INTEGRAL SKILLS

OPERATE A FORKLIFT

TLILIC0003 Licence to operate a forklift truck

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MODIFICATION HISTORY

Version	Date	Nature of Amendment
1	7 Feb 19	Creation

TABLE OF CONTENTS

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INTRODUCTION

This training course is based on the National High Risk Licence Unit of Competence TLILIC0003 Licence to operate a forklift truck.

This unit specifies the skills and knowledge required to operate a forklift truck safely in accordance with all relevant legislative requirements. Competence in this unit, does not in itself result in a HRWL licence to operate this plant.

Forklift truck means a powered industrial truck equipped with lifting media made up of a mast and an elevating load carriage to which is attached a pair of fork arms or other attachments that can be raised 900 mm or more above the ground, but does not include a pedestrian-operated truck or a pallet truck.

A person performing this work is required to hold a forklift truck High Risk Work Licence (HRWL).

This unit requires a person operating a forklift truck to:

- Plan for the work/task.
- Prepare for the work/task.
- Perform work/task.
- Pack up.

LICENSING/REGULATORY INFORMATION

Legislative and regulatory requirements are applicable to this unit of competency.
This unit is based on the licensing requirements of Part 4.5 of the Model Work Health and Safety (WHS) Regulations and meets Commonwealth, State and Territory HRWL requirements.

The National Assessment Instrument (NAI) is the mandated assessment for the HRWL to operate the relevant licencing class as detailed in this unit.

PERFORMANCE EVIDENCE

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all the requirements of the elements and performance criteria on at least one occasion and include:

- Applying safe operating procedures for a forklift truck including:
    - maintaining safe operating speed
    - travelling with load lowered to an appropriate height for the terrain, operating surface and visibility in relation to direction of travel

- Applying relevant forklift truck manufacturer requirements and data plate information and approved modifications to attachments fitted are in accordance with manufacturer requirements:
    - carrying out pre-start checks, including visual inspection which must include:
    - battery charge as required by manufacturer requirements
    - checking and interpreting data plate/s are relevant to the attachment and the forklift truck
    - checking for signs of paint separation and stressed welds indicating potential structural weakness
    - document evidence of damage
    - engine/mechanical fluid level checks including fuel as required by manufacturer requirements
    - ensuring availability of correct forklift truck logbook and updating records as required
    - ensuring forklift truck tynes or other attachment/s are securely fitted
    - ensuring seat and mirrors are adjusted appropriately and seat belt is functional
    - fluid leaks
    - lights are working effectively
    - safety equipment checks
    - signage and labels to ensure they are visible and legible
    - wheels and tyres for damage/correct inflation if applicable
- Conducting and applying risk and hazard assessment strategies including:
    - insufficient lighting
    - other specific hazards including dangerous goods
    - overhead hazards and fixed structures, roof beams and doorways
    - restricted and poorly ventilated areas
    - surface suitability based on forklift truck and task requirements
    - the risk of collision with people, moving plant and fixed structures
    - weather conditions
- Complying with Commonwealth, State and Territory Work Health and Safety (WHS)/Occupational Health and Safety (OHS)/Occupational Safety and Health (OSH) legislation, regulations safe work and workplace procedures.
- Conducting operational checks, which must ensure:
    - all controls are located, identified and tested for functionality
    - all hydraulic functions operated to maximum extension and ensuring attachment (if fitted) movements and control functions are smooth and comply with operating requirements
    - hazard warning systems (e.g. reversing beepers, lights and horns) are functional
    - recording and maintaining accurate information relating to forklift truck operations
    - safety devices as fitted

    - start-up is in accordance with manufacturer requirements
    - steering, transmission and brake functions comply with operating requirements
    - there are no unusual noises
  - Confirming and following traffic management plan procedures relevant to their role in the work area.
  - Conducting relevant procedures for refuelling and isolating fuel/power source as per manufacturer requirements using appropriate PPE.
  - Determining relevant lifting attachment to perform work/task.
  - Determining lift requirements including:
    - positioning of unusually balanced/shaped loads
    - centre of gravity
    - dynamic nature of load
    - tyne/attachment positioning
    - weight
- Ensuring risk control measures within the work area are effective as per workplace procedures.
- Identifying, isolating and tagging out defective equipment and reporting to authorised person/s.
- Interpreting and confirming relevant documentation, workplace instructions, safety information, emergency procedures for the work task and relevant area.
- Interpreting workplace procedures in relation to various environmental conditions.
- Maintaining communication with other workplace personnel through using worksite procedures including:
    - audible and visual warning devices
    - signage
    - two-way radio
    - verbal instructions
    - written instructions
- Maintaining three points of contact whilst accessing and egressing forklift truck and ensuring rungs/steps are free of hazards.
- Operating and monitoring safe forklift truck operations using minimum 250kg dynamic and non-dynamic loads that include:
    - aligning tynes/attachment to load
    - carrying out a lift to 75% of the maximum height
    - conducting trial lift to ensure forklift truck and load are stable, and load is safe to move
    - correctly using horns and mirrors in workplace
    - correctly positioning and using an observer to assist when operating with a load that may restrict vision or be placed out of vision of the operator
    - driving applicable to conditions and moving loads safely

    - driving a forklift truck safely with load in forward and reverse, while maintaining visibility through an obstacle course including:
        - an 'S' bend with a minimum 90 degrees left and right turn
        - ensuring load/s remains stable through pick up, transport and placement
        - forklift truck speed is appropriate to load and surroundings
        - lowering dynamic and non-dynamic loads to appropriate height for travel in forward and reverse
    - picking up, driving, manoeuvring and placing dynamic and non-dynamic loads safely at various heights within a compliant racking system
    - picking up, driving, manoeuvring and placing dynamic and non-dynamic loads safely into/onto an elevated, flat, stable area
    - tilting mast (or forks if applicable) to ensure balance of load
    - using gluts/dunnage appropriately and lowering load safely
    - using tilt and side shift (where fitted) safely to manoeuvre dynamic and non-dynamic loads into allocated space
- Reporting to relevant person/s on site risk control measures that are not in place or are deficient.
- Setting up an exclusion zone.
- Securely parking forklift truck and isolating in appropriate position including:
    - minimising possible access by unauthorised person/s
    - tynes/attachment lowered to required position in accordance with manufacturer requirements
    - park brake applied
    - switching off, isolating fuel/power source and removing key according to workplace procedures
- Shutting down a forklift truck in accordance with manufacturer requirements and workplace procedures.

KNOWLEDGE EVIDENCE

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- Australian and industry standards, codes of practice and guidelines to safely operate a forklift truck.
- Communication procedures including:
    - audible and visual warning devices
    - hand signals
    - questioning techniques
    - signage
    - traffic warning systems

    - two-way radio
    - written instructions
- Forklift truck characteristics and capabilities, manufacturer requirements and instructions for any attachments.
- Impact of the following on the operation of the forklift truck including:
    - failure/loss of control including brakes and steering
    - failure of equipment during forklift truck operations
    - forklift truck instability causes including:
        - deterioration of ground condition
        - overloading
        - pick up and placement of load
        - irregular loads
    - operating on ramps and uneven surfaces and in restricted spaces
    - use of forklift truck data plate and attachment data plate and appropriate methodology to determine weight of a load is appropriate for forklift truck and any attachment if fitted including the estimation or determination from:
        - labels on the actual load
        - markings on the actual load
        - paperwork such as consignment notes, running sheets and weighbridge dockets
        - weighing a carton and calculating load
- Manufacturer requirements, instructions and operator's manual.
- Problems, and appropriate response procedures to unplanned and/or unsafe environmental conditions including:
    - wind
    - lightning
    - water/ice impacted surface/ground
    - rain
    - extreme heat
    - Ultra violet (UV) exposure
- Problems and equipment faults, and implementing appropriate response procedures to unplanned and/or unsafe situations including:
    - lock out and tag out procedures
- Relevant procedures for refuelling and recharging forklift truck using appropriate PPE including:
    - gas bottle
    - connecting battery to charger and disconnecting battery from charger and reconnecting to forklift truck
    - refuelling

- Procedures for recording, reporting and maintaining workplace records and information
- Risk assessment process including hierarchy of control:
    - elimination
    - substitution
    - isolation
    - engineering controls
    - administrative controls
    - personal protective equipment (PPE)
- Safe use and compliance of different types of attachments including:
    - bale clamps
    - carpet spike for carpet rolls
    - drum carrier
    - jib attachment
    - paper roll clamps
    - personnel work platforms
    - rotators
    - slippers/fork extensions on tynes
- Suitability and lifting capability of the attachment to be used.
- Shut down procedures for a forklift truck in accordance with manufacturer requirements.
- Traffic management plan procedures and requirements.
- Typical routine problems encountered operating a forklift truck and associated equipment, and adjustments required for correction.
- Workplace procedures including work plan which may be verbal, documented/written, or electronically generated.
- Work area operating surface suitability including issues with:
    - backfilled ground
    - bitumen (damaged, cracked)
    - concrete (damaged, cracked)
    - hard compacted soil
    - potholes
    - railway tracks
    - rough uneven or difficult terrain including sloping surfaces, uneven surfaces, steel decks and grates
    - soft soils
    - trench covers
- Work Health and Safety (WHS)/Occupational Health and Safety (OHS)/Occupational Safety and Health (OSH) requirements, safe work and workplace procedures.

ASSESSMENT CONDITIONS

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.
Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

- Simulators must not be used in the assessment of this unit of competency.

Resources for assessment must include access to:

- A suitable forklift truck that complies with AS 2359 powered industrial trucks and is in a safe/serviceable condition in accordance with manufacturer requirements.
- Associated equipment for forklift truck operations.
- Suitable dynamic and non-dynamic loads.
- Suitable compliant racking system.
- Relevant and appropriate materials, tools, equipment and personal protective equipment currently used in industry.
- Applicable documentation including:
    - approved codes of practice and relevant guidance material
    - relevant Australian technical standards
    - manufacturer guidelines (instructions, requirements or checklists), relevant industry standards and operating procedures (where applicable)

HIGH RISK WORK LICENCE REQUIREMENTS

Any person who is undertaking training for a High Risk Work (HRW) licence according to the Work Health & Safety (WHS) Regulations must be currently enrolled in a course of HRW training and being supervised at the workplace by a person with a current HRW licence for the work.

The holder of a HRW licence is responsible for taking reasonable care and not adversely affecting the health and safety of other people while performing the HRW.

Once you pass your assessment you will have 60 days to apply for your licence. You must renew your licence within 12 months of its expiry otherwise:

- Your licence can’t be renewed.
- You need to repeat the course and re-apply for your licence.

- You need to enrol in the course again and be supervised by somebody who has a current licence for the same class.

You can still do high risk work without a licence as long as:

- You are enrolled in a high risk course for the class, and
- You are being supervised by a person who has a HRW licence for the same class.

Any licensed worker must take reasonable steps to make sure the way they work does not impact on the safety of themselves or any other worker. This is their legal duty of care. Failing to work safely can result in the health and safety regulator:

- Suspending or cancelling your licence.
- Refusing to renew your licence.
- Ordering that you are reassessed to ensure you are competent.

Your employer might ask you for evidence that you have a high risk licence before you start any high risk work. You can show them:

- Your licence.
- Proof from the training company that you have passed your assessment.
- Proof that you are currently completing a course for high risk work.

WHAT IS A FORKLIFT

A forklift is a powered industrial truck equipped with a mast and an elevating load carriage to which is attached a pair of fork arms or another attachment.

This can also include trucks on which the operator is raised with the attachment for order picking.

Figure 1 – Major parts of a Powered Industrial Forklift Truck

PLAN WORK/TASK

It is important that you are aware of all the requirements relating to your work, before you start. Therefore to work safely we need to plan the work/task by taking into consideration:

- Any compliance documentation.
- Work orders / task.
- Inspecting the work area (layout, structures, equipment & environmental).
- Selection of appropriate equipment as per operational requirements.
- Identifying hazards/risks.
- Implementing hazard/risk treatments.
- Working in accordance with:
    - Procedures (site and equipment)
    - Regulations
    - Codes of practice
    - Australian Standards

COMPLIANCE DOCUMENTATION

Before you begin your task ensure that you access the relevant documentation and plan your work. Part of this is identifying any compliance documentation.

Compliance documentation is essential to all aspects of operations on every worksite.
From work instructions through to quality and environmental requirements, compliance documentation sets out the what, when, how and who of everything that needs to be done in the safest, most effective way.

Interpretation of compliance documentation will allow you to make the right decisions for each situation or task. Interpretation means understanding what is required of you and how you are expected to perform the tasks.

Applying documentation involves following all instructions given by these documents at all times – they are designed to keep you safe.

Statements containing the words “must”, “shall” or “will” are often used within these documents to indicate that there are mandatory (legally must be applied) requirements.
Each project site will have different compliance documentation that must be referred to.

This may include:

- Legislative, organisation and site requirements and procedures.
- Occupational Health and Safety (OHS)/Workplace Health and Safety (WHS) legislation, codes of practice and guidance material.

- Manufacturers' guidelines and specifications.
- Australian Standards.
- Codes of Practice.
- Equal Employment Opportunity and Disability Discrimination legislation.
- Licence and certification requirements.
- Internal permit control systems.
- Mechanical and electrical isolation processes.
- Company policy and permit control systems.

Compliance documentation may be provided by:

- WHS authorities and ASCC/NWHSC.
- Environment Protection Authority (EPA).
- Employment and workplace relations legislation.

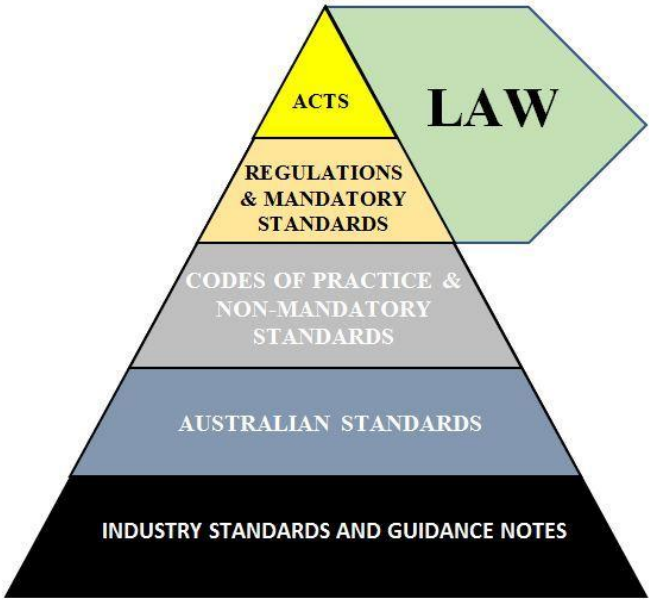


Figure 2 – Legislation Hierarchy

WHS Legislation and Regulations

Workplace Health and Safety (WHS) are laws and guidelines to help keep your workplace safe.

These can be broken down into four main types:

- Acts & Regulations.
- Codes of Practice.
- Australian Standards.
- Regulations.

Legislation/Acts	Acts of Parliament and laws to protect the health, safety and welfare of people at work. For example the Work Health and Safety Act (the WHS Act) 2011.
Regulations	More details or information on particular parts of the Act.
Codes of Practice/Compliance Codes	Practical instructions on how to meet the terms of the law. For example the Code of Practice "Managing the Risk of Falls in Workplaces".
Australian Standards	The minimum levels of performance or quality for a hazard, work process or product. For example AS/NZS 1891

Table 1 – Legislation Descriptions

Harmonisation of Workplace Health & Safety Legislation

In 2011, Safe Work Australia developed a single set of WHS laws to be implemented across Australia. These are known as 'model' laws. For the model WHS laws to become legally binding, the Commonwealth, states and territories must separately implement them as their own laws.

The model WHS laws include:

- The model WHS Act.
- The model WHS Regulations.
- Model Codes of Practice.

These elements are supported by the National compliance and enforcement policy, which sets out principles of how WHS regulators monitor and enforce compliance with their jurisdictions' WHS laws. WHS regulators in the Commonwealth and in each state and territory are responsible for regulating and enforcing the laws in their jurisdictions.

