

24555: Demonstrate knowledge of the safe operation of a motorcycle



Level
2

Learner Guide

Unit standard 24555 v3	Level 2	Credits 3
Demonstrate knowledge of the safe operation of a motorcycle		

Sample Copy

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Introduction

Learning outcome

To successfully complete this unit standard you will show that you are able to demonstrate knowledge of:

- the safe operation of a motorcycle
- motorcycle riding contingency procedures
- the safe operation of a motorcycle with a mounted load.

Notes

All evidence presented in this unit standard must be in accordance with:

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





If you require the Learner Guide to be printed on coloured paper, contact Primary ITO on 0800 20 80 20 and talk to our Learning Support Team.

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.
	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.


Motorcycles in the workplace


Motorcycles are used in workplaces as an efficient way of getting round. They can be used in most terrains and on public roads shared with the general public. No matter where you ride your farm motorcycle, there are legal requirements for a motorcycle, and legal obligations you have to follow.



Legislation you must follow

The Land Transport (Road User) Rule 2004 sets out the legal requirements and obligations that you must follow. These include the following.

Legal requirement	What this means to you
 Registration	<p>When riding a motorbike on a public road it must have a current registration.</p> <p>A motorcycle does not need to be registered if it is only used on private property (in a workplace).</p>
 Warrant of fitness	<p>When riding a motorbike on a public road it must have a current warrant of fitness.</p> <p>You do not need a warrant of fitness if the motorcycle is only used on private property.</p> <p>However, the motorcycle you ride should be:</p> <ul style="list-style-type: none">• well maintained and serviced regularly• suitable for the job it is intended• safe to ride.

Legal requirement	What this means to you
 <p data-bbox="280 456 384 488">Helmet</p>	<p data-bbox="459 315 1169 394">An approved safety helmet must be worn at all times when riding a motorbike on a public road.</p> <p data-bbox="459 465 1209 678">It is highly recommended you use an approved safety helmet when riding a motorbike in your workplace. Your workplace will have policies and procedures for the use of safety helmets and it is important you follow these at all times.</p> <p data-bbox="459 752 1225 875">An approved safety helmet is one that meets the New Zealand Standard NZS 5430: Protective helmets for vehicle users.</p> <p data-bbox="459 949 1222 1072">An approved safety helmet will have a sticker on it showing that it meets an approved safety standard. Your helmet should also:</p> <ul data-bbox="491 1099 1185 1406" style="list-style-type: none"> • fit snugly – it shouldn't be too tight or too loose (a loose helmet is almost as bad as no helmet at all) • be securely fastened when riding • be a bright colour, such as white, orange, yellow, or red • have red reflective material on the back and sides. <p data-bbox="459 1496 1222 1619">Tip: You will need to replace your helmet if it is cracked, has loose padding, frayed straps or exposed metal, or is damaged in any way, as it may not be safe.</p>

Legal requirement	What this means to you
 <p data-bbox="384 434 502 506">Rider licences</p>	<p data-bbox="571 315 1286 394">If you are riding the farm motorcycle on a public road you must:</p> <ul data-bbox="603 423 1310 712" style="list-style-type: none"> • hold at least a current learner motorcycle licence (Class 6L) • be at least 16 years old • have passed a basic skills test offered by most motorcycle dealers, and a theory test similar to the test for a car licence. <p data-bbox="571 786 1098 819">If you have a learner licence, you must:</p> <ul data-bbox="603 848 1086 1189" style="list-style-type: none"> • not ride a bike over 660 cc • not take passengers • keep your speed below 70 kph • have an 'L' plate • not ride between 10 pm and 5 am • carry a licence while riding. <p data-bbox="571 1263 1054 1296">If you have a restricted licence, you:</p> <ul data-bbox="603 1326 1161 1599" style="list-style-type: none"> • must not ride a bike over 660 cc • must keep your speed below 70 kph • must not ride between 10 pm and 5 am • must carry a licence while riding • are allowed a passenger. <p data-bbox="571 1673 948 1706">If you have your full licence:</p> <ul data-bbox="603 1736 1299 1919" style="list-style-type: none"> • there are no restrictions on capacity or speed on private property – you must follow speed limits on public roads • you are allowed a passenger.

Legal requirement	What this means to you
 <p>Rider licences</p>	<p>If you only ride on private property – that is in the workplace with no road riding:</p> <ul style="list-style-type: none"> any person aged 16 or over can drive any vehicle off road with no licence. <p>Your workplace will have policies and procedures on licencing requirements while riding motorcycles on the job.</p> <p>Make sure you know what these policies say, and that you comply with them at all times.</p>
 <p>Carrying a passenger</p>	<p>Many farm motorcycles can carry two people at one time.</p> <p>You should only carry a passenger in the workplace when:</p> <ul style="list-style-type: none"> you have the experience to control the bike with the extra weight of another person the terrain is fairly flat and the surface is not rough the bike has a large enough seat and foot pegs for two your passenger has an approved safety helmet. <p>If you are riding the farm motorcycle on public roads with a passenger, you must both be wearing:</p> <ul style="list-style-type: none"> safety approved helmets protective equipment as stated by your workplace. <p>If you are riding the farm motorcycle on public roads with a passenger, you must have:</p> <ul style="list-style-type: none"> the correct licence a current warrant of fitness a current registration.

Sample copy



To make sure you know the legal requirements for riding a motorbike, look at a current copy of the Road Code.

