

SLEWING MOBILE CRANE LEARNER WORKBOOK

TRAINER'S MARKING GUIDE WITH MODEL ANSWERS

TLILIC0015 Licence to operate a slewing mobile crane (over 100T)



SLEWING MOBILE CRANE LEARNER WORKBOOK

TRAINER'S MARKING GUIDE

TLILIC0015 Licence to operate a slewing mobile crane
(over 100 tonnes)

**With load chart calculations
similar to NAI**



www.easyguides.com.au

National Licence
RTO-VET Learning Materials

Edition 1: Version 1 — April 2021

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Training support materials

Training package:	TLI	Transport and Logistics
Unit of competency:	TLILIC0015	Licence to operate a slewing mobile crane (over 100 tonnes)

Application

TLILIC0015

This unit specifies the outcomes required to operate a slewing mobile crane (up to 20 tonnes) for licensing purposes. It encompasses the requirement for non-slewing mobile crane licence and the vehicle loading crane licence.

Licensing/Regulatory Information

This unit requires the operator to plan the work, conduct routine checks, set up crane, transfer loads, mobile loads and shut down and secure the crane. This unit is based on the requirements of the National Standard for Licensing Persons Performing High Risk Work. This unit in its current form meets state and territory licensing requirements. Any alteration will result in a unit which is not acceptable to regulators for the purpose of licensing.

Disclaimer

All care has been taken to make sure this publication is accurate. The author and Easy Guides Australia Pty Ltd take no responsibility for any loss or damage resulting from any inaccuracies or omissions. Also, this publication does not foreshadow nor take responsibility for future changes to government laws, regulations and guidelines. All attempts have been made to make sure that the current publication is up to date at the time of publication. It is imperative that people working from these documents source relevant manufacturers' documentation and adhere to company, site and statutory procedures and requirements. This publication is a learning tool only. Ultimately, it is the accredited assessor working through the registered training organisation who will determine if a candidate is competent.

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Language – Literacy – Numeracy (LLN) TAELLN411 Address adult language, literacy and numeracy skills



Why LLN matters?

The unit TAELLN411 Address adult language, literacy and numeracy skills describes the skills and knowledge a vocational trainer or assessor requires to identify language, literacy and numeracy (LLN) skill requirements for training in the work environment. The aim is to use resources and strategies that meet the needs of the learner group. The LLN unit applies to individuals who teach, train, assess and develop resources.

Easy Guides training materials have been developed around LLN principles

James Tennant, Managing Director of Easy Guides Australia Pty Ltd has completed the LLN unit as well as a MA (TESOL) Masters of Arts degree in teaching speakers of other languages.

James taught as a Workplace language and literacy (WELL) teacher in industry where he gained knowledge and experience for adapting training to a wide range of learners.

James' qualifications and experience have been embedded into the Easy Guides training materials making them unique in their field.



LLN core skills – customising training

The Australian Core Skills Framework (ACSF) provides a detailed description of each of the five core skills which help people to participate effectively in our society.

The core skills are:

Learning	Reading	Writing	Oral Communication	Numeracy
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Trainers can use knowledge of the core skills of their learners to adjust their training program. For example, a learner may be high in oral communication but low in writing.

For such learners, training materials could:

- be written in simple, plain English
- use pictures and diagrams to explain concepts
- use bullet points or tables instead of long paragraphs
- explain difficult words that students might need to know.

Easy Guides has built many of these LLN learning strategies into their training materials.

Finding LLN resources



Check the Trainer's Resource CD for lots of helpful LLN information and resources to help you plan your training.

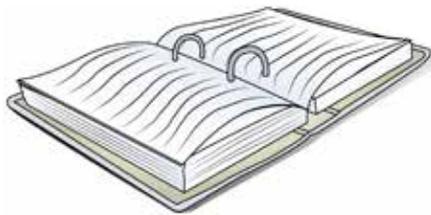


How to get the most out of this book

As a trainer you know there are many ways a learner can find information to complete the training tasks in these learning materials. Below are some examples.

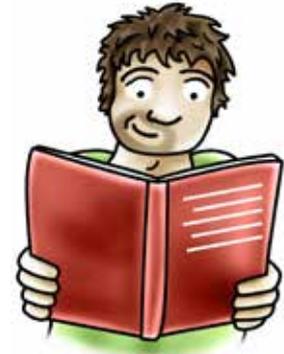
Licensed trainer:

- Can check your workbook answers
- Share knowledge and experience
- Demonstrate and check practical training activities.



Information book:

- Find information to help do training tasks



Other learners:

- Share knowledge
- Demonstrate skills
- Group training exercises.



Other resources:

- The internet
- User manuals
- WorkSafe.



Learner's own experience:

- On-the-job experience
- Other training.



Things to consider when learning

Repeatable competency

At Easy Guides we build repeatable competency into our learning support materials. Here's how we do it.

First, the learner gains the underpinning knowledge through theory/knowledge training tasks.

Second, the learner does a practical training exercise and a practical assessment exercise.

Third, the learner sits the assessment instrument (used by the RTO assessor).

The assessment gives the learner a final opportunity to demonstrate repeatable competency.

Learning styles

Learning styles are simply different ways of learning. You may notice that when you try to learn something new you have a preferred way to learn. You may prefer to listen to someone talk about the information or to read the information yourself. Or you may like to see a practical demonstration and then try it out for yourself.

Easy Guides cater for the three main learning styles:



1. Visual learners

These learners think in pictures. They learn best from diagrams, illustrations, DVDs, digital projections and handouts or a workbook. Visual learners like to take notes to help themselves remember the information.



2. Auditory learners

These learners study best through lectures, talking things through and listening to what others have to say. Written information may have very little meaning to these learners until they hear it or discuss it.



3. Tactile/kinesthetic learners

These learners study best through a hands-on approach. They become bored and distracted if they sit for too long. One way to help overcome this in the classroom is to have partner-and-group work activities rather than long periods of listening to a trainer.

Learners have different learning needs

Learners come with a wide variety of backgrounds, skills, knowledge and experience. The time and experience needed to prepare each learner can vary a lot.

As the licensed operator/trainer, it is up to you to decide what parts of these learning materials you want to use. However, you would expect beginners to cover all these learning materials.

You can use part or all of these training materials in any order. You decide on the needs of each of your learners.

Learning support materials

This Learner Workbook is part of a Start-up pack of learning materials. It supports **TLILIC0015 Licence to operate a slewing mobile crane (over 100 tonnes)**.

Here are the resources in the Slewing Mobile Crane Start-up pack.

Learner Workbook – Slewing Mobile Crane

Trainer’s Marking Guide with model Answers+_

- Gives you training tasks in theory and practice
- Is evidence you’ve done a formal training program
- Maps the learning tasks to the unit of competency.

Safety and Licence Guide – Slewing Mobile Crane

- Includes knowledge training tasks
- Helps learners prepare for their final test

PowerPoint Presentation

- Multimedia version version of the Slewing Mobile Crane Final Review Study Guide
- Great for group learning and revision

PowerPoint Notebook

- The Notebook matches the PowerPoint. This gives the learner the opportunity to take notes while listening to the trainer and watching the PowerPoint.

Record of Training Logbook

- Great for on-the-job training
- Provides evidence that every performance criteria in the unit has been covered
- The learner and supervising RTO use the record of training logbook to keep written record of workplace training.

Trainer’s Resource with editable and printable resources

- Fully editable MS Word documents
- Editable course documentation
- Editable workplace forms and documents
- Editable review questions and answers
- Editable practical tasks
- Editable mapping of unit of competency.

Learning and practical tasks

If you can, have your students train with other learners. Learning is more powerful when you and your learners share ideas and experiences. Below is a brief explanation of how you can use the training tasks in this workbook. Please advise your students if they are to fill in tasks on their own at home or wait until they are in the training room with you.



Theory training tasks

These tasks help the learner understand the underpinning knowledge to safely operate a vehicle loading crane. To help them complete these tasks the learner can use the Information Book and speak to other learners and you, the licensed operator/trainer.



Thinking questions

Thinking questions train your learner to think for themselves. For example, the Information Book does not directly state the answer.



Practical training tasks

These tasks help the learner acquire the practical skills to safely operate a vehicle loading crane. The tasks use high-risk equipment or machinery. Only a licensed operator/trainer can supervise the learner's practical training tasks.



Review

At the end of each element in the workbook, the learner gets to review their training. The review gives the learner a chance to talk with classmates and you about what they learned. Sharing their learning experiences with others helps them learn.



Review questions

You'll find the review questions on the Trainer's Resource CD. Give the questions to the learner toward the end of training to determine if they understand the information they have covered. You can ask your learner to fill in these questions alone or as a group by using the matching questions in the PowerPoint quiz section.



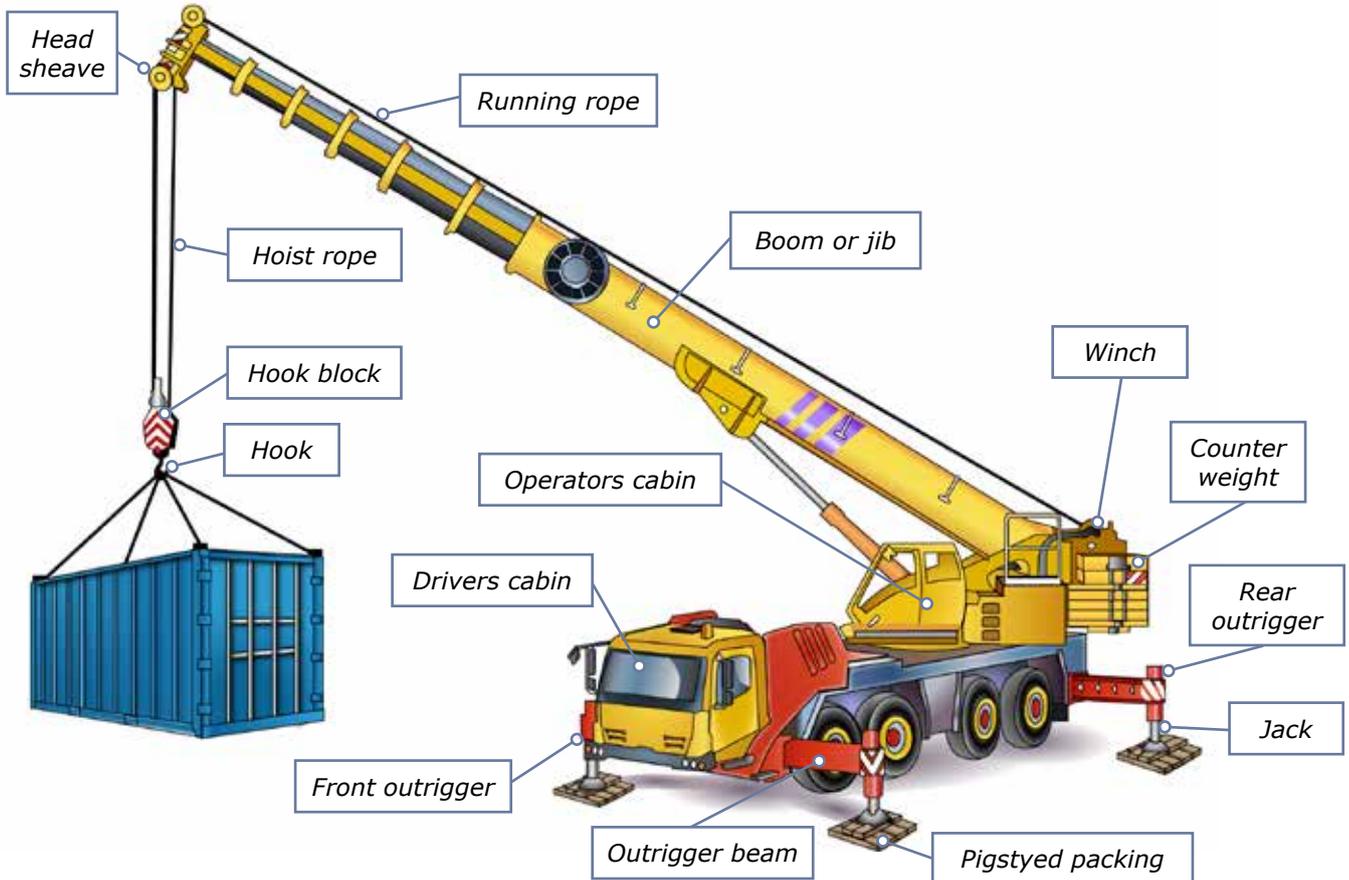
Review—practical tasks

The practical tasks handout is on the Trainer's Resource CD. There is one task for each element and the learner should do all tasks under your supervision.

What is a slewing mobile crane?

A slewing mobile crane is a powered crane which features a boom or jib that can slew from front to back. The crane is mounted on a vehicle.

Parts of a slewing mobile crane



Slewing mobile crane



Crawler crane



Rough terrain slewing crane



This learner resource does not cover front-end loader, backhoe, excavator or similar equipment when configured (arranged or set up) for crane operations.

Notes



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Introduction to high risk licensing



This section contains the following:

- National Vocational Education and Training (VET) Licensing Pathway
- Training and assessment requirements
- Record of training logbook
- Who has a duty of care?
- Where to find licensing information
- Introductory training exercise

National Vocational Education and Training (VET) Licensing Pathway

Training and assessing must be through a Registered Training Organisation (RTO).

“This National Standard recognises the importance of quality training as an underpinning principle in providing skilled workers, and that the most effective form of training is a combination of informal and formal training methods. It requires training and assessment to be undertaken by Registered Training Organisations (RTOs) under the Australian Quality Training Framework (AQTF).”

Introduction

The national system is based on the **‘NATIONAL STANDARD FOR LICENSING PERSONS PERFORMING HIGH RISK WORK’** [Australian Government, Australian Safety and Compensation Council, Canberra, April 2006]. The following quotes from this document will help you to understand the main aims of the system:

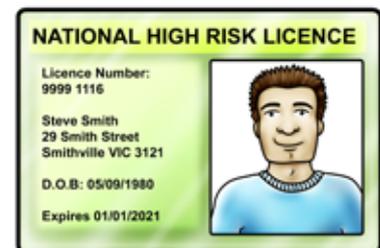
3. OBJECTIVES AND PRINCIPLES

3.1 The objectives of this National Standard are:

- (a) to ensure that persons have the skills and knowledge to perform high risk work in a safe manner; and
- (b) to facilitate the operation of a nationally uniform and efficient licensing system for persons engaged in high risk work.

