

# USER'S GUIDE

## **RAYLIGHT ELECTRIC BIKES**

2004 models: Legacy, Mini, Alpha, Spectra, Superb, Stella

2005 models: Legacy II, Alpha II, Spectra II

2006 models: Alpha 6, Spectra 6, Alpha 6D, MT-A, Breeze

2007 models: Alpha, Conquor, MT-A

2008 models: Spectra, Splendor, MT-B

2009 models: Spectra HD, MTLi



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## RAYLIGHT ELECTRIC BIKES

Cover picture: **RAYLIGHT** Alpha II

### Attention!

- Electric or power-assisted bikes are intended for adult use only!
- Electric bikes are much heavier than regular bikes. Please carry them with caution!
- The electric system in the electric bikes could cause instant shock which is harmful to human body. Please always wear insulated gloves and handle with caution!
- Please check your local bylaws regarding electric bikes before you ride them in streets!
- Rechargeable batteries could explode if not recharged with a compatible charger!
- All lead-acid and other rechargeable batteries could cause permanent environmental damages. Please recycle them properly and responsibly!
- Never leave your important belongings in the compartments!
- **Apply the throttle gently when starting the bike to avoid the potential permanent damages on motor and battery!**
- **Avoid applying full throttle when going up hills to prevent burning fuses!**
- **NEVER SIT ON THE BIKE WHEN IT'S ON STANDS to prevent the potential damages on the stands!**

## Installation

Every electric bicycle is assembled at manufacturer's site then shipped in a sealed box with all accessories. For some models, minor installations are necessary if user receives it in the original box, instead of picking it up at a local retail store.

### **Installation of fenders:**

All models need to install the front fender. Please make sure that it has been installed before you install the front wheel. Some models might involve the installation of side fenders for the rear wheel.

### **Installation of front wheel:**

Please make sure that front fender has been installed before you install the front wheel. You might need to adjust the position of the front fender so that there is a reasonable room between the wheel and the fender. Some models come with a front disk brake. Please make sure the disk is in the seam, leaving equal space to both steel blocks.

### **Installation of handlebars:**

Some models might need to install handlebars and connect front turn signal wires. It might be necessary to pull out the brake cables so as to insert the handlebars into the post. Then connect the wires for front turn signals and reconnect brake cables.

### **Installation of pedals:**

Make sure left shaft, usually marked with an "L" or "左", is on the left side of the bike and right shaft, usually marked with a "R" or "右", is on the right. Only left pedal can fit into the left shaft, same as right pedal. If the axle has steel balls, make sure it fits in the hole on shafts.

### **Installation of rear storage box::**

Apply the double-sided tape on the rack to fasten the box and absorb the shock. Usually, only two of the four holes at the bottom of the box can match the holes on the rack. They are strong enough to hold the box in position with the help of double-sided tape. User's can adjust the rack or drill new holes at the bottom of the box so as to have a stronger attachment to the rack.

## Pre-trip examinations

### **Motor/rear wheel position**

The axle on which the rear wheel revolves has two flat sides. It's very important to make sure that they are parallel to the slots on the rear fork. Otherwise, you need to adjust the axle and the inserts (with flat sides too) and tighten the nuts on both ends of the axle. Shifting axle could pull off the wires connecting the motor.

### **Battery gauge:**

Make sure the battery is fully charged before you leave your home or workplace. Each model comes with a battery gauge on the right side of the panel (Alpha II and Spectra II) or next to the throttle (Legacy II).

### **Brakes:**

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Examine the rear and front brakes before each trip. Properly adjusted brakes are essential to your safe riding. If you cannot solve the problems on brakes, you should take the bike to a bike shop or your retailer so that it will be fixed by qualified technicians.

### **Lights:**

Check the head light, tail light and turn signals (if equipped) before your trip. If any of the bulbs get burned, make sure you replace it with a compatible bulb. Different models have different voltage. Always ask your retailer should you have any questions about the light bulbs.

### **Tires and tubes:**

Proper tube pressure can save your battery power. Usually, we'll preset the tube pressure at 40 psi for average riders. Please adjust it according to your weight.

### **Bolts and nuts:**

The electric bike has many bolts and nuts fastened mechanically. If any of them becomes loose, it should be tightened before you leave.

## Recharging the battery

The charger has two lights, one for power on/off and another for battery status. They are both red when you start recharging the battery (Some chargers' power light will turn off when recharging the battery, then turn green if the battery is fully charged). The battery status light will turn green when the battery is fully charged. There is a protection circuit in the charger to avoid over-charging the batteries, however, never leave the charger on for over 24 hours which could burn the circuit in the charger.

Different batteries have different chargers. Never recharge your electric bike battery with other chargers than the one provided by the supplier or retailer. Compatibility problems could explode the battery, endangering your life and causing property damage.

