before I moved onto the flow test. • I then carried out the flow test. This checks the ability of the system pump. The test data met the manufacturer's specified max flow figure. This test is done by partly restricting the flow to represent a function being performed. I restricted the flow at a range of pressures. I noted the flow figures (bar). • After the two tests were completed, I stopped the tractor and isolated its controls, removed the test kit, cleaned it, inspected it and returned it to the tool store. • I recorded the results and informed my manager that the tests confirmed the tractors hydraulic system was up to specification. • I suggest the next move would be to test the operation of the customer's potato harvester's unloading elevator hydraulic systems components eg motor, speed setting valve, connections, pipes etc.

Job Card	Notes and comments

	• Results from the test:
	  ○ maximum pressure: *results*
	  ○ flow test 1: *results (x pressure)*
	  ○ flow test 2: *results (y pressure)*
	  ○ flow test 3: *results (z pressure).*
	• I reinstated the work area and returned all the equipment to the store.
	• I finally re-checked the risk assessment to check if I had encountered hazards that had not been identified and now needed adding to the risk assessment (There were none).

Materials	6 absorbent cloths, absorbent granules, ear plugs and safety gloves.
Time taken	1hr 20mins
Further action required/ recommendations	The tractor's auxiliary system is performing to manufacturers specifications. I recommend the customer has the hydraulic components on their potato harvester's unloading elevator tested: eg motor, speed setting valve, connections, pipes etc.

Commentary

The candidate completed a comprehensive job card, showing an excellent understanding of how to present diagnostic information, using technical terminology accurately throughout eg auxiliary hydraulic systems, and viscosity.

The symptoms and initial assessment were accurately recorded in detail as part of their **preparation for diagnosis**, including the candidate's note that they had not been able to consult the customer, who may have provided additional information.

The candidate provided a detailed record of the **diagnostic test carried out**, including all the settings and data for their tests (temperature, pressure, flow, results), and their **interpreted information** to conclude that the tractor's hydraulic system was working to specification. This led to the candidate's correct recommendation that the potato harvester's unloading elevator's hydraulic drive components be tested.

The time taken is appropriate to the task and speed of work expected for distinction standard. The candidate included the materials used, so the job card accurately reflects the resources (costs) of completing the task.

Assessor evidence – assessor observation, Q&A, photo and video

Task	Assessment component number
2a) Diagnose machinery with ineffective hydraulics	8717-402
Candidate name	**Candidate number**
Sample Candidate	CG12345
Centre name	**Assessment themes**
Sample Centre	PO4: Preparation for diagnosis PO4: Carry out diagnosis PO4: Interpret information

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 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.	The candidate followed their risk assessment and kept the work area clean and tidy when carrying out the task, and the hazards were identified and controls considered eg wearing PPE as per their risk assessment (gloves, full face mask, eye protection, overalls, ear protectors, non-slip protective footwear), fume extraction system employed as required. Comprehensive and appropriate hand tools and equipment were selected to carry out the pressure and flow test: • hydraulic pressure & flow meter • oil 'spill kit' • fume extraction equipment • service manual – hard copy • diagnostic database - electronic. Ensured the area was clean and uncluttered, and prepared the appropriate resources in case of any spillages (drip tray and absorbent materials). Test equipment was assessed for serviceability prior to use by checking the test equipment calibration date. Prepared the tractor for safe working as per risk assessment – key removed whilst preparing, fume extraction, isolation.

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.*
Sequence of work: • checking oil level and condition • connection to test equipment • checking oil temperature • undertaking the pressure and flow test.	Referred to the workshop manual, and then started the tractor and prepared for the test following the manufacturer's instructions: checked oil level and condition, connected the test equipment correctly (photos 1 & 2) including contamination prevention measures eg wiping couplings with new consumables (photo 3). Double checked connections. Ran the tractor using measures to efficiently achieve the correct oil temperature including operating a valve to restrict the oil flow. Correct engine speed was set as per the manufacturer's instructions. They followed the manufacturer's test procedure: pressure and flow readings were obtained with the oil and test equipment at the recommended temperature (photo 4). Made readings for maximum pressure, and three readings for flow, following flow restriction conditions (video). Compared their readings to the manufacturer's specification, and reported their findings and recommendations that the tractor's auxiliary hydraulic system was operating to specification, and so was very unlikely to be the cause of the reported problem.

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?	Contamination whilst connecting and disconnecting the equipment. Residual oil in the testing equipment.
• 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.
• What would be the logical sequence of further actions?	Check the potato harvester's hydraulic system and components: • 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.

Assessor signature	**Date**
Sample Assessor	23/03/2023

Photo/video evidence

- Photo:
  - connecting the tractor to the test equipment
- Video:
  - undertaking the pressure and flow test: showing the readings during the test (typically 1 minute).

