HM Government

T-LEVELS

T Level Technical Qualification in Agriculture, Land Management and Production

Land-based Engineering Occupational Specialism

Guide Standard Exemplification Material Threshold Competence – Sample 2023

City & Guilds

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Introduction

The sample evidence within this document refer to the Land-based Engineering Occupational Specialism assignment. The aim of these materials is to provide centres with examples of knowledge, skills and understanding that attest to a threshold competence grade.

The evidence presented here has been developed to reflect a threshold competence 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 threshold competence 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 threshold competence.

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 pass (threshold competence), a candidate will be able to:

Demonstrate an adequate level of performance that meets the requirements of a brief, demonstrating sound technical skills and techniques to safely carry out work to adequate quality standards within time constraints.

Identify and work within relevant legislation and regulations, identifying potential risks and applying adequate control measures.

Prepare working area to an adequate standard and select adequate tools and equipment to safely carry out the work to manufacturer's standards.

Carry out practical tasks to an adequate standard whilst applying sound knowledge and understanding of components, systems, machinery, and equipment.

Undertake assessment of the machinery and equipment to establish symptoms. Use adequate information to diagnose the cause, and undertake work based on a diagnosis.

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

Mostly 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 and 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	Untidy Workshop.	Me and others. Slips, trips and falls.	Marked work areas. Granules.	Medium	Notify those nearby when any vehicle is moving. Fume extractor. Clean any spillages.	Me, during the job.	Low
2	Lifting heavy loads.	Me, back injury.	Ensure correct training has been received. PPE (safety boots).	High	Use wheel removing trolly. Use axle stands to support tractor when wheel is removed.	Me.	Low
3	Using hand tools/ equipment incorrectly/sharp objects.	Me. Cuts, abrasions, hand injury.	Ensure proper use of tools and equipment.	Medium	None	Me.	Low
4	Spilt oil when checking oil levels.	Slipping. Myself and others.	PPE (safety glasses). Clean up spillages, using cloths and floor granules.	Low	None	Me, when spillages occur.	Low.
5	Other people starting the tractor.	Me and others. Tractor moving.	Remove key.	Medium	None.	Before starting the job.	Low.
6	Tractor falling off jack when removing the wheel.	Me.	Use axle stands or dry wooden blocks of sufficient size and strength to support hydraulic jack.	High	Visual checks on stands and blocks.	When doing the job.	Low.

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

Commentary

The candidate completed an acceptable risk assessment as part of their **maintenance preparation**, showing an adequate understanding of the requirements of health and safety legislation, for example wearing safety boots, and the difference between hazards, risks and control measures. The candidate identified the major hazards in the maintenance task and demonstrated an understanding of the related risks that might occur, although there were some omissions, such as only considering the risk of lifting the wheels and not moving them, and no reference to lifting equipment checks.

The candidate identified a range of adequate precautions that would keep themselves and others safe, although they missed some detail, such as only specifying the minimum PPE. The candidate correctly categorised the risk ratings. The candidate included additional control measures to reduce the risk ratings, although they sometimes missed who or when the additional actions should be undertaken.

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
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:	Jack. Axle Stand. Torque wrench. Workshop manual.
Work to be carried out	Adjust the 4WD front axle hub swivel taper roller bearings.
Symptoms/diagnostic data	Play in the front wheels.
Diagnosis	I checked the front wheel and found play in the near-side front bearings.
Work carried out	• I followed the workshop risk assessment. • Prepared my tools and work area. • I jacked up and supported the tractor front axle. • I removed the near side front wheel to get access to the bearings. • No oil leaks or play in drive shaft observed

Job Card	Notes and comments
	• I removed 2 spacers from the bearing carrier. • Refitted the wheel, checked the freeplay. • Returned tools and equipment and cleaned work area.
Materials	None.
Time taken	3hrs 30mins
Further action required/ recommendations	None.

Commentary

The candidate completed an acceptable job card, showing an adequate understanding of how to present **maintenance information**, mostly using technical terminology accurately eg 'play' in the front wheels would be more accurately described as 'excessive movement.'

All sections were adequately completed with the **maintenance work carried out**, although it lacks some detail. For example, the symptoms and initial assessment were briefly recorded, although the symptoms reported by the customer were missed. The diagnosis briefly, but clearly, states what the candidate found, although they didn't consider **influencing factors**. The task asked for an inspection of the Universal joint and oil seals; the candidate recorded the outcome without recording the investigative step taken ('No oil leaks or play in drive shaft observed'). The record does not include the detail of the size of the shim that was removed ('removed 2 spacers').

They did not record further actions or recommendations, so the candidate missed an opportunity to pass on good practice to the customer, eg lubrication schedules.

The candidate did not include the materials used therefore the job card does not fully record the resources (costs) of completing the task, for example consumables such as grease and cleaning supplies. The time taken is appropriate to the task and speed of work expected for threshold competence standard.

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 when carrying out the task, and most hazards were identified and considered eg jacking, supporting, manual handling, and the wearing of PPE (eye protection, safety boots). They didn't always maintain a clean and uncluttered work area, although safe working was maintained throughout. Appropriate tools and equipment were selected, but they initially selected the incorrect tool (a ring spanner) for loosening the wheel nuts. They returned to the store to select the correct tool. They then correctly used a socket to remove the nuts. Prepared the machine for safe working by applying the park brake and removing the ignition key, with some working area isolation measures. Safely supported the machine using axle stands.

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.*
• 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 hub bearings. Safely removed the wheel using the correct equipment. They left the wheel nuts/studs on the floor. Photo 1 before cleaning Visually checked the oil seals for leaks (photo 2; no leakage found), and the Universal joint (photo 2). Visually assessed the condition of the hub bearing (photo 3; no damage or excessive wear identified). After cleaning off debris, followed the manufacturer's procedure to adjust the preload: • removed the shims • measured the gap with a feeler gauge (photo 4) • used a non-digital Vernier calliper to measure the shims (photo 5) • removed two shims from the hub bearing carrier • rechecked the preload and found it was within the specification (video). Lubricated the bearings (no consultation of the specification). Safely replaced the wheel. Applied the correct torque to the wheel nuts/studs. Left the work area clean and tidy, and appropriately disposed of the used shims.

