

FORKLIFT TRUCKS

LEARNING OUTCOME

Describe the requirements of the Work Health and Safety legislation and standards relating to the use of forklift trucks.

ASSESSMENT CRITERIA

- Describe the licence requirements for the operators of forklift trucks.
- Describe the safe operating procedures required for forklift trucks within a workplace.
- Discuss basic risk management principles applied to the operation of forklift trucks.

REFERENCES

- Work Health and Safety Regulation 2011
 - s81 to s140, s721 to s728- High Risk Work
 - s686 to s687 – High Risk Work Licences
 - Schedule 3 and 4
 - S214-s220 – Additional control measures for particular plant
 - s37 - s38 – Maintenance and review of control measures
- Managing the risk of Plant in the workplace Code of Practice 2013
- AS2359.1 – Industrial Trucks - Design and Manufacture
- AS2359.2 – Industrial Trucks – Operation

ATTACHMENT

[Forklift safety for workers](#)

FORKLIFT TRUCKS

WHAT ARE FORKLIFT TRUCKS?

A forklift truck is a powered industrial truck equipped with lifting media made up of a mast and an elevating load carriage to which is attached a pair of fork arms or other arms that can be raised 900mm or more above the ground. Pedestrian-operated trucks or a pallet trucks are not classified as a forklift trucks. Forklift trucks are controlled by an onboard operator who must hold a licence. Trainee operators must work under the supervision of an employer-appointed competent, certified forklift operator. An order-picking forklift truck has the operator's control as part of the load carriage/lifting media and lifts with it. Order-picking forklift trucks are generally referred to as "stock pickers". They can be fitted with a platform extension for use in furniture warehouses, or can be a turret truck in narrow aisle warehouses.

Pedestrian operated forklifts (POFs) are not controlled by an onboard operator. There are some hazards specifically associated with the use of POFs.

GENERAL

The person with management or control of powered mobile plant at a workplace must manage the associated risks to health and safety, as far as reasonably practicable.

The operation of powered mobile plant exposes workers to a range of risks to health and safety, including the risks of:

- the plant overturning
- things falling on the operator of the plant
- the operator being ejected from the plant
- the plant colliding or coming into contact with any person or thing (e.g. workers, other vehicles or plant, energised powerlines)
- mechanical or other failures (e.g. hydraulic failures, release of hazardous substances).
- Coming in contact with other persons.

People required to operate or work around powered mobile plant may also be exposed to excessive noise and vibration, hazardous fumes, fall hazards while accessing or evacuating the plant, and musculoskeletal hazards (e.g. access to plant, operator controls).

SAFETY PROCEDURES

It is necessary that a set of safety operating procedures is implemented for every workplace device. These procedures should be regularly updated and made available to all staff via training sessions.

A PCBU must ensure;

- That training and information for operators on all aspects of forklift truck operation and maintenance has been provided. Records of training sessions attended should be kept for each operator throughout their term of employment.
- Appropriate personal protective equipment (PPE) where required for such activities as changing or charging batteries is worn.
- Before starting each shift, operators conduct a thorough inspection of the forklift truck and attachments such as lift and tilt systems, steering, brakes, controls, tyres, warning devices, load arms, brake fluid, hydraulic oil, etc.
- That there is safety procedures for fuel handling and storage, and battery changing and

- charging.
- A method for determining the weights of loads being handled is established.
- That all work areas are safe for using forklift trucks. Including, fit raised edges on loading docks, install warning signs or barricades, impose speed limits, provide adequate lighting and, if necessary fit secure ramps to access work areas.

HIGH RISK WORK LICENCES:

Forklift truck – LF

The LF high risk work licence class allows persons to use forklift trucks, but does not include order-picking forklift trucks (see below).

A forklift truck is a powered industrial truck equipped with a mast and an elevating load carriage which has a pair of fork arms attached (that can be raised 900 mm or more above the ground) or other load holding attachment.

Order-picking forklift truck – LO

To operate an order-picking forklift truck a LO high risk work licence is required.

An order-picking forklift truck has the operator's control as part of the load carriage/lifting media and lifts with it. Order-picking forklift trucks are generally referred to as "stock pickers". They can be fitted with a platform extension for use in furniture warehouses, or can be a turret truck in narrow aisle warehouses.

