

Guide

Forklift safety – reducing the risks

Disclaimer

This publication contains information regarding work health and safety. It includes some of your obligations under the *Work Health and Safety (National Uniform Legislation) Act* – the WHS Act – that NT WorkSafe administers. The information provided is a guide only and must be read in conjunction with the appropriate legislation to ensure you understand and comply with your legal obligations.

Acknowledgement

This guide is based on material produced by Safe Work Australia at www.swa.gov.au



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Version: 1.2

Publish date: September 2018

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Introduction

In warehouses, factories, shipping yards, freight terminals and other workplaces across Australia, forklifts are used to lift, stack and transfer loads. While forklifts offer a practical materials handling solution for many businesses, each year they continue to be associated with workplace deaths and injuries.

The human and financial cost of forklift-related incidents for employees, industry and the community is substantial. However, forklift incidents can be prevented, especially when employees and employers work together to improve health and safety at work.

This document seeks to improve health and safety outcomes in Australian workplaces by offering businesses and employee's practical guidance on managing risks related to forklifts.

Forklift Dangers

As forklifts must be manoeuvrable they are designed to be compact, but when carrying loads they can become unstable under certain circumstances. Fully laden, a standard two tonne forklift can weigh approximately five tonnes in total. With lower stability, and greater manoeuvrability combined with uncontrolled traffic areas in workplaces you'll understand why forklifts are involved in so many incidents.

Even at low speeds, forklifts can cause serious injuries and fatalities.

It's not just the employee using the forklift who can be injured; pedestrians can be crushed against a wall or an object or another vehicle.

Don't wait until there's an injury or death at your workplace before developing a safe system of work to control risks.

About this Guide

Simple safe practices such as observing speed limits, stop signs, wearing correctly fitted seat belts, slowing down and sounding the horn at an intersection can make a big difference.

Having a safe work environment, effective employee training, well-maintained machinery, a traffic management plan, policies and procedures and effective supervision all help reduce the risk of forklift-related injuries.

This publication focuses on simple safety practices and involvement of everyone in the workplace to help reduce the risk of forklift-related injuries.

This guide has four sections, covering:

- physical hazards and safety issues related to forklifts (for example, instability and body strain)
- practical and safe ways to operate your forklift (for example, carrying loads and maintaining the forklift)
- supporting workplace systems (for example, traffic management plans and incident reporting).

This guide also contains suggested checklists and practical information to help you do this.

Legal Responsibilities

Employers: Reducing the Risks

You are responsible for providing:

- a safe work environment
- safe systems of work
- safe and well-maintained machinery
- proper information, training and supervision.

Combined with the four Safe Steps of hazard management (page 19) and an effective traffic management plan, these measures can help reduce the risk of forklift-related injuries. Choosing a safe forklift is one of the most obvious ways to reduce the risk of a forklift-related injury.

Employees: Reducing the Risks

You have responsibilities. You must:

- work with your employer and co-workers to improve safety
- comply with reasonable instructions, training and information given, and follow safe work procedures to do your work
- not put yourself or your co-workers at risk
- report accidents, near misses and hazards (including unsafe equipment) to your employer or supervisor and employees' safety representative
- use protective equipment correctly.

Qualifications and Training

Training

A person who does not hold a high risk work licence must undergo the appropriate training. They are no longer able to do high risk work, even under the supervision of a person who holds a relevant licence unless via a structured training plan formulated by the Registered Training Organisation.

The operator should be competent to operate a forklift in the particular environment in which they are required to work. Specific skills require additional training. For example, gaining your qualification is based on general forklift use with a standard mast, but where attachments are used further supervision and training are required.

Qualifications

Independent authorised assessors will evaluate skills against a national instrument of assessment. Having a qualification indicates you have the knowledge and skills to operate a forklift without danger to yourself or others. Wherever you operate in Australia, a standard age limit applies. A person wishing to be assessed for operation of a forklift must have attained the age of 18. When you operate and/or drive a forklift on a public road, you must hold a current driver's licence.

What employers must do

You must provide site-specific and refresher training to maintain and enhance your employees' skills.

You must ensure employees receive familiarisation training for any new forklift (it may have different controls or varying attachments).

Induction training for new or changed work environments, traffic management plans, policies and safe work procedures are also a must.