The model WHS laws have been implemented in the Australian Capital Territory, New South Wales, the Northern Territory, Queensland, South Australia, Tasmania and the Commonwealth. Some jurisdictions have made minor variations to make sure the legislation is consistent with their relevant drafting protocols and other laws and processes.

Model WHS Act

The Model WHS Act forms the basis of the WHS Acts that have been implemented in most jurisdictions across Australia.

The main object of the Act is to provide for a balanced and nationally consistent framework to secure the health and safety of workers and workplaces. It does this by:

- Protecting workers and other persons from harm by requiring duty holders to eliminate or minimise risk.
- Providing for fair and effective representation, consultation and cooperation.
- Encouraging unions and employer organisations to take a constructive role in promoting improvements in WHS practices.
- Promoting the provision of advice, information, education and training for WHS.
- Securing compliance with the Act through effective and appropriate compliance and enforcement measures.
- Ensuring appropriate scrutiny and review of actions taken by persons with powers or functions under the Act.
- Providing a framework for continuous improvement.
- Maintaining and strengthening national harmonisation of WHS laws and facilitating a consistent national approach to WHS.

Codes of Practice and Australian Standards

Model Codes of Practice are practical guides to achieving the standards of health and safety required under the model WHS Act and Regulations.

To have legal effect in a jurisdiction, a model Code of Practice must be approved as a code of practice there. To determine if a model Code of Practice has been approved in a particular jurisdiction, check with your local WHS regulator.

An approved code of practice applies to anyone who has a duty of care in the circumstances described in the code. In most cases, following an approved code of practice would achieve compliance with the health and safety duties in a jurisdiction's WHS Act and Regulations.
Like regulations, codes of practice deal with particular issues and do not cover all hazards or risks that may arise. Health and safety duties require you to consider all risks associated with work, not only those risk that regulation and codes of practice exist for.

While approved codes of practice are not law, they are admissible in court proceedings. Courts may regard an approved code of practice as evidence of what is known about a hazard, risk or control and may rely on the relevant code to determine what is reasonably practicable in the circumstances.

Duty of Care

Employers/PCBUs, self-employed persons, persons in control of the workplace, Supervisors, Designers, Manufacturers, Suppliers, Workers and Inspectors, have a legal responsibility under duty of care to do everything reasonably practicable to protect others from harm by complying with safe work practices. This includes activities that require licences, tickets or certificates of competency or any other relevant state and territory OHS/WHS requirements.

Organisational and Site Requirements

During your site induction your employer will tell you where to find the compliance documentation relevant to your site and duties.

All work needs to be conducted in accordance with organisational policies and procedures and site requirements.

Procedures exist to ensure that all work is completed in a way that is safe and achieves the required outcomes efficiently without causing harm.

Manufactures Guidelines and Specifications

These requirements will be documented in operator's manuals, equipment specifications and work instructions.

Designers and manufacturers have a responsibility to ensure that structures, plant and equipment meet strict criteria for the safe operation and protection of workers while also meeting relevant environmental standards.

ENVIRONMENTAL PROTECTION REQUIREMENTS

When operating a forklift truck, you should always aim to reduce environmental risk and waste.

To do this you need to:

- Identify the environmental management plans, requirements and constraints.
- Confirm any aspect of the environmental protection requirements that may be unclear.
- Apply and comply with the project environmental protection requirements of all tasks undertaken in and around the worksite.

Some environmental requirements are:

- Organisational/project environmental management plans – These outline the steps and processes required to prevent or minimise harm to the environment due to work operations.
- Waste/clean-up management – This covers the disposal of site waste materials and rubbish as well as the recycling and re-use of waste materials.
- Water quality protection – This can include methods for directing run-off away from the stormwater system or other waterways. Spills of chemicals or other materials and the use of spill kits are included.
- Noise, vibration and dust management – These plans aim to limit or avoid creating noise pollution and vibration for people in and around the worksite. Dust

management includes the use of screens, tarpaulins and other dust suppression methods.

The NSW Environmental Protection Authority (EPA) can investigate and issue fines for sites that do not meet the state and federal environmental protection arrangements that are in place.

If you have concerns, questions or queries about the exact requirements you must meet, you should speak to your supervisor, the site environmental officer or contact the NSW EPA for more information.

REVIEW TECHNICAL INFORMATION BEFORE YOU START

Before starting you need to make sure you obtain all the relevant technical information appropriate for your worksite. This will enable you to conduct your work in the safest and most efficient way. This may include:

- Identification and description of the work site (e.g. site details).
- Assessment of conditions and hazards (e.g. hazard report).
- Work requirements from work orders and supervisor instructions.
- Identifying equipment defects (e.g. fault reports or isolation systems).
- Accessing diagrams or plans.
- Safety Data Sheets.
- Consignment notes (items and weights).

MANAGE HAZARDS

If you can remove or at least control a hazard you can reduce the risk involved. Each worksite has its own specific risks and hazards. Always check to see what systems and procedures are in place before conducting a risk assessment at a worksite, as they may affect the outcomes of the risk assessment.

It is important that personnel/workers with the required relevant skills are involved in the risk identification process.

Consult with other workers about hazards

Make sure you talk to the right people. This can include:

- Safety officers.
- Site engineers (where applicable).
- Supervisors.
- Colleagues.
- Managers who are authorised to take responsibility for the workplace or operations.

These people may have information about site hazards. It is important to communicate with other personnel and safety officers before starting on a worksite to ensure that any workplace policies or site-specific procedures are followed.

Common workplace hazards include:

- Ground Conditions:
    - Condition of pavement
    - Underground Services
    - Non-weight bearing surfaces
    - Slopes, ramps, and inclines
- Overhead Hazards:
    - Electricity/Powerlines
    - Overhead service lines
    - Bridges
- Surrounding Structures:
    - Buildings
    - Obstructions
- Traffic:
    - Pedestrians
    - Vehicles
    - Other plant
- Fork Instability:
    - Overloading
    - Poor load placement
    - Irregular Loads
- Weather:
    - Wind
    - Lightning
    - Rain
- Other hazards:
    - Poor lighting
    - Dangerous materials
    - When checking for any hazards you should check:
        - Above head height – remember the forklift can reach much higher than you can.
        - At eye level – look around to see if there is anything in the way of where you want to drive the forklift.
        - On the ground (and below) – humps and bumps, slippery surfaces and rubbish can all be dangerous. Also make sure that any ramps or flooring can take the weight of the forklift.

Make a note of any hazard you identify in the area. Remember, a hazard can also be a situation so keep an eye on how the people around you are working too.

Each task/procedure/function needs to be evaluated for risks, as well as the work area where the work is being carried out.

You should also check records of injuries and incidents, safety tags and talk to other workers.

Safety Data Sheets (SDS) can be useful tools in identifying potential hazards so make sure you check the SDS documents for your site.

Talk to other workers, your manager, supervisor, team leader or health & safety representative to find out if the risk has already been addressed, and what techniques are available to you to resolve it.

If you find that there is no documentation or guideline in place to resolve an identified risk, you need to assess the risk and identify a feasible course of action to deal with it.

It is important that all records, policies and procedures are kept up to date so that the most relevant information is available and used.

Figure 3 – Workplace Hazards

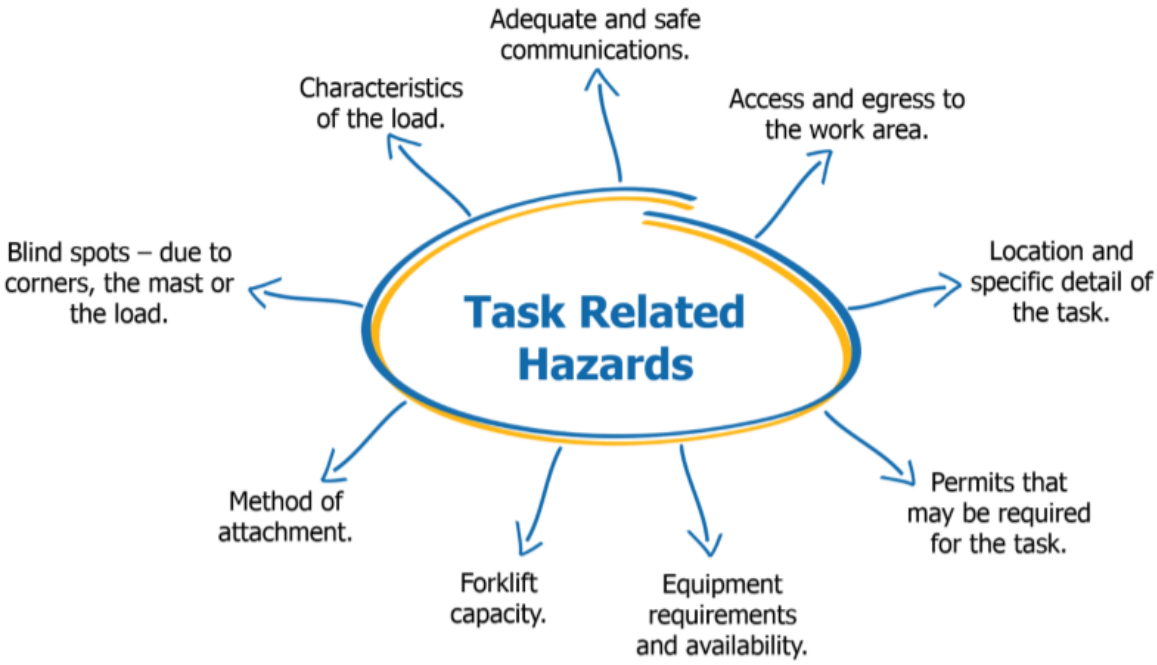


Figure 4 – Task Related Hazards

Risk Management is the process of reducing or managing the risks when working with a hazard or in a hazardous situation and should take into consideration the context of the organisation and work site.

Risk Management must be conducted in accordance with:

- Legislative, organisational and site requirements/procedures.
- Australian Standards.
- Codes of Practice.
- Employment and workplace relations legislation.
- Equal employment opportunity and disability legislation.

Consultation, communication, monitoring and review should be planned for and carried out at every stage of the risk management process.

Identifying risks and hazards and establishing ways of controlling them usually includes talking to the people with knowledge of the situation, or who are directly affected by any action you may take.

Controlling a hazard should be a team effort and it's important that everybody not only has input, but knows what they need to do and how/if they need to change their work processes to suit.

Monitoring and review are an important part of the risk management process and should be planned for at every stage. Monitoring and review involves regular surveillance and checking and clearly identifying the responsibilities of those involved.

It is important that monitoring and review results are recorded, reported and stored for future reference.

PRE—WORK HAZARD ASSESSMENT E.G. SWMS/JSEA'S ETC

A Risk Assessment to identify hazards is to be undertaken prior to commencing work. Such Risk Assessments as an example may include:

- Personal Risk Assessments;
    - Take 5, and
    - SLAMS.
- Group Risk Assessments;
    - Safe Work Method Statements (SWMS), and
    - Job Safety and Environment Analysis (JSEA's).

SWMS/JSEA's may also have been used in the development of as Safe Work Procedures (SWP) and Standard Operating Procedures (SOP). They detail the steps required to carry out a task as well as how specific hazards and risks related to a task will be managed.

They fulfil a number of objectives:

- They outline a safe method of work for a specific job.
- They provide a documented set of steps/processes that workers must read and understand before starting the job.
- They assist in meeting legal responsibilities for the risk management process, hazard identification, risk assessment and risk control.
- They assist in effectively coordinating the work, the materials required, the time required and the people involved to achieve a safe and efficient outcome. They are a quality assurance tool.

How do you complete a SWMS/JSEA?

Each organisation will have different forms and documents to manage risk, some called SWMS, JSEA, JSA etc. The fundamental steps remain the same as follows:

- Break the job down into its basic steps.
- Identify the workplace hazards associated with each step.
- Identify controls to eliminate or control those hazards.
- Rate/rank the risk with the controls in place, this is called the residual risk.
- Once agreement to the hazards and risk ratings has been achieved, the residual risk must be as low as reasonably achievable.

- Each person signs the SWMS/JSEA acknowledging that they have understood its contents.
- Put controls in place.
- Proceed with job, monitoring the controls for effectiveness and looking for new hazards.

The SWMS/JSEA must be available for inspection at any given time and must be reviewed as conditions change.

Risk / Hazard Assessment

Risk/Hazard Assessment has 2 stages:

(1) Risk/Hazard Analysis.

Risk analysis is used to determine the seriousness of a hazard based on how likely it is to happen and the consequences if it does happen. The risk level of each identified hazard should be worked out. Risk analysis comprises of 3 factors Likelihood, Consequence and Risk level.

Using a table similar to the one below, you can analyse how high the risk level is.

Likelihood	Consequence				
	Insignificant	**Minor** First Aid required	**Moderate** Medical attention and time off work	**Major** Long term illness or serious injury	**Severe** Kill or cause Permanent Disability or Illness
Almost certain	M	H	H	VH	VH
Likely	M	M	H	H	VH
Possible	L	M	H	H	VH
Unlikely	L	L	M	M	H
Rare	L	L	M	M	M

Table 2 – Likelihood vs Consequence Matrix

(2) Risk/Hazard Evaluation.

Risk evaluation is based upon the outcomes and results of the risk analysis.

Risk evaluation involves making decisions about:

- Have all the hazards been controlled.
- Is the residual risk acceptable.
- Is it safe to proceed.

Your evaluation should be used to determine how soon you should act to remove or control the hazard to achieve an acceptable level of risk.

You can do this using a table similar to the one shown below:

Risk Level	Action
Very High	Act immediately: The proposed task or process activity must not proceed. Steps must be taken to lower the risk level to as low as reasonably practicable using the hierarchy of risk controls.
High	Act today: The proposed activity can only proceed, provided that: 1. The risk level has been reduced to as low as reasonably practicable using the hierarchy of risk control. 2. The risk controls must include those identified in legislation, Australian Standards, Codes of Practice etc. 3. The risk assessment has been reviewed and approved by the Supervisor. 4. A Safe Working Procedure or Safe Work Method has been prepared. 5. The supervisor must review and document the effectiveness of the implemented risk controls.
Medium	Act this week: The proposed task or process can proceed, provided that: 1. The risk level has been reduced to as low as reasonably practicable using the hierarchy of risk controls. 2. The risk assessment has been reviewed and approved by the Supervisor. 3. A Safe Working Procedure or Safe Work Method has been prepared.
Low	Act this week: The proposed task or process can proceed, provided that: 1. The risk level has been reduced to as low as reasonably practicable using the hierarchy of risk controls. 2. The risk assessment has been reviewed and approved by the Supervisor. 3. A Safe Working Procedure or Safe Work Method has been prepared.

Table 3 – Hazard Evaluation Level example

Note: Any hazard with a residual risk level of high or very high should have further risk treatment measures (controls) in place to reduce the risk to an acceptable level. They will also require a higher level of approval in most cases and a higher level of risk management processes.

RISK/HAZARD TREATMENT

Once hazards have been identified, risk treatment options (controls) need to be considered and applied. Risk treatment involves selecting one or more controls to modify and reduce a risk and then implementing the control. Controls act as a barrier or layers preventing the unwanted event from happening. Every control has its limitations or holes in each layer and can be likened to a piece of Swiss cheese, the more layers / controls the more effective.

