



OPIA

USER MANUAL



This manual is a guide on how to complete assembly, operate, maintain and troubleshoot your electric bike.

ENGLISH

THANK YOU!

Dillenger would like to thank you for support us with your purchase. We hope that you will continue to support us into the future, to help us bring the best and most affordable products to the market, without sacrificing quality.

If you have any questions about your product that isn't covered in this manual, please get in contact with your local Dillenger dealership or the us at Dillenger directly.

We hope that our product serves your needs and ideas well into the future. Thank you for reading.

MECHANICAL SAFETY CHECK

Before your ride we recommend that you check over the bike with a set of tools. Though this is completed by Dillenger dealers before dispatch and sale, though we still recommend this to be completed regularly to ensure the safe and smooth operation of your electric bike.

FIRST RIDE CHECK

Before undertaking your first ride, we recommend that you familiarise yourself with the controls and performance before operation. Ensure that there is also adequate space in front of you before starting your first ride. Completing these few things will ensure that your first ride is a safe one. Remember to wear a helmet at all times while operating the electric bicycle.

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EBIKE COMPONENTS AND TERMINOLOGY

This section will help you understand the operation of an electric bicycle and the common terms and components involved. If you are familiar with what an electric bike is and how it operates, then feel free to skip over this section.

An electric bike consists of multiple complex electronic components that are powered from a central location, the battery. The most common components of an electric bike are:

- A) Electric Motor
- B) Motor Controller
- C) Battery
- D) LCD/Handlebar Display
- E) Throttle (Optional)
- F) Pedal Assistance Sensor and Magnet Ring
- G) Electric Brake Cut-offs (E-brake cut-offs)



A) Electric Motor

The muscle of the electric bike, this component is what applies the rotational force to the wheels and propels the bicycle forward. In most cases these motors are a hub type motor meaning that the motor is built onto the wheel or axle. Some motors will be located near the bicycle pedals and are called mid-drive or crank drive motors.

B) Motor Controller

The main brain of the electric bike. This device takes in inputs from other components and operates the motor. A very complex piece of electronics. This is generally built into the frame of the electric bicycle somewhere, though can be found attached to the motor or frame of the bicycle.

C) Battery

The heart of the electric bike. Without this electronic component there will be no speedy take offs and smooth runs over hills. The battery of an electric bike is generally a Lithium Ion type (though some are still lead acid). They have battery management systems that ensure the safe operation and charging of the battery.

D) LCD/Handlebar Display

The second brain of the electric bike. This component takes in input from the rider and provides it to the motor controller. Or uses the information to restrict the motor controllers operation. This device usually allows the rider to change pedal assistance levels, check battery levels and provide other functions/displays.

E) Throttle (Optional)

This device is controlled by the rider usually located on the handlebar. If the rider operates this device the motor controller will detect its operation and propel the bike based on the amount of throttle utilised.

F) Pedal Assistance Sensor and Magnet Ring

This device is another input to the motor controller. It will detect the rotation of the pedals and tell the motor controller of this. The motor controller will then activate power to the motor based on the setting on the LCD/handlebar display.

G) Electric Brake Cut-offs (E-brake cut-offs)

This component is either attached to the brakes or built in to the brakes. It detects the actuation of the brakes and cuts the motor off. This is an added safety feature built into most pedal assistance based electric bikes.

ASSEMBLY

This section will help complete the initial installation of the electric bike. This is generally only required if you purchased the bicycle online away from our retail stores. Though the information in this section can be helpful for new users.

ASSEMBLY—UNBOXING

Unboxing your new electric bike can be an exciting prospect. Though we recommend caution while unpacking the bike. It can be easy to get a bit enthusiastic and accidentally scratch the side of you bike with a cardboard knife or pair scissors.

It is recommend that you have a partner for this section as removing the electric bike by ones self can be a difficult process as they can be quite heavy. With two people you should be able to easily lift the bicycle out of the box that it is received in.

Carefully unwrap your electric by bike removing all packaging foam and wrapping from each section of the bicycle frame. As mentioned above carefully utilise tools such as knives and snips to remove the packaging as it can be easy to mark the paint work in this situation.

ASSEMBLY—INVENTORY

You should now have all of the following items in front of you, ready for installation.



