

CONSTRUCTION TRAINING INTERNATIONAL

A.C.N. 069 758 023 A.B.N. 49 069 758 023

PO Box 311, Riddells Creek, Victoria 3431

Phone: 5428 6790

fax: (03) 5428 6317 E-mail: constructiontraining@bigpond.com

Website: www.constructiontraining.com.au

SCRAPER (SP)



ASSESSMENT INSTRUMENT

Loadshifting Equipment

Scraper

ASSESSMENT

Part 1 Performance

Part 2 Oral/Written

July 1994

Contents

	<i>Page</i>
Assessor guidelines-general	i
Part one-Performance Assessment	1
Part two-Oral/Written Assessment	7
Assessment Summary	13

Assessor guidelines – general

1. Introduction

1.1 Scope

These general guidelines apply across all the assessment instruments for the certificates of competencies for loadshifting equipment prescribed by the Workplace Health and Safety Act **which are not included** in the scope of the *National Guidelines for Occupational Health and Safety Competency standards for the operation of Loadshifting and Other Types of Specified Equipment*.

As the Assessment Instruments follow the guidelines set down by the National Guidelines for Occupational Health and Safety Competency Standards for the operation of Loadshifting and Other Types of Specified Equipment, Assessors should be familiar with the publication.

1.2 Additional guidelines

Guidelines which provide additional specified information to 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 competency

Evidence of competency is established in number of ways. The method used in the following instrument involve:

- assessment of practical performance
- written and or/oral answers to questions on underpinning knowledge

2. Prepare for the assessment

2.1 Study the instrument

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

2.2 Confirm appointments

Prior to the 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 vary greatly between workplaces, it is important for assessors to plan their approaches to meet the requirements of individual workplaces.

Make sure you take the time frame 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 applicant what is required of them. Check that the applicant has 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 the normal working environment.

Do not ask the applicant questions while he or she is performing a task, as this can distract, and may affect the time taken to complete the assessment.

If, at any time the applicant is endangered 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 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 necessary exhaustive. Use your own judgement when scoring alternative answers.

3.4 Recording responses

Each item and question on the assessment form 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 equipment class. This is to be filled in and signed by the assessor, and countersigned by the applicant.

The original and duplicate is given to the applicant. The applicant provides the original to the certificating authority. The triplicate remains with 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 in each instrument is specified in the specific guidelines and/or on the summary page at the end of each assessment.

4.3 Additional comments

Where an applicant fails to meet the standard of competency, 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 further 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 certificating 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 decision.

Guidelines for OHS Competency Standards

Loadshifting Equipment

Scraper

Performance Assessment

July 1994

SCRAPER

(Performance assessment)

ASSESSMENT INSTRUMENT – SPECIFICATIONS

The following performance assessment covers the Loadshifting standard elements from [NOHSC:1992] which apply to a Scraper.

1.1, 1.2, 1.3, 2.1, 3.1 & 3.2

Assessor guidelines - specific

1. The assessment requires the operator to check the equipment, plan the work and to safely and competently operate the scraper.

The assessment is performed in nine sections:

- 1.1 Conduct routine pre-operational check on scraper.
- 1.2 Inspect the site and plan the work.
- 1.3 Conduct pre-operational and post start up checks on the scraper.
- 1.4 Drive the scraper to the work area.
- 1.5 Grade and level haul road.
- 1.6 Load scraper bowl and haul load.
- 1.7 Dump spread and level surface.
- 1.8 Shut down the equipment and secure the site.

2. Prior learning and experience
- 2.1 Applicant who produces satisfactory documentary evidence (such as a log book) which establishes 50 days experience in the operation of a front-end loader does not require assessment in sections 2, 3, 4 and 10.
3. The performance assessment can be conducted at any location which has:
 - sufficient clear space to operate the machine
 - ground suitable for excavating, hauling, spreading and levelling soil
4. Equipment and Resources Required:
 - A scraper.
 - Suitable site on which to use the scraper to excavate, haul, spread and level soil.
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 and the applicant must be failed.
10. Where an applicant as 'not yet competent' he/she must be informed of the reason(s) for the failure in order to gain further appropriate training.
11. The full performance assessment can take up to 1 hour.
12. The general assessment requirements are set out in Assessors guidelines - general.
13. The applicant's competence in each unit is to be summarised for both performance and knowledge on the summery sheet. Competency is achieved for a unit when the required number of boxes for the unit have been ticked or marked "N/A".

