



Owner's Manual for
Beast 48 & Beast 48 LE
Personal Electric Transportation

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General Safety 1

Improper use and ignoring maintenance can result in serious injury, damage, and decreased performance. It's important to read, understand, and follow the owner's manual and safety warning labels before the first use. Pay particularly close attention to the CAUTIONS, WARNINGS and DANGERS in this manual, which emphasize information related operator, passenger, bystander and property safety.

DANGER!

Hazardous Situation.

Failure to avoid will result in severe injury or death of the occupants, bystanders, or person repairing the vehicle.

WARNING!

Hazardous Situation.

Failure to avoid could result in severe injury or death of the occupants, bystanders, or person repairing the vehicle.

CAUTION!

Hazardous Situation.

Failure to avoid could result in minor to moderate injury and damage to the vehicle or the surroundings.

NOTE

Important information and best practices not related injury or damage.

Every vehicle can be used in a manner and for tasks beyond their original intended purpose making it impossible to anticipate and warn against every possible combination of circumstances and conditions that may be encountered.

Common sense and safe driving practices are the best defense against accidents and injuries.

Warranty Claims, Parts, & Customer Assistance

If you have questions about this vehicle, need to file a warranty claim or order replacement parts, please call 844-MD Carts (844) 632-2787, Monday - Friday from 9 am to 5 pm EST to speak with a factory trained customer support representative. When you call, please be prepared to provide the date of purchase, vehicle model, serial number, and manufacture date code.

Serial Number Plate Location

To locate the serial number and manufacture date code plates, raise the seat and lift the flap on the access panel on the chassis between the seat back supports .

2 Batteries & Charger

NOTE

The instructions in this manual are specific to the batteries and charger supplied with this vehicle.
Instructions vary by manufacturer. If batteries are replaced or if a different charger is used, read and follow the instructions and recommendations provided by the manufacturer of those items.

Understanding the Batteries & Charger

Charging Times and Battery Life

Charging times and battery life are difficult to predict because they vary depending upon a number of factors including use, driving conditions, driving habits, ambient temperature, discharge rate, age, maintenance, and condition.

Improving Battery Performance

Batteries must be fully charged before using the vehicle for the first time.

Always complete the charging cycle before disconnecting the charger from the vehicle.

To improve battery life, keep the batteries fully charged and avoid discharging the batteries below 70% whenever possible.

Use your vehicle often and recharge the batteries after each use, whether it was just a few minutes or all day. Batteries perform best when they're discharged and recharged frequently.

New batteries won't reach full capacity until they've been discharged and recharged 20 to 30 times.

Battery range varies with road conditions, terrain, temperature and the operator's habits.

Recharge the batteries at room temperature. Never recharge the batteries in temperatures of 110°F or higher.

Charging Safety

DANGER!

Explosive Gases

Failure to charge batteries in a well ventilated space can cause an explosion.

Batteries generate explosive hydrogen gas fumes during charging cycles that accumulate in enclosed spaces. A 4% concentration of hydrogen gas is explosive and could cause severe injury or death. Always charge batteries in a well ventilated space with sufficient fresh air circulating to exchange the air every 12 minutes.

Never smoke around batteries or expose them to open flames.

To reduce the risk of explosion that could result in severe injury or death, never smoke around batteries or charge batteries in an area with open flames, sparks, gas water heaters or furnaces or electrical equipment that could cause an electrical arc.

DANGER!

Risk of Electrocution

Failure to use the charger safely can result in serious injury or death.

- The charger must be connected to a dedicated GFCI protected outlet with an appropriately rated circuit breaker grounded in accordance with the manufacturer's recommendations or applicable electrical code (whichever is higher). A grounded outlet is required to reduce the risk of shock.
- Do not use ground adapters or modify the plug.
- Do not use the charger if the cord is damaged or if the charger has received a sharp blow, been dropped, or otherwise damaged in any way. Refer all repairs to qualified technicians.
- Never place the charger on or directly above the vehicle during charging cycles.
- Do not touch the uninsulated portion of output connector or the battery terminal.
- Let charging cycles complete before disconnecting the charger. Arcing and/or burning of the plug receptacle can occur if the charger is on which can cause the batteries to explode. If the charging cycle must be stopped before it is complete, disconnect the AC power supply cord from the outlet first, then disconnect the DC plug from the battery receptacle on the vehicle.
- The charger was manufactured for use only with 48V battery systems. Never use a charger rated for use with a different voltage.
- Do not open or disassemble the charger.
- The battery charger is not intended for use by children, people with reduced physical, sensory, or mental capabilities, or anyone without experience or knowledge until they have received ample instruction and are supervised by the person responsible for their safety.

CAUTION!

Risk of Fire

An extension cord is not a substitute for permanent wiring.

If the vehicle can't be parked close enough for the charger to be plugged directly into the outlet, contact an electrician. Short circuits, overloading, improper use and care of extension cords cause thousands of fires each year. *If an extension cord must be used temporarily, it must be industrial grade, UL approved, rated for 20 amps with a minimum 10 gauge wire.*

- Make sure the pins on the plug are the same number, shape, and size as the plug on the charger.
- Use the shortest length possible. Voltage and efficiency decrease with every extra foot.
- Connect the extension cord to the charger first, then plug the extension cord into the GFCI outlet. When the charging cycle is complete, always unplug the extension cord from the outlet first, then unplug the charger.
- Install a heat sensor or smoke detector and keep a properly rated fire extinguisher nearby.
- Inspect the cord and the plug frequently and discard if either are damaged.
- Never connect multiple cords to make a longer one.

2 Batteries & Charger

Understanding the Batteries & Charger



With the Legend & Pro Series On Board Charger, you don't have to travel to the charger, the charger travels with you.

