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FRONT END LOADER/ BACKHOE

NATIONAL CERTIFICATE OF COMPETENCY

Contents

Loadshifting Equipment

Front-end Loader/Backhoe

ASSESSMENT

Part 1 Performance
Part 2 Oral/Written

June 1995

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 Specified Equipment.*

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.*

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 log books) 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 applicants 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 applicants 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 applicants what is required of them. Check that applicants have provided (or have been provided with) the necessary tools and equipment.

3.2 Practical performance
Complete the 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 or 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 himself/herself 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 are likely to be damaged.

3.3 Knowledge
The knowledge assessment covers both oral and written exercises. The model answers provided with the knowledge assessment instruments are not necessarily exhaustive. Use your own judgement when scoring alternative answers.

3.4 Recording responses
Each item and question on the assessment forms you use is accompanied by a box. Assessors must complete every box as follows:


CORRECT PERFORMANCE/ANSWER


NOT YET ACHIEVED

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 countersigned by the applicant.

The original and duplicate are given to the applicant. The applicant provides the original to the certifying authority. The triplicate is 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 assessment.

In the case of a repeat assessment, the assessor can decide to apply the whole or only part of the assessment.

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 or performance, ask additional questions, and obtain additional evidence, before making your final decision.

National Guidelines for OHS Competency Standards

Loadshifting Equipment

Front-end Loader/Backhoe

Performance Assessment

June 1995

FRONT-END LOADER/BACKHOE

(Performance assessment)

Assessor guidelines—specific

ASSESSMENT INSTRUMENT
- SPECIFICATIONS

The performance assessment covers the following Loadshifting 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/backhoe.

   The assessment is performed in ten sections:

   1.1 Conduct routine pre-operational check front-end loader/backhoe, 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 to the work area.

   1.5 Set up machine and excavate a trench.

   1.6 Use the front-end loader/backhoe as a crane.

   1.7 Backfill the trench and load or simulate loading a truck.

   1.8 Consolidate and level a surface.

   1.9 Pick up and shift material in the bucket.

   1.10 Shut down equipment and secure site.

2. Prior learning and experience

   2.1 An applicant who holds a front-end loader, excavator, dragline or dozer certificate do not require assessment in sections 2, 3, 4, 7, 8 and 9.

   2.2 Applicant who produces satisfactory documentary evidence (such as a log book) which establishes 50 days experience in front-end loader/backhoe operations specifically covering competencies tested in sections 2, 3, 4, 7, 8 and 9 does not require assessment in these sections.

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

   - sufficient clear space to operate the machine
   - ground suitable for excavating.

4. Equipment and Resources Required:

   - Front-end loader/backhoe and equipment.

   - A wire rope sling, chain sling, shackle and a fibre rope tag line.

   - Suitable loads to sling (such as a bundle of timber and a concrete pipe).

   - Suitable site on which to use the front-end loader/backhoe and equipment to excavate and backfill a trench, use the front-end loader/backhoe in the crane mode 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 items in the shaded boxes are of critical importance. Failing to get any of these correct means that competency has not been achieved.

10. 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.

11. The full performance assessment can take up to 1 hour 30 minutes.

12. The general assessment requirements are set out in Assessor's guidelines - general.

13. The applicant's competence in each unit is to be summarised for both performance and knowledge on the summary sheet. Competence is achieved for a unit when the required number of boxes for that unit have been ticked or marked 'N/A'.

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

CONDUCT ROUTINE CHECKS:

Performance Criteria 1.1.1 and 1.1.2

1. Conducts routine checks on vehicle/equipment:
   - Tyre condition and inflation ☐

   Checks liquid levels -
   - fuel ☐
   - hydraulic oil ☐
   - engine oil ☐
   - battery ☐
   - coolant ☐

   Checks structure for defects -
   - damaged or broken parts ☐
   - loose nuts, bolts and couplings ☐

   Checks attachments for defects -
   - damage ☐
   - bucket for missing, worn or loose teeth ☐
   - hoses, fittings, hydraulic rams for oil leaks ☐
   - connections for missing pins or keepers ☐
   - grease holes and grease pins ☐

   Checks other equipment for defects -
   - wire slings ☐
   - chain slings ☐
   - shackles ☐
   - other gear ☐
   - Checks attachments for security ☐

PLAN WORK AND CHECK EQUIPMENT:

Performance Criteria 1.2.1, 1.2.3 and 1.2.5

2. Inspects site and plans work:

   Identifies hazards -
   - power lines ☐
   - phone lines ☐
   - service drains ☐
   - obstructions ☐

   Access and path of movement is indicated -
   - to work area ☐
   - for loads ☐

   Fits appropriate equipment -
   - suitable tools used ☐
   - secures catches ☐
   - correct procedure adopted ☐
   - works safely ☐

Performance Criteria 1.3.1.

