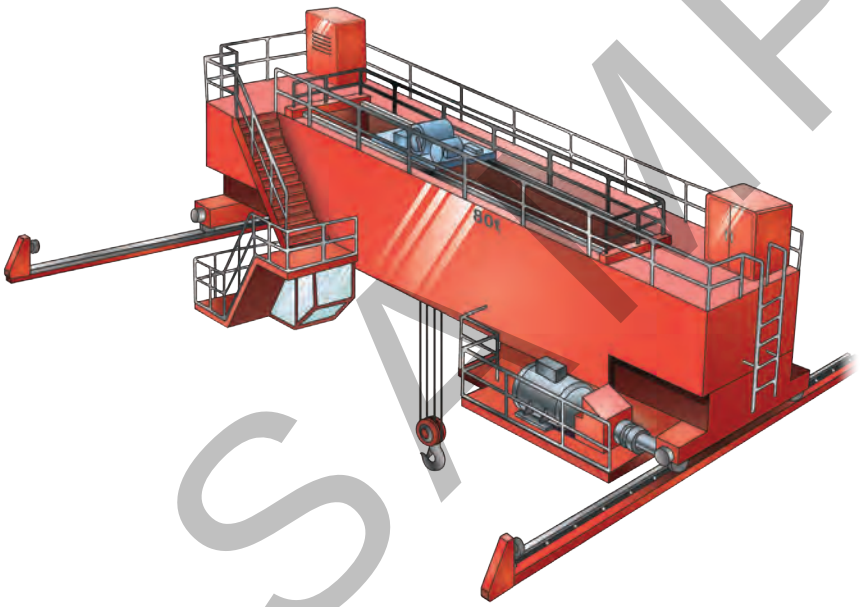
Trainer Value Pack

Bridge and gantry Crane
SAFETY AND LICENCE GUIDE



Training support material for:

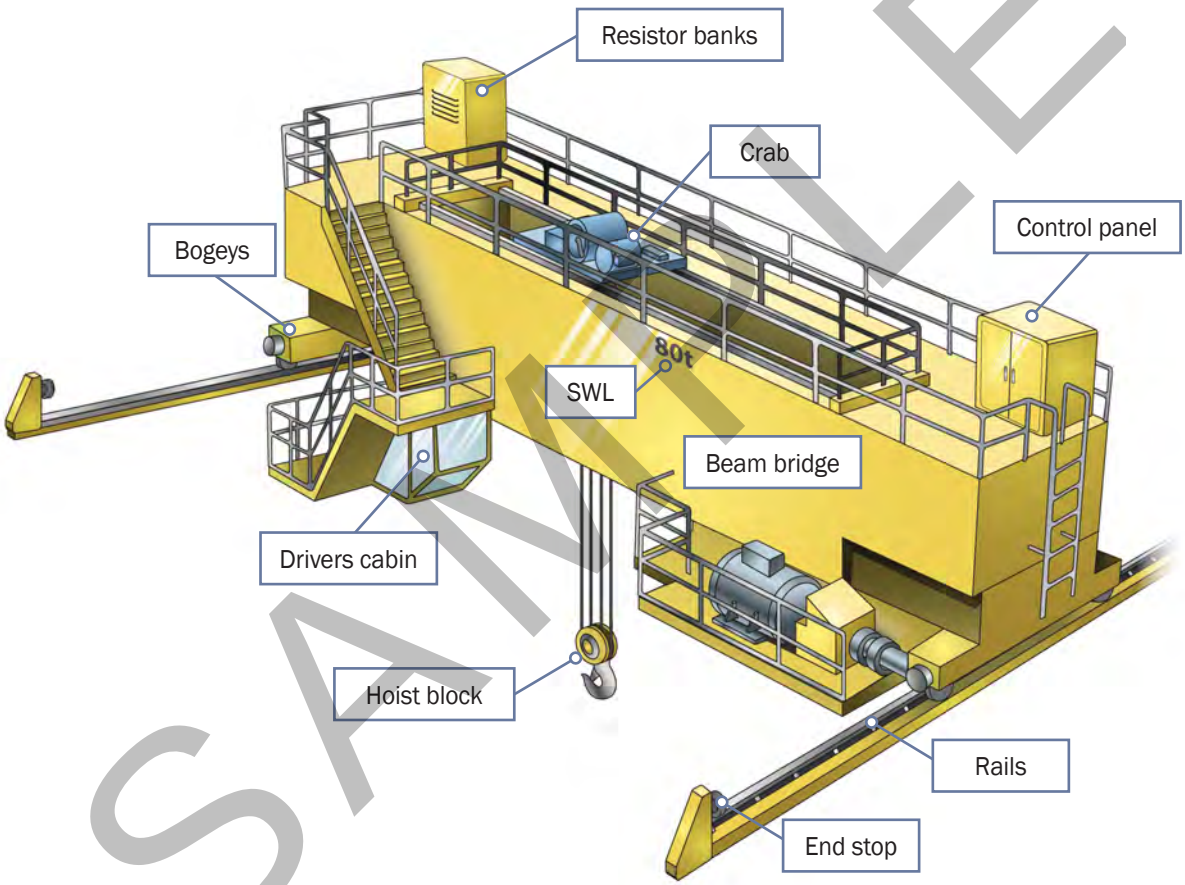
TLILIC0006
Licence to operate a bridge and gantry crane

Produced by:

EASY GUIDES
Australia Pty Ltd

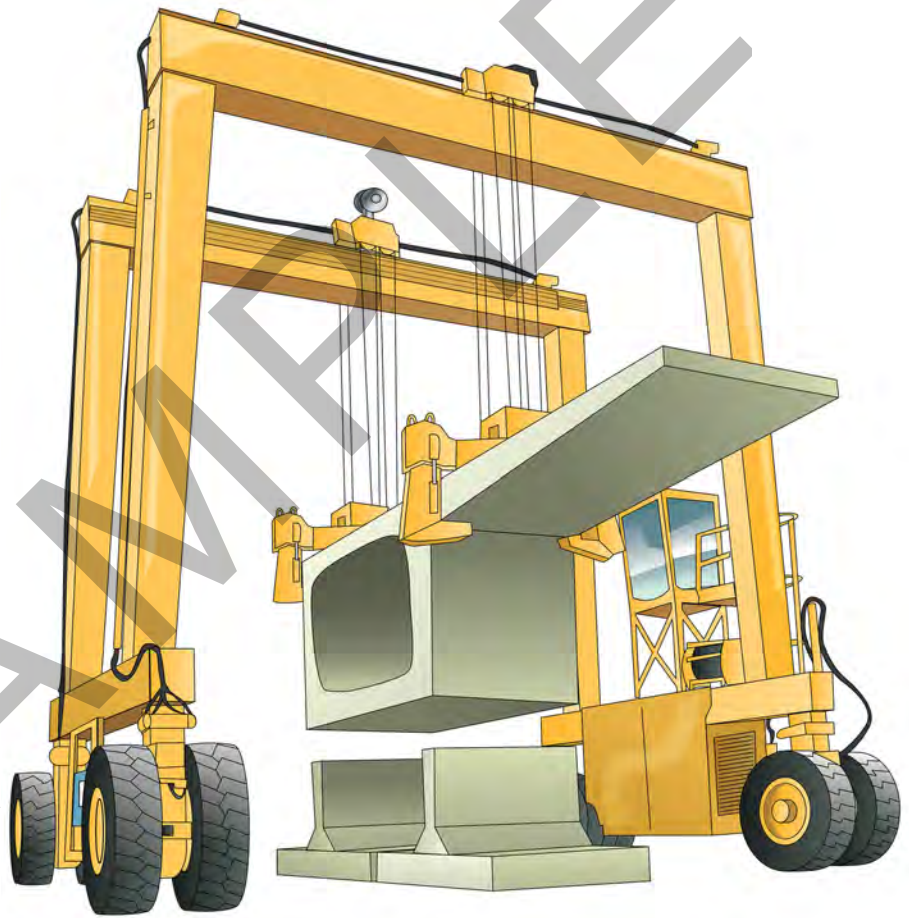
Contents

Parts of a bridge crane



What is a gantry crane?

