e-bike manual supplement

revolution works RWS eBike systems

bristolbicycles

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Supplementary E-bike Manual

Please read this document in conjunction with the main Bristol Bicycles user manual. Both contain important safety and maintenance information. It is essential that you read them thoroughly before you ride your new bike, and keep them for future reference.

Please pay special attention to all the points of safety information in both manuals, as they are in place to help you avoid serious injury.

You must be over 14 to ride an E-bike under UK law.

The drive assist system is limited to a maximum continuous power rating of 250W and a maximum speed of 25Km/h (15 mph).

Be aware that the speed at which an E-bike accelerates may be faster than a normal bike.

Electrical Safety

Only use batteries and chargers supplied by Bristol Bicycles. Never modify the charger in any way. Do not disassemble batteries. Always check that the mains voltage is the same as that stated on the charger label.

A charger that is suitable for one type of battery pack may cause a risk of fire when used with another battery pack; never use the supplied charger with another appliance or attempt to charge the battery with a different charger, even if the plug appears compatible.

Before every use, check the charger cord for signs of damage or ageing. A damaged or tangled charger cord increases the risk of fire and electric shock. Do not abuse the charger cord. Never carry the charger by the cord. Do not pull the cord to disconnect from a socket; grasp the plug and pull to disconnect. Don't coil the cord tightly or wrap it around the charger when storing. Keep the charger cord away from hot surfaces and sharp edges. Do not handle the charger with wet hands. Do not store or charge the battery outdoors. Do not submerge your complete E-bike, battery or charger in water. The charger must be removed from the mains socket before removing the battery.

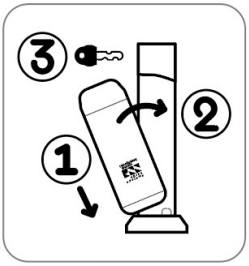
Battery Safety

This bike includes a Lithium-ion battery; do not incinerate batteries or expose to high temperatures, as they may explode. Shorting the battery terminals may cause burns or fire. Do not place the battery on wet or metallic surfaces.

When you dispose of the bike, first remove the battery and dispose of it safely in accordance with local regulations.

Leaks from the battery cells can occur under extreme conditions. Do not attempt to use or charge a damaged or leaking battery. Liquid ejected from the battery may cause irritation or burns, and may be flammable. Do not touch any liquid that leaks from the battery. If the liquid gets on the skin wash immediately with soap and water. If the liquid gets into the eyes, flush them immediately with clean water for a minimum of 10 minutes and seek medical attention. Wear gloves to handle a damaged battery and dispose of immediately in accordance with local regulations.

Battery installation



To install the battery, have the logo on the battery the right way up and facing towards you. Place the base of the battery into the carrier, locating the two pins into the socket. Then pivot the top of the battery from left to right.

IMPORTANT: Always lock the battery into the carrier.

Battery USB port

At the top of the battery there is a USB port for charging mobile devices or lights. The battery cannot be charged via the USB port.

Checking battery charge level

The level of charge in the battery can be checked in two ways:

1. Press the button on the top of the battery:
    - Blue = fully charged
    - Green = good level of charge
    - Red = partially discharged (approx 50% or less)
    - Flashing Red = almost empty
    - If no light is shown, the battery is fully discharged, and should be recharged immediately to avoid damage
2. When the battery is on the ebike and the bike is switched on, the battery charge level is shown on the handlebar display.

Battery Range

The 200Wh 'bottle' battery provides a normal range of 10 - 20 miles.

Battery installation

To install the battery, have the charge indicator facing upwards, and ensure the front of the battery has engaged with the slider in the rack.

Then slide the battery forwards into the rack.

IMPORTANT: Always lock the battery into the rack.

Checking battery charge level

The level of charge in the battery can be checked in two ways:

1. Press the button at the rear of the battery:
    - 5 lights = fully charged
    - 4 lights = good level of charge
    - 3 lights = partially discharged (approx 50% or less)
    - 2 lights = low level of charge
    - 1 light = almost empty
    - If no light is shown, the battery is fully discharged, and should be recharged immediately to avoid damage
2. When the battery is on the ebike and the bike is switched on, the battery charge level is shown on the handlebar display.

Battery Range

The 468Wh rack battery provides a normal range of 25 to 50 miles.

Factors that will extend the battery range:

- Reducing the power assist level to 1.
- Switching off the power assist on flat or downhill sections.
- Keeping the bike in good condition, with a lubricated chain.
- Inflating the tyres to their recommended pressure.
- Less hilly terrain.
- A lighter rider, and less luggage.
- Warm weather (batteries are efficient at higher temperatures).
- A newer battery which has not been used very much.

