

Forklift

GOOD PRACTICE

GUIDELINES

VERSION ONE





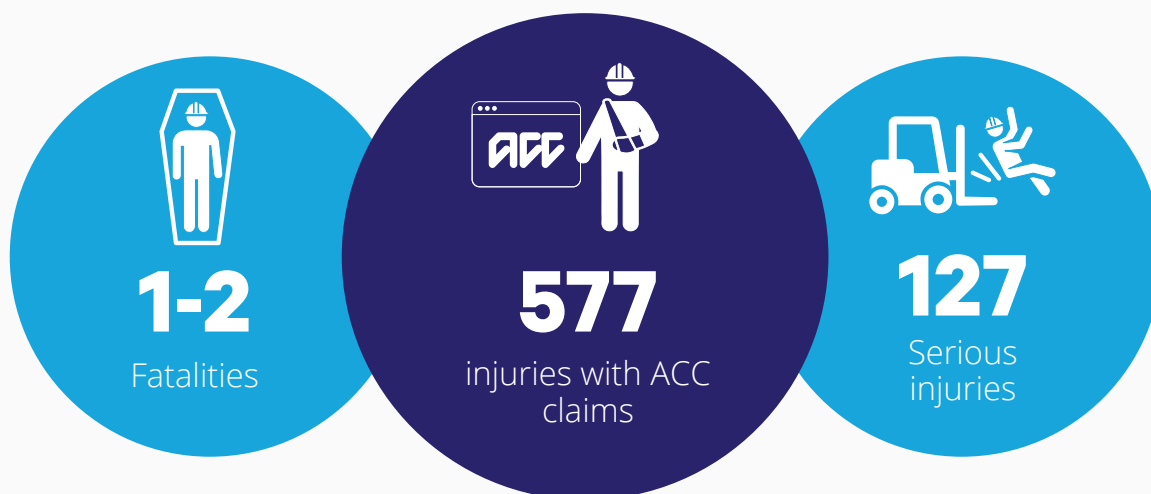
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Since 2013 the forklift industry averaged per calendar year...



NEW ZEALAND FORKLIFT INDUSTRY ASSOCIATION

The NZFIA promotes good safe practices in the use and maintenance of Forklifts in NZ.

We advocate on behalf of our members for consistently high and improving standards towards design, supply, operator training, and in areas of maintenance.

Together with our members, we aim to increase productivity, awareness and the safety of forklift operations within NZ.



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Forward

Forklifts are used for a wide range of operations in New Zealand. Forklifts are an invaluable asset that provide key services within the materials handling sector for multiple industries.

As with all mobile plant, the safe operation of forklifts depends on multiple factors, including the correct selection of forklift and attachments for a given task, the maintenance of the forklift, the training of the operator, site traffic management, material storage systems and human factors.

Forklift operations present significant risk if those factors are not managed correctly. The New Zealand Forklift Industry Association (NZFIA) Forklift Good Practice Guideline (GPG) provides information and guidance to those involved in operations that involve forklifts. This includes, but is not limited to, suppliers, trainers, employers, fleet managers, asset procurement managers, service providers, health and safety personnel and forklift operators.

This GPG provides safe work practices on how to select, maintain and operate forklifts. It also helps duty holders to meet their obligations under the Health and Safety at Work Act 2015 (HSWA 2015). There may be additional and/or alternative methods or processes that meet or exceed these requirements and this document is intended to provide guidance only.

This document refers to other guidance material about forklift safety and hazard control measures. This includes industry standards, codes of practice, guidelines, manufacturers' instructions and other material.

Disclaimer

Reasonable care has been taken by the NZFIA when compiling this Good Practice Guide and verifying its accuracy when published. However its content is subject to change without notice due to factors outside the control of the NZFIA and therefore this Good Practice Guide should be used as a guide only. For example, the technology and know-how contained in this Good Practice Guide are continually improved through industry research and development and this may lead to information in this Good Practice Guide being altered without notice and/or being inaccurate for a period of time. The NZFIA makes no representations or warranties of any kind, expressed or implied, about the accuracy, reliability, currency, completeness and suitability of the information contained in this Good Practice Guide. Readers and users should consult a professional before relying on and/or undertaking any action as a result of information contained in the Good Practice Guide.

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Hire Industry Association of New Zealand (HIANZ)

WorkSafe New Zealand

Elevated Work Platform Association (EWPA)

Australian Forklift & Industrial Truck Association

Cascade New Zealand

AB Equipment - New Zealand



1. Definitions

1.1 General

HSWA 2015 - The Health and Safety at Work Act 2015.

Reasonably practicable

To ensure health and safety or to protect property, means that which is, or was, at a particular time, reasonably able to be done in relation to ensuring health and safety or protecting property, taking into account and weighing up all relevant matters, including:

- a. the likelihood of the hazard or the risk concerned occurring; and
- b. the degree of harm or damage that might result from the hazard or risk;
and
- c. what the person concerned knows, or ought reasonably to know, about—
 - i. the hazard or risk; and
 - ii. ways of eliminating or minimising the risk; and
- d. the availability and suitability of ways to eliminate or minimise the risk;
and
- e. after assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk

Workplace

(1) This is a place where work is being carried out, or is customarily carried out, for a business or undertaking, and includes any place where a worker goes, or is likely to be, while at work.

(2) A workplace also includes a vehicle, vessel, aircraft, ship, or other mobile structure.

Competent operator

A person who has acquired through training, qualification, experience or a combination of these, the knowledge and skill enabling that person to correctly perform the required task.

Note: Different types of forklifts require different competencies, including appropriate training and/or qualifications.

Worker

An individual who carries out work in any capacity for a PCBU, including work as:

- a. an employee; or
- b. a contractor or subcontractor; or
- c. an employee of a contractor or subcontractor; or
- d. an employee of a labour hire company who has been assigned to work in the business or undertaking; or
- e. an outworker (including a homeworker); or
- f. an apprentice or a trainee; or
- g. a person gaining work experience or undertaking a work trial; or
- h. a volunteer worker; or
- i. a person of a prescribed class.

Person Conducting Business or Undertaking (PCBU)

A Person who Conducts a Business or Undertaking, whether alone or with others, and whether or not the business or undertaking is conducted for profit or gain.

For example:

- a. a Sole Owner or Self Employed Person
- b. a Company
- c. a Franchise
- d. a Co-operative
- e. or an Organisation

Principal

A person who, or organisation that, engages any person (other than as an employee) to do any work for gain or reward.

Shall or must

Indicates a legal requirement.

Should

Indicates recommended best practice.

Original Equipment Manufacturer (OEM)

The person/business that designed and manufactured the forklift and/or attachment. The OEM may be the distributor in New Zealand.

Manufacturer's Representative/Distributor

The PCBU that holds authorisation of the OEM to distribute the OEM's products within New Zealand. The manufacturer's representative/distributor will be considered the official point of reference for the brand within New Zealand.

Supplier

A person or PCBU that provides a forklift for profit or reward. This may be a manufacturer's representative, seller and/or hire company.

Road

The definition of a road with regard to forklift operations is kerb line to kerb line of a road carriageway.



1.2 Forklift terminology

Forklift

A forklift is a powered industrial lift truck equipped with lifting media made up of a mast and elevating load carriage with a pair of fork arms or other attachment that can be raised 900 mm or more off the ground.

Forklifts are sometimes referred to as a lift truck, fork truck or truck etc.

Industrial lift truck

Industrial lift trucks are powered mobile plant designed to move goods, materials or equipment. They are equipped with an elevating load carriage and, for normal use, also come with a load-holding attachment. There are different types of powered industrial lift trucks, including ride-on forklift trucks, pedestrian-operated trucks, straddle carriers and reach trucks. Mobile cranes, earthmoving machinery and manually-powered lift trucks, like pallet lifters, are not industrial lift trucks. For the purposes of this Guide, reach stackers, multi-purpose tool carriers and telehandlers are not industrial lift trucks.

Operator - A person who controls the movements of the forklift.

Attachment - A device, component or mechanism fitted either to the carriage or the forks of the forklift. Its principal task is to carry a load.

Centre of gravity - The centre of gravity (CG) of an object is the point at which weight is evenly dispersed and all sides are in balance.

Combined centre of gravity - A forklift and a load both have their own centres of gravity. When a load is placed on a forklift, together they produce a combined centre of gravity.

Data plate/Load plate - Sometimes referred to as a Load Rating plate. This includes important information such as the service weight, fuel type, forklift load capacity, tyre information, attachment information if applicable, and model and serial numbers.

Lateral stability - Stability of the forklift at right angles to the centre line of the machine. i.e., the tendency to tip sideways.

Longitudinal stability - Stability of the forklift at right angles to the front axle of the machine. i.e., the tendency to tip forward.

Lift height - Height from the ground to the upper face of the forks.

Load centre - The load centre is measured from the face of the forks to the load's centre of gravity

Nominal capacity - The initial maximum lifting capacity of the forklift prior to any attachment being fitted. This value is often reflected within the model number of the forklift.

Rated capacity - The maximum lifting capacity of the forklift adjusted to accommodate the current configuration i.e., attachments and forks, and shall be illustrated by the load plate.

Spotter - A person who assists the forklift operator when maneuvering, stacking or de-stacking.

Stability pyramid - A diagrammatic representation of the area where the centre and/or combined centre of gravity must reside in order to maintain vehicle stability.

1.3 Forklift components

Cab - The primary enclosure and control point of the forklift.

Carriage - Mounts the forks and some attachments to the mast.

Mast - Used to elevate the carriage. Masts can vary in height and in the number of sections or stages they contain.

Load backrest - A frame designed to prevent the load from falling onto the operator. A load rests against the backrest to aid load security.

Forks - Forks are attached to the carriage. They are used to support the load from underneath. They come in a variety of widths, lengths, tensile strengths and profiles. Forks are commonly referred to as tynes or load arms.

Overhead guard - The overhead guard is the frame around the cab of the forklift. It prevents large objects from falling onto the forklift operator. The overhead guard is commonly referred to as the Falling Object Protection System (FOPS).

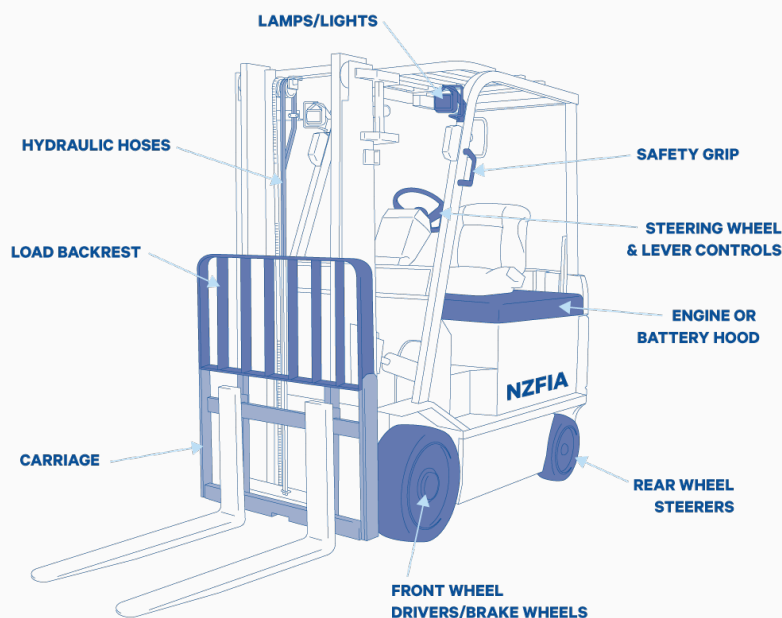
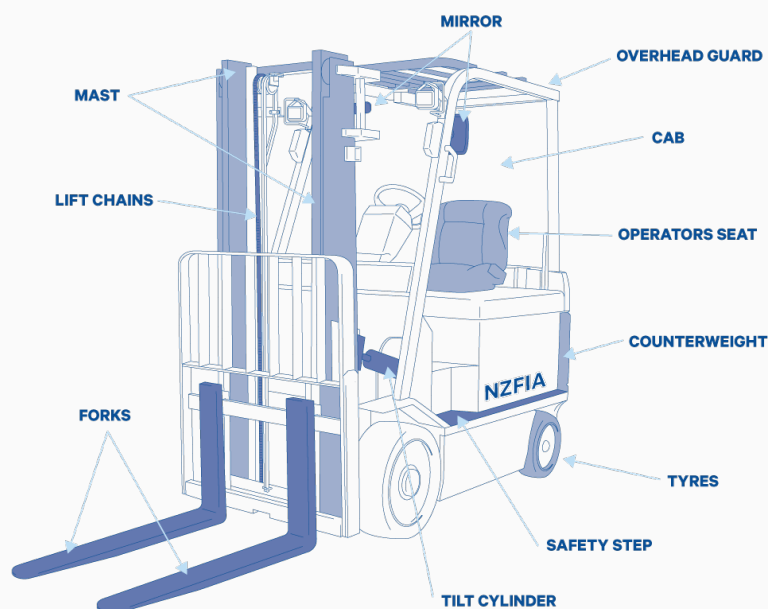
Counterbalance - To balance or offset an opposing force.

Counterweight - The counterweight is located at the rear of the forklift and acts as a counterbalance to the load being carried by the forklift.

Hydraulic cylinders - These are used to regulate the vertical lift and tilt of the mast. Hydraulic cylinders also often control the forks' side shift be it collectively or independently as well as the forklift's steering mechanism.

Tyres - Variations of pneumatic and solid tyres are typically fitted to forklifts. The front tyres are often referred to as 'drivers' and the rear tyres as 'steerers' due to their function.

Inching pedal - The inching pedal progressively disengages the transmission and then applies the brake. This allows the engine RPM to increase or decrease without affecting the drive of the forklift



2. Classifications of forklifts

There are six different classifications of forklift types. The types are based on the fuel type, application, and features of the forklift.

Type 1 – Electric Motor Rider Trucks

- / 1.1 Stand up
- / 1.2 Three wheeled sit down
- / 1.3 Four wheeled sit down

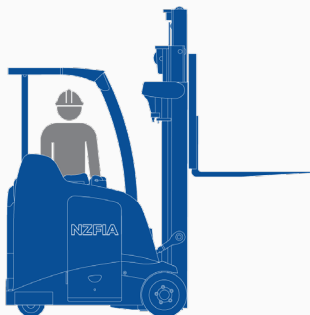
Type one forklifts are battery electric powered forklifts; units can be either stand on or sit down models.

These forklifts are ideally suited to the loading and unloading of tractor trailer, handling pallets, and are used by multiple industries from food and retail storage to manufacturing and general warehousing.

Type one forklifts are commonly used indoors where air quality is a consideration. Internal combustion forklifts emit carbon monoxide which is highly toxic in concentrations of over 1.5 per cent in the atmosphere. Battery powered forklifts are a lot quieter than internal combustion engine models, making them ideally suited to indoor operations.

To help maintain a unit's lifting capacity the industrial battery powering the unit is incorporated as part of its counterbalance.

A type 1.2 may have a smaller turning radius than its type 1.3 equivalent.



1.1 – Stand up



1.2 – Three wheeled sit down



1.3 – Four wheeled sit down

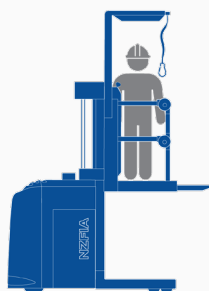
Type 2 – Electric Motor Narrow Aisle Trucks

- / 2.1 High lift straddle truck
- / 2.2 Order picker
- / 2.3 Reach type outrigger
- / 2.4 Side load platforms
- / 2.5 All- direction straddle truck or moving mast style
- / 2.6 Side loaders high lift pallet
- / 2.7 Turret trucks
- / 2.8 Low lift platform

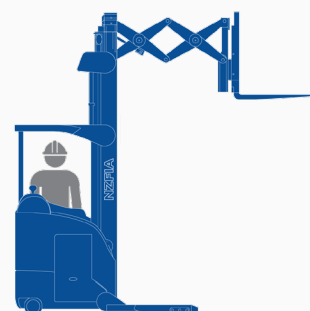
Type two forklifts are engineered for maximum maneuverability which allows them to operate in tighter spaces and narrow aisles. Type two forklifts are ideally suited for applications that need to maximise the use of available floor area and vertical storage space. Type two forklifts are predominantly used by the warehousing and distribution sectors.



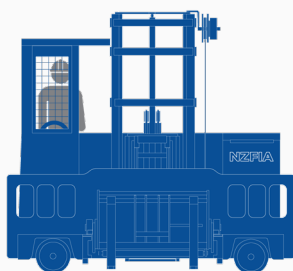
2.1 – High lift straddle truck



2.2 – Order picker



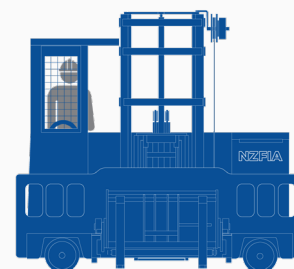
2.3 – Reach type outrigger



2.4 – Side load platforms



2.5 – Multi Direction mast style



2.6 – Side loaders high lift pallet



2.7 – Turret trucks



2.8 – Low lift platform

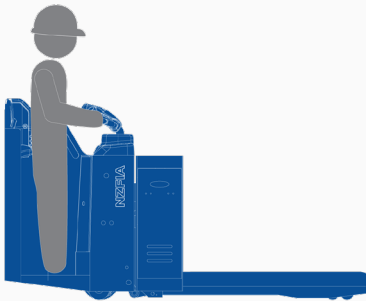


Type 3 – Electric Motor/Hand Trucks (walk behind)

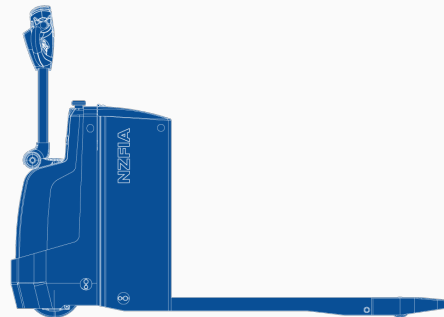
- / 3.1 Low lift platform
- / 3.2 Low lift walkie pallet
- / 3.3 Reach type outrigger
- / 3.4 High lift straddle
- / 3.5 High lift platform
- / 3.6 Walkie/Rider pallet and End Control

Type three forklifts are often referred to as warehouse materials handling equipment.