Never worry about having enough power to make it home when you're on the move and battery power is running low.

Remove the charger cord from the port under the driver's seat and plug it in to any available outlet. After a quick boost, unplug the cord from the outlet and feed back through the port.



Charging the Batteries

- Park the vehicle on a firm, level surface
- Engage the parking brake, turn the ignition switch off and remove the key from the switch.
- Gently pull the charger cord through the port under the driver's seat.
- Plug the charger into the dedicated GFCI outlet.
- The charger starts automatically a few seconds after it's plugged in and will automatically stop when the batteries are fully charged. A steady green light is displayed on the LED indicator when the charging cycle is complete.
- When you're ready to use your vehicle, unplug the charger cord from the outlet and carefully feed it back through the port under the driver's seat.
- If the vehicle is used at least once a week, keep the vehicle plugged into the charger when it's not in use. Keeping the charger connected keeps the batteries fully charged and reduces sulfation on the conductive plates.
- If electrical service is disrupted during a charging cycle, the charger will turn off automatically. In most instances the cycle automatically resumes when service is restored. During power outages, it's normal to hear a clicking sound from the charger.
- *If an extension cord must be used temporarily, always plug the charger cord on the vehicle into the extension cord first, then plug the extension cord into the outlet. When the charging cycle is complete, unplug the extension cord from the outlet first, then unplug the extension cord from the charging cord on the vehicle. Store the extension cord safely out of the vehicle's path.*

NOTE

Vehicle operations are locked out during charging cycles.

LED Charge Indicator



1st Red LED:
Initial charging up to 30%



2nd & 3rd Red LED:
Charging 60% complete



1st, 2nd, & 3rd Red LED:
Charging 90% complete



Blinking Green LED:
Finishing stage



Steady Green LED:
Charge complete

Blinking Fault Codes

If a fault is detected during a charging cycle and the cycle fails to complete, a fault specific light sequence will blink on the LED indicator.

Troubleshooting the Battery Not Detected Fault Code:

- Battery not detected fault code is normal if the charger is plugged into the outlet but not connected to the vehicle.
- If both are connected, disconnect the charger from the outlet and make sure the plugs are clean and connections are secure.
- Unplug the charger from the outlet and plug back in after 3 minutes. Resetting the electronics will often resolve the fault code.

For assistance with fault codes on the battery charger, contact Pro Charging Systems at 800-742-2740.

Blinking LED Fault Code Indicator



1st & 2nd Red LEDs Blinking:
Battery voltage hasn't risen above 1.75 volts per cell within the first 3 hours.



1st, 2nd & 3rd Red LEDs Blinking:
Timed Out. The charging cycle was not completed within the programmed time setting.



1st & 3rd Red LEDs Blinking:
Overheating. The temperature inside the charger case exceeds the maximum setting.



1st Red & Green Blink Simultaneously
Bulk Stage Shutdown.



1st Red & Green Blink Alternately:
No Battery Detected. Normal if not connected to the vehicle.

2 Batteries & Charger

Battery Maintenance & Service

DANGER!

Risk of Electrocution

The voltage stored in the batteries is sufficient to cause death by electrocution.

Use only insulated tools when working on or near batteries. Remove jewelry and other metal objects before servicing the vehicle. Never touch the battery terminals.

Those without proper training and tools should never service the batteries.

WARNING!

Risk of Severe Burns.

Battery electrolyte is a poisonous acid solution containing sulfuric acid that can cause severe burns.

Avoid contact with skin, eyes, and clothing. Always wear a safety shield or approved safety goggles, acid proof gloves and protective clothing when servicing batteries.

Emergency Treatment:

- External contact: flush with water. Seek medical attention if necessary.
- Internal contact: drink large quantities of water or milk followed by milk of magnesia, beaten egg, or vegetable. Seek medical attention.
- Eyes: flush with water for 15 minutes. Seek immediate medical attention.

WARNING!

Risk of Severe Injury.

To prevent serious injury or death, observe the following when servicing the batteries:

- Park the vehicle on a flat surface, engage the parking brake, turn the ignition switch off and remove the key before performing service on the batteries.
- To prevent battery explosion that could result in severe personal injury or death, keep all smoking materials, open flames or sparks away from the batteries
- Battery posts, terminals and related components contain lead and lead compounds. Always wash your hands thoroughly after touching or handling the batteries..
- Never charge a frozen or bulging battery. Charging a frozen or damaged battery can result in serious injury.

CAUTION!

Risk of Severe Injury.

To prevent serious injury or critical damage to the controller, batteries and electronic components, observe the following when servicing the batteries:

- Aerosol containers of battery terminal protectant must be used with extreme care. Insulate metal container to prevent can from contacting battery terminals which could result in an explosion.
- Wrap wrenches and other tools with vinyl tape to prevent the possibility of shorting out a battery, which could result in an explosion and severe personal injury or death.
- Electrical accessories must be grounded directly to the battery (-) post. Never use the chassis or the body as the ground connection. The chassis is a floating ground to protect against short circuits.

Monthly Battery Inspection & Maintenance

- Inspect all wires for fraying, loose connections, corrosion or exposed insulation.
- Make sure the charger connections to the battery terminals are tight and clean.
- Check for damaged or cracked plastic parts.
- Check the charger harness for chaffing and rubbing.
- Check the electrolyte level in each battery cell. Add distilled water if necessary.
- Clean the battery casings and terminals.
- Coat the battery terminals and battery wire terminals with protectant.

CAUTION!

Risk of Severe Injury and Critical Damage to the Vehicle.

