

EV Warrior™



1996

Owner's Manual

ELECTRIC BICYCLE COMPANY

Choose a comfortable gear for pedaling.

Pedal up hills, using the motor as needed to assist you.

Squeeze the brake levers to stop the EV Warrior™. This also disengages the motor even with the accelerator depressed.

Observe the biofeedback/energy use gauge on the center console to see how your pedaling will reduce electric energy consumption.

Plug the charger into the EV Warrior™ when the bicycle is not in use.

The charger cycles to prevent overcharging.

Do not lift the EV Warrior™ by the rear taillight or the motor housing.

Read the Owner's Manual.

Have fun and enjoy your EV Warrior™. Remember, every time you ride instead of driving your car, you are saving the breath of every person in the world.

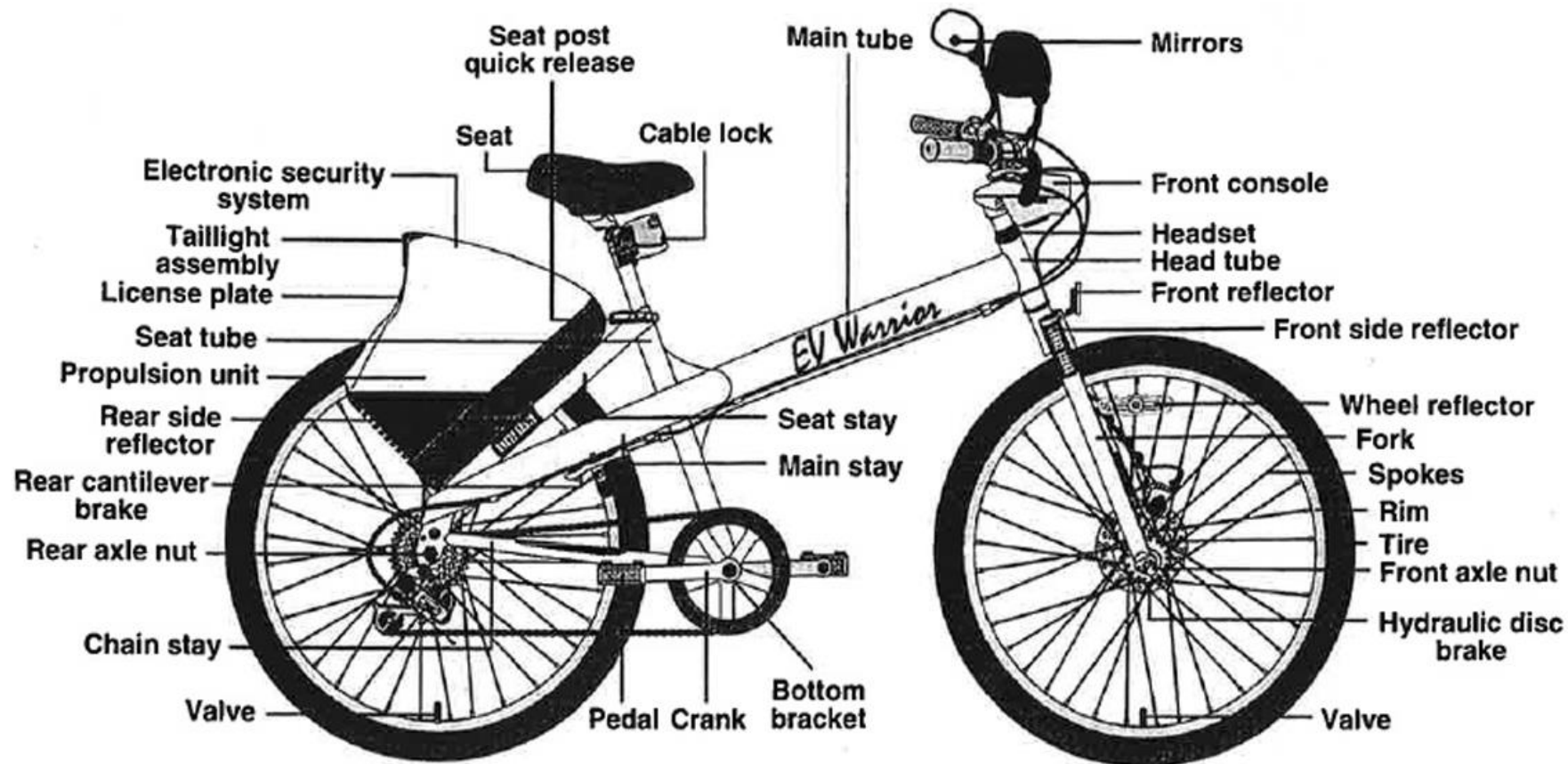


Figure 1
 EV Warrior™ (EVX model shown)

Congratulations! You are now the owner of an EV Warrior™ Electric Bicycle.

The EV Warrior™ is not just a bicycle. It is the world's first practical electric vehicle, designed to provide you with comfortable, economical, non-polluting transportation. Together, your effort and electric power will give you an easy, efficient, clean and reliable ride.

Your EV Warrior™ may be operated without any assistance from the propulsion unit. Simply pedal it as you would a bicycle. You may also operate the EV Warrior™ entirely on electric power without providing any pedaling assistance. However, the EV Warrior™ is most effective when human and electric power are combined.

Human power plus the leverage of a bicycle provides the most efficient form of transportation, and its range is limited only by your own endurance. Cycling is one of the best aerobic workouts known. Electric power is clean and can get you up hills and to your destination without working up a sweat.

This Owner's Manual is designed to help you maximize your enjoyment and safety with your new EV Warrior™. Read it thoroughly before riding. Reading this manual will also assist you in understanding how to operate and maintain your EV Warrior™ safely.

Electric Bicycle Company, LLC (EBC) has incorporated a number of special features into the EV Warrior™.

- The EV Warrior™ is an integrated system of electric and human power. Thus it has been equipped with an energy use gauge, providing biofeedback to show you how your pedaling energy reduces the draw on the batteries and increases your range.
- For safety, the lighting system remains effective for a half hour after the propulsion power is depleted.
- Brake levers activate the brakes and the stop lamp switch, and serve as an emergency motor-power cutoff. See Braking on page 19.
- The EV Warrior™ meets or exceeds all applicable Federal Motor Vehicle Safety Standards.
- The optional electronic security system disables the electric propulsion system until you use the special electronic transmitter.

Best wishes and happy riding from the Electric Bicycle Company, LLC.

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6 SAFETY

As with any bicycle or motorcycle, riding an electric bicycle involves a certain amount of risk. However, taking certain precautions will make riding your EV Warrior™ as safe as possible:

- Wear protective gear.
- Follow the rules of the road.
- Be conspicuous and aware.
- Communicate your intentions.
- Anticipate where you are going and what might happen.
- Ride predictably and defensively.
- Take a bicycle safety course.
- Make sure your EV Warrior™ fits you properly and is in good working order.



Figure 2
Helmet

Use Safety Equipment

Helmet

Always wear an approved and properly fitted cycling helmet. Although some states don't require cyclists to wear helmets, every cyclist should wear an approved helmet to reduce the risk of serious or fatal head injuries. Check your local laws to determine what type of helmet is required when you ride your EV Warrior™.

Other Protective Gear

Wearing cycling gloves with a padded palm will make riding your EV Warrior™ more comfortable, provide a good grip on the handlebars, and help protect your hands from cuts and scrapes in the event of an accident. Wearing protective glasses or a visor will help keep airborne grit, dust and insects out of your eyes. Always wear shoes that will protect your feet and grip the pedals. Wear reflective material so you can be seen. See Be Conspicuous on page 12.

Ask your authorized EV Warrior™ dealer about an EV Warrior™ tool kit.

Always carry identification, coins for a phone call, and any important medical or emergency information (such as a roadside service membership card).

Preparing Your EV Warrior™

Frame

The EV Warrior™ is designed to accommodate most riders. However, to determine whether your legs are too short to ride the EV Warrior™ safely, you need to test the "stand-over" height. Wearing your bicycle-riding shoes, stand over the top tube, midway between the seat and the handlebars. You should have a minimum clearance of one to two inches between you and the top tube. Anyone not meeting this requirement should not even test ride the EV Warrior™.



Figure 3
Stand-over height

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Seat

While you are getting accustomed to your EV Warrior™, you may feel more stable and comfortable with the seat lowered as far as it can go. (**Note: The security cable lock will prevent the seat rails from hitting the motor housing.**)

However, to obtain maximum pedaling power and efficiency, extend the seat post (1) until your heel just rests on the center of the pedal with your leg fully extended. Adjust the height by opening the seat post quick-release (2) and then raising or lowering the seat.

Warning! Do not extend the seat post beyond the "minimum insertion" mark (3). The seat post may break, causing injury.

Seat post quick-release

Once you have set the saddle height, make sure the seat is aligned with the frame, and close the seat post quick-release tight enough that it will not allow any twisting of the seat. If necessary, adjust the quick-release finger nut (4) so that the lever leaves a slight impression in your hand when you close it.

Seat clamp

Loosen the seat clamp bolt (5), and slide the seat forward or backward to adjust the reach to the handlebars. Tighten the seat clamp bolt. Loosening the seat clamp bolt also allows the seat to be tilted. Most people prefer the saddle to be positioned horizontally. Both the pitch and horizontal adjustments should be done separately and sparingly—a small adjustment feels like a big one. Tighten the seat clamp bolt.

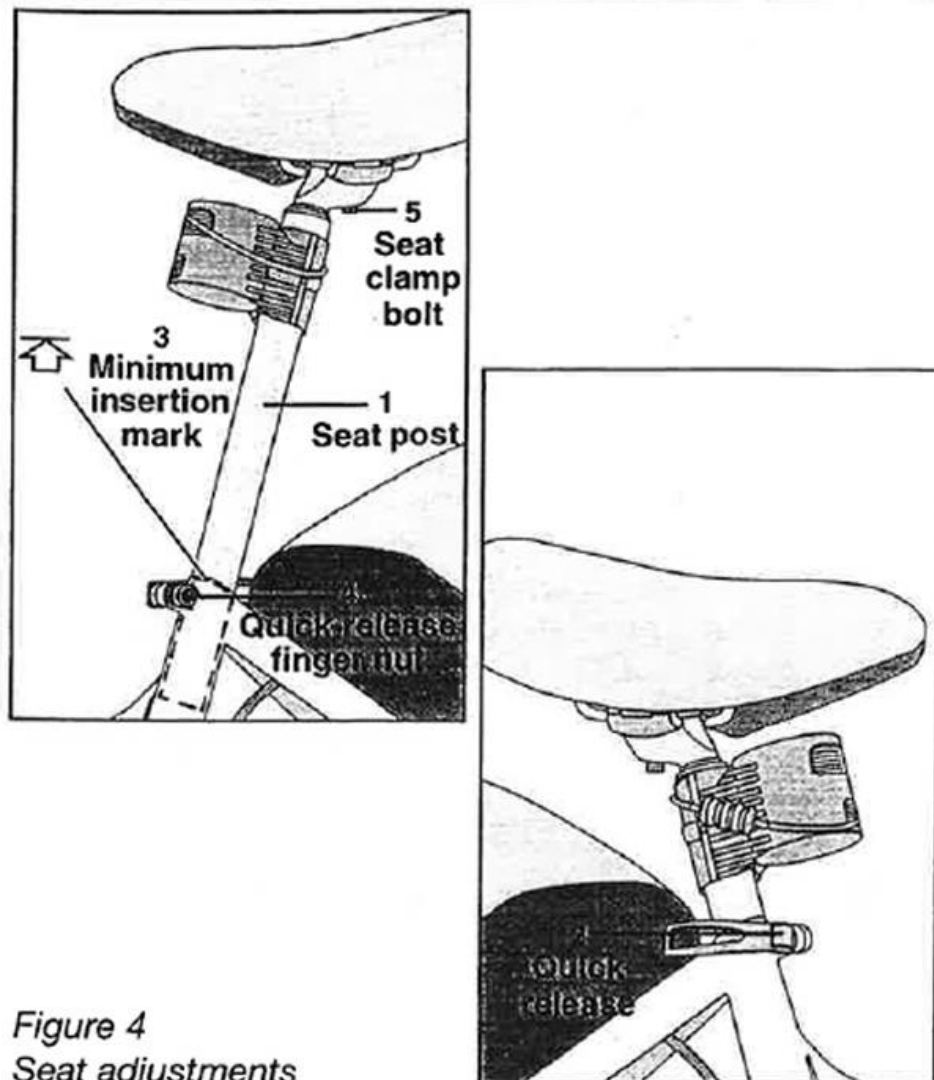


Figure 4
Seat adjustments

Handlebars

The handlebars may be rotated up or down for comfort. To gain access to the handlebar fixing bolts, slide a thin flat tool (1) between the front of the computer mounting plate (2) and the console (3) to release and pop the plate out. **Caution: Be careful not to stretch the wire connection between the computer and the console.** Slightly loosen, but do not remove, the four bolts (4). Rotate the handlebars to the desired angle. Make sure the handlebars are centered. Tighten the bolts so that the handlebars cannot be pivoted. Taking care to keep the computer wire (5) inside the console, angle the mounting plate back into the console and push down until it locks into place. This is the only adjustment that can be made to the handlebars. **Warning! Do not attempt to adjust the stem height; it is fixed and non-adjustable.**

