

# FRONT

## END LOADER

NATIONAL CERTIFICATE OF COMPETENCY

**ASSESSMENT INSTRUMENT** AUGUST 2000  
WorkCover NSW Health and Safety Assessment Instrument

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**OHS Certificates of Competency  
National Assessment Instrument**

**Front-end Loader**

**August 2000**

**(Revision 1)**

# **Loadshifting Equipment**

## **Front-end Loader**

### **ASSESSMENT**

**Part 1      Performance**

**Part 2      Oral/Written**

**AUGUST 2000**

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## **ASSESSOR GUIDELINES – GENERAL**

### **1. Introduction**

#### **1.1 Scope**

These general guidelines apply to all the assessment instruments for the certificates of competency prescribed by the *National Guidelines for Occupational Health and Safety Competency Standards for the Operation of Loadshifting Equipment and Other Types of Specific Equipment*. [NOHSC: 7019]

Assessors should also be familiar with the publication *Assessment guidelines for National Occupational Health and Safety Certification Standard for users and operators of industrial equipment*. [NOHSC:1006]

#### **1.2 Additional Guidelines**

Guidelines which provide additional specific information to certificate assessors are also included in each assessment instrument. Included, where appropriate, are specific instructions on the usefulness of training records (such as logbooks) and other certificates with overlapping competencies.

#### **1.3 Evidence of Competence**

Evidence of competence is established in a number of ways. The methods used in the following instruments involve:

- Assessment of practical performance
- Written and/or oral answers to questions on underpinning knowledge.

### **2. Preparing for the Assessment**

#### **2.1 Study the instruments**

You need to read the assessment instruments and specific instructions carefully before beginning an assessment.

#### **2.2 Confirm Appointments**

Prior to an assessment, you need to confirm the date, time and location of the assessment with the applicant and any other relevant people.

#### **2.3 Equipment Availability**

The availability of equipment, materials and a suitable working area must be organised and confirmed, prior to the assessment.

#### **2.4 Workplace Factors**

Because procedures and processes vary greatly between workplaces, it is important for assessors to plan their approaches to meet the requirements of the individual workplace. Make sure you take the timeframe into account when planning the assessment and also make the applicant aware of any time limits.

#### **2.5 Selecting Questions**

Questions for the written/oral assessment should be randomly selected, either by hand or using the computer system, if applicable.

### **3. Conducting the Assessment**

#### **3.1 Provide an Explanation**

Begin by explaining clearly to the applicant what is required of them. Check that the applicant has provided (or has been provided with) the necessary tools and equipment.

#### **3.2 Practical Performance**

Complete the practical performance checklist, as the applicant works through the required tasks. Wherever possible, this should be done in a normal working environment. Do not ask the applicant questions while he/she is performing a task, as this can be distracting, and may affect the time taken to complete the assessment.

If, at any time, the applicant is endangering themselves or others, stop the assessment immediately. This indicates that the applicant is not yet competent and may require further training, before being reassessed.

Assessments should also be stopped, if equipment or property is likely to be damaged.

### 3.3 Knowledge

The oral/written assessment determines the applicant's underpinning knowledge. The model answers provided with the oral/written assessment instruments are not necessarily exhaustive. Use your own judgement when scoring alternative answers.

### 3.4 Recording Responses

A box accompanies each item and question on the assessment forms you use. Assessors must complete every box as follows:

CORRECT PERFORMANCE/  
ANSWER

X NOT YET ACHIEVED

NA NOT APPLICABLE

If a box is marked incorrectly, cross out the mistake, mark the correct response alongside, and initial the change.

## 4. Determining Competencies

### 4.1 Assessment Summary

A specific assessment summary is given for each certificate class. This is to be filled in and signed by the assessor and counter signed by the applicant.

### Notice of Satisfactory Assessment

The original and duplicate are given to the applicant. The applicant provides the original to the certifying authority. The triplicate is to be retained by the assessor.

### 4.2 Competency Requirements

In order for you to deem an applicant competent, he or she must have completed each section of the assessment to the standard required. You should note any time constraints when arriving at your decision. The standard required for each instrument is specified in the specific guidelines and/or on the summary page at the end of each instrument. In the case of a re-assessment, the assessor can decide to apply the whole or only that part of the assessment not yet achieved.

### 4.3 Additional Comments

Where an applicant fails to meet the standard of competence, you should add a written comment on the Assessment Summary, which briefly explains the problem. Advice to the applicant, on the appropriate remedial action should also be included. This will also assist the certificate assessor, in the event that the applicant undergoes future reassessment. Likewise, if an applicant demonstrates outstanding or remarkable performance, this should be noted.

### 4.4 Further Investigation

As a certificate assessor, it is your role to determine whether or not an applicant has achieved the standard necessary for the certifying Authority to be able to grant a certificate of competency.

Whenever you are unsure of the applicant's performance or knowledge, ask additional questions, and obtain additional evidence, before making your final decision.

**National Guidelines for OHS Competency Standards**

# **Loadshifting Equipment**

## **Front-end Loader**

### **Part 1 Performance Assessment**

**AUGUST 2000**

## ASSESSOR GUIDELINES - SPECIFIC (Performance)

### ASSESSMENT INSTRUMENT - SPECIFICATIONS

The following performance assessment covers the Load-shifting elements

1.1, 1.2, 1.3, 2.1, 3.1 & 3.2

1. The assessment requires the operator to check the equipment, plan the work and to safely and competently operate, the front-end loader.