- A gantry crane has a bridge beam which is supported by legs
- The legs are mounted on carriages which move along supporting surfaces or deck levels
- They have a crab with at least one hoisting mechanism which moves from side to side across the bridge
- Gantry cranes are used in factories and outdoor areas including railway and shipping yards



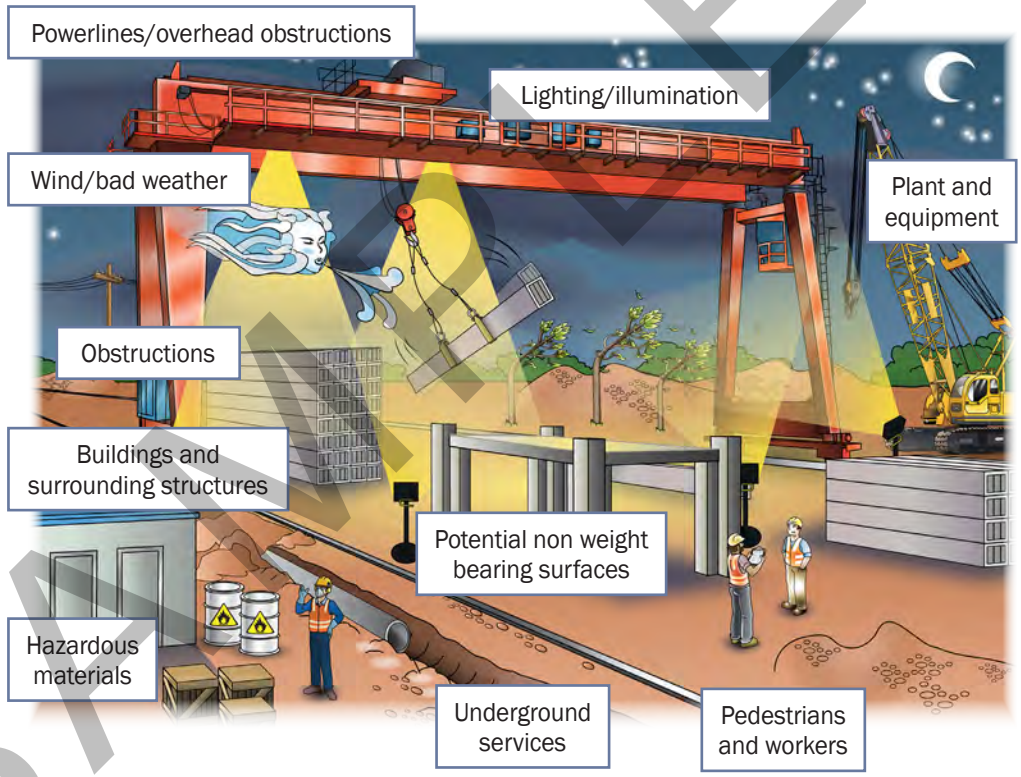
Plan work

Element 1

QUESTION 11

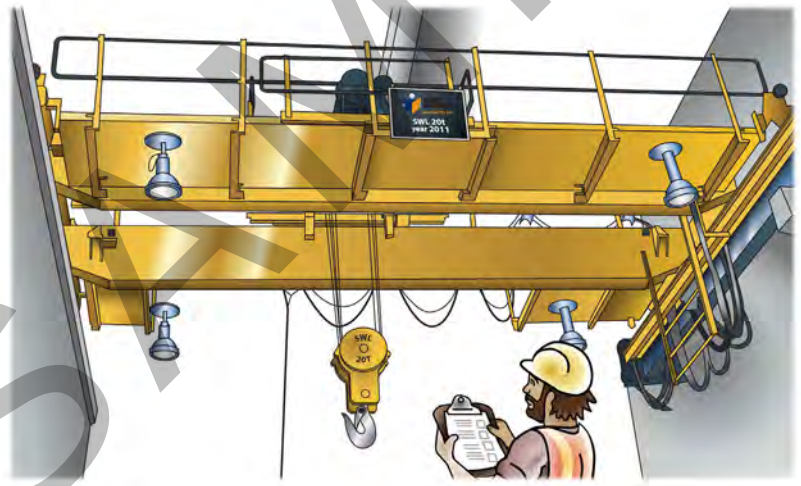
What are some hazards you should think about and plan for?

Some common workplace hazards to be aware of and plan for:



Conduct routine checks

Chapter 2



QUESTION 35

When do you put your hazard (risk) controls in place?

Before you start working. If a hazard arises after you have started work, stop immediately and put controls in place.

QUESTION 39

What do you need when working in the dark?

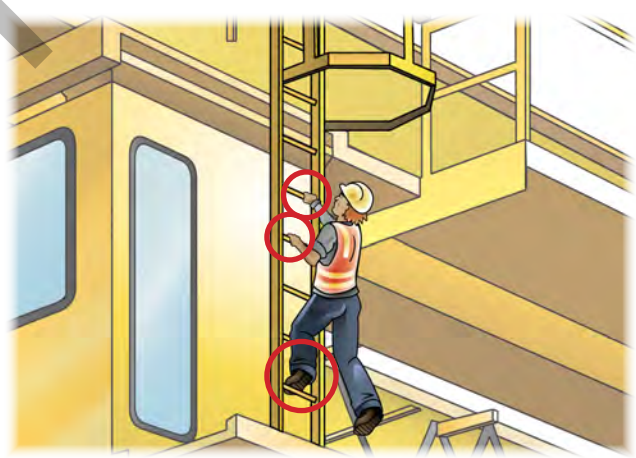
You need enough light to work safely. If the work area is dark, you need extra lighting.

QUESTION 40

How do you safely access the crane's cabin?

Make sure the crane is parked correctly.

Use three (3) points of contact. For example, two hands and one foot or two feet and one hand.



QUESTION 49

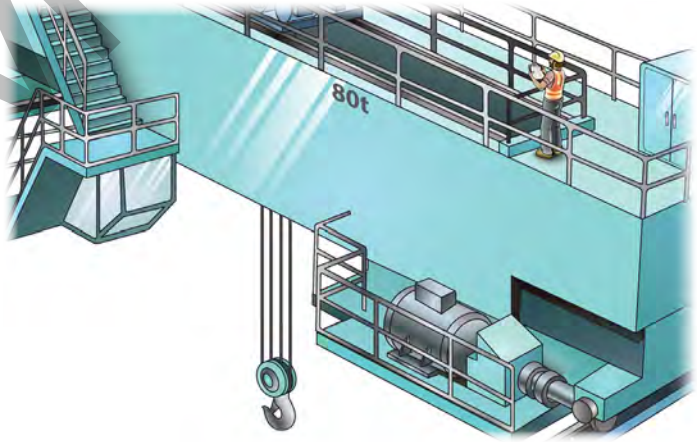
Why must you check the crane and its equipment before starting work?

So you know the crane and its equipment are safe to use and are right for the job.