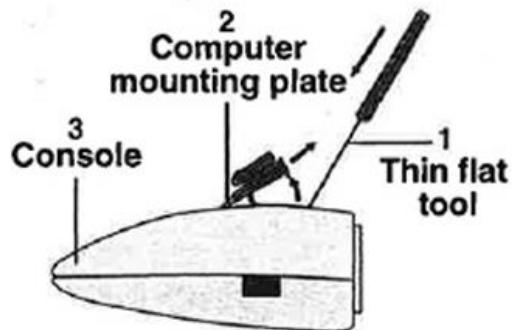


Figure 5
Console with computer mounting plate

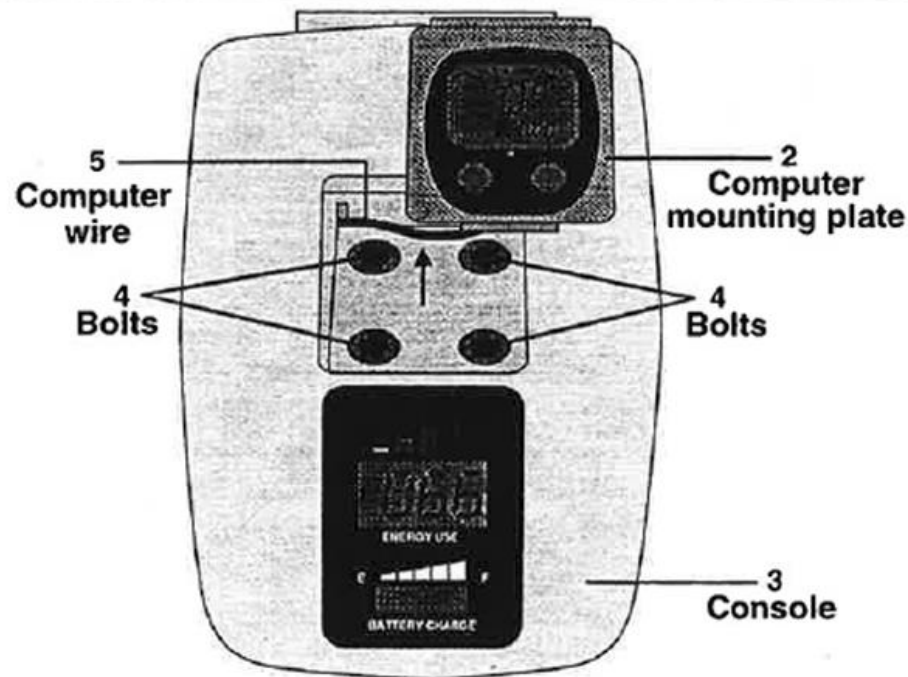


Figure 6
Console with computer mounting plate removed

Batteries

Charge the batteries overnight before riding the first time. See Battery Charger on page 23.

Tire Inflation Pressure

Inflate tires to 40 psi. The electric motor transmission system will not work properly unless the tires are fully inflated.

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License Plate

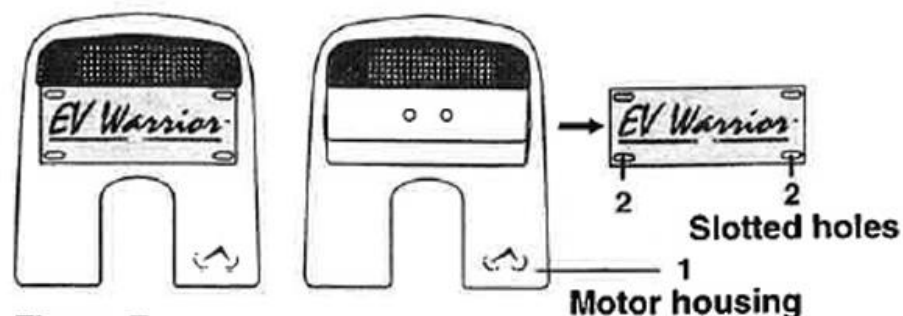


Figure 7

License plate removal/installation

Your EV Warrior™ is shipped with a color-coordinated EV Warrior™ nameplate at the rear of the motor housing (1). If your state's motor vehicle laws require a license plate, mount it as follows:

At the lower corners of the nameplate, you will find slotted holes (2). Use these holes to lift the plate far enough away from the mounting surface to insert a finger under the corner of the plate. Then pull the plate away from the Velcro™ mounting strips. Do not remove the remaining strips from the motor housing surface.

Take the two strips of Velcro™ found in the bag behind the nameplate and stick them onto the strips already in place on the motor housing.

Peel off the protective tape from the Velcro™ strips, and push your license plate against the strips. Your plate is now mounted.

Pre-ride inspection

Before each ride on your EV Warrior™, first check the bicycle over. Look and listen for loose or broken parts. Tighten any loose parts and replace any broken parts. Squeeze the brake levers, and rock the EV Warrior™ forward and backward.

Do the brakes lock the wheel before the brake lever touches the handlebar grip? Is the headset bearing (the one that allows the front wheel to turn) snug? Turn the handlebars from side-to-side. Is the bearing smooth? Make sure the tires are inflated to 40 psi. Check the tires for cuts and wear in the tread and sidewalls. As you begin to pedal, make sure the wheels don't wobble or hop.

Before someone else's first ride

Before allowing another person to ride your EV Warrior™, you should ensure that he or she:

- Wears a properly fitted and approved helmet.
- Meets the stand-over height requirement and has the seat height adjustment properly set.
- Is adequately familiar with the weight, balance, operation and braking of the EV Warrior™.

Be Aware of Your Cycling Environment

Legal Requirements

Familiarize yourself with your state and local bicycle traffic laws and regulations. You are responsible for knowing and obeying all laws.

Licensing and Registration State and local laws and regulations may require you to license and/or register your EV Warrior™, or to obtain a license or operating permit to operate your EV Warrior™.

Equipment State laws vary as to helmet requirements (from no helmet to a bicycle helmet to a motorcycle helmet). Make sure you comply with the helmet law in your state. Your EV Warrior™ is equipped with lights and reflectors mandated by the U.S. Federal Motor Vehicle Safety Standards and will satisfy the requirements of most states. Still, some states may require additional equipment, such as fenders. Check your state's requirements.

Rules of the road Most states will require you to follow the same laws and rules that govern the operation of motor vehicles. Two of the most important (yet least observed) rules are:

- **Come to a full stop at all stop signs and red lights.**
- **Ride on the right with traffic—not against it.**

Know where you can go Normally, you are allowed to ride on bicycle routes and in bicycle lanes. Most, but not all states allow riding EV Warriors™ on bicycle paths. You may

be allowed to ride on sidewalks. Check with your local law enforcement agency.

Physical Surroundings

- **Plan your route.** In selecting your route, take into account your equipment, your physical condition and riding skill. Do you have time constraints? Are alternate routes safer, more secure, shorter, more convenient or offer a smoother road surface? Consider the time of day and the weather. Plan for encounters with other road users. Whether you are looking for adventure or serenity, pick a route that's safe as well as enjoyable.
- **Use all your senses.** Look for road hazards. Listen for motor vehicles. Pay attention to the weather and the light. Consider that sunlight or glare may affect other drivers' vision, reducing their ability to see you.
- **As with any bicycle or other vehicle, do not ride your EV Warrior™ while under the influence of alcohol or drugs.** Doing so is not only illegal but also it impairs your awareness and your ability to respond to cycling emergencies.
- **Riding your EV Warrior™ while listening to music through headphones is dangerous and is illegal in many states.** Such devices severely limit your ability to hear traffic and reduce your awareness of many other hazards.
- **Keep your eyes on the road.**

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Be conspicuous

No rational road user wishes to harm you. Drivers will avoid hitting you if at all possible, but they can only avoid you if they can see you. "Conspicuity" is the ability to be seen by others. To increase your conspicuity, wear bright clothing during the day.

In low light

Other road users will have difficulty seeing you on your EV Warrior™ at dawn, dusk or night. Visibility can also be significantly reduced by rain and other inclement weather conditions. Make yourself and your EV Warrior™ as conspicuous as possible. Turn on your headlight and taillight in low light conditions. Make sure you have proper reflectors (see Figure 1 on page 2), and are wearing light colored and light reflecting clothing. A reflective vest is the best way to be seen by approaching vehicles that have their lights on. Reflective bands on your arms and legs, and reflecting strips on your helmet, also add to your conspicuity.

Horn

Don't forget to use your horn to warn others of your presence if necessary.

Ride where you can be seen

Bicycle riders often feel safest riding as far to the right as possible. However, most state laws require a rider to ride only as far to the right as practical. In fact, it is most often safest to ride predictably in a straight line in the traffic lane where

you can be seen, rather than near the curb with broken glass, or to dodge around parked cars. Someone may open a car door into you.

Communicate your intentions and be predictable

Always use hand signals. Ride in a straight line. Do not weave through traffic.

Anticipate and ride defensively

- Look far enough ahead to see graveled, sandy, uneven or slick surfaces, potholes, manhole covers, drainage grates, obstacles, other vehicles, pedestrians and any other potentially hazardous situations. Doing so will allow you time to take effective steps to avoid them.
- Look both ways before and while passing through an intersection.
- Assume that other vehicles, bicycles and pedestrians are not aware of your presence.
- If you have any doubt, yield—even when you have the right of way.

Share the road

You will encounter other cyclists, pedestrians and motor vehicle traffic wherever you ride. Treat them as you would like to be treated.