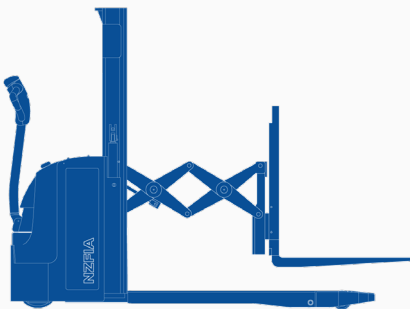
They are predominantly designed and engineered to operate indoors in applications such as warehouses, making them ideal for unloading smaller deliveries or moving goods to staging areas where they can be handled and loaded by larger forklifts.



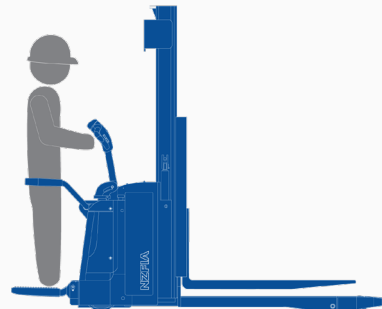
3.1 – Low lift platform



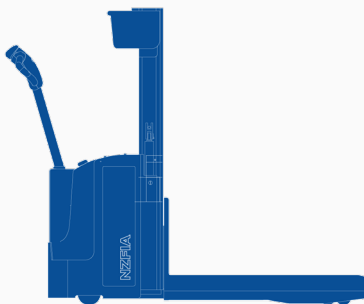
3.2 – Low lift walkie pallet



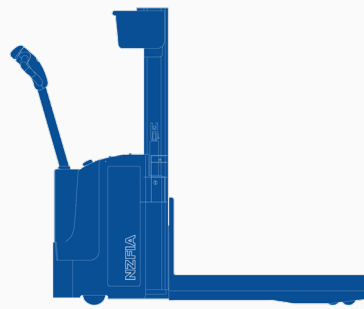
3.3 – Reach type outrigger



3.4 – High Lift Straddle



3.5 – High lift platform



3.6 – Walkie/Rider pallet and End Control

Type 4 – Counterbalanced Internal Combustion Engine Trucks

/ 4.1 Counterbalanced internal combustion engine trucks

Type four forklifts are one of the most common and flexible types of forklifts using an internal combustion engine.



4.1 – Counterbalanced internal combustion engine

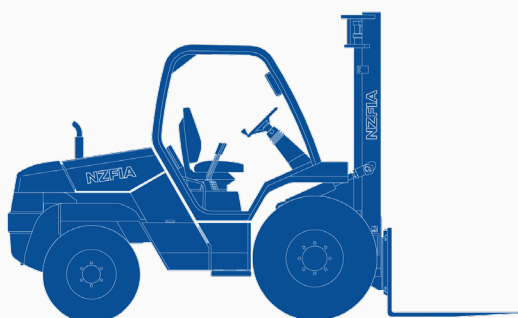
Type 5 – Rough Terrain Forklift

/ 5.1 Vertical mast

Type five forklifts are specially designed and manufactured for outdoor operations.

They are fitted with tough durable tyres, similar to those fitted to tractors, to provide additional ground clearance and to operate on rough or uneven terrain.

These forklifts are almost exclusively internal combustion engine and are often used in outdoor manufacturing, construction sites and agricultural sectors.



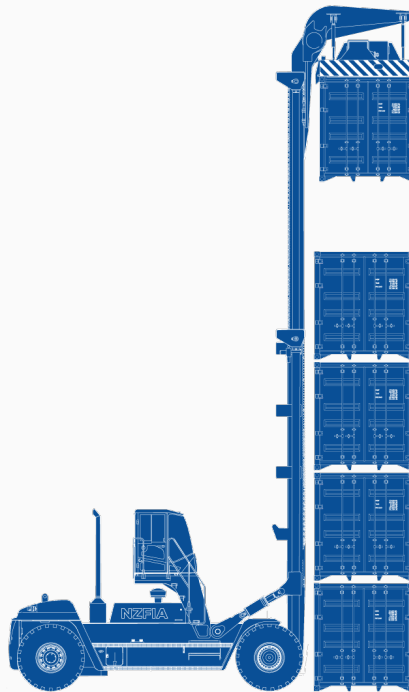
5.1 - Vertical mast



Type 6 – Mast mounted container handler

/ 6.1 Mast Mounted

Type six forklifts are specifically designed and engineered to lift ISO 20' and 40' containers and are most commonly used by freight and logistics companies and in container port operations. For further clarification on type six forklifts, refer to section 6.1.



6.1 - Mast mounted

3. Importation of forklifts

3.1 Importation Standards

All forklifts imported into New Zealand should meet the applicable standards.

The ANSI/ITSDF B56.1-2005 Safety Standard has been adopted by Standards New Zealand. Part three, section 7 provides information for the manufacturer focusing on the design and construction standards required at the time of manufacture. This includes, but is not limited to, information regarding:

- a. Operating instructions
- b. Capacity
- c. Rated capacity
- d. Nameplates and markings
- e. High lift truck requirements
- f. General stability criteria
- g. Tilting platform test requirements and conditions
- h. Additional stability tests for trucks handling freight containers of 6m length or above
- i. Service brake system performance
- j. Park brake system performance
- k. Travel control requirements
- l. Load handling control requirements
- m. Tilt mechanism
- n. Overhead guard requirements, including impact test requirements
- o. Load backrest design requirements
- p. Operator protection
- q. Guards for wheels and other moving parts
- r. Overtravel limits
- s. Warning devices
- t. Pedal and platform surfaces
- u. Design requirements for forklift mounted safety platforms
- v. Fork extensions
- w. Operator restraint systems
- x. Visibility
- y. Sound testing

3.2 International standards

The Australian Standard, AS 2359:2019 and the European Standard, EN1726-1 (ISO3691) are also considered to be suitable Standards of reference.

Please note they have not been formally adopted by New Zealand.

3.3 Evidence of standards

An importer should be able to provide evidence the forklift design standard meets or exceeds these referenced Standards.



4. Duty of care

4.1 Responsibilities of OEMs, manufacturer's representatives, suppliers and employers

OEMs, manufacturer's representatives, suppliers and employers all have responsibilities to ensure machinery is safe to use.

Figure 1 shows who has health and safety responsibilities for each phase or aspect of the machine's life cycle.

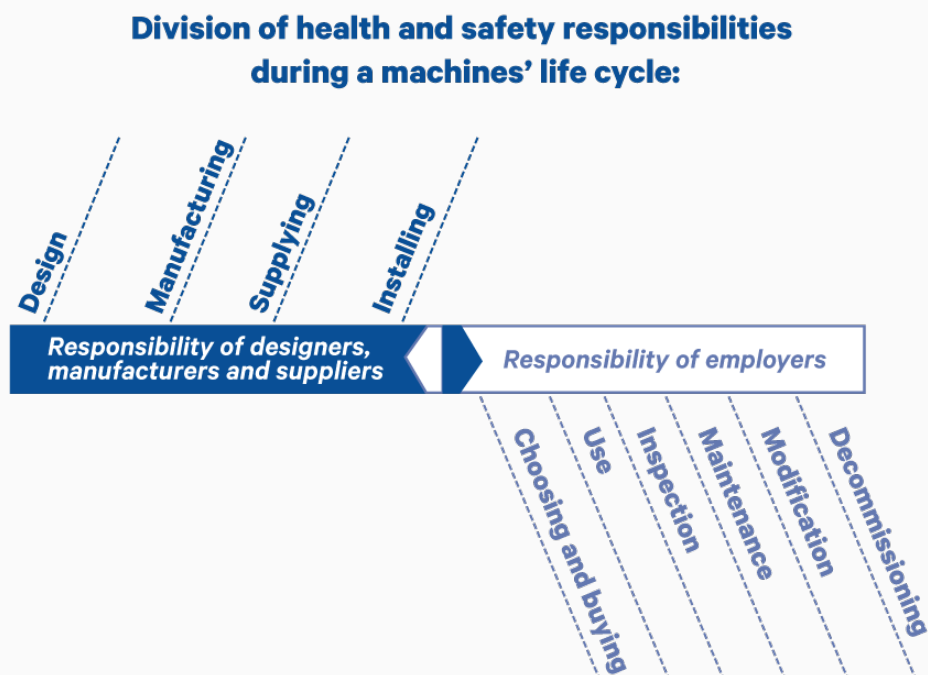


Figure 1

4.2 Responsibilities of the forklift supplier

4.2.1 Under section 42 of the Health and Safety at Work Act 2015, a person who hires, leases, sells or otherwise supplies another person with a machine to be used in a workplace has legal duties. People who hire, lease or loan machinery must find out whether it will be used in a workplace, and if so, how it will be used. They must ensure the machinery has been designed, made and maintained to be safe for its intended use.

4.2.2 People who sell or supply machinery that can be used in a workplace must take all practicable steps to make sure it has been designed, made and maintained to be safe for any known intended use, or any reasonably expected use. If a seller

or supplier agrees to install or arrange a machine, section 42 of the Health and Safety at Work Act 2015 states a PCBU (a Supplier) must take all practical steps to install or arrange the machine so it is safe for its intended use. Health and Safety legislation requires people to make sure others are safe at work.

It also protects people using machinery and equipment.

Any instructions should explain:

- / hazards linked to the machine
- / how to operate the machine safely
- / safe ways to clean and adjust the machine
- / how to maintain and repair the machine
- / regular replacement of parts of the machine that wear
- / how to safely take the machine out of service and take it apart
- / any other relevant matters.

The supplier, or the purchaser or hirer, must understand and follow the information. Further reference can be found in AS/NZS 4024, and Safe Use of Machinery – WorkSafe NZ (while this guidance has not been updated to reflect current work health and safety legislation [the HSWA 2015 and regulations], it may still contain relevant information and practices to keep workers and others healthy and safe).

4.3 Responsibilities of the forklift hiree

4.3.1 The hirer must comply with the instructions set out within the hire or lease agreement.

Both parties should agree to a standard that is considered fair wear and tear prior to the supply of the forklift.

4.3.2 The NZFIA has produced a Fair Wear and Tear Guide – Material Handling, End of Lease Term Guidelines. The fair wear and tear guide clearly and simply outlines a rental company’s expectations of its machines at lease end. It shows the most typical forms of wear and tear sustained by material handling equipment. The guide includes recommendations on how to reduce your exposure to these problems.



5. Fit for use

5.1 Forklift selection

Each type and sub type of forklift listed in section 2 - Classifications of forklifts, are designed for specific purposes.

Different industries use different types of forklifts that best serve the specific requirements, dependent on the forklift's role and the environment in which it operates. If at anytime you suspect that the forklift may not be fit for use, seek advice from a suitably qualified person.

5.2 Selecting an appropriate forklift

Some considerations when selecting the most appropriate forklift may include the following:

- a. What is the required rated capacity of the forklift (site and load assessment carried out)?
- b. Will the forklift be required to have attachments installed?
- c. What type of forks are required?
- d. What surface will the forklift operate on?
- e. Will the forklift be operating in an enclosed area?
- f. What size is the intended area of operations for the forklift?
- g. Is the forklift and its components high enough to straddle any objects that it may encounter i.e., central bearer, static plant etc.
- h. Are there any height constraints or free lift requirements?
- i. Consider the congestion levels and the dynamics of the environment that the forklift will operate within i.e., other forklifts or mobile plant, pedestrians within close proximity.
- j. How long will the forklift be operated for on a daily basis?
- k. What level of protection from the elements or environment i.e., rain, dust, hazardous substances etc. will the operator require?
- l. Will the forklift be required to operate in a flammable or explosive environment?
- m. What safety systems are required?
- n. Will the forklift be required to interact with static plant?
- o. Are additional training requirements for operators required?
- p. Are there budget constraints?
- q. Are there after sales and support issues, as well as service availability?
- r. What is the harmonisation with current fleet?

6.1 Container handling machinery - Forward

Currently, forklifts and reach stackers configured to lift shipping containers are classed as mobile cranes as stated in section 1.4 of The Approved Code of Practice for Cranes, 3rd edition:

Mobile crane:

means mobile mechanical plant which is able to be configured to lift or carry a suspended load. This definition includes “Fully”, “Semi”, “Portable” and “Truck” mobile cranes. For the purposes of this Approved Code of Practice, this definition also includes:

- (1) forklifts and reach stackers configured to lift shipping containers
- (2) telehandlers or forklifts lifting and carrying a suspended load
- (3) construction equipment, such as excavators configured with hooks or other lifting devices and used for purposes other than duties associated with the primary function of the machine (e.g. other than placing of pipes in a trench).

Under their current classification, forklifts that are configured to lift shipping containers must therefore comply with the requirements placed upon cranes. This includes but is not limited to the training and qualifications held by the operator as well as inspection and certification of the mobile crane.

6.1 Container handling machinery

Section 6.1 of this document represents what the NZFIA believes would be considered good practice and is not yet in effect.

It is the NZFIA's position that some of the documentation/legislation governing forklifts and their operation are overdue a review. The below listed items presents the recommendations of the NZFIA where a requirement for change or update has been identified. This change or update is the result of industry feedback and/or to gain consistency with the requirements placed upon similar machinery types or operations.

Issues Identified with the current classification of container handling machinery as mobile cranes.

- a. Current definitions place machinery that elevate a shipping container from underneath e.g. via forks as a forklift. Machinery that utilises a lifting attachment that is placed on the top of a shipping container is classed as a mobile crane due to the load being suspended.
- b. Crane Operator training is not fit for purpose to operate a forklift as defined in section 12 for the below reasons.
 - a. Mobile cranes often utilise a boom and not a vertical mast to elevate materials. A boom has the potential to create variable load centres that are not encountered with vertical masts.
 - b. Mobile cranes have Slewing and luffing functionality not afforded to forklifts.
 - c. Mobile cranes often operate from a static position. The term mobile crane indicates that the crane can move from location to location with ease prior to conducting lifts.
 - d. A forklift that utilises a lifting attachment that is placed on the top of a shipping container will often de-stack, transport and re-stack the shipping container at another location. This is more akin to a forklift handling a large volume and/or over dimensional load.
 - e. A forklift that utilises a lifting attachment that is placed on the top of a shipping container is locked to the attachment securing the load. The load is therefore not suspended via cables typically observed on cranes.
 - f. The Forklift Operator training framework would be more applicable to the operator.
- c. A forklift fitted with a Jib attachment technically becomes a mobile crane should the load be suspended under the current interpretation.

Solutions that provide better (Good) practice can be found in the following subject chapter.

6. Other machinery working as a forklift

Multiple types of machinery available on the market today are able to have fork attachments fitted. The mechanism of elevation as well as the maximum height that the materials may be elevated to will determine if the machine is a forklift. Many of the principles within this Good Practice Guide will cross over to other machinery types, but the requirements placed upon the PCBU and/or operator may not. When employing other machinery to work as a forklift, consider the following:

- a. Independent engineering or manufacturing consultation prior to use
- b. Is the machine sufficiently designed and rated to execute the task/role?
- c. Are you aware of load centre limitations/de-ratings?
- d. Will the machine elevate materials in an arc or vertically? If in an arc, is the area of operation large enough to accommodate this?
- e. What area will the machine be required to work within? Will a centre pivot or front wheel steering machine be able to access the required area/s?
- f. What level of visibility will the operator have?
- g. What type of tyres are best suited to the area of operation - solid or pneumatic?
- h. What surface will the machine operate on?
- i. Is the machine required to operate on any areas that may have a maximum weight limit i.e. ramps, docks etc?

6.1 Container handling machinery

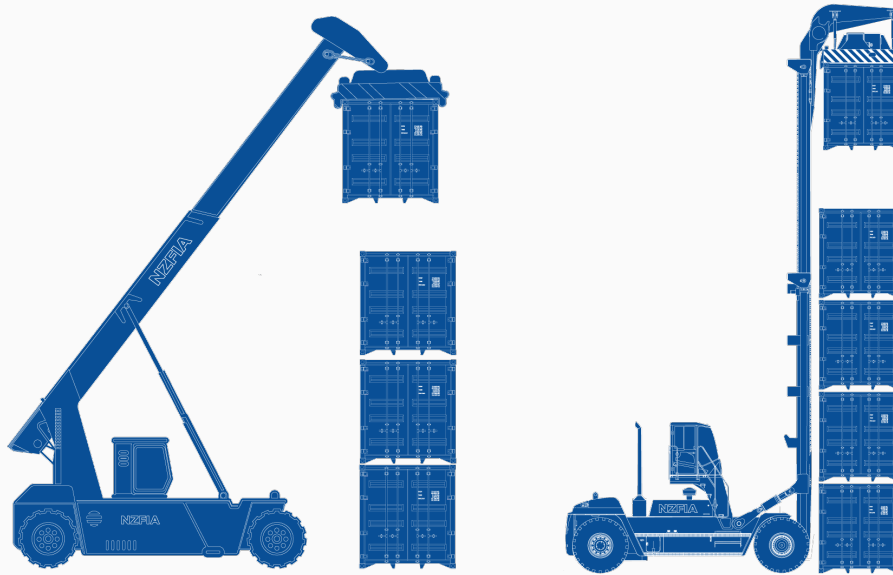
Empty container handlers insert their forks into the fork pockets of the shipping containers as a means of transporting and stacking/de-stacking the units. They are considered forklifts.

Most container handling machinery incorporated either a mast or a telescopic boom that handles the shipping container via an attachment that locks directly to the container. As per the definition of a forklift within this GPG, only machinery that incorporates a mast and elevating load carriage with a pair of fork arms or other attachment is deemed a forklift. Unlike cranes, these forklifts transport the shipping containers while elevated. Those with a telescopic boom are not considered forklifts.

Both of the above machinery types are commonly fitted with pneumatic tyres and are rear wheel steering.

Cranes, along with machinery that incorporate a telescopic boom as a means of elevating loads, have slewing and luffing capability. This function presents additional load handling and operator considerations that are unique to the safe operation of cranes and is not contained within the forklift training framework. The majority of cranes, whether or not they are classed as mobile cranes, operate from a static position.