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. Dirt and dust entering. Loose bearing.

• Why adjust a bearing?	To remove free play.
• State **three** observations that indicate a bearing requires replacement.	Machine vibrating. Very loud squeaking noise. Physical damage to the bearing.
• Why are nuts/studs torqued to the correct setting?	To make sure they don't come loose.
• Why is it important to replace locking devices?	To stop components becoming loose.

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 (TC).MOV

Photo 1 Condition of bearings and seals: before cleaned

Photo 2 Condition of seals: candidate check after cleaning

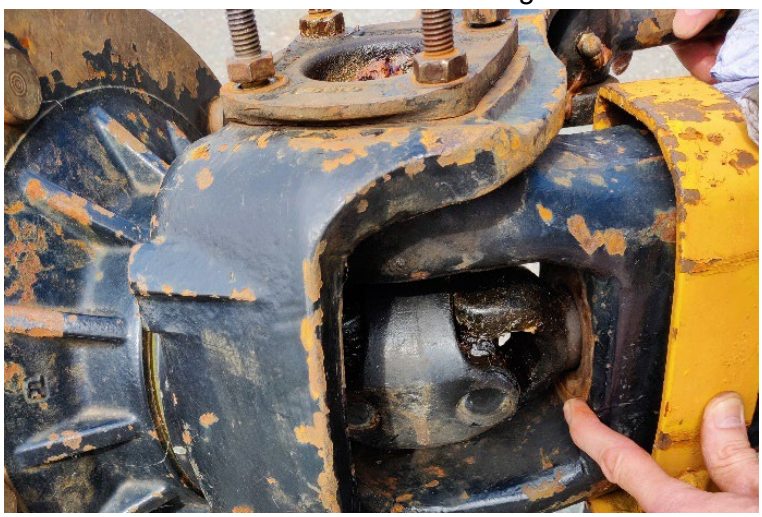


Photo 3 Condition of bearing: candidate check

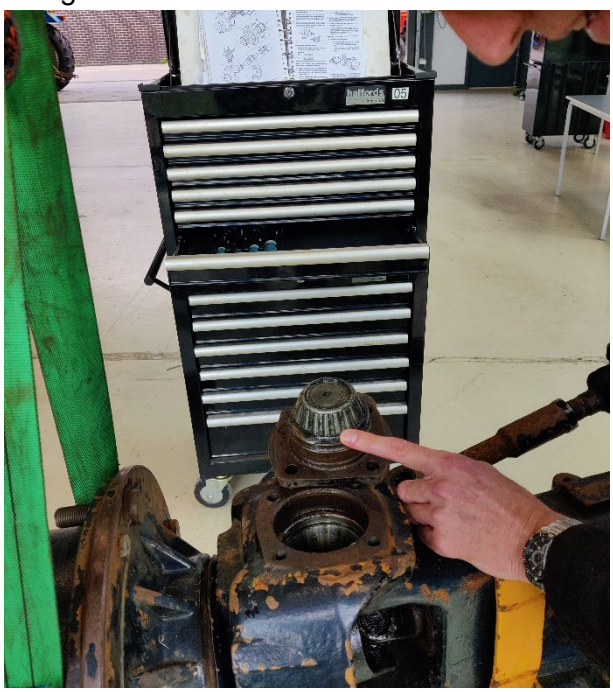


Photo 4 Measuring gap

Photo 5 Measuring shims

Commentary

The candidate demonstrated an adequate level of performance to safely **carry out maintenance** to an acceptable standard within the time given.

The candidate's **maintenance preparation** was adequate: immobilizing the machinery, preparing the work area in line with their risk assessment (PPE and axle stands) and selecting some appropriate tools, although the candidate had to go back to the store.

Workshop tools and equipment were used safely in line with the candidate's risk assessment, although the work area was sometimes cluttered, with the wheel nuts/studs left on the floor.

The candidate followed the maintenance procedure, applying a sound understanding to the task, gathering **information** through visual and physical checks, and correctly disposing of waste. There were some errors and omissions: using the incorrect tool for loosening the nuts (which the candidate did then correct), missing a thorough physical check of the Universal joint, and using a Vernier calliper instead of a micrometer to measure the shims.

The candidate's responses to the questions showed adequate understanding of **carrying out maintenance** and **factors influencing maintenance** eg brief reasons for possible bearing failures and when a bearing might require replacement.

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	Workshop.	Myself and assessor. Slips, trips and falls. Moving vehicles.	Wear PPE (eg safety boots) at all times. Ensure area is always clean and tidy.	Medium	Use extraction if required.	Me, as required.	Low
2	Using hand tools and equipment to undertake preparation for the task.	Myself. Cuts, abrasions, hand injury. Lifting injury.	Ensure proper use of tools and equipment. Wear PPE as required. Manual handling training.	Medium	Monitor condition of PPE during use and replace as required. Follow manual handling procedures.	Myself.	Low
3	Contaminated sprayer.	Myself and others. Chemical contamination.	Ensure correct PPE is worn (thick gloves, goggles/face protection).	Medium	Monitor condition of PPE during use and replace as required.	Myself.	Low
4	Dilute chemical.	Myself and others. Chemical contamination.	Washings collection.	High	Follow washings collection procedure.	Myself and others.	Low
5	Lubricants and protective coatings.	Myself. Chemical contamination.	Wear face mask as required.	Medium	Monitor condition of face mask during use and replace as required.	Myself.	Low

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

Commentary

The candidate completed an acceptable risk assessment as part of their **maintenance preparation**, showing an adequate understanding of the requirements of health and safety legislation, for example wearing safety boots, and the difference between hazards, risks and control measures. The candidate identified the major hazards of the maintenance task and demonstrated an understanding of the related risks that might occur, although they missed some low risk hazards such as the tools and equipment for cleaning the machinery.

