



LEGACY EV

OWNER'S MANUAL

EZ KRUISER RAPTOR



Manufactured and warranted by **Legacy EV, LLC** · Please read this manual thoroughly before operating your vehicle.

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Page numbers reflect this edition of the manual and may shift slightly between print runs.

i Need help? For the fastest, most efficient response, always contact your **certified EZ Cruiser dealer** first — they know your vehicle, your configuration, and your local service options best. For warranty documentation or general questions, Legacy EV, LLC customer care can be reached at **warranty.ezkruiser@gmail.com**.

Introduction

Thank you for purchasing an EZ Kruiser Raptor, manufactured by **Legacy EV, LLC**. This manual has been prepared to help you safely and confidently operate, maintain, and care for your vehicle. Please read it thoroughly before your first drive, and keep it in the vehicle for future reference.

Your Raptor is designed for use on golf courses, resorts, private communities, campuses, and other low-speed environments approved by local authorities. Always confirm local regulations before operating your vehicle on public roads.

 Legacy EV, LLC continually improves its vehicles and reserves the right to change specifications, equipment, and this manual without prior notice. If any information in this manual conflicts with your specific vehicle configuration, contact your authorized EZ Kruiser dealer for clarification.

How to Use This Manual

Safety information is marked with three signal words, used consistently throughout this manual:

 **DANGER**

Indicates a hazard that **WILL** result in death or serious injury if not avoided.

 **WARNING**

Indicates a hazard that **COULD** result in death or serious injury if not avoided.

 **CAUTION**

Indicates a hazard that could result in minor or moderate injury, or damage to the vehicle.

READ BEFORE YOU DRIVE

Safety Practices

Your EZ Kruiser Raptor is intended for use on golf courses, resort and residential communities, campuses, and other areas where local authorities permit low-speed vehicle operation. It is **not** intended for use as an off-road or all-terrain vehicle unless specifically equipped and approved for that purpose.

⚠ WARNING

Do not exceed the rated passenger and cargo capacity of your vehicle. Overloading affects handling, braking, and stability, and can cause loss of control.

- ◆ The vehicle must only be operated, serviced, or repaired by individuals who have read and understood this manual.
- ◆ The driver must be at least 16 years old and hold a valid driver's license, unless local law establishes a different minimum age.
- ◆ Only drive on roads, paths, and areas approved and licensed for low-speed vehicle use by your local municipality.
- ◆ Do not operate the vehicle on grades steeper than **20% (approximately 11.3°)**. Reduce speed before descending any slope and never coast downhill in Neutral.
- ◆ All occupants must remain seated with seat belts fastened whenever the vehicle is in motion. Children must be seated in the center position under adult supervision and are never permitted to ride standing or on laps.
- ◆ Keep hands, arms, and legs inside the vehicle at all times while driving.
- ◆ Never modify the vehicle's speed controller, braking system, steering, or electrical system. Unauthorized modification voids your warranty and can create a serious safety hazard.

◆ SAFETY INSTRUCTION PICTOGRAMS

 Do not disassemble, repair, or modify battery, motor, or controller components without factory authorization.	 Do not expose the vehicle or battery to open flame or submerge in water.	 Do not short-circuit battery terminals with tools, jewelry, or conductive material.
 Keep the vehicle and battery away from flammable and combustible materials.	 High-voltage components can cause serious shock — service by qualified technicians only.	 Dispose of batteries and worn components through an approved recycling center — never in household trash.

◆ ENVIRONMENTAL PROTECTION

Batteries, electronic components, tires, and fluids must be disposed of in accordance with local environmental regulations. Contact your EZ Kruiser dealer or a state-approved recycling facility for proper disposal of any vehicle component at end of life.

Blue Speed Battery

Your EZ Kruiser Raptor is equipped with a **Blue Speed lithium (LiFePO4) battery pack**, engineered for long service life, consistent power delivery, and low maintenance compared to traditional lead-acid batteries. Please read this section carefully — lithium batteries are cared for differently than lead-acid batteries, and following these instructions will maximize the life and safety of your pack.

 WARNING

Use only the charger supplied with your vehicle or a Legacy EV-approved replacement. Using an unapproved charger can damage the battery, create a fire hazard, and will void your warranty.