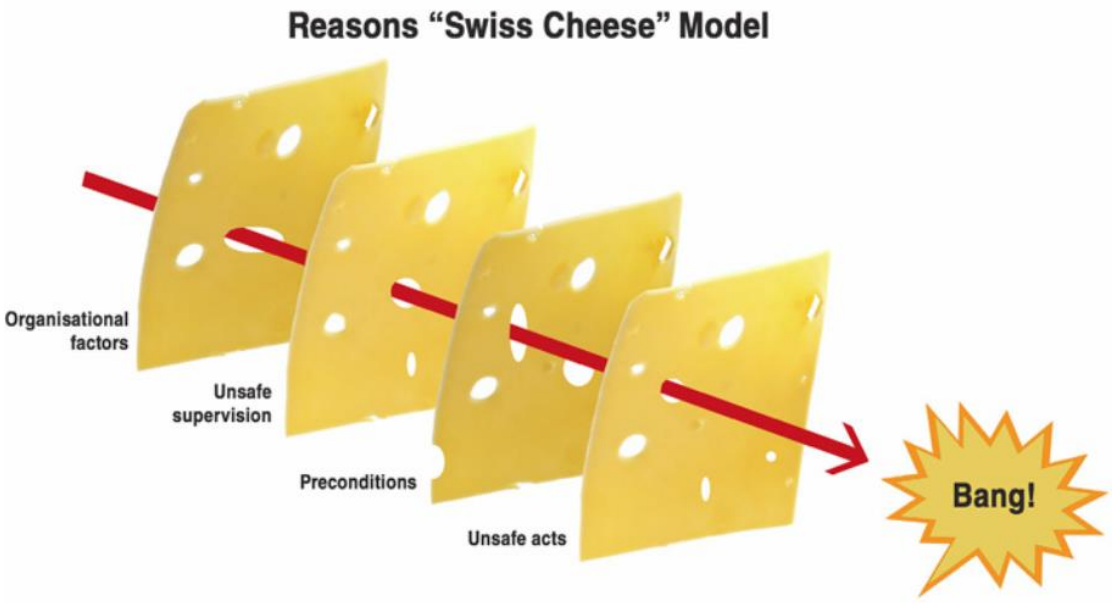


Figure 5 – "Swiss Cheese" model

Hierarchy of Control

Control measures can be ranked from the highest level of protection and reliability to the lowest. The WHS Regulations require duty holders to work through this hierarchy to choose the control that most effectively eliminates or minimises the risk in the circumstances. This may involve a single control measure or a combination of two or more different controls.

The hierarchy of control is as follows:

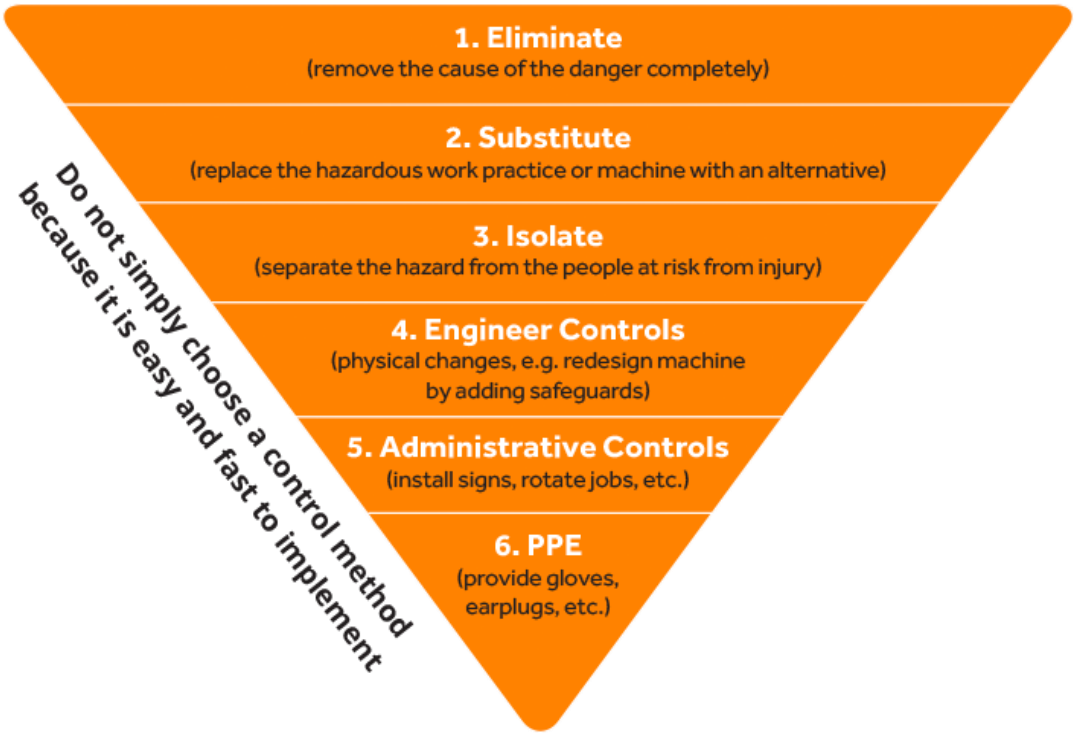


Figure 6 – Hierarchy of Control

SAFE WORK PRACTICES

Safe work practices are methods that must be implemented to make sure a job is carried out as safely as possible. Safe work practices are governed by legislative requirements and workplace procedures and relate to such things as drugs and alcohol at work, requirements for safe work at heights, including safety devices, general requirements for use of personal protective equipment and clothing just to name a few.

The scope of tasks and the safe work practices you are going to apply should be referred to, and documented, when completing Safe Work Method Statements (SWMS) or Job Safety and Environment Analysis (JSEA).

This will provide a guideline for how to carry out all tasks safely in accordance with WHS requirements.

APPLY CONTROL MEASURES

Control measures need to be implemented before you start work, or as soon as a hazard is identified during the work.

Talk to the other workers in the area to make sure they are aware of the work you are doing, and the control measures you have put in place.

Control measures could include:

- Disconnecting power when working near power lines or overhead services.
- Putting safety tags on electrical switches or isolators to stop somebody from turning the power back on while you are working on or near power lines.
- Insulating power lines.
- Using a safety observer (also known as a spotter) inside the exclusion zone to make sure you don't get too close to power lines.
- Setting up barricades and traffic control to keep the area clear.
- Placing pedestrian controls (barricades, signs, etc.) to limit the number of people in the area.
- Moving any obstructions out of the way.
- Wearing PPE such as high-visibility clothing and non-slip work boots.
- Setting up additional lighting in the work area.
- Put excavation safeguards in place (if applicable).

Check the situation after you have applied a control measure to see if more controls, or different controls are needed to make the job safe. If more controls are needed, make sure they are applied before you start or continue the work.

Personal Protective Equipment (PPE)

Personal Protective Equipment (PPE) is clothing and equipment designed to lower the chance of you being hurt on the job. It is required to enter most work sites.

You should select and inspect your PPE before you start work.

PPE includes:

- Head protection – hard hats and helmets.

- Foot protection – non-slip work boots.
- Hand protection – gloves.
- Eye protection – goggles, visors or glasses.
- Ear protection – plugs or muffs.
- Breathing protection – masks or respirators.
- Hi-visibility clothing – clothing that makes you stand out and lets other people know where you are.
- Weather protection – clothing that protects you from the sun or from the cold.

Make sure any PPE you are wearing is in good condition, fits well and is right for the job.

If you find any PPE that is not in good condition, tag it and remove it from service. Then tell your supervisor about the problem and they will organise to repair or replace the PPE.

Strategies for Traffic Control

If the work area is going to be shared with pedestrians, site personnel, vehicles or mobile plant, you will need to make sure you have control measures in place before you start.

These may include:

- Using a flag person or traffic controller to control traffic.
- Setting up flashing hazard lights.
- Setting up warning signs and barriers.
- Setting up pedestrian and vehicle exclusion zones.
- Using a Traffic Management Plan.
- All forklifts should be fitted with flashing amber safety lights and horns.
- Traffic management plan if required.

Barriers with safety signs, or a traffic controller, should always be in place when the forklift is being operated over a roadway, footpath or public access area.

NEVER lift loads over people's heads. There is a risk of injury or death if the load or part of the load falls from the forklift truck.

NEVER let people ride or be lifted on the forks or a pallet! Passengers may only be carried on the forklift if it has been designed and equipped with a seat to carry more than one person.

Strategies for operation in darkness

If you are using the forklift at night or in dark areas, additional lighting needs to be used across the entire work area.

This is to make sure you and other workers can see properly and work safely.

Figure 7 – Additional lighting at night

REPORTING AND RECORD KEEPING

Make sure you record any action you have taken and talk to your supervisor and WHS officer about the control strategies in place. Keeping records is important as they can help ensure that any risk management activities are traceable.

Records also provide a basis for improving methods and tools in the risk management process, as well as improving the overall process.

WORKING NEAR ELECTRICITY/POWERLINES

The dangers of operating a forklift near electricity/power lines are very real.
It is vital that you are aware of the safe operating distances for different types of electricity/power lines and the steps you must take if the task requires you to work closer than these prescribed distances.
Generally, if you are required to work closer than the prescribed safe work distance you must:

- Contact the relevant local electrical authority for exemption.
- Have the electricity/power lines shut off (or insulated if this is not possible).
- Use a safety observer - A safety observer is a competent person who watches and guides plant and equipment around electricity/power lines. Check with each state authority for their safety observer requirements.

Distances vary depending on the voltage of the electricity/power lines. You should refer to the local electrical authority for information and advice to determine the voltage of electricity/power lines in your work area.

Figure 8 – Typical Powerlines

SA / TAS / ACT (AS2550.1)

In South Australia, Tasmania and the ACT, equipment must not be closer than the following distances to electric/power lines:

Electricity/Powerline Type	Distance
Distribution lines up to and including 133kV (usually poles)	6.4m or 3.0m with a qualified 'safety observer'
Transmission lines greater than 133kV (towers)	10m or 8m with a qualified 'safety observer'

Victoria

In Victoria the Framework for Undertaking Work Near Overhead and Underground Assets states that equipment must not be closer than the following distances to electricity/power lines:

Electricity/Powerline Type	Distance
Distribution lines up to and including 66kV (power poles)	6.4m or 3.0m with a qualified 'safety observer'
Transmission lines greater than 66kV (towers)	10m or 8m with a qualified 'safety observer'

New South Wales

In New South Wales, equipment operation may not be any closer than the following distances to electric/power lines:

Electricity/Powerline Type	Distance
Up to 132kV	3.0m
132kV up to 330kV	6.0m
More than 330kV	8.0m

To work closer than these distances requires authority from the relevant electrical authority and adherence to cl.64(2)(e) of the regulations.

Queensland

The Queensland Electrical Safety Regulation breaks down the distances in detail. Exclusion zones are broken down not only by size of electricity/power line but also by the competency level of the operator. This means that the requirements should be clarified with the electrical authority before work commences even if the distance appears to be outside the zones.

The Code of Practice gives the following minimum distances as guidance:

Electricity/Powerline Type	Distance
Up to 132kV	3.0m
132kV up to 330kV	6.0m
330kV to 500kV	8.0m

Western Australia

In Western Australia this falls under Regulation 3.64 from the OSH Regulations and states the following as the minimum distances:

Electricity/Powerline Type	Distance
Less than 33kV	3.0m
Over 33kV	6.0m
Over 133kV	8.0m

Northern Territory

In the Northern Territory safe electric/power line working distances falls under the Electricity Reform (Safety and Technical) Regulations. Table 2, Schedule 3 gives the following minimum distances:

Electricity/Powerline Type	Distance
Up to 33kV	1.5m
Above 33kV to 132kV	3.0m
Above 132kV to 275kV	4.0m
275kV to 330kV	6.0m
Above 330kV to 500kV	8.0m

Table 4 – Powerline clearance distances

Tiger Tails

Tiger tails are used as a visual aid to identify the location of overhead electricity/power lines. It is important to note that tiger tails DO NOT insulate the electricity/power lines so exclusion zones and safe operating distances must still be maintained, even when tiger tails are present.

Figure 9 – Tiger Tails

FORKLIFT TRUCKS

Selecting the correct equipment for the job is vital.
Before starting the job you will need to think about:

- Ground conditions.
- Type of load.
- How much room you have to work in.
- Work area ventilation.

These factors will influence your choice of forklift truck and attachments.
The types of forklift truck include:

Cushion Tyre Forklift

- Fuel Type: Gas, LPG or Diesel.
- Good for indoor use and smooth surface.

Pneumatic Tyre Forklift

- Fuel Type: Gas, LPG or Diesel.
- Good for indoor or outdoor use on uneven surfaces.
- Most versatile of the forklifts.

4 Wheel Electric Forklift

- Tyre Options: Cushion or pneumatic.
- Electric units work well in poor or no ventilation environments (don't release emissions).
- Good for unloading trucks and moving pallets and other loads.
- Environmentally friendly.

3 Wheel Electric Forklift

- Tyre Options: Cushion or Pneumatic.
- Good for unloading trucks and moving pallets and other loads.
- Mainly used indoors on smooth surfaces, has a tighter turning radius for more manoeuvrability in small spaces.
- Good for unloading trucks and moving pallets and other loads.

Rough Terrain Forklift

- Fuel Options: Gas or Diesel.
- Tyre Option: Large Pneumatic for outdoor use on uneven ground.
- Good for lumberyards, construction projects, landscaping and other outdoor applications.

NOTE: DO NOT USE AN INTERNAL COMBUSTION FORKLIFT IN A CONFINED SPACE AS THE FUMES COULD CAUSE SERIOUS INJURY OR DEATH

Counter Balanced Forklift Trucks

Counterbalanced forklifts are among the most common types of forklift truck. These forklifts use the entire weight of the forklift (behind the point of balance) as a counterweight to the weight of the load. By using the entire weight of the forklift, a load can be lifted safely without tipping the forklift forwards.

The point of balance (fulcrum) is located at the front axle of the forklift. Everything behind the front axle of the forklift is used to counter the weight of the load that is being lifted.

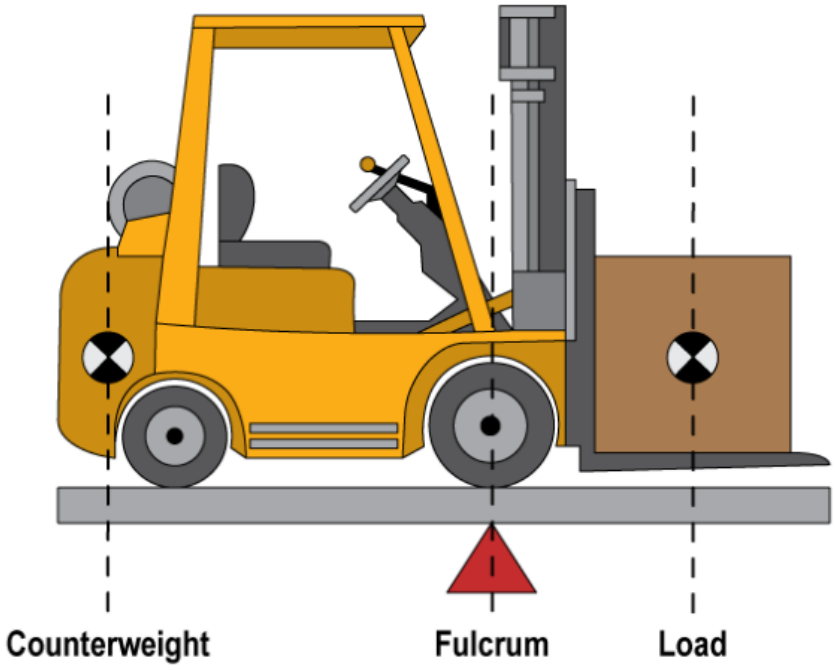


Figure 10 – Forklift Fulcrum & Counterweight

Note: Never add additional counterweights to the forklift truck without referring to the forklift manufacturer instructions first.

FORKLIFT STABILITY AND CENTRE OF GRAVITY

Stability is an important part in the safe operation of forklifts. Some factors that affect the stability or the forklift are:

- Centre of gravity.
- Stability triangle.
- Load centre distance.
- Forklift rated capacity.

Centre of Gravity

The centre of gravity (CG) of any object is the single point about which the object is balanced in all directions. Every object has a CG.

The forklift truck has moving parts and therefore has a CG that moves. The CG moves forward and back as the mast is tilted forward and back. The CG moves up and down as the upright moves up and down.

When the lift truck picks up a load, the truck and load have a new combined CG. The stability of the lift truck is determined by the location of its CG, or if the truck is loaded, the combined CG. The centre of gravity moves forwards and upwards when the forks are raised.

