

19044: Demonstrate knowledge of the legal requirements and hazards associated with tractor use

Level
2



Learner Guide

Unit standard 19044 v4	Level 2	Credits 3
Demonstrate knowledge of the legal requirements and hazards associated with tractor use		

Sample Copy

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Introduction

Learning outcome

This unit standard is for people working, or intending to work, in the primary sector.

People credited with this unit standard are able to:

- identify the legal requirements for tractors and tractor drivers on both
- private property and on public roads
- demonstrate knowledge of hazards associated with tractor use
- describe reporting requirements for accidents and near-misses.

Important information you need to know

You are also expected to know about the following legislation:

- Health and Safety at Work Act 2015
- Land Transport (Driver Licensing) Rule 1999
- Land Transport (Road User) Rule 2004.

You also need to follow all **workplace procedures**.

Workplace procedures refer to verbal and written instructions to staff on procedures for machinery maintenance, and safety.

Glossary

You may find new words (highlighted in **bold black**) as you read through this Learner Guide. The meanings of these words are in the glossary at the back.

Symbols

You'll also see symbols which we've used to help you know what's going on, for example:



Alert: you must be aware of this.



Activity: a written activity for you to do.



Search online: refer to online references for information on this topic.



Attachment: Attach required documents where you see this icon.



Top tip: key information and useful tips.

Assessment

You will find a separate Assessment booklet for this unit standard. You will need to work through the activities in the Assessment.

Your Verifier will fill in the Verifier declaration once they are satisfied you have achieved the learning outcomes for the unit standard. Your Verifier may be your Supervisor or Workplace Trainer.

The Assessor will check all declarations and fill in the final sign-off once final competency is achieved. The Assessor may be your Training Adviser or a Workplace Assessor.

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Legislation around tractors

Tractors make many of the agricultural tasks that a workplace needs to do easier, faster, and more cost effective. However, tractors are powerful and have the **potential** to cause harm to the operator, the environment, and to others.

New Zealand has **legislation** around the use of tractors that aims to keep people safe and protect the environment. This legislation includes:

Land transport (Driver Licensing) Rule 1999	The Land Transport (Driver Licensing) Rule 1999 specifies the requirements for obtaining and renewing a drivers licence in New Zealand.
Land Transport (Road User) Rule 2004	The Land Transport (Road User) Rule 2004 establishes the rules under which traffic operates on roads. It applies to all road users, whether they are drivers, riders, passengers, pedestrians, or leading or droving animals.
Health and Safety at Work Act 2015	Under the Health and Safety at Work Act, you are responsible for: <ul style="list-style-type: none">• taking reasonable care of your own safety• taking care that your actions do not harm others• following any vehicle driving requirements given to you by your workplace.

New Zealand's legislation identifies the **rights** and responsibilities of people who are operating tractors. This legislation covers:

- age restrictions for driving a tractor
- requirements for driving on public roads
- requirements for driving on private property
- the licencing requirements of tractors to ensure they are safe to be used.

Legal requirements

To know how New Zealand's legislation relates to you and your job, you must know the requirements you have to follow. These requirements include:

- using safety belts
- the personal protection equipment (PPE) you must use and wear
- safety frame – Roll Over Protection Structures (ROPS)
- carrying passengers
- WoF/CoF requirements
- licenses
- registration
- legal age for driving a tractor
- vehicle displays.



Knowing the legal requirements to drive a tractor on both public and private roads is an important part of your role.

Using safety belts

All new tractors, bought after 31st August 2001, should have safety belts fitted.

Safety belts must be worn when the tractor has ROPS (Roll Over Protective Structures) also known as a safety frame fitted. This is so that the person in the tractor will be kept inside the structure that the ROPS has created, stopping the tractor from crushing them if or when it rolls. It also stops them from being thrown out of the tractor.

PPE

Personal protection equipment will vary, depending on the purpose of the job being undertaken on the tractor. The minimum PPE should be:

	Hearing protection
	Sturdy footwear
	First aid kit
	Fire extinguisher
	Cell phone or 2-way radio.

Safety frame (ROPS)

All new tractors should have ROPS fitted (Roll Over Protective Structures). These structures are designed to keep the operator inside the tractor if the tractor should roll, preventing them from being thrown out of the tractor, and preventing them from being crushed by the tractor.

All tractors must have rollover protection unless they were bought new on, or before, 31 August 2001. This excludes:

- crawler tractors
- wheeled tractors weighing under 762 kg or more than 4000 kg.

All new tractors purchased after 31 August 2001 must have rollover protection. This excludes tractors that weigh less than 700 kg.

Carrying passengers

All passengers must wear seat belts. If there are no seat belts, then you should not carry passengers.

WoF/CoF requirements

Tractors and trailers operating under 40 kph will not require a Warrant of Fitness (WoF), or Certificate of Fitness (CoF), or have to pay Road User Charges (RUC). However they must be up to a road worthy standard.

If your tractor will be operated at 40 km/h or more than 40 km/h, then you do require a WoF. No CoF will be required.

Agricultural trailers operating over 40 kph will need to be registered, licensed, and will require either a WoF or CoF.

A WoF expires after 12 months, whether the person operating the tractor is a farmer or a contractor. The vehicle must be licensed correctly in order to receive a WoF.

Driver licencing

The following driver licence requirements are for people driving tractors of up to 18 tonne on the road.

	Drivers holding a Restricted Class 1 licence can drive a tractor with a GLW (gross laden weight) or GCW (gross combined weight – for example, agricultural tractor and agricultural trailer) of not more than 4500 kg (4.5 tonne), and can exceed 40 km/h on the road.
	Drivers holding a Full Class 1 licence can drive a tractor with a GLW or GCW of not more than 6000 kg (6 tonne), and can exceed 40 km/h on the road.
	Drivers holding a Restricted or Full Class 1 licence can drive a tractor that has a GLW of not more than 18,000 kg (18 tonne), if driven at speed not exceeding 40 km/h.
	Drivers holding a Full Class 1 plus wheels 'F, T, R or W' endorsement licence can drive a tractor more than 6000 kg (6 tonne) but not more than 18,000 kg (18 tonne), and can operate on the road over 40 km/h.