All our 2005 models come with silicone batteries, which have many advantages over lead-acid batteries, such as better performance at large-current discharge, retaining high capacity under cold temperature, lower rate of self-discharge, acid vapor-free at recharging and environmentally friendly, longer battery life (>400 full cycles) and so on.

## Riding tips

The maximum speed of an electric bike is 32 km/hr. If the bike's speed is higher than 32 km/hr, the motor won't start even you apply the throttle.

Direct current or DC motor means quick acceleration. Always apply the throttle gently or start with pedaling then apply the throttle.

Sometimes, the throttle would not be able to retreat by itself if the screw at the right end of the handlebars is too tight or the spring inside the throttle is broken. Though you can push back the throttle to stop the motor, it's recommended to adjust or fix it right away.

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Our 2005 models are designed to carry a maximum load of 110 kilograms on even roads. For your safety, never overload the bike or carry passengers, which is against Canadian regulations.

The seat position shall be adjusted so that both of your feet can reach the ground at the same time.

### Maintenance

The electric system of the bike is sealed to be water-proof, however, always keeping it in a dry place and avoiding direct summer sunlight will definitely extend its life.

The range of an electric bike is determined by its battery capacity. All our 2005 models have a range of over 45 kilometers. However, it varies with road condition, weather and load. It's important to fully recharge the battery after every use to retain the maximum capacity.

The body of the electric bikes is made mostly of plastic materials. It's important to handle it with care. Replacement for the broken plastic parts might not be immediately available due to the match of color.

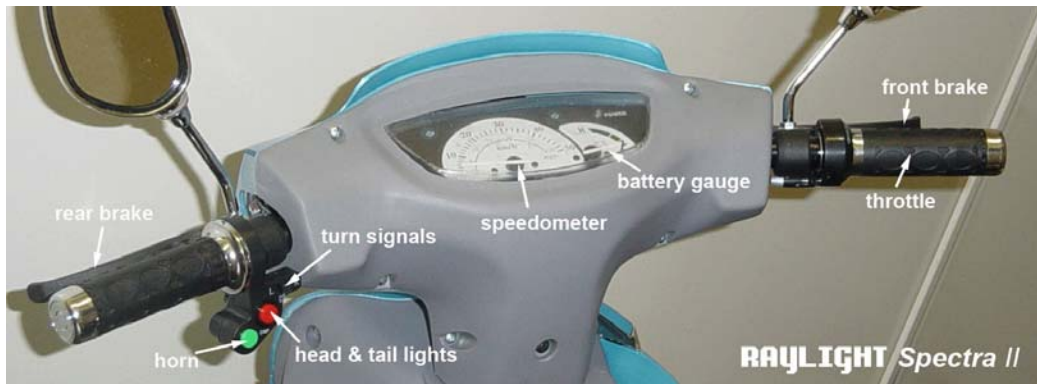
Electric bikes are designed for daily commutation and leisure purposes. They are NOT sporting vehicles. Any exhaustive play could permanently damage the motor and the electric system.

Our electric bikes come with both front and rear suspensions and are very good at climbing hills. However, they have their limitations and you should avoid riding them on bumpy roads and very steep hills.

### Switches on 2005 and 2006 models



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For switches on Alpha II, please consult the picture for Spectra II.

### Frequently Asked Questions

**Q: Why I could not have the 45 km range sometimes?**

**A:** The range of the electric bikes is determined by many factors. The most common factors resulting in shortened range are: an overweight rider, uneven roads, frequent stops, sudden acceleration, constant full throttle, improper tire pressure, cold weather, and etc.

**Q: How do you get the number of 45 km for range?**

**A:** The number is from the manufacturer-side tests. The electric motor's typical power consumption is 250 watts for an average weight rider of 160 lbs with a speed of 31 km/h on flat ground. For a 36 volt model:

$$((36V * 12AH) / 250 \text{ watts}) * 31 \text{ km/h} = 53.6 \text{ km}$$

For a 48 volt model:

$$((48V * 12AH) / 250 \text{ watts}) * 31 \text{ km/h} = 71.4 \text{ km}$$

With low-voltage protection system, you won't be able to drain the battery completely, thus the range is always shorter than the calculated numbers.

**Q: Why it's so bumpy when riding the electric bikes?**

**A:** The very sensitive micro-switches on both rear and front brake levers will cut off the power to the motor if you apply either of the brakes. It's one of the essential safety features on the electric bikes. Please check them before you ride the bikes.

*This guide contains only the general information about our 2005 and 2006 models. It's not intended to be exhaustive and complete. We might change or modify the content at later stages without advanced notifications. Please feel free to ask us should you have any questions. It's our customers' needs that drove the consistent improvements over our products and helped us stand out of our competitors.*