Trainer Value Pack

SLEWING MOBILE CRANE (60T)
SAFETY AND LICENCE GUIDE

Training support material for:

TLILIC0023
Licence to operate a slewing mobile crane
(up to 60 tonnes)

Produced by:

EASY GUIDES
Australia Pty Ltd

Introduction to Slewing Mobile Crane (up to 60 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.

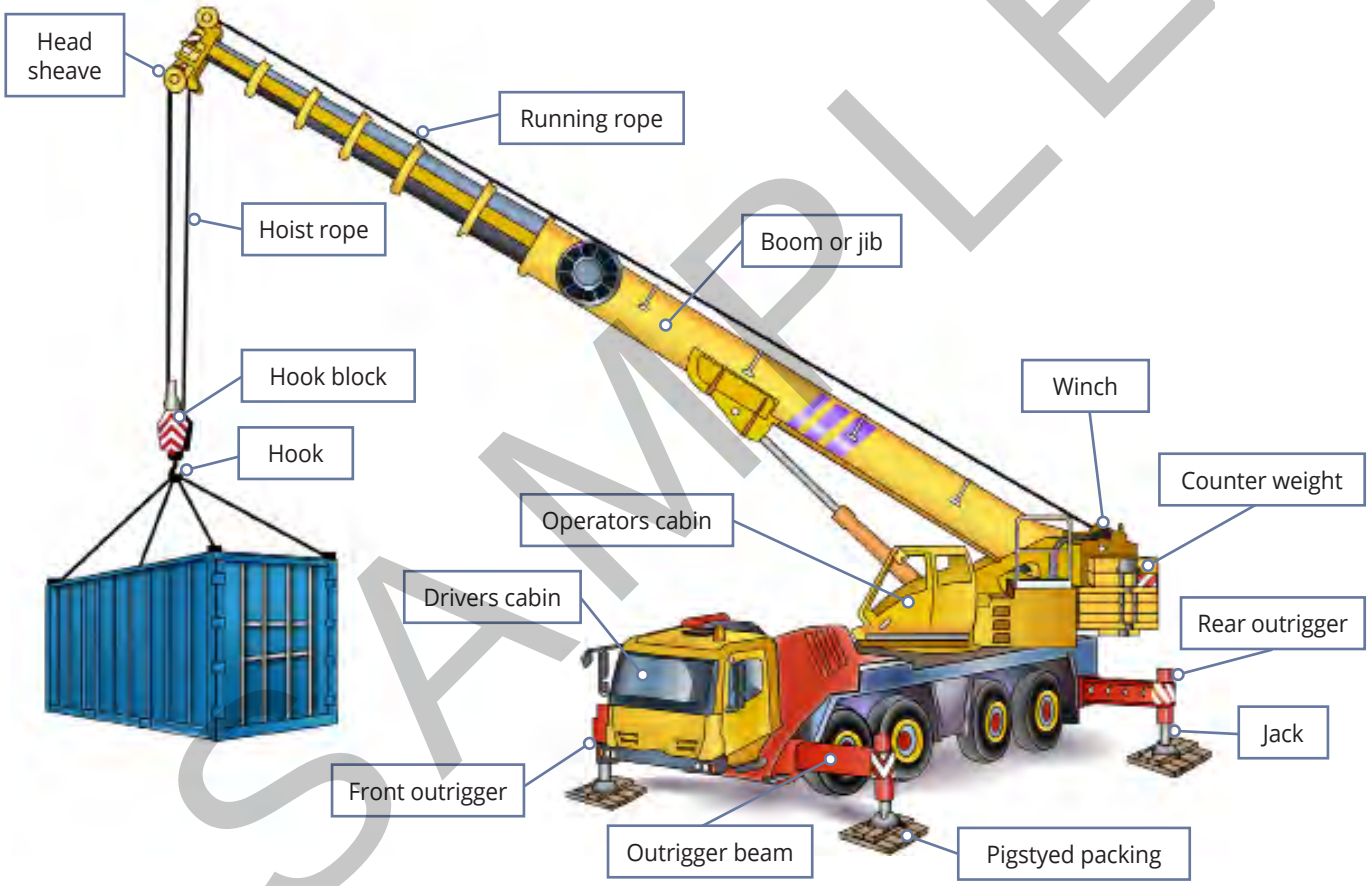
Slewing mobile crane

Rough terrain slewing crane

Crawler 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

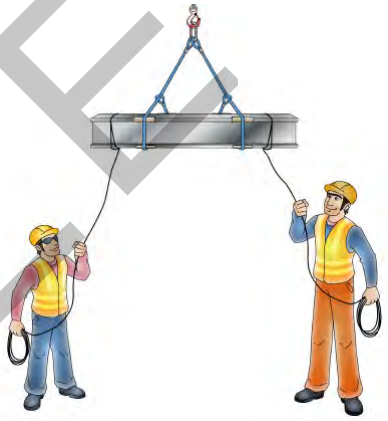


What is a dogger/dogman?

The crane operator must work closely with a dogman (dogger).

The dogman is responsible for:

- Selecting and inspecting lifting gear/equipment
- Slinging loads
- Guiding/directing a crane operator in the movement of a load
- Working out the weight of a load
- Working out the best ways to sling a load
- Working with the crane operator to make sure the crane is right for the job.



You must hold the correct licence or be enrolled in a course with an RTO and under the supervision of a licenced dogman to perform any of the tasks listed above.

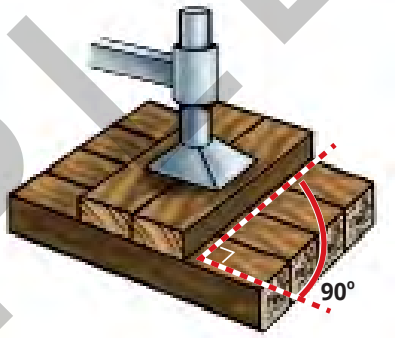
In this book the term **dogger** or **dogman** also means **rigger**.

Element 1 – Plan work / task

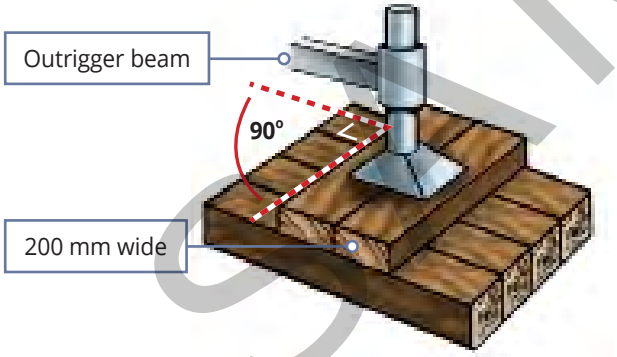
Outriggers and packing (continued)

The base layer of packing should be closely laid and at least 75 mm thick

The packing should be pigstyed. This means each layer is at right angles (90° degrees) to the next.