For further information visit: www.nzta.govt.nz

Registration

All tractors driven on public roads must be registered. If the tractor is Exempt Class B (EB) then it is restricted to a 21 km round trip from base.

Registration and vehicle licencing are actually two different things, even though they are commonly thought of as being the same.

Your registration is a one-off fee that adds your vehicle's details to the Motor Vehicle Register.

Vehicle licencing is a fee you pay each year at any Transport Agency to use your vehicle on public roads. You need to give the vehicle type and the usage of the vehicle when you apply and renew the license. Tractors are code 03, vehicle type tractor, and are designed principally for traction at speeds not greater than 50 km/h.

Legal age

The operator of the tractor must be a minimum of 15 years old, unless they are a farm worker who is over 12 years old and has been fully trained (or is in the process of being trained in the use of the tractor) and the tractor is being used for agricultural work.

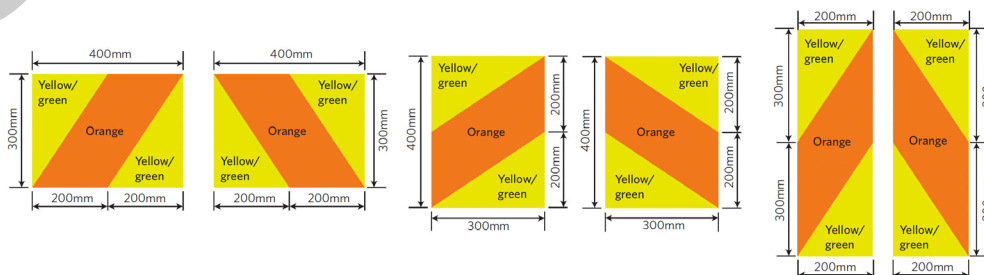
Vehicle displays

Vehicle displays are visual signals that let other people know of any potential hazards and must be used when a vehicle or load is over dimension.

Hazard warning panels:

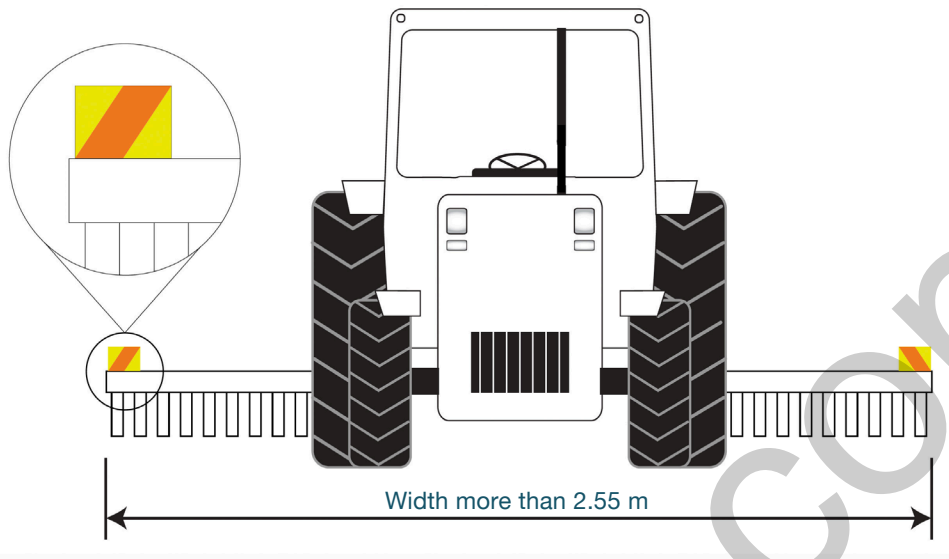
- must be reflective yellow-green with a reflective orange diagonal stripe (see diagrams below)
- are preferred over flags as the panels are more visible during both day and night
- only the New Zealand-style hazard panels are allowed – red and white hazard panels must not be used
- only use hazard panels when required to – do not leave them displayed on the vehicle when the vehicle is only standard size.

Examples of hazard warning panels are shown below.



Source: www.nzta.govt.nz

The following example shows the correct hazard panel location and orientation. Panels show the excess dimensions to other road users and are visible from the front and rear, or to the side for front and rear overhang.



Source: www.nzta.govt.nz

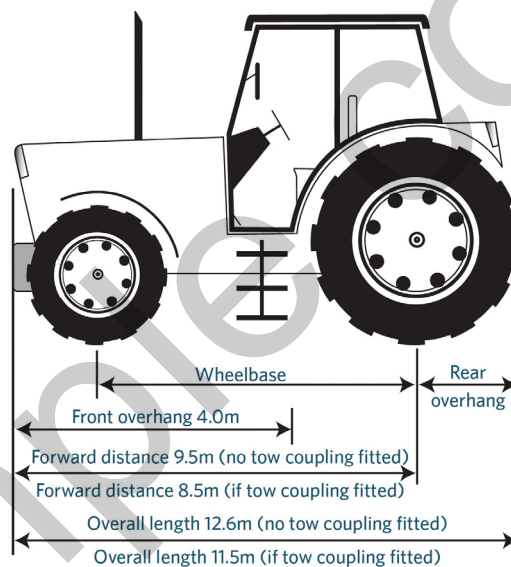
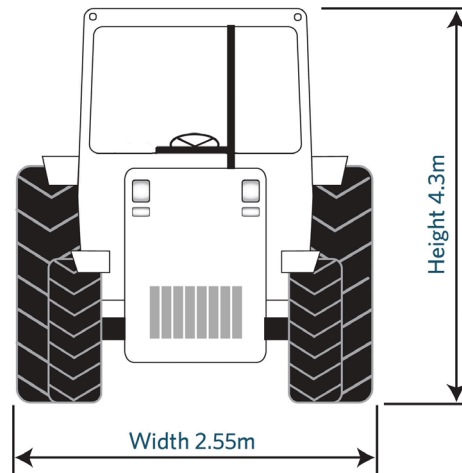
Amber beacon

To make agricultural motor vehicles more visible when operated on the road, one or more amber beacons must be fitted to agricultural motor vehicles registered on or after 1 June 2013. The beacon must be visible for up to 100 metres from the front or rear of the vehicle.