 BATTERY SPECIFICATIONS

Chemistry	Lithium Iron Phosphate (LiFePO4) — Blue Speed, Model 4232T-48V105Ah
Cell Configuration	16S1P (16 cells in series)
Nominal Voltage	51.2V (marketed as a 48V-class pack)
Nominal Capacity	105 Ah
Standard Charge Current	25A (50A max continuous)
Full Charge Voltage	58.4V
Discharge Cutoff Voltage	40.0V
Max Continuous Discharge	100A (300A peak, 10 sec)
Cycle Life	4,000 cycles to 80% SOH at 25°C · 2,000 cycles to 80% SOH at 45°C
Pack Dimensions (L×W×H)	490 × 345 × 246.5 mm (19.3" × 13.6" × 9.7")
Weight	49 kg (108 lb)
Ingress Protection	IP67 (dust-tight, water-resistant)
Charging Temperature Range	14°F to 131°F (−10°C to 55°C)
Discharging Temperature Range	−4°F to 131°F (−20°C to 55°C)
Recommended Operating Temperature	59°F to 95°F (15°C to 35°C)

Every Blue Speed battery pack is factory-tested to withstand short-circuit, overcharge, over-discharge, thermal shock, crush, drop, and temperature-cycling tests without fire, explosion, or leakage, per the manufacturer's published specification.

 USE & CARE

- ◆ Charge the battery after each use, regardless of how much charge remains. Unlike lead-acid batteries, lithium packs do not need to be run down before recharging and have no "memory effect."
- ◆ Recommended state-of-charge operating range is 5-95%. If the battery becomes fully discharged, recharge it within 24 hours — leaving it fully depleted for longer can permanently damage the pack.
- ◆ Charge only within the rated temperature range of 14°F to 131°F (−10°C to 55°C), in a dry, ventilated area away from direct sunlight and heat sources.
- ◆ Do not charge for more than 12 continuous hours. Overcharging beyond the recommended time can affect battery life and create a safety risk, even with the protective BMS in place.
- ◆ Do not attempt to open, puncture, crush, or disassemble the battery pack (rated IP67). There are no user-serviceable parts inside.
- ◆ The Blue Speed Battery Management System (BMS) automatically balances individual cells and protects against overcharge, over-discharge, short circuit, and over-temperature — no manual "equalizing charge" or watering is required or possible with this battery.
- ◆ If the vehicle will be stored for an extended period, charge the battery to approximately 30-70% state of charge before storage and check the charge level every 3 months, topping off as needed. Storing the pack fully empty or fully charged for long periods causes irreversible capacity loss.
- ◆ Your Blue Speed battery includes an onboard SOC display and Bluetooth app connectivity, allowing you to monitor charge level, voltage, and diagnostic alerts from your phone.

If the vehicle won't power on after sitting in storage, check the battery charge level first: the BMS automatically shuts the pack down after 15 days of inactivity above 20% charge, or after just 3 days of inactivity below 20% charge, to protect the cells.

 CAUTION

Do not use lead-acid battery maintenance practices — including specific-gravity testing, watering, or equalizing charges — on your Blue Speed lithium pack. These procedures do not apply to lithium chemistry and can damage the battery or void your warranty.

◆ CHARGING INSTRUCTIONS

- 1 Park the vehicle, turn the power switch to OFF, and set the gear switch to Park/Neutral.
- 2 Confirm the battery is powered on (see *Battery Power Switch* below) — the charger cannot communicate with the battery management system (BMS) if the battery itself is switched off.
- 3 Connect the charger's output plug to the charging port on the vehicle, then plug the charger into a grounded AC outlet.
- 4 The charger and BMS handshake automatically over CAN bus before charging begins. Standard charge current is 25A (up to 50A max), tapering as the pack approaches full charge at 58.4V.
- 5 Check the battery's SOC display or connected app to confirm charging progress and completion (see *Battery Status Indicator* below). Do not leave the battery on the charger for more than 12 continuous hours.
- 6 Disconnect the charger from the wall outlet first, then disconnect it from the vehicle.

◆ BATTERY POWER SWITCH

The battery pack has its own power switch, independent of the vehicle's dashboard start button. It's located on the battery box, just below the positive (red) battery connection cable. Press and hold for approximately 1 second to power the battery on, and press and hold for approximately 3 seconds to power it off. The battery must be switched on before the vehicle can precharge and start, and before it will accept a charge.