The top layer of packing must be at right angles to the direction of the outrigger beam and at least 200 mm wide.



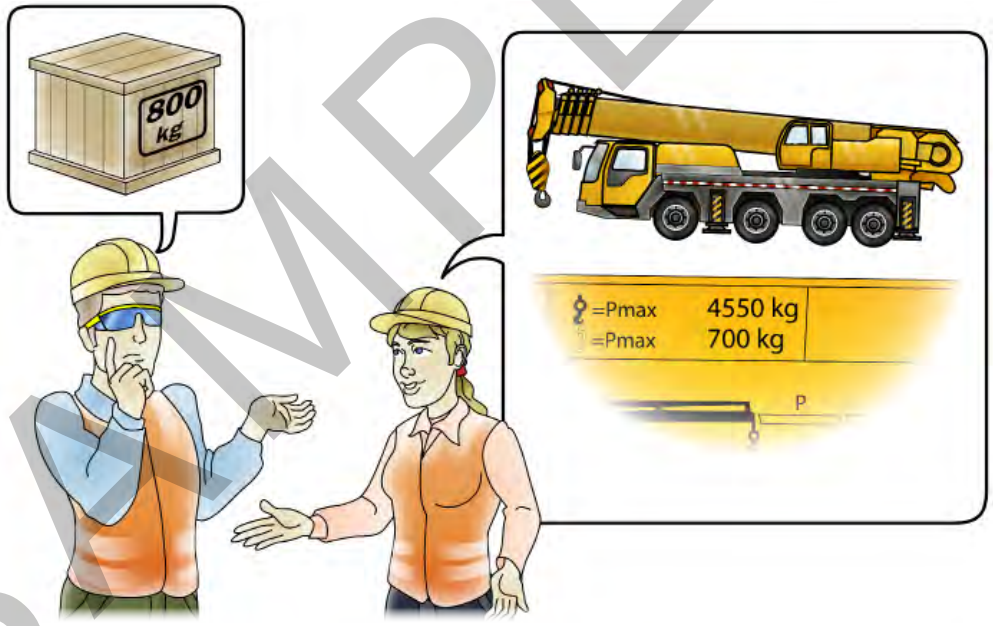
Packing, outriggers and jacks should be checked regularly during an operation.

QUESTION 22

Is it the crane operator's job (responsibility) to know the weight of the load?

Yes. The dogger and the crane operator must communicate about the weight of the load and the crane's capacity (the weight it can lift).

The crane operator needs to tell the dogger about the capacity and limitations of the crane. The crane operator must make sure the load is within the capacity of the crane.



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 45

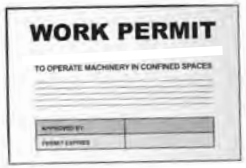
You need to use a crane on a public road.

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

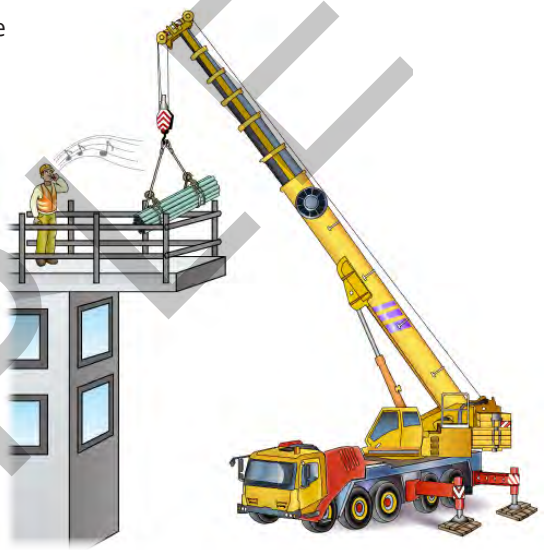
What is the right time to select and check your safety equipment, for example PPE?

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

QUESTION 51

When would the dogger communicate with the crane operator using a whistle?

The dogger uses a whistle when he can see the load but the crane operator cannot.



The dogger can use a whistle whether or not he can see the crane operator clearly.

QUESTION 52

When would you communicate with the dogger using a fixed-channel two-way radio?

When you the crane operator **cannot** see the dogger

If it's too noisy to hear whistles

...CONTINUES ON NEXT PAGE

Element 2 – Prepare for work / task

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.

Workplace conditions

Always use a slewing mobile crane that best suits the workplace conditions.

For example, think about the weather you will be working in.

- Are there storms?
- Is it windy?

Check the manufacturers specifications or labeling on the crane to find out the maximum wind speed the crane is rated to operate in.

An accurate wind speed reading can be obtained by using a wind speed meter (anemometer) to measure the winds velocity.

The Beaufort wind scale can also be used as a guide to help you judge wind speed. (Sample on following page).

However a more accurate reading from a **wind speed meter** is recommended. (Example shown).

Note:
If the cranes boom or the load have a large surface area it may be necessary to reduce the maximum wind speed specified by the manufacturer.

This is more important if the crane is lifting loads close to its rated capacity.

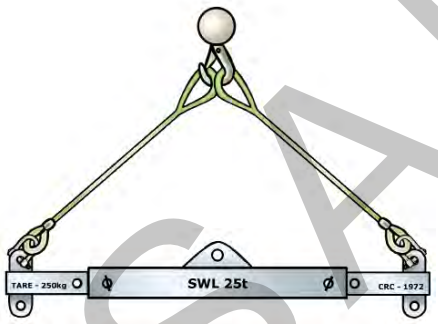
Check the working load limit (WLL) of the load.

