



**evinci™ ELECTRIC BICYCLE  
USER MANUAL**

**TD Plus-Series  
TUI+ / FALCON+**

**PLEASE READ CAREFULLY**



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## Safety Instructions

Thank you for purchasing an **evinci** electric bike, designed by NZEBIKES. This electric bicycle features the most recent innovation in technology and applies to the AS/NZ standard. For safety reasons, it is most important that you read this User Guide BEFORE you operate the bike. Improper handling can reduce its riding performance and most importantly, pose danger to your safety and health!

NZEBIKES is continuously updating and innovating this product. The printed manual may therefore not always include the latest updates. However, we shall make sure that our online manual will always be up to date on [www.evinci.nz/support](http://www.evinci.nz/support).

We want also encourage you to **register** your bike with your frame serial number. This allows us to help you finding your bike in case of theft, as we get contacted by the police when bikes are recovered.

Your frame serial number is stamped into the front of the headset tube below the handlebar.



To register just go to our **evinci** website (evinci.nz) and click on "Login" to create an account with your details. You may register up to two bikes within the same account.

## Symbols

Please pay particular attention to information next to one of the symbols shown below as it can be very important for your personal safety.



### WARNING

This symbol indicates that improper handling poses a risk to your health and safety



### ATTENTION

This indicates that improper handling could damage components and make void the warranty.



### NOTE

Points out to useful tips

## Introduction

You have decided in favour of a Pedelec (Pedal Electric Cycle) - a bicycle that is equipped with an electric motor to give you additional assistance when riding. With this bicycle you can make better progress in headwinds, when transporting heavy loads or on steep slopes.

You can select the level of power assistance required according to the weight of your load and/or the prevailing road conditions, the effectiveness of the power assistance depends on your pedal power and the level of assistance selected.

Before switching on the electric assistance system, please read the chapter "Charging the battery". The battery must be fully charged before you go for a ride the first time.

## Modes of operation and extent of electronic power assistance

As soon as you turn on the electric assistance system and begin pedalling or turning the throttle, electronic power assistance is available. Depending on the selected assistance level and mode the motor will add a certain amount of power to assist you.

There are two riding modes in this ebike model: *Pedal Assist* and *Torque Assist*. With *Pedal Assist* the more you pedal on your own the less power the motor has to add, which increases the all over range. *Pedal Assist* does not measure your pedal effort, this means you can relax when being exhausted and let the motor take over most of the work. Just keep in mind that the battery will get used up faster.

*Torque Assist* will add a certain amount of power depending on the selected level and how much you push into the pedals. This creates a more natural riding experience and gives you more control. It will also increase the average range you can achieve.

## Levels of support (as shown as Assist number on display)

There are three **Torque Assist** levels:

1 = ECO, 2 = STD, 3 = PWR

And five **Pedal Assist** support levels:

4 = 20%, 5 = 40%, 6 = 60%, 7 = 80%, 8 = 100%

With higher support the motor will reach also a higher speed.

## What comes with the bike?

- 240V mains charger
- A set of 2 keys for the battery lock
- Integrated LED lights, front and rear

- Mudguards
- Carrier, rated 25kg

### Optional available accessories

- High power CREE LED lights, rechargeable
- Front and rear baskets
- Motor home battery charger

Please ask your dealer if you are interested in any of these items.

### TUI / FALCON – components



1	LCD Control Display	5	Battery Lock
2	Gear Shifter	6	Hub Motor
3	Throttle	7	Derailleur
4	Adjustable Stem	8	Torque Sensor

## Basic Safety Tips



Always pull the brakes and hold the handlebar firm and straight before taking off in order to make sure you keep control of the bike when power assistance is in action! NOTE that power assistance is triggered off IMMEDIATELY as soon as the crank moves slightly in riding direction. Also, keep in mind that the right hand half-throttle is active. By pulling one of the brakes the motor will be disengaged.

## For your own road safety

- Always wear a suitable bike helmet
- Wear bright clothing or reflective elements to be seen better by other road users
- Wear shoes with a non-slip sole
- Wear close-fitting clothing on your legs or wear trouser clips
- Wear bicycle gloves
- Use your bike lights also during day light as they make you better stand out



Ref(1)

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## How to use your charger

To charge the battery your **evinci** bike comes with a 3Ah quick charger. Please do not use any other charger.