You can access the Road Code for motorcyclists on the NZ Transport Agency website: www.nzta.govt.nz

You can also access this by entering 'Road Code for motorcyclists NZ' into Google and clicking on the link.

Google

Road Code for motorcyclists NZ

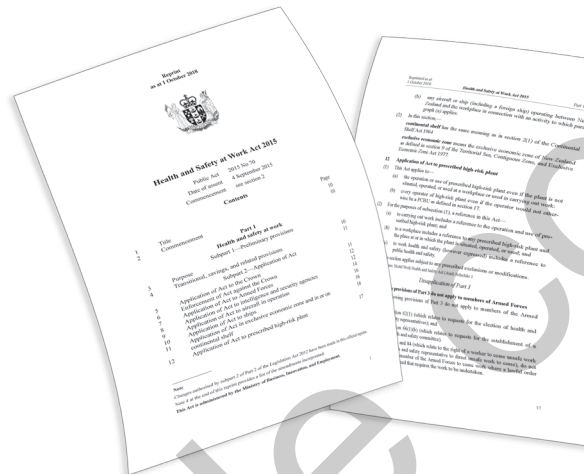


Other legislation you must follow

The Health and Safety at Work Act 2015 (HSWA)

The Act requires workplaces to manage their hazards and risks so everyone is kept safe.

It sets out the responsibilities of employers and workers.



Employer responsibilities

Your workplace has the primary duty of care to take all reasonable steps to minimise risk to workers and others, such as visitors. When workers need to use motorbikes, the workplace should do the following:

- make sure all workers are trained and competent to use the motorbike
- provide personal protective equipment (PPE) and make sure the equipment is worn and/or used
- make sure the motorbike is in good working order and well maintained
- make sure the workers are following safe operating procedures
- make sure the workers understand that not working safely is serious misconduct and could lead to disciplinary action.

Worker responsibilities

As a worker you must:

- take reasonable care of your own health and safety and the safety of others
- pay attention when riding the motorbike
- wear a helmet and suitable clothing (appropriate footwear) or safety equipment provided – glasses and gloves may be useful
- drive at an appropriate speed for the task
- not overload the motorbike
- always follow your workplace's health and safety policies, procedures, and instructions
- identify and report hazards so your workplace can put in place controls to minimise the risks to your safety from these hazards.



For more information about the Health and Safety at Work Act 2015 (HSWA), Google search: 'Health and Safety at Work Act 2015'.



Health and Safety at Work Act 2015





Knowing the law and how it applies to you when riding farm motorcycles

Read through the statements and decide if they are true or false. Mark with a tick in the correct box.

	True	False
You need to have a full licence to ride a farm motorcycle on a public road.		
You must be 16 or older to ride a farm motorcycle on a public road.		
It is the law to wear a safety approved helmet on in the workplace.		
It is the law to wear a safety approved helmet on a public road.		
Only farm motorcycles that are used on public roads need a warrant of fitness.		
You must display 'L' plates if you are on your restricted licence.		
Farm motorcycles must be registered if they use any public access, for example, crossing a public road to get to another area of the workplace.		
Farm motorcycles must be well maintained and regularly serviced.		
You must wear all safety gear your workplace provides when riding the farm motorcycle on the job.		

Hazards in operating a motorcycle

Two-wheeled farm motorcycles are often used to get around workplaces where the terrain is difficult or **inaccessible** for other vehicles. Riding at work may also mean you work in isolation and in different weather conditions.

Riding a two-wheeled motorcycle can be a hazard with the potential to cause harm or injury to you. Your workplace will have identified most of the hazards in operating a motorcycle and have controls in place to either minimise or eliminate the risk of harm.

It is a shared responsibility to identify the hazards in the workplace.

It is the workplace's responsibility to put controls in place to minimise the risk of harm

It is your responsibility to follow all the controls put in place by your workplace.

You will find the controls either in the workplace hazard register or in your workplace's policies and procedures.

WorkSafe New Zealand has identified a number of hazards and their controls when riding in a workplace, such as on a farm. Your workplace may have these as well as other controls in place for each of the hazards.

Below is a summary of hazards when riding a motorbike in the workplace and the recommended controls to minimise the risk.

Hazard
Ground conditions, such as rough, slippery, or steep.
Harm they can cause to people
<ul style="list-style-type: none"> • Riders can lose control and crash.
Control for the hazard
<ul style="list-style-type: none"> • Apply good riding techniques, including active riding. • Always wear an approved safety helmet while riding.

Hazard
Obstacles in the ground, such as race tape, wire, irrigation pipes, and other stationary objects.
Harm they can cause to people
<ul style="list-style-type: none"> • You can hit the object and come off the bike, hurting yourself, or damaging the bike.
Control for the hazard
<ul style="list-style-type: none"> • Note hazards on workplace maps and watch for fluorescent tape or flags identifying these hazards. • Always wearing an approved safety helmet while riding.

Hazard
Multi-tasking – where you are concentrating on the task and not on your riding.
Harm they can cause to people
<ul style="list-style-type: none"> • Injury from falls when you lose control of the bike, for example, where the surface changes and you haven't noticed it. • Falling from the bike, particularly at speed and injuring yourself.
Control for the hazard
<ul style="list-style-type: none"> • Stopping the bike and getting off before doing something else. • Reducing speed and looking ahead at the terrain to identify hazards or obstructions.

Hazard

Carrying loads

- Changes the bike's width.
- Makes it harder to lean when cornering.
- The extra weight alters the centre of gravity, making it harder to control the bike and increasing braking distances.

