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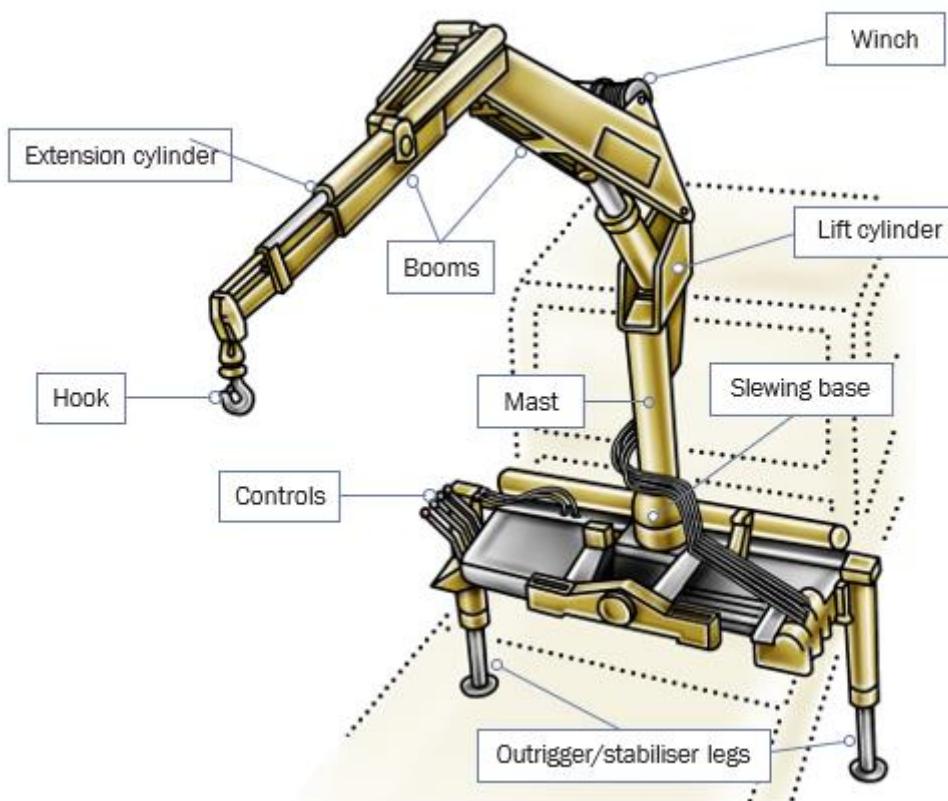
VEHICLE LOADING CRANE

RIIHAN307E



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).



PLEASE BE ADVISED: You will **NOT** be issued a High Risk Licence for completing this course.

You will be issued with a Statement of Attainment to operate a vehicle loading crane UNDER 10 metre tonne capacity (RIIHAN307E)

Please speak with our trainer if you require the HRW licence for:

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

10 metre tonnes

A High Risk Work licence is needed when the vehicle loading crane has a capacity of 10 metre tonnes or more. The metre tonnage of a vehicle loading crane is a number which is worked out by multiplying the lifting capacity by the working radius of the boom for that lifting capacity.

To calculate 10 metre tonnes

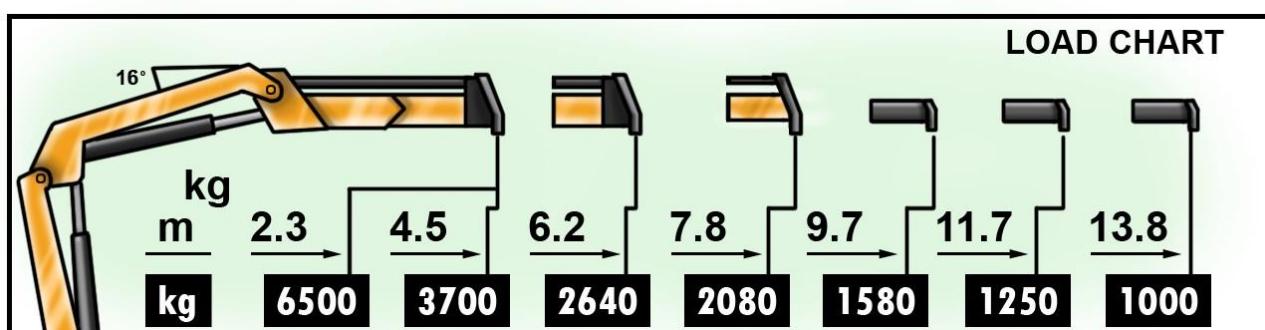
MULTIPLY THE SWL × THE WORKING RADIUS FOR THAT SWL = METRE TONNES

from the centre line of slew to the centre line of hook. This calculation must be done for each Safe working load (SWL) on the load chart.

If any one calculation amounts to 10 metre tonnes lifting capacity or greater, the crane operator will require the appropriate High Risk Work Licence.

For example

The load chart below indicates the crane can lift 1300 kilograms at 8.5 metres. $1300 \text{ kg} \times 8.5 \text{ m} = 11,050$



— as this is greater than 10,000 a HRW Licence is required to operate the crane.

Does the operator of a VLC need a dogging licence?

- Currently you do not have to have a Dogging (DG) high risk licence to operate a VLC. Please check with your state regulatory authority on a regular basis in case this changes

To exercise judgment means:

Selecting the slinging method by considering the shape of the load

Selecting the lifting gear by determining the weight (its mass) and centre of gravity of the load and inspecting the lifting gear to ensure it is not defective by considering its condition.

The vehicle loading crane HRW licence includes the application of load estimation and slinging techniques to move a load competently. **Holders of a vehicle loading crane HRW licence can exercise judgment on the load and slinging method and select and inspect the lifting equipment when operating a vehicle loading crane.**

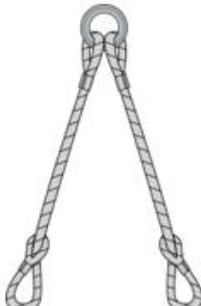
The holder of a vehicle loading crane HRW licence **cannot**:

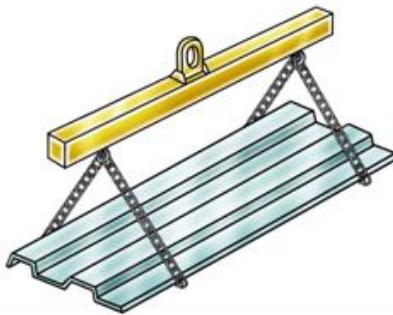
- Exercise judgement or inspect lifting gear for any other class of crane unless they hold the relevant HRW licence
- Operate the VLC if the load is out of view
- Direct another VLC operator in the movement of a load when the load is out of the operators view



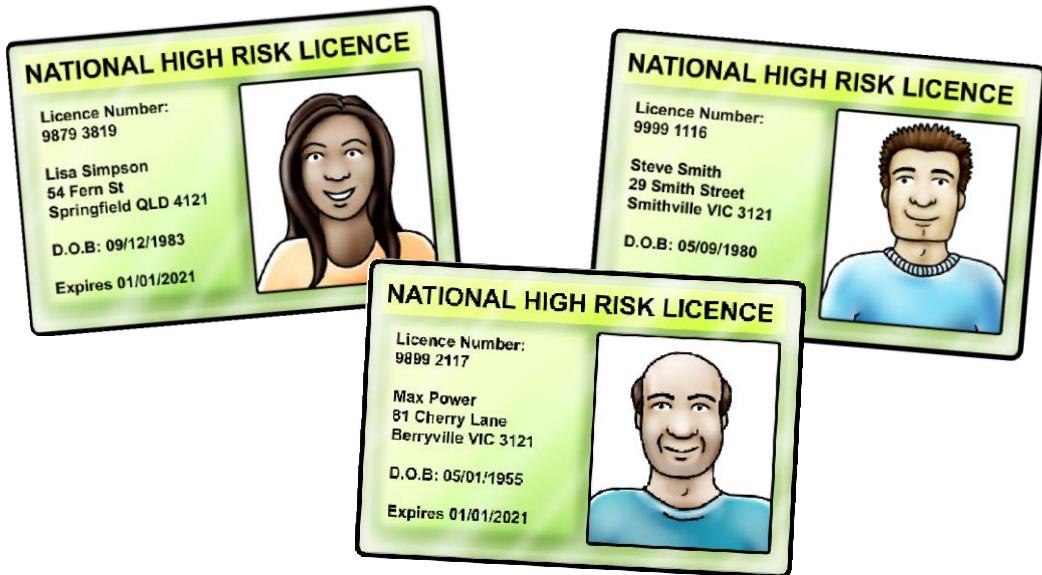
Lifting Gear

As a VLC operator, you will need to make use of many types of lifting gear which may include:

Fibre ropes 	Wire ropes 	Chain 
Synthetic webbing slings 	Multi-leg slings 	Hooks 

Lifting rings, shackles and eyebolts 	Beam and plate clamps 
Pallet forks and cages 	Spreader and lifting beams 

High Risk Licensing and the Law



Your legal responsibility when doing high risk work

Work carefully

Look after your own health and safety.

You must also make sure that your work does **not** harm the health and safety of others.



Penalties for working unsafely

You may not be able to renew your licence

You may have your licence suspended or cancelled

You may have to do your high risk licence test again to make sure you can do the work safely and competently.

You may be prosecuted and have to go to court.

You may not be able to get your licence renewed



Duty of care

Duty of care means your legal responsibility to ensure the safety and well being of others who could be affected by your actions.

Duty of care applies to:

Employers/persons conducting a business or undertaking (PCBU)

Workers' which includes people who are:

employees contractors

sub-contractors outworkers

employees of labour hire companies

volunteers

Worker's duty of care

By law, as a worker you must:

- Take care of your own health and safety
- Take care of the health and safety of other people in the workplace because of the things you do or forget to do
- Do your best to follow workplace, health and safety (WHS) / Occupational health and safety (OHS) requirement from your PCBU/employer
- Don't misuse anything provided at the workplace for WHS / OHS either deliberately or recklessly.

PCBU's/Employer's duty of care



Note: PCBU means employer

By law, as an employer you **must**:

provide a workplace that is safe and without risk to health or safety to people

provide information and training so that work will be done safely

provide safe plant, equipment and structures put systems in place to work safely

provide ways to make sure plant, structures and substances are used, handled and stored safely.
make sure facilities are in good condition

Penalties

If you are a PCBU/employer or worker, the government can fine or even imprison you for failing your duty of care.

You have your high risk work licence. If you are going to work using an unfamiliar crane, what must your employer do?

Your employer must make sure that you have:

- information about the crane
- training on the crane
- instruction on how to use the crane
- you are supervised while getting used to the new crane.



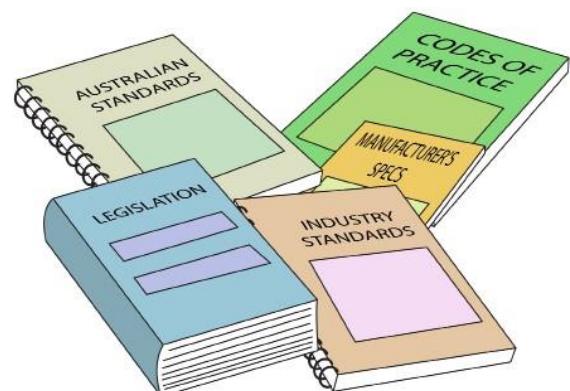


OHS / WHS Guidelines, instructions and people

Before operating the crane you must be aware of any guidelines, instructions and people for the crane you will be operating and for crane operation in general at the workplace.

The types of documents you may need to refer to include:

- Manufacturers instructions such as an operator's manual
- Safe work or job procedures
- Specific workplace policies and procedures
- OHS / WHS workplace representatives
- Plans by managers
- Codes of practice
- WHS /OHS policy
- Health and Safety Acts and Regulations (OHS/WHS)
These can be found at www.safeworkaustralia.com or
on your state/territory Health and Safety Regulators website.
- Australian and industry standards
You can search for standards at www.standards.org.



What is a lift plan?

A lift plan is a document that outlines the size of a load, weight, dimensions, center of gravity, resources needed for lift, sling equipment list and a hazard risk assessment. The following is a sample template of a lift plan.

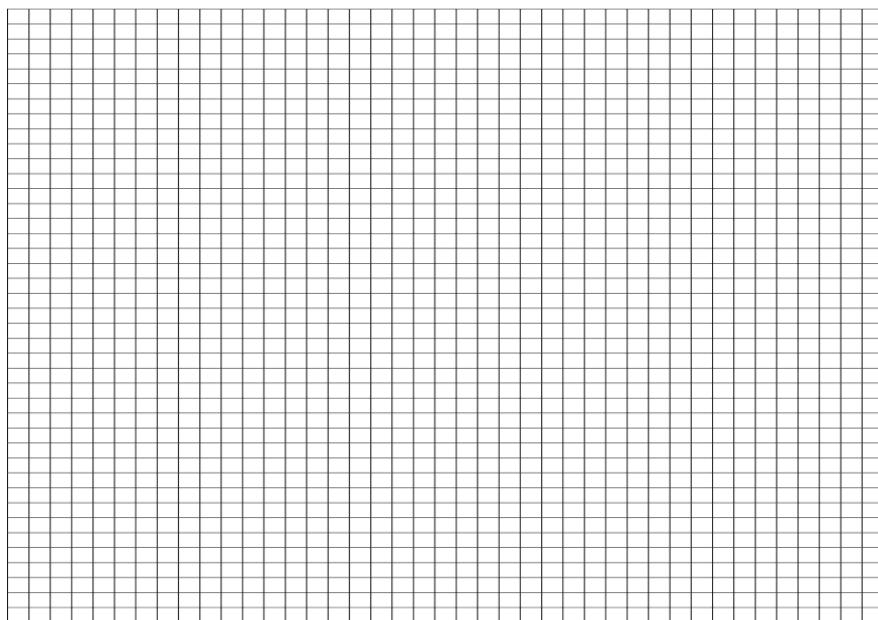
Lift Plan

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		Kg		Kg	
Weight of rigging	Kg		Kg		Kg		Kg		Kg		Kg	
Weight of hooks	Kg		Kg		Kg		Kg		Kg		Kg	
Additional Weight	Kg		Kg		Kg		Kg		Kg		Kg	
Total*	Kg		Kg		Kg		Kg		Kg		Kg	
Boom Length	M		M		M		M		M		M	
Boom sequence												
Line pull	Tonne / kg		Tonne / kg		Tonne / kg		Tonne / kg		Tonne / kg		Tonne / kg	
Parts of line	M		M		M		M		M		M	
Hook block WLL	Tonne / kg		Tonne / kg		Tonne / kg		Tonne / kg		Tonne / kg		Tonne / kg	
Pick up radius	M		M		M		M		M		M	
Set down radius	M		M		M		M		M		M	
Max radius	M		M		M		M		M		M	
RC at Max radius	Kg		Kg		Kg		Kg		Kg		Kg	
Communication Method	H	2WR	W	H	2WR	W	H	2WR	W	H	2WR	W
* Operator to Calculate / Sling Calculation												
2. Equipment for load lift / sling												
Dogger/Assessor initial												
3.* Sling Calculation Notes:												
4.^ Risk Controls: See additional note template.												

5.% Sketch

For one of your lifts you will need to sketch the environment and any obstacles present.

- Sketch **one** load and show the following:
 1. Crane standing position
 2. Stabiliser location
 3. Load location
 4. Show distances and load movement-direction
 5. Any obstacles

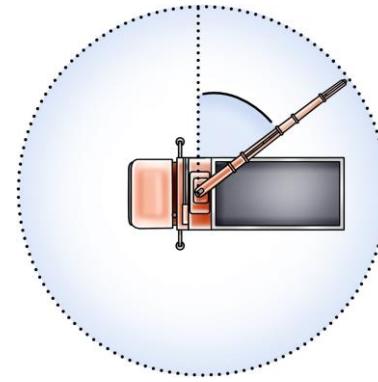


Crane lift plans are essentially overviews of safety risks that may occur and precautions that will be taken when completing the haul.

Crane lift plans look at the size and weight of the haul as well as how far items are being moved and what sort of environment they are moving in.



Boom safe working radius



Things that might get in your way

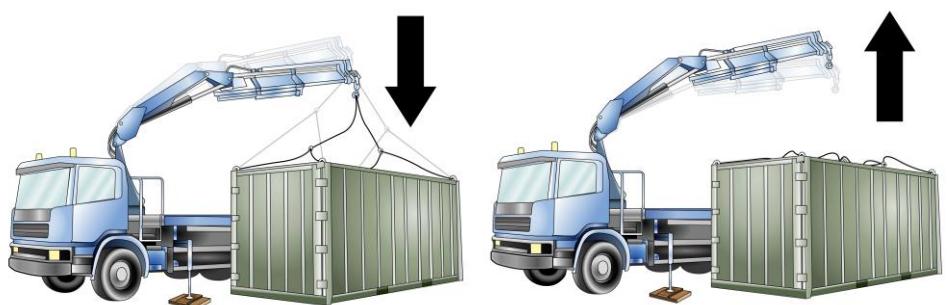
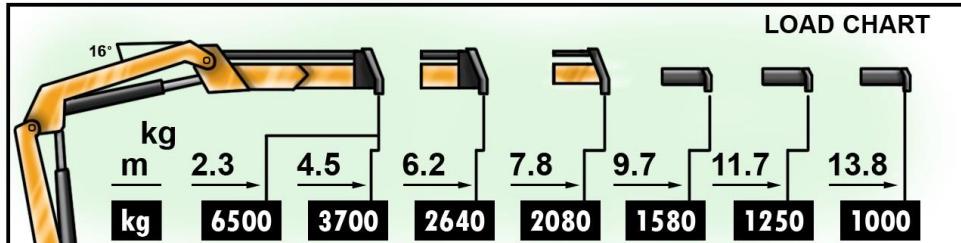


How you will get in (access) and out (egress) of the work area



You have some lifting jobs to do.

What should you think about and plan for?



Boom deflection.

How do you compensate for boom deflection?

The crane operator can then release the load by lowering the boom/jib slightly to compensate for any boom deflection. The boom will spring up when the load is released as the deflection releases from the boom. Make sure there is a safe distance from any obstructions before releasing the load.

Hazard versus risk

What is the difference?

Different hazards and risks emerge constantly—sometimes instantly.

Hazard

A hazard is any thing or any situation which could injure or harm you.

In other words, it is anything that can hurt you.



Risk

A risk is the chance of a hazard causing harm such as injury, illness or even death.

In other words, how likely it is that somebody or something may be harmed by the hazard.



What is The Hierarchy of Hazard Control?

The Hierarchy of Hazard Control is a list of controls that you can use to eliminate or lower the danger from a hazard in the workplace.

What are the six (6) levels in the hierarchy from first choice to the last choice?

1. Elimination:

If possible, remove (take away) the hazard.

2. Substitution:

Use a safer method if you can't remove the hazard.

3. Isolation:

Stop access to the hazardous (dangerous) area.

4. Engineering control measures:

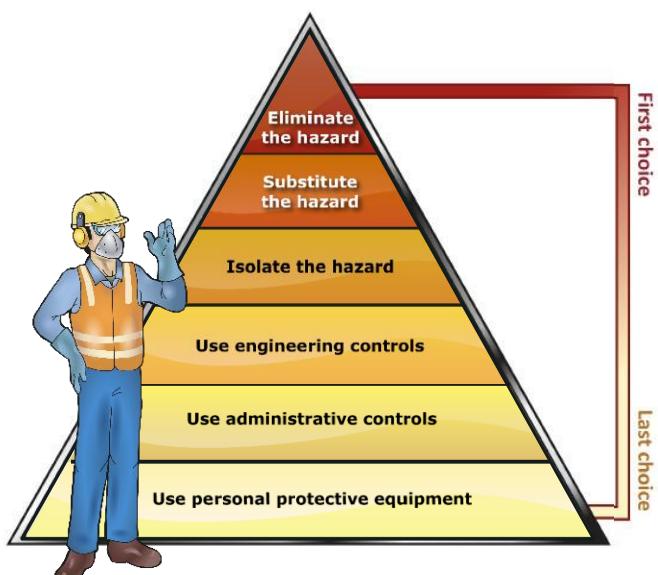
Change the tools, equipment or environment to make it safer.

5. Administrative practices:

Reduce the time the worker is exposed to the hazards by using training, job rotation, the timing of jobs, etc

6. Personal Protective Equipment (PPE):

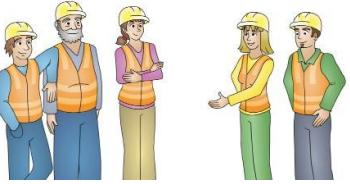
Use PPE as your last line of defence.



Memory aid: Every Saturday I Eat A Pie

Communicate clearly

Communicating clearly is an important part of working safely. You should discuss communication methods with the people you need to work with and agree on the best way to communicate. Choose the method at the planning stage or before starting work. Some examples are:

<p>Speaking, listening, and asking questions</p> <p>Talk with your workmates. They might be able to give you information about the job or make you aware of hazards you don't know about.</p> 	<p>Site rules</p> <p>The site rules tell you the rules and procedures for the worksite you are on.</p> <p>You might read about these on noticeboards or be told about them in an induction.</p> 	
<p>Toolbox meetings</p> <p>Toolbox meetings are like small staff meetings.</p> 	<p>Hand gestures or yelling.</p> 	<p>Two-way radios</p> <p>You can use a two-way radio when you can't see your workmate.</p> <p>If you are using them, always make sure they are working properly before you start the job.</p> <p>Check the batteries have enough charge and check you have the right channel to communicate with your workmates.</p> 

Who might you talk to about site hazards before you start the job?

Supervisors, managers and team leaders



Workmates



Workplace health and safety representatives and safety committee members.



Workplace engineers.



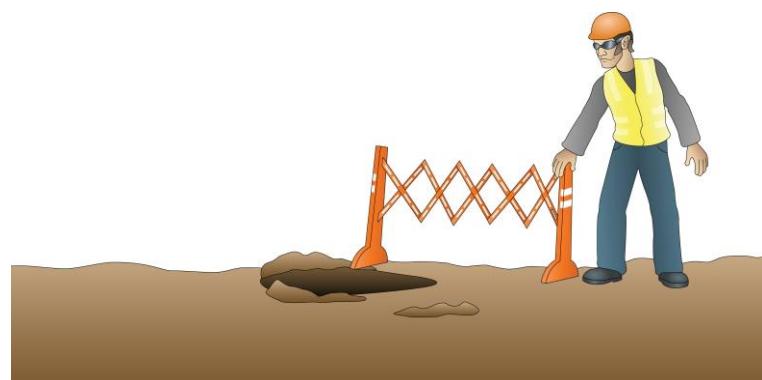
Why is it important to talk to people in the workplace (such as workplace health and safety representatives) about hazards before you start work.

Why do you think it is important to do this?

You will find out what the hazards are and how to control them.

You will find out about any ground conditions that are a hazard.

To make sure that you follow workplace policies and procedures.



Set up your control measures BEFORE you start the job, or as soon as you find a hazard when you are working

Bearing capacity of different types of ground

You should assess if the type is able to support the crane. Different soil types have different load bearing pressures and these should be considered when choosing packing for outriggers. The pressure a certain type of ground can take is called its **bearing capacity**. Different ground types have different bearing capacities.

This table shows the different types of ground and their bearing capacity from **weakest** to **strongest**.

Ground type	Maximum bearing capacity P _{MAX} (Tonnes per m ²)	Sample of soils
Wet clay	Less than 10	
Loose sand	10	
Soft clay (dry)	10	
Stiff clay (dry)	20	
Compacted sand	20	
Asphalt	20	
Compacted gravel (with up to 20% sand)	40	
Shale rock and sandstone	80	
Hard rock	200	

Unsure? If you are unsure what the bearing pressure value of the soil is get a competent person such as an engineer with experience to work it out.

Ground types

Some ground is soft or rocky and needs packing for outriggers.

Ground types include:

- Rough, uneven ground, backfilled ground, soft soils, hard, compacted soil, rock, bitumen, concrete, pre-contaminated soils, bitumen.



Ground stability

It is important that you check the ground condition. Make sure that the ground is firm and level to keep the crane stable while it is moving the load. Water impacted ground will need packing.

You should check for recently filled trenches as the ground may be soft and the crane may sink while it is moving the load.



Check the area for slopes (inclines) and drop-offs



Types of packing

Types of packing you may use include:

Steel plates



Hardwood packing



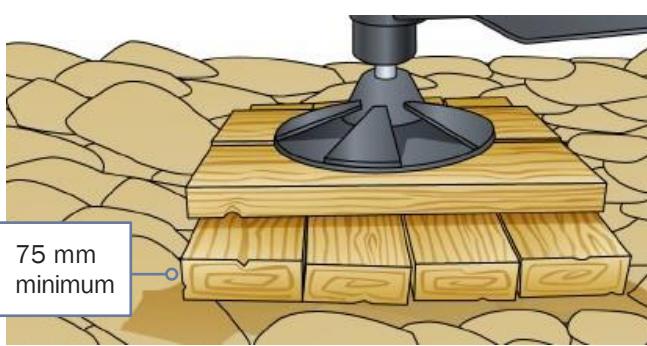
Sleeper mats (matting)



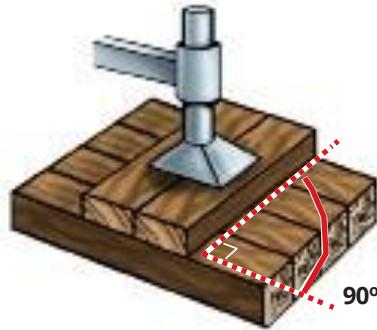
Note: It is important to work out the minimum area of packing needed under each stabiliser to make sure that the load will be kept stable.

Beware of water impacted ground. Packing will be used to keep the crane stable.