OPERATION

PCBUs have a duty to ensure that:

- The forklift truck is only used for the purpose for which it was designed.
- A worker holds a high risk work licence to operate a forklift truck or be an authorised trainee. Workers are not fatigued whilst using a forklift.
- Seatbelts are worn where one is provided. The only exception is if a risk assessment advises otherwise, for example when operating a forklift truck on a wharf.
- Forklifts are operated in a safe manner and that the forklift truck is used strictly in accordance with manufacturer's specifications.
- Loads are within the rated load capacity of the forklift truck. That loads are carried as close to the ground as possible.
- The forklift truck is operated with the load placed fully against the truck carriage or back rest. The mast should be tilted sufficiently backward to safeguard the load.
- A forklift truck is used to raise a person only if the truck is designed for this purpose or there is an approved work platform attached.
- A clear view is always maintained ahead and behind (via a correctly adjusted rear view mirror) and give clear indication of your intentions. Maintain a safe distance from other vehicles.
- Speed limits are strictly adhered to and that the worker can safely stop at any time. That workers avoid rapid acceleration, deceleration and quick turns.
- Workers drive carefully on wet or slippery surfaces or when pedestrians are near.
- Workers reduce speed when making a turn. Take care that the tip of the fork (or load) or the rear side of the forklift truck does not touch a nearby person or object.
- Workers drive in reverse if vision is obscured by a bulky load.
- The load leads when driving up gradients. On gradients, tilt the mast back sufficiently to safeguard the load and raise the forks so they clear the ground.
- When travelling on an incline with no load, place the forks on the downhill side of the

forklift truck.

- Before driving a forklift truck onto a truck, trailer or rail wagon, check that the brakes of the receiving vehicle are set and the wheels are chocked.
- The ignition/starter switch key is removed when workers leave the forklift truck. Ensuring controls are in neutral, the power is shut off, the park brakes are applied and the forks fully lowered.
- The forklift is never parked or left in any doorway, entrance, emergency exit or in front of fire extinguishing equipment.
- That the forklift truck is separated from people either by distance or physical barrier,

For example:

- constructing a booth from which the plant can be operated remotely
- using concrete barriers to separate mobile plant from workers.

CONFINED SPACES

Exhaust emissions from forklift trucks operating in confined spaces can lead to carbon monoxide poisoning.

Carbon monoxide is an odourless, colourless and a poisonous gas. Precautions must be taken when forklift trucks are used in confined spaces such as cold rooms and freezers to ensure exposure to toxic levels are kept as low as possible.

What to do

- Use electric forklift trucks instead of fuel or LP gas-powered types.
- Fit a catalytic converter to fuel or LP gas-powered types to catalytically oxidise carbon monoxide to the less toxic gas carbon dioxide.
- Fit fuel control devices, to maintain an acceptable fuel-air ratio, and check them daily. Monitor fuel usage rates to detect variations in the fuel-air ratio.
- Use exhaust gas analysers as an aid during regular engine tuning.
- Monitor and record carbon monoxide levels around workers. Personal or area monitoring can be undertaken.

OVERHEAD ELECTRICAL POWERLINES

Exclusion zones apply when working close to overhead electrical powerlines. Requirements for exclusion zones vary with voltage, and are listed in Appendix B of the Code of Practice for Working Near Exposed Live Parts. The electrical supply authority should be contacted whenever a forklift truck or any part of its load has to be close to overhead electrical powerlines. Safeguards and precautions required by the authority should be observed.

In the event of a forklift truck contacting a powerline, the operator should:

- if practicable, stay where they are and keep others away
- wait until the powerline power is shut off before leaving the vehicle
- if practicable, move the vehicles off the powerline.

FLAMMABLE ATMOSPHERES AND HANDLING FLAMMABLE MATERIALS

Great care must be taken when operating a forklift truck in flammable atmospheres or when they are used to handle flammable materials.

Safe work practices are also vital when fuelling forklift trucks or charging batteries.

Potential ignition sources include:

- flames or sparks from an exhaust
- heat generated by the engine or exhaust
- flashback produced by vapours being drawn into the engine
- over-revving the engine
- excess speeding
- sparks and heat generated by brake components
- sparks from tynes striking concrete
- static electricity discharged by tyres rubbing up against something
- an arc from a starter motor or electrical equipment.

Using non-flameproof forklift trucks where flammable dangerous goods are stored or handled without precautions can create an immediate and severe risk of fire or explosion.

Do not allow non-flameproof forklift trucks into an area where mixing, transferring or decanting of fuels and other flammable materials is carried out.

It is not normal practice for a forklift truck to be manufactured as flameproof. Flameproofing a forklift truck is a specialist engineering activity that is carried out after manufacture, such that flameproofing is retrofitted to a normal forklift truck. The degree of flameproofing applied is determined by the flammable zones in which the machine may be required to operate (Zone 1 or Zone 2 only, never Zone 0).

Not all forklift trucks can be economically flameproofed. Generally, it can be economic to flameproof forklift trucks that have compression engines (diesel fuel) or electric engines but not economic to flameproof machines that have spark ignition engines (LPG fuel or petrol).

