

# SLEWING MOBILE CRANE LEARNER WORKBOOK

# TRAINER'S MARKING GUIDE

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

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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.



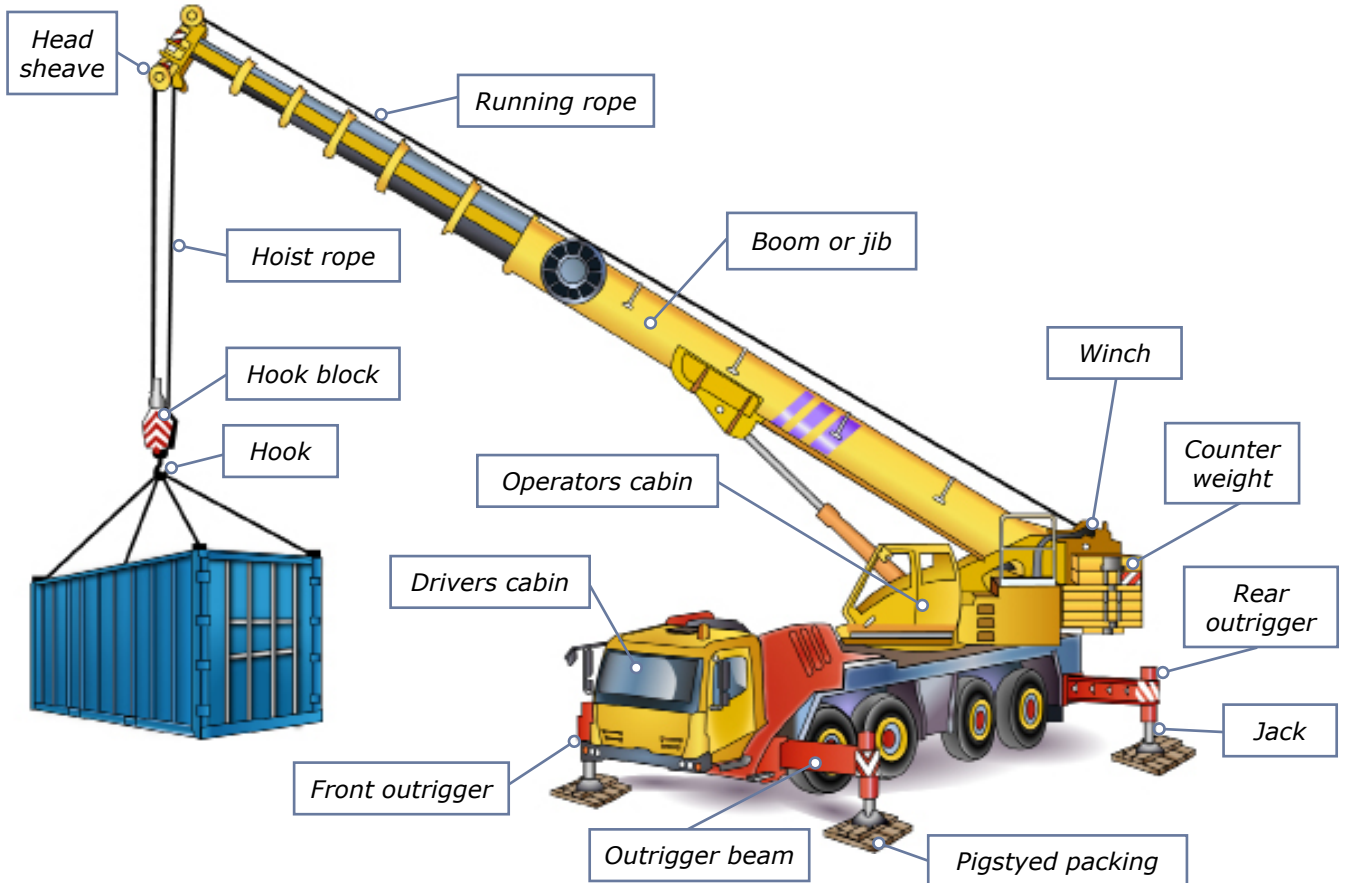
## Review—practical tasks




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



<p>Slewing mobile crane</p> 	<p>Crawler crane</p> 
<p>Rough terrain slewing crane</p> 	

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



**Trainers please note:**

**The answers in this book are in no way conclusive and are to be used as a guide only. Use your own knowledge and experience to correct the variation of answers that may be given by learners.**



# 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

Answers may include  
but not limited to:



## Above head height

- powerlines and overhead service lines
- trees
- buildings
- other obstructions

## Ground level to eye level

- other equipment
- machinery/plant
- people and pedestrians
- things in the path of travel
- environmental conditions
- surrounding structures
- facilities
- dangerous materials
- other obstructions
- insufficient lighting

## Ground level (and below)

- stable/level surface
- spills or wet surfaces
- debris and rubbish
- trenches or recently filled trenches
- unstable ground
- underground services
- surface is strong enough to support the weight of any equipment/materials



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

**Trainers: encourage your learners to place a tick beside hazards they have seen in their past or present places of employment.**







## 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?

**Call Dial Before You Dig on 1100.**

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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.

