

SLEWING MOBILE CRANE (20T) SAFETY AND LICENCE GUIDE

Training support material for:

TLILIC0022

Licence to operate a slewing mobile crane
(up to 20 tonnes)



Produced by:



CONTENTS

Introduction to Slewing Mobile Crane (up to 20 tonnes)	5
.....	
High Risk Licensing and the Law	9
.....	
Element 1 - Plan work /task	23
.....	
Element 2 - Prepare for work /task	105
.....	
Reading Load Chart - for cranes up to 20 tonnes	183
.....	
Element 3 - Perform work/task	197
.....	
Element 4 - Pack up	239

Introduction to Slewing Mobile Crane (up to 20 tonnes)

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.

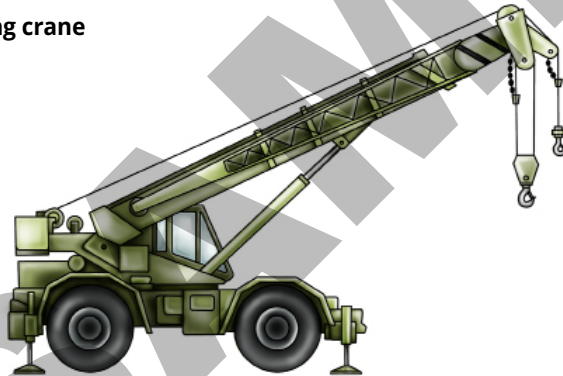
Slewing mobile crane



Crawler crane

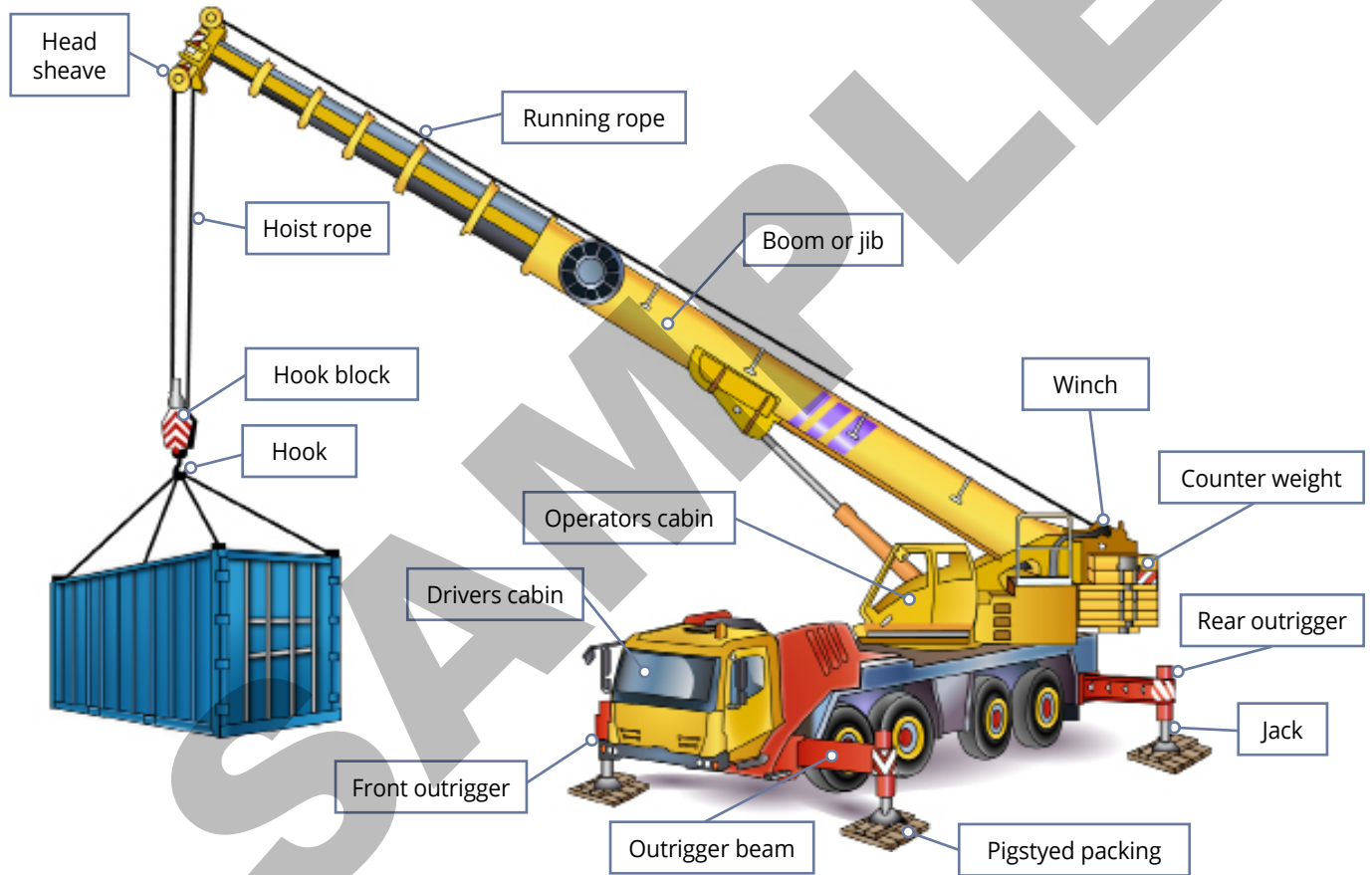


Rough terrain slewing crane



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

Parts of a slewing mobile crane



Element 1 – Plan work / task

Why you need packing

You **must** use packing under the outriggers. Each outrigger takes some of the weight of the crane and the load. Packing spreads that weight over a larger area. You must work out the minimum area of packing needed under each outrigger. This will keep the crane stable.

Packing spreads the weight



No packing



If you **do not** use packing the outriggers could sink and the crane could tip over.



How soil types affect packing

The type of ground you are working on changes how much packing you need.

