

FORKLIFT SAFETY

Reducing the risks



Australian Government

Comcare

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CONTACT US

Inquiries regarding the licence and any use of this document are welcome at:

Production Services
Comcare
GPO Box 9905
Canberra ACT 2601

Ph: 1300 366 979
Email: production.services@comcare.gov.au
www.comcare.gov.au

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INTRODUCTION

Forklifts or industrial lift trucks are used to lift, stack and transfer loads in warehouses, factories, shipping yards, freight terminals and other workplaces right across Australia.

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 workers, industry and the community is substantial.

However, forklift incidents can be prevented, especially when workers and persons conducting a business or undertaking (PCBU) 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 workers practical guidance on managing risks related to forklifts.

This guidance is not intended to cover all duty holders' responsibilities or hazards and risks associated with industrial lift trucks. Where container forklifts are used, such as in shipping yards and freight terminals, additional risks exist that are not specifically covered in this document.

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 worker using the forklift who can be injured—pedestrians can be struck by a forklift or its load.

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

ABOUT THIS GUIDE

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

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

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

This guide has four sections, covering:

- > the responsibilities of PCBUs, workers and others
- > 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).

LEGAL RESPONSIBILITIES

PERSONS CONDUCTING A BUSINESS OR UNDERTAKING (PCBU): 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 principles of hazard management (see page 21) and an effective traffic management plan, these measures can help reduce the risk of forklift-related injuries.

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

Choosing a safe forklift is one of the most obvious ways to reduce the risk of a forklift-related injury. If you are about to purchase or hire a forklift, see 'Selecting a forklift' on page 7.

WORKERS: REDUCING THE RISKS

You also have responsibilities to ensure a safe workplace by:

- > working with the PCBU and co-workers to improve safety
- > complying with reasonable instructions, training and information given, and following safe work procedures to do your work
- > not putting yourself or your co-workers at risk
- > reporting incidents, near misses and hazards (including unsafe equipment) to your PCBU or supervisor and health and safety representative
- > using protective equipment correctly.

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

QUALIFICATIONS AND TRAINING

To operate a forklift you must have a high risk work licence or be closely supervised while you are getting a high risk work licence. A high risk work licence requires you to be first trained by a Registered Training Organisation. Check with your local workplace safety authority (see page 25) for requirements in your state or territory.

TRAINING

Training must be provided by a Registered Training Organisation and in the workplace under the competent supervision of a person with the same high risk work licence.

Records of training (a logbook) must be maintained while you undertake your training.

Registered Training Organisations provide logbooks to record training. Records should reflect the type of training undertaken to evidence both theory and practical training.

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, before an operator starts using a forklift or an attachment that is different to the one used for training and gaining qualifications further training and supervision is required.

QUALIFICATIONS

Independent accredited assessors will evaluate skills against a national instrument of assessment.

Having a qualification indicates you have the basic knowledge and skills to operate a forklift without danger to yourself or others. More specific skills are necessary for specialised forklift types, attachments and worksite characteristics.

A standard age limit applies wherever you operate a forklift in Australia. A person wishing to be assessed for operation of a forklift must be 18 years of age. Contact your local work health and safety authority for further information about the age requirement to operate a forklift (see page 25).

If you do not hold a qualification, you can only operate a forklift under the direct supervision of an appropriately qualified forklift operator or assessor who holds the relevant qualification. Direct supervision means that the qualified forklift operator or assessor must be close enough that they can see what you are doing and provide appropriate verbal instruction.

When you operate and/or drive a forklift on a public road, you must hold a current driver's licence and the forklift must be registered.

WHAT PCBUS MUST DO

A PCBU must:

- > provide site-specific and refresher training to maintain and enhance their workers' skills
- > ensure workers receive familiarisation training for any new forklift (it may have different controls or varying attachments)
- > provide induction training for new or changed work environments, traffic management plans, policies and safe work procedures
- > maintain a register of licensed forklift operators
- > ensure that all contractors and any other persons using a forklift at your workplace hold the relevant forklift licences.

In addition, if your operators are required to use purpose-designed attachments and specific forklifts, you need to ensure that they have received sufficient instruction and training in a language that they understand.

Ensure training manuals and manufacturer's information is available to your workers.

CONSULTATION

To achieve a safe and healthy workplace, PCBUs, workers, managers, contractors and visitors must communicate with each other and work together.