**\* Trainers please check YOUR state/territory.**





Performance Criteria: 1.5, 2.2

## Hazard control measures

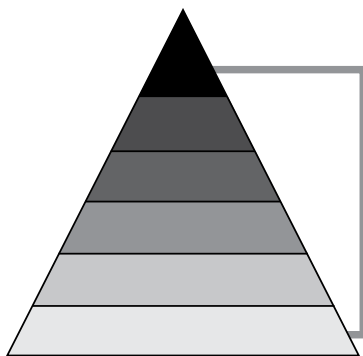
Hazard control measures are actions you take to control or prevent a danger that can injure or hurt you. You use the actions to lower the risk to people and property. Set up the hazard controls before you start work.



## Theory Training Task 5

Performance Criteria: 1.5, 2.2

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



1. **Elimination** .....
2. **Substitution** .....
3. **Isolation** .....
4. **Engineering Control Measures** .....
5. **Administrative Controls** .....
6. **PPE** .....



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

**Elimination – you should try to remove the hazard entirely.**



## 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**



**Trainers please note:**

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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?

**Answer may include:**

- Whistle
- Hand signals
- Two-way radio
- Mobile phones
- Written instructions
- Speaking, listening, asking questions
- Signs (ensure you can read and write enough to understand spoken and written instructions and safety signs).

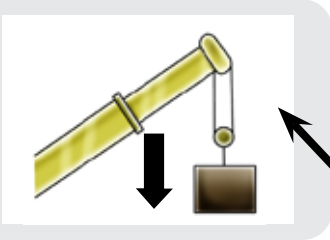


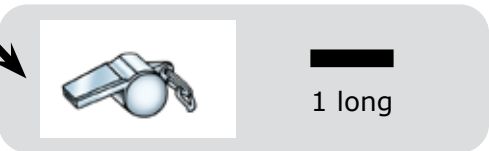
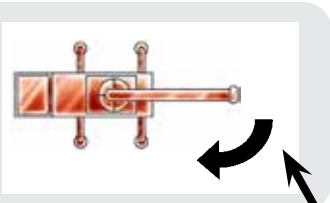


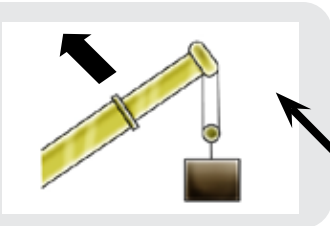

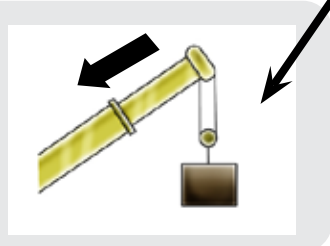





# Theory Training Task 12

Performance Criteria: 3.4, 3.7

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

<b>Hoisting down</b>		
<b>Stop</b>		 1 long
<b>Slewing right</b>		
<b>Travel and transverse</b> Indicate the direction you want the crane to go		
<b>Luffing boom up</b>		 1 long, 2 short
<b>Telescoping boom retract. Jib-trolley in.</b>		

## Part 3

# Check the crane



**Trainers please note:**

**The answers in this book are in no way conclusive and are to be used as a guide only. Use your own knowledge and experience to correct the variation of answers that may be given by learners.**

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.