For example, if you need to set up on soft clay you will need more packing than if you are setting up on shale or rock. The three best ground types are hard rock, shale or sandstone, and compacted gravel with up to 20% sand.



Types of packing

Types of packing you may use include:

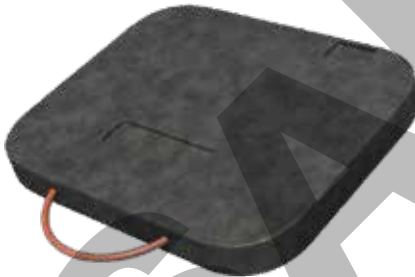
Steel plates



Hardwood packing



Sleeper mats



Concrete rafts



Packing is placed under the outriggers to distribute the weight of the crane and load.

Choosing the right crane

- Make sure the crane is the right size for the work area
- Check the crane's lifting capacity to make sure it can lift the load
- Make sure the crane is appropriate for the site and weather conditions
- The crane is the correct type for the job. For example a slewing or non-slewing crane.



Booms

A slewing mobile crane has a telescopic boom that can:

Extend out



Retract in



QUESTION 13

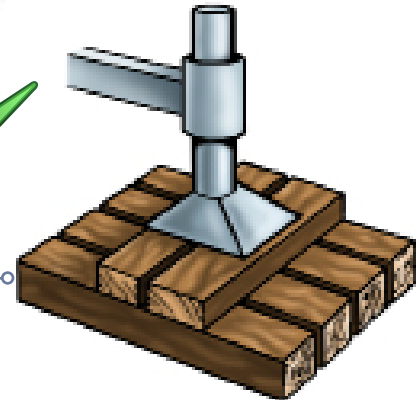
You will work in an area with soft, wet ground. The crane might sink.

How can you make the crane stable?

You can use hardwood packing or steel plates (cribbing or pigstyng).



Pigstyng



QUESTION 14

What does uneven ground do to the capacity of a crawler crane?

Uneven ground **reduces** the capacity of a crawler crane.



QUESTION 17

What are some of the things that can effect the stability and or lifting capacity of a crane while you are working?

