

SLEWING MOBILE CRANE LEARNER WORKBOOK

TLILIC0020 Licence to operate a slewing mobile crane
(over 100 tonnes)

**With load chart calculations
similar to NAI**



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**National Licence
RTO-VET Learning Materials**

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Learning and practical tasks

If you can, have your students train with other learners. Learning is more powerful when you and your learners share ideas and experiences. Below is a brief explanation of how you can use the training tasks in this workbook. Please advise your students if they are to fill in tasks on their own at home or wait until they are in the training room with you.



Theory training tasks

These tasks help the learner understand the underpinning knowledge to safely operate a vehicle loading crane. To help them complete these tasks the learner can use the Information Book and speak to other learners and you, the licensed operator/trainer.



Thinking questions

Thinking questions train your learner to think for themselves. For example, the Information Book does not directly state the answer.



Practical training tasks

These tasks help the learner acquire the practical skills to safely operate a vehicle loading crane. The tasks use high-risk equipment or machinery. Only a licensed operator/trainer can supervise the learner's practical training tasks.



Review

At the end of each element in the workbook, the learner gets to review their training. The review gives the learner a chance to talk with classmates and you about what they learned. Sharing their learning experiences with others helps them learn.



Review questions

You'll find the review questions on the Trainer's Resource CD. Give the questions to the learner toward the end of training to determine if they understand the information they have covered. You can ask your learner to fill in these questions alone or as a group by using the matching questions in the PowerPoint quiz section.