To prevent serious injury or critical damage to the batteries and other electronic components, observe the following when adding water to the battery cells:

- The batteries must be fully charged before adding water. Adding water to partially discharged batteries can lead to boil-over, which can cause injury, damage to the vehicle and property.
- Do not overfill batteries. Overflow and electrolyte expelled during charging cycles can cause injury and corrosion, which will damage the battery and electrical components.
- Neutralize acid spills first using a solution of 1/4 cup (60 ml) sodium bicarbonate (baking soda) dissolved in 1 1/2 gallons (6 liters) of water before rinsing with clear water. Rinsing with clear water before neutralizing flushes acid deposits to other parts of the vehicle and the surrounding area.

2 Batteries & Charger

NOTE

Always add distilled water to the batteries. Never use tap water, even if it's filtered.

A considerable amount of water is used over the life of the batteries. Trace minerals and chemicals that remain even in filtered water can shorten battery life.

Adding Water to the Batteries

- Lift the front seat to access the battery compartment.
- Remove the vent cap from the top of the battery.
- Look inside each cell to check the electrolyte level. Add distilled water if necessary.
- Using a plastic funnel, pour distilled water slowly into each cell until the electrolyte is $\frac{1}{2}$ " above the plates, leaving approximately $\frac{1}{4}$ " between the electrolyte and the vent tube.
- Replace the vent cap securely.
- Repeat the process for each battery.

NOTE

Automatic watering systems available at most auto parts stores can save time, minimize contact, and prevent over or under filling.

Cleaning the Batteries

WARNING!

Risk of Severe Injury.

Never rest metal objects in, around, or on top of the battery compartment.

Insulate tools and insulate aerosol containers of terminal protectant. Metal objects making contact with battery terminals could result in an explosion.

CAUTION!

Risk of Critical Damage.

Baking soda neutralizes acid in the battery cells causing permanent and irreversible damage.

Before cleaning the batteries, make sure all vent caps are tightly sealed to keep baking soda solution and other debris out of the battery cells.

- Mix a neutralizing solution of $\frac{1}{4}$ cup (60 ml) of baking soda and 1 $\frac{1}{2}$ gallons (6 liters) of clear water in a garden sprayer with a non-metallic tip.
- Before rinsing with clear water, spray top and sides of the batteries with baking soda solution to neutralize acid deposits. Make sure metal components adjacent to the batteries are also coated with the baking soda solution.
- Let solution set for at least three minutes; remove residue with a soft bristle brush or cloth.
- With light pressure from a water hose, rinse the entire surface and area below and around the vehicle well. After batteries are clean and dry, the terminals should be coated with terminal protectant (available at most auto parts stores).

Long Term Storage

WARNING!

Risk of Severe Injury and Damage.

Never charge a frozen, bulging or damaged battery.

Contact a qualified technician for service before storing the vehicle.

NOTE

Batteries should be clean, fully charged with the battery charger and other electronic devices disconnected to reduce battery discharge during long term storage.

- Store the vehicle in a cool, dry location where it's protected from harsh elements.
- Park on a firm, level surface, engage the parking brake, turn the ignition switch off, and remove the key.
- Batteries self discharge over time. Monitor discharge level every 2 to 4 weeks and recharge when necessary.
- Never let the let batteries discharge below 70%.
- Avoid storing the vehicle in extremely hot or cold temperatures. Batteries discharge faster in temperatures above 90°F. If vehicle is stored in temperatures 90°F and higher, check the discharge level every 2 weeks.
- *Keeping batteries fully charged in freezing temperatures is critical.* Fully charged batteries will not freeze unless the temperature falls below -75°F. However, batteries exposed to freezing temperatures can freeze as they self discharge. If the vehicle is stored in temperatures below 32°F, monitor the discharge level every 2 weeks and recharge as needed.
- Charge batteries completely before using the vehicle.

3 Vehicle Overview

Dashboard Controls

Battery Meter

When the ignition switch is on, horizontal light bars display the usable battery power.



The top bar is illuminated when the batteries are fully charged.



Light bars go dark from top-down as battery power is depleted.

NOTE

Never discharge the batteries below 70% capacity.

Direction Selector Switch



Press the three-position rocker switch to select the travel direction.

- In the center position, the vehicle is in NEUTRAL.
- Press the top of the switch to move FORWARD.
- Press the bottom to move in REVERSE.

WARNING!

Risk of Severe Injury & Damage

Never move the direction selector switch while the vehicle is in motion.

To prevent the risk of severe injury, loss of vehicle control, and damage to the electronic components, bring the vehicle to a complete stop before moving the direction selector switch. If the switch is pressed while the vehicle is in motion, the vehicle automatically begins breaking rapidly and speed is reduced suddenly. An alarm will sound until the vehicle stops.

NOTE

Press the switch to select the direction before turning the ignition switch on.

Ignition Switch & Key



Turning the key turns the electrical systems on and off.
OFF: All electrical applications are disabled. *Always remove the key when you exit the vehicle.*
ON: All electrical applications are enabled. *The key cannot be removed when the ignition switch is ON.*

NOTE

The batteries will drain within 1-2 days if the ignition switch is ON when the vehicle is not in use.

Head Lights & Tail Lights



Pull the light knob out to turn the headlights and tail lights on.
Push the light knob in to turn them off.

Steering Column

Horn & Turn Signal Stalk



Turn Signal

- Right Turn: Move the stalk up.
- Left Turn: Move the stalk down.

The signal lights turn off and the stalk returns to its original position automatically when the turn is complete.



Horn

The horn button is located at the end of the turn signal stalk. To sound the horn, gently push the horn button into the stalk.