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

CONDUCT ROUTINE CHECKS:

Performance Criteria 1.1.1. and 1.1.2

1.1 Routine checks on vehicle/equipment:

- Tyre condition and Inflation

Checks liquid levels -

- fuel
- hydraulic oil
- engine oil
- battery
- coolant

Checks equipment for defects -

- damaged or broken parts
- loose nuts, bolts and couplings
- hoses, fittings, hydraulic rams for oil leaks
- connections for missing pins or keepers
- grease holes and grease pins

PLAN WORK AND CHECK EQUIPMENT:

1.2 Inspects site and plans work:

Performance Criteria 1.2.1, 1.2.3 and 1.2.5

Identify Hazards -

- power lines
- phone lines
- service drains
- obstructions

Access and path of movement is indicated -

- to work area
- for loads

Appropriate equipment for the task -

- equipment is appropriate for the task

Performance Criteria 1.3.1.

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
- starts engine/engines
- gauges
- warm up allowed
- attachment movement
- clear for travel
- foot brake
- holding brake
- steering

SHIFTS LOAD:

Performance criteria 2.1.1 and 2.1.3

1.4 Drives to the work area:

- raises bowl to clear obstructions
- ensures travel direction clear
- selects appropriate route
- travels at safe speed

1.5 Grades and levels haul road:

- bowl and blade at correct level
- uses sufficient revs and speed for work
- acceptable and safe speed

1.6 Loads scraper bowl and hauls load:

- approaches cut at reduced speed
- avoids excessive wheel spin
- maintains alignment (particularly if being pushed)
- bowl low as conditions permit for travel
- uses appropriate path of travel (avoids edge fill)
- travels at a safe speed (reduces speed when turning)

1.7 Unload and spread soil:

- avoids edge of fill
- evenly spreads load

- maintains a even travelling surface

Performance criteria 2.1.1, 2.1.4, 2.1.5 and 2.1.6

General performance of sections 4, 5, 6, and 7.

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

SHUTS DOWN EQUIPMENT AND SECURES SITE:

Performance criteria 3.1.1, 3.1.2 and 3.2.1

1.8 Shuts down equipment and secures site:

Parks equipment -

- machine parked in suitable area
- bowl lowered to ground

Shuts down equipment -

- neutralises controls
- applies holding brake
- idles to stop and locks ignition
- moves controls to release pressure

Avoiding hazards -

- parks away from danger areas
- removes keys

Guidelines for OHS Competency Standards

Loadshifting Equipment

Scraper

Oral/Written Assessment

July 1994

SCRAPER

(Knowledge)

ASSESSMENT INSTRUMENT – SPECIFICATIONS

The following performance assessment covers the Loadshifting standard elements from [NOHSC:1992] which apply to a Scraper.

1.1, 1.2, 1.3, 2.1, 3.1 & 3.2

Assessor guidelines - specific

1. Knowledge assessment for Scraper 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)

1.2 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 1)

2.1.3 (select 3)

2.1.4 (select 2)

2.1.5 (select 1)

2.1.7 (select 1)

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/backhoe, front-end loader, excavator or dragline certificate and who answers questions for performance criteria 1.1.1, 1.2.2, 1.3.2 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 and the applicant must be failed.

CONDUCT ROUTINE CHECKS

Performance criteria 1.1.1

(select 4 including 1 with a shaded box)

1. What precautions must be taken when an inspection or work has to be performed under a raised bowl?
(Provision provided to prevent the bowl from descending.)
2. What should be done before working inside the bowl behind the ejector?
(The ejector should be securely blocked.)
3. Name three defects that you would look for when conducting a routine check on the hydraulic system of the scraper.
(Hydraulic oil leaks, loose connections and hoses for splits, fractures or bulges.)
4. Why shouldn't the hydraulic oil storage tank be filled above the filled mark?
(Space in the tank is needed for displacement in the system.)
5. What problem could be indicated by bubbles or milky engine oil in the sump?
(Water leaking into the sump.)
6. When changing a battery which battery clamp should be removed first?
(The grounded battery clamp.)
7. Briefly describe how you would check the air pressure of water filled tyres on a scraper.
(Check with the valve at the top of the wheel)
8. If an air system is installed on the scraper what daily action would you take with condensation in the air receiver.
(Drain the water from the tank.)