Unstable surfaces



The failure of a surface to support the load



Incorrect weight given for loads



Underground cavities like stair wells or pipes

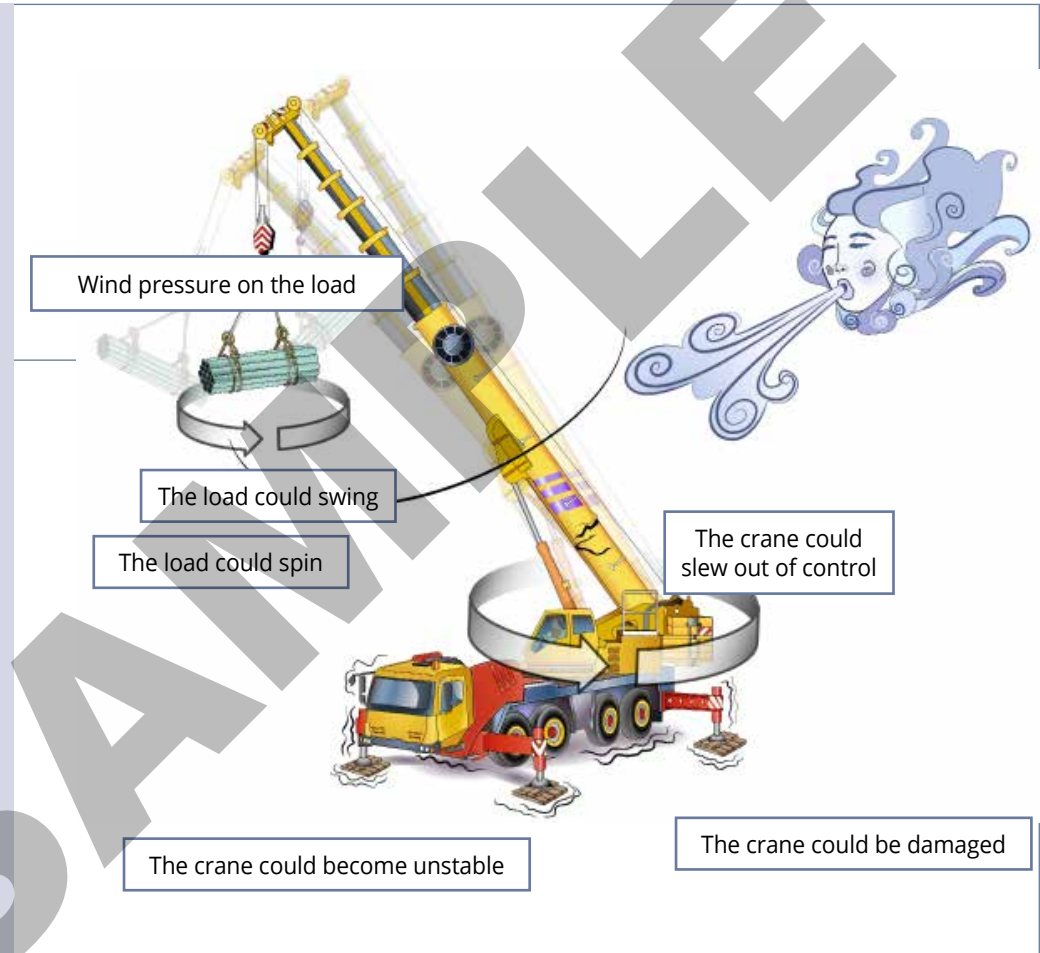


...CONTINUES ON NEXT PAGE

QUESTION 33

A crane is moving a load on a windy day.

What hazards can the wind cause?



QUESTION 34

What hazards (dangers) are there if people work near the outriggers or chassis of a slewing crane?

The crane or load could hit or crush a person between the crane and outrigger. Individuals should stay **outside** the exclusion zone.



QUESTION 35

You are working on a demolition site.

What are some of the **hazards** you must plan for?

If you set up on rubble it might be unstable.



There might be holes you can't see. For example lift wells, stairwells, or other cavities or chambers.



...CONTINUES ON NEXT PAGE

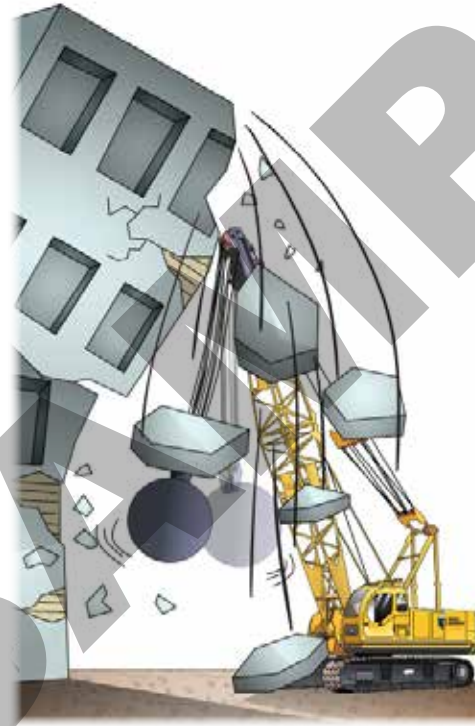
QUESTION 35

...CONTINUED FROM PREVIOUS PAGE

You are working on a demolition site.

What are some of the **hazards** you must plan for?