3 Vehicle Overview

Foot Pedals

Accelerator



The vehicle moves when the accelerator is pressed if the ignition switch is on.
When the accelerator is released the vehicle gradually slows down.

NOTE

Keep feet away from the accelerator pedal when sitting in the vehicle.

Combination Service & Parking Brake Pedal

WARNING!

Risk of Severe Injury.

Always make sure brakes are functioning before each use.

A damaged or malfunctioning brake system can result in severe injury or death.

WARNING!

Risk of Severe Injury and Damage

The parking brake automatically releases when the accelerator is pressed. If the accelerator is pressed unintentionally when the ignition switch is on, the vehicle may move unexpectedly.

The automatic brake release feature protects the braking and motor control systems from critical damage that would occur if the vehicle were driven with the parking brake engaged.

- Always turn the ignition switch off when the vehicle is parked, especially if people are sitting in the parked vehicle.
- Always put the direction switch in FORWARD, engage the parking brake, turn the ignition switch off and remove the key before exiting the vehicle.

Foot Pedals

Service Brake



Press the lower section of the brake pedal to slow the vehicle's speed, bring it to a stop, and release the parking brake.

Parking Brake



Press the upper section of the brake pedal until it locks in place to engage the parking brake. Press the service brake to release it.

NOTE

Always press the service brake before turning the ignition switch on or off.

- To prolong the life of the braking system, always press the service brake to release the parking brake.
- Pressing the service brake before turning the ignition switch prevents unexpected movement when the ignition is turned on.

3 Vehicle Overview

LE Model Cage Frame, Canopy. & Windshield

WARNING!

Risk of Severe Injury.

The canopy, canopy mounts, and cage frame on LE models are not designed or intended to provide protection from roll over or falling objects.

The windshield does not provide protection from tree limbs or flying objects.

Canopy, Canopy Mounts & Cage Frame on LE Models



The canopy top provides protection from light rain and reduces exposure to sunlight. It will not provide shelter in heavy rain or protect you from falling objects and is not designed for roll over protection.

The canopy mounting bars and cage frame on LE models are not designed for or intended for roll over protection.

Split Windshield



Carefully pry the rubber clamp at the top of the windshield from both sides of the frame.



Slide the windshield rim into the rubber gaskets on both sides at the base of the windshield. Reverse the process to put the windshield back up.

Vehicle Safety

Keep the vehicle in good condition and operate it responsibly. Improper use and the lack of proper maintenance may result in damage or decreased performance.

Every vehicle can be used in a manner and for tasks beyond their original intended purpose. It's impossible to anticipate and warn against every possible combination of circumstances and conditions that operators and passengers may encounter.

WARNING!

Risk of Serious Injury and Damage

Testing the brakes for proper operation before each trip is critical to your safety.

Never operate the vehicle if the brakes are malfunctioning, damaged or malfunctioning braking system poses a serious risk of injury and damage.

Before Each Ride

Before each trip inspect each item on the pre-ride checklist. If repairs are needed do not use the vehicle until service is complete. The vehicle should be considered potentially hazardous when service is needed.

Pre-Ride Check List

Before getting in

Body	Look for loose, damaged, or missing parts
Fluid Leaks	Look underneath and around the vehicle for fluid
Tires	Look for low air pressure, tread wear, and inspect for damage, cracks, & debris
Wheels	Check for loose or missing hardware
Front & Rear Suspension	Check for loose or missing hardware

Before putting the key in the ignition switch

Brake system	Check pedal travel for resistance when pressed and return when released.
Parking Brake	Make sure vehicle doesn't roll when parking brake is engaged.
Accelerator	Make sure pedal moves down freely and returns to its original position.
Steering	Check for excessive play and unusual noise when steering wheel is turned

Put the key in the ignition switch and turn to the ON position

Batteries	Check charge level to make sure batteries are fully charged
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4 Operating

Driving Condition Safety

WARNING!

Risk of Serious Injury and Damage

Rough terrain, inclement weather and other factors can affect your ability to control the vehicle.

To reduce the risk of severe injury or death resulting from loss of control:

- Do not drive on public roads. Observe rules for the location where the vehicle is operated.
- Always drive carefully and only as fast as considerations permit.
- Consider the terrain, traffic conditions, and environmental factors which effect vehicle control.
- Use extra care and reduce speed when driving in inclement weather, on loose dirt, wet grass, gravel, and other soft surfaces.
- Avoid extremely rough terrain.
- Use caution when driving on uneven surfaces to prevent damage to the vehicle undercarriage.
- Use caution when traveling near or through dry grass and brush. The motor gets very hot.

Steep slopes, sudden stops, and changes in direction can cause the vehicle to tip unexpectedly.

- **NEVER** drive vehicle up, down, or across an incline that exceeds 14° (25% grade).
- Avoid steep slopes. Drive in a straight path when going up and down hills.
- Maintain a safe speed when driving downhill. Press the service brake to control speed when traveling down an incline.
- Avoid sudden stops and changing direction at high speeds.
- Slow down before and during turns
- Be extremely careful when approaching blind curves and sharp turns.
- Avoid driving in hilly areas and across slopes. If driving across an incline is unavoidable, do not drive at an angle and be extremely careful.
- Sudden shifts in weight distribution and cargo with a high center of gravity can cause the vehicle to tip unexpectedly. Move cargo as close to the front of the vehicle as possible and distribute weight evenly across the load bed.



Driver & Passenger Safety

WARNING!

Risk of Serious Injury and Damage

Common sense, experience, and safe driving practices are the best defense against accidents and injuries.