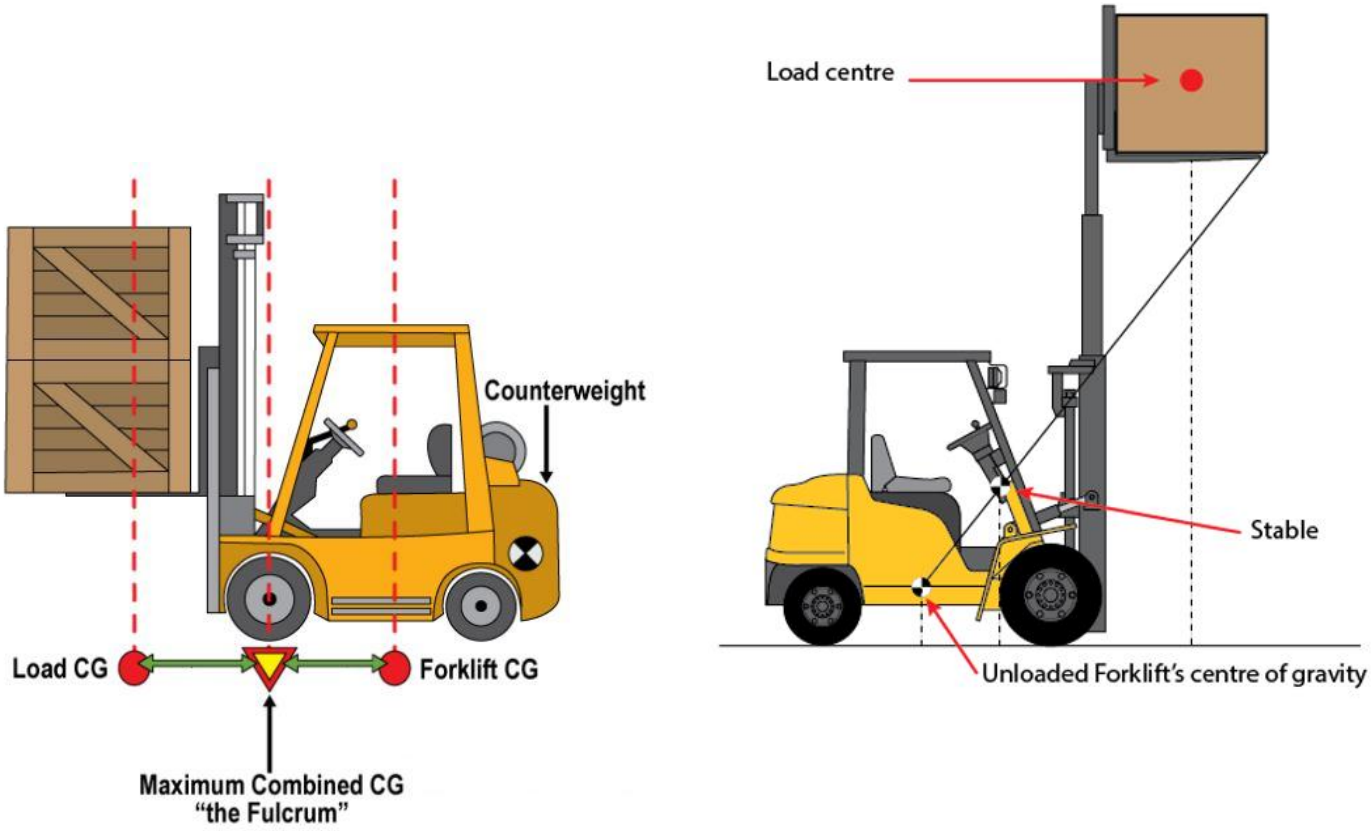


Figure 11 – Centre of Gravity

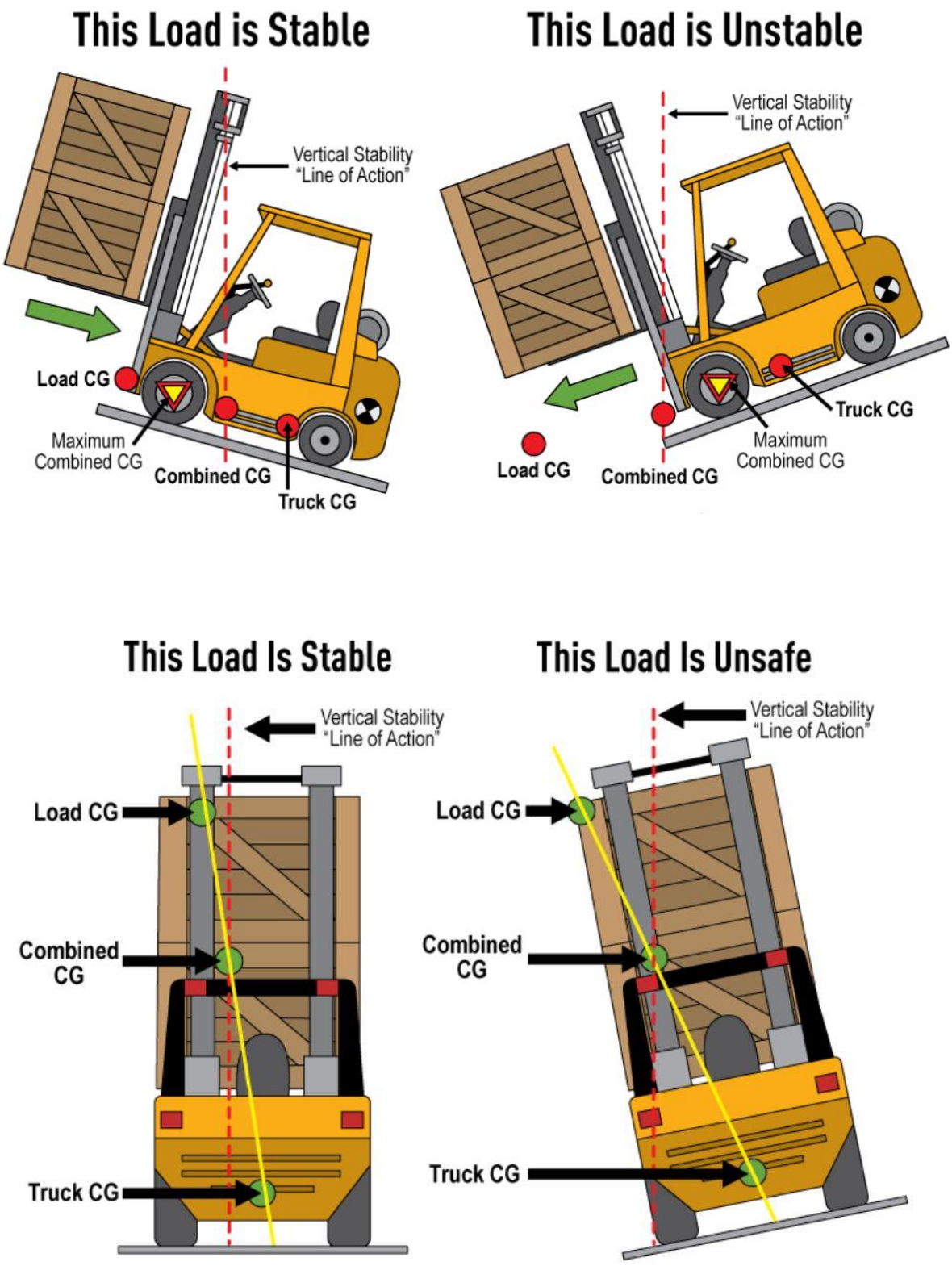


Figure 12 – Centre of Gravity on slopes

Stability Triangle

In order for the forklift truck to be stable, the CG must stay within the area represented by a triangle drawn between the drive wheels and the pivot of the steering axle. This area is called the stability triangle.

The centre of gravity of the forklift will move outside the stability triangle if:

- The load is picked up on the tip of the forks.
- The load is tilted forward.
- The load is tilted too far back when raised.
- The load is wide.
- Forklift movement also causes the centre of gravity to shift.

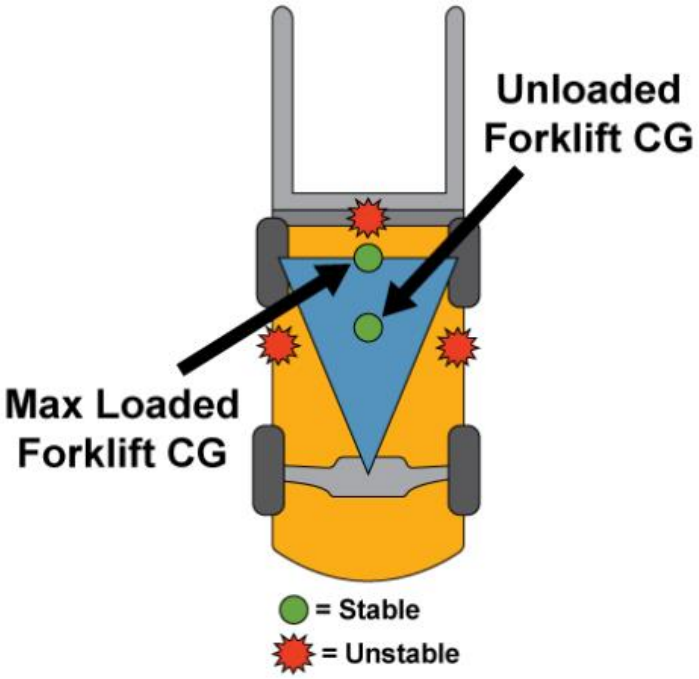


Figure 13 – Stability Triangle

The centre of gravity, and therefore the stability, of the loaded truck is affected by a number of factors including:

- Size.
- Weight.
- Shape.
- Position of the load.
- Height to which the load is elevated.
- The amount of forward or backward tilt.
- Tyre pressure.
- Dynamic forces created when the truck is moving.

The dynamic forces are caused by things like acceleration, braking, operating on uneven surfaces or on an incline, and turning.

These factors must be considered when travelling with an unloaded truck as well, because an unloaded truck will tip over to the side more easily than a loaded truck with its load in the lowered position.

Load Centre Distance

The distance from the front face of the forks (or the load face of an attachment) to the centre gravity of the load and from the top face of the fork blades vertically upwards is called the Load Centre Distance.

As load centre distance increases, the forklift's capacity decreases. The use of special attachments instead of forks will also decrease the regular capacity of the forklift truck.
If the load is not hard up against the heel of the fork arms, the forklift truck's capacity is reduced and stability may also be affected.

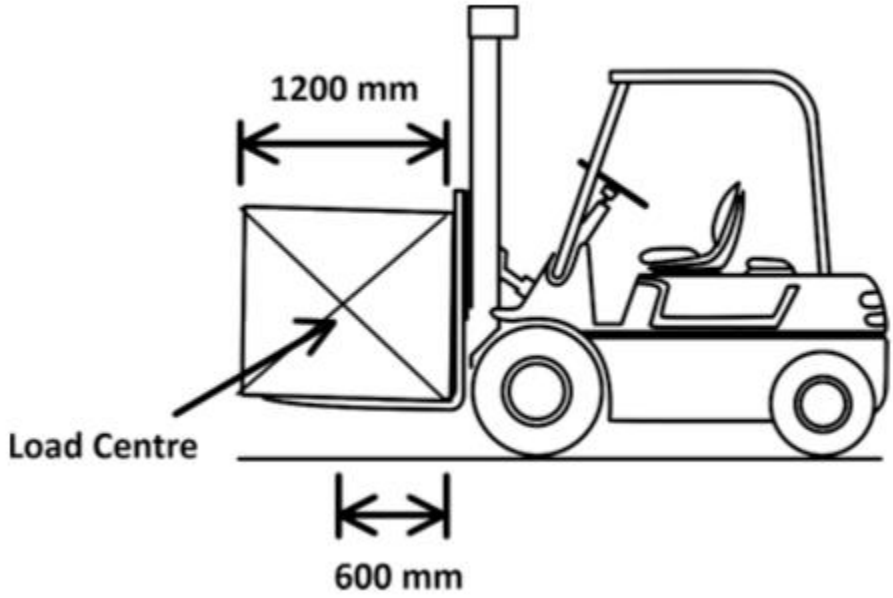


Figure 14 – Load Centre

Forklift Rated Capacity

The rated capacity is the maximum load the forklift truck can handle at a specific configuration based on load weight, height and load centre distance.

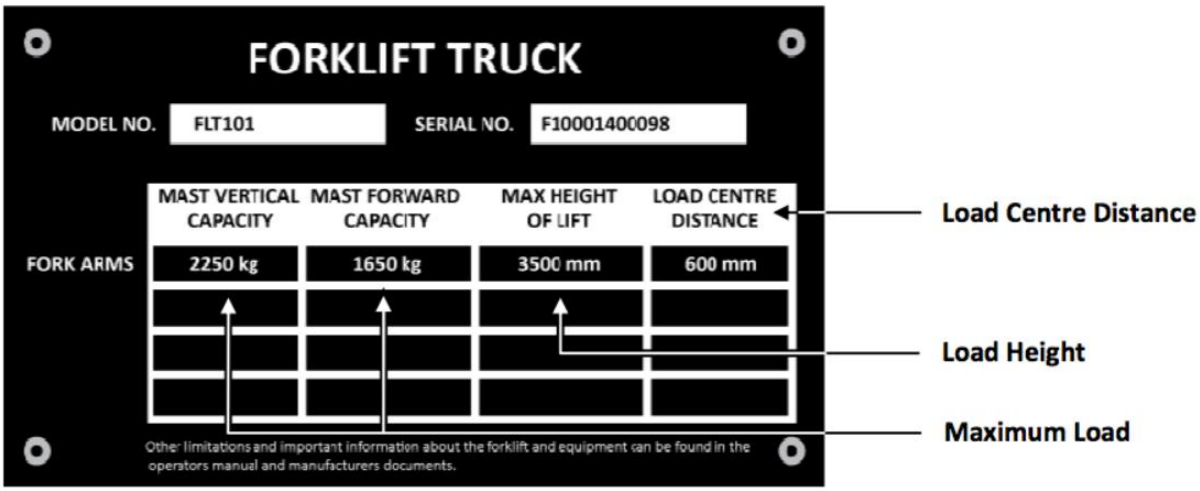
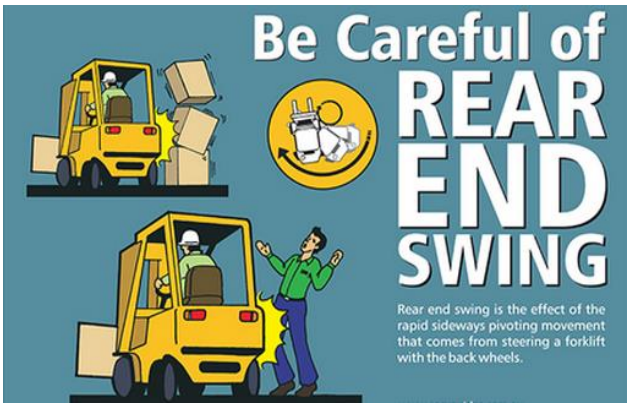


Figure 15 – Data Plate example

REAR END SWING

Rear end swing is the rapid sideways movement at the rear of the forklift truck. This creates a hazard, particularly for pedestrians nearby.

As forklifts steer with the back wheels, the rear of the forklift turns up to three and a half times faster than the speed of travel. With the rear end, steering operators need to keep to the inside of every turn to allow enough room for the rear of the forklift to swing around.
As soon as forklift operators become careless about watching the swing, damage starts to occur. Most damage to stock, racking and machinery is caused by the rear of the forklift hitting it.



A solution to this is to reinforce the dangers of rear end swing and to exclude pedestrian access from forklift operating areas.

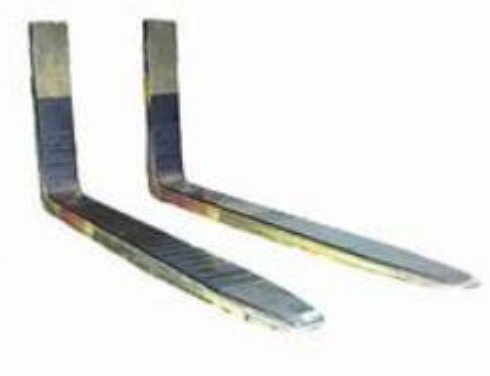
ATTACHMENTS

Before using any attachment on the forklift, make sure you check the manufacturer's specifications and load chart to see that the attachment can be used safely. Also make sure the attachment is secured properly before trying to lift a load with it.