PCBUs can facilitate the consultation process by talking to the workers who use forklifts, as they have first-hand knowledge of any associated safety issues at the workplace.

PCBUs need to involve health and safety representatives and health and safety committees in this process.

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.

A PCBU should consult:

- > when identifying the specific hazards and assessing the risks associated with the forklifts in their workplace
- > when developing a traffic management plan
- > before implementing any action to control the risks
- > before making any change to the worksite
- > before buying or hiring 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.

SELECTING A FORKLIFT

The PCBU should develop and implement a purchasing policy.

The following people should be consulted in the selection process:

- > PCBUs
- > supervisors
- > forklift operators
- > health and safety representatives and the health and safety committee
- > purchasing officer
- > supplier.

The selection of the forklift should take into consideration the capacity and safety features specific to 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 workers, health and safety representative(s) and others who may be affected by the new forklift before you make your final decision.

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
- > the maintenance and servicing requirements.

If you hire out forklifts, ensure:

- > each forklift is fit for the intended purpose for which it was 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 a worker using a forklift. If a worker jumps from a tipping forklift, the chances of serious injury are high. Seatbelts save lives and must be worn.

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 fork arms raised too high (loaded or unloaded)
- > strike low doors or overhead structures
- > turn too fast
- > use a forklift that is not designed to tow (pushing or pulling).

Most tip-over incidents involve unloaded forklifts, which are more unstable than a loaded forklift with the load carried low.

Counter balanced forklifts are usually supported at three points called the 'triangle of stability'. The front left wheel, the front right wheel and the middle of the rear axle at the pivot pin connected to the steer axle make an imaginary triangle. This is important because the centre of gravity must remain within this triangle of stability. If the centre of gravity falls outside the triangle, the forklift will tip over. This principle explains why an un-laden forklift can easily tip over with a simple sharp turn, even on a level surface.

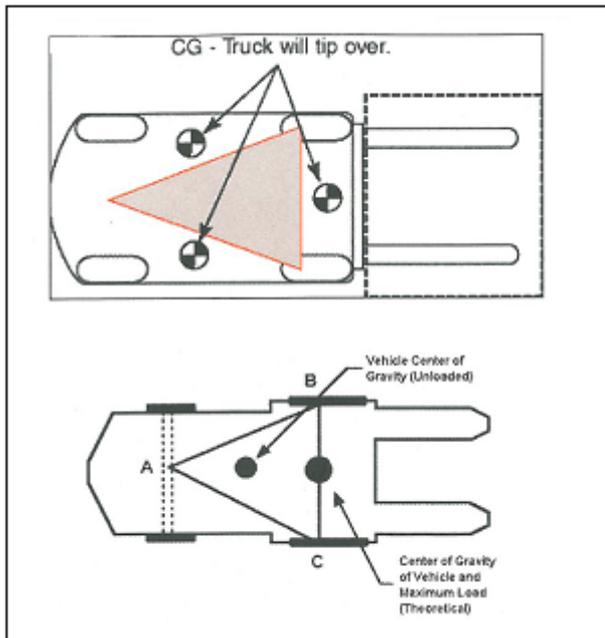


Figure 1: Diagrammatic representation of the triangle of stability

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.
- > Stacking/raising off-centre loads at full height—on a surface with a 2% difference in gradient (20mm in 1 metre)—can significantly affect stability.
- > Loads suspended from a jib or rotator attachment on a forklift make it more likely to tip forward when braking or sideways when turning.

What PCBUs can do

- > Conduct a risk assessment of the area where the forklift will be operating to determine a suitable forklift.
- > Get the manufacturer's information about your forklift's limitations including:
 - the suitability of different types of tyres for your needs
 - capacities at different lift height and positions.
- > Adjustments or alterations to parts of forklifts should not be made unless the manufacturer has been consulted. Changes to specifications of the forklift, including rated capacity and reach as a result of an alteration must be recorded by a competent person on the data plate.
- > Make sure the operators do not load the forklift above the weight specified on the load capacity plate. Ensure the data plate is legible and help operators to understand the difference between the forklift's model numbers painted on the side of the forklift and the forklift's load capacity plate.
- > Buy or hire forklifts with seatbelts, reversing beepers, flashing lights, intelligent systems, speed-limiting devices, load-weighting devices and other stability-enhancing features.