QUESTION 50

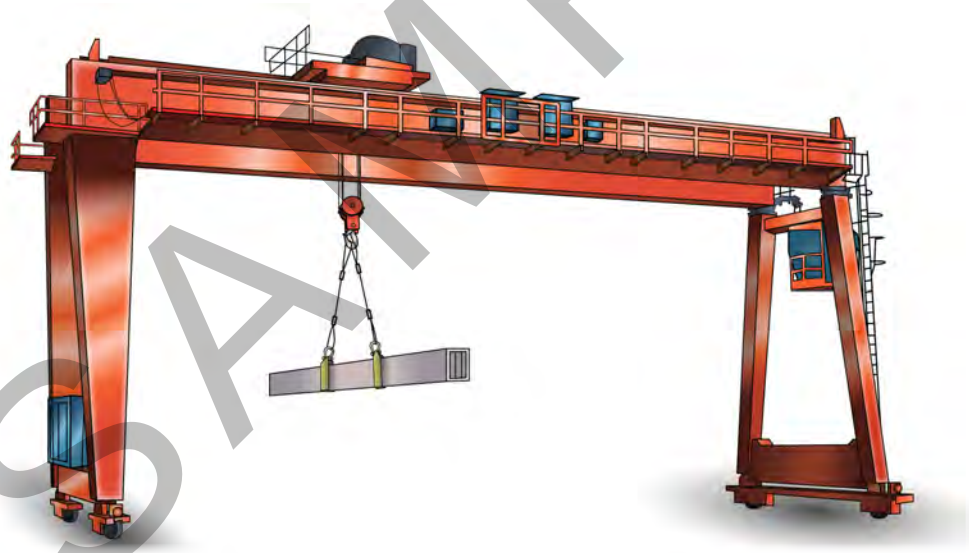
When do you check everything works on the crane?

Before you use it.



Transfer loads

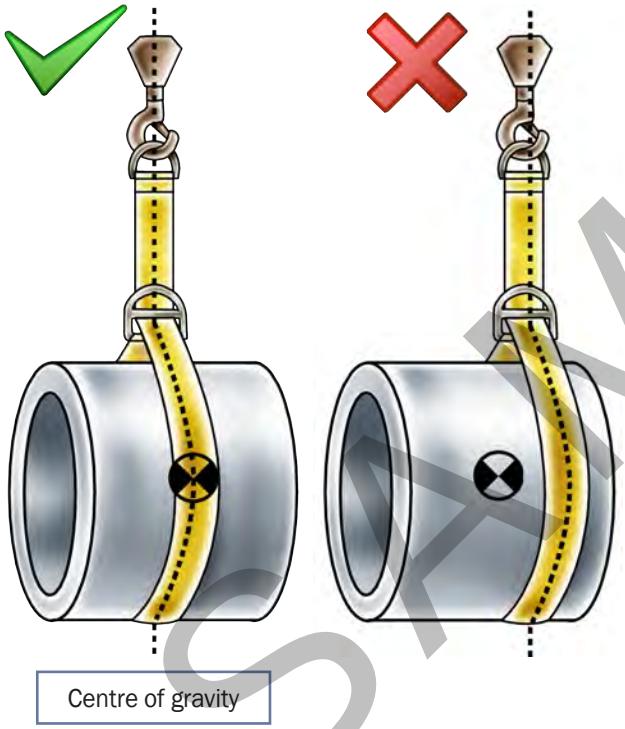
Chapter 3



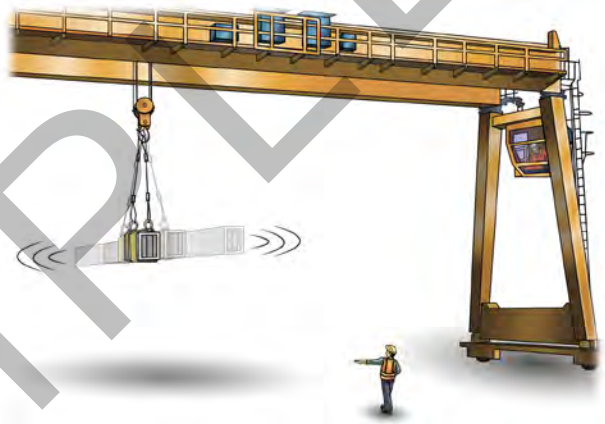
Position the hoist block

You use the hoist block for raising and lowering the hook. The block might have one or more sheaves.

Position the hoist block over the load's centre of gravity.



When the hoist block is set up properly it reduces the risk of load swing, damaging the crane, or overloading the crane.



If required, a dogger can help you set up and position the hoist block.

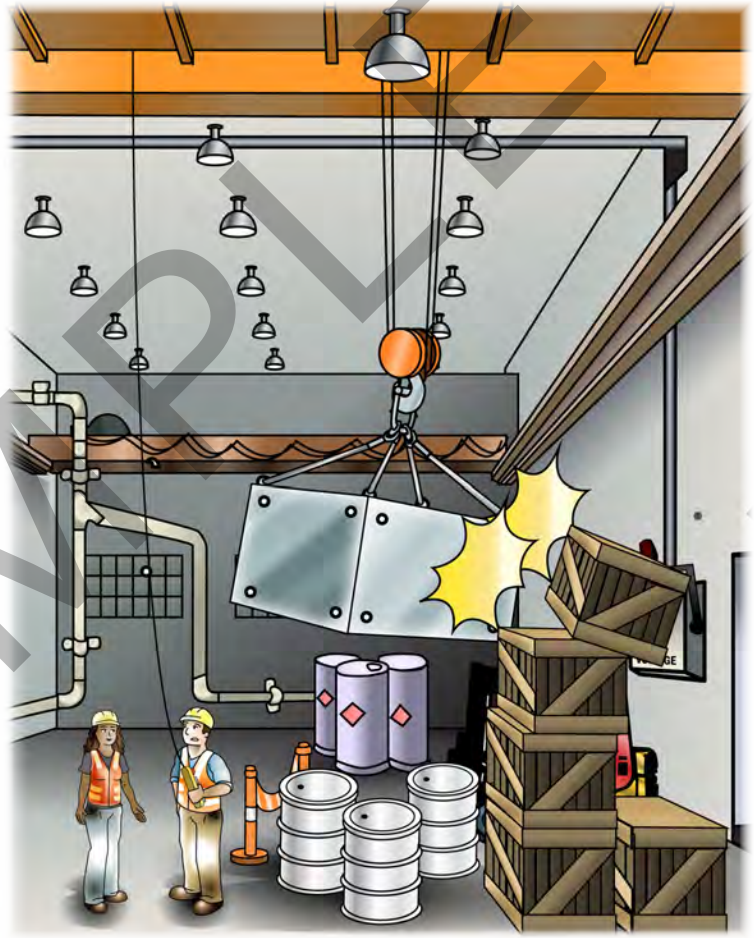
Watch the load at all times

Always keep the load in view while you're moving it.

If you take your eyes off the load even for a moment, something unexpected and dangerous could happen and someone might be hurt.

Look out for:

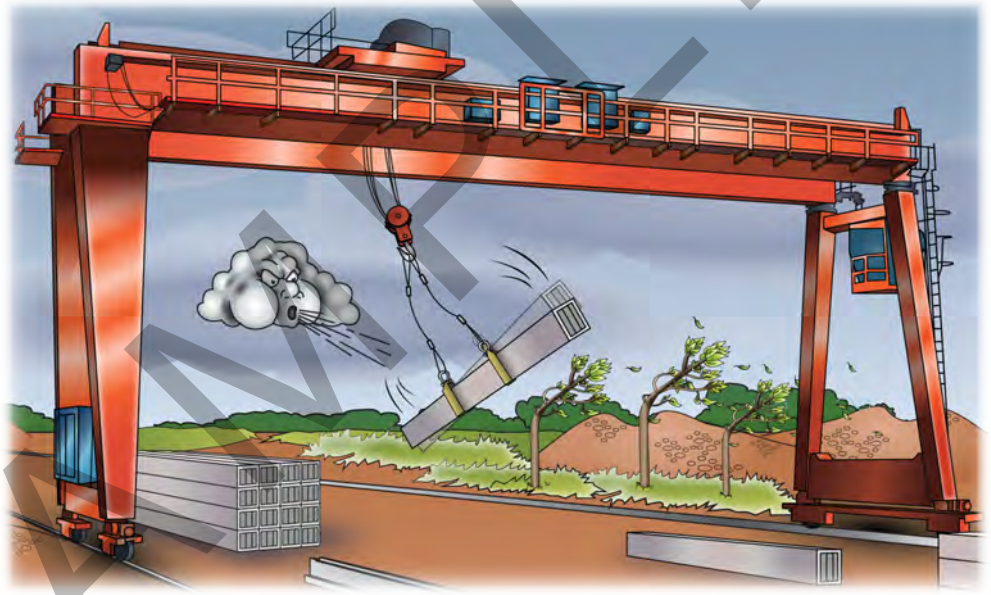
- People
- Vehicles and other plant
- Dangerous materials
- Anything else that might become a hazard.