Maintain a register of licensed forklift operators. Make sure all contractors and any other persons using a forklift at your workplace hold the relevant forklift licences.

If your operators are required to use purpose-designed attachments, ensure they have received sufficient instruction and training.

Ensure training manuals and manufacturers information is available to your employees.

Consultation

To ensure your workplace is safe and healthy, employers, employees, managers, contractors and visitors must communicate with each other and work together.

As an employer, a good place to start is with employees who use forklifts, as they have first-hand knowledge of any associated safety issues.

Involve your health and safety representative and your health and safety committee, if applicable.

By tapping into their knowledge, solutions are more likely to be practical, accepted and adopted. In turn, your worksite is more likely to reduce forklift-related injuries and make your workplace safer and healthier.

You should consult:

- when identifying the specific hazards and assessing the risks associated with the forklifts in your workplace
- as you develop a traffic management plan
- before implementing any action to control the risks
- before making any change to the worksite
- before you buy or hire any equipment
- once solutions have been implemented to ensure they are effective and practical.

Everyone in the workplace is responsible for workplace health and safety.

Manufacturers and Suppliers: Reducing the Risks

Manufacturers and suppliers need to provide information to workplaces about a forklift's capabilities and limitations.

Manufacturers should eliminate risks posed by forklifts during the design process. An example is introducing and promoting intelligent systems, such as making it impossible to start the forklift unless the seatbelt is fastened.

Suppliers or importers must provide information on:

- any hazards associated with forklifts
- the conditions needed to ensure operators use forklifts correctly and safely
- the correct and safe use of any attachments supplied specifically for a workplace
- any specific workplace conditions the forklift was supplied to meet.

If you hire out forklifts, ensure:

- each forklift is fit for the intended purpose for which designed, and is safe to use
- each forklift is maintained according to the manufacturer's specifications
- people hiring a forklift are appropriately licensed and know how to use it safely.

Physical Hazards and Safety Issues

Instability

Tipping over is the biggest danger for an employee using a forklift? A forklift can tip over by rolling or overturning sideways; or by pitching forward, when the back wheels lift off the ground.

Forklifts can tip over if you:

- accelerate quickly in reverse
- brake too quickly, especially on a loaded forklift
- brake or accelerate while cornering
- brake or accelerate down a slope
- carry a load facing down a slope
- carry an unevenly balanced load
- collide with another vehicle
- drive across inclines or uneven ground such as potholes (particularly with a height difference greater than 20mm across the front wheels)
- drive with the tines raised too high (loaded or unloaded)
- strike low doors or overhead structures
- turn too fast

- tow without using the designated tow point.

Forklift stability: key practical issues

- To avoid a forklift tipping over, the most important specifications to consider are lift capacity, the maximum load supported, and vertical lift travel.
- When stationary at the rated load and with the load down, forklifts have a stability safety margin of 30–50%.
- For a fully elevated load with a vertical mast, the stability safety margin is reduced to 15–20%.
- While stacking with off-centre loads at full height — on a surface with a 2% difference in gradient
- (20mm in 1 metre) — stability can be significantly affected.
- Loads suspended from a jib attachment on a forklift make it more likely to tip forward when braking.
- When making lifts over four metres, a dual wheel forklift should always be used to improve stability.

What employers can do

- Do a risk assessment where you will be working, to determine a suitable forklift.
- Get the manufacturer's information about your forklift's limitations including:
 - operation on uneven surfaces and inclines
 - the effect of different tyre types on stability
 - capacities at different lift height and positions
 - how the limiting capacity was determined
- When commissioning a new forklift, adjustments can be made to mast lift cylinders to prevent overloading.
- The maximum hydraulic pressure should be set at about 110 per cent of the rated load at full height with the mast vertical.
- Forklifts are often supplied with a model number painted on the side, which can be mistaken for the forklift's operating capacity.
- Make sure operators use the load capacity data plate, and don't assume the forklift's capacity from these markings.
- Ensure seatbelts are correctly fitted and worn (for example, by installing intelligent systems, the forklift can only be started if the seatbelt is fastened). Seatbelts may be retro-fitted.
- Buy or hire forklifts with speed-limiting devices, load-weighing devices and other stability-enhancing features.
- Be aware that productivity incentives may encourage your employees to drive and work too quickly which can increase the risk of incidents.
- Implement traffic control measures that account for the risks in the workplace, to reduce the risk of instability.
- Reduce the speed limit at your workplace.
- Ensure all forklifts are appropriate for the workplace.