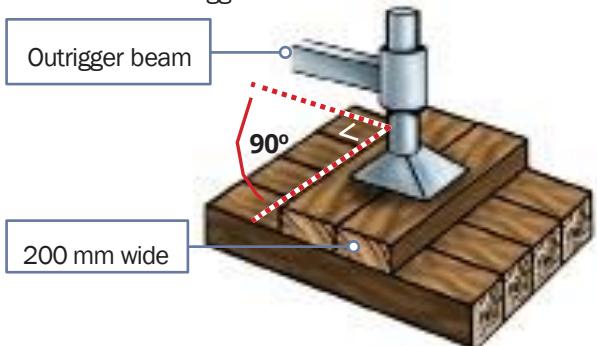
The base layer of packing should be closely laid and at least 75 mm thick



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.



Ground conditions

Choosing the set-up location

It is important to check the ground stability before starting to work. Check the ground to see if it is firm enough to support the crane and equipment. Check the ground is firm and level to keep the crane stable while you move or drive the load.

You should check the ground for recently filled trenches as the ground may be soft and the crane may sink when you use it.



Check that the crane can be set up level. Don't use the crane unless it is level. Also check that the boom can move through its full range of movement without hitting overhead electric power lines or other obstacles.



The bearing pressure value of soil needs to be worked out.

Who can do this?

Only a competent and qualified person. For example an engineer who has knowledge about the bearing pressure value of soil.



What is bearing pressure of soil?

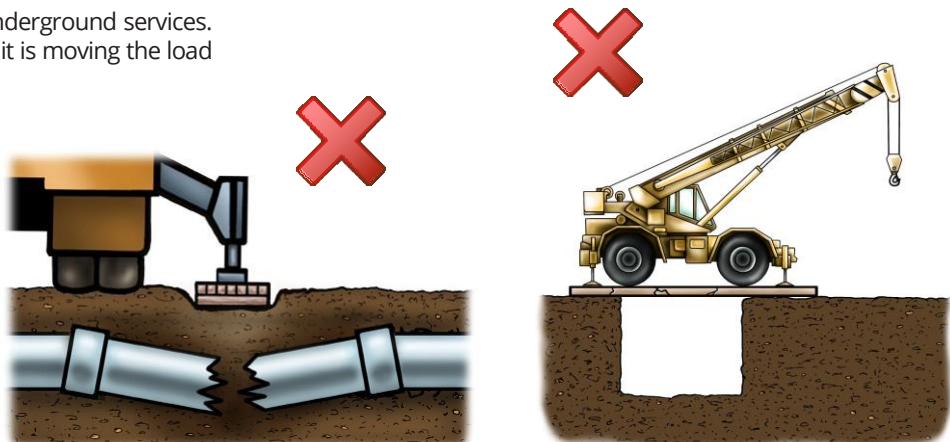
The ultimate bearing capacity of soil is the maximum vertical pressure that can be applied to the ground surface, at which point a shear failure mechanism develops in the supporting soil. In essence, this means the maximum amount of load the soil can take before it fails, or gives way completely.

Underground services

Cranes should **not** be set up over underground services. The crane may sink or tip over while it is moving the load or damage the services.

Look for backfilled trenches, manhole covers, inspection covers and drains when checking a worksite for hazards.

Beware of potential non-weight bearing surfaces.

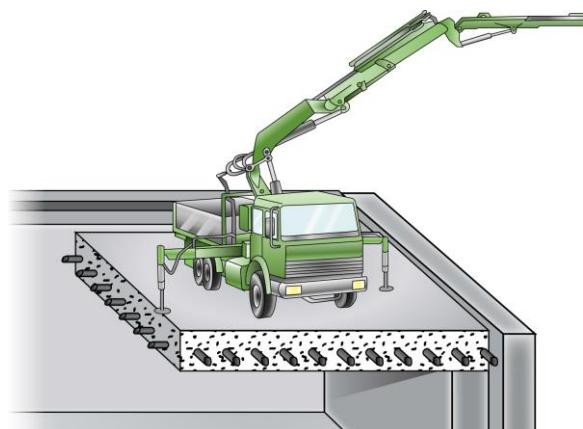


Suspended floors/slabs

Check with an engineer and/or competent person if any suspended slabs can take the load of the crane plus material.

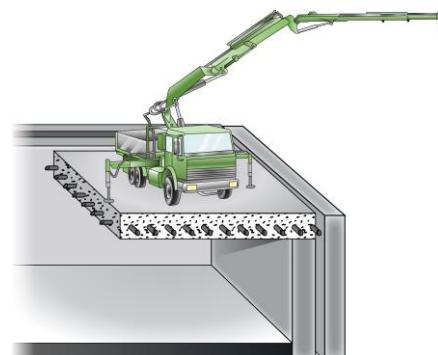
When setting up a crane on a suspended floor or temporary formwork you should consider the following:

- The floor is strong enough to take the weight of the crane and load
- Beware of single point loadings
- The age of the slab
- Whether back propping or shoring is needed on the floors underneath
- Written confirmation from a qualified engineer.



You are about to work on a concrete slab.
What do you need to be sure about?

The concrete slab must be strong enough to hold the crane and the load.



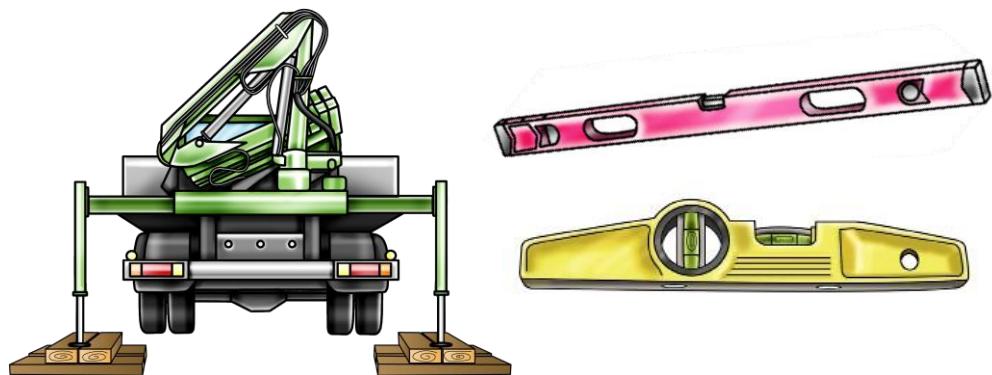
You need to set up the crane on a concrete slab.
Who can tell you if the slab can hold the weight of the crane and its load?

An engineer or competent person who has the knowledge to tell you.



How can you find out if the crane is sitting flat and level?

The crane should have a bubble level indicator fitted.



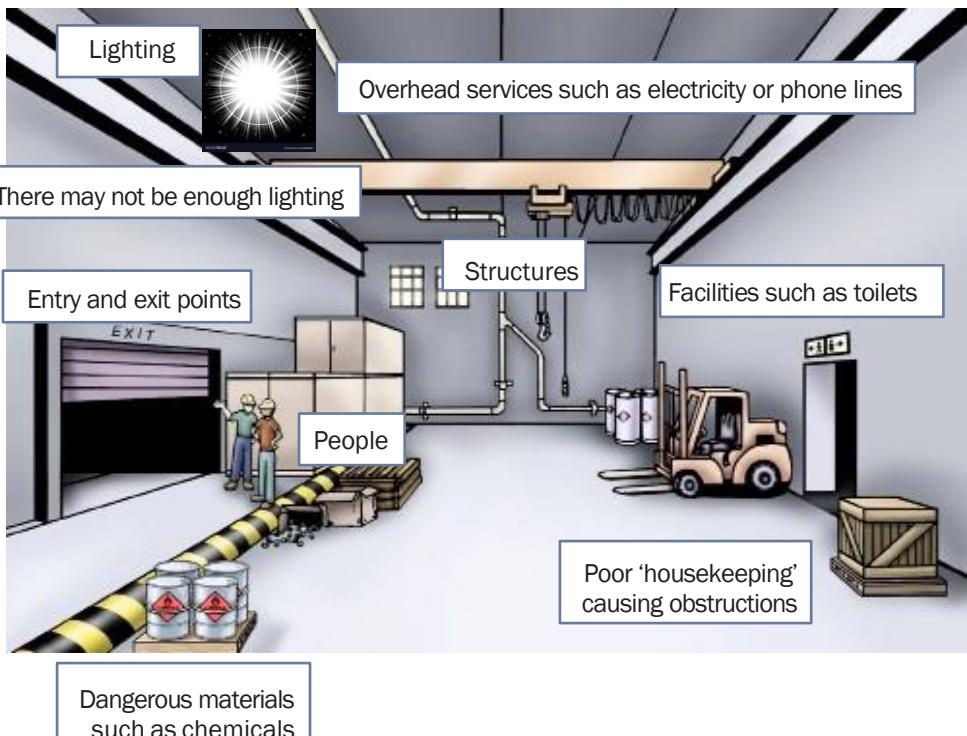
Why does the crane need to be level before you start lifting?

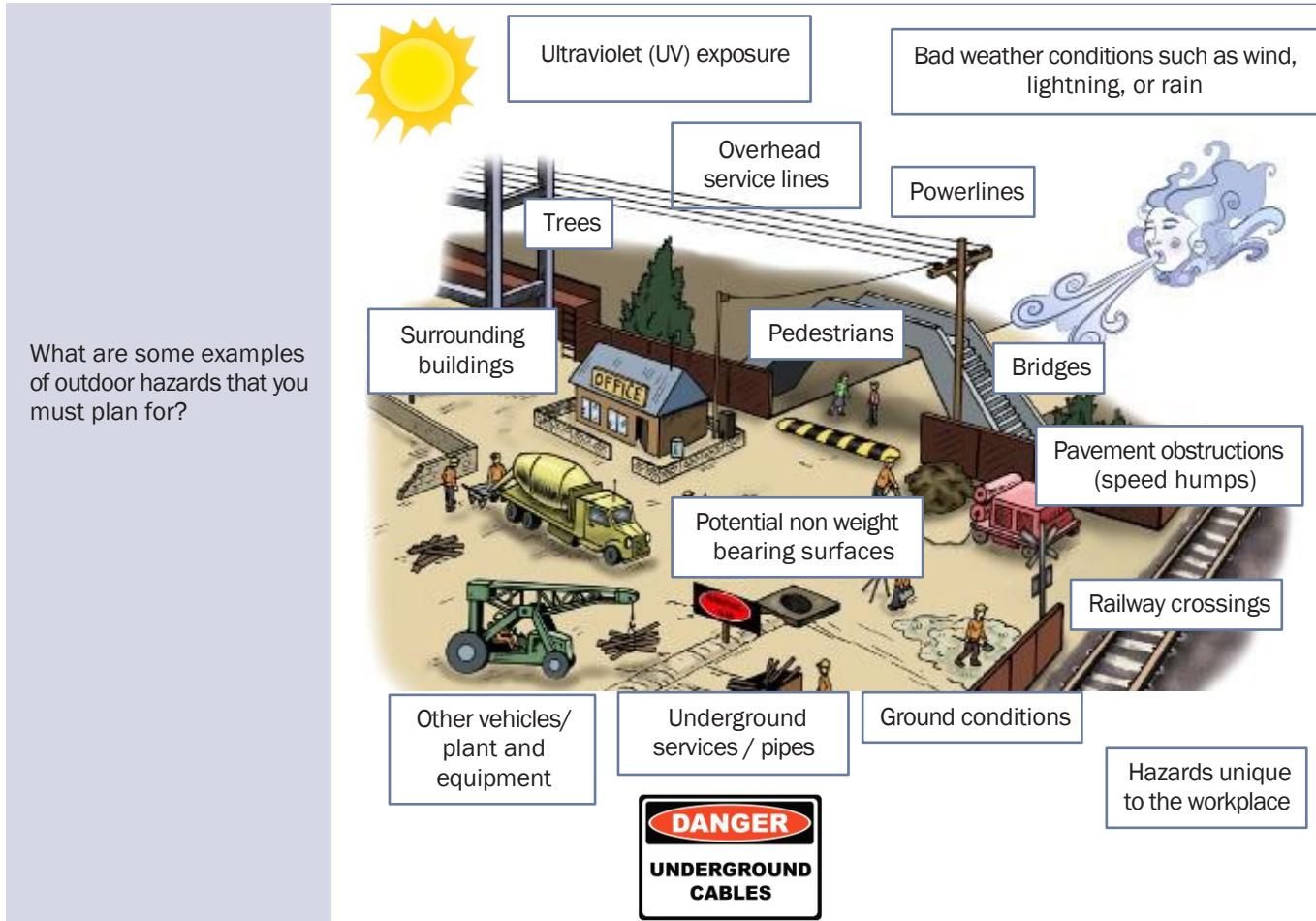
Because it's safer to use the crane when it's stable and well-balanced.



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 indoor hazards that you must plan for?





You've already planned for site hazards.

What other things do you plan for before using the crane?

Safe work procedures



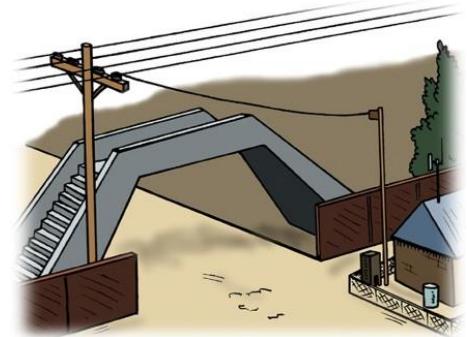
Communication



How will you get in and out of the site safely?



Where will you use the crane?



Problems or challenges at the site. For example, shift times, movement of people, etc.



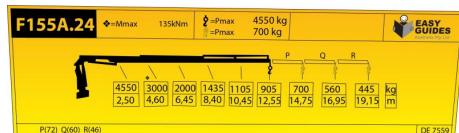
What equipment do you need? Is it available?



Do you need any permits or licenses?

WORK PERMIT				
JOB	Remove electric motor and gearbox	LOCATION	Top of crusher 'B'	
Date started:				
Date completed:				
Name	Task	Time on	Signature on	Signature off
Fred Jones	Isolate power and confirm safe	7.35 am	Fred Jones	Fred Jones
Ron Walker	Disconnect power	8.10 am	R. Walker	R. Walker
Barry Smythe	Dogger remove motor	8.25 am	B. Smythe	
Pat Kicker	Trades assistant	8.25 am	P. A. Kicker	

Does the crane have enough capacity to carry the load? Check the data plate.



Do you need a dogman/rigger or a tag line?



The cranes movement sequence

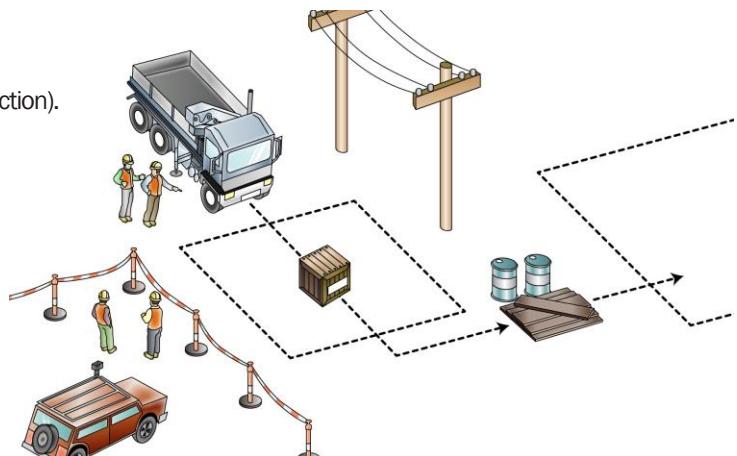


Condition, weight, and size of load.

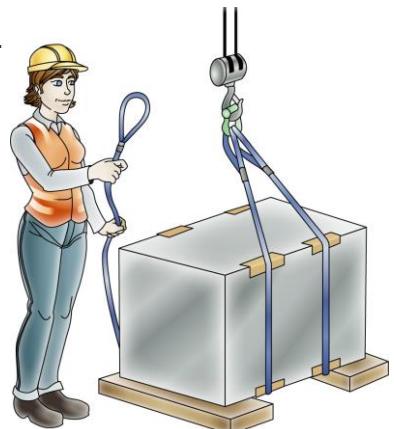
You've already planned for site hazards.

What other things do you plan for before using the crane?

Travel requirements
(distance, speed and direction).



Slinging methods. The load must be balanced and secure.



You are using a vehicle loading crane near uninsulated powerlines. Working near powerlines is **very** dangerous and can kill you.

What are the minimum safe approach distance rules you **must** follow?

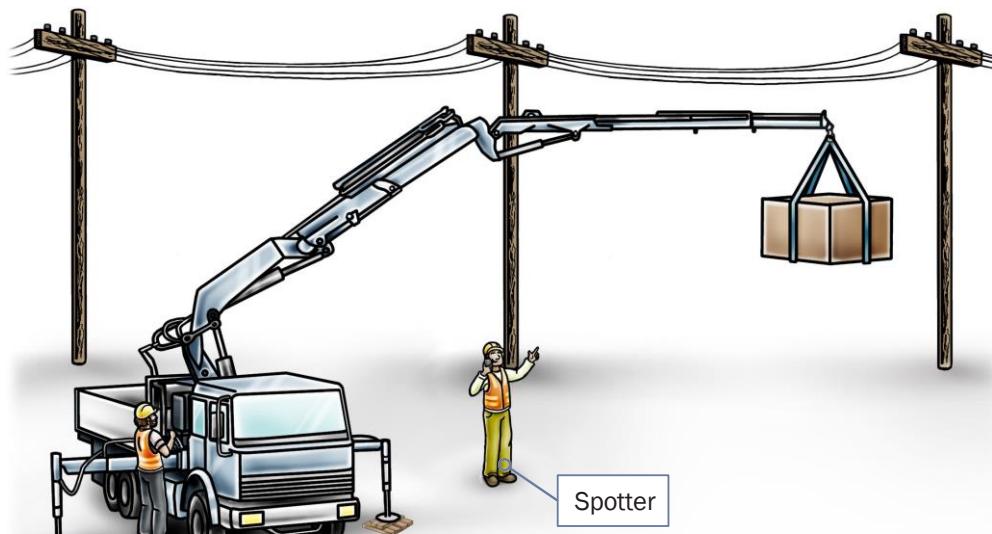
[H&I Safety and Training also runs a course designed for this. Speak with your trainer if you would like further training]

Approach distance is the minimum distance any part of the crane can go near live powerlines. The minimum safe distance rules you must follow can be different for each state/territory. For example, only some use spotters.

A **spotter** is someone who helps you work closer to powerlines [Check if this is allowed in your state/territory].

Uninsulated means the powerlines have no cover. If you touch them you could be hurt or killed.

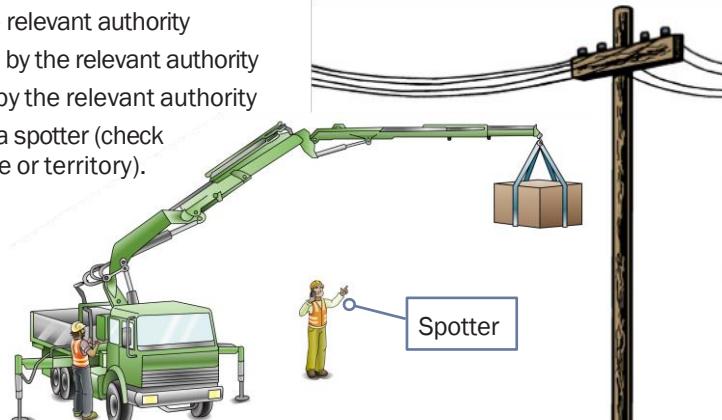
Most states and territories use Australian Standard AS [See next page/slide.]



You need to work closer to powerlines than the minimum safe distance.

What do you need to do?

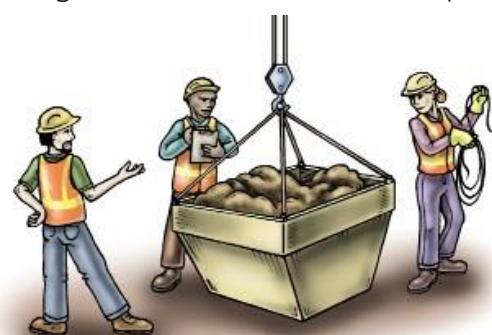
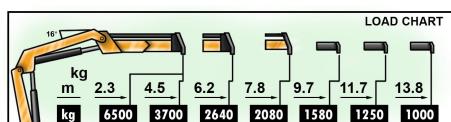
Get permission from the relevant authority
Get power disconnected by the relevant authority
Get the lines insulated by the relevant authority
You may be able to use a spotter (check legislation for your state or territory).



Whose job is it to find out the weight of the load that the crane is going to lift?

This person would also be qualified to inspect lifting equipment associated with a VLC High Risk Work licence.

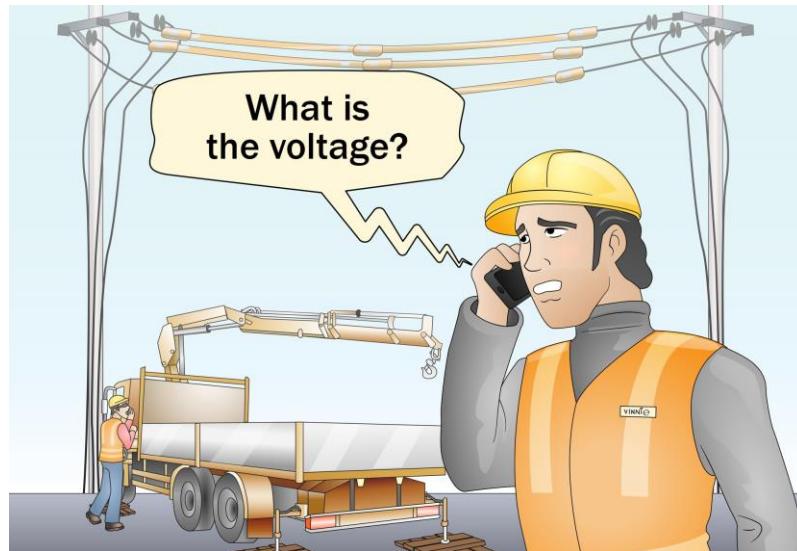
A vehicle loading crane operator with a High Risk Work licence or a dogger or rigger who holds a High Risk Work licence. The VLC operator must give information about the cranes capacity.



Finding out the voltage of overhead electric powerlines

You are about to work with a vehicle loading crane. You must find out what voltage the overhead powerlines are.

How will you do this?

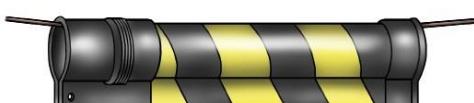


Contact the local power company responsible for the electric lines.

Tiger tails

Tiger tails are **black and yellow pipes** that hang off powerlines.
They are a **warning device** to make the powerlines easier to see.

Be aware that tiger tails are very different to insulated powerlines.



Tiger tails:

- **DO NOT** insulate wires
- **DO NOT** protect you from the risk of electrocution or electric shock
- **DO NOT** allow you to work closer to powerlines

Markers

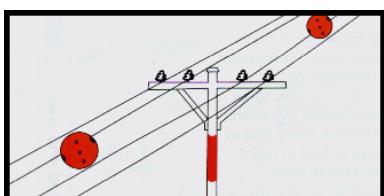
Markers of different colors such as white and orange.



Poles

Poles with the lower section painted up to 3m above ground.

Power line marker balls



Warning / danger signs



Overhead powerlines on poles (National Standard)

These are usually '**Low Voltage**'. This means powerlines of less than 133KV.

The information below is taken from the National Standard.

* Always check the distances for your state or territory, as they may be different.

AS2550.1

Powerline distances

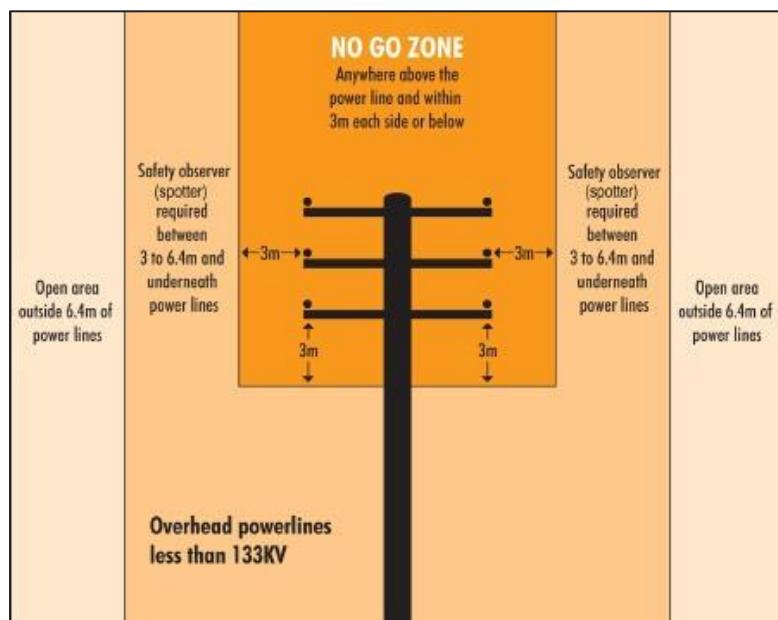
Powerline distances "Look up and live!"

Always check overhead for powerlines and make sure you and any equipment or materials you are using do not come into contact with them.

The safe operating distances for working near powerlines are outlined on the following pages.

A **spotter** is required if you are working between 3 to 6.4 metres from distribution lines on poles.

The term '**spotter**' is defined as a safety observer who is a person competent for the sole task of observing and warning against unsafe approach to overhead powerlines and other electrical apparatus.



In some states or territories a spotter **must be** qualified.