Harm they can cause to people

- Increases the potential for the motorcycle to roll or lose traction when cornering or because the load makes the bike harder to balance.

Control for the hazard

- Using the front and rear carriers to evenly carry the load.
- Securing the load well so it does not move around.
- Allowing for the extra width of the load when riding.
- Not **exceeding** the load-carrying capacity and following the manufacturer's recommendations.

Hazard

Carrying passengers

- Motorcycles can become unbalanced and harder to control when a passenger's weight is added.
- Carrying passengers raises the bike's centre of gravity and makes it harder to use active riding techniques because both you and your passenger have to work together.

Harm they can cause to people

- Injury from crashing or falling off.

Control for the hazard

- Wearing protective gear including heavy duty boots.
- Only carrying passengers if the manufacturer's specifications indicate the bike can take the load and passengers.
- Working together on active riding.
- Only taking passengers if proper pillion passenger footrests are attached to the bike and they are in good condition.

Hazard
Working in isolation which puts you at risk of becoming stranded.
Harm they can cause to people
<ul style="list-style-type: none"> • Unexpected accidents or emergencies. • Unexpected breakdowns. • Bad weather that can put you at risk of becoming chilled, dehydrated, or sick.
Control for the hazard
<ul style="list-style-type: none"> • Recording where you are working on the workplace board and giving: <ul style="list-style-type: none"> ◦ your route ◦ the time you left ◦ when you should be back. • Carrying a mobile phone or two-way radio if possible or an emergency beacon. • Carrying water and food, such as extra muesli bars. • Having regular check-in times. • Carrying a first aid kit with you. • Doing a pre-check to ensure the motorcycle is in good condition and any maintenance issues have been addressed. • Fueling up before leaving.



Working in isolation puts you at risk of becoming stranded
a long way from base if you have vehicle troubles.

Hazard

Personal factors, such as:

- stress
- fatigue
- attitude (overconfidence or recklessness)
- drugs or alcohol.

These factors can affect your judgment, decision making, or slow your reaction times.

Your balance and coordination can also be affected.

Harm they can cause to people

- Injury or death from falling off the bike or crashing.

Control for the hazard

- Never riding a bike under the influence of drugs or alcohol.
- Talking with your Supervisor if you are stressed or fatigued.
- Eating well, sleeping well, and taking regular breaks.
- Applying active riding techniques at all times while riding.



Drinking water will keep you hydrated and alert.

Hazard
<p>Poor maintenance</p> <ul style="list-style-type: none"> • Poor maintenance can create hazards such as brake failures or broken foot pegs. • Being left isolated if working remotely because of mechanical failure.
Harm they can cause to people
<ul style="list-style-type: none"> • Injury – from broken components. • Sickness from environmental conditions such as dehydration, hypothermia, and sunstroke.
Control for the hazard
<ul style="list-style-type: none"> • Carrying out regular maintenance and servicing of the motorcycle. • Reporting faults according to workplace policies and procedures. • Seeking specialist input where required to fix faults, for example, getting an auto electrician to fix electrical issues, such as the bike not starting reliably or the battery not charging. • Carrying out pre (before riding) and post (after riding) checks on the motorcycle.



Checking the motorcycle tyre pressure is an important pre-ride check.



Hazards and risks of harm

When operating a motorcycle there are many hazards you will come across.

What are the most common hazards you are faced with when operating a motorcycle and what are the controls you have in place to keep you safe?

Hazards and its potential harm	Controls you have to implement

Reporting and recording accidents or near-misses

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:



Name

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.

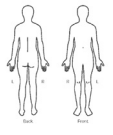
FARM INCIDENT/NEAR-MISS REPORT

IN CASE OF AN EMERGENCY:
Contact emergency services (111)
Use this form (FSA 0302 030 040)

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

Employment details
FARM NAME: _____ JOB TITLE: _____
 Employer Contractor Visitor

Accident details
DATE: _____ TIME: _____
 Near miss No treatment First aid Doctor Hospital Serious harm
Type: _____ Hours of work: _____ Days reported: _____

Nature of injury
 Struck/object Cut Hand injury Fire/burn/scald Crushed/caught Motor vehicle Heavy lift
LOCATION OF INJURY (CIRCLE LOCATIONS) WHERE DID THE ACCIDENT HAPPEN (E.G. SHEET, FLOOR, ETC.)
HOW DID THE ACCIDENT HAPPEN?


WAS THE PERSON TRAINED FOR THE TASK THEY WERE DONE? 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

WorkSafe NZ incident and near-miss report template.

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 or near-miss.
5	Identify the task you were completing, and say if: <ul style="list-style-type: none">• 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. <ul style="list-style-type: none">• What were your actions immediately after the accident or 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?

2. Is this the same for reporting an accident? Yes No

If no, then what is different?



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

Safety requirements

To keep yourself safe when riding a motorcycle there are requirements for:

- yourself
- the motorcycle
- any passengers you carry.

These safety requirements are aimed at protecting you and any passengers and making sure the motorcycle is safe to use and in good working order.

Have a look at the following safety requirements.

