SLEWING MOBILE CRANE
SAFETY AND LICENCE GUIDE

e-book

Training support material for:

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

Produced by:

EASY GUIDES
Australia Pty Ltd

PICTURE BASED. PLAIN ENGLISH. LEARNING MADE EASY.

Contents

Introduction to Slewing Mobile Crane (over 100 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.

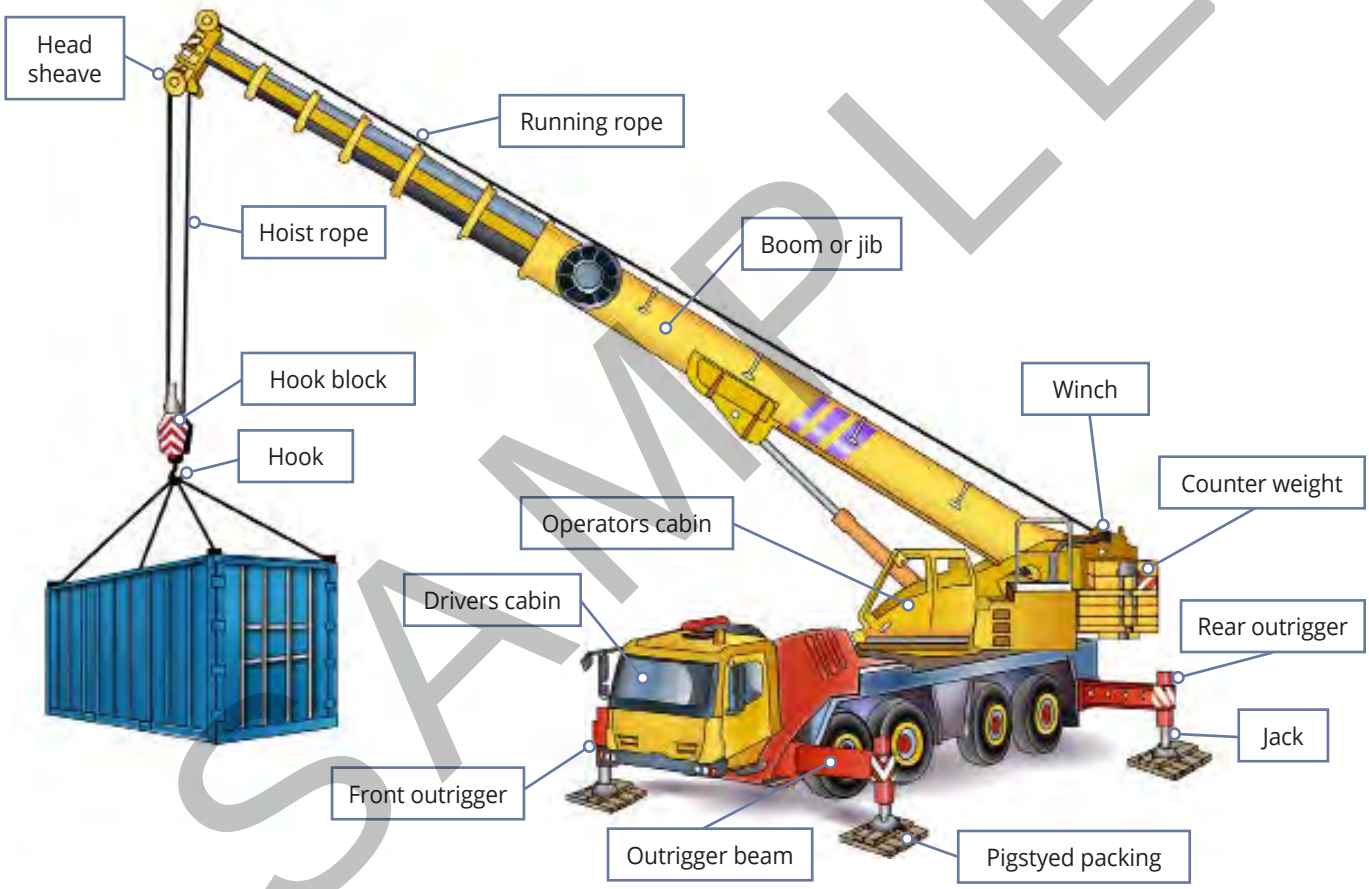
Slewing mobile crane

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



Element 1 – Plan work / task

QUESTION 7.2

How do we determine what loads must be performed?