- > Ensure seatbelts are correctly fitted and worn (for example, by installing intelligent systems which mean the forklift can only be started if the seatbelt is fastened). Monitoring/supervision of these intelligent systems should be such that they cannot be easily defeated. Seatbelts may be retro-fitted, but only in accordance with the manufacturer's specifications.
- > Be aware that productivity incentives may encourage your workers 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. See 'Traffic management plans' on page 21.
- > Reduce the speed limit at your workplace.

Buy or hire forklifts with a greater load capacity than you actually need to safely perform the workplace tasks.

What workers can do

Drive safely. See 'Operate the forklift safely' on page 16 for information. 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.

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 it is safe to do so, move the forklift off the power line.

Jumping from an overturning forklift often results in serious injury or death.

SPEED AND STOPPING DISTANCES

Applying a forklift's brakes inappropriately can cause the forklift to tip forward or lose its load.

Speed limits

Your hazard management process (see 'Develop your traffic management plan' on page 21) will determine the speed limits appropriate to your workplace. Consider the stability of the forklift under braking, its stopping distances and environmental factors.

Reduce speed to walking pace taking into consideration congestion, vision, other vehicles and pedestrians etc.

Make sure speed limits are observed and enforced.

Buy or hire forklifts with speed limiting devices or have a competent person 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 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.

Reaction distance and total stopping distance for laden forklift (typical reaction time: 1.5 secs)

Speed (km/h)	Speed (m/sec)	Distance travelled based on a reaction time of 1.5 secs	Distance travelled while forklift is decelerating (based on deceleration of 1.9 m/sec)	Total distance (m)
6	1.7	2.5	0.73	3.2
8	2.2	3.3	1.30	4.6
10	2.8	4.2	2.03	6.2
12	3.3	5.0	2.92	7.9
14	3.9	5.8	3.98	9.8
16	4.4	6.7	5.20	11.9
18	5.0	7.5	6.58	14.1
20	5.6	8.3	8.12	16.5
22	6.1	9.2	9.83	19.0
24	6.7	10.0	11.70	21.7
26	7.2	10.8	13.73	24.6
28	7.8	11.7	15.92	27.6
30	8.3	12.5	18.27	30.8
32	8.9	13.3	20.79	34.1

Data from the Monash University Accident Research Centre

Table is based on a 1.5 second reaction time, plus a deceleration of 1.9 m/sec^2 (this is based on the range achievable without tip over for the majority of **fully laden forklifts**).

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 the forklift and its load
- > its mechanical and tyre condition
- > the road or floor surface.

A laden forklift cannot use its maximum braking capacity, because the load may slide or fall from the fork arms, 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 PCBUs can do

- > Consider forklifts with swivel seats and/or closed circuit video systems to reduce neck 'craning' and twisting.
- > Fit mirrors if practicable.
- > Ensure road surfaces and floor surfaces are even and in good condition.
- > Ensure the forklift seat is in good condition and has sufficient cushioning so that it supports the back and minimises vibration and jolting.
- > Ensure that the cabin is in good condition.
- > Allow variety in forklift operator 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 PCBUs 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 and floor 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 operators can clearly see the ground surface. Ensure that the ground is not muddy, slippery, or uneven.
- > Provide workers with information and training on the correct and safe way to get on and off forklifts.
- > Minimise the number of times that operators need to get on and off their forklift to help reduce the number of slips, trips and falls. See 'Get on and off safely' on page 15.

ATTACHMENTS

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

Using attachments

When an attachment is fitted to a forklift, the forklift's operating characteristics may change, making it necessary to de-rate the forklift capacity and restrict some operating controls.

Attachments must have rated capacities.

Where an attachment is used, an effective control method is stamping the combined rated capacity on the forklift load capacity plate. This may require adding an additional capacity plate. Make sure a competent person determines the rated capacity of the combination of the forklift and the attachment.

Only use attachments designed for the forklift they are intended to be 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. PCBUs 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 person
- > manufactured by competent people
- > safely used on the forklift.

Check with your local workplace authority (page 25) for requirements in your state or territory.

OPERATION AND MAINTENANCE

CHECK THE FORKLIFT BEFORE YOU START

- > Before you start to operate 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 the PCBU, supervisor, manager or health and safety representative immediately.
- > If any damage or problems are noticed, isolate the forklift so it cannot be used.
- > Complete these checks 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, these checks will help you become familiar with the machine.
- > Make sure the checks are done according to the manufacturer's instructions.