The candidate identified a range of adequate precautions that would keep themselves and others safe, although some were incomplete, for example sometimes missing the detail of identifying the specific PPE that must be used. The candidate correctly categorised risk ratings. The candidate included additional control measures to reduce the risk ratings, although they sometimes missed who or when additional actions should be taken.

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	
Machinery/equipment details:	**Pedestrian-controlled mower**	**Mounted crop sprayer**
Make	Guilds Supplies	Guilds Supplies
	(Note: make and model 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:	Cleaning equipment. Containers for waste. Protective coating and brushes. Workshop manual.	
Work to be carried out	Prepare for out of season storage.	
Symptoms/diagnostic data	None.	
Diagnosis	The mower was covered in grass. The crop sprayer looked ok.	
Work carried out	• The mower needed cleaning. • The crop sprayer needed cleaning and a protective coating applied. • I followed the workshop risk assessment. • Prepared my tools and work area.	

Job Card	Notes and comments

	Mower:
	• I took the following actions:
	  ○ cleaned down the mower with a brush
	  ○ power washed
	  ○ visually inspected the components:
	  ▪ blade needs sharpening
	  ▪ no other faults identified.
	  ○ engine running as expected
	  ○ control mechanisms and safe stop working ok
	  ○ emptied the fuel from the tank
	  ○ applied rust protection.
	• Returned tools and equipment to store and cleaned work area.
	• Completed job card.
	• Disposed of hazardous fluids and cleaning materials.
	
	Crop Sprayer:
	• The sprayer was already in the washing area.
	• I flushed through the sprayer with water and cleaning fluid.
	• Washed down the sprayer.
	• I checked hoses, fittings, and tanks for leaks – none identified
	• I took the following actions:
	  ○ cleaned the filters
	  ○ removed the nozzles for safe storage – allows the sprayer to drain
	  ○ applied rust preventative coating
	  ○ added antifreeze.
	• Returned tools and equipment and cleaned work area.
	• Completed job card.
	• Disposed of contaminated fluids and cleaning materials.

Materials	Grease, protective coating.
Time taken	3hrs

Job Card	Notes and comments
Further action required/ recommendations	Book in for pre-season services.

Commentary

The candidate completed an acceptable job card for the **maintenance work carried out**, showing an adequate understanding of how to present maintenance information, mostly using technical terminology accurately with some exceptions eg ‘grease’ instead of ‘lubrication.’ All sections were adequately completed, including an overview of the main actions taken, although it lacks some detail, for example what was visually checked on the mower.

The candidate recorded an appropriate further action that reflects the situation but is generic and lacks detail. The candidate didn’t include all the materials used therefore the job card does not fully reflect the resources (costs) of completing the task, for example missing out the antifreeze. The time taken is appropriate to the task and speed of work expected for threshold competence 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 when carrying out the task, and the main hazards were identified and considered eg supporting machines, manual handling, wearing of PPE (gloves, face protection, coveralls, wellingtons), and handling hazardous chemicals. They didn't always maintain a clean and uncluttered work area, although safe working was maintained throughout. Appropriate tools and equipment were selected, although they had to return to the store for additional cleaning materials that were not to hand. Specialist tools selected: • containers for waste • protective coating and brushes • workshop manual.
• Preparation of the machinery to be worked on, including cleaning. • Safe immobilisation. • Inspection and preparation to comply with manufacturer's specifications.	**Mower:** Prepared the mower for safe working by supporting it on its side (photo 1; positioned to minimise fuel and/or oil leakage). The mower was thickly covered with old grass clippings. Cleaned down the mower with a brush – missed some grass behind the chute. Waste grass was put in the bin. Power washed the mower removing visible residues.

• Apply protective coatings. • Classification and disposal of waste.	Completed a visual inspection and correctly identified that the blade needs sharpening. Checked lubrication level (photo 2). Applied rust inhibiting coating with a pressurised spray as per the manufacturer's procedure (photo 3), covering exposed surfaces but missing some small difficult to access surfaces. 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. Left the work area clean and tidy, and appropriately disposed of the hazardous materials, following the workshop procedure. **Crop sprayer:** 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. Cleaned the filters. Removed the nozzles and filters (photo 4) and stored them safely in a box (photo 5). Applied rust inhibiting coating with a pressurised spray as per the manufacturer's procedure. Safe working practices were observed for the collection of the hazardous fluids: PPE, working in the designated washing area, gloves when handling parts which may be contaminated eg nozzles. Returned tools and equipment and cleaned work area. Completed job card. 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 Mower supported for safe working

Photo 2 Lubrication level of mower

Photo 3 Applying protective coating to mower

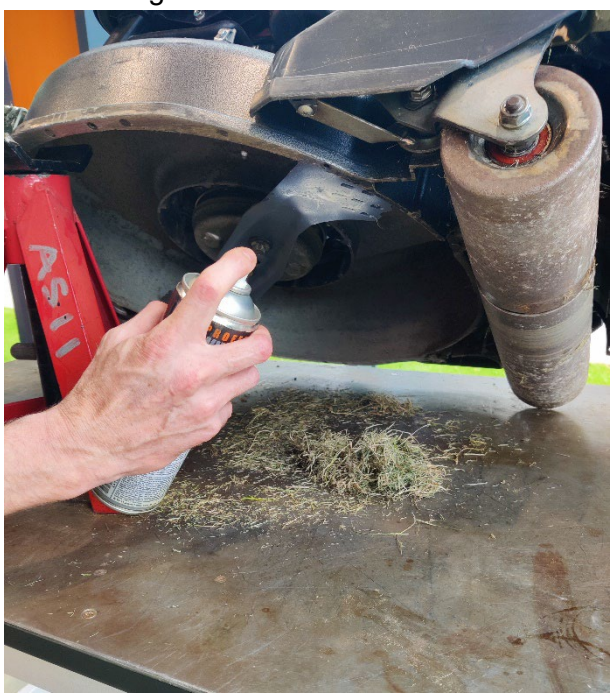


Photo 4 Serviced parts: removed nozzles

Photo 5 Sprayer: keeping nozzles safe

Commentary

The candidate demonstrated an adequate level of performance to safely **carry out maintenance** to an acceptable standard within the time given.

