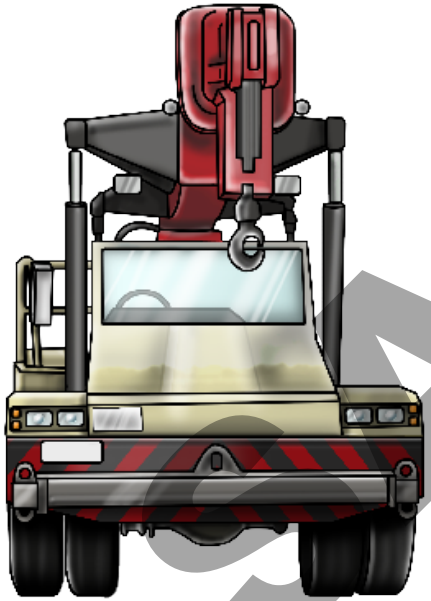
Trainer Value Pack

NON-SLEWING MOBILE CRANE SAFETY AND LICENCE GUIDE



Training support material for:

TLILIC0018
Licence to operate a non-slewing mobile crane
(Greater than 3 tonnes capacity)

Produced by:

EASY GUIDES
Australia Pty Ltd

CONTENTS

About this guide

The guide is a follow-up to your formal training.

Like all Easy Guides, this one uses plain words and pictures to help you remember what you learned in your formal training. So you can pass your test — and get your licence.

Good luck from the team at Easy Guides Australia Pty Ltd.

Note: This guide does not use the same wording as the Safe Work Australia Assessment Instrument. This Instrument cannot be shown to the learner before the test.

Easy Guides training materials have been developed around Language – Literacy – Numeracy (LLN) principles.

How to use this guide

Use it in hard copy

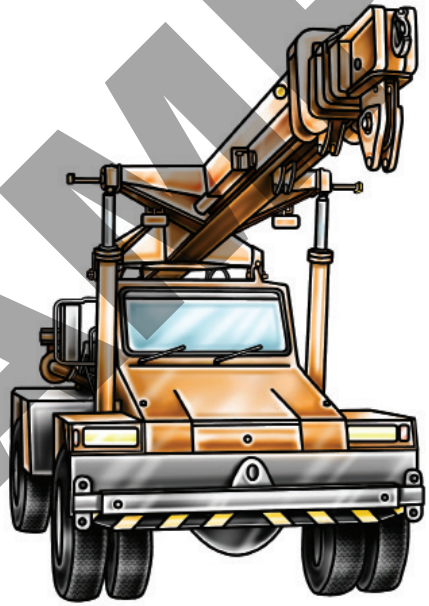
This guide helps you prepare for the test at the end of the course. Study it carefully, and then ask a friend to help you practise. They can ask you each question, and then you give the answer. Writing down the answers can also help you remember them. This also helps you see what you still need to learn. Good luck!

Or use it on screen

This guide also comes in a multimedia presentation, so you can use it on your computer or screen. The multimedia presentation is just like the guide and has exactly the same questions with the same short words and easy-to-understand pictures.

Trainers can use the multimedia presentation in class to help learners discuss questions. The trainer first shows the question and asks if anyone knows the answer. Next, the trainer will show the answer and discuss it with the learners.

INTRODUCTION TO NON-SLEWING MOBILE

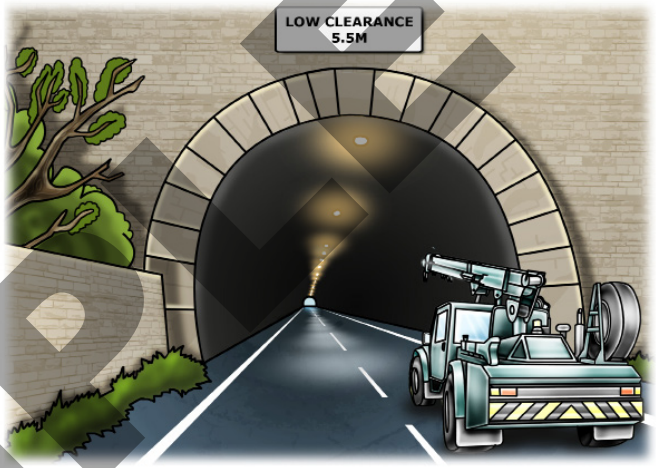


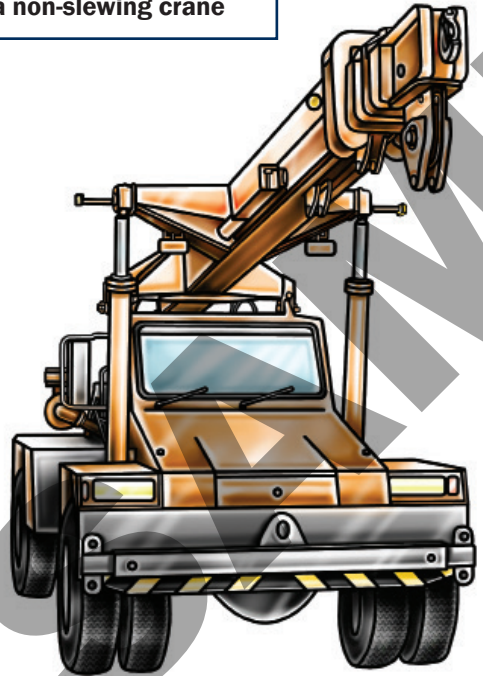
What is a non-slewing mobile crane?

A non-slewing mobile crane is a powered crane which features a boom or jib that does not slew.

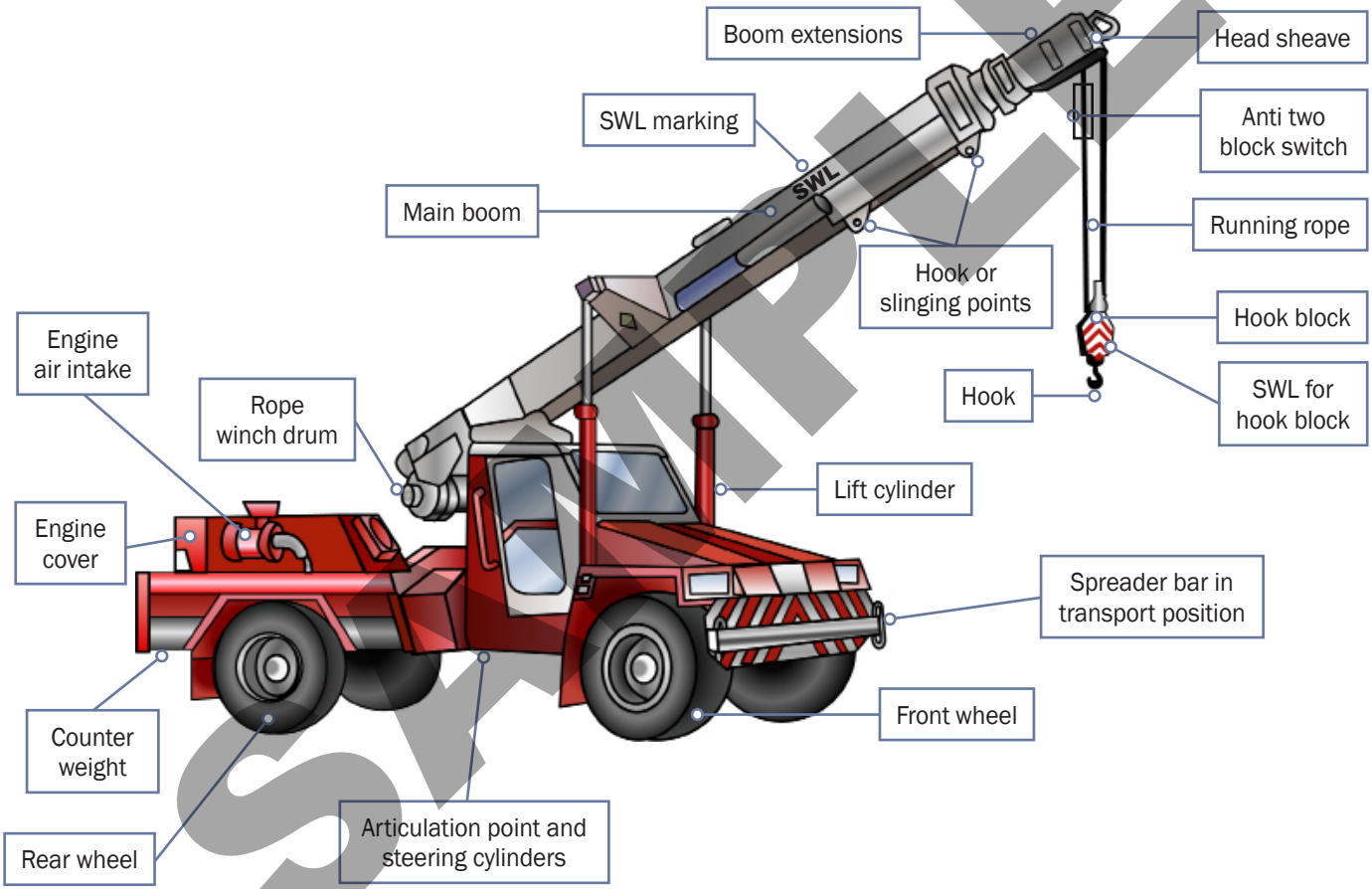
The boom can only luff up and down and telescope in and out. The crane is mounted on a vehicle.

In some states a telescopic handler is classed as a non-slewing crane





Parts of a non-slewing crane



PLAN WORK / TASK

Element 1

Identifying workplace hazards

Workplace hazards need to be identified **before** you start work.

Take a good look at your workplace and decide if anything could possibly cause injury to you or anyone else in the area.