The assessment is performed in six sections:

1.1 Conduct routine pre-operational check of front-end loader/equipment and the security of attachments.

1.2 Inspect the site, plan work and select and fit appropriate attachments.

1.3 Conduct pre-operational and post start up checks.

1.4 Drive the front-end loader to the work area.

1.5 Operate Loader

1.6 Shut down the equipment and secure the site.

2. Prior learning and experience

2.1 An applicant who holds a front-end loader of a skid-steer type, front-end loader/backhoe, excavator, dragline or dozer certificate does not require assessment in sections 2, 3 and 4.

3. The performance assessment can be conducted at any location which has:

- Sufficient clear space to operate the machine
- Ground suitable for levelling and shifting soil

4. Equipment and Resources Required:

- A front-end loader and equipment.

- Suitable site on which to use the front-end loader and equipment to shift and level soil and to load or simulate loading of a truck.

5. Unless other arrangements are agreed to by the assessor, it will be the responsibility of the applicant, applicant's employer or trainer to provide the required equipment and resources.

6. To be assessed an applicant must wear:

- Safety helmet (where required)
- Appropriate footwear
- Other protective clothing and equipment as appropriate.

7. The performance of each applicant is to be recorded on the assessor's checklist.

8. Safety of personnel:  
When an applicant is working dangerously, recklessly or without the necessary co-ordination, the assessor must direct the applicant to cease work and terminate those parts of the assessment immediately.

9. The applicant must undertake all performance criteria. An assessor must use his/her discretion in assessing competence under each criteria. The elements under each criteria must be marked with the appropriate tick, cross or n/a to indicate an applicant's competence level for that element.

**Assessors Note:** All performance criteria marked with a star ★ are compulsory/critical. To determine a person's competence under each performance criteria, a prescribed number of elements are required to be demonstrated/answered under that criteria. The applicant must achieve the minimum specified number or more, of the performance elements to achieve competence for those criteria. To record the applicant's competence for the criteria a tick must be placed in the star.

10. Where a performance element cannot be performed the assessor can simulate or ask a question. The response must be recorded.
11. Where an applicant is assessed as not yet competent he/she must be informed of the reason(s) in order to gain further appropriate training.
12. The full performance assessment can take up to 1 hour.
13. The general assessment requirements are set out in Assessors Guidelines - General.
14. Competence is achieved for a unit when the required number of stars for that unit has been ticked.

Overall competence is achieved when competence in all units has been achieved.

## UNIT 1: CONDUCT ROUTINE CHECKS:

### Performance Criteria 1.1.1. and 1.1.2

#### 1. Conducts routine checks on front end loader (at least 9 elements checked)

- complete walk around machine
- underneath for any oil or water leaks
- tyre / wheel condition and inflation
- fuel
- hydraulic oil level
- vent hydraulic tank (releases pressure)
- transmission oil
- engine oil
- brake fluid
- power steering
- battery security, water level and cleanliness
- coolant
- air tank drained
- air pre-cleaner
- air filter indicator

#### 2. Visual check of structure / attachment for defects – (checks at least 8 elements)

- attachments for condition and security
- damaged or broken parts

- falling objects protective structure (FOPS)
- roll-over protective structure (ROPS)
- loose nuts, bolts and couplings
- bucket for damage
- bucket for missing, worn or loose teeth
- worn skid plates/cutting edge
- hoses, fittings, hydraulic rams for oil leaks
- connections for missing pins or keeper/plates
- grease fittings and grease pins

#### 3. Checks other equipment for defects (checks for at least 4 defects)

- lifting lug
- wire slings
- chain slings
- synthetic slings
- shackles
- other lifting gear

### PLAN WORK AND CHECK EQUIPMENT:

### Performance Criteria 1.2.1, 1.2.3 and 1.2.5

#### 4. Inspects site and plans work:

#### All hazards are identified where applicable (identifies at least 8 hazards)

- power lines

- trees
- overhead service lines
- bridges surrounding buildings
- obstructions
- other equipment in area
- workers in area
- dangerous materials
- underground services
- recently filled trenches

**5. Appropriate access and path of movement is shown - (identifies at least 2 elements)** ★

- to work area
- for the loads being moved
- traffic control considered

**6. Appropriate equipment for the task is selected- (identifies at least 2 elements)** ★

- Bucket suitable for work
- Loader suitable for ground conditions

**Performance Criteria 1.3.1**

**7. Conducts pre-operational start-up checks in accordance with manufacturer's specifications /operating manual. (Identifies at least 11 checks)** ★

- windows clean
- mounts correctly

- adjusts seat
- fastens seat belt
- gear in neutral
- park brake on
- engine start
- warning device
- gauges
- warm up allowed
- attachment movement
- clear for travel
- foot brake, moving forward & reverse
- holding brake, moving forward & reverse
- steering

**UNIT 2: SHIFT LOAD:**

**Performance Criteria 2.1.1 and 2.1.3**

**8. Drives to the work area: (at least 4 elements considered)** ★

- raises attachments smoothly
- ensures travel direction clear
- selects appropriate route
- travels at safe speed
- carries bucket at safe travelling height and crowded back