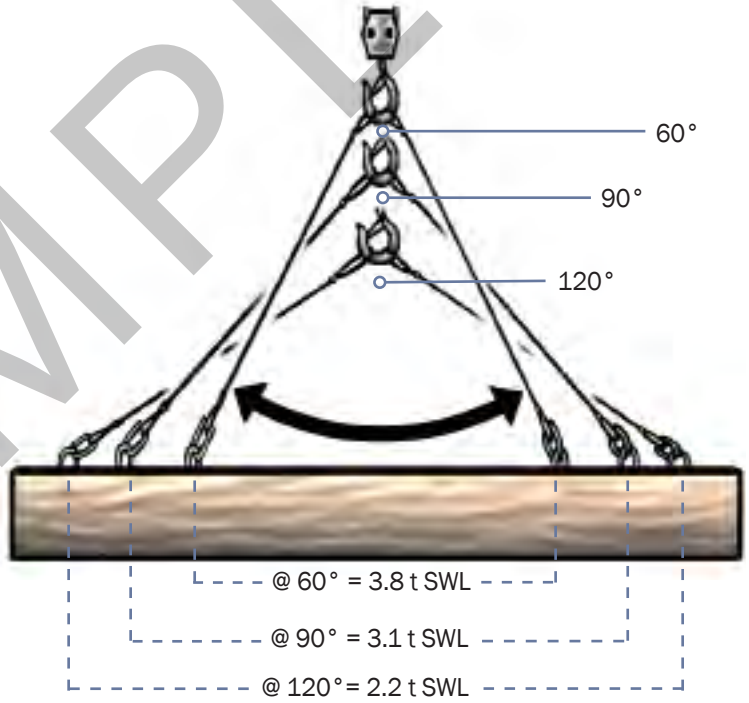
WLL refers to the maximum allowed weight that a particular piece of rigging can handle under normal conditions. For instance, a winch strap with a WLL of 10,000 (10T) should not be used to secure any load above that weight, as it exceeds what it is rated for.

When you use two slings at an angle, each sling has more force on it.

This means the slings cannot lift as much weight. As the angle goes up, the amount you can lift goes down.

Does the crane and equipment have enough capacity to carry the load? Check the SWL.

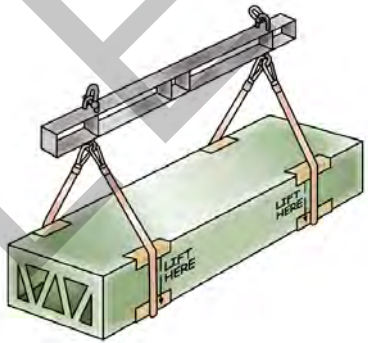




Lifting or slinging points on a load

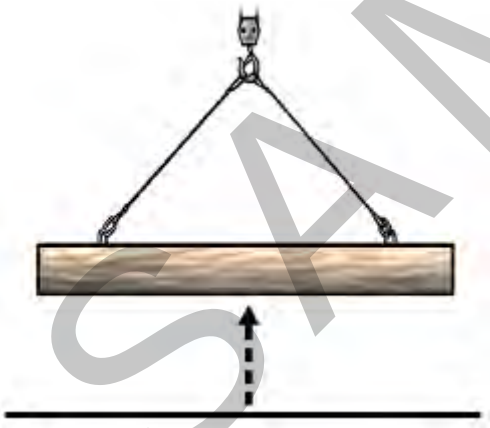
Some loads have specific areas they must be lifted by. These areas may be re-enforced to help distribute the weight evenly when it is being lifted.

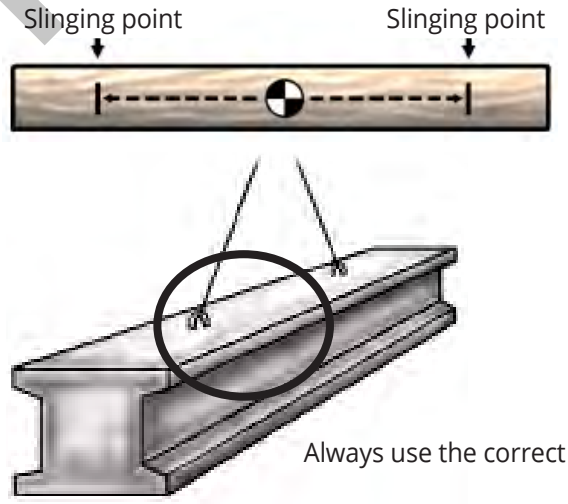
Check for manufacturer's specifications/markings on the load. If the load has set points for lifting gear they will be marked by decals (symbols) or writing.



To work out the safe lifting/sling points you can:

1. Measure the distance from the centre out to the sling points. Make sure the weight is evenly distributed.

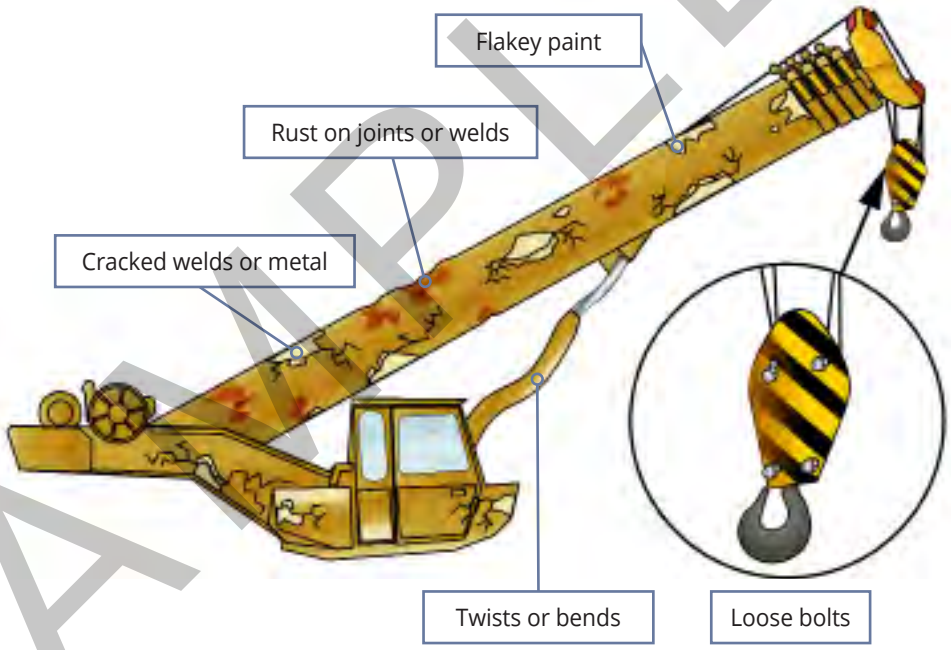




QUESTION 60

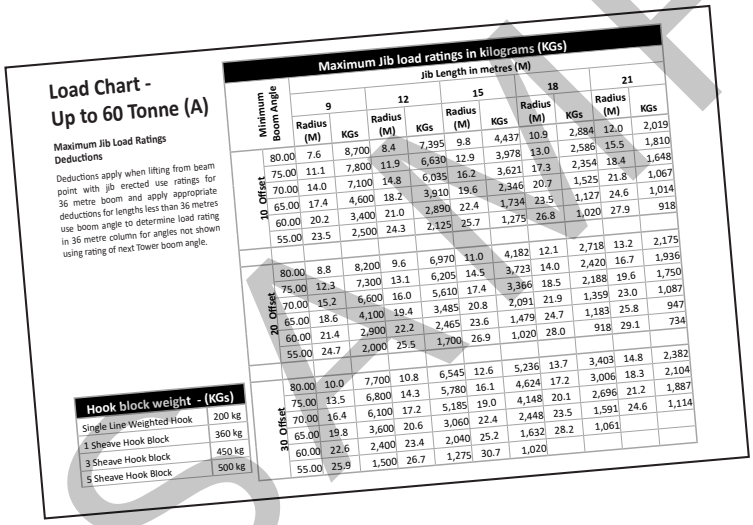
You are inspecting the crane.