To reduce the risk of severe injury or death resulting from improper operation:

- Read and observe all warnings and operating instruction labels on the vehicle. Replace damaged or missing labels.
- Never operate under the influence of drugs or alcohol.
- Operators must read and understand the owner's manual, be at least 59" tall, have a valid operators license, and demonstrate a proficiency in operating the vehicle safely.
- Always be prepared to stop.
- Follow rules established for the location where the vehicle is being operated.
- Maintain a safe distance between other vehicles and pedestrians.
- Look in all directions for oncoming traffic, pedestrians, and other obstructions before pressing the accelerator. Check the area behind the vehicle carefully before operating in REVERSE.

Make sure all passengers understand how to ride safely before they get into the vehicle.

To reduce the risk of severe injury or death of passengers:

- When there is a risk of lightning, all occupants must leave the vehicle.
- Never leave young children unattended on or around the vehicle.
- All occupants must tall enough that their feet are on the floor when seated.
- All occupants must remain seated and keep their entire body inside vehicle while it's in motion.
- Never allow more than one passenger in each seat. Don't let children ride on anyone's lap.
- The vehicle is not designed for child safety seats or children who are required to use them.
- Never let passengers ride on the cargo load bed.

NOTE

Pay particularly close attention operating the vehicle in areas where pedestrians are present.

Electric vehicles make very little noise and pedestrians may not hear or see your vehicle approaching.

4 Operating

Starting & Driving



- Make sure the batteries are fully charged.
 - Disconnect the charger cord and store it safely out of the vehicle's path.
-



- Verify all occupants are seated and cargo is secured.
 - Press the service brake to release the parking brake and prevent accidental movement.
-



- Move the direction selector to the correct position.
- Put the key in the ignition switch and turn it to the ON position.
- Look in all directions to be sure the vehicle's path is clear of oncoming traffic, pedestrians, and obstacles.

NOTE

When the direction selector is in the REVERSE position, an audible warning signal indicates the vehicle is ready to move in reverse.



- Put both hands on the steering wheel, move your foot from the service brake to the accelerator and carefully press it toward the floorboard.
 - Apply pressure slowly, gradually increasing the vehicle's speed.
-

Coasting



- If accelerator is released when the vehicle is in motion the motor controls the rate of deceleration. The vehicle will gradually lose speed until it eventually stops.
-



- Pressing the service brake gives the operator control of the vehicle's speed and stopping distance.

Stopping



- Press the service brake to slow the vehicle or bring it to a complete stop.
-



- When ready to park the vehicle, engage the parking brake, move the direction switch to the FORWARD position, turn the ignition switch off and remove the key.

4 Operating

Regenerative & Motor Controlled Braking

WARNING!

Risk of Serious Injury and Damage

To prevent of loss of control and traveling at unsafe speeds that could cause severe injury or death, press the service brake to reduce speed quickly and safely.

Regenerative and motor controlled braking prevents coasting downhill at uncontrolled speeds. They do not prevent traveling downhill at unsafe speeds and are no substitute for using the service brake. Pressing the service brake gives the operator control of the vehicle speed and stopping distance.



Regenerative Braking

Regenerative braking prevents the vehicle from picking up speed in excess of its high limit whether the accelerator is pressed or not.

If the operator moves the key or direction selector to a different position in an attempt to override the regenerative braking system, the vehicle brakes rapidly until it slows down to approximately 2 mph.

Motor Controlled Braking

Motor controlled braking prevents the vehicle from gaining excessive speed when

- the accelerator is released for 1 second and
- the vehicle is traveling downhill at between 8 mph and its top speed.

The speed gradually reduces to 8 mph. The vehicle coasts at between 8mph and 3mph until the accelerator is pressed again.

Towing the Vehicle

WARNING!

Risk of Serious Injury and Damage

Familiarize yourself with changes in the braking distance and handling characteristics in an isolated area before traveling near other vehicles and pedestrians.

To reduce the risk of severe injury or death:

- Drive with extreme caution when towing the vehicle.
- Tow only one vehicle at a time.
- Do not exceed 10 mph.
- Never ride on the vehicle being towed.
- Tow only with a tow bar. Never use ropes or chains.
- Never tow the vehicle on highways.

Transporting the Vehicle

WARNING!

Risk of Serious Injury and Damage

To reduce the risk of serious damage, severe injury, and death .

To reduce the risk of severe injury or death:

- Secure the vehicle with ratchet tie downs.
- Remove personal and loose items that are not part of the original vehicle equipment.
- Never ride on the vehicle being transported.
- Always remove the windshield before transporting.
- Maximum speed with sun top installed is 50mph (80 kph).
- If the vehicle is transported at highway speeds, the sun top must be removed and the seat bottoms secured.
- When transporting vehicle below highway speeds, make sure hardware is tight and check for cracks in sun top at mounting points. Always remove windshield. Make sure the vehicle and contents are adequately secured.
- The rated capacity of the trailer or truck must exceed the weight of the vehicle and load plus 1000 lbs.

5 Maintenance

Maintenance & Service

Preventative maintenance at recommended intervals is the best way to optimize vehicle performance and extend its life. Refer to the Periodic Service Schedule on page 33 for recommended service intervals under normal use. Some items need to be serviced more frequently if the vehicle is regularly used at the maximum weight capacity or in areas with extreme temperatures, dust and debris.

A vehicle that needs repairs is potentially hazardous. If any item needs repair, do not use the vehicle until service is complete. After the vehicle is serviced, test drive it in a safe area with no vehicle or pedestrian traffic. Keep detailed and complete records of the vehicle's maintenance history.

DANGER!

Risk of Explosion, Electrocution, Serious Injury and Death

Never attempt maintenance or service without the proper tools and adequate training.

