

# **Forklift Operator**

## **Best Practice Guide**



**Forklift Training Centre**

**Lifting the Standards**

**FORWARD >>>>>>>>>>**

This booklet **is not** a prime reference for forklift training but rather a document that provides employers, business owners, forklift operators and industry trainers with basic information about common dangers associated with forklift operations, and ways to make workplaces safer.

Whilst every effort has been made to ensure its accuracy, the contents of this booklet do not constitute legal advice and should not be relied on as such.

This booklet does not over-ride legislation governing the operation of forklifts.

No liability is assumed by FTC South (NZ) Ltd for any losses by any person relying directly or indirectly on the contents of this booklet. If the user of this booklet is unsure whether the material is correct, they should refer to the relevant legislation or the manufactures operating manual.

A forklift operator course conducted by FTC South (NZ) Ltd satisfies the requirements of the “Approved Code of Practice for Training Operators and Instructors of Powered Industrial Lift Trucks (Forklifts)”.

The main aim of the forklift operator’s course is to improve and develop operators operating techniques and to make them more aware of the safety and mechanical implications of their operating methods.

FTC South (NZ) Ltd acknowledges the assistance of the Ministry of Business, Innovation and Employment (MBIE) and the New Zealand Transport Agency (NZTA) in the preparation of this handbook.

**Please note It is required that forklift operator retraining is to be undertaken every three years.**



Maurice Ridler  
Diploma Adult Education  
Director  
FTC South NZ Ltd

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## LEGISLATION and CODES

**The Health and Safety at Work Act 2015 (HSWA)** contains the New Zealand's workplace health and safety law. HSWA sets out the principles, duties and rights in relation to workplace health and safety.

**The Forklift Safety Standard (NZS/ANSI/ITSDF B56.1.2005)** contains the safety standards for low and high lift trucks.

**The Powered Industrial Trucks General Requirements (NZS/AS2395.1.1995)** contains the requirement for the design, manufacturing, marking and testing of powered industrial lift trucks and their attachments.

**The Land Transport (Road User) Rule 2004** contains the regulations for driving a forklift on a road.

**The Road Code** is a 'plain english' interpretation of the Land Transport (Road User) Rule 2004.

**The Land Transport (Driver Licensing) Rule 1999** contains the licence and endorsement requirements for a driver wanting to drive a forklift on a road.

**The Land Transport (Driver Licensing) Amendment Rules** contains updated information to the Land Transport (Driver Licensing) Rule 1999.

**The Truck Loading Code** contains the requirements for safety of loads on vehicles.

**The Safety Code for Forklift Truck Operators No 1, Front Loading Forklift Trucks** contains the requirements for safe operation of forklifts.

**The Approved Code of Practice for Training Operators and Instructors of Powered Industrial Lift Trucks** contains the requirements for training operators of forklifts.

## NZ TRANSPORT AGENCY

### GENERAL

If a forklift is, at any time driven on a road, it has to be registered as a vehicle like other road vehicles and the driver/operator must satisfy two legal requirements:

- Be a licensed driver.
- Have an endorsement known as "endorsement F" on his/her drivers licence. (see driver licence requirements)

To obtain an endorsement F, you are required to pass a prescribed course (by an approved course provider) comprising NZQA unit standard 18496 "demonstrate knowledge and skills for driving a forklift on a road for endorsement F (forklifts)".

Candidates who show competency in this unit standard will receive a NZ Transport Agency certificate which is to be presented to a licence issuing agent (within 60 days of the date of issue) to have their current NZ drivers licence endorsed.

### DRIVER LICENCE REQUIREMENTS

DLAR 1 June 2006

If you want to drive a forklift on a road and it has a gross laden weight (GLW) of **no more** than 18,000kg then you need to have a full NZ Class 1 Driver Licence and F Endorsement.

If you want to drive a forklift on a road and it has a gross laden weight (GLW) of **more than** 18,000kg then you need to have, at least, a full NZ Class 2 Driver Licence and F Endorsement.

### ROAD DEFINED

The definition of a road includes:

- Streets, motor ways, beaches.
- Place's to which the public have access, whether as of right or not.
- All bridges, culverts, ferries and fords forming part of a road or street or motorway.
- All sites at which vehicles may be weighed for the purpose of the act.

A road is essentially an area principally used for vehicles or pedestrian traffic, which the general public uses as thoroughfares to gain access to another place. In practice this will generally be areas and thoroughfares that the general public use and expect to be able to use such as a road, street or supermarket car parks.

Access may be restricted by many devices including any or all of the following:

- Physical barriers.
- Security checks.
- Signs limiting ‘that’ may enter or a condition under which access is permitted.