It is a safety requirement that:	Impact on safety:
<p>You and any passengers have the correct personal protective equipment and use it as intended.</p> <p>Protective equipment can include:</p> <ul style="list-style-type: none">• well-fitted safety approved helmets for you and any passengers• heavy duty boots• goggles• long clothing, such as a long sleeved shirt or trousers• high vis clothing• approved footrests for your passengers• emergency beacons and two way radios, or cell phones.	<p>By wearing and using the correct personal protective equipment, both you and your passengers will have more protection if you fall or have an accident.</p> <p>Having a phone or radio will let you get help quickly if you get into trouble.</p>

It is a safety requirement that:	Impact on safety:
<p>Being prepared for the job you are doing. This includes:</p> <ul style="list-style-type: none"> • pre-checking the motorcycle before use • having the motorcycle fully fuelled • having a planned route • informing your Supervisor of your route and the time you expect to be back • having a first aid kit with you. 	<p>Your workplace will have policies and procedures around recording where you are in the workplace. Using these procedures will mean that you can be found in case of an emergency or accident.</p> <p>It also means your Supervisor can look for you if you do not return as planned.</p> <p>Having a first aid kit with you, means if you are injured, you may be able to give first aid before help can get to you.</p>
<p>Making sure you're only using the motorcycle for the right job.</p>	<p>Making sure the motorcycle is suitable for the job.</p> <p>Using the motorcycle within the capabilities and manufacturer's specifications so you are less likely to cause harm to yourself, any passengers or the environment around you.</p>
<p>You have been trained and are competent in riding the motorcycle.</p>	<p>You are not undertaking tasks that you are not trained in or are above your skill level.</p> <p>Working within your skill level means you are less likely to get into difficulty, lose control of the motorcycle or be harmed when riding.</p>

It is a safety requirement that:	Impact on safety:
<p>Your physical and mental state when operating a motorcycle.</p>	<p>Having a good physical and mental state when operating the motorcycle means you are likely to:</p> <ul style="list-style-type: none"> • have good concentration • stay alert. <p>This means you are less likely to have an accident or injure yourself.</p>
<p>Knowing the:</p> <ul style="list-style-type: none"> • environmental features, such as the terrain • conditions, such as surfaces you ride on • weather on the day. 	<p>Checking the weather forecasts before riding will help you be prepared with PPE suited to the weather, for example, wet weather clothing, sunblock or water bottles.</p> <p>Planning the route you take will enable you to avoid hazards, ride the safest route and have alternate routes should conditions change and become unsafe.</p> <p>This means you are unlikely to be affected in any adverse way due to the weather and the environmental conditions.</p>

It is a safety requirement that:	Impact on safety:
<p>Knowing hazards in the workplace, such as fences and structures that can be obstacles or provide you with location markers.</p>	<p>Having a hazard register and controls in place to manage these hazards will help you:</p> <ul style="list-style-type: none"> • avoid these hazards in the routes you take • know how to work around these hazards • use these to know where in the workplace you are. <p>Knowing where these hazards are and the controls in place, will minimise the risk of harm.</p>
<p>Regular maintenance of the motorcycle to ensure it is safe to ride.</p>	<p>Carrying out pre and post checks on the motorcycle at the beginning of your work day and when you have finished will identify any mechanical issues that need fixing.</p> <p>Carrying out regular maintenance of the motorcycle as per your workplace procedures and the manufacturer's specifications.</p> <p>Checking tyres for tread depth, wear and tear, and pressure to ensure the tyres are fit for the surfaces you will be riding on and giving good traction.</p> <p>Checking brakes and brake fluid to ensure these work correctly when needed.</p>



Safety requirements

Your workplace will have safety requirements that may be different to the ones provided. What are some of the safety requirements your workplace expects you to follow?

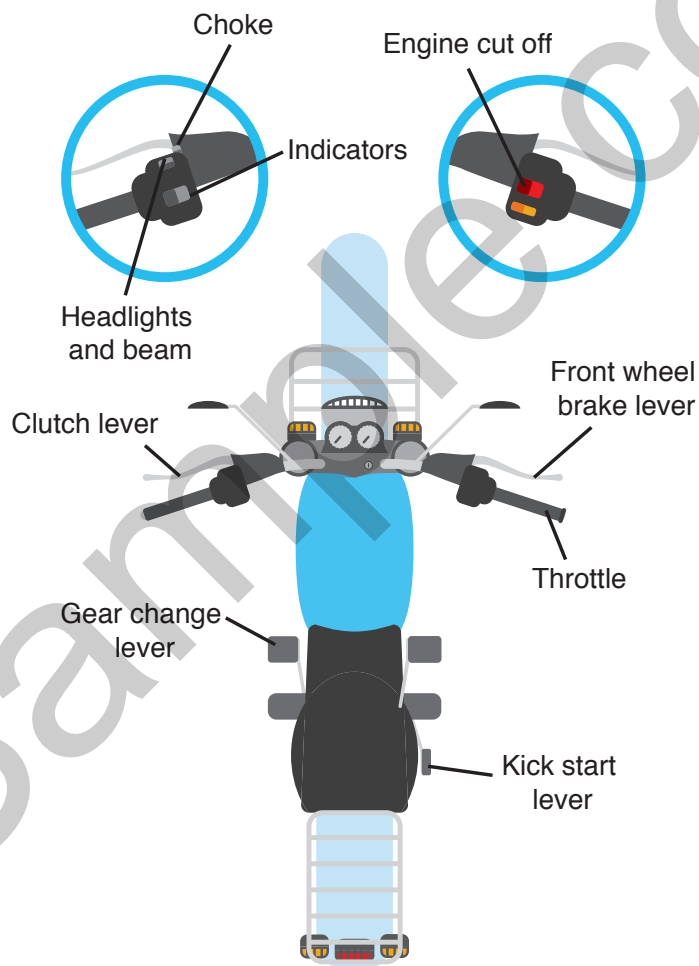
Safety requirement from my workplace	Why it is in place

Controls and displays





Farm motorcycles can be manual or automatic. This will determine how you change and use the gears on the motorcycle.