Over dimension

Over dimension means your vehicle is outside the standard dimensions that vehicles must fit within to drive on public roads. If your vehicle is over dimension (OD), it must have the correct signage to warn other road users of this potential hazard.

Maximum permissible dimensions for standard-size vehicle



Source: www.nzta.govt.nz

Rear overhang:	For a tractor – the lesser of 4 m or 70% of wheelbase.
Front overhang:	The maximum allowable front overhang is 4 m as measured from the front of the tractor seat to the most forward point of the overhang.



Remember, the measurement of front overhang will include the distance that any FEL, or attachment/load carried on the FEL, protrudes from the front of tractor. Allowable distance is 4 m as measured from the front of the tractor seat.

Your oversize sign:

- must be black lettering on yellow-green background (see diagram below)
- may be in two parts: **over** and **size**
- must be visible to both the front and the rear.



Source: www.nzta.govt.nz



Only use oversize signs when required to. Do not leave them displayed on the vehicle when the vehicle does not require them.

Requirements for driving on a public road

Public roads include any places that the public have access to. This means that public areas include bridges, beaches, riverbeds, carparks, reserve lands, wharves, and road shoulders where the public are able to access them and use them.

You need to always have the correct licence to drive on a public road. Not having the correct licence can result in you being fined and the tractor being impounded for 28 days.

If you are towing a trailer or implement on a public road, the entire length of the tractor and implement cannot be more than 20 m. However, a tractor can tow:

- up to two trailers as long as the total length is not more than 20 m
- one simple empty trailer as long as the length is not more than 22 m.

Trailers must be fitted with safety chains (which must be bolted, not welded).

- One safety chain is required for trailers under 2000 kg (2 tonne).
- Two safety chains are required for trailers over 2000 kg (2 tonne).

If you are driving on the road, and your tractor has projecting parts, you must minimise the risk to other road users.

Example

When you are driving a tractor with a bucket, keep the bucket as low as possible and rotate the leading edge of the bucket, so the sharpest part of the bucket is facing downwards. These actions improve visibility and safety.



This image shows a loader that needs to be lowered to improve visibility and stability.

Other requirements

The following are other requirements you need to be aware of when driving on a public road.

- Any tractor or implement over 2.55 metres (m) in width must have flags.
- Front-end loader or forks have to be kept as low as possible to maximise visibility for the driver and the stability of the vehicle.
- If a loader is more than 4 m in front of the tractor seat (measured from the front of the seat) then flags are required.
- If the tractor or implement is so wide that it is over the centreline by 0.5 m, then a pilot vehicle is needed. The pilot vehicle must be white, have headlights on dip, a revolving light, and a sign that reads 'wide load follows'.
- Slow moving vehicles on public roads must use flashing lights. This can be hazard lights but a rotating orange flashing light on the roof of the cab is best. It is now mandatory for tractors registered from 1 June 2013 to be fitted with beacons. Flashing hazard lights become a hazard for other road users because there are no indicators to show when turning.



Hazard panels and lighting should be kept clean.

Driving the tractor on private property

If driving a tractor on private property, there are requirements you still need to follow:

- it is illegal for anyone under 12 years old to operate a tractor on a farm
- unless a special passenger seat is provided, it is an offence to carry passengers at any time on the tractor
- if seat belts are fitted they must be worn.

The tractor must be properly maintained at all times. This is the responsibility of the owner, but if you are operating the machine you have a responsibility to see that it is in good working order.



Remember, if you or anyone else who is on the tractor while you are in control of it has an accident, you will be at fault and may face prosecution.



There are requirements you need to follow when driving on private property.



Legislative requirements and how they apply to you and the tractor(s) you drive

For the tractor you use in your workplace, answer the following questions.

1. What is the legal age you must be to drive this tractor on:

Public roads:	
Private property:	

2. What is the type of tractor you drive?

--

3. Do you meet the legal requirements for driving the tractor on public roads?

Meet the requirements for driving:	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Explain how you do or do not meet the legal requirements for driving:		

4. Does it have seat belts fitted? If yes, what are the requirements around using them?

Does it have seat belts fitted?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
If yes, what are the requirements around using them?		

5. What PPE do you need to wear when operating the tractor and how does this keep you safe?

PPE I wear:	
How this keeps me safe:	

6. What PPE does the tractor have that you must use and how does this aim to keep you safe?

PPE on the tractor:	
How this keeps me safe:	

7. Does the tractor have a safety frame? If yes, what are the requirements that are met with the safety frame and how does it keep you safe?

Does the tractor have a safety frame?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
How this keeps me safe:		

8. Describe a situation where you **can** carry passengers.

9. Describe a situation where you **cannot** carry passengers.

10. What vehicle display does your tractor have to have?

11. What tractors require WoFs?




12. What licenses (rego) does the tractor require?




Hazards and safety

Tractors cause a number of deaths and injuries every year.

Your health and safety when working in and around tractors is important and this is why you need to have and wear the correct equipment.

You may often be working on your own, in isolated areas of your workplace. It may take others a long time to notice that you are missing should you be involved in an accident.

	<p>Ear muffs or other hearing protection</p> <ul style="list-style-type: none">• Hearing loss is permanent. Although you may not notice it straight away, because it happens gradually, hearing loss is a major side-effect from working with loud machinery. Always wear hearing protection when you are working on a tractor without a sound proof cab.
	<p>Safety belts</p> <ul style="list-style-type: none">• If safety belts are fitted, then you should use them. If your tractor has ROPS fitted, then you will not be confined within the area unless you have a safety belt fitted.• If you don't have a ROPS then don't wear a seat belt. It is dangerous.• Always keep the safety belts in good working order. The anchorage part of the seat belt should be fixed securely. The seat belt webbing should not have any cuts, tears, or stretching. The buckles should not be damaged, bent, or broken. The buckles and tongues should lock easily and remain locked, but also release easily.
	<p>Safety boots</p> <ul style="list-style-type: none">• Always wear sturdy, closed toe footwear with gripping soles. Steel capped boots will protect your toes from being crushed and safety boots give you good grip on slippery surfaces.