Pre-operational forklift checks

Forklift operators should check the following before starting work:

- > **Tyres**—check all tyres for wear or damage, and pressure (if applicable).
- > **Fluids**—check oil, hydraulics, battery, fuel, coolant and brake fluid.
- > **Seating**—check the condition and adjustment.
- > **Warning devices**—check lights, horns, reversing beeper and flashing light.
- > **Capacity**—check that the load capacity data plate is fitted and legible.
- > **Mast**—check for any wear or damage to the lift chains and guides.
- > **Hydraulic cylinders and hoses**—check for any leaks.
- > **Fork arms (Tines)**—check for wear, damage, cracks or repairs.
- > **Seatbelt**—make sure it is in good working order.
- > **Guarding**—check that all guards are in place.
- > **Controls**—check that all pedals and controls operate correctly.
- > **Brakes**—check that all (including parking brake) operate correctly.

This list is not exhaustive, and does not replace the principles of hazard management (see page 21). The issues identified during that process should guide you.

CHECK THE WORKPLACE BEFORE YOU START

A PCBU must provide a safe work environment. The principles of hazard management (see page 21) plus your traffic management plan can help you do this.

If you're a worker, 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 PCBU (or supervisor or manager) immediately.

Complete checks like the ones following.

Workplace environment checks

Before starting:

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

This list is not exhaustive, and does not replace the principles of hazard management (see page 21). The issues identified during that process should guide you.

GET ON AND OFF SAFELY

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

What workers can do

- > Lower the fork arms 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 that your vision of the road surfaces and other traffic (including pedestrians) is clear. The PCBU should ensure that all forklifts are fitted with anti-slip surfaces and grab-rails. See 'Slips, trips and falls' on page 12.

A forklift can be one of the most dangerous pieces of equipment in the workplace.

OPERATE THE FORKLIFT SAFELY

Only after you have 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.
- > Obey speed limits and warning 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 as necessary.

Operating basics

- > Use extra caution and avoid turning when negotiating grades, ramps and inclines.
- > Take particular care not to damage pallet racking. Report damaged racking to your manager/supervisor so that it can be repaired.
- > 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 travelling, fork arms should be just below axle level but must be kept clear of the road/floor surface.
- > 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 is in operation.
- > Be aware of any overhead hazards and maintain a safe distance from powerlines and electrical cables.

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 fork arms or pallets.
- > Do not allow anyone to stand, work or walk under raised fork arms.
- > Be conscious of people working around you (for example, tail end swing). Do not allow people to walk beside you or be in close proximity to a travelling forklift.
- > Do not allow people to be near stacked loads being loaded or unloaded. High stacked loads can become unstable and topple.

Work environment

See also 'Workplace environment checks' on page 15.

- > Do not drive over spilled liquids or powders as this reduces the traction of the tyres and spreads the substance, causing problems for other traffic and/or pedestrians.
- > 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.

Order-picker forklifts

- > 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, fitted with a fall arrester, must use two independent designated anchor points. Working through the principles of hazard management (see page 21) will help you determine the type of travel restraint or fall prevention system appropriate to your workplace and the work you do.
- > An order-picking forklift truck licence is required to operate this type of forklift.

Work platforms

- > While forklifts were not designed to lift people, work platforms may be used for raising people performing short-term tasks e.g. changing light bulbs. Activities such as order picking, however infrequent this may occur, are not regarded as short-term tasks. The work platform must be securely attached to the forklift. You may be required to register design-approved work platforms. Contact your local health and safety authority for more information (see page 25).
- > Work platforms should only be attached to a compliant forklift, with a load capacity data plate stating the attachments that may be used.
- > A flow restrictor should be fitted to a forklift that lifts a work platform to control the rate of descent in the event of a hydraulic hose burst.
- > Ensure your traffic management plan deals with tasks involving work platforms.
- > Before starting work ensure:
 - the parking brake is set
 - the controls are in neutral
 - the mast is vertical
 - all controls are immobilised except lift and lower.
- > 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 work platform has a clear path.
- > Workers must be trained in the safe use of work platforms, including emergency procedures, to ensure occupants can be rescued if an incident or breakdown occurs.
- > Workers must stand on the floor of the work 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.
- > Do not use work platforms to transport people or to exit at height e.g. mezzanine floor.