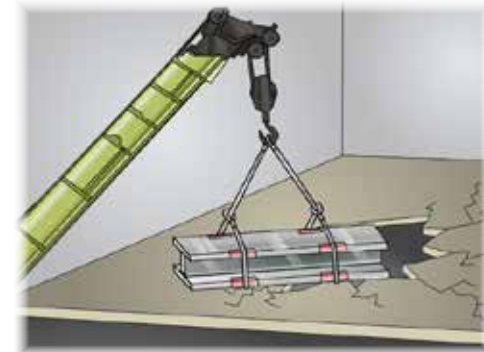
The building you are demolishing could fall on the crane



The weight of parts of the structure (building) you are moving with the crane



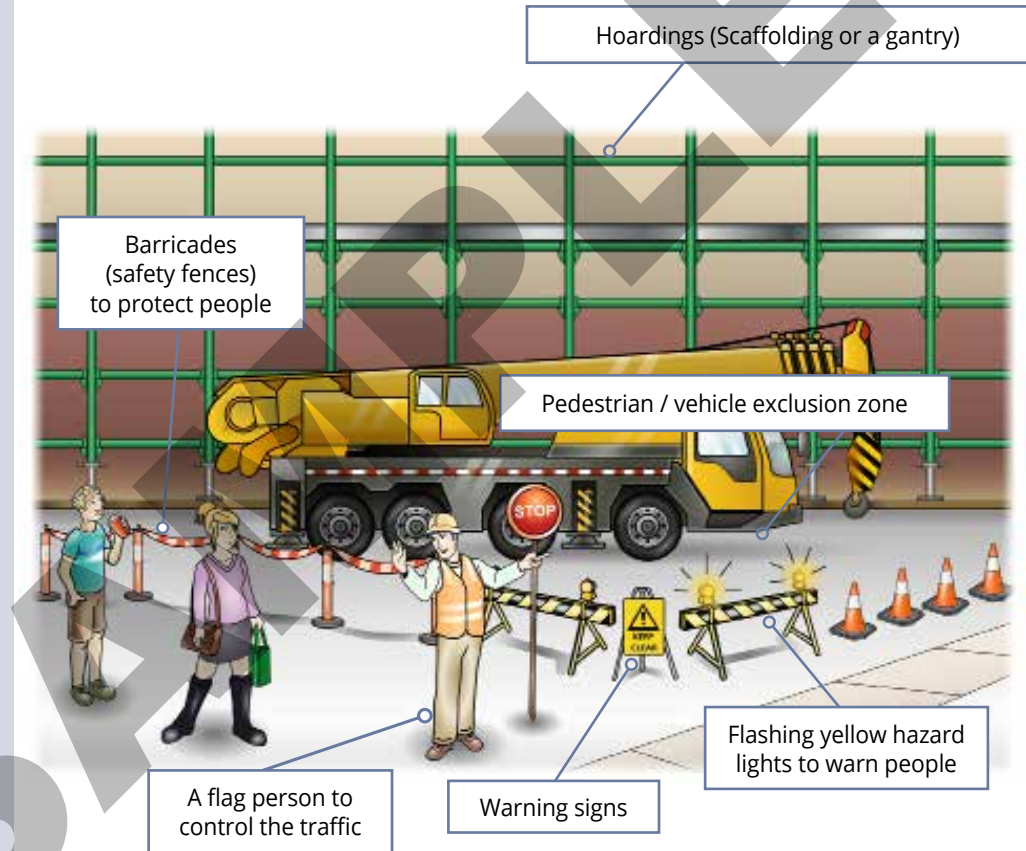
Make sure the surfaces can support the things you are lifting onto them.



QUESTION 44

How can you warn and control people on site?

Some methods you can use are:



QUESTION 45

You need to use a crane on a public road.

Do you have to organise it with the local council before starting the job?

Sometimes you might need a permit because of zoning or traffic control. You will also have to check if there are any rules for using a crane and where to set it up. Are exclusion zones needed?

**QUESTION 46**

What is the right time to select and check your safety equipment, for example PPE?

Before you start work. When you are planning how to do the work.



Element 2 – Prepare for work / task

Too dark

You must be able to see clearly. Ask your boss to have the area properly lit up. They may need to set up temporary lighting while you work.

Hazard

If the work area is dark or dimly lit you might not be able to see clearly.



Control

Use extra lighting such as portable lamps, or try to find a brighter area if you can.



Multiple crane lifts

Sometimes you will need to lift a load which is too long or wide for one crane to lift. In these cases you will need to do a multiple crane lift.

For example, if you are lifting a 60 tonne load with two cranes, you need to add a safety margin on top of the load share of both cranes.

See the table below, which shows the safety margins with a 60 tonne load.

Check the load chart to make sure the cranes have the capacity to lift their share of the load. This is shown in the **Capacity each crane needs** column. See AS 2550.1 for more information.