  Video is a separate file: Task 2a assessor video - pressure & flow test (D).mp4

Photo 1 Connecting the tractor to the test equipment: correctly connected

Photo 2 Connecting the tractor to the test equipment: correctly connected

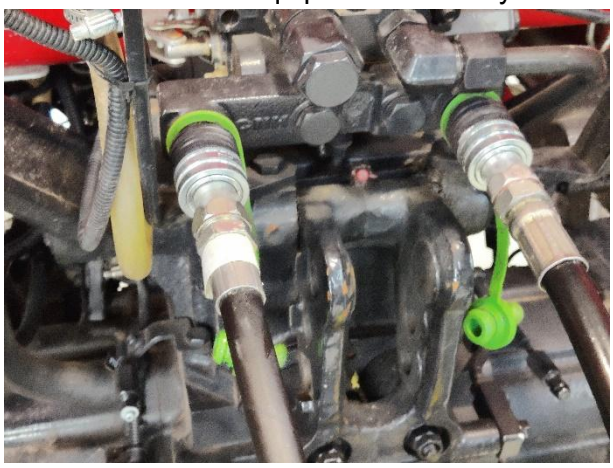


Photo 3 Connecting the tractor to the test equipment: cleaning connections

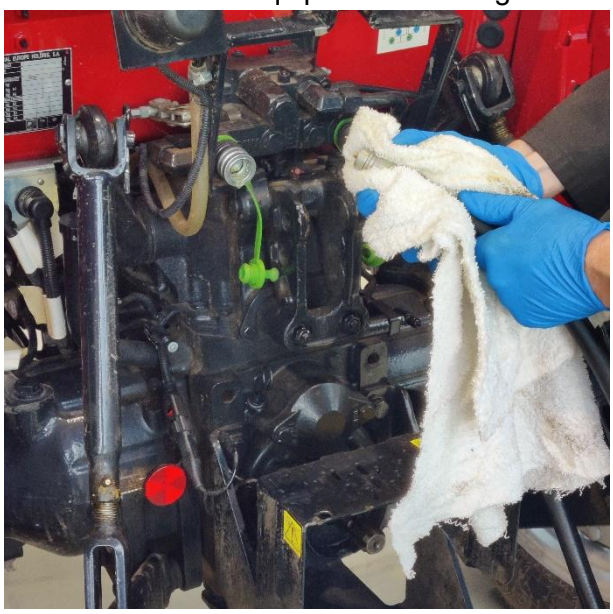
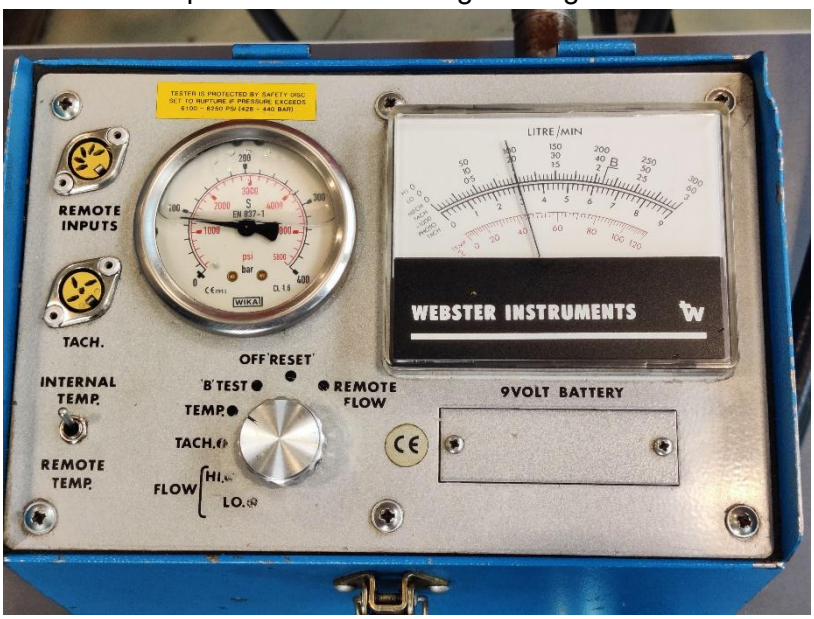


Photo 4 Reached correct temperature before taking readings



Commentary

The candidate demonstrated an excellent level of performance to **prepare for** and **carry out the diagnostic** test safely and efficiently to high quality standards within the time given.

The candidate's **preparation for the diagnostic** test was excellent: preparing the work area in line with their risk assessment (including uncluttered work area, checking the test equipment calibration date prior to use, controls for spillages available), and selecting a comprehensive and appropriate range of tools, including the calibrated test equipment.

Workshop tools and equipment were used safely, in line with the candidate's risk assessment, with comprehensive controls applied eg checking connections to make sure no oil escaped during the test.

The candidate applied their excellent skills and understanding to comprehensively prepare the tractor for testing, considering the detailed requirements of the task: checking oil level and condition, avoiding contamination via the couplings, efficiently achieving the correct oil temperature (by restricting the oil flow), and setting the engine speed as per manufacturer's instructions.

When **carrying out the diagnostic** test the candidate worked systematically to undertake the tests, including multiple flow readings. The candidate's accurate analysis when **interpreting information** correctly identified that the tractor was performing to the manufacturer's specifications.

The candidate's responses to the questions showed a depth of understanding of **carrying out a diagnostic** test and **interpreting information** eg potential causes of contamination and testing the potato harvester.

Task 2b) Diagnose machinery in limp mode

Evidence contributes to the following:

Performance outcome	Assessment themes
PO4 Diagnose land-based machinery and equipment faults	Preparation for diagnosis
	Carry out diagnosis
	Interpret information

Evidence	Assessment themes	Candidate producing	Assessor producing	Included in this GSEM
risk assessment	PO4: Preparation for diagnosis	√		
job card	PO4: Preparation for diagnosis PO4: Carry out diagnosis PO4: Interpret information	√		
assessor observation, including Q&A	PO4: Preparation for diagnosis PO4: Carry out diagnosis PO4: Interpret information		√	
photos			√	

Task 3 – Repair land-based machinery and equipment

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

Evidence contributes to the following:

Performance outcome	Assessment themes
PO3 Repair land-based machinery and equipment	Repair processes (Dismantle machinery and equipment)
	Repair processes (Reassemble machinery and equipment)