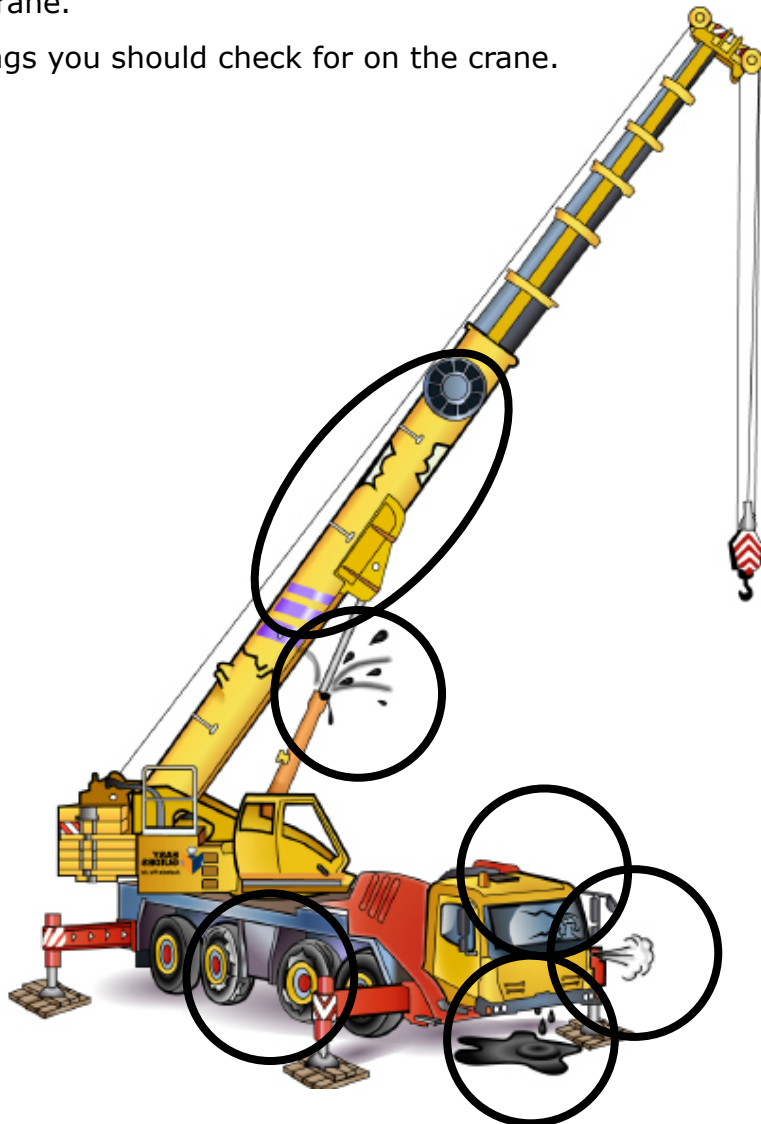
## Theory Training Task 13

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.

Answer may include:

- Flaking paint, bends, twists and cracks on the boom or outrigger arm may be signs of wear or a welding fault.
- Fluid on ground may be an oil, brake or hydraulic leak.
- A broken windscreen may be a sign of vandalism.
- A damaged tyre may need to be replaced.

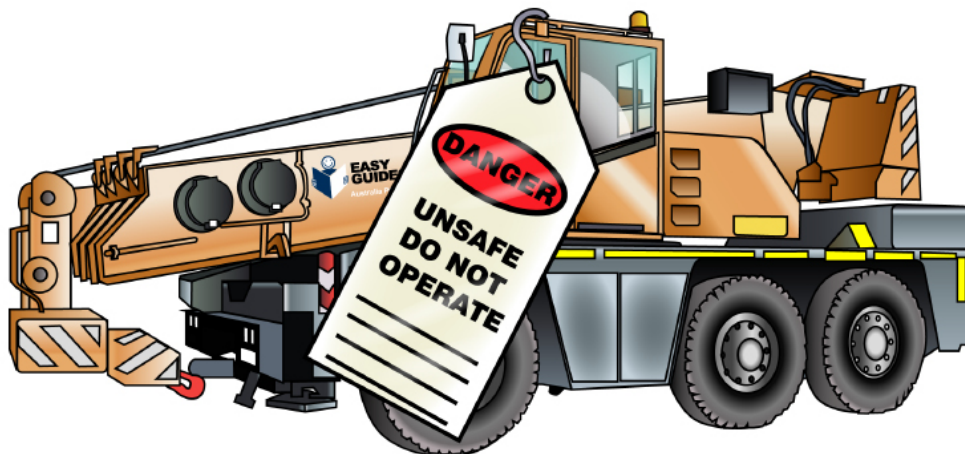


## Theory Training Task 15

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



**Trainers please note:**

**The answers in this book are in no way conclusive and are to be used as a guide only. Use your own knowledge and experience to correct the variation of answers that may be given by learners.**

# How to read load chart

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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	15.8			13.1	13.7			11.8	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	11.0/13.0	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	9.8			8.5	8.7				54.0
	58.0			8.5	7.8		8.5	8.2		7.3	8.7	8.0		8.3	8.1	7.8			58.0
	62.0			7.8	8.8		7.4	8.4	8.0m/5.4	7.8	7.1			4.4	7.5	8.9			62.0
	66.0			7.1	6.1		6.7	5.8		6.0m/7.8	6.4	5.4		5.7	6.2	8.0m/4.0			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															8.0m/3.2	3.3		82.0
86.0																8.0m/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?

**Answer: = 2 (located on bottom of load chart – Reeves)**

## 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]