Below are some examples of attachments for forklifts.

Load Stabiliser

Magnetic Fork Protectors



Sweeper

Hook

Four Fork

Carpet Spike

MininTipping Skip

Coil and Ram lifter

Drum Clamp

Cable Reel Roller

Jib

Blade

PLAN AHEAD BEFORE MOVING

Prior to moving the forklift it's a good idea to check the path that you're intending to take to make sure that you have identified all hazards in the path of movement and implemented effective control measures.

Always check that the forklift will fit and that there are no obstacles in the way. Also check for any other equipment or people working in the area.

Communication

Communication with those around you while you work is vital. You also need to be able to understand the instructions to use the forklift safely.

These can include:

- Manufacturer's guidelines (instructions, specifications, checklists).
- Industry operating procedures.
- Workplace procedures (work instructions, operating procedures, checklists).

Workplace communication can take the form of:

- Verbal and non-verbal language.
- Written instructions.
- Signage.
- Hand signals.
- Listening.
- Questioning to confirm understanding, and appropriate worksite protocol.

PREPARE FOR WORK/TASK

As preparation for your task you are required to:

- Check control measures for hazards identified.
- Conduct Pre-Start inspection on forklift, including the setup of attachments.
- Starting the forklift.
- Conduct operational checks.

CONTROL MEASURES

All controls that have been identified are required to be installed and checked for effectiveness. This includes:

- Having barriers in place.
- Having signage in place.
- Spotters ready and in place.
- Checking for any new hazards and implementing additional controls.

Note: All controls should be checked periodically throughout the task to ensure continued effectiveness.

PRE-START INSPECTION

Before you start the forklift you must check that it is safe to use. Always use a forklift pre-start inspection checklist when doing routine checks on the forklift truck to make sure you check everything properly, and so that you can report any problems that you find.

There are a number of areas that may need to be filled out, including:

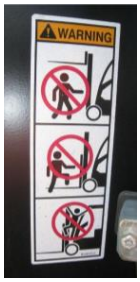
- Company/machine/operator details.
- Forklift parts/operational checklist.
- Fault report.
- Maintenance report.
- Return to service signoff.

A pre-start check should include the following:

- Visual checks.
- Decals and signage checks.
- Fluid checks.
- Forklift control checks.
- Safety device checks.
- Tyres.
- Attachments.
- Log book checks.

If you find damage or defects e.g. missing data plate you should:

- Do not operate.
- Tag out of service and note in the log book.
- Report to supervisor.

Item	Check
Visual Checks 	• The condition of the forks/tines or attachment. • Under the forklift for oil leaks. • The condition of the mast and of the hydraulic rams and hoses. • The condition and security of the load backrest (load guard). This is important as the load guard stops the load from fouling the mast and also stops the load from falling on the operator. • For visual evidence of structural weaknesses (including paint separation or stressed welds).
Decals and signage  	• Check that the forklift has the appropriate signage and labels, including the data plate. Make sure you can read it clearly and that it is firmly attached to the forklift. • If the forklift does not have a data/load plate, or you cannot read it, you must tag out of service the forklift and report the defect to an authorised person. <u>DO NOT USE A FORKLIFT WITHOUT A DATA/LOAD PLATE</u>
Fluid Checks 	• Hydraulic oil. • Engine oil. • Transmission oil. • Brake fluid. • Cooling water. • Fuel. • Battery electrolyte level in each cell. • Fuel. • Battery electrolyte level in each cell. If you need to refuel the forklift, make sure the engine is switched off. Re-fuelling while the engine is running may cause the fuel to ignite.
Forklift Controls 	• Check that you can find and identify the forklift controls. Check the operator's manual if you are unsure.

Item	Check

Safety Devices
 
	• Lights
	  ○ Flashing amber light.
	  ○ Head lights.
	  ○ Brake lights.
	  ○ Reverse lights.
	• Guards
	  ○ Roll-Over Protection (ROP).
	  ○ Falling Object Protection (FOP).
	  ○ Load backrest.
	  ○ Foot guard.

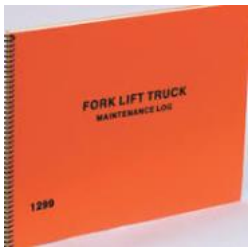
Tyres 	• Inflated. • Wear (even or not) – within wear limit. • Rubber missing. • Splits. • Lactating nuts on rims secure.
Attachments 	• Fitted correctly as per manufacture specifications. • Secure. • Correctly adjusted for task.
Log Book 	• Check for previous faults. • Check if faults noted have been fixed. • Check for any comments.

Table 5 – Pre-Start Inspection

STARTING THE FORKLIFT TRUCK

When entering or exiting the Forklift truck always ensure that you use 3 points of contact. Always wear your seatbelt whenever you operate a forklift as this will stop you from falling out of the forklift if it tips over and prevents you from being thrown from the vehicle in the event of a collision.

Always start the forklift truck as per manufacturer's specifications.

Figure 16 – Three Point Contact

OPERATIONAL CHECKS

Operational checks are done once the forklift has been started. Listen for any abnormal noises during start-up as these may indicate a fault.
Operational checks include:

- Hazard warning systems (for example lights and horns) and gauges are functional.
- Mast / attachment movements and control functions are smooth and comply with operating requirements (check to their full extent).
- Steering, transmission and brake functions comply with operating requirements.

Item	Check
Hazard Warning Systems 	• Lights. • Horn. • Gauges.
Mast / Attachment 	• Test full range of movement. • Fully raise/lower. • Tilt forward/back. • Side shift left/right.
Steering and Brake 	• Full lock left/right. • Move forward/reverse. • Test brakes.

Table 6 – Operational Checks

Report a fault

If you find anything wrong with the forklift during your checks you must:

- Immediately stop the forklift and remove the keys.
- Tag the forklift as out of service to stop anybody using it.
- Record the problem in the logbook or on the inspection checklist. Give as much detail as possible.
- Report the fault to your supervisor or other authorised person.
- DO NOT use the forklift until repairs are carried out.

PERFORM WORK/TASK

Before you try to lift something, check that the forklift will be able to shift it safely. Ask yourself the question, is the load within the safe working load of the forklift?

You can check the weight of a load a number of ways:

- Weigh the load.
- Check for markings on the load.
- Calculate the weight of the load.
- Check the weighbridge certificate.

When using an attachment, always make sure you have factored in the weight of the attachment with your calculations.

Check the shape of the load. Make sure the heaviest part of the load is against the mast.
If the load is unstable or poorly stacked, restack it before you try to move it. You may need to secure the load using shrink wrap or strapping/banding. Check the pallet that the load is sitting on. If it is too damaged to lift, re-stack the load onto a new pallet.

CALCULATING THE LOAD WEIGHT

If you find you need to calculate the weight of a load, make sure you consider:

- How many items.
- What each item weighs.
- The weight of the pallet the items are placed on.

Say you need to move a load of cartons that have been stacked on a pallet. There are 6 cartons per layer and 5 layers on the pallet. Each carton weighs 20kg. The pallet is standard size and weighs 15kg.

To work out how much this load weighs you need to add the total weight of all of the cartons to the weight of the pallet:

- 20kg (carton) x 6 (per cartons per layer) x 5 (layers) = 600 kg
- 600kg (weight of all cartons) + 15kg (weight of pallet) = 615kg (total weight)

ESTIMATING WEIGHTS BY VOLUME

Where the weight or mass of an object may not be known, it becomes necessary to work this out. To do this, the volume of the object must be known or measured. This volume may be in cubic meters, or if a liquid, in liters (capacity).

It is relatively easy to measure and calculate the volume and weight of regular shaped objects such as a cube or cylinder. Tapered or oddly shaped objects are more difficult.

Take a cube, 2m x 2m, having a total volume of 8 cubic meters (2 x 2 x 2 = 8). If this is made up of concrete which weighs 2.4 tons per cubic meter the cube would weight approx. 19.2 tons (8 x 2.4 = 19.2 tons).

If the cube is of solid steel, at 7.8 tons per cubic meter, then 8 x 7.8 = 62.4 tons.

If made of steel plate 6mm thick, we must find the total area of plate. (An easy way to calculate the weight of steel plate is to remember that one square meter of steel plate, one millimeter thick weighs approximately 8kg). Each of six sides being 4 square meter sin area = 24 square meters then 24 x 48 = 1232kg or 1.232 tons.

If a tank was filled with water, which weighs one ton per cubic meter, the total weight of tank and water would be: 8 tons (water) = 1.232 tons (steel) = 9.232 tons.

For other solids or liquids, use the same method and the appropriate weight per cubic meter. Where the object is not of a regular shape, mentally divide it into sections, calculate the volume of each section and add these together.

If the object is a tapered cylinder, say 1m diameter at one end and 2m diameter at the other, take the mean diameter as 1.5m and after calculating its area, multiply this by the length and find the volume. The area of a circle is equal to 3.4 multiplied by its radius squared. This is then multiplied by the weight per cubic meter of the material if the object is solid.

If the object is hollow then the area of material in its walls must be found. For example in a cylinder, if the circumference is roughly 4.7m (diam. x 3.14), and the length is 5m then the area of plate in the walls is 23.5 square meters. To this must be added the ear of the ends, namely 3.52m square meters (1.76 x 2 ends) giving a total of 27 square meters.

If the object is of 10mm steel plate at 80kg per square meter then the total weight is:
27 x 80 = 2160kg or 2.16 tons.

Where you are doubtful about the calculations, allow a generous margin for safety.

Formulas for Calculating Area of Volume

CODES		
L = Length	M= Metre	D = Diameter
W = Width	M2 = Square Metre	R = Radius
H = Height	M3 = Cubic Metre	C = Circumference
OD = Outside Diameter	ID = Inside Diameter	T = Thickness
Pi = π = 3.1 4 (for calculation Purposes)		

FORMULAE		
AREA	Of a square or rectangle	L x W = M2
VOLUME	Of a square or rectangle box or tank	L x S x H = M3
CIRCUMFERENCE	Of a circle	π x D= M
AREA	Of a circle	π x R x R = M2
AREA	Of an open cylinder	π x D x L= M2
VOLUME	Of a solid cylinder	π x R x R x L= M3
VOLUME	Of a concrete or steel pipe	π x OD x L x T= M3
AREA	Of a triangle	(L x Base x H) π 2= M2
AREA	Of a sphere	4 x π x R2= M2
VOLUME	Of a sphere	4/3 x π x R3= M3
VOLUME	Of a cone	1/3 x π x R2 x H= M3

Table 7 – Formulas

OPERATING A FORKLIFT

PICKING UP A LOAD

When picking up a load with the forklift ensure that you:

- Approach the load from front on.
- Insert the forks all the way into the pallet.
- Raise the forks and tilt the load back slightly for stability.
- Position the load at axle height or as low to the operating surface as practicable for safe travel.

DO NOT carry the load on only one fork arm. If you do the stability of the forklift may be affected, and you may cause damage to the forklift.

USING TWO FORKLIFTS TO PICK UP A LOAD

In some situations you may require two forklifts to be used to lift a load. This may be because of the size, shape or length of the load.

When using two forklifts for the same load:

- Use only experienced operators.
- Have a third person who is responsible and experienced control the operation. Ensure that the load applied to each forklift truck is no more than 75% of its rated capacity, taking account of stability, load-centre distance and any other factors which may affect the forklift truck's safe working load.
- The distance travelled is limited to clearing the load carrier.

STEERING

The forklift is steered by the rear wheels, so the rear of the machine moves further than the front.

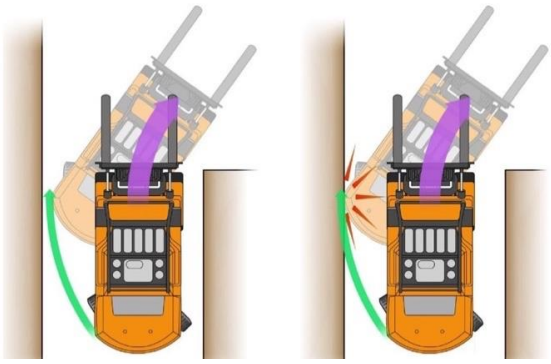
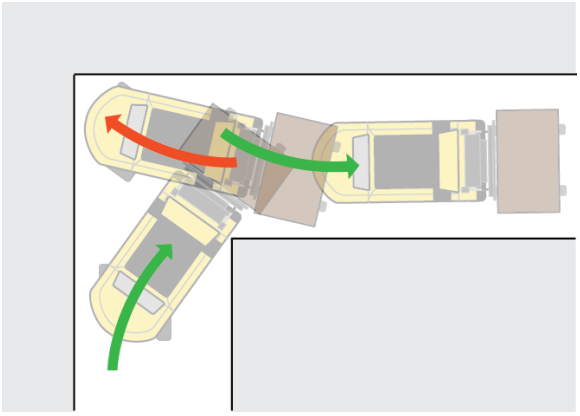
1. When turning a sharp corner, keep the inside front wheel close to the corner and turn as soon as the front wheel is at the corner. 2. Use maximum steering lock when working in sheds and warehouses.	
3. When turning in a narrow aisle, use a three point turn to load or unload, and make a 90° approach.	

Table 9 – Steering

OPERATING ON A SLOPE

Forklifts are heavier on the front end when loaded and heavier on the rear end when unloaded. Keep the heavy end pointing uphill.

Do	Don't
✓ Make sure there is a flat, level turn around area so you can turn, load and unload safely.	× Do not work across a slope unless the angle is less than the equipment manufacturer's recommendation (see the OMM).

Down Hill

Without a Load 1. Test the brakes. 2. Lower the forks close to the ground. 3. Drive forwards at a controlled speed.	
With a Load 1. Test the brakes. 2. Lower the load close to the ground. 3. Reverse down the hill at a controlled speed. 4. Do not allow the engine to over speed while driving downhill.	

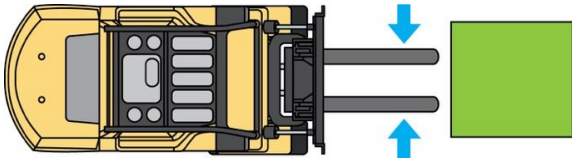
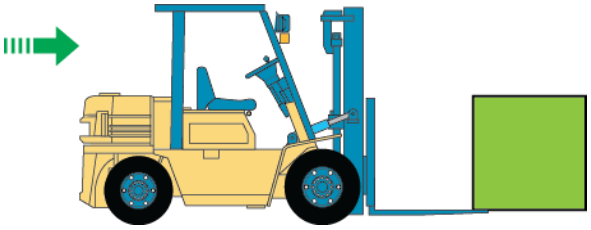
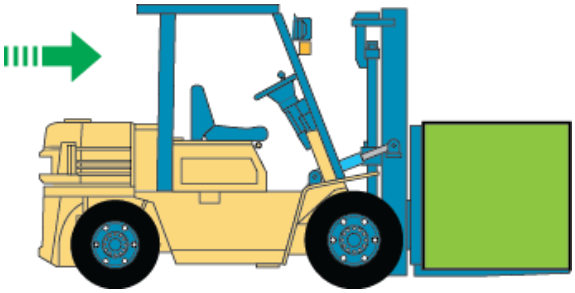
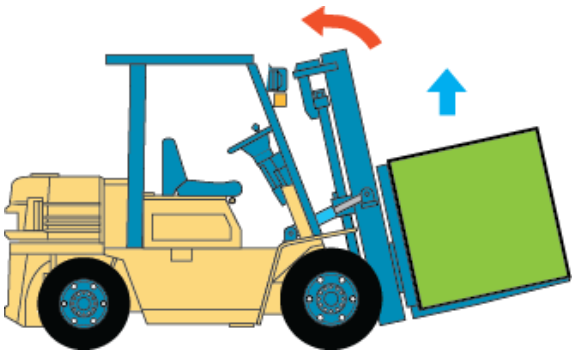
Up Hill

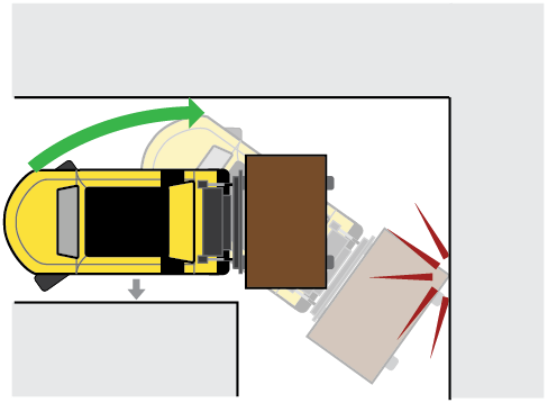
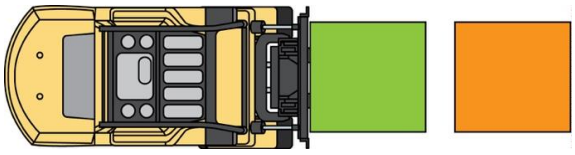
Without a Load 1. Test the brakes. 2. Lower the forks close to the ground. 3. Reverse uphill at controlled speed.	
With a Load 5. Test the brakes. 6. Lower the load close to the ground. 7. Drive forward uphill at a controlled speed.	