3.2 Licences issued in accordance with this National Standard will be recognised in Australian States and Territories to promote the portability of skills and the free movement of labour across State and Territory borders.

3.3 This National Standard provides a national policy approach for authorising the performance of high risk work and promoting safety standards relating to high risk work.



Classes of high risk work covered by the National Standard

Crane and hoist operation:

- tower cranes
- self-erecting tower cranes
- derrick cranes
- portal boom cranes
- bridge and gantry cranes
- vehicle loading cranes
- non-slewing mobile cranes
- slewing mobile cranes
- material hoist
- personnel and materials hoist
- boom-type elevating work platform
- vehicle-mounted concrete placing boom

Forklift operation:

- forklift truck
- order-picking truck

Scaffolding work

Rigging work

Dogging work.

NOTE:

Earthmoving equipment is NOT included in the National Standard.



Training and assessment requirements

The source for the following quotation comes from the 'National Standard for Persons Performing High Risk Work, April 2006'.

6. TRAINING AND ASSESSMENT REQUIREMENTS

6.1 *This part must be interpreted in conjunction with the AQTF Standards for RTOs. Where either this National Standard or the AQTF sets a higher standard for training and assessment, then the higher standard will apply.*

6.2 *The applicant must complete the relevant nationally endorsed unit or units of competency in a Training Package or accredited course that meets the licensing requirements.*

6.3 *The training and assessment must be delivered under the supervision of, or in partnership with, an RTO in accordance with the AQTF. It must consist of relevant evidence of:*

- *structured training*
- *practical training and experience, and*
- *an assessment of the trainee's competency through the use of nationally approved assessment instruments.*

6.4 *Practical training can be undertaken in the workplace as part of the productive work of the trainee, or in a training facility that includes a simulated work environment, or using a combination of both these training environments.*

Recognition of Prior Learning

6.5 *An RTO:*

- a *must assess the adequacy of any equivalent qualifications or evidence of prior learning against the licensing requirements, and*
- b *may exempt a person from undertaking all or part of the training to the extent that the person's equivalent qualifications and prior learning are relevant to the competency.*

Assessment

6.7 *A trainee must be assessed against the requirements of the relevant nationally endorsed unit or units of competency or accredited course. To achieve competency the trainee must be able to demonstrate that he or she:*

- *has the relevant underpinning knowledge and can safely perform the high risk work under realistic workplace conditions, and*
- *can use the English language at a level that enables the safe performance of high risk work as specified in the competency standard.*

Licensing system

- Training and assessment must be done in partnership with an RTO
- Training and assessment must be done in accordance with the AQTF
- Recognition of prior learning (RPL) is allowed under certain conditions
- Training and assessment must show evidence of:
 - structured training
 - practical training and experience
 - assessment of the trainee's competency.

Who has a duty of care?

Discuss with your learners the importance of duty of care. Duty of care applies to employers and self-employed persons, persons in control of the work site, construction supervisors, designers, manufacturers and suppliers, building workers, subcontractors and inspectors.

Employee's duty of care

By law, as an employee you must take care of your own health and safety—and the health and safety of other people in the workplace. You must not put the health and safety of yourself or other people at risk.

You must also:

- Do your best to follow reasonable safety instructions from your employer/PCBU (boss)
- Follow workplace health and safety procedures and policies
- Do not do work if you believe a hazard would be a serious risk to your health or safety



PCBU's/Employer's duty of care

By law, as an employer you must provide a workplace that is safe and without risk to health.

You must instruct, train and supervise your employees to work safely. You must do so in a way that is easy for your employees to understand.

Penalties

If you are an employer or employee the government can fine you for failing your duty of care.



Guidance notes

Many state/territory WHS/OHS regulators provide guidance notes, safety alerts and other information to improve safety for persons performing high risk work. You can find many more of these by going to the website for your state/territory WHS/OHS website (shown on the next page) for guidance and alert notes. These alerts and notes should be provided to learners via training sessions.

Example 1	Example 2
<p>The following is an excerpt from the safety alert <i>Fires on mobile plant</i> on the WorkSafe Victoria website:</p>  <p>(November 2012)</p>	<p>The following is an excerpt from the safety alert <i>Maintaining mobile plant</i> (May 2010) on the WorkCover NSW website. It covers controlling risks related to securing mobile plant properly.</p> <p>“The primary control measure is to ensure that nobody goes near the plant until it is secured. Apply the parking brake, select neutral and switch the engine off – do not assume the parking brake will hold the vehicle if the engine is running.</p> <p>If it is necessary to have the engine running to perform maintenance:</p> <ul style="list-style-type: none"> • ensure that the park brake is applied and fully operational, and that neutral is selected • ensure that someone is seated at the controls of the plant with their foot on the brake • use wheel chocks (or other safety devices) when required • where possible, work from a safe location considering the potential for unintentional movement of the plant – eg. work from the side of the plant rather than the front or back.”

Where to find licensing information

You can check these websites for more information about workplace health and safety.



WA WorkSafe

www.commerce.wa.gov.au/WorkSafe

NT WorkSafe

www.worksafe.nt.gov.au

QLD Workplace Health and Safety

www.justice.qld.gov.au



SA SafeWork

www.safework.sa.gov.au

NSW WorkCover

www.workcover.nsw.gov.au

ACT WorkCover

www.worksafe.act.gov.au

VIC WorkSafe

www.worksafe.vic.gov.au

TAS WorkSafe

www.worksafe.tas.gov.au/home

You can read more about the WHS Act at www.safeworkaustralia.gov.au

Introductory training exercise

The national high risk licensing system

a] Is earthmoving equipment part of the high risk licence system?

Circle the correct answer

YES

NO

b] Look back at the last few pages and read Section 3.1 of the *National Standard for Licensing Persons Performing High Risk Work*. What are the two main aims/objectives of the system stated in Section 3.1?

Answer should include the following information, either copied and written, or in the learner's own words:

3.1 The objectives of this National Standard are:

(a) to ensure that persons have the skills and knowledge to perform high risk work in a safe manner.

(b) to facilitate the operation of a nationally uniform and efficient licensing system for persons engaged in high risk work.

c] Can you gain your high risk licence without the services of a registered training organisation?

Circle the correct answer

YES

NO

d] Look back at the last few pages and read Section 6.3 of the *National Standard for Licensing Persons Performing High Risk Work*. After you have successfully completed your training course how will your final competency be checked?

Answer may include all or some of the information contained in Section 6.3.

However the key point in Section 6.3 is that at the end of the unit of competency training the applicant will be assessed using a nationally approved assessment instrument.

e] What is the main duty of care/obligation of an employer?

An employer must provide a safe workplace. They must also provide employees with information, instruction, training and supervision so they can carry out their work duties in a safe manner.

The national high risk licensing system

f] Give an example of a duty of care/obligation of an employee/worker.

Answer may include any of the following:

- **An employee must take care of their own health and safety as well as the health and safety of others they work with**
- **Employees must comply with safe work practices**
- **Employees must carry out their tasks or use equipment according to safety instructions**
- **Employees must co-operate with their employer and follow all systems or procedures in the workplace to the extent necessary to allow compliance with the Act.**

g] Other than the WHS/OHS Act where else could you get government information about slewing mobile crane safety?

Answer may include but not limited to:

- **Guidance notes (on OHS regulator websites such as WorkCover)**
- **Standards (e.g. National Standard for Licensing Persons Performing High Risk Work)**
- **Regulations.**

Notes



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Part 1

Prepare for hazards



Trainers please note:

The answers in this book are in no way conclusive and are to be used as a guide only. Use your own knowledge and experience to correct the variation of answers that may be given by learners.

Performance Criteria: 1.5

Prepare for hazards

A **hazard** is anything that can harm you or others while you work.

A **risk** is the chance of a hazard hurting someone.





Theory Training Task 1

Performance Criteria: 1.5, 2.9

Identify (know) workplace hazards. A hazard is anything that can harm you or others while you work. You need to identify (know) workplace hazards before you start work. Look for hazards. Look above you, look around you and check the ground below you.

a) Give examples of hazards you should look for before you begin work

Answers may include but not limited to:



Above head height

- powerlines and overhead service lines
- trees
- buildings
- other obstructions

Ground level to eye level

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

Ground level (and below)

- stable/level surface
- spills or wet surfaces
- debris and rubbish
- trenches or recently filled trenches
- unstable ground
- underground services
- surface is strong enough to support the weight of any equipment/materials



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

Trainers: encourage your learners to place a tick beside hazards they have seen in their past or present places of employment.



Theory Training Task 3

Performance Criteria: 2.2

You are working on ground that might be above an underground service, for example, a water pipe. Where can you find out?

Call Dial Before You Dig on 1100.

.....

.....



Theory Training Task 4

Performance Criteria: 1.5, 2.2

Check the safe working distances for powerlines in your state or territory. How many metres is the NO GO zone for **distribution lines on poles in your state or territory**?

The NO GO zone for (state/territory)
is metres.

*** Trainers please check YOUR state/territory.**



Performance Criteria: 1.5, 2.2

Hazard control measures

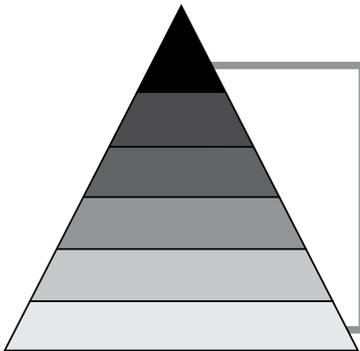
Hazard control measures are actions you take to control or prevent a danger that can injure or hurt you. You use the actions to lower the risk to people and property. Set up the hazard controls before you start work.



Theory Training Task 5

Performance Criteria: 1.5, 2.2

a) List the **six** levels of the Hierarchy of Hazard Control.



1. **Elimination**
2. **Substitution**
3. **Isolation**
4. **Engineering Control Measures**
5. **Administrative Controls**
6. **PPE**



b) What is the first thing you should try if you find a hazard?

Elimination – you should try to remove the hazard entirely.



Theory Training Task 6

Performance Criteria: 1.5

Tick the **hazard control measures** you may need to put in place when using a slewing mobile crane.

- Warning signs and barriers
- Flag person
- Traffic control
- Flashing hazard and lights
- Wash the crane so it looks nice
- Pedestrian exclusion zone
- A hoarding, gantry or scaffolding
- Recharge the battery so it works





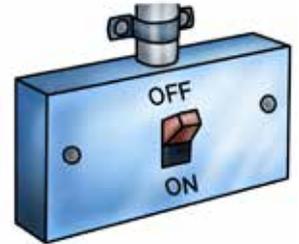
Theory Training Task 7

Performance Criteria: 1.5

List the things you may need to do when working near powerlines.

Answer may include:

- Consulting with the electricity supply company
- Using safety tag or lock-out systems
- Use a spotter
- Disconnect the power



Theory Training Task 8

Performance Criteria: 1.5

Look at the picture below.

List the hazard control measures you could use to make the job safer.

Answer may include:

- Put up a barricade around the crane to stop people coming into the crane's working area , for example witches' hats.
- Put up a safety fence around the worksite to keep people out.
- Put warning signs on the fence.
- Ask the driver of the other vehicle to move it, if possible.
- Use two-way radios to communicate with the spotter or dogger.
- Clean up rubbish, tripping hazards and mess around the site.
- Barricade the trench/excavation.
- Check the maximum recommended wind speed for safe operation in the crane's user manual/ manufacturer's instructions or by looking on the cranes data plate.
- Stop work during a thunderstorm.
- Have the electrical company insulate or disconnect the powerlines.



Fencing is not shown in this picture

Practical Training Task 1

Part 1 — Prepare for hazards

Performance Criteria 1.1, 1.5, 2.2

Prepare for hazards

Learners: You **must** do this task under the **control of a licensed operator**.
Please wait for your trainer to advise you before trying the task.

In this activity your trainer will set up the worksite for you. The worksite will have a few hazards in it. Identify the hazards, assess the risk of the hazard hurting you, and work out how to control the hazards.



- Task requirements are identified from work orders or equivalent and a lift plan is confirmed with associated personnel and a site inspection is conducted in accordance with workplace procedures
- Potential workplace hazards are identified. This means you look out for anything that can harm you or others while you work.
- Hazard prevention/control measures are identified consistent with appropriate standards to ensure the safety of personnel and equipment. This means you try to find the best way to control or prevent a hazard if you find a hazard in the workplace.
- Appropriate hazard prevention/control measures are applied to the work area in accordance with procedures. This means you can use many different ways to control hazards on a work site.

Part 1 - PC 1.1, 1.2, 3.6:

Competent

Not yet competent

Signature (licensed operator/trainer) Date

Practical Training Task 2

Part 1 — Prepare for hazards
Performance Criteria 1.5, 2.2

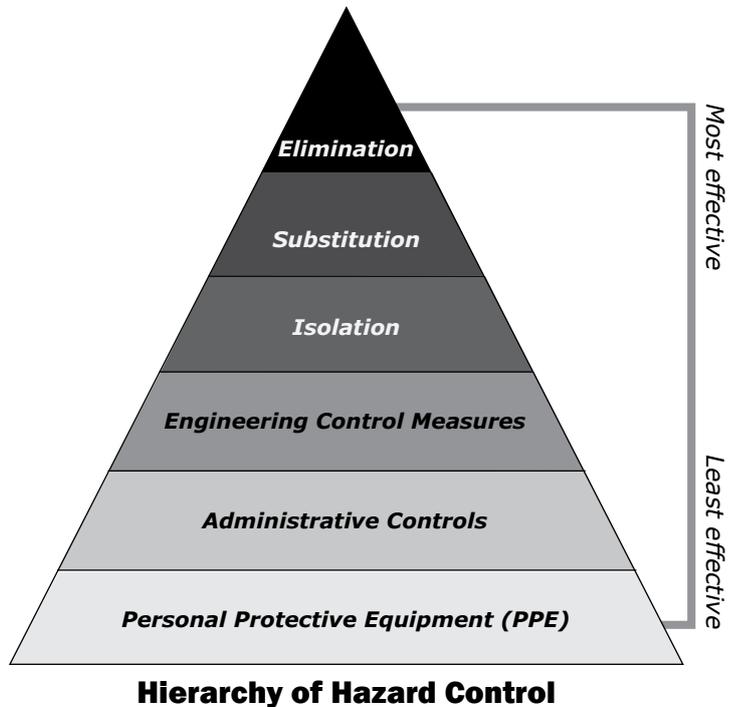
Applying the Hierarchy of Hazard Control

Learners:

You **must** do this task under the **control of a licensed operator**. Please wait for your trainer to advise you before trying the task.

