Legislative requirements

Hazards are all around us in a forklift operating environment. Later in this guide we will go into some of the common ones. But first lets define the word '**HAZARD**':

- **Something that may cause harm or injury**

Whenever there are hazards, we also have risks. For example, you spill some water on a kitchen floor and the floor becomes wet. The wet floor is the 'hazard'. The risk is that you may slip over and hurt yourself. This word '**RISK**' is defined as:

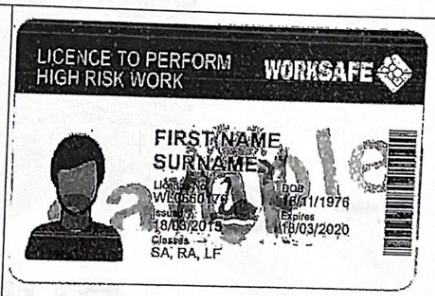
- **What could happen to you when exposed to a hazard**

When you are working in a high risk environment where forklifts are, you have a legal "DUTY OF CARE" as a worker. But what does this involve?

- **Take care of your own safety**
- **Take care of others safety**

+2

If you were to work in an unsafe manner whilst you hold a HRWL (high risk work licence) our safety regulator (Worksafe WA) could take the following actions:



- **Suspend your HRWL**
- **Cancel your HRWL**
- **Refuse to renew your HRWL**

+2

Legislative requirements (continued)

If you need sources of information relating to safety you can check any of the following documents or references:

- **Operator's manual**
- **Safety policies** +3
- **Australian standards**
- **Safe work procedures (SWP's)**
- **Job Safety Analysis (JSA'S)**
- **Safety Data Sheets (SDS)**
- **Safe work load charts (SWL charts-racking)**
- **Codes of practice**

It is up to our employer to **PROVIDE** us with everything we need to ensure we are safe and healthy at work. This includes:

- **PROVIDE a safe workplace**
- **PROVIDE safe working equipment** +3
- **PROVIDE safe working systems**
- **PROVIDE safe facilities**

So now you hold a High Risk Work Licence for a forklift (Class LF). If you get to work and are **unfamiliar with the forklift** you have been provided by your employer, they must provide:

- **Training**
- **Supervision**
- **Information** +2
- **Instructions**

Hazards – controls and planning

So we now know what a 'hazard' is. But before we start our work on the forklift we need to talk to other people in the workplace about these known hazards:

- **Supervisors**
- **Co-workers**
- **Managers**
- **First aid officers**
- **Fire wardens**
- **Truck drivers**

Communication is important with workplace personnel so everyone can be:

- **aware of hazards in the workplace**
- **able to identify hazards and controls**

Let's now think about ourselves operating a forklift in the workplace. There are so many common **HAZARDS** in a forklift operating environment. Here's some examples:

- **Powerlines**
- **People**
- **Other forklift traffic**
- **Poor lighting**
- **Poor ventilation**
- **Poor weather conditions**
- **Uneven surfaces**
- **Wet surfaces**
- **Blind corners**
- **Obstructions**
- **Slopes or ramps**
- **Overhead light fixtures**
- **Damaged racking systems**
- **Truck traffic**
- **Loading docks**
- **Excessive noise**
- **Hot or cold environments**
- **Surrounding structures**
- **Dangerous goods**

Making powerlines more visible

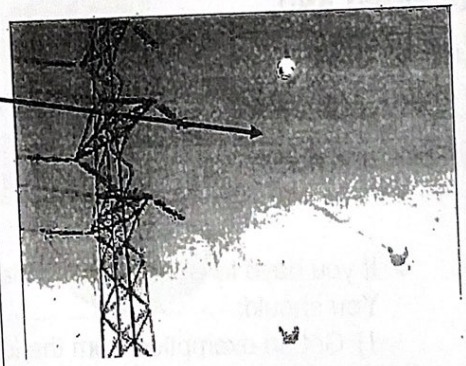
Operating a forklift around powerlines can be very risky. Especially if there is a lot of sun glare, making the powerlines harder to see clearly. There are many different types of visual indicators used to help here:

- **Tiger Tails**
(Black and yellow stripes wrapped around a powerline)

x2

- **Warning signs**

- **Powerline marker balls**
(Bright orange balls evenly placed apart on the powerline)



Operating forklifts around powerlines

Each state or territory in Australia has their own government regulations when it comes to working near power lines and there are minimum safe-working distances that apply.

Electric / Power line Type	Distance
WESTERN AUSTRALIA	
Live insulated power lines 1000V or less	**0.5m**
Live uninsulated power lines 1000V or less	**1m**
Live power lines between 1000V and 33000V (insulated or not)	**3m**
Live power lines exceeding 33000V	**6m**
NEW SOUTH WALES	
Up to and including 132kV	**3.0m**
Above 132kV up to and including 330kV	**6.0m**
Above 330kV	**8.0m**
QUEENSLAND	
Up to 132kV	**3.0m**
132Kv up to 330kV	**6.0m**
330Kv and above	**8.0m**

- If you have to work closer to the power lines than these distances You should;
  1) Get an exemption from the local power company
  2) Ask the power company to cut the power to the power lines.

Let's say you were operating the forklift near power lines but you're unsure of the voltage. The best way to find out is to:

- **Call the local power company**

If you weren't paying attention and accidently came into contact with the overhead powerlines whilst you were operating the forklift. There is a **FIVE** step procedure that must be followed **IN ORDER:**

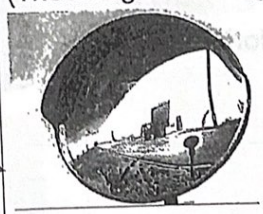
1. **Warn people to stay away**
2. **Try to break away from the powerlines**
3. **Stay in the forklift if safe. If not, exit the forklift and jump/shuffle 8m away with feet together**
4. **Report to a supervisor**
5. **Check forklift before reuse**

Hazards – controls and planning (continued)

During your day to day operations of the forklift you need to apply various **CONTROL MEASURES** to keep pedestrians or other vehicle traffic safe from your forklift operating area. These are some common examples:

- **Warning signs**
- **Barriers**
- **Walkways**
- **Flashing lights**
- **Traffic mirrors**
- *Risk controls should be applied before the job commences*

(These signs are bright yellow)

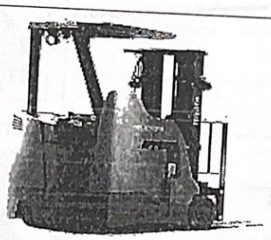
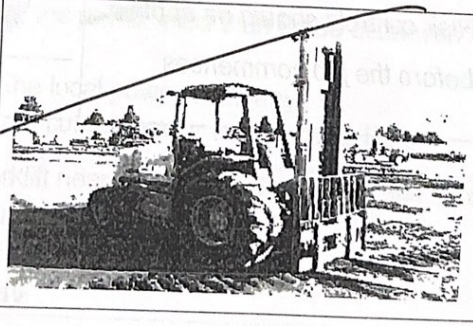


When you are operating the forklift at night or in dark areas always have:

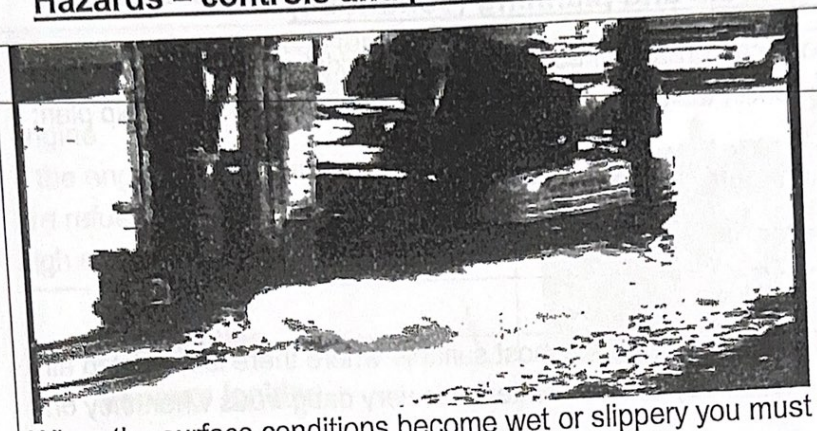
- **Adequate lighting**

Types of forklifts

Forklifts come in different types. The type of forklift you use will depend on the task at hand.