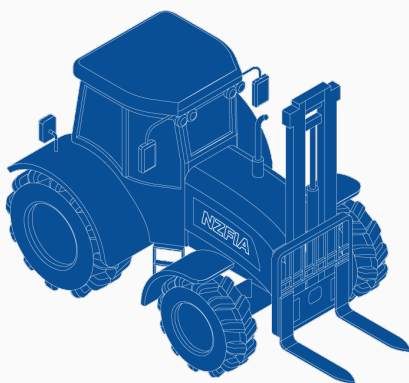




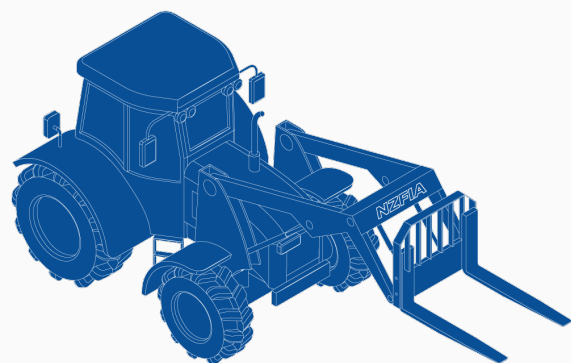
Container Stackers

6.2 Tractors

Tractors may have a front or rear mounted mast with forks fitted for the purpose of handling material. Tractors may also use a fork attachment mounted to a front-end loader type attachment via a quick hitch mechanism. The mast attachment will elevate the materials vertically, whereas the front-end loader attachment will raise the materials in an arc. The load rating of the fork attachment may be de-rated in the absence of counterweight.



Tractor Forklift



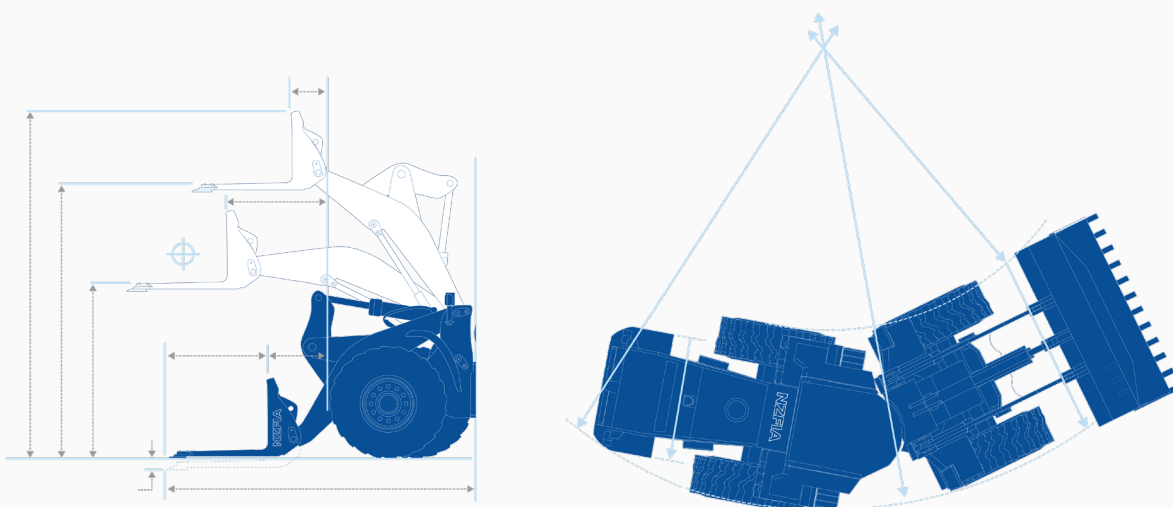
Tractor Variable Reach Forks

6.3 Wheeled loaders

Wheeled loaders usually employ four-wheel drive and a centre pivot steering mechanism. There are many benefits to central pivot steering mobile plant that are advantageous in specific settings. Wheeled loaders are usually of a moderate to large size, making them less practical for work in confined spaces.

Forklifts usually employ a rear wheel steering configuration. This allows for increased maneuverability that is useful when operating in confined spaces. Rear wheel steering also makes the machine more difficult to control at moderate to high speeds.

Wheeled loaders commonly use a fork attachment mounted to a front-end loader attachment. This configuration will raise materials in an arc that requires a greater area of operation.



Wheel Loaders



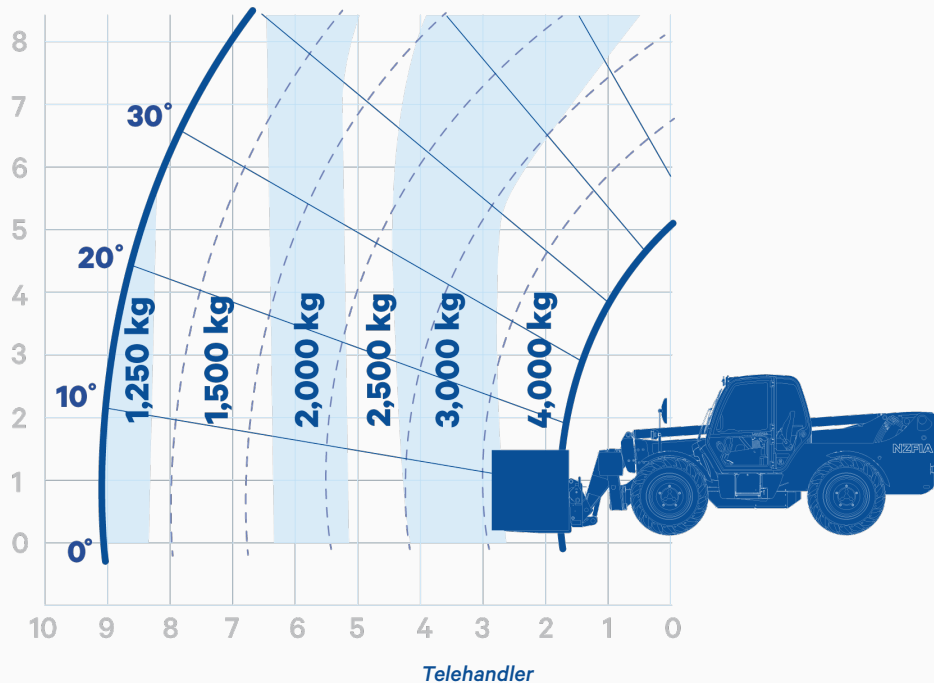
6.4 Telehandlers

A telehandler is a mobile, all-terrain machine fitted with a telescopic boom and a lifting attachment. It is also known as a telescopic materials handler or variable reach truck. The lifting mechanism consists of a telescoping boom at the end of which is fitted a mechanism which facilitates the quick interchange of attachments, commonly referred to as a “quick hitch.”

Attachments used with telehandlers may include forks; jibs, hooks and winches for suspended loads; buckets for moving bulk material.

Telehandlers use a fork attachment mounted to a telescopic boom. This configuration raises materials in an arc that requires a greater area of operation. Telehandlers are often four-wheel drive machines fitted with pneumatic tyres.

The below load diagram illustrates how the rated capacity of the telehandler changes dependent on its position. It should be noted that most other machines working as a forklift will not have a load plate stating the rated capacity alongside a given load centre for the operator to reference.



Australian Standard AS 2550.19-2007, Cranes, hoists and winches – Safe use, Part 19 Telescopic handlers, is a useful reference for the operation of telehandlers and covers the following:

- / Planning
- / Selection
- / Sitting
- / Operation
- / Maintenance, inspection and repair
- / Examples of inspection checklists and logbooks

This document is available from the Telescopic Handler Association (TSHA) website at: <https://tsha.com.au/>

The TSHA has also produced a Good Practice Guide for Telehandlers available at: <https://tsha.com.au/resources/good-practice-guide/>

7. Attachments

There is a wide selection of attachments available to be mounted to forklifts. Each attachment is designed to handle specific materials and reduce the likelihood of causing damage to loads, and increase safety and productivity.

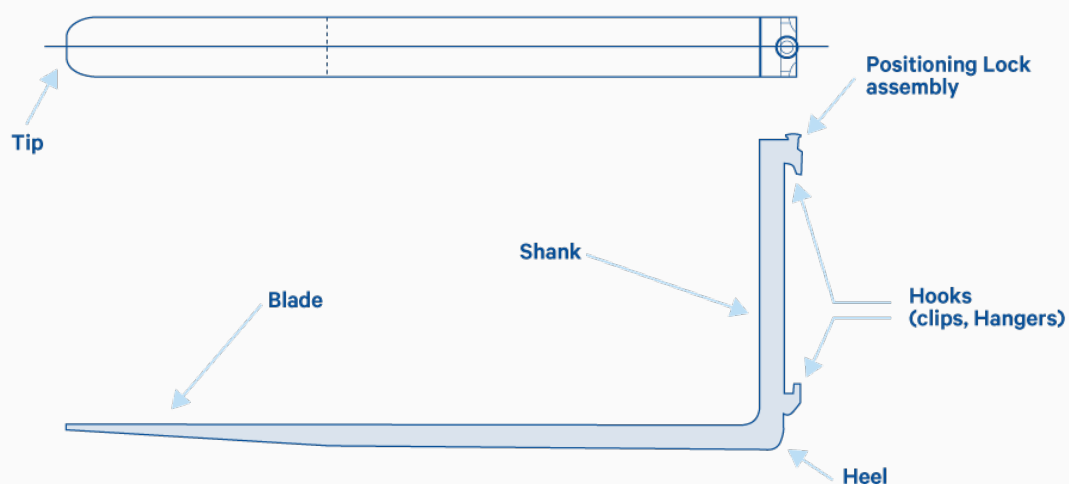
The below list of attachments is by no means exhaustive. The vast majority of attachments available to industry either fall within, or are a modification to, the below categories.

All attachments must be rated and display this information clearly. Once fitted, attachments become part of the forklift and must be included in pre-operational inspection. Some attachments may be required to be fitted by an appropriately qualified person. All forklifts must display a data plate revising the rated capacity of the machine, taking into account any attachments fitted when applicable. When an attachment is fitted to a forklift, its operating characteristics may change, making it necessary to de-rate the forklift capacity and restrict some operating controls. Attachments must have rated capacities matched to the appropriate classification and capacity of forklift.

7.1 Forks

7.1.1 Fork terminology

- a. Blade/Fork - The horizontal portion of the fork upon which the load is supported
- b. Heel - The radiused portion of the fork connecting the blade to the shank
- c. Shank - The vertical portion of the fork to which the supporting hooks are attached
- d. Hooks, clips or hangers - Lugs attached to the shank to support and retain the fork on the carriage
- e. Tube - The tube is used for mounting forks onto shaft or pin type carriages
- f. Tip - The free end of the blade
- g. Positioning locking pin - Device for locating the fork on the fork carriage.





7.1.2 Types of forks

Forks (often referred to as tynes) vary in length, width, thickness, mounting type, tensile strength and profile. The forklift rated capacity, load centre, carriage design and role will help determine the correct fork type for a particular machine. There are many options available to cater for specific needs. These include, but are not limited to, different bevel options (tip profiles) ranging from no bevel, bevel and chisel tips, as well as different taper profiles. Common taper profiles include standard, full top, full bottom and two stage tapers. Installing the correct fork types to your machine will help reduce damage to materials being handled, reduce premature wear of the forks and help the forklift operator carry out their tasks.

Different methods of attachment to the carriage are also available. The most common attachment methods include Hook Type, Pin Type and T west. Each mounting type presents benefits depending on the forklift's capacity, attachments and intended use.

Some fork attachments allow multiple sets of forks to be mounted. Twin and multi-fork attachments are often fitted with side shift functionality and allow the forklift to handle larger loads, as well as multiple pallets and one time.

7.1.3 Fork extensions

Fork extensions are extend the length of the fork blade when handling larger loads. Fork extensions are designed for occasional use and should not be a permanent substitute for appropriately sized forks.

Fork extensions can increase the load centre by allowing loads to be placed further away from the fulcrum. So, while they can handle larger loads, they cannot carry heavier loads and do not increase the rated capacity of the forklift.

Fork extensions should be sufficiently rated and supported by the supporting forks to aid in safe operation and prevent damage to the fork extensions and/or materials being handled.

The rating must be clearly displayed on each fork extension and have a method of securing them to the supporting forks.

7.2 Clamps

Many variants of clamps are available for specific requirements. Each clamp is designed to conduct a specific task or handle specific materials. Some clamps incorporate a rotating functionality. A suitably qualified person is required to fit clamps to a forklift. Once fitted, the forklift will be de-rated because the attachment will alter the forces exerted on the forklift. Always refer to manufacturer's specifications/recommendations.

7.3 Jib attachment

Jib attachments are primarily designed to suspend a load from a single suspension point. Jib attachments vary in design and may come as a slip-on or carriage-mounted attachment. Most fall into one or more of the below categories:

- a. Flat
- b. Variable pitch
- c. Variable extension

All jib attachments shall have a rated capacity from either the manufacturer or a Chartered professional engineer. Jib attachments with variable pitch and/or extension will have a detailed rating plate indicating capacity at the various positions available.

WorkSafe New Zealand produced the approved code of practice for load lifting in December 2012. This document provides recommendations and procedures for safe practice while carrying out lifting with rigging and handling suspended loads. While this guidance has not been updated to reflect current work health and safety legislation (the Health and Safety at Work Act 2015 and regulations), it may still contain relevant information and practices to keep workers and others healthy and safe.

7.4 Push-pull attachments

Push-pull attachments allow the receipt and stowage of non-palletised materials. Most push-pull attachments use a slipsheet and typically handle bagged products such as seed, agricultural products, cement or cased products like food, electronics and bottled goods.

7.5 Side shift

Side shifters fall into two categories.

- a. Side shift – adjusts the fork's position on the carriage laterally whilst maintaining a fixed width between forks
- b. Fork positioner – adjusts the fork's position on the carriage laterally by increasing or decreasing the width between forks.

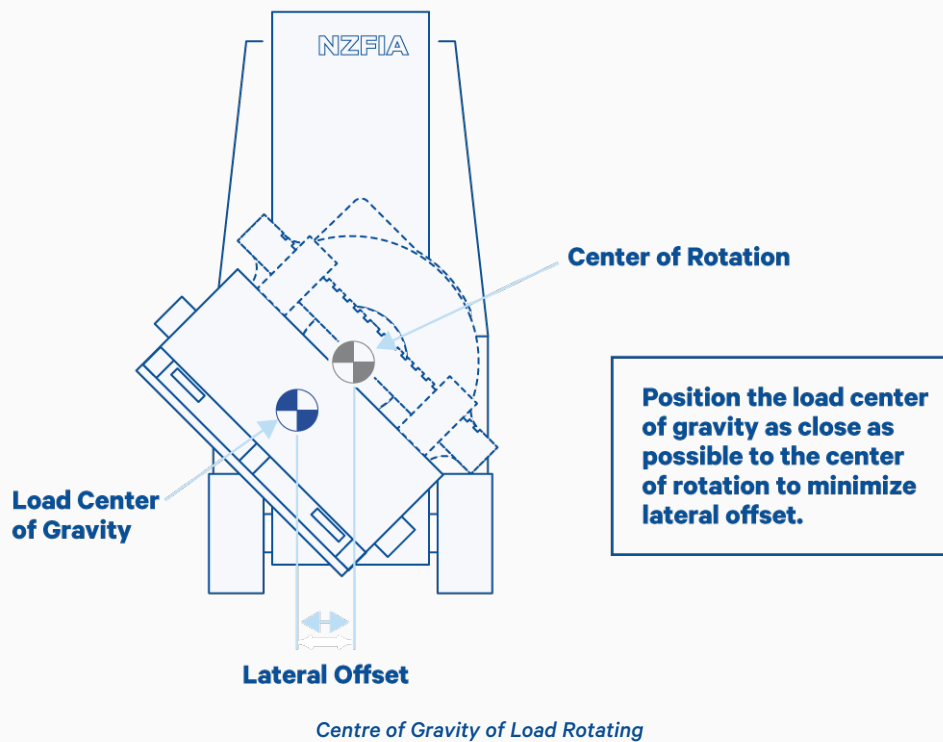
Side shifts and fork positioners help to reduce damage to pallets and racks by allowing for ease of adjustment when entering and exiting pallets, and stacking and de-stacking from racks.



7.6 Rotators

Rotators are sometimes incorporated into clamps. They allow a load to be rotated in both directions and are often used in food processing, chemical handling, waste management and manufacturing industries for inverting and dumping loads/ contents.

Rotators may exert a unique load profile onto forklifts as illustrated in the below diagram.



7.7 Pole attachments

Pole attachments are often used to handle rolls of carpet, pipes or other rolls in the warehousing and manufacturing industries. Pole attachments may be carriage or slip-on mounted. Some pole attachments may extend beyond four meters. This reduces the maneuverability of the forklift and requires close attention from the forklift operator. Pedestrian movement should be excluded from zones while a forklift fitted with a pole attachment is operating.

7.8 Trailer push attachment

Before workers begin moving any equipment with the forklift it is recommended they complete a comprehensive risk assessment. This includes checking that the attachment has been installed correctly and that the load is safe to push.

7.9 Forklift mounted safety platforms

While forklifts were not designed to elevate people, forklift mounted safety platforms may be used for raising people performing short-term tasks. Mobile elevating work platforms (MEWPs), such as scissor and boom lifts and scaffolds, are designed to elevate people and their equipment for medium to long duration tasks.

- a. Forklift mounted safety platforms must be securely attached to the forklift
- b. They should only be attached to a compliant forklift, with a load capacity data plate
- c. Ensure the traffic management plan deals with tasks involving forklift mounted safety platforms
- d. Before starting work ensure:
 - a. the parking brake is set
 - b. the controls are in neutral
 - c. the mast is vertical
 - d. tilt controls are immobilised where practical
- e. The forklift operator should hold Unit Standard 18409 – Use a Forklift Mounted Safety Platform
- f. The forklift operator must remain at the controls at all times. The forklift operator should perform an initial trial lift without a person inside to ensure the forklift mounted safety platform has a clear path
- g. Workers must be trained in the safe use of forklift mounted safety platforms, including emergency procedures, to ensure occupants can be rescued if an incident or breakdown occurs
- h. Workers must stand on the floor of the forklift mounted safety platform, not on a ladder, the guardrails or other object. They must stay within the confines of the work platform unless engaged in an emergency situation
- i. Do not use forklift mounted safety platforms to transport people at height
- j. The forklift operator may make minor positional adjustments while the platform is occupied with consent of the occupant
- k. Communication must be maintained between the forklift operator and the occupants of the platform.