- Buy or hire forklifts with a slightly greater load capacity than you actually need.

What employees can do

To ensure your own safety, and that of others, always operate forklifts safely. However, if tipping occurs you should:

- stay in the cabin with the seatbelt on
- brace yourself with your feet pressing down and your arms pushing you back into your seat
- stay with the forklift and lean in the opposite direction of tipping.

Jumping from an overturning forklift often results in death. While seatbelts might be considered a nuisance, they can also be a lifesaver.

Speed and stopping distances

Applying a forklift's brakes inappropriately can cause the forklift to tip forward or lose its load. The workplace environment always needs to be considered.

Speed limits

Your hazard management process will determine the speed limits appropriate to your workplace. Consider the stability of the forklift under braking, its stopping distances and environmental factors.

Once you've determined the speed limits, these should be prominently signposted. Make sure signs are placed so that employees on forklifts can see them easily. Make sure speed limits are observed and enforced. Buy or hire forklifts with speed limiting devices or retro-fit them to your current forklifts.

Stopping distances

You need to know stopping distances when you plan speed limits, forklift routes and your overall traffic management plan.

The following table shows the typical distance it takes for a 2.5 tonne forklift to stop once the employee has applied the brakes. This is in optimal conditions: travelling on a dry, even surface with good traction, driven by an alert employee not distracted by other activities.

Reaction Distance and total stopping distance (typical reaction time: 1.5sec)							
Speed (kilometres/hour)	6	12	14	16	18	20	22
Speed (metres/second)	1.7	3.3	3.9	4.4	5	5.6	6.1
Distance travelled while driver reacts and begins to apply the brakes in an emergency (metres)	2.5	5	5.8	6.7	7.5	8.3	9.2
Total emergency stopping distance (metres)	2.9-3.2	7-8	8-10	9.5-12	11-14	13-16.5	14.5-19

Stopping distances are often significantly under-estimated.

For example, even at six kilometres an hour (i.e. walking pace) a forklift needs at least three metres to stop.

The distance at which a forklift can stop is affected by:

- the speed at which it is travelling
- the weight of its load
- its mechanical and tyre condition
- the road surface.

A laden forklift cannot use its maximum braking capacity, because the load will slide or fall from the tines, or the forklift will tip forwards.

Sprains and Strains

Sprains, strains and other soft tissue injuries to the neck, back and arms can cause long-term health problems.

Common hazards that injure forklift drivers include:

- continuously and/or repeatedly looking up during high stacking
- continuously and/or repeatedly looking behind while reversing
- repeatedly hitting bumps or driving on uneven surfaces
- using poorly positioned or poorly maintained controls.

Save money and time by choosing and maintaining a forklift with features to prevent these injuries.

What employers can do

- Consider forklifts with swivel chairs and/or closed circuit video systems to reduce neck 'craning' and twisting.
- Ensure road surfaces are even and in good condition (maintain and repair).
- Ensure the forklift seat is in good condition to minimise vibration and jolting, that it supports the back and has sufficient cushioning, and that the cabin is also in good condition.
- Allow variety in forklift driver tasks so that they can change their posture.
- Check that the controls are comfortable to reach and operate.
- Ensure the forklift is regularly serviced and maintained including its controls and seating

Slips, Trips and Falls

Many forklift-related injuries involve slips, trips and falls when getting on and off.

What employers can do

- Ensure your forklifts have:
 - adequate access and egress to provide three points of contact (hands and feet) while getting on and off
 - steps with anti-slip surfaces and enough space to stand on firmly
 - grab handles or rails that allow proper grip, and are positioned in an accessible location
 - suitable locations for controls and foot pedals to eliminate trip hazards
- Buy or hire forklifts with the above features or retro-fit them to your current forklifts.
- Repair or replace broken steps, rails and handles.
- Ensure road surfaces are in good condition (maintain and repair) and clear of debris and other obstructions.
- Provide a location to park the forklift that is well lit so drivers can clearly see the ground surface, and that is not muddy, slippery, or uneven.
- Provide employees with information and training on the correct and safe way to get on and off forklifts.
- Minimise the number of times that employees need to get on and off their forklift to help reduce the number of slips, trips and falls.