Table 10 – Operating on a slope

Note: If the forklift begins to sideslip or the load begins to move on a grade, immediately lower the load to the ground.

LIFTING, LOWERING AND PLACING LOADS

1. Position the forklift square to the load, with the mast vertical. 2. Spread or close the forks to support the weight of the load evenly. **NOTE:** Forks should be ½ to ¾ of the width of the load apart.	
3. Approach the load slowly. 4. Slide the forks under the load.	
5. Move in until the load is against the carriage backrest. **NOTE:** Make sure that the load is positioned centrally over the forks.	
6. Raise the forks slowly to take the weight of the load. 7. Tilt the mast back to stabilise the load. **NOTE:** Any load higher than the carriage backrest should be secured with load rated straps before moving.	

8. Raise the forks to the required travel height. Keep the load as low as practicable. 9. Turn and travel slowly, watching clearances around and above the load. **NOTE:** If a load obscures your view, travel in reverse or use a spotter to guide you.	 
10. If visibility is restricted, e.g. going through doorways, approaching a corner, slow down and sound the horn to alert personnel that you are approaching.	
11. When lowering a load, position the forklift at 90° to the required site. 12. Approach the site slowly with the mast tilted back and the forks at sufficient height to avoid contact with the ground.	

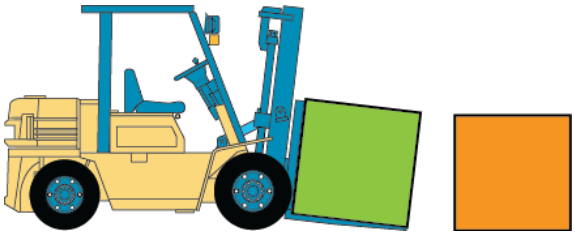
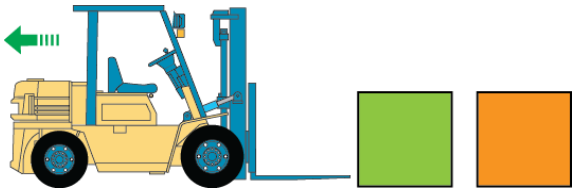
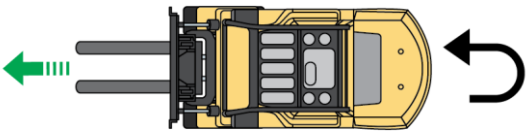
13. Slowly lower the mast and place the load in the required position. 14. Tilt the mast forward to assist the positioning of the load, and smooth withdrawal of the forks. 15. With the load lowered, take the weight off the forks and ensure that the load is stable.	
16. Place the machine in reverse and withdraw the forks cleanly without disturbing the load.	
17. Lower the forks to a safe travel position, check the machine clearance, turn around and then drive away at a steady pace.	

Table 11 – Lifting, lowering and placing loads

PALLETS

Do
✓ Know the weight of the material.
✓ Check that material is correctly secured on the pallet.
✓ Place heavier items on the bottom.
✓ Tie items together or place them in a cradle or cage.
✓ Place small drums upright, close together in the middle of the pallet.
✓ Place compressed gas cylinders upright in a cradle and check cylinder straps to ensure load is secure.
✓ Space larger items evenly on the pallet.
✓ If there are only a few large items, spread them as wide as possible on the pallet to increase stability.

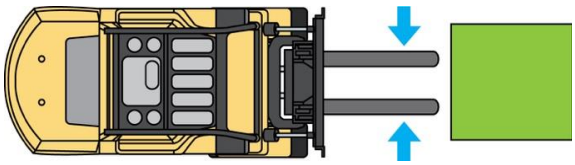
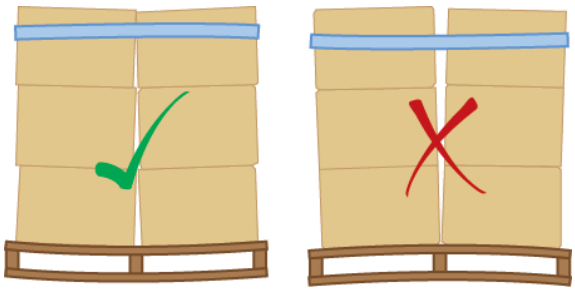
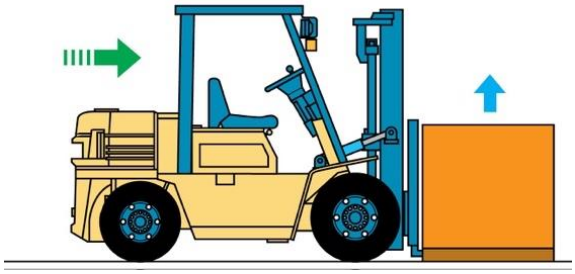
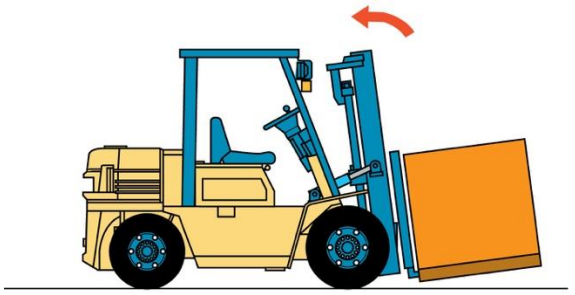
1. Spread the forks to ½ to ¾ the width of the pallet.	
2. Approach pallet squarely with the mast tilted slightly forward. 3. Slowly move forks into the pallet under the load.	
4. Stop the forklift, then raise the mast to take the weight of the pallet gradually.	
5. Tilt the mast back to help stabilise the load.	

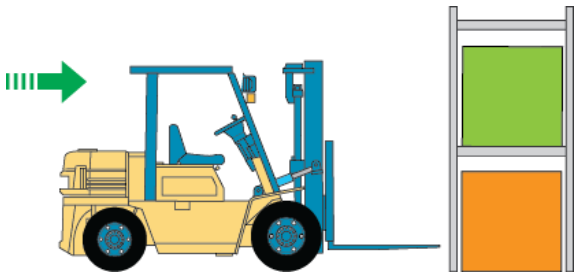
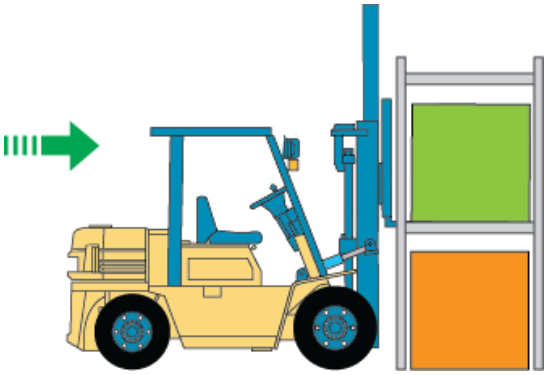
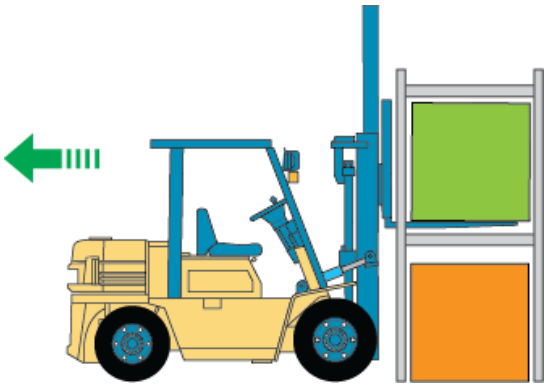
Table 12 – Lifting Pallets

RACKS

Know the weight that the rack can take and take into consideration the combined weight of any items already on the rack.

When lifting or placing loads onto racks care must be taken not to contact the rack and disturb other items on the racking.

Keep movements smooth and slow to ensure load and machine stability and to avoid disturbing items on the racks.

1. Position the forklift square to the load, with the mast vertical.	
2. Raise the mast to the required height. 3. Slide the forks under the load.	
4. Stop the forklift then raise the forks slightly to take the weight of the load. 5. Keep the load vertical and reverse out, without tilting the load.	

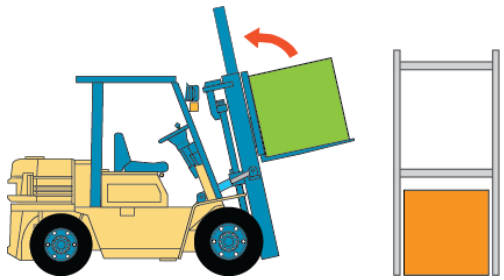
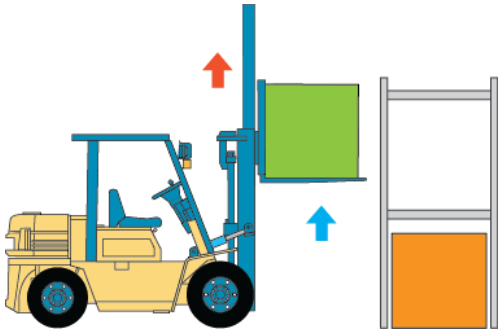
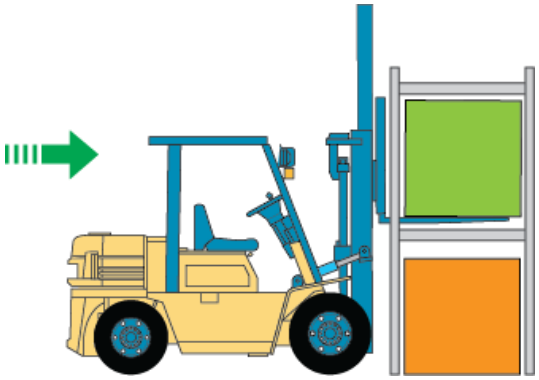
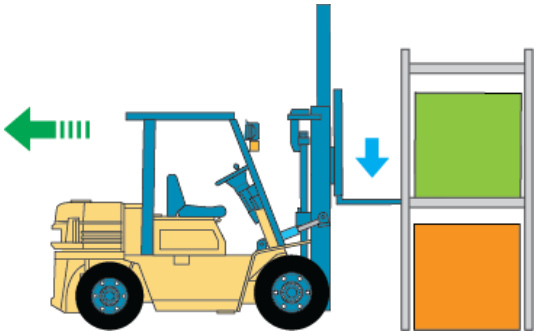
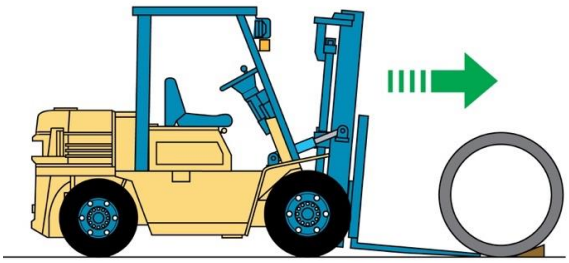
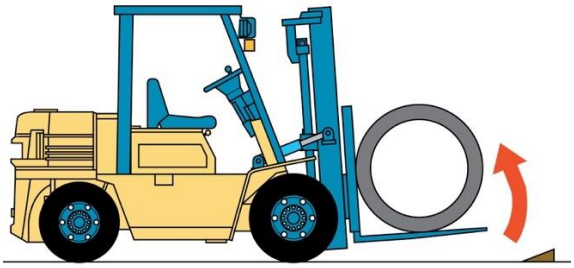
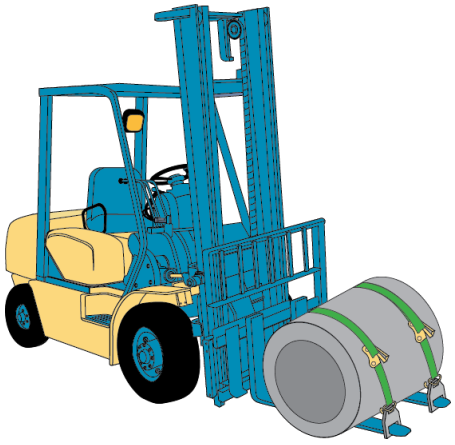
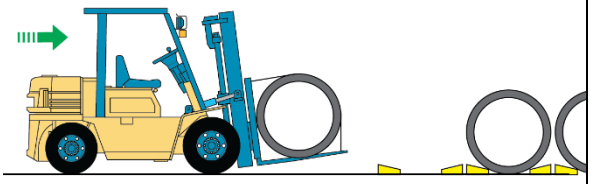
6. When the load is clear of the racking, tilt the mast back to stabilise the load.	
7. When placing a load onto racks, approach front on with the mast vertical. 8. Raise the forks to just above the set down point.	
9. Move in, and position the load over the rack. Check the clearance around the load, so that you do not hit the racks.	
10. Stop the forklift. 11. Slowly lower and position the load. 12. With the load lowered, take the weight off the forks and ensure that the load is stable. 13. Place the machine in reverse and withdraw the forks cleanly without disturbing the load.	

Table 13 – Using Racking

LIFTING ROUND OBJECTS

1. Position a chock behind the round object to stop it from rolling. 2. Tilt the attachment forward. 3. Slide the forks along the ground to get under the load.	
4. Tilt the attachment slightly to the rear and allow the load to roll gently against the attachment bracket. 5. Lower forks with forks tilted. 6. Stop forklift. 7. Park fundamentally stable with park brake on and wheels chocked if required.	
8. Isolate the machine. 9. Secure the load with load rated straps. 10. Check around the forklift for personnel, other vehicles, clearances, etc. before moving off.	
11. When placing round objects, ensure that there is a suitable set down arrangement to prevent objects from rolling, e.g. frame, chocks, etc.	