QUESTION 109

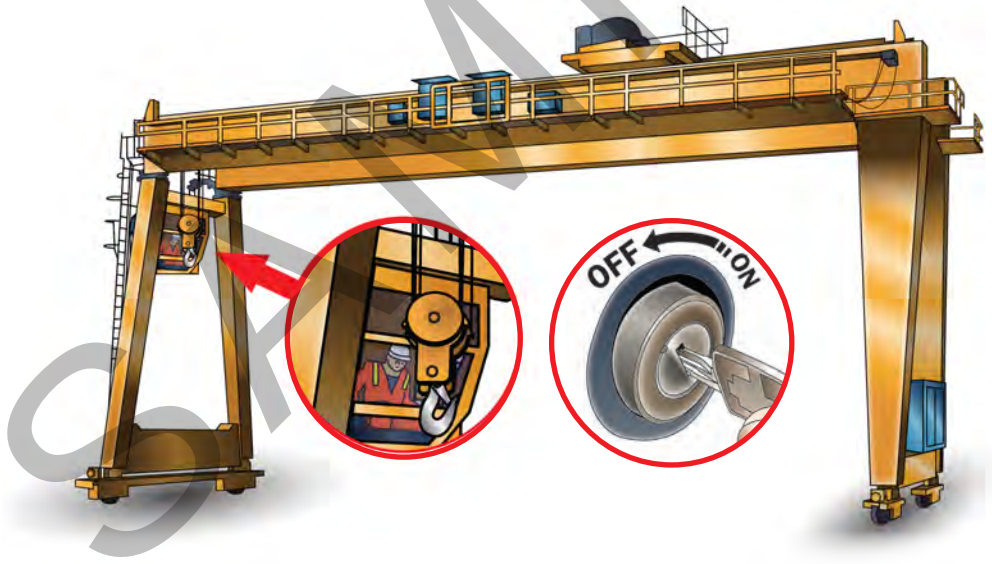
You are operating the crane and the wind starts to get strong, what should you do?

- Lower the load to the ground
- Check if the wind speed is close to or more than the manufacturers specifications
- If it is stop operation.



Shut down and secure crane

Chapter 4

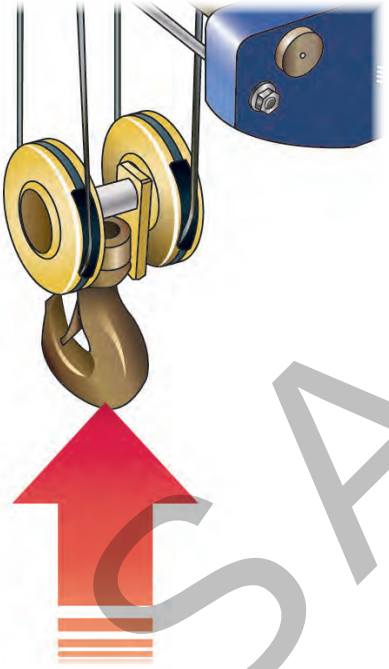


Stow and secure crane and equipment

Remember to do these procedures when you stow and secure the crane and equipment. Check your worksite's procedures, the crane's operator's manual show you the procedure or check the Australian Standards.

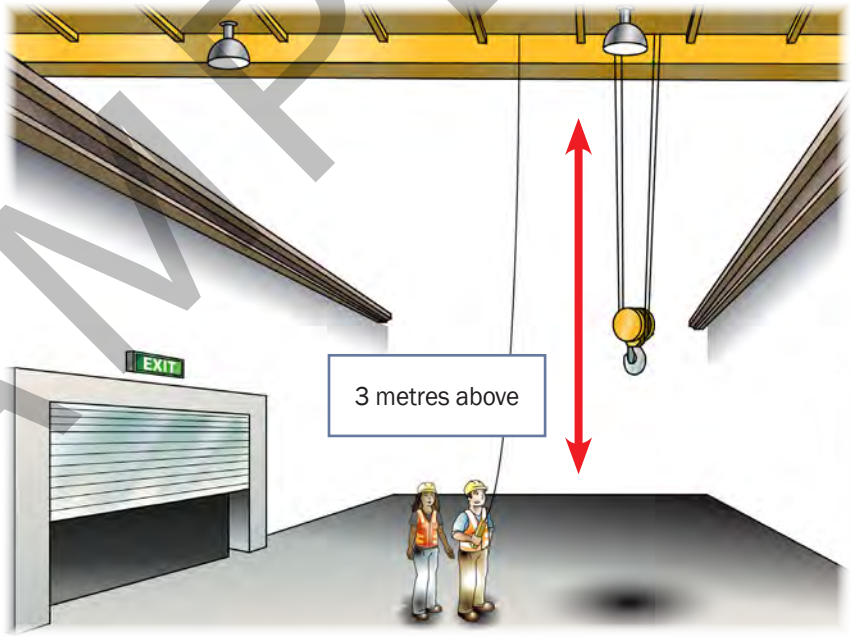
Remove the slings and lifting equipment from the lifting assembly.

Next, lift the hook or lifting assembly.



The crane will have a normal shut down height. Usually this will be at least 3 metres above head height.

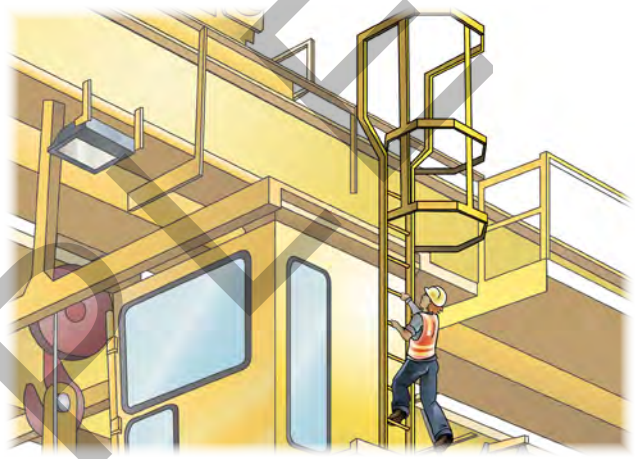
The hook and lifting assembly should be well clear of people, buildings and equipment.



QUESTION 115

Where do you park the crane so you can easily get in and out of the cabin?

In the parking bay designated by your worksite inline with the access ladder.



QUESTION 116

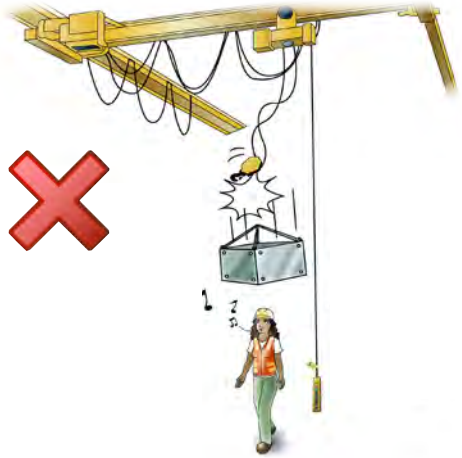
Can you leave a load hanging from the hook after you leave the crane or shut it down?