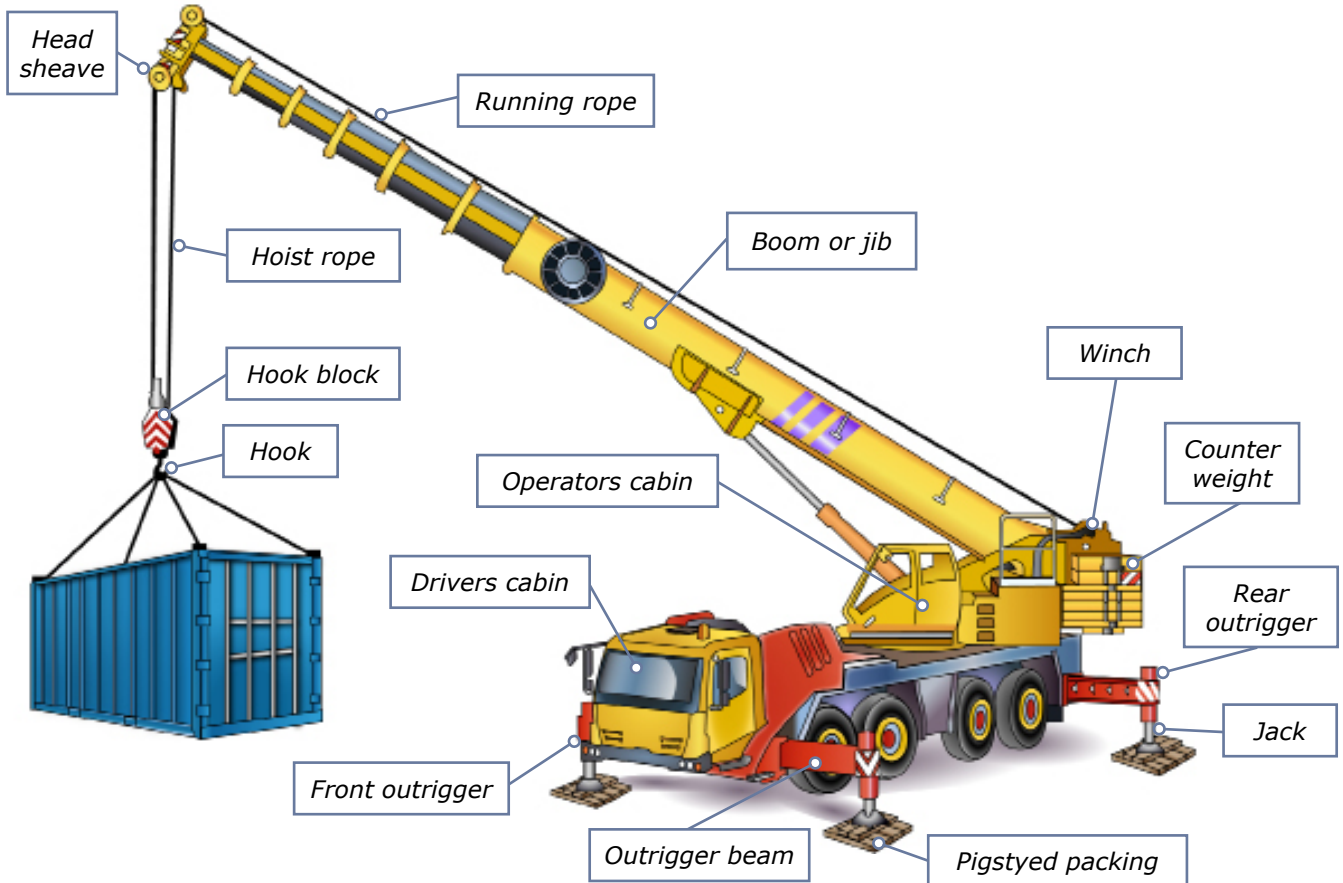
Review—practical tasks

The practical tasks handout is on the Trainer's Resource CD. There is one task for each element and the learner should do all tasks under your supervision.

What is a slewing mobile crane?

A slewing mobile crane is a powered crane which features a boom or jib that can slew from front to back. The crane is mounted on a vehicle.

Parts of a slewing mobile crane



Slewing mobile crane



Crawler crane



Rough terrain slewing crane



This learner resource does not cover front-end loader, backhoe, excavator or similar equipment when configured (arranged or set up) for crane operations.

Part 1

Prepare for hazards





Theory Training Task 1

Performance Criteria: 1.5, 2.9

Identify (know) workplace hazards. A hazard is anything that can harm you or others while you work. You need to identify (know) workplace hazards before you start work. Look for hazards. Look above you, look around you and check the ground below you.

a) Give examples of hazards you should look for before you begin work

Above head height

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Ground level to eye level

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Ground level (and below)

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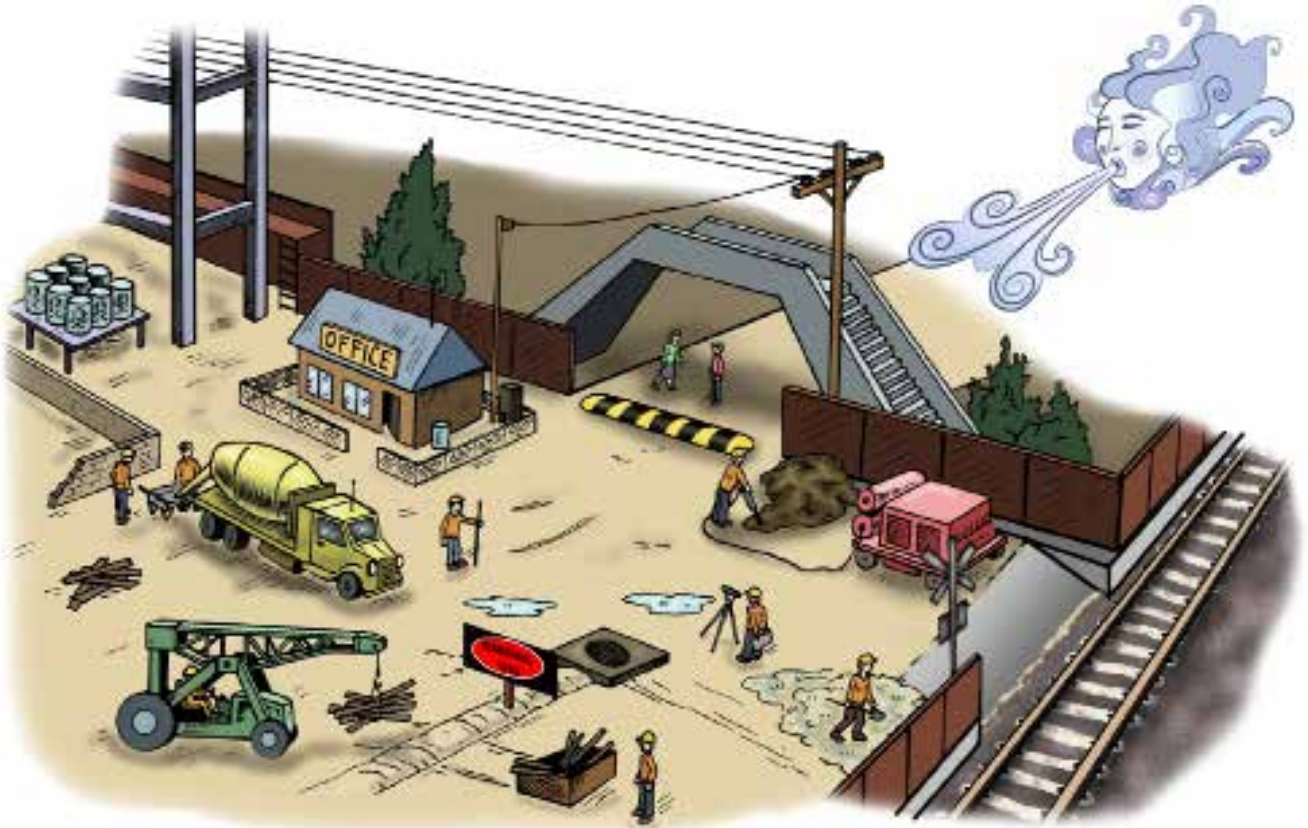
b) Tick any of these hazards you may have come across in past or present workplaces.