Your trainer will help you to choose a common hazard that may be found in the area where you work.

In this training task you will put the hierarchy of hazard control into action!



Go through as many steps as you need to until you eliminate (get rid of) or control the hazard.

HAZARD:

Step 1: Elimination

Can you remove or take away the hazard?

Yes / No

.....

.....

.....

Step 2: Substitution

Can you use a safer method if you cannot remove the hazard?

Yes / No

.....

.....

.....

Practical Training Task 2 (continued)

Step 3: Isolation

Can you lower the risk of damage or harm by restricting or preventing access to the hazardous area?

Yes / No

.....
.....
.....

Step 4: Engineering control measures

Can you change the tools, equipment or environment to lower the risk?

Yes / No

.....
.....
.....

Step 5: Administrative controls

Can you put more safe work practices into place?

Yes / No

.....
.....
.....

Step 6: Personal protective equipment (PPE)

Do you need to wear PPE? (PPE should not be the only method to control a hazard.)

Yes / No

.....
.....
.....

Finally, **discuss** your results with your trainer and/or training group.
How many steps did you have to use to control the hazard?

Part 1 - PC 1.2:

Competent

Not yet competent

Signature (licensed operator/trainer) Date

Notes



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Communicate clearly



Trainers please note:

The answers in this book are in no way conclusive and are to be used as a guide only. Use your own knowledge and experience to correct the variation of answers that may be given by learners.

Performance Criteria: 1.7

Communicate clearly

Choose the communication equipment you will use for the job. After you have made your choice, test the equipment to make sure it's working.

Make sure you understand the dogger's hand signals if you use hand signals.



Theory Training Task 9

Performance Criteria: 1.7, 3.7

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

Answer may include:

- **Whistle**
- **Hand signals**
- **Two-way radio**
- **Mobile phones**
- **Written instructions**
- **Speaking, listening, asking questions**
- **Signs (ensure you can read and write enough to understand spoken and written instructions and safety signs).**





Theory Training Task 10

Performance Criteria: 1.7, 3.7

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



Hand signals



Whistle



Two-way radio



Theory Training Task 11

Performance Criteria: 1.7 & 3.7

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

The two-way radio and whistle.



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

- **Change it for working equipment.**
- **Follow site procedures for tagging out faulty equipment.**

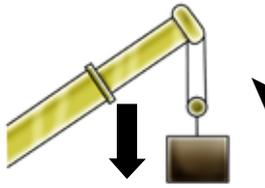
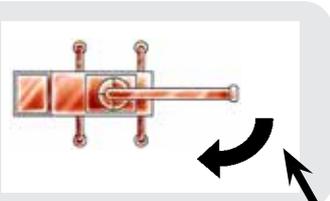
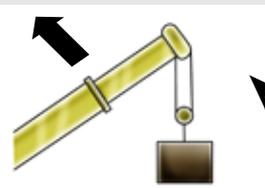
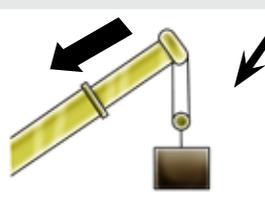




Theory Training Task 12

Performance Criteria: 3.4, 3.7

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

Hoisting down		
Stop		
Slewing right		
Travel and transverse Indicate the direction you want the crane to go		
Luffing boom up		
Telescoping boom retract. Jib-trolley in.		

Practical Training Task 3

Part 2 — Communicate clearly

Performance Criteria 1.7, 3.4, 3.7

Communicate clearly

Learners: You **must** do this task under the **control of a licensed operator**.

Please wait for your trainer to advise you before trying the task.



- (a) Your trainer will take you to an area where you'll practise the Australian Standard hand signals with the trainer or dogger. Make sure you understand all of the signals.
- (b) Choose a two-way radio and check it for faults or damage. Follow the tag out procedure if the radio doesn't work.

- Appropriate communication methods are identified in consultation with associated personnel. This means you use communication equipment best suited to the job you are to do.
- All communication equipment is checked for serviceability. This means you make sure any communication equipment you use works properly.
- All communication equipment is tested for functionality. This means you test your communication equipment to see if it works.
- All required communication signals are correctly interpreted in accordance with procedures and the appropriate standard. This means when moving a load, ensure you know and understand the dogger's hand signals.

Part 2: **Competent** **Not yet competent**

Signature (licensed operator/trainer) Date

Part 3

Check the crane



Trainers please note:

The answers in this book are in no way conclusive and are to be used as a guide only. Use your own knowledge and experience to correct the variation of answers that may be given by learners.

Performance Criteria: 2.4

Do visual checks

Before you start working, there are important crane safety checks you need to do first. Start with the visual check. Look around the crane for obvious problems such as leaks and damage.



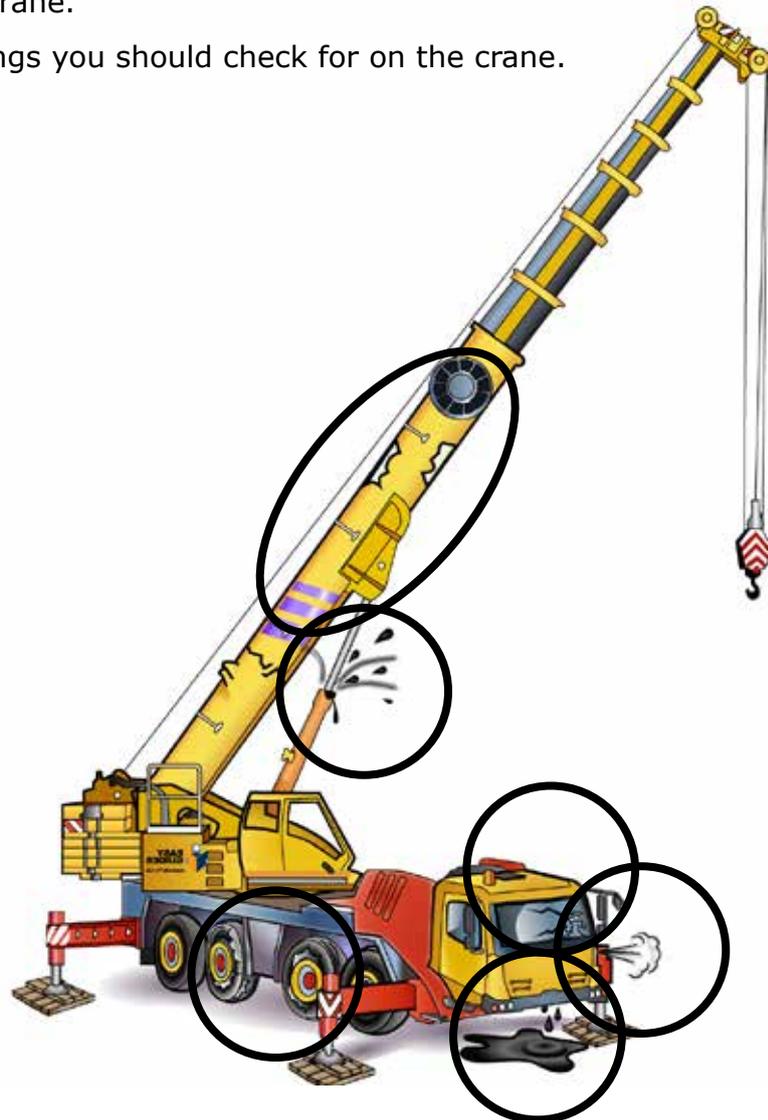
Theory Training Task 13

Performance Criteria: 2.4



Look at this crane.

Circle the things you should check for on the crane.





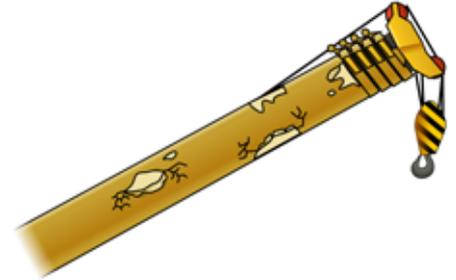
Theory Training Task 14

Performance Criteria: 2.4

Choose two of the areas you circled and explain why you think it's important to make the check.

Answer may include:

- Flaking paint, bends, twists and cracks on the boom or outrigger arm may be signs of wear or a welding fault.
- Fluid on ground may be an oil, brake or hydraulic leak.
- A broken windscreen may be a sign of vandalism.
- A damaged tyre may need to be replaced.

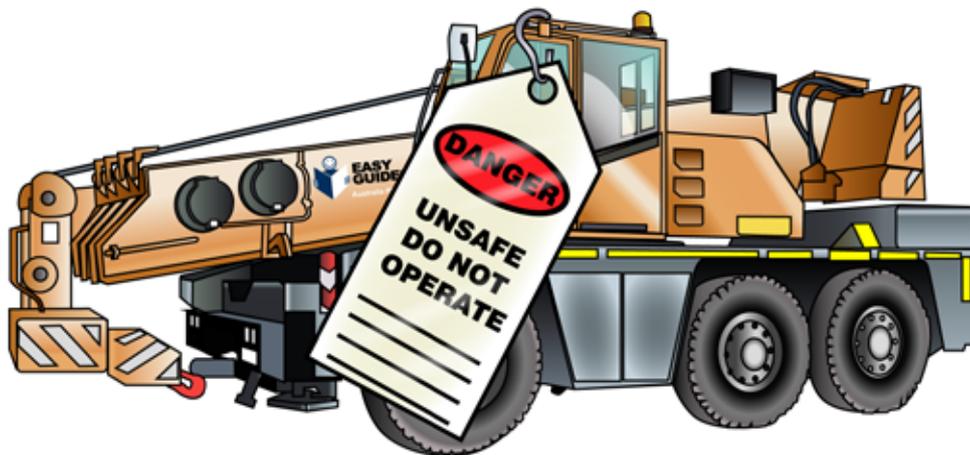


Theory Training Task 15

Performance Criteria: 2.4

Who is allowed to remove a danger tag?

- Anyone involved in the work
- Anyone with a dogging licence
- The person who signed the tag
- The supervisor of the person who signed the tag



Performance Criteria: 2.4

Check signs and labels

Check the signs, labels and decals on the crane. These will tell you the crane's load limits and what it can and can't do. All signs and labels must be readable and clear.



Theory Training Task 16

Performance Criteria: 2.4

List at least 2 things you should be able to read on a data plate.

Answer may include:

- **Weight (GVM)**
- **Model number**
- **Dimensions**
- **Date of manufacture**
- **WLL/SWL**
- **Serial number**



Performance Criteria: 2.4

Do the pre-operational checks

Do the pre-operational checks to make sure the crane is safe to use.



Theory Training Task 17

Performance Criteria: 2.4

What are four (4) pre-operational checks you need to do on the crane?

Answer may include:

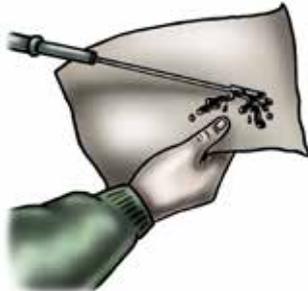
- **No safety tags on the crane**
- **Rope drums**
- **Load charts**
- **Lifting hook**
- **Tyres (condition, pressure)**
- **Communication system**
- **Ropes, wires and anchorages**
- **Fluid levels and leaks (oil, water)**
- **Logbook is present and in good condition**
- **Structural damage to crane (including boom/jib)**
- **Signage (including manufacturer's data plate and working load limit)**



Theory Training Task 18

Performance Criteria: 2.4

a) Label the fluid checks shown below.

	
Coolant	Battery fluid
	
Brake fluid	Engine oil



b) If you forgot to check one of these fluids and they ran dry, what might happen to the slewing crane?

Answer may include but is not limited to:

- The slewing crane could be damaged.



Theory Training Task 19

Performance Criteria: 2.4, 2.6, 2.7

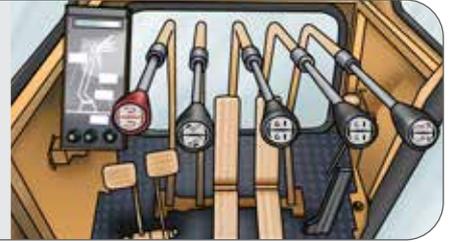
On a lattice boom crane, what problems can cause the boom brakes to creep and engage the boom pawl and ratchet?

Brake condition, mechanical failure or moisture.

Performance Criteria: 2.7

Crane controls

Get to know the controls on the crane you will use.



Theory Training Task 20

Performance Criteria: 2.7

Name the main controls on a slewing mobile crane.

Answer may include:

- Brake levers
- Luffing levers
- Hoisting and lowering levers
- Boom extension levers (if fitted).



Performance Criteria: 2.8

Check the logbook

Check the crane service logbook for records of faults, servicing and repairs.



Theory Training Task 21

Performance Criteria: 2.8



a) Why do you need to check the crane's service logbook?

- It is the right logbook for the crane being used
- The crane meets Australian Standards (AS) 1418
- Someone has fixed any faults
- To ensure maintenance or repairs have been done.



b) How often should the crane be serviced?

At least every three months.

Performance Criteria: 2.7

Listen for noises

Start the crane and listen for any strange noises and vibrations.



Theory Training Task 22

Performance Criteria: 2.7

a) Where do you find the start-up procedure?

You look in the user manual or in the manufacturer's specifications.

b) How do you start the crane?