**Performance Criteria 2.1.1, 2.1.3, 2.1.4, 2.1.5, 2.1.6**

9. **Operates loader: Picks up load, loads truck or backfills trench, (at least 14 elements performed)** ★
- bucket at correct level and angle
  - uses sufficient revs and speed
  - avoids excessive wheel spin
  - crowds bucket to fill
  - picks up material
  - carries material in bucket
  - competently shifts material
  - equipment operated at a safe speed
  - ensures direction of travel clear
  - travels with bucket low
  - minimises spillage and ground damage
  - uses appropriate path of travel
  - approaches trench or truck correctly
  - smoothly raises and dumps load
  - Re-positions bucket ready for reload
  - maintains stockpile and working surface
  - signals are interpreted and observed
  - loads placed to ensure stability
  - loads placed to avoid causing hazard

10. **Identify all of the following signals.** ★

- stop - hand
- boom up - hand
- boom down – hand
- travel - hand

11. **Consolidates and levels surface (at least 3 elements achieved)** ★

- consolidates fill with loader
- levels surface with bucket blade
- excess fill for natural compaction
- maintains level surface to work from

**UNIT 3: SHUT DOWN EQUIPMENT AND SECURE SITE:  
Performance Criteria 3.1.1, 3.1.2 and 3.2.1**

12. **Shuts down equipment and secures site: ( demonstrates at least 8 elements)** ★

- parks and shuts down equipment
- machine parked in suitable area
- attachments lowered to ground
- cutting edge of bucket on ground
- neutralises controls
- applies holding brake
- idles to stop, locks ignition
- moves controls to release pressure

- applies safety lock (where applicable)
- parks away from danger areas
- removes keys

**National Guidelines for OHS Competency Standard:**

# **Loadshifting Equipment**

## **Front-end Loader**

### **Part 2 Oral/Written Assessment**

**AUGUST 2000**

## ASSESSOR GUIDELINES - SPECIFIC (Oral/Written)

### ASSESSMENT INSTRUMENT - SPECIFICATIONS

The oral/written assessment covers the following Loadshifting elements

1.1, 1.2, 1.3, 2.1, 3.1 & 3.2

1. Oral/written assessment for Front-end Loader is divided into three units and nineteen sections (performance criteria 1.1.1, 1.1.2 etc).
2. To satisfy the requirements for competency the applicant must correctly answer (either in writing or orally) all critical questions as indicated by a star and a minimum of 75% of the non-critical questions from each unit.

**Assessor note:** The assessment summary specifies the appropriate number of non-critical questions to be achieved.

### Unit 1.0

#### 1.1 Conduct routine checks

- 1.1.1 (select 10) including 5 stars
- 1.1.2 (select 3) including 1 star

#### 1.2 Plan work

- 1.2.1 (select 10) including 5 stars
- 1.2.2 (select 5) including 2 stars
- 1.2.3 (select 2) including 1 star
- 1.2.4 (select 1)
- 1.2.5 (select 3) including 2 stars

#### 1.3 Check controls and equipment

- 1.3.1 (select 9) including 4 stars
- 1.3.2 (select 1)

### Unit 2.0

#### 2.1 Shift load

- 2.1.1 (select 3) including 2 stars
- 2.1.2 (select 10) including 4 stars
- 2.1.3 (select 9) including 6 stars
- 2.1.4 (select 1)
- 2.1.5 (select 3)
- 2.1.6 (select 1)
- 2.1.7 (select 3) including 2 stars

### Unit 3.0

#### 3.1 Shut down equipment

- 3.1.1 (select 3)
- 3.1.3 (select 1)

#### 3.2 Secure site

- 3.2.1 (select 2)

### 3 Prior learning and experience:

An applicant who holds a front-end loader of a skid steer type, excavator, dragline or dozer certificate who answers questions for performance criteria 1.1.1, 2.1.2 and 2.1.5 satisfactorily is not required to complete the rest of the assessment.

- 4 The full oral/written assessment of eighty questions can take up to 2 hour to complete.
5. The items indicated by a star are of critical importance. Failing to get any of these correct means that competency has not been achieved.
6. Competence is achieved for a unit when the required number of boxes for that unit have been ticked or marked correct.

Overall competence is achieved when competence in all units has been assessed and achieved.

**UNIT 1: CONDUCT ROUTINE**

**CHECKS:**

**Performance criteria 1.1.1 (select 10 including 5 with a star)**

- 1. What precautions must be taken when inspecting under a raised bucket? ☆  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- 2. Name three defects to look for in the hydraulic system. □  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- 3. When should slings be inspected? □  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- 4. What % wear in a shackle would cause it to be discarded? ☆  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- 5. Briefly describe how you would check the air pressure of water filled tyres. □  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- 6. What safety precautions should be taken when inflating tyres fitted with demountable split rims? □  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- 7. Why are you not permitted to join a chain sling with a bolt? □  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- 8. What percentage of broken wires within a lay or eight diameters of a wire rope sling would cause it to be discarded? ☆  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- 9. What safety precautions should be taken when checking the tyre pressure or inflating/deflating a tyre fitted to the wheel that has a split safety-locking ring? ☆  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- 10. How would you know that the tyres on a front-end loader are water ballast? □  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- 11. List six defects that would condemn a flexible steel wire rope (FSWR)? □  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

12. List six defects that would cause a lifting chain and hook to be condemned?

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13. Describe how you would fill the tyres on a front-end loader with water ballast?