Controls and Displays

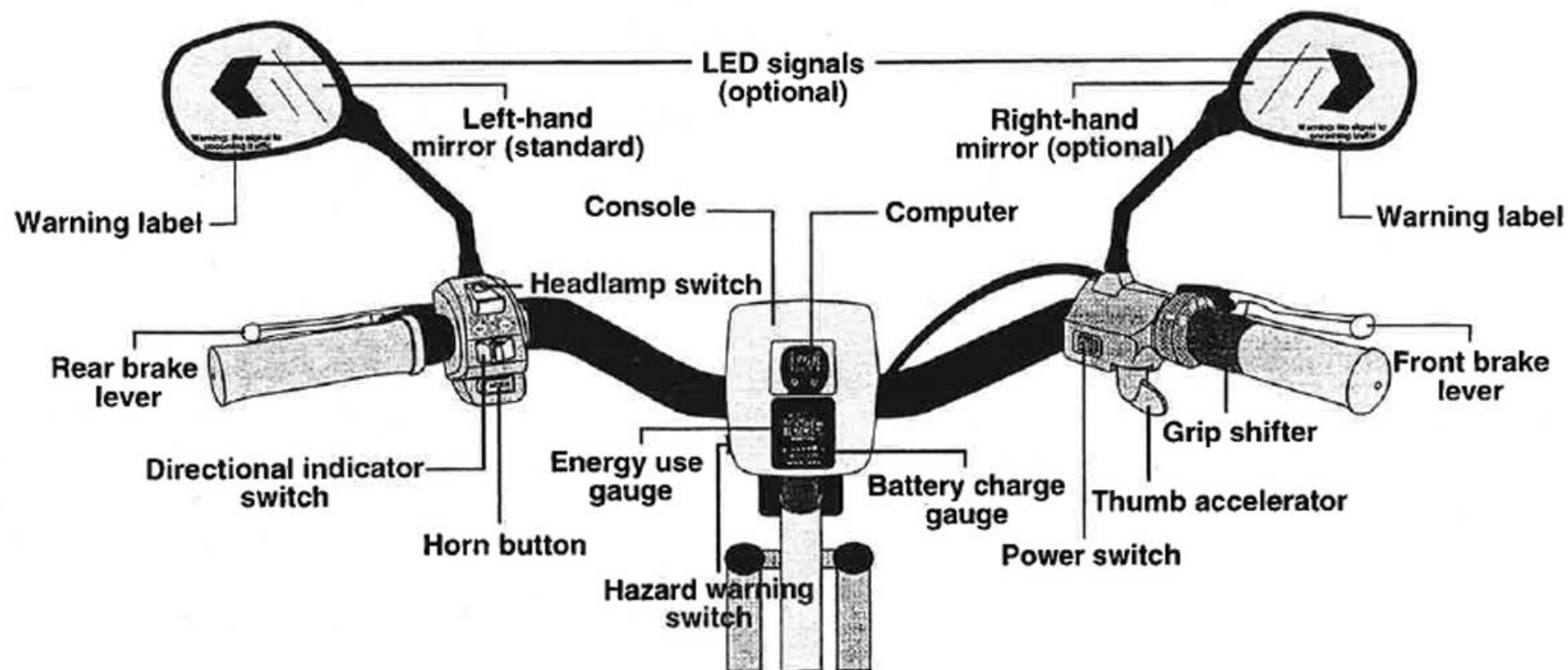


Figure 8
Handlebar controls and displays
(EVS model shown)

14 OPERATION

Brake Levers

Caution: Pursuant to Federal Motor Vehicle Safety Standards, the right brake lever operates the front brake. The left brake lever operates the rear brake. Both levers activate the stop lamp and serve as emergency cutoffs to motor power. See *Braking* on page 19.

Headlamp Switch

The headlamp switch (1) activates the headlamp, taillight and license plate lamp. As an additional safety measure, the EV Warrior™ is designed with special circuitry to give you approximately a half hour of lighting after the propulsion power cut-off.

Directional indicators (optional on EVS)

Push the turn indicator switch (2) to the left or right to alert traffic **behind** you that you plan to make a turn. **Note: Directional indicators are not intended to and cannot signal to oncoming traffic. Always use proper hand signals.** Push the white button (3) in the center to cancel the turn indicator.

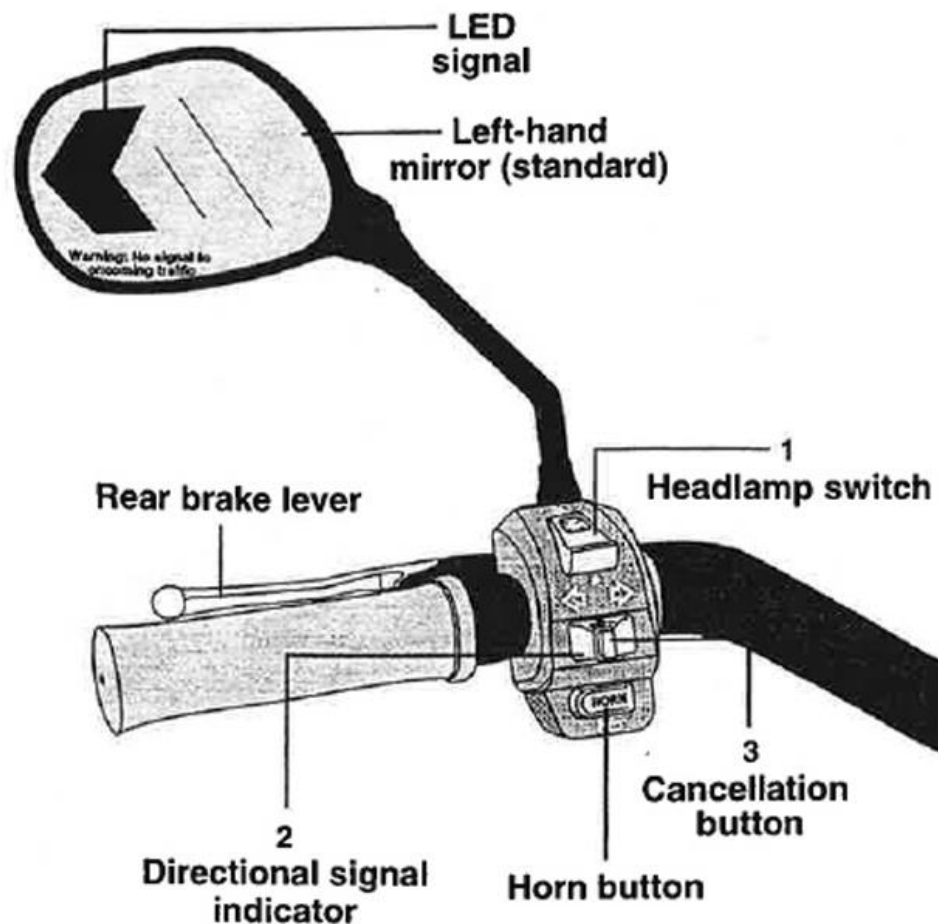
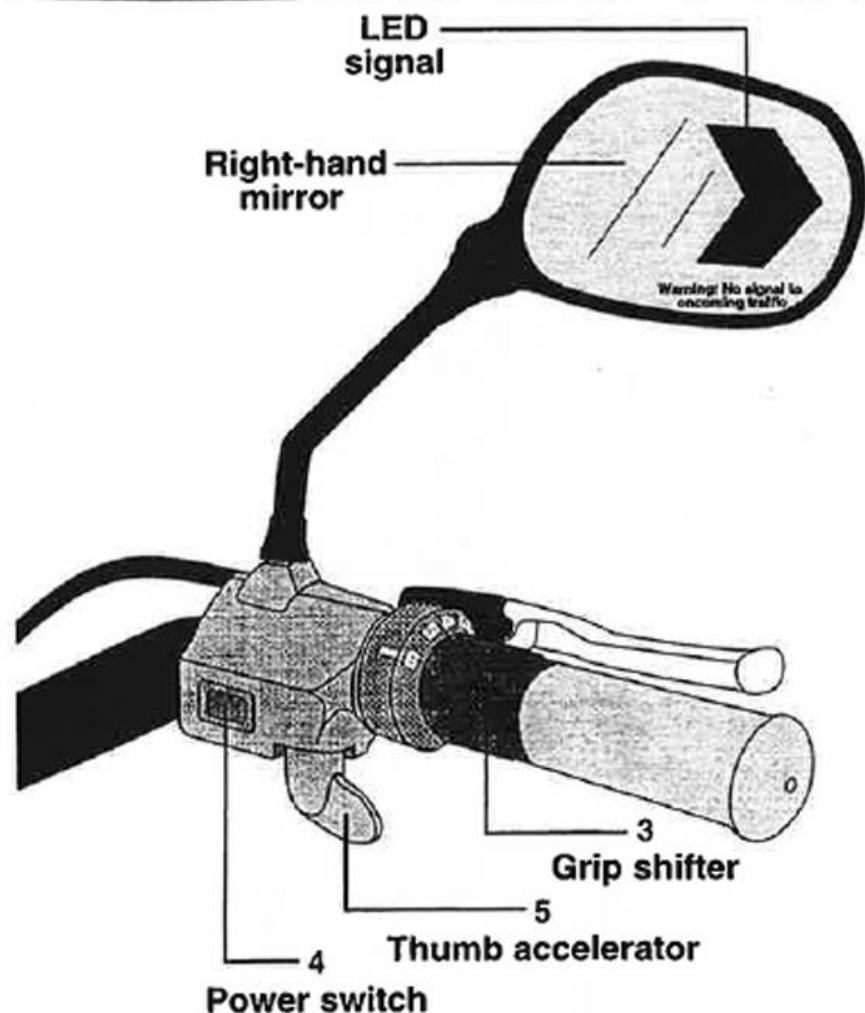


Figure 9
Left-hand controls and displays (EVX model shown)



The Grip Shift™ grip shifter

Rotate the grip shifter (3) to change gears for human power. See Shifting on page 20.

Power switch

The power switch (4) turns the system on and off; an indicator light in the switch illuminates when the power switch is turned on.

Accelerator

The thumb accelerator (5) controls power to the motors. See Electric Power on page 21.

Mirrors

The left-hand mirror is standard and the right-hand mirror is an available dealer installed accessory.

Signal Mirrors

If your EV Warrior™ is equipped with the optional signal mirrors, the internally mounted light-emitting diodes (LED) can be used to indicate a stop, a turn or a hazard to following traffic. The mirror lenses are treated with a unique polarized coating that allows the LEDs to be seen by people behind and to the side of your bicycle without shining in your eyes.

Hazard warning switch

Pushing the hazard warning rocker switch on the console to the illuminated on position (see Figure 11 on page 16) activates the LED flashers on the taillight and signal mirrors (optional), warning traffic **behind** you.

Warning! The LED signals are not intended to and cannot signal oncoming traffic. Always use proper hand signals.

Figure 10
Right-hand controls and displays (EVX model shown)

16 OPERATION

CONSOLE

Computer

The computer (1) provides information on speed (current average and maximum), distance (trip and total) and time (stop watch, time of day, automatic start/stop).

See the computer owner's manual in the owner's information packet for complete information.

Battery charge gauge

The EV Warrior™ is equipped with sophisticated circuitry that assesses the battery's current level (battery charge).

Energy use gauge

The energy use gauge (3) is located in the center console. See Maximizing Your Range/the Biofeedback Principle on page 22.

Hazard warning switch

Pushing the hazard warning rocker switch (4) on the console to the illuminated on position activates the LED flashers on the taillight and signal mirrors (optional), warning traffic **behind** you.

Note: The LED signals are not intended to and cannot signal oncoming traffic. Always use proper hand signals.