We look at the lift plan.

How else can we determine the rated capacity of a crane?

We can look at the load chart.

Lift Plan

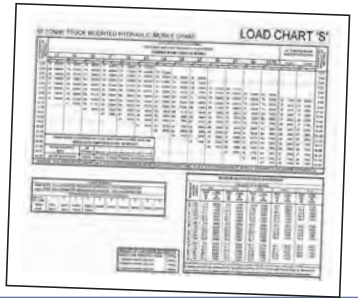
1. Project Details:		Version No:	
Candidate Name:		**Site Pick up address:**	
Operator Contact Details / Supervisor		**Site Drop off Address:**	
Crane make / model		**Crane ID**	
Lift 1 Description			
Lift 2 Description			
Lift 3 Description			
Lift 4 Description			

Item Details	**Lift 1**	**Lift 2**	**Lift 3**	**Lift 4**
Weight of Load	Kg	Kg	Kg	Kg
Weight of rigging	Kg	Kg	Kg	Kg
Weight of hooks	Kg	Kg	Kg	Kg
Additional Weight	Kg	Kg	Kg	Kg

The following is some information that you might find in a **lift plan.**

- **Load 1.** a load of >50% of the RC of the crane with a boom length of >75%, and
- **Load 2.** stillage containing at least ten scaffolding standards or containing a load of steel pipes of equivalent weight that requires a dogger to sling, and
- **Load 3.** an asymmetrical load that requires a dogger to sling, and
- **Load 4.** a round load with a minimum diameter of 300 mm and minimum length of three m that requires a dogger to sling

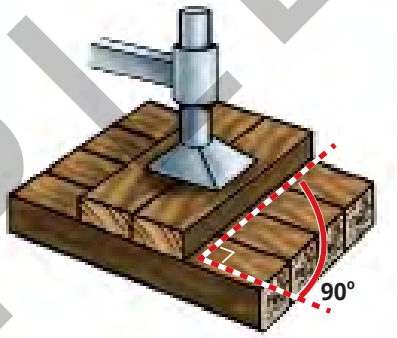
asymmetrical load



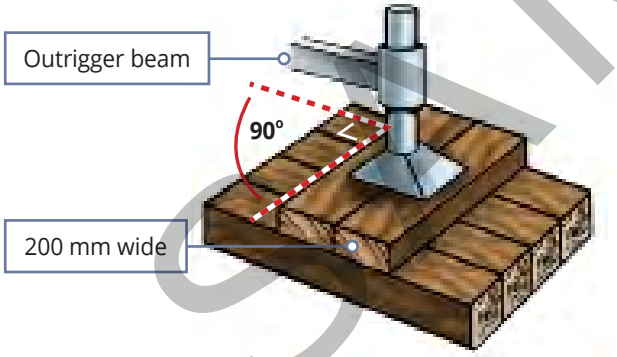
Outriggers and packing (continued)

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.



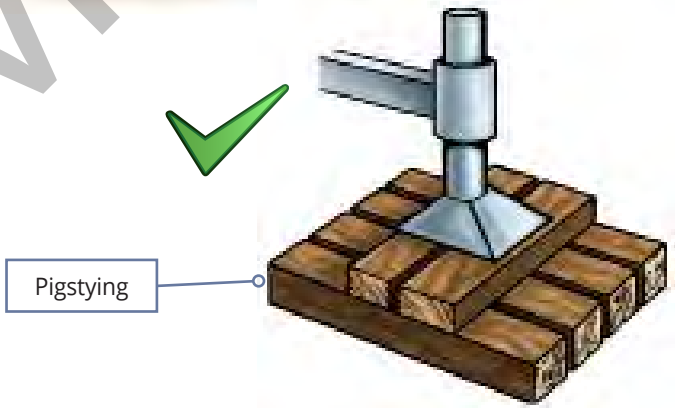
Packing, outriggers and jacks should be checked regularly during an operation.