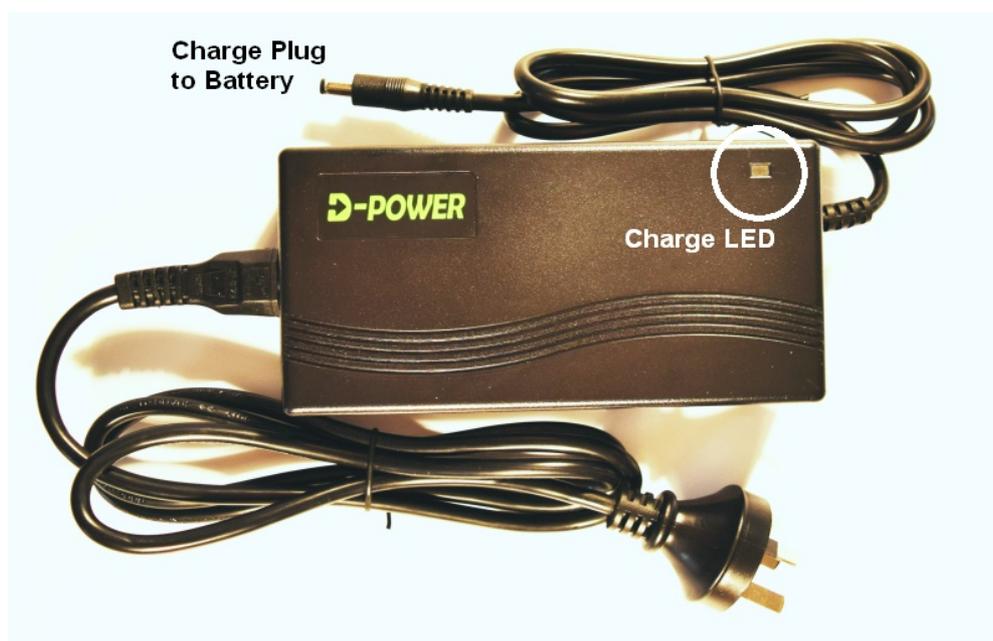


*If you want to charge your battery from a car or motor home (12V systems), NZEBIKES or your retailer can supply a special charger called PowerBuddy for this purpose.*

Before you first use the charger please read the following notes regarding safety carefully!



- Keep the charger away from children!
  - In order to prevent any possible injury this charger should only be used for the original lithium battery which is supplied together with the **evinci** e-bike
  - Any other battery is not compatible and risks to explode while charging, causing serious injury to people as well as damage to other equipment
  - Please make sure that the charger is always kept dry and does not get wet at any time.
  - Place the charger at a well ventilated place as it will get hot during charging
- 
- Should there be an incidence of contact with water or any other liquid, make sure to unplug the charger immediately from the power socket and have it inspected by your dealer.
  - Make sure the charger is always placed on a flat surface when in use.
  - Please make sure that the charger is always unplugged and removed from the power socket when not in use.
  - Before using the charger, always make sure that the plug and the cables are not damaged.
  - Never connect a damaged cable or plug to the power socket. Never try to disassemble the charger. There are no serviceable parts in the charger.
  - Always unplug the charger before cleaning it. The charger should only be cleaned with a dry cloth. Never use a wet cloth, oil or any other liquid.
  - Only use the original cable supplied with the charger.



The charger LED (1) indicates the battery status:

LED	STATUS
green	the battery is not connected
red	the battery is charging
green	the battery is charged, the charger has switched off



*Before using your battery the first time, it has to be charged once over night for at least 12 hours.*

## Safety notes concerning the battery



- Keep the battery out of reach for children
- Never try to open the battery. Apart from this being dangerous, all warranty will be void
- Do not provoke a shortcut circuit with metal gadgets
- Remove the battery from the bike when transporting on an external bike rack
- Do not dip the battery in water or any other liquid
- Do not keep the battery close to heat or open fire
- A battery needs to be re-cycled after use, never throw it in an open fire as it could explode
- If the battery is damaged because it has been dropped somewhere or because of a biking accident, there might be a risk of an internal short-circuit
- Immediately stop using a damaged battery.

In order to maximise the use of this battery, please consider the following: The battery will not charge when exposed to temperatures below +0°C or above +60°C. It is therefore recommended to keep the battery at room temperature before charging it.

The charger operates with a microcomputer system with automated control functions. It automatically stops charging when the battery is full. It cannot be damaged by overcharging.