Zones/areas to check for hazards:

Above eye level

You should check above eye level for:

- powerlines
- other overhead services
- buildings
- trees
- surrounding structures and facilities
- other obstructions

Ground to eye level

You should check around eye height for:

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

Ground level (and below)

You should check the ground to see if:

- the surface is stable and level
- there is debris or rubbish in the way
- the surface is strong enough to support the weight of any equipment or materials
- if there are any open trenches or recently filled trenches/excavations
- unstable ground
- underground services

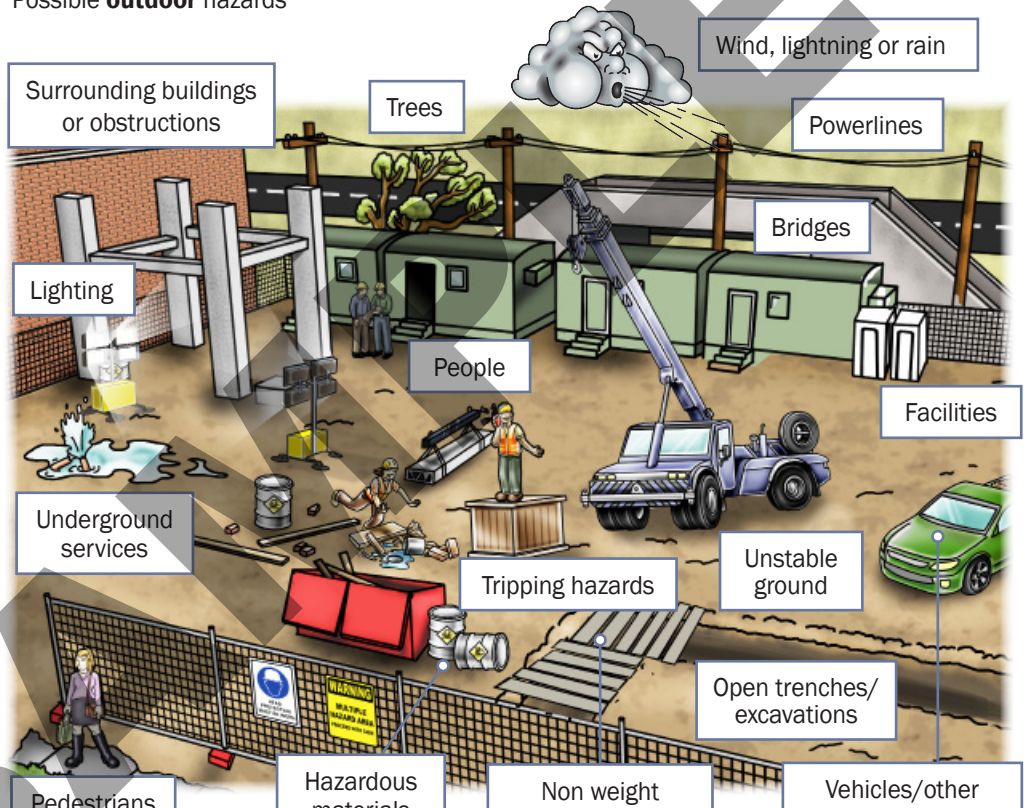
QUESTION 10

...CONTINUED FROM PREVIOUS PAGE

You have arrived on site and you are about to start using the crane. There are hazards (dangers) you might run into when using the crane.

What are some examples of hazards that you must plan for?

Possible **outdoor** hazards



QUESTION 18

What hazards (dangers) are there if you work near (the radius) of the outriggers or chassis of a non-slewing crane?

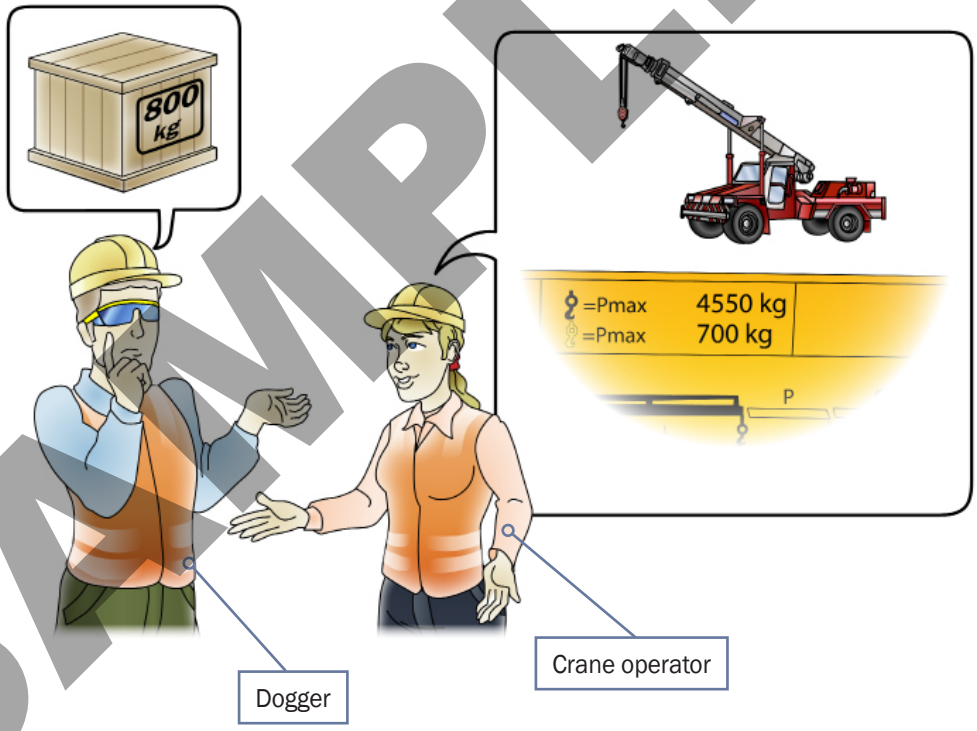
The crane or load could hit or crush you. You should stay outside the exclusion zone.

QUESTION 27

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.



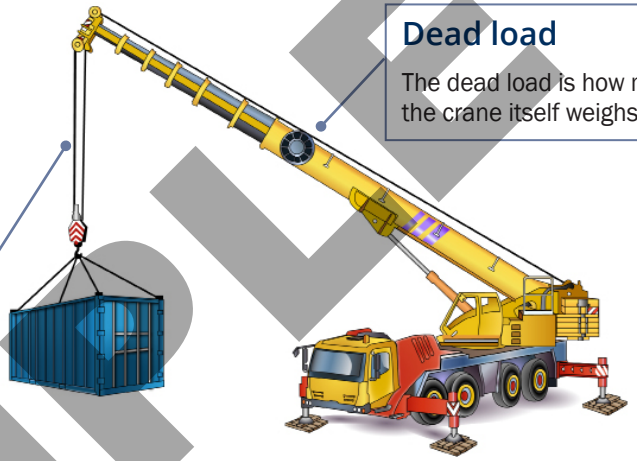
Types of loads

Types of loads to think about when you plan a job are:

Dead load
Live load
Static load
Dynamic load
Wind load.

Live load

Live load includes anything hanging from the boom, including the load, the hook, hook block and slings.



Dead load

The dead load is how much the crane itself weighs.

Static load

Static load is the weight of the crane and load on the bearing surface.

Dynamic load

The dynamic load changes when the crane and load moves.

Wind load

Wind load is when wind puts extra force on the crane and load, making it seem heavier.

PREPARE FOR WORK / TASK

Element 2

Preparing for the lift

This section covers the steps you will take when it is time to implement the lift plan.

Including:

Talking with other workplace personnel to ensure lift plan is clear and understood

Assessing weather and work environment condiitions

Putting in place all risk control measures for identified hazards (dangers)

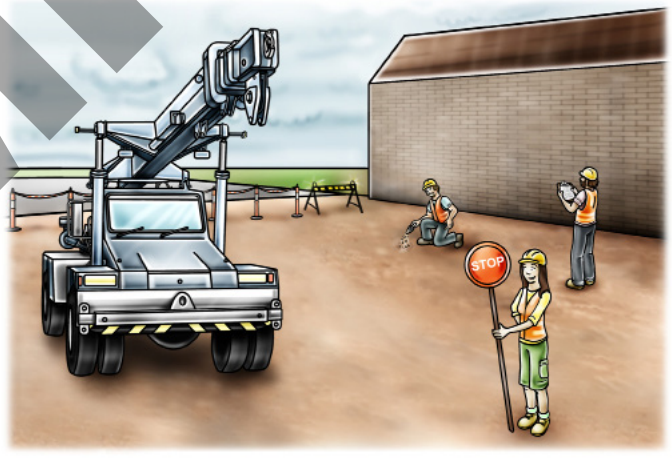
Conducting pre-operational and operational checks on all equipment

Checking the crane logbook for compliance

Calculating load weight and working load limit (WLL)

Checking the suitablility of the load destination

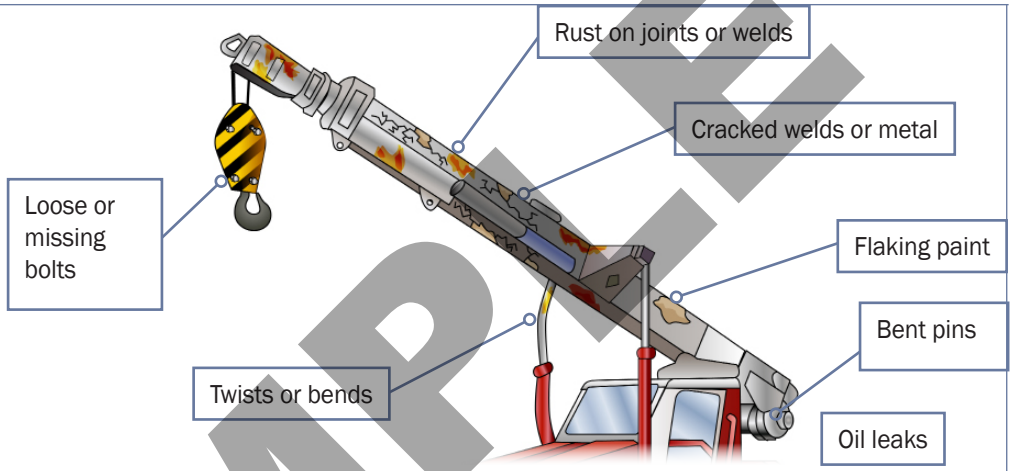
Setting up the crane for the task



QUESTION 47

You are inspecting the crane.

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



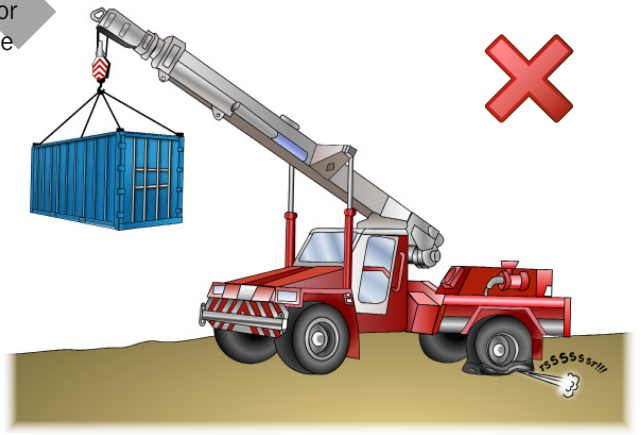
QUESTION 48

You are using a rubber tyre crane. Your crane's tyres must be at the right pressure.