No Go Zone /Safe Approach Distance (SAD) / Exclusion Zone

Overhead powerlines on towers (National Standard)

These are usually '**High Voltage**'. This means powerlines of more than 133KV.

The information below is taken from the National Standard.

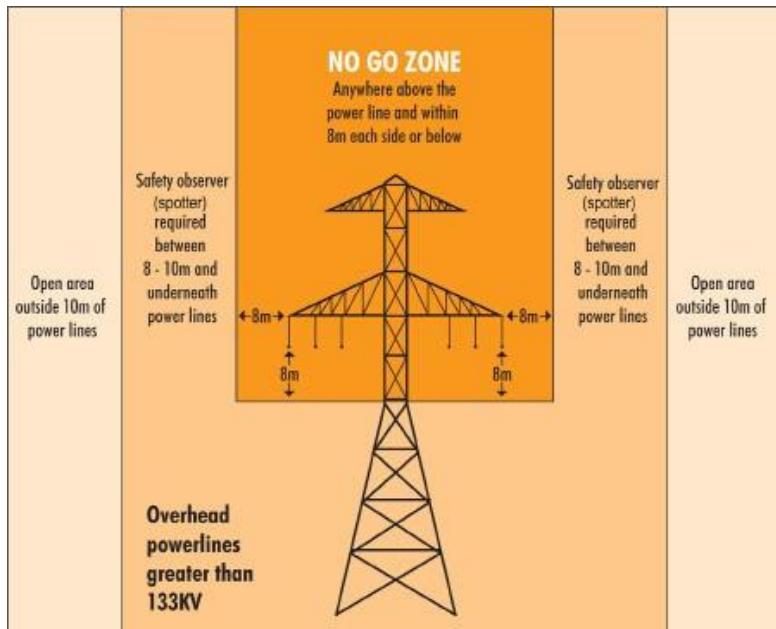
* Always check the distances for your state or territory, as they may be different.

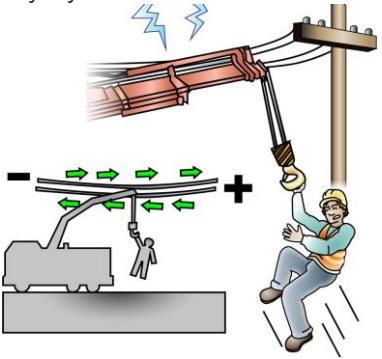
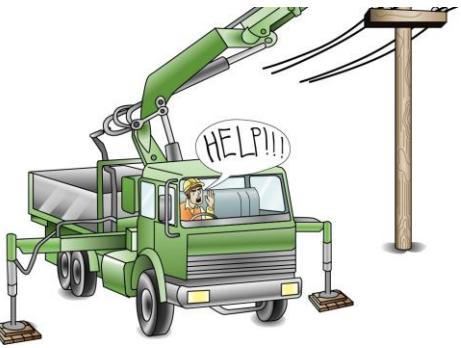
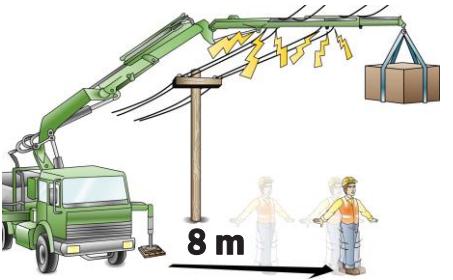
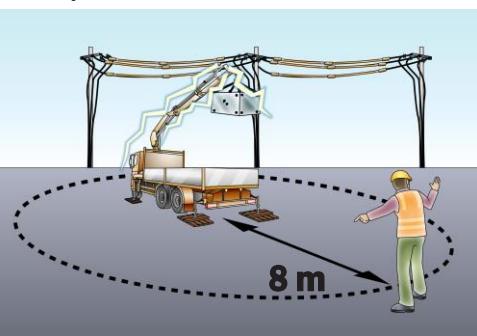
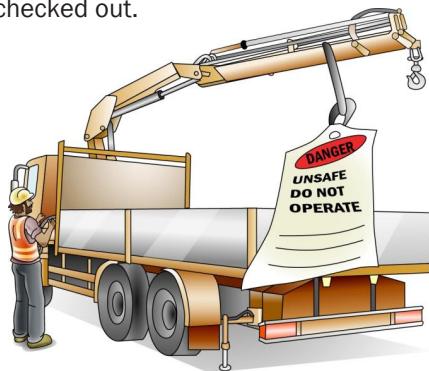
AS2550.1

Powerline distances

A **spotter** is required if you are working between 8 to 10 metres from transmission lines on **towers**.

The term '**spotter**' is defined as a safety observer who is a person competent for the sole task of observing and warning against unsafe approach to overhead powerlines and other electrical apparatus.

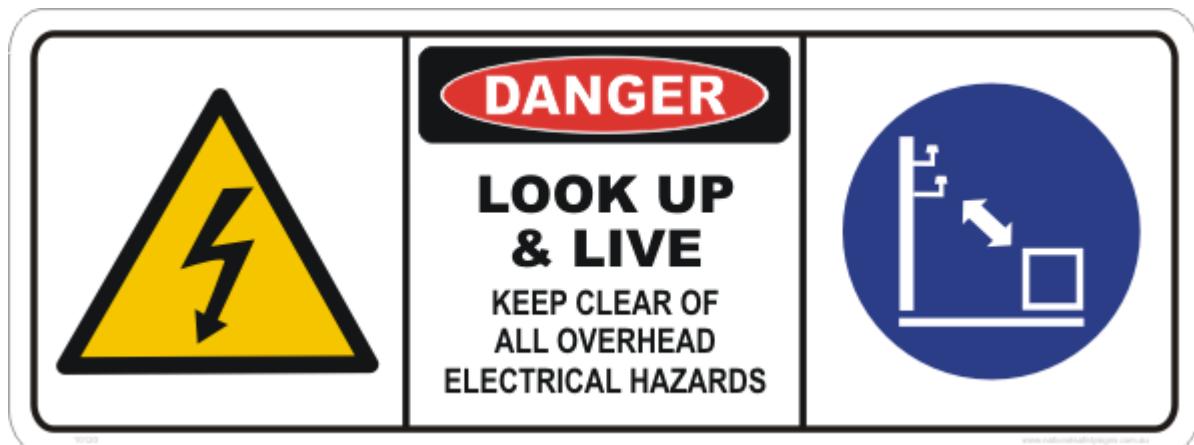


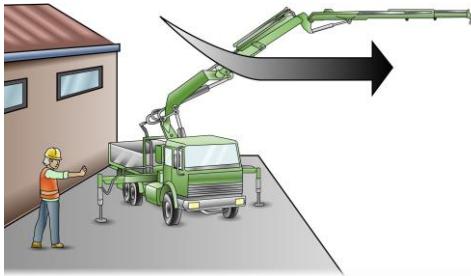
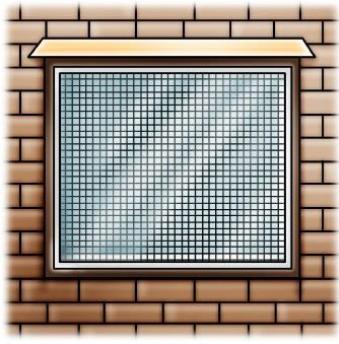
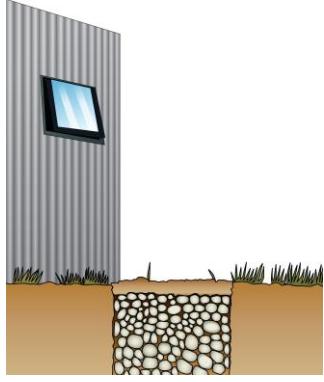
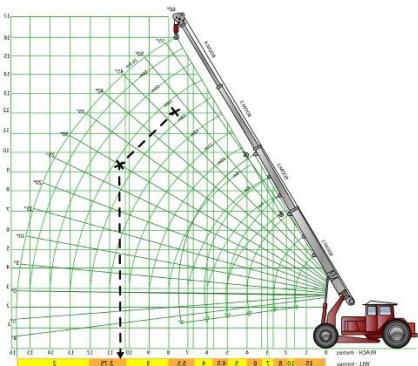
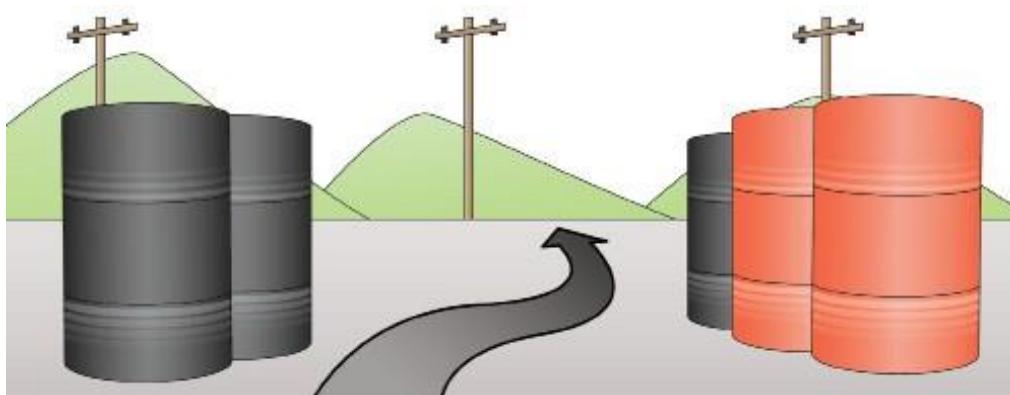
<p>Lift the hook away from the dogger if you can. Move the boom or load away from the electricity if you can.</p> 	<p>If you can't break away from the electricity, stay in the crane if it's safe. Do not touch any metal parts. Call for help.</p> 
<p>You are operating a crane and one of these two emergencies:</p> <p>a) Your crane contacts overhead powerlines or b) The dogger touches the hook and jumps like they are getting a shock.</p> <p>What must you do?</p>	<p>If you can't stay in the crane (for example, it's on fire), check for any water or objects on the ground.</p>  <p>If the way is clear, jump out of the crane. Do not touch metal parts.</p> 
<p>When you get to the ground, move away from the crane by hopping or by shuffling with both feet together.</p> <p>Do not run or walk because the ground might be electrified. Get to at least 8 metres away.</p> 	<p>When you get clear of the crane, warn everyone else to stay at least 8 metres away from it.</p> 
<p>Do all the incident reporting that you should. Do any first aid you need to.</p> 	<p>Do not use the crane until it has been checked out.</p> 

Contact with overhead power lines is a serious risk that can result in electrocution, electric shock or burns. Other risks include fires and explosions that may immobilise mobile plant involved in work.

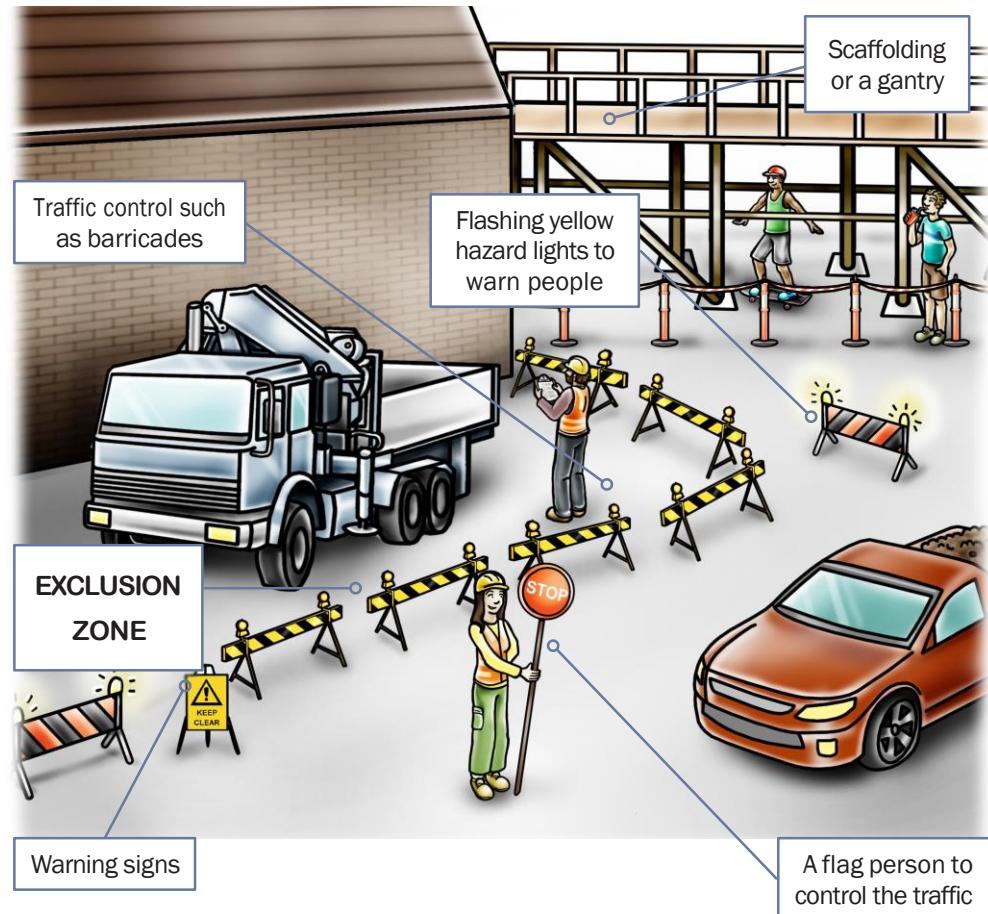
Persons conducting a business or undertaking near energised overhead power lines and associated electrical apparatus should do the following before commencing work:

- Clearly identify the height and voltage of high and low voltage power lines, including overhead service lines to buildings.
- Conduct a risk assessment of the proposed work.
- If necessary, consult with the relevant electricity supply authority about the work and comply with any special conditions imposed by them.
- Eliminate the risk by arranging for the electricity supply authority to isolate the electricity supply for the duration of the work.
- If the risk cannot be eliminated, separate the electrical hazard from the mobile plant and the workers by ensuring the following approach distances are maintained:
 - Up to 132,000 volts – 3 metres
 - Between 132,000 volts and 330,000 volts – 6 metres
 - Above 330,000 volts – 8 metres.
- **Note:** when applying the above approach distances, it is important to take into account the ‘sag and swing’ of the powerlines, the movement of the mobile plant and the strength of the wind, as well as possible operator error or equipment malfunction.
- Ensure a safety observer is used whenever a mobile plant is in motion and is likely to come closer than the above approach distances.
- Ensure an effective communication system is in place for the workers performing the work.
- Remember the safe work procedure when working near overhead power lines – **LOOK UP AND LIVE.**



<p>Set up the boom to slew away from the building</p> 	<p>Protect the building from damage For example, use screens for windows.</p> 
<p>Any back-filled ground that's close</p>  <p>You are setting up a crane close to a building. What are some things you must be careful of?</p>	<p>Wind can be stronger near buildings.</p> 
<p>Check load chart to know how where to place outriggers / stabilisers.</p> 	<p>Underground services and foundations</p> 
<p>How will you get in (access) and out (egress) of the work area?</p> 	

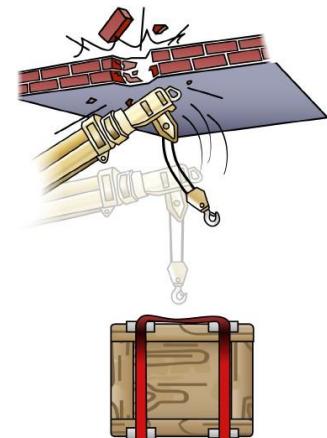
You are going to operate a VLC near pedestrians, other workers, vehicles and mobile plant. What are some control measures you could use?



You are about to set up a crane in a busy street.

Name the things you need to check?

When you release a load, the boom could spring upwards quickly and hit something (boom deflection). Make sure there is nothing above the boom and release the load slowly.



What is the hazard when releasing a heavy load from a crane hook?

Do you need permits for traffic control?
Are exclusion zones needed?



Are there any special rules you must follow?

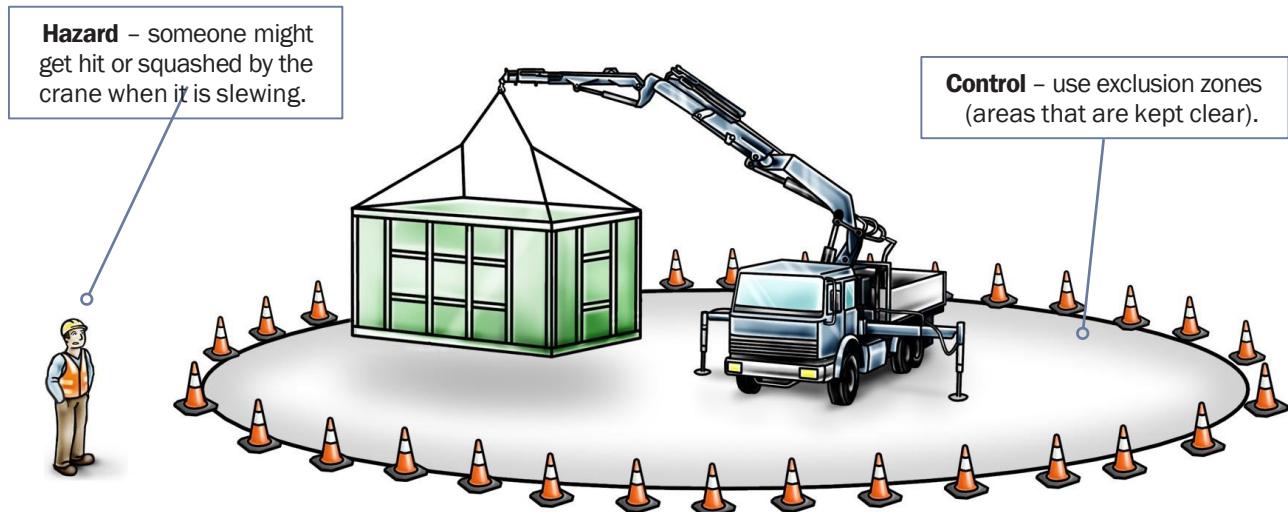


Are there any underground services?

The risk to people working near the operating radius of your crane

You are working near people or other equipment.

What is the **main risk** for people in the operating radius, and how can you **control** it?



CALCULATIONS

The following pages give examples of how a load can be identified, calculated or estimated.

What are some ways you can find out the weight of a load?

You can find the weight by:

Checking the weighbridge certificate, delivery docket or other information.



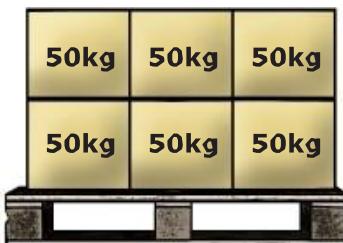
Weighing the load



Calculating the weight of the load.

For example:

$$\begin{aligned} 50 \text{ kg} \times 6 \\ = 300 \text{ kg} + 15 \text{ kg pallet} \\ = 315 \text{ kg} \end{aligned}$$

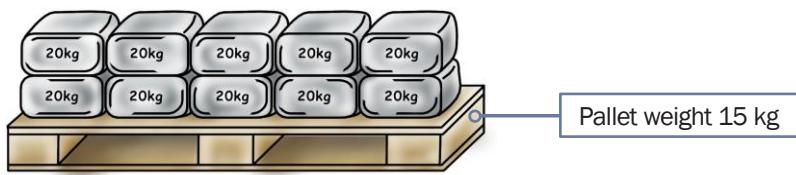


Reading the weight marked on the load.



Calculating the weight of a load

It may be necessary to calculate the weight of a load yourself. On the next pages are two examples of calculating loads.



It may be necessary to calculate the weight of the load. For example, $20 \text{ kg} \times 10 \text{ bags} = 200 \text{ kg}$

Do not forget to **add** the weight of the pallet that is 15 kg. For example, $200 \text{ kg} + 15 \text{ kg} = 215 \text{ kg}$

Example – Weight of a steel beam



Job:

Lift $6 \times$ steel beams

Specifications:

Beam weight = 100 kg per metre

Beam length = 5 metres

Work out the weight of 1 beam: $100 \text{ kg} \times 5 \text{ metres} = 500 \text{ kg per beam}$

Multiply the weight of 1 beam \times 6 beams: $500 \text{ kg} \times 6 \text{ beams} = 3000 \text{ kg (3 tonne)}$

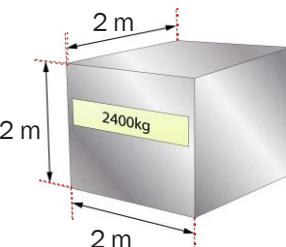
Table of common weights

Material	Size	Weight
Beer	50 L + keg	64 kg
Blue metal	1 m ³ (1 cubic metre)	1900 kg
Bricks	1 pallet	1000 kg
Cement	Bag	20 kg (50 bags per tonne)
Concrete	1 m ³ (1 cubic metre)	2400 kg
Drum (empty)	200 L (litres)	13 kg
Drum (full of liquid)	200 L (litres)	200 kg + 13 kg (drum)
Scaffold tube	48 mm outside diameter, 4.8 mm thick	5.2 kg per metre
Steel	1 m ³ (1 cubic metre)	7850 kg
Timber (hardwood)	1 m ³ (1 cubic metre)	Approx 1100 kg, if wet up to 50% more
Timber (softwood)	1 m ³ (1 cubic metre)	640 kg
Water	1 m ³ (1 cubic metre) 100 L (litres)	1000 kg 100 kg

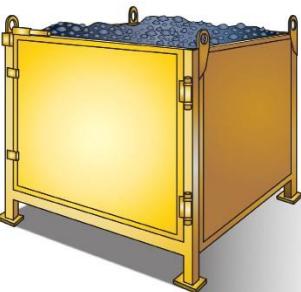
What is the mass (weight) of:

- a) 100 litres of water? **= 100 kg**
- b) 1 cubic metre of concrete? **= 2400 kg**
- c) 1 cubic metre of blue metal? **= 1900 kg**





c) 1 cubic metre of blue metal
= 1900 kg



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

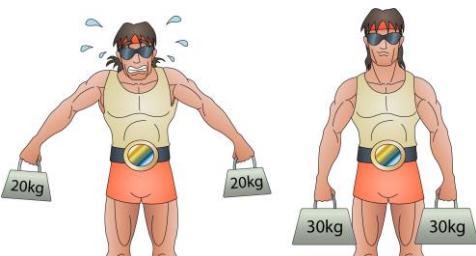
90 degrees is the recommended maximum angle between two legs of a sling for general work. 120 degrees is the maximum allowed angle between two legs of a straight sling lift.

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

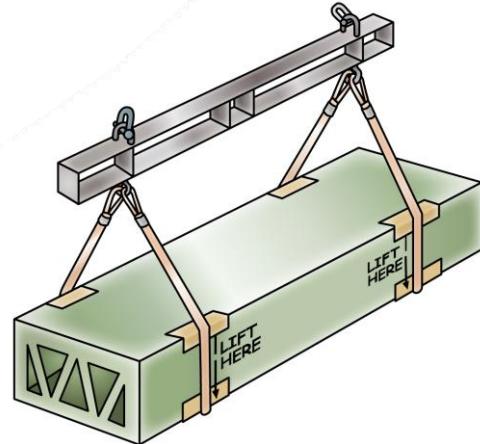
Methods of attachment

Type of attachment	Load shape	Load factor
Basket		= 2 Note: A single sling with vertical legs doubles the load factor on a round load.
Basket		= 1 Note: The corners of the load creates a nip point which reduces the capacity of the sling by 50%. Thus 50% of a load which originally had a load factor of 2 (see round load) is now reduced to a load factor of 1.
Single sling		= 1 Note: The load factor is one.
Reeve/choke		= 0.5 Note: The lifting capacity of the sling is reduced by 50%. Due to the corners of the load creating nip points.
Reeve/choke		= 0.75 Note: The lifting capacity of the sling is reduced by 25%.

Before slinging the load.

You need to work out the right lifting points for a load.

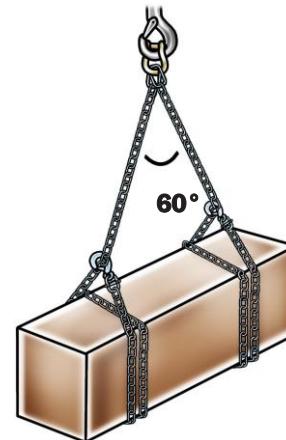
When must you do this?



60 degrees.

A two legged sling has been reeved around a load.

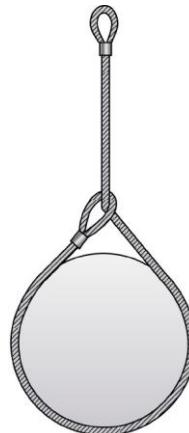
What is the maximum angle allowed between the two legs of the sling?



The load factor of this load is 0.75.

A FSWR sling is choke hitched around a round load.

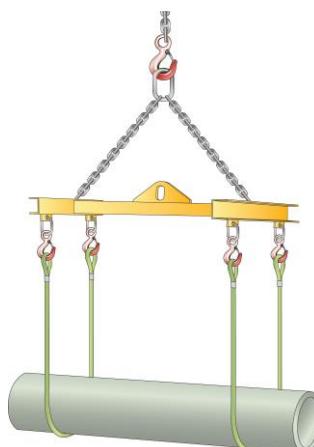
What is the load factor?



The load factor is 2.

A sling is basket hitched around a round load.

What is the load factor?



You will be doing a lift where you need to use shackles.