None the less, we strongly recommend to always disconnect the power plug from the wall socket after the battery is charged as power surges, i.e. lightning, through the grid can damage the charger or battery electronics!

When storing the battery for a longer time period, (>3 months, e.g. over winter) it is important to place it in a dry and cool place. Furthermore it is from advantage to have the battery only at about 80% charge. There is usually no need to recharge the battery.



Li-Ion batteries have the chemical property to create small amounts of gas if stored for a longer time period with 100% charge. This will affect the capacity and life time. From a technical point of view it is therefore better to store Li-Ion batteries not fully charged.

## Charging the battery



You may charge the battery on the bike or remove it to a more convenient place. Li-Ion battery have no memory effect, this means you can top them up as you go

1. Open the rubber cover and connect the charger plug to the battery
2. Connect the power cord to a mains socket
3. Make sure to neatly close the charge port with the rubber cover to prevent water and dust from getting in



*The charger will get warm while charging – do not cover while in use as it might cause a malfunction.*

## How to remove and insert the battery

1. Removal: if the battery is locked, first unlock the battery
2. Swivel the seat to the front and pull the battery upwards till it unlocks from the rail. Move it away from the rail and pull it upwards out
3. Insert: Slide the battery into the battery rail, make sure it sits in it's correct position (keep it away from the rail till reaching the lowest point). Secure it in the frame with the battery frame lock



*Make sure the battery is fully inserted into the battery rail and locked to prevent theft.*



*Never try to push the key into the charge port! It will damage the key and destroy the charge port*

## Before starting to ride

### Adjust Seat height

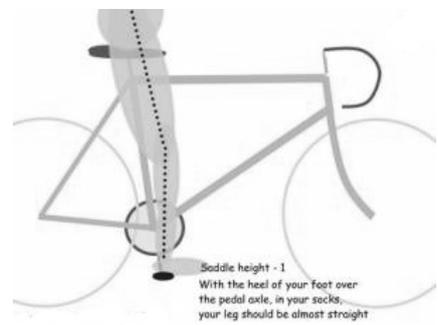
Open the quick release lever at the seat clamp, adjust seat height and close the lever firmly. If the lever is too loose, open the lever again and turn the adjusting nut clockwise till you feel resistance. Now close lever again. It should close with noticeable resistance.



*Never tighten the seat post if the maximum mark is visible, otherwise you can injure yourself or damage the seat post.*

### How to find the correct saddle height?

1. Sit on bike saddle
2. Try to reach pedal with your heel when it is in the bottom position. Your knee should be more or less fully straightened out
3. Place the ball of your foot on the centre of the pedal. If your knee is now slightly bend, the saddle height is correct



### Adjusting the saddle angle

Best riding comfort is found when the saddle is horizontal, some riders prefer a slight forward angled seat.



*Never angle a seat backwards as it can quickly lead to back pain or physical injuries*

1. Loosen the clamping nut on one side anti-clockwise
2. Tilt the saddle to the required angle
3. Tighten the clamping nut clockwise. Make sure that the nut is tightened firmly (20 NM)

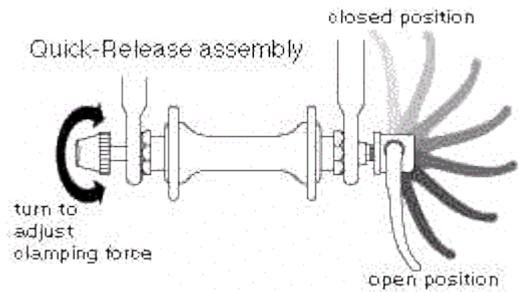


## Mount or dismount front wheel

For easy transport, you may remove the front wheel using the quick release at the front wheel axle (Only Tui and Falcon).

To remove the wheel flip the lever into the open position. Now hold the lever and turn the bolt on the other side about 8-9 times to loosen the axle – do not remove the bolt! You should be now able to lift the wheel out of the fork.

To mount the wheel repeat procedure the other way round. Guide the rotor in between the brake pads. Hold the lever pointing parallel to the fork in the open position (downwards), turn the bolt till you feel a slight resistance. Try to close the lever – if it is too hard to do so, loosen the bolt a bit and try again.



*Before every ride make sure the quick release is tightened properly. To fail so can lead to serious injuries!*

## Adjust the stem and handlebar

The models TUI+ and FALCON+ allow an easy and tool free adjustment of the handlebar in regard of angle and reach. Push lock lever in direction of arrow and lift clamp arm. Adjust height and angle to your requirements. Push clamp arm back into lock position.