The candidate's **maintenance preparation** was adequate: preparing the work area in line with their risk assessment (eg wearing PPE), and selecting appropriate tools, although the candidate had to go back to the store during the task.

Workshop tools and equipment were used safely in line with the candidate's risk assessment, although the work area was sometimes cluttered.

The candidate followed the maintenance procedures showing a sound application of skills and understanding to prepare the equipment for seasonal storage, although there were some minor errors and omissions: the candidate could have been more thorough in some areas, for example they missed some grass when cleaning, and left some small hard to reach areas bare when applying the protective coating.

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	Carrying out the testing procedure.	Self. Minor injuries.	Wear PPE (eg ear protection). Awareness of first aid provision.	Medium	None	n/a	Medium
2	Fire in or around work area.	Self & colleagues. Burns, inhalation of smoke.	Awareness of evacuation procedures. Fire extinguishers.	Low	None	n/a	Low
3	Slips, trips & falls.	Self & colleagues. Physical injury.	Tidy, uncluttered work area. 'Oil Spill Kit'. Anti-slip footwear worn.	Low	Check provision is readily available.	Self. Before the task.	Low
4	Tools & Equipment 'Not fit for purpose'.	Self. Physical injury.	Tool & Equipment: procedures for checking tools and equipment are fit for purpose.	Low	Visual inspection of tools and equipment prior to use.	Self. Before the task.	Low
5	Tractor able to be started by others.	Self. Physical injury.	Key removal procedures in place.	Medium	Follow procedures.	Self. Before the task.	Low
6	Oil under pressure escaping during test.	Self. Physical injury.	Tool & Equipment checks. PPE: gloves, eye protection, overalls.	Low	Check test equipment connections.	Self. Before and during the task.	Low

7	Engine fumes.	Self & colleagues. Inhalation of fumes.	Workshop fume extraction facilities.	Medium	Check the effectiveness of extraction facilities.	Self. Before the task.	Low

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

Commentary

The candidate completed an acceptable risk assessment as part of their **preparation for diagnosis**, showing an adequate understanding of the requirements of health and safety legislation, for example wearing ear protection, and the difference between hazards, risks and control measures. ‘Slips, trips and falls’ were used to describe a hazard which is acceptable; accurate terminology would be to state the specific hazards, such as fluid spillage or an untidy work environment.

The candidate identified the major hazards in the diagnostic process and demonstrated an understanding of the related risks that might occur, although they missed some low risk hazards such as moving the tractor before the test, and entering and exiting the tractor.

The candidate identified a range of adequate precautions that would keep themselves and others safe. The candidate missed some detail, such as how someone might be harmed by escaping oil. The candidate correctly categorised risk ratings and included some 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
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. Diagnostic database.
Work to be carried out	Auxiliary hydraulic system test & report.
Symptoms/diagnostic data	Slow moving unloading elevator on the customer's potato harvester.
Diagnosis	The tractor's auxiliary system meets the performance specifications of the manufacturer.
Work carried out	• I checked I had all the recommended PPE. • Prepared the tractor for test. Checked all fluid levels, hydraulic system control operation, and tractor fault warning system. • Attached the fume extraction system. • Checked the recommendations made in the risk assessment and isolated access to the tractor cab. • Attached the hydraulic test kit. Checked the connections were clean and had no visible damage.

Job Card	Notes and comments

	• Switched on the fume extraction system, I waited until the oil had reached its recommended test temperature and thickness.
	• I carried out the test following the manufacturer's instructions.
	• I first did the maximum pressure test. The test data met the manufacturers specified maximum pressure figure.
	• I then carried out the flow test. The test data met the manufacturer's specified max flow figure.
	• 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.
	• Results from the test:
	  ○ Maximum pressure: *results*
	  ○ Flow test: *results*
	• I reinstated the work area and returned all the equipment to the store.

Materials	PPE
Time taken	1hr 30mins
Further action required/ recommendations	The tractor's auxiliary system is performing to manufacturers specifications. I recommend the harvester is checked.

Commentary

The candidate completed an acceptable job card, showing an adequate understanding of how to present diagnostic information, mostly using technical terminology accurately with some exceptions eg 'thickness' instead of 'viscosity.'

All sections were adequately completed, with a brief record of their **preparation for diagnosis** (checks, tools and equipment) and the **diagnostic test carried out**. For example, the candidate provided an overview of the main actions taken, although it lacks some detail, such as the settings for the pressure test. The candidate **interpreted information** to conclude that the tractor's hydraulic system was working to specification.

The candidate recorded an appropriate recommendation that reflects the situation, but it lacks detail such as what should be checked on the harvester. The candidate did not include all the materials used therefore the job card does not fully reflect the resources (costs) of completing the task, for example missing out the absorbent materials. The time taken is appropriate to the task and speed of work expected for threshold competence standard.

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 when carrying out the task, and most hazards were identified and considered eg PPE (gloves, eye and ear protection, overalls), fume extraction system employed as required, but not all emergency procedures were checked. They didn't always maintain a clean and uncluttered work area, although safe working was maintained throughout. They had some spill provision to hand (absorbent granules at the other end of the workshop). Appropriate hand tools and equipment were selected after a number of attempts, including. • oil spill kit • fume extraction equipment. • diagnostic database. The pressure and flow test equipment were correctly selected. Prepared the tractor for safe working by applying the handbrake, with some isolation measures.
Sequence of work: • checking oil level and condition	Prepared for the test by checking the oil level and correctly connected the test equipment on the second attempt after consulting the manual (photos 1, 2 and 3), although they did not use measures to prevent contamination before connecting.