NZS/ANSI/ITSDFB56.1:2005, Section 7.37.1, Platforms: Elevating, and the AS2359, Sections 6 and 12 states the design requirements for forklift mounted safety platforms used in New Zealand. Any forklift mounted safety platforms not adhering to the above standard must be removed from service.



8. Safety systems

Safety systems may be installed at the time of forklift procurement, or retrofitted to an existing fleet. Safety systems fall into two categories - passive and active safety systems.

The wide scope of roles, environments and settings in which forklifts operate determines what safety systems are required. A risk assessment focusing on the role, environment and settings in which the forklift operates will help identify the most appropriate system(s) to fit to the forklift. Consideration should also be given to integration with any systems that may already be on site, as well as the level (if any) of modification that will be required (see section 11.6).

Systems may be mounted to the forklift, other vehicles, static structures and objects, or worn by pedestrians. The below is an example of some of the forklift safety systems currently available.

8.1 Passive safety systems

Passive safety systems reduce the chance of serious injury or death in instances is an accident occurs.

- a. Seatbelts
 - i. Replace like for like
 - ii. Indicate that it is been worn by the operator
- b. Collision measuring devices and alarms
- c. FOPs – Falling Object Protection Structures
- d. ROPS – Roll Over Protection Structures
- e. CPD – Crush Protection Device
- f. Speed governors

8.2 Active safety systems

Active safety features are positive control measures for reducing risk:

- a. Seatbelt sensors
- b. Lighting
 - i. Strobe or rotating light
 - ii. Forklift orientation markers
 - iii. Safety zone projection lighting
 - iv. Front facing work lights
 - v. Reversing work lights
- c. Operator presence sensors
 - i. Weight-on seat sensors
 - ii. Footbrake depressed sensors
- d. Electronic access control
 - i. Operator RFID swipe systems
 - ii. Pin number input systems
 - iii. Allocated key management systems
- e. Safe starting sequence inhibitor
- f. Cameras
 - i. Dash type camera
 - ii. Reversing camera
 - iii. Fork or carriage-mounted camera
 - iv. Pedestrian identification and alert cameras
- g. Pedestrian proximity warning systems
- h. Proximity warning systems
- i. Mirrors
- j. Audio communication device

The NZS/ANSI/ITSDF B56.1.2005 (and any subsequent amendments) requires certain safety features on a forklift. Furthermore, this guidance provides a list of items on a forklift as a minimum standard.

- a. A functional, adjustable seat (sit on)
- b. A support and/or locking device to securely hold the operator on the forklift whilst travelling (stand on)
- c. NZ Standards approved safety belt fitted as manufacturer's specification (sit on)
- d. Padding/protective covering on all sharp protrusions in the operator cab/space (stand up)
- e. Park brake
- f. Operator controls return to a neutral position
- g. Overhead guard
- h. Horn/warning device manually operated by the operator
- i. Strobe/flashing warning light that can be seen from all angles of the forklift (except in the small areas shadowed by the mast)
- j. Reverse alarm



9. Site traffic management

WorkSafe NZ produced the Managing Work Site Traffic – Good Practice Guidelines in 2020. This document is of particular use to a PCBU who manages a work site where there are vehicles or mobile plant operating, or whose workers carry out work at a work site where there are vehicles or mobile plant operating.

A traffic management plan is a set of rules for managing the safest and most efficient movement of traffic at a workplace. It contains practical, workable controls and should cover all vehicles, not just forklifts. The plan should also be specific to the workplace.

The most effective way to control risks is to eliminate them in the first place. If this is not practical, consider other risk minimisation measures. The best way to reduce the risk of forklift-related injuries is to separate pedestrians and forklifts. This should be the most important aim of a traffic management plan.

When considering potential control measures and deciding which to use, follow the priority order set out in the Hierarchy of Control:

1. Elimination (most effective control)
 - a. e.g., consider options to eliminate the use of forklifts or the requirement for pedestrians or workers on foot within the area
2. Substitution
 - a. e.g., use a safer type of forklift. For areas with high traffic flow or pedestrian movement, consider a forklift that affords the operator maximum visibility
3. Isolation
 - a. e.g., provide an overhead or protected pedestrian walkway
4. Engineering/redesign
 - a. e.g., use speed limiting devices on forklifts
 - b. lighting
 - c. pedestrian proximity warning systems
 - d. proximity warning systems
 - e. cameras.
5. Administration
 - a. e.g., task-specific SOPs i.e., trucks only unloaded once the operator has removed all forms of load restraint, chocked the truck, removed the keys and moved to a designated area
 - b. training
 - c. warning signs.
6. Personal protective equipment (least effective control)
 - a. e.g., high visibility vests.

9.1 Key factors regarding site traffic management

- a. Work site traffic can be a major cause of harm to workers and other people at work sites.
- b. Businesses have a duty to keep people safe around vehicles and mobile plant at work sites.
- c. Where more than one business shares a work site, they must work together to manage the risks related to work site traffic.
- d. Businesses must consult with their workers when deciding how to manage the risks related to work site traffic.
- e. Consider the layout of the site. Shorter forklift movements often reduce operational costs i.e., fuel, maintenance, and wear to mobile plant components. This reduced cartage may also reduce the duration where mobile plant and pedestrians are operating within the vicinity of each other.

9.2 Speed and stopping distances

Known stopping distances are particularly useful when implementing speed limits, forklift routes and an overall traffic management plan. Hazard management process will determine the speed limits appropriate to a workplace. Consider the stability of the forklift under braking, its stopping distances and environmental factors. Some sites may elect to have laden and unladen and/or area-specific speed limits in place.

Table 1 (below) shows the typical distance it takes for a fully laden 2.5 tonne forklift to stop once the operator has applied the brakes. This is in optimal conditions: travelling on a dry, even surface with good traction, driven by an alert operator not distracted by other activities.

Even at six kilometers per hour (i.e., brisk walking pace) a forklift needs at least three meters to stop. The distance at which a forklift can stop is affected by:

- a. the speed at which it is travelling
- b. the weight of the forklift and its load
- c. its mechanical and tyre condition
- d. the road or floor surface.



Table 1. Reaction distance and total stopping distance for fully laden 2.5 tonne forklift

(Based on the range achievable without tip over for the majority of fully laden forklifts)

<i>Speed (kilometres/hour)</i>	<i>Speed (metres/second)</i>	<i>Distance travelled (metres) – based on a typical reaction time of 1.5 secs</i>	<i>Distance travelled while decelerating (metres) – based on a deceleration rate of 1.9m/sec²</i>	<i>Total stopping distance (metres)</i>
6	1.7	2.5	0.73	3.2
8	2.2	3.3	1.3	4.6
10	2.8	4.2	2.03	6.2
12	3.3	5	2.92	7.9
14	3.9	5.8	3.98	9.8
16	4.4	6.7	5.2	11.9
18	5	7.5	6.58	14.1
20	5.6	8.3	8.12	16.5

Data from the Monash University Accident Research Centre

PCBUs should monitor compliance with speed limits and ensure that they are observed and enforced. Forklifts with speed limiting devices help to ensure site-specific speed limits are observed.

10. Human factors

The duty of care of a PCBU states that the health of workers and the conditions at the workplace are monitored for the purpose of preventing injury or illness of workers arising from the conduct of the business or undertaking.

The environment the forklift is operated in can impact on the physiology and mental wellbeing of a forklift operator. The following considerations are intended as a guide, and not as an exhaustive list, to aid in the appropriate selection of mobile plant, operator management and PPE.

10.1 Industrial noise

10.1.1 WorkSafe's recommendations for the maximum average noise exposure in an eight hour day is 85 dBA with a peak sound pressure level of 140 dB, whether the operator is wearing hearing protection or not. If hearing protection is required in a workplace, forklift operators must be aware of other methods of identifying hazards and communicating with team members that do not rely solely on hearing.

10.1.2 Note that reversing alarms have a maximum rated level of 97 dB, which is over twice as loud as 85 db. If several forklifts are working in the same area, this additional noise should be factored into any calculations and considerations for the use of hearing protection (see Safety Systems, Section 8 for more information).

10.2 Environment and temperature

10.2.1 Adverse environmental conditions include airborne particles (fumes from internal combustion engines, dust from the company's operations and from driving, pollen, etc), weather (wind, rain, snow and sleet) and temperature (extremes of hot and cold, and sunburn).

10.2.2 Closed-cab forklifts with pollen filters and air conditioning provide the best operator protection outdoors.

10.2.3 Environmental factors can be mitigated by the use of PPE, such as face masks and gloves, suitable clothing and sunscreen. However, this should not be a starting point. The use of a forklift that is fit for purpose, as well as changes to the environment, may provide more permanent control measures.

10.2.4 In all environments, dehydration is a factor if operators are not provided opportunities to drink. Hot weather affects operators quicker, cold weather can cause dexterity issues in hands. Once again, correct PPE may assist in the reduction of these factors. Section Seven – Fit for Use provides often superior control measures.

10.3 Fatigue

10.3.1 Operators should ensure they get enough sleep and rest between shifts because reaction times increase with fatigue. Policies for rest breaks are important. Those operating forklifts on a constant/daily basis should be considered within the PCBU's Fatigue Management plan.



10.4 Hazardous substances

10.4.1 All operators who handle dangerous goods must be trained in their safe handling, as well as how to use any safety equipment, such as spill kits.

10.4.2 Appropriate PPE must be issued to the forklift operator, inspected prior to use and maintained.

10.4.3 Forklifts transporting hazardous substances on roads and/or areas that members of the public may access unincumbered must comply with the appropriate laws regarding the transportation of dangerous goods where applicable. See Land Transport Rule Dangerous Goods 2005 Rule 45001/2005 for further information.

10.4.4 Consideration should be given to positive pressure ventilation systems within the cab during the risk analysis phase and appropriate selection of forklift type.

10.5 Glare

10.5.1 Operators driving from areas with low ambient light levels, such as warehouses, to outdoor or bright environments may experience a temporary reduction in vision until their pupils adjust. Risks can be mitigated by excluding pedestrians from these areas and ensuring obstacles are well marked. Providing the operator with sunglasses may also reduce the risk in some settings.

10.6 Ergonomics

10.6.1 Due to the stability requirements set out in NZS/ANSI/ITSDF B56.1.2005 (and any subsequent amendments), forklifts are not fitted with conventional type suspension. The forklift chassis is often directly mounted via a three-point rigid suspension system. Tyre profiles are either solid or higher pressure pneumatic that offer little to no absorption of bumps and or vibrations. Long-term use on bumpy or harsh surfaces may cause medical issues due to repetitive vibration and jolting. Neck strain is possible when operators are often looking up at high racking or operating in reverse for extend periods i.e., when transporting large volume and over-dimension loads over moderate distances.

10.6.2 Seats are available in either ridged mount, mechanical or air suspension profiles.

Seats are the main method of dampening any forces exerted on the operator and are a major factor contributing to either the comfort or discomfort of the operator.

Comfort levels will directly affect the fatigue levels of the operator and appropriate seat selection may reduce the likelihood of back and neck-related injuries.

10.6.3 Positioning. Ensure the forklift operator can position the seat so they are able to reach all controls and inputs easily.

10.6.4 Many injuries occur when climbing in and out of forklifts. Ensure three points of contact are made available to the forklift operator and that foot surfaces are non-slip.

10.7 Stress and scheduling

10.7.1 Unreasonable scheduling may increase the risk of accidents by causing operators to drive more offensively and carelessly due to stress and time pressures. Forklift operators who are under-performing may require additional training, and schedules should be evaluated to check they are realistic and appropriate.

11. Maintenance – generic

11.1 Owners’ and managers’ responsibilities

Current requirements for forklift maintenance are covered by the adopted NZ Standard NZS/ANSI/ITSDF B56.1:2005 and subsequent amendments. The Health and Safety at Work Act 2015 also states the duties applicable to forklift operations. All owners and managers of forklifts should be aware of the maintenance requirements described in these documents.

All maintenance and repairs should be carried out by a trained and competent person, and the procedures must be carried out to the specifications provided by the manufacturer for that forklift. Parts and maintenance manuals must be adhered to for any maintenance procedure.

A planned schedule of maintenance, lubrication, and inspection shall be followed.

Only personnel who can demonstrate that they are qualified in the inspection, repair, and adjustment of forklifts, and who are authorised by their employers, shall be permitted to carry out this work in accordance with the manufacturer’s specifications. (Refer to section 6.2 of NZS/ANSI/ITSDF B56.1:2005 (and any subsequent amendments), and appendix M Accidents & Serious Harm (records and notifications)). A NZ Certificate in Heavy Automotive Engineering Level 3 and 4 with a Material Handling qualification is a way of demonstrating competency. Manufacturer employees may have training and qualification frameworks available that are equal to or greater than the NZ Certificate.

Record keeping must be carried out for all maintenance and inspection procedures and copies of these inspections/ service maintenance procedures must be kept by the owner and companies operating the forklift. The service/maintenance documentation must be signed by the person who completed the task and the company that is using the forklift.

If the forklift is being used on a public road, the service and maintenance must also conform to the requirements of NZTA which apply to the Registration and Warrant of Fitness requirements.

This does not imply that only personnel trained by forklift manufacturers or distributors are deemed competent, but may include technicians authorised by an employer or forklift owner who have the knowledge and equipment to carry out any repair or maintenance with competence.

11.2 Routine maintenance

Forklift maintenance programmes should include a regular schedule of servicing, preventative maintenance, inspection and cleaning. Records of maintenance should be retained. Routine maintenance (servicing) is normally carried out as per the manufacturer’s specification on engine hours operated or specified time schedules. The site conditions which may cause these schedules to be modified should have approval from the manufacturer or their representative before any adjustments to these schedules can be made. Failure to adhere to these schedules without correct authorisation may deem any warranty void and or adversely affect the operation and lifespan of the forklift.

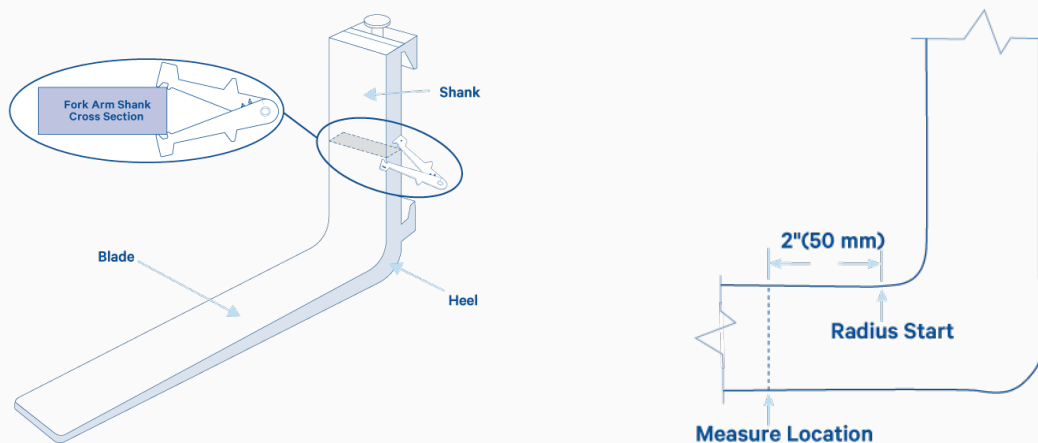
Parts, oils, and lubricants used during routine maintenance must be within the specifications set out in the applicable workshop and maintenance manual for the equipment being serviced. The use of alternative grades and types of oils and lubricants may alter the performance of the forklift and create an unsafe hazard.



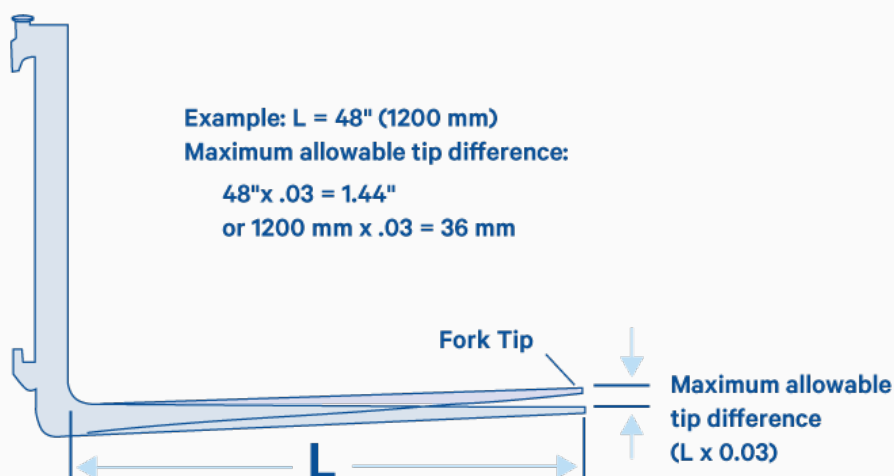
11.2.1 Forks

Forks come in many shapes and sizes with multiple tip, bevel, taper and mounting options. All forks are rated to specific capacities at specific load centres at the time of manufacture. Forks require continual monitoring for the following defects and should be removed from service if they are outside of the manufacturer's specifications. NZS/ANSI/ITSDF B56.1:2005, Section 6.2.8, Inspection and Repair of Forks in Service on Forklift Trucks states, that forks should be inspected at intervals not exceeding 12 months or whenever any faults are identified. Forks supplied after 1994 should be stamped with the forks' original dimensions and a given load at a specific load center rating on each fork.