Evidence	Assessment themes	Candidate producing	Assessor producing	Included in this GSEM
risk assessment	PO3: Repair processes (Dismantle machinery and equipment)	√		√
job card	PO3: Repair processes (Reassemble machinery and equipment)	√		√
assessor observation	PO3: Repair processes (Dismantle machinery and equipment, Reassemble machinery and equipment)		√	√
photo			√	√

Candidate evidence – risk assessment

Candidate's name	Sample Candidate	Enrolment number	CG12345
Task/Activity	3a) Remove and refit a double-acting hydraulic cylinder	Location	Centre training area
Assessor's name	Sample Assessor	Date	23/03/2023

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)
1	Untidy working area.	Myself and others in the workshop. Slips, trips & falls. Crushing and entrapment by moving vehicles.	PPE (gloves, non-slip protective footwear). Workshop protocol measures for safe working eg storage of equipment, cleaning equipment prior to starting a job, marked walkways, spill kits. Emergency procedures, first aid kits.	Medium	Check PPE and work area before commencing task, check spill kit access, clean machine if required, operate in an uncluttered workspace.	Myself, prior to starting the job.	Low
2	Lifting heavy loads when removing the hydraulic cylinder.	Myself. Personal back injury from lifting.	Manual Handling training received. Use of lifting equipment, slings, forklift truck.	High	Assess lift to establish if lifting equipment is needed. Check lifting equipment has been tested, use appropriate manual lifting techniques.	Myself, prior to starting the job.	Low
3	Use of hand tools and small equipment needed for the task.	Myself. Injury as a result of using incorrect, faulty tools or equipment	Ensure correct selection of tools for the activity. Ensure proper use of tools and equipment.	Low	Visually check condition of tools and equipment and report any defects.	Myself, prior to starting the job.	Low

4	Spilt liquid that may occur or residue that may leak from the hydraulic cylinder.	Myself Slips, trips & falls.	Should a spillage occur ensure correct procedures are followed to clean up, using cloths and absorbent granules and spill kits.	Low	Dispose of waste correctly.	Myself, during and after the job.	Low
5	Other persons starting the tractor whilst the task is being carried out.	Myself. Injury as a result of tractor moving.	Machine isolation procedures.	High	Ensure tractor isolation procedures are carried out (key removal) prior to starting the maintenance.	Myself, during the job.	Low
6	Machinery moving when hydraulic cylinder is being removed.	Myself. Serious injury as a result of trapping and crushing.	Training received on releasing stored energy in hydraulic systems and positioning machinery for dismantling.	High	Use recommended machinery support method, eg mechanical locks.	Myself, during the job.	Low

Date of assessment: 23/03/2023	Risk assessment carried out by: Sample Candidate

Commentary

The candidate completed a comprehensive risk assessment as part of the **repair process**, showing an excellent understanding of the requirements of health and safety legislation, for example emergency procedures and manual handling. The candidate considered the logical order of the process to **dismantle** and reassemble the **machinery** to identifying a comprehensive range of hazards, demonstrating an excellent understanding of the risks that might occur, and the appropriate control measures.

The candidate demonstrated understanding of the difference between hazards, risks and control measures, providing a range of detailed precautions to minimise risk to themselves and others. The candidate made clear links between the risks and suitable precautions eg ensuring correct use of hand tools and visually checking their condition, and checking the lifting equipment has been tested before using it. The candidate correctly categorised risk ratings and considered further control measures that could be applied to reduce the risk ratings.

Candidate evidence – job card

Candidate's name	Sample Candidate	Enrolment number	CG12345
Task/Activity	3a) Remove and refit a double-acting hydraulic cylinder	Location	Centre training area
Assessor's name	Sample Assessor	Date	23/03/2023

Job Card	**Notes and comments**
Customer name	Guild Hire Ltd (contact name)
Machinery/equipment details: Make Model Registration Chassis/serial no. Odometer/hours	**Front end loader** Guilds Supplies (note: make and model are fictional for purposes of GSEM) 1234 AB AB01 CDE 98765432 6,520
Location of work	BLE Engineering Company
Date	23/03/2023
Specialist tools and equipment	Spill Kit. Hand tools, including 'open end' spanners, drifts, oil tray/container. Fume extraction facilities. Workshop manual.
Work to be carried out	Remove the leaking 'bucket tilt' cylinder for repair.
Symptoms/diagnostic data	Oil leaking, which is likely to cause bucket slipping when under load.
Diagnosis	The symptoms indicate the cylinder piston and cylinder cap seals need replacing.
Work carried out	• I positioned the tractor in the workshop work-bay, prepared my tools and equipment and ensured the spill kit was at hand. I needed to run the tractor to test the repair so needed fume extraction. • I positioned the loader so it would not move when the cylinder was being removed and released the oil pressure in the lift and return side of the cylinder.

Job Card	Notes and comments
	• I isolated the tractor starting system and ensured I was not obstructing the walkways in the workshop. • I removed the 2 hydraulic pipes and positioned them to reduce the leakage. • I removed the cylinder retaining pins and lifted the cylinder onto the bench. • When the cylinder had been repaired, I refitted it securing both locating pins and hydraulic pipes. • I greased both securing pins. • I then started the tractor and tested the loader hydraulic system; no leaks were found, and the bucket did not move when I put a load in it. • I re-instated the work area, cleaned, and returned the tools. • I re-checked the Risk Assessment to ensure it did not need updating after my experience. • I completed the job card and reported the job was complete.
Materials	2 new 'split pins' for the cylinder locating pins & 1 litre of hydraulic oil.
Time taken	1hr 40mins
Further action required/ recommendations	Recommend to the customer to keep an eye on the other cylinders that have exposed to the same conditions as the repaired one.