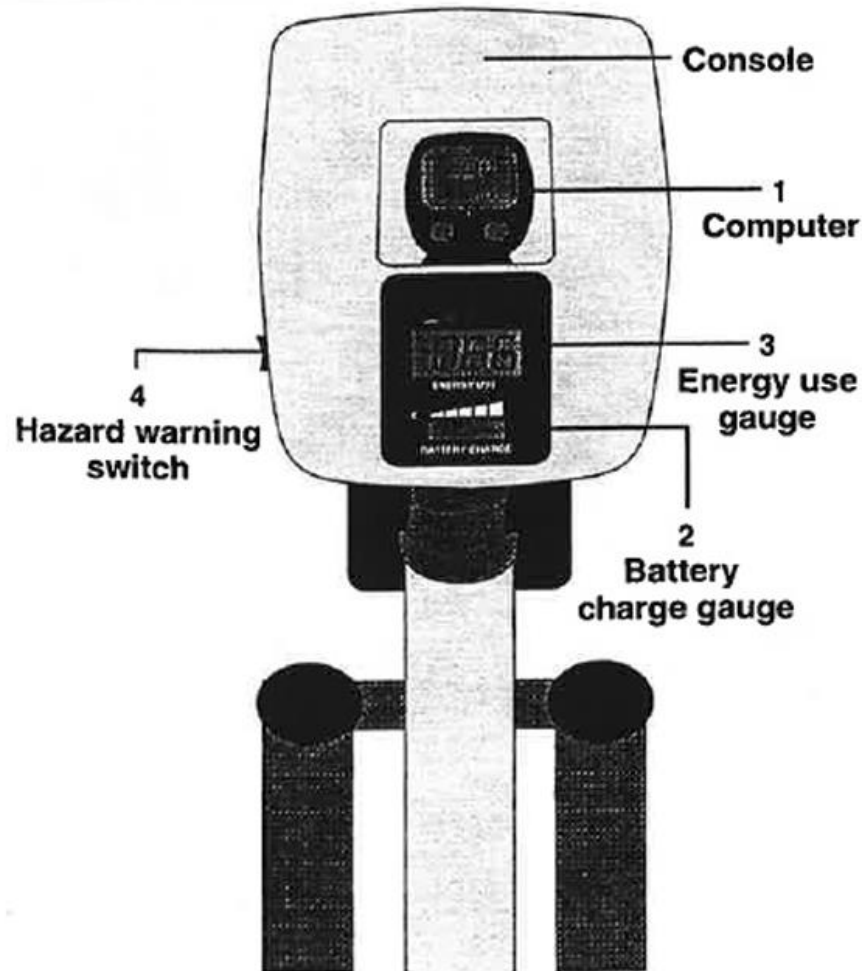


Figure 11
Console controls and displays

Security Cable Lock

Unlocking

Set the tumblers to the combination and disconnect the cables. Safeguard the removable combination sticker.

Securing

When the lock (1) is not in use, pull the cable ends around behind the seat post and lock it. Make sure the lock is in a position that does not interfere with your legs while you are riding.

Locking your EV Warrior™

Unlock the lock and pull both cables out at the same time. Pass them through the frame and around a secure object, such as a bicycle rack. Close the lock and rotate the tumblers.

Note: If you do not pass the cable through the frame, the seat and lock can be removed simply by releasing the quick release and the EV Warrior™ can be stolen.

Electronic Security System (optional)

If your EV Warrior™ is equipped with an electronic security system, the motor is automatically disconnected when the main power switch (see Figure 10 on page 15) is turned off. For more information, see the flyer in the enclosed owner packet.

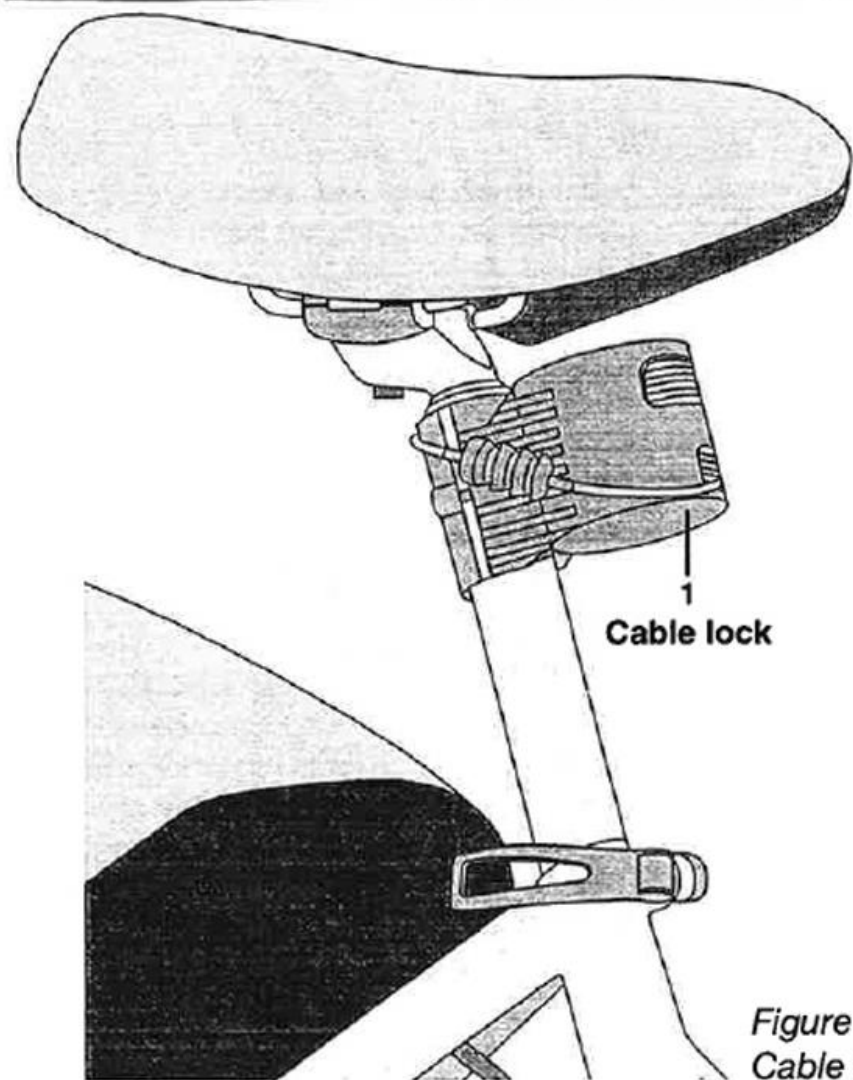


Figure 12
Cable lock

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HANDLING

Your EV Warrior™ shares many components and traits of more traditional bicycles. However, there are some unique characteristics you should familiarize yourself with prior to riding your new electric bicycle.

Propulsion Unit

The propulsion unit adds a significant amount of weight to the rear of the EV Warrior™. As a result, the front end tends to be light, especially in a turn. When stopping, slowing and standing, keep the bicycle upright. It is especially important to keep the bicycle upright when mounting and dismounting. When the EV Warrior™ is leaned over without the weight of a rider, the front wheel may tend to rise up and the rear end may roll or lean to the side. **Never activate the electric power until you are sitting on the seat.** In order to familiarize yourself with your EV Warrior™, just pedal it until you get a feel for the balance and handling, and limit your rides to clean, smooth pavement in an area without motor vehicles or pedestrian traffic.

Warnings:

- **Do not carry passengers on your EV Warrior™!**
- **Never carry any item that could obstruct your vision or interfere with control of your bicycle, or could get caught in the wheels or other moving parts of the EV Warrior™.**

- **Do not sit on the propulsion unit or carry anything on it.**
- **Do not lift the EV Warrior™ by the taillight or motor housing.**

No Off-Road Use

The EV Warrior™ was not designed to be operated on unpaved, uneven, muddy or graveled terrain. The EV Warrior™ is intended for use on paved streets and bicycle paths, and is not suitable or safe for operation in off-road conditions. Off-road riding will pose an additional risk of damage to the vehicle and injury to the rider and will void the warranty.

Wet-Weather Riding

Take extra precautions while operating your EV Warrior™ on wet roads. Wet conditions significantly reduce the braking power, traction and cornering ability of all vehicles, including your electric bicycle. Remember that when the road is wet, you need to ride slower than normal and avoid sudden stops or turns. Because wet conditions reduce the braking ability of your EV Warrior™, you need to begin braking earlier than you would in dry conditions. Even greater caution is called for during wet conditions when you ride over metal street covers or painted surfaces because these areas are slicker than the adjacent paved surfaces. When braking, avoid using the front brake aggressively. This could lock up the front brake, causing you to lose control.

BRAKING

The brakes on your EV Warrior™ are engaged by squeezing the brake levers. Pursuant to Federal Motor Vehicle Safety Standards, **the brake lever on the right handlebar activates the front brake and the brake lever on the left handlebar activates the rear brake.**

Apply the rear brake first. This shifts the weight to the front wheel. Then, maintaining the EV Warrior™ in an upright position, apply the front brake. Never apply the front brake first. The front brake provides the majority of braking power on most vehicles.

Note that the optional Sachs™ hydraulic disc brake has substantially greater stopping power. When using the front brake, be aware that applying too much force on the brake lever could result in front wheel lock-up. This may cause you to lose control of your EV Warrior™ and crash.

When braking, apply as much force as is required to reduce speed or stop in a controlled and safe manner. If you ever sense that the front wheel is skidding, release the front brake. When turning your EV Warrior™ on graveled or slick surfaces, use the front brake sparingly. These conditions increase the risk of the front wheel sliding out. Take the time to learn how to use the brakes safely and effectively.

20 OPERATION

GEARS/HUMAN-POWER TRANSMISSION

Why multiple gears?

The speed at which one turns the pedals is called “cadence.” Cadence is expressed as “rpm” or revolutions per minute. Beginning cyclists typically pedal at about 50 rpm, while a racer pedals at about 100 rpm. Each person has an optimum cadence. Generally, a higher cadence is more efficient. The purpose of multiple gearing is to allow you to maintain your optimum cadence regardless of such factors as grade, wind, road resistance or your physical stamina.

Shifting

Your EV Warrior™ is equipped with a six-speed Grip Shift™ shifter and a Shimano™ rear derailleur of the type found on many premium bicycles. The shifter is located on the right side of the handlebar (see Figure 10 on page 15). The shifter is operated by twisting the inside ring of the grip away from you (clockwise) for a higher (smaller) gear and toward you (counterclockwise) for a lower (larger) gear.

Which gear to use?

Lower gears—larger sprockets—will give you the power to get started, ride into head winds and climb hills, while higher gears—smaller sprockets—will allow you to ride at faster speeds.

Clutching

To shift the derailleur, keep pedaling (but ease up on the pedal pressure) as you twist the grip to select the desired gear. This allows the chain to move easily or “derail” from one sprocket to another. If possible, it is always better to shift to a lower gear just before you need it.

Shifting with electric power

To shift the rear derailleur while operating the EV Warrior™ under electric power, it may be necessary for you to release the throttle lever to operate the shifter. If you are in the right gear just before starting up or down a hill, you won't have to release the throttle to shift gears.

ELECTRIC POWER

Always sit on your EV Warrior™ before turning on the power. If your EV Warrior™ is equipped with an electronic security system, deactivate it (see the instructions in the owner's information packet). To activate the electric system of your EV Warrior™, push the power switch. With or without pedaling the bicycle, depress the thumb accelerator lever with your right thumb. The farther you depress the lever, the more power you provide to the electric motors and the faster you will go—up to the maximum speed of the vehicle. The accelerator lever is spring-loaded. Once you remove pressure from the lever, it will spring back to the “idle” position. **Always turn the power switch to the off position before dismounting from your EV Warrior™.** Turning the power switch to the off position activates the electronic security system (if equipped). The security system must be deactivated again before the power system can be turned on.

ELECTRIC AND HUMAN POWER TOGETHER

Your EV Warrior™ may be operated without any assist from the propulsion unit simply by pedaling as you would a normal bicycle. You may also operate the EV Warrior™ entirely on electric power without providing any pedaling assistance. However, the EV Warrior™ is most effective when electric and human power are combined. By itself, a bicycle provides the most efficient form of transportation and its range is limited only by your endurance. Cycling is also one of the best aerobic workouts known. On the other hand, electric power is clean and can get you to your destination without working up a sweat. It will take you up hills effortlessly. It will take you farther than you may be able to go by yourself.