Factors that will reduce the battery range:

- Increasing the power assist to level 3.
- Keeping the power assist switched on all the time.
- A worn, badly adjusted or badly lubricated bicycle.
- Riding the bike with under-inflated, soft tyres.
- Hilly terrain.
- A heavier rider, or more luggage.
- Cold weather (batteries are inefficient in cold temperatures).
- An older, well-used battery which has experienced many discharge and recharge cycles.

Charging the battery

To charge the battery, plug the charger into a mains supply socket using the mains lead provided, and then plug the charger's charging lead into the circular charging socket in the base of the battery. The battery can be taken out of the battery carrier to charge it or it can be left in place.

Do not use the charger outdoors.

IMPORTANT: Only use the charger supplied with your ebike and follow instructions shown on the label of the charger.

The indicator light on the charger will show red initially when charging commences. When the indicator light on the charger shows green the battery is fully charged and the charger should be disconnected from the battery. The level of charge on the battery can be checked after it has been disconnected from the charger by pressing the button on the battery or checking the handlebar display. The charging can be stopped at any time and the battery used; 100% charge level need not necessarily be reached.

The 468Wh rack battery takes approximately 7 hours to fully charge from empty.

The 200Wh 'bottle' battery takes approximately 3 hours.

Do not leave the battery permanently on charge, this leads to many small charge/discharge cycles, reducing the battery life.

Battery Storage

When not in use, the battery should be kept in dry conditions at normal room temperature. Storing the battery at less than zero degrees centigrade (freezing point) can damage the battery cells. To keep the battery in good condition it must be kept charged (ideally with the indicator light showing green) when stored.

If stored for long periods the level of charge should be checked every 3 months and the battery recharged if necessary.

Battery lifespan

As the service life of the battery increases, the capacity slowly decreases. This also reduces the range of your ebike. This is not a defect, it is a feature of all Lithium Ion batteries. The battery life depends on various factors: the number of charging cycles, the age of the battery and the storage conditions. The battery will deteriorate and some capacity will be lost even if it is not used.

Factors that will extend battery life:

- Maintain the battery's charge level between 40% and 100% as much as possible.
- Normally charge the battery when it drops below 50% – don't keep "topping it up" if it is already almost fully charged.
- Check the battery charge every month or two, even if unused.
- Only use the standard 2A charger supplied with your bike.

Factors that will reduce battery life:

- Deep discharge. If you regularly drain the battery below 20%, this won't cause instant damage but will shorten the battery's life.
- Leaving the battery permanently on charge. (If you leave your battery charging once full, this leads to many small charge/discharge cycles, reducing the battery life).
- Leaving the battery unused for many months. Li-ion batteries slowly self-discharge, and are irreparably damaged if they fully drain.
- Frequently placing a heavy load on the battery, e.g. always using maximum assist, constant very hilly terrain, high rider weight or heavy luggage.
- Using a fast charger of greater than 2A.

- Switch on the handlebar control by pressing and holding the power button for 2 seconds. The display will then light up.
- The power level is selected by pressing either the - or + button which will increase or decrease the power level. There are three power levels, these are shown on the display.
- Power levels can be selected at any time, either when cycling along or when the bike is stationary. Battery level is also shown on the handlebar display.

SAFETY WARNING: When the handlebar display is activated the bike is 'live' and the motor will drive forward whenever the pedal cranks are turned. Do not push on the pedals until it is safe to move forward and you are ready to ride.

RIDING YOUR EBIKE

To start riding your ebike select a power level on the handlebar control. Upon starting to pedal the pedal assist will commence and continue until you reach 15.5mph (25kph), as long as you keep pedalling.

When you stop pedalling the pedal assist will cease, and re-start again if you start pedalling again.

Power can also be switched on or off at any time, both when cycling along or when the bike is stationary, for instance to save battery charge when cycling on the flat or down hill. When you finish your ride, press and hold the middle button on the handlebar control to switch off the power and save battery charge. If you forget to do this then the power will switch off automatically after about five minutes.

To make most effective use of your ebike use the gears in the same way as if there was no pedal assist, especially changing into a lower gear before starting up an incline.

Observe all local regulations applying to ebikes where you ride

All parts of the ebike can be cleaned down with a damp/wet cloth or washed in the same way that a normal bike can be.

The electrical parts of the ebike, the motor, handlebar control and battery do not need routine maintenance and must not be dismantled in any way.

Never pressure-wash or steam clean your ebike as this could drive water water into the controller, cabling, battery or motor.