Why is this important?

Tyres that are low in pressure, flat or at different pressures can make the crane unstable.

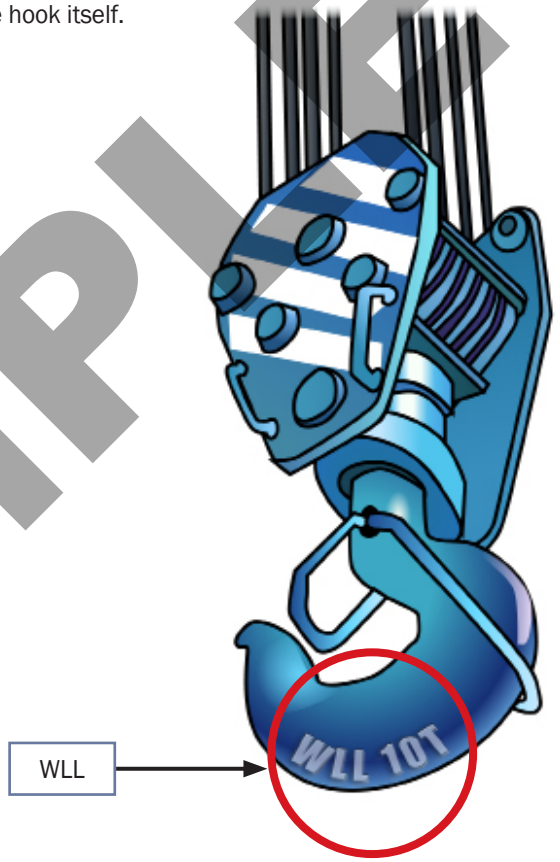
Check the load chart to find the correct tyre pressure for the crane.



QUESTION 58

How do you find out the WLL of the crane's hook?

The WLL should be marked on the hook itself.

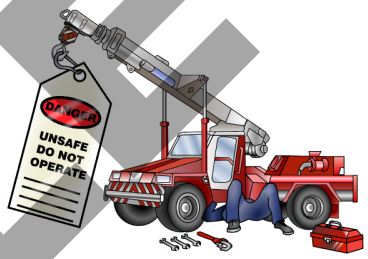


QUESTION 70

What is the crane logbook used for?

The crane logbook is used to record information for any:

- Defects that have been reported
- Defects that have been repaired
- Daily safety inspections
- Record how and when the cane was operated.
- Owner of the logbook is recorded.



MOBILE CRANE - Daily Inspection Checklist

Week Starting ___/___/___

Company/Site _____ Machine Type _____

Machine Hour Meter _____ / / Machine Number _____

CHECK DAILY BEFORE EACH SHIFT: [✓] = OK [X] = Action needed [N/A] = Not applicable	Mon	Tue	Wed	Thur	Frid	Sat	Sun
STRUCTURE: Frame, damage, wear, undercarriage, leaks, slewing							
ATTACHMENTS: Hooks, block, sheaves, winch, pulleys, hoist rope drums, stabilisers/outriggers, counterweight							
BOOM: Angle, length indicator, welds, fly extension, mounting							
WHEELS & TYRES: Nuts, pressure, damage, wear, tracks							
HYDRAULICS: Steering rams, lifting rams, hoses, leaks, wear							
GUARDS: In place, secure, alarms, warning signs, warning lights							
LOAD CAPACITY PLATE: Present, legible, clean, correct							
ENGINE: Engine oil, coolant, hydraulic oil, brake fluid, fuel, belts, air filter, power steering, wiper water, grease, battery, leaks, hoses							
CABIN: Access, seat belt, seat, loose objects							
LIGHTS: Indicators, headlights, brake lights, warning devices							
VISIBILITY: Windscreen, wipers, washer, defroster, mirrors, windows							
COMPUTER: Angle, length indicator, radius indicator							
CRANE FUNCTIONS & CONTROLS: Slew, boom raising & lowering, boom extension & retraction, steering, limit switch or cut outs, brakes, park brake, slew brake, horn, beeper, outrigger extension & retraction							
MISCELLANEOUS: Fire extinguisher, radio, door locks, decals, operators manual, warning signs, load chart, gauges							
Operator doing check to clearly write/sign their name at the bottom of each column.							

FAULT REPORTED BY _____ Date: ___/___/___

DANGER DO NOT OPERATE Description of fault _____

NOTE: Operator to TAG OUT machine if needed.

ACTION TAK

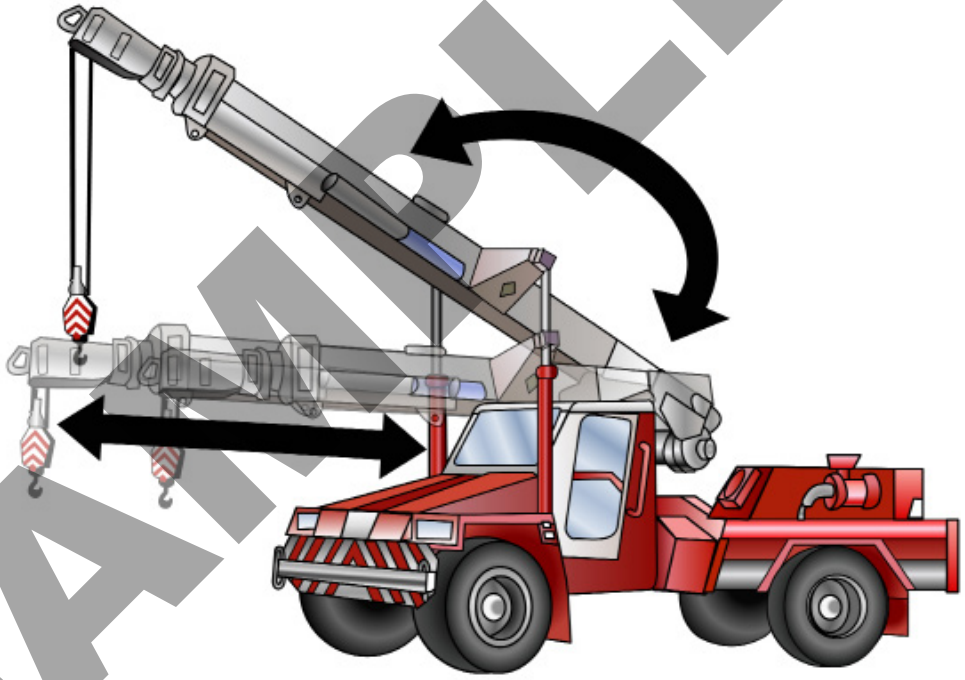
Print Name _____

Date ___/___/___

QUESTION 81

Why do you need to test all of the crane's movements and functions?

You need to test the crane fully to make sure it operates correctly and is safe to use.

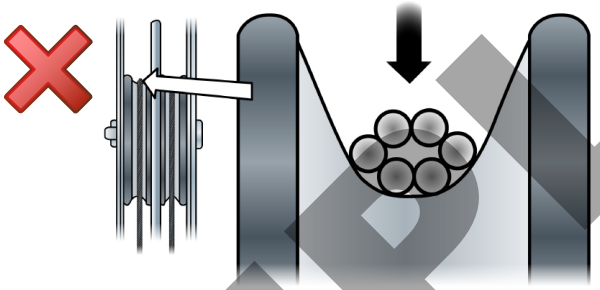


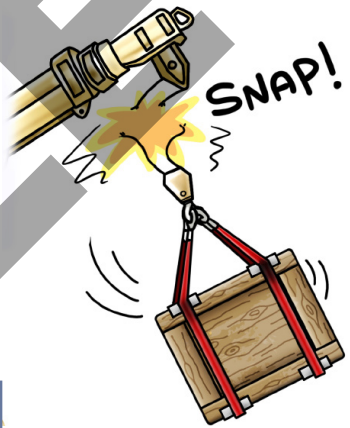
QUESTION 92

What can happen if the sheave groove is too big for the FSWR?

The FSWR can flatten out if the groove is too big.

The FSWR could fail.





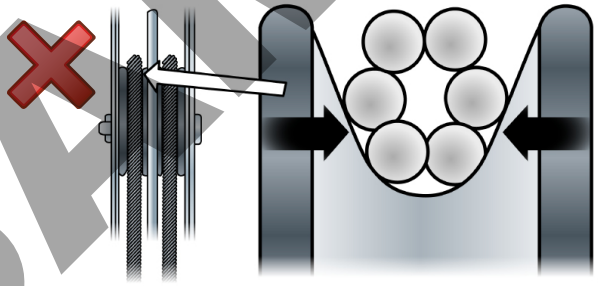
If the sheave is too large it may flatten the rope

QUESTION 93

What can happen if the sheave groove is too small for the FSWR?

A small groove can pinch or leave abrasions (rub marks) on the FSWR.

The FSWR could fail.



If the sheave is too small it may pinch or wear the rope

Angle factors

Greater angle = greater tension

Tension develops in each sling at different included angles. The greater the sling angle the greater the WLL of the slings you will need to use.

For general work

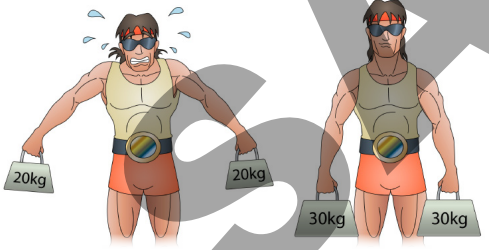
90 degrees is the recommended maximum angle between two legs of a sling for general work.

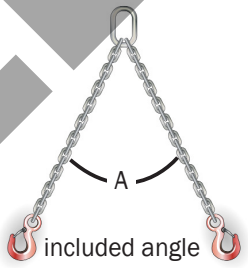
To work out the SWL, you multiply the WLL of the sling by the angle factor.

Formula:

Safe Working Load (SWL) = WLL × Angle Factor

So, the greater the angle, the less you can lift.