Theory Training Task 2

Performance Criteria: 1.5, 2.2

a) **Circle** all the hazards you can find in the picture below.



b) Can you explain why the people in this picture might be a hazard if you were to operate a slewing mobile crane nearby?

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c) Can you think of ways to make sure these people do not get in the way of the slewing mobile crane?

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Theory Training Task 3

Performance Criteria: 2.2

You are working on ground that might be above an underground service, for example, a water pipe. Where can you find out?

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.....



Theory Training Task 4

Performance Criteria: 1.5, 2.2

Check the safe working distances for powerlines in your state or territory. How many metres is the NO GO zone for **distribution lines on poles in your state or territory?**

The NO GO zone for (state/territory)
is metres.



Performance Criteria: 1.5, 2.2

Hazard control measures

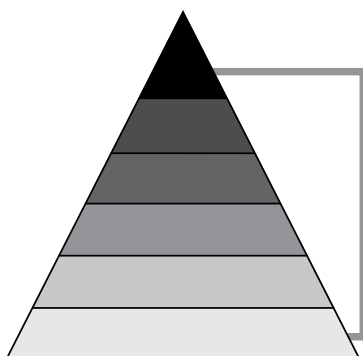
Hazard control measures are actions you take to control or prevent a danger that can injure or hurt you. You use the actions to lower the risk to people and property. Set up the hazard controls before you start work.



Theory Training Task 5

Performance Criteria: 1.5, 2.2

a) List the **six** levels of the Hierarchy of Hazard Control.



1.
2.
3.
4.
5.
6.



b) What is the first thing you should try if you find a hazard?



Theory Training Task 6

Performance Criteria: 1.5

Tick the **hazard control measures** you may need to put in place when using a slewing mobile crane.

- Warning signs and barriers
- Flag person
- Traffic control
- Flashing hazard and lights
- Wash the crane so it looks nice
- Pedestrian exclusion zone
- A hoarding, gantry or scaffolding
- Recharge the battery so it works



Communicate clearly



Performance Criteria: 1.7

Communicate clearly

Choose the communication equipment you will use for the job. After you have made your choice, test the equipment to make sure it's working.

Make sure you understand the dogger's hand signals if you use hand signals.