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.*
• connection to test equipment • checking oil temperature • undertaking the pressure and flow test.	Operated the tractor to achieve the correct oil temperature. Correct engine speed was set as per the manufacturer's instructions, although this was not set correctly on the first attempt. Pressure and flow readings were obtained with the oil at the recommended temperature (photo 4). Made readings for maximum pressure, and for flow, following flow restriction conditions (video). Compared their readings to the manufacturer's specification and reported their findings that the tractor's auxiliary hydraulic system was operating to specification.

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?	Not cleaning the couplings before connecting.
• Why is the temperature of the oil important for the test?	So that the oil will flow properly.
• What would be the logical sequence of further actions?	Check the potato harvester's hydraulic system, connectors, pipes and motors.

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

Photo/video

- 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 (TC).mp4

Photo 1 Connecting the tractor to the test equipment: incorrect connection (first attempt)

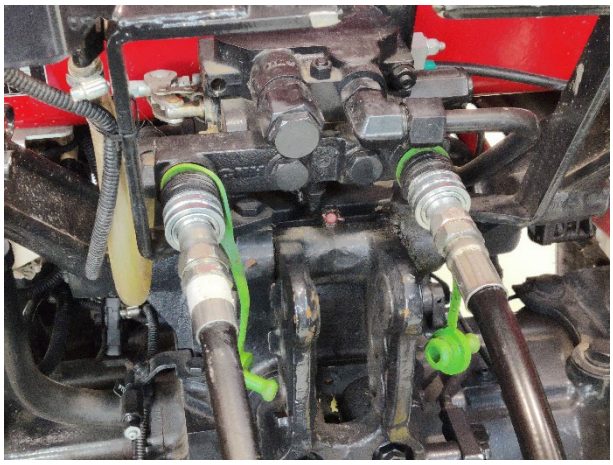


Photo 2 Connecting the tractor to the test equipment: correct connection (second attempt)

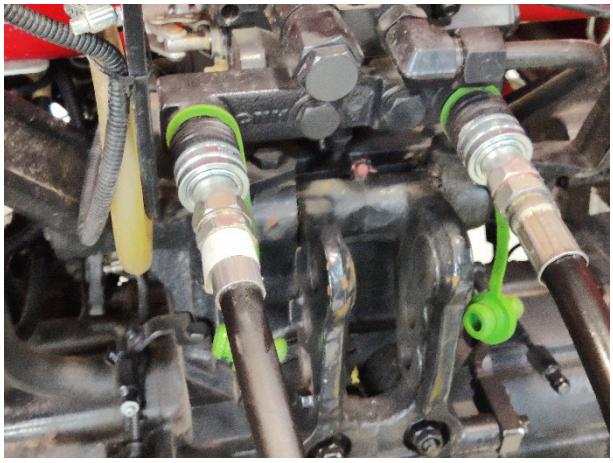


Photo 3 Connecting the tractor to the test equipment: correctly connected

Photo 4 Reached correct temperature before taking readings

Commentary

The candidate demonstrated an adequate level of performance to safely **prepare for** and **carry out the diagnostic** test to an adequate standard within the time given.

The candidate's **preparation for the diagnostic** test was adequate: preparing the work area in line with their risk assessment (including PPE, tractor isolation, fume extraction), and selecting some tools correctly first time including the correct test equipment. The candidate applied their sound understanding to prepare the tractor for testing: checking the oil level, setting the engine speed as per manufacturer's instructions.

Workshop tools and equipment were used safely in line with the candidate's risk assessment, although the work area was sometimes cluttered.

When **carrying out the diagnostic** test the candidate followed the test procedure showing sound application of skills and understanding to the task with the correct oil temperature being set. There were some minor errors and omissions: engine speed and connection of the test equipment were achieved on the second attempt after consulting the manufacturer's manual. The candidate completed the minimum number of tests, and correctly compared the results to the manufacturer's specifications when **interpreting information**.

The candidate's responses to the questions showed adequate understanding of **carrying out a diagnostic** test and **interpreting information** eg brief response about cleaning connectors, why the oil temperature is important, and a brief sequence of further actions.

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	Keeping myself and the workshop clean & tidy.	Me and others in the workshop. Slips, trips & falls, moving vehicles.	PPE requirements. Marked walkways. Spill kits.	Medium	Check PPE and work area before commencing task, clean machine if required, operate in an uncluttered workspace.	Me before starting the job.	Low
2	Lifting heavy loads when removing the hydraulic cylinder.	Me. Personal back injury from lifting.	Manual Handling training. Workshop lifting equipment. PPE, safety boots.	High	Visually check equipment, use lifting equipment if needed.	Before starting the job.	Low
3	Spilt oil.	Myself. Slips, trips & falls.	PPE, gloves. Absorbent granules and spill kits.	Low	Dispose of waste correctly.	Myself.	Low
4	Other persons starting the tractor whilst the task is being carried out.	Myself, injury as a result tractor moving.	Remove key.	High	None	n/a	
5	Machine moving when working on it.	Myself, serious injury.	Training received on positioning machinery for dismantling.	High	Use machinery support.	Myself, during the job.	Low

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

Commentary

The candidate completed an acceptable risk assessment as part of a **repair process**, showing an adequate understanding of the requirements of health and safety legislation (eg PPE, although they could have specified what PPE to use in item 1, and they could have referred to other procedures and policies such as emergency procedures), and the difference between hazards, risks and control measures. More accurate terminology would be to state the specific hazards, such as fluid spillage or an untidy work environment.