What are some defects you should look for on the boom or superstructure?



READING LOAD CHARTS

FOR CRANES UP TO 60 TONNES



Load Chart - Up to 60 Tonne (A)

Maximum Jib Load Ratings Deductions

Deductions apply when lifting from beam point with jib erected use ratings for 36 metre boom and apply appropriate deductions for lengths less than 36 metres use boom angle to determine load rating in 36 metre column for angles not shown using rating of next Tower boom angle.

Maximum Jib load ratings in kilograms (KGs)

Minimum Boom Angle	Jib Length in metres (M)	9		12		15		18		21	
		Radius (M)	KGs	Radius (M)	KGs	Radius (M)	KGs	Radius (M)	KGs	Radius (M)	KGs
10 Offset	80.00	7.6	8,700	8.4	7,395	9.8	4,437	10.9	2,884	12.0	2,019
	75.00	11.1	7,800	11.9	6,630	12.9	3,978	13.0	2,586	15.5	1,810
	70.00	14.0	7,100	14.8	6,035	16.2	3,621	17.3	2,354	18.4	1,648
	65.00	17.4	4,600	18.2	3,910	19.6	2,346	20.7	1,525	21.8	1,067
	60.00	20.2	3,400	21.0	2,890	22.4	1,734	23.5	1,127	24.6	1,014
	55.00	23.5	2,500	24.3	2,125	25.7	1,275	26.8	1,020	27.9	918
20 Offset	80.00	8.8	8,200	9.6	6,970	11.0	4,182	12.1	2,718	13.2	2,175
	75.00	12.3	7,300	13.1	6,205	14.5	3,723	14.0	2,420	16.7	1,936
	70.00	15.2	6,600	16.0	5,610	17.4	3,366	18.5	2,188	19.6	1,750
	65.00	18.6	4,100	19.4	3,485	20.8	2,091	21.9	1,359	23.0	1,087
	60.00	21.4	2,900	22.2	2,465	23.6	1,479	24.7	1,183	25.8	947
	55.00	24.7	2,000	25.5	1,700	26.9	1,020	28.0	918	29.1	734
30 Offset	80.00	10.0	7,700	10.8	6,545	12.6	5,236	13.7	3,403	14.8	2,382
	75.00	13.5	6,800	14.3	5,780	16.1	4,624	17.2	3,006	18.3	2,104
	70.00	16.4	6,100	17.2	5,185	19.0	4,148	20.1	2,696	21.2	1,887
	65.00	19.8	3,600	20.6	3,060	22.4	2,448	23.5	1,591	24.6	1,114
	60.00	22.6	2,400	23.4	2,040	25.2	1,632	28.2	1,061		
	55.00	25.9	1,500	26.7	1,275	30.7	1,020				

Hook block weight - (KGs)	
Single Line Weighted Hook	200 kg
1 Sheave Hook Block	360 kg
3 Sheave Hook block	450 kg
5 Sheave Hook Block	500 kg

NOTE:
Please read the 'Reading Load Charts for all crane classes' before reading this section.

Introduction to load charts

Load chart

All cranes have their **own** load chart. They should be in place and readable. The load chart gives information about the load capacity of the crane in a given configuration (set up). The cranes capacity changes depending on how the crane is set up.

Configuration

The configuration of the crane includes things like:

- The outrigger set up (if applicable)
- The length and angle of the main boom
- Operating radius
- Maximum line load and winch capacity
- Fly jib and hook attachments.

Important information

Other important information may include:

- Limitations of boom angles
- Operational conditions. For example wind speed.

Crane set-up

A load chart refers to a crane that is set up:

- According to manufacturers specifications
- On firm, level ground
- In ideal weather conditions
- With outriggers/stabilisers fully extended (where applicable)
- Tyres correctly inflated and in good condition.

Read all of the information on the load chart.

Introduction to load charts

All cranes have their own load chart. The load chart gives information about the load capacity of the crane in a given configuration (set up). The crane's capacity changes depending on how the crane is set up.

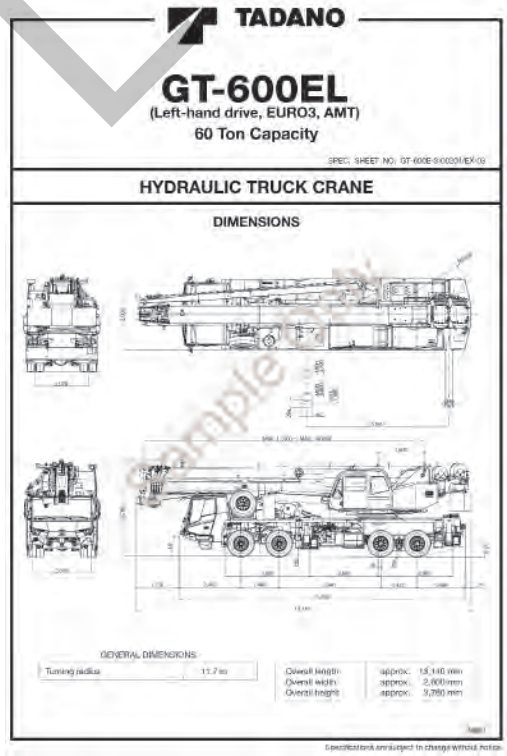
The configuration of the crane includes:

- the outrigger set up
- the length and angle of the main boom
- maximum line load and winch capacity
- fly jib and hook attachments.

Other important information can include:

- specific limitations of boom angles
- operational condition such as wind speed.

Read all of the information on the load chart.


TADANO

GT-600EL

(Left-hand drive, EURO3, AMT)

60 Ton Capacity

HYDRAULIC TRUCK CRANE

DIMENSIONS

GENERAL DIMENSIONS

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:

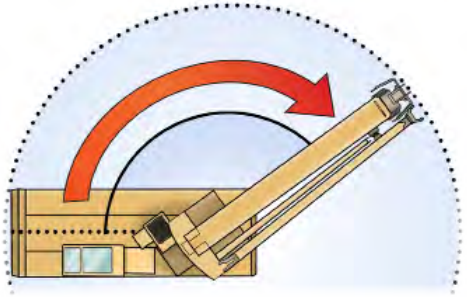
The crane can do the lift. You do not need to lift the load far off the ground to check that it is stable.