- 1. Apply the parking brake to stop the vehicle from moving.**
- 2. Make sure the manual accelerator control lever is in the catcher and crane control levers are in the neutral positions.**
- 3. Set the vehicle's shift lever in the neutral position.**
- 4. Start the engine.**
- 5. Depress the clutch pedal, pull up the power take up (PTO) lever completely, and release the clutch pedal slowly. This will start the hydraulic pump.**
- 6. CAUTION – in winter and cold climates, do not operate the crane immediately after doing steps 1 – 5. (First, boom up and slew a few times without a load to warm up the hydraulic oil.)**



c) What do you do if you hear abnormal (meaning strange) noises coming from the crane when you start it?

You should have the crane inspected to find the cause of the problem.



Performance Criteria: 2.7

Test safety devices

Test the crane's safety devices to make sure the crane is safe to use.



Theory Training Task 23

Performance Criteria: 2.7

- a) Label these safety device checks you should carry out before starting a slewing mobile crane.



Horns/sirens



Warning lights



Over hoist limit/anti-two block device



Luff up limit

b) What does the anti-two block device do?

It prevents the lower load block from hitting the upper load block and dragging the hook block into the head sheaves. This is called double blocking.

c) How can you check that the anti-two block device is in working condition?

Check that the switches and weights can move freely.

Performance Criteria: 2.7

Do the post-start operational checks

Do the post-start operational checks after you have started the crane.



Theory Training Task 24

Performance Criteria: 2.7

List the post-start operational checks you should make once you have started the slewing mobile crane.

Answer may include:

- Hazard controls
- All controls and motions to full capability/extension
- Make sure the crane is safe to use. For example the throttle control and steering.
- Warning devices/systems
- Horn/lights/drive indicator
- Gauges
- Load radius indicator
- Communications
- Brakes (travel brake handbrake)
- A clear view from the cabin across the work area.



Performance Criteria: 2.7

Record and report faults

If you find any faults with the crane, follow the tag out procedure and do not use the crane.



Theory Training Task 25

Performance Criteria: 2.7

Label and explain the steps you must take if you find a fault or have any problems with the slewing mobile crane you use.

<p>1. Remove the key</p> 	<p>Remove the key so no one else can use the slewing mobile crane.</p> <p>.....</p> <p>.....</p>
<p>2. Tag</p> 	<p>Place an out of service or danger tag on the slewing mobile crane so it cannot be used.</p> <p>.....</p> <p>.....</p>
<p>3. Record</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Fault Reported By:..... Date:...../...../.....</p> <p>Description of fault:.....</p> <p>NOTE: Operator to TAG OUT machine if needed.</p> </div>	<p>Record the fault in the logbook/ daily inspection checklist book.</p> <p>.....</p> <p>.....</p>
<p>4. Report</p> 	<p>Report the fault to your supervisor, manager or other authorised person.</p> <p>.....</p> <p>.....</p>

Practical Training Task 4

Part 3 – Check the crane

Performance Criteria 2.4, 2.7, 2.8

Check the crane

Learners: You **must** do this task under the **control of a licensed operator**. Please wait for your trainer to advise you before trying the task.

First, your trainer will take you to an area where you will use a slewing mobile crane.

Second, your trainer will ask you to do a routine check of the crane before you start the motor.

Third, your trainer will see if you can find any faults or damage on the slewing mobile crane



- Crane is visually checked for any damage or defects. This means have a look around the crane for obvious problems.
- All signage and labels are checked to ensure they are visible and legible in accordance with the appropriate standard. This means you check signs and labels.
- Routine pre-operational crane checks are carried out in accordance with procedures. This means that once you do a visual check of the crane you then do a thorough pre-operational check.
- All controls are located and identified. This means you get to know the position and use of all the controls on the crane.
- Crane service logbook is checked for compliance. This means you find and check the service logbook and daily inspection checklist book.
- Crane is started in accordance with procedures and checked for any abnormal noises. This means you start the crane and listen for strange noises.
- All crane safety devices are tested in accordance with procedures. This means you test the safety devices on the crane for problems.
- Post-start operational checks are carried out in accordance with procedures. This means you do checks after you have started the crane.
- All damage and defects are reported and recorded in accordance with procedures, and appropriate action is taken. This means if you find any defects and faults with the crane, you need to record and report them.

Your trainer will assess your routine checks of the slewing mobile crane. After you finish, the licensed operator/trainer will then sign and date the box below.

Part 3: **Competent** **Not yet competent**
Signature (licensed operator/trainer) Date

Part 4

Plan the lift



Trainers please note:

The answers in this book are in no way conclusive and are to be used as a guide only. Use your own knowledge and experience to correct the variation of answers that may be given by learners.

Performance Criteria: 1.3

Find out the weight of the load

You are planning the lift. Find out or estimate the weight and size of the load you are going to lift.



Theory Training Task 26

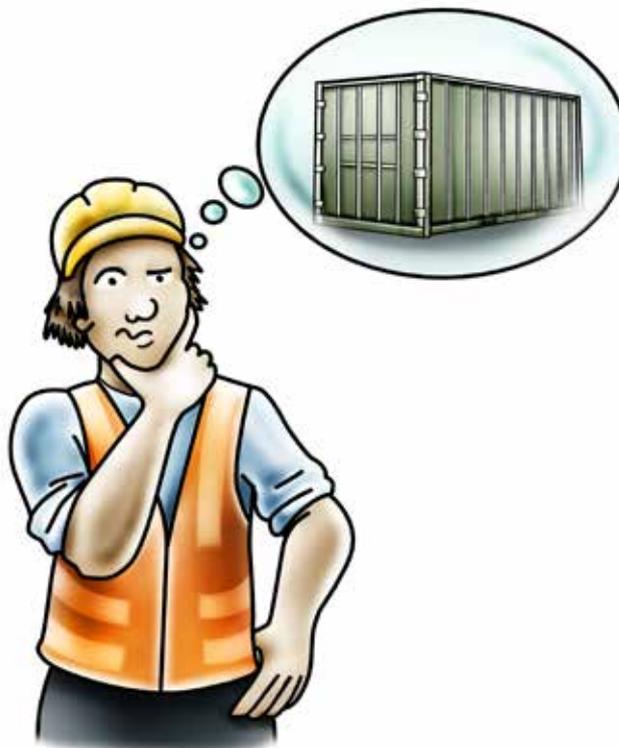
Performance Criteria: 1.3

Give some examples of how you find the weight of an unmarked load.

Answer may include:

You can find the weight of an unmarked load by:

- The weighbridge certificate, consignment note or other paperwork
- The load itself or its packaging
- Calculate the weight of the load yourself
- Weighing the load.





Theory Training Task 27

Performance Criteria: 1.3

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

- Weight of structural steel = 7840 kg per cubic metre
1 mm = 0.001 m
- Flanges (top and bottom)
 - Length = 12 m
 - Width = 250 mm
 - Thickness = 15 mm
 - Flange = $L \times W \times D \times 2 \times$ weight of structural steel
- Web
 - Length = 12 m
 - Width = 275 mm
 - Thickness = 40 mm
 - Web = $L \times W \times D \times$ weight of structural steel

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

$$\text{Flange} = 12 \text{ m} \times 0.25 \text{ m} \times 0.015 \text{ m} \times 2 \times 7840 \text{ kg}$$

$$\text{Flange} = 705.6 \text{ kg}$$

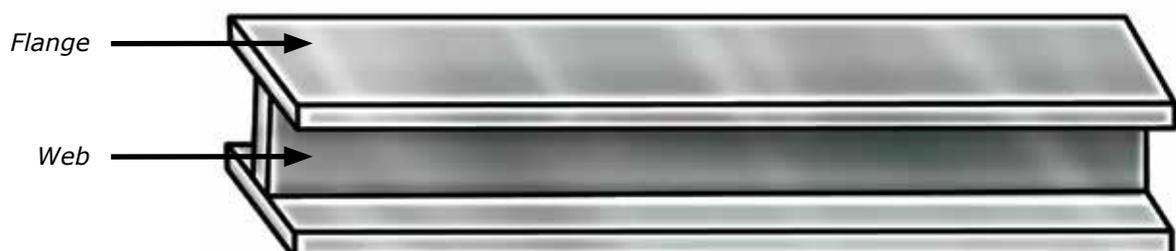
$$\text{Web} = 12 \text{ m} \times 0.275 \text{ m} \times 0.04 \text{ m} \times 7840 \text{ kg}$$

$$\text{Web} = 1034.88 \text{ kg}$$

$$\text{Total weight} = 705.6 \text{ kg} + 1034.88 \text{ kg}$$

$$\text{Total weight} = 1740.48 \text{ kg}$$

$$\text{Total weight} = 1740.5 \text{ kg}$$



Performance Criteria: 2.5, 3.1

Check the load charts

Check the load charts and make sure the crane can lift the load.



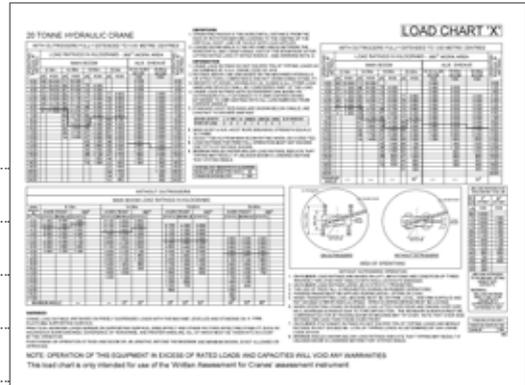
Theory Training Task 28

Performance Criteria: 2.5, 2.6, 3.1

- a) How do you find out the crane's lifting capacities to make sure the crane can lift the load?

You can find out by reading the:

- Crane's lifting limits in the user manual
- Crane's load charts
- May be marked on the crane.



- b) List at least three (3) things a load chart tells you.

Answer may include:

- Rated capacity
- Length of boom
- Operating radius
- Winch capacity
- Maximum wind speed
- Speed
- Outrigger set up
- Angle of boom
- Line load / hoist limits
- Jib ratings
- Mobilising limits

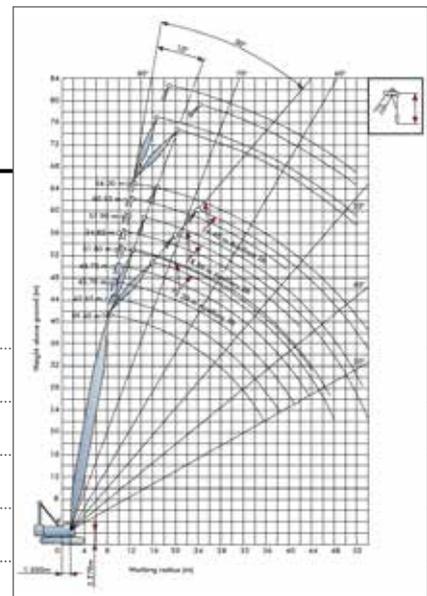


Theory Training Task 29

Performance Criteria: 2.5, 2.6, 3.1

Name at least three (3) things a range diagram shows you.

- Range of boom lengths
- Crane structure (configuration)
- Boom point elevation
- Boom angles
- Radius





Theory Training Task 30

Performance Criteria: 1.3

- a) You are doing a multiple crane lift with two cranes.
The load is 20 tonnes.
How much capacity does each crane need to lift this load safely?

Load share of each crane = total load ÷ number of cranes

$$20 \text{ t} \div 2 = 10 \text{ t}$$

Capacity each crane needs = load share of each crane × safety margin

$$10 \text{ t} \times 1.2 = 12 \text{ t}$$

- b) How much extra capacity (safety margin) do you need for a three crane lift?

33%

Performance Criteria: 1.4

Plan your path

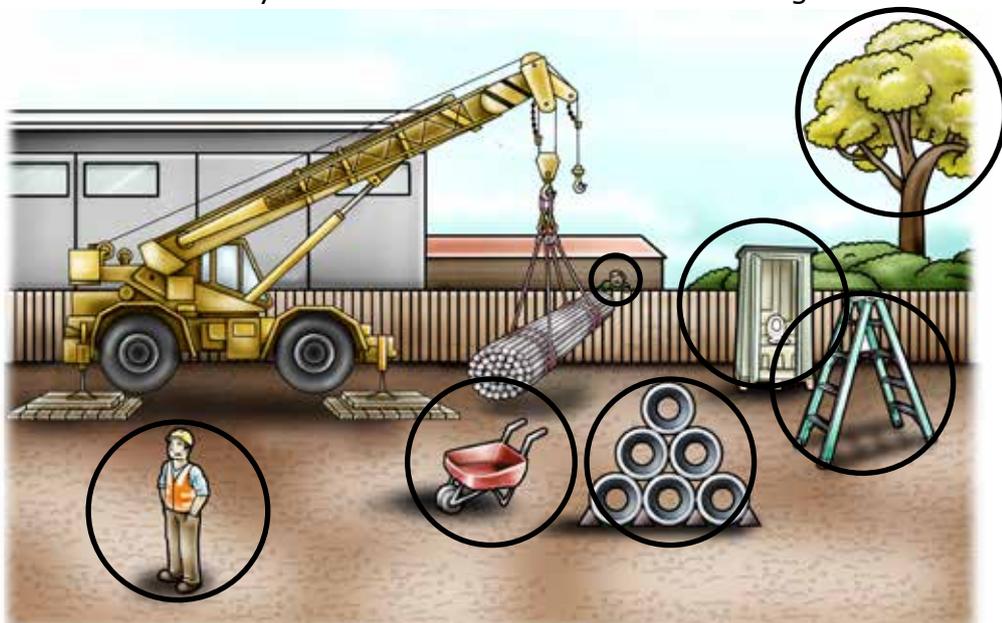
Plan the path you will take to move the load, and look out for hazards.



Theory Training Task 31

Performance Criteria: 1.4

Check the path of movement of loads to avoid hazards.
Circle the **hazards** you should look out for when moving a load.



Performance Criteria: 1.2

Check the ground conditions

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



Theory Training Task 32

Performance Criteria: 1.2

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

Circle the correct answer.

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



Theory Training Task 33

Performance Criteria: 1.2

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

The slewing mobile crane could:

- Sink
- Tip over while it is moving the load
- Damage the underground services.





Theory Training Task 34

Performance Criteria: 1.2

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

Answer includes:

- Dial before you dig, phone 1100.
- Check site plans.
- Contact the water authority or local council.
- Check the nearby drains or manholes.
- Check for signs posted by service providers.