QUESTION 13

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

How can you make the crane stable?

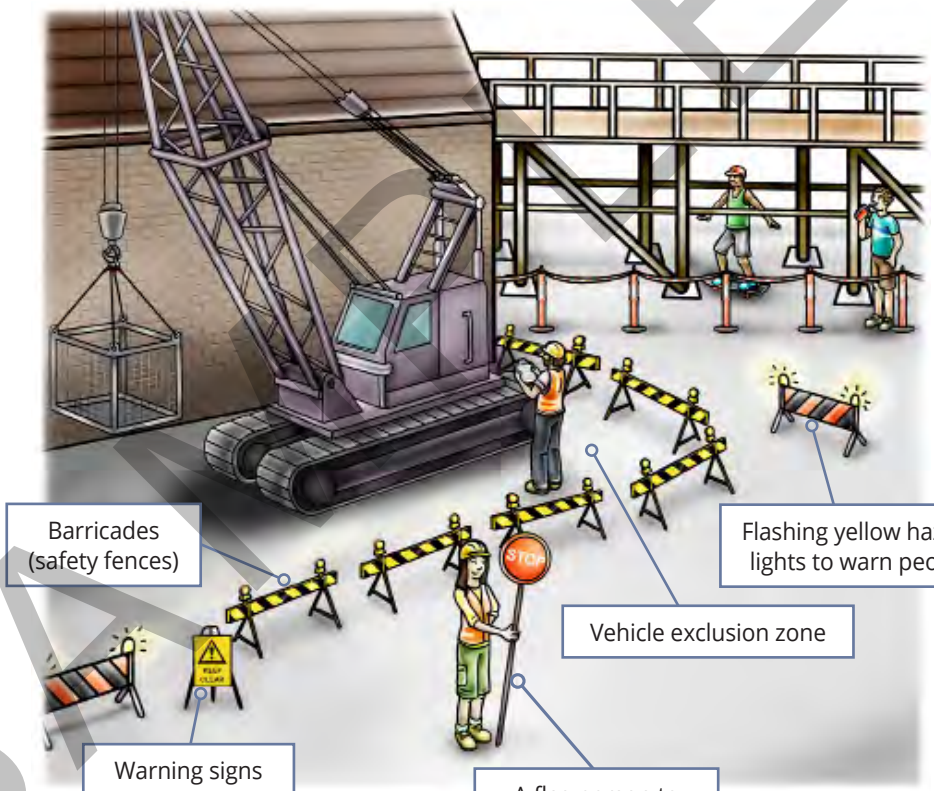
You can use hardwood packing or steel plates (cribbing or pigstying).



QUESTION 43

What hazard controls can you use for vehicles or plant on the job?

Some methods you can use are:



Element 2 – Prepare for work / task

Crane computer

Enter configuration data into the crane's computer

The crane's computer helps prevent the crane from overloading and overturning. The computer also has a load limiting/indicating system.

Make sure that the computer is operating properly. The computer needs to be calibrated (tested for accuracy and adjusted if needed) every 6 months by picking up a load you know the weight of and comparing the actual weight against the computer reading.

Before using the crane, enter the boom/jib and counterweight configuration data into the crane's computer.

Examples of data you may enter into the crane's computer include:

- Boom length
- Operating radius
- Outrigger extension
- Number of falls of rope.