	<p>Means of communication</p> <ul style="list-style-type: none"> • Always have a means of communication with you. Have a cellphone in the tractor with you, in easy reach. Do not use it while operating the tractor, as this is a hazard in itself, but have it somewhere that it is easily accessible. If there is limited cellphone reception where you are working with the tractor, then you need to have a two-way radio with you that you know how to operate.
	<p>First aid kit</p> <ul style="list-style-type: none"> • You should have a first aid kit in the tractor with you in case of an accident or injury.
	<p>Fire extinguisher</p> <ul style="list-style-type: none"> • You should carry a fire extinguisher in the tractor.



Clean tractor steps, the windscreen mirrors, and the floor of the cab regularly.



For the PPE you use on the tractor, check the following:

Seat belts

Does the tractor have seat belts?	
If so, how do you release them in the case of an emergency?	
What checks do you undertake before driving the tractor?	

Means of communication

What means of communication do you have on the tractor?	
Who do you contact?	
How do you make contact?	
Do you know how to use it in an emergency?	

First aid kit	
Where is the first aid kit located in the tractor?	
What are the contents of the first aid kit (list them)?	
Have you read the instructions on how to use the items in the first aid kit and are you confident in using them correctly?	

Fire extinguishers	
What is the fire extinguisher you have on board?	
Have you been trained how to use it or have you read the instructions that accompany it on how to use it?	
When was it last serviced, and when is it due for the next service?	

Hazards associated with tractor use

There are a number of hazards that can put you, or others, at risk when driving a tractor. Some of these hazards will be about your environment and work area, such as driving on a hill or poor visibility. Other hazards will be about how you drive and the decisions you make.

Hazards always need to be controlled so their risk of causing you harm can be minimised. Controlling the hazard means:

- eliminating hazards where you can, for example, making sure the tractor is at a complete stop before getting off
- minimising hazards to reduce the risk of them causing harm, for example, driving at safe speeds and to the conditions.

The following are some of the hazards you will have when driving a tractor and actions you can take to control the hazard so it is less of a risk to your safety.

Passengers

Passengers are a hazard. They can be distracting to you when you are driving. Passengers can easily be injured if something goes wrong. If the tractor goes over uneven terrain, then the passenger can be shaken or lurched from their position, or fall off the tractor. If they hit the ground hard, hit a part of the tractor, or are run over by the tractor, they can be seriously hurt or they can die.



Most older tractors are not designed to carry passengers. Passengers should only be carried if the tractor is fitted with:

- ROPS
- cabs
- an instructor seat
- safety belts.

Control measures to eliminate or minimise risks

- ✓ Only carry passengers if they wear a seat belt, are in an instructor seat, and the tractor has ROPS.
- ✗ Do not carry passengers on any tractor-mounted implements or trailers that are not designed specifically to carry people.

Getting on and off the tractor

Clothing can snag when you get on or off the tractor. If you jump down from the tractor onto uneven ground, you can:

- land heavily
- twist an ankle
- hurt your knees if you don't land properly.

If you get off, facing away from the tractor, you are more likely to injure yourself as your balance is more unsteady, you don't see that your clothing is likely to snag, and your hand-holds are non-existent.

Control measures to eliminate or minimise risks

- ✓ When climbing on and off the tractor, always keep three points of contact (two hands and one foot) with the tractor or the ground.
- ✓ Get on and off facing **towards** the tractor.
- ✓ Wear shoes with good grip and clothes that are less likely to snag.
- ✓ Before getting off, engage brakes and put the tractor into neutral, and disengage the power take-off. Lower mounted implements and FEL to the ground.
- ✓ If you are leaving the tractor, even just for a few minutes to do something else, turn the tractor off.
- ✗ Never jump off a tractor.
- ✗ Never get on or off a moving tractor.

Loud noise

Drivers of tractors can be exposed to a lot of loud noise which can affect your hearing, especially over time. It is accepted by industry that if your tractor has a sound proof cab and you drive with the windows closed, you do not need to wear hearing protection, such as earmuffs.

However, it is sensible to wear hearing protection as much as possible. You may need to get in and out of the tractor often, and that repeated exposure to loud noise can, over time, contribute to hearing loss.

Control measures to eliminate or minimise risks




- ✓ Wear hearing protection unless you have a tractor with a sound proof cab with closed windows.



It is sensible to wear hearing protection as much as possible.

Tractor controls

Tractor controls are designed to be used from the driver's seat. They are usually colour coded to identify the levers.

	Orange are the tractor movement controls, (2WD – two wheel drive, 4WD – 4 wheel drive, accelerator, gears, brakes).
	Yellow are the PTO (power take off).
	Black are the hydraulic controls.

If you try to use the controls from the ground, you are more likely to be run over and crushed by the tractor.

Control measures to eliminate or minimise risks

- ✓ Start the engine only from the driver's seat, even if the controls can be operated from the ground.
- ✓ Always use the controls from the driver's seat.
- ✓ If the manufacturer has specifically designed the controls to be used from the ground, stand in a place where you are not going to be run over and crushed if something goes wrong.
- ✗ Never start the engine from the ground.

Hydraulics

Hydraulic power on a tractor is usually used for mounted implements. The use of hydraulics can be dangerous as it uses high pressure oil to raise and lower the implements. When you are connecting and disconnecting the hoses, you need to take extra care, as you don't want to spray any high-pressure oil all over yourself or the machinery. Oil can penetrate your skin easily and cause lots of problems for you. It is very painful and very dangerous.

If a high-pressure hose fails, then the load it is carrying will fall. Anything that is underneath the load will be crushed. Because you don't know when the hose will fail, the effect it has is unexpected and often frightening.

Anyone or anything in the path of the falling object will be seriously injured or hurt.