You need to confirm the weight of the load.

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

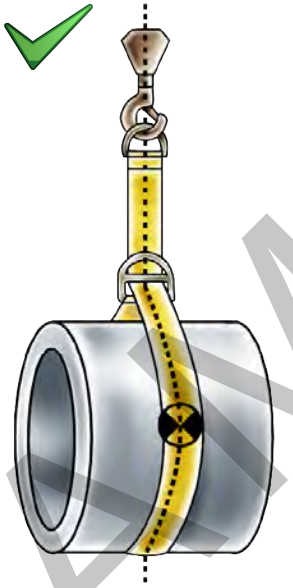
- Lifting slings/chains have been positioned correctly for even weight distribution
- Make sure the load is secure.
- Make sure the crane is stable.
- Check that crane functions are working.

There is enough clearance for the boom movement

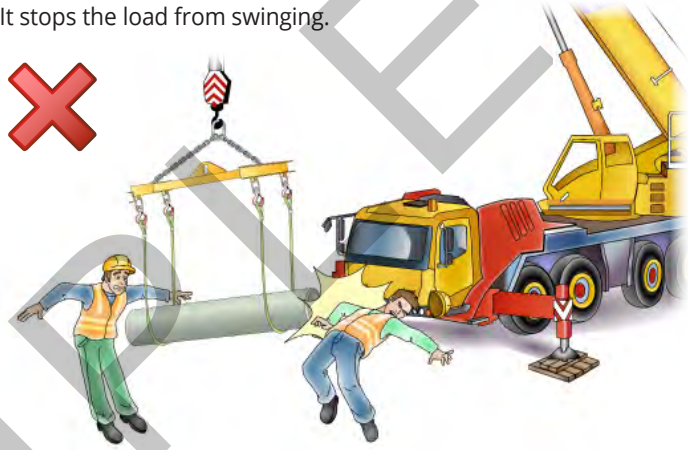


QUESTION 118

Why does the lifting hook need to be over the centre of gravity of the load?



It stops the load from swinging.



This also stops the load from being snigged or dragged.

SLEWING MOBILE CRANE LEARNER WORKBOOK

TLILIC0023 Licence to operate a slewing mobile crane (up to 60T)

With load chart calculations similar to NAI

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Learner name:

Student number: Date:

Contents

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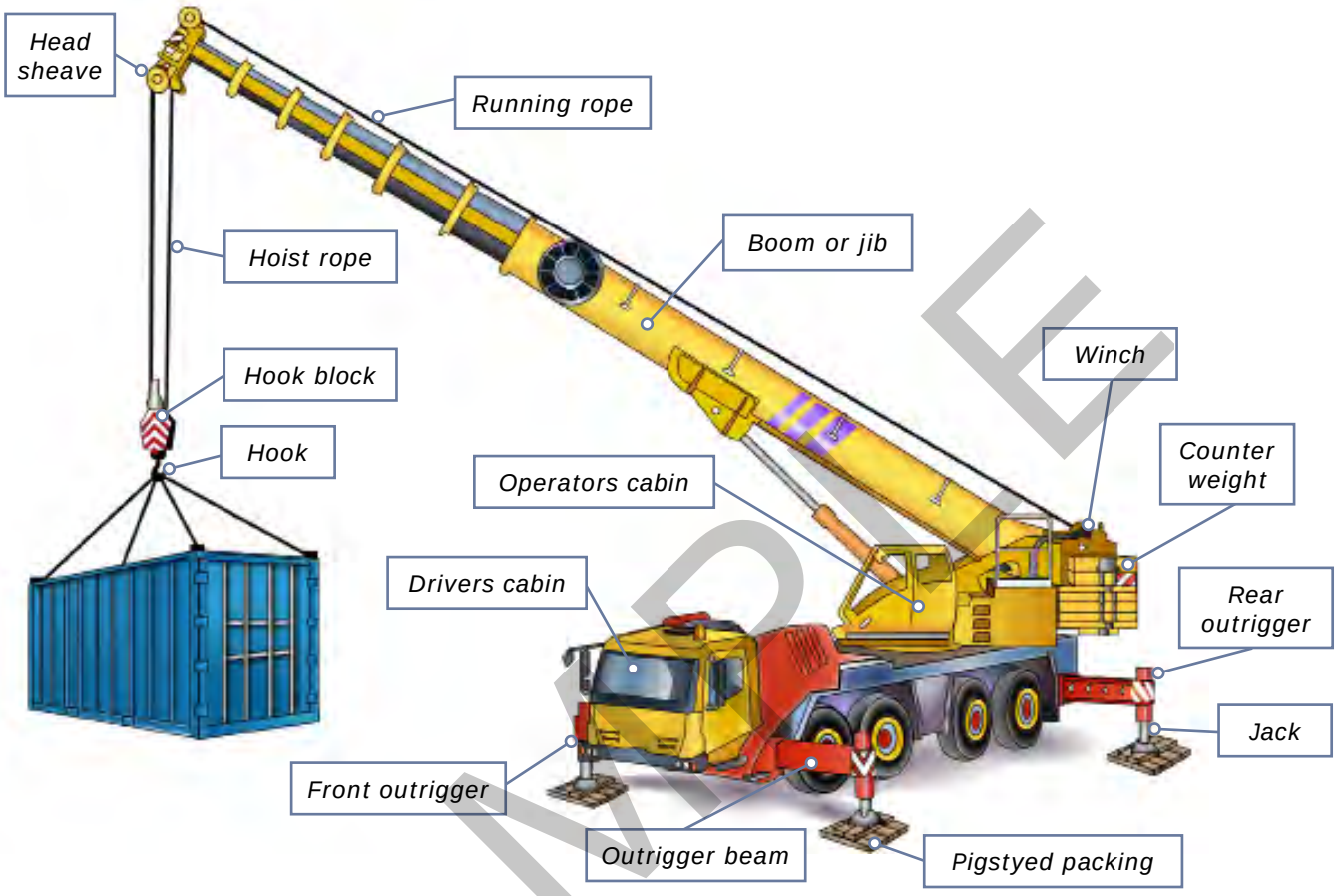
Parts of a slewing mobile crane



Slewing mobile crane

Rough terrain slewing crane

Crawler 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 3

Check 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.