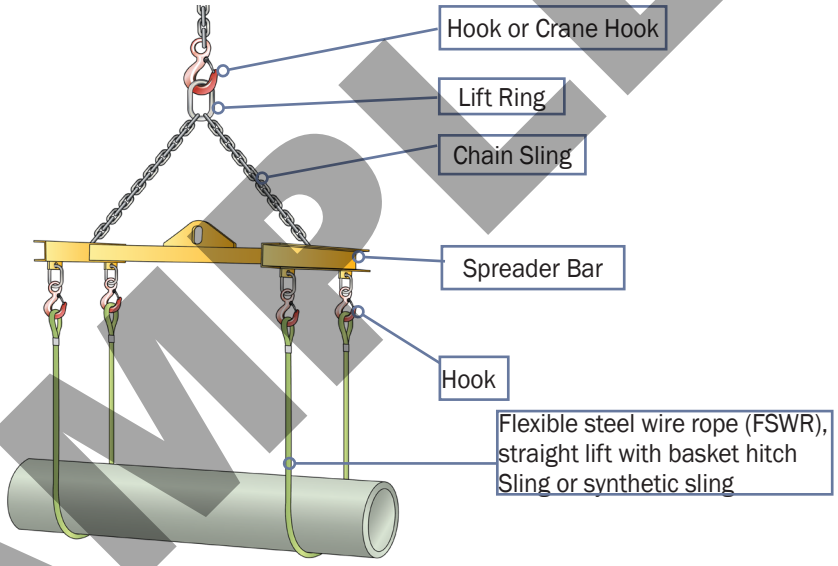
Alloy Grade T or 80 Chain Sling			
2, 3 or 4 Leg Slings			
			
Chain size (mm)	**Included Angle**		
	60	**90**	**120**
6.0	1.9	1.6	1.1
7.0	2.6	2.1	1.5
8.0	3.5	2.8	2.0
10.0	5.5	4.5	3.2

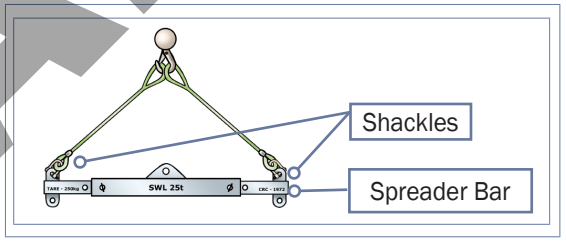
QUESTION 112.7

When lifting different load types such as a concrete piping load, you can use a number of sling lifting techniques.

From the following diagram identify the equipment and the slinging techniques used.

- *SLING Type:* FSWR, straight lift with basket hitch sling with spreader bar and (angle chain sling or FSWR angle sling)





PERFORM WORK / TASK

Element 3

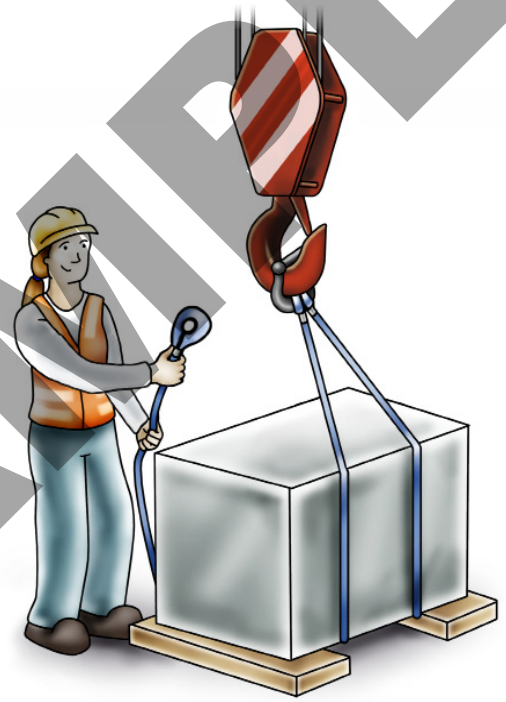
QUESTION 115

What are some ways that you can make sure the crane's hook is safely positioned over the load?

Communicate with other personnel, to make sure that the hook is directly under the load.

Make sure that the chain hoist of the hook is not swinging when you place it over the load.

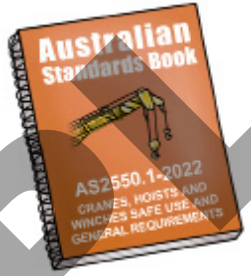
Make sure that the hook shank and lower hook are in line with each other.



Operate crane according to procedures

Follow Australian Standards and site procedures when operating a non-slewing mobile crane.

For example, if you don't know how to start the crane, read the user manual or manufacturer's instructions.

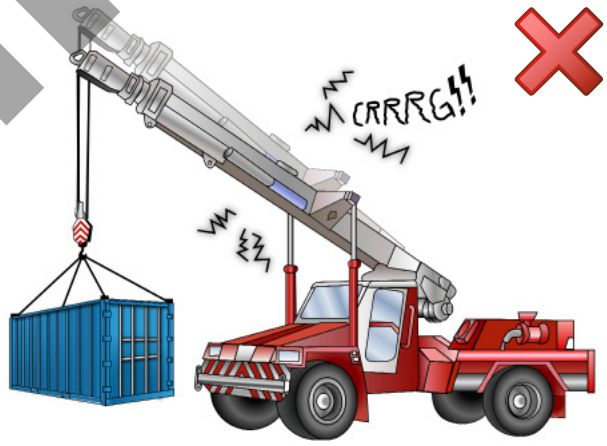


Check load at all times

Always keep the load in view while moving it. You need to find hazards as they happen and control the risks.

Always watch the slewing mobile crane and its load so you can identify hazards as they arise and put control measures in place immediately.

If you hear an unusual noise or feel a vibration or shaking, you should **stop** work and find out what the problem is.

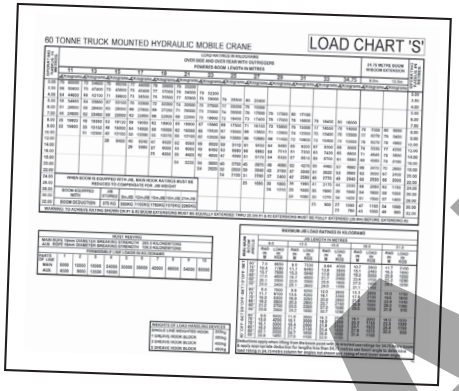


Keep crane stable during operations

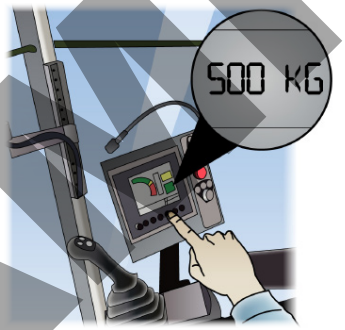
Put the non-slewing mobile crane where you can do the job safely and effectively.

Check that:

You have set up the crane correctly according to the manufacturer's specifications

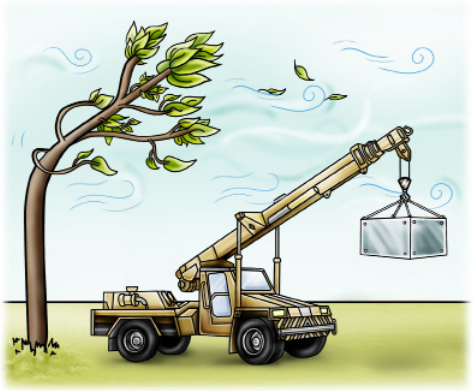


Does the crane have enough capacity to carry the load? Check the crane's load chart. Operate the crane below its maximum rated capacity.



Check crane computer display for any changes from crane set-up

Prevent shock loading



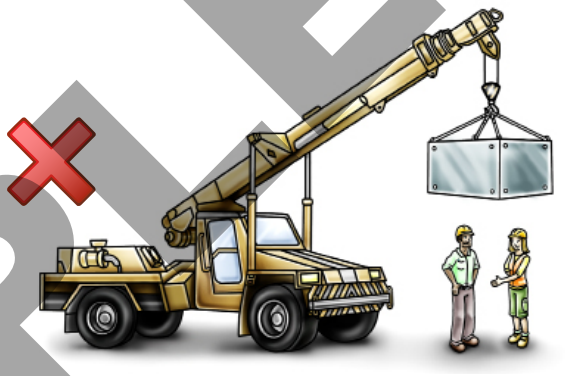
Make sure the crane is being operated below the wind speed set in the manufacturer's specifications.

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.

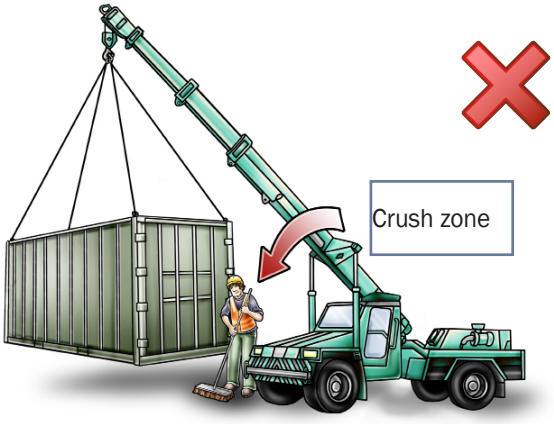


It is unsafe to raise or lower a load above a person.

Crush zone

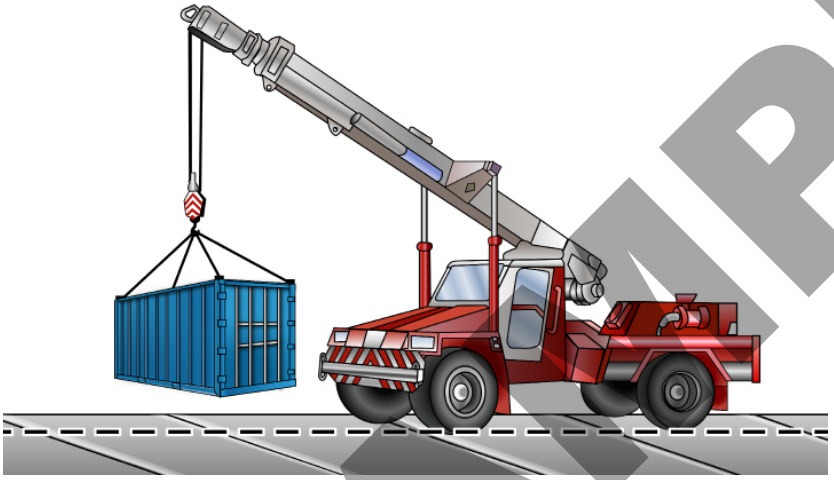
Do not stand between the truck and load.
Make sure you have a clear view of the work area.