Control measures to eliminate or minimise risks

- ✓ Use a stable support underneath anything that is raised by a hydraulic ram if you have to work underneath it.
- ✓ Use a jack stand or other support that is reliable and strong.
- ✓ Make sure that there is a regular maintenance check of all the hydraulic hoses.
- ✓ Check for wear and tear before using a hose.
- ✓ Always wear the correct PPE when working with hoses. At a minimum, this is eye protection and gloves.
- ✓ Work the hydraulics from the driver's seat.
- ✓ Always follow the manufacturer's instructions.
- ✓ Lower the front and rear hydraulics to the ground when parking the tractor, regardless of the length of time you are parking for.
- ✗ Never work under equipment that is supported only by a hydraulic ram.
- ✗ Do not put your hands around a hose that is under pressure.

Implement loading – front-end loading

Front-end loading will change the centre of gravity of a tractor which changes the way that it drives and increase the chances of it rolling over. Front-end loaders also carry a lot of weight and if they fall on somebody they will injure them or kill them.

When driving on a road, if a tractor has front-loaded tines, buckets, forks or other devices, they can cause a lot of damage to other vehicles.

Control measures to eliminate or minimise risks:

- ✓ Check that the tractor has a rated lifting capacity. Check the specifications about lift ratings.
- ✓ You may need to attach a counter-balance on the 3 point linkage before attaching a front-end loader.
- ✓ Keep the attachment as low as possible to reduce the centre of gravity as much as you can. This will also maximise driver visibility.
- ✓ Make sure that the front-end loader is regularly maintained to reduce the possibility of anything going wrong, and check for any stressed parts and excessive wear or tear.
- ✓ Keep your speed down when driving with a load.
- ✓ Back down slopes when carrying a load. Do not go forwards down a slope with a heavy front-end load.
- ✓ Lower the front-end loader when parking, even when parking for a very short amount of time.
- ✓ **Avoid** any sudden stops when driving with a load. Sudden stops can cause the tractor to overbalance and tip over or roll.

Braking

Braking systems in tractors are used to slow down or stop the tractor from moving. Tractor braking systems are either hydraulic or mechanical.

The main safety issue with braking in tractors is due to the weight and speed of the tractor. If you are travelling at a high speed and need to stop quickly, the weight of the tractor is more likely to result in the vehicle overturning or rolling over. To prevent this, you should try to keep your speed to a minimum, particularly on rough terrain where the balance of the vehicle is also affected. As the speed of the tractor increases any sudden turns, gear changes and braking is felt much more abruptly. This increases your chances of rolling over.



Your tractor will also have a handbrake. You should always engage the handbrake before getting off the tractor, stopping the engine and removing the key.

Tractors and trailers without adequate braking systems can jackknife, lose control, and overturn. When driven on-road, they need to be able to stop safely within a reasonable distance under any conditions.

When you are working, you may be working on slopes, or on slippery surfaces. You need to be able to manoeuvre the tractor and/or trailer on difficult surfaces without slipping and sliding. Good braking systems are essential for this.

The ability to stop is critical to the safe operation of your vehicle, and even more so if you are driving a vehicle combination, for example, towing a trailer which, in New Zealand, is probably not braked. There are various requirements for brake performance which your vehicle needs to meet. When driving on a road, be sure to lock the left and right brake pedals together if the vehicle has independent left and right wheel brakes.

The service brake of a trailing implement must be able to be applied by the driver from the driver's normal driving position in a controlled and progressive manner.

1. An agricultural vehicle, together with any trailer(s) towed, must be able to stop within a distance of 7 m from a speed of 30 km/h.
2. The parking brake of an agricultural vehicle must be capable of:
 - a. stopping the vehicle within a distance of 18 m from a speed of 30 km/h, or
 - b. holding the vehicle stationary on a slope of 1 in 5 whether facing uphill or downhill.

Control measures to eliminate or minimise risks

- ✓ Reduce speed before turning or applying brakes.
- ✓ Keep the tractor in an appropriate gear to allow the engine compression to act as a brake.
- ✓ Choose the right gear **before** going up or down a slope. When going downhill, too high a gear will give insufficient engine-braking, while a gear that is too low will increase the risk of wheel sliding.
- ✓ Use the same gear to go down a hill that you would use to pull the load uphill.
- ✓ Use a tractor large enough and with adequate braking power to control the load being pulled. If the load you are towing exceeds the weight of the tractor, the trailer should have independent brakes.
- ✓ Properly maintain and adjust braking systems for tractor-trailers to ensure efficiency and safety.
- ✓ Keep hydraulic and air brake couplings clean.
- ✓ Make sure linkages are properly lubricated and operate freely, and keep them maintained.
- ✓ Check the parking brake works properly. They need regular maintenance.
- ✓ Engage the handbrake, and park lever if fitted, before stopping the engine and removing the key.

Work area

When you are working, you may be working on hilly areas, uphill or downhill slopes. This might mean turning on the slopes, pulling loads up and down hills. There is also the likelihood of overhead power lines. Assess the risks around working in areas where there may be hazards such as doors, people moving around you etc., so that you minimise any risks to people that you are working with.

1. Slopes

Slopes will change a tractor's centre of gravity. If you are working across a slope, do not turn down the slope, always turn up the slope. Turning down the slope is very dangerous and is likely to cause the tractor to turn over. Work across the slope so that you can turn up it, rather than down it.

Control measures to eliminate or minimise risks

- ✓ Slow down before turning or crossing slopes.
- ✓ Apply a single brake in the direction of the turn (if you are turning left, apply the left brake).
- ✓ You may want to apply the uphill wheel brake to maintain stability. This will force the bottom wheels to drive forward, maintaining the nose of the tractor uphill, and giving you better traction.

2. Hill descents (going downhill)

Descending a hill is one of the most dangerous things that you will do as a tractor operator/driver. Factors which cause this risk are:

- Usually only the rear wheels of tractors have brakes. Front wheels are braked through the four wheel drive link to the rear wheels.
- When descending a hill the traction is transferred away from the rear (braking) wheels and onto the front wheels (non braked).
- Tractor tyres have directional tread with maximum traction for driving in forward direction but minimal when reversing. The traction required when braking is using the grip in the reverse mode. Tyres give far less traction in the braking mode than the pulling forward mode.