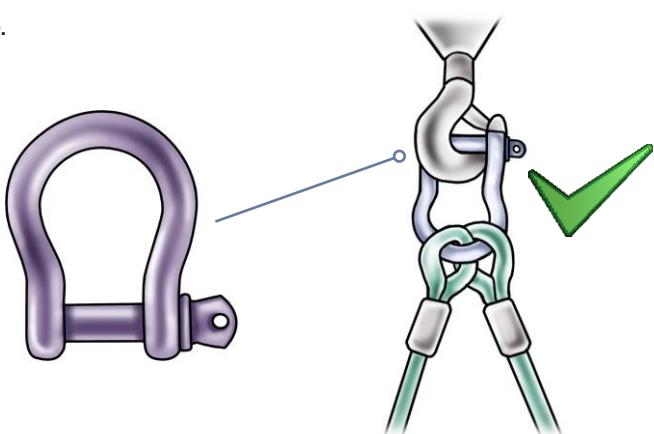
What kinds of shackles can you use?

You can use a bow shackle or a D shackle.



For supporting two or more slings what kind of shackle should you use?

You should use a bow shackle.



What information should be clearly marked on a shackle?

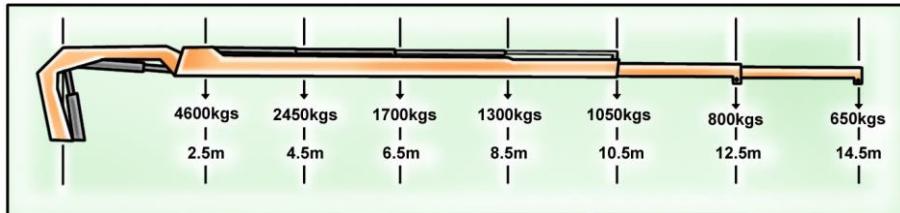
Information on the shackle should include:

- Working load limit (WLL)
- Manufacturer's identification
- Quality Grade, M or 4, S or 6
- Identification marking to match the shackle to the test certificate.



The crane chart will tell you what the crane can do (capability) and how much (capacity) it can lift. ***It is the crane operator's job to make sure the crane has the capacity to lift the load.***

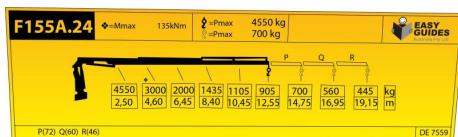
Why is it important to find the load chart on the crane and make sure it is readable?



Marked on the crane

You are about to lift a load.

Name some places you can find out if your crane can lift it.



Specifications from the crane's maker



The crane's load charts



The crane's operators manual



Dynamic forces are from the crane moving and the load being lifted.

You are planning some work with a crane. You need to know about forces around you.

Explain what the following two (2) forces are:

- Dynamic forces
- Wind load



A **wind load** is when wind puts force on the load and the crane.

If it's too windy you can't work. Australian Standard (AS 2550) has information on the rules.



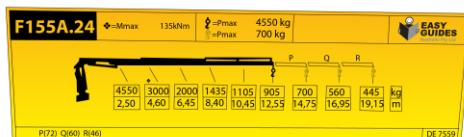
The manufacturer's specification such as in a operators manual.

It's a windy day so you need to know the maximum wind velocity the crane can work in.

Where can you find this information?



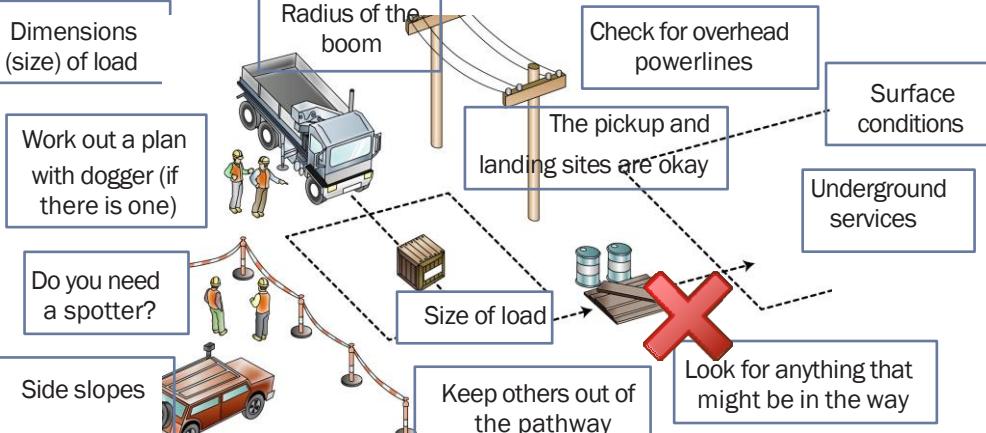
Marked on the crane's chart.

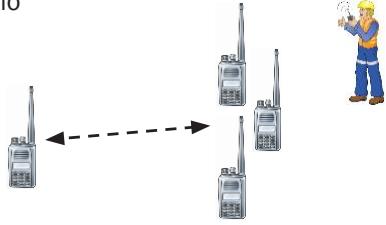
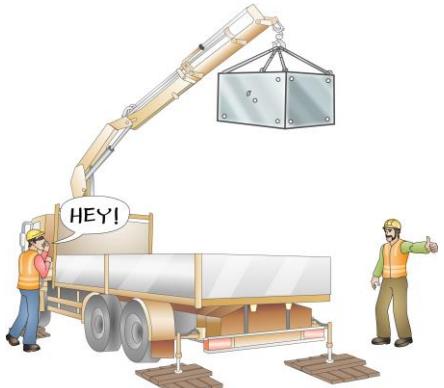


The load chart in the crane.

You are planning your path of movement for the crane or load.

What are some things to keep in mind?

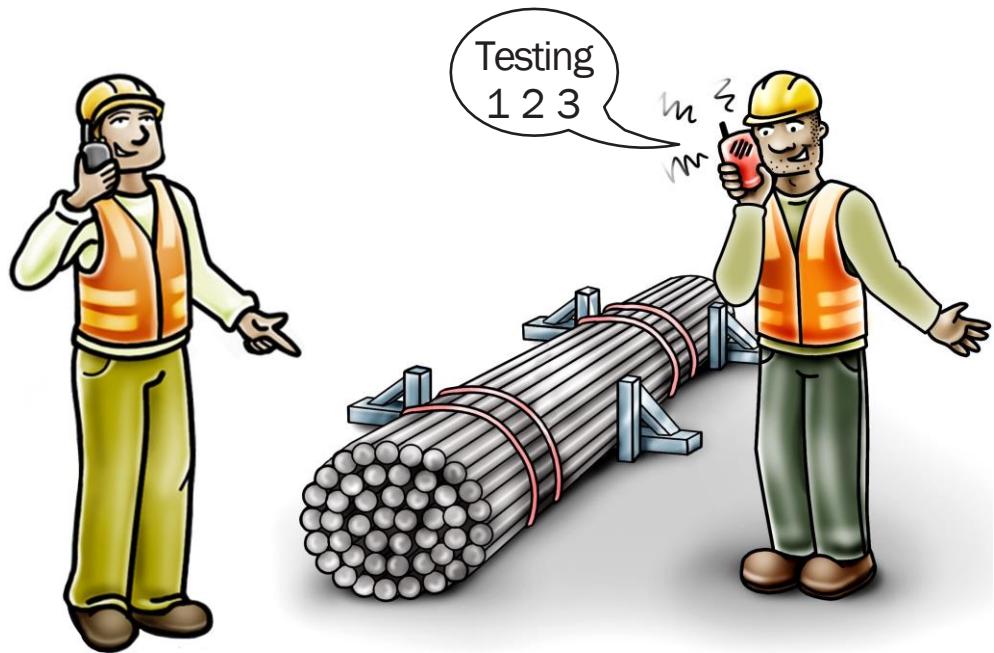


<p>You are operating a crane. Name some ways you can communicate with the dogger. Note: Choose the way you are going to communicate at the planning stage.</p>	<p>Use hand signals</p>  <p>Used a fixed frequency (trunked) two-way radio</p>  <div style="border: 1px solid black; padding: 5px;"> <p>Fixed frequency radio is a two-way system that locks other users out of your frequency. This makes it possible to have several groups operating on one site without interfering with each other.</p> </div>
<p>Talk or shout</p> 	<p>Use a whistle</p> 

<p>When do you choose how you'll communicate on the job?</p>	<p>You should choose the best way of communicating in the planning stage, after you have thought about the task. Check your communication equipment before you start to make sure it is working properly.</p> 
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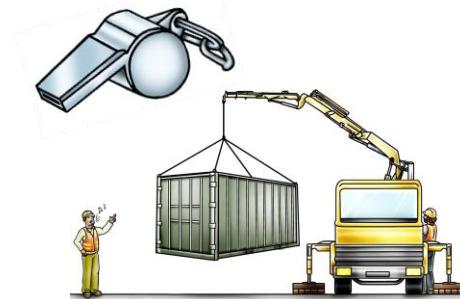
You need to make sure the equipment is working.

Why do you need to test the communications equipment before you use it?

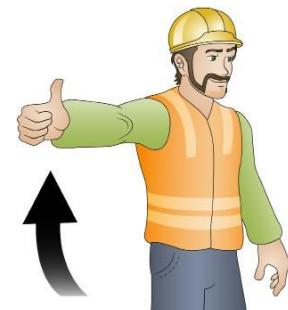


When would you use each way of communicating with the dogger?

Use a whistle when the dogman can see the load but the crane operator can't.



Use hand signals when you and your workmate **can see** each other.



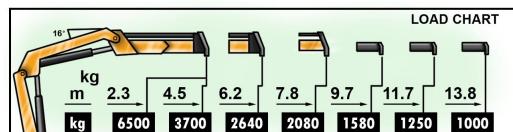
Use a fixed channel two-way radio when:

- You can't see the dogger.
- Whistle signals can't be heard.
- Whistle signals might get mixed up with whistle signals from other cranes.
- You've thought of everything else and the radio is the best way to communicate.

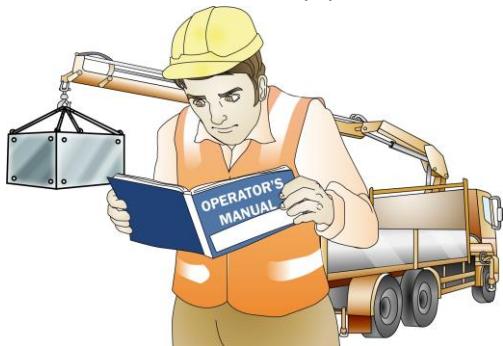


What type of information is included in the owners manual or operators manual?

- The way we should use the equipment or operate and interpret e.g. load chart.
- How we should maintain the equipment.
- How to inspect that machinery and its parts.
- How to store the equipment.



Instructions on how to use the equipment, lift features.



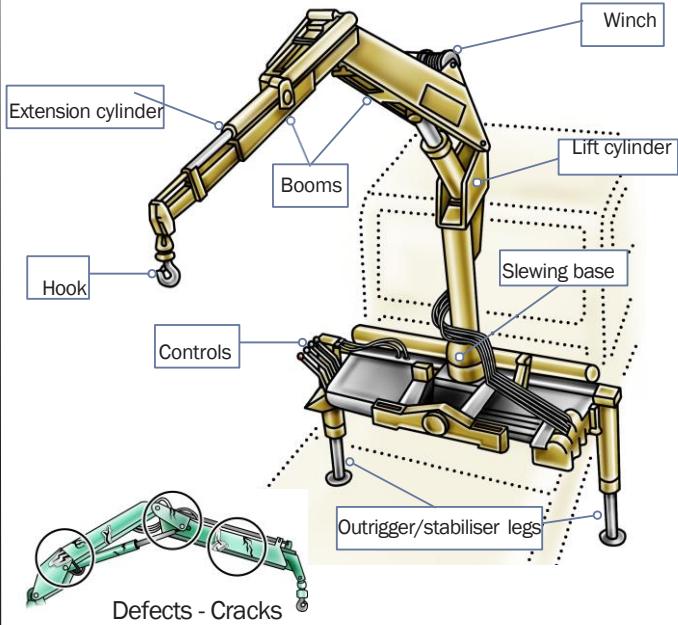
Check your manual for storage requirements.

Maintain the equipment by Checking all fluid levels (oil, water, fuel, hydraulic fluid). Check for leaks.



Inspect machinery and its parts

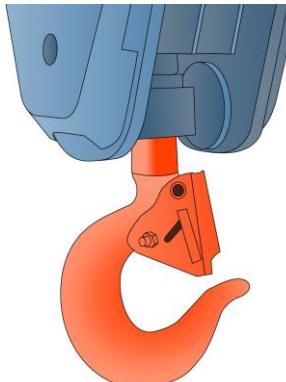
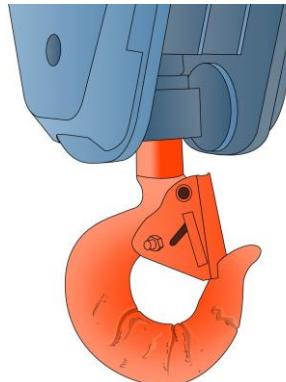
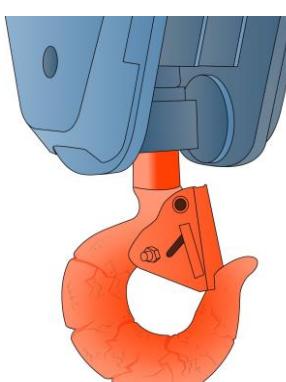
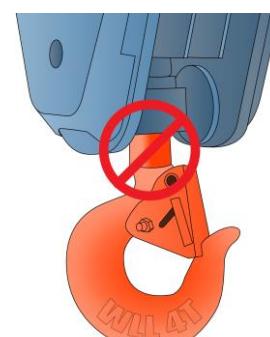
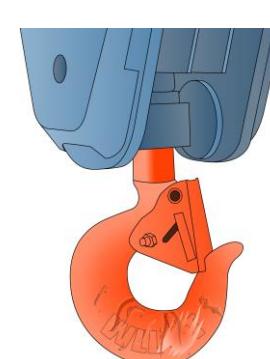
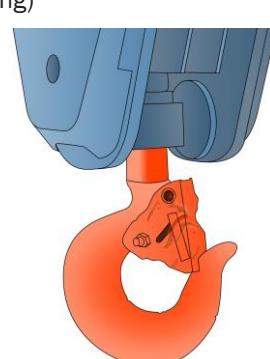
Check if there are any defects with the vehicle loading crane.



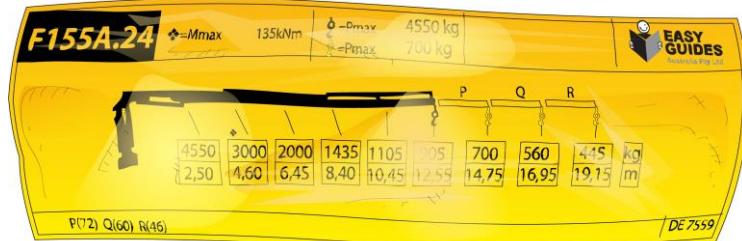
Pre Starts



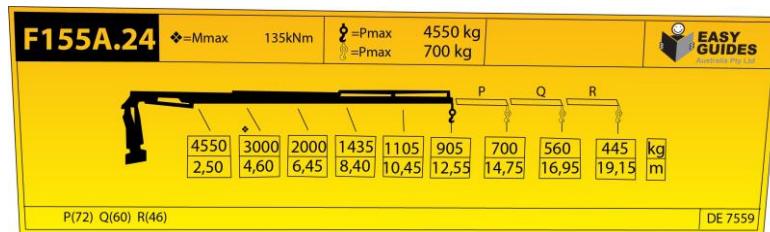
Name some defects you can easily see on a crane's boom.	Cracked welds or metal in the boom or superstructure. 	Twists or bends
Flaking paint		Rusty welds or joints
Loose bolts		Oil leaks

	<p>Bill stretched (more than 5%)</p> 	<p>Gouges and cuts (more than 10% wear)</p> 
<p>What are some defects that would make a hook unsafe to use?</p>	<p>Cracked or twisted hook</p> 	
	<p>Has been exposed to high heat. For example 280° degrees Celsius.</p> 	<p>Hook swivel not working</p> 
	<p>Rated capacity not marked on hook.</p> 	<p>Obvious damage (eg safety latch broken or missing)</p> 

Labels and signs tell you about the crane's capacity and capabilities. Capacity is how much weight the crane can support (SWL). Capability is what the crane can do. For example, how far the boom can reach.



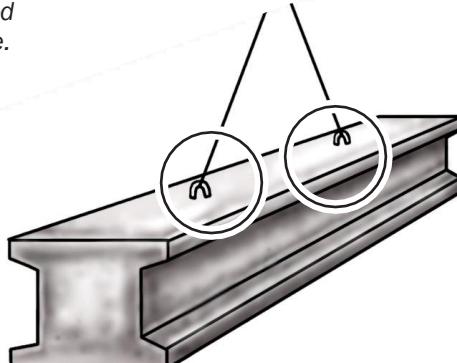
Why must all labels, charts and signs be readable and in the correct place on the crane?



The load you will lift has lifting lugs fitted.

Name some things you must check for before you lift with these lugs?

- Serviceability – The lugs must not be split, cracked, stretched, twisted, rusted or have any obvious signs of damage.
- WLL (rated capacity) – are the lugs strong enough?
- Position – are the lugs in the right places for lifting the load (centre of gravity)?



You (the operator) must check the lifting equipment and the crane **before** using it.



Whose job is it to inspect the crane and the lifting equipment before using it?

Whose job is it to inspect the lifting equipment associated with the crane before use?

Someone who holds a High Risk Work licence for:

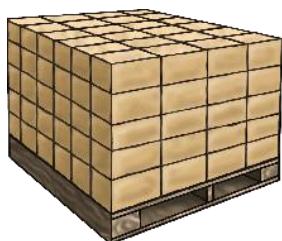
- Vehicle Loading Crane
- Dogging
- Rigging work

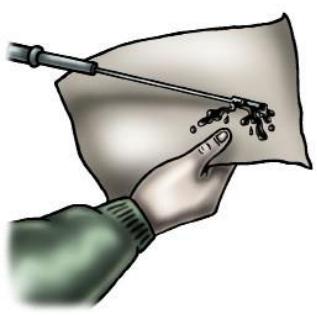
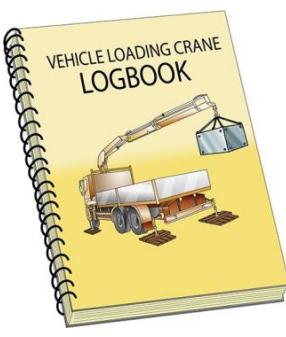
must inspect the equipment.



Why is it important to check the crane and equipment before you start work?

The crane and equipment must be safe to use. The crane must be in good condition for the job.



<p>Check for leaks</p> <p>You are going to use a crane. You need to do pre-start checks.</p> <p>Name some checks.</p>	<p>Make sure the data plate and WLL markings are there and readable.</p>   	<p>Check oil, water and fluid levels</p> 
<p>Look for damage to the boom and the crane itself</p> 	<p>Check the wire ropes and anchorages</p> 	<p>Check the tyres for equal pressure and good tread (legal)</p> 
<p>Make sure the crane is not tagged out</p> 	<p>Make sure the log book is there and up to date</p> 	<p>Check the outriggers / stabilisers and packing. Make sure the stabiliser legs are locked and in position.</p> 
<p>Check the load charts are there and are right for the crane</p> 	<p>Check the winch drums are in good order. Inspect for any signs of damage</p> 	

You should report the problem to your supervisor or the person responsible for the crane.

[Note: Tamper is to change or touch (something) especially in a way that causes damage.]

You are about to use the vehicle loading crane and notice it has been tampered with.

Who should you report this to?



No. The 'Out of Service' tag can only be removed when a competent person has decided it is safe to use.

You are doing pre-operational checks and see that someone has placed an Out of Service tag on the crane.

Is it OK to take the tag off and use the crane?



When must lifting gear be inspected?

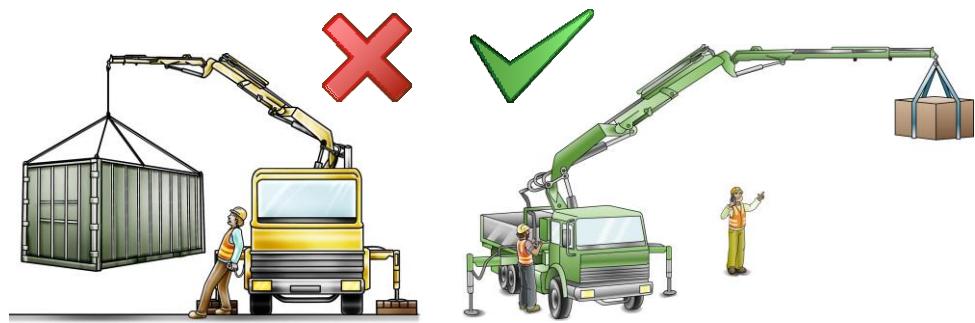
Lifting gear must be inspected before and after every use.
Always refer to manufacturers specifications.



You are using a vehicle loading crane with two sets of controls, one set on each side. The boom is extended and holding a load over one set of controls.

Which controls do you use?

The controls furthest away (opposite side) from the load are the safest to use. If you use the controls in the path of the boom or the load, you could be hit, or crushed and killed.



You are checking the crane logbook before starting work.

What do you need to check?

Is the logbook the right one for the crane?

MOBILE CRANE - Daily Inspection Checklist		Machine Type	Week Starting	/ /
Machine Hour Meter	Machine Number			
CHECK DAILY BEFORE EACH SHIFT: Sight & Listen - Check for any damage. STRUCTURE: Frame, Gantry, steel, brackets, bolts, nuts, fasteners. HYDRAULIC SYSTEM: Hoses, lines, sleeves, valves, pumps, seals, logic valves. BOOM: Arms, weight indicators, welds & assembly, mounting, fittings, nuts, bolts, washers, pins, sleeves, nuts, bolts, washers, pins, sleeves. INTERNAL: Bearings, oil levels, filters, switches, sensors, valves. GEARBOXES: Lubrication, torque, alarms, warning signs, sensors, light. LIGHTING: Headlight, side marker, rear, parking lights, turn signals, hazard lights, emergency lights. SPOTLIGHT: Intensity & coverage, hydraulic or electric power source, beam, lenses, brackets, safety locks, hoses. CABIN: Access, seat belt, seat belt harness, windows, mirrors. LADY TIR INFORMATION: Weighted bottom signs, steering, steering wheel, handbrake, gearshift, clutch, accelerator, break, parking brake. COMPUTER: Anti-theft software, radio module. CRANE & TOWER CONTROL: Slave boom memory & functioning, boom extensions, limiters, load moment indicators, counterweight, hook blocks, limit blocks, limit, magnetic resonance & vibration. MATERIAL HANDLING: Forklift, scissor lift, boom lift, telehandler, truck, dozer, backhoe, excavator, grader, motor grader, etc. WINDSHIELD: Wipers, defrosters, etc. OPERATOR: Operator ID card to carry workstation name & any other identification.				
Not Inspected	Not Inspected	Off	ACTION TAKEN TO RETURN TO SERVICE	
NOTICE: Operator to TAG OUT machine if needed.		Prev Name _____ Date _____ Signature _____		

If a defect (problem) is written in the logbook. Has the problem been fixed?



In the crane logbook.

Make sure that you follow the manufacturer's specifications for problems that have been fixed.

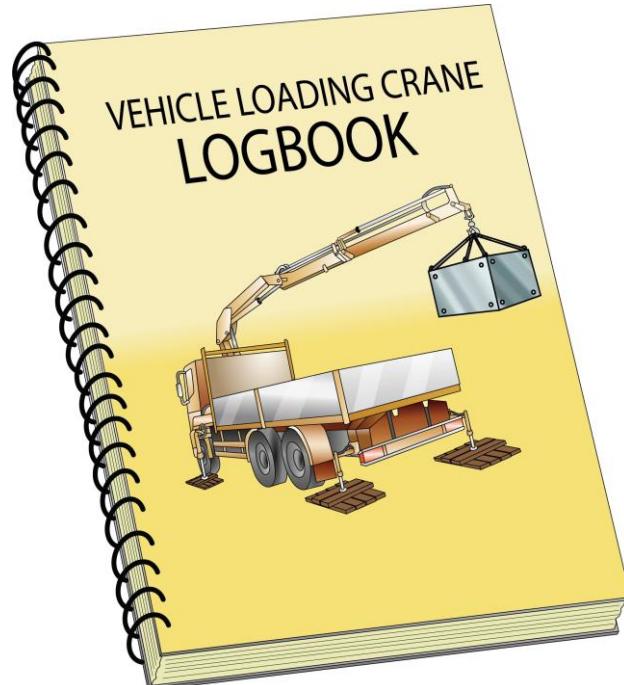
Where will you keep records and information about a crane?

CRANE OPERATOR LOG

Model No:	Unit No:	Hour Reading:							
Operator:	Week Ending:								
For each "Inspection Item" indicate one of the following: P=Pass - F=Fail - N/A=Not Applicable									
Pre-use Check		M	T	W	T	F	S	S	Comments
Structural condition									
Weather condition									
Damage									
Running repairs									
All accidents & incidents									
Shock loading Incidents									
Items Checked		M	T	W	T	F	S	S	Comments

Name some things that you check for in the logbook.

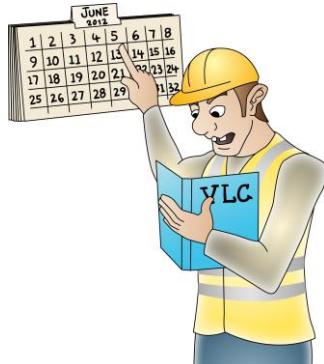
- It is the correct logbook for the crane
- The owner of the crane
- Defects that have been reported but not fixed
- Repairs that have been done



The load moment (rated capacity) indicator (LMI) must be calibrated.