Attachments

Attachments include any side shift devices, jibs, extension tines and specifically designed devices for load manipulation or carrying.

Using attachments

When an attachment is fitted to a forklift, the dynamic and operating characteristics may change, making it necessary to de-rate the forklift capacity and restrict some operating controls. Attachments must have:

- rated capacities
- de-rated capacities due to the attachments.

If an attachment is fitted, make sure you have access to information on the de-rated capacity of the forklift.

Only use attachments designed for the forklift they are used on. Make sure the attachment is secured correctly and safely on the forklift. Do not tilt the mast forward. If a load is suspended, drive slowly to avoid the load swinging, as this will increase the forklift's instability.

Specific skills require specific additional training and supervision. Employers must ensure that where attachments are used, further training is given to forklift operators and adequate supervision is provided.

Selecting attachments

Ask the manufacturer of the attachment whether it can be used safely on your forklift.

Forklift attachments must be:

- designed by a competent engineer
- manufactured by competent people
- safely used on the forklift.

Operation and Maintenance

Check the forklift before you start

Before you start the forklift, ensure it is in safe working order, ready to be used and capable of completing the task(s) required of it. Develop and implement a system of work that nominates the person who will ensure that safety checking occurs, e.g. a manager or supervisor. Report any damage or problems to your employer, supervisor, manager or employee safety representative immediately. If any damage or problems are noticed, isolate the forklift so it cannot be used.

Complete a checklist as part of your pre-operational routine (example below). This is an important part of any effective maintenance programme. If you are using a new or different forklift, this checklist will help you become familiar with the machine.

Pre-operational forklift checklist

Tyres:	check all for wear or damage, and pressure (if applicable)	<input type="checkbox"/>
Fluids:	check oil, hydraulics, battery, fuel and coolant	<input type="checkbox"/>
Seating:	check the condition and adjustment	<input type="checkbox"/>
Warning devices:	check lights, horns, reversing beeper and flashing light	<input type="checkbox"/>
Capacity:	check that the load capacity data plate is fitted, legible and correct	<input type="checkbox"/>
Mast:	check for signs of wear to the lift chains and guides	<input type="checkbox"/>
Hydraulic cylinders and hoses:	check for any leaks	<input type="checkbox"/>
Tines:	check for excessive wear, damage, cracks or repairs	<input type="checkbox"/>
Seatbelt:	make sure it is in good working order (if fitted)	<input type="checkbox"/>
Guarding:	check that all guards are in place	<input type="checkbox"/>

Once started:

Controls:	check that all pedals and controls operate correctly	<input type="checkbox"/>
Brakes:	check that all (including parking brake) operate correctly	<input type="checkbox"/>

Check the workplace before you start

An employer must provide a safe work environment. The four Safe Steps of hazard management plus your traffic management plan can help you do this. If you're an employee, check the area you'll be working in before you start your forklift, as well as the 'no go' zones for pedestrians or forklifts. If you notice any problems, report them to your employer (or supervisor or manager) immediately.

Pre-operational work environment checklist

	Yes	No
Are "no go" zones clearly marked with signs and fences?	<input type="checkbox"/>	<input type="checkbox"/>
Is there sufficient lighting and ventilation for you to work safely?	<input type="checkbox"/>	<input type="checkbox"/>
Is there a lot of noise (from other machines) that may impair your ability to hear?	<input type="checkbox"/>	<input type="checkbox"/>
Are road surfaces even and clear of obstructions? (Are there features such as ramps and rail tracks?)	<input type="checkbox"/>	<input type="checkbox"/>
Are there overhead features such as low doorways, fittings, cables and power lines?	<input type="checkbox"/>	<input type="checkbox"/>
Are there any other obstructions?	<input type="checkbox"/>	<input type="checkbox"/>
Are there wet and dry areas? (Any spills?)	<input type="checkbox"/>	<input type="checkbox"/>
Are loading docks clear? (Do they have edge protection?)	<input type="checkbox"/>	<input type="checkbox"/>
Is there sufficient room or capacity on storage racking?	<input type="checkbox"/>	<input type="checkbox"/>
Are forklift operating paths clear? (Are they wide enough?)	<input type="checkbox"/>	<input type="checkbox"/>
Are there any congested areas?	<input type="checkbox"/>	<input type="checkbox"/>
Are there any blind spots?	<input type="checkbox"/>	<input type="checkbox"/>
Is there any interaction with pedestrians or other traffic?	<input type="checkbox"/>	<input type="checkbox"/>

Get on and off safely

Around a quarter of all forklift-related injuries occur when an employee gets on or off.