Farm motorcycles may also be electric start or kick start and this will determine:





- the controls the motorcycle has, for example, a choke if kick start but no choke if electric start
- how you start the motorcycle, for example, kicking the kick start or pushing the electric start button.



Below is a list of motorbike controls. To ride a motorbike safely, you must know which of these controls your motorcycle has, where they are located, and what they do.

Control	Function
<p>Clutch lever</p> 	<ul style="list-style-type: none"> • Only on manual motorcycles. • This lever operates the clutch. • When the lever is pulled in, the engine disengages power from the rear wheel. • When the lever is released, power is restored to the rear wheel. • The clutch is used to give you control when you start moving the motorcycle and to help prevent stalling when moving off and stopping. • You also use the clutch to change gears.
<p>Indicators/signals</p> 	<ul style="list-style-type: none"> • Indicators tell users when you intend to change direction. • They must be used if you are riding on public roads.
<p>Front wheel brake lever</p> 	<ul style="list-style-type: none"> • This lever engages the front brake. • The harder you squeeze, the harder the bike brakes. Release the lever to disengage the brakes.
<p>Throttle (accelerator)</p> 	<ul style="list-style-type: none"> • The throttle or accelerator controls the speed of the engine. As you twist the throttle towards you, this increases the amount of air/fuel mixture that enters the engine which in turn increases the speed. • Turning the throttle back decreases the speed of the engine.

Control	Function
<p>Engine cut off</p> 	<ul style="list-style-type: none"> • Sometimes know as the engine kill switch. • This stops the engine in an emergency.
<p>Kick start lever or electric start</p> 	<ul style="list-style-type: none"> • This starts the engine of the motorcycle.
<p>Gear change lever/pedal</p> 	<p>You use this to change gears to match engine power with the speed you want to ride.</p> <ul style="list-style-type: none"> • Low gears enable you to ride at a slow speed and are also used when moving off, going uphill, or when you need to accelerate. • Higher gears are used as you gain speed. <p>Note: At higher speeds, higher gears allow for the same engine power to be used, but to travel at a faster speed.</p>
<p>Headlights and beam (high and low) controls</p> 	<p>This turns on and off the headlamp. It must be used on public roads at all times. If you are riding at night or in the fog, it is used to identify that you are travelling in the area so other people notice you.</p>
<p>Choke</p>	<p>The choke is used to help you start a cold engine by changing the amount of air in the air/fuel mixture burned by the engine.</p>

Displays	
Fuel	This tells you how much fuel the motorcycle has.
Speedometer 	The speedometer tells you the current speed of the motorcycle in kilometres per hour (km/h).
Odometer 	This tells you the total amount of kilometres the motorcycle has done in its lifetime.
Tachometer (may be referred to as a rev counter) 	The rev counter informs you how fast the engine is working in revolutions per minute (RPM). The higher the RPM: <ul style="list-style-type: none"> • the faster the engine's internal components are working • the more fuel is used and as engine components are moving extremely fast, the more heat is generated.
Warning lights 	This tells you about the systems that are in operation and if any issues have arisen. For example, the low fuel indicator tells you it's time to put some more fuel in the tank.

Motorcycle dynamics, traction, and control

Motorcycle dynamics is the way the movement of motorcycles, their riders, and the components (such as loads being carried) respond due to force acting on them.

Motion is the change in the position of an object over time such as:

- how fast the motorcycle travels
- where the weight is placed and how this shifts with movement
- where the centre of gravity is at any given time and how this affects the stability and balance of the motorcycle.

As a rider, you can maintain control of the motorcycle by mastering the dynamics of the motorcycle. You can do this by:

- manoeuvring and steering the motorcycle
- maintaining the stability of the motorcycle
- braking appropriately and in a timely manner
- applying active riding techniques.

By mastering the dynamics of the motorcycle you will also be able to maintain traction.

Maintaining traction is important as it stops you from:

- being involved in accidents where you can injure yourself through loss of control
- crashing or falling from the bike causing damage to the bike, the environment, and yourself
- flipping the motorcycle causing harm to yourself and the bike.

Active riding involves:



Weight transfer

You use weight transfer to help:

- control the bike
- get more traction lower to the centre of gravity
- making cornering easier and safer.

You transfer weight by:

- moving forward in your seat
- moving to the rear of your seat
- leaning left or right depending on the corner or slope
- standing on the pedals.



Balance

You use your body to balance the bike and keep the bike upright. By transferring your weight, you can help balance the bike.

Your **stance** when riding will also contribute to how well balanced the bike is.



Body position

How you position your body on the motorcycle will help you to:

- maintain control of the bike
- balance the bike
- assist with climbing or **descending** a hill
- assist with towing a trailer or carrying a passenger.



Head and eye position

This involves you looking forward to where you are going. It ensures that you are aware of what is going on around you and what you have coming up ahead of you.

Methods to maintain traction on motorcycles

Traction is proportional to the weight carried by your tyres. It is also the amount of contact patches your tyres have with the surface you are riding.

Traction can be affected when:

The tyres do not have the necessary weight required over the wheels to keep contact with the surface

The amount of contact of the tyres with the surface is not enough or too much.