## LOADING VEHICLES

General factors affecting the safe loading and unloading of vehicles on a road are:

- Other road users.
- Weather conditions.
- Light conditions.
- Road conditions.
- Forklift condition. (road safe)

## PARKING ON A ROAD

When parking a forklift on a road, the parking drill does not differ to that when parking in general; however the following considerations should be taken:

- Alternative fuel valves are closed. (if fitted)
- Battery master switch turned off. (if fitted)
- Key removed and forklift secured.
- Do not park a forklift on an incline, ramp, hill or slope.

## FORKLIFT DOCUMENTATION

To legally drive on a forklift on a road, the following documentation must be displayed:

- Registration plate. (rego)
- Licence label.
- Warrant of fitness. (WoF)

## DIMENSIONS AND WEIGHTS (forklifts with rigid suspension and single solid tyres on its axles)

The maximum specifications allowed before a permitted is need are:

- Height 4.25m or any lesser height. (to clear any construction or wire legally over the road)
- Width 2.5m or 1.25m from the longitudinal centre line of the vehicle.
- Side overhang 200mm either side of the forklift.
- Front overhang 3m from the front edge of the driver’s seat to the end of the load.
- Front axle weight 6000kg single tyres.
- Front axle weight 8200kg twin tyres.

## REDUCE THE RISK

To reduce the risk when loading and unloading vehicles consider the following:

- Ensure all vehicles are parked on flat ground.
- Place cones or temporary signs out if required.
- Ensure vehicle driver remains in a safe and visible position.
- Have another person help with traffic control.
- Wear hi-viz clothing.



## FORKLIFT STABILITY

### GENERAL

An un-loaded (un-laded) forklift is less stable laterally than a loaded (laden) forklift and can be easily overturned when cornering. While the risk of overturning can be reduced the fact remains that there is always the potential for a forklift to overturn.

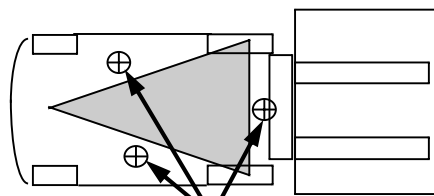
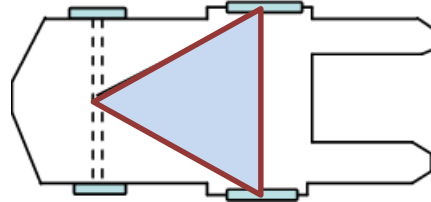
Consequently it is imperative that seat belts (operator restraints) are used to minimise the likelihood and severity of injuries should an overturn occur. To reduce the risk associated with over turning and tipping it is necessary to ensure forklift load data information provides operators with comprehensive information on safe load capacities at all mast heights and tilt angles. Many rollovers involve un-loaded forklifts.

## STABILITY ZONE

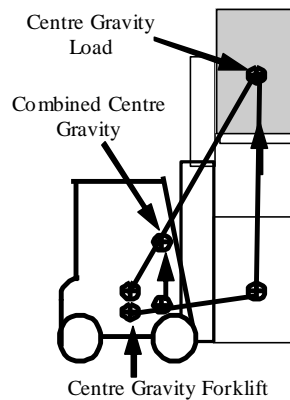
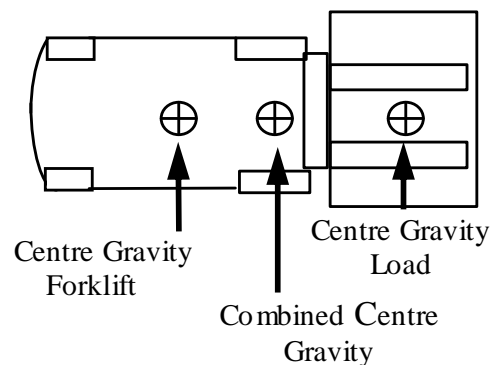
Forklifts are designed on the principle of the 'see-saw' and the stability of the forklift is determined by the location of the centre of gravity. (or if the forklift is loaded, the combined centre of gravity)

In order for the forklift to be stable during operation, the centre of gravity must stay within the area of the forklifts stability zone.

This zone is an imaginary triangle drawn between the centre of the two front wheels and the centre of the rear axle.