Some components are heavy, highly corrosive, explosive, produce high amperage, reach extreme temperatures or require specialized tools. To prevent serious injury to the person servicing the vehicle and bystanders, always be extremely cautious when performing maintenance and service. When diagnosing, removing or replacing components, always consider your safety and the safety of those around you.

Have your vehicle serviced by a qualified technician if you lack the proper tools and training, or are uncertain about potential hazards to your safety, the safety of others, and risks of damage.

- Always wear safety glasses and protective clothing when performing maintenance or service.
- Remove all jewelry (rings, watches, necklaces, etc.)
- Remove loose clothing and tie back long hair to prevent entrapment in moving parts.
- Use care not to touch hot objects.

WARNING!

Risk of Serious Injury and Damage

Unintended movement of the vehicle during cleaning, maintenance, and service can cause serious injury and damage to property and the vehicle

Always park the vehicle on a firm, level surface, engage the parking brake, move the direction selector to the FORWARD position, turn the vehicle off and remove the key from the ignition switch.

Cleaning the Vehicle

CAUTION!

Risk of Damage

Use of excessive water pressure and some chemical cleaning agents can cause damage.

- When pressure washing the vehicle exterior, do not use pressure in excess of 700 psi.
 - To reduce the possibility of cosmetic damage, do not use any abrasive or reactive solvents to clean plastic parts.
- Washing with excessive water pressure and some cleaning agents can damage the seals, plastic parts, seat material, surface finishes and electrical system.
 - Clean the windshield with clear water and a soft, clean cloth. Commercially available window cleaning products may damage or discolor the windshield. Minor scratches may be removed with a commercial plastic polish.
 - Clean the seats, plastic parts, and rubber trim using a solution of mild soap and water with a sponge or soft cloth. Wipe down with a clean, damp cloth.
 - Use a commercially available vinyl/rubber cleaner to remove oil, tar, asphalt, etc.
 - Wash painted surfaces frequently with mild detergent in lukewarm or cold water and a clean, soft sponge or cloth.
 - Flush the under body with clear water every time the vehicle is washed. Some fertilizers and dust control agents contain corrosive materials that can collect on the under body. Thoroughly clean areas where mud, grass cuttings and other debris can collect.
 - Occasional use of non-abrasive wax products safe for clear coat automotive finishes will enhance the appearance of painted surfaces.

Wheels & Tires

WARNING!

Risk of Serious Injury and Damage

Over and under inflated tires can lead to poor handling and loss of vehicle control.

- Never exceed the inflation pressure rating on the tire sidewall.
- Use caution when inflating tires. Over inflation could cause the tire to separate from the wheel or cause the tire to explode, either of which could cause severe injury.
- Never install low inflation tires or any tire with an inflation pressure lower than the recommendation in the owner's manual.

5 Maintenance

Air Pressure

- When tires are cool, remove the valve stem cap and check the air pressure in all four tires.
- Confirm the air pressure on the tire sidewall and add air if necessary. The air pressure should be the same in all four tires.
- Because the tires are small and air volume is low, over inflation can occur within seconds. To reduce the possibility of tire explosion, pressurize the tire with small amounts of air intermittently to seat beads. Never exceed the tire manufacturer's recommendation when seating a bead.
- Replace the valve stem cap after checking the pressure or adding air.

Air Pressure & Tread Wear

Keeping the tires properly inflated prolongs the life of the tires, improves ride quality, vehicle safety, control and performance.

- *When the tires are properly inflated, the tread wears evenly across the entire surface.* There's no discernible difference in tread wear on the sides and in the middle of the tire.
- *When air pressure is too low, the tread wears faster on the sides than the middle.* The outer tread makes too much contact with the ground, causing the sides to wear prematurely. The ride is smooth but the motor works harder making performance sluggish.
- *When air pressure is too high, the tread wears faster in the middle than the sides.* Ground contact on the sides is limited, reducing traction and compromising safety. The ride is rough and bumpy.



When tires are properly inflated, dust and dirt doesn't accumulate on the sidewalls. Tread wears evenly across the entire surface.

NOTE

Tire inflation depends upon the terrain where the vehicle is predominantly used.

- **On grassy areas with hard turf** - inflation pressure should be on the higher end of the allowable range
- **On grassy areas with soft turf** - inflation pressure should be on the lower end of the allowable range to reduce the possibility of tires cutting into the turf.
- **On paved areas or hard surfaces** - inflation pressure should be on the higher end of the allowable range.

Lifting the Vehicle

WARNING!

Risk of Severe Injury and Vehicle Damage

The vehicle is extremely unstable during the lifting process. To reduce the possibility of severe injury or death when lifting the front wheels, rear wheels, or entire vehicle:

- Never get under the vehicle while it is supported by a jack or on jack stands.
- The vehicle weight shifts when the jack is lowered. If the jack is lowered too quickly or the jack stands shift, the entire vehicle will fall.
- Before lifting the vehicle, set the jack stands to the minimum appropriate height for the service being performed. Keep children and pets away.
- Park the vehicle on a firm, level surface.
- Never lean on, sit in, or add additional weight when the vehicle is on the jack or jack stands.
- Always place chocks in front of and behind both of the wheels on the end not being raised.