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: 1.2

Check the ground conditions

Before you set up the crane in the work area, check that the ground can support the crane and the load.

Theory Training Task 32

Performance Criteria: 1.2

Do you think the following **ground conditions** are safe to set up a slewing mobile 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 33

Performance Criteria: 1.2

What might happen if you set up the slewing mobile crane over underground services?

Slewing mobile crane charts (up to 60 tonnes)

Answer these questions if you are studying the **TLILIC0013 Licence to operate a slewing mobile crane (up to 60 tonnes)**.
If you are studying for a different licence, skip to that section.

Note: For the following crane exercises us the TADANO GT-600EL 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.

TADANO

GT-600EL

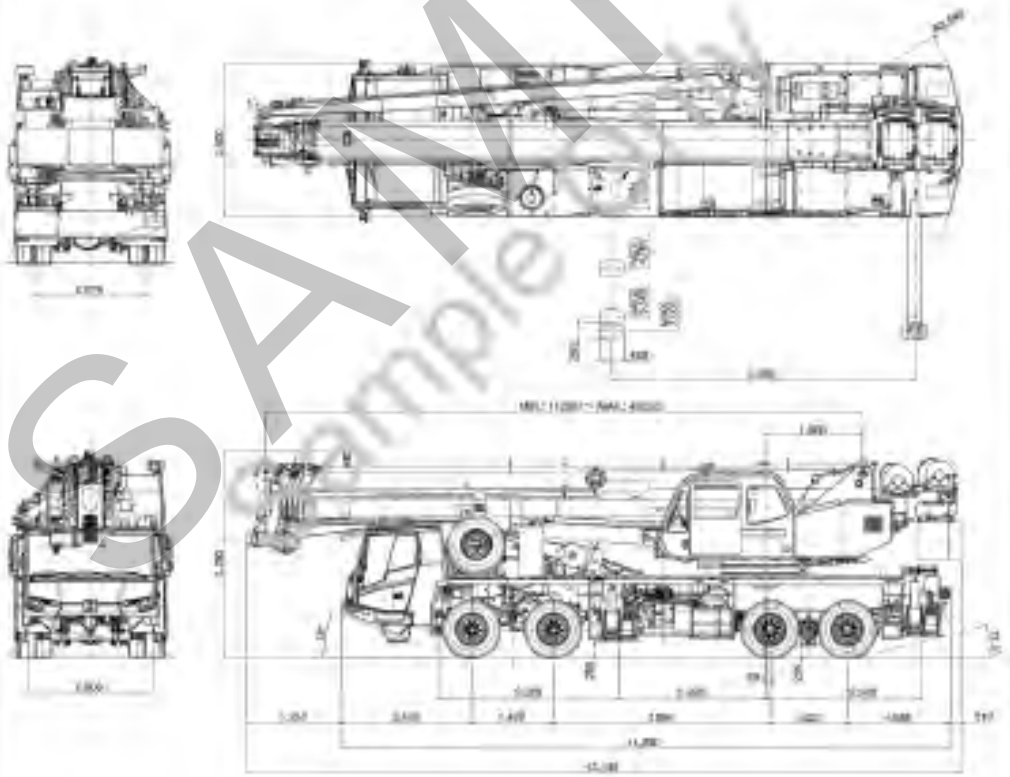
(Left-hand drive, EURO3, AMT)

60 Ton Capacity

SPEC. SHEET NO. GT-600EL3-0201/Ex-03

HYDRAULIC TRUCK CRANE

DIMENSIONS



GENERAL DIMENSIONS

Turning radius	11.7 m	Overall length	approx. 13,140 mm
		Overall width	approx. 2,800 mm
		Overall height	approx. 3,780 mm

Page 1

Specifications are subject to change without notice.

Load Chart Activity 1

Performance Criteria: 2.7, 3.1

Note: Use the TADANO GT-600EL load charts

Scenario 1

Now that you have setup the Tadano GT-600EL with a 6.5m outrigger spread, you extend the boom to 19m in Telescoping Mode I and lower the 60T hook block to unload a machine motor from a truck

a) How many boom sections are extended with a 19m boom length in tele mode 1?

Answer: = ...

b) What is the maximum parts of line can the 60T hook block be configured in with the configuration listed in scenario 1?

Answer: = ...

c) What is the rated capacity at a 14m radius?

Answer: = ...

d) You receive a weighbridge certificate that shows that the machine motor weighs 4.1t. Can you lift the panel off the truck at a 14m radius? Show working

Answer: = ...

.....

.....

Calculations:

Rated capacity at 14m radius with boom length of 19m in telescoping mode I is = 4.5 tonnes.
Deductions:
Hook block 430 kg
Maximum load that can be lifted = Rated capacity – deductions =
(4.5 tonnes - 0.43 tonnes) = 4.07 tonnes.

Answer: = ...

[Continued next page]

e) How could you re-configure the crane to pick up the machine motor and keeping a main boom length of 19m? show reasoning why?

Answer: = ...

Scenario 2

Now that you have setup the Tadano GT-600EL with a 6.5m outrigger spread, you extend the boom to 35m in Telescoping Mode II and lower the 60T hook block to unload a precast panel from a truck.

f) What is the rated capacity of the winch in a single fall composition?

Answer: = ...

g) How many boom sections are extended with a 35m boom length?

Answer: = ...

h) How many parts of line should the 60T hook block be configured in?

Answer: = ...

i) On 4.7m spread outriggers, what is the rated capacity at a 10m radius?

Answer: = ...

j) You receive a precast panel certificate that shows a weight of 6.6T. Can you lift the panel off the truck at a 10m radius? Show working

Calculations:

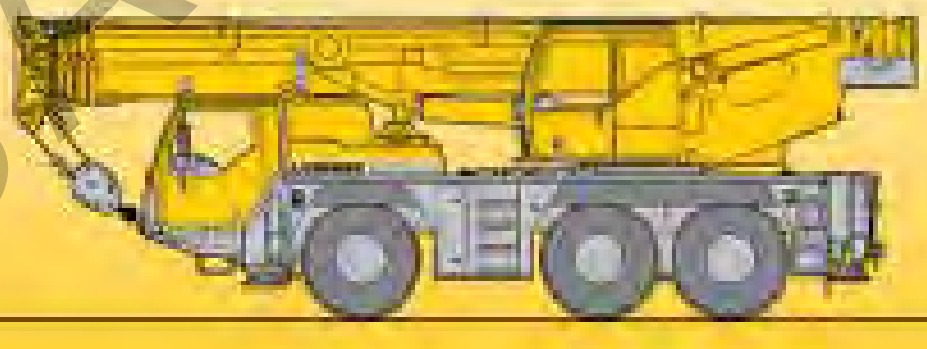
Rated capacity at 10m radius with boom length of 35m in telescoping mode II is 6.8 tonnes.
Deductions:
Hook block 430 kg
Maximum load that can be lifted = Rated capacity – deductions =
(6.8 tonnes - 0.43 tonnes) = 6.37 tonnes.