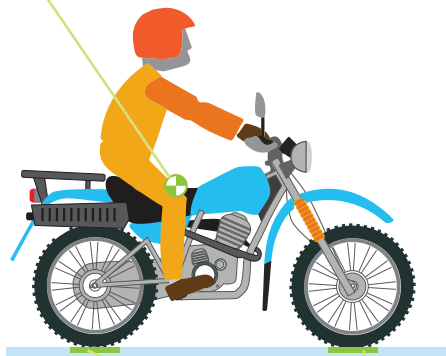


Traction can be affected when the amount of contact of the tyres with the surface is not enough or too much.

There are some methods you can use that will help you to maintain traction. These methods include the following.

- Using knobbly tyres on the motorcycle and checking your bike has good tread on its tyres before setting off.
- Before riding, checking your tyres are the correct pressure (PSI). For example, correct tyre pressure as per manufacturer's recommendation:
 - front 18–28 PSI
 - rear 16–18 PSI.
- Using the throttle correctly. For example, easy use of the throttle, not explosive. This will ensure the bike does not lurch out of control or at speed.
- Using the brakes correctly. For example, easing into braking before you reach a corner. This will enable you to have control of the bike as you go into the corner, keeping your steering smooth and your manoeuvres steady.
- Weight transfer and body positioning to ensure the tyres have the correct contact with the surface, and the centre of gravity is maintained.

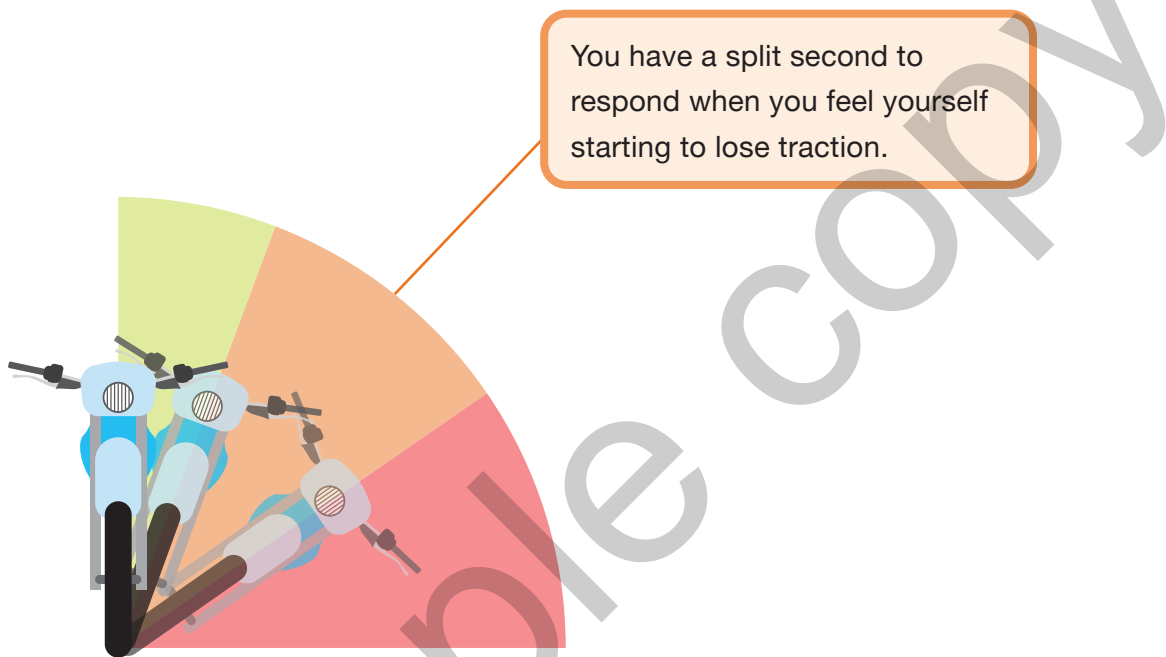
This is the centre of gravity. The centre of gravity is determined on weight distribution and height from the ground.



These are the contacts the tyres have with the surface. They are what give you traction – it is the grip of the tyres with the surface.

Traction and correcting traction

Despite using good active riding techniques when out riding, there may be times when you lose traction. When this happens, you will have a split second to correct that traction and regain control of the motorcycle. For example, when you brake your front tyre gains traction while the rear one loses it. This is dangerous if it means you lose too much traction and your tyre slides as it can not grip the surface.



Maintaining traction when stopping quickly

Traction is lost when the force of the bike wants to keep going but you have slowed the front wheels, and the bike is still travelling at the speed before the brakes were applied.

Using both the front and rear brakes together will result in the fastest stopping time.

As you slow down, you need to be downshifting which will engage the engine in braking which will help you slow down safely and maintain traction.

Downshift and then release the clutch, so the engine creates extra braking of its own.

Maintaining traction through corners

When riding around corners the weight transfer, balance, and body position can cause the tyres to lose contact with the surface. This can result in a skid if they are not exactly distributed as needed to keep the bike balanced and the weight over the wheels.

A good cornering technique is to get the right speed before you start turning and to use a little bit of throttle through the corner to keep the bike balanced.

Tips on cornering include:

- use both brakes every time you slow or stop
- apply the front brake slightly before the back (some riding instructors disagree with this)
- brake before the curve rather than through it
- if you have to brake in a curve, use both brakes gently.

Maintaining traction uphill

Traction is lost when you start off in too low a gear at the bottom of the hill and are leaning too far over the front of the bike.

You can gain traction by:

- starting in a higher gear
- sitting in the middle of the seat
- leaning forward.

This will help to stop the bike rearing up and the back wheel losing contact with the surface. Correct tyre contact with the surface will ensure traction is maintained.