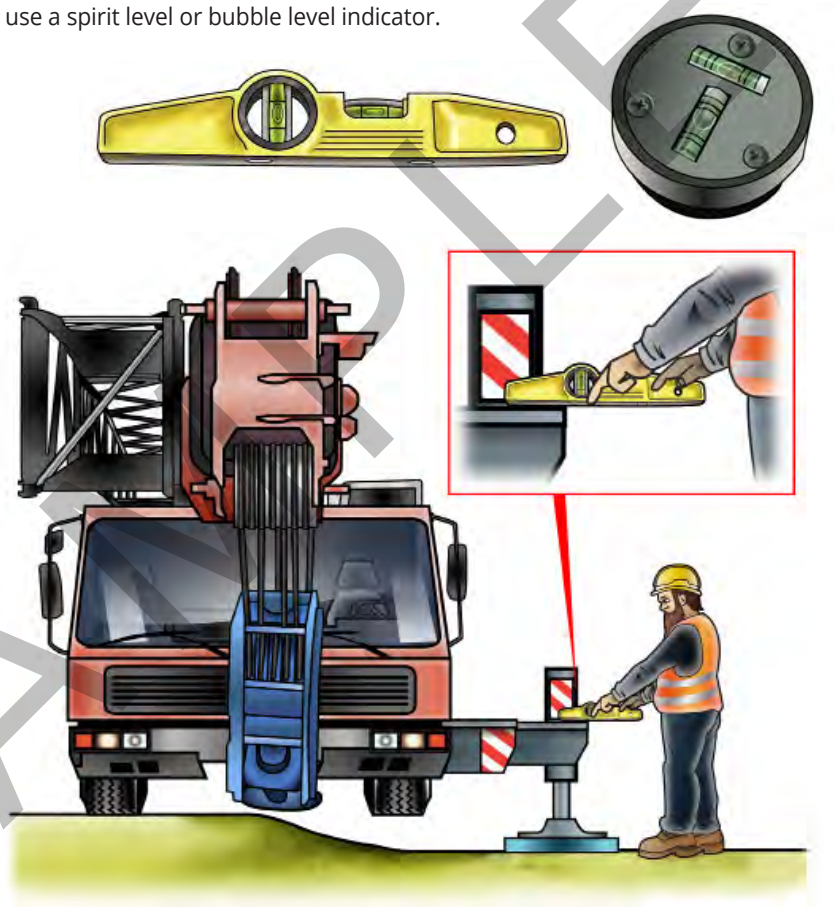
Example of a load meter/crane computer

Note:
If the load meter/crane computer shows a value more than the rated load for the empty vehicle, **do not** try to hoist the load as it is. Decrease the working radius so you **do not** overload the crane.

QUESTION 88

How do you check the crane is level?

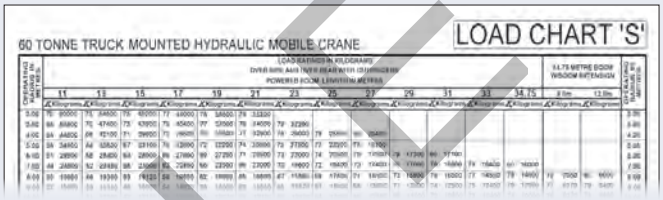
You can use a spirit level or bubble level indicator.



Element 3 – Perform work / task

Introduction to load charts

This book covers all four slewing mobile crane capacities. You only need to read the sections relevant to the licence you are studying.


60 TONNE TRUCK MOUNTED HYDRAULIC MOBILE CRANE

LOAD CHART 'S'

Load chart

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 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.