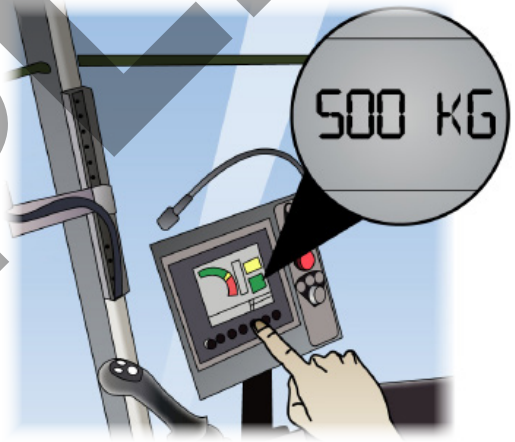
Avoid the crush zone.



Load moment indicator

How do you test the load moment indicator (LMI) to make sure it is accurate?



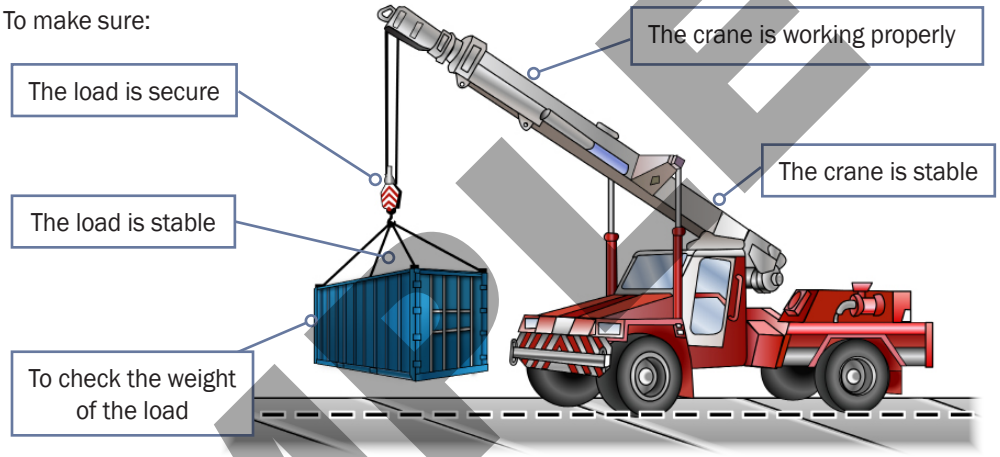


You can test the LMI by picking up a weight you know.

QUESTION 116

Why is it important to do a test lift?

To make sure:

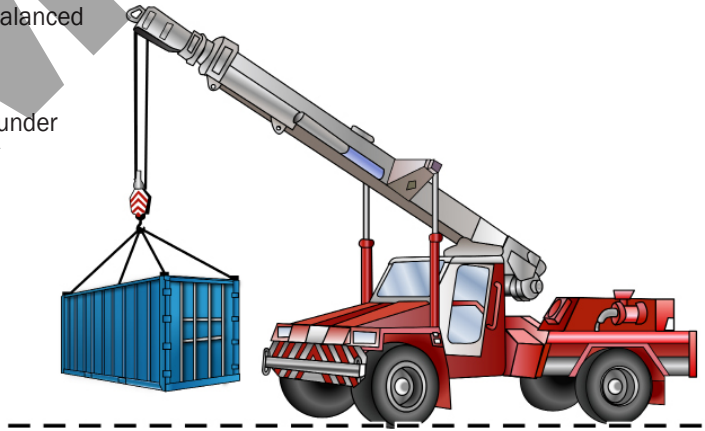


QUESTION 117

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 secure and balanced
- There are no loose parts hanging from the load
- There is nothing caught under the load.

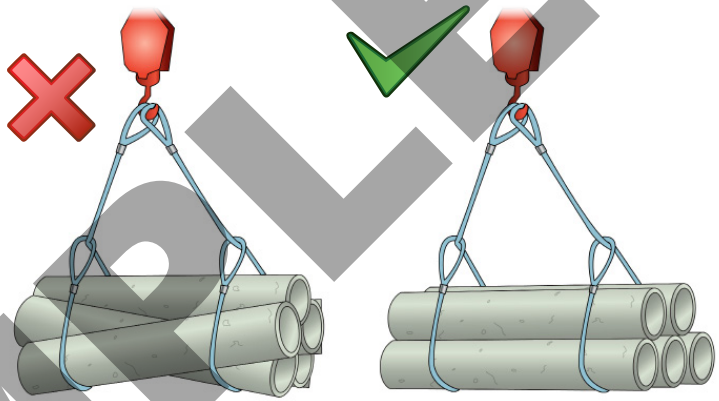


QUESTION 118

You are doing a test lift and there are problems with the lift, for example, the load is unstable.

What should you do?

Lower the load and fix the problem. Do not go any further until the problem has been fixed.



QUESTION 119

Is raising or lowering a load above people safe?

No, never raise or lower a load above people.

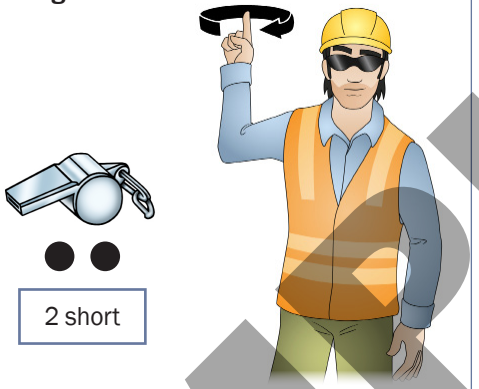
The boom or load could hit someone. Or even worse, the load could fall on the people and kill them.

QUESTION 127

Some of the Australian standard signals used are shown here.

What does each of these signals mean?

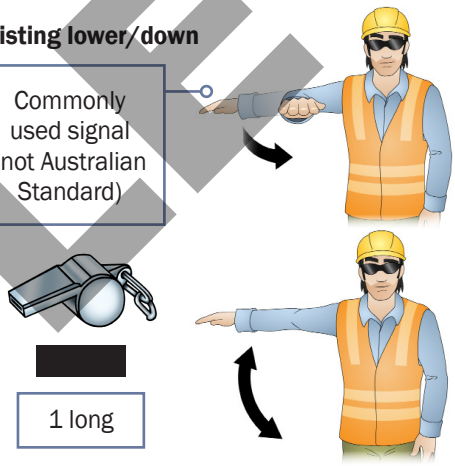
Hoisting raise



2 short

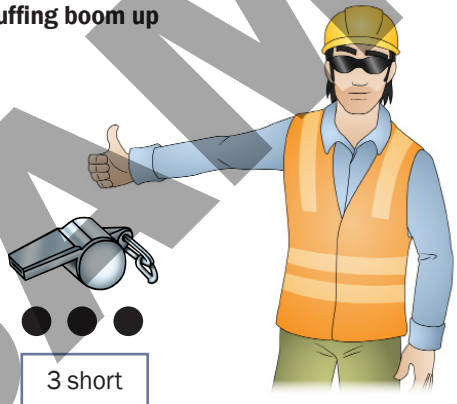
Hoisting lower/down

Commonly used signal (not Australian Standard)



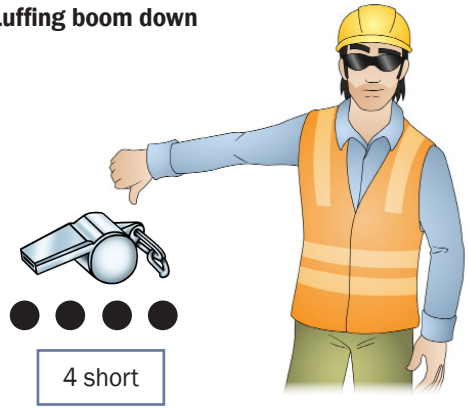
1 long

Luffing boom up



3 short

Luffing boom down



4 short

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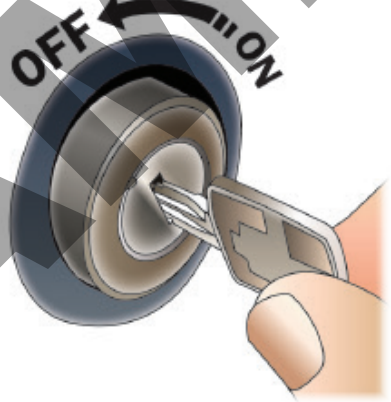
PACK UP

Element 4



Shutting down the crane and packing up

This section is about what to do after the lift is completed.

Including:

Post-operational checks.

Checking equipment for any damage, leaks or signs of wear

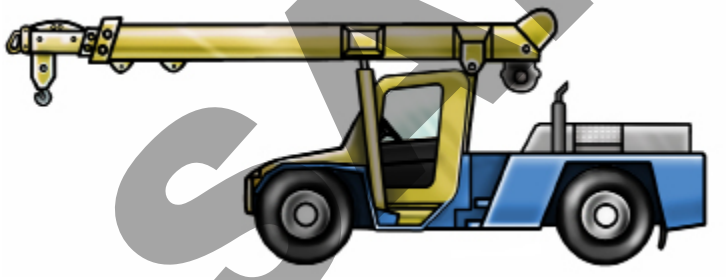
Shutting down the crane

Stowing and securing equipment

Using motion locks

Preparing the crane for travel

Securing the crane

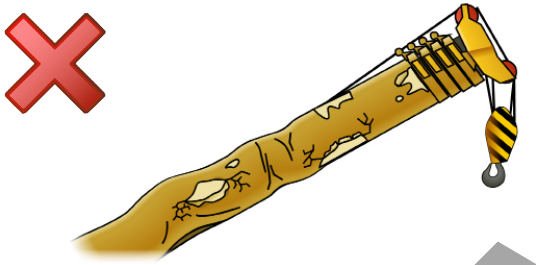


Post-operational checks

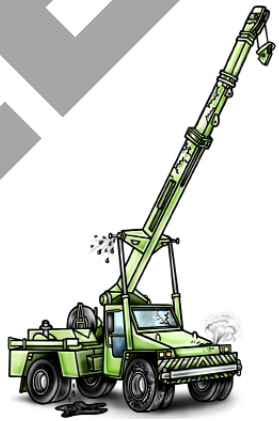
Do the post-operational checks when you finish using the non-slewing mobile crane.