Forklift May Tip Over



## CENTRE OF GRAVITY

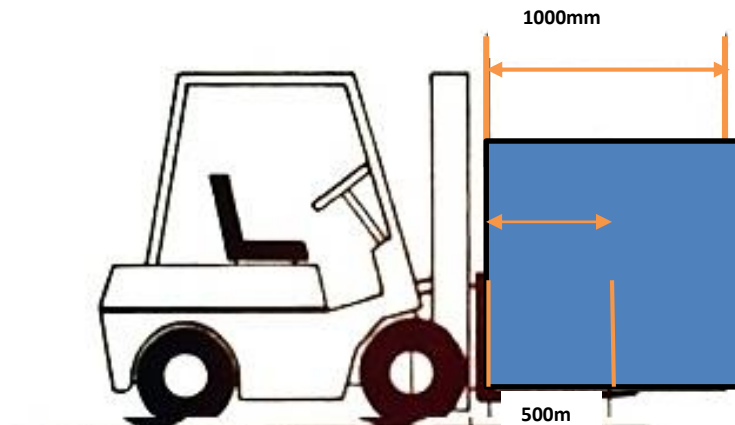
The forklift has moving parts and therefore also has a centre of gravity that moves. This centre of gravity moves forward and rearward as the mast is tilted forward and rearwards. The centre of gravity also moves up or down as the forks move up or down. The stability of a forklift can be affected by such factors as:

- Size, weight and position of load.
- The height the load is to be lifted to.
- Forward and rearward tilt.
- Inertia and centrifugal forces.
- Operating surfaces.
- Exceeding the rated capacity.

If the centre of gravity moves outside of the forklifts stability triangle this could cause the forklift to tip/turn over.

## LOAD CENTRE

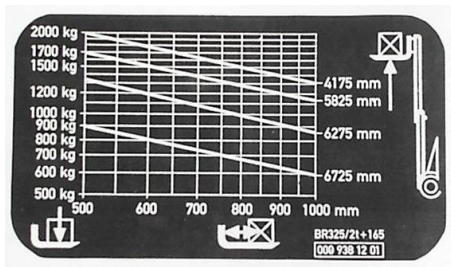
A load centre distance is the measurement from the front face of the forks/backrest to the centre of the load.



If the load on the forks (as shown above) was 1000mm long, then the load centre measurement would be 500mm.

## LOAD CAPACITY PLATE

By law the forklift must have a readable load capacity plate. This plate should be situated inside the cab of the forklift and ideally on the dash board, not beside the seat. The forklifts' **rated** capacity can be found on the plate.



**WARNING** IMPROPER OPERATION OR MAINTENANCE  
COULD RESULT IN INJURY OR DEATH

MODEL: [ ] SERIAL No. 3731000000  
TYPE: [ ] TRUCK WT. 3,650 lbs  
CAPACITY OF STANDARD TRUCK WITH SIMPLEX MAST  
AND FORKS: 5,000  
MAXIMUM HEIGHT of 130 IN. RATED CAPACITY WITH  
OPTIONAL MAST AND/OR ATTACHMENT LISTED BELOW.

MAST: VERTICAL	A		B		FORKS ONLY		ATTACH	
	in	mm	in	mm	lbs	kg	lbs	kg
24"	156	3972	24	610			4,500	2,045

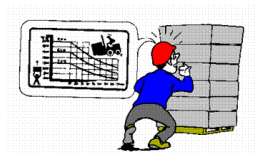
ATTACHMENT: Sideshifter  
MEETS DESIGN SPECS ANSI B16.1

The load capacity plate (sometimes referred to as a load chart) is the means by which the operator can determine what weight the forklift can safely lift, to what height, given what load centre

Load Centre's greater than specified on the capacity plate may be used if the weight of the load is decreased proportionately.

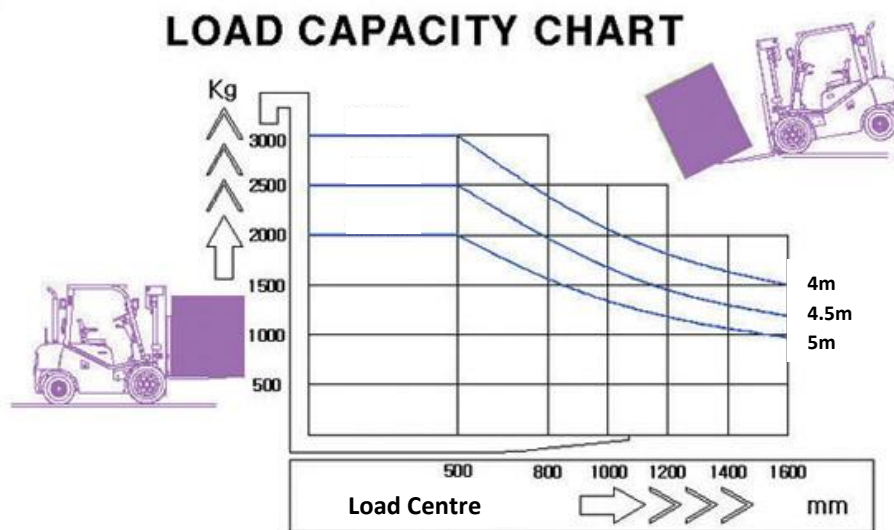
If the load is not uniform then the heaviest portion should be placed closer to the backrest, for stability, and centred on the forks.

Handle only loads within the rated capacity of your forklift as shown on the forklifts capacity plate.