ASSEMBLY—FRONT WHEEL

Installation of the front wheel is made simple with the quick release axle. The quick release axle is zip tied to the spokes of your front where. Remove the zip ties and unscrew the nut off the axle as shown in the top left picture.



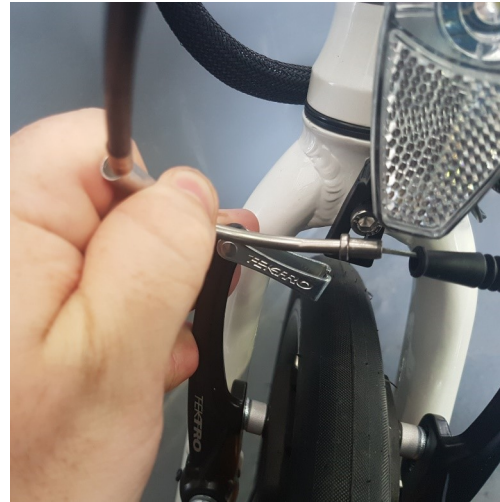
Insert the axle through the front wheels hub and loosely screw on the nut. Ensure that you insert the spring on before the nut. You can now place the front wheel in the front forks of the bike. Insert the wheel as shown below. Tighten the quick release mechanism by tightening the nut on the axle.



Close the axle clamp to lock the wheel on the bike. If this is quite easy to do you may need to tighten the nut a little more until it is firm clamp.

ASSEMBLY—FRONT BRAKES

To install the front wheel it is likely that the front brakes will not be attached. This section will give you a basic step by step of how to reattach the brakes.



Locate the front brakes. One side of the brakes will have a clip insert to hold the cable line. Simply reinsert the cable line into the clip as shown in the pictures.



Your brakes may need adjustment now to properly align them to the rim of the wheel. You can do this with a 5mm allen key. On each brake pad is a bolt that when loosen will allow you to reposition the brake pads into a more suitable location. Ideally each brake pad will have a small gap between it and the rim of the wheel.

ASSEMBLY—HANDLEBARS

Installation of the handlebars is a simple process. Just follow the following steps.



Locate the handlebar folding joint, this can be seen in the top left picture. Rotate this upwards to close the folding joint. Please note also that the allen bolt shown in the top left picture will adjust the steering alignment tension and may require a small amount of adjustment after the handlebars have been installed.



Fold the main clamp upwards until it 'clicks' into position.

ASSEMBLY—HANDLEBARS

Installation of the handlebars continued...



Locate the handlebar clamp, this can be seen in the top left picture. Insert the handlebar stem into the handlebar base. One side of the handlebar is grooved so that you cannot insert it the wrong. Though check that the cables are not twisted before insertion.



Insert the handlebar to the desired height ensure that the engraved maximum handlebar height is not visible. (insert them below the clamp). The maximum handlebar height markers are shown in the top right picture. Close the clamp as shown in the bottom two pictures. If this is too hard or too easy to close you should adjust the tension of the clamp by tightening the thumb screw while the clamp is open. This will ensure that the clamp is firmly closed and no nuisance movement will occur.

ASSEMBLY—PEDAL

All bicycles (electric bikes included) have left and right side pedals. Make sure you identify each one. This image shows how to identify each pedal. You can see the 'R' written on this pedal, denoting this is the right side pedal, to be used on the right side of the bike (if you were sitting on the bike).

The right side pedal mounts to the right side crank (if you were sitting on the bike) and left side pedal on the left crank. The right side pedal is a right hand thread, it will tighten by turning clockwise (normal). The left side pedal is a left hand thread and will tighten by turning anticlockwise (opposite normal). It is essential not to confuse which pedal is used where and not to cross thread the pedal. If it feels too tight, you might have made a mistake



ASSEMBLY—SEAT

Assembling the seat is the simplest process. Just open the seat post latch. Slide in the seat post and close the latch at the desired height. Remember to make sure the maximum seat height marker is below the seat clamp at all times.

If the seat post is sliding into the clamp when the clamp is closed, you may need to adjust the tension of the clamp. To do this while the clamp is open rotate the clamp clockwise to tighten. Attempt to close clamp again at the desired tightness. If you are unable to close the clamp it may be too tight and require loosening. Check the maintenance document for more details.



ASSEMBLY—ADDITIONAL CHECKS

Although most assembly is completed, there are some additional checks that are recommended before starting your first ride.