Answer: = ...

Mobilkran · Mobile Crane LTM 1055-3.2

Grue mobile · Autogrù
Grúa móvil · Мобильный кран

Technische Daten · Technical Data
Caractéristiques techniques · Dati tecnici
Datos técnicos · Технические данные



LIEBHERR

General Questions

a) What counterweight is fitted to the crane to allow it to have on-road axle weights of 12t?

Answer: = ...

b) What is the rated capacity of the 7-sheave hook block?

Answer: = ...

c) What is the tare weight of the 30.2t rated capacity hook block?

Answer: = ...

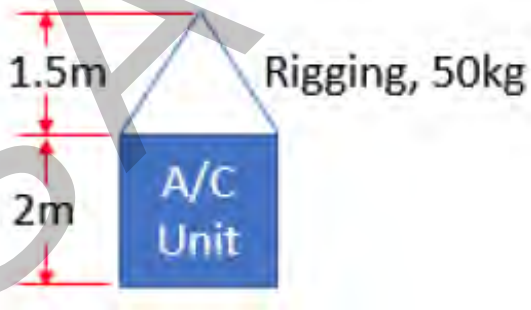
d) The working radii on the LTM 1055 3.2 is measured from where on crane?

Answer: = ...

Scenario 1

A Liebherr LTM 1055-3.2 is used to lift an air conditioner to the top of a 30m building. The crane is set up such that the edge of the building is 8m away from the slew centre of the crane. The centre of the air conditioner needs to be landed 2m from the edge of the building.

Dimensions of the air conditioner and rigging are shown below:



e) What is the minimum boom length you should use to lift this air conditioner unit?

Answer: =

[Continued next page]

Part 5

Set up the crane

Performance Criteria: 1.4, 1.6

Follow safety procedures

Follow all of the safety procedures when you drive the crane to the work area.

Theory Training Task 36

Performance Criteria: 1.4, 1.6

Circle the correct answer for the following statements.

a) When driving a crane you do not have to obey road signs.

True **False**

b) When driving a crane you must check for clearances below tunnels and powerlines.

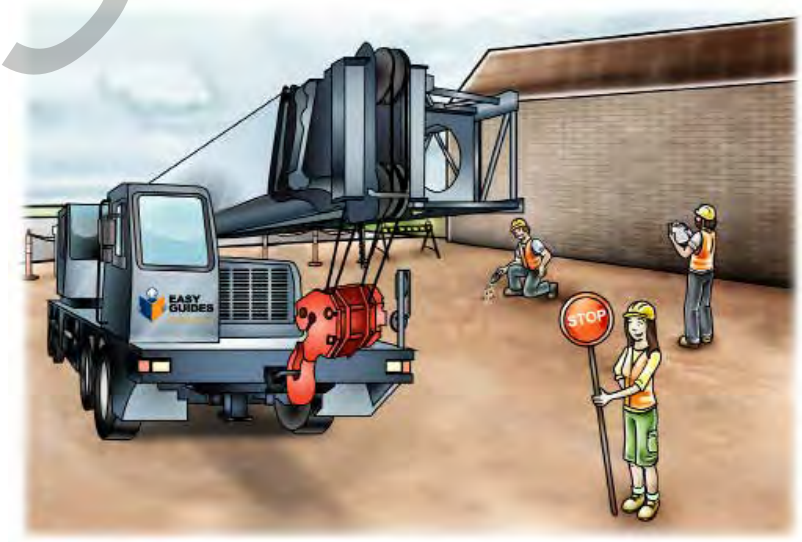
True **False**

c) When driving a crane outriggers/stabilisers do not have to be retracted.

True **False**

d) Pedestrians don't need to be a safe distance from the crane.

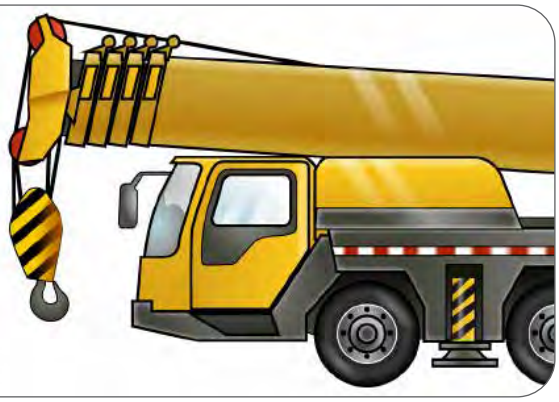
True **False**



Performance Criteria: 1.2, 2.1

Position the crane

Position the crane in a spot which is good for balance and the lift.

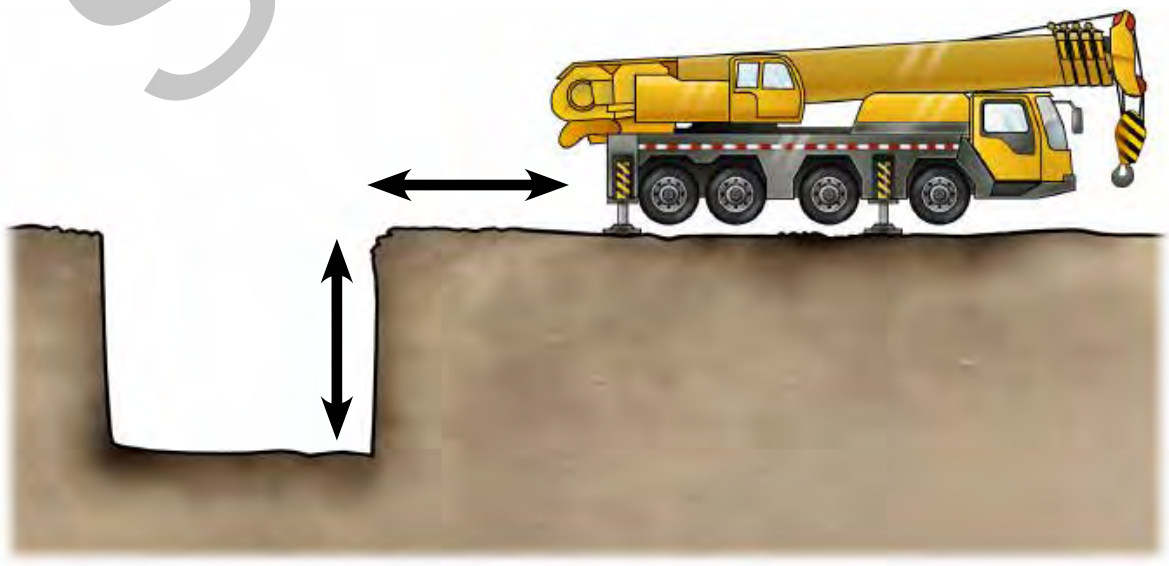


Theory Training Task 37

Performance Criteria: 1.2, 2.1

a) How far away should you set up your crane from a 4 metre deep trench or excavation?

b) If the ground is soft near the trench, what should you do?