Shown below is a typical load chart for a 3000kg (3 tonne) rated capacity forklift. The chart is made up of three basic components.

- Far left side of chart: = Weight's in kilograms (Kg).
- Along the bottom of chart: = Load centres in millimetre's (mm).
- Far right side of chart: = Lift height in meters (m).



The load chart above tells us that this forklift can lift approximately:

- **3000**kg to a height of **4**m at a standard load centre of **500**mm.
- **2500**kg to a height of **4.5**m at a standard load centre of **500**mm.
- **2000**kg to a height of **5**m at a standard load centre of **500**mm.

The load chart above also tells us that the forklift can lift approx:

- **1500**kg to a height of **4**m on an extended load centre of **1600**mm.
- **1100**kg to a height of **4.5**m on an extended load centre of **1600**mm.
- **1000**kg to a height of **5**m on an extended load centre of **1600**mm.

## WEIGHT RATIOS

Forklifts are engineered to handle specific load sizes and weights within a specific work area. Operators should be aware of the weight ratios of a forklift in case they are required to operate their forklift in a weight restricted area.

The table below is showing the approximate weight ratios on the front and rear axles of a standard forklift.

Forklift	Axle	% of total weight
Loaded	<b>Front</b>	90
	Rear	10
Un-Loaded	Front	40
	Rear	60

When loaded the front axle of the forklift becomes the load-bearing axle.

## WEIGHT TERMINOLOGY

- **Capacity:** is the maximum load weight that can be handled (with a given load centre and with the mast in the vertical position).
- **Tare weight:** is the weight of an un-laden/unloaded forklift. This is equal to approx one and half times the nominal capacity. (e.g. 2000kg nominal capacity plus 1000kg equals 3000kg tare weight.)
- **Gross laden weight:** is the laden/loaded weight of a forklift. (tare weight of the machine plus the load)

## DE-RATING

If an attachment is fitted to a forklift in its standard format, it will affect the amount of load weight the forklift can lift thus de-rating the forklift. If this is the case then the load capacity plate should be replaced to indicate the re-rated capacity of the forklift.

An extra mast section could de-rate a forklift up to 100kgs, and a side-shift up to 150kgs. For other attachments, refer to the forklift manufactures technical manuals.

## ATTACHMENTS

### GENERAL

A forklift can have a variety of attachments depending on the job requirement for the forklift. These could include but are not limited to:

- Side shift.
- Drum clamp.
- Bale clamp.
- Extra mast.
- A safe working platform.

Before any attachment is used, the forklift manufacturer's operating manual (or the manufacturer) must be consulted to ensure that the attachment is safe to be used on that model forklift truck. Also note that the load capacity plate is to be annotated for any attachment/s likely to be used.

### MAST

One important operation aspect of a mast assembly is free lift. Free lift means the "vertical distance forks can be raised before the mast begins to extend". Free lift is important if you are loading containers.

Masts also come in various sizes or stages:

- **Stage one mast** consists of 2 upright channels, which the fork carriage travels; it has less moving parts and provides the greatest stability in terms of load movement at a given height.
- **Stage two or three masts**, means the manufacture has fitted another mast inside the current mast. The advantage of this is that it allows extra height. The disadvantage is that the visibility for the operator is less and the load capacity is reduced. It can also affect the stability of the forklift when working at height.

### FORK ARM ATTACHMENTS

The fork arms of forklift trucks should only be used for the purpose for which they were designed. Where other types of loads are required to be moved, specialist removable attachments should be used. Design and manufacture of attachments must ensure:

- Unintentional detachment from the fork carriage or the fork arms is prevented, and
- Sideways displacement is prevented.

If an attachment (like fork extensions) is designed and manufactured on site then:

- Design calculations must be done, or checked by, a competent engineer.
- A competent welder must do welding.
- The attachment should be weighted and the weight marked on it together with any safe working load restrictions.
- Generally fork extension's (fork slippers) should not exceed the base fork length by more than 50%.

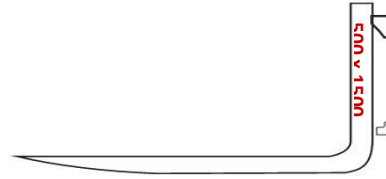


## FORKS

Ensure forks are rated for the required load and load center. The fork rating is found stamped on the arm of each fork. A 3000kg nominal capacity forklift should have stamped on each fork arm 500 x 1500

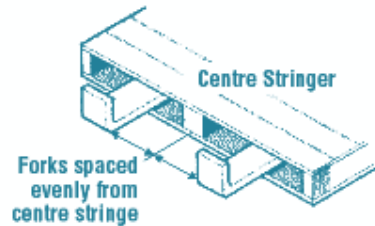
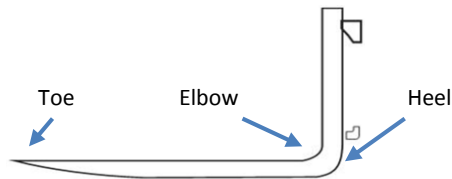
Operators should check the forks for:

- Wear on the heel of the fork.
- Cracking in the elbow of the fork, and
- Condition of the fork attachment to the carriage.