Number of cranes	Load share of each crane (Total load ÷ number of cranes)	Safety margin	Capacity each crane needs (Safety margin × load share)
2	30 tonnes	20%	$1.2 \times 30 \text{ tonnes} = 36 \text{ tonnes}$
3	20 tonnes	33%	$1.33 \times 20 \text{ tonnes} = 26.6 \text{ tonnes}$
4 or more	15 tonnes	50%	$1.5 \times 15 \text{ tonnes} = 22.5 \text{ tonnes}$

Start the crane

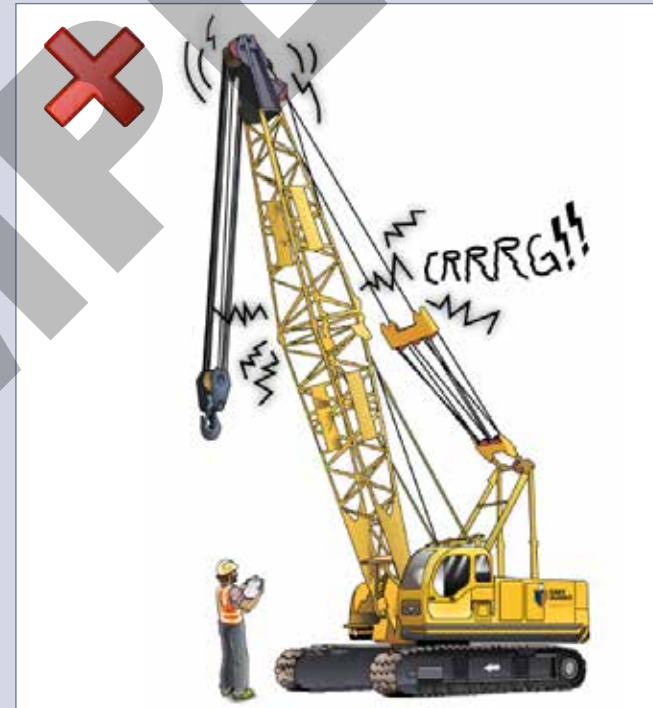
Look in the user's manual or manufacturer's instructions to find out the right way to start the slewing mobile crane.

1.	Apply the parking brake to stop the vehicle from moving.
2.	Make sure the manual accelerator control lever is in the catcher and crane control levers are in the neutral positions.
3.	Put the vehicle's shift lever in the neutral position.
4.	Start the engine.
5.	Depress the clutch pedal, pull up the power take-up (PTO) lever completely, and release the clutch pedal slowly. This will start the hydraulic pump.
6.	CAUTION - in winter and cold climates do not operate the crane immediately after doing steps 1 - 5. First, operate the hydraulic pump alone to warm up the hydraulic oil.

Strange noises

Listen for unusual or strange noises and vibration or shaking in the slewing mobile crane when you start it.

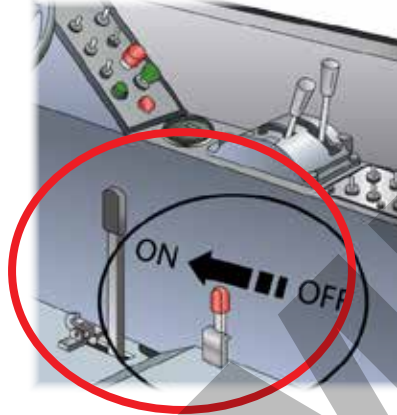
Strange noises could mean the crane has a fault and you should have the crane inspected to find the cause of the fault.



Post-start checks

Once you start your slewing mobile crane you need to do post-start checks which include:

Slew brake



Warning devices or systems



Hazard controls



All controls and motions to full capability/extension (to make sure the crane is safe to use).