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14. What defects would you look for when carrying out the external check on the bucket of a front-end loader?

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15. What defects would you look for on the hydraulic rams and high pressure hydraulic hoses?

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16. When would you check the transmission fluid in a front-end loader?

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17. What happens when you add ballast to the tyres of a front-end loader?

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18. If a single wire in a sling was broken could you use the sling? Explain your answer.

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19. What would you do if a strand were broken in a (FSWR) sling?

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20. Why is it important that the front tyres are of equal pressure on your front-end loader?

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**Performance criteria 1.1.2 (select 3 including 1 with a star)**

21. What would you look for to make sure that the bucket is securely attached to the machine?

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22. What must you do if the SWL tag is missing from a chain sling?

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23. What would you look for on the attachment pins to ensure they will not fall out?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

24. What action would you take if during the routine check you found excessive wear in the power arms and connections that made the loader dangerous to operate?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**PLAN WORK:**

**Performance criteria 1.2.1 (select 10 including 5 with a star)**

25. What underground services would you check for before starting to excavate?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

26. Who should be contacted in order to find out the location of underground services?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

27. Name two methods that should be used to prevent a cave in of a trench or excavation?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

28. If you accidentally damaged an underground electrical cable who would you immediately contact to render the power supply safe?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

29. Name six possible hazards that may be found on a work site that you must check for before operating the front-end loader?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

30. If you are operating a front-end loader and it makes contact with powerlines what should you do?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

31. What is the minimum distance any part of a front end loader is allowed to operate from:

- a) Distribution powerlines
- b) High voltage transmission lines

a) \_\_\_\_\_  
b) \_\_\_\_\_

**NOTE: Assessors must ensure that the applicant is aware of Statutory Authority regulations.**

32. Why is it dangerous to drive along the high side of a trench?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

33. Name five (5) checks that you would make of the work area for site hazards?

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34. What is the danger of using a front-end loader on uneven soft or sloping ground? ★

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35. What is the danger of starting and running an internal combustion engine in an enclosed space? ★

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36. What action must be taken before starting up and whilst operating an internal combustion engine in an enclosed space?

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37. Why is it important to keep the machine floor plates free from oil, grease and tools?

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38. What must be provided and maintained on the exhaust of an internal combustion engine operated in a confined space such as a shaft or tunnel?

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**Performance criteria 1.2.2 (select 5 including 2 with a star)**

39. What must be provided to prevent a person falling into a trench? ★

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40. When should hearing protection (ear muffs) be worn?

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41. When should an operator wear a safety helmet?

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42. When would you be required to shore an excavation?

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43. What is the minimum type of footwear that an operator should wear to operate loadshifting equipment?

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44. What must be provided for a passenger to ride on a machine with the operator? ★

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45. You have to cut an excavation deeper than 1.5m. The workers have to enter this excavation and there is a likelihood that the walls may collapse. What action could you take using the front-end loader to make the excavation safe to enter?

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46. You have to load a truck with large boulders using your front-end loader. You are on the same level as the truck. What are the dangers?

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**Performance criteria 1.2.3 (select 2 including 1 with a star)**

47. Which is the preferred direction of travel, on a sloping surface?

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48. What gear should be selected to travel down a steep sloping surface?

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49. What hazards would you check for on a travel route before moving the loader to perform work?

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**Performance criteria 1.2.4 (select 1)**

50. What documentation would you be required to obtain from the Relevant Authority to operate the front-end loader in a hazardous working area?

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51. What Government license do you require to drive a front-end loader over 4.5 tones on a public road?

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**Performance criteria 1.2.5 (select 3 including 2 with a star)**

52. What should be provided on a front-end loader to prevent the operator from been pinned by an overturned machine?

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53. When earth-moving equipment is used in a demolition process what must be provided on the machine to protect the operator?

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54. Name two types of buckets used on a front-end loader?

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55. Name four operations that may be performed by a 4 in 1 bucket?

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**CHECK CONTROLS AND EQUIPMENT:**

**Performance Criteria 1.3.1 (select 9 including 4 with a star)**

56. What action would you take if you noticed a bulge form in a hydraulic hose?

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57. When should the operator complete tests, checks and inspections on a front-end loader that is to be operated?

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58. Describe how to safely mount/dismount a front-end loader.

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59. Where can the start up/shut down procedures for each front-end loader be found?

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60. Before performing any work with a front-end loader what should you do if you have not used the machine before?

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61. On mounting the front-end loader what should you do before attempting to start the engine?

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62. Once sitting in the operator's seat and before driving off, what should you do for safety and comfort?

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63. What should be referred to for the correct start up and shut down procedure for the equipment

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64. Before moving off where should the loader bucket be positioned and why would you place it in this position?

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65. Name the important items that should be tested after moving off.