We recommend that you check over the bike with a set of tools. Though this is completed by dealers before dispatch and sale, though we still recommend this to be completed regularly to ensure the safe and smooth operation of your electric bike.

Checking the action of the brakes is at the desired tension. This is an important step, there is nothing worse than your brakes being soft and not stopping you adequately in those emergency situations. See the maintenance document for more detail on how to adjust your brakes tension.

Check your tyre pressure before your first ride. Most of the tyres are only partially inflated before shipment. So ensure that you inflate your tyres up to in between the pressure values listed on the side of the tyre wall.

Finally, we recommend that you familiarise yourself with the controls and performance before operation. Ensure that there is also adequate space in front of you before starting your first ride. Completing these few things will ensure that your first ride is a safe one. Remember to wear a helmet at all times while operating the electric bicycle.

Enjoy your first ride and be sure to keep your local dealer and the manufacturer in the loop with regards to your experiences!

OPERATION

This section will detail some of the operation of the bicycle in particular the LCD/handlebar display, battery and folding (if applicable). After reading through this section you should have a good idea of how to operate the majority of the functions of the electric bike.

OPERATION—BATTERY CHARGING

Charging the battery is a simple process and can be completed with the battery mounted to the bicycle or when the battery has been removed from the electric bike.



Follow the following steps:

- Plug the charger into the wall socket
- Locate the charger plug on the base of the frame near the folding joint. Shown on the left of the middle picture.
- Plug in the charger to the battery.
- The charger LED light will turn red while charging and green once finished charging.
- Unplug the charger from the battery and the wall socket once charging is complete.

If charger does not stop charging after the charge time indicated in the bike description. Disconnect the charger and contact support.

To calculate charge time: Capacity of battery (Ah) divided by the charge current (A) = hours to charge. Usually $10.4\text{Ah}/2\text{A} = \sim 5$ hours

OPERATION—BATTERY REMOVAL

This section will detail how to remove the battery from the frame for storage, travel or charging. To remove the battery from the bicycles frame follow the follow steps:



Firstly ensure that the bicycle has placed in a folded state (see section Operation—Folding). Locate the key hole on the battery which is located slotted into the frame as shown in the above pictures



Insert the key in the hole and turn. The battery will unlock from the frame and allow the battery to be removed from the frame of the bike. Once the battery has been removed you can store it or charge it as you so desire. To reinstalled the battery. Just reinsert it into the frame and lock the battery with the key.

OPERATION—HANDLEBAR DISPLAY

This section will help detail the basic operation of the handlebar display which controls pedal assistance levels and shows details of the running operation of the electric bike. For more detailed information on what is displayed please see the manual for the individual product.

The handlebar display has three buttons. A power button, mode button and light button.



To turn the LCD on, hold down the power button for half a second, the light will flash and turn on. Battery meter is displayed in the bottom right and the pedal assistance level shown on the bottom right.

To change pedal assistance level press the mode button. This will toggle the bike between the three pedal assistance levels. Low, Medium and High.

To turn the light on/off press the light button.

To turn the system off hold down the off button for half a second.

These are the basics of the operation of the handlebar display.

OPERATION—FOLDING

This section will detail a step by step process of how to fold you bike up for storage or easier transport. We will start with how to fold your handlebars down.



Locate the folding mechanism for the handlebars this can be seen in the top left picture. Rotate the plastic safety latch around anti clockwise to release the main latch as shown in the top right picture.



Release the main latch by pull it back towards yourself as shown in the bottom left picture. This releases the main latch and will allow you to rotate the handlebars down towards the side of the wheel as shown in the bottom right picture. Please ensure that no cables are caught or twisted when folding the handlebars down, this will prevent unwanted damage to the cables.

OPERATION—FOLDING

This section will help show how to fold down the pedals on the bike. Each bike may have a different mechanism. The following photos show how to fold the pedals down.



Push the outside of the pedal towards the bike.



Rotate the pedal upwards to fold the pedal. To unfold the pedal just rotate the pedal back to its normal position and you should hear a click.

OPERATION—FOLDING

This section will help complete the initial installation of the electric bike. This is generally only required if you purchased the bicycle online away from our retail stores. Though the information in this section can be helpful for new users.