Internal combustion (LPG, diesel & petrol) forklifts: Not suitable in a space with restricted air flow because: • **Fumes can kill you** /OVERCOME (Used outdoors)	
The most suitable forklift in a confined area with limited air flow is: • **An electric forklift** (Used indoors)	
All terrain forklifts: Only forklift suitable when the ground conditions are rough and boggy. These forklifts can easily tip over due to having a higher centre of gravity.	

Hazards – controls and planning (continued)

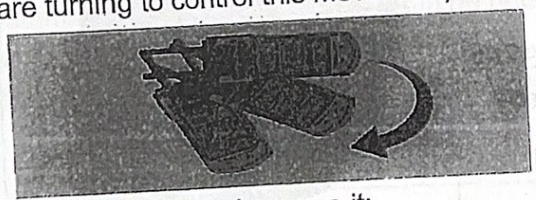


When the surface conditions become wet or slippery you must take extra caution when operating the forklift. Take certain precautions such as:

- **Slow down**
- **Brake slowly**
- **Turn slowly**
- **Avoid using ramps/slopes**

+2

Most forklift have the steering wheels at the rear. This gives the operator the ability to take tighter and sharper turns. However this creates a risk when the rear end is swinging round at about three times the speed of the forklift. This is known as 'REAR END SWING'. (Keep the front wheel close to where you are turning to control this movement)



This is dangerous because it:

- **Could hit people or objects nearby**

Hazards – controls and planning (continued)

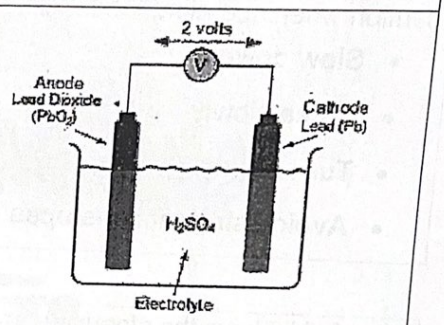
Weather conditions can greatly affect our job as a forklift operator. It's always best to plan your forklift tasks around the weather forecasts as it will help plan:

- **Helps to schedule the work tasks**
- **Helps plan for risk controls**

+1

So we now know an electric forklift is most suitable where there is restricted air flow. However the chemistry in these batteries is very dangerous when they on charge.

A wet cell battery consists of an acid solution (sulfuric acid and water). This is combined with a positive (anode) terminal and a negative (cathode) terminal, usually made up of lead and zinc plates.



When a forklift battery is on charge you are "boiling" the acid solution to generate more electricity into the battery. This process gives off a gas known as: "Hydrogen Sulphide".
THIS GAS IS EXTREMELY EXPLOSIVE!
Always keep the battery in a ventilated area, when on charge to:

- **Release <u>EXPLOSIVE GASES</u> and prevent explosions**

Refuelling the forklift

If the internal combustion forklift needs refuelling be sure to turn off the engine.
If the engine is still running whilst you are refuelling the forklift there is a high chance of the:

- **Fuel igniting** x 1
- **Vapours igniting**
- **Gases igniting**

Communications

There are dozens of ways to communicate with people in a workplace whilst you are operating the forklift such as:

- **Using the horn**
- **Verbally (face to face)** x 3
- **Hand signals**

Sometimes when you are operating the forklift co-workers need to communicate to you. The forklift can be noisy or you could be concentrating on what you are doing.
If a signal is given to you by a co-worker, that was unclear be sure to:

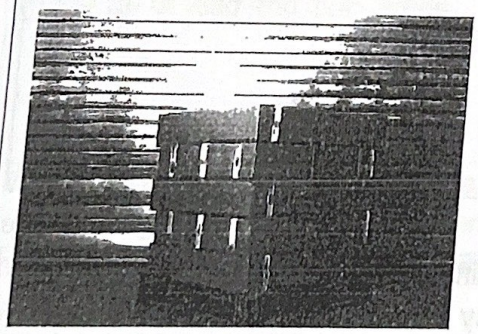
- **Stop the forklift and ask to repeat the signal**

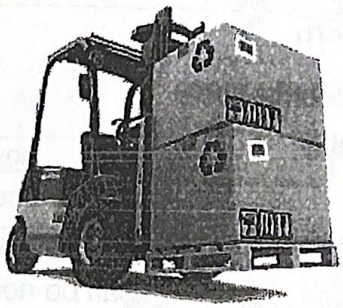
Planning your job

As a forklift operator you are going to be shifting loads around the workplace. The nature of a forklift is a "load shifting" piece of equipment. So ask yourself a series of questions like "What does my load weigh?" before you shift loads with your forklift.

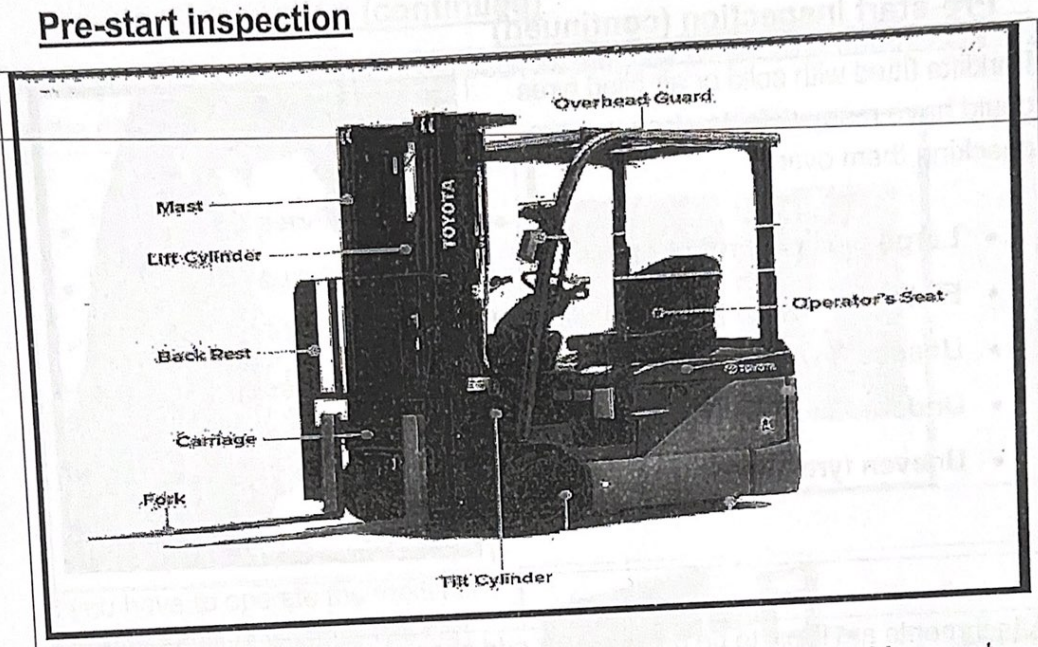
Things **OTHER THAN HAZARDS** need to be considered, before carrying out the shifting of various loads such as:

- **Load weight** (What is the load weight?)
- **Safest route to get to the load** (What is best path to get my load?)
- **Location of the load** (Where is my load located?)
- **Type of forklift** (Do I need a gas forklift? Or electric?)
- **Type of attachment** (What attachment do I need on my forks?)
- **Capacity of the forklift** (How much weight can my forklift lift?)