Your post-operational check should include:

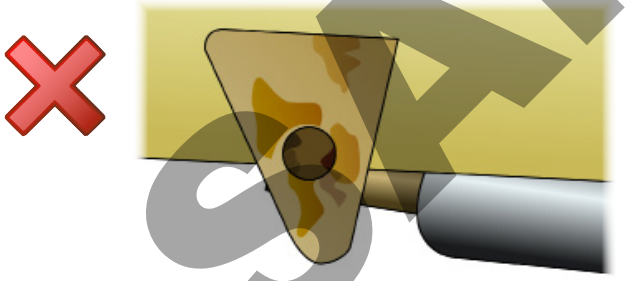
Check boom for dents, cracks, flaking paint and wear in the boom (possible overstressing caused by overload)



Inspect for any signs of damage to the crane.



Check all pins and locks are in place and secure. Check there are no signs of rust forming.



Retract hoist rope and hook block. Make sure it is raised clear of obstructions.

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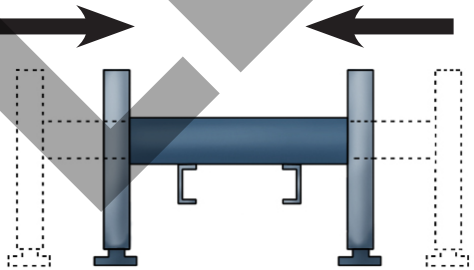
Post-operational checks (continued)

Secure loose items. Use load restraints where needed.

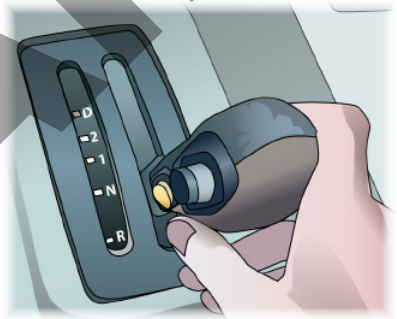
Check hook is secure

Lift and stow outriggers according to procedures.



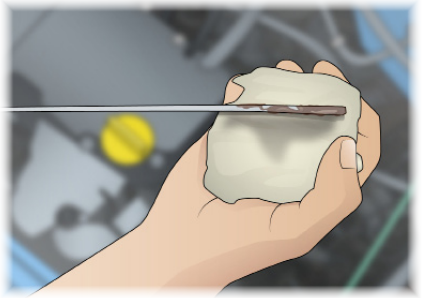
Check tyres are not damaged

Make sure all controls are in neutral (where possible).



Check the fluid levels for the engine oil, water, fuel and hydraulic fluid.

Check for leaks. Check filters.



Shut down according to procedures

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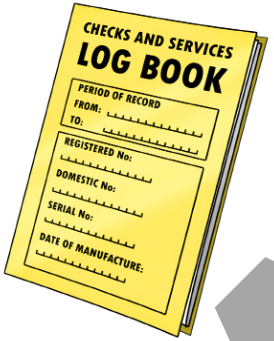
Update crane logbook

Add information to logbook if needed.



Secure crane cabin

Lock the cabin to stop people getting in.

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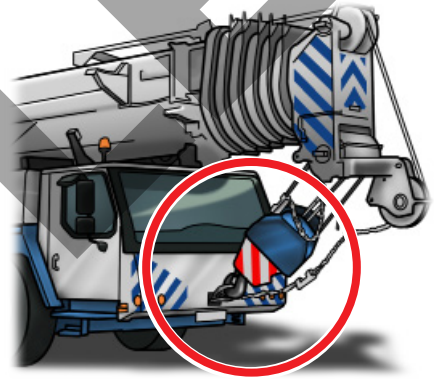
QUESTION 147.5

You have finished using the crane.

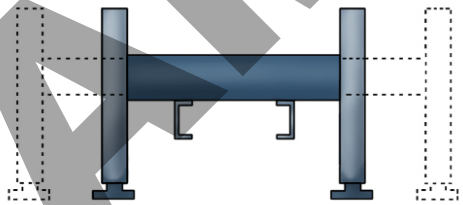
How do you shut it down properly?

Lower and retract (pull in) the boom

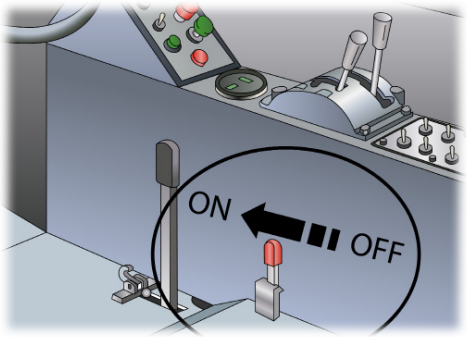
Stow and secure the boom/jib and equipment



Retract the outriggers

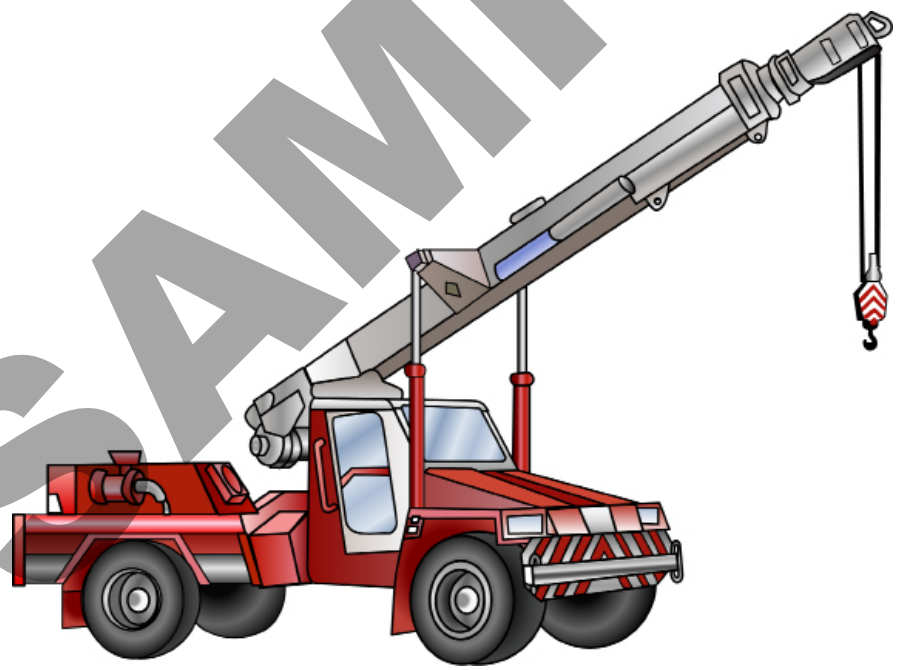


Apply motion locks and brakes



NON-SLEWING MOBILE CRANE LEARNER WORKBOOK

TLILIC0018
Licence to operate a non-slewing mobile crane (greater than 3 tonnes capacity)



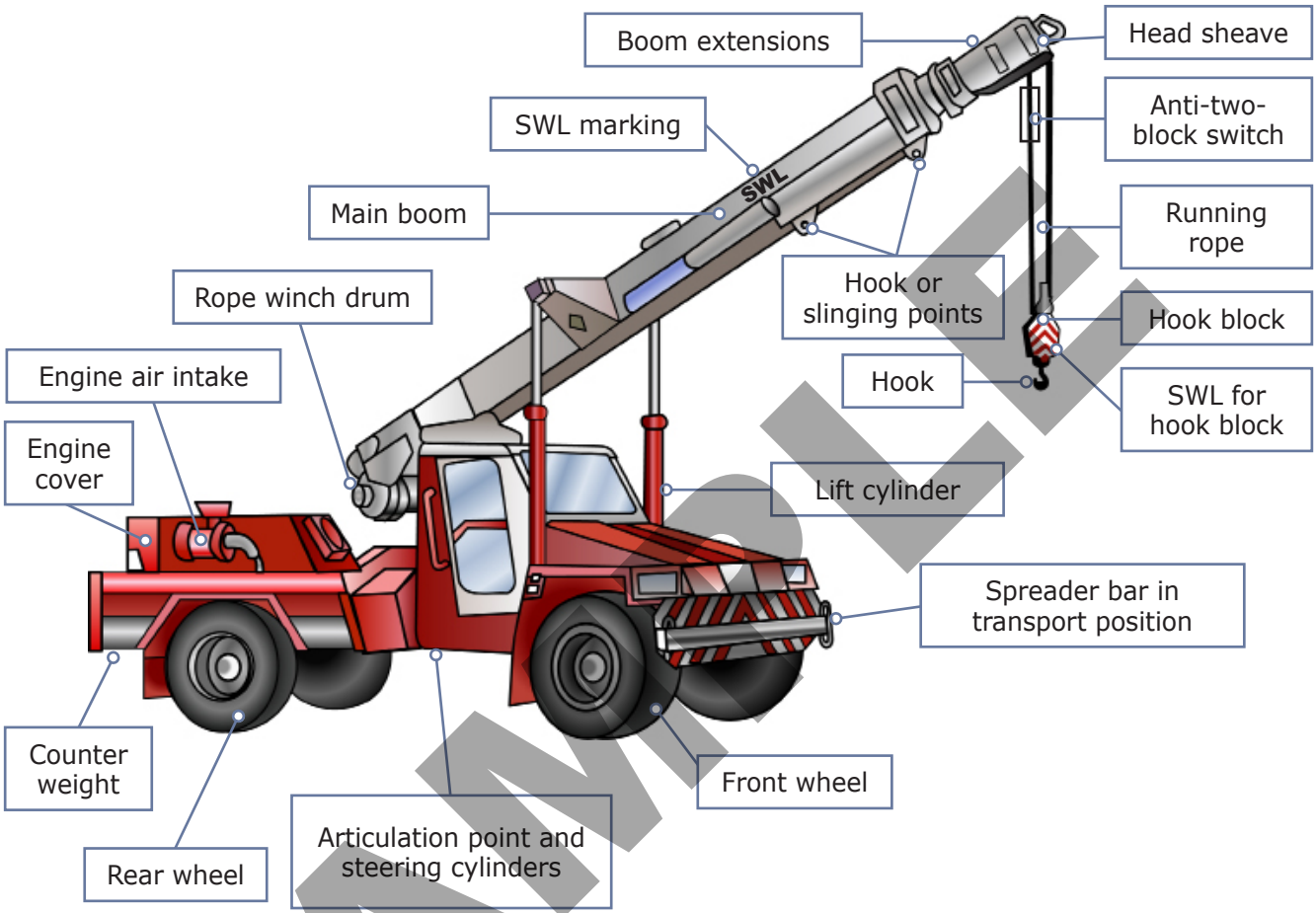
EASY GUIDES
Australia Pty Ltd
www.easyguides.com.au