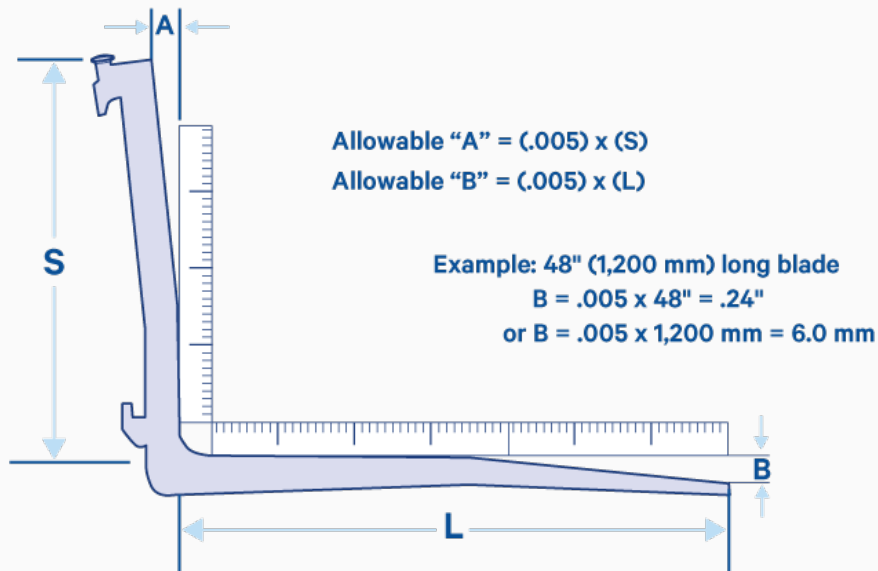
- a. **Wear:** Worn forks will no longer have the capacity at the prescribed load centre as stated at the time of manufacture. Incorrect chain tension, improper and extended use all contribute toward fork wear. Fork wear is determined by taking measurements of the shank as well as 50mm forward of the heel's internal radius. The measurement taken on the blade must be no less than 90% of the thickness of the shank. This applies to all profiles of fork with the exception of full taper forks.



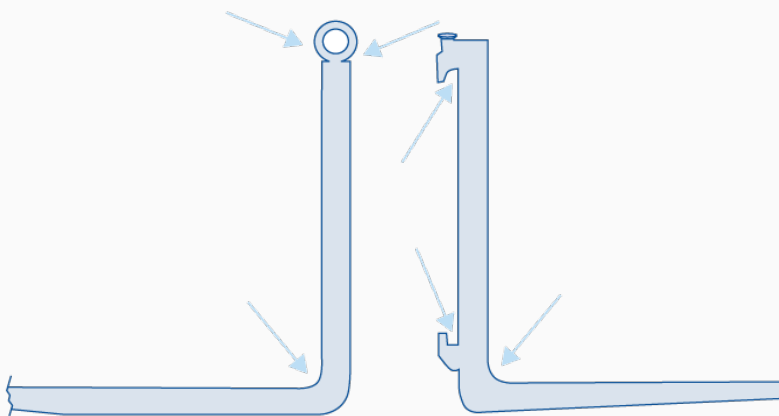
- b. **Deviation:** This can be caused by attempting to lift or suspend an item from a single fork or by attempting to lift an item outside of the forks' capacity. Deviation adversely affects the forklift operator's ability to insert the forks into fork pockets, pallets, in between stacks etc. This may increase to product damage on site.



- c. **Damage to the tips of the fork:** This can be caused by lifting with the tips of the fork or by striking them into hard objects. This will either bend, tear or burr the tip. This can lead to product damage which, in some cases, may be repaired easily on-site depending on the severity of the damage. Minor burrs may be ground away. Caution should be exercised when attempting to repair moderate to large or frequent burring to ensure that both forks remain the same length.



- d. **Mounting wear:** All mounting types wear. Specialist equipment is required to measure the extent of wear to both hook type and shaft/pin type systems. Worn mounting systems often impair side shifting functions in addition to reducing the capacity of the fork.
- e. **Cracks or structural damage:** This can be caused by snatching loads and or general wear and tear. The bellow illustration highlights the most common areas where cracks or structural damage can be found.



- f. **Modification to forks:** Modifications should only be made by the manufacturer, or a person deemed suitably qualified by the manufacturer. The drilling of holes and welding on the forks' surfaces can adversely affect the forks' capacity and properties. Modifications can be made to forks as long as the modification avoids critical areas and is within the tolerances set by the manufacturer. A new maximum capacity and load centre will often have to be established post modification.



11.2.2 Chains

Forklift chains should be inspected regularly for the following in addition to the manufacturer's recommendation. Specialist tooling such as chain gauges are available from most forklift part and forklift chain distributors.

- a. Protruding or turned pins: The pins of the forklift chain are critical, they hold the entire load. Lack of lubrication can cause the pins to twist out of place resulting in chain failure.
- b. Cracked chain leaf: Cracks occur for a variety of reasons: stress, corrosion, environmental conditions, or the chain lifting a greater load than it was designed to handle. If a crack or enlarged holes are discovered in the leaf, the forklift should be removed from service until a replacement chain has been fitted.
- c. Forklift chains should be completely lubricated at all times.
- d. Stretch or wear: Using a chain gauge, measure the wear of the forklift's chain (we recommend having a certified technician do this inspection annually as a minimum).
- e. Broken links: Dropping a load or operating the lift truck on an uneven surface can cause chain links to break. Any chain with broken links should not be used.
- f. Rust and corrosion: Similarly, a lift truck with chains showing any rust or corrosion should be taken out of service until a new chain is installed.

11.2.3 Rollers

Mast rollers must also be inspected and lubricated where necessary. Due to the rollers often being concealed within the mast sections, a full inspection is often only able to be carried out once the mast has been removed from the forklift and separated. Over lubrication may also cause the roller not to rotate and it may eventually create a flat spot on the roller, further impairing its function. When a mast roller fails, you may notice rollers or ball bearings deposited from the bottom of the mast. Continual use will stress the roller stubs and may cause them to shear off the mast's inner section.

11.2.4 Tyres

Forklift tyres require regular inspection. The steerers typically wear at twice the rate of the drivers due to frequent low or nil speed turning inputs. Solid tyres often have a wear indicator located on the side wall of the tyre. Pneumatic tyres have their wear indicator within the tread pattern. Solid tyres are primarily designed for indoor use whereas pneumatic tyres are generally more appropriate for indoor/outdoor, or exclusively outdoor applications. Pneumatic tyres fitted to forklifts require regular inspection and must be rated and inflated to the pressures prescribed in the operation manual. The rated capacity of the forklift has been calculated with this in mind.

11.2.5 Grease points

Regardless of the greasing system, all grease points should be checked and lubricated when necessary. Dry grease points are the leading cause of premature wear to masts, steering and drive components.

Refer to the manufacturer's recommendations with regard to the type of lubricant to use. Avoid using low viscosity grease and ensure any excess lubricant is removed. This excess lubricant can form large clumps that may be transferred to materials being handled. It may also fall and contaminate the ground, possibly presenting a slip hazard. Excessive lubricant also traps contaminants such as dust etc., that may have abrasive properties. This will contribute towards premature wear.

11.3 Non-routine maintenance

Non-Routine maintenance can be described as the repair or replacement of failed or worn components or adjustment of components on a forklift. It may also include fitting components to enhance the operation of the forklift or increase the safety aspects during the operation of the Forklift. The person carrying out this maintenance must be aware that the fitting or adjustment of one particular part may alter the operational efficiency of related parts. All non-routine maintenance should be performed by a suitably qualified technician authorised by their employer.

11.4 Pre-operational inspection

Pre -operational inspections should be carried out at durations set by the manufacturer as a minimum. The PCBU may elect to increase the inspection frequency at their discretion taking into consideration the environment and duration of use, along with changes of operator. An example of this may be daily inspections for environments where the forklift is operated in a more conventional eight-hour workday, or for environments where forklifts operate for 24 hours, the forklift may be inspected at the start of each shift. This operation should be carried out by the operator or a suitably qualified third party. This is to ensure the forklift is in safe working order, ready to be used and capable of completing the task(s) required. The forklift operator is responsible for inspecting the forklift or ensuring that it has been inspected at the start of the shift or before the forklift's use.

The inspection results should be recorded. If there is a safety issue with any of the components, the issue must be repaired before the forklift may be operated. An example of the pre-operation checklist can be found in the Appendices to this document.

11.5 Unsafe forklifts

An unsafe forklift may be identified during routine or non-routine maintenance, pre-operational inspections or following an incident involving the forklift. A worksite should develop and implement a procedure for workers to follow should they discover an unsafe forklift. This should include removing it from service by isolating and tagging the forklift and reporting the matter to the appropriate person immediately.

Further guidance can be found in the WorkSafe NZ – Keeping Workers Safe When Servicing Machinery quick guide. This includes content on the importance of managing the risks of machinery, when machinery should be locked out, individual, multiple and group lockout procedures, restart procedures and what to do if machinery must keep operating and cannot be locked out.

Where the function or condition of a forklift is impaired or damaged to such an extent it poses a risk to safety, a suitably qualified and trained person must be engaged to:

- a. Inspect and assess the forklift
- b. Advise the nature of any faults, wear or damage
- c. Advise of the repairs that should be carried out to safely operate the forklift
- d. Equipment under locked out status should be released for operation by the repairer or a suitable person as delegated by the PCBU.





11.6 Modification

Removing items from a forklift, or adding them to the machine, must be done in such a way that the structural integrity of that forklift is not compromised in any way. Nor should anything be done to the forklift to interfere with the design and safety capabilities as intended by the manufacturer.

Special attention must be considered concerning forklifts registered through the Ministry of Transport about additional lighting and attachments which exceed width, height and length dimensions to ensure the Warrant of Fitness inspection is not compromised. Attachments should not be fitted if they reduce the operational visibility for the operator.

Any welding, screwing, riveting or drilling of the frame may void the warranty and compromise the structural integrity of the frame as designed by the manufacturer to comply with the standards for importation into New Zealand. Any attachments that are fitted to the overhead protection structure of the forklift should be clamped to the structure.

Structural modifications should be approved by the manufacturer or verified by competent persons such as a chartered professional engineer. Cracks and deformation found in the fall protection system (overhead guard) should not be repaired, but replaced with manufacturer's supplied replacement.

12. Training - Forward

Under the current legislation (ACOP), there are three training streams available to provide evidence of forklift operator competency. An employer may elect to pursue a specific qualification/certification process in order to provide an employee authorisation to operate a forklift on their site. PCBU's are still required to provide workplace-based training as well as ongoing competency assessment in accordance with the HSWA 2015.

When selecting an appropriate training stream as a PCBU, consideration should be given to the below points:

- a. Is the training being provided to the operator sufficient and fit for purpose?
- b. What level of workplace training will be required to complete the forklift operators training?
- c. Will the selected level of training present a risk to the PCBU should a serious incident occur?

Internal/workplace training

The OSH certificate is not mandatory. A PCBU may elect to have its own internal training processes. This training process must be to the equivalent or higher standard than that prescribed within the Approved code of practice for training operators and instructors of powered industrial lift trucks (forklifts).

OSH Certificate

The Approved code of practice for training operators and instructors of powered industrial lift trucks (forklifts) outlines a standard of training that may be provided by forklift owners, managers and trainers of forklift owners, managers and trainers of forklift operators. It covers common causes of accidents, maintenance of forklifts, instructor registration and training programmes.

Forklift unit standards

NZQA has developed nationally recognised qualifications focused on forklift operation. This has been broken down into the below unit standards. Unit standard based training is often regarded as the highest level of training, awarding qualifications recognised nationwide. Trainers must complete a specific course/s in order to award unit standards within their prescribed scope. The training material must be approved and moderated by the ITO, the assessment moderated and approved by NZQA. Additionally, the ability for employers to be satisfied with the authenticity of the qualification reduces risk.

10851: Operate a powered industrial lift truck (forklift)

10852: Operate a powered industrial lift truck (forklift) fitted with attachments

18409: Use a forklift mounted safety platform in the workplace

12. Training

Section 12 of this document represents what the NZFIA believes would be considered good practice and is not yet in effect.

It is the NZFIA's position that some of the documentation/legislation governing forklifts and their operation are overdue a review. The below listed items presents the recommendations of the NZFIA where a requirement for change or update has been identified. This change or update is the result of industry feedback and/or to gain consistency with the requirements placed upon similar machinery types or operations.

Issues identified with regard to Forklift Training include the following:

- a. The Forklift Industry is the only Industry in New Zealand that has adopted parallel qualification streams. That being internal/workplace training, the current OSH Certificate and Unit Standard Framework.
- b. There is currently no register of the total number of forklift operators in New Zealand to accurately identify how the industry is fairing with relation to harm within the workplace.
- c. Forklift Trainers are essentially able to award a qualification for learners to operate machinery that they themselves are not familiar with. An example of this is a trainer who solely has counterbalance type forklift experience and knowledge providing training to a learner who will use a man-up forklift. This places the onus upon the learners PCBU to provide sufficient workplace training. The NZFIA believes that suitably qualified trainers providing fit for purpose training would better complement workplace-based training and provide safer workplaces.
- d. Learners who have passed the current OSH Certificate or Unit standard framework are able to operate any forklift type.

Solutions that provide better (Good) practice can be found in the following subject chapter.

12. Training

Primary training is separated into three parts. Foundation training, workplace training (including ongoing competency assessment) and refresher training.

A competent operator is one who has the means of demonstrating competency through the combination of the following:

1. The holding of nationally recognised Forklift NZQA unit standards appropriate to the type of forklift, and
2. Successful completion of role-specific workplace training on the type of forklift they operate, and
3. Ongoing competency assessments.

Note: Different types of forklifts and the use of attachments require different competencies, including appropriate training and/or qualifications.

All forklift operators should be supervised during the training period until the person has satisfied the training requirements.

12.1 Foundation Training

One means of demonstrating competency is through achieving nationally recognised Forklift NZQA unit standards or an equivalent or higher qualification. Competency should also be assessed through supervision during the use of the equipment.

A forklift operator must also be able to demonstrate that they have the knowledge and skills required to carry out an effective hazard and risk assessment within their area of operations.

The foundation training should cover at least:

1. Legal requirements
2. Applicable safety codes
3. Hazard management – identifying, assessing and controlling hazards
4. Equipment and safety features
5. Reporting faults, near misses and incidents
6. Forklift definition, classes, components, and terminology
7. Control facilities and positions
8. Pre-start (pre-operational) inspection
9. Refuelling and/or battery charging
10. Limitations of the forklift
11. Interpret data and load rating plates
12. Rated capacity
13. Stability pyramid
14. Safe operating practices
15. Stacking and de-stacking, including loading other surfaces
16. Working near overhead power lines
17. Safe working zones/alert zone – carry out a risk assessment when operating within bounds of this zone
18. Reporting problems and incidents
19. Practical assessment

Upon successful completion of the foundation course, the training provider shall provide a forklift operator's competency certificate with a validity period of no greater than three years. This also includes any additional qualifications listed in section 14.7.

Note: While NZQA unit standards achieved will not expire, competency of foundation training shall be refreshed after a duration no longer than three years.



12.2 Workplace training

Under the Health and Safety at Work (General Risk and Workplace Management) Regulations 2016 (the GRWM Regulations), a person conducting a business or undertaking (PCBU) must ensure, as far as is reasonably practicable, the information, training, instruction and supervision provided to workers is suitable and adequate.

A PCBU must ensure, so far as is reasonably practicable, that every worker who carries out work of any kind, uses plant of any kind, or deals with a substance of any kind that is capable of causing a risk in a workplace— either has adequate knowledge or experience of similar work so they are not likely to cause harm to themselves or other people, or are supervised by someone who has the relevant knowledge and experience.

They must also ensure workers are adequately trained in the safe use of all plant, objects, substances, or equipment those workers are handling, or may be required to handle, as well as all personal protective equipment (PPE) that the workers wear, or may be required to wear or use.

The PCBU must ensure the supervision and training provided to a worker is suitable and adequate, having regard to:

- (a) the nature of the work carried out by the worker; and
- (b) the nature of the risks associated with the work at the time the supervision or training is provided; and
- (c) the control measures implemented in relation to the work that the worker is undertaking.

The PCBU must ensure, as far as is reasonably practicable, that the training is readily understandable by any person to whom it is provided.

In the GRWM Regulations, training includes the provision of information or instruction.

12.3 Ongoing competency assessment

Fostering and maintaining a positive safety culture within the workplace is paramount. Consider what workplace refresher training is required, and how often, to ensure workers are still following safe work practices. The obligations placed on the PCBU as defined within the GRWM Regulations 2016 are ongoing.

Continuous supervision, monitoring and training ensures bad habits are identified and can be rectified at the earliest opportunity.

Operators should be made aware of any changes to existing standard operating procedures within the workplace, or the introduction of new ones.

Simulator training may be appropriate in building foundational skills for those new to industry, in preventative and refresher training and in remedial training.

12.4 Refresher training

Operators require regular refresher training that meets the requirements stated within Section 12.1 of these guidelines. The training provider shall provide evidence of the refresher training in the form of a replacement forklift operator's certificate stating the updated validity period of no greater than three years.

12.5 Remedial training

Remedial training may be required in certain circumstances i.e., findings from a post-incident investigation, failure to comply with site specific standard operating procedures (SOPs) etc.

Remedial training should be fit for purpose and focused on the performance improvement programme being initiated. Remedial training may contain theory or practical training while under supervision by a workplace trainer or a third-party training provider. Where a significant risk to people or property is concerned, simulator-based training may be an appropriate as a means of providing a controlled environment for learning.

12.6 Foundation course trainers/assessors

A foundation course trainer/assessor should be competent in operating the forklifts they provide training for. All foundation course trainers/assessors must hold the unit standards being assessed and have scope for their delivery.

Trainers should:

- a. Have knowledge of the machinery and workplace they provide training to
- b. Be able to communicate with people for whom English may be a second language c. Effectively communicate with learners who may have learning difficulties
- c. Undergo training in the delivery of adult education and maintain currency within the adult education and forklift industries.



12.7 Workplace training provider

Trainers and supervisors of workers should be competent as deemed by the PCBU, in delivering training to adult learners. They may be sourced in-house or from external organisations.

Considerations when planning workplace training and deciding who should provide the training are:

- a. What level of experience/competence do trainers or supervisors need to have?
- b. Do your workers have previous experience with the work?
- c. Do your workers have poor literacy or is English as a second language? Do your workers learn better one-to-one or in a group?
- d. What method of delivery will achieve the desired outcomes?
- e. Are there relevant formal qualifications workers could obtain (e.g., unit standards from NZQA)?
- f. How will workers provide evidence they understand the information delivered?
- g. How will successful completion of the formal training be recorded?