Together, your muscles and electric power will provide you with easy, efficient, effective, clean and reliable transportation. You can combine human and electric power to maximize your workout, to increase your range and save your battery, or to look your best upon arrival. With electric power, you can program the level of exertion over a given trip without losing speed to warm ups and cool downs. You can challenge yourself to use less energy as you become a stronger rider—still without losing speed. When you commute to the office, you can save the sweat for the ride home—also a great stress reliever! There are many ways to combine electric and human power. Experiment and see what works best for you.

22 OPERATION

MAXIMIZING YOUR RANGE/ THE BIOFEEDBACK PRINCIPLE

The energy use gauge rates your consumption of electric energy on a scale of zero to one thousand. At zero, there is no current draw. The 1,000 rating means you are drawing maximum energy. The energy use gauge measures only current to the motor. Other electrical loads, such as lights, may induce the gauge to read a smaller or negative value. This is not a flaw and does not require service. This phenomenon is not noticeable when the motor is being used. Keeping the reading as low and steady as possible will maximize your range. Under normal circumstances (on a smooth flat surface, with an average weight rider and few accelerations), your EV Warrior™ will take you about 15 miles. Use electric energy whenever you wish, but notice that when you accelerate, carry a heavy load or climb a hill, the energy use reading climbs rapidly. The more you rely on electric power, the faster you will deplete the batteries and reduce your range. To see the difference this can make, check your energy use gauge while you are traveling at a steady rate of speed. Next, while maintaining that rate of speed, begin pedaling. The power usage will drop without a loss of speed, thus increasing your range.

Thus, the more you pedal, the lower your energy usage. The more you use your own power, the farther you can go on electric power. The energy use gauge gives you information not only about your consumption of electric energy, but also about the expenditure of your own power. Thus, it acts as a biofeedback gauge. Working to minimize the reading, you will find that you will automatically minimize your consumption of electric energy and maximize the bicycle's range while expending only a reasonably small amount of your own energy. The more you use your own power, the greater the health benefits.

Exercise burns calories which, in turn, can reduce your weight. A lighter rider will have a greater range and will tax the batteries less.

Warning! The energy use gauge is fascinating and informative, but remember to watch the road and to glance at the gauge only when it is safe.

BATTERY CHARGER

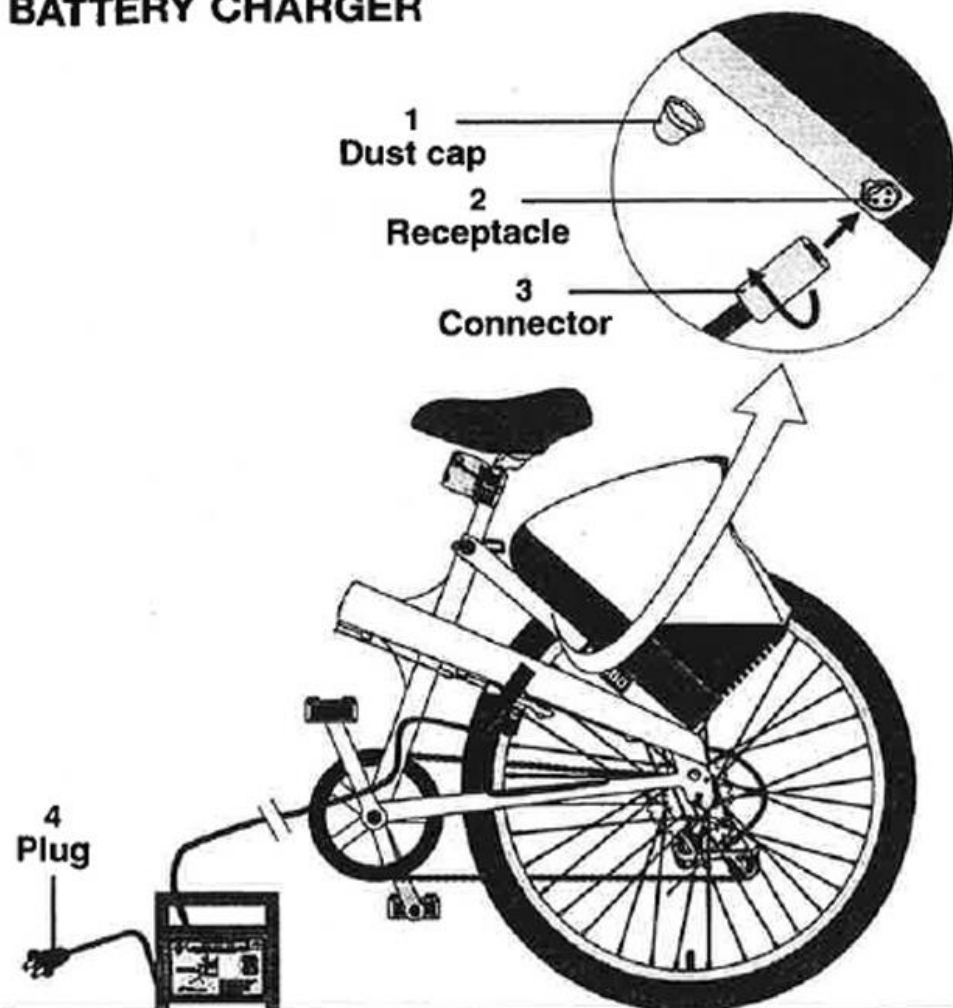


Figure 13
Battery charger hook-up

Charging the Batteries

- Remove the dust cap (1) from the receptacle (2).
- Insert the connector (3) into the receptacle on the motor housing by rotating until it aligns. Push in fully.
- Insert the plug (4) into a 120-volt grounded outlet.
- Confirm that the charger is properly connected by noticing that both the red and the amber lights are illuminated.

Caution: Do not plug the charger into a 120-volt power source unless it is first plugged into the charger connector on the motor housing. Also, disconnect the charger from the 120-volt outlet before unplugging it from the EV Warrior™.

- After charging, replace the protective dust cap.

Whenever you are not riding your EV Warrior™, it is recommended that you charge the batteries. The battery charger is designed to bring the batteries to full charge and keep them there without overcharging.

24 OPERATION

Safety

Warning! NEVER smoke or allow a spark or flame in the vicinity of the battery. There is a risk of explosive gases. Working in the vicinity of a lead-acid battery is dangerous. Batteries generate explosive gases during normal operation, as well as while being discharged or charged.

Warning! This charger is designed to be used only in conjunction with the EV Warrior™ EVS and EVX models. Using the charger on other types of batteries may cause the batteries to burst, resulting in personal injury and property damage.

Use of any attachment not recommended or sold by your authorized EV Warrior™ dealer may result in fire, electric shock or injury.

Position the AC and DC leads of the charger to avoid tripping over them and to prevent damage; protect the leads from heat, oil and sharp edges.

To reduce the risk of electric shock, unplug the charger from the AC outlet before attempting any maintenance or cleaning. Turning off EV Warrior™ power will not reduce this risk. While charging the battery, put it in a dry, well-ventilated area which is free of dangerous vapors and dust. Never place articles on or around the charger, and never place the charger where cooling air will be restricted from flowing through its housing.

Locate the charger at least 18 inches above ground level, as far away from the battery as the cables permit.

Do not open the propulsion unit.

Always have someone within range of your voice, or close enough to come to your aid, when working around lead-acid batteries. Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing or eyes. If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters your eye, immediately flush the eye with running cold water for at least 10 minutes and get prompt medical attention.

Turn off all electrical "loads," including lights, before charging your EV Warrior™. Do not operate the charger if it has received a sharp blow, been dropped or otherwise damaged. Take it to an authorized EV Warrior™ service center.

NEVER charge your EV Warrior™ if the battery has frozen. Thaw it out first. Charging will then be safer and more efficient. Connectors must be clean. When a battery is very cold, partially discharged or sulphated (worn out), it will not draw its rated amps from the charger. This is a limited safety factor. It is both dangerous and damaging to a battery to force a higher amperage into it than it can effectively use in recharging.

AC Power Cord

Warning! To reduce risk of damage to the electric plug and cord, pull the plug rather than cord when disconnecting the charger. If the plug will not fit outlet, have a proper outlet installed by a qualified electrician. An improper connection can result in electrical shock. Disconnect the plug from the outlet when the charger is idle.

This battery charger is for use on a nominal 120-volt circuit. Make certain the electrical outlet to be used with the charger has been properly installed, fused and grounded in accordance with the National Electrical Code and any local codes exceeding those of the NEC.

Extension Cord

An extension cord should not be used unless it is absolutely necessary. Should you choose to use one, make certain it is a UL-approved and/or CSA-approved extension cord in good condition. Use of an improper extension cord could result in shock or fire hazard.

26 OPERATION

Recharge Time

The standard 5-amp charger will charge the EV Warrior™ in approximately 3.5 hours.

Automatic Charger

Your EV Warrior™ charger is fully automatic, with three LED lights continuously monitoring the state of charge in the battery. As the battery reaches full charge, the yellow and green lights will flash alternately. This automatic cycling of the charger prevents overcharging as the battery reaches its full capacity. Once fully charged, the charger will continue to cycle.

Red Light—Indicates the charger is properly connected to a 120V supply.

Yellow Light—Indicates correct polarity and when combined with the red light, indicates charger is charging.

Green Light—Indicates a full charge. Green and yellow will flash alternately indicating the battery is being maintained at peak capacity.

Note: Automatic chargers will not turn on unless the battery has between 3.0 and 4.0 volts output. A voltage less than this normally indicates a defective battery. Attempting to charge it can be dangerous. The battery should be checked by your authorized EV Warrior™ service center.

Provided you can monitor the battery's condition on a regular basis, your automatic charger may be left connected to the battery indefinitely.

Overcharging

Overcharging conditions can occur even with automatic chargers. A battery which is hot to the touch or bubbling vigorously is being overcharged and should never be left unattended. Disconnect the charger and have the battery checked at your authorized EV Warrior™ service center.

Your EV Warrior™, like any vehicle, requires periodic tuning and adjustments. For your own safety and enjoyment, and to ensure a long, useful life for your electric bicycle, you or your authorized EV Warrior™ service center should clean, inspect, maintain and repair your EV Warrior™ on a regular basis. See the Maintenance Table on page 29 for periodic maintenance. While many bicycle owners prefer and enjoy performing maintenance, adjustment and repair of their bicycles, do not perform any repairs or service on your EV Warrior™ without the necessary knowledge and tools to competently perform those tasks. Improper modifications, adjustments, repairs or maintenance of your EV Warrior™ could render your bicycle unsafe and dangerous to ride. Repairs or modifications to the electrical system or propulsion unit will void the warranty.

Owner Maintenance and Repair

The following information concerning maintenance, adjustment and repair of the various components of your EV Warrior™ is provided to assist you should you decide to undertake repairs or adjustments yourself. However, only you can determine if you have the required knowledge, skill and tools to properly and safely perform these tasks. Unless you are certain you can safely maintain, adjust or repair your EV Warrior™, have an authorized EV Warrior™ service center perform the necessary maintenance. There are no user serviceable electrical or electronic components; attempts

by the user to maintain or modify such components will void the warranty. If, in spite of this instruction, you attempt to work on the electrical or electronic components, always disconnect the battery first.