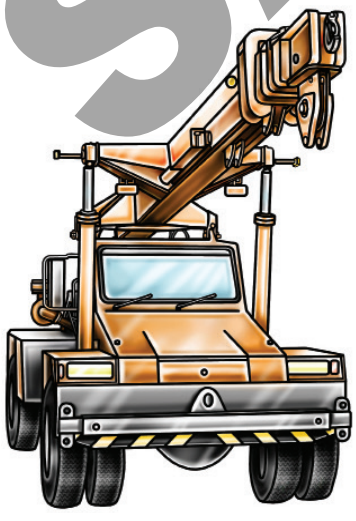
National Licence
RTO-VET Learning Materials

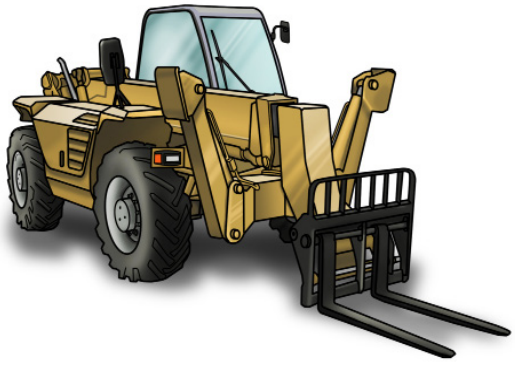
Contents

What is a non-slewing mobile crane?

A non-slewing mobile crane is a powered crane which features a boom or jib that does not slew. The boom can only luff up and down and telescope in and out. The crane is mounted on a vehicle.







In some states a telescopic handler is classed as a non-slewing crane

Part 1

Prepare for Hazards

Theory Training Task 1

Performance Criteria: 1.5, 2.2

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

Above head height

Ground level to eye level

Ground level (and below)

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

Part 2

Communicate Clearly

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

You can communicate many different ways. What are some of the ways you can communicate with other workers while moving a load?

Theory Training Task 10

Performance Criteria: 1.7, 3.7

How should you and the dogger communicate when you can see each other? Circle the correct answer.

Hand signals

Whistle

Two-way radio

Theory Training Task 11

Performance Criteria: 1.7

a) Name the communication equipment you should test before you start work to see if it functions.

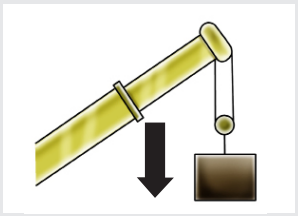
b) What should you do if the equipment doesn't work?

Theory Training Task 12

Performance Criteria: 3.7

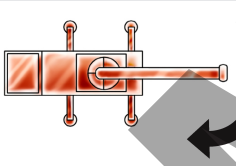
Match the crane boom motion on the left with the correct hand or whistle signals on the right.

Hoisting down



Stop

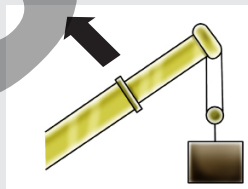
Slewing right



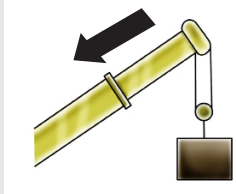
Travel and transverse

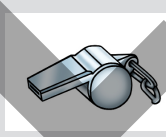
Indicate the direction you want the crane to go

Luffing boom up

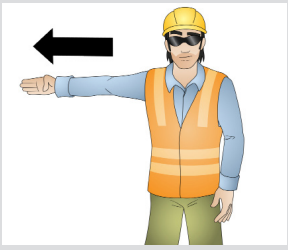


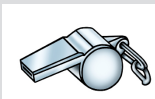
Telescoping boom retract. Jib-trolley in.





1 long

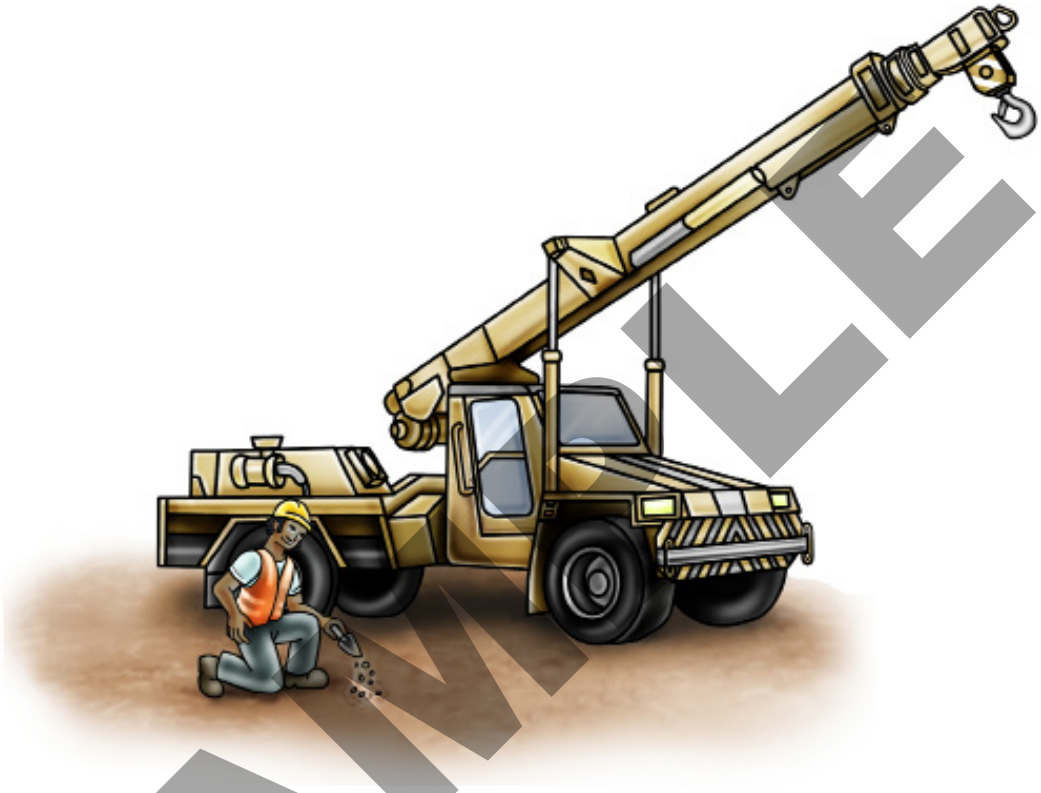




1 long, 2 short

Part 4

Plan the Lift



Theory Training Task 26

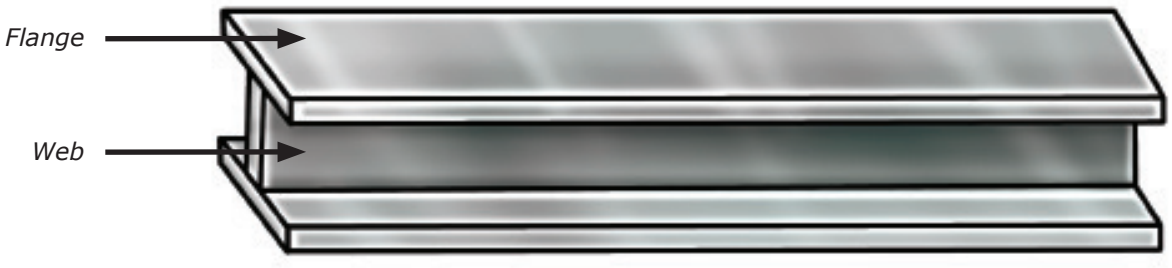
Performance Criteria: 1.3

a) You will lift a steel universal beam. The dimensions are:

- Weight of structural steel = 7840 kg per cubic metre

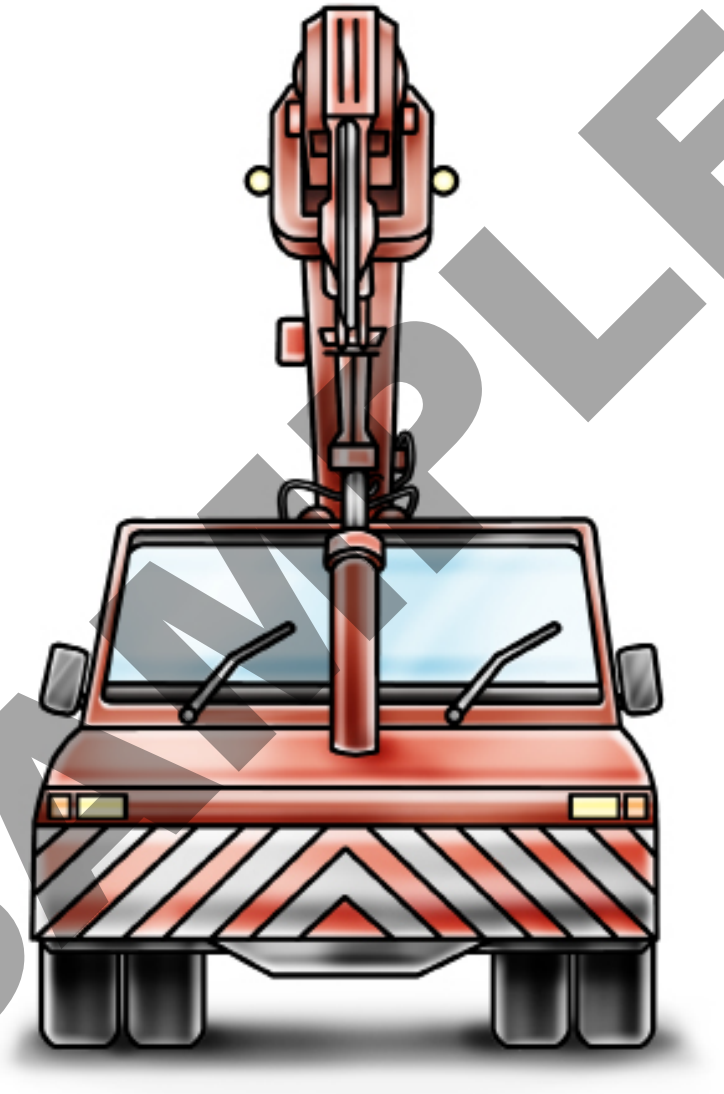
  1 mm = 0.001 m
- Flanges (top and bottom)
  - Length = 12 m
  - Width = 250 mm
  - Thickness = 15 mm
  - Flange = L × W × D × 2 × weight of structural steel
- Web
  - Length = 12 m
  - Width = 275 mm
  - Thickness = 40 mm
  - Web= L × W × D × weight of structural steel

What is the total weight of the steel universal beam in kilograms?