12.8 Qualification framework

In cases where an equivalent to, or greater than nationally recognised forklift NZQA unit standard-based training programme is being adopted, the below framework should be observed with regard to the forklift type that the trainee was assessed on.

USxxxxx1 – Fundamental forklift operations – 100 % theory based

USxxxxx2 – Counterbalance electric/ICE - (forklifts classified as Types 1, 4 and 5)

USxxxxx3 – Specialist warehousing equipment – (forklifts classified as Type 2)

USxxxxx4 – Walkie/rider – (forklifts classified as Type 3)

USxxxxx5 – Container handling forklifts - (forklifts classified as Type 6)

US10852 - Operate a forklift with attachments

US18409 - Use a forklift mounted safety platform

12.9 Forklift operators' competency certificate

Upon successful completion of the foundation course, regardless of whether it is a refresher or the learner's first time attending the course, the training provider shall provide a forklift operator's certificate/card with a validity period no greater than three years. This also includes any additional qualifications listed in section 12.8. The forklift operators certificate is not a parallel qualification to the Unit Standard Framework, but a certificate of currency.

The forklift operator's competency certificate shall display the following:

1. Full name of trainee
2. Serial number unique to the trainee/certificate issued
3. All serial numbers shall be traceable and match the details on the certificate/card. This information should be readily available for verification of authenticity
4. Date that the achievement was awarded
5. Date that the achievement requires refresher training
6. List of the Unit Standards or a description of forklift classes referred to in section 12.8 and/or any attachments that they have been qualified in
7. Full name of the trainer/assessor and employing company that has awarded the qualification.



13. Principles and physics

Forklift physics, dynamics and standards

The ANSI/ITSDF B56.1-2005 is a Standard adopted by New Zealand that defines the safety requirements relating to the elements of design, operation and maintenance of forklifts. This includes, but is not limited to, the component strength, rated capacity calculations and stability requirements of forklifts imported into New Zealand.

13.2 Nominal capacity of a forklift

Capacity is based on the strength of the various components of the forklift and on stability tests specified in the ANSI B56.1-2005 Section 7.6.

The model number of some forklifts often refers to the nominal capacity of the forklift. This should not be confused with the rated capacity. The nominal capacity is the base capacity of the forklift model set by the manufacturer often prior to the fitment of a load backrest, forks or an attachment.

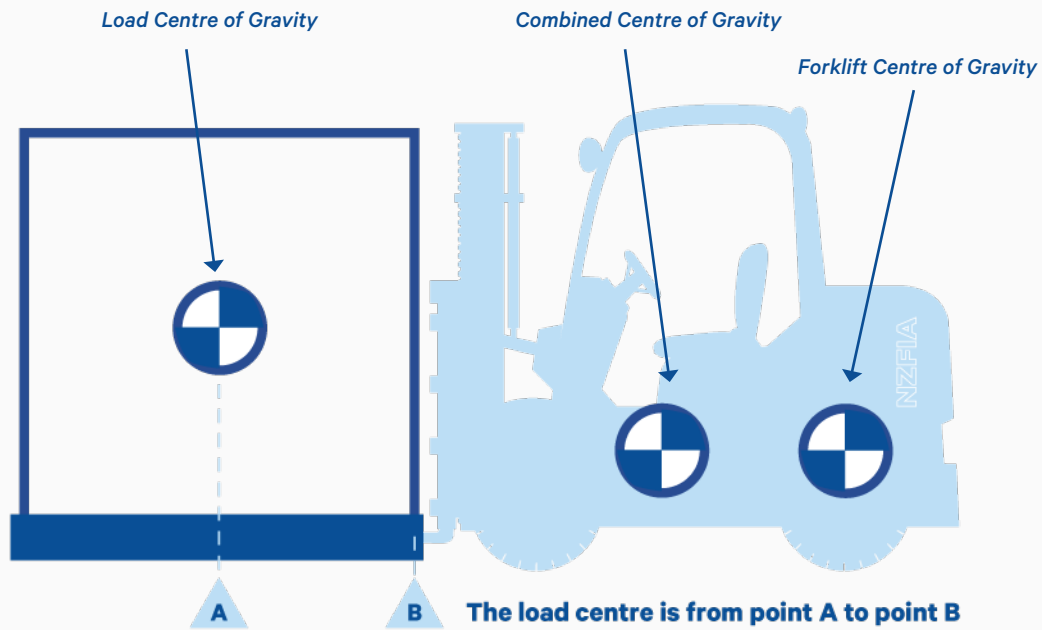
13.3 Rated capacity of a forklift

The rated capacity is the maximum weight expressed in kilograms at a specified load centre that a forklift can transport and stack to a height established by the manufacturer with a given configuration. The rated capacity of a forklift must be recalculated should the configuration of the forklift change i.e., the addition or removal of attachments, modification to fitted attachments, change in fork dimensions etc.

The rated capacity is often less than the nominal capacity because it reflects a given configuration.

13.4 Load centre

The load centre describes the distance from the face of the forks to the centre of gravity of the load. If the load centre is exceeded, the forklift will become unstable and prone to overturning. The greater the load centre, the greater the effect upon the forklift's stability due to the lever effect. This commonly results in the rated capacity of the forklift being reduced as the load centre is extended.



13.5 Stability

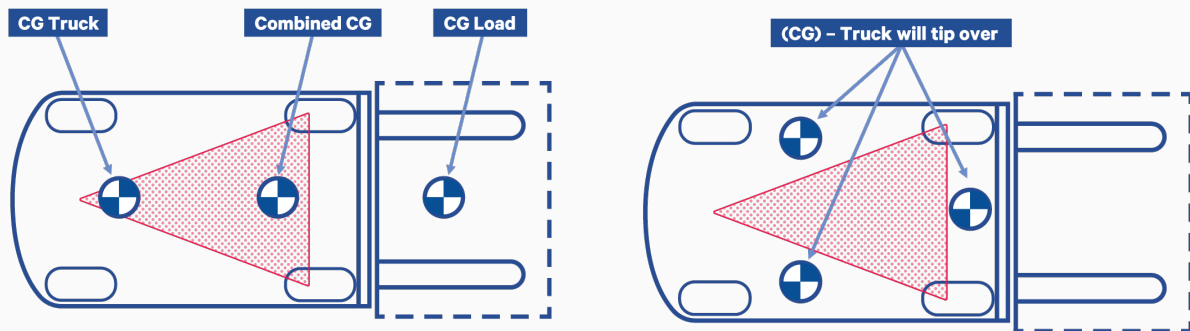
Design stability is the measure of a forklift's resistance to overturning. Factors that may influence stability are weight, weight distribution, wheelbase, wheel tread, method of suspension, forklift speed, as well as tyre, mast and fork deflection under load. Stability is determined by performing either tilting platform tests or by using calculated stability values from manufacturers. Tilt table tests differ depending on the type of forklift. These tests set out the stability requirements to verify the rated capacity. These tests are detailed within Section 7 of the ANSI B56.1-2005.

The combined centre of gravity moves as the load is moved and as the forklift travels over various surfaces and/or inclines.

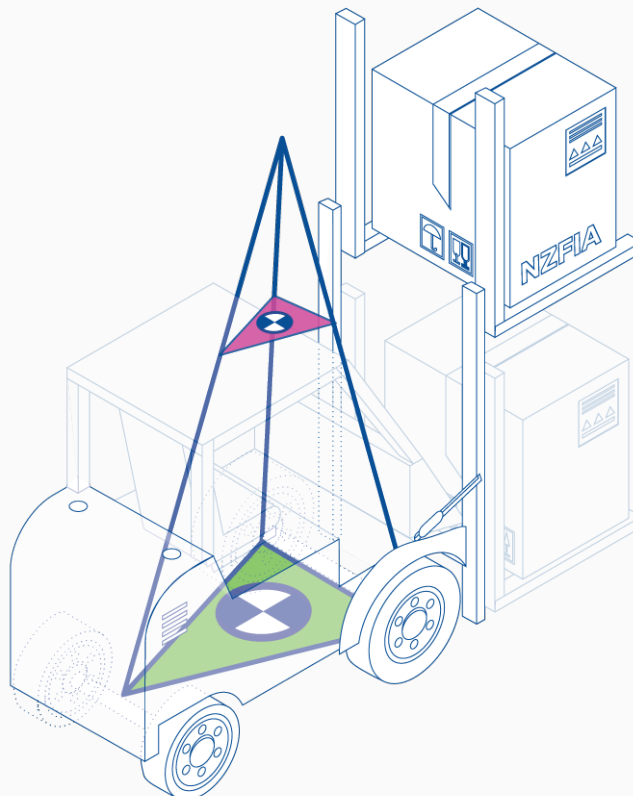


13.6 Stability triangle and pyramid

Forklifts are designed using a three point rigid suspension system. The points of suspension are located over both of the front wheels (drivers) and at the centre of the rear (steering) axle. If these three points of suspension are joined with one continuous line, the shape of a triangle will be formed as illustrated below. This is the stability triangle. The combined centre of gravity must remain within the stability pyramid for the forklift to remain stable. The combined centre of gravity is the product of the forklift's unladen centre of gravity being affected by the load's centre of gravity. The stability triangle is a two dimensional model.



- a. A three dimensional model of the stability triangle forms the stability pyramid. The stability pyramid serves to better illustrate additional factors contributing to the overall stability of the forklift. It is sometimes easier to think of the stability pyramid as multiple stability triangles laid on top of each other. As the below diagram illustrates, the higher the centre of gravity, the smaller the stability triangle becomes.



Examples of factors that may cause the combined centre of gravity (when in a loaded configuration) or the forklift's centre of gravity (when in an unladen configuration) to move outside the bounds of the stability and make the forklift liable to overturn are listed below.

- a. Handling a load greater than the rated capacity of the forklift
- b. Handling a load outside of the rated load centre of the forklift
- c. Moving with an elevated mast and/or load
- d. Mast tilted forward
- e. Poor side shift operation
- f. Handling unstable loads – unexpected centre of gravity shift g. Harsh accelerating, braking, and cornering
- g. Sudden change in surface conditions
- h. Operating on a gradient i.e., travelling down ramps with a load forward, turning on ramps etc
- i. Contact with other objects, including overhead structures
- j. Using the forklift for tasks it is not designed for i.e., pushing or towing l. Mechanical failure



14. Operator responsibilities

Safe operation of the forklift is the responsibility of the operator.

The operator shall develop and maintain safe working habits through foundation training and workplace training, including ongoing competency assessment and refresher training. Forklift operators must be able to identify hazardous conditions, including a change in the conditions or risk, in order to protect themselves, other personnel, the forklift and other materials.

The operator is responsible for any persons conducting work while in a forklift-mounted safety cage. The operator is deemed responsible for an unattended forklift if it has not been shut down correctly.

The forklift operator is responsible for inspecting the forklift or ensuring that an inspection has occurred upon commencement of their shift or prior to the forklift's use.

Workers must:

- / Take reasonable care of their own health and safety and ensure that your actions do not cause harm to themselves or others.
- / Comply with any reasonable instructions, policies or procedures on how to work in a safe and healthy way.
- / Take all reasonable steps to ensure that the load, equipment, or property are not damaged in the course of their duty.

Staff should let someone at the workplace (such as a supervisor, or a Health and Safety representative) know if they have a health and safety concern, or want to suggest an improvement.

15. Safe operation

Safe operation of the forklift is the responsibility of the operator. The below rules and procedures should be adhered to in addition to any local/site-specific safe working practices.

15.1 Young people working with machinery

The WorkSafe, Safe Use of Machinery – Best Practice Guidelines, Section 2.6.2 - Safe use of

Machinery Responsibilities outlines the restrictions for young people working with machinery.

Employers must take all practicable steps to stop anyone under the age of 15 years old working or helping with work with machinery.

No one under the age of 15 years old should be in an area where:

- / Goods are being prepared or manufactured for trade or sale
- / Construction work or forestry work is done

Unless they are:

- / In a public access area
- / Under the direct supervision of an adult
- / On a guided tour of the area
- / In an area only used for the sale of goods or services.

15.2 Basic safety rules

- a. Always wear a seatbelt when operating a forklift (refer section 8.2)
- b. Forklifts are only to be operated by trained and competent personnel who hold current certification, unless they are under training and direct supervision
- c. Forklift operators must have written and recorded authorisation to operate the forklift from the site PCBU
- d. Operators should be physically and mentally able to ensure satisfactory speed of reaction, adequate vision and judgement of distance
- e. Operators must be alert at all times to avoid accidents
- f. Operators must check that their forklift is in a serviceable condition and is fit for use prior to operation
- g. If at any time the forklift develops a fault, or if there is reason to think it unsafe, stop, tag and isolate the forklift. Report immediately to the appropriate authority. Do not use the forklift until it has been deemed safe by an appropriately qualified person
- h. Unless authorised, and able, do not attempt repairs or adjustment to the forklift
- i. Load pallets evenly; avoid building up unstable loads which could collapse when moved
- j. Look all around before moving the forklift truck
- k. Loads must be strictly within the weight and load centre capacity limits of the truck as shown on the load plate
- l. Never operate the forklift truck on gradients with the load elevated more than necessary
- m. Forks of a forklift are designed to have reduced friction between them and a load, and they stabilise the load with two faces of contact. Tilting the forks backwards when carrying a load prevents the load slipping off the forks.
- n. A safe working zone/alert zone no smaller than a three meter radius around the forklift should be observed. Carry out a risk assessment when personnel are required to operate within bounds of this zone.



Care should be taken when traversing a threshold or change of surface level. Depending on the class of forklift, the change in surface level can be difficult. Using the correct forklift for the application (includes surface being used on) assists. Further, a site assessment should identify problem areas and have appropriate controls used to make traversing easier and safer.

Costly damage to the forklift mast base and/or the surface can occur from hitting the change in surface.

Care should be taken when changing surface levels at an angle. The load should be positioned low on the mast and well tilted back. Traversing in an “S” fashion with the outer wheel of the turning arc making the change in surface level ensures positive drive over the height change point.

15.3 Towing with a forklift

A forklift shall not be used for towing trailers etc., unless it is designed for towing and is rated accordingly on its serial/data plate.

In addition, Australian Standards AS2359 part 2 “Operation”, 3.2 (General Rules) states: “Do not use an industrial truck for any purpose for which it is not designed or equipped, such as pushing a load or any other object.”

Unless specifically stated by the original equipment manufacturer that the unit is safe and able to tow equipment, forklifts are only designed to lift heavy materials via its forks.

Forklifts generally don't possess the weight distribution and braking capacity needed to tow equipment safely. The configuration of steering and braking does not provide the operator with the level of control needed to tow a vehicle safely and there is an increased risk of the forklift losing control and tipping over.

A forklift's forks are not designed to drag or tow heavy weights.

Towing a vehicle or equipment may result in them becoming damaged or uneven, reducing the stability of the towing unit which could result in it tipping over.

Counterbalanced forklifts may be equipped with a tow coupling, pin or hitch under the counterweight. This tow point is only provided so the forklift can be safely towed (e.g., winched onto a transport truck). It is not to be used for towing.

15.4 Driving procedures

- a. Always carry loads as near to the ground as practicable. In the event of brake failure, lower the load to the ground
- b. Always look in the direction of travel
- c. Remember the effect of tail swing. To make a turn, reduce speed and take care that the forklift or its load does not contact any object or person nearby.
- d. If a load obscures forward vision, drive in reverse or use a spotter to guide you
- e. Only carry loads that are supported by the load backrest or stanchions depending on the forklift's application
- f. Drive at a speed consistent with the operating conditions. Always follow site rules and slow down for changes in the surface conditions
- g. Keep a safe braking distance from vehicles in front of the forklift and never overtake when approaching crossroads or in blind areas
- h. When approaching intersections or pedestrian areas, slow down, sound horn, and if vision is obstructed keep well to the correct side of the aisle
- i. Passengers must not be permitted to ride on the forks or load, or any other part of a forklift truck. Exceptions are forklifts fitted with a designated passenger seat and seatbelt

- j. The use of a forklift as a hoist for personnel must not be permitted unless a work platform complying with the appropriate standard has been fitted
- k. Do not run over loose objects. Stop the forklift, remove objects (dunnage, etc.) to the side of the aisle and report to supervisor
- l. Never attempt to handle loads that exceed the forklift's rated capacity. This involves not only weight, but the load centre. Remember the allowable load to be carried is reduced if a high lift is involved (refer to the forklift truck load chart rating)
- m. Never cross railway lines unless the lines have been recessed into the surface
- n. Never park a forklift so that any part is closer than 4m from any railway line or overhead powerlines
- o. Never use a forklift to tow or push objects or other equipment unless sufficiently rated
- p. Never attach a tow rope to the mast or load backrest to pull or drag loads
- q. Forks should always be placed well under the load, preferably to their full length. When travelling, the back of the load should be located against the fork carriage or back rest and the mast tilted back sufficiently to safeguard load
- r. When a forklift is travelling with or without a load, the forks should be at a height no higher than 100 to 150mm above the ground level
- s. Do not allow anyone to stand or walk under the elevated forks, whether or not a load is being carried
- t. Always be aware of pedestrians and workers within the operational area.

15.5 Forklifts that elevate the operator

Where a forklift elevates the operator within a load platform, the operator is considered to be working at height. Further training shall take place to ensure the safety of the operator and a rescue plan must be in place should an incident occur.

Type 2 forklift training, as per Section 12.8, includes additional content pertaining to Elevated Work Platforms (Vertical Lift) training and safe use of harness training.

If an operator or a person is elevated by a forklift, the person shall wear a safety harness in restraint unless exempt due to meeting the conditions contained within the best practice guidelines for working at height produced by WorkSafe New Zealand in 2019.