Commentary

The candidate completed a comprehensive job card, showing an excellent understanding of how to present information for a **repair process**, using technical terminology accurately throughout eg 'cylinder' rather than 'ram.'

The symptoms and initial assessment were accurately recorded in detail as part of the dismantling and **reassembly of the machinery**, including a possible cause of the symptoms and recommendation for further monitoring, which showed understanding of potential reasons for failure.

The candidate provided a detailed record of their repair work, including the conditions of the functionality testing.

The time taken is appropriate to the task and speed of work expected for distinction standard. The candidate included the materials used, so the job card accurately reflects the resources (costs) of completing the task.

Assessor evidence – assessor observation and photo

Task	Assessment component number
3a) Remove and refit a double-acting hydraulic cylinder	8717-402
Candidate name	**Candidate number**
Sample Candidate	CG12345
Centre name	**Assessment themes**
Sample Centre	PO3: Repair processes (Dismantle machinery and equipment) PO3: Repair processes (Reassemble machinery and equipment)

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, 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.	The candidate followed their risk assessment, including the safe management of stored energy (releasing the system pressure), and kept the work area clean and tidy when carrying out the task. The hazards were identified, and control measures considered, eg supporting the cylinder when removing it, following manual handling training. Appropriate tools and equipment were selected to carry out the removal and refitting of the hydraulic cylinder, quickly finding the correct type of spanner and spanner size on all occasions, and appropriate drifts and circlip pliers to remove the locating pins. All equipment was visually checked before use. Comprehensive equipment selected: • spill kit • hand tools, including ‘open end’ spanners, drifts, oil tray/container • fume extraction facilities • workshop manual. Used appropriate PPE as in their risk assessment, including hand protection due to the hydraulic oil and lubricants, non-slip protective footwear.

	Prepared the work area, with an absorbent cloth that they used to clear up hydraulic oil drips. Prepared the machine for safe working and removed the ignition key (photo 1). They considered a wide range of potential hazards and employed control measures such as isolating the work area from others, vehicle isolation (photo 2), put the machinery in a neutral position (tines resting on the floor), and limiting trip hazards by storing tools and equipment appropriately during the task.
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 • appropriate classification and disposal of waste.	Stood back to confirm the neutral position of the machine (photo 3) before starting work. Released the system pressure. They then labelled the pipes with cable ties before disconnecting them. They put the covering caps on the connectors and had a drip tray for collecting oil if required. Asked for assistance to safely support the hydraulic cylinder during removal and carrying to the work bench. They had assistance to support the cylinder when refitting it. They cleaned the connectors on the machine before connecting the pipes, initially hand tightening the pipes to avoid cross threading the fittings. Cleaned and lubricated the locating pins and refitted the circlips. After fitting the hydraulic cylinder, they greased the locating pins. They made a final check of the connector tightness, and then asked the assessor to check the refit, including the tightness of the pipes and the circlip location: no issues were identified by the assessor. Completed a functionality test by checking the surrounding work area for obstructions and other people. They used the fume extraction facilities and started the machine. They then operated the full travel of the hydraulic cylinder. They also checked the lift and lower hydraulic service for correct operation. They checked the hydraulic oil level on completion of the job (no top up required). Disposed of contaminated materials correctly.

Assessor signature	**Date**
Sample Assessor	23/03/2023

Photo/video evidence

- Photo:
  - preparation and immobilisation of the machinery: the machinery once prepared and immobilised.

Photo 1 Preparation and immobilisation of the machinery: the machinery once prepared and immobilised: removal of the ignition key

Photo 2 Preparation and immobilisation of the machinery: the machinery once prepared and immobilised: removal of the isolator

Photo 3 Preparation and immobilisation of the machinery: tines in neutral position

Commentary

The candidate demonstrated an excellent level of performance to carry out the **dismantling and reassembly of the machinery** safely and efficiently to high quality standards within the time given.

The candidate's preparation for the **repair process** was excellent: preparing the work area in line with their risk assessment (including uncluttered work area, PPE, oil spillage controls), isolating and immobilising the machine, checking the machine was in a safe neutral position, and selecting a comprehensive and appropriate range of tools, all resulting in efficient working.

The candidate worked systematically, safely using tools and equipment in line with their risk assessment, with comprehensive controls applied eg releasing the system pressure, and checking the condition of equipment before use.

The candidate applied their excellent skills and understanding, considering the detail of the requirements, such as labelling the pipes to ensure correct reconnection, initially hand tightening the pipes to reduce the risk of damage, getting the assessor to check the tightness of the pipes and circlip location, and a thorough verification of functionality.

Task 3b) Repair a double-acting hydraulic cylinder

Evidence contributes to the following:

Performance outcome	Assessment themes
PO3 Repair land-based machinery and equipment	Information and factors influencing repairs
	Repair processes (Dismantle machinery and equipment)
	Repair processes (Component repair methods)
	Repair processes (Reassemble machinery and equipment)

Evidence	Assessment themes	Candidate producing	Assessor producing	Included in this GSEM
risk assessment	PO3: Repair processes (Dismantle machinery and equipment)	√		√
job card	PO3: Information and factors influencing repairs	√		√
assessor observation, including Q&A	PO3: Information and factors influencing repairs		√	√
photo	PO3: Repair processes (Dismantle machinery and equipment, Component repair methods, Reassemble machinery and equipment)		√	√

Candidate evidence – risk assessment

Candidate's name	Sample Candidate	Enrolment number	CG12345
Task/Activity	3b) Repair a double-acting hydraulic cylinder	Location	Centre training area
Assessor's name	Sample Assessor	Date	23/03/2023