3. Conducts pre-operational and post start-up checks in accordance with manufacturer's specifications/ operating manual.
   - mounts correctly ☐
   - adjusts seat ☐
   - in neutral ☐
   - warning device ☐
   - engine start ☐
   - gauges ☐

- warm-up allowed ☐
- attachment movement ☐
- clear for travel ☐
- foot brake ☐
- holding brake ☐
- steering ☐

SHIFT LOAD:

Performance criteria 2.1.1 & 2.1.3

4. Drives to the work area -
   - raises attachments smoothly ☐
   - secures backhoe bucket ☐
   - ensures travel direction clear ☐
   - selects appropriate route ☐
   - travels at safe speed ☐
5. Sets up backhoe and excavates -
   - positions backhoe competently ☐
   - applies brake ☐
   - lowers bucket ☐
   - secures and mounts backhoe seat ☐
   - checks controls ☐
   - lowers stabilisers (lowest side first) ☐
   - back wheels off ground ☐
   - smoothly operates controls ☐
   - tackles task in logical sequence ☐
   - uses sufficient revs for work ☐
   - uses correct bucket angle ☐
   - crowds sufficiently to fill bucket ☐
   - deposits full buckets of soil ☐
   - deposits soil away from trench ☐
   - keeps persons out of operating radius ☐
   - cuts trench to specifications ☐
   - demonstrates digging around a pipe ☐

Performance Criteria 2.1.2

6. Operates front-end loader/backhoe as a crane -
   - checks sling attachment point ☐
   - establishes weight of load ☐
   - load not more than SWL for the operation ☐
   - selects appropriate slings and gear ☐
   - raises bucket to connect load ☐
   - supervises correct slinging of the load ☐
   - ensures tag line connected (if required) ☐
   - trial lifts load ☐
   - moves load to hand signals ☐
   - moves load safely ☐
   - lowers load to designated location ☐

7. Backfills trench and loads truck -
   - bucket at correct level and angle ☐
   - uses sufficient revs and speed ☐
   - avoids excessive wheel spin ☐
   - crowds bucket to fill ☐
   - ensures direction of travel clear ☐
   - travels with bucket low ☐
   - acceptable and safe speed ☐
   - minimises spillage and ground damage ☐
   - uses appropriate path of travel ☐
   - approaches trench or truck correctly ☐
   - smoothly raises and dumps load ☐
   - repositions bucket ready for reload ☐
   - maintains stockpile and working surface ☐

8. Consolidates and levels surface -
   - consolidates fill with loader ☐
   - levels surface with bucket blade ☐
   - leaves excess fill for natural compaction ☐
   - maintains level surface to work from ☐

9. Picks up and shifts material in the bucket:
   - picks up material ☐
   - shifts material in bucket ☐

Performance criteria 2.1.1, 2.1.4, 2.1.5 and 2.1.6

General performance of sections 4, 5, 6, 7, 8 and 9

- equipment suitable for the work ☐
- machine suitable for ground conditions ☐
- competently shifts material ☐
- equipment operated at a safe speed ☐
- signals are interpreted and observed ☐
- loads placed to ensure stability ☐
- loads placed to avoid causing hazard ☐

SHUT DOWN EQUIPMENT AND SECURE SITE:

Performance criteria 3.1.1, 3.1.2 and 3.2.1

10. Shuts down equipment and secures site:

Parks equipment -
- machine parked in suitable area ☐
- attachments lowered to ground ☐
- cutting edge of bucket on ground ☐

Shuts down equipment -
- neutralises controls ☐
- applies holding brake ☐
- idles to stop, locks ignition ☐

- moves controls to release pressure ☐
- applies safety lock (where applicable) ☐

Avoids hazards:

- parks away from danger areas ☐
- removes keys ☐
- locks cabin (if applicable) ☐

National Guidelines for OHS Competency Standards

Loadshifting Equipment

Front-end Loader/Backhoe

Oral/Written Assessment

June 1995

FRONT-END LOADER/BACKHOE

(Knowledge)

Assessor guidelines—specific

ASSESSMENT INSTRUMENT
- SPECIFICATIONS

The knowledge assessment covers the following Loadshifting elements.