What employees can do

- Lower the tines to ground level ensure the parking brake is set, and the controls are in neutral.
- Don't jump from your forklift. Face the forklift and maintain three points of contact (hands and feet) when you get on and off.
- Minimise the number of times you need to get on and off.
- Work and park in well-lit areas so your vision of the road surfaces and other traffic (including pedestrians) is clear.

Your employer should ensure all forklifts are fitted with anti-slip surfaces and grab-rails. A forklift can be one of the most dangerous pieces of equipment in the workplace.

Operate the Forklift safely

Only after you've checked the forklift and the work environment, should you start using the forklift.

Safety basics

- Only use a forklift for the purpose it was designed. Dangerous work practices include bumping pallets, pushing piles of material out of the way, moving heavy objects by using makeshift connections and attachments.
- Wear a seatbelt (if fitted).
- Obey speed limits and stop signs. Drive at speeds suitable to the road surfaces and traffic conditions.
- Wear safety glasses or goggles to protect your eyes from dust and debris when you move stored products from overhead shelving.

Operating basics

- Use extra caution and avoid turning when negotiating grades, ramps and inclines.
- Slow down and sound your horn before going through a doorway; before entering or crossing a main aisle and approaching an intersection or corner (especially blind corners).
- Always travel at a safe distance behind another forklift or other vehicles.
- When moving, tines should be just below axle level or at a safe height.
- Be aware of blind spots created by the mast and other parts of the forklift. Even small parts may block out large areas of your view of the workplace.
- Don't reach through the mast or place parts of your body outside the forklift while it's in operation.

People

- Do not carry passengers unless the forklift is designed to carry more than one person. An additional seat, footrest and seatbelt should be provided.
- Do not raise people on tines or pallets.
- Do not allow anyone to stand, work or walk under raised tines.
- Be conscious of people working around you (for example, tail end swing). Do not allow people to walk beside you while you are using the forklift.

Work environment

- Do not drive over spilt liquids or powders as this reduces the traction of the tyres and spreads the substance, causing problems for other traffic.
- Remove hazards or obstructions from the floor rather than drive around or over them. (Report any dangerous surface conditions to your supervisor immediately.)
- Be aware that driving from a wet to dry surface or dry to wet affects tyre traction, braking and stability.
- Allow enough time for your eyes to adjust when you move from dark to light areas and vice versa.

Guardrails and safety harnesses

- Order-picking forklifts must have guardrails to prevent falls.
- If it is possible for someone to extend their body over the guard or step from the platform of an order-picking forklift, then a safety harness must be provided and worn. The harness must be attached to a strong anchor point by an approved lanyard and shock absorber. Working through the four Safe Steps of hazard management will help you determine the type of travel restraint or fall prevention system appropriate to your workplace and the work you do.

Work cages

- Work cages must be used to raise people performing short-term tasks and the cage must be securely attached to the forklift.
- Work cages should only be attached to a compliant forklift, with a load capacity data plate stating the attachments that may be used.
- Ensure your traffic management plan deals with tasks involving work cages.
- Before starting work, ensure the parking brake is set, the controls are in neutral, the mast is vertical, and all controls are immobilised except lift and lower.
- Employees should be trained in the safe use of work cages including emergency procedures to ensure occupants can be rescued if an incident or breakdown occurs.
- Employees must stand on the floor of the work cage, not on a ladder or other object.
- Do not use work cages to transport people.
- The employee operating the forklift must remain at the controls at all times. The forklift operator should perform an initial trial lift without a person inside, to ensure the cage has a clear path.

Incidents

- Develop and implement incident procedures (including forklift breakdown). Make sure everyone knows what these are and what to do.
- If a forklift overturns, do not jump off. Stay in the cabin with your seatbelt on, hold on and brace yourself with your feet pressing down and your arms pushing you back into your seat. Stay with the forklift and lean in the opposite direction of the tipping.
- If the forklift touches an overhead power line, stay in the forklift and warn others to stay away. Keep still and avoid touching anything in the forklift. Wait as long as it takes for confirmation that the power has been disconnected/isolated before leaving the forklift. Then, if practicable, move the forklift off the power line.