Sample Kobelco CKE2500 Crawler Crane over 100 Tone load Chart

Unit: metric ton

Counterweight: 90.0 t, Carbody weight: 24.0 t

45.7 m Boom Length

Boom length (m)	45.7				51.8				57.9				61.0				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	28.1																18.0
20.0	27.8				22.4				18.3								20.0
22.0	27.5				22.1				18.0				16.3				22.0
24.0	27.1				21.8				17.7				16.1				24.0
26.0	26.6	27.6			21.5				17.4				15.9				26.0
28.0	26.0	27.1			20.6	20.8			17.1				15.4				28.0
30.0	24.7	26.6			19.6	19.8			16.2	17.0			14.6	15.3			30.0
34.0	22.5	23.0			17.6	17.9			14.6	15.3			13.2	13.8			34.0
38.0	20.4	20.0			15.8	16.1			13.2	13.8			12.0	12.5			38.0
42.0	18.0	17.6			14.0	14.5			12.1	12.5			10.9	11.4			42.0
46.0	14.7	15.6	48.0 m/11.9		12.4	12.9			11.0	11.4			10.0	10.4			46.0
50.0	48.0 m/12.8	14.0	11.3		10.8	11.4	52.0 m/10.4		10.1	10.5			9.2	9.5			50.0
54.0		52.0 m/13.3	10.1	9.3	9.2	10.0	9.8		9.3	9.7	9.6		8.5	8.8	56.0 m/8.9		54.0
58.0			9.2	8.4		8.5	8.9	8.1	8.4	8.8	8.6		7.5	8.1	8.5		58.0
62.0			8.3	7.7			8.0	7.3	60.0 m/7.7	7.7	7.8	7.0	5.6	7.5	7.7	64.0 m/6.4	62.0
66.0			64.0 m/8.0	7.0			7.3	6.6		64.0 m/7.0	7.1	6.3		6.6	6.9	6.1	66.0
70.0							6.6	5.9			6.4	5.6			6.2	5.5	70.0
74.0								72.0 m/5.6			5.8	5.1			5.6	4.9	74.0
78.0												4.6			4.8	4.4	78.0
82.0																4.0	82.0
Reeves	3				2				2				2				Reeves

QUESTION 143

Some of the Australian standard signals used in dogging are shown here.

What does each of these signals mean?

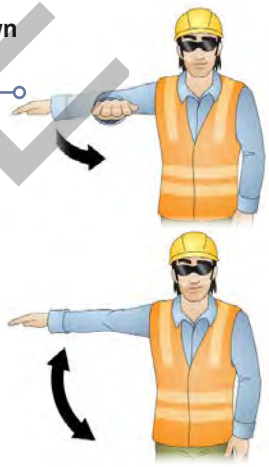
Hoisting raise

2 short

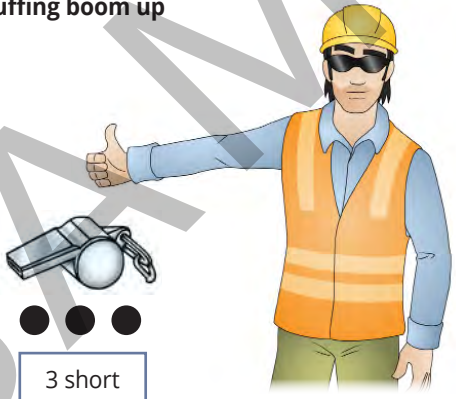
Hoisting lower/down

Commonly used signal (not Australian Standard)