When should this be done?

Every twelve months or when the manufacturer says it should.



Vehicle loading cranes made after 2003 must have a load moment indicator (LMI) made for the crane where it is fitted.

What is the purpose of the load indicator.

How do you calibrate (test) the load moment indicator to check its accuracy?

Pick up a load you already know the weight of.

Check that it matches what the load mass indicator says.

The load indicator warns the crane operator if the load exceeds 90 per cent of the rated capacity.

The load indicator gives a different warning if the rated capacity is exceeded.

Test the LMI by picking up a known weight.



Have you set up hazard controls?



Can you clearly see the work area from where you are operating the crane?



Is the communications equipment working properly?



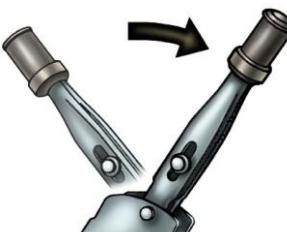
You have done the pre-operational checks. You have started the crane.

Name some **post-start** checks you must do.

Check warning lights, warning devices and warning systems.



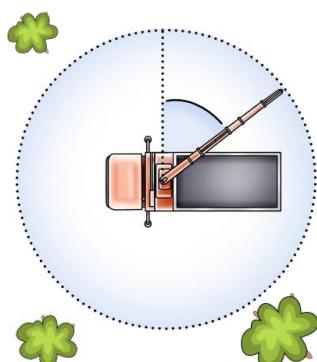
Are the brakes working?



Check two block limit.



Can the crane slew without hitting anything?



Are all controls and movements working to their full capability? Make sure the crane is working properly and is safe to use.



Why do you need to fully test all of the crane's capabilities?

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



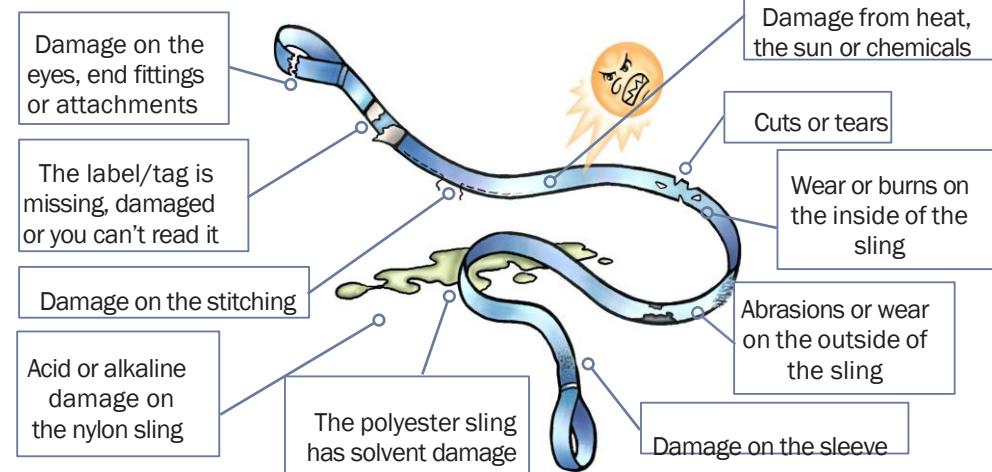
When is the right time to check that the communications equipment is working properly?

You should check **before** you start the job. It could be part of your pre-start procedure. Finding out later that the equipment is not working can cause an accident.



Name problems that make a synthetic sling unsafe to use.

Do not use the synthetic sling for lifting if you can see:



What do you do when you find faulty equipment such as slings or shackles?

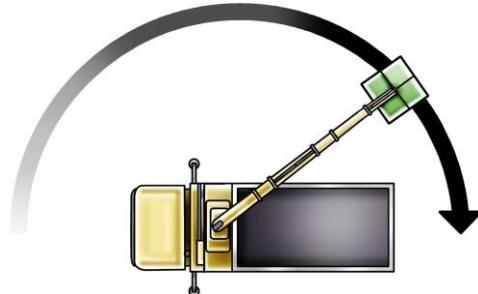
You **must** tag out the equipment and move it away from the good equipment. The faulty equipment must be inspected by a competent person.



Is the area big enough for the crane?
Can the outriggers be fully extended?



Is there enough room to slew the boom safely?



You are about to set up a crane on stable ground. But there isn't much space.

Name some things you must be careful of.

Are other people and things out of the way?



Is there anything you might have to do that goes against the manufacturer's instructions?

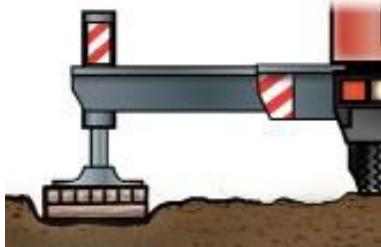
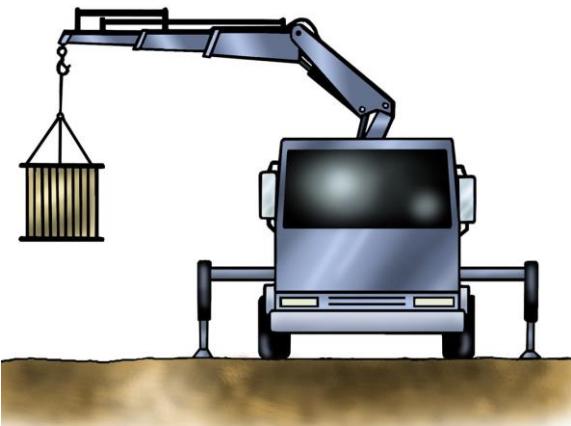


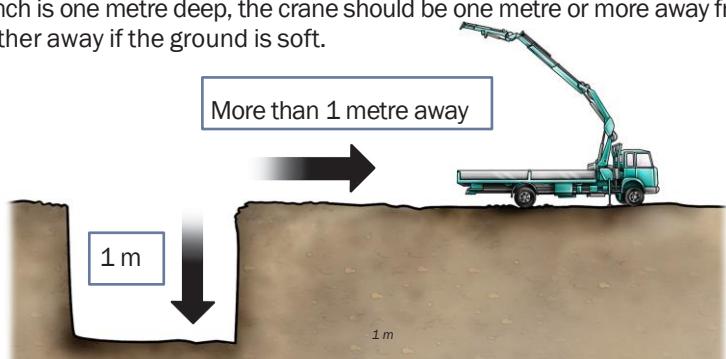
Is a dogman or spotter needed?

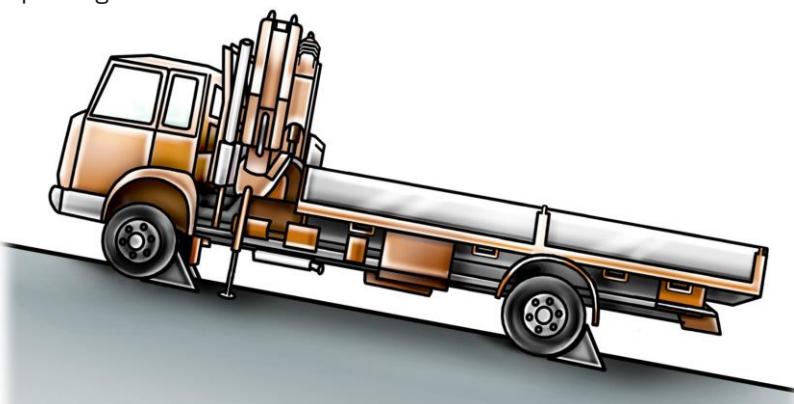


Can you get to the load okay?
Is it safe to sling and land the load?



<p>A workmate set up the crane, but you can see that one of the wheels or outriggers is sinking.</p> <p>What do you have to do?</p>	<p>1. Lower the load and stop working.</p>  	<p>2. Try to fix the sinking problem if you can.</p> 
	<p>3. If you can't fix the problem, move the crane to safer ground.</p> 	

<p>There is a risk of setting up the crane's stabilisers / wheels next to a recently filled trench. The trench could collapse.</p> <p>How far away from recent excavations and trenches (holes) should you set up a vehicle loading crane?</p>	<p>There is a danger of a trench collapsing if you park too close to it. A general rule is – however deep the trench is, be at least that far away from the trench.</p> <p>For example, if the trench is one metre deep, the crane should be one metre or more away from the trench. Set up further away if the ground is soft.</p> 
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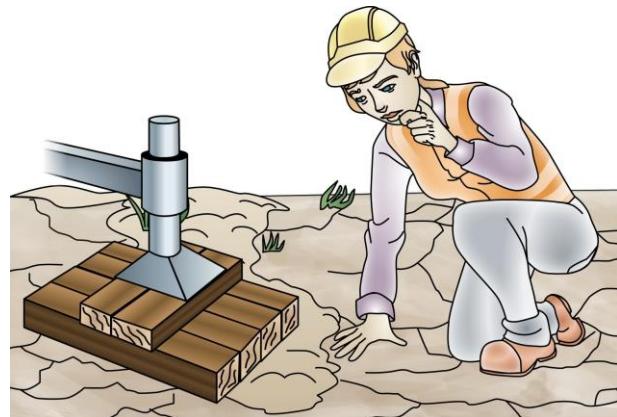
<p>If you are setting up the vehicle loading crane on a sloping surface you will need to chock the wheels and apply the hand brake.</p> <p>When must this be done?</p>	<p>Before you start operating the crane.</p> 
--	---

You are going to work in an area with soft, wet ground. The crane might sink.

How can you make the crane stable?

- Extend and lower outriggers
- Use steel plates, hardwood packing (pigstyng, cribbing) or matting underneath for added stability.

Outriggers must be deployed and locked in accordance with manufacturers instructions.



You must work out the minimum area of packing under each outrigger.

Why?

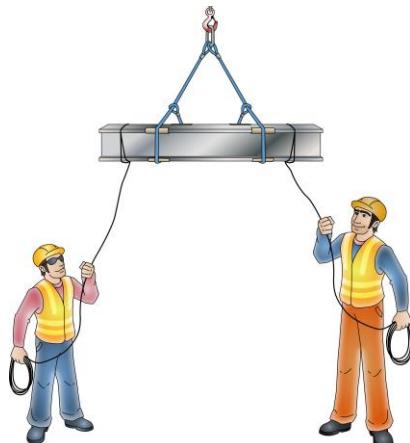
- To make sure the crane is stable
- To make sure the load is stable.

It may be necessary to consult an engineer to help determine the type and amount of packing required.



What are taglines used for?

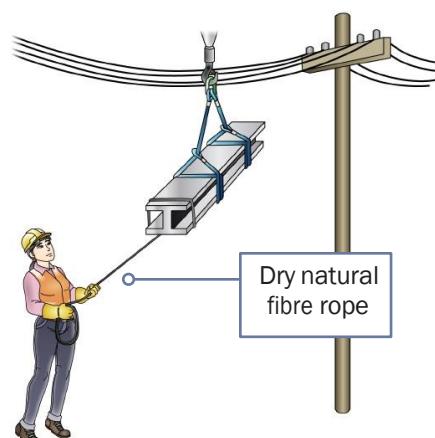
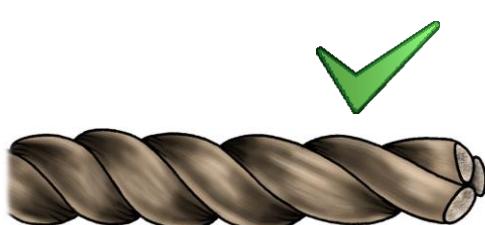
They help stop the load rotating.



You are operating a crane near overhead powerlines.

What sort of tagline must you use?

Dry natural fibre rope, dry natural rope or dry non-conductive rope.

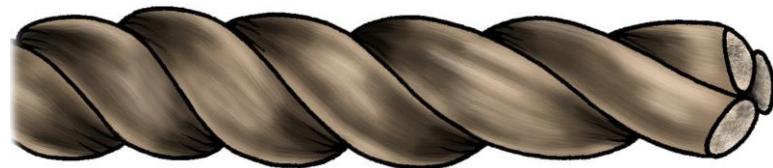


You are using a fibre rope as a tagline near overhead powerlines.

What's the smallest diameter it can be?

What must the tagline be made of?

The smallest diameter is 16 mm. The tagline must be made of dry non-conductive natural fibre rope or dry natural rope.

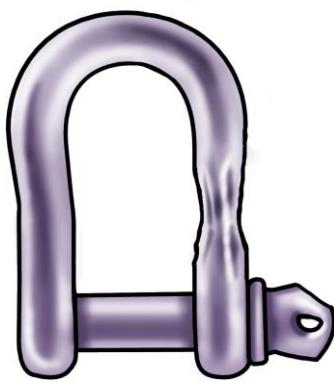
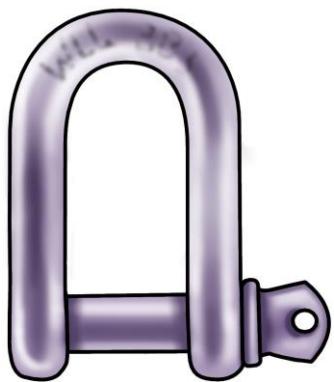
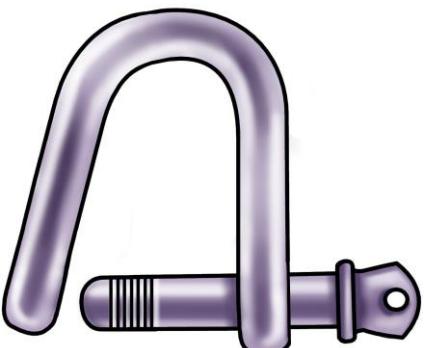
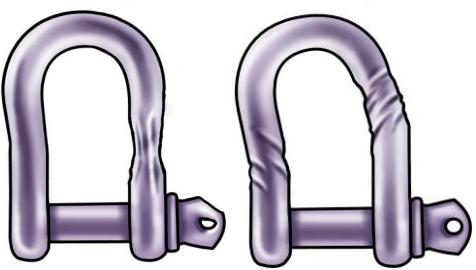
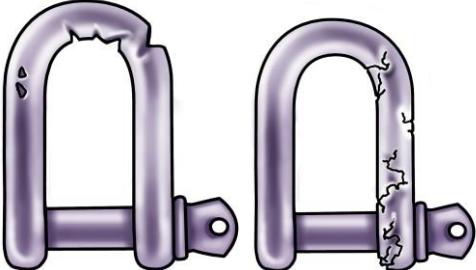


16 mm

Actual size

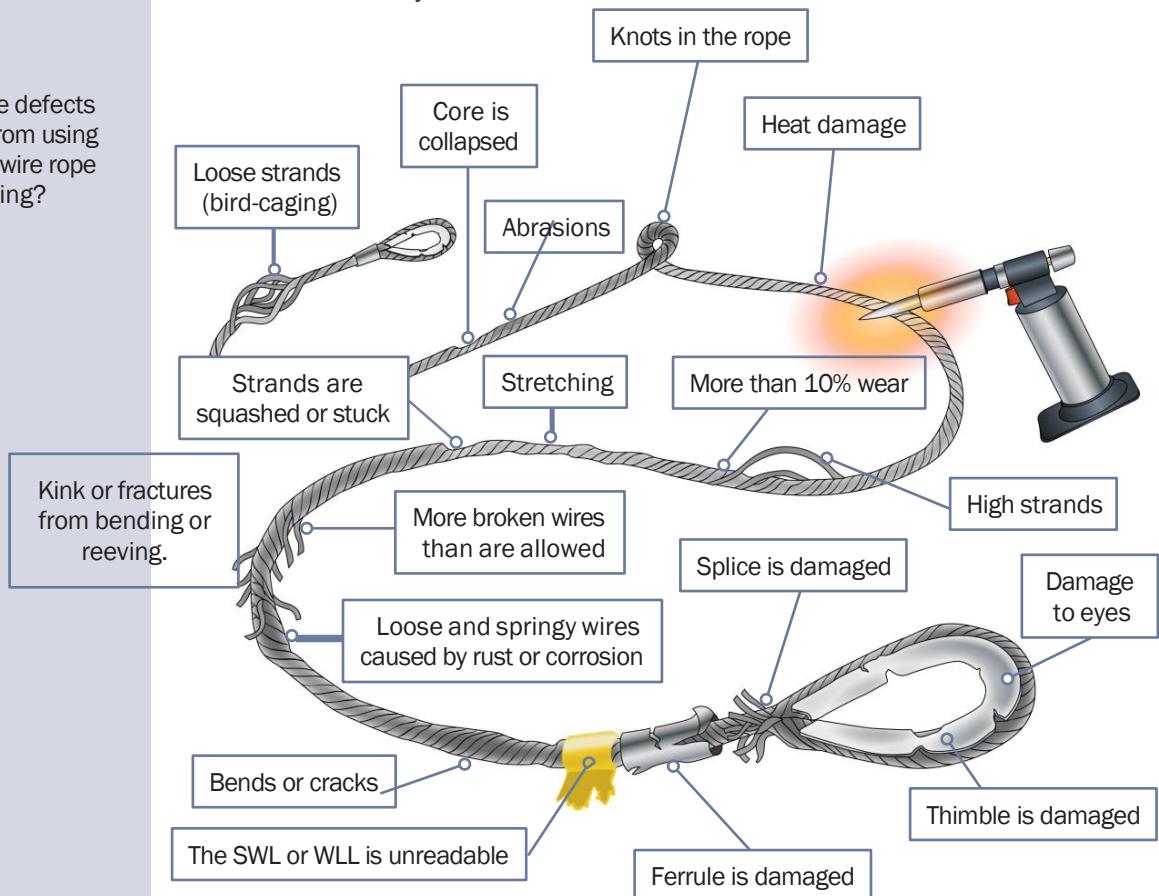
The following section will talk about lifting gear and equipment used for the task



<p>What amount of wear stops you from using the equipment below?</p>	<p>The bite of a hook = 10% or more</p> 	<p>Crane sling shorteners = 10% or more</p> 
<p>Shackles = 10% or more</p> 	<p>Chain = 10% or more</p> 	
<p>Name some problems that stop you from using shackles for lifting.</p>	<p>No Working Load Limit (WLL) marked</p> 	<p>Pin is wrong, missing, won't screw in all the way or is stretched or damaged</p> 
<p>Bent or warped</p> 	<p>Cracks and chips. 10% or more wear.</p> 	

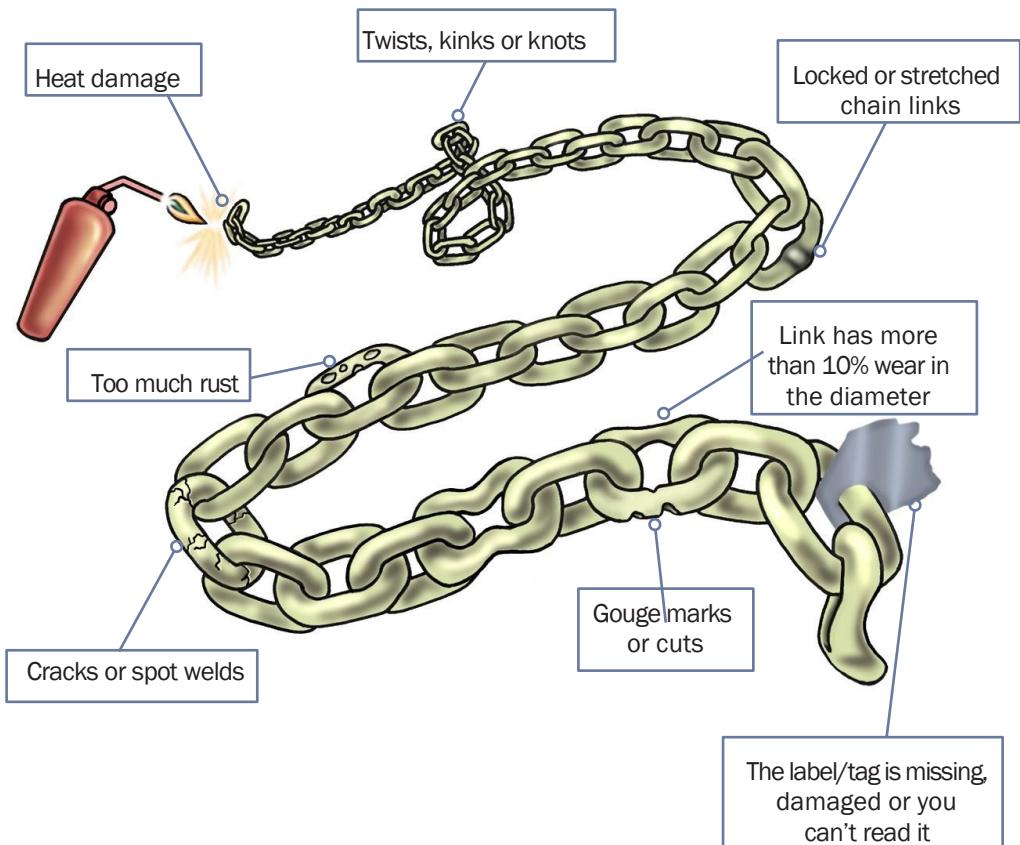
What are some defects that stop you from using a flexible steel wire rope (FSWR) for lifting?

Do not use the FSWR if you can see:



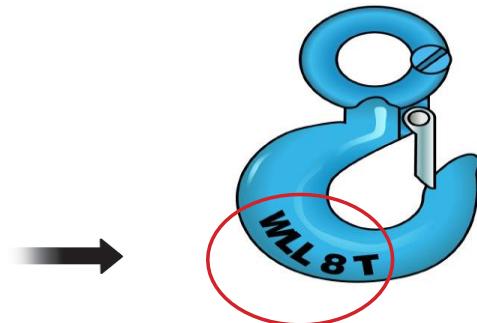
Name some problems that stop you from using a lifting chain for lifting.

Do not use the lifting chain if you can see:



Where on the hook can you find the Working Load Limit (WLL)?

The WLL should be marked on the hook itself.



Sling Equipment Types - Rope

When it comes to sling, you have a number of different types of rope to support the lifting a load, which are;

Flexible steel wire rope (FSWR), Chain slings, Synthetic slings.

Flexible steel wire rope (FSWR)

Flexible steel wire rope (FSWR) is made of wires laid around a central core.

Each strand is made of wire.

It is used for slinging, hoisting and guying.



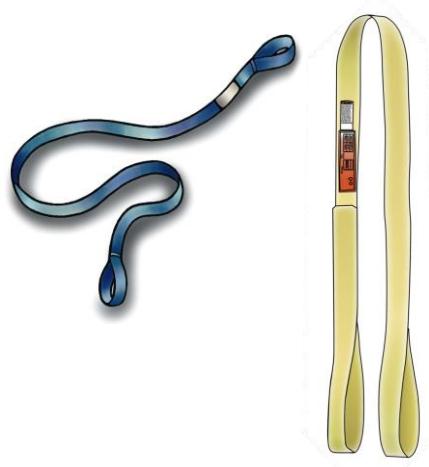
Chains

Chain slings are made from links of steel and are heavier, stronger and more durable than FSWR.



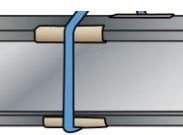
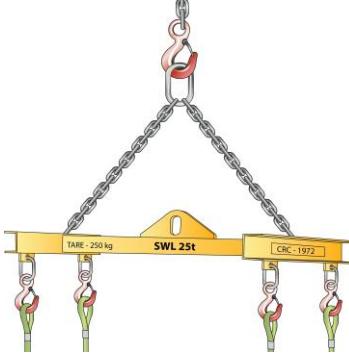
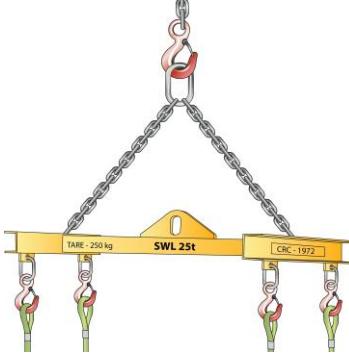
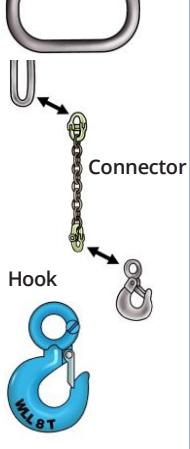
Synthetic slings

Synthetic slings are made from nylon, polyester, polypropylene or aramid polyamide.



Types of equipment to rig a sling configuration

In slinging a load, you use a number of items to join the sling configuration, such as the following: Shackles, Eye bolts, Plate Clamp / Beam Clamp, Lifting Ring, Spread Beam / bars, hooks, sling protection covers, plastic protection covers or card board, connector.

Shackles  Shackles are used to attach slings to a load or anchor point. Shackles are designed to take vertical forces only. Shackles are either a 'D' shape or 'bow' shape.	Beam clamps  Beam clamps are used to attach or suspend equipment such as temporary lifting gear to the bottom flange of an overhead beam or girder.	Eyebolts  An eyebolt is a lifting lug (a projection by which something is held or supported) that is screwed into a load. There are two types of eyebolts.	Protection Covers 
Plate clamps  Plate clamps are used to lift steel plates. They latch onto the edge of the plate and can be used to lift the load vertically or horizontally.	Spreader bar  A spreader bar and beam is designed to lift large, heavy, wide or long loads. A spreader bar is used: To spread the load over a longer length of the load Change an angled lifting sling to a vertical or straight lift.		Lifting rings 

Slinging Information

What is a WLL?

WLL stands for **Working Load Limit**. The WLL is the maximum load that can be applied to the equipment to be safely used in its best possible configuration (straight lift).