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)
1	Unclean and unsafe working area.	Myself and others in the workshop. Slips, trips & falls, Crushing and entrapment by moving vehicles. Dermatitis.	PPE (gloves, non-slip protective footwear, coveralls). Workshop protocol measures for safe working eg storage of equipment, cleaning equipment prior to starting a job, marked walkways, spill kits. Emergency procedures, First aid kit.	Medium	Check PPE and work area before commencing task, check spill kit access, clean cylinder if required, operate in an uncluttered workspace. Check first aid kit and fire extinguishers are in place.	Myself, prior to starting the job.	Low
2	Use of hand tools and small equipment needed for the task.	Myself, injury as a result of using incorrect, faulty tools or equipment.	Ensure correct selection and use of tools for the activity. Ensure proper use of tools and equipment.	Low	Visually check condition of tools and equipment and report any defects.	Myself, prior to starting the job.	Low
3	Oil spillage from the hydraulic cylinder.	Myself & others, Slips, trips & falls.	PPE (gloves, non-slip protective footwear). Marked work areas and marked walkways.	Low	Dispose of waste correctly.	Myself, during and after the job.	Low

			Should a spillage occur ensure correct procedures are followed to clean up, using cloths and absorbent granules and spill kits.				

Date of assessment: 23/03/2023	Risk assessment carried out by: Sample Candidate

Commentary

The candidate completed a comprehensive risk assessment as part of the **repair process**, showing an excellent understanding of the requirements of health and safety legislation, for example emergency procedures and manual handling. The candidate considered the logical order of the process to **dismantle** and repair the **machinery** to identify a comprehensive range of hazards, demonstrating an excellent understanding of the risks that might occur, and the appropriate control measures.

The candidate demonstrated understanding of the difference between hazards, risks and control measures, providing a range of detailed precautions to minimise risk to themselves and others. The candidate made clear links between the risks and suitable precautions eg ensuring correct use of hand tools and visually checking their condition, and following procedures for managing spills. The candidate correctly categorised risk ratings and considered further control measures that could be applied to reduce the risk ratings.

Candidate evidence – job card

Candidate's name	Sample Candidate	Enrolment number	CG12345
Task/Activity	3b) Repair a double-acting hydraulic cylinder	Location	Centre training area
Assessor's name	Sample Assessor	Date	23/03/2023

Job Card	**Notes and comments**
Customer name	Guild Hire Ltd (contact name)
Machinery/equipment details: Make Model Registration Chassis/serial no. Odometer/hours	**Loader** Guilds Supplies (note: make and model are fictional for purposes of GSEM) 1234 AB AB01 CDE (registered in 1995) AB123456 6,520
Location of work	BLE Engineering Company
Date	23/03/2023
Specialist tools and equipment:	Spill kit. Hand tools, including, circlip pliers, spanners, seal removing tool. Drip tray. Workshop manual.
Work to be carried out	Replace piston seals, cylinder cap seals and 'o' rings.
Symptoms/diagnostic data	Hydraulic oil leaking.
Diagnosis	Seal is damaged, most likely from the operating conditions of the loader eg excessive use, exposed to adverse weather conditions. Replace the piston seals, cylinder cap seals and 'o' rings.
Work carried out	• I checked the Risk Assessment and checked I was not obstructing walkways in the workshop. • I checked the seal replacement procedure in the workshop manual.

Job Card	Notes and comments
	• I removed the cylinder cap and cylinder rod. • I removed the old seals in the piston and refitted the new ones following the recommendations in the manual. • I removed the old seals in the cylinder cap and refitted the new ones following the recommendations in the manual. • Reassembled the cylinder following the procedures in the manual taking care not to damage the new seals and 'o' rings. • I checked the full travel of the cylinder rod. • I re-instated the work area, cleaned, and returned the tools. • I re-checked the Risk assessment to ensure it did not need updating after my experience. • I completed the job card and reported the job was complete.
Materials	Seal kit, part Nº 876523 Cylinder rod cover and 2 hydraulic connector protection caps.
Time taken	1hr 15mins
Further action required/ recommendations	Ask customer to monitor the other hydraulic cylinders for signs of leakage.

Commentary

The candidate completed a comprehensive job card, showing an excellent understanding of how to present repair **information**, and using technical terminology accurately throughout eg piston seals, cylinder cap seals.

The **information** gathered (symptoms and assessment) was accurately recorded in detail, including application of the candidate's understanding to note **factors influencing repairs** that could cause damage to the seals, logically leading to the noted further action/recommendation.

The candidate provided a detailed record of their work and the materials used, so the job card accurately reflects the resources (costs) of completing the task. The time taken is appropriate to the task and speed of work expected for distinction standard.

Assessor evidence – assessor observation, Q&A, and photo

Task	Assessment component number
3b) Repair a double-acting hydraulic cylinder	8717-402
Candidate name	**Candidate number**
Sample Candidate	CG12345
Centre name	**Assessment themes**
Sample Centre	PO3: Information and factors influencing repairs PO3: Repair processes (Dismantle machinery and equipment) PO3: Repair processes (Component repair methods) PO3: Repair processes (Reassemble machinery and equipment)

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. • Prepare the work area.	The candidate followed their risk assessment, including ensuring a safe working environment, and keeping the cordoned off work area clean and tidy when carrying out the task. The hazards were identified, and control measures considered, eg managing the risk of slips and trips from spilt lubricants/oils, limiting trip hazards by storing tools and equipment. Appropriate tools and equipment were selected to carry out the repair of the hydraulic cylinder, so they did not have to return to the store during the task. Comprehensive specialist equipment selected: • spill kit • hand tools, including, circlip pliers, spanners, seal removing tool • drip tray • workshop manual. Used appropriate PPE as in their risk assessment, including eye and hand protection due to the hydraulic oil and lubricants. Prepared the work area with an absorbent cloth that they used to clear up hydraulic oil drips, and a drip tray on the bench for collecting oil.