HAZARDOUS AREAS

If you store or handle flammable dangerous goods, you should:

- review the MSDS and package labelling to identify the hazardous properties of each flammable dangerous goods
- classify areas within the workplace where flammable liquids, gases or solids are stored or handled as hazardous areas according to AS/NZS 60079.10.1-2009 Explosive atmospheres – Classification of areas
- identify each hazardous area with markings, warning lights and warning signs
- separate ignition sources from hazardous areas by an appropriate distance or physical barriers
- provide training and supervision to workers about the risk of ignition sources and how to prevent fire or explosion
- never use a spark ignition, forklift truck (including petrol and LP gas-powered) in any hazardous area
- not use any forklift trucks in any areas where flammable atmospheres exist continually (zone 0 area). These areas should be made free of any sources contributing to the flammable atmosphere, prior to forklift entry
- adhere to hot work permits at all times. Hot work permits should include strategies to:
 - monitor flammable vapour and gas using calibrated flammable atmosphere devices
 - inspect the area and forklift before entry
 - ensure adequate ventilation
 - remove and shut down processes or materials that may give rise to a flammable atmosphere
- use a forklift truck that is either compliant with AS 2359.12:1996 Powered Industrial Trucks - Hazardous areas or non 'spark ignition engine', where flammable atmospheres

may be present during normal operation (zone 1 area). Ensure an appropriate hot work permit system is effectively implemented

- use either a powered forklift truck that has been modified for use in a zone 2 area; or is not a spark ignition engine forklift and is operated with an effective hot work permit system, where a flammable atmosphere may occur for short periods of time (zone 2 area)
- use only forklift trucks specifically designed for use in explosive or flammable areas, and ensure that they comply with the relevant Australian Standards
- train all employees on how to eliminate the risks involved in handling flammable atmospheres and materials and potential ignition sources
- ensure there is a strictly enforced 'no smoking' policy in refueling areas or battery charging areas
- NOT use naked flames when checking levels of battery cells
- handle and store liquid fuel and LP gas in accordance with the relevant Australian Standards
- ensure adequate ventilation in workplaces where using forklift trucks powered by LP gas, petrol or diesel fuel
- refuel, park and store LP gas-powered forklift trucks in well ventilated areas that are safely away from combustible material and sources of heat or ignition. Ensure that the LP gas cylinder is turned off at the valve when the forklift truck is not in use
- ensure LP gas cylinders are removed and replaced by correctly trained employees following procedures that comply with relevant Australian Standards
- ensure batteries are recharged and changed by correctly trained employees and in strict accordance with the relevant standard. Before changing or recharging batteries, ensure the park brake is applied and the vent caps are functioning correctly
- prevent the build-up of flammable gasses by holding the battery cover open while the battery is on charge
- use the correct tools and keep metal objects away from battery cells when changing or charging batteries
- not use liquids with a flashpoint of less than 61oC for cleaning forklift trucks
- follow the recommendations of the flameproofing company about the inspection and maintenance of the flameproofing features for forklifts that have been flameproofed
- establish and maintain procedures for diesel forklifts that have been flameproofed to ensure that the spark arrestor tank on the exhaust line is attended to in accordance with the recommendations of the flameproofing company.

AROUND FORKLIFTS

- Employers and trained forklift truck operators should be aware of what not to do with and around forklifts. The PCBU has a duty to ensure safety, so far as reasonably practicable, and a supervisor's role includes monitoring operator adherence to the workplace policies and procedures. A forklift truck must not be used as a towing or push device, unless appropriate attachments are fitted.
- A tow rope must never be attached to the mast to pull or drag loads.
- Unless of an authorised design, fork extensions should not be fitted.
- A person should not push on the point of one or both forks. Nor should a person stand or walk under the elevated forks, even when a load is not being carried.
- The backrest extension and overhead guard of the forklift truck should not be removed, unless specifically authorised.
- A forklift truck should not be left stationary, with the engine running, in confined spaces.
- A forklift truck must not be parked or stacked on an incline, or operated on gradients with the load elevated more than necessary.
- A passenger must never be carried on the forks or load.
- An operator's arms, hands, legs and head must not leave the confines of the cab or be placed between the uprights of the mast.

- A forklift should not cross railway lines, unless the lines are recessed into the surface; or be driven over a bridge plate, unless it is securely fixed and can support the total weight. There must be a strictly enforced no smoking policy in a refueling or battery charging area.
- Naked flames should not be used when checking the level of electrolyte in battery cells.

WHAT ARE PEDESTRIAN OPERATED FORKLIFTS?