⚠ WARNING

Always power off the battery before connecting or disconnecting the positive and negative terminals. Connecting a live battery to a load can cause sparking, which may damage the battery, controller, or vehicle wiring.

◆ BATTERY STATUS INDICATOR

The battery's onboard SOC (state of charge) display uses color to show remaining charge at a glance:

INDICATOR COLOR	STATE OF CHARGE
● Green	Above 50%
● Yellow	20% - 50%
● Red	Below 20% — recharge as soon as possible

◆ COLD WEATHER USE

Lithium battery performance and available range are reduced in cold temperatures. The Blue Speed pack will not accept a charge below 14°F (−10°C) and should not be discharged below −4°F (−20°C). Whenever possible, store and charge the vehicle in a temperature-controlled space between 59°F and 95°F (15°C-35°C) for best performance and battery life.

Charger LED Display

LED INDICATOR	MEANING
 Red LED Flashing	Charging in progress
 Solid Green LED	Charge complete
 Red & Green Flashing in Sequence	Charger fault — disconnect and contact your EZ Kruiser dealer

◆ HOW TO USE THE CHARGER

 **WARNING**

To reduce the risk of electric shock, make sure the charger plug and cord are undamaged before every use. The power cord has a grounded plug — never remove, cut, or bend the ground post.

- 1

Inspect the charger cord for cuts, cracks, or damage before each use.
- 2

Plug the charge handle fully into the vehicle's charging receptacle.
- 3

Plug the AC power cord completely into a grounded wall outlet.
- 4

The charger will begin automatically within a few seconds of being connected.
- 5

The charger will stop automatically once the battery reaches a full charge.
- 6

Remove the AC charge cord before operating the vehicle.

◆

Make sure the vehicle's power switch is OFF before connecting the charger — the vehicle will not charge while powered on.

◆

Charge in a safe, dry environment away from extreme heat, open flame, and standing water.

◆

Use only the charger that came with your vehicle, or a Legacy EV-approved replacement matched to your model. Contact your certified EZ Kruiser dealer to obtain or replace charging equipment.

◆

Keep a fire extinguisher rated for electrical and lithium battery fires in the area where you store or charge your vehicle.

◆ CHARGER MAINTENANCE

 **WARNING**

If the plug pins are bent, contact your EZ Kruiser dealer for replacement. Do not attempt to repair the AC cord, plug, or pins yourself.

Electrical Cords

Examine the charger's electrical cord for wear before every use. Replace the cord immediately if you notice any of the following:

Plugs & Receptacles

Examine electrical plugs and receptacles for wear before every use. Replace immediately if you notice any of the following:

CORD WEAR CONDITION	PLUG/RECEPTACLE WEAR CONDITION
Cracks	Bent pins
Cuts	Corrosion
Frayed wiring	Cracks
Insulation damage	Loose connections
Loose connections	Missing pins
Spliced sections	

Cleaning the Electrical Plugs & Receptacles

- ◆

Disconnect the AC cord from the power source.
- ◆

Disconnect the AC cord from the battery charger.
- ◆

Disconnect the DC cord from the vehicle's charging receptacle.
- ◆

Apply an electrical contact cleaner to the plugs and receptacles per the cleaner manufacturer's instructions.
- ◆

Wipe clean, then apply a light electrical-grade lubricant to the plugs and receptacles.

Technical Parameters

The EZ Kruiser Raptor is available in four configurations. All share the same Blue Speed lithium battery, KDS drive motor, and core safety systems; length, seating, and controller amperage vary by model as shown below.