Part 5

Set Up the Crane



Follow safety procedures

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

Theory Training Task 36

Performance Criteria: 1.6, 2.2, 4.1

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.

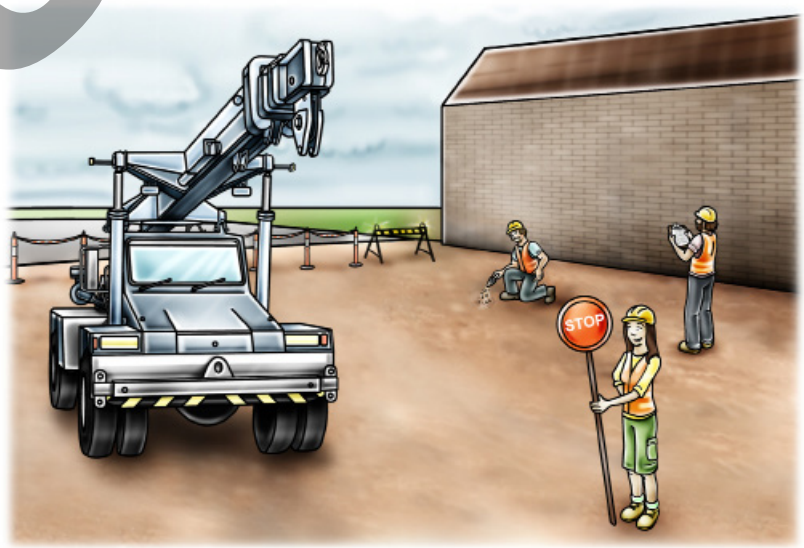
True **False**

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

True **False**

d) Pedestrians need to get out of your way when you are driving a non-slewing mobile crane.

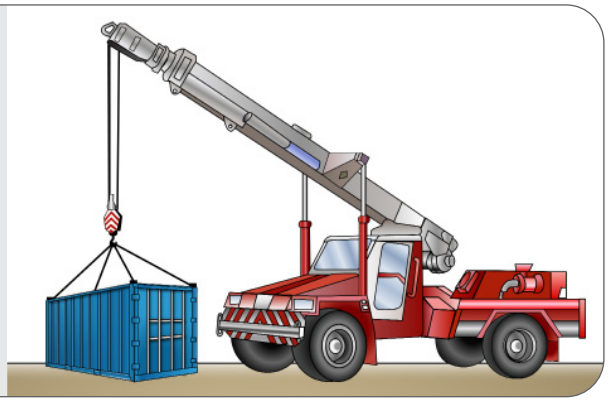
True **False**



Performance Criteria: 1.2

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

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

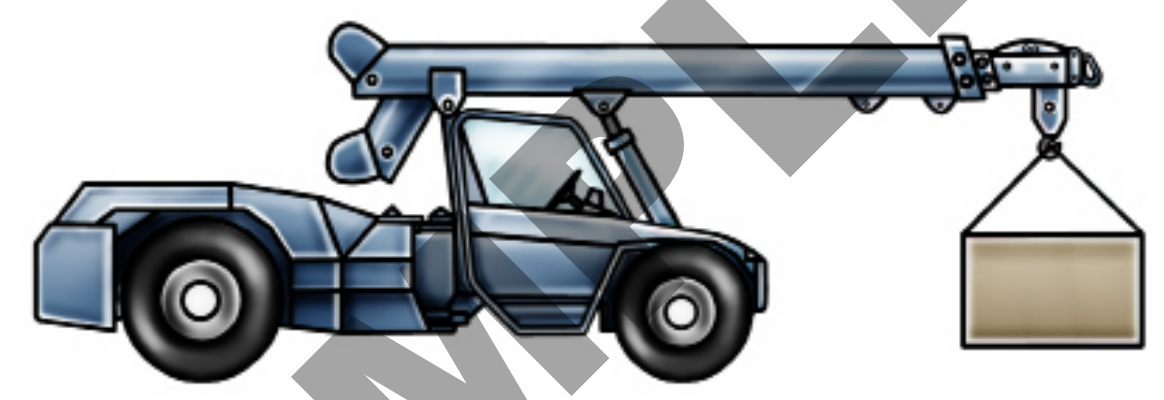
b) Circle the correct answer for the following statement.

Never lift the rear truck wheels off the ground.

True **False**

Part 6

Do The Lift



Performance Criteria: 2.3

Access the crane safely

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

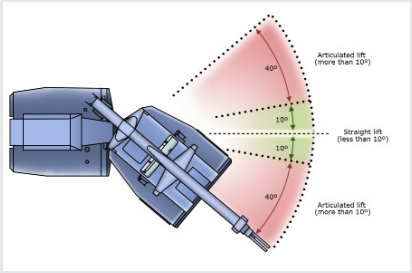
Theory Training Task 47

Performance Criteria: 2.3

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

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, 3.1

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

BOOM PIVOT TO HEAD SHEAVES—MANUAL EXTENSION RETRACTED																				MAN EXT.	FLY JIB	
		Boom Length (m)																			0°	12.5°
		5.67	6.00	6.50	7.00	7.50	8.00	8.50	9.00	9.50	10.00	10.50	11.00	11.50	12.00	12.50	13.00	13.50	13.85	17.90	20.83	20.76
Boom Angle	60°			12600	12600	12600	12600	12600	12600	11850	11200	10600	8950	7800	7200	6700	6250	5800	5550	2550	1500	1300
				12600	12600	12600	12600	12600	12600	11850	10700	9750	8950	7800	7200	6700	6250	5800	5550	2550	1500	1300
				1.04	1.29	1.54	1.79	2.04	2.29	2.54	2.79	3.04	3.29	3.54	3.79	4.04	4.29	4.54	4.72	6.74	8.25	8.73
	50°	12600	12600	12600	12600	12600	11150	9950	9000	8200	7500	6900	6400	5950	5550	5200	4850	4600	4400	2250	1200	1120
		12600	12600	12600	12600	11500	10150	9050	8150	7400	6800	6250	5750	5350	5000	4650	4350	4100	3950	2250	1200	1120
		1.45	1.66	1.98	2.30	2.62	2.95	3.27	3.59	3.91	4.23	4.55	4.87	5.20	5.52	5.84	6.16	6.48	6.71	9.31	11.22	11.64
	40°	12600	12600	11800	10300	9100	8100	7300	6650	6100	5600	5150	4800	4450	4150	3900	3650	3450	3300	2050	970	920
		12600	12600	10750	9350	8250	7350	6600	6000	5500	5050	4650	4300	4000	3750	3500	3300	3100	2950	2050	970	920
		2.16	2.42	2.80	3.18	3.56	3.95	4.33	4.71	5.10	5.48	5.86	6.25	6.63	7.01	7.39	7.78	8.16	8.43	11.53	13.79	14.13
	30°	12050	10850	9350	8250	7300	6550	5950	5400	4950	4600	4250	3950	3650	3400	3200	3000	2850	2700	1900	850	820
		10950	9850	8500	7450	6600	5950	5350	4900	4450	4100	3800	3500	3250	3050	2850	2700	2500	2400	1700	850	820
		2.75	3.03	3.47	3.90	4.33	4.77	5.20	5.63	6.07	6.50	6.93	7.36	7.80	8.23	8.66	9.10	9.53	9.83	13.34	15.88	16.14
	20°	10300	9300	8100	7150	6350	5700	5200	4750	4350	4000	3700	3450	3200	3000	2800	2650	2450	2350	1700	770	770
		9350	8400	7300	6450	5750	5150	4650	4250	3900	3600	3300	3050	2850	2650	2500	2350	2200	2100	1500	770	770
		3.19	3.50	3.97	4.44	4.91	5.38	5.85	6.32	6.79	7.26	7.73	8.20	8.67	9.13	9.60	10.07	10.54	10.87	14.68	17.43	17.59
	10°	9400	8500	7400	6550	5850	5300	4800	4350	4000	3700	3400	3200	2950	2750	2600	2400	2300	2200	1550	750	750
		8500	7700	6700	5900	5300	4750	4300	3950	3600	3300	3050	2850	2650	2450	2300	2150	2000	1900	1350	750	750
		3.46	3.79	4.28	4.77	5.27	5.76	6.25	6.74	7.24	7.73	8.22	8.71	9.21	9.70	10.19	10.68	11.18	11.52	15.51	18.39	18.45
	0°	9050	8200	7150	6350	5700	5100	4650	4250	3900	3600	3350	3100	2850	2700	2500	2350	2200	2100	1500	750	750
		8200	7450	6500	5750	5100	4600	4200	3800	3500	3200	2950	2750	2550	2400	2200	2100	1950	1850	1300	750	750
		3.57	3.90	4.40	4.90	5.40	5.90	6.40	6.90	7.40	7.90	8.40	8.90	9.40	9.90	10.40	10.90	11.40	11.75	15.80	18.73	18.69

Two fall hook block: 95kg
Single fall hook block: 30kg
Single fall capacity (max): 4200kg

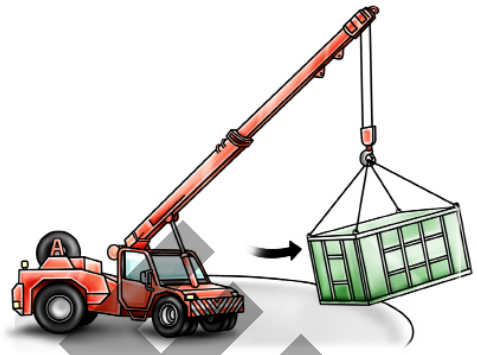
Straight lift (kg)
Articulated lift (kg)
Radius (degrees)

Above the line: Structural damage
Below the line: Tipping over

Theory Training Task 49

Performance Criteria: 2.5, 3.1

What do you need to plan for when moving a load within the crane's working radius?



Theory Training Task 50

Performance Criteria: 1.3, 2.5, 3.1

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

Performance Criteria: 3.2

Position the boom/jib

Position the boom/jib and hoist block over the load's centre of gravity.

Theory Training Task 51

Performance Criteria: 3.2

Who guides you when you're positioning/ placing the boom/jib and hoist block over the load?