Incidents

- > Develop and implement incident procedures (including forklift breakdown). Make sure everyone knows what these are and what to do. See 'Incident reporting' on page 24.

Finishing work

See also 'Get on and off safely' on page 15.

- > Before getting off the forklift, lower the fork arms 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 off the LPG at the cylinder.
- > 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 a level and even surface. Make sure the forklift is at least three metres away from a power line or rail line.
- > 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

- > PCBUs and supervisors should know 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.
- > 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.
- > 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; stability is decreased further if the load is off-centre. 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.

Carrying the load

- > Know how to read load capacity data plates, which detail the load each forklift can safely lift at different mast orientations, or when fitted with an attachment.
- > 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. Do not pick up a load if you do not know its mass.
- > 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 fork arms when the load is lifted.
- > Set the fork arms width to provide the greatest support for the load, and position the load so it is balanced evenly on the fork arms. Take special care with irregular loads or loads that may slide (such as steel on steel). Ensure the fork arms and the loads are centred.
- > Insert the fork arms fully beneath the load.
- > Check around the load before lifting to ensure it does not affect anything or anyone around it.
- > Ensure each load is against the backrest carried, lowered and set down according to the manufacturer's recommendations and your safe work procedures.
- > 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:

- > Do not drive with a raised load. Lower the load to forklift axle height to clear the road/ floor surface before moving or turning.
- > Do not lift a load that extends above the fork arm 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 (pull or push) with a forklift unless a proper towing connection is fitted and designed to do so in accordance with the manufacturer's recommendations.
- > Do not use a forklift to push or bump other loads into position.
- > Do not add additional counterweight to the forklift.
- > Do not sling loads from fork arms, as there may be a risk of the load sliding off the fork arms. Always use a jib or load shifting equipment.

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, the parking brake is on, and the key is secured
- > the access ramp is sufficiently locked so it won't come adrift, and make sure it can support the forklift and load.

Procedures should also be implemented to ensure the truck is not driven away until loading is finished.

The truck trailer must be supported by sturdy supports or remain attached to the truck so that it does not collapse or tilt when the forklift is operating inside it. If it is attached to a skeleton trailer, then additional supports will be needed.

If the trailer remains attached to the truck, ensure a system is used so the truck does not pull away from the loading dock during loading or unloading.

Using ramps

Develop and implement a safe work procedure.

Ramps must:

- > be wide enough and strong enough to take the forklift and load
- > be 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
- > have portable ramps secured according to the manufacturer's instruction and the appropriate load rating attached.

Seeing clearly

- > If the load obstructs your view while travelling up an incline, get another worker 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 worker, safely positioned, as a spotter in this instance.

MAINTAIN THE FORKLIFT

- > Your forklift maintenance programme should include a regular schedule of services, preventative maintenance, inspections and cleanings. Maintenance programs and pre-operational checks (see page 14) should be completed 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 suitably qualified and trained persons may inspect, maintain or repair forklifts. Unauthorised changes to forklifts—e.g. drilling holes in fork arms—should not be undertaken.
- > 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

A PCBU should 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 workers 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, 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

Separate pedestrians and forklifts

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

PCBUs and supervisors should develop a traffic management plan by consulting with workers and others in your workplace, and by using the principles of hazard management:

IDENTIFY THE HAZARD—associated with the movement of forklifts, other vehicles and pedestrians:

- > Study the way forklifts, other vehicles and pedestrians move or need to move around in all areas of your workplace.
- > 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 workers about any problems they have noticed.
- > Review your incident and injury records (including 'near misses'), as well as manufacturers' information.

'Practical issues to consider for your traffic management plan' (page 23) can help you decide what needs to be in your traffic management plan.

ASSESS THE RISK—caused by these hazards. PCBUs, 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.

CONTROL THE RISK—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. consider options to eliminate the use of 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 pallet jack or conveyor system)?

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

REVIEW CONTROL MEASURES—review your control measures to ensure they have been implemented and are not creating new hazards.

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

For more detailed information about the principles of hazard management, call your local workplace safety authority.