Never immerse the complete bike, motor, controller, battery or charger in water.

Removing and Refitting the Rear Wheel

To remove the rear wheel, e.g. to replace the inner tube or tyre:

1. Disconnect the rear V-brake if fitted (refer to the main bike user manual for details)
2. Remove the clip holding the motor cable to the bike frame
3. Disconnect the motor cable
4. Unscrew both wheel nuts a couple of turns using an 18mm spanner
5. Remove the wheel from the bike

To refit the rear wheel:

1. Insert the wheel fully into the frame, ensuring that the anti-turn washer on the axle is facing downwards
2. Tighten both rear wheel nuts to 40Nm using an 18mm spanner. **If the wheel nuts are not tightened correctly the axle can turn, damaging the bike frame beyond repair**
3. Reconnect the motor cable, ensuring the arrows on both plugs are aligned. Refit the cable clip.

Issue	Possible Cause	Action
1. The battery won't charge fully/doesn't hold its charge.	1.The battery has been charged too many times. Cell capacity is reduced to between 70%-80% after 500 charge cycles. All lithium-ion batteries have this characteristic.	1. Purchase another battery from your dealer. Please dispose of your battery responsibly.
2. Display doesn't turn on	1. Motor or display cable damaged or not connected.	1. Check cable connectors to motor and display. 2. Check cables to motor and display for damage.
	2. Battery not charged	1. Check battery charge level and charge if necessary.
3. Motor doesn't turn on (but battery and display are functioning correctly)	1. Internal electrical issue.	1. Contact Dealer

The RW250 powertrain is designed to comply with UK/EU requirements for electric pedal-assisted cycles (EPACs) EN 15194:2017. It will provide electric assist up to 15.5mph (25kph) as long as the rider keeps pedalling.

Hub Motor

Rated Power	250 Watts
Average power consumption	8Wh/km for a typical journey
Motor	High efficiency brushless direct current sensorless motor
Body	High quality aluminium alloy with an anodised finish for long lasting and reliable operation
Weight	2.3 kg
Peak efficiency	91%
Brake Type	Disc or rim brake options

Motor Controller & Pedal Assist Sensor (PAS)

- State of the art electronics using high specification components throughout to ensure reliable and efficient operation.
- Designed and developed from first principles to give optimised operation. The controller uses full sine wave commutation to achieve virtually no motor noise.
- The PAS detects the motion of the chainset to control the switching on and off of the hub motor when the pedals are

turned. This is sealed into the hub motor casing with the motor controller so that electrical connection to the motor is immediate and well protected.
- Ultra fast response rate of the motor controller enables full control of the drive system.

Battery

- 24V nominal, 200Wh rechargeable Li-on batteries with high quality cells to provide excellent performance and long life. Weight; 1.3kg.
- A 2 amp charger is supplied to charge the battery from mains supply. Charging time is two hours to 80%, 3 hours to 100%
- The battery is provided with a lockable carrier and is provided with a USB port to charge up mobile devices.

Handlebar Control/Display

- The handlebar controls consist of three buttons. The central one is the on/off button for the display and the power assist system. Push once to switch on, push again to switch off. The system can be switched on and off at any time, either when the ebike is stationary or when it is in motion.
- Pushing the “+” button once increases the power level one level, pushing it once again increases the power level to the maximum. The display shows which power level the system is in, Low, Medium, (Med) or High. Pushing the “-” button once decreases the power level one level, pushing it once again decreases the power level to the minimum. The power levels can be increased or decreased at any time, either when the ebike is stationary or when it is in motion.
- The Handlebar display also shows the battery charge level.

- Do not insert any object into the contacts in the base of the battery.
- Do not puncture the battery or expose it to fire.
- Do not dismantle the battery in any way.
- Only use the charger supplied with your ebike to charge the battery and follow instructions shown on the label of the charger.
- If you notice the battery becoming hot during use, charging or storage, developing a strong odour, changing appearance, or any other abnormality, do not continue to use the battery. Immediately stop using the battery and have a dealer check it before you use it again.
- As with any electrical equipment, regularly check the charger and cables for signs of damage or ageing. Discontinue use immediately if any damage is found.
- Do not use the charger outdoors.
- When you dispose of the bike, first remove the battery and dispose of it safely in accordance with local regulations.

All Bristol Bicycles are tested and certified to comply with BS EN 14764 and/or ISO 4210.

Bristol Bicycles is a trading name of Jake's Bikes Ltd, a company registered in England & Wales with company number 07449533. Registered address: 6A Haymarket Walk, Bristol BS1 3LN

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