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.	Used the correct manual handling techniques to position the cylinder on the work bench (photo 1). Followed the correct sequence of work to disassemble, inspect and repair the hydraulic cylinder, using appropriate force without damage: • checked the seal replacement procedure in the workshop manual • drained and collected as much hydraulic fluid as possible before removing the cylinder cap (manipulating the rod to assist with this) • removed the cylinder cap and cylinder rod • removed the old seals in the piston and refitted the new ones following the recommendations in the manual • removed the old seals in the cylinder cap and refitted the new ones following the recommendations in the manual and using seal fitting protection devices • reassembled the cylinder following the procedures in the manual taking care not to damage the new seals and 'o' rings • confirmed that the hydraulic cylinder should work to specification by checking the full travel of the cylinder rod. Returned tools and equipment and cleaned work area. Completed job card and re-checked risk assessment. Disposed of contaminated materials and used parts as per workshop procedure.

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?	A lot of factors would influence whether to replace or repair parts, such as: • availability of replacement parts and how quickly need the customer needs the machine working • what it will cost; one might be cheaper than the other • what the warranty requires for continued coverage, eg original equipment from the manufacturer.
• What is cavitation in a hydraulic system?	Cavitation is recognised by a noise, such as a knocking sound when the hydraulic system is operating. The hydraulic cylinder may move slowly and/or judder.
• What causes it?	Usually, it is caused by air trapped in the hydraulic oil. This might be because of a lack of oil in the system.

Assessor signature	Date
Sample Assessor	23/03/2023

Photo/video evidence

- Photo:
  - strip and inspect the hydraulic cylinder: stripped cylinder before repair.

Photo 1 Stripped cylinder before repair

Commentary

The candidate demonstrated an excellent level of performance to carry out the **component repair** safely and efficiently to high quality standards within the time given.

The candidate's preparation for the task was excellent: preparing the work area in line with their risk assessment (including uncluttered work area, PPE, oil spillage controls), and selecting a comprehensive and appropriate range of tools, all resulting in efficient working.

The candidate worked systematically, safely using tools and equipment in line with their risk assessment and applying their excellent skills and understanding to **dismantle, repair and reassemble** the hydraulic cylinder, considering the detail of the **repair process**, such as manipulating the rod to help with draining the cylinder, and checking the full travel of the rod after reassembly.

The candidate's responses to the questions showed a depth of understanding of **factors influencing repairs** and **reassembly of machinery** eg what might cause trapped air in hydraulic oil.

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

Task 4a) Prepare for a customer handover

Evidence contributes to the following:

Performance outcome	Assessment themes
PO5 Handover land-based machinery and equipment	Handover

Evidence	Assessment themes	Candidate producing	Assessor producing	Included in this GSEM
preparation notes	PO5: Handover	√		√

Candidate evidence – preparation notes

Candidate's name	Sample Candidate	Enrolment number	CG12345
Task/Activity	4a) Prepare for a customer handover	Location	Centre training area
Assessor's name	Sample Assessor	Date	23/03/2023

Preparation notes and plan for handover
(Note: make and model are fictional for purposes of GSEM)

Content	time
Introductions: My name, my role, Confirm meeting operator at Guild Hire Ltd, Why I am here: handover the all-terrain vehicle (not demonstrating), Confirm safe and suitable setting to hand over – done risk assessment.	5

The vehicle:
All-terrain vehicle made by Guilds Supplies. Model 1234 AB.
 	
Key features:
• 2-wheel drive - can change to 4WD
  ○ 180mm ground clearance
  ○ adjustable preload front and rear suspension
• 500cc fuel injection, longitudinal mounted engine
  ○ manual transmission: 5 forward gears and reverse
  ○ unleaded
  ○ fuel tank of 13.3litre capacity (2.6l reserve)
• Highway compliant.
 	
How the ATV is highway compliant:
• Registered as a light agricultural vehicle:
  ○ number plate on rear
  ○ don't need MOT
  ○ can't carry passengers
  ○ highway compliant lighting and mirrors.
	5

Owner's manual: Must read the manual **Operation, Instruments & Controls:** Instruments & control locations p21-32: *show diagram & where on ATV.* *Explain Operation* and point out each instrument/control p64. Display p24-32: manual provides more detail about how each works:	15

• Main display:
  o gear position (on/neutral/reverse)
  o speedometer
  o hourmeter/odometer/tripmeter.
• High coolant temperature indicator
• Low oil pressure indicator
• Hourmeter/odometer/tripmeter – select button.
 	
Fuel gauge: When gauge needle is on red band must refuel.
Reserve fuel valve: under fuel tank on right hand side.
 	
Refer to manual:
• Starting procedure p70:
  o ignition & start, throttle
  o 2wd/4wd selector
  o headlights – on, dim
  o horn.
• Stopping procedure p73:
  o brakes – front, rear, parking.
• Changing gear p75 – 5 forward gears and reverse.
• Braking p79 – disc brakes.
• Reversing p77 – warning.
• Turning p81.
 	
Being ready to ride:
• What to wear:
  o always wear a crash helmet such as an approved motorcycle helmet
  o also recommend eye protection, sturdy boots, gloves p38.
• What to check – fuel, tyres, guards, load limits p54.
• Training.	