Give a reason.

No, because the load might fall or swing and injure somebody.

The winch or boom could creep and the load might drop down slowly.

See the Australian Standards (AS 2250).

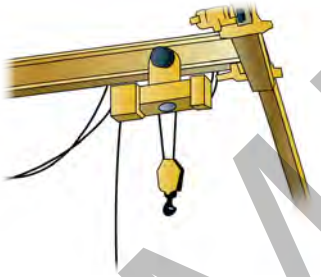


Shut down the crane

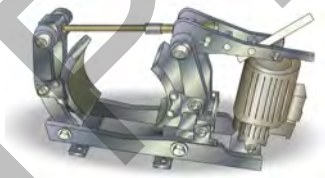
These are the steps to shut down and secure the crane:

Remove the slings from the hook

Raise the hook clear of obstructions, and so it is not a hazard to other people or plant.



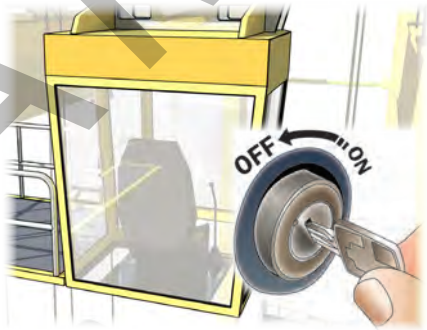
Apply the hoist brake



Put all controls in neutral

Apply the storm brake

Turn off the power in the cabin



Turn off the power with the main isolation switch.

The isolation switch is normally lockable.

VEHICLE LOADING CRANE
LEARNER WORKBOOK

TLILIC0024
Licence to operate a vehicle loading crane
(capacity 10 metre tonnes and above)

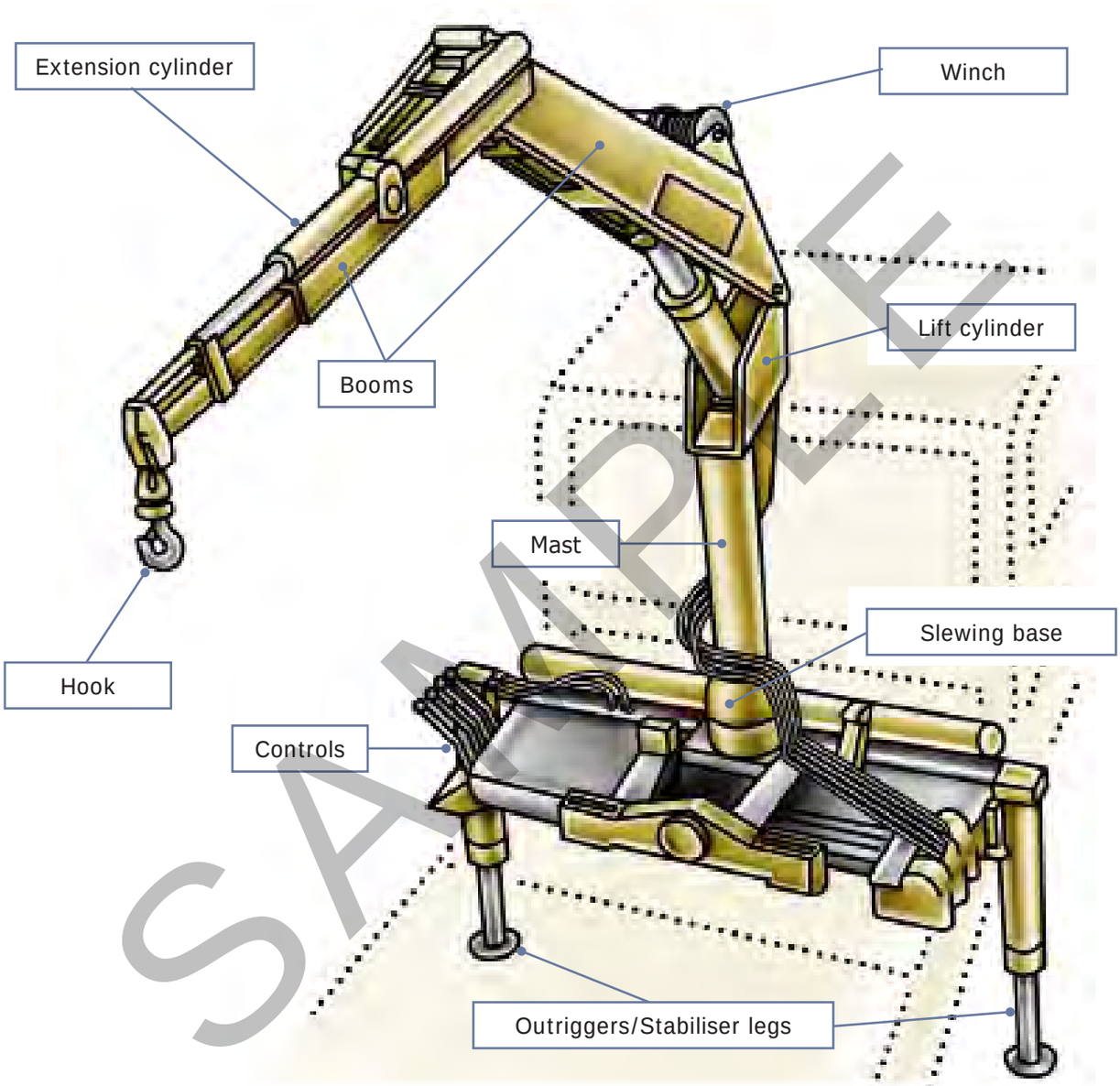
EASY GUIDES
Australia Pty Ltd
www.easyguides.com.au

National Licence
RTO-VET Learning Materials

Contents

What is a vehicle loading crane?

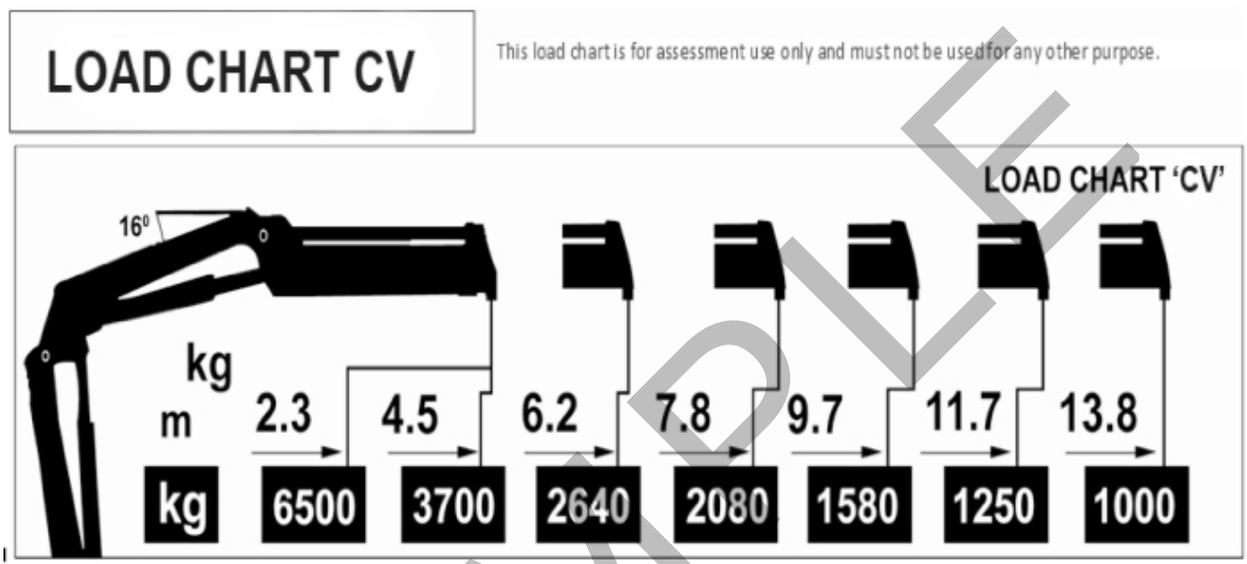
A vehicle loading crane is a crane which is mounted to a vehicle for loading and unloading. Vehicle loading cranes have hydraulic booms with power supplied from the vehicles engine through a PTO (power take off).