Pre-start inspection



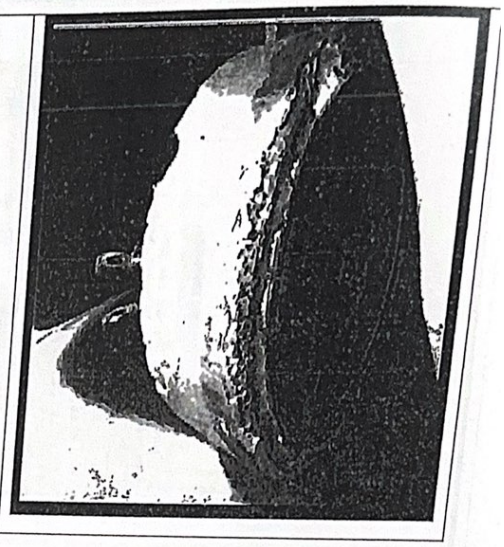
Pre-starts need to be done **BEFORE YOU TURN ON** the forklift. You must check:

- **Tyres & wheels**
- **Fluid levels**
- **Forks**
- **Mast** x6
- **Battery**
- **LPG cylinder (gas forklift)**
- **Data plate**
- **Seat**
- **Seat belt**
- **Guards (Overhead & load)**
- **Attachments**
- **Hydraulic hoses**
- **Chains**
- **Hydraulic rams**
- **Pulleys**
- **Structural damage**
- **Mirrors**
- **Carriage**

Pre-start inspection (continued)

Forklifts fitted with solid or air filled tyres could have many defects when you are checking them over:

- **Large pieces of rubber missing**
- **Flat tyres**
- **Unsecure wheels**
- **Underinflated tyres**
- **Uneven tyre tread**



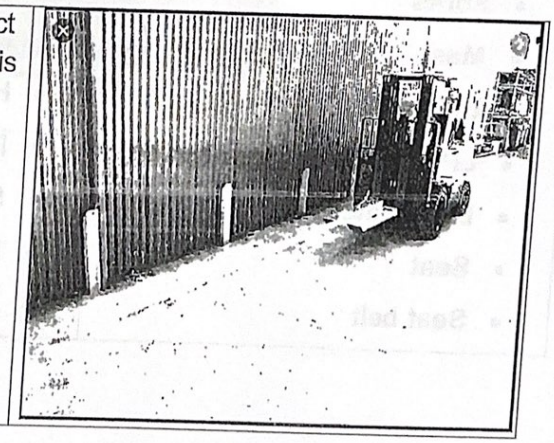
Attachments are likely to be used to shift odd shape loads such as rolls of carpet, stacks of tyres, 200L drums, engine blocks etc. If you are unsure about how to secure the attachment to your forklift, you can refer to the:

- **Operators manual** (for the attachment)

Attachments have a dramatic effect on the forklifts overall capacity. This photo is a "Carpet Spike". As you can see it is extremely long in length. This will greatly:

- **Lower the capacity**

(Due to having a greater load centre distance)



Pre-start inspection (continued)

When you find a fault on the forklift such as the data plate being unreadable or the data plate is missing;

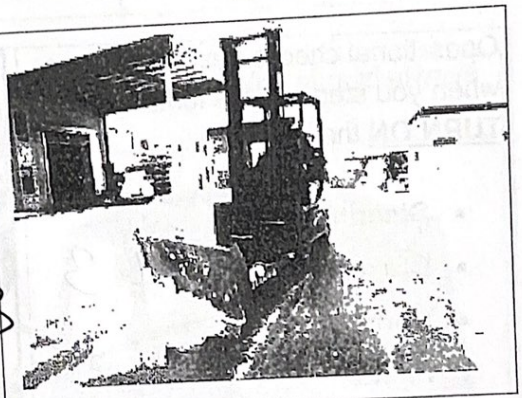
- **Tag "out of service"** →
- **Report to a supervisor**
- **Have the forklift checked and repaired before re-use**

X1

If you have to operate the forklift in different types of weather this can pose unique hazards:

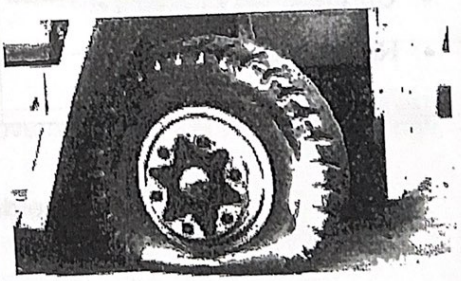
- **Wet/slippery conditions**
- **UV rays from the sun**
- **Cold/strong winds**
- **Fog limits visibility**
- **Extreme cold temperatures**

X3



Tyres on some forklifts are air-filled. It is important to ensure all tyres are at the same operating pressure:

- **To keep the forklift <u>AND</u> load stable**



Start-up operational checks

All forklifts are fitted with two guards, which have a function to protect:

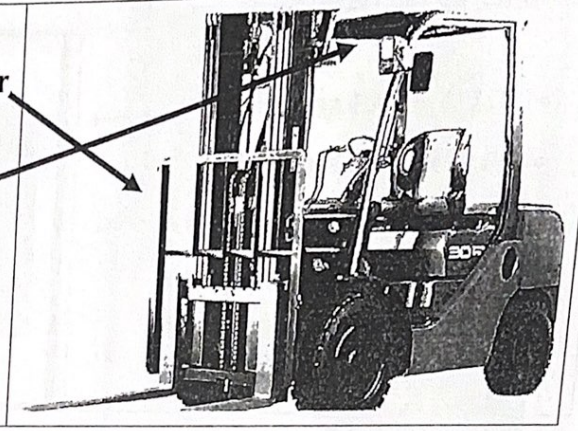
- **Load Guard**

(Protects the mast and operator from the load)

+2

- **Overhead Guard**

(Protects the operators head from falling objects)



Operational checks need to be done when you step into the forklift and **TURN ON** the ignition:

- **Steering**
- **Brakes**
- **Horn**
- **Lights**
- **Hydraulic levers**
- **Gauges**
- **Reverse beeper**

+3

General operations

Before you insert the forks into the load you need to work out its weight. The following ways can be used to work out the weight of the load:

- **Checking weighbridge documents**
- **Calculating the weight**
- **Checking the load for labels**
- **Weighing the load**
- **Checking the inventory system**

x3

A load can often obstruct your view due to it being too tall. You should always do these things when your view is obstructed:

- **Travel in reverse**
- **Use a spotter**

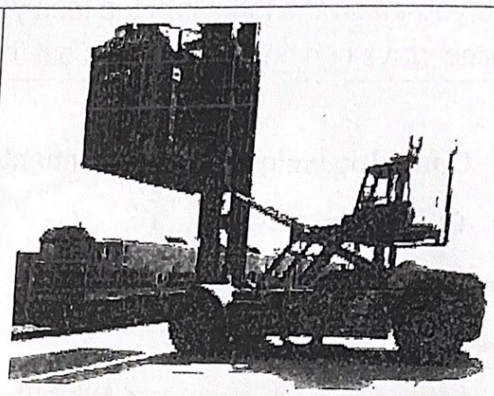
While you are travelling with a load its movement needs to be **MONITORED**:

- **To keep the forklift AND load stable**

General operations (continued)

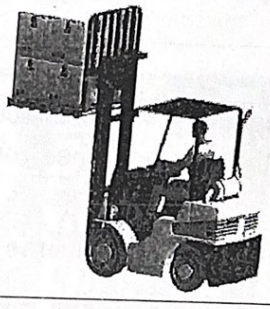
In very rare circumstances you are permitted to carry passengers on the forklift. Some sea container forklifts, like the one pictured are permitted to carry people. The only time it is allowed is:

- **When it's designed to**



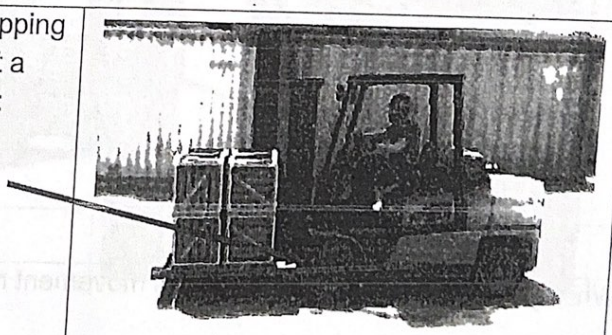
Whenever you travel with the load NEVER have it raised too high. This creates a high risk that the:

- **Forklift could tip over**



To prevent the forklift from tipping over always keep the load at a "safe height" when travelling:

- **At axle height**
  OR
- **As low as possible**

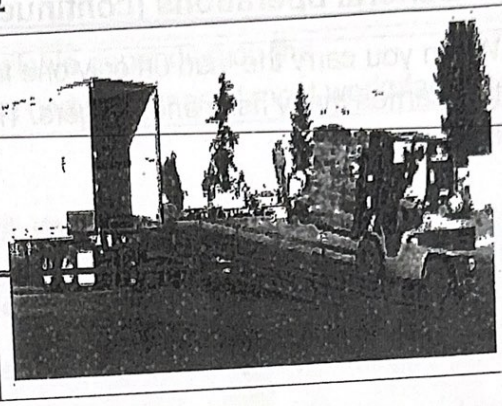


General operations (continued)

Forklifts carrying a load can travel up or down ramps.

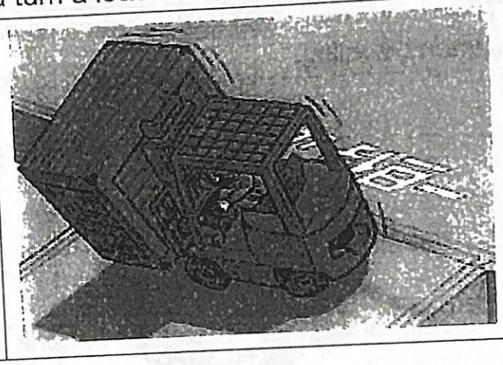
Always be sure to face the load:

- **Up the ramp**



Travelling with a load on ramps or sloping surfaces is very dangerous if you are not facing the ramps squarely. If you turn a loaded forklift on a ramp:

- **You could lose the load**
- **You could tip the forklift**



Operating a forklift whilst carrying a load poses a high risk to people below the load. If you raise or lower the load over people there is a:

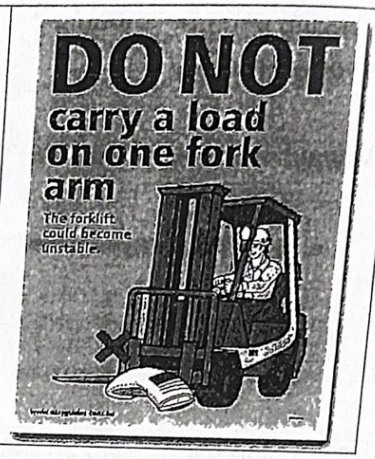
- **Risk of injury or death if load falls**

General operations (continued)

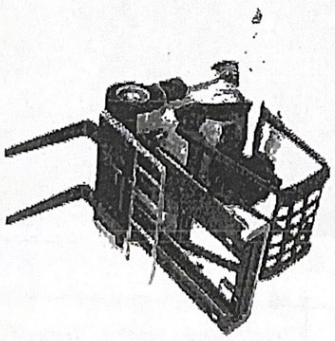
When you carry the load on only one fork arm this carries many risks and dangers. The most obvious ones are:

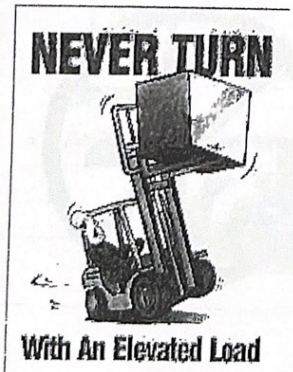
- **Tipping the load**
- **Tipping the forklift**
- **Damaging the forklift**

+ 2



There are many **ACTIONS** that could cause the forklift to tip over **SIDEWAYS** when travelling:



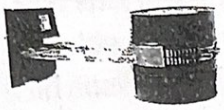
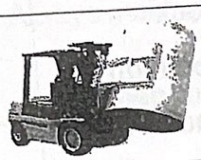
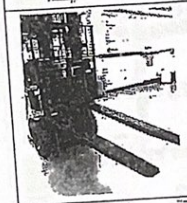
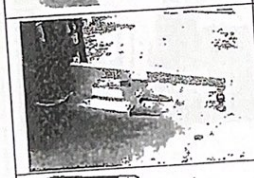
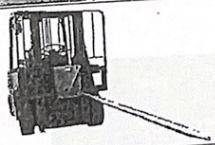
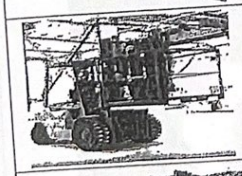
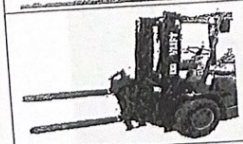


- **TURNING too fast**
- **TURNING on ramps**
- **TURNING with a load too high**
- **TURNING off loading docks**
- **TURNING on uneven surfaces**
- **Carrying the load on one fork**
- **Uneven tyres**
- **Side shift not in centre**

+3

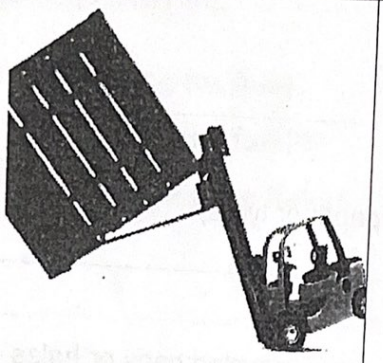
Attachments

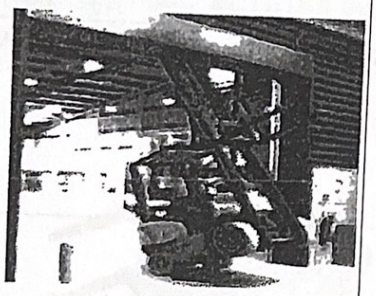
There are a multitude of attachments available depending on the characteristics of the load. Here are some common ones at most workplaces:

	• **Drum CLAMP** (Used to pick up 200L drums)
	• **Paper Roll CLAMP** (Used to clamp large rolls of paper or tyres)
	• **Bale CLAMP** (Used to pick up crushed stacks of recycled cans or bales of hay)
	• **Fork extensions (Slippers)** (Used to pick up two loads at once or a load longer in length)
	• **Jib** (Used to swing odd shaped loads such as engine blocks or gearboxes)
	• **Carpet Spikes** (Used to pick up large rolls of carpet or artificial turf)
	• **Personnel Work Platforms** (Used to elevate people to perform maintenance or count stock)
	• **Rotators** (Used to rotate loads like a bin full of grapes into a wine hopper)

Actions to tip the forklift over forwards

There are many ACTIONS that could cause the forklift to tip over **FORWARDS** when travelling





- **DRIVING** overloaded +3
- **DRIVING** off a loading dock
- **DRIVING** with the load too high
- **DRIVING** into an overhead obstacle
- **DRIVING** too fast
- **DRIVING** with load facing forwards down slopes
- Having too much forward tilt with the load raised
- Having the load too far forward on the forks
- Braking severely

Defects or damage

A forklift should be checked for defects or damage:

- At the start of the shift
- After a collision or accident
- The forklift is making an abnormal noise