Safety procedures and features: *explain at the same time as the operation.*
• In the manual – exclamation mark image 'Danger, Warning, Caution' – *show page 6 of manual.*
 	
Never carry a passenger – only designed and licenced for one person. They could interfere with ability to move around, maintain balance and control.
 	
Meaning of warning and safety symbols in the operator manual and on the ATV *talk about as walk around the vehicle:*
• On the cargo racks – front and rear (p17/18):
  o warning – max cargo load 30kg/60kg
  o risks from overloading – change handling, stability and braking.
• On the seat (p17):
	10

○ no passengers – risk of severe injury or death. • On the wheel arch (p17): ○ tyre pressure – 25.0kPa on both front and rear ○ maximum weight capacity of 220kg. • Bodywork (p18): ○ Braking – on both front and rear wheels ○ Operator age minimum of 16 years old ○ Max. tow weight capacity 200kg. • Safe operation (p18): ○ suitable speed ○ wear helmet and protective gear.	
Maintenance and warranty requirements: Servicing & maintenance schedule (p95): • see table with procedure and frequency • inspect, clean, adjust, lubricate or replace • next service due 1,000 hours (910 hours now, so just had a service) • oil: SE, SF or SG, Viscosity: SAE10W-40 (Full specifications on p214 of manual). **Warranty conditions:** • manufacturer's warranty has 1 year left to run • covers engine and gear box – parts only – will be genuine parts • must keep maintenance records. Warranty does not cover (more detail in warranty terms & conditions): • alteration, modification and misuse eg racing • normal deterioration, wear and tear, and routine maintenance eg, inspections, adjustments, lubrications. Warranty will only be valid if manufacturer's original parts are used.	5
Questions & paperwork: Go through paperwork – highlight: • VIN: on front frame: 987654 • engine number: on upper side of rear crankcase: 43210. Do they have any questions? **Make sure handover form is signed**.	5

Commentary

The candidate created comprehensive preparation notes with detailed information for the **handover**, including owner manual page references that they could easily access during the handover if additional information is required.

The candidate's breakdown of timing allows appropriate time for each section, for example recognising that explaining the operation of the ATV will take longer than maintenance and warranty requirements.

Task 4b) Pre delivery inspection

Evidence contributes to the following:

Performance outcome	Assessment themes
PO5 Handover land-based machinery and equipment	Handover

Evidence		Candidate producing	Assessor producing	Included in this GSEM
risk assessment	PO5: Handover	√		
pre delivery inspection checklist		√		√
assessor observation			√	√
photos			√	

Candidate evidence – pre delivery inspection checklist

Candidate's name	Sample Candidate	Enrolment number	CG12345
Task/Activity	4b) Pre delivery inspection	Location	Centre training area
Assessor's name	Sample Assessor	Date	23/03/2023

Inspection requirement	Tick when checked	Comments
Machinery/equipment details: Make Model Registration Chassis/serial no. Odometer/hours	√	**All-terrain/utility vehicle** Guilds Supplies (note: make and model are fictional for purposes of GSEM) 1234 AB AB01 CDE 98765432 910 hours
Operator handbook/instructions available	√	
Bodywork condition	√	Small scratches on cargo racks; no sign of rust.
Function and operation of the machinery/equipment		
Function of all controls and switches	√	All checked and function is correct.
Safety guards and devices	√	All checked and function is correct.
Vision		
Wipers	n/a	
Mirrors	√	Cleaned.
Wheels and tyres		
Tyre condition and pressure	√	Low pressure in front o/side tyre – inflated to meet manufacturer's specification for typical loads.
Wheel nuts/bolts	√	Loose wheel nut on rear o/side wheel – tightened to torque in manufacturer's specification.
Wheel bearings	√	Physical check (manual manipulation).

Inspection requirement	Tick when checked	Comments
Wheel rim fixings	n/a	
Grease points	√	All checked.
Brake connections	√	All checked.
Mechanical couplings	n/a	
Superstructure		
Frame, body	√	No visible damage.
Hitch	√	Towbar already fitted, electrical socket for trailer lights.
Trailer bed	n/a	
Suspension axle and fixings	√	Safe.
Lights	√	Cleaned and checked for correct function.
Safety decals	√	All present and readable.
Function decals	√	
Oil levels	√	Checked – correct level (engine and brakes).

Date	23/03/2023
Technician Name	Sample Candidate
Signature	Sample Candidate
Company	BLE Engineering Company

Commentary

The candidate completed a comprehensive PDI checklist, showing an excellent understanding of how to present information for a **handover**. All sections were completed with appropriate details eg what the candidate has done.

Assessor evidence – assessor observation and photos

Task	Assessment component number
4b) Pre delivery inspection	8717-402
Candidate name	**Candidate number**
Sample Candidate	CG12345
Centre name	**Assessment themes**
Sample Centre	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.	The candidate followed their risk assessment. Hazards and risks were identified, and control measures applied, eg isolating the ATV and keeping the work area clean and tidy. Comprehensive and appropriate tools and equipment were selected to carry out the inspection, quickly finding the correct type of wrench and wrench size on all occasions. Used appropriate PPE as per risk assessment, including gloves and coveralls to protect from irritants, and non-slip protective footwear. Prepared the vehicle for safe working by removing the ignition key and taking it out of gear. They also isolated the work area from others with signage.
• Carry out checks and adjustments as stipulated in the PDI checklist. • Identification of faults and undertake adjustments to comply with manufacturer's specifications.	Worked methodically through the PDI Checklist, checking each item against the manufacturer's specification. They cleaned the lights and mirrors, and correctly recorded the vehicle details. Correctly made two rectifications that they recorded on the PDI Checklist: • increased pressure in front o/side tyre to meet specification for a typical load • tightened wheel nut on rear o/side wheel to specified torque (photos 1 & 2). Checked torque wrench calibration date before use (photo 3). (These adjustments were set by the assessor prior to the task.)