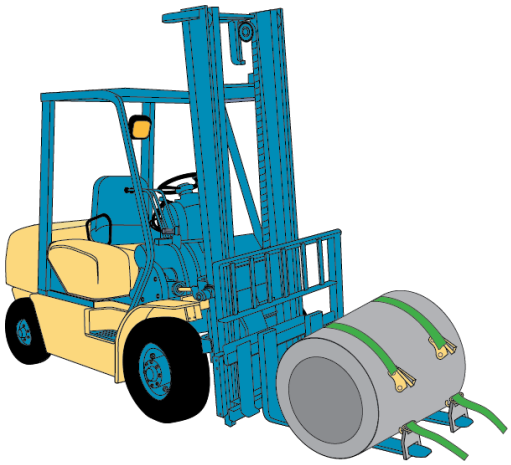
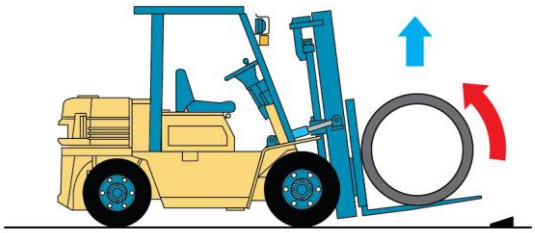
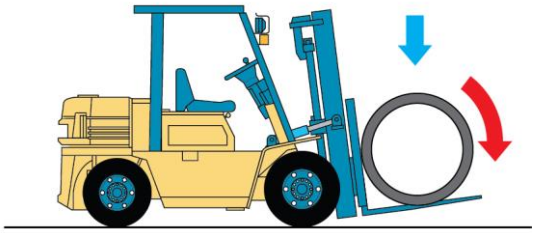
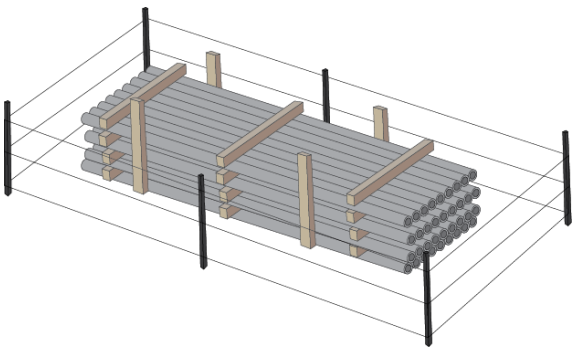
12. With the mast tilted back, release any securing straps or chains.	
13. Slowly raise the mast to clear any framework, stanchions, etc. 14. Keep the mast tilted back so the load rests on the carriage backrest.	
15. Position the load over the set down point, lower the mast as close to the point as possible. 16. Tilt the mast forward slowly to allow the load to roll off the forks in a controlled manner into positon. **NOTE:** Ensure load cannot roll away uncontrolled, consider placing chocks to stop roll.	
17. Make sure that the set down point is barricaded and there are no unauthorised personnel or vehicles in the area. **WARNING:** Do not leave the area until you have ensured that the load is stable at the set down point.	

Table 14 – Lifting Round Objects

LIFTING OVERSIZE MATERIAL

Use a spotter to guide you and to keep other personnel and equipment away.

If using fork extensions (slippers) over the forks to help stabilise the load, they must be engineered and rated to carry the required WLL and must not exceed a third of the fork length.

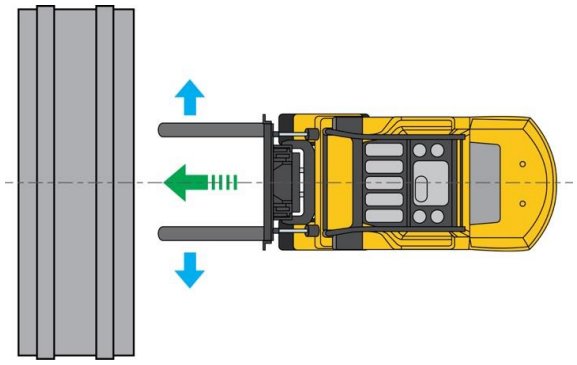
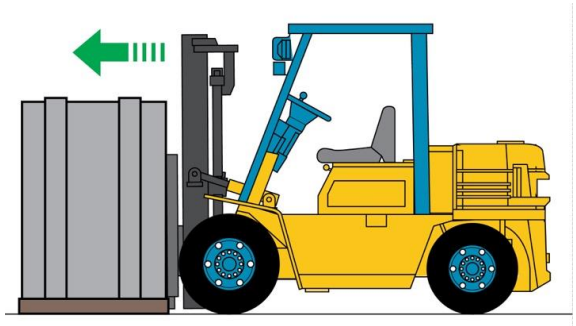
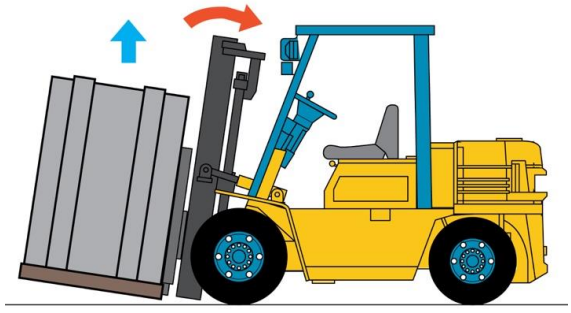
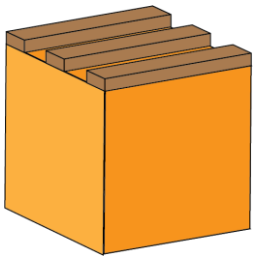
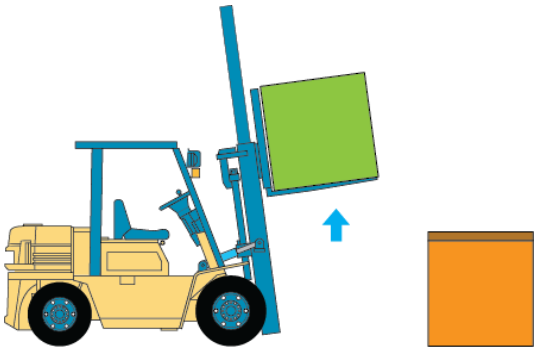
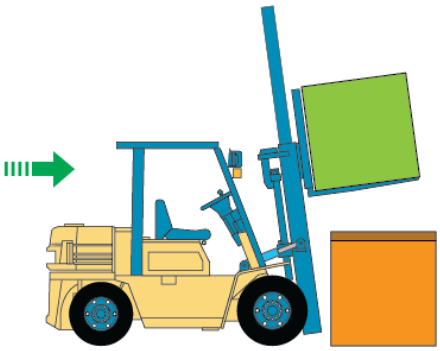
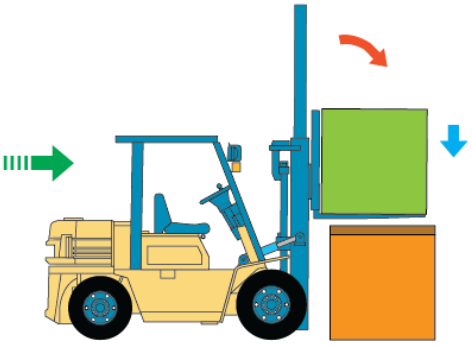
1. Position the forklift as close as possible to the center of the load. 2. Spread the forks as wide as possible to spread the weight of the load evenly. 3. Slide the forks along the ground to get under the load.	
4. Move in until the load is against the carriage backrest. **NOTE:** Make sure that the load is positioned centrally over the forks.	
5. Raise the forks slowly to take the weight of the load. 6. Tilt the mast back. 7. Be particularly vigilant about clearances around and above the load.	

Table 15 – Lifting Oversize Material

STACKING LOADS IN THE OPEN

Prepare area before lifting load. If load is to go on top of another item, put chocks on top of item, to enable the forks to slide in and out between loads.

1. Prepare area before lifting load. If load is to go on top of another item, put chocks on top of item, to enable the forks to slide in and out between loads.	
2. Raise the forks above the set down point.	
3. Move in and position the load over the set down point.	
4. Stop forklift, then slowly lower and position the load. 5. Tilt the mast forward slightly to assist the positioning of the load, and ensure smooth withdrawal of the forks.	

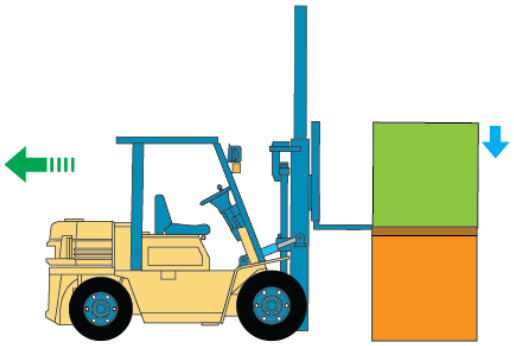
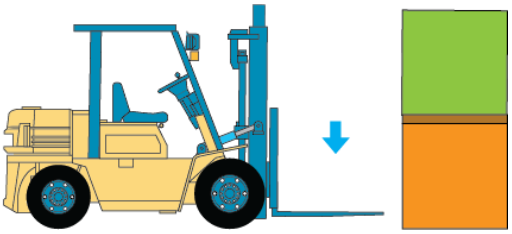
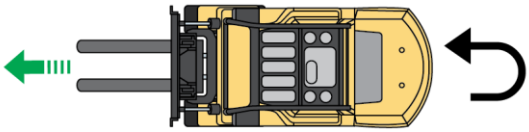
6. With the load lowered, take the weight off the forks and ensure that the load is stable. 7. Place the machine in reverse and withdraw the forks cleanly without disturbing the load.	
8. Lower the forks to a safe travel position.	
9. Check the machine clearance, turn around and drive away at a steady pace.	

Table 16 – Stacking Loads in Open

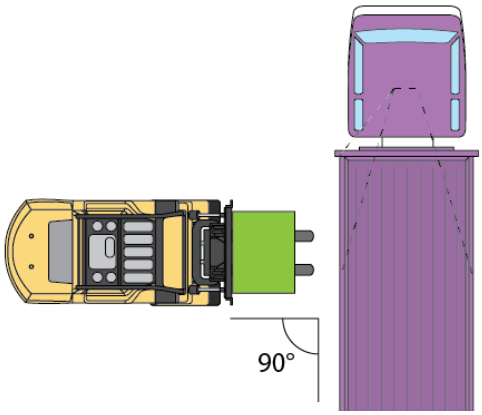
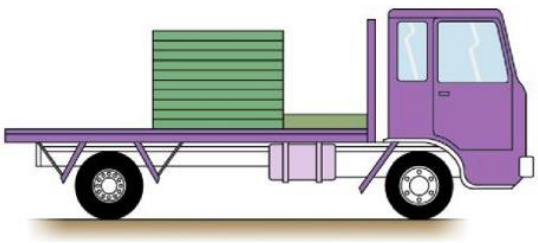
LOADING AND UNLOADING VEHICLES

When loading vehicles, keep within the legal axle load limit.

Do not allow personnel or other vehicles to enter the loading zone unless they have made positive communications with the forklift operator and it is safe to do zone.

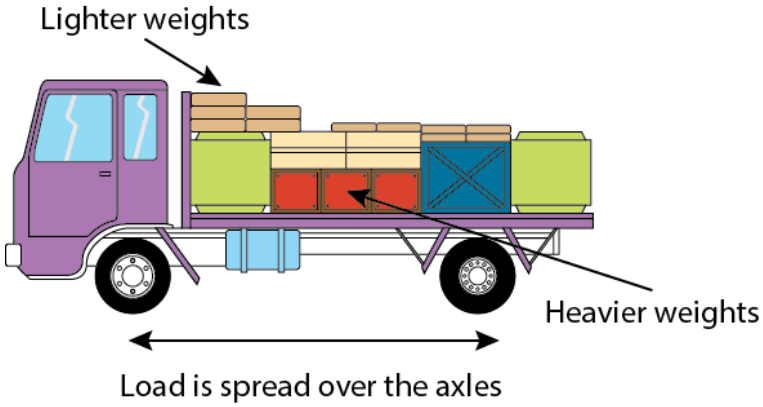
Forklift operations must STOP whenever personnel enter the work area.

Loading

1. Plan the task and maintain positive communication with the vehicle driver.	
2. Load vehicles at right angles.	
3. Place and secure items against the headboard so the load will not move during transport. 4. If this is not possible place the load against a large baulking object, such as a piece of strong timber, fitted and fixed across the vehicle tray.	

5. Stack heavier items at the bottom of the load.

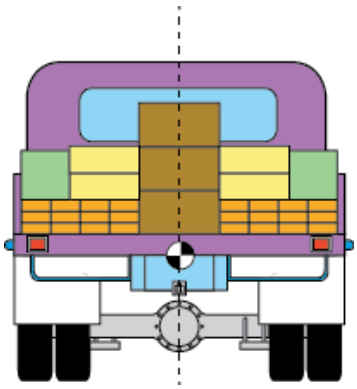
6. Keep center of gravity as low as possible and spread the weight of the load evenly along the axles of the truck.



7. Place heavier items along, or close to the center line of the truck, with lighter items to the sides. This will keep the center of gravity of the load in the center of the truck, maximising lateral stability.

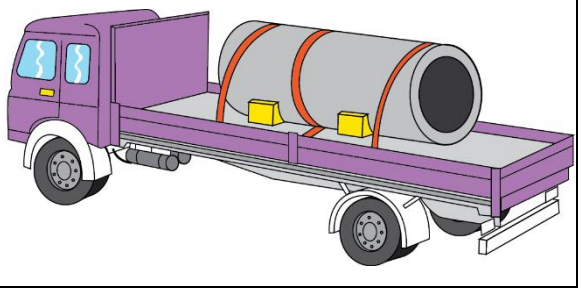
WARNINGS:

- A badly loaded vehicle will seriously affect the stability and handling of the truck and may cause it to overturn.
- High or tall loads should be carried on a vehicle with a low platform, e.g. a low loader.



8. Use blocks, wedges and chocks to prevent load movement.

9. Secure the load with ropes and/or chains or cover with a suitable cargo net.



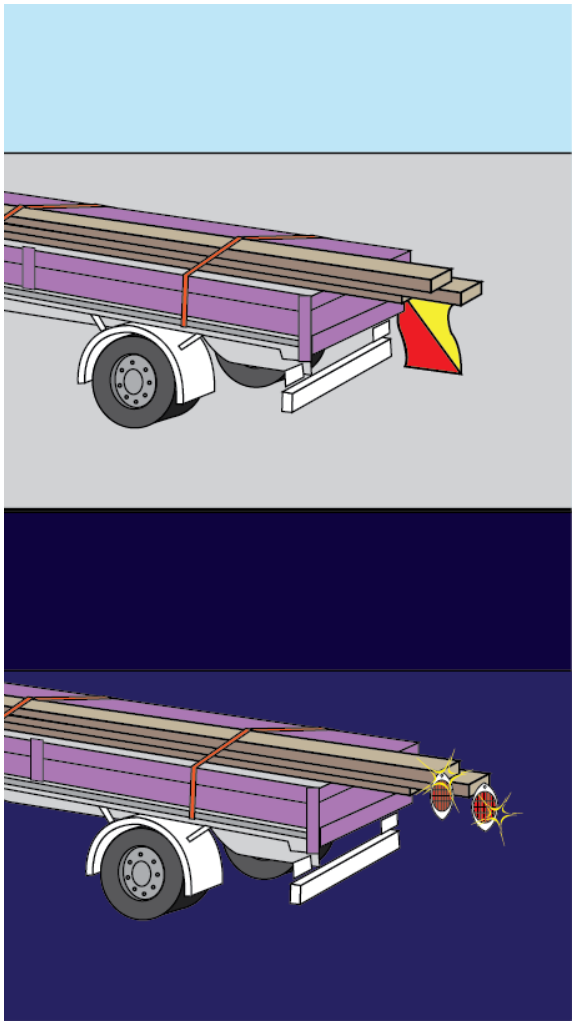
10. Overhanging loads must not exceed the road regulation limitations. **NOTES:** • Clearly visible loads that project up to 1.2 m from the back of the vehicle or trailer do not need a warning device. • Any load that projects more than 1.2 m from the back of the vehicle or trailer must display a warning device at the very end of the load, as follows: ○ **Day:** A brightly coloured red, red and yellow, or yellow flag at least 450 mm x 450 mm fixed to the extreme back of the load. ○ **Night:** A red warning light that is visible from at least 200 m away, OR at least two red reflectors capable of reflecting from the headlights of a following vehicle.	