If the thickness of the fork heel is reduced to 90% of the original thickness, then the fork is no longer suitable for further service.

When inserting forks into a pallet the forks should be spaced as wide apart as practical.



## RAISING PEOPLE

Forklifts (other than purpose built order picking lift trucks) are designed to lift loads - **not people**. Raising people on pallets or on the bare fork arms is extremely dangerous and totally unacceptable.

Raising people on a properly designed maintenance work platform, attached to the fork arms of a forklift, is a common practice where "one off" jobs of short duration need to be performed at height.

The stability of the forklift under the weight and dynamic loads of the work platform and occupants at the working height should be confirmed through consultation with the manufacturer or supplier.

## WORK PLATFORMS

Work platforms shall be fitted with:

- Guardrails,
- Intermediate rails and kick boards,
- Gate (must open inwards and have a spring loaded latch)
- A 2m high guard (to the back of the platform),
- Restraint anchor point (ideally at the bottom of the platform).
- Operating instruction.
- A full restraint system. (consisting of a full harness and short lanyard, allowing free movement only within the platform. The restraint must be anchored to the platform).



When lifting people. When lifting people within the work platform then the forklift operator must be a certified operator and remain seated at the controls at all times. The platform must be secured to the forklift in such a way that it cannot slide or be displaced.

## GAS CYLINDER

If fitted, always check that the gas cylinder is properly mounted in the correct radial position in its mounting brackets and that the safety relief valve is positioned at the top. LPG gas is a combustible fuel that is heavier than air. Escaping gas may accumulate in low areas. Always turn the gas off when leaving the forklift for a period of time.

Only trained and authorised personnel should:

- Replace a forklift gas bottle.
- Charge or change a forklift battery.
- Refuel a forklift.

# FORKLIFT SAFETY

## GENERAL

Forklifts present serious potential dangers to operators and pedestrians. For employers and business owners that failed their legal duty to provide a safe work place, the legal and financial costs can be overwhelming.

The forklift operator is primarily responsible for the safety of people working in a forklifts operational area of approx 7.5m (25ft).

## FORKLIFT DEFINED

A powered industrial forklift (Lift truck) is a vehicle drawn, propelled and operated by mechanical, electrical or manual power designed incorporating a powered lift principally to lift, carry or stack by means of:

- A fork consisting of one or more arms which support the load, or
- A platform, or
- Any attachment or other mechanism.



## CAUSES OF FORKLIFT ACCIDENTS

Analysis of the forklift accidents reported indicates that the main causes of accidents are:

- Excessive speed.
- Not looking in the direction of travel.
- Carrying/lifting passengers.
- Poor stacking procedures.
- Poor forklift maintenance.
- Inadequate operator training.
- Exceeding the rated capacity of the forklift.
- Travelling with the load raised high.
- Getting on and off a forklift. (incorrectly)

## BASIC OPERATOR SAFETY RULES

Forklifts should only be operated by trained and competent operators.

Operators should:

- Be physically fit.
- Have a high standard of vision.
- Have a good judgment of distance.
- Have knowledge of established local rules for the work place.

## TIP-OVER

In case of tip-over, the following international procedure is to be followed:



**STAY ON SEAT**        **DON'T JUMP**



**BRACE FEET**



**HOLD ON TIGHT TO STEERING WHEEL OR OVERHEAD GUARD**



**LEAN AWAY FROM DIRECTION OF ROLL**



## SAFETY RULES GENERAL

- 🚫 Only properly trained and authorised personnel should operate a forklift.
- 🚫 Always look in the direction of travel.
- 🚫 Remember the effects of tail/rear end swing.
- 🚫 Only carry loads that are supported by the backrest.
- 🚫 If a bulky load obscures forward vision, drive in reverse. (However the load must lead when travelling up gradients, ramps and slopes)
- 🚫 When approaching crossings in aisle or gangways, slow down sound horn.
- 🚫 Avoid making fast starts, jerky movements and quick turns.
- 🚫 Passengers must not be permitted to ride on the forks/load or any other part of a forklift, unless a passenger seat has been fitted by the manufacture.
- 🚫 Always keep a safe distance from other vehicles.
- 🚫 Avoid running over loose objects.
- 🚫 Keep a safe braking distance and never overtake when approaching cross roads or blind corners.
- 🚫 Never cross railway lines unless the lines have been recessed into the surface.
- 🚫 Always cross obstacles diagonally whenever possible.
- 🚫 Never use a forklift to tow or push railway cars or wagons.
- 🚫 Never push on the point of one or both forks.
- 🚫 Never attempt to handle loads that exceed the forklift rated capacity.
- 🚫 Never attach a tow rope to the mast to pull or drag loads.
- 🚫 Before moving off, (forward or backward) look around, check your area of responsibility (7.5m or 25ft) and when clear move off without inconveniencing other users.
- 🚫 Drive at a speed consistent with the load you are carrying and workplace conditions. (walking pace)
- 🚫 Never place any part of the body between the uprights of the mast or outside of the forklift cab.
- 🚫 When leaving the forklift, ensure that the controls are at neutral, power is shut off, brakes applied, forks lowered and ignition key is removed. (gas is turned off)
- 🚫 If you are required to elevate personnel use an approved work/safety platform.
- 🚫 Carry loads as close to the floor as possible. (suggested carry position is approx 100-150mm above the ground, approx axle, height with rear tilt applied)
- 🚫 When travelling keep the load against the backrest, with rear tilt applied.
- 🚫 Do not permit anyone to stand under elevated forks.
- 🚫 Do not elevate load with mast tilted forward.
- 🚫 Slow down for wet and slippery areas.
- 🚫 Bring the forklift to a near stop before reversing.
- 🚫 Keep the forklift under control at all times.
- 🚫 Avoid stunt driving and horse play.
- 🚫 Always watch load and mast overhead clearance.
- 🚫 Watch side clearance with wide loads.



## RAMPS AND LOADING DOCKS

Keep the load as low as possible. Before entering a truck/trailer, that vehicle must be in neutral, its brakes applied, and wheels chocked. Any bridging ramps should be secure to both the truck and docking bay. Semi-trailers must have fixed jacks to prevent upending.

The following rules apply when operating on gradients, ramps and loading docks:

- When travelling with a load, the load must always be on the uphill side of the forklift.
- If you cannot see over the load, then use an assistant to guide you.
- When traveling without a load, the forks must always be on the downhill side of the forklift.
- Never stack loads on gradients or ramps.
- The mast must be tilted back. The forks must be raised high enough to clear the ground.
- Never drive over a bridge plate unless you are satisfied that it will support the entire weight of the forklift, and that the bridging plate is securely fixed. Then drive over very slowly.
- A forklift must never be left or parked on gradients or ramps.

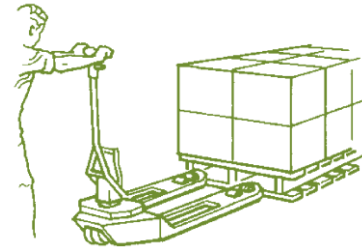
## REACH TRUCKS

- Never drive, loaded or un-loaded, with the reach mechanism extended.
- Before operating the reach mechanism make sure the brakes are applied.
- Never allow anyone to step over the reach legs, or insert a limb between mast and power unit, while the reach truck is being operated.
- Do not use the reach movement by itself as a means of pushing or dragging loads into position.
- Be sure that the load is raised (just above the reach legs) before retracting the reach mechanism.

## PEDESTRIAN OPERATED VEHICLES

Because pedestrian-controlled powered forklift trucks are often used by untrained personnel, it must be emphasised that the general rules apply equally to these forklift trucks.

- Each operator is responsible for reporting any faults to his/her supervisor.
- When reversing in very confined areas, keep your feet clear of the forklift trucks chassis.
- When reversing from a stack, always ensure that there is sufficient standing space between the control handle and the stack.



## TURNING POINTS

When moving forward start your turn when the front axle is in line with your turn point. When moving rearward, start your turn when the rear of the front wheel is in line with your turn point. The main function of the forklifts rear wheels is to steer the forklift.

## STACKING AND DE-STACKING

### BASIC STACKING PROCEDURE

- Approach the stack with the load low and tilted backward.
- Slow down and stop at the face of the stack, reducing backward tilt to an amount just sufficient to stabilise the load.
- Raise the load to the desired stacking height.
- When the load is clear of the top of the stack, move slowly forward.
- When the load is over the stack, bring the mast to the vertical position and lower the load on to the stack.
- When the load is securely stacked, lower the forks until they are free of pallet, check rear of forklift is clear then withdraw forks from pallet by reversing the forklift.
- When clear of the stack, lower the forks to the required travel height, apply rear tilt, check rear of forklift is clear then move away.

The stack should not be straightened by pushing against the stack with the mast, forks or end of the forklift.