Maintaining traction downhill

Traction is lost when you use the brakes as you go down hill.

You can gain traction by:

- changing up a gear
- only using engine brakes.

Maintaining traction while traversing a slope

Traction is lost when the back wheel slips down hill.

You can gain traction by:

- leaning into the hill
- pointing the bike slightly down hill.

This will help the tyres grip the surface and maintain traction.

Maintaining traction in wet conditions

Traction is lost when:

- there is too much speed
- the tyres are worn
- you have selected the wrong gear.

You can gain traction by:

- slowing your speed
- changing up a gear
- changing PSI for the surface.

This will help the tyres grip the surface and maintain traction.

Maintaining traction on loose surfaces

Traction is lost when:

- there is too much speed for the condition of the road
- active riding techniques are not used correctly
- there is too much or uneven weight on the bike.

You can gain traction by:

- slowing your speed and riding to the surface conditions
- using your body weight to control the bike
- following manufacturer's advice on loading.



Loss of traction will result in the bike losing stability and causing an accident.



Maintaining traction

Read through the scenarios where traction could be lost and match it with a suitable action to ensure traction is maintained.

Loss of traction	
The load on the bike is uneven and when cornering the bike is skidding.	Follow manufacturer's advice on loading and ensure the load is distributed evenly.
While traversing a hill, the back wheel slips.	Suitable action that would mean traction was maintained.
When braking going downhill your wheels skid.	Change into a higher gear and do not use the brake.
Riding in a wet pasture and your wheels are skidding.	Slow down and brake before you move into a corner.
Wobbling and skidding when going round corners.	Lean into the hill and point the bike down hill.
	Change the PSI of the tyres to suit the conditions and changing up to a higher gear.

Mounted loads

There may be times when you are going to carry a load on the motorcycle.

These loads can be:

Static loads – a load that doesn't change its weight or position.

Static loads can include a hay bale or strapped fence posts.

Movable loads – a load that can change its weight bearing points, position, and force.

Moveable loads can include water, drenches, lambs, calves, and passengers.

Carrying loads can impact on the dynamics of the motorbike and need you to change the way you ride the motorcycle. The type of load and the terrain and surfaces you are riding may mean you need to change the way you:

- steer
- manoeuvre the motorcycle
- brake
- select and apply gears to different situations, such as coming up to corners, surface changes, riding up or down a hill
- maintain stability and traction.



Before carrying any loads you need to:

- check the manufacturer's specifications for loading weights
- read the loading label attached to the frame of the bike
- make sure you do not exceed the specifications.




Responsiveness

Any loads on the bike will change how responsive it is. For example, this can be as simple as making the steering light or as serious as not being able to keep upright on the bike. You need to be aware of how the load you are carrying will affect:

- the centre of gravity and balance
- traction and control
- stopping distances and times.

The following are some general rules to follow when riding with a load to help maintain the bike's centre of gravity, balance, and traction.

1	Loads should be kept low to keep the centre of gravity low.
2	Loads must be tied down using tie downs or panniers, so they don't move while riding different terrain and surfaces, as any shifting of the load will make the bike less stable.
3	Where possible, distribute the load evenly. This will help the bike maintain balance and traction as the weight is across the wheels.
4	Where possible, keep the load forward – place the load on, or in front of, the rear axle. Placing items behind the rear axle may make the bike wobble.
5	<p>The load should be no taller than a person on the rear tray, and should not interfere with visibility if it's in the front tray.</p> <ul style="list-style-type: none">• As you increase the height and weight of the load you increase the centre of gravity.• The higher the centre of gravity, the less stable or balanced the bike will be. It will, therefore, be harder to stay upright.

	Baffle containers carrying liquids such as weed spray units. Baffles stop the load shifting too much within the container. For example, 20 litres of water in a 30 litre container will produce a sideways shift of 20 kg when you are cornering. This could throw you off balance.
	Stock or dogs need to be secured so they do not make any sudden movements which could significantly or suddenly change the bike's balance or stability.
	If the load is a passenger, then the passenger needs to work with you to keep the bike's weight and balance suited for the terrain and the surfaces being ridden.



Carrying a load

For each of the following situations think about how the load will affect the balance, stability, and the traction of the motorcycle, and what you should do to maintain balance, stability, and traction.

Consider:

- how you steer the motorcycle
- how you manoeuvre the motorcycle
- braking
- use of the gears
- maintaining balance and stability
- what you do to maintain control and traction.

Situation

You are carrying drench and drenching equipment on your motorcycle. You are using the race to get to the animals you will be treating.

What impact does the load have on the motorcycle?

What you would do to ensure the motorcycle's balance, stability, and traction?

Situation

You are riding the motorcycle over rough terrain with fence posts and wire to fix a fence.

What impact does the load have on the motorcycle?

What you would do to ensure the motorcycle's balance, stability, and traction?

Situation

You come across a lamb in need of some medical attention. You bring the animal back to the sheds over rough terrain.

What impact does the load have on the motorcycle?

What you would do to ensure the motorcycle's balance, stability, and traction?

Situation

You have had rain for a few days, and you and a workmate need to go out and do an animal welfare check. You ride the motorcycle over flat terrain with your workmate on the back.

What impact does the load have on the motorcycle?

What you would do to ensure the motorcycle's balance, stability, and traction?

Situation

You need to travel up and down rolling terrain on the motorcycle carrying water to refill a drench pack.

What impact does the load have on the motorcycle?