Finishing work

- Before getting off the forklift, lower the tines to ground level, ensure the parking brake is engaged, and the controls are in neutral.
- If the forklift is liquefied petroleum gas (LPG) powered, turn the LPG off.
- Do not park the forklift near a source of ignition, near a doorway, or near a pit.
- Park the forklift in a well-lit area under cover and on an even surface.
- Remove the ignition key and secure the forklift at all times when not in use. (This will stop unauthorised people from using the forklift.)

Carrying and handling loads safely

Forklift capacity

Employers and supervisors should be involved in knowing how loads and loading are being controlled.

- A forklift's capacity (also known as the rated capacity) is the maximum weight it can safely carry at a specified load centre. Overloading can damage the forklift and increase the risk of forklift-related injuries.
- Load capacity data plates detail the load each forklift can safely lift at different mast orientations, or when fitted with an attachment.
- The model number of some forklifts may be confused with its lifting capacity. Ensure you use the load capacity data plate to accurately determine the capacity.

Loads

- The weight, shape, size and composition of a load affect the way it should be lifted.
- When a load is raised, the forklift is less stable. Tilting forwards or backwards with a raised load will also affect stability.
- Driving with a raised load is dangerous. It makes the forklift less stable and leads to tipping over, particularly if the forklift is being driven at speed, around a corner, or on an uneven surface.
- Take the time to familiarise yourself with each new type of load before you start work.

Check the load before you start

- Know how to read load capacity data plates.
- Know the capacity of your forklift and do not exceed it. Check the marked weight of an object, or use a weight gauge or scale to weigh loads.
- If the load is not placed safely and correctly, reload it.
- If the pallets are damaged, remove them.
- If the load is particularly long or wide, see if you need to take an alternative route.
- If the load comprises different lengths of material, ensure the point of balance is in the middle of the tines when the load is lifted.
- Set the tine width to provide the greatest support for the load, and position the load so it is balanced evenly on the tines. Take special care with irregular loads or loads that may slide (such as steel on steel). Ensure the tines and the loads are centred. Insert the tines fully beneath the load.
- Check around the load before lifting to ensure it does not affect anything or anyone around it.

Carrying the load

- Ensure each load is carried, lowered and set down according to the manufacturer's recommendations and your safe work procedures.
- Do not drive with a raised load. Lower the load before moving or turning.

- Do not lift a load that extends above the backrest unless the load is secured. This way, it can't fall back on you.
- Do not attach a towrope to the mast to pull or drag loads. Do not tow with a forklift unless a proper towing connection is fitted.
- When operating the forklift on an incline, the load must be tilted back and raised only as far as needed to clear the road surface. The load must be facing up the incline. Do not try to turn on an incline.
- Do not add additional counterweight to the forklift.
- Do not sling loads from tines, as there may be a risk of the load sliding off the tines. Always use a jib.

Driving onto trucks

Develop and implement a safe work procedure.

Before driving onto the back of a truck, make sure:

- the truck's tray is sound, and it can support the forklift and load
- the truck wheels are chocked and the parking brake is on
- the access ramp is sufficiently locked so it won't come adrift, and make sure it can support the forklift and load.

Also:

- implement procedures to make sure the truck is not driven away until loading is finished
- it is preferable that the truck remains attached to a trailer during loading, as the legs (or the ground beneath the legs) may not be sufficiently stable to support the forklift and load on the trailer.

Using ramps

Develop and implement a safe work procedure.

Ramps must be:

- wide enough and strong enough to take the forklift and load
- maintained in good condition
- have good traction in wet weather
- have side rails to prevent wheels slipping off
- allow a smooth weight transfer on and off the ramp
- have a gradient that does not exceed the angle recommended for safely operating the forklift.

All variable level ramps that a forklift is required to work on must be provided with locking and interlocking facilities.

Seeing clearly

- If the load obstructs your view while travelling up an incline, get another employee to guide you from a safe position. Ensure all other people are in full view at all times. If you lose sight of them, stop immediately.
- Drive in reverse if a bulky load obscures your forward view. However, the load must lead when travelling up inclines. Use another employee, safely positioned, as a spotter in this instance.