Always descend a hill in a straight line, straight down the hill. Do not try to descend on a diagonal. The tractor is more likely to overturn or roll if it is driven on an angle down a slope.

Hills descended in a forward gear without four wheel drive engaged can be lethal and even more so when being pushed by a trailed load.



Most modern tractors have a safety feature of when the brakes are applied, the four wheel drive is automatically engaged. This is not the case on all tractors. Be aware of your tractor's ability to do this.

A trailer that pushes the tractor downhill is likely to create a jackknife situation which is a serious risk.

Most agricultural trailers or trailed loads in New Zealand do not have trailer brakes.

Best practice standard for towing trailed loads on hills is that you should not tow a greater weight than the weight of the tractor. In detail that would mean that the total weight on the trailer axles should not be more than the total weight on the tractor axles. To calculate this we need to adjust for weight transferred from the trailer to the tractor (that is the weight on the tractor drawbar).

The tractor should be operated in an appropriate gear to give you more control over the machine while operating on a slope. Too high a gear will prevent the required engine braking while too low a gear will give too much engine braking which may cause a lack of traction and cause the tractor to slide downhill. The tractor should also be used in four wheel drive as this provides more traction and gives you a stronger ability to brake. In two wheel drive, only the rear-wheels brake whereas in four wheel drive all four wheels brake.

Always operate the tractor at a slow and cautious speed appropriate when doing work on sloping ground.

Control measures to eliminate or minimise risks

- ✓ Always keep the tractor in gear while operating on slopes and hilly terrain.
- ✓ Always engage four wheel drive **before** you go on hills.
- ✗ Avoid changing gear on hills.
- ✗ Avoid starting and stopping on hills if possible.
- ✗ Do not make any sudden direction changes.
- ✓ Make your headland turns, stops, and other changes on more level ground at the beginning or ending of the slope if at all possible.
- ✓ Find a safer route.



Always keep the tractor in gear while operating on slopes and hilly terrain.

3. Hill ascents (going uphill)

The weight moves to the rear of the tractor when you are moving uphill which increases the risk of the tractor flipping over backwards. Wheels can lose traction which makes the tractor go sideways, increasing the risk of tipping over or rolling over.

Weight transferring to rear of the tractor can cause backflip but only when driving in a forward gear. It is the result of a torque reaction. Disengaging the drive (pushing the clutch in) will instantly reduce backflip tendency but unless the brakes are activated at the same time, there is risk of roll back.

Roll back can grow in momentum very quickly and this situation can also lead to backflip when brakes are applied when trying to arrest a roll back.

There is an appropriate gear for ascending (climbing) hills. Too high a gear will cause tractor to stall because of a lack of power. Too low a gear may cause tractor to lose traction (skid).

Control measures to eliminate or minimise risks

- ✓ Select an appropriate gear before driving up the slope.
- ✓ Apply the throttle to minimise the possibility of the engine stalling.
- ✓ Reverse up the hill so that the heavy end of the tractor is going up first.
- ✓ If it is a straight climb, engage the differential lock and four wheel drive before starting the ascent.
- ✗ Do not change gear once you have started the climb.
- ✓ If you lose traction, apply the brake and clutch together and select reverse gear, and back down the hill.
- ✓ Find a safer route.

4. Speed

Rollovers or tipping can occur either when going up, across or downhill, in hilly country or when there are obstacles like stumps, ditches or stones but many rollovers occur on flat ground. Higher speed increases the risk of rollover because tractors have a high centre of gravity and when they are operated with mounted loads, the implements/FELs when raised high will give a tractor a higher centre of gravity which increases the rollover risk.

Speed adds centrifugal force, longer stopping distances and less stability to the equation which increases risk. Any obstacle that causes them to brake suddenly, change their direction quickly or turn abruptly is likely to cause a serious rollover accident.

Control measures to eliminate or minimise risks

- ✓ Keep your speed low, avoid sudden changes of direction and sudden braking.
- ✓ Keep implements and FELs low.

5. Environment, bad weather, bright sunshine

All of these environmental issues can cause a driver problems. By driving slowly and paying attention to the environment around them, a driver is more likely to be aware of any potential hazards and risks.

Control measures to eliminate or minimise risks

- ✓ Every time you use a tractor, look out for other people, wherever you are, as other workers are often nearby.
- ✓ Always keep a look out for children.
- ✓ Keep windscreens, visors, and mirrors clean and adjusted.

6. Overhead electricity power lines

Overhead electricity power lines (OHPL) may be present in many workplaces. Contact with any OHPL can kill, so plan to avoid working near them if possible. Be aware of any minimum line heights and the maximum height/reach of tractors passing below or near power lines. Get the power lines checked by your distribution network operator if you have doubts about their height.

Control measures to eliminate or minimise risks

- ✓ Check that lines are marked on a map of your workplace and pass on this information to contractors and other visitors that need to know where the lines are.
- ✓ Consider the height and reach of machinery when working near the power lines if you can't avoid working in that area.
- ✓ Use alternative access points and routes to avoid the lines wherever possible.
- ✓ Look out for warning signs, barriers, posts and warning tapes. Put up any warning signs if there aren't any already there.
- ✓ Always provide and use safe tipping areas away from OHPLs.



Avoid working near OHPL if possible.

7. Power take off shaft

The power take off (PTO) shaft is found at the rear, and sometimes on the front of the tractor. It uses the tractor's engine to drive any tools or equipment attached to the engine. This may be equipment such as mowing equipment, spraying equipment, cultivating equipment, feed grain mills. This equipment does not have its own engine, so it needs the PTO to use the tractor's engine for power.

It is a drive shaft that rotates at a fast speed. The main injuries that occur from the PTO is when clothing gets caught in the shaft or couplings, and cannot be untangled, resulting in the person getting crushed, or breaking bones. They can easily be killed.