### BASIC DE-STACKING PROCEDURE

- Halt at the face of the stack, bringing mast to the vertical position.
- Raise forks to a position permitting clear entry into pallet or under load.
- Slowly drive forward until the backrest is against the load. Ensure the lower parts of the mast do not hit the stack when moving forward.
- Lift load until clear of stack and apply rearward tilt (if possible) just sufficient to stabilise the load.
- When the load is clear of the top (of the stack) check the rear of the forklift is clear, then move slowly backward to clear face of stack.
- Lower the load to the correct carrying position (100-150mm or axle height), before applying (further) rearward tilt.
- Extreme care must be taken to avoid jerky movements when lifting a load forward or backward, especially when the load is at height.
- Only move or drive a forklift with the forks or load fully raised when stacking or de-stacking only.

## SPEED

- The travel speed of a forklift should be consistent with the type of load and general working conditions.
- When turning, the rear of a forklift will travel at approx 3 times the forklifts forward speed.

## BRAKING DISTANCE

The stopping distance of a loaded forklift is often seriously underestimated. At walking pace a forklift has a stopping distance of at least 3 meters. Adjacent doorways, intersections with pathways or blind corners often do not provide a clear line of sight of 3m or more.

While a forklift's braking effectiveness is low compared to many vehicles it is still high enough to cause:

- Tip-over or
- Loss of load in an emergency stop.

If the brakes fail on a forklift, lower the fork/load to the ground and let the friction act as a break, do not attempt to use the gear change lever to attempt to stop.

## MAINTENANCE

### GENERAL

Regular forklift maintenance carried out in accordance with manufacturers' recommendations play a critical role in preventing breakdowns and other mechanical failures which can affect safety.

### COMMON FAULTS

- Faulty brakes.
- Worn hydraulic hoses.
- Low hydraulic fluid levels.
- Sub-standard tyres.
- Sub-standard seat.
- Operator controls are not marked correctly or working properly.
- Lights and warning devices are not working.



### PRE - OPERATIONAL CHECKS

Daily before any forklift is operated in the workplace; the forklift operator must check ensuring that the forklift is ready to be used, is capable of doing the required tasks and is safe to operate. This includes conducting an environmental/hazard check.

If a defect affecting the safe operation of a forklift is detected, the forklift must be immediately taken out of service and is not to be used until the fault is rectified.

A forklift operator should never attempt to repair any faults on a forklift no matter how minor or major they may be. Any faults or damage's should be reported in accordance with established site procedures.

### DAILY CHECKS LIST

Shown is a suggested basic format that may be used as a daily check list. Ideally this check list should be filed away for future reference.

Two yellow inspection tags with a hole at the top. The left tag is titled 'FORKLIFT INSPECTION' and contains a checklist of items to inspect, each with a checkbox. The right tag is also titled 'FORKLIFT INSPECTION' and contains a section for notes with several horizontal lines for writing.

FORKLIFT INSPECTION		
<input type="checkbox"/> GAS	<input type="checkbox"/> LP	<input type="checkbox"/> ELECTRIC
INSPECT UNIT CAREFULLY BEFORE SIGNING INSPECTION RECORD		
<input type="checkbox"/> Horn Operational	<input type="checkbox"/> Lights Operational	<input type="checkbox"/> Fire Extinguisher Charged
<input type="checkbox"/> Brakes Operational	<input type="checkbox"/> Parking Brake Operational	<input type="checkbox"/> Oil at Proper Level
<input type="checkbox"/> Tires (Good Condition)	<input type="checkbox"/> Coolant at Proper Level	<input type="checkbox"/> Hydraulic Fluid at Proper Level
<input type="checkbox"/> Steering Operational	<input type="checkbox"/> Backup Alarm Operational	<input type="checkbox"/> Broken Gauges/ Indicators
<input type="checkbox"/> Overhead Guards		
<input type="checkbox"/> Chains Operational		
<input type="checkbox"/> Forks Adequate		
<input type="checkbox"/> Load Backrest		
<input type="checkbox"/> Hydraulics No Leaks		

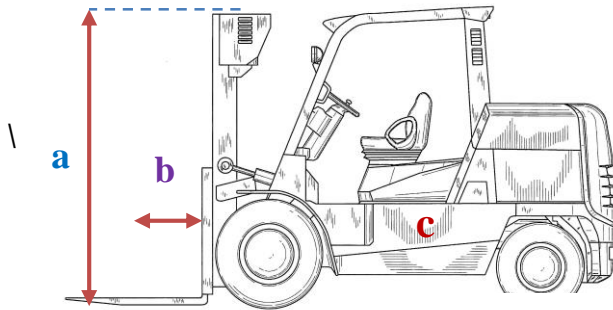
IF ANY ITEMS ARE FAULTY,  
REPAIR BEFORE USE.