Maintain the forklift

- As well as pre-operational checks, your forklift maintenance programme should include a regular schedule of services, preventative maintenance, inspections and cleanings. These pre-operational checks should be done according to the manufacturer's recommendations and relevant standards.
- Components added to the forklift (such as attachments, control and warning devices) must also be maintained and serviced.
- Only a suitably qualified and trained person may inspect, maintain or repair forklifts.
- Only licensed gas fitters may repair and/or replace parts on LPG powered forklifts.
- Only qualified tyre fitters should remove and fit tyres. To prevent injury should the assembly fail, use a safety cage when inflating and/or fitting tyres on split rim wheel assemblies. Fit the hose for the compressed air with a clip-on chuck so the fitter does not have to be in front of the wheel rim while inflating the tyre.
- Fuel-powered forklifts are noisy and produce higher concentrations of carbon monoxide if poorly maintained.

Record keeping

An employer must keep records of all maintenance and services including testing and commissioning and any alterations made to the forklift. Keep these records for the life of the forklift. If you sell the forklift, transfer them to the new owner (unless the forklift is being sold as scrap or spare parts).

Unsafe forklifts

Develop and implement a procedure for your employees to follow if they discover an unsafe forklift. This should include isolating and tagging the forklift and reporting the matter to the appropriate person immediately.

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

- inspect and assess the forklift
- advise you of the nature of any faults, wear or damage
- advise you of the repairs that should be carried out to safely operate the forklift.

Unsafe forklifts should not be operated until they are made safe.

Supporting Systems

Traffic Management Plans

The best way to reduce the risk of forklift-related injuries is to separate pedestrians and forklifts.

Separating pedestrians and forklifts is the most important aim of your traffic management plan.

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

Everyone affected by the plan must understand it and follow it.

Don't wait until an injury or death occurs at your workplace before separating pedestrians and forklifts.

Develop your traffic management plan

Employers and supervisors should develop a traffic management plan by consulting with employees and others in your workplace, and by using the four Safe Steps of hazard management:

Spot the hazard

Assess the risk

Fix the problem

Evaluate results

Spot the Hazard — associated with the movement of forklifts, other vehicles and pedestrians.

- Walk around your workplace and study the way forklifts, other vehicles and pedestrians move or need to move around.
- Identify the places where there is the potential for a collision to occur.
- Consider the physical structure of your workplace. Look at floor surfaces, exits, driveways and housekeeping standards.
- Ask your employees about any problems they've noticed.
- Review your incident and injury records (including 'near misses'), as well as manufacturers' information.

The checklist 'Practical issues to consider for your traffic management plan' below can help you decide what needs to be in your traffic management plan.

Assess the Risk — caused by these hazards. Employers, supervisors and operators should ask these questions:

What is the potential **impact** of the hazard?

- How severe could an injury be?
- What is the worst possible damage the hazard could cause to someone's health?
- Would it require simple first aid only? Or could it cause permanent ill health or disability? Or could it kill?

How **likely** is the hazard to cause someone harm?

- Could it happen at any time or would it be a rare event?
- How frequently are employees exposed to the hazard?

You should also consider how many people are exposed to the hazards.

Fix the problem - the most effective way to control risks is to eliminate them in the first place. If it is not practical to control risks by eliminating them, consider other measures that can minimise them. 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) — e.g. remove forklifts
- (2) substitution — e.g. use a safer type of forklift
- (3) isolation — e.g. provide an overhead pedestrian walkway
- (4) engineering/redesign — e.g. use speed limiting devices on forklifts
- (5) administration — e.g. training and/or warning signs
- (6) personal protective equipment (least effective control) — e.g. high visibility vests.

Once you have considered potential control measures in the correct order, implement the most effective controls practical, or a combination of controls. For example, can you eliminate risks by removing forklifts from your workplace completely? If that is not practical, can you replace them with more people-friendly load shifting equipment (such as a walker stacker or conveyor system)?

Other control measures might include creating more efficient routes and traffic flows; creating 'no go' zones; and using signs and barriers.

Evaluate results — Review your control measures to ensure they have been implemented and are not creating new hazards.

Repeat the Safe process at regular intervals and also whenever there is a change at your workplace or after a near miss or incident.