1 long

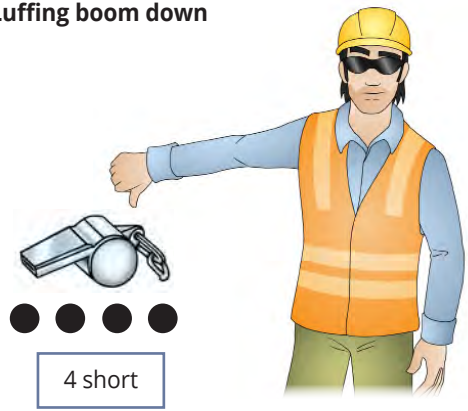


Luffing boom up



3 short

Luffing boom down



4 short

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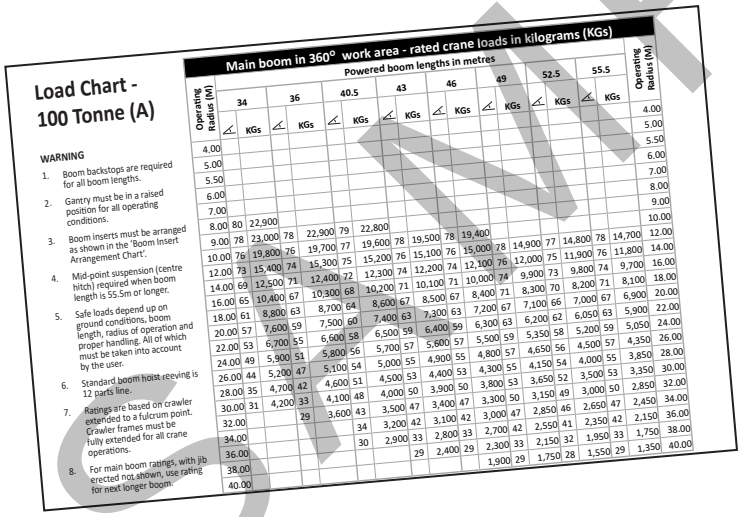
READING LOAD CHARTS

FOR CRANES OVER 100 TONNES



Load Chart - 100 Tonne (A)

WARNING

1. Boom backstops are required for all boom lengths.
2. Gantry must be in a raised position for all operating conditions.
3. Boom inserts must be arranged as shown in the 'Boom Insert Arrangement Chart'.
4. Mid-point suspension (centre hitch) required when boom length is 55.5m or longer.
5. Safe loads depend up on ground conditions, boom length, radius of operation and proper handling. All of which must be taken into account by the user.
6. Standard boom hoist reeving is 12 parts line.
7. Ratings are based on crawler extended to a fulcrum point. Crawler frames must be fully extended for all crane operations.
8. For main boom ratings, with jib erected not shown, use rating for next longer boom.

Main boom in 360° work area - rated crane loads in kilograms (KGs)

Operating Radius (M)	Powered boom lengths in metres																				Operating Radius (M)
	34		36		40.5		43		46		49		52.5		55.5						
	∠	KGs	∠	KGs	∠	KGs	∠	KGs	∠	KGs	∠	KGs	∠	KGs	∠	KGs					
4.00																					4.00
5.00																					5.00
5.50																					5.50
6.00																					6.00
7.00																					7.00
8.00	80	22,900																			8.00
9.00	78	23,000	78	22,900	79	22,800															9.00
10.00	76	19,800	76	19,700	77	19,600	78	19,500	78	19,400											10.00
12.00	73	15,400	74	15,300	75	15,200	76	15,100	76	15,000	78	14,900	77	14,800	78	14,700					12.00
14.00	69	12,500	71	12,400	72	12,300	74	12,200	74	12,100	76	12,000	75	11,900	76	11,800					14.00
16.00	65	10,400	67	10,300	68	10,200	71	10,100	71	10,000	74	9,900	73	9,800	74	9,700					16.00
18.00	61	8,800	63	8,700	64	8,600	67	8,500	67	8,400	71	8,300	70	8,200	71	8,100					18.00
20.00	57	7,600	59	7,500	60	7,400	63	7,300	63	7,200	67	7,100	66	7,000	67	6,900					20.00
22.00	53	6,700	55	6,600	58	6,500	59	6,400	59	6,300	63	6,200	62	6,050	63	5,900					22.00
24.00	49	5,900	51	5,800	56	5,700	57	5,600	57	5,500	59	5,350	58	5,200	59	5,050					24.00
26.00	44	5,200	47	5,100	54	5,000	55	4,900	55	4,800	57	4,650	56	4,500	57	4,350					26.00
28.00	35	4,700	42	4,600	51	4,500	53	4,400	53	4,300	55	4,150	54	4,000	55	3,850					28.00
30.00	31	4,200	33	4,100	48	4,000	50	3,900	50	3,800	53	3,650	52	3,500	53	3,350					30.00
32.00			29	3,600	43	3,500	47	3,400	47	3,300	50	3,150	49	3,000	50	2,850					32.00
34.00					34	3,200	42	3,100	42	3,000	47	2,850	46	2,650	47	2,450					34.00
36.00					30	2,900	33	2,800	33	2,700	42	2,550	41	2,350	42	2,150					36.00
38.00							29	2,400	29	2,300	33	2,150	32	1,950	33	1,750					38.00
40.00										1,900	29	1,750	28	1,550	29	1,350					40.00