Cleaning

Regular cleaning will protect the finish of your EV Warrior™ and remove moisture-collecting dirt which can lead to rust or corrosion. Cleaning will also expose loose bolts, screws or nuts, damage to the frame, and any problems with other components. Each cleaning of your bicycle is an opportunity to discover any worn or broken parts. Dirty chains, brakes and derailleurs do not perform as efficiently or smoothly as those which are properly cleaned and maintained. Dirt and grit on your EV Warrior™ also act as an abrasive compound which can prematurely wear, damage or mar various components. To clean your EV Warrior™, wash it with soap and water and wipe it dry. Do not spray water into the handlebar switches, center console, propulsion unit or bearings! Once dried, use a mild solvent to cut through old grease and loosen up rusty components. As you clean, look for any loose, improperly adjusted or worn-out components. Remove all soap and oil residue from the brake pads, rotors and wheel rims to ensure that your brakes work properly. Never wipe your EV Warrior™ without washing it first. A simple and regular washing of your EV Warrior™ will add to your enjoyment and safety in riding, and can extend the useful life of your bicycle.

28 MAINTENANCE

Inspection

The best time to inspect your EV Warrior™ is when you clean it.

For your own safety and enjoyment, and to ensure a long, useful life for your electric bicycle, regularly inspect your EV Warrior™.

- **Periodic Inspection**—Conduct a periodic inspection after every five to ten rides, depending on the length and conditions of the ride. Review the maintenance table for the periodic checklist.
- **Accidents**—Should you suffer an accident, inspect the EV Warrior™ for broken, bent, abraded or otherwise damaged components. Do not ride the bicycle after an accident unless you have inspected it and have determined it is safe to ride. Have any damaged parts inspected by an authorized EV Warrior™ service center. Failure to inspect and replace damaged parts within a reasonable period of time after an accident may result in sudden and unexpected failure of those parts, causing loss of control, further damage to your bicycle and possibly serious injury. Failure to inspect and replace or repair damaged parts within 30 days of an accident will void your Warranty.

General Maintenance

Recommended regular maintenance of your EV Warrior™, in addition to cleaning and inspection, should include:

- Checking the brakes to be sure they are properly adjusted and that the brake cables are not frayed. Replace all frayed cables immediately.
- Checking tire pressure (40 psi).
- Lubricating your chain, rear derailleur and rear gear sprockets with oil as needed.
- Inspecting headlights, taillight, turn signals (if installed) and reflectors to be sure they are securely mounted and functioning properly.
- Having any unusual condition or noise checked by an authorized EV Warrior™ service center.
- Checking all bolts, screws and nuts are properly tightened.
- Checking for wear or damage and for any loose or broken parts.

Page	Component	Sub-system	Inspect Before Every Ride	Periodic Inspection	Lubricate	Adjust/Tighten	Repair/Replace
31	Brakes	Pad adjustment		•		•	
30		Pad wear		•			•
32	Wheels	Axle nuts	•	•		•	
33		True	•	•		•	
33		Hub bearings		•	•	•	
33	Tires	Air pressure	•	•			
33		Sidewalls and tread		•			•
35	Chain	Lubrication		•	•	•	
36	Derailleur	Adjustment		•	•	•	•
37	Headset			•			
37	Bottom Bracket	Adjustment		•	•	•	
37	Crankset and Pedals	Adjustment		•		•	
38	Cables	Tension	•	•		•	
38		Fraying		•			•
38	Handlebar	Grips	•	•			•
39	Controls and Displays	Computer battery		•			
	Thumb Accelerator			•			
40	Charger			•			
40	Reflectors			•		•	
40	Mirrors	Adjustment	•			•	

Figure 14 Maintenance Table

30 MAINTENANCE

Specific Components

This section is arranged by component, with specific tips on cleaning, inspection, lubrication, maintenance and repair.

Tools

You should always carry a tool kit on your EV Warrior™ to deal with on-road adjustments and repairs. This tool kit should include a tire pump, a tube patch kit, a spare tube, tire lever(s), a set of Allen wrenches in 2.5-mm, 4-mm, 5-mm and 6-mm sizes, a 15-mm box or open wrench for loosening or removing axle nuts, and a No. 2 Phillips screwdriver. Also, 8-mm, 9-mm and 10-mm wrenches are useful. Ask your dealer about the optional EV Warrior™ tool kit.

Brakes

Brake Cable Release

To release the cantilever brakes to remove a wheel, squeeze the cantilevers (1) together and remove the straddle cable wire (2) from the cantilever. To reinstall the brake straddle cable wire, again squeeze the brake pads together and insert the cable wire into the slot (3).

Pad wear

Make sure the brake pads are wearing evenly and that there is brake pad material (not metal) against the rim or rotor.

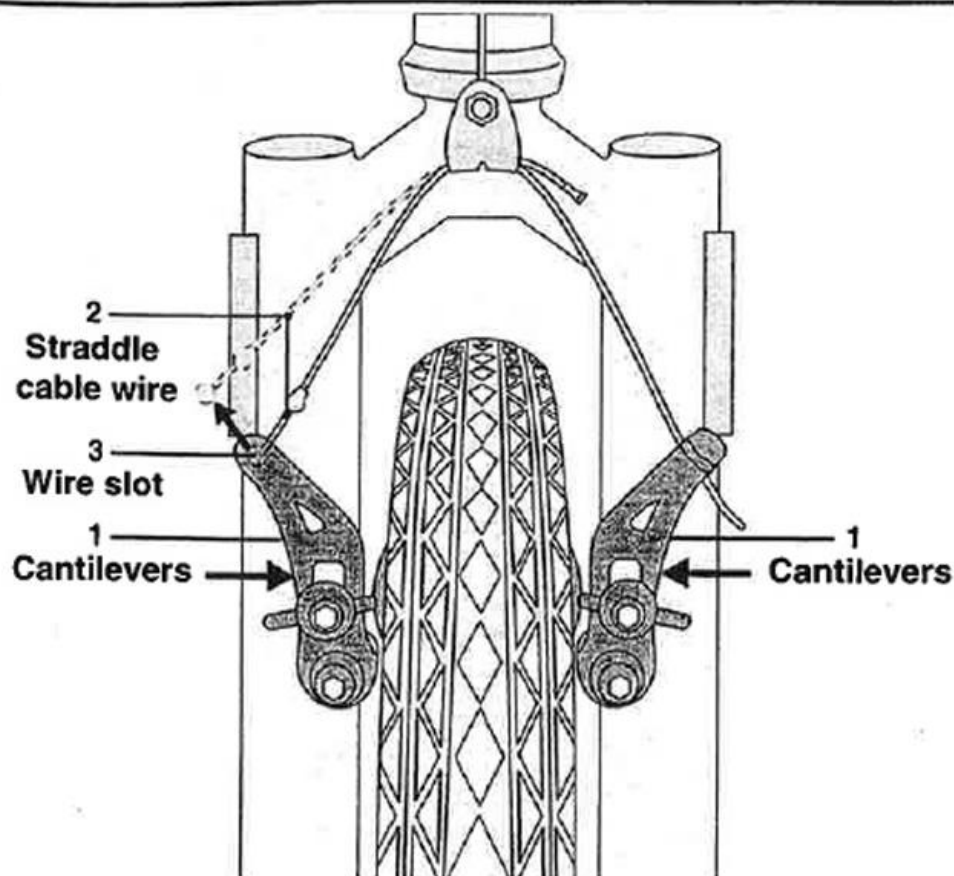


Figure 15
Releasing brake straddle cable

Brake Pad Alignment

The brake pads can be adjusted in and out, twisted and rotated on two axes. Make sure that the cantilever brake pads are set to contact the wheel rim fully, but do not rub against the sidewall of the tire when the brakes are applied.

Toe-in

If the brakes tend to squeal, it is likely that the brake pad "toe-in" needs adjustment. Proper toe-in allows the front of the pad to contact the rim first, preventing the rim and pad from setting up a harmonic vibration or squeal.

Brake Levers

Make sure that even if the brake lever is squeezed hard, the lever does not contact the grip. Otherwise, the brakes may not apply full pressure to the rim.

Hydraulic Disc Brake (optional)

See the Sachs™ Power Disc™ Owner's Manual for servicing the hydraulic front disc brake. This separate manual is in the owner's information packet.

Service

If your brakes are out of alignment or squeal during use, or if the pads need replacing or the cables need tightening, bring your EV Warrior™ to an authorized EV Warrior™ service center for maintenance.

Wheels

Inspection

Regularly inspect the axle nuts on your wheels to be sure they are properly tightened. Periodically inspect your wheels to be sure they are true (they should not wobble when you spin them) and that there are no loose or broken spokes. Periodically check that both wheels are centered in the frame and fork of your EV Warrior™. Be sure the axles are fully seated in the dropouts. See Figure 16 on page 35.

Wheel Removal

This procedure is essential for fixing a flat tire, truing the wheel and adjusting, repairing and maintaining the hubs and free wheel:

- Release the cantilever brakes. See Brake Cable Release on page 30.

Note: There is no need to release the hydraulic disc brake calipers. However, while the rotor is removed, it is recommended that a piece of cardboard or other material be inserted between the pads. In any case, do not squeeze the hydraulic brake lever unless the rotor is in place.

- With a 15-mm wrench, loosen, but do not remove, both axle nuts.
- To remove the rear wheel, shift the rear derailleur so that the chain is on the smallest sprocket (the one farthest away from the hub). Pull the derailleur rearward. Bump the rear tire and push the wheel down and forward until the axle comes out of the frame dropouts.

Wheel Installation (reverse the procedure for removal)

- Rear Wheel Installation: To install the rear wheel, shift the derailleur to the highest gear (sixth). Holding the derailleur body back, put the chain on the smallest sprocket and pull the wheel up and back so that the axle seats fully into both rear dropouts with the axle nuts on the outside of the dropouts. Release the derailleur and make sure that it returns to its normal position, tensioning the chain.
- Snug the axle nuts.
- Set the EV Warrior™ on its wheels.
- Using a 15-mm wrench, tighten the axle nuts fully while ensuring that the axle is seated in the dropouts and the wheel is centered in the frame or fork.
- Reconnect the cantilever brake straddle wire. See Brake Cable Release on page 30.

Re-inspect

Whenever a wheel has been removed and re-installed, be sure to check that the:

- Axle nuts are properly tightened. Riding your EV Warrior™ with improperly tightened axle nuts could allow the wheel to wobble or detach from the bicycle. This could result in damage to the EV Warrior™ and serious injury to the rider.
- Wheel is centered. Spin the wheel to make sure it is centered in the frame or fork and does not rub on the brakes.
- Brakes function correctly. Squeeze the brake lever to ensure the brake has been properly reset and adjusted.

On-road Repair

Broken Spoke(s): Loose or broken spokes will take your wheel out of true, make it weaker and prone to failure, and make riding your EV Warrior™ potentially dangerous. If you break a spoke on one of your wheels during a ride, wrap it around the adjacent spokes to keep it from becoming entangled with the wheel and frame. If it is not so out of true that it rubs on the brakes when you spin the wheel, then you may ride slowly and cautiously. It is not safe to ride your bicycle with only one brake. So, if the wheel rubs on the brake pads, release the straddle cable wire and walk your EV Warrior™.

Service

If your wheel is out of true, or you have any loose or broken spokes, have your wheel serviced by an authorized EV Warrior™ service center. The hub bearings should also be serviced, as necessary, only by an authorized EV Warrior™ service center.

Tires

Inspection

Be sure your tire pressure is always within the range recommended on the sidewall of the tires, and never ride your EV Warrior™ with under- or over-inflated tires. In particular, it is critical to the electric motor transmission that rear tire pressure be at **40 psi**. Use a tire gauge to check the tire pressure. You should also periodically check your tires for cuts, worn tread or sidewalls, or other damage.

Inflation

The EV Warrior™ factory tires for both the EVS and EVX models are rated at **40 psi**. Use a tire gauge to check the tire pressure.