Practical issues to consider for your traffic management plan

- Create 'no go' zones for forklifts (pedestrian-only areas): e.g. around tearooms, time clocks, amenities and entrances. Create clearly marked pedestrian crossings.
- Create 'no go zones for pedestrians (forklift only areas): e.g. loading and unloading zones. These should be enforced within a three-metre radius of forklifts. This

distance should increase when the height of the load increases, or the speed increases, or the hazard management process identifies that it must.

- Assess the physical environment: lighting, ventilation, housekeeping and road surfaces.
- Assess traffic destination, flow, volume and priorities (such as rail traffic).
- Consider high-visibility or reflective clothing for pedestrians and employees operating forklifts, and high-visibility markings for forklifts. However, this is no substitute for physically separating pedestrians and forklifts. Make sure that any high-visibility clothing does not blend in with other brightly coloured objects in your workplace.
- Consider speed limits, signage and speed-limiting devices.
- Consider forklift stopping distances and load characteristics when determining speed limits.
- Examine the forklift and its characteristics: movement, stability, attachments, and braking distances.
- Examine the loads being moved: their height and type.
- Investigate proximity devices that trigger signals, boom gates and warning signs.
- Locate signs where they will give advanced warning to pedestrians and operators.
- Look at security measures.
- Be alert for black spots caused by stationary equipment and vehicles.
- Make sure roads are well formed, and clearly marked. Where possible, remove blind corners and ensure intersections are well lit. Overhead dome mirrors may help. Consider making roads two-way carriageways.
- Use a combination of audio (alarms and horns) and visual (flashing lights) warning devices, and make sure these are working at all times the forklift is operating. Flashing lights are imperative in areas with a high level of ambient workplace noise.
- Use signs, safety barriers, containment fences, boom gates and even overhead walkways. Install signs that indicate who must give way. Implement and enforce procedures that cover when and how pedestrians and forklifts must give way to each other.
- This list is not exhaustive, and does not replace the four Safe Steps of hazard management. The issues identified during that process should guide you. These issues are discussed throughout this guide.

Record your traffic management plan

You should now be able to identify traffic flow, speed limits, parking areas, manoeuvring and loading areas, 'no go' zones, pedestrian crossings, required 'give ways', and areas requiring actions in your workplace.

Detail this information in a site map, and display it in your workplace.

Everyone in your workplace, including contractors and visitors, must know your traffic management plan. Use induction and training sessions, and post information at workplace entrances and notice boards.

This process may also help you to develop safe work practices and procedures for forklifts. These will complement your traffic management plan, and are an important way to ensure a safe workplace.

Policies and safe work procedures

Policies and safe work procedures ensure everyone who uses forklifts understands how to do so safely and correctly. Policies should cover the hazard management process; selecting a forklift; training and licences; incident reporting and investigation.

Safe work procedures (or operating procedures) should cover many of the topics discussed in this guide — for example, checking the forklifts and the workplace, using attachments, operating the forklift, carrying loads, and maintenance. Other issues you should consider include fatigue, manual handling, refuelling, and battery charging.

As with your traffic management plan (above), everyone in your workplace, including contractors and visitors, must know your policies and safe work procedures. Again, you could use induction and training sessions, and post information at workplace entrances and notice boards. You should also review these regularly to ensure they remain appropriate. You should also ensure people are complying with them.

Incident Reporting

Develop and implement an incident reporting procedure. Reporting incidents using the Safe Steps allows you to:

- find out what went wrong and why
- improve work practices or the physical environment
- prevent similar incidents happening again.

Near misses must also be recorded and followed up. Reporting near misses can give you the chance of preventing a severe accident, so treat them seriously. You may use the four Safe Steps of hazard management in this process.

Selecting a Forklift

Develop and implement a purchasing policy.

The following people should be involved in the selection process – employer, supervisors, operator, and purchasing officer. You need to work out which forklift, including what capacity and safety features, your workplace needs. Determining these needs before you buy or hire the forklift is the most effective way of reducing the risk of forklift-related injuries.

For example:

- if you need a forklift to work in a flammable or explosive atmosphere, ask the manufacturer or supplier if the machine can do this safely
- if you need a forklift to work in poorly ventilated areas, make sure it's electric. There is a significant risk of poisoning or asphyxiation if fuel-powered forklifts are used in these environments.

Forklifts are being released with ever-increasing safety measures and features. But you need to ensure these features do not create additional risks in your workplace.

Remember to consult with your employees, employees' safety representative and others who may be affected by the new forklift before you make your final decision.

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