The candidate identified the major hazards in the process to **dismantle** and reassemble the **machinery** and demonstrated an understanding of the related risks that might occur, although they missed some low risk hazards such as the selection and use of hand tools.

The candidate identified a range of adequate precautions that would keep themselves and others safe, although some additional actions were incomplete, missing the detail of who or when additional actions should be taken. The candidate correctly categorised risk ratings and included some additional control measures 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
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:	Drip tray. Hand tools.
Work to be carried out	Remove leaking 'bucket tilt ram' for repair.
Symptoms/diagnostic data	Oil leaking.
Diagnosis	Remove the leaking ram for repair.
Work carried out	• I put the tractor in the workshop, prepared the equipment I needed and isolated the tractor starting system. • I then positioned the loader so it would not move when I removed the ram and released oil pressure in the system. • I then took off the hydraulic pipes, removed the locating pins and removed the ram for repair. • When the ram was repaired, I refitted it to the loader, secured the locating pins and refitted the hydraulic pipes. • I started the tractor and tested the system for leaks, all was OK. • Cleaned the work area and returned the tools.

Job Card	Notes and comments
	• Completed the job card.
Materials	None.
Time taken	2hrs
Further action required/ recommendations	None.

Commentary

The candidate completed an acceptable job card, showing an adequate understanding of how to present information for a **repair process**, mostly using technical terminology accurately, although the candidate referred to 'ram' rather than 'cylinder.' Most sections were adequately completed, including an overview of the main repair actions taken as part of the dismantling and **reassembly of the machinery**, although it lacks some detail, for example the details of the functionality testing were not included.

The candidate didn't record any further actions or recommendations, so they missed an opportunity to pass on good practice to the customer eg monitor other cylinders that have been exposed to the same conditions.

The candidate didn't include the materials used therefore the job card does not fully reflect the resources (costs) of completing the task, such as consumables. The time taken is appropriate to the task and speed of work expected for threshold standard.

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 release of stored energy and carrying out the task. Most hazards were identified and considered eg supporting the cylinder when removing it, manual handling, and the wearing of PPE. They didn't always maintain a clean and uncluttered work area, although safe working was maintained throughout. Appropriate tools and equipment were selected (drip tray, hand tools), but they initially selected the incorrect tool for loosening the pipe connections (adjustable spanner when the correct size of open-end spanner was available). Prepared the work area but had to go back to the store to get an absorbent cloth that they used to clear up hydraulic oil drips. Prepared the machine for safe working by applying the park brake and removing the ignition key (photo 1), with isolation measures (photo 2). They put the machinery in a neutral position (tines resting on the floor, photo 3).

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.*
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.	Released the system pressure. They disconnected the pipes and had a drip tray in position. They asked for assistance to safely support the hydraulic cylinder that they removed. They put the hydraulic cylinder on the bench. They had assistance to support the cylinder when refitting it. They connected the pipes using a spanner and locating pins correctly. They asked the assessor to check the refit: no issues were identified by the assessor. Completed a functionality test by starting the machine and operating the hydraulic service (partial travel of the hydraulic cylinder) and checking for leaks. They 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 adequate level of performance to safely carry out the **dismantling and reassembly of the machinery** to an adequate standard within the time given.

The candidate's preparation for the **repair process** was adequate: preparing the work area in line with their risk assessment (eg wearing PPE), immobilising the machine, and selecting some tools, although they had to return to the store for more equipment.

Workshop tools and equipment were used safely in line with the candidate's risk assessment, although the work area was sometimes cluttered.

The candidate followed the process showing a sound application of understanding to the task (releasing stored energy, having a drip tray ready), although there were some minor omissions such as only completing partial travel of the cylinder during the functionality test, and not checking the oil level.

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 PO3: Repair processes (Dismantle machinery and equipment, Component repair methods, Reassemble machinery and equipment)		√	√
photo			√	√

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	Keeping myself and the workshop clean & tidy.	Me and others in the workshop. Slips, trips & falls. Dermatitis.	PPE, safety boots, gloves etc. Spill kits. First aid kit.	Medium	Check PPE and work area before commencing task.	Me, prior to starting the job.	Low
2	Use of hand tools and small equipment needed for the task.	Me, minor cuts.	Inspect tools.	Low	None	None	Low
3	Oil spillage.	Me, Slips, Trips & Falls.	PPE. Absorbent granules and rags.	Low	None	None	Low

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

Commentary

The candidate completed an acceptable risk assessment, showing an adequate understanding of the requirements of health and safety legislation as part of a **repair process** (eg first aid kit), and the difference between hazards, risks and control measures. More accurate terminology would be to state the specific hazards, such as fluid spillage or an untidy work environment.

The candidate identified the major hazards in the process to **dismantle** and repair the **machinery**, and demonstrated an understanding of the related risks thar might occur, although they missed some low risk hazards such as incorrect or faulty tools and equipment.

The candidate identified a range of adequate precautions that would keep themselves and others safe, although they missed some such as marked work areas and identifying the specific PPE that must be used. The candidate 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	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
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:	Drip tray. Hand tools. Workshop manual.
Work to be carried out	Replace seals in cylinder.
Symptoms/diagnostic data	Oil leaking.
Diagnosis	Replace ram seals. Damage might be because of overuse.
Work carried out	• Checked the Risk Assessment. • Dismantled the ram. • Removed old seals. • Refitted new seals. • Checked travel of rod. • Cleaned the work area and returned the tools. • Completed the job card.

Job Card	Notes and comments
Materials	Seal Kit.
Time taken	2hrs
Further action required/ recommendations	None.

Commentary

The candidate completed an acceptable job card, showing an adequate understanding of how to present repair **information**, mostly using technical terminology accurately, although the candidate referred to ‘ram’ rather than ‘cylinder,’ and did not specify the type of oil that was leaking.

Most sections were adequately completed, including an overview of the main actions taken although it lacked detail, for example whether the candidate followed the manufacturer’s recommendations. The candidate briefly recorded the **information** gathered and potential **factors influencing repairs** eg overuse could have caused the damage to the seals.