Practical issues to consider for your traffic management plan

- > Designate exclusion zones for pedestrians and forklifts. Use impact barriers to separate pedestrians and forklifts. Less permanent or less sturdy barriers, such as bollards or expandable fences may be adequate for temporary demarcation. If less sturdy barriers are used, factor in the likely stopping distances by considering the weight of the forklift and its expected load and the likely speed of the forklift. As an example of how speed affects stopping distances consider on page 11 a laden 2.5 tonne forklift.
- > Audio visual warnings can supplement controls in areas of partial separation. A mix of high volume alarms and horns coupled with flashing lights best warn pedestrians of approaching forklifts. Flashing lights are imperative in areas of high levels of ambient workplace noise.
- > Consider using proximity devices.
- > Safety intersections and blind corners can be managed with devices that ensure pedestrians slow down or stop, such as swinging or interlocked gates and chicanes. These controls can be enhanced by the addition of overhead mirrors. Avoid placing bins, racks or storage units that obstruct a forklift operator's view at intersections or around corners.
- > Use signs, 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.
- > Create 'no go' zones for forklifts (pedestrian-only areas)—e.g. around tearooms, time clocks, amenities and entrances. Create clearly marked pedestrian crossings.
- > Assess traffic destination, flow, volume and priorities (such as rail traffic).
- > Consider high-visibility or reflective clothing for pedestrians and workers 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 and speed-limiting devices.
- > Examine the forklift and its characteristics—movement, stability, attachments, and braking distances.
- > Examine the loads being moved—height and type.
- > Look at security measures.
- > Be alert for black spots caused by stationary equipment and vehicles. Black spots must be controlled.
- > Make sure roads are well formed, and clearly marked. Consider making roads two-way carriageways.
- > This list is not exhaustive, and does not replace the principles of hazard management (see page 21). 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.

Creating a site map can help you analyse the workplace while developing the traffic management plan. Once the plan is developed, the finalised site map will help reinforce and communicate the traffic management plan. Review and monitor the traffic management plan at pre-determined and regular intervals.

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 (see page 21), everyone in your workplace, including contractors and visitors, must know your policies and safe work procedures.

Provide contract staff with the same level of training on traffic management as direct workers. Manage visitors so there is no possibility of them entering forklift operating areas. If this is not possible inform them of 'no-go' areas or ensure visitors are accompanied by a worker. 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 and that people are complying with them.

INCIDENT REPORTING

Develop and implement an incident reporting procedure. Incidents involving forklifts must be reported immediately to the manager or supervisor.

Reporting incidents 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 principles of hazard management in this process. See page 21 for more information.

It is important that if someone is killed or seriously injured—or could have been killed or seriously injured at your workplace—your local workplace health and safety authority must be notified.

ADDITIONAL INFORMATION

AS 2359 Powered Industrial trucks

AS/NZS 1891 Industrial fall-arrest systems and devices

LUEZ Loading, Unloading Exclusion Zones

CONTACTS AND ACKNOWLEDGEMENTS

LOCAL WORKPLACE HEALTH AND SAFETY AUTHORITIES

Victoria

WorkSafe Victoria—1800 136 089 or visit www.worksafe.vic.gov.au

New South Wales

WorkCover NSW—13 10 50 or visit www.workcover.nsw.gov.au

Queensland

Workplace Health and Safety Queensland—1300 369 915 or visit www.worksafe.qld.gov.au

South Australia

SafeWork SA—1300 365 255 or visit www.safework.sa.gov.au

Tasmania

Workplace Standards Tasmania—1300 366 322 or visit www.wst.tas.gov.au

Western Australia

WorkSafe WA—1300 307 877 or visit www.commerce.wa.gov.au/worksafe

Northern Territory

NT Worksafe—1800 019 115 or visit www.worksafe.nt.gov.au

Australian Capital Territory

ACT WorkCover—(02) 6207 3000 or visit www.ors.act.gov.au/workcover

Commonwealth

Comcare—1300 366 979 or visit www.comcare.gov.au

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FURTHER INFORMATION

The following relevant Commonwealth legislation is available from Comlaw (www.comlaw.gov.au):

- > *Work Health and Safety Act 2011* (Cth)
- > *Work Health and Safety Regulations 2011* (Cth)

CONTACT DETAILS

You can contact Comcare on 1300 366 979 or via email WHS.help@comcare.gov.au

You can also access information on our website www.comcare.gov.au