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66. For travel and particularly whilst loaded, why should the loader bucket be as close as possible to the ground and tilted back? ☆

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67. Before reversing a front-end loader what action should you take? ☆

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68. Your front-end loader has run out of diesel, you refill the tank but the motor will not start. What could be the possible cause? □

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**Performance criteria 1.3.2 (select 1)**

69. What action would you take if you found damage or a defect on the front-end loader? □

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70. What must be provided on a front-end loader before it is used as a crane? □

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**UNIT 2. SHIFT LOAD:**

**Performance criteria 2.1.1 (select 3 including 2 with a star)**

71. Why are you not allowed to hoist persons with the bucket of a front-end loader? ☆

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72. Why are you not allowed to attach slings to the teeth of the bucket? ☆

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73. The load you are going to lift is likely to swing, how would you prevent this from happening? □

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74. What is the minimum diameter size tag line that should be used to control a load? □

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**Performance criteria 2.1.2 (select 10 including 4 with a star)**

75. You are required to operate a front-end loader on soft and uneven ground. What effect would this have on the load capacity that you could raise and carry with the loader? ☆

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76. What effect does a choker hitch around a square load have on the WLL of the sling?

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77. How do you calculate the cubic capacity of the bucket on a front-end loader?

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78. How would you determine the maximum weight that can be safely lifted with a front-end loader?

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79. Of topsoil or clay, which is more cohesive and harder, to excavate, push and spread?

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80. State the rule of thumb formula to calculate the SWL of flexible steel wire rope (FSWR).

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81. What is the formula for determining the SWL of a grade 80 chain?

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82. What is the formula for determining the SWL of a grade 30 to grade 75 lifting chain?

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83. What is the SWL of a 12mm diameter, mild steel chain?

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84. What is the SWL of a 7.1mm diameter, grade 80 chain?

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**For variation of question 84 use:**

- |  |
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| <ul style="list-style-type: none"><li>• 8mm grade 80</li><li>• 10mm grade 30</li><li>• 13mm grade 80</li></ul> |
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85. What diameter grade 80 chain is required to lift a load of 4.5 tonne?

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86. What size diameter sling (FSWR) would you need to lift a load of 2 tonne?

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87. What is the SWL of an 8mm diameter (FSWR) flexible steel wire rope?

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*For variation of question 87 use:*

- 10mm
- 12mm
- 16mm

88. What effect does reeving or using a choker hitch around a large water pipe have on the SWL of the sling?

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89. List two ways that you would assess the weight of a load to be hoisted?

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90. When a sling is reeved around a square load how is the WLL/SWL altered?

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91. What is the approximate weight of cubic metre of concrete?

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**Performance criteria 2.1.3 (select 9 including 6 with a star)**

92. Before reversing the front-end loader what actions/precautions should you take?

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93. When filling a trench using a front-end loader what direction should you approach the trench?

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94. What precautions would you take if a person was in a trench (in excess of 1.5m deep) while you are lowering pipes into that trench? ★

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95. Where a front-end loader has two pedals for independent rear brakes what must be done to these pedals before the loader is driven on a road? ★

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96. The front-end loader you are about to operate is fitted with air brakes, List four precautions must you take when operating?

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97. How high must the loader bucket be kept above the ground when driving forward? ☆

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98. What device is fitted to the rear brakes of a front-end loader that assist with manoeuvring? □

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99. What action should be taken if you discover a large rock in the side of a trench that you are digging? ☆

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100. How far away from an excavation must material be dumped? □

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101. List three precautions that must be taken when dumping material into a truck using a loader? □

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102. What is the danger of loading a truck across a sloping surface? ☆

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103. How are vehicles/machines stopped from coming too close to an excavation? ☆

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104. What are the dangers of driving your front-end loader close to the edge of an excavation? □

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**Performance criteria 2.1.4 (select 1)**

105. You have to travel a front-end loader, which is fitted with very large balloon type tyres on a road. What are the dangers? □

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**Performance criteria 2.1.5 (select 3)**

106. Interpret the following Signal □



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107. Interpret the following Signal



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108. Interpret the following Signal



\_\_\_\_\_

109. Interpret the following Signal



\_\_\_\_\_

**Performance criteria 2.1.6**  
**(Select 1)**

110. What must be provided on a loader to attach slings to use the loader as a crane?



\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

111. What are the dangers of undercutting a bank or stockpile?



\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Performance criteria 2.1.7**  
**(select 3 including 2 with a star)**

112. How would you dismantle a machine that contacted live power lines where the machine could not be released or the power turned off?



\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

113. If the slings shifted on a load been hoisted, what action would you take?




\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

114. The front-end loader you are operating overheats and coolant level requires checking. What precautions would you take prior to removing the radiator cap and topping up the coolant?




\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

115. You are excavating using the front-end loader. What would be the indications that you are excavating quite close to an underground service? 

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116. While excavating you suspect there could be an underground service in the area of the excavation, what action would you take? 


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**UNIT 3. SHUT DOWN EQUIPMENT:**


**Performance criteria 3.1.1 (select 3)**

117. Name three areas where you would not park the front-end loader. 

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118. When leaving the front-end loader what should be done with all hydraulically raised attachments? 

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119. What type of surface is the ideal type to park a loader on? 

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120. What is the danger of parking near an excavation? 