MODEL	RAPTOR H-4F	RAPTOR B-6	RAPTOR B-4	RAPTOR B-4F
Seating	4-Passenger	6-Passenger	4-Passenger	4-Passenger
Length	123"	129"	119"	123"
Width	51"	51"	51"	51"
Height (Lifted)	81"	79"	81"	81"
Height (Non-Lifted)	76.5"	77"	76.5"	76.5"
Tire Size (Lifted)	23x10-14	23x10-14	23x10-14	23x10-14
Tire Size (Non-Lifted)	215/35-14	215/35-14	215/35-14	215/35-14
Min. Ground Clearance	6.25"	6.25"	6.25"	6.25"
Max Speed*	25 mph	25 mph	25 mph	25 mph
Max Grade	20% (approximately 11.3°)			
Controller	350 Amp	350 Amp	350 Amp	350 Amp
Motor	KDS, 5 kW	KDS, 5 kW	KDS, 5 kW	KDS, 5 kW
Battery	Blue Speed Lithium (LiFePO4), 105 Ah, 51.2V nominal (48V-class)			
Charger	Onboard, 51.2V, 25A standard / 50A max	AC, 100-250V input	Onboard, 51.2V	AC, 100-250V input
Brakes	Hydraulic 4-wheel disc, automatic electromagnetic parking brake			
Front Suspension	Dual independent front suspension			
Seat Belts	3-point	3-point	2-point	3-point

*25 mph top speed is available only on units programmed and titled as a state-approved Low Speed Vehicle (LSV). Standard golf cart programming is limited to 19 mph.

Shared Standard Features

- ◆ Electric power steering

◆ Self-canceling turn signals

◆ Adjustable steering wheel
- ◆ Locking / flip-down rear trunk

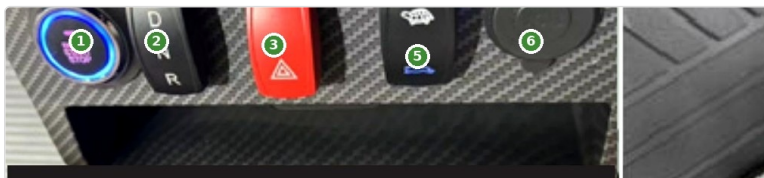
◆ Adjustable armrests

Control Mechanism

◆ DASHBOARD OVERVIEW



- 1 One-Click Start
- 7 Multimedia Display
- 2 Forward / Backward Switch
- 8 Lights / Turn Signals
- 3 Hazard Alarm Switch
- 9 Steering Wheel
- 4 Speed Display
- 10 Adjustable Steering Column
- 5 USB Interface
- 11 Storage Box
- 6 Wireless Charging Station



Push-Button Starter & Switch Cluster



Accelerator (GO) & Brake (STOP) Pedals

◆ POWER SWITCH

The power switch has three positions: **RUN**, **OFF**, and **EMB** (Electromagnetic Brake release, used only for towing — see *Maintenance & Repair*). Press and hold the One-Click Start button for approximately 3 seconds to power the vehicle on; press and hold again to power off.

◆ GEAR SWITCH

The Forward/Backward switch is mounted on the steering column. Move it to select Forward (D), Neutral (N), or Reverse (R). A reverse warning buzzer sounds automatically whenever Reverse is selected. Always bring the vehicle to a complete stop before changing direction.

◆ STEERING WHEEL & COMBINATION SWITCH

The combination switch, mounted on the steering column, controls turn signals, low-beam and high-beam headlights, and the horn. The steering column is adjustable — loosen the adjustment lever, set your preferred position, and re-tighten before driving.

LCD Screen Display



1 Menu / Apps **2** Volume Up **3** Instrument Screen **4** Volume Down **5** Back

◆ BLUETOOTH PAIRING

- 1 From the Home Screen, tap the Bluetooth icon to open the pairing menu.
- 2 On your phone, open Bluetooth settings and select the vehicle's display unit from the list of available devices.
- 3 Confirm the pairing code on both screens if prompted.
- 4 Once paired, use the touchscreen to make and receive calls or stream audio. The unit will reconnect automatically to previously paired phones when within range.

Exact menu names and steps may vary slightly by infotainment software version. If your unit differs from the steps above, consult the quick-start card included with your touchscreen or contact your dealer.

Operating Procedures

◆ PRE-OPERATION INSPECTION

Before each use, confirm the following:

- ◆ Tires are properly inflated and free of visible damage.
- ◆ Brake pedal engages firmly with no unusual sponginess.
- ◆ Headlights, taillights, turn signals, and hazard flashers all function.
- ◆ Seat belts are in good condition and function properly for all occupants.
- ◆ Battery charge level is sufficient for your planned trip.
- ◆ No unusual noises, fluid leaks, or warning lights are present.