The candidate didn’t record any further actions or recommendations, so they missed an opportunity to pass on good practice to the customer eg monitor the other cylinders that have been exposed to the same conditions.

The candidate did not include all the materials used therefore the job card does not fully reflect the resources (costs) of completing the task, for example what type of seal kit was used. The time taken is appropriate to the task and speed of work expected for threshold competence 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. Most hazards were identified and considered eg cleaning up oil spills to reduce the risk of slips and trips, and wearing PPE. They didn't always maintain a clean and uncluttered work area, although safe working was maintained throughout. Appropriate tools and equipment were selected but were not always to hand. Collected drip tray, hand tools, workshop manual. Prepared the work area with 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	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: • checked the seal replacement procedure in the workshop manual • 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

• appropriate classification and disposal of waste.	• 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 • confirmed that the hydraulic cylinder should work to specification by checking the travel of the cylinder rod. Returned tools and equipment and cleaned work area. Completed job card. They disposed of contaminated materials as per workshop procedure.

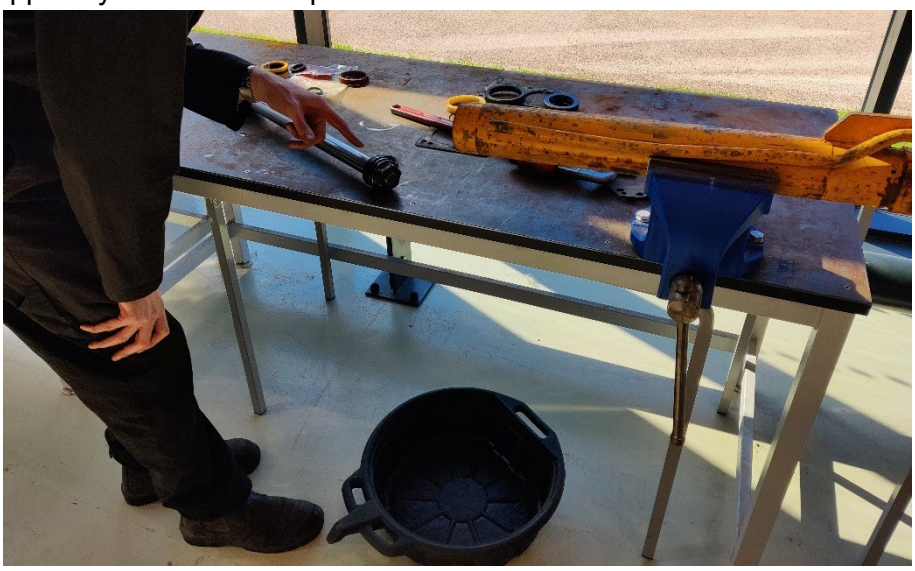
Responses to questions	**Notes –** *detailed, accurate and differentiating notes which identify areas of strength and weakness are necessary to distinguish between different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.*
• What would influence whether to replace or repair individual parts?	It depends on whether it is something that could be fixed and how much it would cost. The warranty might require a replacement with original parts.
• What is cavitation in a hydraulic system?	Cavitation is the noise when there is a problem with a hydraulic system.
• What causes it?	The noise is caused by air trapped in the hydraulic oil

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 adequate level of performance to safely carry out the **component repair** to an adequate standard within the time given.

The candidate's preparation for the task was adequate: preparing the work area in line with their risk assessment (including a drip tray), and selecting some tools, although they were not always to hand.

Workshop tools and equipment were used safely in line with the candidate's risk assessment, although the work area was sometimes cluttered.

The candidate followed the process to **dismantle, repair and reassemble** the hydraulic cylinder showing a sound application of understanding of the **repair process**, although there were some minor omissions: the candidate could have collected as much hydraulic fluid as possible before removing the cylinder cap.

The candidate's responses to the questions showed adequate understanding of **reassembly of machinery** with brief responses about **factors influencing repairs**, and cavitation.

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

10 minutes
Introductions

The vehicle:
All-terrain vehicle made by Guilds Supplies. Model 1234 AB

Key features:

- 4 wheel drive
- Unleaded fuel
- 500cc
- Manual: 5 gears and reverse
- Highway compliant:
  - registered as a light agricultural vehicle
  - front and rear lights
  - number plate on rear
  - mirrors.

10 minutes
Operation of the ATV:
Must read the owner's manual.

Instruments and Controls:
Show where they are on ATV:

- ignition and start, throttle
- gear shift lever
- brakes – front, rear, parking
- reverse selector
- 2wd/4wd selector
- headlights – on, dim
- cargo racks
- fuel gauge
- reserve fuel valve: under fuel tank.

Display

- gear position (on/neutral/reverse)

- speedo
- oil pressure light
- high coolant temperature indicator.

Riding:
- what to wear: helmet, boots, gloves
- what to check: fuel, tyres, guards.

10 minutes
Safety procedures and features:
Warning and safety symbols:
- On the front cargo rack:
  - max. cargo load 30kg.
- On rear cargo rack:
  - max. cargo load 60kg.
- On the seat:
  - no passengers – risk of severe injury or death.
- On the wheel arch:
  - tyre pressure – 25.0kPa on both front and rear
  - max. weight capacity 220kg.
- Bodywork:
  - braking – on both front and rear wheels
  - operator age minimum of 16 years old
  - max. tow weight capacity 200kg.
- Safe operation.

10 minutes
Maintenance requirements:
Servicing & maintenance schedule with procedure and frequency, just had a service.
Full specification in manual: fuel, oil etc.

Warranty conditions:
- manufacturer's warranty has 1 year left to run
- covers engine and gear box parts only
- need to keep maintenance records.

Warranty does not cover lots of things eg racing. More info in the warranty paperwork.
Must use genuine parts.