Theory Training Task 35

Performance Criteria: 1.2

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

- 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.



Load charts

This book covers up to 100 tonnes slewing mobile crane capacities.

Read this page, and answer the questions about the crane capacity you are studying for. For example, if you are studying for the Licence to operate a slewing mobile crane (up to 20 tonnes), you only need to do those questions.

Introduction to load charts

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

The configuration of the crane includes:

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

Other important information can include:

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

Read all of the information on the load chart.



How to read load chart

To calculate the maximum load that you can safely lift, there are some basic rules for all load charts.

1. Outriggers

Work out the outrigger set up. This will help you know which section of the load chart to look at.

2. Boom length

Work out the length of the boom. This will help you know which column to look at.

3. Operating radius

Work out the operating radius. This will help you know which row to look at.

4. Capacity

The figure in the box will state the capacity of the crane.

5. Hook block/s

The weights of hook block(s) are part of the load. Deduct the weight from the capacity. These weights are on the load chart.

6. Jib weight

The weight of the jib (fly), either fitted or stowed are part of the load and may be a deduction from the capacity. This information is on the load chart.

7. Line (hoist rope)

Look at the hoist rope reeving to determine how many parts of line (hoist rope) are needed to support the load. For example, if the load you will lift is 5 tonnes and if the hoist rope has a capacity of 3 tonnes then 2 parts of line are required to safely hoist the load.

8. Jib configuration

Information about the load capacity of the different jib configurations (exclusive jib load chart).



Slewing mobile crane charts (over 100 tonnes)

Answer these questions if you are studying the **TLILIC0015 Licence to operate a slewing mobile crane (over 100 tonnes)**.

If you are studying for a different licence, skip to that section.

Note: For the following crane exercises use the Calculations-CO LOAD CHART_KOBELCO CKE2500-2 load chart. This is located in the 'Trainer's Resource' of the Easy Guides training material. Your trainer will provide you with this crane chart.





Load Chart Activity 1

Performance Criteria: 2.7, 3.1

Note: Use the Calculations-CO LOAD CHART_KOBELCO CKE2500-2.

Scenario 1

You have been asked to operate a Kobelco CKE2500 Crawler Crane in luffing jib configuration. You have been told that the crane has the following:

- 45.7m boom inserted
- 61m of jib.

You want to check the crane configuration before you begin lifting because you weren't there when the crane was rigged.

What is the total counterweight required for stable crane operation in this configuration? (information located on page 13 of the load chart)

Boom length (m)		51.8																Boom length (m)	
Jib length (m)		45.7				51.8				57.9				61.0				Jib length (m)	
Boom angle		88°	83°	68°	63°	88°	83°	68°	63°	88°	83°	68°	63°	88°	83°	68°	63°	Boom angle	
Working Radius (m)	18.0	25.2																	18.0
	20.0	25.9				21.2													20.0
	22.0	26.7				20.9				17.3				15.7					22.0
	24.0	25.4				20.8				17.0				15.4					24.0
	26.0	25.1	28.0			20.3				16.7				15.1					26.0
	28.0	24.8	25.7			20.0	20.5			16.4				14.8					28.0
	30.0	24.5	25.4			19.4	19.5			16.1	18.0			14.5	32.0m/14.5				30.0
	34.0	22.5	22.7			17.4	17.7			14.5	15.2			13.1	13.7				34.0
	38.0	20.5	18.7			15.6	15.8			13.1	13.7			11.8	12.4				38.0
	42.0	18.0	17.3			13.9	14.3			12.0	12.4			10.0	11.3				42.0
	46.0	14.9	15.4			12.3	12.7			11.0	11.4			10.0	10.3				46.0
	50.0	88.0m/13.0	13.8	10.6		10.7	11.3			10.1	10.4			9.2	9.5				50.0
	54.0		52.0m/13.1	9.5		9.2	9.9	9.2		9.3	9.8			8.5	8.7				54.0
	58.0			8.5	7.8		8.5	8.2		7.3	8.7	8.0		8.3	8.1	7.8			58.0
	62.0			7.8	8.8		7.4	8.4	8.0m/5.4	7.8	7.1			4.4	7.5	8.9			62.0
	66.0			7.1	6.1		6.7	5.8		6.0m/7.8	6.4	5.4		5.7	6.2	8.0m/4.9			66.0
	70.0				5.8		6.1	5.2			5.8	4.8			5.8	4.7			70.0
	74.0						32.0m/5.8	4.8			5.2	4.3			5.0	4.2			74.0
	78.0							36.0m/4.4			4.7	3.9				4.5	3.7		78.0
	82.0															8.0m/3.2	3.3		82.0
86.0																8.0m/3.1		86.0	
	Reeves		2			2				2				2				Reeves	

Total counterweight = Counterweight + Carbody Weight = 90 + 24 = 114 tonnes
= 114 tonnes

Question - How many falls of rope should be on the hook block?

Answer: = 2 (located on bottom of load chart – Reeves)

Scenario 2

What are the most flexible configurations for the boom and jib arrangements for this scenario? Show the correct order of assembly.

Boom Arrangements (Lengths) – use Luffing boom Arrangements for luffing (see extract)

[Continued next page]

Luffing Boom Arrangements for Luffing

Boom length m (ft)	Boom arrangement
21.3 (70)	※ [Diagram: 20m boom with 1.0m top and 0.3m base]
24.4 (80)	※ [Diagram: 20m boom with 1.0m top and 0.3m base] [Diagram: 20m boom with 1.0m top and 0.3m base] [Diagram: 20m boom with 1.0m top and 0.3m base]
27.4 (90)	※ [Diagram: 20m boom with 1.0m top and 0.3m base] [Diagram: 20m boom with 1.0m top and 0.3m base]
30.5 (100)	※ [Diagram: 20m boom with 1.0m top and 0.3m base] [Diagram: 20m boom with 1.0m top and 0.3m base] [Diagram: 20m boom with 1.0m top and 0.3m base]
33.5 (110)	※ [Diagram: 20m boom with 1.0m top and 0.3m base]
36.6 (120)	※ [Diagram: 20m boom with 1.0m top and 0.3m base] [Diagram: 20m boom with 1.0m top and 0.3m base] [Diagram: 20m boom with 1.0m top and 0.3m base]
39.6 (130)	※ [Diagram: 20m boom with 1.0m top and 0.3m base] [Diagram: 20m boom with 1.0m top and 0.3m base]
42.7 (140)	※ [Diagram: 20m boom with 1.0m top and 0.3m base] [Diagram: 20m boom with 1.0m top and 0.3m base] [Diagram: 20m boom with 1.0m top and 0.3m base]
45.7 (150)	※ [Diagram: 20m boom with 1.0m top and 0.3m base]

Boom length m (ft)	Boom arrangement
48.8 (160)	※ [Diagram: 20m boom with 1.0m top and 0.3m base] [Diagram: 20m boom with 1.0m top and 0.3m base] [Diagram: 20m boom with 1.0m top and 0.3m base]
51.8 (170)	※ [Diagram: 20m boom with 1.0m top and 0.3m base] [Diagram: 20m boom with 1.0m top and 0.3m base]
54.9 (180)	※ [Diagram: 20m boom with 1.0m top and 0.3m base] [Diagram: 20m boom with 1.0m top and 0.3m base] [Diagram: 20m boom with 1.0m top and 0.3m base]
57.9 (190)	※ [Diagram: 20m boom with 1.0m top and 0.3m base]
61.0 (200)	※ [Diagram: 20m boom with 1.0m top and 0.3m base] [Diagram: 20m boom with 1.0m top and 0.3m base]

※ Indicates the most flexible combination of insert luffing booms, which can be modified to form all shorter luffing boom arrangements.

Symbol	Luffing Boom Length	Remarks
[Diagram: Base symbol]	7.6 m	Boom Base
[Diagram: Top symbol]	1.0 m	Luffing Boom Top
[Diagram: Tapered symbol]	3.6 m	Luffing Tapered Boom
[Diagram: Insert 3.0m symbol]	3.0 m	Insert Boom
[Diagram: Insert 6.1m symbol]	6.1 m	Insert Boom
[Diagram: Insert 12.2m symbol]	12.2 m	Insert Boom

Answer: =

Answer = (note the * signifies the most flexible combination for that jib length)

B	10	20	40	40	11.7B	C
7.6m	3m	6.1m	12.2m	12.2m	3.6m	1m

Scenario 3

Jib Arrangements (Lengths) – use luffing jib arrangements (see extract)

Answer: =

Luffing Jib Arrangements

Jib length m (ft)	Jib arrangement
21.3 (70)	※ [Diagram: 9.1m jib with 3m top and 0.3m base]
24.4 (80)	※ [Diagram: 9.1m jib with 3m top and 0.3m base]
27.4 (90)	※ [Diagram: 9.1m jib with 3m top and 0.3m base] [Diagram: 9.1m jib with 3m top and 0.3m base]
30.5 (100)	※ [Diagram: 9.1m jib with 3m top and 0.3m base] [Diagram: 9.1m jib with 3m top and 0.3m base]
33.5 (110)	※ [Diagram: 9.1m jib with 3m top and 0.3m base] [Diagram: 9.1m jib with 3m top and 0.3m base]
36.6 (120)	※ [Diagram: 9.1m jib with 3m top and 0.3m base] [Diagram: 9.1m jib with 3m top and 0.3m base]

Jib length m (ft)	Jib arrangement
39.6 (130)	※ [Diagram: 9.1m jib with 3m top and 0.3m base] [Diagram: 9.1m jib with 3m top and 0.3m base]
42.7 (140)	※ [Diagram: 9.1m jib with 3m top and 0.3m base]
45.7 (150)	※ [Diagram: 9.1m jib with 3m top and 0.3m base] [Diagram: 9.1m jib with 3m top and 0.3m base]
48.8 (160)	※ [Diagram: 9.1m jib with 3m top and 0.3m base] [Diagram: 9.1m jib with 3m top and 0.3m base]

※ mark shows the installing position for mid suspension guy line.
※ Indicates the most flexible combination of insert luffing jibs, which can be modified to form all shorter luffing jib arrangements.

Jib length m (ft)	Jib arrangement
51.8 (170)	※ [Diagram: 9.1m jib with 3m top and 0.3m base] [Diagram: 9.1m jib with 3m top and 0.3m base]
54.9 (180)	※ [Diagram: 9.1m jib with 3m top and 0.3m base]
57.9 (190)	※ [Diagram: 9.1m jib with 3m top and 0.3m base] [Diagram: 9.1m jib with 3m top and 0.3m base]
61.0 (200)	※ [Diagram: 9.1m jib with 3m top and 0.3m base] [Diagram: 9.1m jib with 3m top and 0.3m base]

Symbol	Luffing Jib Length	Remarks
[Diagram: Base symbol]	9.1 m	Luffing Jib Base
[Diagram: Top symbol]	9.1 m	Luffing Jib Top
[Diagram: Relay symbol]	3.0 m	Relay Jib
[Diagram: Insert 3.0m symbol]	3.0 m	Luffing Insert Jib
[Diagram: Insert 6.1m symbol]	6.1 m	Luffing Insert Jib
[Diagram: Insert 12.2m symbol]	12.2 m	Luffing Insert Jib

Answer: = (note the * signifies the most flexible combination for that jib length)

JB	10A	20	20	40	10	40	JT
9.1m	3m	6.1m	6.1m	12.2m	3m	12.2m	9.1m

Scenario 4

You have been asked to operate a Kobelco CKE2500 Crawler Crane in luffing jib configuration. You have been told that the crane has the following
45.7m boom inserted

51.8m of jib

You have been asked to pick up a 4tonne load (including rigging) at a 24m radius and place it at a 70m radius. Refer to the load charts and manufacturers specifications.

See extract of load chart below

Boom length (m)		51.8												Boom length (m)				
Jib length (m)	45.7				51.8				57.9				61.0				Jib length (m)	
Boom angle	88°	83°	68°	63°	88°	83°	68°	63°	88°	83°	68°	63°	88°	83°	68°	63°	Boom angle	
Working Radius (m)	18.0	20.2															18.0	
	20.0	25.9			21.2												20.0	
	22.0	25.7			20.9				17.3				15.7				22.0	
	24.0	25.4			20.8				17.0				15.4				24.0	
	26.0	25.1	26.0		20.3				16.7				15.1				26.0	
	28.0	24.8	25.7		20.0	20.5			16.4				14.8				28.0	
	30.0	24.5	25.4		19.4	19.5			16.1	18.0			14.5	12.0 m/14.5			30.0	
	34.0	22.5	22.7		17.4	17.7			14.5	15.2			13.1	13.7			34.0	
	38.0	20.5	18.7		15.0	15.8			13.1	13.7			11.8	12.4			38.0	
	42.0	18.0	17.3		13.0	14.3			12.0	12.4			10.0	11.3			42.0	
	46.0	14.9	15.4		12.3	12.7			11.0	11.4			10.0	10.3			46.0	
	50.0	15.8 m/13.0	13.8	10.6		10.7	11.3		10.1	10.4			8.2	9.5			50.0	
	54.0		12.9 m/13.1	9.5		9.2	9.0	9.2		9.3	9.8		8.5	8.7			54.0	
	58.0			8.5	7.8		8.5	8.2		7.3	8.7	8.0		8.3	8.1	7.8		58.0
	62.0			7.8	8.8			7.4	6.4	6.0 m/6.4	7.6	7.1		4.4	7.5	6.9		62.0
	66.0			7.1	6.1			6.7	5.8		6.0 m/7.8	6.4	5.4		5.7	6.2	6.0 m/4.0	66.0
	70.0				5.8			6.1	5.2			5.8	4.8			5.8	4.7	70.0
74.0							12.0 m/3.8	4.8			5.2	4.3			5.0	4.2	74.0	
78.0								36.0 m/4.4			4.7	3.9			4.5	3.7	78.0	
82.0												3.5			6.0 m/4.2	3.3	82.0	
86.0																6.0 m/3.1	86.0	
Reeves			2				2				2				2		Reeves	

Question 1: What main boom angle is required to pick up the load vertically?

Answer: =

Answer: = 88 degrees

Question 2: Can you complete this operation in a single lift? How?