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**Performance criteria 3.1.3 (select 1)**

121. What post-operational checks should the operator carry out on the front-end loader to prepare it for the next operator? 


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**SECURE SITE:**


**Performance criteria 3.2.1 (select 2)**

122. For what reason should the key be removed from the ignition of the machine? 

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123. Before leaving the site what must be provided to restrict access to the site? 

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124. List eight things that must be done to ensure safe parking of a front-end loader? 

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## ANSWERS TO WRITTEN QUESTIONS

### CONDUCT ROUTINE CHECKS:

1. **Chocks, Blocks or safety bars must be used to prevent the bucket from falling.**

2.

- Oil leaks.
- Loose connections.
- Splits, fractures or bulges in hoses.
- Bent piston rod.
- Damaged rams.

3. Prior to and after their use. (ASI666.1).

4. **10% wear.**

5. Check with the valve at the top of the wheel or when using a glycerine gauge, the wheel can be in any position.

6. Do not stand in front of the wheel and inflate tyre in a cage if available and ensure all split rim bolts are secure.

7. Because the bolt is not an approved joining method and does not have a load rating.

8. 10% of the wires.

9. **Use a gauge with a chuck and inflate the tyre in a cage (if available) or by standing to the side. Do not stand in front of the wheel**

10. There would be a warning riveted or screwed to the loader near the driving station. Also when valve is at lowest point water would appear when checking the tyre pressure.

11.

- One broken wire immediately below or above a terminal or end fitting.
- Abrasion and core collapse.
- Corrosion.
- Kinks and fractures.
- Crushed and jammed strands.
- Birdcaging.
- Damaged splices.
- 10% of broken wires in 8 diameter of rope.
- Stretched.
- Affected by heat.

12.

- Cracks in links.
- Over 10% wear.
- Over 10% elongation.
- Over 5% wear or stretch in throat of hook.
- Over 10% wear in bite hook.
- Twisted or damaged links.
- Rust marks.
- Chain had been affected by heat.
- Spot-welded links.
- Stretched or locked links
- Knotted

13. Wheel jacked up with the valve at the top of the wheel, fill with water to the manufacture's specifications, add anti-freeze if required and then add air pressure.

14. Worn or missing teeth or a worn cutting edge and other damage to the actual bucket and bucket pivot pins and keeper plates.

15. Leaks from seals, split or fractured hoses, and bent or damaged rams.

16. When the transmission is cold and after the transmissions hot or in-accordance with manufacture's specifications.

17. Increases the weight and the stability of the loader and provides better traction as the tread is embedded.

18. Yes. You can use a wire rope provided that no more than 10% of the wires are broken in a length 8 times the diameter of the rope, unless the broken wire is immediately below or above a terminal or end fitting, then it cannot be used.
19. It must never be used and it should be discarded.
20. **If the tyre pressure is not equal the weight of the load would transfer to the side of less pressure, which may cause the front-end loader to over turn.**

### Performance criteria 1.1.2

21. That the safety pins and keepers are in place.
22. Check for the grade markings, if grade markings are not clear calculate for mild steel. Then return to manufacturer for re-tagging.
23. Ensure that all pins, clips and keeper plates are not worn, damaged or missing.
24. **Inform supervisor, tag equipment and refrain from operating the loader until repairs were carried out.**

### PLAN WORK:

#### Performance criteria 1.2.1

25. **Check for power, telephone, gas, water, sewer, drainage, fibre-optic cable lines.**
26. The site supervisor who will contact the supply authorities or council for maps of the site.
27. Shoring, battering, benching or shoring/trench shields.
28. Supervisor who would contact the electrical supply authority.

- 29.
- Uneven/unstable ground,
  - Personnel
  - Powerlines,
  - Trees,
  - Overhead service lines,
  - Bridges,
  - Surrounding buildings, structures
  - Obstructions,
  - Other equipment,
  - Dangerous materials,
  - Underground services (gas, electricity, sewerage, water, communication lines)
  - Recently filled trenches.

30.

- Stay calm, remain in seat, warn other to keep away, try to break contact by lowering bucket (if possible), try and get someone to switch off the power, don't climb down off the machine.**
- If you think the machine could catch fire or if you are alone - jump well clear of the machine, don't make contact with the ground and the machine at the same time, if you have contacted underground power be aware the area around could be electrified.**
- Remain near to the machine to warn others to keep clear, have someone notify the site manager/supervisor who should report immediately to the appropriate authority.**

31. (a) **At least 2 metres from distribution powerlines**

(b) **At least 6 metres from high voltage transmission lines**

**NOTE: Assessors must ensure that the applicant is aware of Statutory Authority regulations.**

32. The trench could cave in and cause the loader to overturn.

33. .

- Hidden holes,
- Drop off,
- Embankments,
- Overhead obstructions,
- Underground services,
- Overhead power lines
- Telephone lines
- Other obstructions that could be dangerous.

34. **The machine could overturn.**

35. **Exhaust fumes given off by an internal combustion engine in an enclosed space can kill.**

36. The 'enclosed space' must be adequately ventilated.

37.