Pedestrian operated forklifts (POFs) differ from forklift trucks because they are not intended to be controlled by an operator riding on the vehicle. While similar safe operating and maintenance procedures apply to all types of forklifts, the following control measures relate specifically to POFs.

A licence/certificate is not required to operate POFs.

HOW TO OPERATE POFs SAFELY

The PCBU has a duty to ensure safety, so far as reasonably practicable, and a supervisor's role includes monitoring operator adherence to the workplace policies and procedures; these include ensuring that;

- Only trained operators operate a POF.
- Pre-operational and post-operational safety checks occur.
- The POF is suitable for the grades intended to be travelled.
- Appropriate personal protective equipment, such as high visibility vest and steel capped footwear are always worn.
- Slip hazards are managed such as ensuring footwear or hands are not slippery.
- The work area floor is not damaged, that there are no overhead obstructions, ramps and docks and that workers are not working too close to the edges of ramps or docks.
- When travelling in reverse, that all care is taken to not bump into objects, run over loose objects or trip over objects. Do not use a POF in an unauthorised area or explosive atmospheres.
- Arms, hands, legs and feet away from kept away from the lifting mechanism and wheels.
- The horn is used when approaching intersecting aisles or blind corners.
- When operating a POF on grades, ramps or inclines, face the load uphill, do not make turns. If it is necessary to park the POF on an incline, make sure the wheels are securely chocked.
- Anyone other than the operator does not ride on the POF. The safe lift limit of the POF is met when handling a load. These limits are specified on the data plate.
- Spread forks far enough apart to maintain a good balance (about 75 per cent of the load width) and place the forks as far under the load as possible.
- The POF is tilted forward only when it is over a stack, rack or vehicle. Tilt the POF backwards only enough to stabilise the load.
- Attachments are secure as per the manufacturer's instructions, and remember that attachments may affect the load centre of gravity.
- When parking:
 - use the handbrake
 - lower forks to the ground
 - tilt forward if possible
 - do not leave key in the ignition if unattended.

LOADING AND UNLOADING A FORKLIFT

Pallets

A pallet is defined as a portable load-carrying platform usually having two interconnected decks spaced apart so as to permit the entry of lifting equipment, such as fork arms or tines, and used as a base for assembling, storing, stacking, handling or transporting goods as a single unit load.

Captive pallet—pallet designed for reuse within the confines of a single enterprise or system.

Disposable pallet—pallet intended to be discarded after a single shipment or a single cycle of use.

NOTE: A disposable pallet is also known as an expendable, non-returnable, one-way or single-trip pallet.

Four-way pallet—pallet designed to permit the entry of tines or arms from four directions.

Non-captive pallet—pallet used in unrestricted operations which extend through one or more enterprises (private, corporate or military) and may include common carrier services and pallet exchange pools.

Re-usable pallet—pallet intended for multi-trip use.

Standard pallet—pallet complying with the requirements of this Standard.

Two-way pallet—pallet designed to permit the entry of tines or arms from two opposite directions only.

Handling Pallets

The following considerations should be contemplated when handling pallets.

- Weight and size of the pallet
- The material used in the manufacture of the pallet
- The pallet condition (broken or missing components)
- Environmental effects (wet verses dry)
- PPE (gloves)

Hazards

- Musculoskeletal injury
- Soft tissue injuries (splinters, cuts, punctures)

STEEL RACKING / ADJUSTABLE PALLET RACKING

Steel racking is a storage system comprising upright frames perpendicular to the aisles and independently adjustable, positive locking pallet beams parallel to the aisles, spanning between the upright frames, and designed to support unit load actions.

Racking components

- Base plate
- Bay height
- Bay width
- Ceiling clearance
- Diagonal frame brace

- End frame extension
- Frame spacer (back tie)
- Horizontal frame brace
- Open face bracing
- Pallet beam, connector, pallet rail (runner) and safety backstop
- Plan (horizontal) bracing
- Rack (row) length
- Spine (vertical or back) bracing
- Upright frame
- Wall tie (ceiling tie)

Operation and maintenance of adjustable pallet racking

- General operation
- Inspections
- Impact damage
- Plumb racking
- Damage classification and risk management

Hazards

- Unsecured (free standing)
- Collapse due to incorrect loading or unloading
- Struck by other sources
- Overloading

WHSQ Resources

- [Managing risks of plant in the workplace – Code of Practice 2013](#)
- [Using forklift attachments](#) PDF
- [Other guidance and case studies](#)
- [Forklift safety – Traffic Management](#) PDF
- [Separating forklifts and workers](#) guidance material PDF
- [Using forklift attachments](#) PDF
- [Understanding a forklifts capacity](#) PDF

Version	Date	Author
1	30/06/2018	WHSQ