Answer: =

Answer: = Yes. Set the main boom angle to 88° to allow the operator to reach a radius of 24 m to pick up the load. Then luff the main boom down to a main boom angle of 68°. Then luff down the fly jib to place the load at a radius of 70 m.

Note: For the following crane exercises us the Calculations-CO LOAD CHART_ GROVE GMK5130-2 load chart. This is located in the 'Trainer's Resource' of the Easy Guides training material. Your trainer will provide you with this crane chart.

Grove Manitowoc National Crane Potain



GROVE GMK 5130-2

Product guide

-  130 t
-  60 m
-  11 - 32 m
-  95 m



All Terrain Crane

Scenario 1

Using the load charts for the Grove GMK 5130-2, the crane is setup with the following:

- 40.1t cw
- 6 parts of line on a 50t
- Main boom length of 45.99m

Question 1 What is the counterweight configuration required to achieve a counterweight configuration of 40.1t?

Answer: =

Answer: =

Quantity	Counterweight Number	Weight
1	1	2.5
1	2	2.5
3	3	5 x 3 = 15
1	4	5
1	6	2.5
2	10	2 x 5.8 = 11.6
1	11	1
	Total	40.1t

Question 2 What is the Minimum and maximum working radius in this boom configuration?

Answer: =

Answer: =

Minimum = 6m

Maximum = 42m

Question 3 What is the maximum speed that the hook can be raised in in this configuration? Show working.

(See extract from page 2 of load chart – see below)

	Infinitely variable • Stufenlos • Progressivement variable Infinitamente variable • Infinitamente variabile Плотно-изменяемый	Rope • Seil • Cable Cable • Fune Канат	Max. Single line pull • Max. Seilzug • Effort maxi su brin simple Tiro máximo por ramal • Tiro max. per singola fune Макс. натяжение каната
	0 - 120 m/min Single line • Rie einfaches Strang • Brin simple Rama! simple • Tiro a fune singola Однократная запосовка	19 mm / 255 m	70 kN
	0 - 120 m/min Single line • Rie einfaches Strang • Brin simple Rama! simple • Tiro a fune singola Однократная запосовка	19 mm / 225 m	70 kN
	0 - 1,5 min ⁻¹		
	-3° to + 83° 45 s		
	12,9 to 60 m 430 s		

Answer: =

Answer: = Calculation = 120m/min (load chart) / 6 parts of rope
= 20m/min

[Continued next page]

Scenario 2

Observing the site requirements, what percentage of site's allowed rated capacity is the crane at when the load is landed at the 14m radius? Round up to 2 decimal places. Show workings.

The crane is set up with the following:

Calculations

Total Deductions = Hook Block Weights + Rigging

Total Deductions = 675 kg for 50 t hook + 80 kg Rigging = 755 kg

Total load = 8 tonne + 755 kg = 8.755 tonnes. (Same as part 1 load and rigging does not change)

Crane Capacity at 16m radius = 14.5 tonnes

75% of crane capacity = $0.75 \times 14.5 = 10.875$ tonnes allowed at site

Percentage of sites allowed rated capacity for lift = $(\text{Total Load} \div \text{Site Rated Capacity}) \times 100$
 $= (8.755 \div 10.875) \times 100$
 $= 80.51\%$

Answer: =

Answer: = 81%

Outrigger Calculations C0

Grove GMK 5130-2 All terrain crane

You are working on a Quarry site with recent earthworks being completed, you have received the site plans showing that underground water mains are 5m below the surface, your crane is fitted with the following:

- 28.5t of counterweight
- 100t capacity hook block
- 40t load to be lifted
- All 4 outrigger pads are 1.2m x 1.2m

Question 1

Calculate the pressure that will be applied to the ground when lifting directly over one outrigger foot

Convert the formula for calculating outrigger pad area required to now have the formula for calculating the pressure being applied to the ground - see below:

$$\text{Area (m}^2\text{)} = \frac{0.65 \times (\text{CM} + \text{L})}{P_{\text{max}}}$$

P_{max}

switch around to this

$$P_{\text{out}} = \frac{0.65 \times (\text{CM} + \text{L})}{\text{area}}$$

area

Step 1 - First calculate the crane mass (CM) (this is located on page 2 of the load chart)

[Continued next page]



Axle • Achse Essieu • Eje Акс • Ось	1	2	3	4	5	Total weight • Gesamtgewicht Poids total • Peso total Peso totale • Сукупний мас
t	12	12	12	12	12	60*

* with 8,5 t counterweight, 10x8x10, 16.00 R25 tyres, 11/18 m hi-fold outrigger, 20 t hookblock / 11 t counterweight, 10x8x10, 14.00 R25 tyres, 20 t hookblock
 * mit 8,5 t Gegengewicht, 10x8x10, 16.00 R25 Reifen, 11/18 m Doppelklappstütze, 20 t Hakenflasche / 11 t Gegengewicht, 10x8x10, 14.00 R25 Reifen, 20 t Hakenflasche
 * avec contrepoids de 8,5t, 10x8x10, pneus, 16.00 R25, extension tréillis 11/18m, 20t moufle / contrepoids de 11 t, 10x8x10, pneus, 14.00 R25, 20 t moufle
 * con 8,5 t contrapeso, 10x8x10, neumáticos16.00 R25, 11/18 m plumin articulado, gancho de 20 t / 11 t contrapeso, 10x8x10, neumáticos14.00 R25, gancho de 20 t
 * con a bordo 8,5 t di zavorra, 10x8x10, Gomme tipo 16.00 R25, falange ripiegabile da 11/18 m, gancio da 20 t / a bordo 11 t di zavorra, 10x8x10, Gomme tipo 14.00 R25, gancio da 20 t
 * с протитоварним 8,5 т, 10x8x10, шинами 16,00 R25, двійною складним удлинителем стрелы 11/18 м, кроковий блок 20 т / с протитоварним 11 т, 10x8x10, шинами 14,00 R25, кроковий блок 20 т

Crane mass (travelling on road) = 60t mass (with a 8.5t cw and a 20t hook)

Take off the cw and hook (for travel) and substitute it for what the crane will have fitted to perform the lift (working weights)

$$= 60\text{t mass} - 8.5\text{t cw} - 325\text{kg (20t hook)} + (1150\text{kg (100t hook)} + 28.5\text{t cw})$$

$$= 80.825\text{t}$$

Step 2 - Second calculate the pad area in $\text{m}^2 = 1.2\text{m} \times 1.2\text{m} = 1.44\text{m}^2$

$$P_{out} = \frac{0.65 \times (CM + L)}{\text{area}}$$

Now use P_{out} formula:

Answer: =

Answer: = 54.54 t/m² (rounded up to 2 decimal places)

Question 2

You are working on a new infrastructure site with recent NBN fibreoptic cabling being completed, you have received the site plans showing that fibreoptic cables are 4m below the surface, your crane is fitted with;

- 23.5t of counterweight
- 100t capacity hook block
- 50t load to be lifted
- All 4 outrigger pads are 1m x 1.5m

Using this crane but setting up on soft clay -dry, calculate the outrigger pad size so the crane does not sink

(Chart below is same as assessment paper- check to see if you want to change it)

Ground type	Maximum permissible ground pressure, P_{MAX} (Tonnes per m^2)
Hard rock	200
Shale rock and sandstone	80
Compacted gravel (with up to 20% sand)	40
Asphalt	20
Compacted sand	20
Stiff clay (dry)	20
Soft clay (dry)	10
Loose sand	10
Wet clay	Less than 10

[Continued next page]

Use the outrigger Pad size formula

$$\begin{aligned} \text{CM} &= 60\text{t mass} - 8.5\text{t cw} - 325\text{kg (20t hook)} + (1150\text{kg (100t hook)} + 23.5\text{t cw}) \\ &= 75.83\text{t (rounded up to 2 decimal places)} \end{aligned}$$

$$\begin{aligned} \text{Area required} &= 0.65 \times (\text{CM} + \text{Load}) / 10 \\ &= 0.65 \times (75.83 + 50) / 10 \\ &= 8.18\text{m}^2 \end{aligned}$$

Answer: =

Answer: = Square root answer $\sqrt{8.18\text{m}^2} = 2.87\text{m} \times 2.87\text{m}$ (pad size required)

Round up to 2.9m x 2.9m



Practical Training Task 5

Part 4—Plan the lift

Performance Criteria 1.3, 1.4, 3.1

Plan the lift

Learners: You **must** do this task under the **control of a licensed operator**.

Please wait for your trainer to advise you before trying the task.

First, your trainer will take you to an area where you will use a slewing mobile crane.

Second, your trainer will select a basic task for you to plan—for example, moving a load.

Third, your trainer will help you fill out a Safe work method statement (SWMS) for you to plan moving your load.



- Weight of load is identified and estimated in consultation with relevant workplace personnel. This means before you start a job there are rules and plans you need to know about.
- Crane is appropriate to the load/s and workplace conditions. This means you check the crane you use can lift the load.
- Appropriate path for moving loads in work area is inspected and determined. This means you check the route you will take to move the load.
- Ground suitability is checked. This means you check the ground is okay to use the slewing mobile crane before you set up.

Now fill out your SWMS (see over). After you finish your SWMS, your trainer will check you have done all the planning you needed to do. The licensed operator/trainer will then sign and date the box below.

Part 4: **Satisfactory** **Not yet satisfactory**

Signature (licensed operator/trainer) Date

Set up the crane



Trainers please note:

The answers in this book are in no way conclusive and are to be used as a guide only. Use your own knowledge and experience to correct the variation of answers that may be given by learners.

Performance Criteria: 1.4, 1.6

Follow safety procedures

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



Theory Training Task 36

Performance Criteria: 1.4, 1.6

Circle the correct answer for the following statements.

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

True

False

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

True

False

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

True

False

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

True

False



Performance Criteria: 1.2, 2.1

Position the crane

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



Theory Training Task 37

Performance Criteria: 1.2, 2.1

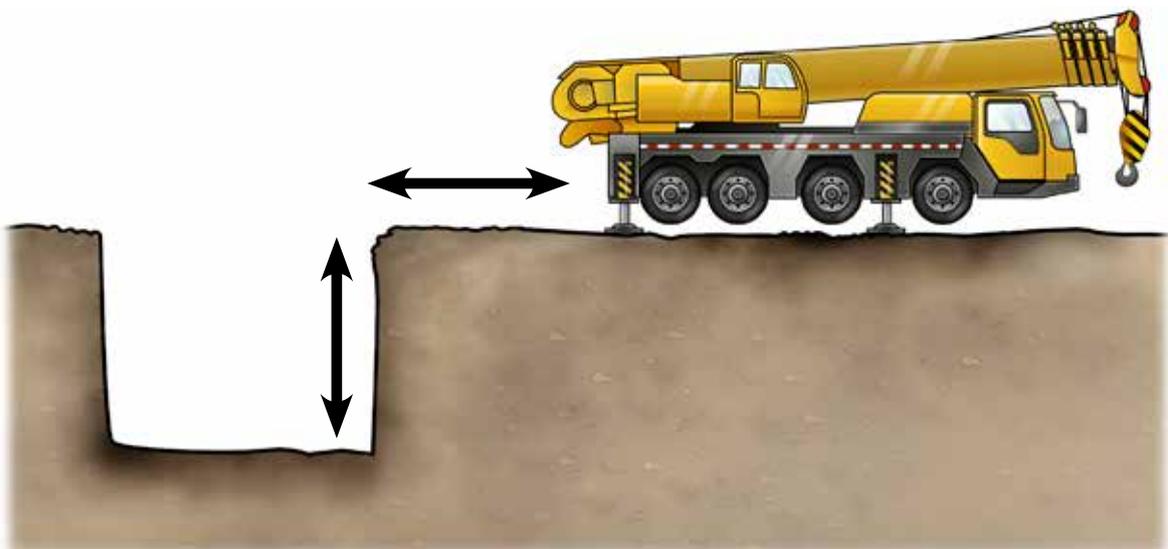
- a) How far away should you set up your crane from a 4 metre deep trench or excavation?

At least four metres away.



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

You might need to set up further away from the trench.





Theory Training Task 38

Performance Criteria: 1.2

Write a number in each box to show the right order in which you **set up** a slewing mobile crane on **sloping ground**.

2

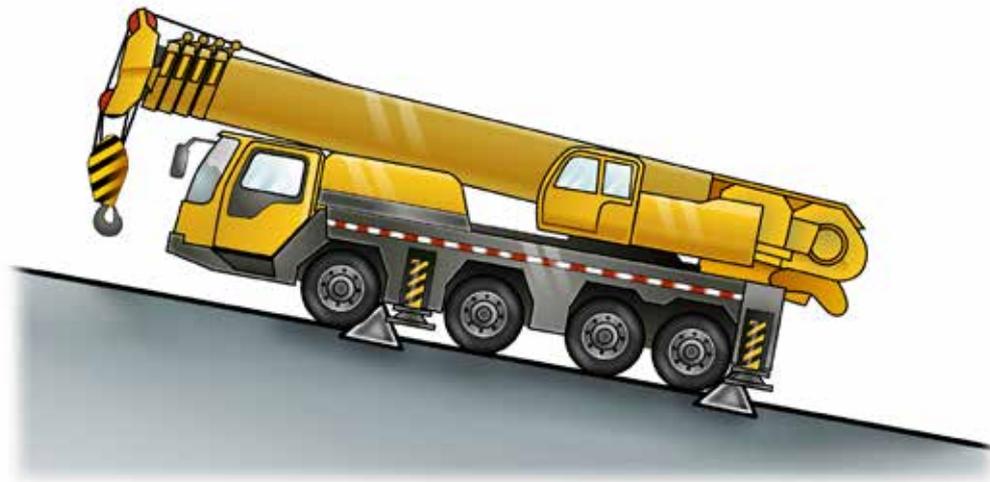
Chock the wheels

1

Put on the parking brake

3

Set up the outriggers on the lowest side to level the truck



Theory Training Task 39

Performance Criteria: 3.3



Why are outriggers and packing important when you use a slewing mobile crane?

- **Outriggers help keep the crane stable.**
- **Packing distributes the weight of the crane and load over a bigger area.**





Theory Training Task 40

Performance Criteria: 1.8, 3.3

a) What is the formula for calculating packing?

$$\text{Area} = \frac{0.65 \times (\text{Cm} + \text{L})}{\text{V}}$$

b) Use the figures below to estimate the area needed for packing.