◆ POWER-ON PROCEDURE

- 1 Sit in the driver's seat and fasten your seat belt.
- 2 Confirm the gear switch is in Neutral or Park.
- 3 Press and hold the One-Click Start button for approximately 3 seconds until the display illuminates and reads "READY."
- 4 Select Forward or Reverse, check your surroundings, and release the parking brake before proceeding.

◆ POWER-OFF PROCEDURE

- 1 Bring the vehicle to a complete stop and apply the parking brake.
- 2 Move the gear switch to Neutral or Park.
- 3 Press and hold the One-Click Start button for approximately 3 seconds to power off.

◆ ACCELERATOR & BRAKE PEDALS

Depress the accelerator (GO) pedal smoothly to increase speed — avoid abrupt, full-throttle starts. Depress the brake (STOP) pedal firmly and progressively to slow or stop the vehicle. Never rest your foot on the accelerator while braking.

◆ TURN SIGNAL & LIGHTING SWITCH

Move the combination switch up or down to signal a turn; the switch self-cancels or can be manually returned to center after completing the turn. Rotate the switch collar to select parking lights, low beams, or high beams as needed.

Maintenance & Repair

 WARNING

Always disconnect the battery's positive and negative cables before performing any service on the electrical, motor, or controller systems.

◆ **TRACTION MOTOR**

- ◆ Operate the vehicle only within the motor's nominal working voltage range — never idle the motor or short-circuit its terminals.
- ◆ Keep the motor housing free of debris and buildup to maintain proper heat dissipation.
- ◆ Inspect motor carbon brushes (if equipped) every 3 months.

SYMPTOM	POSSIBLE CAUSE
Abnormal noise	Bearing damage
Vibration	Bearing gap out of tolerance
Motor won't turn, but a sound is present	Power supply failure
No rotation, unusual sound	Overload or seized bearing
Overheating	Excess voltage or sustained overload
Bearing overheating	Bent or damaged shaft

◆ **ELECTRONIC CONTROL GEAR (CONTROLLER)**

The controller uses MOSFET-based switching and includes High Pedal Disengagement (HPD) protection, which blocks motor output if the accelerator is depressed more than 20% at startup, as well as self-diagnosis and automatic thermal shutdown protection.

Every 3 months, inspect: contactor contacts, accelerator microswitch, direction switch, and all motor/battery/controller connections for tightness and cleanliness. Always discharge the filter capacitor before servicing the controller. Never clean the controller with a direct water spray — use a soft brush or compressed air only.

SYMPTOM	POSSIBLE CAUSES
Vehicle will not start	No signal to controller · loose connection · damaged motor/controller · incorrect motor encoder phase sequence · controller in thermal protection · electromagnetic brake locked
Moves in one direction only	Damaged direction switch · loose/damaged reverse contactor (CVT models)
Maximum speed reduced	Low battery charge · parking brake not released · worn brake shoes · faulty accelerator pedal · faulty controller · excessive load · controller in thermal protection

◆ **BRAKES**

Pedal free travel should not exceed two-thirds of total pedal stroke. Inspect brake shoes regularly and replace when worn; lubricate the brake hub bearing per the maintenance schedule.

◆ **LUBRICATION**

Brake Fluid	DOT 3
Grease Points	Steering gearbox, tie rods, steering knuckles, wheel bearings

◆ **RUNNING-IN (BREAK-IN) PERIOD**

The break-in period is the first 1 month or 621 miles (1,000 km), whichever comes first. Before break-in, verify fluid levels and tire pressure. Operate only on approved, licensed roads, and inspect/tighten fasteners at the end of the break-in period.

- ◆ Check rear powertrain grease every 3 months.
- ◆ Check brake shoe wear every 3 months.
- ◆ Check electrical fastenings monthly.
- ◆ Verify fuse ratings match specification before replacement.
- ◆ Disconnect the battery's positive and negative cables before any service work.
- ◆ Avoid abrupt, full-throttle acceleration.
- ◆ Do not descend hills at high speed; slow down before entering turns.
- ◆ Passengers should use handrails at all times; children must be seated in the center position and supervised at all times.