Each piece of equipment is tagged with safety information. For example the following is a Synthetic webbing sling, that has a label tag that outlines;

- The working load limit of weight that can be applied to equipment sling e.g kg kilograms, lbs,
- Angle factors.
- Material: e.g. Polyester,
- Length: e.g. 2M or 2 Meters,
- Manufacturer
- Grade (how much stress the sling can take, eg. T = Grade 80,
V = Grade 100
- Inspection date, year of manufacture, serial number.
- Rated Capacity: e.g. Vertical, Choked, Basket.



Angle factors: The following are methods of slinging loads or techniques you can use to lift a load:

- Straight / Direct/ Vertical
- Reeved / Choked
- Basket
- Angle Sling

Straight / Direct/
Vertical Sling



Reeve / Choke Hitch
Rounded Load Sling



Rounded Basket
Sling



2. sling with
an angle



What is a Load Factor?

A **load factor** is a value that has been calculated, to determine the required working limits of a particular lifting configuration.

When lifting a load use the correct load factor assigned to the configuration and sling method material used. The following table is an example of a Reeve sling configuration and its load factor table.

Flat webbing and round synthetic slings			Alloy Grade T(80) Chain slings			Flexible Steel Wire Rope (FSWR) slings		
Vertical	Choke	Basket	Adjustable sling	Reeved	Choke reeved	Choke hitch round load	Choke hitch rectangular	Basket hitch round
1	0.8	2	0.75	0.75	1.5	0.75	0.5	2

Flat webbing round synthetic Single Sling Direct



Calculate the maximum load of a sling when a Single Sling configuration is used?

if load is 1000 kg

Calculation is:

kilograms x load factor

$$1000 \text{ kg} \times 1 = 1000 \text{ kg}$$

Alloy Grade T(80) Reeve Choke Hitch Rounded Load Sling



Calculate the maximum load of a sling when a Reeve Choke Hitch Rounded Load configuration is used?

if load is 1000 kg

Calculation is:

kilograms x load factor

$$1000 \text{ kg} \times 0.75 = 750 \text{ kg}$$

(FSWR) Rounded Basket Sling



Calculate the maximum load of a sling when a Rounded Basket configuration is used?

if load is 1000 kg

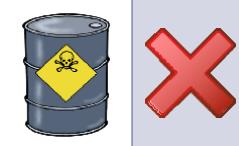
Calculation is:

kilograms x load factor

$$1000 \text{ kg} \times 2 = 2000 \text{ kg}$$

Synthetic webbing slings

There are a number of types of webbing slings used in lifting.

Terminal attachment This type of sling has a triangle fitting on each end. These slings are used in vertical and basket hitches. Some have a choker fitting on either end for choker hitches. 	Endless slings Endless slings are very versatile. They can be used in all three types of hitches. When used in a choker or basket hitch the legs can be spread for improved load control and balance. 	Flat eye sling Flat eye slings can be used in vertical, choker, and basket hitches. 	DO NOT use nylon slings when working with acids as they can damage the sling 
Reversed eye sling Reversed eye slings have eyes that are twisted 90 degrees to form a better choker hitch. This type of sling also sits better in the crane hook. 	Wide load sling A wide load sling is a sling that has been joined together down its length. The eyes can be flat or reversed. 		DO NOT use polyester slings when working with alkaline like caustic soda as they can damage the sling 

Synthetic webbing slings – Working load limits (WLL)

There are two ways to find out the working load limit (WLL) for **synthetic webbing slings**:

1. Colour coding to Australian standards.
2. Colour alone is not enough. You must check the tag on the sling.

FLAT WEBBING SLINGS MANUFACTURED TO AS 1353 SAFETY FACTOR 8:1				ROUND SLINGS MANUFACTURED TO AS4497 SAFETY FACTOR 7:1						
Flat Webbing & Round Slings										
Webbing Slings & Round Slings 8:1 Safety Factor										
Lifting Load Capacity		Vertical SWL	Choke SWL	Basket SWL	30° SWL	60° SWL	90° SWL	120° SWL	60° SWL	60° Choke SWL
Kg	Colour Code	Kg	Kg	Kg	Kg	Kg	Kg	Kg	Kg	Kg
1000	Violet	1000	800	2000	1900	1700	1400	1000	1700	1400
2000	Green	2000	1600	4000	3800	3400	2800	2000	3400	2800
3000	Yellow	3000	2400	6000	5700	5100	4200	3000	5100	4200
4000	Grey	4000	3200	8000	7600	6800	5600	4000	6800	5600
5000	Red	5000	4000	10000	9500	8500	7000	5000	8500	7000
6000	Brown	6000	4800	12000	11400	10200	8400	6000	10200	8400
8000	Blue	8000	6400	16000	15200	13600	11200	8000	13600	11200
10000	Orange	10000	8000	20000	19000	17000	14000	10000	17000	14000

Chain slings

A chain sling must have a metal tag attached, stating the chain grade and chain size.

It must also show the Safe Working Load (SWL) when using the sling in different configurations such as a straight sling or an angled sling.

Note:

Slings with missing or unreadable load tags **should not be used**.

Tag out and remove the sling from the work area.

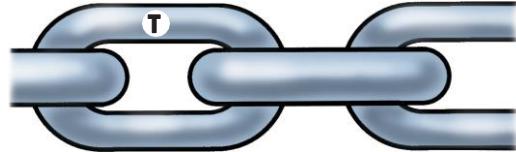


Grades of chains

There are different types (grades) of lifting chain.

The grade refers to the strength rating of the chain.

- **High Tensile and Very High Tensile (Grade T. 80 and 100, 120)** are used most often for lifting.
- **Low-grade chain (Grade L = 30)** is rarely used for lifting
- **Low-grade chain (Grade M = 40)**
- **Low-grade chain (Grade P = 50)**



Grade markings are either marked on every 20th link or 1 metre of chain length, whichever is shorter.

Higher tensile, quenched and tempered chain

Grade 80 chain

Branded: T. 8, 80, 800 or PWB, or CM and HA800 alternately. This is the common grade used for lifting purposes.

Grade 100 chain carries the mark 10 or 100, VIS200-10 or MA10

Grade 120 chain carries the mark 12 or 120 depending on the manufacturer.

Grade (T) 80 Working Load Limits (tonnes)												
Chain 	Single leg slings			Slings of 2, 3, or 4 legs			Endless slings			Reeved sling		
	Diameter mm	Straight sling	Adjustable sling	Reeved sling	60°	90°	120°	60°	90°	120°	60°	90°
6	1.2	0.95	0.95		1.9	1.6	1.1	1.6	1.3	0.95	1.6	1.3
7	1.6	1.2	1.2		2.6	2.1	1.5	2.0	1.7	1.2	2.0	1.7
8	2.0	1.5	1.5		3.5	2.8	2.0	2.6	2.1	1.5	2.6	2.1
10	3.2	2.4	2.4		5.5	4.5	3.2	4.1	3.4	2.4	4.1	3.4
13	5.4	4.0	4.0		9.4	7.6	5.4	7.0	5.7	4.0	7.0	5.7
16	8.2	6.1	6.1		14.2	11.6	8.2	10.6	8.7	6.1	10.6	8.7
20	12.8	9.6	9.6		22.2	18.1	12.8	16.6	13.6	9.6	16.6	13.6
22	16.0	12.0	12.0		27.8	22.7	16.0	20.8	17.0	12.0	20.8	17.0
26	20.6	15.5	15.5		35.8	29.2	20.6	26.8	21.9	15.5	26.8	21.9
32	32.8	24.6	24.6		56.8	46.3	32.8	42.6	32.7	24.6	42.6	34.7

Maximum Safe Working Loads in tonnes of 1000 kg under general conditions of use.

- DO NOT EXCEED SAFE WORKING LOAD
- DO NOT EXCEED 120°
- SWL at 60° must never be exceeded, even at smaller angles

IMPORTANT INSTRUCTIONS ON THE USE OF ALLOY GRADE T(80) CHAIN SLINGS

SAFETY WARNING OF HAZARDOUS CONDITIONS

Extreme care should be taken when using the Grade T(80) Chain Slings in close proximity of high temperature. It is therefore recommended that the user make ample provisions for reduced Safe Working Loads.

TEMPERATURE CONTROL

-30°C to 200°C No reduction in SWL 200°C up to 300°C Reduce SWL by 10% 300°C up to 400°C Reduce SWL by 25% Do not use above 400°C

ACIDIC CONDITIONS

Alloy Grade T(80) slings should not be used in acidic solutions nor in any other corrosive environment.

GALVANISING

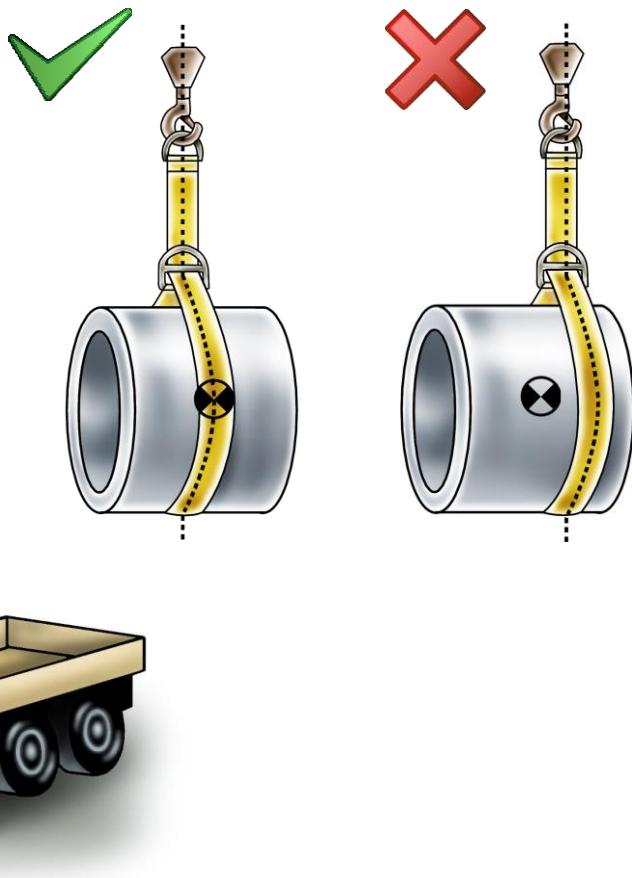
Alloy chains and fittings should not be hot-dip galvanised nor electro-plated as the Safe Working Load is reduced by 20% after galvanising.

Position the hook above the load

The crane hook needs to be positioned directly above the load centre of gravity and the lifting gear connected.

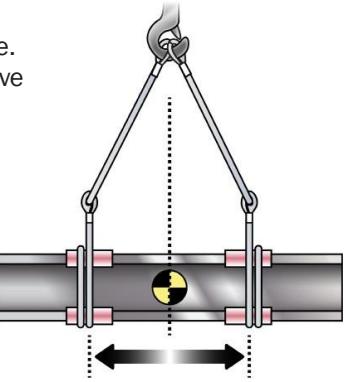
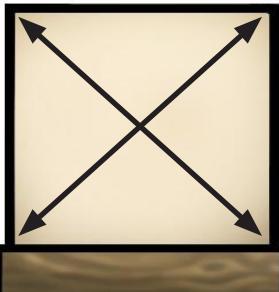
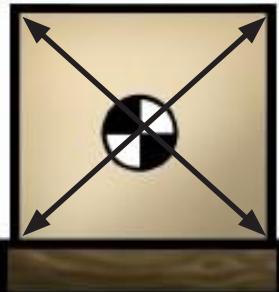
If the load is not over the centre of gravity the load may try to tip, be snigged (dragged) or swing when lifted clear of the ground.

Do a test lift to make sure the load is balanced, the slings are connected correctly and the load is safe to lift.



Finding the centre of gravity

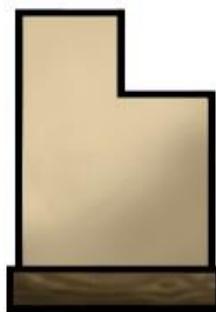
Finding the **centre of gravity** is simple with a regular shaped load. If it is not marked on the load you can measure and/or calculate to find it.

<p>Measure the length of the beam and halve the measurement to find the centre</p> 	<p>Place the slings equal distances from the centre. Make sure the hook is above the centre of gravity.</p> 
<p>You can also measure from corner to corner.</p> 	<p>The point where the two measurements cross will be the centre.</p> 

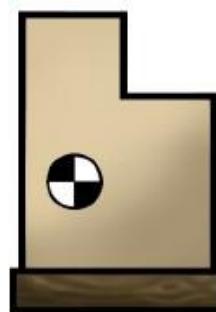
Irregular shaped loads can be more difficult.

Snigging the load

If you snig the load it means it is dragged along the ground when lifting.

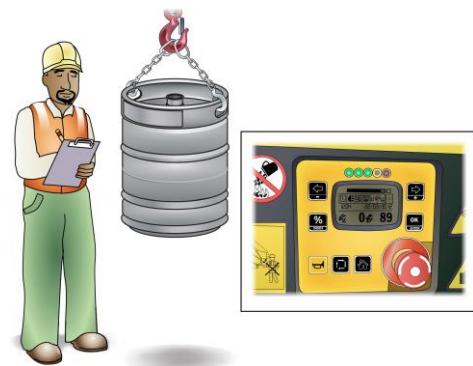


It may require an experienced person to find the centre of gravity.



You will need to do a test lift before moving a load to check the balance of the load.

This will allow you to make adjustments if the load is unstable.

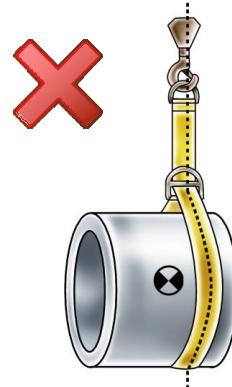


It is important to identify a loads centre of gravity as this will affect the slinging of the load and the position of the crane hook. If the load is unbalanced it may slip from its slings, swing uncontrollably or you could snig the load when it is lifted.

This load is an irregular shape and the centre of gravity can be more difficult to find.



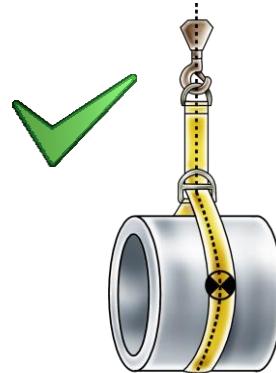
The sling and hook position for this load is incorrect.

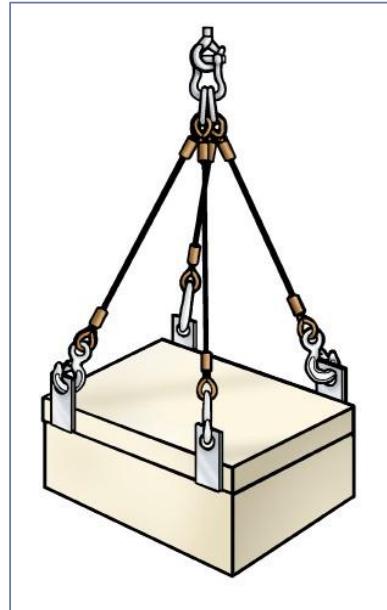


If the hook is not over the centre of the load it could be dragged and damaged.



This load is slinged correctly and the hook is over the centre of gravity.





Attach the lifting gear to hook

The hook should be positioned at a suitable height to connect the lifting gear.

Use shackles or lifting rings to secure the slings to the hook.

If you are using two or more slings you should use a bow shackle to allow more room for the slings.

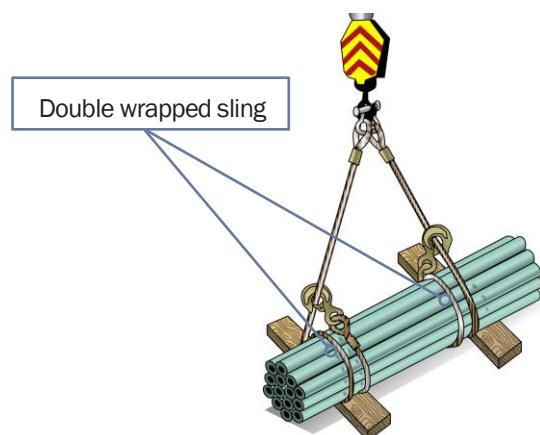
Lifting loads

When lifting loads that can slip or be damaged if not correctly lifted, special equipment or slinging methods should be used.

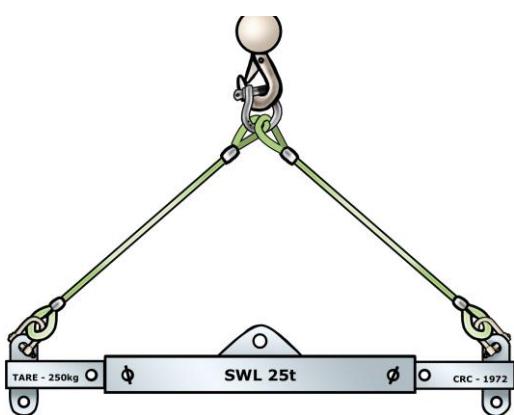
A load which has parts that can slip should be double wrapped with the sling.

Loads such as roof trusses or air conditioning duct work can be easily damaged by compression forces or unsupported sections bending.

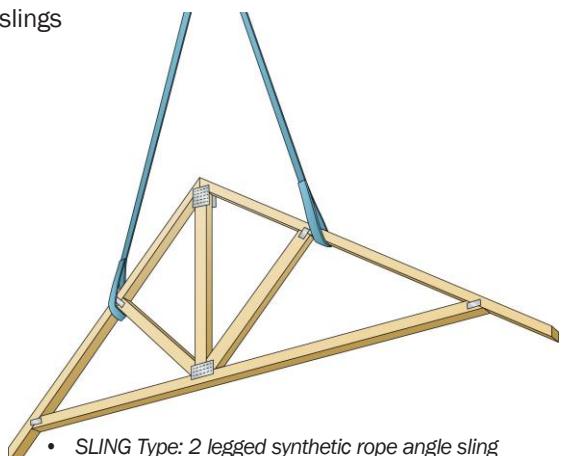
These should be lifted using special equipment such as spreader bars or long slings to reduce the compression forces as slings try to move to directly under the hook.



Spreader bar



Long slings

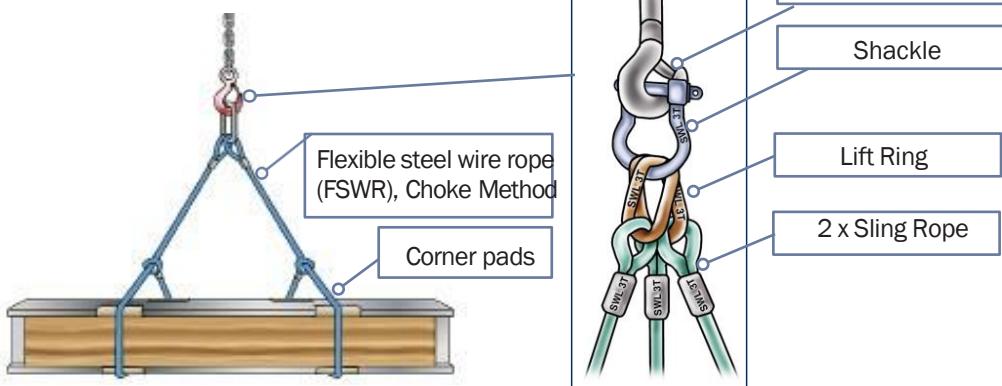


Lifting load types

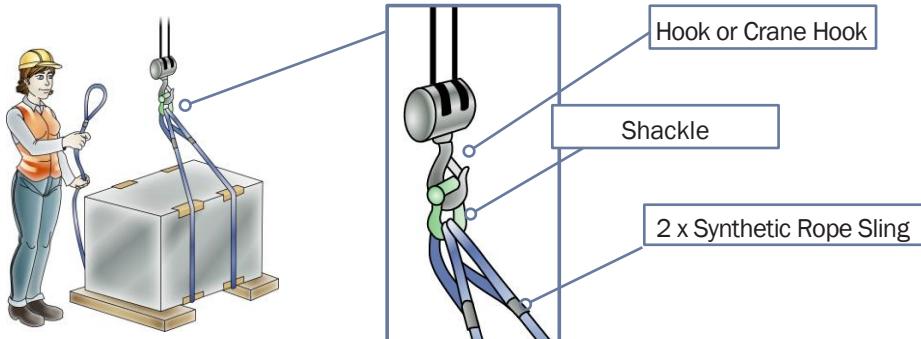
When lifting different load types you can configure the sling in different ways, such as the following:

A steel load

- SLING Type: Choked 2 legged sling with angle



A concrete piping load



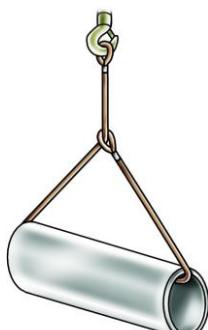
A concrete load

SLING Type: 2 legged basket synthetic rope sling or you could use a flexible steel wire rope (FSWR) sling

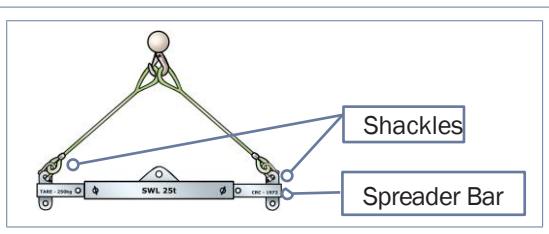
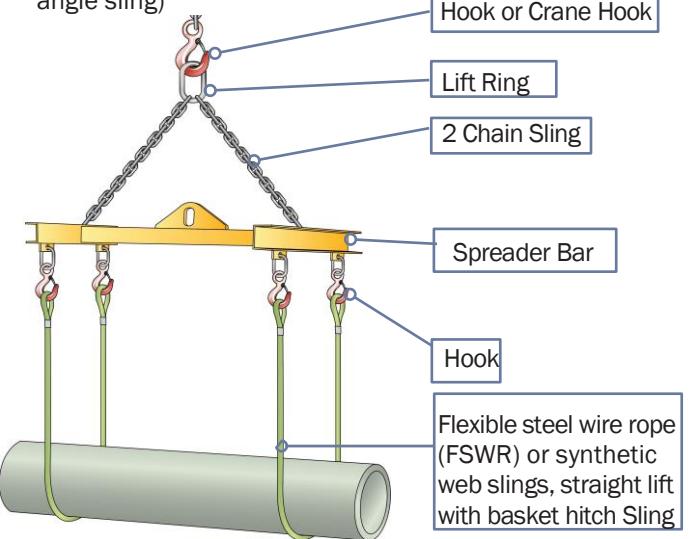
- SLING Type: FSWR, 2 choked legged sling



- SLING Type: FSWR, 1 choked legged sling



- SLING Type: FSWR or synthetic web slings, straight basket hitch sling with spread beam and (angle chain sling or FSWR angle sling)

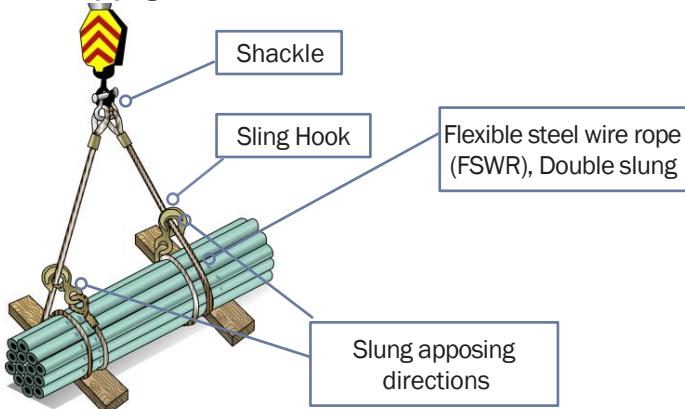


Lifting load types

When lifting different load types you can configure the sling in different ways, such as the following;

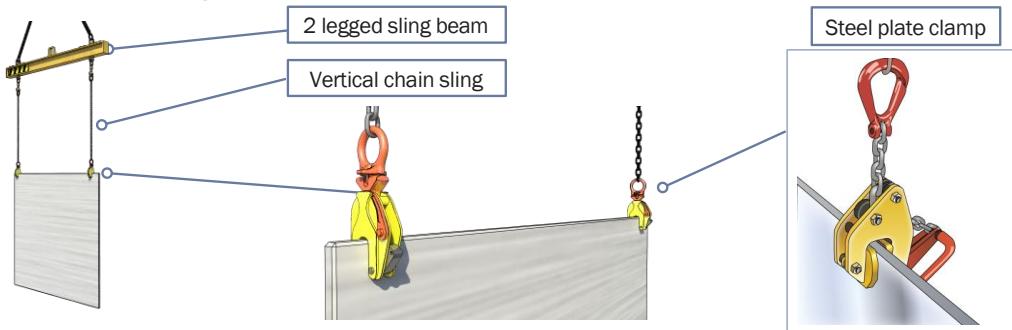
A steel rod piping Load

- SLING Type: 2 legged FSWR double slung choke hitch



A steel plate load

- SLING Type: 2 legged vertical chain sling with steel plate clamp and 2 legged angel chain sling with 2 anchor point beam spreader



What safety device does a crane hook have which stops the slings slipping off?

A safety latch on the crane hook.