What you would do to ensure the motorcycle's balance, stability, and traction?

Glossary

Term	Definition
Administer	To give. For example, to administer first aid, is to give first aid to a person.
Descend	Means to go down, such as down a hill.
Disengage	Refers to ending an action. For example, when you disengage the clutch you can't make changes to the gear selections.
Engage	Refers to setting something in motion. For example, when a clutch engages it means you are ready to move the gear into a position.
Exceeding	To go over what is allowed or stipulated by a set limit. For example, a weight limit on a load, speed limit set in the workplace.
Flat terrain	Flat terrain is defined as class A and B land under the Land Use Capability Classification, which comprises slopes between 0–7° (flat to gently undulating, to undulating terrain).
Inaccessible	Refers to areas that are very difficult or impossible to travel on.
Obstructions	Refers to an anything that can cause some kind of blockage or get in your way and need you to manoeuver around it.
Rolling terrain	Rolling terrain is defined as class D land under the Land Use Capability Classification, which comprises slopes between 16–20° (rolling to strongly rolling).

Term	Definition
Stance	The way you deliberately hold your body. For example, an upright position.
Visibility	How far you can see given the light and weather conditions.

Sample copy

Activity answers

Check your activity answers below.



Knowing the law and how it applies to you when riding farm motorcycles

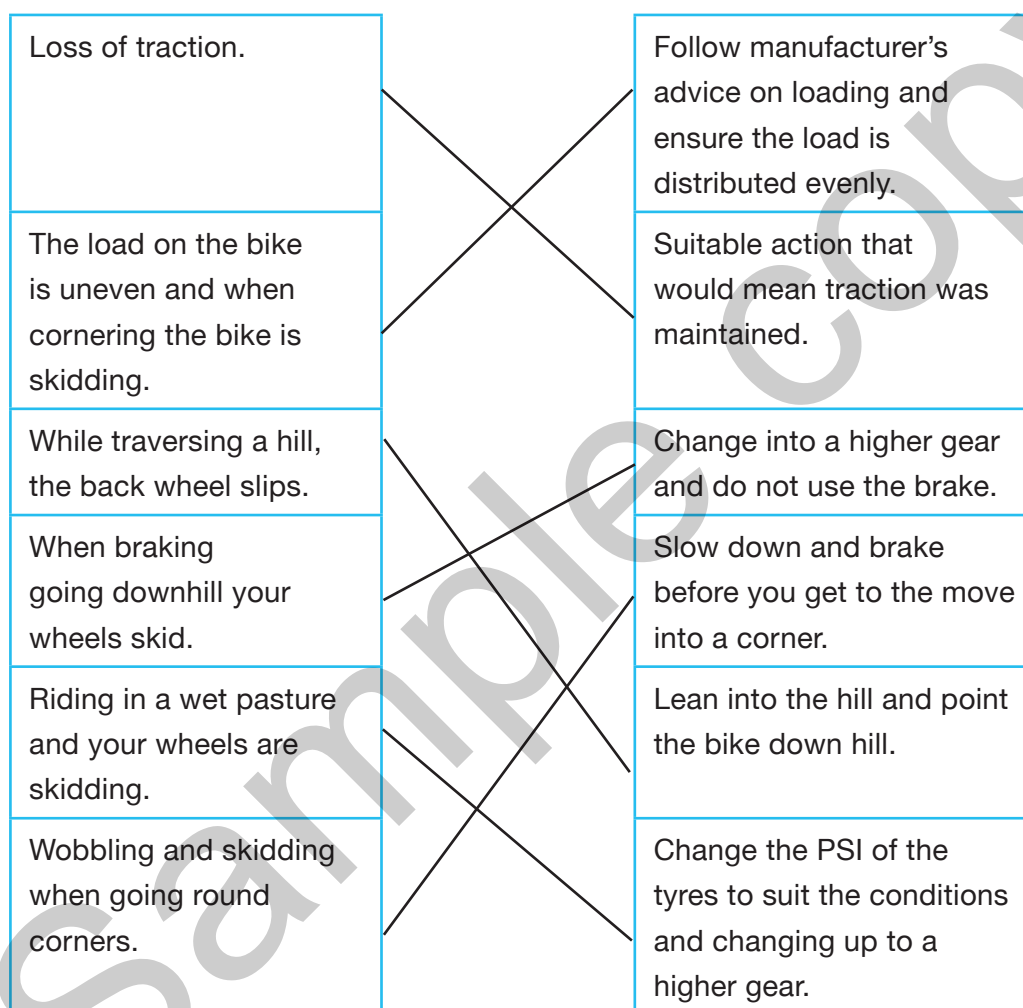
Read through the statements and decide if they are true or false. Mark with a tick the correct box.

	True	False
You need to have a full licence to ride a farm motorcycle on a public road.		✓
You must be 16 or older to ride a farm motorcycle on a public road.		✓
It is the law to wear a safety approved helmet when riding in the workplace.		✓
It is the law to wear a safety approved helmet on a public road.	✓	
Only farm motorcycles that are used on public roads need a warrant of fitness.	✓	
You must display 'L' plates if you are on your restricted licence.		✓
Farm motorcycles must be registered if they use any public access, for example, crossing a public road to get to another area of the workplace.	✓	
Farm motorcycles must be well maintained and regularly serviced.	✓	
You must wear all safety gear your workplace provides when riding the farm motorcycle on the job.	✓	



Maintaining traction

Read through the scenarios where traction could be lost and match it with a suitable action to ensure traction is maintained.



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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