The clamp pressure can be adjusted with an Allen key.



Make sure to lock the clamp arm properly

## Check tire pressure

It is very important to maintain the correct tire pressure. Too low pressure will decrease the range and can lead to rim or tire damages when riding over edges. The recommended tire pressure is 40 psi.

## Operation

- Turn the display on by pushing the (M) button
- Select the desired assistance level with the (+) and (-) keys. The initial assistance level is 1 (Torque ECO mode).
- Levels 4 to 8 are Pedal-Assist levels (4=low...8=high)
- Use the throttle as desired to add additional power to the selected assistance
- When finished riding keep the (M) button pressed for 2 sec to turn the electrics off



## Display functions

**Battery level:** The display shows the battery level with 5 bars. Each level is about 20% of power, when the battery reaches about 10% no bars will be shown and the battery icon starts to flash. At this stage the controller or battery might turn off when a higher load is applied, i.e. riding uphill. Please recharge as soon as possible.

**Power:** the power bars above the battery indicator shows the rider how much power the motor uses while riding. More bars means the battery will get faster depleted.

**Turning off:** The display turns off automatically after 5 min. To manually turn it off keep the (M) button pushed for 2 seconds.

**Trip information:** the display shows the current speed and trip details. By default the last travelled distance will be shown. By pushing the (M) button the following information can be displayed:

 Max speed for last trip

 ODO meter

 Travel time last trip

 Auto cycle (in auto cycle these information will be shown in a cycle automatically).

 Last travelled distance

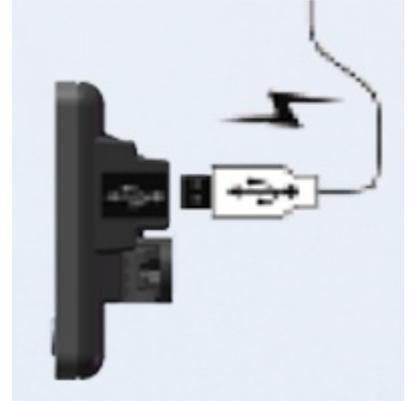
**To reset the trip information:** press and hold (+) and (-) buttons for 2 sec, then push (-) once to clear trip distance (all other values will be cleared as well). ODO meter can not be reset! To exit press (+) and (-) again. Make sure that you don't change any other settings.

**Integrated LED Lights:** To turn the lights on or off push the (+) plus key for 2 sec to toggle the light function. The display is also backlit.

**Walk assistance:** you can activate the motor to support you pushing the bike up a hill. Press and keep depressed the (-) minus button. After 2 seconds the motor will start with a maximum speed of 6kph (PAS level must be >0).

**USB Charge Port:** to charge your phone you may open at the back of the display the USB charge port by removing the rubber plug. Make sure to close the port neatly after use to prevent any water damage.

To power the port, press the buttons <M> and <+> for 2 sec. An USB icon will appear in the display indicating that the power is turned on.



## Throttle

The right hand side half-throttle allows the rider to add power to the selected assistance level. This can be useful when starting off or to give you an extra boost when riding up a hill.



*Throttle-only mode: when selecting PAS level 0 no motor assistance will be provided when pedalling, but the throttle is still available*

## Gears



*Only change gears while pedalling otherwise the derailleur might get damaged*

If you have to change gears, i.e. to start off in first gear, lift the rear wheel using the side stand and turn the crank while changing gears.

As a rule of thumb, gears on a bike are changed and used similar to a car with a manual gearbox.

You will start off in 1<sup>st</sup> or 2<sup>nd</sup> gear, on a flat road you will choose gear 4 or 5 to pedal along. Uphill go back to 3 or for steeper hills gear 1. If you ride faster or downhill choose higher gears.

The assistance level chosen on the display will assist you up to a certain speed.



Choose assistance level and gear according to your needs and riding style. Watch you crank revolutions, if you have the feeling you have to push too hard at too low revolutions, change to a lower gear. If you pedal very fast with less effort, choose a high gear or reduce the assistance level.



*When you intend to stop it is good practise to change the gears back to the 1<sup>st</sup> gear so you may start off without any problems. This can easily be done while braking and slowly pedalling as the motor will not push you further.*

## Brakes

We recommend always to use both brakes at the same time – this allows the rider to take best control over the braking process without stressing the front or rear brake. To brake efficiently, your front brake is there to stop you and the back brake is there to shave off speed. Roughly 70-80% of your stopping power comes from the front brake. Leaving 20-30% for the back brake. As soon as one of the brakes gets engaged the motor support will stop.