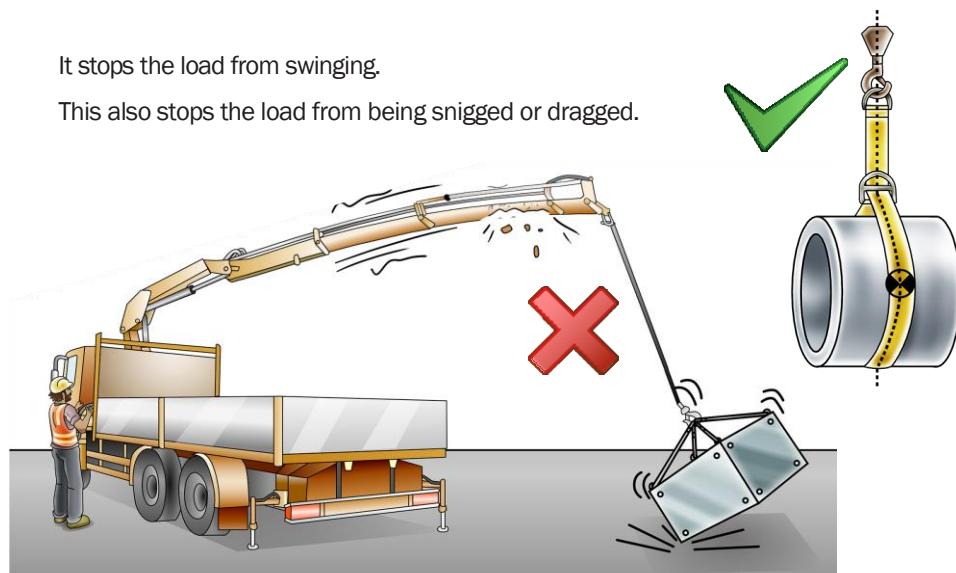
Safety latch



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 snugged or dragged.



What kind of lifting equipment do you need to use when you are lifting:

- d) Steel plates
- e) A gas bottle
- f) Bricks on a pallet

- a) Use plate clamps to lift steel plates.



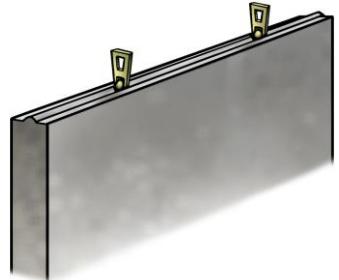
- b) Use a lifting box to lift a gas bottle.



What is the right lifting equipment to use when you are lifting:

- a) pre-cast panels
- b) timber trusses
- c) loose pipes?

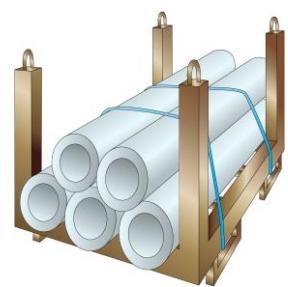
- a) Use lifting clutches to lift pre-cast panels.



- b) Use synthetic sling to lift a timber truss.



- c) Use a lifting pallet or stillage to lift a load of loose pipes.



What is a tag line?

Tag lines are used to help control loads while they are being moved and to assist in landing the load safely.

They are connected to the load using a clove hitch, rolling hitch or bowline.

Use dry non-conductive rope. This could be dry natural fibre rope or dry natural rope. This is especially important when operating near powerlines. Natural fibre ropes **do not** conduct electricity and are safer to use as tag lines than synthetic fibre ropes.



Ropes used for tag lines should be at least 16 mm in diameter

16 mm

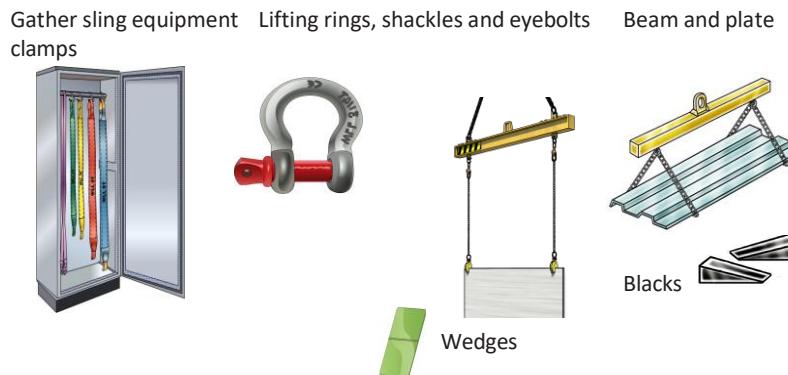
Note: If the synthetic fibre rope is **wet**, it may still conduct electricity and is **not** safe for use around powerlines.

condition of equipment

Lifting equipment and gear is prepared for safe use

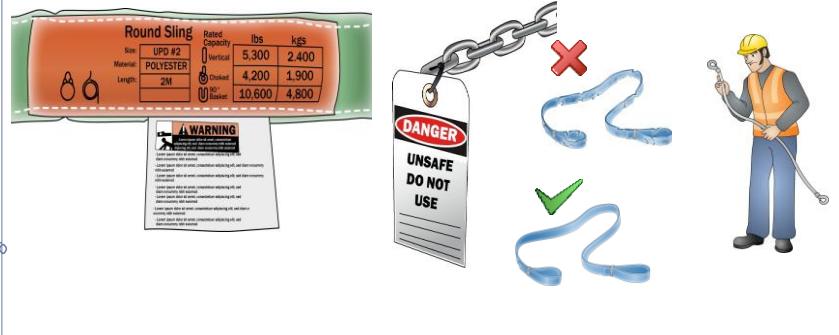
What would you do in preparation of lifting a load?

You would;



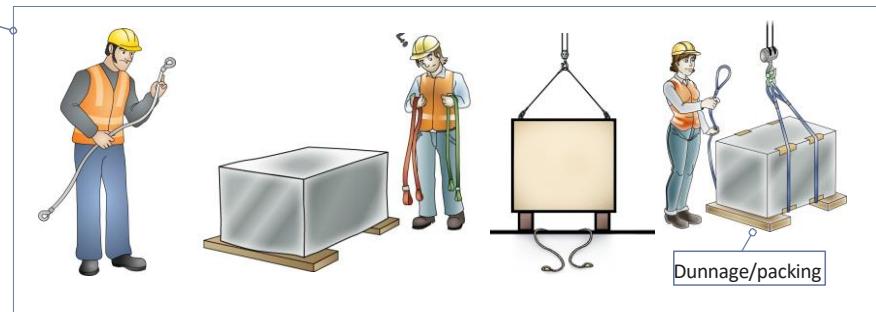
1. Gather equipment and gear

2. Inspect equipment tag information, other load lifting factors and inspect working

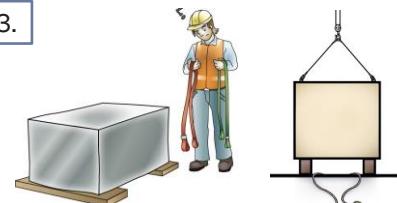


3. Layout load equipment and assemble

4. Inspect destination is setup to receive load (e.g. work blocks, wedges)



5. Do a test run.

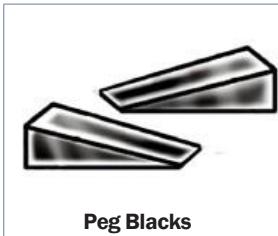
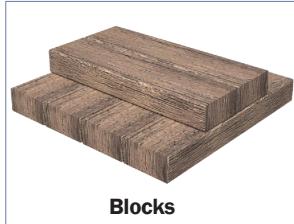
<p>What would you do in preparation of lifting a load?</p>	<p>You would;</p> <ol style="list-style-type: none"> 1. Gather equipment and gear. 2. Inspect equipment tag information, other load lifting factors and inspect working condition of equipment 3. Layout load equipment and assemble 4. Inspect destination is setup to receive load (e.g. work blocks, wedges) 5. Do a test lift. 	    
--	---	--

Inspect the destination is setup to receive a load

When lifting equipment and gear is being prepared for safe use, you also need to inspect the destination area is ready to receive load

For example;

- Work blocks,
- Peg blocks,
- Braces ready for concrete slabs.

 <p>Preparing to move a concrete slab into place</p>	 <p>Braces</p>	 <p>Peg Blocks</p>
 <p>Blocks</p>		

Conduct a test lift

What is 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** check to see if it stays stable.

- You do not need to lift the load far off the ground to check that it is stable.
- You may be able to measure and calculate the centre of gravity before lifting the load.



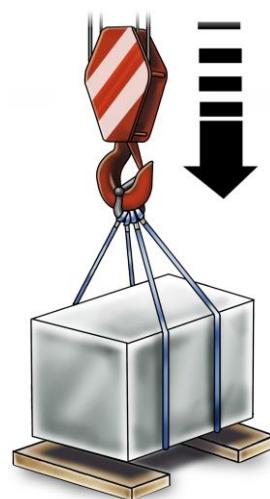
Perform a test lift

Sometime the only way to be sure the load is correctly slung and balanced is to perform a **test lift**. A test lift will also help you to make sure that the slings are fitted securely. The slings must not slip or move on the load. The load should not move or tilt when the weight is applied to the sling.

1. Lift the load off ground.		2. Stop.	
3. Check lifting slings/chains have been positioned correctly for even weight distribution.		4. If safe, stable and secure, go ahead with lifting the load.	

How to do a test/trial lift

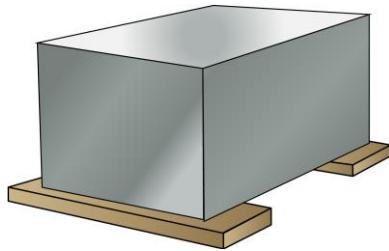
Conducting a test lift	Suspend the load	Any problems
<p>Conducting a test lift</p> <p>Doing a test/trial lift before you use the crane to move a load. This helps you check:</p> <ul style="list-style-type: none">• The crane can do the lift and is not overloaded• All crane equipment works properly• The load is stable and secure• There is enough clearance for the boom movement• The outriggers/packing is secure.	<p>Suspend the load</p> <p>When you suspend (hang) the load just off the ground, check:</p> <ul style="list-style-type: none">• The load is stable and the slings are secure• Near-capacity loads do not overload the crane• Loads of unusual shape or weight distribution are slung correctly• Load-measuring equipment can be used to verify the calculated weight of the load• All equipment works correctly• Adjustments to the slinging can be made safely.	<p>If the trial lift shows there are problems with the lift, then you should:</p> <ul style="list-style-type: none">• Stop instantly• Lower the load back to the ground• Adjust the slings• Do not continue with the work until you fix the problem.



Prepare load destination

You may be moving a load to a spot on the ground, a loading platform, a suspended floor or onto a vehicle.

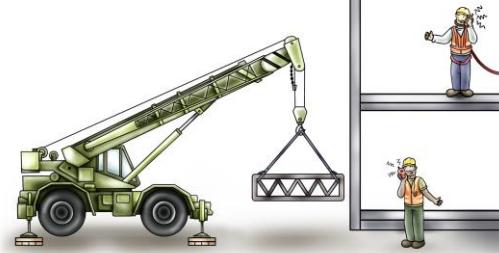
Before you start to move a load you need to make sure the load destination (the place where you are moving the load to) is ready for the load. The load may need to be **landed** on supports if the slings can be crushed or jammed preventing easy removal. Loads will need to be chocked if there is any chance of the load rolling.



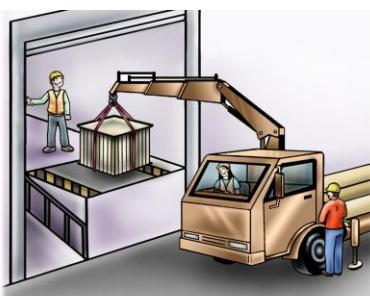
Ground



Loading dock



Suspended floor



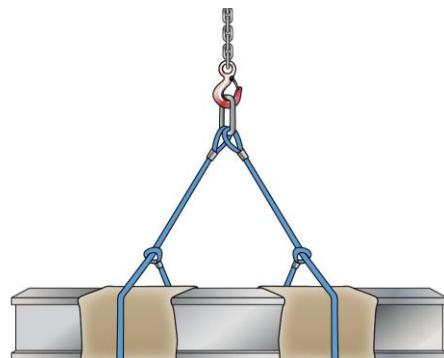
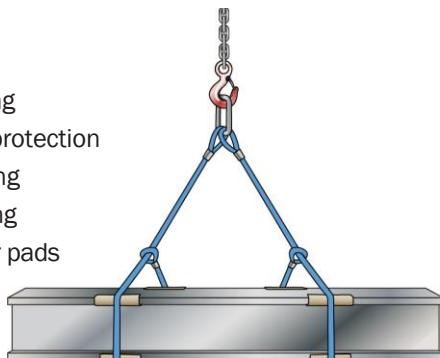
Loading onto a vehicle



The load you will lift has sharp edges.

What can you use to make sure the sling and the load do not get damaged?

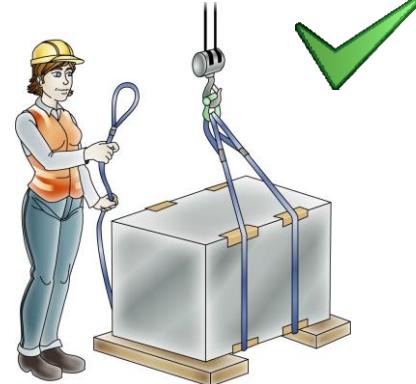
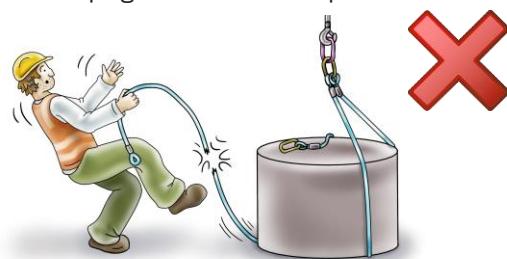
- Lagging
- Edge protection
- Padding
- Packing
- Corner pads



Name some reasons why dunnage and packing are used when moving a load.

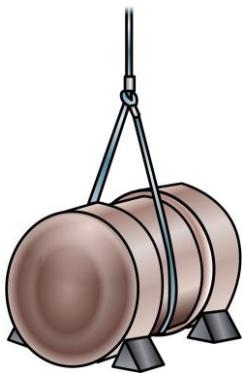
Dunnage and packing are used for:

- Helping with connection and disconnection of slings
- Stopping the lifting gear getting damaged
- Keeping the load safe and protected.



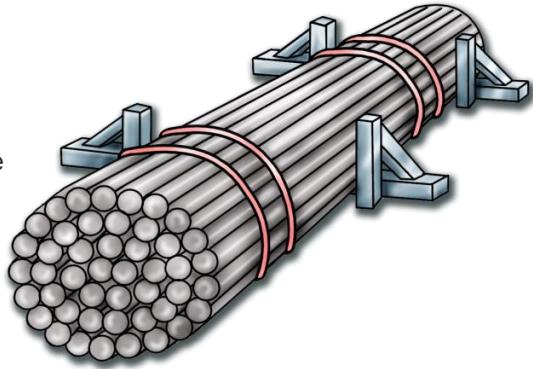
Chocks

If the load is round you may need to set up chocks to hold the load in place when you remove the lifting gear.



Dunnage

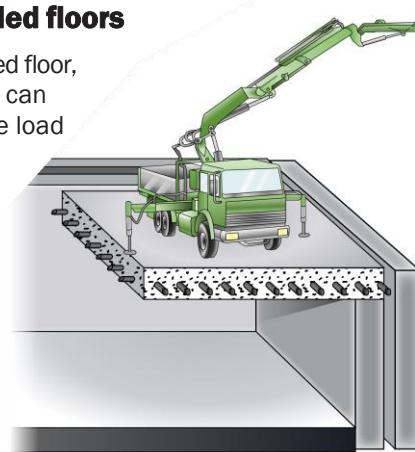
You may need to lay down dunnage (timber supports) to protect the load, make it easier to remove the slings, and help stop damage to the lifting gear.



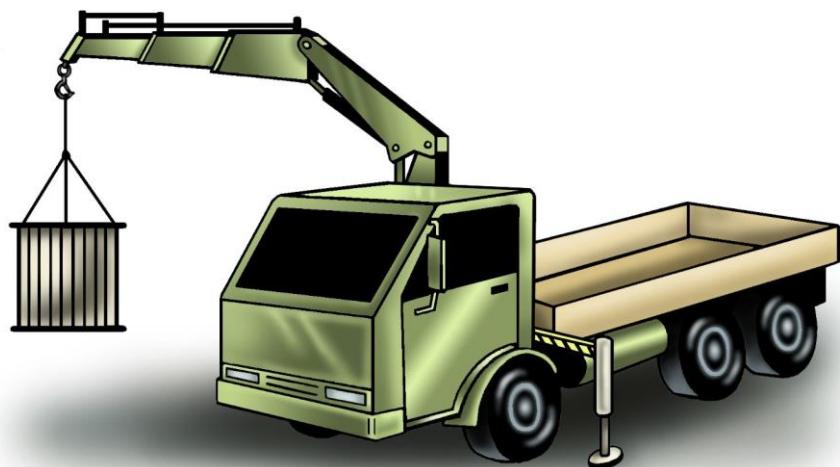
Loading on suspended floors

If loading onto a suspended floor, make sure that the floor can support the weight of the load and equipment.

You may need to check with an engineer for this information.



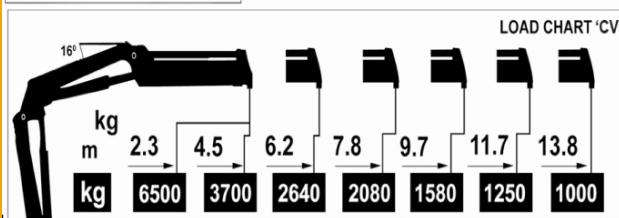
Do not land a load on a suspended or concrete floor without checking with an engineer or site personnel first. The floor may collapse under the weight of the load.



Introduction to load charts

LOAD CHART CV

This load chart is for assessment use only and must not be used for any other purpose.



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.

Important information

Other important information may include:

Limitations of boom angles

Operational conditions.

For example wind speed (the maximum wind velocity that a vehicle loading crane is capable of safely operating in).

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.

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.

How to read a load chart

To calculate the maximum load you can safely lift, there are some basic rules for all load charts. Look at the following **Load chart X**, which is for a 20 tonne hydraulic crane.

Follow the steps:

1. Outriggers

Choose the outrigger set up. This will help you know which section of the load chart to look at. For this example, look at the **Without outriggers** on the chart. The crane is set up to mobile on rubber.

2. Boom length

Choose the length of the boom. This will help you know which column to look at. In this example, we'll use a boom length of 14.06 metres.

3. Operating radius

Choose the operating radius. This will help you know which row to look at. For this example we'll use 4.30 metres. Round up to 4.50 metres.

4. Capacity

Read down the boom length column and across the operating radius row. This is the capacity (WLL) of the crane. In this example it is 5200 kg.

5. Hook block/s

The weight of the hook block/s is part of the load. Deduct the weight from the capacity. These weights are on the load chart. In this example, deduct 200 kg for a 3 sheave hook block.

6. Jib weight

The weight of the jib (fly), either fitted or stowed, is part of the load and may be a deduction from the capacity. This information is on the load chart. In this example, we can't use the jib because we are not using outriggers.

7. Line (hoist rope)

Look at the hoist rope reeving to work out how many parts of line (hoist rope) you need to support the load. In this example, the load being lifted is 5 tonnes. The hoist rope has a capacity of 3340 kg which is less than 5 tonnes so you need 2 lines to safely lift the load.

8. Jib configuration

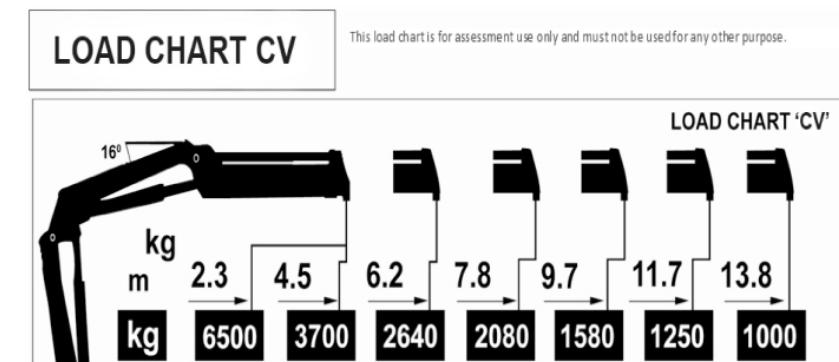
Find the information about the load capacity of the different jib configurations. This information is in the **Jib load ratings-kgs** on the bottom right-hand side of the chart. With jib offset the crane has more capacity, but the jib is meant to give you more lifting height. Some load charts will have information on auxiliary jibs and their limitations.

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 10 tonnes or more.

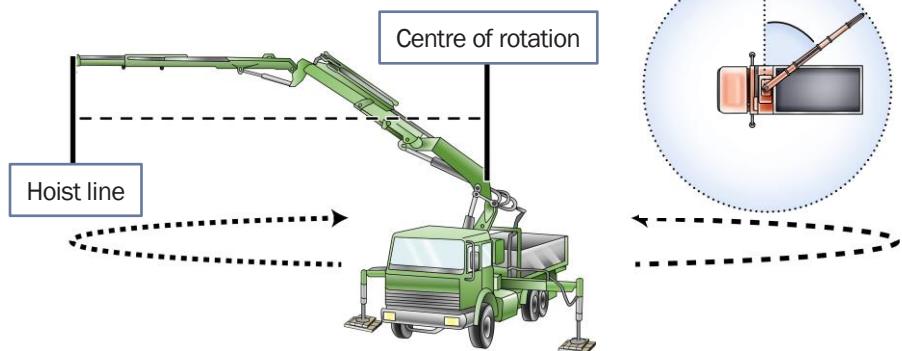


The operating radius shows you the distance at which the crane can safely lift a known weight.

You are looking at the crane load chart.

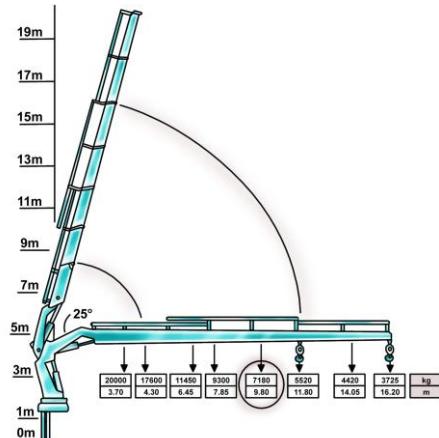
What does **operating radius** show?

Note: When the operating radius is not shown on the load chart use the longer. This reduces the crane capacity.



Name some things you will find on a load chart.

- The winch line pull
- The crane's rated capacity for different configurations
- The hook block's mass/weight
- Multiple rope fall capacities (eg. 2-fall and 4-fall hook block configurations)
- Operating radius



The weight of any lifting gear like:

You are looking at the load chart and working out how much the crane can lift. You need to subtract some weights from the rated capacity of the crane.

What do you subtract to find out how much the crane can lift?

The hook block
Spreader beams
Ladles

Kibbles
Lifting slings



You must find out if your crane can lift the weight of a load. You want to use an operating radius of 9 metres. But you find that 9 metres is not on the load chart.

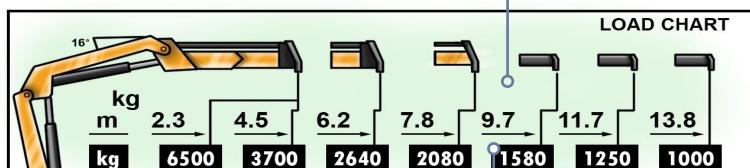
Should you go by the operating radius on the chart that is higher than 9 metres or lower than 9 metres?

Why would you choose what you did?

You would choose the operating radius that is higher than 9 metres.

The higher radius makes the rated capacity (the weight the crane can lift) lower. This means you are less likely to lift a load that is too heavy for the crane.

9 metres is not on the chart. Choose 9.7 metres not 7.8 metres



Rated capacity for 9.7 metres is smaller than for 7.8 metres

The cranes load chart.

You need to use a manual extension on the crane.

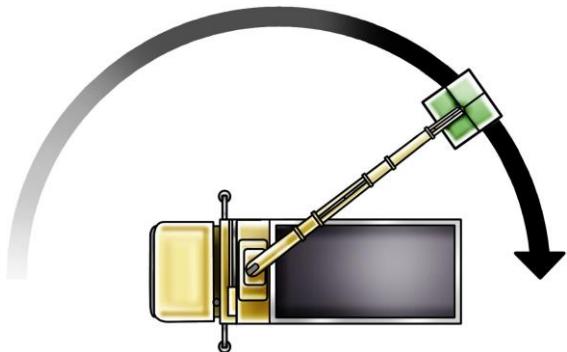
What do you use to work out the capacity?



The crane's capacity may change a lot when slewing front to back. Check the load chart for more information about the crane's capacity.

A crane's boom can slew from front to back.

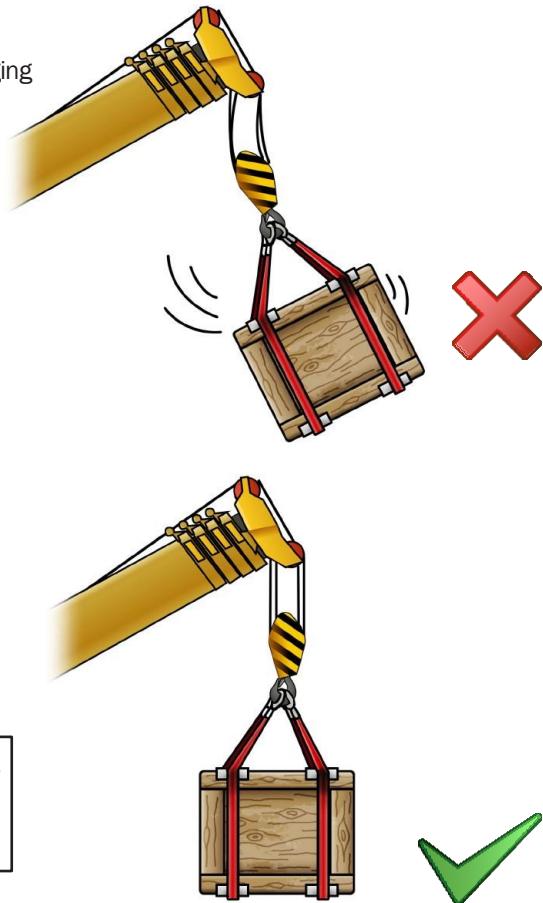
What does slewing like this do to the crane's capacity?