Locate the folding latch and lift the black safety latch upwards. Open the chrome latch outwards to unlock the folding mechanism.



You can now fold the bike in half for storage.

BATTERY INFORMATION

This section will detail what a battery is and its features and how to maintain good battery health over the batteries lifetime. An electric bike battery contains multiple battery cells combined in series and in parallel to make up the Voltage (V) and capacity (Ah) respectively. A common battery configuration is 10S4P which means 10 cells in series and 4 in parallel which makes a 36V, 10.4Ah (374.4Wh) battery. That's 40 battery cells in total! As you might imagine maintaining the health of each of these individual cells can be a difficult proposition. Though fortunately there are built in electronic systems to make this an automatic and simple process.

The smart battery charger will ensure that the cells are charged to maximum capacity, without overcharging the battery, which could cause damage to the cells and possibly even fire. Our chargers are designed to stop charging when the battery is fully charged, though we still would recommend observation and charging in a fire retardant area to ensure nothing can go wrong.

Over time each cell bank can get out of balance, which means that other cell banks have to do more work to compensate for the lose in balance. The Battery Management System's (BMS) job is to ensure that each of those cells are balanced and healthy. Each cell is balance regularly automatically by the BMS when the cells become out of balance.

Each cell is rated for a number of cycles. A cycle is a discharge and full charge. 500 cycles is a common amount of cycles for a good quality cell. This means that if you use it each day the battery should last 1.37 years before replacement is necessary.

BATTERY INFORMATION—TIPS

There are some things that you can do or avoid to increase the lifetime of your battery:

Try not to discharge your battery down to 0%.

The amount that you discharge your battery is correlated to the life cycle of the battery. Reducing the total amount that you discharge your battery will in turn increase the longevity of the batteries life cycle.

Reduce strain in cold conditions.

Just like a human, getting started in the cold morning can be difficult. Go easy on the bike on cold morning/days to prevent unwanted strain on the system. Avoid going straight into full throttle or highest pedal assistance mode. Start out low and increase over time to allow the battery to gradually warm up as opposed to sharp increase in temperature.

Avoid operating in very high temperatures for long periods.

Lithium Ion batteries can suffer stress when exposed to high temperatures avoid leaving your battery in sun for long periods of time, especially when fully charged.

Maintain good charging habits.

Ensure that you charge your battery after each use or when the battery is low. The smart battery systems that are built into each component will manage individual cells .

How do I store my battery?

It is recommended that you discharge the battery down until about 50%, remove the battery from the frame and store in a dry, cool area. This will ensure that the battery is in its natural state and is less likely to reduce the health/lifetime of the battery. Do not leave your battery at a low charge for a long periods of time.

BATTERY INFORMATION—TIPS

What about reducing the voltage that you charge the batteries?

There are lots of studies and evidence about increasing the cycle life of the battery cells by reducing the maximum voltage that you charge the battery to. It is said that you can double the amount of cycle life by decreasing the charge voltage of each cell by 0.1V. For a normal 36V battery that means the charge voltage would reduce from 42V to 41V. This will decrease your maximum capacity by approximately 14%, which in turn will decrease range. This can be difficult to achieve with the current battery charger as you have to monitor the voltage of the battery periodically during the charge and take it off charge once it reaches that voltage. If you wish to undertake this style of charging we recommend that you still charge the battery to 100% every week to ensure that the BMS can efficiently balance the cells.

There are many online resources and white papers explaining this information and good tips for caring for your lithium ion battery. Battery university has lot of information on all types of batteries and is a good place to start, just google 'battery university lithium ion care'. Remember though to ensure that your warranty remains intact only use the provided charger to charge your battery.

MAINTENANCE

How much maintenance is required?

The most common question we get is how much maintenance is required? The basic answer is not much more than a normal bicycle. Maintaining proper care of your bicycle is very important. Ensuring that you complete the following on a regular basis:

- Clean and oil your drive train (chain)
- Clean and oil your gearing system
- Check the tyre pressure is within range
- Check the wear on the brakes and replace if necessary
- Check the wear on the tyres and replace if necessary
- Check for loose spokes on both of the wheels and tighten if necessary.
- Check all fasteners
- Wipe down the rest of the bike

Possibly the most important one of those points is spoke maintenance. An electric wheel produces small amounts of vibrations that can loosen spokes over time. It is important that you keep eye out (and ear out) for loose spokes and fix them up before it gets out of hand. Audible buzzing can be heard on occasion when a loose spoke is present on the motor hub. This is a good indication that spoke maintenance may be required. We would recommend any competent wheel builder for this kind of maintenance. Though there are loads of youtube videos that will be a great guide on fixing any spoke tensioning issues you might have.