Compressed Air

Be careful if you use a gas station air hose when you inflate your tires because these hoses are not intended for use on bicycle tires and can raise tire pressures quickly. To avoid overinflating your tires with this type of air hose, add air to your tires in short bursts, and check tire pressure between bursts.

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Manual Pumps

Attach and lock the pump to the valve. A frame pump (one that travels with the bicycle) can be steadied by holding the barrel with your fingers and wrapping your thumb around the tire.

Road Repair, Flats

The most common on-road repair is fixing a flat tire.

Follow these steps:

- Deflate the tire by depressing the air valve in the tube stem.
- Release the brake straddle wire on cantilever brakes. See Brake Cable Release on page 30.
- Remove the wheel. See Wheel Removal on page 32.
- Grip one side of the tire at a point opposite the valve stem and remove bead of one side of the tire from the rim by lifting and peeling the bead with both hands.
- If you are unable to remove the bead with your hands, use the tire lever(s). Be careful not to puncture the tube with the tire lever or pinch the tube between the lever and the wheel rim or tire.
- Remove the tube from the tire by gently pushing the valve stem through the wheel rim and then pulling the tube from the tire.
- Thoroughly inspect the tire, inside and out, to locate the cause of the puncture. Remove any and all sharp objects which may have caused the puncture, along with other foreign materials found inside the tire casing.
- Patch the puncture in the tube (see Tube Repair on page 35), or use a spare tube.
- Place the valve stem of the patched or new tube through the hole in the rim and carefully put the tube inside the tire.
- Inflate the tube just enough to provide shape, then carefully position the tube in the tire.
- Starting at the valve stem and working your way around the wheel, seat the bead inside the rim. It is often helpful to put the wheel on edge with the valve at the top and stretch the tire around the rim. This method leaves more tire to slip on at the end. Be sure that you don't pinch the tube between the tire and the rim because this could damage the tube and cause another puncture.
- If you are unable to get the last portion of bead back on the rim with your hands, use a tire lever. Be very careful that you don't puncture or pinch the tube.
- Be sure the tire is completely and uniformly seated on the wheel rim and that no portions of the tube are sticking out under the tire bead.
- Inflate. See Inflation on page 33. While inflating the tire, be sure that the bead remains properly seated on the rim. Slowly inflate the tire to the recommended pressure.
- Replace the valve cap.
- Install the wheel. See Wheel Installation on page 32.
- Replace the cantilever brake straddle wire. See Brake Cable Release on page 30.

Tube Repair

Once you have removed the punctured tube from the tire casing:

- Get out a patch kit, including patches, glue (vulcanizing fluid) and sandpaper or roughing tool.
- Locate the puncture in the tube. If it is not readily apparent, pump some air into the tube and immerse it in water. The bubbles will expose the puncture. If the puncture is too small to see easily, enlarge it with a nail or similar object.
- Clean and dry the spot to be patched. Using the sandpaper or roughing tool, roughen an area around the hole larger than the patch you intend to apply.
- Apply vulcanizing fluid (glue) to an area slightly larger than the patch. Let it set for a few minutes.
- When the glue is tacky, remove the underside backing of the patch (usually paper, fabric or foil) and apply the patch.
- Using a dull metal object, such as a screwdriver, score the patch until the upper backing begins to come off. Remove the remaining plastic backing (if applicable).

Human Propulsion Drivetrain

Your EV Warrior™ is equipped with a Shimano SIS™ indexed rear derailleur designed to provide rapid and precise shifting.

Inspection

Check the rear derailleur for adjustment if shifting becomes slow or difficult, or if you notice any grinding or rubbing noise during or after a shift of gears, or if the chain rubs on the EV Warrior™ or falls off the freewheel during or after a shift. If your chain skips or jumps, the chain or sprocket set may be worn. A squeaking chain indicates lubrication is required.

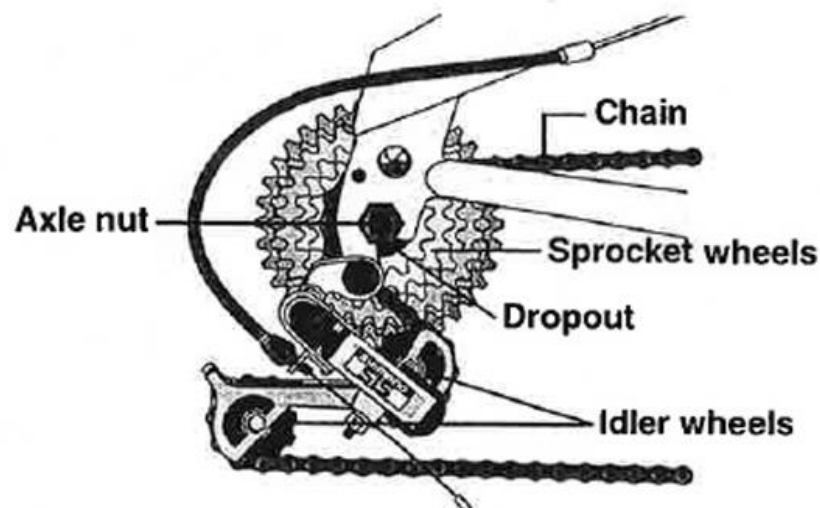


Figure 16
Derailleur, sprockets and chain

36 MAINTENANCE

Lubrication

Clean the chain thoroughly. While turning the pedals by hand backward, apply a good quality bicycle chain oil to each side of each chain link, then wipe the chain with a rag. Apply one drop of oil to each of the derailleur pivot points. Apply a few drops of oil to each of the derailleur idler wheels.

Service

Initial adjustment and occasional readjustment of your indexed rear derailleur must be precise for the derailleur to operate properly, and should be performed by an authorized EV Warrior™ service center. Remember, a clean and properly lubricated chain is essential to good shifting.

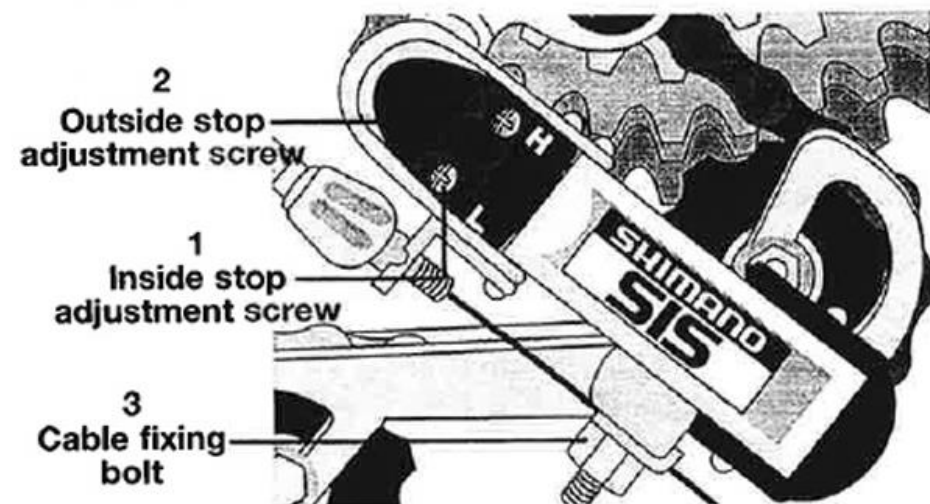


Figure 17
Derailleur adjustments

Adjustments

Inside "L" (low gear) Stop

The inside stop adjustment screw is the lower Phillips head screw (1) on the derailleur body. If the derailleur moves the chain beyond the large sprocket and onto spokes, turn the screw clockwise. If the derailleur cannot move all the way to the large sprocket, then back off the adjustment screw (counterclockwise).

Outside "H" (high gear) Stop

The outside stop adjustment screw is the upper Phillips head screw (2) on the derailleur body. If the derailleur moves the chain beyond the small sprocket and onto the frame, turn the screw clockwise. If the derailleur cannot move all the way to the smallest sprocket, then back off the adjustment screw (counterclockwise).

Cable Adjustment

Loosen the cable fixing bolt (3) on the derailleur body. With the shifter in the highest (smallest) gear, pull the cable taut and tighten the fixing bolt. Make sure you do not move the derailleur cage as you tighten the fixing bolt. For fine adjustment, shift to third or fourth gear and twist the derailleur adjuster barrel in or out until the chain runs quietly in that gear.

Headset

The headset (see Figure 1 on page 2) is the combination of bearings and lock rings in your EV Warrior's™ head tube. The headset allows the fork to turn within the frame and is critical to steering.

Inspection

Check the adjustment of your headset by lifting your bicycle's front wheel off the ground and then turning the front wheel left and right. Any binding or roughness indicates that the headset is too tight. Next, while applying the front brake, slightly rock the EV Warrior™ forward and backward on the ground to detect any play in the bearing.

Service

An improperly adjusted headset will adversely affect the steering of your EV Warrior™ and result in premature bearing wear. Adjustment, cleaning and lubrication of your headset should be performed by an authorized EV Warrior™ service center. These tasks require disassembly and reassembly of the headset, a complicated procedure involving the use of specialized tools.

Crankset, Bottom Bracket and Pedals

Inspection

Should your crankset (see Figure 1 on page 2) be difficult to turn, the bottom bracket cups may be too tight and need adjustment. Any significant play in the crankset or bottom bracket also requires adjustment. To test for play, grasp the pedal end of a crank arm and try to move it sideways. There should be little or no sideways play. If your crankset or pedals click or creak during pedaling, check to be sure the pedals are tight in the crank arms, that the crank bolt attaching the crank arm to the bottom bracket is tight and that all chain ring bolts are tight. Grinding or knocking during pedaling indicates one or more of the following problems: bottom bracket bearings need lubrication, adjustment, or replacement; bottom bracket cups need adjustment; pedal bearings require lubrication or replacement.

Service

Adjustment of your pedals, crankset and bottom bracket requires specialized tools and knowledge, and should be performed by an authorized EV Warrior™ service center.

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Cables

Your EV Warrior™ gearshifting system and cantilever brakes use steel cables as an integral part of their design. These cables are subject to wear and require simple but regular maintenance to ensure proper function and to avoid premature wear.

Inspection

Regularly inspect all cables for sticking, rusting, fraying or breakage.

Lubrication

Place a drop or two of light oil at each end of the cable housings.

Service

Have any frayed or broken cable replaced immediately by an authorized EV Warrior™ service center.

Handlebars

Make sure handlebars, stem and steerer tube are securely fastened together. Make sure grips are on securely and cover the ends of the handlebars. The ends of the handlebars can cause injury during a fall if they are not covered by the grips!

Propulsion Unit

The propulsion unit consists of an electronic controller, two 12-volt batteries, and two 24-volt electric motors powering a driveshaft with an aluminum roller wheel. All are contained within the housing on the rear of your EV Warrior™. When you apply power, the torque of the electric motors creates centrifugal force and swings the roller onto the rear tire, driving the bicycle forward. If, in the normal drive mode, the electric motor drive wheel slips on the tire or puts an abnormal amount of drag on the rear tire, the drive wheel pivot point may need adjusting. However, before taking your EV Warrior™ in for adjustment, **check the air pressure in your tires (40 psi)**. All service, maintenance and repair of any parts or components of the propulsion unit must be performed by an authorized EV Warrior™ service center. Any repair or service of the propulsion unit by other than an authorized EV Warrior™ service center will void the warranty on your EV Warrior™.

Headlamp/Front Console

Your EV Warrior™ is equipped with a console mounted in the center of the handlebars which contains a headlight, horn, cycle computer, energy use gauge and battery charge meter. Only the headlamp beam angle adjustment and computer battery replacement are owner serviceable.

Beam angle adjustment

Loosen, but do not remove, the two front screws (1) holding the console halves together. Move the tab (2) on the bottom of the dual beam integral headlamp assembly forward to raise the beam angle or backward to lower the beam angle.