15.6 Ramps and loading docks

- a. Never operate over a bridge plate unless it is rated to support the combined weight of your forklift and its load. Ensure it is secured and drive over it carefully
- b. Before entering a truck, trailer, or rail wagon, its brakes should be set on and its wheels chocked
- c. The ramp should:
 - a. be wide enough and sufficiently rated to take the forklift and load
 - b. be maintained in good condition
 - c. have good traction in wet weather
 - d. allow a smooth weight transfer on and off the ramp
 - e. have a gradient that does not exceed the angle recommended for safely operating the forklift
 - f. Have a safe working load displayed
- d. A forklift must never be left unattended on an incline
- e. When travelling on an incline and carrying a load, it is recommended that the load must always be on the uphill side of the forklift
- f. It is recommended that when travelling on an incline without a load, the forks should be on the downhill side of the forklift truck
- g. On all gradients, the mast must be tilted back and raised sufficiently to safeguard the load and to prevent the forks from contacting the ground
- h. Never stack on gradients.

15.7 General

- a. Never place any parts of your body between the uprights of the mast or outside the limits or the forklift's cab
- b. Prolonged use of a forklift powered by an internal combustion engine within a confined space will produce a build up of fumes and gases that can be dangerous. Ventilation systems and carbon monoxide sensing equipment will help measure the environmental conditions. The use of electric forklifts is recommended when operating within confined spaces.
- c. When leaving the forklift, ensure that the controls are at "neutral", power is shut off, park brake is applied, forks fully lowered and tilted forward, the steerers are facing straight ahead and the ignition key or starter switch key removed (This helps prevent unauthorised people from using the machine)
- d. Never leave a forklift unattended or parked closer than four meters to railway lines
- e. Under no circumstances must additional counterweights be added to forklift trucks to increase their load carrying capacity without prior reference to the manufacturer. No person should stand or sit on the counterweight
- f. All repairs, rebuilds or adjustments shall be made in accordance with the manufacturer's design criteria
- g. When a forklift truck or any part of its load must be closer than four metres to any live overhead powerlines, the electrical supply authority should be contacted
- h. In the event of a forklift contacting a power line:
 - a. the operator should stay where they are and keep others away
 - b. if possible, move the forklift clear of the power line using the opposite inputs that caused the contact
 - c. if the operator must leave the truck, they are to jump well clear to avoid the risk of electrocution.
 - d. if the power line is broken -
 - i. DO NOT get off the truck
 - ii. Wait until the power is shut off before leaving the truck or allowing anyone to come near.

15.8 Additional rules for reach trucks

- a. Take all reasonable steps to limit the occasions a reach truck is driven, whether laden or unladen, with the reach mechanism extended
- b. Before operating the reach mechanism of reach trucks, make sure the brakes are applied
- c. 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
- d. Do not use the reach movement by itself as a means of pushing or dragging loads into position
- e. Be sure that the load is raised just above the reach legs before retracting.

15.9 Additional rules for pedestrian-operated vehicles

Pedestrian-operated vehicles fall into two categories; manually powered or motorised.

Manually powered pedestrian-operated vehicles are a self-loading truck equipped with an elevating mechanism designed to raise the load only enough to permit horizontal movement. Popular types are low lift platform trucks and pallet trucks.

Motorised pedestrian-operated vehicles are often called walkies and/or walkie stackers. These are self-propelled and may incorporate electronic or hydraulic assistance to elevate the load. The walkie stacker is designed for a person to operate the equipment while walking, not riding. Unlike forklifts that are counterbalanced and designed for heavier loads, the walkie stacker is designed for less demanding loads and shorter travel distances.

Because pedestrian-controlled powered forklifts are often used by untrained personnel, it must be emphasised that the general rules in this publication apply equally to pedestrian-controlled forklifts. A data plate is mounted on every walkie stacker and should be located near the power handle. The data plate lists the load capacity of the forklift as well as other vital information. The load capacity is determined by the truck's own physical weight and based on a load centre standard of 500mm. The load centre distance is measured from the load bracket to the centre of the load.

- a. Foot PPE is a requirement for use
- b. Keep feet clear of the truck frame while operating
- c. Do not ride on the truck
- d. Always keep hands and fingers inside the protected area of the control handle
- e. Always place both hands on the control handle when operating in reverse
- f. Always enter an elevator or other confined areas with the load leading
- g. Be cautious when travelling in reverse due to the steering characteristics
- h. Be careful of drive end swing when turning while operating in reverse
- i. Exercise caution when turning into an aisle. The load wheels tend to cut the corner
- j. Never travel at a speed greater than normal walking speed.



16. Operating a forklift on public roads - Forward

A public road is defined by the Land Transport Act 1998 as below:

A road includes:

- (a) a street; and
- (b) a motorway; and
- (c) a beach; and
- (d) a place to which the public have access, whether as of right or not; and
- (e) all bridges, culverts, ferries, and fords forming part of a road or street or motorway, or a place referred to in paragraph (d); and
- (f) all sites at which vehicles may be weighed for the purposes of this Act or any other enactment

This may be interpreted that forklift operations on a site that is not secure i.e. does not have a full perimeter fence with either a manned or electronic access system that physically prevents and controls unauthorised public access is classed as a public road.

Currently, forklift operation on public roads triggers the below requirements.

Drivers Licence requirements

Any forklift operator that operates on a public road must hold an F endorsement on their New Zealand drivers licence. If the Gross Laden Weight (GLW), meaning the all up weight of the forklift, any attachments and its load is 18,000kgs or less, the forklift operator must also have their Class one drivers licence. If the GLW is over 18,000kg, the forklift operator must hold their Class 2 driver licence.

Warrant of Fitness (WoF) requirements

Forklifts are required to comply with WoF requirements only as far as is practicable for their design and type. The requirements are detailed at www.vehicleinspection.nzta.govt.nz/virms/in-service-wof-and-cof/forklifts and states what the NZTA considers to be practicable in relation to the inspection and certification of forklifts

Registration requirements

using an unregistered vehicle on a road is an offence. A list of vehicles exempt from registration requirements can be found www.nzta.govt.nz/vehicles/licensing-rego/exemptions/exemption-from-registration

16. Operating a forklift on public roads

Section 16 of this document represents what the NZFIA believes would be considered good practice and is not yet in effect.

It is the NZFIA's position that some of the documentation/legislation governing forklifts and their operation are overdue a review. The below listed items presents the recommendations of the NZFIA where a requirement for change or update has been identified. This change or update is the result of industry feedback and/or to gain consistency with the requirements placed upon similar machinery types or operations.

Issues identified with regard to Using a forklift on public Roads and Warrant of Fitness (WoF).

- a. Inconsistent application with similar mobile plant e.g. Mobile Elevating Work Platforms, Agricultural Tractors, agricultural motor vehicles, telehandlers etc
- b. Currently the ruling being is largely ignored due to its overreach into what is considered a public road and triggering the requirement for a WoF – Namely “a place to which the public have access, whether as of right or not” including parking areas, driveways, open sites etc
- c. Many WoF Centres are unable to issue a WoF for forklifts
- d. Many of the “normal” WoF Checks are unable to be completed due to the design characteristics of the forklift including but not limited to;
 - a. Brake performance including brake testing
 - b. Park Brake performance when un-laden. 90% of the vehicle weight is typically on the rear (unbraked) axle
 - c. Nil Low and High beam lights
 - d. White rear facing work lights
 - e. Excessive play in steering mechanism due to extensive steering angle available to forklifts
 - f. Tread depth of Solid tyres

F-Endorsement

Issues Identified with the current F – Endorsement.

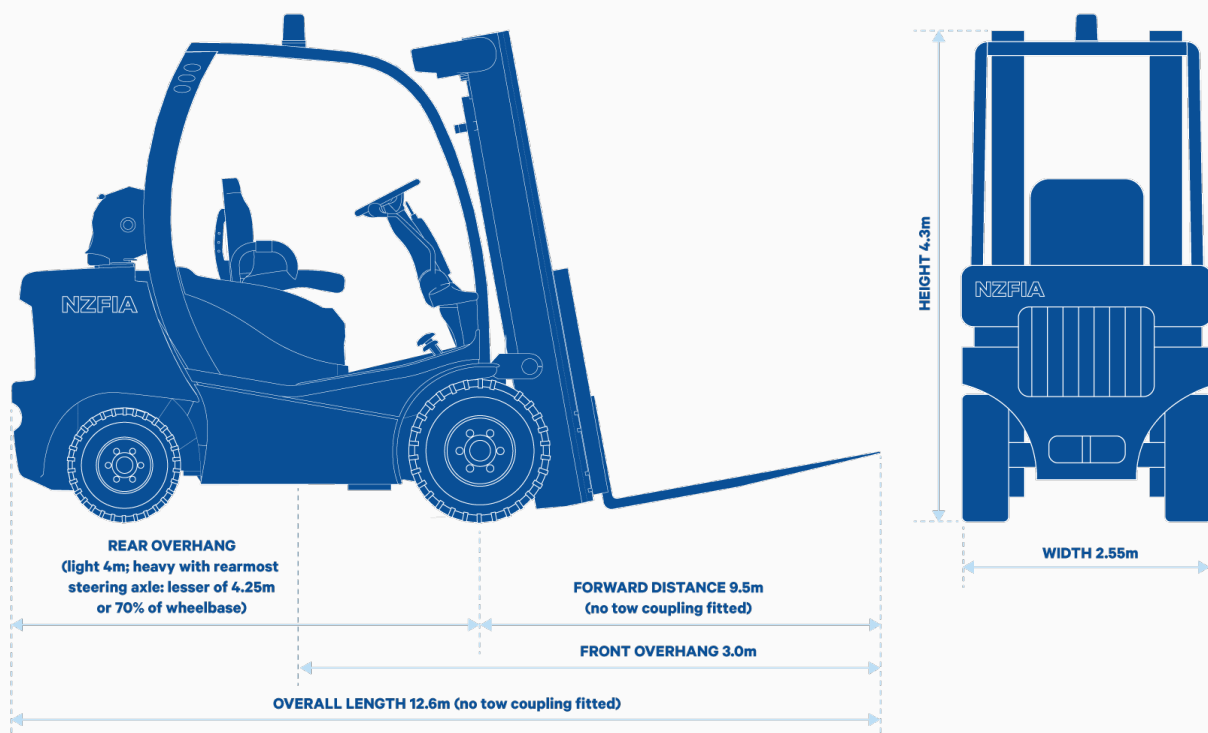
- a. Inconsistent application with similar mobile plant e.g. Mobile work platforms, Agricultural Tractors, telehandlers etc
- b. The F- Endorsement is being largely ignored due to its overreach into what is considered a public road and triggering its requirement, namely “a place to which the public have access, whether as of right or not” including parking areas, driveways, open sites etc
- c. Confusion where people believe they have their “forklift Licence” and therefore do not need to obtain the appropriate Unit Standards or OSH Certificate to operate a forklift.

Solutions that provide better (Good) practice can be found in the following subject chapter.

16. Operating a forklift on public roads

When a forklift is loading or unloading materials in car parks, driveways/right of ways, yards, construction sites etc., it is not considered to be operating on a public road. However, when a forklift is transiting on a public road where vehicular traffic is usually present, additional requirements come into effect.

- a. If you are driving a forklift on the road you must follow the road rules
- b. All forklifts driven on the road must be in good condition and safe to use on the road. This means that generally they need to meet the same requirements as a WoF where applicable
- c. Ensure the load is adequately secured
- d. Check that the forklift and its load is not overweight for any roads or bridges that will be used
- e. Check that the forklift and its load does not exceed axle weight limits prescribed by Wake Kotahi NZ Transport Agency
- f. Check that the forklift and its load does not exceed the maximum dimensions to operate on public roads as detailed in the below illustration
- g. When operating a forklift on public roads, the operator must hold a minimum of a restricted Class One New Zealand Driver's Licence and comply with the requirements of operating the vehicle on the road.



17. Stacking

17.1 Common causes of incidents involving racking systems

Worksafe NZ has produced Working Safely With Pallet Racking Systems guidance that is available on their website. This guidance is for forklift operators and persons conducting a business or undertaking (PCBUs). It explains what good practice looks like when selecting, using and maintaining an adjustable or selective pallet racking system. Below is a list of common causes of incidents involving racking systems.

- a. Unsuitable storage system being used
 - a. for example, systems collapsing because they were not appropriate for the load they were supporting
- b. Incidents with racking systems and pallets usually occur due to:
 - a. the racking system and/or pallets are badly designed
 - b. the racking system has been incorrectly installed
 - c. the racking system is damaged – and/or not inspected
 - d. pallets are badly constructed or are damaged
 - e. the wrong type of pallet is used
 - f. pallets are incorrectly loaded and/or unloaded
 - g. pallets on racking incorrectly stowed (not square to the face or protruding into the aisle way)
 - h. supervision/management is inadequate
 - i. the store or warehouse has a structural fault
 - j. the safe working load of the system has been exceeded
 - k. Seismic event



17.2 Common cause of incidents involving timber stacks

Worksafe NZ has produced Safe Stacking Of Sawn Timber And Board Materials guidance. This guidance contains practical advice for PCBUs, such as timber manufacturers, mills or yards, and other PCBUs who stack sawn timber or board materials. The guidance may also be of benefit for other materials stored in a similar manner. Below is a list of common causes of incidents involving stacks.

- a. Bearer failure
 - a. use of damaged, poor condition or insufficient bearers to support the stack.
 - b. poorly positioned, incorrect length or non-uniform bearers being used
- b. Poorly assembled, unstable stacks
 - a. excessive stack heights being assembled.
 - b. misplacement or missing fillets
 - c. use of poor-quality packets
 - d. seismic event
- c. Strap failure
 - a. incorrect strapping used to support load
 - b. incorrect positioning of strapping
- d. Unsafe work practices or poor site design
 - a. vehicles contacting the stack due to not enough space to work around the stack
 - b. workers climb the stack to access packets or other items stored incorrectly
 - c. stacks are not monitored regularly for change and restacked if needed
 - d. poor unstacking practices being used.

17.3 Considerations

The below considerations should be part of a site traffic management plan as well as a materials storage plan.

17.3.1 Environmental

- a. Ground stability
 - a. ground below and around the stack needs to be sound and strong enough to hold the load of the stack as well as any machinery that might be used
- b. Slope
 - a. ground should be flat, or if the foundation has been sloped to encourage water to drain, any slope should not exceed 2°
- c. Drainage
 - a. the site should have adequate drainage so that heavy rain will not affect the ground stability. Pooling of water can also deteriorate the bearers
- d. Prevailing wind
 - a. stacks that are outside may be affected by wind. Even relatively light wind can dislodge timber. Where possible construct them so a small cross section is facing the prevailing wind direction. If appropriate in high wind areas, upper layers of the stack can be restrained to prevent movement.

17.3.2 Site characteristics

- a. Surface construction below stack
 - a. the surface that the stack is on should be solid and well maintained with no potholes or cracking. The foundation and soil below the stack should be fit-for-purpose for the load of the stack it will need to support
- b. Access to stack
 - a. the stack needs to be accessible for whatever method will be used to assemble or unstack the stack. For example, if forklifts or side loaders will be used on or around the stack, leave enough room around the stack to work safely
 - b. set stacks out so that workers can safely access and scan identification codes.
- c. Visibility
 - a. consider what visibility pedestrians and vehicles will have once the stack has been assembled. Stack areas should have adequate lighting
- d. Suitability of buildings
 - a. if buildings are to be used for timber storage, a competent person should assess their suitability. For example, the walls of storage sheds may require reinforcing.

17.3.3 Location of other features

- a. **Location of power lines** - Stacks should be located so that machines that work with them are further than the distances required by regulations from any live power line. For more information, see WorkSafe guidance New Zealand Electrical Code of Practice for Electrical Safe Distances (NZECP 34:2001 at <https://www.worksafe.govt.nz/laws-and-regulations/standards/electricity-standards-and-codes-of-practice/>)
- b. **Location of underground services** - Consider where underground services, manholes, fire hydrants or other site utilities are located. They may need to be accessed after the stack is built.
- c. **Location of site boundary** - When material is stacked beside a boundary where there is public access, assemble the stack end-on and at least one metre from the boundary.

17.4 Safe Stack assembly

Different storage methods present different risks. WorkSafe has produced clear guidance with regard to pallet racking systems and timber stacking - Working Safely With Pallet Racking Systems and sSafe Stacking Of Sawn Timber And Board Materials quick guides. This guidance includes:

- a. Managing risks
- b. Safe site management
- c. Safe stacking practices
- d. Stack height limit ratios
- e. Safe unstacking practices
- f. Safe storage.



17.5 Loading and unloading of loads onto other surfaces

Some surfaces are considered a surface, other than what the forklift is operating on. A non-exhaustive list may include the following:

- a. Vehicle deck
- b. Trailer
- c. Static machinery in-feed
- d. Loading bay
- e. Platforms and mezzanine

Note: Purpose built racking and storage systems are not considered as 'other surfaces'.

The Land Transport Act 1998 contains the load security legislation that is administered by the NZ Transport Agency and enforced by the NZ Police. It provides strict liability for offences involving insecure loads and loads falling from vehicles. Guidance specific to the loading of trucks can be found within the NZTA – The official New Zealand truck loading code.

For this reason, it is encouraged that the forklift operator discusses these aspects with the truck driver prior to loading. When lifting large volume loads onto a carrying vehicle, a spotter should be used to ensure the load is positioned correctly on the carrying vehicle. A site-specific risk assessment with adequate controls, complemented by standard operating procedures should be in place.

When 'pushing through' a load on a carrying vehicle deck to the far side of the deck, care should be taken. An exclusion zone for all people shall be set up on the far side of the vehicle. Care is to be taken that the load does not shift out of proportion to the load carrying base (pallet or dunnage). The operator should measure load size in comparison to the carrying vehicle deck to ensure loads are fully supported by the deck.

Care is to be taken when 'tipping' a load off the forks onto another surface. The load shift can make the forklift unstable and move the combined load centre outside of the stability triangle. Therefore, this practice is not recommended.

If tipping' a load onto another surface, an exclusion zone on the far side shall be set up to prevent anyone entering this area whilst the load is being positioned and 'tipped' in.

Prior to 'tipping' the load, the forklift should be in neutral, with park brake on and an operator at the controls at all times during the operation.

At no time, should someone position themselves between or under the load and the carrying vehicle to support or assist the load coming off the forklift. An assisting person shall only work from the side of the load and be in easy communication with the operator (seen and heard).