Vehicle loading crane charts
(capacity10 metre tonnes and above)

Answer these questions if you are studying the **TLILIC0002 Licence to operate a vehicle loading crane (capacity 10 metre tonnes and above).**
If you are studying for a different licence, skip to that section.

Note: For the following crane exercises use the Calculations- CV 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.



EXAMPLE OF CALCULATIONS

Question 1

Method used to calculate the approximate weight of a steel universal beam.

You need to calculate the cubic meter of steel for the two components that make up the beam. These are the "Flange" and the "Web" (See diagram 1b)

This done by using the following formula; Width x Depth x Length (W x D x L)

(Diagram 1a) (Diagram 1b)

Example: Top and Bottom Flanges:	Web:
Width – 250 millimetres	Width – 350 millimetres
Depth – 12 millimetres	Depth – 35 millimetres
Length – 12.5 metres	Length – 12.5 millimetres

Calculation:

Make sure to convert all measurements to metres because volume is measured in cubic metres (m3).

Note: Structural steel weighs 7840kg/m3.

Remember to calculate what is in the brackets first.

Continued on next page

For top and Bottom Flanges

= 2 (W x D x L) x weight of steel 7840kg/cu mtr

2 (0.250m x 0.012m x 12.5m) x 7840kg/m3

2 (0.0375m3) x 7840kg/m3

= 0.075m3 x 7840kg/m3 (m3 cancel out)

= 588 kgs

Weight of Web = W x D x L x weight of steel 7840kg/cu mtr

(0.350m x 0.035m x 12.5m) x 7840kg/m3

(0.153125m3) x 7840kg/m3 (m3 cancel out)

= 1200.5 kgs

Total weight of Beam

= 588kg + 1200.5kg = 1788.5 kgs

Question (a) What is the weight of 6 of these beams, answer to the nearest whole tonne?

Answer: = ...

Question Using the load chart CV provided are you permitted to lift 6 beams at once?

Answer: = ...

Question Using the load chart CV provided at what radius is the crane permitted to lift 2 beams?

Answer: = ...

Performance Criteria: 1.4

Check path of load

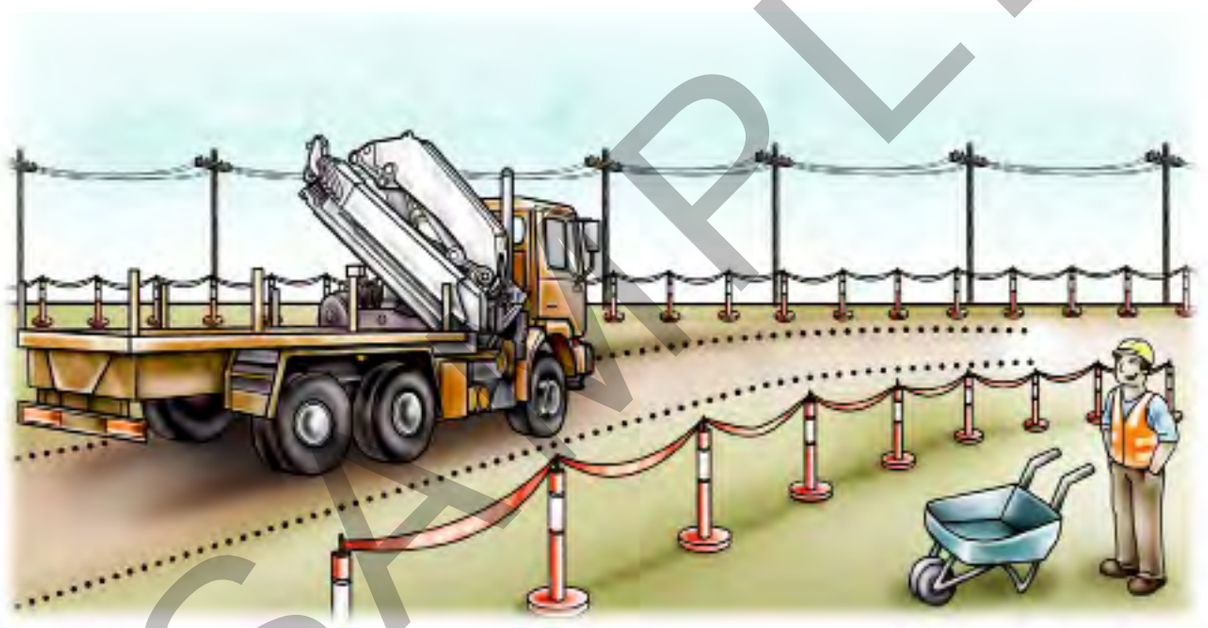
Check the route you will take to move the load. Look out for hazards to avoid.

Theory Training Task 19

Performance Criteria: 1.4

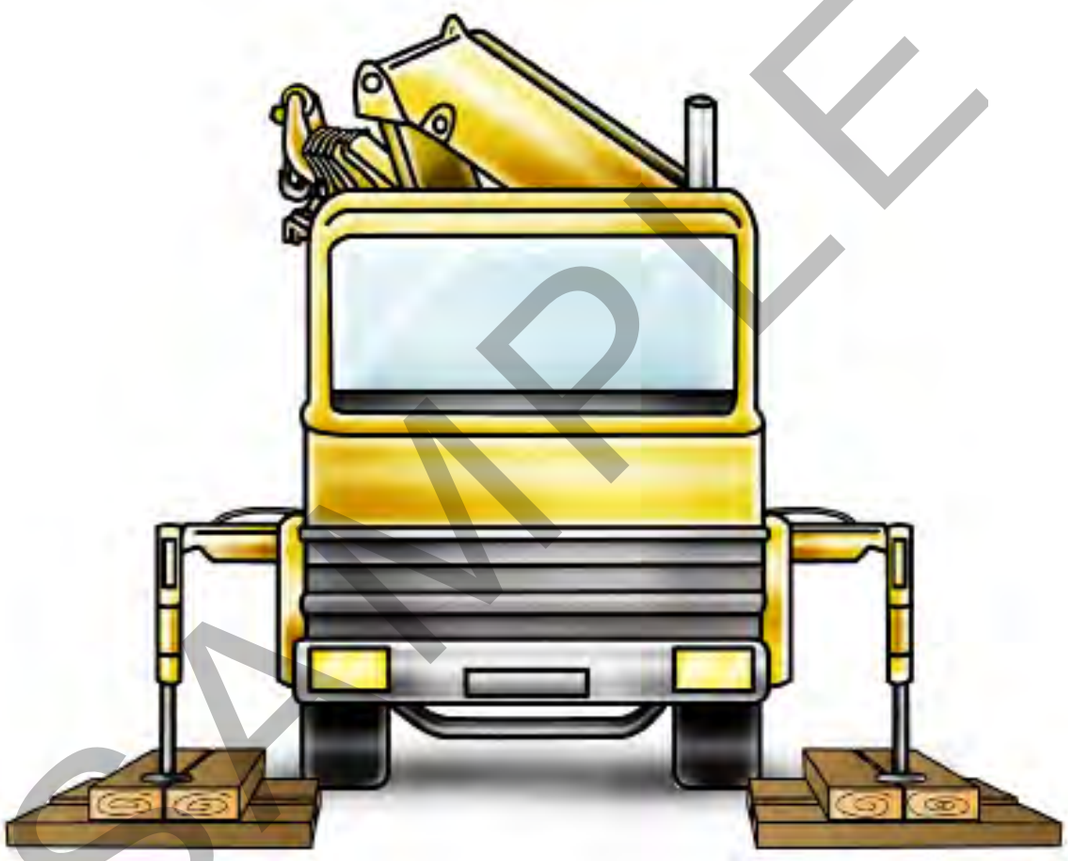
Check the path of movement of loads to avoid hazards.