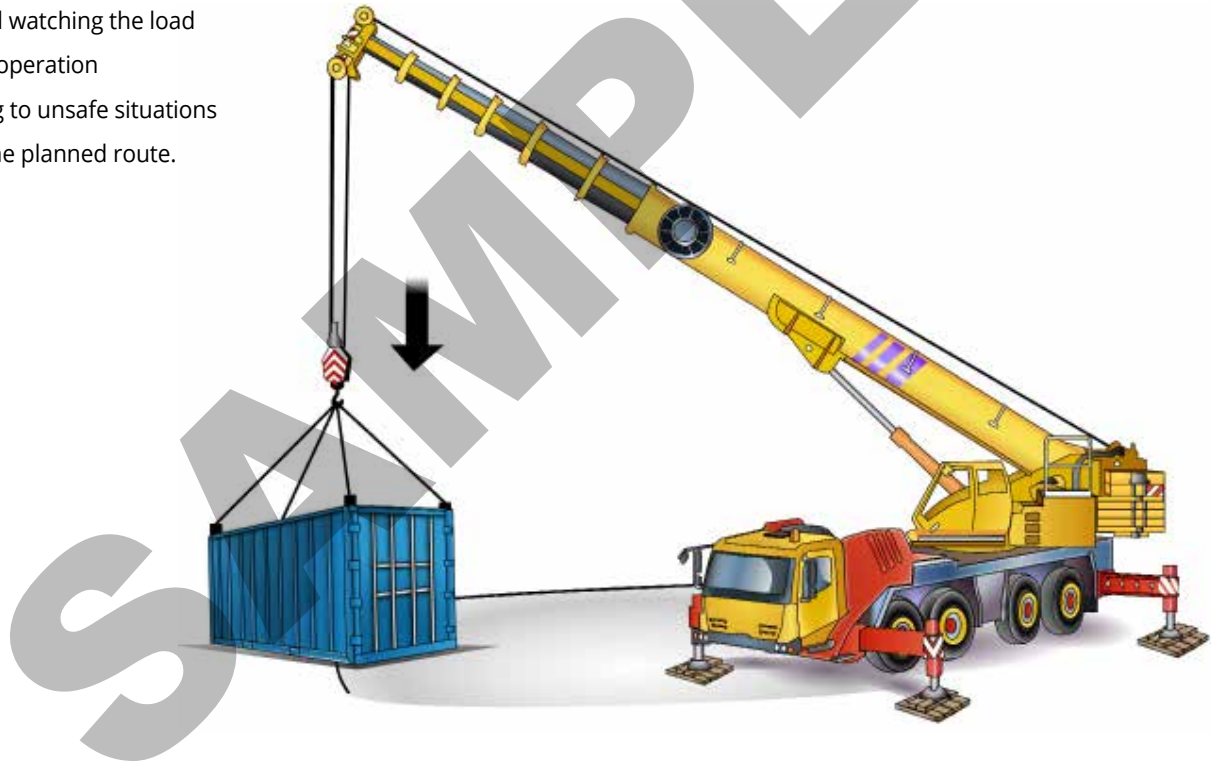
Element 3 – Perform work / task

Do the lift

This part of the book is about how to do a lift.

It covers:

- Positioning the hoist block and boom/jib
- Test lifts
- Moving and watching the load
- Safe crane operation
- Responding to unsafe situations
- Checking the planned route.



Conduct a test lift

With some loads it can be difficult to establish where the load's centre of gravity is. Sometimes the only way to be sure that the load will be stable while moving is to perform a **test lift** to see if it stays stable.

Test lift

Do a test/trial lift before you use the crane to move a load. This helps you check:

The crane can do the lift. You do not need to lift the load far off the ground to check that it is stable.

You need to confirm the weight of the load.



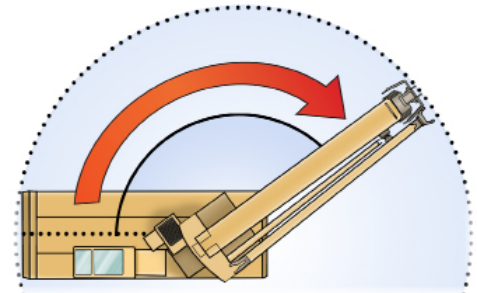
- Outriggers/packing are secure
- All crane equipment works properly



- Lifting slings/chains have been positioned correctly for even weight distribution
- Make sure the load is secure.
- Make sure the crane is stable.
- Check that crane functions are working.



There is enough clearance for the boom movement



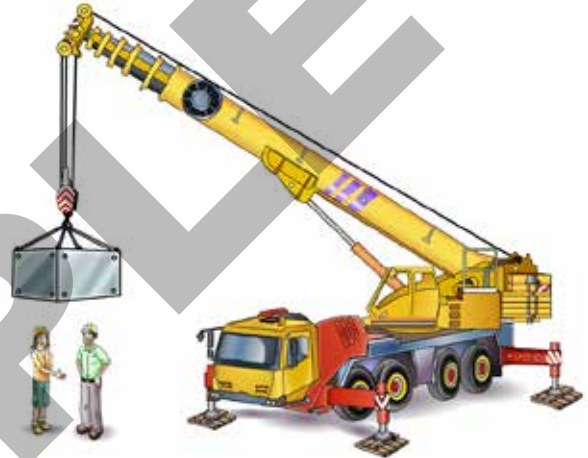
Use the crane carefully

Keep out of **dangerous areas** at all times when operating the crane.