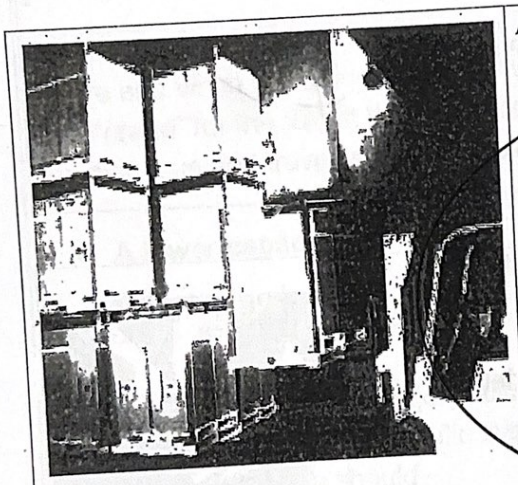
General operations (continued)

Most modern forklifts are equipped with a third hydraulic lever which makes the load guard shift left and right. This is commonly referred to as the:

"Side shift function"

This side shift function gives the operator the ability to square up a load or butt it up against an adjacent load next to it. But does carry some risks when using it. Always make sure to "centralise" the side shift when carrying a load:

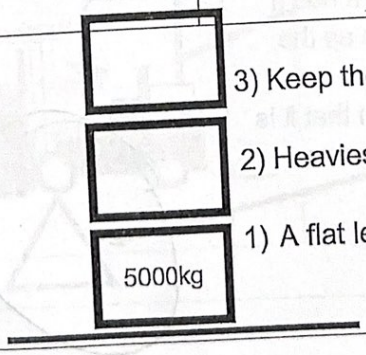
- **To keep the forklift AND load stable**



A common task that you may need to do as a forklift operator is stack loads on top of each other. Always plan for these **THREE** things when stacking the loads up on top of each other:

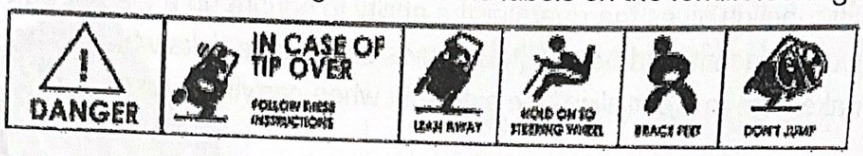
1. **A flat level surface**
2. **Heaviest goods on the bottom**
3. **Keep the stack stable**

The diagram below explains this process



General operations (continued)

If you were to turn around a corner too fast there is a high chance that your forklift could tip over sideways. It is very important to look out for your own safety if this is happening. You will find labels on the forklift looking like this:



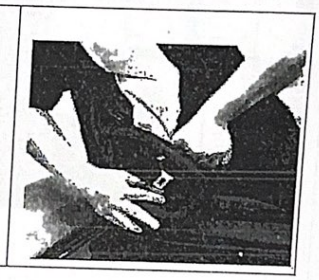
If your forklift is tipping over sideways, you must always do the following to protect yourself from being crushed by the forklift:

- **Stay in the forklift** (NEVER JUMP OUT!)
- **Brace yourself**
- **Lean away from tipping side**

+2

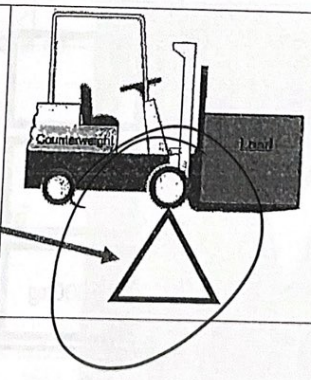
Most forklifts are equipped with a seat belt. The function of the seatbelt is:

- **To stop you falling out in an accident**

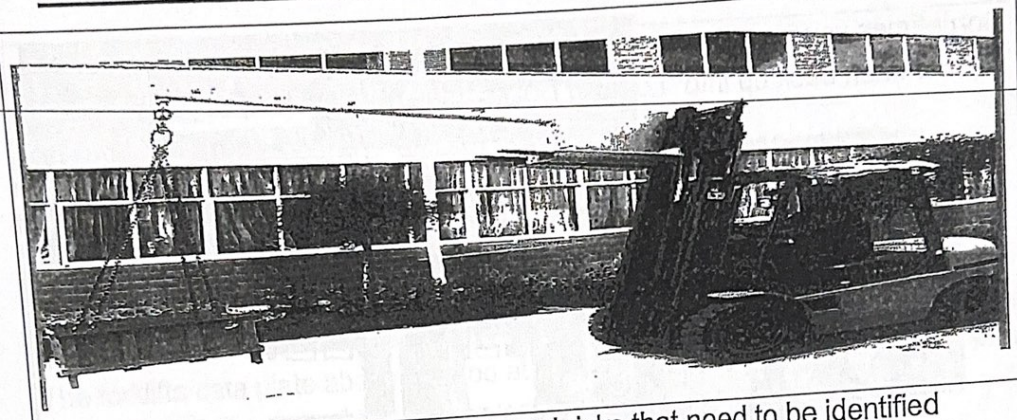


Every counter-balance forklift has a balance point. Its referred to as the "FULCRUM"
You can see on this diagram that it is indicated using a **triangle** under:

- The front tyres touching the ground



General operations (continued)



Jib attachments pose certain hazards and risks that need to be identified before and when operating the forklift with them attached. Because a jib acts as a "crane" for the forklift there can be a lot more movement of the load when you pick it up and travel with it. This can cause:

- **A lower capacity**
- **A Swinging load**

X 1

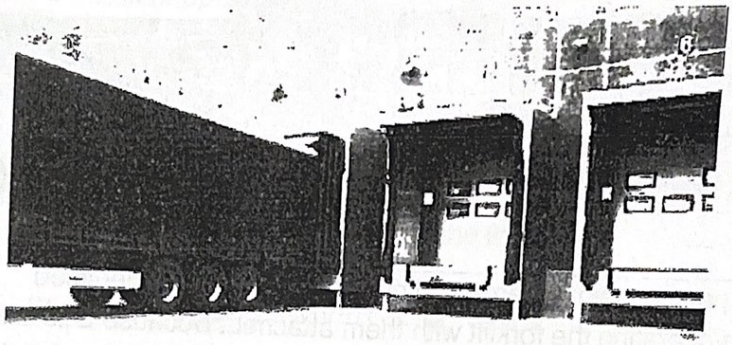
If you had a catastrophic (major) failure to your brakes, steering or hydraulic systems during operations you should -

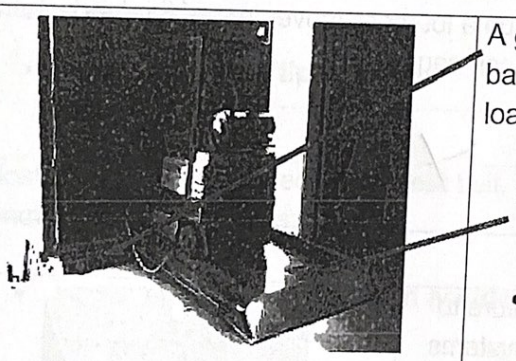
- **Stop the forklift if possible**
- **Tag "out of service"**
- **Report to a supervisor**

X 2

Loading Docks

Sometimes you need to unload goods by driving directly into a sea container. Trucks often back up into "Loading Docks" (see photo below)





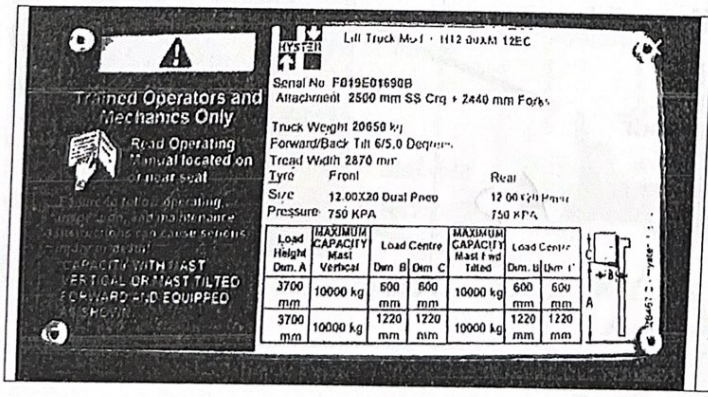
A gap is then created between the back of the truck and the front of the loading dock. You must place either:

- **Dock Plates**

  OR

- **Bridge Plates**

Across this gap before shifting a load.