1.1, 1.2, 1.3, 2.1, 3.1 & 3.2

1. Knowledge assessment for Front-end Loader/Backhoe is divided into three units and seventeen 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) the specified number of questions in each of the following sections:

   Unit 1.0

   1.1 Conduct routine checks

   1.1.1 (select 4)
   1.1.2 (select 1)

   1.2 Plan work

   1.2.1 (select 2)
   1.2.2 (select 3)
   1.2.3 (select 1)
   1.2.4 (select 1)
   1.2.5 (select 1)

   1.3 Check controls and equipment

   1.3.1 (select 1)
   1.3.2 (select 1)

   Unit 2.0

   2.1 Shift load

   2.1.1 (select 1)
   2.1.2 (select 3)
   2.1.3 (select 1)
   2.1.5 (select 1)
   2.1.7 (select 2)

   Unit 3.0

   3.1 Shut down equipment

   3.1.1 (select 1)
   3.1.3 (select 1)

   3.2 Secure site

   3.2.1 (select 1)

3. Prior learning and experience:

   An applicant who holds a front-end loader, 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 knowledge assessment of twenty six questions can take up to thirty minutes.

5. The items in the shaded boxes are of critical importance. Failing to get any of these correct means that competency has not been achieved.

6. The applicant's competence in each unit is to be summarised for both performance and knowledge on the summary sheet. Competence is achieved for a unit when the required number of boxes for that unit have been ticked or marked 'N/A'.

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

CONDUCT ROUTINE CHECKS:

Performance criteria 1.1.1 (select 4 including 1 with a shaded box)

1. What precaution must be taken when inspecting under a raised attachment?
   Provision provided to prevent attachment descending. ■

2. Name three defects to look for in the hydraulic system.
   Oil leaks, loose connections, splits, fractures or bulges in hoses. ☐

3. When should slings be inspected?
   Prior to their use. (AS1666) ☐

4. What % wear in a shackle would cause it to be discarded?
   10% wear. ☐

5. Briefly describe how you would check the air pressure of water filled tyres.
   Check with the valve at the top of the wheel. ☐

6. What safety precautions should be taken to inflate split rim wheels?
   Do not stand in front of the wheel and inflate tyre in a cage if available. ☐

7. Is it permissible to join a chain sling with a bolt?
   No. ☐

8. What % of broken wires within a lay or in eight diameters of a wire rope sing would cause it to be discarded?
   10% of the wires. ☐

Performance criteria 1.1.2 (select 1)

9. What must be done to a lowered backhoe bucket before travelling?
   Raise the bucket and secure it. ☐

10. What shall be provided on a front-end loader/backhoe before it is used as a crane?
    Special provision to attach the slings to and the SWL marked on the equipment. ☐

PLAN WORK:

Performance criteria 1.2.1 (select 2)

11. In built-up areas what checks should be made before excavating?
    Check for power, telephone, gas or drainage lines. ☐

12. What would you refer to in order to establish the location of underground services?
    Supply authority or council maps. ☐

13. Name two methods that you would use to prevent a cave in of a trench or excavation?
    Shoring, battering or benching. ☐

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

Performance criteria 1.2.2 (select 3 including 1 with a shaded box)

15. What shall be provided to prevent a person falling into a trench?
    Barricades or guardrails or fencing. ■

16. When should ear protection be worn?
    Where the noise could contribute to the loss of hearing. ☐

17. What is the danger of loading a truck across a sloping surface?
    The loader could overturn. ■

18. When should an operator wear a safety helmet?
Where the person could be struck on the head. ☐

19. In doubtful soil, what depth trench is required to be shored before it is entered?
Trenches over 1.5m deep. ☐

20. What is the minimum type of footwear that an operator should wear to operate loadshifting equipment?
Non-slip footwear that encloses the foot. ☐

Performance criteria 1.2.3 (select 1)