Theory Training Task 9

Performance Criteria: 1.7, 3.7

You can communicate many different ways. What are some of the ways you can communicate with other workers while moving a load?

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Theory Training Task 10

Performance Criteria: 1.7, 3.7

How should you and the dogger communicate when you can **see** each other?
Circle the answer.



Hand signals



Whistle



Two-way radio



Theory Training Task 11

Performance Criteria: 1.7 & 3.7

- a) Name the communication equipment you should test before you start work to see if it functions.

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- b) What should you do if the equipment doesn't work?

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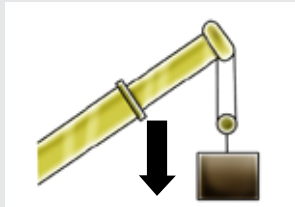


Theory Training Task 12

Performance Criteria: 3.4, 3.7

Match the crane boom motion on the left with the correct hand or whistle signals on the right.

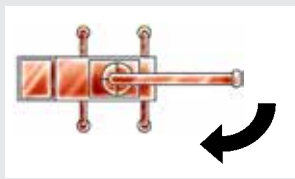
Hoisting down



Stop



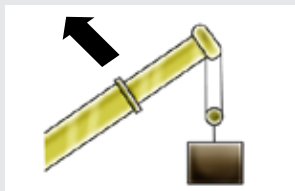
Slewing right



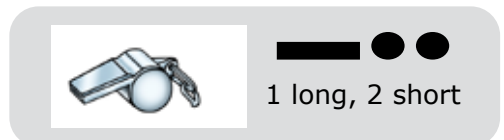
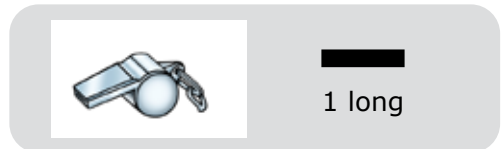
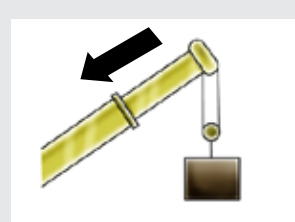
Travel and transverse

Indicate the direction you want the crane to go

Luffing boom up



Telescoping boom retract. Jib-trolley in.



Part 3

Check the crane



Performance Criteria: 2.4

Do visual checks

Before you start working, there are important crane safety checks you need to do first. Start with the visual check. Look around the crane for obvious problems such as leaks and damage.