9. How would you establish the service and the frequency of the service to be carried out on the machine you are required to operate?
(By the service manual provided by the manufacturer.)
10. What should be the first check of your machine at the start of your shift?
(Walk around it looking for visual defects.)
11. Name five pre-operational checks that should be carried out on the loadshifting equipment before the unit is started.
Radiator, battery, fuel, oil, hydraulic lines, tyres or tracks, structure etc.)
12. What fault in the scraper would excessive or uneven wear on tyres be an indication of?
(A bent axil or wheel misalignment.)

PLAN WORK

Performance criteria 1.2.1 (select 2)

13. What hazards would you look for and avoid to establish the most appropriate haul route for loads?
(Sloping, soft or rough terrain, obstructions such as trees, stumps or rocks and underground services.)
14. What would you refer to in order to establish the location of underground services?
(Supply authority or council maps)
15. Before hauling loads what action would you take with a rutted, rough or pitted hauling route?
(Level the hauling route with blade of the bowl.)

– 16 If you accidentally damaged an underground electrical cable who would you immediately contact to render the power supply safe?
(The electrical supply authority)

17 What is the danger of travelling near the edge of the fill with a scraper?
(The edge fill may collapse.)

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

18 What shall be provided to prevent a person falling into a trench or excavation?
(Barricades or guardrails or fencing)

19 When should ear protection be worn?
(Where the noise could contribute to the loss of hearing)

20 If there is a likely hood of the scraper being overturned what must be provided on the scraper to protect the operator?
(A roll over protective structure and safety belts.)

21 When should a person wear a safety helmet?
(Where the person could be struck on the head.)

22 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)

23 Which is the preferred route of travel, diagonally across or directly down a sloping surface?
(Directly down the sloping surface)

24 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)

25 In hazardous working areas where permission is required to work what must the operator ensure before the work is commenced?
(That the required permits have been obtained)

26 What is required to be obtained before unregistered rubber tyred loadshifting equipment is driven along a public road?
(An unregistered vehicle permit.)

27 What government licence do you require to drive a rubber tyred scraper on a public road?
(A class licence for plant up to 4.5 tonnes and C class licence for plant over 4.5 tonnes or other jurisdiction as applicable. ie Australian heavy vehicle licence.)

Performance criteria 1.2.5 (select 1)

28 What may be used to assist were the scraper has difficulty in cutting and loading soil?
(A machine such as a dozer to push the scraper.)

29 What purpose does an elevator/ejector on the bowl perform?
(Loads the soil after it has been cut by the blade and scooped up by the apron and ejects the soil from the bowl.)

30 What purpose does the apron perform on the scraper bowl?
(Scoops up the soil to elevator and bowl after it is cut by the blade.)

CHECK CONTROLS AND EQUIPMENT

Performance Criteria 1.3.1 (select 1)

31 On a dual powered scraper unit which engine should be started first?
(The tractor engine.)

32 On the post start-up check you notice a bulge form in a hydraulic hose. What action would you take?
(Switch off the machine and have the hose replaced.)

33 When should tests, checks and inspections be made by the operator on the loadshifting equipment that is to be operated?
(Daily before use)

Performance criteria 1.3.2 (select 1)

34 What action would you take with damage and defects found on the machine?
(Report the damage and defects to the authorised person or to site requirements and refrain from operating if a danger exists.)

SHIFT LOAD

Performance criteria 2.1.1 (select 1)

35 When should the elevator/ejector never be operated?
(When the bowl is full and the apron closed.)

36 Name three earthmoving tasks that a scraper is designed to perform.
(Excavating, levelling, loading, hauling and spreading soil.)

37 What height should the bowl be positioned to haul the load and why should it be placed in this position?
(As low as the conditions permit in order to maintain stability.)