- To prevent the foot plates from becoming slippery and causing operator to slip when mounting or dismounting
- To prevent the tools from fouling controls

38. An approved exhaust control unit, catalytic converter (scrubber)

#### **Performance criteria 1.2.2**

39. **Barricades, guardrails or fencing.**

40. When the noise level could contribute to the loss of hearing.

41. When there is a possibility that the person could be struck on the head.

42. Excavations over 1.5m deep.

43. Footwear that encloses the foot and has a non-slip sole.

44. **A special seat and seat belt must be provided within the safety confines of the machine for the passenger.**

45. Batter or bench the sides of the excavation.

46. As you raise the bucket the boulders could tip out of the bucket onto the truck

#### **Performance criteria 1.2.3**

47. **Directly up or down the sloping surface.**

48. The lowest possible gear.

49.

- Personnel
- Hidden holes,
- Drop offs,
- Embankments,
- Overhead obstructions,
- Underground services,
- Overhead power lines
- Telephone lines
- Other obstructions that could be dangerous.

#### **Performance criteria 1.2.4**

50. The required safe work permits.

51. The appropriate license as required by the relevant state vehicle licensing authority

#### **Performance criteria 1.2.5**

52. **Roll over protection equipment. (ROPS) and seat belt.**

53. **A falling object protective structure. (FOPS)**

54.

- General purpose( fixed type) bucket
- 4 in 1 bucket

55.

- Scraping,
- Loading,
- Clam-shelling
- Dozing.

## **CHECK CONTROLS AND EQUIPMENT:**

### **Performance Criteria 1.3.1**

56. **Stop operating, tag the machine and make sure the hose is replaced before the machine is used again.**
57. Daily before use.
58. **Facing the machine use the grab rail or hand rail and steps to mount/dismount the machine (Three points of contact)**
59. In the appropriate manufacturer's manual.
60. Read the operator's manual to familiarise yourself with the machine (e.g. controls and decal information). Seek training and supervision from your employer if you consider you cannot competently operate the equipment.
61. Make sure controls are in neutral or park and park brake is on.
62. Adjust seat until comfortable, adjust mirror (if applicable) and secure safety belt.
63. Always refer to the manufacturer's manual for the correct procedure.
64. Low to the ground and tilted back to provide maximum vision for travel.
65. The foot brake and steering.
66. **For greater stability, better vision and to contain the load in the bucket.**
67. **Look over both shoulders to ensure the path of travel is clear and sound horn twice before moving unless there is a reversing alarm fitted. Continue to look in direction of travel**

68. Air in the fuel system and it needs bleeding.

### **Performance criteria 1.3.2**

69. Tag the machine, put it out of service and report the damage or defects to the authorised person.
70. A manufacturer's approved lifting lug with the SWL marked on the machine.

## **SHIFT LOAD:**

### **Performance criteria 2.1.1**

71. **The manufacturer did not design the machine to hoist persons and it is against all safe operating procedures.**
72. **You may break off the teeth, which may cause the load to fall which may injure or kill someone or damage the load. It is also against regulations to sling loads from the bucket of a loader without fitting the approved lift connection.**

73. Attach tag lines to control the swing.

74. Not less than 16mm diameter

### **Performance criteria 2.1.2**

75. **It would reduce the load that could be raised and safely carried.**

76. The SWL is reduced by half.

77. 
$$\frac{L \times W \times Ht}{2}$$

78. **By the load plate on the loader or by the manufacturer's recommendations**

79. Clay.

80. **Diameter in mm squared x 8 = SWL in kg**

81. Diameter in mm squared x 32 = SWL in kg or Diameter in mm squared x 80 x 0.4 = SWL in kg.

82. **Diameter in mm squared x grade x 0.3 = SWL in kg**

83.  $12 \times 12 \times 30 \times 0.3 = 1296\text{kg}$

84.  $7.1 \times 7.1 \times 32 = 1613.12\text{kg}$

or

**For variations of question 84 use:**

- |        |               |
|--------|---------------|
| • 8mm  | Answer 2048kg |
| • 10mm | Answer 900kg  |
| • 13mm | Answer 5408kg |

85. load kg  $\div$  32

$4500 \div 32 = 140.625$

$\sqrt{140.625} = 11.858\text{mm}$

12mm diameter sling required.

86. load kg  $\div$  8

$2000 \div 8 = 250$

$\sqrt{250} = 15.8\text{mm}$

16mm diameter sling required

87.  $8 \times 8 \times 8 = 512\text{kg}$

or

**For variations of question 87 use:**

- |        |               |
|--------|---------------|
| • 10mm | Answer 800kg  |
| • 12mm | Answer 1152kg |
| • 16mm | Answer 2048kg |

88. It reduces the WLL/SWL by 25%.  
The sling will only be safe to lift  
75% of its rated capacity.

89.

- By calculating the weight
- delivery docket
- weighbridge certificate
- weight marked on the item.

90. Reduces the WLL/SWL by 50%.

91. 2.4 tonnes.

### Performance criteria 2.1.3

92. Look over both shoulders to ensure the path of travel is clear. Sound the horn twice before moving unless there is a reversing alarm fitted. Whilst moving continue to look in the direction of travel.

93. Square on with the trench (ie: form a T with the trench).

94. **Ensure that the trench is shored and the person is standing well clear of either end of the pipes been lowered.**

95. **The pedals must be connected together.**

96.