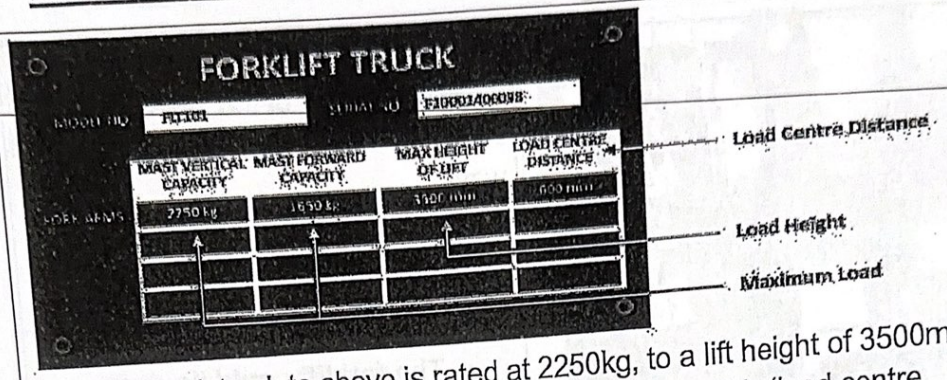


This is an example of the forklifts:

- **Data plate**

It is where you will find the forklifts rated capacity. (10000kg on this forklift)

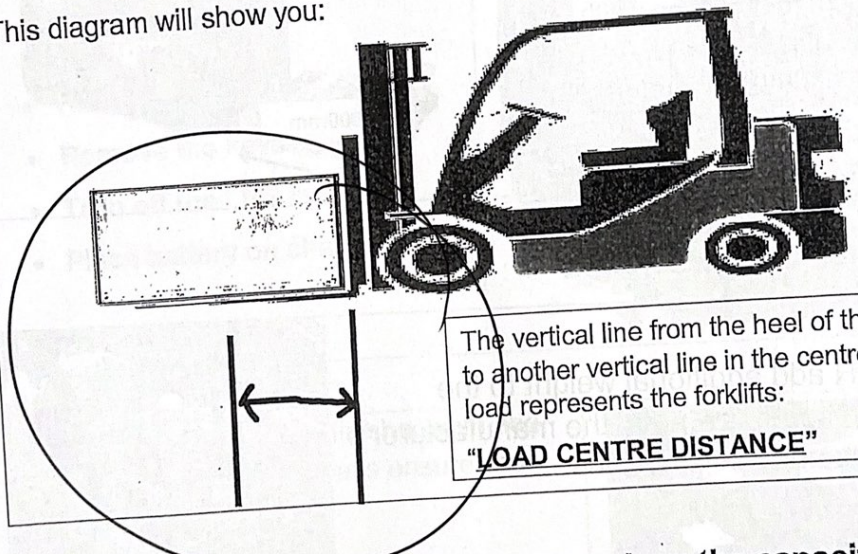
Load centres



The forklifts data plate above is rated at 2250kg, to a lift height of 3500mm with a load centre distance of 600mm (or less). What does this 'load centre distance' mean?
The manufacturer measures this distance:

- **From the vertical face (heel) of the forks to the loads centre of gravity**

This diagram will show you:



The vertical line from the heel of the forks to another vertical line in the centre of the load represents the forklifts:

"LOAD CENTRE DISTANCE"

- **Increasing the load centre will reduce the capacity of the forklift.**

Load centres (continued)

This photo has a load that is **NOT** against the heel of the forks. The **FORKLIFT** will be effected in two ways:

- **A lower capacity**

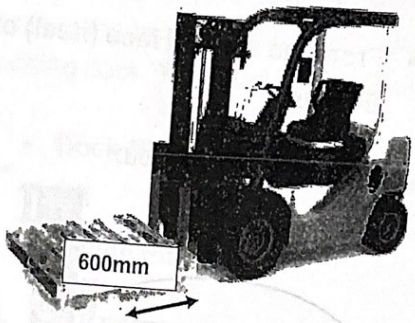
  OR

- **The forklift could tip over**

Most forklifts in Australia are rated at a load centre distance of:

- **600mm**

This comes from half the width of a standard pallet.
(1200mm x 1200mm - Length X Width)

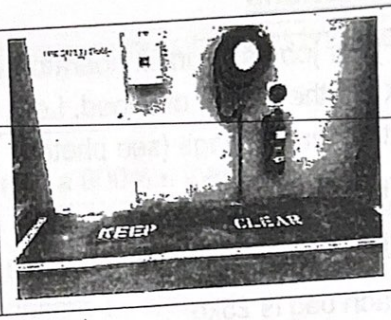


Additional forklift weight

! NEVER add additional weight to the forklift without referring to the manufacturer's guidelines and specifications.

Shut down

There are many places in a workplace that a forklift should **NOT** be parked in. Here are some examples:



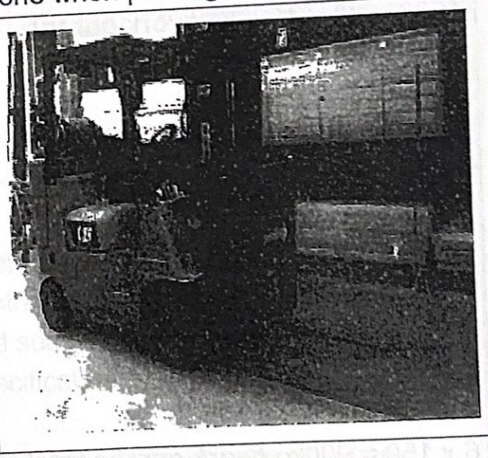
- **Near first aid stations**
- **Near emergency exits**
- **Near fire extinguishers**
- **On ramps**
- **On walkways**

x3

There are several steps that need to be done when parking a forklift:

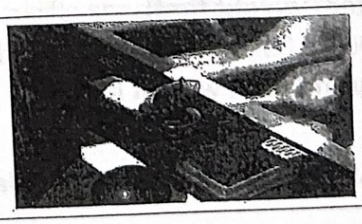
- **Tilt forks forward and lower to the ground**
- **Neutral gear**
- **Hand brake on**
- **Remove the keys**
- **Turn off the LPG cylinder**
- **Place battery on charge**

x3



When the forklift has been finished with and you park up for the day always ensure you remove the key:

- **To prevent unauthorised use**



Calculations

Part of your job as a forklift operator is too do some basic maths calculations to work out the weight of a load. Let's do some examples:

A pallet of cement bags (see photo):

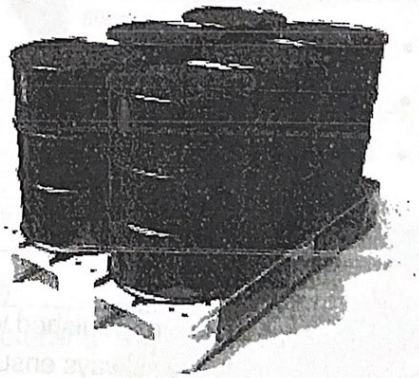
- Five bags to a layer
- Eight layers on the pallet
- Each bag is 25kg
- The pallet weighs 30kg

5 x 8 = 40bags **(work out the total items first)**
40 x 25 = 1000kg **(work out the total item weight next)**
1000 + 30 = 1030kg **(work out the grand total weight last)**