NOTE: Please read the other 'Reading Load Charts' section 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.

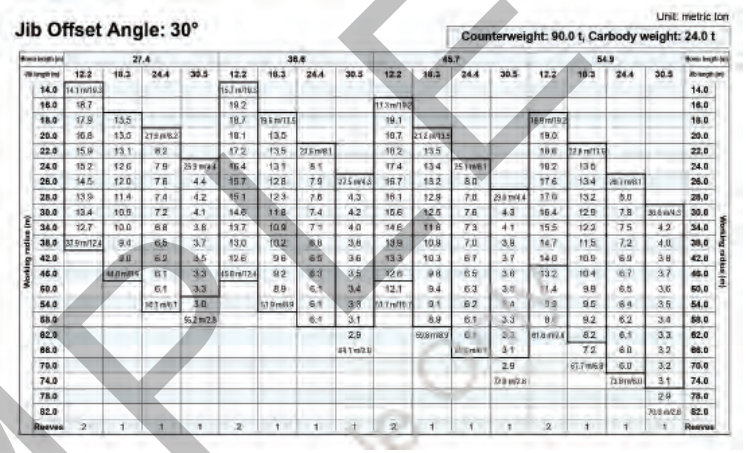
Read all of the information on the load chart.

Step 1 - Find the right load chart

The first step in reading a load chart is to make sure the load chart you have matches the crane you are using.

You should check the heading on the load chart and make sure it matches the type of crane you are using.

For example, this chart is for a crane which can lift up to 100 tonnes.



Jib Offset Angle: 30°

Unit: metric ton

Counterweight: 90.0 t, Carbody weight: 24.0 t

CRANE CHART CALCULATIONS

Look at crane charts in the Trainer's Resources in the Easy Guides 'Start-up Pack for Mobile Slewing Cranes (over 100T)'.

The crane charts include:

- CO LOAD CHART_KOBELCO CKE2500-2
- CO LOAD CHART_GROVE GMK5130-2

Answer the questions related to these crane charts. Your trainer will check your answers.

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.

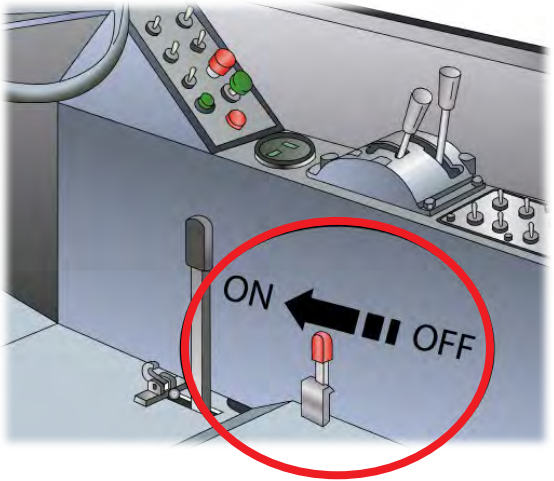
Stow boom/jib and equipment

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

Check that you have turned on all motion locks and brakes.

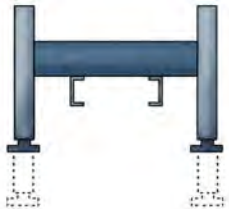


Stow and secure outriggers/stabilisers

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.