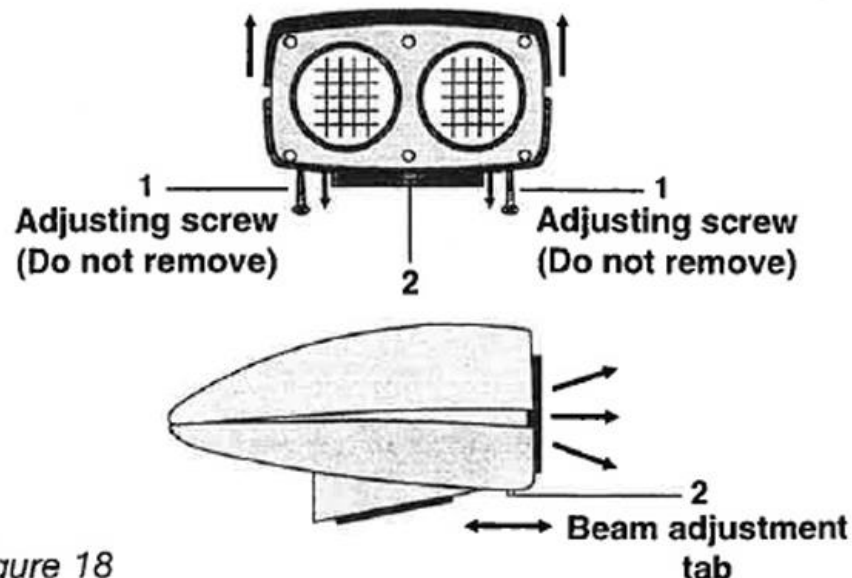


Figure 18
Headlamp beam adjustment

Computer battery

To replace the computer battery, slide a thin flat object between the headlight housing and the front of the computer mounting plate and pop the plate out. See Figure 5 on page 9. Be careful not to pull out the computer wire. Remove the computer from its own bracket by pushing it forward while pushing down the release lever at the back of the unit.

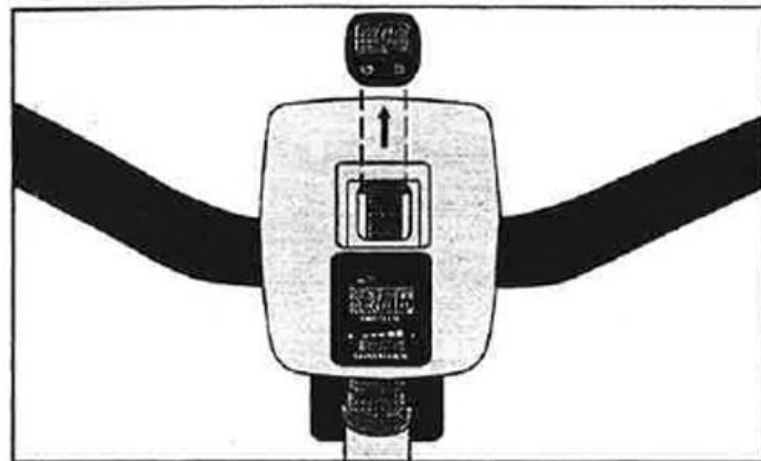


Figure 19
Computer installation/removal

Turn the computer over, remove the battery case cover with a coin and insert a new lithium battery (CR2032) with the (+) pole upward. Then close the cover securely. Slide the computer onto the bracket until it clicks into position. Carefully replace the computer wire and snap the computer mounting plate into the console. See Figure 5 on page 9.

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Lights

There are no user serviceable lights. All lights must be replaced only by your authorized EV Warrior™ service center.

- **Headlight bulb.** The headlight employs dual quartz halogen bulbs that meet Federal Motor Vehicle Safety Standards. They are designed so one bulb will stay lit even if the other burns out.
- **Stop light/taillight assembly.** The light assembly employs new, efficient light emitting diodes (LED). These high tech lights have a long life expectancy, so they will probably not have to be replaced within the life of the bicycle. However, if they do burn out, they should be replaced only by an authorized EV Warrior™ service center.
- **License plate light.** The license plate light is activated by the headlight switch and uses long-life incandescent bulbs.

Mirrors

Make sure mirrors are clean and properly adjusted before each ride.

Reflectors

Make sure the reflectors are clean, unobstructed and fixed securely to the EV Warrior™ (see Figure 1 on page 2 for reflector locations).

Battery Charger

Do not disassemble the battery charger. Take it to an authorized EV Warrior™ service center when repair is required. Incorrect reassembly may result in a risk of electric shock or fire. Store the charger in a safe, dry location and maintain it in perfect condition. Have a damaged cord or plug replaced immediately. Never alter the charger's original AC cord plug.

Electric Bicycle Company recommends that all assembly, maintenance, tuning and repair of your EV Warrior™ be performed by an authorized EV Warrior™ service center and that you regularly visit your dealer for tune-ups and safety checks. Your EV Warrior™ is designed to provide extended periods of reliable operation. In order to achieve the best performance from your EV Warrior™, it is essential you follow the maintenance schedule in this section.

Service Record and Warranty

The terms of EBC's warranty require the vehicle be serviced by an authorized EV Warrior™ service center according to the schedule (see Service table on page 42). For repairs made under the warranty, your authorized EV Warrior™ service center will need to see the records section of this manual to ensure the schedule has been followed.

Please also fill in the Owner and Bicycle Identification form on the inside back cover because this information may be required if any repair is necessary during the warranty period.

Pre-Delivery Service

Before you receive your EV Warrior™, your authorized dealer will perform a pre-delivery service. See Service table on page 42.

Initial Service

After you have ridden your new EV Warrior™ several times, the derailleur and brake cables and the spokes may stretch and develop slack, and various nuts, bolts and screws may loosen. After the first few rides, or 90 days, it is suggested you visit your EV Warrior™ service center for a tune-up and/or inspection.

Standard Service

Standard service is recommended every six months.

Major Service

Major service is recommended every two years.

Component	Pre-Delivery	Initial Service (90 Days)	Standard Service (Every 6 months)	Major Service (Every 2 years)
Brakes	X	X	X	X
Wheels	X	X	X	X
Tires	X	R	R	
Tubes	X	R	R	
Shifter	X	X	X	X
Headset	X	X		
Bottom bracket, Crankset and Pedals	X	X		
Cables	X	X	X	R
Controls and Displays	X	R	R	
Computer battery	X	R	R	
Propulsion unit	X	X	X	
Batteries	X	X		
Charger	X	X		
Lamp bulbs	X	R	R	
X = Service				
R = Repair or Replace as needed				

Figure 20
Service table

Transporting Your EV Warrior™

DO NOT LIFT THE BICYCLE BY THE MOTOR HOUSING/TAILLAMP ASSEMBLY

Because of the weight and the high center of gravity of your EV Warrior's™ propulsion unit, do not transport your EV Warrior™ on a standard bicycle car rack. A specially designed EV Warrior™ rack can be mounted to virtually any car, truck or van through the attachment of a trailer square hitch receiver. Ask your authorized EV Warrior™ dealer for more information.

Storage and Security

- Store your EV Warrior™ indoors whenever possible.
- Lock your EV Warrior™ through the frame and to a stationary object.
- To use your cable lock, simultaneously pull out both cable ends.
- Make sure the cable or lock cannot be removed by lifting it off the object.
- Close the lock and rotate the tumblers.
- The type of security you employ to secure your EV Warrior™ should be appropriate for the location, time of day and length of time you leave it.
- The first line of defense against theft should be your electronic security system (optional); see page 17.

It will prevent someone from taking your EV Warrior™ by using electric power.

- For medium security situations, the cable lock (1) supplied with your EV Warrior™ will provide a short-term deterrent.
- For higher security situations, a heavier "U" type lock is recommended. If you are using your EV Warrior™ to commute to work or other regular destination, find an indoor storage location such as a closet or bicycle locker. If you park in a parking structure, make sure the EV Warrior™ is in full view of the parking attendant or in an area with plenty of foot traffic.

At home, even if you keep the EV Warrior™ in your garage, lock it. Bicycles are sometimes stolen right out of the owner's garage.

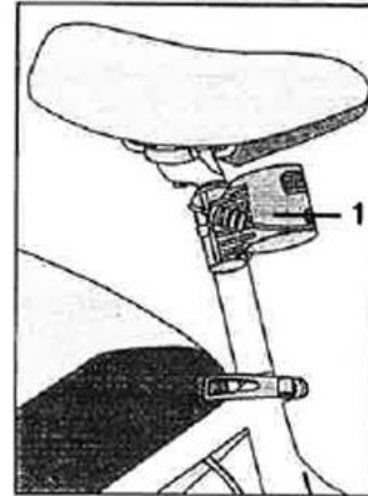


Figure 21
Cable lock

44 SPECIFICATIONS

Model EVS

- Frame style: EV Warrior™ single-slash oval main tube; single chainstay
- Frame material: Full chromium molybdenum steel tubing
- Frame measurements: Size, 43 cm (17 in.); length, 180 cm (71 in.); wheelbase, 117.6 cm (44 in.); head tube angle, 68 degrees; seat tube angle, 70 degrees; chain stay length, 46 cm (18 in.)
- Fork: "H" type, straight blades, slightly tapered, offset: 35 mm
- Tires: 26 x 2.125; inflate to 40 psi
- Motors: Dual 24-volt, 900-watt DC
- Batteries: Dual 12-volt, 17-amp, sealed lead acid
- 5-amp charger
- Electric propulsion system: Friction drive through a knurled aluminum drive wheel with a one-way roller clutch against the rear tire
- Rear motor housing and center console material: ABS plastic
- Headlights: Dual quartz halogen integral beam
- Taillight and stoplamp: Energy-efficient light emitting diode (LED)
- Cable lock

- Computer
- Energy use gauge
- Battery charge gauge
- "Premier Collector Edition" graphics

EVS Options

The following upgrade options are available for the EVS model:

- Hydraulic front disc brake
- Rearview mirror LED signal system (includes right-hand rearview mirror)
- Electronic security system

Model EVX

Includes all EVS specifications and features plus all EVS factory options

EV WarriorWear™ and EV WarriorWare™

Ask your authorized EV Warrior™ dealer about upcoming EV WarriorWare™ (accessories) and EV WarriorWear™ (clothing).

All specifications are subject to change without notice.

Your EV Warrior™ by EBC is warranted to be free from defective materials or workmanship for a period of one year from the date of purchase from an authorized EV Warrior™ dealer. During the term of this warranty, the Electric Bicycle Company will adjust, repair or replace, at its sole option, all parts or components found by the Electric Bicycle Company to be defective.

This warranty does not cover tires, brake pads or other parts that have deteriorated through normal wear and tear. EBC makes no other warranties, written or oral, expressed or implied, including warranties of merchantability.

In order to make a claim under this warranty, the owner of the EV Warrior™ must deliver the bicycle to an authorized EV Warrior™ service center together with proof of purchase and initial purchase date. Identify your EV Warrior™ by its frame serial number, located underneath the bottom bracket, and its Vehicle Identification Number on the Manufacturer's Certification Label located at the front of the frame tube on the right side.

This warranty does not apply to damage to the bicycle or any of its parts resulting from operation of your EV Warrior™ off road, from other unintended use, or from abuse, improper or inadequate maintenance or servicing, modification, or accidents.

46 MAINTENANCE LOG

TYPE OF SERVICE	DATE	SERVICING DEALER	NOTES
Initial Service			
Standard Service			
Standard Service			
Standard Service			
Standard Service			
Major Service			
Standard Service			
Standard Service			
Standard Service			
Standard Service			
Standard Service			
Major Service			



We Move People™

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