Control measures to eliminate or minimise risks

- ✓ The PTO shaft should have a guard on it known as the POC (power output coupling) guard. This should be permanently attached to the tractor. If it is moveable, it should be held securely in place when the tractor is moving.
- ✓ Workers should be trained properly in the use of the PTO and should be made aware of the dangers of using the PTO and other equipment.
- ✓ Workers should wear close-fitting clothing that is not going to get caught in the PTO or couplings.
- ✗ Workers should not wear jewellery that could get caught in the PTO or couplings.
- ✓ Long hair should be tied back or secured so it can't get caught up in the machinery.
- ✓ There should be a PIC guard (power input coupling) guard permanently in place. There should be no place where body parts or clothing or jewellery can be caught.
- ✓ There should be a PTO shaft guard. This may be a rotating guard, but it may not be. A non-rotating guard needs to be restrained in some way. A rotating guard must be able to be stopped by hand without risk of injury.
- ✓ All guards must be well-maintained.

- ✓ All guards must be those supplied by the manufacturer.
- ✓ If a guard is to be removed, the machinery should be isolated and locked out so that it cannot be used whilst the guard is not in place.
- ✓ All guards must be checked daily for any wear and tear.
- ✗ Do not start the PTO until all personnel are clear of the machinery.
- ✗ Do not lean over a PTO while it is in operation.
- ✓ Turn the PTO off **before** you get off the tractor.

8. Front-end loaders (FELs)

A front-end loader, especially when it is loaded, can cause a lack of balance with weight distribution. This often leads to instability and rollovers. This is made worse by any sharp turns, high speeds and uneven terrain.

Front-end loaders change the physical and handling characteristics of a tractor. When it is loaded with materials, these characteristics are even more unpredictable.

Factors that give risk to FELs on tractors are:

- As the FEL is raised so does the tractors centre of gravity. A high centre of gravity (top heavy) results in a vehicle that is easy to topple (roll over).
- The load on the FEL is carried in front of the front axle which takes weight off the rear axle. The rear axle of a tractor is fixed and designed to carry heavy loads and give the tractor stability. The front axle is hinged (it pivots) is not designed to carry great loads nor designed to give stability but is designed to float over undulations.
- Weight transferred from the stable rear axle to the hinged [pivoting] front axle leads to less overall stability which can lead to rollover.

Manoeuvrability and machine clearances (especially under electricity wires) are different when compared to operating tractors without the loader attachment. Adjust your driving and the way you handle operations accordingly.

Always check that FEL attachments (buckets, forks, etc.) and loads are securely attached. Any insecure attachments or unsecured loads have the ability to fall backwards when loader is fully raised, causing the load or attachment, to fall into operator's platform or cab. This is a serious risk.

Control measures to eliminate or minimise risks

- ✓ Use a rollover protective structure and a seat belt for protection in the event of a rollover.
- ✓ Engage four wheel drive when using FEL because traction is added to front but reduced on rear.
- ✓ Adjust the width of the tractor wheels so they are as wide apart as is practical.
- ✓ Ballast the tractor loader combination as recommended by the manufacturer, or attach wheel weights to the rear axles or wheel rims. Weight may also be carried by a three-point hitch attachment.
- ✓ Keep the bucket as low as possible when turning or transporting materials.
- ✓ Watch carefully for obstructions and depressions in the ground.
- ✓ Drive smoothly, avoiding quick starts, stops, and turns.
- ✓ Make sure the ground is level and free from holes or depressions before raising the loader to its full height.
- ✓ Carry loads as low as possible to the ground.
- ✗ Do not travel with the bucket in the raised position.
- ✓ Raise and lower the loader arms slowly and steadily.
- ✓ Raise the loader in an area free from overhead obstacles, such as power lines.

- ✓ Load the bucket evenly from side-to-side, and keep within the normal capacity of the tractor and loader.
- ✓ Use caution when handling loose or shifting loads.
- ✓ Allow for the extra length of the loader attachment when making turns.
- ✓ Keep the loader low while carrying loads and/or while driving on a hill.
- ✓ Drive with loaded buckets facing uphill rather than downhill, and stay off steep slopes to prevent bouncing and loss of control.
- ✓ Keep the tractor away from the outer edges of banks and slopes.



Front-end loaders change the physical and handling characteristics of a tractor.

9. Operator and bystander safety

Front-end loaders are often used in situations where there are helpers or other workers around you. This can be hazardous because the bucket can make it difficult to see people working near the loader.

Control measures to eliminate or minimise risks

- X** Do not ever lift or carry people in the bucket.
- X** Do not move or swing a load should with people in the vicinity of your work area.
- X** Do not ever walk or work under a raised loader.
- ✓** Avoid putting your hands or fingers near pinch or crush points and make sure others are also clear of these points.
- ✓** Operate the controls only when seated on the tractor.
- ✓** Always use the safety support locks on the cylinders, if the loader must be raised for maintenance.
- ✓** When not in use leave loader resting on the ground.

10. Managing yourself

Often you will find yourself working alone, in isolation. It might be some time before someone realises you are missing or it might take time before any help can reach you.

Making sure that someone always knows where you are, that you have a first aid kit in the tractor and that you know basic first aid is essential. Make sure you have regular check-in times with another person. If you are expected to check-in and you don't, and someone knows where you are working, help will arrive more quickly. It may mean the difference between life and death if help arrives sooner.

Control measures to eliminate or minimise risks

- ✓ Have a first aid kit with you.
- ✓ Have a way of contacting people (cellphone or two-way radio).
- ✓ Have regular check-in times.
- ✓ Have an emergency plan so people know what to do if something goes wrong.



Make sure you have regular check-in times with another person.

11. Impairment

Fatigue, stress, drugs, and alcohol can impair tractor drivers. All of these factors can affect your judgement, balance, reaction times, and even your balance. If you operate a tractor while you are tired, stressed, or under the influence of drugs or alcohol, you are more likely to suffer from an accident.

Control measures to eliminate or minimise risks

- ✗ Do not drive when overly tired or stressed.
- ✗ Do not drive when under the influence of drugs or alcohol.
- ✓ Find another task that you could do instead.
- ✓ Ask someone else to do the tractor driving for you.
- ✗ Do not let others drive the tractor if you suspect they are tired, stressed, or under the influence of drugs or alcohol.



If you operate a tractor while you are tired, stressed, or under the influence of drugs or alcohol, you are more likely to suffer from an accident.