*Service that must be performed under the vehicle is best left to professionals.
Contact a qualified technician for repairs under the vehicle*

NOTE

*There's really no reason to lift the entire vehicle when changing the tires.
It's safer to work on one tire at a time and move the jack after completing work on each tire.*

Required Tools

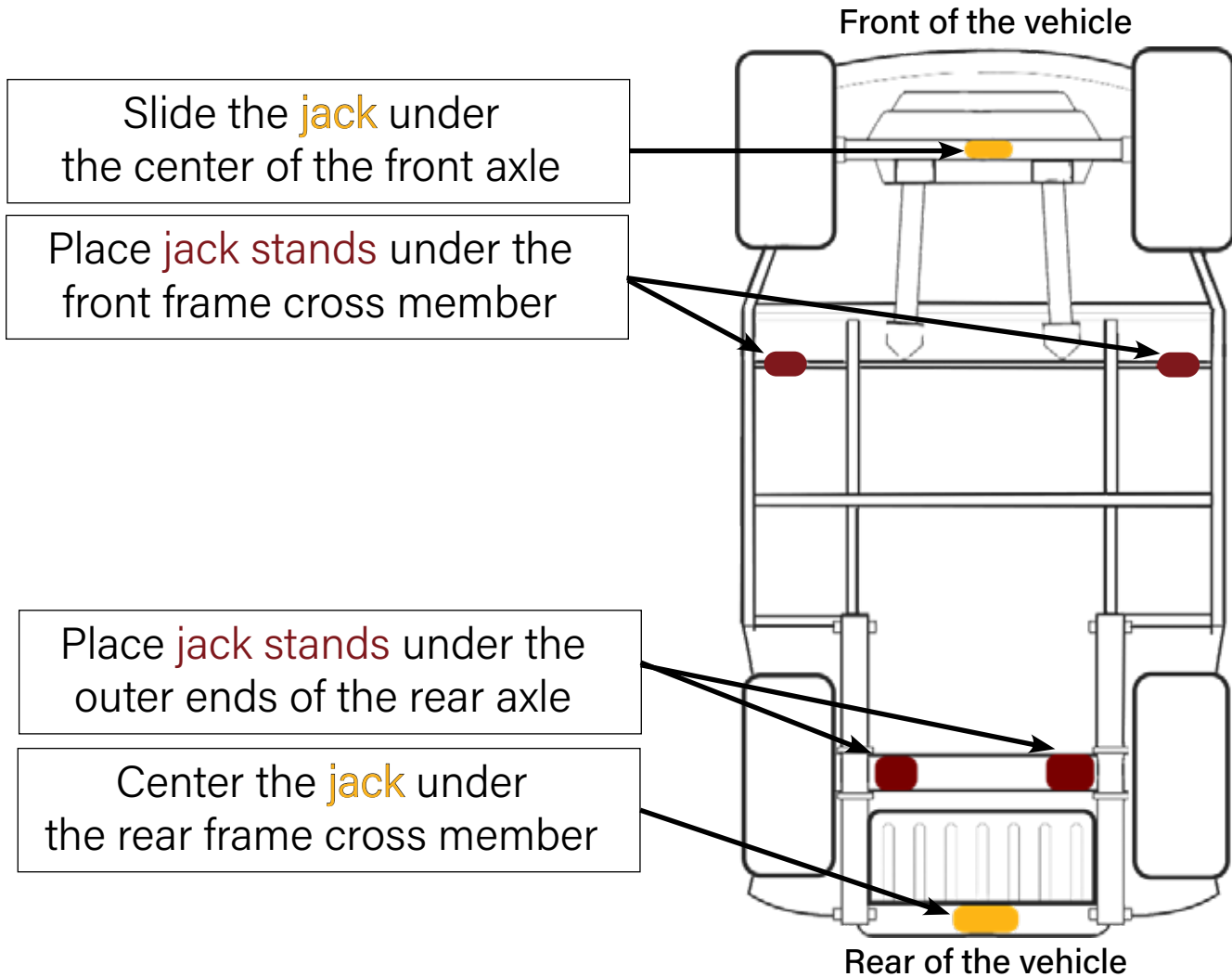
1	Floor Jack
4	Jack Stands
4	Wheel Chocks



Place chocks in front of and behind both of the wheels on the end of the vehicle not being lifted.

5 Maintenance

Underside view for **Jack** for **Jack Stand** Placement



Lifting the Entire Vehicle

*Refer to the diagram above for **jack** & **jack stand** placement*

Raise the rear end first.

- Center the **jack** under the rear frame cross member.
- Raise the vehicle slowly, making sure it remains stable and doesn't move as it's raised. Continue lifting slowly until it's high enough to place the **jack stands**.
- Reach in to place the **jack stands** under the outer ends of the rear axle. Back away from the vehicle.
- Lower the **jack** slowly, making sure the vehicle and **jack stands** remain stable as it's lowered.

Raise the front end.

- Slide the **jack** under the center of the front axle.
- Slowly raise the vehicle enough to place **jack stands** under the rear frame cross member.
- Lower the **jack** slowly and make sure the vehicle is stable on all four **jack stands**.

Reverse the lifting sequence to lower the vehicle.

Removing & Remounting the Wheels

There's really no reason to lift the entire vehicle when changing the tires. It's safer to work on one tire at a time and move the jack after each tire. If you choose to lift the entire vehicle, don't raise the jack stands more than a few inches following the procedure to lift the entire vehicle on the preceding page.

WARNING!