This will:

- prevent the load from swinging, dragging or snagging as it is lifted.
- prevent shock loading
- keep the crane stable
- prevent damage to the crane

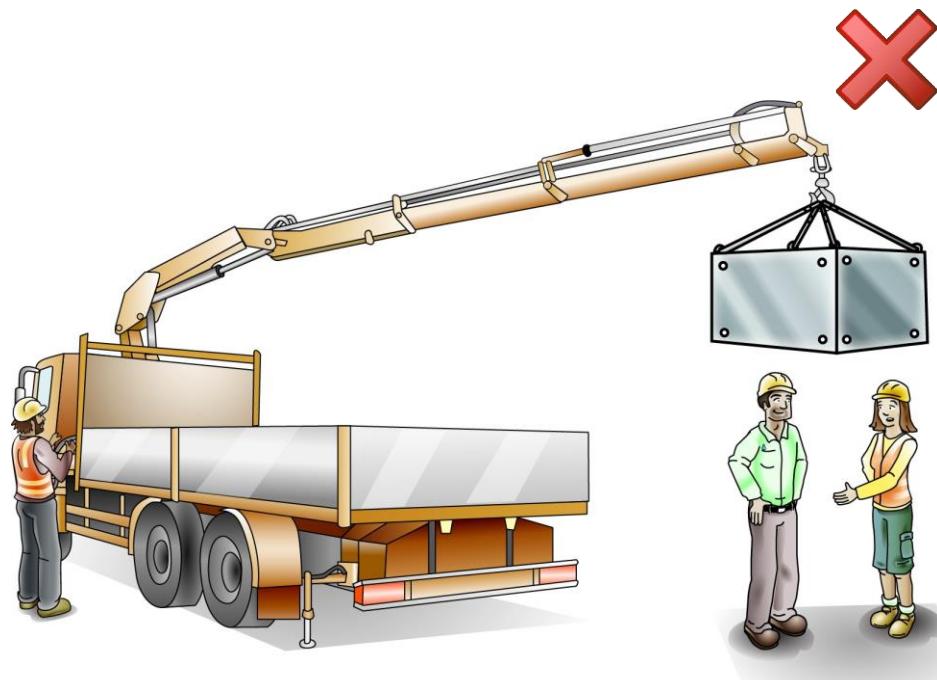
Gently accelerate and brake on slew / boom to minimise load swing.



It is **unsafe** to raise or lower the boom or the load over people.

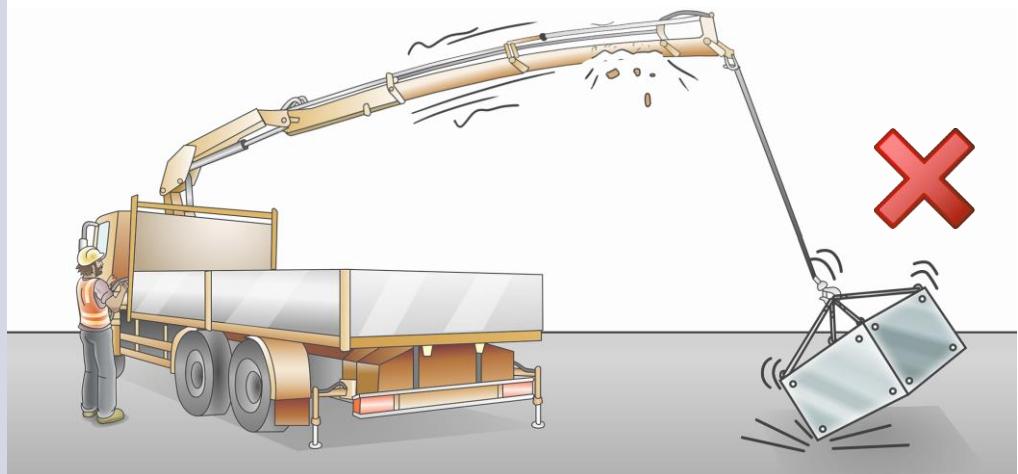
Why?

People under the boom or load can be injured or killed.
It could also overload the crane and affect its stability.



Why is it bad to drag or snag a load?

This can damage the crane, the load and the lifting equipment. It could also overload the crane and affect its stability.

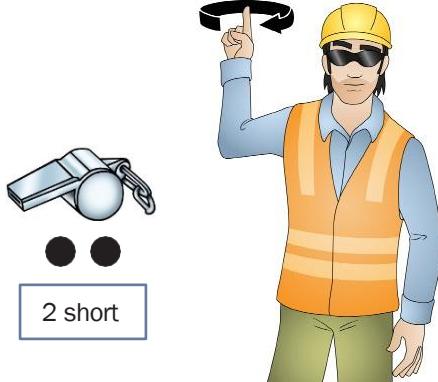


Some of the Australian Standard signals used in dogging are shown here.

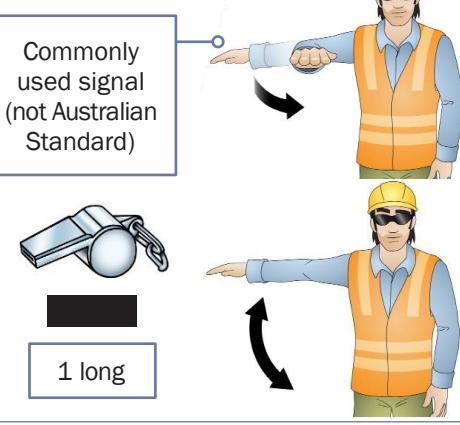
What does each of these signals mean?

[Note: Signals may vary between worksites. You need to check.]

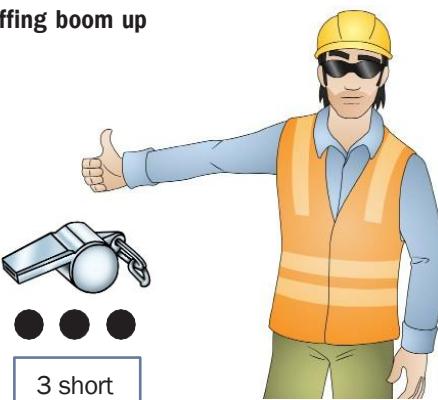
Hoisting raise



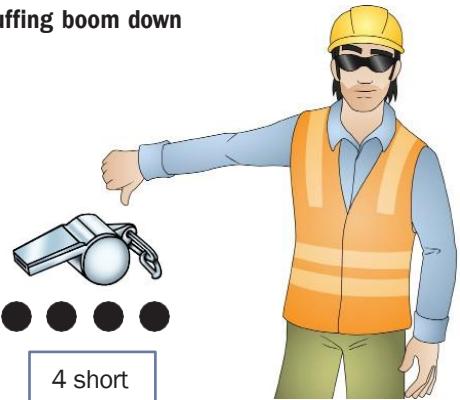
Hoisting lower/down



Luffing boom up



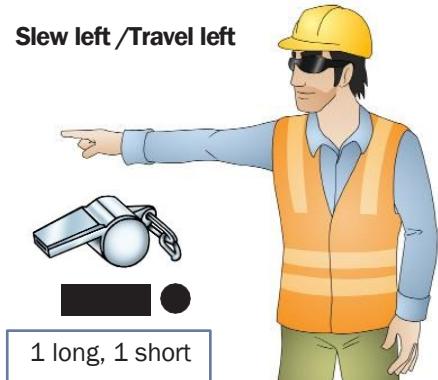
Luffing boom down



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

What does each of these signals mean?

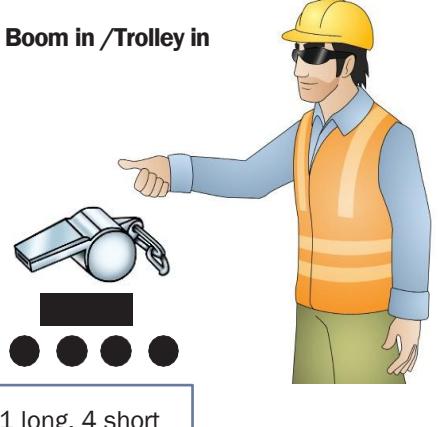
Slew left /Travel left



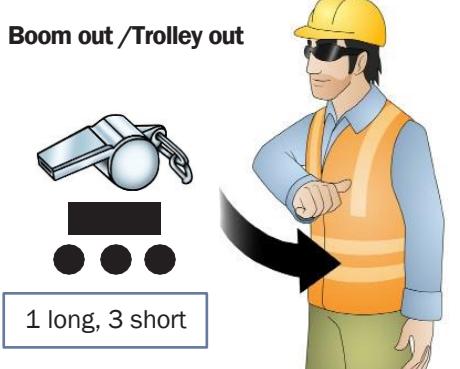
Slew right /Travel right



Boom in /Trolley in



Boom out /Trolley out



Travel and traverse

Indicate the direction you want the crane to go

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

What does each of these signals mean?



Not applicable

Stop



1 short



A dogger or co-worker gives you a signal and you didn't understand it.

What should you do?

You should **stop** operating the crane.



Ask your workmate to repeat or **explain** the signal.



You are going to land a round load.

What can you do to stop a round load from rolling away?

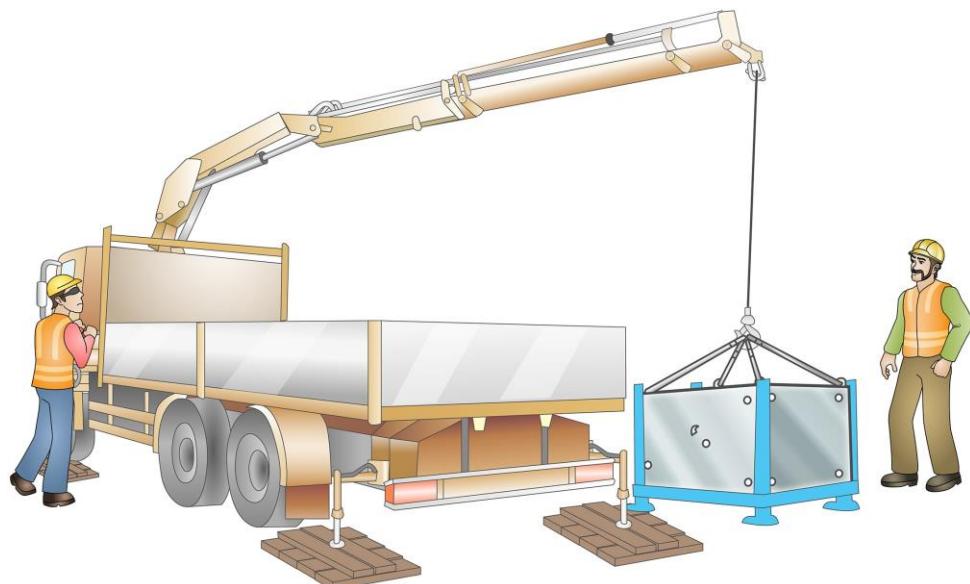
You can use chocks to stop the load rolling away.



- Make sure the weight is off the slings.
- Make sure the crane doesn't operate while the load is being unslung.

You are using your crane. You have moved and landed the load.

What must you do before you remove the slings?



You have landed a heavy load. You are about to release the load from the crane hook.

How can you stop the boom springing up when the load is released (boom deflection)?

a) Lower the boom a bit as you release the load.



b) Use a slow and smooth movement to release the load.

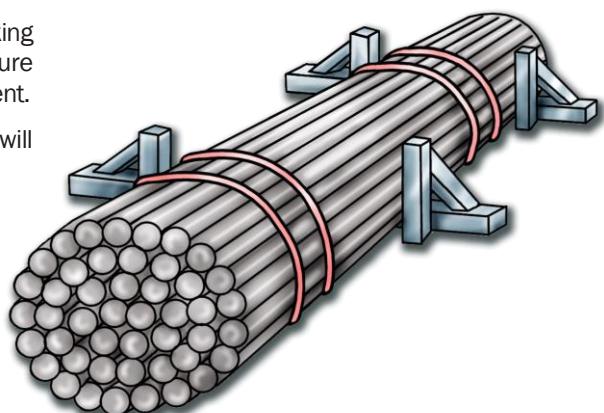


What should you use to stop the load moving while you take off the lifting equipment?

Use packing and dunnage. The packing and dunnage will keep the load secure while you remove the lifting equipment.

Keeping the load stable and secure will mean that:

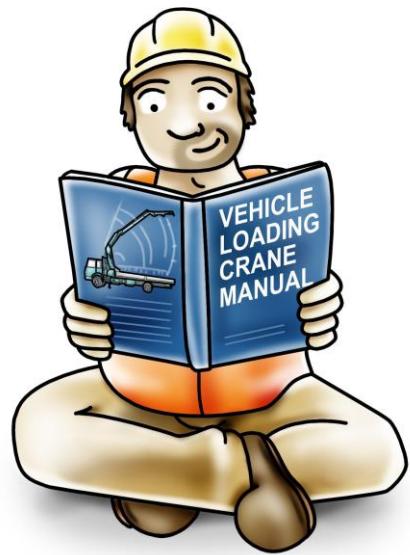
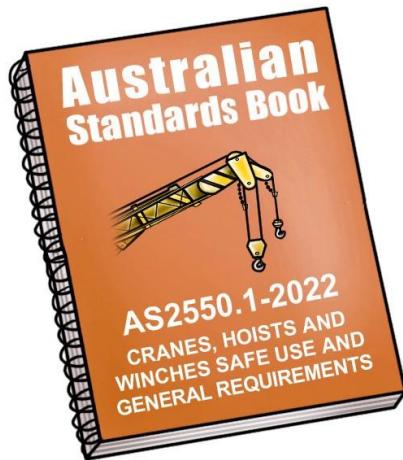
- the load will not be damaged
- workers will not be injured.



You must follow the Australian Standards (AS 2550) and the manufacturer's information.

What rules do you have to follow while operating a vehicle loading crane?

For example, the safe use of slings.



<p>You are using a crane and there is a loud noise. The boom is vibrating (shaking). What should you do?</p>	<ol style="list-style-type: none">1. Tell the person dogging the load and other people in the area.	<p>2. Stop lifting the load. Lower it if safe to do so.</p>	<p>3. Stop working. Shutdown the crane. Decide whether the crane can be fixed immediately.</p>
	<ol style="list-style-type: none">4. Tag the crane out of service and complete the logbook. Report the fault to an appropriate person. Fill out the logbook.	<p>5. Have the crane inspected for damage. Do not use the crane until it is fixed.</p>	<p>X</p>

When you cannot see the load and need someone to direct you to transfer and land it safely.

You are lifting and transferring a load using the crane.

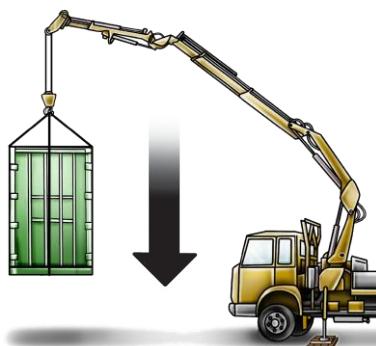
In what situation would you need a dogger?



You are operating a crane. One of the outriggers is sinking.

What should you do?

1. Reduce the radius (retract boom) and lower the load if you can.



2. Stop working and check out the situation.



3. See if you can fix the problem.
Ask for help if you need it.
Move the crane if possible.



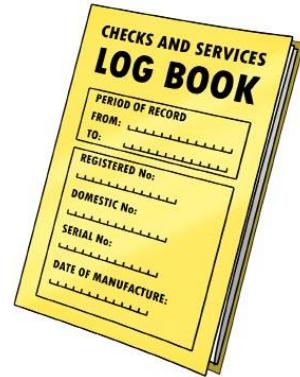
You find that the crane can't go through its full range of movements.

What must you do?

1. Tag the crane so others won't use it.



2. Record the problem in the service logbook.



3. Follow the site rules for reporting the problem.



Defective equipment

If you find any defective equipment during your work tasks you must:

Isolate and tag

Tag out the equipment.

Put a danger/out of service tag on the equipment so other workers know it is unsafe to use.



Report

Report the fault to your supervisor or site manager.



Find out other rules

There may be other rules on site to record and report equipment faults.

Check with your:

Supervisor

Manager

WHS representative

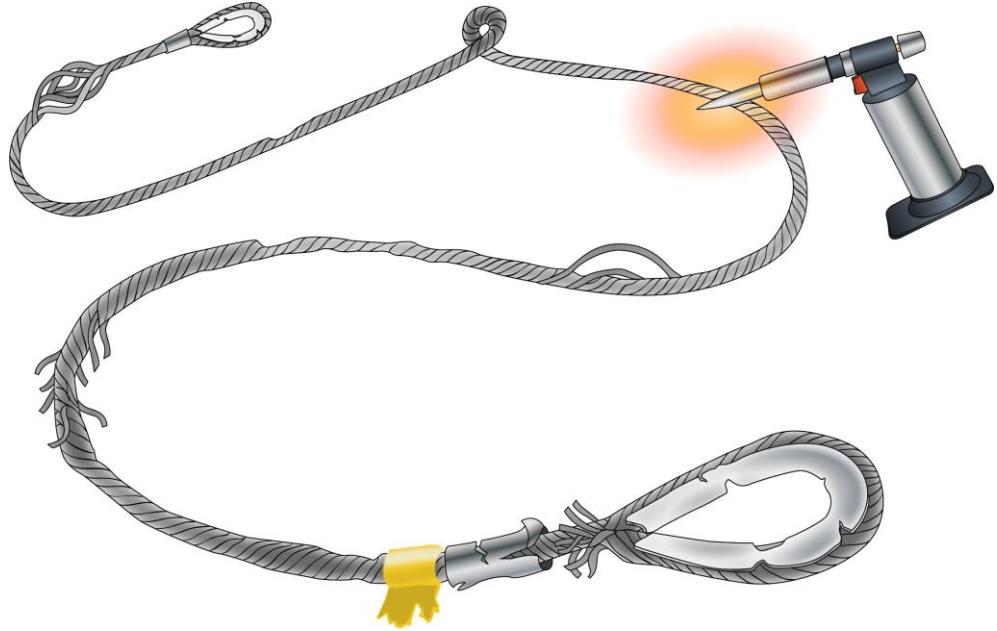
to find out **how** you record and report any faulty equipment.



Isolate defective equipment

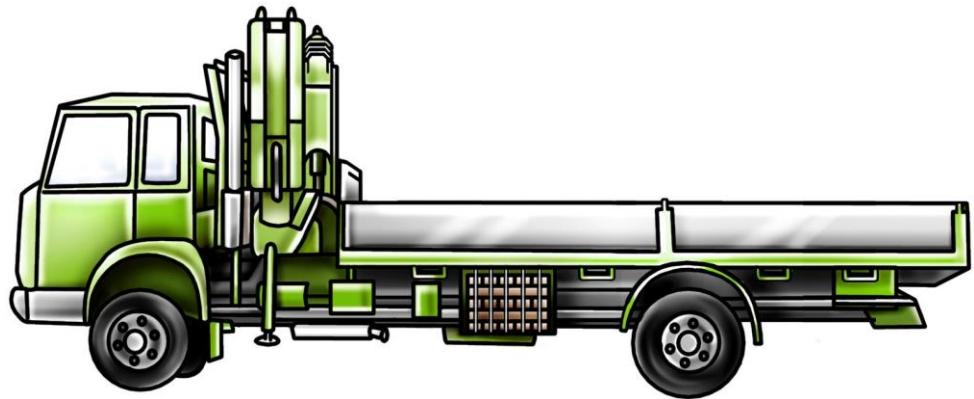
Isolate (remove from use/service) any lifting gear that shows:

- Excessive wear
- Damage
- Stretching
- Broken wires
- Cut/damaged fibres.



The crane's boom and equipment must be stowed and secured when you finish the job.

How do you do this?



The manufacturer's information or operator's manual will tell you where and how to stow and secure the crane boom, stabilisers/outriggers and equipment.

When do you use motion locks and the park brake?

These should be used when you:

- Shut down the crane
- Leave the crane
- Stop operations.

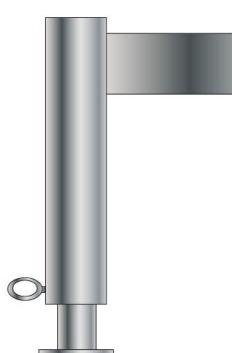


What are the steps for stowing outriggers/stabilisers?

1. Raise up the footplate's and retract (bring in) the outrigger beams.



2. Lock with the pin.



3. Clean the steel plates.



What should you keep in mind when storing synthetic lifting equipment?

Make sure the sling is kept in a place with fresh air.

Make sure slings are stored according to manufacturer's instructions.

Make sure the sling is kept out of direct sunlight.

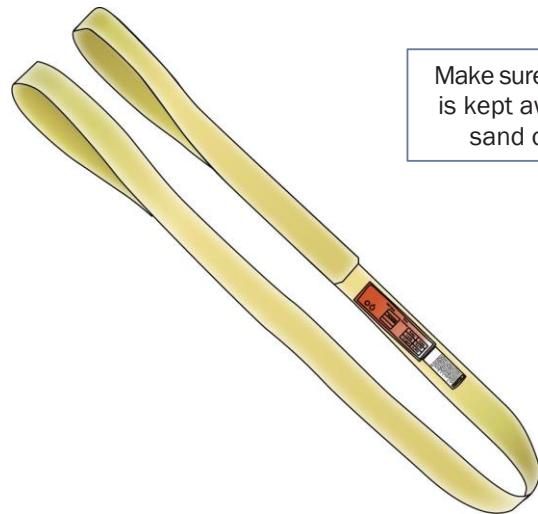
Make sure the sling is kept dry.

Make sure the sling is kept clean.

Make sure the sling is kept under cover.

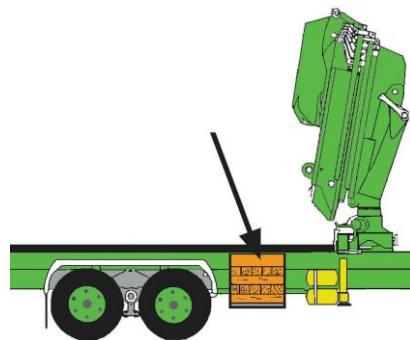
Make sure the sling is kept away from chemicals.

Make sure the sling is kept away from oils.



What do you need to do when shutting down and packing up the crane?

Make sure that plates and packing are stowed in the right place.



Fold and lower the boom. Make sure the hoist brake is on.



Make sure all controls are in neutral..



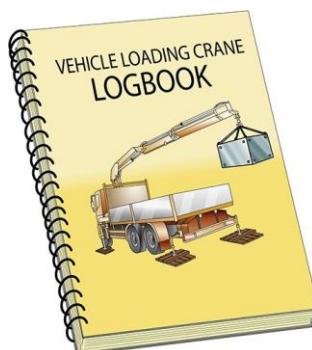
Lock and secure the cabin controls and access to the cabin. This will keep unauthorised people out of the crane.

Turn off the isolator switch and make sure it is secure.



What do you need to do when shutting down and packing up the crane?

Add to the logbook if necessary.



Remove hazard controls if you need to.



Is it okay to leave a load hanging from the hook when the crane is unattended or after you've shut down the crane?



It's **not** okay to leave a load hanging. The load could swing or become unstable. It could cause mechanical failure.

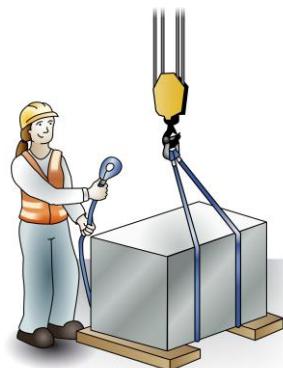


The load might swing, lower, or become unstable.

You have finished work and you will leave the crane controls.

What do you need to do?

1. Make sure the crane isn't under load.



2. Shut down the crane following the crane's manual.



3. Fold the boom if it's raised or extended.



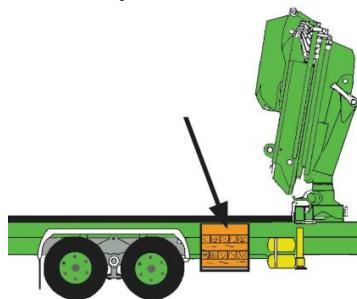
4. Lock cabin and make sure the crane is secure.



All checks that the manufacturer says should be carried out (for example, in the crane's manual). These checks might include:



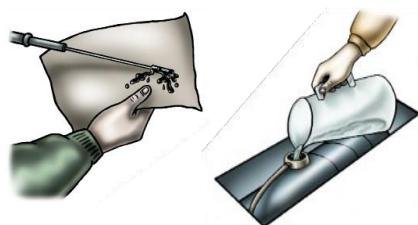
Make sure that loose items are securely stowed away.



You have finished a job.

What post-operational checks must be carried out on the crane after shutting down?

Check for obvious signs of damage on the boom / jib or crane. Stow the boom according to manufacturer's specifications.



Check all fluid levels (oil, water, fuel, hydraulic fluid). Check for leaks.



Make sure all controls are in the neutral position



Check that the hook/lifting assembly is raised clear of obstructions.



Check that pins and locks are in place.

Do all checks according to manufacturer's specifications.

Don't forget that PPE also plays a part in the safe operations of a vehicle loading crane. You should always ensure your PPE is in good condition and fit for the task.

As a vehicle loading crane operator, you may need to wear gloves and a hard hat. You could also be expected to wear high visibility clothing and steel cap boots.



Check that the PPE is in good condition. For example, you find the hard hat is cracked
– Do not use it.