5 minutes
Do they have any questions?
Sign handover form.

Commentary

The candidate created adequate preparation notes with an acceptable range of information that should be covered in a **handover**.

The main areas were covered however there was some detail missing. For example, the candidate may struggle to cover all of the requirements unless they remember the details such as when the next service is due. Adding page numbers for reference during the handover would help.

The candidate's breakdown of timing is acceptable but may not have allowed for the amount of content in each section. For example, maintenance and warranty will not need as long as explaining the operation of the ATV.

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	√	
Function and operation of the machinery/equipment		
Function of all controls and switches	√	
Safety guards and devices	√	
Vision		
Wipers	n/a	
Mirrors	√	
Wheels and tyres		
Tyre condition and pressure	√	Low pressure in front tyre
Wheel nuts/bolts	√	Loose wheel nut on rear wheel
Wheel bearings	√	
Wheel rim fixings	n/a	
Grease points	√	
Brake connections	√	

Inspection requirement	Tick when checked	Comments
Mechanical couplings	n/a	
Superstructure		
Frame, body	√	No rust
Hitch	√	Ok
Trailer bed	n/a	
Suspension axle and fixings	√	Safe
Lights	√	All working
Safety decals	√	
Function decals	√	
Oil levels	√	

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

Commentary

The candidate completed an acceptable PDI checklist, showing an adequate understanding of how to present information for a **handover**. All sections were completed, with some comments lacking detail such as what the candidate did to resolve the issues found.

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. Main hazards and risks were identified, and control measures applied eg wearing PPE (coverall and boots). They didn't always maintain a clean and uncluttered work area, although safe working was maintained throughout. Appropriate tools and equipment were selected, but they initially selected the incorrect tool for checking the wheel nuts (incorrect socket size on the first occasion). They had to go back to the store for absorbent cloth to wipe off the oil level dipstick. Prepared the vehicle for safe working by applying the park brake and removing the ignition key, although not all potential hazards were considered eg restricting access to the work area by other people.
• Carry out checks and adjustments as stipulated in the PDI checklist. • Identification of faults and undertake adjustments to comply with manufacturer's specifications.	Checked each item on the PDI Checklist against the manufacturer's specification, although they didn't work methodically or efficiently so they had to go back to check the tyre pressure rather than at the same time as checking the condition of the wheels. They 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

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.*
	• tightened wheel nut on rear o/side wheel to specified torque (photos 1 and 2). (These adjustments were set by the assessor prior to the task.) 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

Commentary

The candidate demonstrated an adequate level of performance to safely carry out the pre delivery inspection for the **handover** to an acceptable standard within the time given.

The candidate's preparation for the task was adequate: preparing the work area in line with their risk assessment (including PPE), immobilising the vehicle, and selecting some tools, although the candidate had to return to the store when they initially made an error in the socket size, but then selected the correct size.

Workshop tools and equipment were used safely, in line with the candidate's risk assessment, although the work area was sometimes cluttered.

The candidate worked through the PDI and PDI checklist showing a sound application of understanding to the task, correctly identifying the pre-set rectification work and making the correct adjustments to 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	Farm vehicles.	Me and others. Crushing.	PPE – high visibility jacket, safety boots. Speed limits.	Medium	None	None	Medium
2	Farm animals.	Me and others. Injury.	Fences.	Medium	None	None	Medium
3	Farm conditions – weather, work area.	Me and others. Physical injury.	Existing safe working on farm.	Medium	None	None	Medium

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

Commentary

The candidate completed an acceptable risk assessment for the customer **handover**, showing an adequate understanding of the requirements of health and safety legislation, and the difference between hazards, risks and control measures. The candidate identified the major hazards in the handover, and demonstrated an understanding of the related risks that might occur, although they missed the low risk hazard of unloading the ATV at the site.

The candidate identified a range of adequate precautions that would keep themselves and others safe, although they missed some detail, such as referring to the farm's risk assessments. The candidate correctly categorised risk ratings. The candidate could have considered additional controls to reduce the risk ratings, such as identifying a suitable work area with the customer, away from the risks.

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. The main hazards and risks were identified, and control measures applied eg wearing a high-visibility jacket.
Explaining the vehicle and covering all the points on the handover checklist: • How to operate the vehicle (no practical demonstration/starting required). • The safety procedures and features. • Explaining the vehicle's highway compliance. • The importance of the operator handbook. • The meaning of warning and safety symbols in the operator handbook and on the vehicle. • Maintenance and warranty requirements. • The importance of serial numbers.	They mostly followed their notes and plan and covered the main areas of the handover in about 30 minutes: • key features – brief, correct summary of the vehicle and it's highway compliance • how to operate the vehicle – some reference to the owner's manual and safety procedures eg what to wear, what to check before use • safety procedures and features – talked about the majority of the warning and safety symbols on the vehicle; spent the most time on maximum loads of the vehicle and cargo racks but missed some of safe operation eg risks from overloading the cargo racks • maintenance and warranty requirements – included service schedule and confirmed the most recent service had happened but gave a vague explanation of what might invalidate the warranty • serial numbers were not mentioned • checked 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.*
	They had a disorganised approach to the handover, explaining the operation of the vehicle and then explaining the safety requirements separately. They forgot some of the details during the handover and had to pause to look them up in the owner's manual. They sometimes referenced their plan and the owner's manual and mostly used technical terminology correctly, eg referring to 'warning lights' instead of 'warning indicators.'

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?	There are courses that you can find on the internet.
• What are the legal requirements to drive this on the highway?	Number plate, driver's licence.

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

Commentary

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

The candidate worked through their plan, although they weren't always efficient in their approach, with separate explanations of operation and safety requirements. The candidate mostly used technical terminology accurately, for example overloading, although they referred to 'warning lights' instead of 'warning indicators.'

The candidate sometimes referenced the owner's manual and provided adequate responses to the questions, resulting in an acceptable level of information for the customer.

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