- Make sure correct air pressure is up and can be maintained before moving off
- Never pump or fan the air brakes
- Brake firmly in one application
- Never use a brake that neutralises the transmission when travelling

97. **Only high enough to provide ground clearance at all times.**

98. Dual brake pedals, a separate brake pedal for each rear wheel.

99. **The rock should be removed.**

100. Not closer than 1 metre with material coming to rest no closer than 0.5 metres from the excavation.

101.

- The truck must be correctly positioned,
- No load must pass over the cabin of the truck,
- A layer of soil must be laid first to take the impact if large rocks are to be loaded,
- The loader bucket must be capable of accommodating the load.
- The truck drivers whereabouts must be known.

102. **The loader could overturn.**
103. **By using barricades and warning signs.**
104. The excavation could collapse causing the front-end loader to overturn or to fall into the excavation.

**Performance criteria 2.1.4**

105. At speed, wheel bounce will develop making it more difficult to control the loader.  
Front tyre pressures should be lowered before travelling on the road.

**Performance criteria 2.1.5**

106. Stop
107. Boom up
108. Boom down
109. Travel and traverse

**Performance criteria 2.1.6**

110. A specially designed lifting lug and the machine must be marked with its SWL.
111. The bank or stock pile could collapse causing the front-end loader to overturn or the front end loader and operator could be trapped under the collapse.

**Performance criteria 2.1.7**

112. **Jump well clear, making sure that you do not make contact with the ground and machine at the same time.**
113. Carefully lower the load and have the slings re-positioned and secured

114. Allow the machine to cool down, loosen radiator cap to release pressure using a cloth to protect from hot water burns then remove the radiator cap slowly. Top up using manufacturer's recommended coolant.

115. **Observe the spoil, the appearance of any of the following would be an indication of previous excavation work.**

- Crushed blue metal**
- Plastic tape**
- Clean sand**
- Sand bags**
- Broken tiles**
- Moisture**
- Any other unusual material**

116. Stop operating immediately and hand dig to investigate further. Check with appropriate authority to ascertain what maps/ plans are available for the area.

**UNIT 3: SHUT DOWN EQUIPMENT:**

**Performance criteria 3.1.**

- 117.
- Access ways,
  - Near overhangs,
  - Refuelling sites,
  - Tidal or flood areas,
  - Adjacent to an excavation.
- 118.
- Attachments lowered,
  - Cutting edge flat on ground
  - Lever placed in float position
  - Pressure removed from hydraulic lines.
119. A firm level surface.
120. The weight of the loader could cause the excavation to cave in particularly if the ground is effected by rain.

### **Performance criteria 3.1.3**

121.

- Look under and around the loader for leaks or defects. Check the structure and equipment for defects and wear
- Check the oil, fuel and water level when the machine is cool.

### **SECURE SITE:**

#### **Performance criteria 3.2.1**

122. To prevent unauthorised movement.

123. Barricades or fences.

124.

- Park clear of access ways overhangs and fuelling site.
- Park clear of excavations and trenches.
- Park clear of fire hazards.
- Park clear of entrances, exits.
- Parked clear of fire-fighting and electrical equipment.
- Park clear of tidal and flood areas.
- Park on a firm level ground or if on an incline facing slope.
- Lower the bucket with cutting edge on ground.
- Engine is stopped in accordance with manufacturer's manual (idle engine before turning off).
- Secure parking brake, leave controls in park position or in neutral.
- Remove the keys.
- Secured the machine against unauthorised movement.

# FRONT-END LOADER ASSESSMENT SUMMARY



## ORAL/WRITTEN ASSESSMENT

OPERATIONAL AREA UNIT	Number of critical criteria required	Number of critical criteria achieved	Number of non-critical criteria required	Number of non-critical criteria achieved	Competent? (tick)		
					YES	NO	
1	20	<input type="text"/>	18	<input type="text"/>	<input type="text"/>	<input type="text"/>	
2	14	<input type="text"/>	12	<input type="text"/>	<input type="text"/>	<input type="text"/>	
3	0	<input type="text"/>	5	<input type="text"/>	<input type="text"/>	<input type="text"/>	
Assessment start time:		: am/pm	Finish time:		: am/pm		
Oral/Written Assessment completed within time allowed – approx 2 hours						<input type="text"/>	<input type="text"/>

## PERFORMANCE ASSESSMENT

OPERATIONAL AREA UNIT	Number of criteria required with a star	Number of criteria achieved	Competent? (tick)			
			YES	NO		
1	7	<input type="text"/>	<input type="text"/>	<input type="text"/>		
2	4	<input type="text"/>	<input type="text"/>	<input type="text"/>		
3	1	<input type="text"/>	<input type="text"/>	<input type="text"/>		
Assessment start time:		: am/pm				
Assessment finish time:		: am/pm				
Performance Assessment completed within time allowed – approx 1 hour					<input type="text"/>	<input type="text"/>

**Applicant is:**  **COMPETENT**

(tick or circle the result obtained)  **NOT YET COMPETENT**

**Name of Assessor:**..... **Name of Applicant:**.....

**Signature:**..... **Signature:**.....

**Date:** .../.../....

**Comments/Feedback** (Assessor to make additional comments which clarify the assessment results)

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