17.6 Basic Stacking Rules

- a. Approach the stack with the load low and tilted backward
- b. Stop at the face of the stack, reducing backward tilt to an amount just sufficient to stabilise the load, apply the brake, gear lever into neutral
- c. Raise the load to the desired stacking height
- d. When the load is clear of the top of the stack, move slowly forward. The inching pedal (if fitted) may be of use at this stage
- e. When the load is over the stack, bring the mast to the vertical position and lower the load on to the stack
- f. When the load is securely stacked, lower forks until free of pallet or dunnage strips, check behind and withdraw by reversing the forklift. At this position slight forward tilt may be of assistance
- g. When clear of the stack, lower the forks to just above the ground level, then tilt the mast backward to the normal travelling position
- h. The stack should not be straightened by pushing against the stack with any part of the forklift.

17.7 Basic de-stacking rules

- a. Stop at the face of the stack, bringing mast to the vertical position
- b. Raise forks to a position permitting clear entry into pallet or dunnage strips
- c. Slowly drive forward until the backrest is against the load. Slight forward tilt may be of assistance at this stage. See additional notes for reach trucks
- d. Ensure the lower parts of the mast do not contact the stack when moving forward
- e. Lift load until clear of stack and apply backward tilt just sufficient to stabilise the load
- f. When the load is clear of the top of the stack, check behind and then move slowly backward to clear face of stack
- g. Lower the load to the correct carrying height, before applying further backward tilt, to bring into normal travelling position
- h. Extreme care must be taken to avoid jerking when tilting a load forward or backward, especially when the load is at height.



18. Large volume and over-dimension loads

18.1 General forklift guidance

Additional precautions need to be taken when handling large volume and/or over-dimension loads. The wider and taller the load the greater the dynamics exerted on the forklift due to the lever effect. This will often result in the forklift operating nearer to the limits of its operational stability envelope.

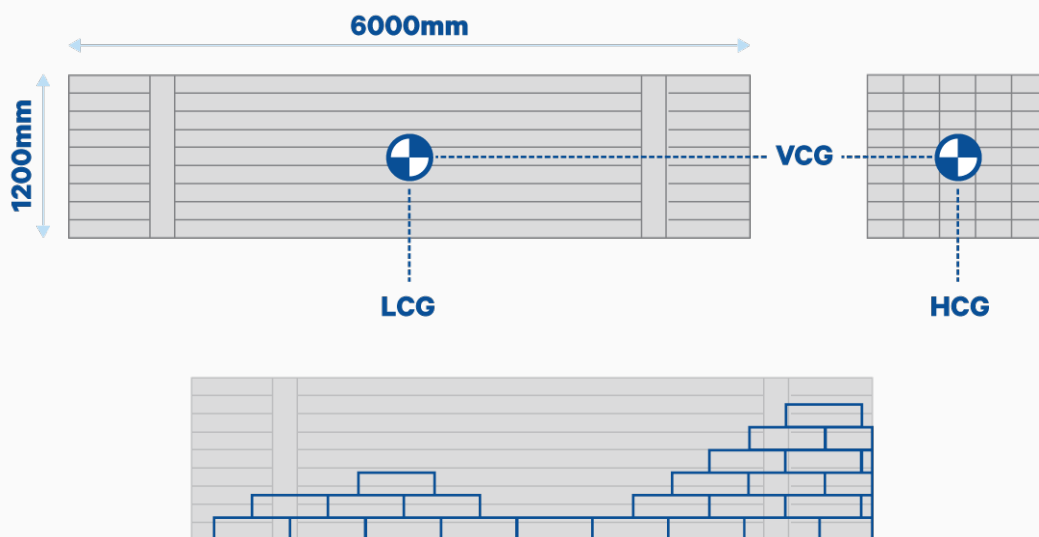
The site should have a safe system of work in place for these applications and these should be addressed in the Site Traffic Management Plan (STMP).

Forklifts with dual wheels (wider wheelbase), wider carriages and forks and/or purpose-built attachments are more appropriate for wide loads. The loads being handled, the frequency with which they are handled and the environmental conditions they operate in need to be taken into account when assessing a forklift's suitability for the task.

18.1.1 Wide loads

Accurately identifying the load's centre of gravity to ensure maximum stability may become more challenging with wider loads.

With uniformly distributed wide loads, for example a bundle of steel tubes, packet of timber etc., the vertical center of gravity (VCG), the horizontal center of gravity (HCG) and the lateral center of gravity (LCG) will be in the center of the bundle/wide load as per illustration.



Note: When it is necessary to lift a wide load where the lateral load centre of gravity is unknown, perform a test lift first to determine lateral centre of gravity and potential movement with the load during transport.

18.1.2 Tall loads

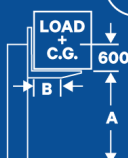
The vertical centre of gravity of the load should not exceed what is shown on the capacity plate of the forklift (see illustration 3). This is measured from the topside blade of the fork to the load's vertical centre of gravity.

A load that is taller than 1200mm may have a (VCG) greater than 600mm which the trucks are rated for.

Special precautions need to be taken when handling loads where the VCG is greater than what is shown on the capacity plate.

CAPACITY KGS

UPRIGHT VERTICAL	UPRIGHT TILTED	"B" mm	"A" mm
1000	650	600	5560
2500	1625	600	3000



Speed reduced at

Serial Number **1234567**

TRUCK WT.

4800 KG

Attachment data



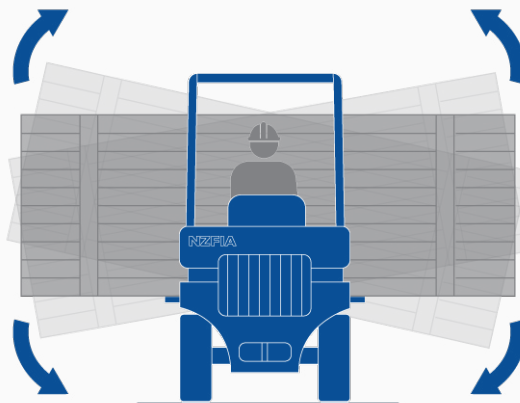
18.2 Carting large volume and over-dimension loads

Transporting wide loads or loads with a vertical load centre greater than 600mm is allowed with the following conditions:

- a. Total load does not exceed the maximum capacity (kg) as shown on the capacity plate
- b. For double stack loads the heaviest load should be on the bottom
- c. Load is supported, stabilised and secured if necessary
- d. Drive, steer and brake in a smooth manner
- e. With oversized loads, be mindful of increased clearance requirements
- f. Continually monitor the surface condition
- g. Be aware that visibility may be affected when driving in forks' first direction and take appropriate notice of the surroundings. When carrying a bulky load which blocks or restricts forward visibility, the forklift should be driven with the load trailing and if necessary, under the direction of a person who has visibility in the direction of travel, unless safe work practices allow otherwise.
- h. If a load is segmented (not secured e.g., not shrink-wrapped or strapped) ensure that the load backrest is of a sufficient width and height to minimise the risk of loose objects falling onto operator.
- i. Consider side shift position for stability.
- j. When transporting loads with a VCG greater than 600mm, elevate the load no higher than the axle height of the forklift and operate to the conditions.

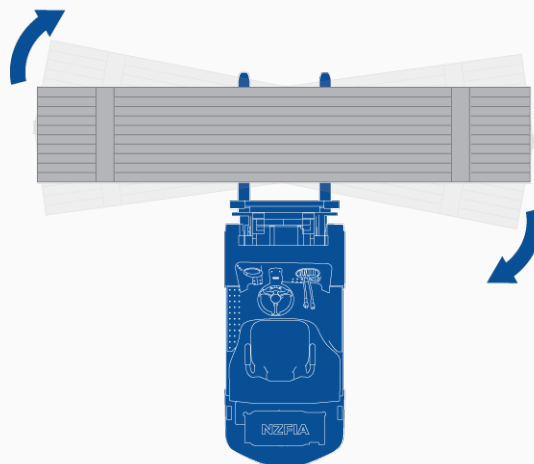
18.2.1 Load stability

Be careful when stopping or changing direction suddenly, lifting or lowering suddenly as wide loads are generally more likely to become unstable. Road surface conditions, load support, load clearance and windage are all factors that may affect load security and should be part of the Traffic Management Plan.



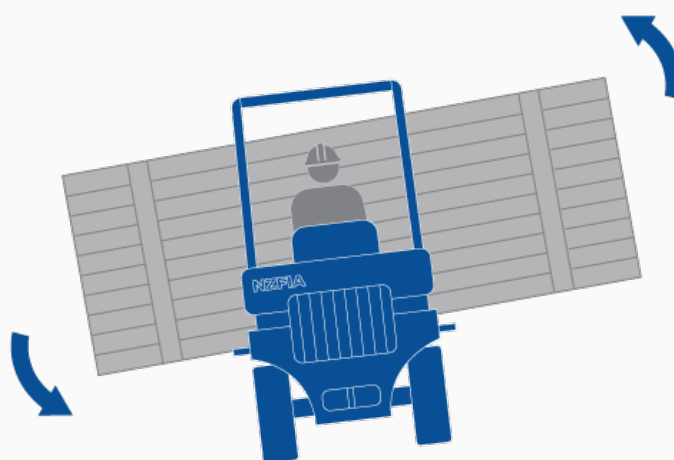
18.2.2 Load swing

Be careful whilst travelling or turning, the load will swing on a greater radius. Make sure you have adequate clearance and watch out for people in the area.



18.2.3 Load shift

Changes in surface conditions, such as potholes or ramps, may also cause the load to shift. Prior inspection for hazards in the travelling path should be undertaken with hazards controlled accordingly.



18.2.4 Visibility

When carrying a bulky load which blocks or restricts forward visibility the forklift shall be driven with the load trailing and if necessary, under the direction of a person who has visibility in the direction of travel, unless safe work practices allow otherwise. Do not rely solely on the assistance of reversing cameras or rear vision mirrors.



19. Transporting forklifts

Accidents and injuries can occur when transporting forklifts to and from sites. Part of the health and safety planning for the task should include transporting and unloading the forklift to the site as well as the loading and removing the forklift from the worksite once the task is completed.

Transport operators who are required to operate a forklift in order to load or unload, should be competent operators for the type of forklift being transported.

Refer to Waka Kotahi NZ Transport Agency's, The Official New Zealand Truck Loading Code for more information on loading, securing and transporting vehicles.

When forklifts are driven on and off highway trucks or trailers, the brakes on the highway trucks or trailers shall be applied and wheel chocks or other positive external mechanical means shall be used to prevent unintentional movement. Whenever forklifts are driven on and off trailers that are not coupled to a towing vehicle, supports may be needed to prevent upending or corner dipping.

Consider the weight distribution of the forklift. Forklifts are often reversed up onto the truck or trailer to place as much weight as possible onto the driving wheels in order to transit the forklift up the ramp. Truck or trailers loading ramps may provide difficulties for the forklift to ascend or descend under control if wet or even at a moderate incline. Winches are the preferred method for the loading and unloading of forklifts where available.

Care should be taken to ensure braked axles do not lift off the ground as the load shifts as the forklift is loaded or unloaded.

Ensure that the forks are centred and lowered, tilting them forward slightly before they contact the deck.

Isolate the forklift from its battery supply, ensure an isolation device is fitted and remove any loose items stored on the forklift. Secure the forklift to designated anchor points using appropriately rated and tensioned restraints.

The configuration of the restraints needs to secure that load in accordance with Waka Kotahi NZ Transport Agency's guidelines.

Care needs to be taken when selecting attachment points on the forklift. Ensure damage will not occur to any of the forklift components i.e., steering mechanism, steering rams, hydraulic or auto greasing lines etc. Load backrests and tow pins are not a suitable anchor point.

Where wheel chocks are used, they should be secured to the tray or the special wheel tracks by

10mm pins or bolts capable of being locked to prevent dislodgement by vibration. Chocks should be firmly placed on each side of all vehicle wheels.

Take note of the overall height and weight of the load. Due to the design of forklifts, the maximum allowable height may be exceeded depending on the height of the truck or trailer combined with the mast of the forklift. The rated or nominal capacity should not be mistaken for the tare or service weight of the forklift. For example, a forklift with a rated capacity of 18 tonnes can have a tare weight of as much as 28.5 Ttonnes.

Ensure the truck or trailer system, including its ramps, are suitable for the forklift to be transported.



20. Useful references

Below is a list of references that have been used to create this document and may be of further assistance. This is by no means an exhaustive list of useful references and there are many more site/industry specific references available.

Health & Safety at Work Act 2015

The overarching legislation stating the requirement of PCBU's, Workers and Workplaces with regard to health and safety
<https://www.legislation.govt.nz/act/public/2015/0070/latest/DLM5976660.html>

The Forklift Safety Standard (NZS/ANSI/ITSDF B56.1.2005)

Document defining the safety requirements relating to the elements of design, operation and maintenance of low lift and high lift powered industrial trucks. <https://www.standards.govt.nz/shop/nzsansiitsdf-b56-12005/>

Powered industrial trucks - General requirements AS 2359.1—1995

This standard specifies requirements for the design, manufacture, marking and testing of powered industrial trucks and their attachments.

<https://www.saiglobal.com/PDFTemp/Previews/OSH/As/as2000/2300/23591.PDF>

The Land Transport (Road User) Rule 2004

This rule establishes the rules under which traffic operates on roads. It applies to all road users, whether they are Forklift operators, riders, passengers, pedestrians, or leading or driving animals

<https://www.legislation.govt.nz/regulation/public/2004/0427/latest/DLM302188.html>

The Land Transport (Driver Licencing) Rule 1999

This rule specifies the requirements for obtaining and renewing a driver licence or licence endorsement in New Zealand. It also specifies the requirements for driver licensing service providers

<https://www.legislation.govt.nz/regulation/public/1999/0100/latest/whole.html>

The official New Zealand truck loading code

Code of practice for the safety of loads on heavy vehicles.

<https://www.nzta.govt.nz/assets/resources/roadcode/truck-loading-code/docs/tlc.pdf>

New Zealand Road Code

The official New Zealand Road code is a user-friendly guide to New Zealand's traffic law and safe driving practices.

<https://www.nzta.govt.nz/roadcode/general-road-code/>

Land Transport Rule Work Time and Logbooks 2007 Rule 62001/2007 As at 1 May 2021

This document contains information regarding the management of work time and Forklift operator fatigue.

<https://www.nzta.govt.nz>

Land Transport Rule Dangerous Goods 2005 Rule 45001/2005 As at 1 April 2021

This rule pertains to the transport of dangerous good on public roads.

<https://www.nzta.govt.nz>

Ministry of Business, Innovation and Employment (MBIE) Building and construction ACOP load lifting rigging

This Code applies to all places of work at which persons use lifting and rigging practices in the course of their duties.

<https://www.worksafe.govt.nz/assets/dmsassets/zero/401WKS-1- building-and-construction-ACOP-load-lifting-rigging.pdf>

WorkSafe NZ Vehicles Work Site Traffic Good Practice Guideline

These guidelines are for (PCBU) who manages a work site where there are vehicles or mobile plant operating.

<https://www.worksafe.govt.nz/topic-and-industry/vehicles-and-mobile-plant/site-traffic- management/managing-work-site-traffic-gpg/>

WorkSafe NZ Safe stacking of sawn timber and board materials

This guidance contains practical advice for PCBUs such as timber manufacturers, mills or yards, and other PCBUs who stack sawn timber or board materials

<https://www.worksafe.govt.nz/topic-and-industry/manufacturing/safe-stacking-of-sawn-timber- and-board-materials/>

WorkSafe NZ Forklift and carbon monoxide

This fact sheet is for PCBUs that use forklifts. It explains the risks of carbon monoxide poisoning when using fuel powered forklifts and how to keep your workers healthy and safe.

<https://www.worksafe.govt.nz/topic-and-industry/vehicles-and-mobile- plant/forklifts/controlling-the-risk-of-carbon-monoxide-poisoning/forklifts-and-carbon- monoxide/>

WorkSafe NZ Working safely with pallet racking systems

This guidance explains what good practice looks like when selecting, using and maintaining an adjustable or selective pallet racking system.

<https://www.worksafe.govt.nz/topic-and-industry/warehousing/working-safely-with-pallet- racking-systems/>

Cascade Fork Safety Guide

A fork inspection guide that covers checking for wear, damage as well as providing Fork safety reference material

https://www.cascorp.com/web2/downloads.nsf/links/6842299_US/%24FILE/6842299_ForkSafet yGuide_NA.pdf

Cascade 2018 Fork Facts

A document produced by Cascade that includes information regarding the different types of forks, their mounting systems, how to measure wear as well as how to correctly measure replacement forks.

https://www.cascorp.com/web2/downloads.nsf/links/USA_FORKFACTS/%24FILE/2018%20ForkF acts.pdf

Approved Code of Practice for the Management of Noise in the Workplace

<https://www.worksafe.govt.nz/assets/dmsassets/zero/779WKS-1-noise-ACOP-management-of- noise-in-the-workplace.pdf>





NZTA – Reversing alarms leaflet v1.0

NZTA guidance on the specifications, types and fitment of reversing alarms

<https://www.nzta.govt.nz/assets/Highways-Information-Portal/Technical-disciplines/Noise-and-vibration/Research-and-information/Leaflets/NZTA-Reversing-alarms-leaflet-v1.0.pdf>

NZFIA Fair Wear and Tear Guide

This fair wear and tear guide outlines a Rental Companies' expectations of its machines at lease end. It shows the most typical forms of wear and tear sustained by material handling equipment.

<https://nzfia.org.nz>

WorkSafe NZ – Keeping workers safe when servicing machinery quick guide

This guidance advises small to medium PCBU how to use lockouts, to safely isolate and de-energise the parts of machinery that could cause harm to workers when servicing this machinery.

<https://www.worksafe.govt.nz/topic-and-industry/machinery/keeping-workers-safe-with-machine-lockouts/>

WorkSafe NZ - Approved code of practice for load-lifting rigging

This code provides recommendations and procedures for safe practice while carrying out lifting with rigging. It includes guidance for determining the appropriate loading methods, configurations and equipment for load-lifting in construction.

<https://www.worksafe.govt.nz/topic-and-industry/load-lifting-and-rigging/>