Cm (crane mass) = 42 t

L (load mass) = 21 t

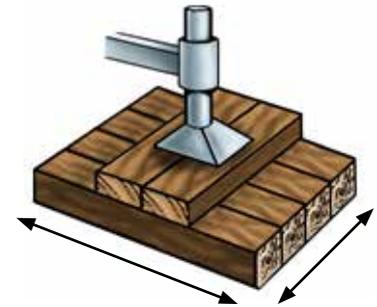
V (bearing pressure of the ground in tonnes m²) = 25 t

Round up to the nearest whole centimetre.

$$\text{Area} = 1.638 \text{ m}^2$$

Round up to the nearest whole centimetre

$$\text{Area} = 1.64 \text{ m}^2$$



c) What is the length of one side of packing?

$$\sqrt{1.64} = 1.28 \text{ m}$$



Theory Training Task 41

Performance Criteria: 1.2

Label the types of packing shown below.



Pigsty timber packing

Sleeper mats

Steel plates

Performance Criteria: 1.8, 2.6, 3.1, 3.3

Set up the crane

Check the rated capacity, and set up the crane properly for the lift.



Theory Training Task 42

Performance Criteria: 1.8, 3.1, 3.3

What does 'rated capacity' mean?

The rated capacity tells you how much the crane can lift at a specific boom length, boom angle and boom radius.



Theory Training Task 43

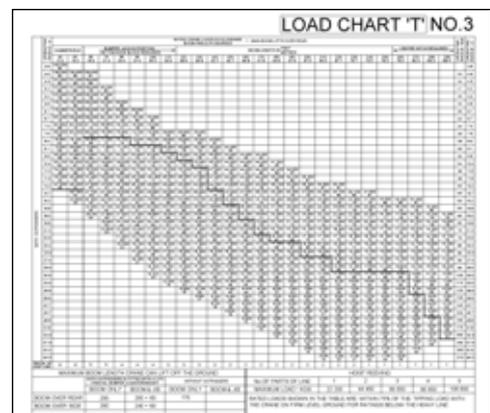
Performance Criteria: 2.5

- a) Where can you find out the configuration you need for the load you'll lift?

On the load chart.

- b) Where can you find the crane's load chart?

The load chart must be in the cabin of the crane.



Enter data into the computer

Enter the boom/jib and counterweight configuration into the computer.



Theory Training Task 44

Performance Criteria: 2.6, 1.3

What does the load meter/crane computer show you?

- Boom length
- Boom angle
- Capacity of the crane in its configuration
- Actual load on the crane
- Outrigger position
- Which hook is being used (main or auxiliary).



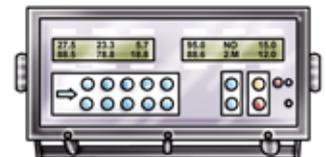
Theory Training Task 45

Performance Criteria: 2.6, 1.3

What data do you enter into the crane's computer?

Some examples are:

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



Theory Training Task 46

Performance Criteria: 1.3

a) What is the purpose of the crane's computer?

The crane's computer is used as a guidance system.

You don't rely on it alone. Check the load chart first

and use the computer to cross check.

b) How does the crane's computer help improve safety when you're lifting a load?

- **The computer helps prevent the crane from overloading and overturning.**
- **The computer has a load limiting/indicating system.**



Practical Training Task 6

Part 5—Set up the crane

Performance Criteria 1.2, 1.3, 1.4, 2.5, 2.6

Set up the crane

Learners: You **must** do this task under the **control of a licensed operator**.
Please wait for your trainer to advise you before trying the task.

First, your trainer will take you to an area where you will use a slewing mobile crane.

Second, your trainer will choose a crane for you to set up.

Third, you'll set up the crane including positioning the crane, positioning the boom/jib and entering the load data into the crane's computer.



- Crane is driven to the work area in accordance with procedures. This means you follow all procedures and guidelines when driving the slewing mobile crane to the work site.
- Crane is positioned for work application and stability in accordance with procedures. This means you put the slewing mobile crane where you can do the job safely and effectively.
- Appropriate crane configuration for work task is determined in accordance with procedures. This means checking the crane's load chart and rated capacity to make sure you set up the crane properly.
- Boom/jib and counterweight configuration data is input into crane computer as required. This means the load your crane can lift will depend on the type of boom/jib and counterweight you use during a lift.

Your trainer will check how you set up the slewing mobile crane. After you finish, the licensed operator/trainer will then sign and date the box below.

Part 5:

Competent

Not yet competent

Signature (licensed operator/trainer) Date

Notes



A series of horizontal dotted lines spanning the width of the page, intended for writing notes.

Part 6

Do the lift



Trainers please note:

The answers in this book are in no way conclusive and are to be used as a guide only. Use your own knowledge and experience to correct the variation of answers that may be given by learners.

Performance Criteria: 2.3

Access the crane safely

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



Theory Training Task 47

Performance Criteria: 2.3

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

- **When you're climbing into the cabin, 3 body parts should be touching the crane at the same time.**
- **Use 2 feet and 1 hand, or 2 hands and 1 foot.**
- **Using 3 body parts at the same time will keep you stable while you are climbing in or out.**



Performance Criteria: 1.3, 2.5, 2.6

Check the crane's capacity

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



Theory Training Task 48

Performance Criteria: 1.3, 2.5, 2.6

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

- **Check the load chart.**
- **Keep an eye on the crane's computer.**

A detailed load chart for a crane, titled "LOAD CHART 'Z'". It contains multiple tables of data, including columns for "LIFTING CAPACITY", "BOOM LENGTH", "LIFTING HEIGHT", and "LIFTING SPEED". The chart is used to determine the safe working limit (SWL) of the crane based on various operating conditions. A note at the bottom states: "NOTE: OPERATION OF THIS EQUIPMENT IN EXCESS OF RATED LOADS AND DISREGARD OF INSTRUCTIONS VOIDS WARRANTY".



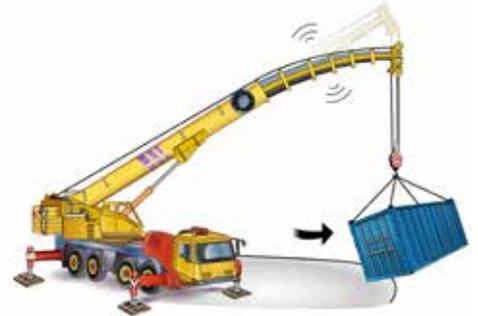
Theory Training Task 49

Performance Criteria: 2.6, 3.2

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

Plan for:

- Boom/jib deflection
- Boom angle



Theory Training Task 50

Performance Criteria: 2.5

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

No. Not ever.

Performance Criteria: 3.2

Position the boom/jib

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



Theory Training Task 51

Performance Criteria: 2.6, 3.2

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

The dogger.





Theory Training Task 52

Performance Criteria: 3.2



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

Answer includes:

- To reduce the risk of overloading the crane.
- To prevent load swinging on lift.
- To prevent damaging the crane.
- To prevent damage to the load caused by load toppling.



Performance Criteria: 3.4

Do a test lift

Once you've set up, do a test lift to make sure the lift can be done safely.



Theory Training Task 53

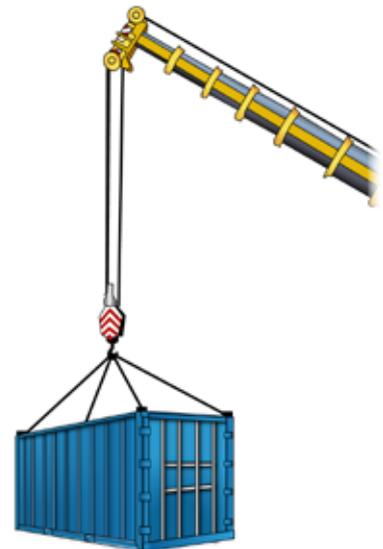
Performance Criteria: 3.4



Why should you do a test/trial lift?

Answer includes:

- To check the crane can do the lift.
- To see if all crane equipment works properly.
- To check the load is stable.
- To make sure there is enough clearance for the boom movement.
- To ensure the outriggers/packing are secure.





Theory Training Task 54

Performance Criteria: 3.4

Explain the procedure for doing a test lift.

1. **Lift the load off ground.**

.....

.....

2. **Stop.**

.....

.....

3. **Check lifting slings/chains have been positioned correctly for even weight distribution.**

.....

.....

4. **If safe and secure - GO AHEAD.**

.....

.....



Performance Criteria: 3.6

Use crane movements

When you are moving the load, use all movements of the crane safely and follow the rules.



Theory Training Task 55

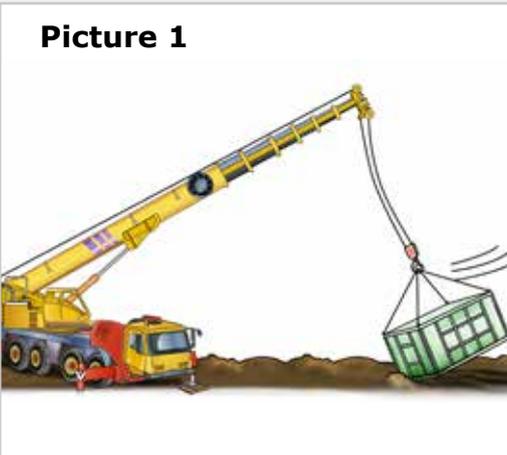
Performance Criteria: 3.6



When you lift or move a load, you have to think about a number of things. Look at the picture examples of moving or lifting a load shown here. Answer these questions for each picture example:

- Explain what the crane operator is doing wrong.
- Why is this unsafe?
- How would you avoid this unsafe moving or lifting a load?

Picture 1



Answers may include:

a) **Dragging (snigging) a load.**

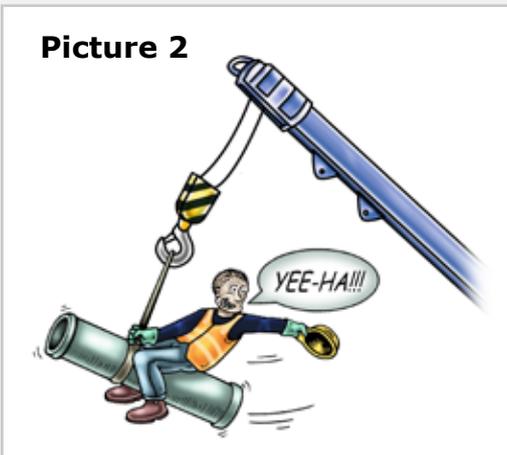
.....

b) **It can damage the crane, lifting equipment or load. It can also cause the load to swing or fall over.**

c) **Sling the load correctly and guide it as it's being moved.**

.....

Picture 2



a) **Riding on the lifting hook, sling or suspended load.**

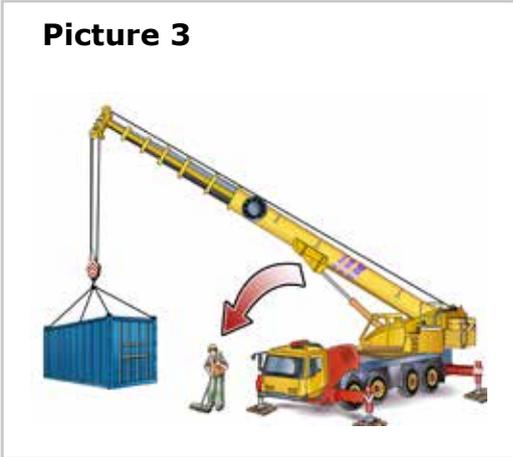
.....

b) **The lifting equipment may break, the extra weight may tip the crane or the person may hit an obstacle.**

c) **Use a workbox.**

.....

Picture 3



- a) Standing between the truck and the load (crush zone).
- b) The load blocks your view. You don't have a clear view of the boom and jib movements.
- c) Work at the side with the controls, seated at the controls or nearby if using a remote control.

Picture 4



- a) Making contact with powerlines with a crane or load.
- b) Personnel could be electrocuted and the crane could be damaged.
- c) Keep a safe distance from powerlines at all times. If this is not possible you can have the powerlines insulated or isolated.



Theory Training Task 56

Performance Criteria: 3.5



Why is it dangerous to raise or lower the load above a person?

- The boom or load could hit and injure or kill the person.
- NEVER raise or lower the boom or load over people.



Performance Criteria: 3.5, 3.6

Use the crane

Find out how to set up and use the crane by checking the right information.



Theory Training Task 57

Performance Criteria: 3.5, 3.6



If you were not sure how to start up a slewing mobile crane, where would you find out?

You should read the user manual/operator's manual or the manufacturer's instructions.



Theory Training Task 58

Performance Criteria: 3.2

On a lattice boom crane, what can happen if you luff out too quickly with the boom pawl engaged?

The pawl might bend or break.





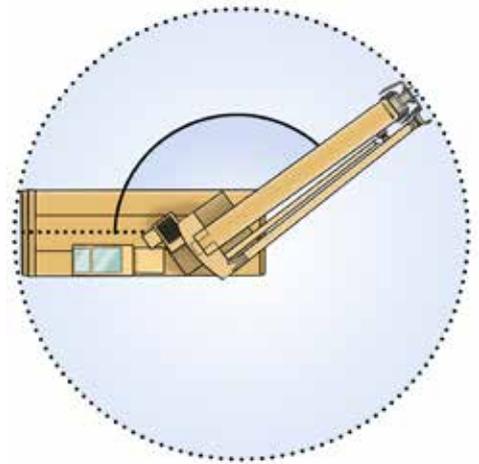
Theory Training Task 59

Performance Criteria: 2.5

When the crane slews from front to rear, what happens to the crane's capacity?

The crane's capacity may be greater over the rear.

The load chart gives information on the crane's capacity in all configurations.



Performance Criteria: 3.6

Keep an eye on the load

Always watch the load while you are moving it.



Theory Training Task 60

Performance Criteria: 3.6

Why must you always watch the load when you're moving it?

Always watch the load to make sure it's clear of hitting hazards such as people, buildings or equipment.



Performance Criteria: 3.6

If you find a problem

If you find a fault with the crane while you are using it, follow the safety procedures.