Table 17 – Loading Vehicles

Unloading

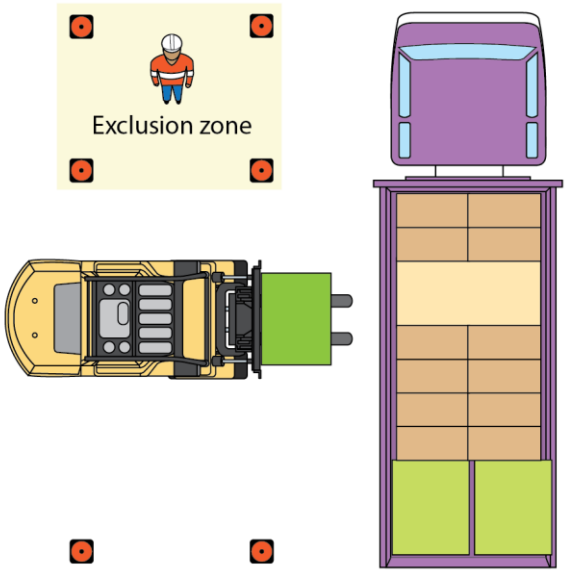
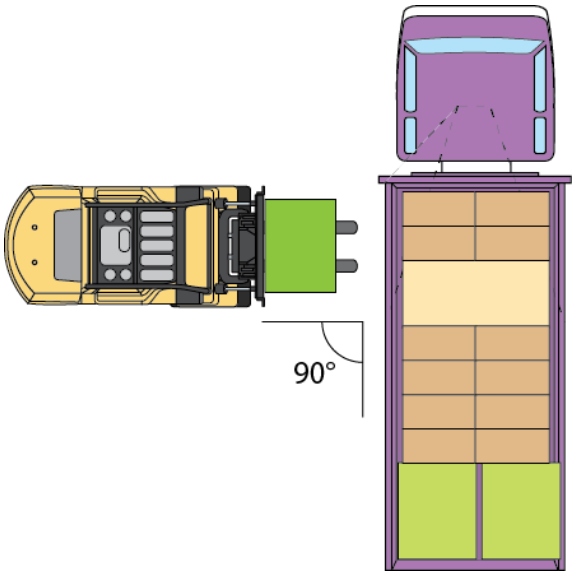
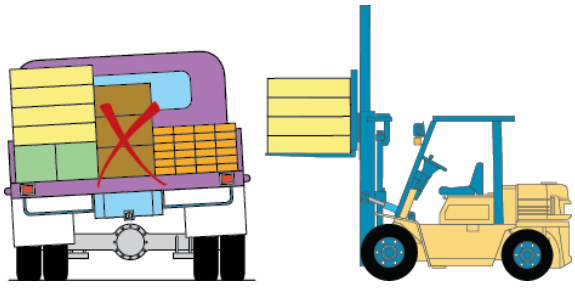
1. Before unloading a truck make sure that the truck is positioned on firm, level ground with the brakes on and isolated against unexpected movement. 2. All personnel and vehicles must stay clear of the work area unless they make positive communications with the forklift operator first. **WARNING:** When unloading pipes, all personnel (except the forklift operator) MUST remain clear of the operation.	
3. Approach the vehicle at right angles. 4. Check the load to ensure that items are secured and have not spilled or become unstable during transit. If this is the case conduct a risk assessment and notify your supervisor before proceeding.	
5. Unload from top to bottom, lighter items first. 6. Unload equally from both sides of the truck so that the truck does not tilt, depending on the load weight.	

Table 18 – Unloading Vehicles

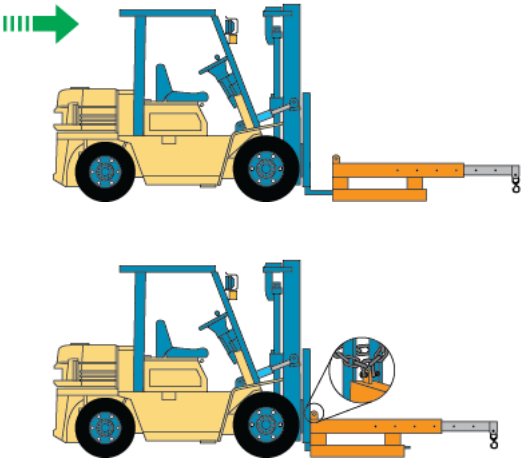
FORKLIFT ATTACHMENTS

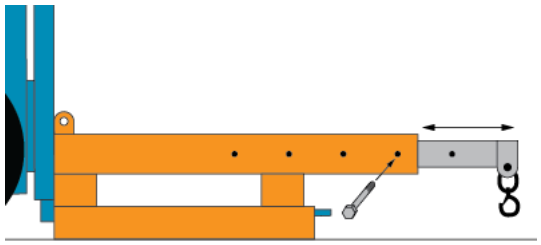
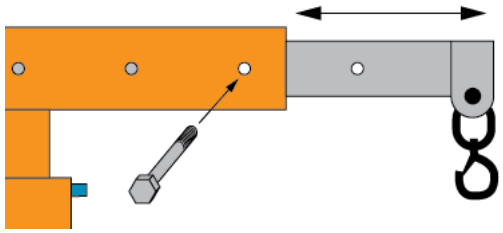
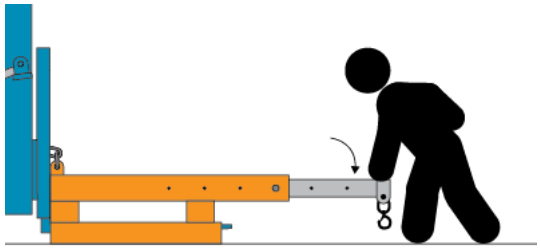
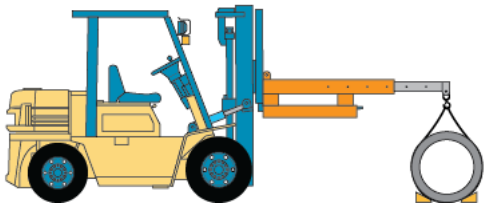
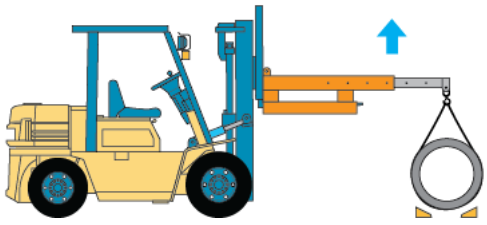
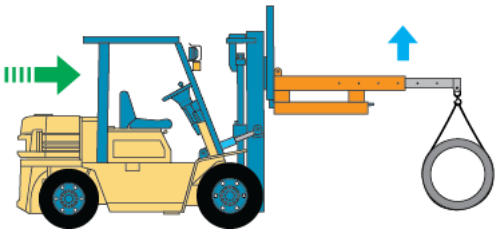
Ensure that you follow all manufacturer guidelines with all attachments.

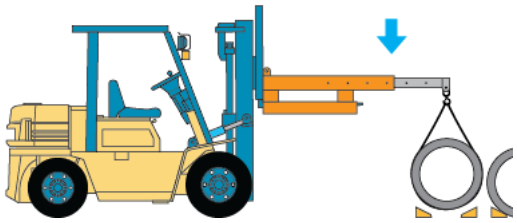
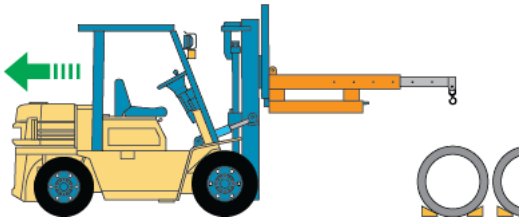
Lifting Loads with a Jib Attachment

Check site procedures for any competencies required for using a jib.

Know the SWL of the jib and refer to the lifting chart on the jib to ensure that it has sufficient operating load capacity to lift the load.

1. Inspect the pick-up, travel and set down areas for hazards and plan the task. 2. Inspect the equipment, including the jib for damage. Do not use damaged equipment. 3. Maintain positive communication with the Dogger (if applicable) and all other personnel involved in the task.	
4. Attach jib to machine according to manufacturer instructions.	

5. Extend or retract the jib to the required length by removing the retaining pin and sliding the jib extension in or out. **NOTE:** Extending the jib decreases the load capacity. Look for the SWL stamped on the jib.	
6. Reinsert the retaining pin and make sure it is secure.	
7. Check the security of the attachment by gently pressing the arm against the ground.	
NOTE: The load should be prepared and slung by a qualified person ready for connecting to the jib. 8. Attach the load to the hook at the end of the jib.	
9. Conduct a trial lift, raising the load just off the ground. 10. If the load slips, lower the load and arrange for it to be re-slung.	
11. If successful, slowly lift the slung load. 12. Lift and carry the load as low as possible and as close as possible to the machine.	

13. Travel to the set down area and slowly lower the load into place.	
14. Secure the load in position before leaving the site.	

Guidelines for Lifting and Slinging

Do	Don't
✓ Place packing/dunnage under loads to allow for easy sling removal after setting down. Secure packing firmly if loads are to be stacked.	× Do not use worn or broken gear.
	× Do not trail slings along the ground or pull slings from beneath loads.
✓ Use bow shackles where more than two slings are placed on a hook, particularly if the hook is large.	× Do not knot wire rope and chains, or join chains with nuts and bolts.
	× Do not overload hooks or lift loads on the point of hooks.
✓ When using more than one sling on a load that is heavy at one end, check that the sling at the heavy end is rated accordingly.	× Do not use bricks, concrete blocks or other crushable objects when packing under loads or between stacks.
✓ Carry loads as close to the ground as possible and only high enough to clear any obstacles.	× Do not leave the pins out of shackles when not in use or use bolts if the pins are lost.
✓ Ensure that the Dogman stands clear of the load, particularly when travelling.	× Do not guess the load weight, machine capacity or lifting gear capacity. Find out before lifting and moving the load.

Table 19 – Jib Attachment and Slinging

Other Attachments

Type	Comments
Work Platform 	Forklift Work Platforms are used to elevate personnel/workers for various working activities. A work platform is specially designed for mounting on the forks of a forklift truck for the purpose of providing a safe working place for personnel/workers. Serious accidents and injuries occur when people fail to use a correctly designed and fitted work platform, or if they use it in an inappropriate manner. Standing on the forklift tines, on pallets or in unsuitable stillage's, are common causes of falls from height. • The work platform must be secured to the forklift. • The operator of the forklift must remain seated at the controls of the forklift at all times while personnel/workers are elevated in the work platform. • No more than two people are to be lifted in a work platform at any given time. Personnel/workers must remain in the work platform during raising or lowering and must not be moved from place to place other than for small positional adjustments. • The load capacity of the platform must not exceed 250kg unless the type and design of the forklift is manufactured in accordance with AS 2359 Powered industrial trucks and the appropriate hazard identification and risk assessment has been done.
Carpet Spike Attachments 	When using a carpet spike, you should be aware that the protruding length of the spike causes the longitudinal stability and load capacity to be significantly reduced. Particular care must be taken when turning the forklift.

Type	Comments
Rotating and Side Shift Attachments 	Side-shift attachments need to be centred before travelling with a load or the forklift truck will become unstable. This is because the centre of gravity of the load is off to one side. While travelling, a revolving attachment must never be used to rotate the load. It can impact on the forklift's stability. Rotation of loads should only be done while the forklift is stationary.
Drum Clamps 	Drums can be carried by the forklift using a drum clamp. Alternatively drums can be transported while loaded onto a pallet.

Table 20 – Forklift Attachments

LATERAL INSTABILITY

Causes of a forklift truck to tip over sideways (lateral instability) include:

- Unevenly distributed load.
- Turning at an unsafe speed.
- Side shift not centred.
- Driving over uneven surfaces.
- Driving with a flat or underinflated tyre.
- Driving too fast (loaded or unloaded).
- Turning with the load raised.
- Driving with the load in the elevated position.
- Operating on a sloping surface.

LONGITUDINAL INSTABILITY

Causes of a forklift truck to tip forward lengthways (longitudinal instability) include:

- Driving with the load in the elevated position.
- Overloading.
- Severe braking.
- Incorrect use of the mast tilt (especially with the load carried at a high level). Unevenly distributed load.
- Shifting of the load centre forward (centre of load is forward of the approved load centre).
- Operating on sloping surface.
- Driving over uneven surfaces.
- Load not positioned against the heel of the fork arms.
- Driving too fast (loaded or unloaded), including reversing.

EMERGENCY PROCEDURES

In the case of any workplace emergency you must make sure that you:

- Call Emergency - Alert the relevant personnel/workers of the emergency situation.
- Nature of emergency - Communicate the nature of the emergency to the supervisor and others.
- Unsafe areas - Inform personnel/workers of unsafe areas.
- Provide information to emergency services.

It is important that you give right of way to all emergency vehicles during emergency situations.

WHAT TO DO IN THE EVENT A FORKLIFT ROLLS OVER

If you lose control of the forklift and it begins to tip sideways you should:

- Remain in the forklift.
- Brace yourself until the forklift is stationary and is safe to exit.
- DO NOT try to jump from the forklift while it is tipping over.

Figure 17 – forklift Roll Over

CONTACT WITTH ELECTRICITY SOURCES OR POWERLINES

If the forklift truck makes contact with electricity or power lines you must take action to limit any further exposure to danger.

1. Warn others in the area.

2. If possible, attempt to break contact with the electricity source or power lines by moving the forklift clear, lowering the fork arms or moving the mast. Before attempting this it is important to consider that the controls may be electrified. If this is the case, do not touch them.

3. If it is not possible to break contact with the electric/power lines, you should stay in the forklift if it is safe to do so. Be careful not to touch any metal parts of the forklift as they may be electrified.

4. If it is unsafe to stay in the forklift (because of fire or some other life threatening situation), you need to check to see if the area around the forklift is clear of any obstacles. If the area is clear you can attempt to jump from the forklift. DO NOT touch any metal part of the forklift and the ground at the same time. Once on the ground you need to hop or shuffle away from the forklift (keeping both feet together) until

you are at least 8m away from the forklift. DO NOT ever walk or run from the forklift as the ground may be electrified.

5. Complete any incident reporting documentation in line with workplace policies and procedures.

6. DO NOT use the forklift again until it has been checked and returned to service.

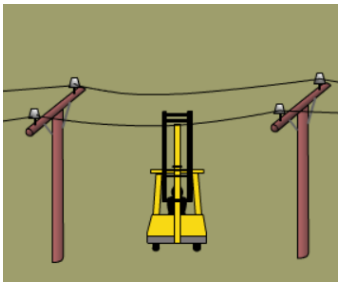


Figure 18 – Contact with Powerlines

FORKLIFT MALFUNCTION

If the load drops suddenly, or you suspect there is a problem with the hydraulic system, immediately lower the load and turn off the forklift.

Check the forklift for any signs of damage or wear and check hydraulic lines for splits or bulges.

Tag the forklift out of service and do not allow other persons to use it. Report the fault to an authorised person and do not use it again until repairs have been completed and you have gained authorisation to use it.

PACK UP

SHUT DOWN AND SECURE THE FORKLIFT

When you have finished using the forklift, you will need to:

- Park it.
- Remove the keys.
- Conduct post-operational checks.

PARKING THE FORKLIFT

Always park the forklift on a flat surface out of the way of other traffic.

Do	Don't
✓ Make sure the fork arms are correctly positioned (tips down, tilted forward, lowered to ground). ✓ Select an appropriate transmission/gear (neutral) and apply the hand/parking brake. ✓ Turn the engine off and remove the keys from the ignition to prevent unauthorised movement of the forklift (if applicable). ✓ Shut off the LPG gas cylinder valve (if applicable). ✓ Any other site-specific procedures as required. ✓ If you have to park the forklift on an incline, make sure you also chock the front wheels in addition to normal parking procedures.	× On sloping surfaces. × Near First Aid stations. × Near fire-fighting equipment/vehicles etc. × Near doorways. × On or near pedestrian walkways. × Emergency exits. × Where it is obstructing other traffic. × Next to train tracks (no closer than 2m). × Under overhead electric/power lines where the clearance is insufficient to be safe.

Table 21 – Forklift Park Up

POST OPERATIONAL CHECKS

After you have finished using the forklift, you need to check it to make sure it is ready for the next operator. You should:

- Attach batteries to a charger if applicable.
- Ensure that you do not smoke around a charging battery – the fumes could ignite, causing an explosion or a fire.
- Always charge batteries in a well-ventilated area away from any naked flame.
- Check for any leaks.
- Check for structural damage.

If you find any fault with the forklift during the inspection:

1. Stop any operation.
2. Tag the forklift – put a danger tag on the forklift to stop anybody using it.
3. Record the problem in the logbook or on the inspection checklist. Give as much detail as possible.
4. Report the fault to an authorised person.

Figure 19 – Danger and Out of Service Tags