Fuse Location

The fuse box is located on the left side of the vehicle and contains six DC-system fuses and six AC-system fuses. A single bayonet-style main fuse is located on the lower controller mounting plate beneath the rear seat.

Maintenance Schedule

Follow this schedule to keep your EZ Kruiser Raptor operating safely and reliably. A qualified technician should perform a road test after any maintenance service.

ITEM	DAILY	WEEKLY	MONTHLY	QUARTERLY
Battery: charge after use	✓			
Battery: check charge level via BMS/app or dash indicator	✓			
Battery: cover during charging	✓			
Battery: wipe surface / check terminal tightness		✓		
Charger: observe operation, check for socket heating	✓			
Charger: remove dust from housing/vents		✓		
Controller/motor connections: tightness & cleanliness				✓
Accelerator pedal: flex & return-to-idle check				✓
Brake shoes / friction material wear				✓
Brake hoses/lines & fluid level			✓	
Tire tread, pressure & lug nut torque			✓	
Shock absorbers: leaks/noise				✓
Drive shaft/axle fastener check				✓
Rear axle gear oil change	Every 1,000 miles — oil type/grade is listed on the sticker affixed to the rear axle			
Front/rear suspension & toe-in check				✓
Body, seats, motor & controller cleaning			✓	

IF SOMETHING GOES WRONG

Emergency Handling

⚠️ WARNING — BATTERY FIRE

Lithium battery fires burn hot and can reignite. Do not use water to extinguish a lithium battery fire.

- 1 Immediately move away from the vehicle to a safe distance and call your local fire department / emergency services.
- 2 If the fire is confined to the wiring harness (not the battery itself) and it is safe to do so, a CO2 or dry chemical extinguisher may be used.
- 3 If the battery pack itself is involved, do not attempt to extinguish it — lithium battery fires are best managed by trained emergency responders with appropriate equipment. Keep bystanders clear and let the fire department handle suppression and cooling.
- 4 If you suspect smoke inhalation, seek medical attention immediately.
- 5 Afterward, notify your EZ Kruiser dealer for inspection before the vehicle is used again.

If a fire results from a charging fault, disconnect power at the wall outlet immediately if it is safe to do so, rather than disconnecting at the vehicle.

OFF-SEASON CARE

Storage & Transportation

◆ STORAGE

When the vehicle will not be used for an extended period, store it in a cool, dry, and ventilated space, protected from direct sun, rain, and dust. Charge the Blue Speed battery to approximately 50-80% before storage and check the charge level every 60 days, topping off as needed.

◆ TRANSPORTATION & TOWING

Set the power switch to the **EMB** position to release the electromagnetic parking brake before towing or transporting the vehicle on a trailer. Secure the vehicle with proper tie-downs at the frame, not the suspension components, before transport.

WEAR ITEMS

Braking Components

Rear Axle Gear Oil	Replace every 1,000 miles — see the oil-type sticker on the rear axle
Brake Fluid	Replace every 2 years
Brake Discs	Replace if unevenly worn
Brake Calipers	Repair or replace if loose, shaky, sticking, or failing to retract
Brake Pads	Replace at 2-3 mm remaining thickness
Brake Hoses	Replace if cracked or damaged
Ball Joints	No routine maintenance; replace if noisy
Shock Absorbers	No lubrication; replace only if a visible oil leak is present

For additional detail, refer to your EZ Kruiser Warranty and Maintenance documentation, or contact your authorized dealer.

WE STAND BEHIND IT

After-Sales Service & Warranty

Thank you for choosing an EZ Cruiser Raptor. In addition to your vehicle, you have access to technical support and service from Legacy EV, LLC and our authorized dealer network. For the fastest, most efficient help with service, maintenance, or parts, always contact your **certified EZ Cruiser dealer** first — they know your vehicle and can resolve most issues directly.

i Full warranty terms are provided in a separate document, the **Limited 1-Year Warranty for EZ Cruiser Electric Vehicles**, which covers all provisions, exclusions, and conditions pertaining to your purchase. Keep a copy with this manual.

◆ PREMIUM DETAILS



Illuminated Grille Badge



Center Console Storage



Cupholder & Armrest



Premium Stitched Seating

Legacy EV, LLC · EZ Cruiser Raptor Owner's Manual · Please retain this manual with your vehicle.