21. Which is the preferred route of travel, diagonally across or directly down sloping surface?
Directly down the sloping surface. ☐

22. What gear should be selected to travel down a steep sloping surface?
A low gear. The gear required to climb the sloping surface. ☐

Performance criteria 1.2.4 (select 1)

23. What would you be required to obtain from the Relevant Authority to operate a machine in a hazardous working area?
The required permits. ☐

24. What Government licence do you require to drive a front-end loader/backhoe over 4.5 tonnes on a public road?
The appropriate heavy vehicle licences. ☐

Performance criteria 1.2.5 (select 1)

25. What attachment would you use to break up reinforced concrete?
Hydraulic hammer attachment. ☐

26. When a front-end loader/backhoe is used in a demolition process what shall be provided to the machine to protect the operator?
An overhead protective structure. (AS 2601) ☐

CHECK CONTROLS AND EQUIPMENT:

Performance Criteria 1.3.1 (select 1)

27. What action would you take if you noticed a bulge form in a hydraulic hose?
Replace the hose before the machine is used. ☐

28. When should tests, checks and inspections be made by the operator on the front-end loader/backhoe that is to be operated?
Daily before use. ☐

Performance criteria 1.3.2 (select 1)

29. What action would you take with damage and defects found on the machine?
Report the damage and defects to authorised person and ensure safety is not jeopardised. ☐

SHIFT LOAD:

Performance criteria 2.1.1 (select 1)

30. Is it permissible to hoist persons with the bucket of a front-end loader/backhoe?
No. ☐

31. Is it permissible to attach slings to the teeth of the bucket?
No.

Performance criteria 2.1.2 (select 3)

32. What effect would sloping ground have on the load that you would hoist and carry with the front-end loader/backhoe?
It would reduce the load that could be safely carried.

33. What is the approximate weight of cubic metre of concrete?
2.4 tonnes.

34. What is the approximate SWL of a 12mm diameter wire rope?
12 x 12 x 8 = 1152kg.

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

36. What effect does a choker hitch around a square load have on the SWL for the sling?
Reduces the SWL by 50%.

37. State the rule of thumb formula to calculate the SWL of wire rope.
Diameter in mm squared x 8 = SWL in kgs.

Performance criteria 2.1.3 (select 1)

38. Before reversing the machine what precaution should be taken?
Ensure the direction of travel is clear.

39. What is the added danger when a trench is under cut?
The trench is more likely to cave in.

Performance criteria 2.1.5 (select 1)

40. Applicant to state the meaning of the hand signal for "hoisting lower" demonstrated by the assessor.
Hoisting lower.

41. Applicant to state the meaning of the hand signal for "hoisting raise" demonstrated by the assessor.
Hoisting raise.

42. Applicant to state the meaning of the hand signal of "stop" demonstrated by the assessor.
Stop.

Performance criteria 2.1.7 (select 2)

43. What action would you take if a hydraulic hose sprung a leak while the bucket was raised?
Lower bucket and have repairs carried out.

44. If the machine contacted a live power line which could not be released or the power turned off, how would you dismount the machine?
Jump clear ensuring contact with the ground and machine is not at the same time.

45. If the slings shifted on a load being hoisted, what action would you take?
Stop the crane, warn people in the area, then carefully lower the load and have the slings re-positioned and secured.

SHUT DOWN EQUIPMENT:

Performance criteria 3.1.1 (select 1)

46. Name three areas where you would not park the front-end loader/backhoe.
Access ways, near overhangs, refuelling sites, tidal or flood areas, adjacent to an excavation.

47. When leaving the loadshifting equipment what should be done with all hydraulically raised attachments?
Attachments lowered and pressure removed from hydraulic lines. ☐

Performance criteria 3.1.3 (select 1)

48. What post-operational checks should be carried out by the operator on the front-end loader/backhoe to prepare it ready to be reoperated?
Check the structure and equipment for defects and wear and the oil, fuel and water levels. ☐

SECURE SITE:

Performance criteria 3.2.1 (select 1)

49. What shall be provided when a front-end loader/backhoe has to be parked on or protrudes onto an access way?
Barricades, lights and signs. ☐

50. For what reason should the key be removed from the ignition of the machine?
To prevent unauthorised movement. ☐

51. Before leaving the site what must be provided to restrict access to the site?
Barricades or fences. ☐

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