Control measures to keep yourself and other safe

What do you consider to be **four** of the biggest hazard to your safety when driving a tractor at work, and what do you do to control the risks?

Hazard when driving the tractor at work	What controls are in place to reduce the risks and keep you safe?
1.	
2.	
3.	
4.	

Reporting requirements

Even though workplaces and workers work hard to try to avoid any accidents from occurring, there are times when accidents do happen. When an accident does occur, it needs to be reported. This is so your workplace can learn from the incident, what led up to it, why it happened, and hopefully prevent it from occurring again.



It is a legal requirement under the Health and Safety at Work Act 2015 to record all work-related accidents.

Your workplace should have somewhere for you to report any accidents (or near-misses). This is where you will write down:

- your name
- your date of birth
- your position (job title)
- the injuries you **sustained** (if any)
- the date of the accident or near-miss
- the time it occurred
- what happened
- where it happened (location)
- what caused it to happen.

Make sure you know where to report any accidents or near-misses, and how to report them.

You need to report the accident or near-miss as soon as possible, after the incident. If you are unable to report it yourself, you need to make sure that someone else reports it for you.

Most workplaces will require you to report your accident or near-miss within 24 hours. The reason for this is they need to review their policies and procedures.

If the accident or near-miss is the result of an identified risk, they may need to change the way they manage that risk.

If it is the result of a new, or unidentified risk, then they will need to find a way to manage that risk to prevent another accident or injury occurring.

It may mean that machinery needs servicing more regularly, or there needs to be a change in maintenance schedules.

As well as the form, some workplaces also have a board which lists the latest accidents. This means everyone is aware of what has happened and can avoid it happening again as much as possible.

FARM INCIDENT/NEAR-MISS REPORT

In case of an emergency:
- Contact emergency services: 111
- Call WorkSafe: 0800 030 040

Personal details
NAME: _____ PHONE NUMBER: _____
ADDRESS: _____ DATE OF BIRTH: _____
SEX: Male Female

Employment details
FARM NAME: _____ JOB TITLE: _____
 Permanent Casual Contractor Visitor

Accident details
DATE: Near-miss No treatment First aid Doctor Hospital Serious harm
TIME: AM PM Hours at work: _____ Date reported: _____

Nature of injury
 Strain/sprain Cut Head injury Fracture/break Gradual process
 Bruising Burns Poison/chemical Multiple injuries No injury

LOCATION OF INJURY (CIRCLE LOCATION) WHERE DID THE ACCIDENT HAPPEN (EG SHED, PADDOCK ETC)

HOW DID THE ACCIDENT HAPPEN?

WAS THE PERSON TRAINED FOR THE TASK THEY WERE DOING? Yes No
IF A VEHICLE WAS INVOLVED, RECORD TYPE OF VEHICLE _____
WAS A SIGNIFICANT RISK INVOLVED? Yes No
IF YES, WHAT WAS THE SIGNIFICANT RISK? _____
IS THE RISK ON THE RISK REGISTER? Yes No

PERSON RESPONSIBLE: _____ BY WHEN: _____ DATE COMPLETED: _____
NOTE IF A DOCTOR'S VISIT WAS REQUIRED:
 Able to do light duties
 Assistance required at home Unable to work Transport assistance needed
POSITION: _____
DATE FORM WAS COMPLETED: _____

Incident/near-miss report form

If you are reporting an accident or near-miss:

1. Get the facts. Make sure you know the date, time, and specific location of the accident or the near-miss.
2. Describe the events leading up to the accident or near-miss. Give any relevant environmental conditions, such as poor visibility, noise, or bad weather.
3. Identify if anyone else was there, such as any witnesses.
4. State what you were doing at the time of the accident/ near-miss.
5. Identify the task you were completing, and say if:
 - anything unusual happened
 - something that usually happens didn't
 - everything was the same as it usually was.
6. Give the circumstances (what PPE were you using, what tools and materials were you using)
7. Give the specific injuries you sustained Where were you injured? How badly?
8. Describe the actions you took:
 - What were your actions immediately after the accident/ near-miss?
 - What first aid did you **administer**? Or did someone else administer for you? Did you need to call an ambulance?
 - Did you call for assistance from anyone else?
 - If it was a near-miss, how did you avoid injury?



Reporting near-misses and accidents

Find your workplace policy and procedure on how to report near-misses and accidents.

Read this documentation and complete the following:

1. What are the steps you take to report a near-miss?

<p>Sample copy</p>

2. Is this the same for reporting an accident? If no, then what is different?

Yes

No

If no, record what is different here:

<p>Sample copy</p>



Attach a copy of the documentation you are required to complete for both near-misses and accidents.

3. Have a go completing the workplace documentation for the following scenario.

Scenario:	Coming down hill you lose traction and skid about two metres coming close to hitting the fence.
------------------	---

Have your Supervisor check your reporting and give feedback to you.

4. Record the main points of the feedback you received from your Supervisor.

Sample copy

Glossary

Term	Definition
Administer	To give. For example, to administer first aid, is to give first aid to a person.
Avoid	Refers to keeping away from or stopping yourself from doing (something).
Legislation	Refers to the law as it is recorded.
Potential	Refers to something having the power or being capable of happening or causing something. For example, a potential hazard is a hazard that may present itself in the future.
Rights	Rights is a term that deals with various practices that provide protection to an employee in an workplace.
Responsibility	A term that deals with various practices that an employer must put in place for the workplace.
Sustained	To experience. For example, a sustained injury is an injury they got from work.
Workplace procedures	Workplace procedures refer to the policies and procedures set out in verbal or written form by the employer or organisation. Procedures must reflect current legislative requirements and manufacturer's guidelines.

Resource Feedback

In order to keep our resources as up-to-date and relevant as possible we would appreciate any comments, feedback or suggestions you may have with regard to this particular resource or others that you have used.

Please contact us via email **product@primaryito.ac.nz** if you have any suggestions that you feel would be useful.

Please remember to indicate the resource you are giving feedback on in your email, and please provide your contact details.

Thank you for taking the time to provide us with feedback.

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