*When using Pedal Assist Mode: to go around narrow corners by just using the riders pedalling power pull one of the brake levers only slightly without actually engaging the brake. This will stop motor support.*

## Maintenance

Your **evinci** E-Bike needs regular maintenance as any other normal push bike. All bike shops can help you with these maintenance steps. There is no maintenance necessary on the electrical components.

### Brakes

This bike uses hydraulic brakes which are self-adjusting. If you feel that the brake force gets lower or the way you have to press the brake levers exceed 50% of X (Fig 1) most likely the brake pads have to be replaced. Please see your local bike shop.

For further adjustments and maintenance please refer to the Tektro Maintenance Manual.

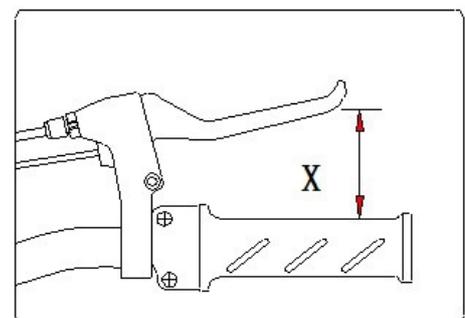
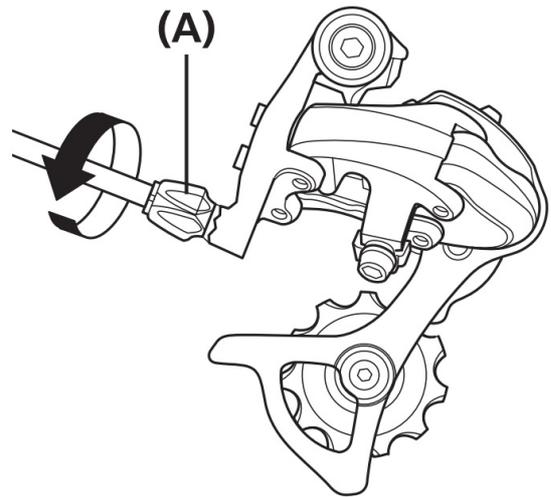


Fig 1

## Gears

Our bikes use a solid and easy to maintain Shimano Altus gear system.

It can happen after a while that gears do not perfectly change any more or you experience a rattling noise while pedalling. This is normal due to the nature of the used control wire hells which get compressed over time. To re-adjust it is usually enough to slightly tighten the gear wire.



For the rear derailleur turn (A) anti-clockwise while turning the pedals till the rattle goes away.

Check if all gears can be reached and changed without problems.

## Lubrication

Use very sparsely a special bike lubrication oil on the derailleur and chain. We recommend to use a wax in water based solution over oil based products as they do not accumulate dirt, i.e. Squirt Dry Lube



*Do not use sprays like CRC or WD40 – these sprays are to loosen and actually degrease parts, they will do more harm than good.*

## Cleaning your bike

Just use a dry cloth or if very dirty, a hose and a brush to rinse down. You may use a soft detergent (i.e. handwash soap) to remove greasy residuals. You can get special bike cleaning products from your local bike shop.



*Do not use a water blaster! High pressurized water may enter axle or crank bearings and damage them! This will void the warranty.*

## Safety points

We recommend a 6 month interval service or every 1000 km.

Important checkpoints are:

- front axle nuts
- headset
- stem clamp
- bottom bracket and crank screws
- rear wheel axles nuts
- seat post clamp
- brake caliper screws
- spoke tension



Spoke tension has to be checked on a regular interval. Failing can cause spoke breakage and will void the warranty

## Repairing a puncture

With the motor in the rear wheel it is slightly more complex to replace a tire or tube. In case of a puncture we first recommended to check if the puncture can be repaired using a patch, without removing the wheel from the frame.

1. Lay bike on the derailleur side (protected, or use a repair stand)
2. Pull tire off rim (one side is enough)
3. Pull tube out of the tire
4. Identify puncture in tube and check tire for any sharp objects to be removed
5. If tube is still repairable apply patch
6. Refit and pump up tire

## Removal of rear wheel

- Change to gear 7 (makes it easier to get chain from cassette)
- Unclip motor cable from chain stay
- Unplug motor cable
- Remove axle nuts (take derailleur protector off)
- Pull wheel out of drop-outs

Assemble in the same way – make sure to plug in motor cable correctly (arrows must match). Never force it as it can damage the pins!