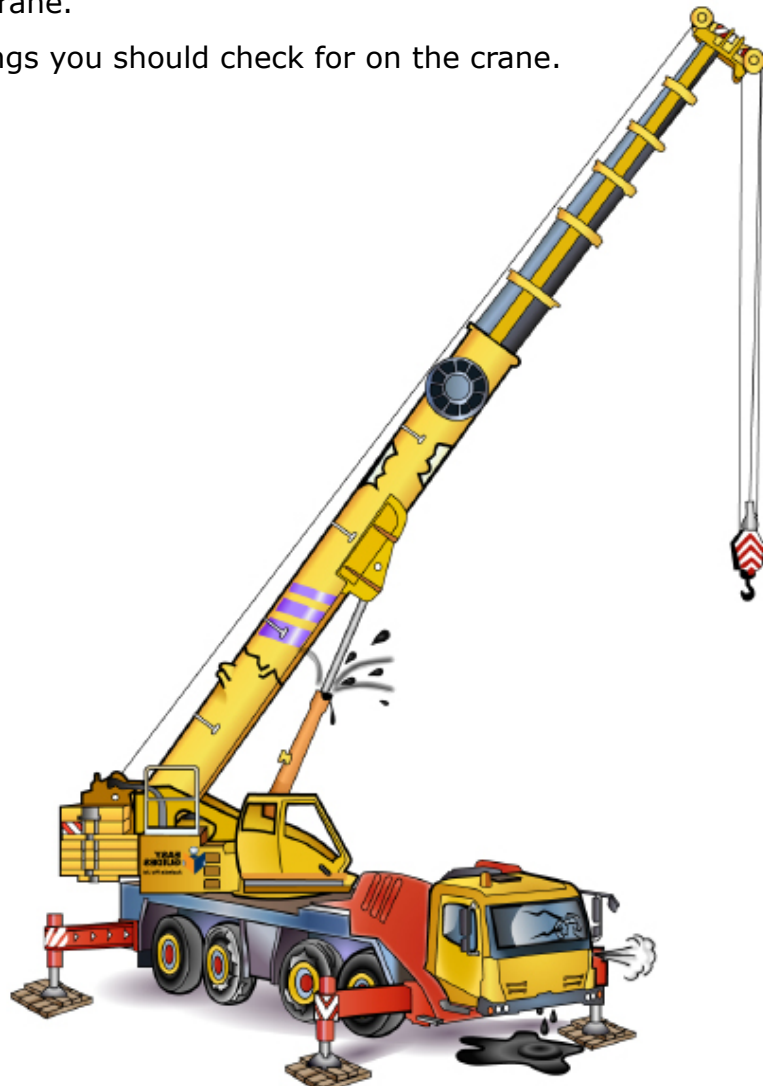
Theory Training Task 13

Performance Criteria: 2.4



Look at this crane.

Circle the things you should check for on the crane.





Theory Training Task 14

Performance Criteria: 2.4

Choose two of the areas you circled and explain why you think it's important to make the check.

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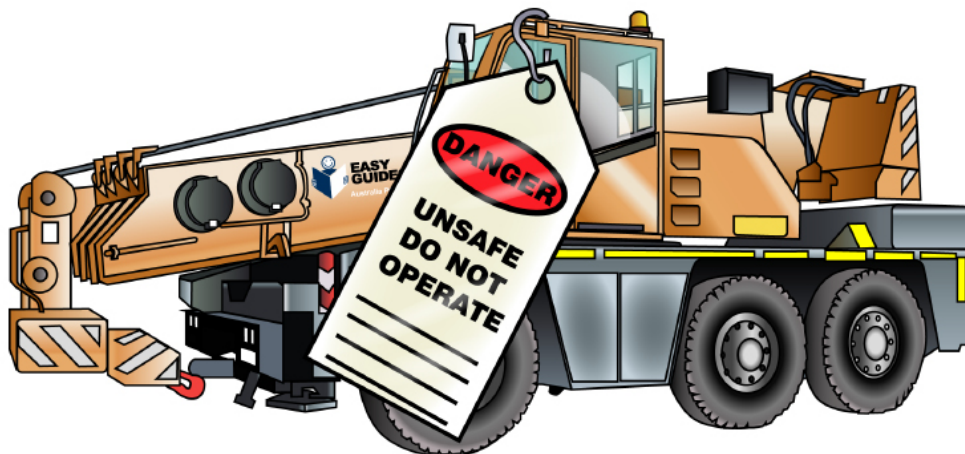


Theory Training Task 15

Performance Criteria: 2.4

Who is allowed to remove a danger tag?

- Anyone involved in the work
- Anyone with a dogging licence
- The person who signed the tag
- The supervisor of the person who signed the tag



Part 4

Plan the lift



Performance Criteria: 1.3

Find out the weight of the load

You are planning the lift. Find out or estimate the weight and size of the load you are going to lift.



Theory Training Task 26

Performance Criteria: 1.3

Give some examples of how you find the weight of an unmarked load.

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How to read load chart

To calculate the maximum load that you can safely lift, there are some basic rules for all load charts.

1. Outriggers

Work out the outrigger set up. This will help you know which section of the load chart to look at.

2. Boom length

Work out the length of the boom. This will help you know which column to look at.

3. Operating radius

Work out the operating radius. This will help you know which row to look at.

4. Capacity

The figure in the box will state the capacity of the crane.

5. Hook block/s

The weights of hook block(s) are part of the load. Deduct the weight from the capacity. These weights are on the load chart.

6. Jib weight

The weight of the jib (fly), either fitted or stowed are part of the load and may be a deduction from the capacity. This information is on the load chart.