It cant be said enough that having a good maintenance routine can be one of the best ways to catch an issue early before it becomes are large problem, saving you time and potentially a lot of money.

TROUBLESHOOTING AND ADVICE

This section will detail some common faults that occur with electric bikes and what to do in each case. Please check these before contacting support.

Before commencing troubleshooting, disconnect all components. Try not to skip this process. There are countless times a loose plug is the cause of a problem. By disconnecting all the plugs and then reconnecting just the crucial components such as battery and display, this will solve any loose plug issue. Go through one by one plugging in the other components (such as the e-brake plugs or the motor cable) to see if any of these are the cause of the problem. In this basic state you may discover the culprit quickly.

Troubleshooting table is on the next page

Range Extension Advice:

- Reduce use of throttle. Using the throttle burns a lot more energy than utilising the pedal assistance system, as you can ride without the need to input any energy into the system
- Use a lower pedal assistance level. It is lovely being able to max out your pedal assistance and ride at full speed with little to no effort. Though decreasing your pedal assistance level to a more medium to low number will increase your range and also have the added benefit of improving your health.
- Choose an appropriate tyre pressure. If your tire pressure is getting a bit low, this can be a burner of energy from the battery. Maintain your tire pressure to the appropriate level for your ride. The tire pressure range is written on the side of the bicycles tire wall.
- Avoid mountainous areas. Although electric bikes are great at climbing hills, hills exhaust more battery as the motor requires more energy to climb. If you can designate a route to your location that is flatter then you will likely get more range out of your battery.
- Ensure that you fully charge your battery before leaving for your journey.
- Pedal more! This cant be said enough. It is easy to become lazy with an electric bike. Pedalling will decrease strain on the battery and give you health benefit at the same time.

TROUBLESHOOTING TABLE

Issue	Solution
Display wont turn on	Check all connections from the motor controller to the front handlebars starting with the plug coming from the display. Ensure that the battery is switched on.
Display turns on but the motor does not activate	Check the motor plug from the controller. Ensure that this plug is aligned correctly and seated very firmly.
A high pitched rattling noise can be heard when accelerating	Vibration from the motor is small, though is can cause sounds in conjunction with a loose component near the motor. Check all fasteners on the bicycle starting with the ones closest to the motor. This could be a loose spoke or nut on rear rack.
Rim has a wobble or buckle	The wheel likely has a spoke tension issue. We can recommend a wheel builder. Although there are loads of youtube videos and websites that explain how to fix spoke problems.
There is a small amount of movement in the folding joint	There are a number of fasteners on the joint. Try tightening them all. There is also a small grommet that can be adjusted to help steady the mechanism.
My battery runs out in a shorter distance than what is listed in the specification	A lot of factors effect range of the electric bike which is why we can only offer you an approximation on range. Try our range extension advice. If your battery is getting on in age then it may need replacing. Contact support for advice. We may offer a complimentary discharge test to evaluate the health of your battery.
My battery cuts out while riding up a hill or while under a lot of strain.	A battery has a safety mechanism in it called a Low Voltage cut off. This can trigger if the battery is low in charge and is made to perform high strain activity such as hill climbing. As the batteries voltage will 'sag' during high strain activities. This is a normal to occur and is designed to protect your battery.
The motor activates periodically while pedalling	It is possible that your pedal assistance sensor has become misaligned. Send a picture of the pedal sensor to support for advice on how to realign.

CONTACT US

Please do not hesitate to contact Dillenger directly through our website:

<http://dillengerelectricbikes.com.au/>

<http://dillengerelectricbikes.co.uk/>

<http://dillengerelectricbikes.com/>

If there is any information that you would like added to these manual's, we always appreciate feedback from our customers.

This manual is written by the staff at EBikery with permission from Dillenger. You can contact EBikery here:

<https://www.ebikery.com.au/>

Thank you for taking the time to read this document. We hope that you enjoy your product for years to come.