These areas include:

- The path of the boom/jib
- The path of the load
- The area underneath the load
- Any areas between the load and the crane.

**It is unsafe to raise or lower a load above a person.
The load could fall and hit the person resulting in injury or death.**

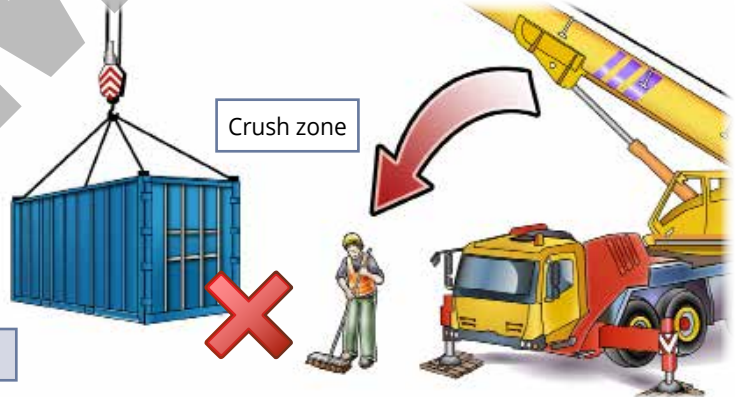


Crush zone

Do not stand between the truck and load.
Make sure you have a clear view of the work area.

Avoid the crush zone.

Crush zone

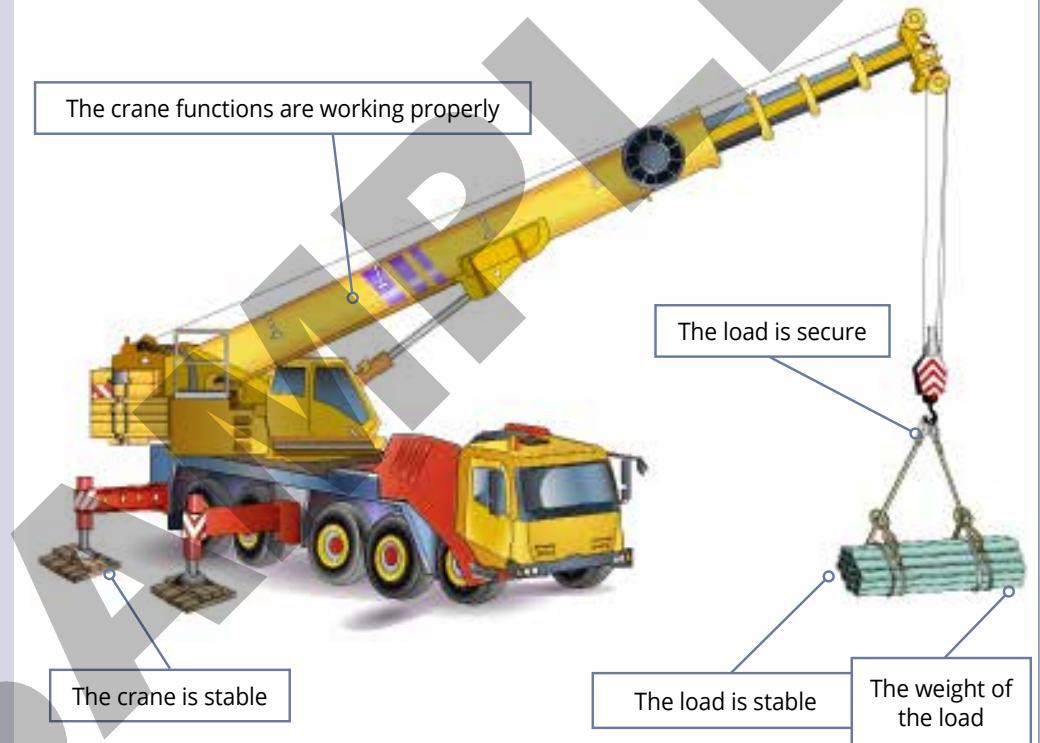


DO NOT stand on the same side as the load

QUESTION 127

Why is it important to do a test lift?

To make sure:



QUESTION 128

You are doing a test lift and you have lifted the load just off the lifting plane (ground).

What do you need to check?