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.*
	Tidied up and disposed of contaminated materials correctly.

Assessor signature	**Date**
Sample Assessor	23/03/2023

Photo/video evidence

- Photos:
  - using the torque wrench – showing hand, wrench and wheel
  - the torque wrench setting and manufacturer's specification.

Photo 1 Using the torque wrench: hand, wrench, wheel, and manufacturer's specification

Photo 2 Torque wrench setting

Photo 3 Checking torque wrench calibration date

Commentary

The candidate demonstrated an excellent level of performance to carry out the pre delivery inspection for the **handover** safely and efficiently to high quality standards within the time given.

The candidate's preparation for the task was excellent: immobilizing the machinery, preparing the work area in line with their risk assessment (appropriate tool storage and isolation measures), and selecting a comprehensive and appropriate range of tools, that all resulted in efficient working.

The candidate worked systematically, safely using tools and equipment. The candidate applied their excellent skills and understanding to the task, considering the detail of the requirements, such as cleaning the lights and mirrors to ensure the vehicle was presented as well as possible.

The candidate completed the PDI and PDI Checklist, correctly identifying the pre-set rectification work and making the correct adjustments to meet manufacturer's specification.

Task 4c) Customer handover

Evidence contributes to the following:

Performance outcome	Assessment themes
PO5 Handover land-based machinery and equipment	Handover

Evidence	Assessment themes	Candidate producing	Assessor producing	Included in this GSEM
risk assessment	PO5: Handover	√		√
handover checklist		√		
assessor observation, including Q&A			√	√

Candidate evidence – risk assessment

Candidate's name	Sample Candidate	Enrolment number	CG12345
Task/Activity	4c) Customer handover	Location	Centre training area
Assessor's name	Sample Assessor	Date	23/03/2023

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)
1	Moving farm vehicles.	Self and customer. Crushing and entrapment.	PPE: Wear non-slip protective footwear and high visibility clothing. Vehicle speed limits. Flashing beacons/lights used.	Medium	Agree with the customer a safe area to work in.	Myself with customer, prior to and during the handover.	Low
2	Animals and other people moving around.	Self and customer. Injury, crushing.	Animal pens/fencing.	Low	Agree with the customer a safe area to work in.	Myself with customer, prior to and during the handover.	Low
3	Environment of the farm (weather conditions, tidiness of work area, ground/floor surfaces, lighting).	Self and customer. Slips, trips & falls.	Farm's risk assessment for safe working.	Medium	Agree with the customer a safe area to work in.	Myself with customer, prior to the handover.	Low
4	Unloading the ATV from the delivery trailer.	Self and customer. Crushing.	Safe unloading procedures.	Low	None	n/a	Low

Date of assessment: 23/03/2023	Risk assessment carried out by: Sample Candidate

Commentary

The candidate completed a comprehensive risk assessment for the customer **handover**, showing an excellent understanding of the requirements of health and safety legislation, for example referring to PPE. The candidate identified a comprehensive range of hazards in the handover, demonstrating an excellent understanding of the risks that might occur and the appropriate control measures.

The candidate demonstrated understanding of the difference between hazards, risks and control measures. The candidate made clear links between the risks and suitable precautions that would keep themselves and others safe eg arranging a suitable work area with the customer to minimise the risk of harm by moving farm vehicles. They correctly categorised risk ratings and included additional control measures to reduce the risk ratings.

Assessor evidence – assessor observation

Task	Assessment component number
4c) Customer handover	8717-402
Candidate name	**Candidate number**
Sample Candidate	CG12345
Centre name	**Assessment themes**
Sample Centre	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.	The candidate followed their risk assessment. Hazards and risks were identified, and control measures applied, eg agreeing a safe area to handover the vehicle.
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.	They followed their notes and plan to comprehensively cover the handover in about 40 minutes: • introductions and explained purpose of conversation – polite and clear • key features – correct details about the vehicle • explaining the vehicle's highway compliance – including that can't carry passengers • how to operate the vehicle – with continuous reference to the owner's manual and safety procedures eg what to wear, what to check before use • safety procedures and features – pointed out all the warning and safety symbols on the vehicle, including maximum loads of vehicle and both cargo racks • maintenance and warranty requirements – included when the next service is due, and the importance of using genuine parts in order to meet the warranty requirements • serial numbers • checking if the customer had any questions • handover checklist signed.

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.*
• The importance of serial numbers.	They took a logical approach to the handover, working around the vehicle and explaining the operation of the vehicle and the relevant safety requirements as they went. They paused after each section to check if the customer had any questions, respectfully reinforcing the key points. They referenced their plan and the owner's manual and used technical terminology correctly throughout the handover. They correctly answered the customer (assessor) questions (see below).

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?	Colleges and manufacturers run a recognised training course.
• What are the legal requirements to drive this on the highway?	It depends if it is registered as a light agricultural vehicle or as a road legal quad bike. The gov.uk website has the quad bike rules.

Assessor signature	Date
Sample Assessor	23/03/2023

Commentary

The candidate demonstrated an excellent level of performance to **handover** the vehicle safely and efficiently within the time given.

The candidate worked systematically through their plan efficiently explaining each operation and safety requirement as they worked around the vehicle, using technical terminology accurately throughout.

The candidate referenced the owner's manual throughout and was able to provide detailed responses to the questions, resulting in a comprehensive level of information for the customer.

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