Always show all your calculations

A pallet of drums (see photo):

- Six drums on the pallet
- Each drum weighs 150kg
- The pallet is 35kg



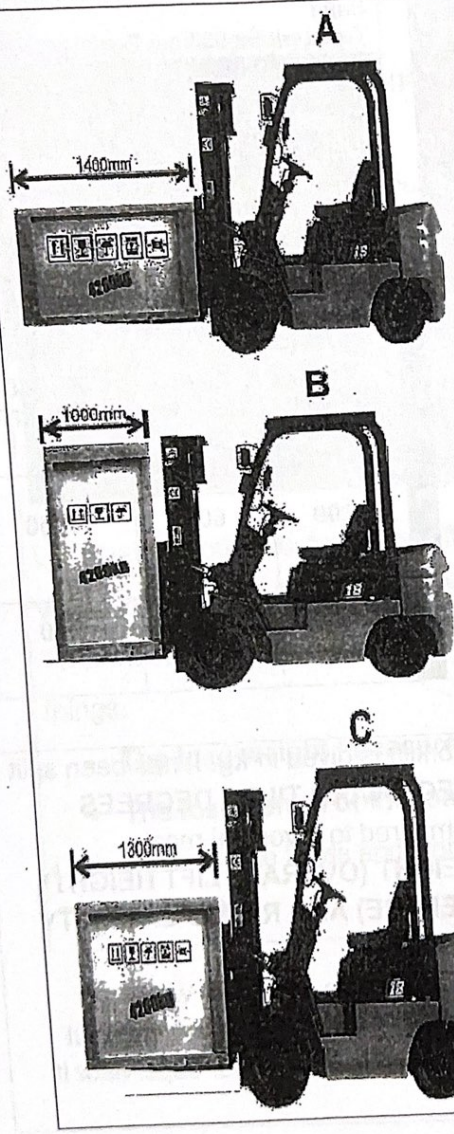
6 x 150 = 900kg **(work out the total item weight first)**
900 + 35 = 935kg **(work out the grand total weight last)**

Always show all your calculations

Load centre distances

Let's briefly go back to load centre distances to work out how to find the load centre of any given load.

- The forklift below is rated at 4200kg at a 600mm load centre



To work out the load centre distance of each of the loads is a simple maths equation:

Load width(or length) divided by 2 = Load Centre Distance

Load A: $\frac{1400}{2}$ = 700mm load centre

Load B: $\frac{1000}{2}$ = 500mm load centre

Load C: $\frac{1300}{2}$ = 650mm load centre

Then you check each calculated load centre against your forklifts load centre and see which one is within the specifications.

In this case Load B is the only one within this forklifts specifications as its load centre is 500mm.

Data plates

FORKLIFT DATA PLATE (example only)

MODEL	SERIAL NO	MAX HEIGHT	MAX FWD TILT
J2.0 XYZ	ACLF-20	4200mm	5 DEGREES

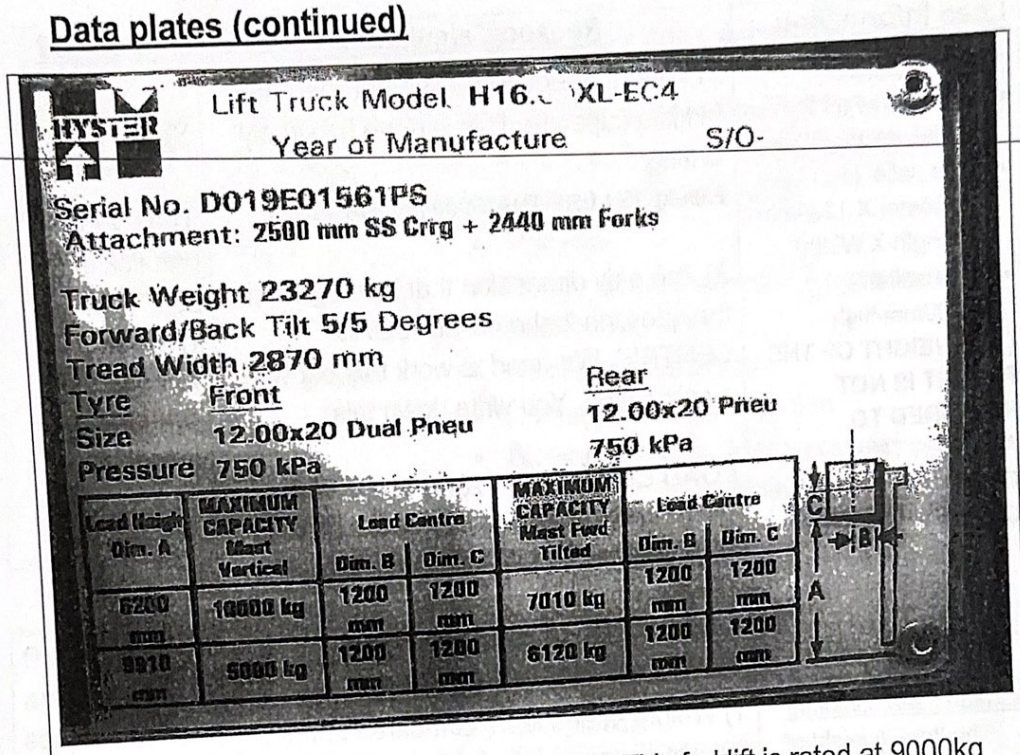
Tyre Front Rear
Size: 200/50-10 Solid 15x4.5-8/3.0 Solid
Tread width: 908mm Pressure: N/A

TRUCK WEIGHT 5050 kg
FUEL TYPE: LPG

MAST VERTICAL				MAST FORWARD TILT 5 DEGREES		
ATTACHMENT TYPE	FORK HEIGHT mm	LOAD CENTRE mm	RATED CAPACITY kg	FORK HEIGHT mm	LOAD CENTRE mm	RATED CAPACITY kg
1070mm Forks and Side shift	4200	600	2500	4200	600	2050
3000mm Carpet Spike	4200	1800	1000	4200	1400	750

In this example of a data plate the capacity of the forklift is given in **kg.** It has been split into **two** sections; **MAST VERTICAL AND MAST FORWARD TILT 5 DEGREES**
The capacity will change with a forward tilt mast compared to a vertical mast.
The **three** columns on each section give; **FORK HEIGHT (OVERALL LIFT HEIGHT), LOAD CENTRE (HEEL OF FORKS TO LOADS CENTRE) AND RATED CAPACITY (OVERALL WEIGHT THAT CAN BE LIFTED SAFELY)**
It is important that you understand how to read a data plate so you know what your forklift is capable of. Each manufacturer will use a similar layout to this example, but some manufacturers lay out their data plates differently Always ask your supervisor if you are unsure how to read the forklift data plate

Data plates (continued)



Let's have another look at a forklift data plate. This forklift is rated at 9000kg with a load centre distance of 1200mm (Dim. B) at a lift height of 9910mm.

To work out whether a load can be lifted by the forklift, you must look at **TWO** things.