NOTES: \_\_\_\_\_  
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## DESIGN CRITERIA

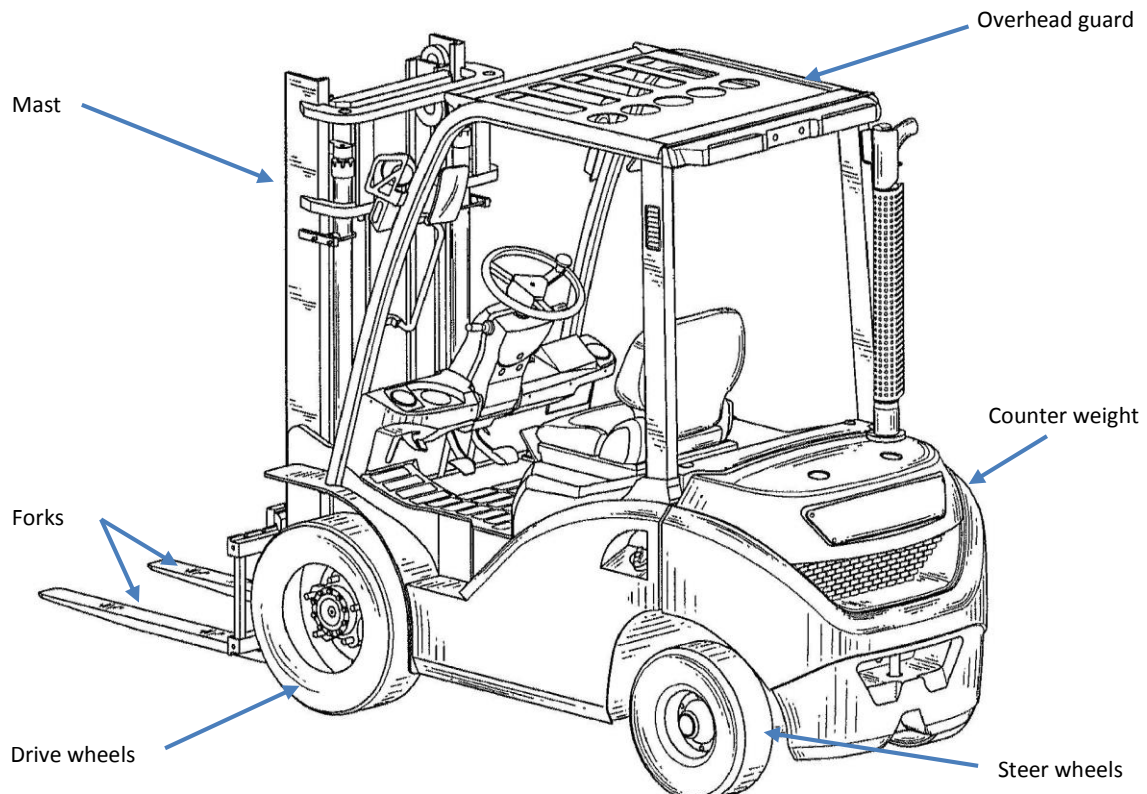
Basically there are three (3) design criteria's' of a standard forklift.

- Mast height **a**. (standard 4m)
- Load centre **b**. (standard 500mm)
- Nominal capacity **c**. (tonnes or kg's)



## COMPONENTS

The basic components of a forklift are shown below:



## WEIGHTS

The weights below are **approximate** weights only.

	METRIC
1 m <sup>3</sup> of Copper	= 9.0 tonne
1 m <sup>3</sup> of Cast Steel	= 7.85 tonne
1 m <sup>3</sup> of Cast Iron	= 7.2 tonne
1000 Bricks	= 4.0 tonne
1 m <sup>3</sup> of Concrete	= 2.4 tonne
1 m <sup>3</sup> of Blue Metal	= 2.0 tonne
1 m <sup>3</sup> of Earth	= 1.9 tonne
1 m <sup>3</sup> of Clay	= 1.9 tonne
1 m <sup>3</sup> of Terra Cotta	= 1.8 tonne
1 m <sup>3</sup> of Wet Sand	= 1.5 tonne
1 m <sup>3</sup> of Timber, Iron Bark	= 1.4 tonne
1 m <sup>3</sup> of Dry Sand	= 1.3 tonne
1 m <sup>3</sup> of Timber (other hardwoods)	= 1.1 tonne
1 m <sup>3</sup> of Water	= 1.0 tonne
25 Bags of Cement	= 1.0 tonne
1 m <sup>3</sup> of Ashes	= 800 kg
1 m <sup>3</sup> of Coal	= 864 kg
1 m <sup>3</sup> of Timber (softwoods)	= 640 kg
200 litre Drum of Petrol	= 200 kg
200 litre Drum of Oil (all types)	= 200 kg

### Chep pallet (recommended carry weight)

Plastic	= 1.270 tonne
Wooden	= 1.200 tonne

### Chep Pallets (weight of pallet)

Wooden 1.0m x 1.2m	= 30 kg
Plastic 1.016m x 1.220m	= 26 kg