In this picture below, circle two (2) hazards you should look out for when moving a load.



Chapter 3

Set Up Crane



Performance Criteria: 1.2

Check ground conditions

Check the ground is okay to use the vehicle loading crane **before** you set up. Ground conditions affect the use of outriggers and the need for packing.

Theory Training Task 41

Performance Criteria: 1.2

Do you think the following **ground conditions** are **safe** to set up a vehicle loading crane or need further checking to make sure they are stable?

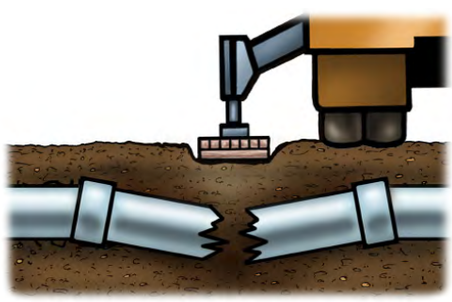
Circle the correct answer.

Recently flooded ground	**Safe**	**Needs further checking**
Hard compact soil	**Safe**	**Needs further checking**
Bitumen road	**Safe**	**Needs further checking**
Swamp area	**Safe**	**Needs further checking**
Soft soil	**Safe**	**Needs further checking**
Uneven ground	**Safe**	**Needs further checking**

Theory Training Task 42

Performance Criteria: 3.1

What might happen if you set up the vehicle loading crane over underground services?



Theory Training Task 43

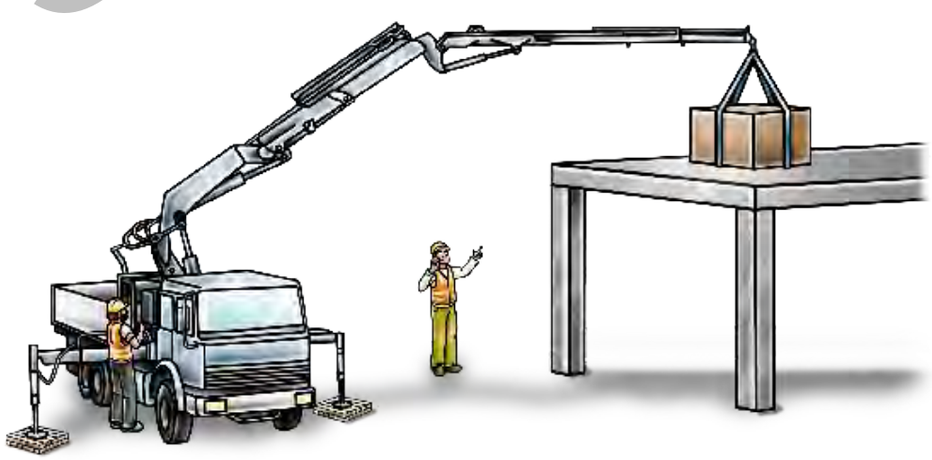
Performance Criteria: 1.2

List the ways you can find out where underground services are:

Theory Training Task 44

Performance Criteria: 1.2

List the things you need to think about when you set up a crane on a suspended floor or temporary formwork.



Chapter 4

Transfer Loads

Performance Criteria: 1.3

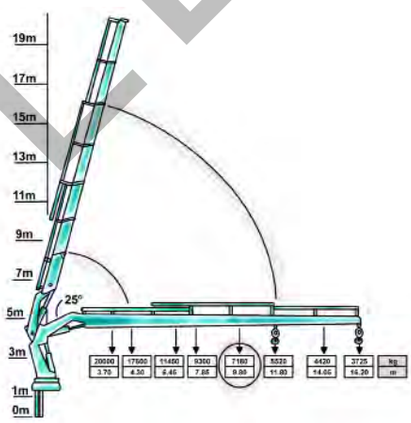
Check crane's load capacity

Always stay within the safe working load (SWL) of the crane. For example, you may change the boom radius during a lift. Ensure the **whole** lift stays inside the boom's limits and **never** exceeds the SWL.

Theory Training Task 60

Performance Criteria: 1.3

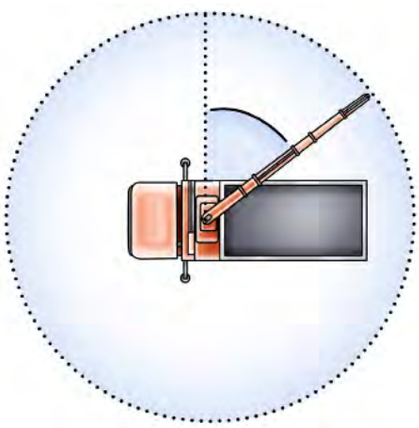
What is the load chart and what does it tell you?



Theory Training Task 61

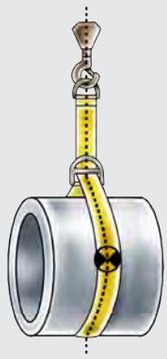
Performance Criteria: 1.3

Can you exceed the safe working load (SWL) at a given radius of the crane?



Performance Criteria: 2.6

Position boom/jib and hoist block over load



You need to position the boom/jib and hoist block over the load.
This means you put the lifting hook over the load's centre of gravity.

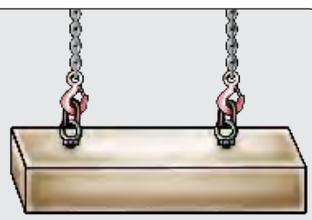
Theory Training Task 62

Performance Criteria: 2.6

Why is it important to put the lifting hook over the load's centre of gravity?

Performance Criteria: 2.6

Attach and secure lifting equipment



Make sure you use the correct fixed lifting points.

Theory Training Task 63

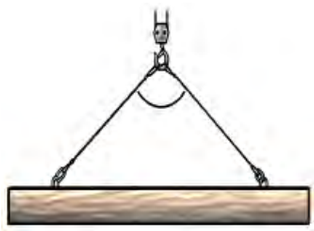
Performance Criteria: 2.6

What is the load factor for a straight lift?

Theory Training Task 64

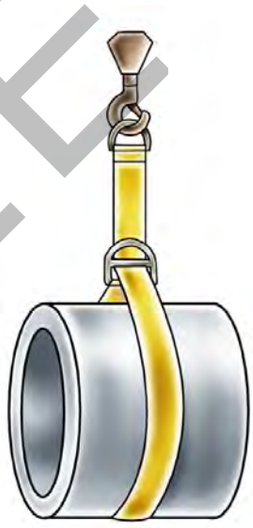
Performance Criteria: 3.3

a) What is the recommended safe angle between two legs of a sling?



b) What load factor should you use when using two leg slings attached with an angle of 90 degrees?

c) What load factor should you use when using two leg slings attached with an angle of 120 degrees?



d) How much reduction is there in the sling capacity when you use a choker hitch around a round load?