Theory Training Task 61

Performance Criteria: 3.6

What should you do if you hear the crane make an unusual noise or you feel the crane vibrate or shake?

You should stop work and find out what the problem is.



Performance Criteria: 1.4

Check your route

Check your planned route for hazards and things that might be in your way.



Theory Training Task 62

Performance Criteria: 1.4

a) You're planning the path you'll use to move the load.
What sorts of unusual or difficult surfaces do you need to look out for?

- **Bumpy ground**
- **Soft or wet ground**
- **Check the ground type**
- **Suspended floors**
- **Recently filled excavations**

b) Who can give you information about unusual or difficult surfaces?

The site engineer.



Performance Criteria: 2.6, 3.2, 3.5

Configure the boom/jib and mobile safely

Set up the crane and boom/jib so you can mobile (drive) the crane safely.
Follow the rules while you are mobiling (driving) the crane with a load attached.



Theory Training Task 63

Performance Criteria: 2.6, 3.2, 3.5

- a) Where should you position the load before mobiling?

As close to the ground as possible.

.....

- b) Why?

To keep the crane well-balanced.

.....



Theory Training Task 64

Performance Criteria: 2.6, 3.5

When you're mobiling a load up or down a hill, in which direction should the boom and load be facing? Why?

- **The load should be facing up the hill.**
- **To keep the crane balanced.**

.....





Theory Training Task 65

Performance Criteria: 3.5

You are mobiling (moving) a load.
How fast should you mobile the load?

**You should mobile the load at creep
speed as slowly as you can.**



Theory Training Task 66

Performance Criteria: 2.6, 3.5, 3.6

How can you keep the load well balanced?

Answer may include:

- **Keep the boom/jib as short as you can.**
- **Keep the load close to the ground.**
- **Attach a bridle to the load.**

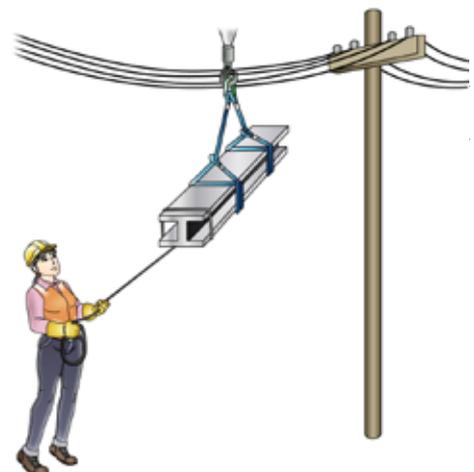


Theory Training Task 67

Performance Criteria: 3.5

What are taglines used for?

Taglines help keep the load clear of hazards.



Practical Training Task 7

Part 6—Do the lift

Performance Criteria 1.2, 2.3, 2.5, 2.6, 3.2, 3.4, 3.5, 3.6, 3.8

Do the lift

Learners: You **must** do this task under the **control of a licensed operator**.

Please wait for your trainer to advise you before trying the task.

First, your trainer will take you to an area where you will use a crane to transfer a load.

Second, your trainer will choose a load for you to transfer and a place for you to transfer it to.



- Crane is accessed in a safe manner. This means you get on and off the crane as safely as you can.
- Lifts are determined within the capacity of the crane. This means you always stay with the safe working load (SWL) of the crane.
- Boom/jib and hoist block is positioned over load following directions from relevant workplace personnel. This means you put the lifting hook over the load's centre of gravity.
- Test lift is carried out in accordance with procedures to allow for safety checks to be safely made, in consultation with relevant personnel. This means you do a test/trial lift before you use the crane to move a load.
- Loads are transferred using all relevant crane movements in accordance with procedures and the appropriate standard. This means you need to think about a number of things to move the load correctly.
- Crane is operated in accordance with procedures. This means you follow Australian Standards and site procedures.
- Load movement is monitored constantly to ensure safety of personnel and load, and crane stability. This means you always keep the load in view while moving it.
- Unplanned and/or unsafe situations are responded to in accordance with procedures. This means things can go wrong when you use your crane.

Practical Training Task 7 (continued)

- Suitability of planned route for crane is checked for the crane in accordance with procedures. This means you should look out for difficult or unusual surfaces in your planned route.
- Crane is configured to mobile load in accordance with procedures. This means you should set up and move loads safely.
- Load is moved using best mobile practice in accordance with the appropriate standard. This means you should follow procedures such as driving the crane slowly, and keeping the load close to the ground.

Your trainer will assess how well you moved the load. After you finish, the licensed operator/trainer will then sign and date the box below.

Part 6:

Satisfactory

Not yet satisfactory

Signature (licensed operator/trainer) Date

Notes



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Part 7

Shut down and pack up



Trainers please note:

The answers in this book are in no way conclusive and are to be used as a guide only. Use your own knowledge and experience to correct the variation of answers that may be given by learners.

Performance Criteria: 4.1

Stow the boom

You've finished the lift. Stow the boom as shown in the user manual or manufacturer's instructions.



Theory Training Task 68

Performance Criteria: 4.1

Explain how you should stow/put away the boom, jib and equipment.

- You remove the load, stow the boom, jib and equipment as shown in the operator's manual.
- Take off any lifting parts and attach them to the crane.



Performance Criteria: 4.3

Use motion locks

Turn on all motion locks and brakes.



Theory Training Task 69

Performance Criteria: 4.3

- a) You have finished using the crane. How can you stop unauthorised people from using the crane?

Apply the motion lock and brake to disable the motions of the crane and to prevent unauthorised people using the crane.

- b) Where can you find out more information?

Australian Standard (AS 2550 6.5 c).



Performance Criteria: 4.4

Stow outriggers

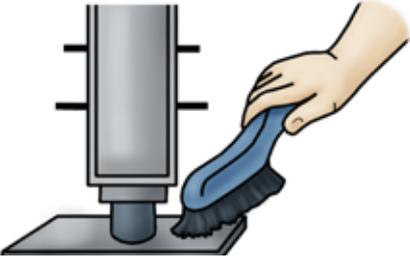
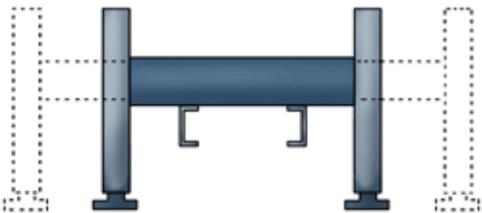
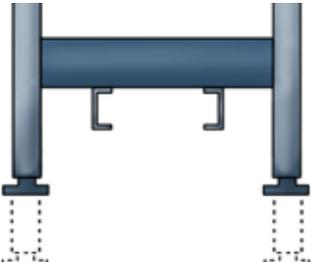
Pack up and stow outriggers/stabilisers.



Theory Training Task 70

Performance Criteria: 4.4, 4.6

Number the steps to show the correct procedure for stowing outriggers/stabilisers on a slewing mobile crane.

<p>3</p> 	<p>4</p> 
<p>Pick up the packing timbers</p>	<p>Clean steel plates</p>
<p>2</p> 	<p>1</p> 
<p>Use the controls to retract the outriggers</p>	<p>Use the controls to raise the outrigger footplates</p>

Performance Criteria: 4.1, 4.2, 4.3, 4.4, 4.5, 4.6

Shut down the crane

Shut down the crane by following the instructions in the user's manual.

Different cranes have different shut down procedures.



Theory Training Task 71

Performance Criteria: 4.1, 4.2, 4.3, 4.4, 4.5, 4.6

List the shutdown process for the slewing mobile crane.

Answer includes:

- **Hook block/hoist rope/lifting assembly is raised clear of any obstructions**
- **The crane jib is lowered, retracted, folded and raised, extended or unfolded according to user manual manufacturer's specifications**
- **The boom is retracted/folded/lowered for travel**
- **Retract and store outriggers and packing**
- **Make sure the hoist brake is applied**
- **Retract and store outriggers and packing**
- **Make sure all controls are in neutral**
- **Idle engine to stabilise temperature**
- **Turn off engine (if applicable)**
- **Remove/take key from ignition**
- **Lock and secure cabin controls and access to the crane**
- **Turn off and secure the isolating switch**
- **Remove hazard controls (if applicable).**





Theory Training Task 72

Performance Criteria: 4.5

Give some examples of what to do if you leave the crane unattended.

Answer includes:

- Secure/lock the crane
- Raise the hook to a safe height
- Turn off the crane power (if possible)
- If you leave the crane unattended overnight, remove the load and shut down the crane.



Performance Criteria: 4.6

Do the post-operational checks

After you've shut down the crane, do the post-operational checks to find out if the crane has any defects or damage.



Theory Training Task 73

Performance Criteria: 4.7

List the post-operational checks you should make when you finish using the slewing mobile crane.

Answer includes:

- Check boom for dents, cracks, flaking paint and wear in the boom (possible overstressing caused by overload)
- Lower and retract boom and jib
- Check all pins and locks are in place and secure
- Retract hoist rope and hook block
- Check hook is secure
- Check outriggers are retracted
- Check tyres are not damaged
- Check for leaks from oil filters, diesel lines and water hoses.



Performance Criteria: 4.6

Stow plates and packing

Finally, stow and secure all plates and packing so you are ready for travel.



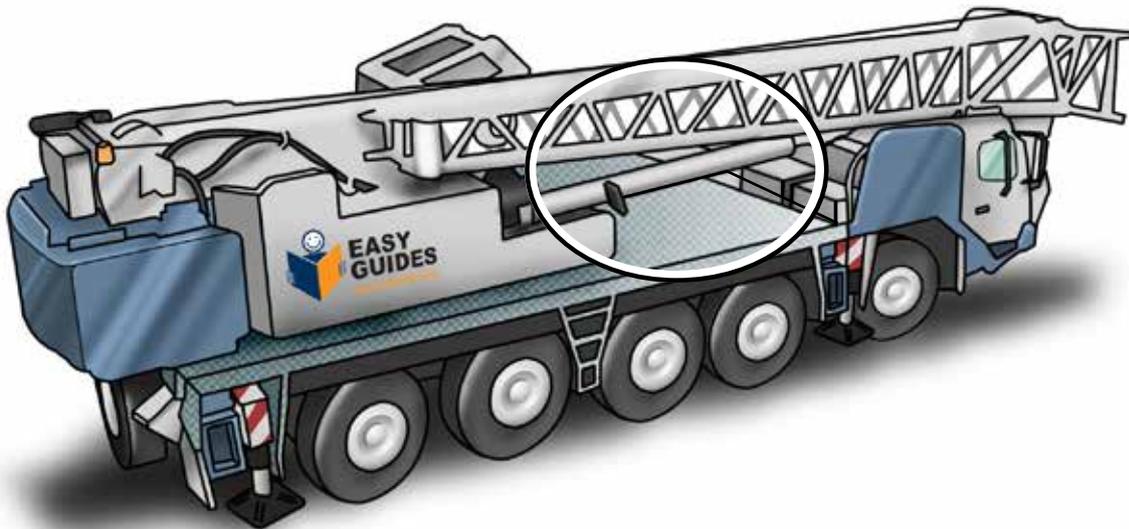
Theory Training Task 74

Performance Criteria: 4.6

- a) On a slewing mobile crane, where do you stow the plates and packing?

In the designated area on the crane.

- b) Mark with a circle the area where you stow the plates and packing.



- c) How do you secure the packing?

Tie the packing down with ropes or straps.

Practical Training Task 8

Part 7—Shut down and pack up

Performance Criteria 4.1,4.3, 4.4, 4.6, 4.6

Shut down and pack up

Learners: You **must** do this task under the **control of a licensed operator**.

Please wait for your trainer to advise you before trying the task.

In this activity you will practise shutting down and packing up the crane and the equipment.

This includes stowing equipment such as packing and outriggers, shutting down the crane and applying motion locks and doing the post-operational checks.



- Crane boom/jib and equipment are stowed and secured as required in accordance with procedures and the appropriate standard. This means you stow the boom as shown in the user manual or manufacturer's specifications.
- Relevant motion locks and brakes are applied as required. This means you check all motion locks and brakes are turned on.
- Outriggers/stabilisers are stowed and secured in accordance with procedures. This means you check that outriggers/stabilisers are stored safely for travel.
- Crane is shut down in accordance with procedures. This means the user manual shows you how to shut down the slewing mobile crane.
- Routine post-operational crane checks are carried out in accordance with procedures. This means you do a post-operational check when you finish using the slewing mobile crane.
- Plates or packing are stowed and secured. This means you secure all packing properly and safely.

Your trainer will assess how you shut down and stowed and secured the slewing mobile crane. After you finish, the licensed operator/trainer will then sign and date the box below.

Part 7: **Satisfactory** **Not yet satisfactory**

Signature (licensed operator/trainer) Date

Beaufort Wind Scale

The Beaufort Wind Scale is to be used as a guide only. Please consult with operator manuals and workplace rules and regulations on determining when you should stop working during windy conditions.

Beaufort Scale Number	Description	Units in km/h	Description for land
0	Calm	0	Smoke rises vertically
1-3	Light winds	19 km/h or less	Wind felt on face Leaves rustle Ordinary vanes moved by wind
4	Moderate winds	20-29 km/h	Raises dust and loose paper Small branches are moved
5	Fresh winds	30-39 km/h	Small trees (in leaf) begin to sway Crested wavelets form on inland waters
6	Strong winds	40-50 km/h	Large branches in motion Whistling heard in telephone wires Umbrellas used with difficulty
7	Near gale	51-62 km/h	Whole trees in motion Inconvenience felt when walking against wind

Reference: www.bom.gov.au/lam/glossary/beaufort.shtml — for more details

Flash/bang rule

If a storm is approaching you should cease work until safe to do so. The flash/bang rule is an indication only and you should find out what your workplace rules are.

After you see lightning count the seconds until you hear thunder.

Every 3 seconds means the lightning is 1 km away. For example, a 30 second gap means the lightning is 10 kms away.

You should NOT work if lightning is within a 15 km radius.

Notes



A series of horizontal dotted lines spanning the width of the page, intended for writing notes.

Acknowledgements

Easy Guides would like to thank the following people for kindly volunteering their time and expertise in assisting with this set of slewing mobile crane learning materials.

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