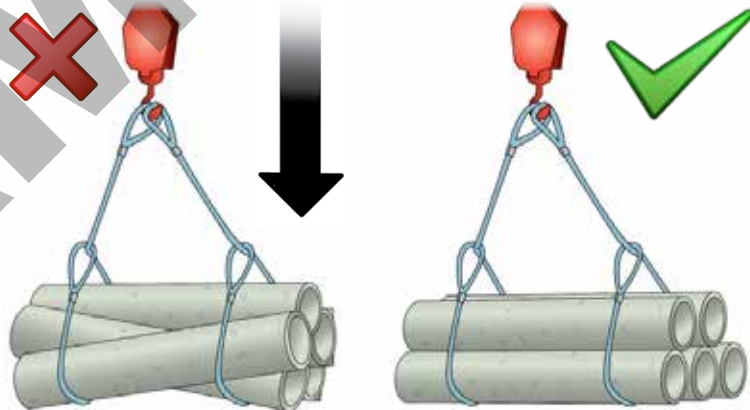
- The load is slung properly
- There are no loose parts hanging from the load
- There is nothing caught under the load.

**QUESTION 129**

You are doing a test lift. The load is unstable.

What should you do?

Lower the load and fix the problem.

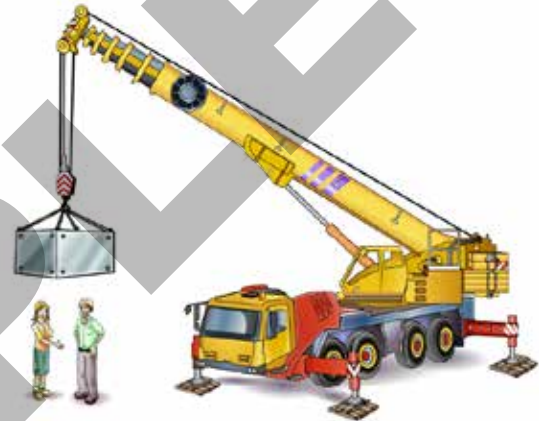


QUESTION 130

Is raising or lowering a load above people safe?

No, never raise a load above people.

The load could hit and injure someone. Or even worse, the load could fall on the people and kill them.

**QUESTION 131**

Why is it wrong to drag or snig a load?

Dragging or snigging a load can overload or damage the crane, the load and the lifting equipment. It can also make the crane unstable.



QUESTION 132

What piece of equipment must you use when lifting a person with a crane?

You must use a work box that meets Australia Standards.

Work boxes have a compliance plate.

It tells you:

- Working Load Limit (WLL)
- Weight of the box
- The number of people who can work in the box.

WLL : 250 kg
Unit Weight : 205 kg
Suitable for 2 people

**QUESTION 133**

A crane is lifting a workmate in a workbox.

Where should the dogger be?

The dogger/rigger must be in a position to safely observe and direct crane movements when there is a person in the workbox.

Alternatively, the dogger must be in the workbox.

Dogger

Workmate



Element 4 – Pack up

Shut down and pack up

This part of the book is about how to shut down, pack up and put away equipment.

It covers:

- Stowing and securing equipment
- Using motion locks
- Shutting down the crane
- Post-operational checks.

Stow boom/jib and equipment

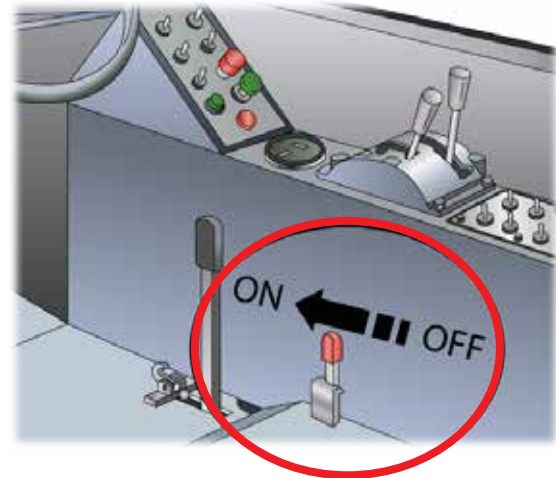
Stow your boom as shown in the manufacturer's instructions or the specifications.

Remove any lifting parts from the boom and securely attach them to the correct position on the vehicle.



Apply motion locks and brakes

When shutting down the crane or leaving it unattended, check that you have turned on all motion locks and brakes.

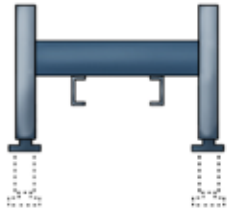


Stow and secure outriggers/stabilisers

Check that outriggers/stabilisers are stored safely for travel.

To secure and stow outriggers you should:

1. Use the controls to raise the outrigger footplates.



2. Use the controls to retract the outriggers.



3. Pack up the packing timbers.



4. Clean steel plates.



Stow and secure plates and packing

Secure all packing properly and safely.

Use straps or ties to hold packing timbers down.