Performance criteria 2.1.2 (select 1)

38 Of topsoil and clay which is more cohesive and harder to excavate and load
(Clay.)

Performance criteria 2.1.3 (select 3 including 1 with a shaded box)

39 If the brake system pressure gauge does not work what action would you take?
(Shut down the scraper immediately and have repairs carried out)

40 When hauling what level should the bowl be positioned?
(As low as conditions permit.)

41 What brake in addition to the normal brakes may be provided to stop the scraper?
(An emergency brake.)

42 What is the danger of slipping tyres on shale or rock?
(The tyres may be cut and blow out.)

43 How would you establish the capabilities and limitations of the equipment?
(By information provided by the employer and documented by the manufacturer.)

44 Before reversing a machine what precaution should be taken?
(Ensure the direction of travel is clear.)

Performance criteria 2.1.4 (select 2)

- 45 What direction would you approach and how would you cross a ditch?
(At an angle and slowly.)
- 46 When travelling at speed what action would you take before turning a corner?
(Slow down to a speed acceptable for the corner.)
- 47 In addition to service brakes, for what purpose is a retarder fitted to some scrapers?
(To control the speed of the scraper on downgrades instead of the service brake)
- 48 When travelling what would you do before travelling down a steep grade?
(Reduce speed with service brake or retarder and select the appropriate gear for the grade.)
- 49 What effect does fanning the break instead of a firm application of the breaks have on the air pressure for the breaks?
(Fanning may exhaust the pressure faster than the compressor can replace it.)

**Performance criteria 2.1.5 (select 1)
(Oral)**

- 50 Applicant to state the meaning of the hand signal of "stop" demonstrated by the examiner.
(Stop)

(Written)

- 50 State the meaning of the illustrated diagram.
(Stop)

Performance criteria 2.1.7 (select 1)

- 51 While operating the scraper what action would you take if a hydraulic hose sprung a leak?
{Have repairs carried out (Replace hose.)}
- 52 How would you dismount a machine that contacted live power lines?
(Jump clear ensuring contact with the ground and machine is not at the same time).
- 53 If the brakes and retarder failed while travelling downgrade what action would you take to stop the scraper.
(Lower the bowl and insert the blade to stop the scraper.)

SHUT DOWN EQUIPMENT

Performance criteria 3.1.1 (select 1)

- 54 Name three areas where you would not park the scraper.
(Access ways, near overhangs, refuelling sites, tidal or flood areas, adjacent to an excavation)
- 55 When leaving the loadshifting equipment what should be done with the raised bowl?
(Attachments lowered and pressure removed from hydraulic lines)

Performance criteria 3.1.3 (select 1)

- 56 What post-operational checks should be carried out by the operator on the loadshifting equipment to prepare it ready to be reoperated?
(Check the structure and equipment for defects and wear and the oil, fuel and water levels.)

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SECURE SITE

Performance criteria 3.2.1 (select 1)

- 57 What shall be provided when a scraper has to be parked on or protrudes onto an access way?
(Barricades, lights and signs)
- 58 For what reason should the key be removed from the ignition of the machine?
(To prevent unauthorised movement)

Assessment summary

Scraper

Unit	Form of assessment	Total number of boxes in the assessment	Number of boxes given ✓ or NA	Number of boxes required to meet standard	Were all critical boxes given ✓ or NA?		Assessment standard requirements achieved *	
					Yes	No	Yes	No
1	Performance	30		27	Yes	No	Yes	No
	Knowledge	14		8	Yes	No	Yes	No
	Assessment completed within time allowed						Yes	No
2	Performance	22		20	Yes	No	Yes	No
	Knowledge	9		6	Yes	No	Yes	No
	Assessment completed within time allowed						Yes	No
3	Performance	8		5	Yes	No	Yes	No
	Knowledge	3		2	Yes	No	Yes	No
	Assessment completed within time allowed						Yes	No

* Performance standard = Number of items required to meet standard (including all critical boxes)
 Knowledge standard = Number of questions required to meet standard (including all critical boxes)

Summary

Candidate is: • COMPETENT Date:
 (circle the result obtained) • NOT YET COMPETENT

Name of assessor Name of candidate

Signature Signature

Comments/feedback
 (assessors to make any additional comments which clarify the assessment)

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