7. Line (hoist rope)

Look at the hoist rope reeving to determine how many parts of line (hoist rope) are needed to support the load. For example, if the load you will lift is 5 tonnes and if the hoist rope has a capacity of 3 tonnes then 2 parts of line are required to safely hoist the load.

8. Jib configuration

Information about the load capacity of the different jib configurations (exclusive jib load chart).



Slewing mobile crane charts (over 100 tonnes)

Answer these questions if you are studying the **TLILIC0020 Licence to operate a slewing mobile crane (over 100 tonnes)**.

If you are studying for a different licence, skip to that section.

Note: For the following crane exercises use the Calculations-CO LOAD CHART_KOBELCO CKE2500-2 load chart. This is located in the 'Trainer's Resource' of the Easy Guides training material. Your trainer will provide you with this crane chart.





Load Chart Activity 1

Performance Criteria: 2.7, 3.1

Note: Use the Calculations-CO LOAD CHART_KOBELCO CKE2500-2.

Scenario 1

You have been asked to operate a Kobelco CKE2500 Crawler Crane in luffing jib configuration. You have been told that the crane has the following:

- 45.7m boom inserted
- 61m of jib.

You want to check the crane configuration before you begin lifting because you weren't there when the crane was rigged.

What is the total counterweight required for stable crane operation in this configuration? (information located on page 13 of the load chart)

Boom length (m)		51.8																Boom length (m)	
Jib length (m)		45.7				51.8				57.9				61.0				Jib length (m)	
Boom angle		88°	83°	68°	63°	88°	83°	68°	63°	88°	83°	68°	63°	88°	83°	68°	63°	Boom angle	
Working Radius (m)	18.0	25.2																	18.0
	20.0	25.9				21.2													20.0
	22.0	26.7				20.9				17.3				15.7					22.0
	24.0	25.4				20.8				17.0				15.4					24.0
	26.0	25.1	28.0			20.3				16.7				15.1					26.0
	28.0	24.8	25.7			20.0	20.5			16.4				14.8					28.0
	30.0	24.5	25.4			19.4	19.5			16.1	18.0			14.5	32.0m/14.5				30.0
	34.0	22.5	22.7			17.4	17.7			14.5	15.2			13.1	13.7				34.0
	38.0	20.5	18.7			15.6	15.9			13.1	13.7			11.9	12.4				38.0
	42.0	18.0	17.3			13.9	14.3			12.0	12.4			10.0	11.3				42.0
	46.0	14.9	15.4			12.3	12.7			11.0	11.4			10.0	10.3				46.0
	50.0	88.0m/13.0	13.8	10.6		10.7	11.3			10.1	10.4			9.2	9.5				50.0
	54.0		52.0m/13.1	9.5		9.2	9.9	9.2		9.3	9.6			8.5	8.7				54.0
	58.0			8.5	7.6		8.5	8.2		7.3	8.7	8.0		6.3	8.1	7.8			58.0
	62.0			7.8	6.8		7.4	6.4	6.4	6.0m/6.4	7.6	7.1		4.4	7.5	6.9			62.0
	66.0			7.1	6.1		6.7	5.8		6.0m/7.6	6.4	5.4		5.7	6.2	6.0m/6.0			66.0
	70.0				5.8		6.1	5.2			5.8	4.8			5.8	4.7			70.0
	74.0						32.0m/5.8	4.8			5.2	4.3			5.0	4.2			74.0
	78.0							36.0m/4.4			4.7	3.9			4.5	3.7			78.0
	82.0														3.5		3.0m/3.2	3.3	82.0
86.0																3.0m/3.1		86.0	
	Reeves		2			2				2				2				Reeves	

Total counterweight = Counterweight + Carbody Weight = 90 + 24 = 114 tonnes
= 114 tonnes

Question - How many falls of rope should be on the hook block?

Scenario 2

What are the most flexible configurations for the boom and jib arrangements for this scenario? Show the correct order of assembly.

Boom Arrangements (Lengths) – use Luffing boom Arrangements for luffing (see extract)

[Continued next page]