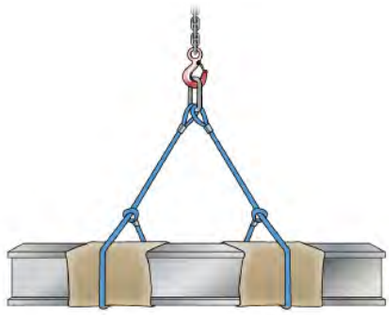
e) How much increase is there in the sling capacity when you use a basket hitch around a round load?

Theory Training Task 65

Performance Criteria: 3.3

a) Why should you use packing, padding, lagging, corner pads or edge protection when you sling a load with sharp edges?

b) What type of shackle do you use to support more than one sling?



Mapping

TLILIC0024 Licence to operate a vehicle loading crane

(capacity 10 metre tonnes and above)

The information and questions contained in the learner guide and PowerPoint presentation have been mapped to the elements, performance criteria, and knowledge evidence for the unit of competency TLILIC0024 Licence to operate a vehicle loading crane (capacity 10 metre tonnes and above)

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Elements and performance criteria

Element 1	**Performance Criteria**	**Learner guide and PowerPoint**	**Learner Workbook / Marking Guide**
Plan work / task	1.1 Task requirements are identified from work orders or equivalent and a lift plan is confirmed with associated personnel and a site inspection is conducted in accordance with workplace procedures	• Question 1, 2, 12, 13, 69 • OHS/WHS Guidelines • What is a lift plan?	• Practical training task 1 • Theory Training Task 21 b
	1.2 Work area operating surface is confirmed to determine the quality of ground suitability for operational use of vehicle loading crane in accordance with workplace procedures	• Bearing capacity of different types of ground • Ground types • Types of packing • Ground conditions • Underground services • Suspended floors / slabs • Question 5, 6, 7, 8, 9	• Theory Training Task 41 • Theory Training Task 43 • Theory Training Task 44 • Practical training task 1 • Theory Training Task 3
	1.3 Vehicle loading crane rated capacity (RC) and the lifting gear Working Load Limit (WLL) are established for the load/s and work/task requirements in accordance with manufacturer requirements and workplace procedures	• 10 metre tonnes • Work out weight of web • Angle factors • Methods of attachment • Question 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 75	• Theory Training Task 6 • Theory Training Task 7 • Theory Training Task 8 • Theory Training Task 9 • Theory Training Task 51 • Theory Training Task 60 • Theory Training Task 61 • Practical training task 1

	1.4 Appropriate paths for operating the vehicle loading crane and moving and placing load/s in work area are assessed and determined in accordance with workplace procedures	• Question 40, 41 • The risk to people working near the operating radius of your crane	• Theory Training Task 19 • Theory Training Task 45 • Theory Training Task 46 • Practical training task 1
	1.5 Relevant hazard identification and risk elimination/control measures are applied and advised to associated personnel in accordance with workplace procedures	• Overhead powerlines on poles (National Standard) • Overhead powerlines on towers (National Standard) • Hazard versus risk • Underground services • What is the hierarchy of hazard control? • Finding out the voltage of overhead powerlines • Question 3, 4, 10, 11, 13, 14, 15, 17, 19, 20	• Theory Training Task 1 • Theory Training Task 4 • Theory Training Task 13 • Theory Training Task 18 • Theory Training Task 47 • Theory Training Task 52 • Theory Training Task 53 • Theory Training Task 54 • Practical training task 2 • Theory Training Task 5 • Practical training task 1
	1.6 Traffic management plan implementation is confirmed and followed in accordance with workplace procedures	• Question 18, 19, 20	• Practical training task 1 • Theory Training Task 52
	1.7 Appropriate communication procedures are identified and tested with associated personnel in accordance with workplace procedures	• Communicate clearly • Question 42, 43, 44, 45	• Theory Training Task 20 • Theory Training Task 21 • Theory Training Task 33 • Theory Training Task 55 • Practical training task 1
	1.8 All tasks are confirmed to ensure requirements for the relevant work area in accordance with workplace procedures	• Question 46	• Practical training task 1
	1.9 Information required to ensure that lifting equipment and gear inspection, use, maintenance and storage complies with manufacturer requirements is obtained and interpreted	• What type of information is	• Theory Training Task 22

Element 2	Performance Criteria	Learner guide and PowerPoint	Learner Workbook / Marking Guide
Prepare for work / task	2.1 Consultation with workplace personnel is established and maintained to ensure all crane and lifting operations are clear and consistent with site requirements in accordance with a lift plan and workplace with a lift plan and workplace procedures	• Question 69	• Practical training task 3
	2.2 Risk control measures for hazards identified are checked for implementation in accordance with the lift plan and safe work procedures	• Overhead powerlines on poles (National Standard) • Overhead powerlines on towers (National Standard) • Tiger tails • PPE • Question 4, 13, 14, 15, 16	• Theory Training Task 2 • Theory Training Task 18 • Theory Training Task 54 • Practical training task 2.
	2.3 Vehicle loading crane controls are accessed safely in accordance with manufacturer requirements and safe work procedures	• Question 57, 58	• Theory Training Task 26 • Theory Training Task 28 • Practical training task 3
	2.4 Pre-start vehicle loading crane checks are carried out and any damage and defects are reported, recorded and appropriate action is taken in accordance with manufacturer requirements and safe work procedures	• Question 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59	• Theory Training Task 22 • Theory Training Task 23 • Theory Training Task 24 • Theory Training Task 25 • Theory Training Task 27 • Theory Training Task 34 • Practical training task 3
	2.5 Vehicle loading crane is set up correctly with any lifting gear as per the lift plan in accordance with relevant manufacturer requirements including load chart/s and safe work procedures	• Lifting gear • Question 29, 64, 69, 70, 71, 72, 75	• Theory Training Task 15 • Theory Training Task 16 • Theory Training Task 17 • Theory Training Task 56 • Theory Training Task 57 • Theory Training Task 58 •

			• Theory Training Task 51 • Practical training task 3
	2.6 Boom jib and lifting gear are set up as required in accordance with specific manufacturer requirements and safe work procedures	• Question 85, 86, 87, 88, 89, 127	• Theory Training Task 51 • Theory Training Task 62 • Theory Training Task 63 • Practical training task 3
	2.7 Vehicle loading crane is stabilised appropriately in accordance with the lift plan, relevant manufacturer requirements and safe work procedures	• Types of packing • Question 70, 71, 72, 73, 74	• Theory Training Task 48 • Theory Training Task 49 • Theory Training Task 50 • Practical training task 3
	2.8 Operational checks are carried out and any damage and defects are reported, recorded and appropriate in accordance with manufacturer requirements and safe work procedures	• Question 64, 65, 66, 76, 77, 78	• Theory Training Task 30 • Theory Training Task 31 • Theory Training Task 32 • Theory Training Task 34 • Theory Training Task 72 • Theory Training Task 75 • Practical training task 3
	2.9 Vehicle loading crane logbook is inspected and is correct for the crane type, is completed and signed and required rectifications have been signed off in accordance with manufacturer requirements and safe work procedures	• Question 59, 60, 61	• Theory Training Task 29 • Practical training task 3
	2.10 Weather and work environment conditions are assessed to determine any impact on vehicle loading crane operations in accordance with manufacturer requirements and safe work procedures	• Question 39, 40	• Theory Training Task 18 • Practical training task 3
	2.11 Weight of load is identified, calculated or estimated	• Question 14, 15, 21, 22, 23, 24, 26, 27, 28, 62, 63 • Calculating the weight of a load • Table of common weights • Work out flange weight	• Theory Training Task 6 • Theory Training Task 7 • Theory Training Task 8 • Theory Training Task 9 • Theory Training Task 14 • Theory Training Task 10 • Theory Training Task 35 • Practical training task 3