## Trouble shooting

Problem	Resolution																				
Display is turned on, but motor won't start (throttle or pedal-assist)	Check brake levers – if one of the brake levers is not in it's initial position the motor won't work. Check motor plug at rear stay. Unplug once and plug back in (Align arrows! Needs some force!) Take bike to your retailer for further checks.																				
Battery is charged and properly fitted but display won't turn on	If possible measure voltage at the battery connector (left and right pin). If no voltage can be measured, take battery to your retailer. Check display cable plug if accidentally unplugged (close to display at handlebar)																				
Charger is plugged in, but LED stays green	Battery or charger fault, please take battery and charger to your retailer for further tests																				
Error code on display 	Please refer to error code table: <table border="1" data-bbox="703 1090 1439 1632"> <thead> <tr> <th>Error code</th> <th>definition</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Current error or MOS damaged</td> </tr> <tr> <td>2</td> <td>Throttle error(Start detection)</td> </tr> <tr> <td>3</td> <td>motor no phase position</td> </tr> <tr> <td>4</td> <td>Hall error</td> </tr> <tr> <td>5</td> <td>Brake error(Start detection)</td> </tr> <tr> <td>6</td> <td>Under voltage</td> </tr> <tr> <td>7</td> <td>Motor stalling</td> </tr> <tr> <td>8</td> <td>communication controller receiving error</td> </tr> <tr> <td>9</td> <td>communication display receiving error</td> </tr> </tbody> </table>	Error code	definition	1	Current error or MOS damaged	2	Throttle error(Start detection)	3	motor no phase position	4	Hall error	5	Brake error(Start detection)	6	Under voltage	7	Motor stalling	8	communication controller receiving error	9	communication display receiving error
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**Error 5:** Only appears when one of the brake levers is engaged while turning the bike on. Please check that both brake levers are in neutral position. Otherwise unplug the cables coming from the the brake levers to identify a possibly faulty cut-out switch.

**Error 2:** the throttle is engaged while turning the bike on.

# Glossary

## **BMS**

BMS is an electronic circuit for battery monitoring. It increases a battery pack's safety by making sure that all cells are operated within the permitted voltage range only. When current is too high, temperature is too high or one line of batteries inside the battery is outside the permitted voltage range the charge output will be switched off. This avoids total discharge of the battery during normal operation. An integrated balancer insures that any differences in voltage between single cells are equalised. In case of a problem with the charging device the BMS makes sure that the battery cannot be overcharged. A capacity gauge maybe included to display the remaining capacity.

## **Controller**

The controller is the heart of any electric bicycle. It has the power electronics to drive the motor and a microprocessor. The controller processes all input signals coming from the different sensors and it talks to the display on the handlebar. The microprocessor runs the firmware, which is the piece of software telling the controller what to do. Firmware updates can be applied to improve or add functions.

## **Display**

The display is usually mounted to the handlebar and allows the rider to readout vital information about the e-bike system and control the functions in the controller. There are different kind of controllers with LED or LCD interface.

## **Hall sensor**

Hall sensors are used in motors, cadence sensors, brake switches and power throttles. Inside the motor they determine the motor direction and submit it to the controller so the motor will turn in the right direction right at the start. Inside the PAS they detect if the magnet disc is rotating. Inside the power throttle they measure how far the throttle is rotated. Hall sensor can be of the analogue or digital kind. Functional principal: When hall sensor are passing by a magnetic field they emit an initial voltage, which is proportional to the product of magnetic field strength and current (Hall Effect). They are named after their inventor Edwin Hall.

## **Pedal Assist Sensor (PAS)**

In an electric bicycle the PAS measures if the crank is moving in riding direction. This information will be passed on the controller which then activates the motor to support the rider. The PAS can distinguish between forwards and

backwards movements of the crank. PAS does not consider how much effort the rider puts into riding.

## **Torque Sensor**

By measuring the amount of force the rider applies to the pedals the torque sensor signals without any delay to the controller how much support the motor has to add. This creates a very responsive but at the same time smooth riding experience. Torque sensors are mostly placed in the crank, with or without the motor. They are more expensive to build than PAS sensors.

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### **References**

Ref (1): Ministry of Health NZ, Website

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