- **The load weight (measured in kg), AND**
- **The load centre of the load (measured in mm)**

Let's look at some loads and work out if this forklift can lift them of not. **(TURN TO PAGE 34)**

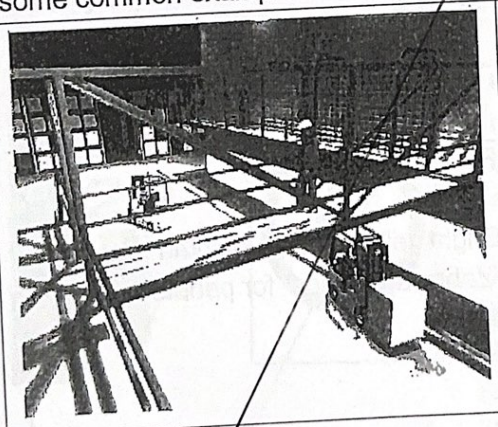
Load Information	Reason/Calculations	Yes or No?
A pallet of bags • The bags and the pallet weigh 2500kg • The pallet is 1200mm X 1200mm (Length X Width) • ~~The pallet is 1400mm high~~ **(THE HEIGHT OF THE PALLET IS NOT REQUIRED TO ANSWER THIS QUESTION, SO CROSS THIS OUT)**	1) Weight needs to be compared to the forklifts capacity. This is done by simply writing: **2500kg IS LESS THAN 9000kg CAPACITY** 2) The only dimension that is not given in the question is the pallets 'LOAD CENTRE'. We need to work this out with a calculation. You write down this: **LOAD CENTRE IS 1200/2 = 600mm,** Then make a comparison to the forklifts load centre distance rating, so write this down: **LOAD CENTRE IS LESS THAN FORKLIFT RATING (1200mm)**	**Yes!** *Then you can tick the box "YES" to answer the second part of the question*
A loaded sea container • The 'tare' (weight of the empty sea container) weight of the sea container is 5000kg • The load to be placed into the sea container is 7000kg • ~~The sea container is 6m X 2.4m X 2.2m (Length X Width X Height)~~ **(THE DIMENSIONS OF THE SEA CONTAINER ARE NOT REQUIRED TO ANSWER THIS QUESTION, SO CROSS THEM OUT)**	1) Weight needs to be compared to the forklifts capacity. We don't know the total weight of the loaded sea container yet. So we need to start with a calculation. So write down this: **5000 + 7000 = 12000kg** We can clearly see this total weight is over the forklifts maximum capacity, therefore we write down: **ABOVE 9000kg CAPACITY**	**No!** Then you can tick the box "NO" to answer the second part of the question

Other information (FOR HELP WITH STUDENT WORKBOOK)

An operator needs to be aware that most forklifts are designed for hard flat surfaces such as hard bitumen or flat concrete surfaces. The following surfaces should be avoided at all times when operating any type of forklift:

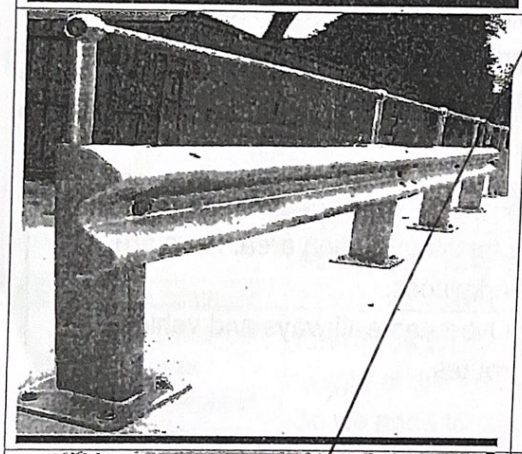
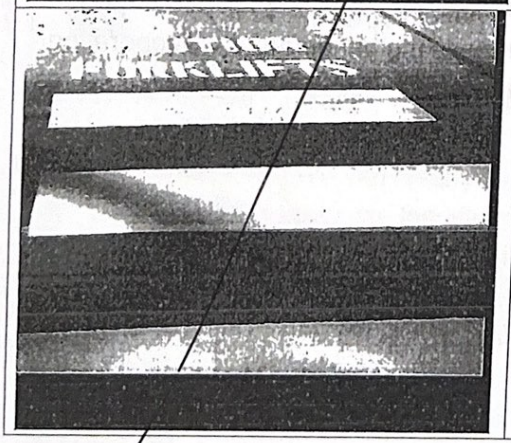
- Backfilled ground
- Damaged cracked concrete
- Trench covers or grates
- Soft soils
- Railway tracks
- Potholes
- Rough uneven surfaces (rough terrain trucks okay here)
- Hard compacted soil
- Damaged cracked bitumen
- Sloping surfaces (High reach truck forklifts are not suitable due to being top heavy)

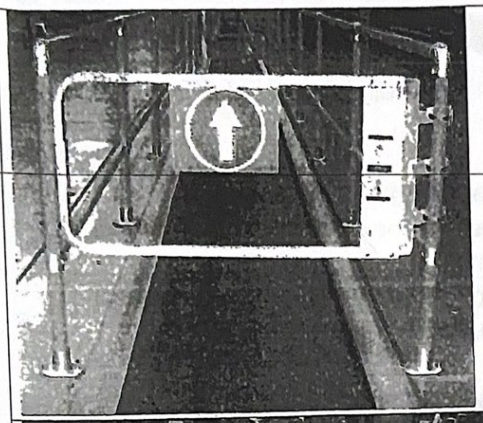
Pedestrians are most at risk when it comes to the forklift operating area. There are many ways to separate them from the forklift operation area. Here are some common examples used in many workplaces:



Overhead walkways and vehicle routes.

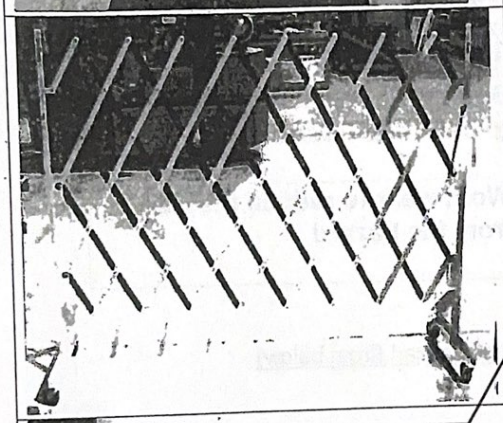
These are used to suspend people above the dangerous forklift operating area.

	Designated walkways and parking areas. Usually bright yellow stripes painted across the floor, with a "foot" symbol painted at intervals to indicate pedestrian walking area only.
	High impact barriers Strong galvanised steel barriers, able to withstand a larger impact.
	Pedestrian crossings Bright yellow stripes painted like "Zebra Crossings" for people to walk over.



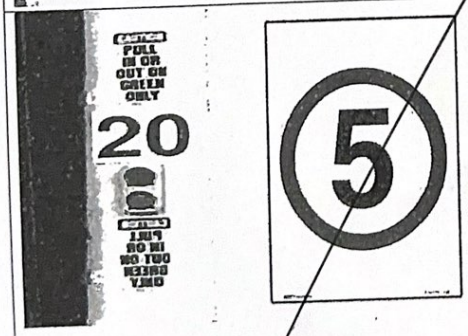
Gates and bollards (or guardrails)

The bollards are usually bright yellow so they stand out clearly. The gates have spring hinges so they close automatically behind the passing pedestrian.



Temporary barriers

Simple, but effective barriers bright yellow in colour, that can erected quickly and moved around if needed.



Flashing lights and signs – for example "Keep to a speed limit of 5km/h at all times", "No pedestrian access", and "Forklift in Use."

Flashing lights are usually found on the back of loading docks to indicate to a forklift driver that a truck is now safe to unload or load.
Speed limit signs are white, red and black.

HIERARCHY OF CONTROL

1. Elimination	Completely remove the hazard
2. Substitution	Swap a dangerous work method or object for something safer
3. Isolation	Isolate or restrict access to the hazard
4. Engineering	Design something or use equipment or machinery to make something safer
5. Administration	Site rules, policies, or signage to control a hazard
6. PPE	Work-wear to reduce the risk from the hazard

- What are the 3 steps when preparing to lift a load (from below)

1. _____
2. _____
3. _____

- Number all the load-lifting steps in order (1-7)

LEVEL FORKS ___
LOOK OVER SHOULDERS ___
TILT BACK ___
STOP 1 METRE ___
NEUTRAL ___
LIFT IN NEUTRAL ___
REVERSE AND WATCH LOAD ___