Part 6

Do the lift

Performance Criteria: 2.3

Access the crane safely

Climb in and out of the crane's cabin safely.

Theory Training Task 47

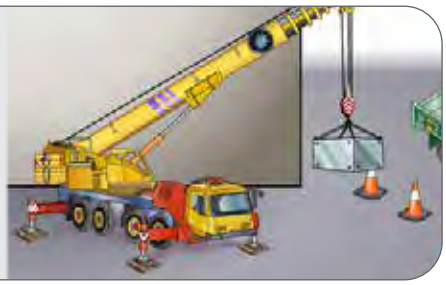
Performance Criteria: 2.3

How should you get in and out of the crane's cabin?

Performance Criteria: 1.3, 2.5, 2.6

Check the crane's capacity

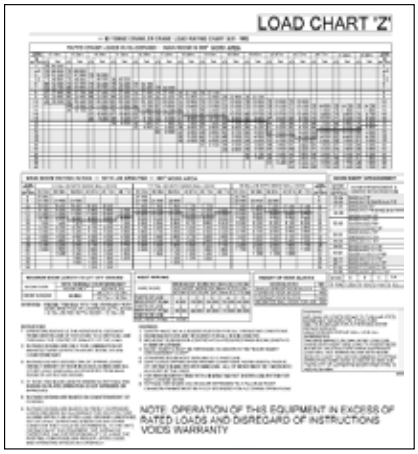
Check the crane's load capacity, and always stay within the safe working limit (SWL) of the crane and boom.



Theory Training Task 48

Performance Criteria: 1.3, 2.5, 2.6

How do you know that the load is within the limits of the crane?



TLILIC0013

Licence to operate a slewing mobile crane

(up to 60 tonnes)

MAPPING DOCUMENT

The information and questions contained in the Safety and Licence Guide/PowerPoint Presentation, Learner Workbook/Assessment and Logbook have been mapped to the elements, performance criteria, and knowledge and performance evidence for the unit of competency TLILIC0013 Licence to operate a slewing mobile crane (up to 60 tonnes)

Elements and Performance Criteria

Element 1	Performance Criteria	Safety and Licence Guide and PowerPoint	Learner Workbook / Trainer's Marking Guide	Review Questions Formative Assessment
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	• Set up the crane for the task • Plan the lift • Identify and estimate the weight of the load **Question** 8, 9	Practical Training Task 1	Question 24
	1.2 Work area operating surface is confirmed to determine ground suitability for operational use of mobile crane in accordance with workplace procedures	• Outriggers and packing • Why you need packing • Bearing capacity of different types of ground • Packing formula • Types of packing **Question** 10, 11, 12, 13, 14, 15, 16	Theory Training Task 1 Theory Training Task 32 Theory Training Task 33 Theory Training Task 34 Theory Training Task 35 Theory Training Task 37 Theory Training Task 38 Theory Training Task 41 Practical Training Task 6	Question 33

	1.9 Information required to ensure that lifting equipment and gear inspection, use, maintenance and storage complies with manufacturer requirements is obtained and interpreted	• Make sure lifting equipment complies with manufacturer's requirements. Page 103.	Make sure lifting equipment complies with manufacturer's requirements. Page 103.	Question 21
Element 2	**Performance Criteria**	**Safety and Licence Guide and PowerPoint**	**Learner Workbook / Trainer's Marking Guide**	**Logbook Review Questions Formative Assessment**
Prepare for work/task	2.1 Consultation with workplace personnel is established and maintained to ensure lift plan is clear and consistent with site requirements in accordance with a lift plan and workplace procedures	**Question** 48, 49,50	Theory Training Task 37	Question 14 Question 13
	2.2 Risk control measures for hazards identified are checked for implementation in accordance with the lift plan and safe work procedures	• Hierarchy of hazard control details • Personal Protective Equipment (PPE) • Too dark **Question** 55, 56, 57	Theory Training Task 2 Theory Training Task 3 Theory Training Task 4 Practical Training Task 1	Question 7 Question 8 Question 11 Question 12
	2.3 Mobile crane is accessed safely in accordance with manufacturer requirements and safe work procedures	**Question** 58, 59,	Theory Training Task 47 Practical Training Task 7	Question 38
	2.4 Pre-start mobile 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	• Check the crane • Crane computer • Conduct pre-operational checks • Lifting equipment **Question** 58, 60, 61, 62, 63,64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85	Theory Training Task 13 Theory Training Task 14 Theory Training Task 15 Theory Training Task 16 Theory Training Task 17 Theory Training Task 18 Theory Training Task 19 Practical Training Task 4	Question 18 Question 19 Question 20 Question 21

	2.5 Mobile crane is set up correctly with any lifting gear as and stabilised as per the lift plan in accordance with relevant manufacturer requirements including load chart/s and safe work procedures	• Multiple crane lifts • Rated capacity **Question** 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97	Theory Training Task 28 Theory Training Task 29 Theory Training Task 43 Theory Training Task 48 Theory Training Task 50 Theory Training Task 59 Practical Training Task 6 Practical Training Task 7	Question 30 Question 31 Question 35 Question 39 Question 40

Element 2	**Performance Criteria**	**Safety and Licence Guide and PowerPoint**	**Learner Workbook / Trainer's Marking Guide**	**Review Questions Formative Assessment**
Prepare for work/task	2.6 Counterweight/s are set up as required in accordance with the lift plan, relevant manufacturer requirements and safe work procedures	**Question**		
	2.7 Fly jib is set up as required in accordance with specific manufacturer requirements and safe work procedures	**Question** 98, 99, 100, 122, 123	Theory Training Task 19 Theory Training Task 28 Theory Training Task 29 Theory Training Task 44 Theory Training Task 45 Theory Training Task 48 Theory Training Task 49 Theory Training Task 51 Theory Training Task 63 Theory Training Task 64 Theory Training Task 66	Question 21 Question 30