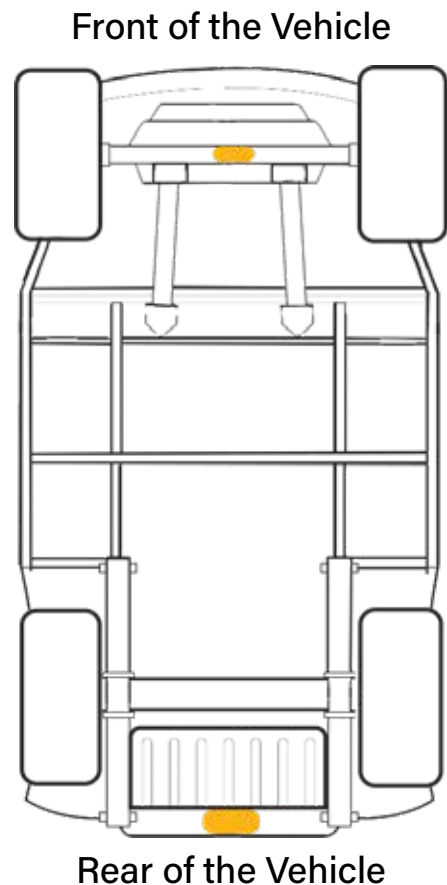
Risk of Severe Injury and Vehicle Damage

To reduce the risk of severe injury caused by a broken socket, always use sockets designed for use with an impact wrench when removing the wheels.

Removing the Wheels

Required Tools	
1	¾" Lug Wrench
1	¾" Impact Socket
1	Impact Wrench
1	Torque Wrench, ft. lbs

- Place wheel chocks in the front and back of the tires on the end not being raised.
- While the vehicle is still on the ground, loosen the lug nuts on the tire you are removing. *Never remove any of the lug nuts before the tire is off the ground.*
- Slide the jack under the vehicle making sure it's in the appropriate position.
- To remove a wheel on the front end: Slide the jack under the center of the front axle. *Refer to diagram on the right.*
- To remove a wheel on the rear end: Slide the jack under the center of the rear frame cross member. *Refer to diagram on the right.*
- Slowly lift the vehicle just enough to raise the tire a few inches off the ground.
- Make sure the vehicle is stable on the jack.
- Remove the lug nuts and store them safely out of the way.
- Slide the wheel off the lug studs.
- If the wheel isn't replaced immediately, lower the vehicle just enough to level it while you're away. Never leave the jack under the vehicle for more than a few hours.



5 Maintenance

Mounting the Wheels

- Make sure the vehicle is stable on the jack.
- With the valve stem facing the outside, slide the wheel over the lug studs.
- Replace the lug nuts and hand tighten in a 'cross sequence' pattern (Ref. Fig. 11).
- Slowly lower the jack just enough for the ground to prevent the wheel from spinning when the lug nuts are tightened.
- Tighten the lug nuts following the same cross sequence pattern to 50 - 85 ft. lbs. (70 - 115 Nm) torque in 20 ft. lbs. (30 Nm) increments. To prevent stripping, never tighten the lug nuts to more than 85 ft. lbs. (115 Nm) torque.
- Slide the jack from underneath the vehicle and remove the wheel chocks.



Repairing Punctures

The vehicle is equipped with low pressure tubeless tires mounted on one piece rims. Punctures in the tread can often be repaired with commercially available tire plugs. If the tire is flat, inflate the tire to the maximum recommended pressure, remove the wheel and immerse in water to locate the leak. Mark the puncture with chalk and insert the plug following the manufacturer's instructions for the plug you purchased.

If the leak cannot be fixed with a plug and wheel must be removed from the rim, the mounting/demounting machine must be permanently mounted to the floor. Do not attempt to remove the tire from the rim without the proper equipment. Contact a qualified tire service center for the repair.

Adjusting the Powertrain

To access the powertrain, lift or remove the seat and remove the rear access panel.

Both drive wheels must be raised and the vehicle properly supported on jack stands if the powertrain is adjusted while the vehicle is running.

To reduce the possibility of motor damage, never operate vehicle at full throttle for more than 4 - 5 seconds in a no load condition.

Inspecting the Rear Axle

Inspect the area under the vehicle frequently for leaks. If there are no visible leaks from the rear axle, replace the lubricant every five years.

Hardware

Inspect the vehicle periodically for loose fasteners. Use care not to over tighten. There are three classes of standard hardware and two classes of metric hardware used in the vehicle. Grade 5 hardware has three marks on the hexagonal head and grade 8 hardware has 6 marks on the head. Metric hardware is marked on the head with 8.8 or 10.9. Unmarked hardware is Grade 2.

Page number for information		Daily Before each use	Monthly or 20 hours	Quarterly or 60 hours	Every 6 Months or 125 hours	Annually or 250 hours	5 Years
32	Hardware - tight and in tact	✓	✓	✓	✓	✓	
22	Reverse Warning Indicator - works properly	✓	✓	✓	✓	✓	
7, 8	Batteries - fully charged	✓	✓	✓	✓	✓	
11, 12	Batteries - check electrolyte levels, add water if necessary		✓	✓	✓	✓	
13	Batteries - no corrosion, wires in good condition, harness, hardware, & terminal connections are tight	✓	Clean	Clean	Clean	Clean	
7, 8	Charger - GFCI outlet reset tested, no debris on vent fins, air flow unobstructed, plug is clean, no signs of wear or damage on plugs or cords	✓	✓	✓	✓	✓	
16	Accelerator - Pedal moves freely, returns to original position when released	✓	✓	✓	✓	✓	
17	Brake Pedal - resistance when pressed toward floor board, returns to original position when released, consistent stopping distance	✓	✓	✓	✓	✓	
17	Brakes - parking brake holds on an incline, aggressive service braking is responsive		✓	✓	✓	✓	
19	Steering - tight & responsive, no excessive play or unusual sounds when turned	✓	✓	✓	✓	✓	
27, 28	Tires - air pressure is correct, even wear, ample tread, good condition	✓	✓	✓	✓	✓	
19, 32	Front Suspension - no leaks, no excessive play in hubs, bushings not worn, hardware tight & in tact		✓	✓	✓	✓	
28	Front Alignment - tires are evenly worn, adjust if necessary			✓	✓	✓	
19	Rear Suspension - no leaks, bushings not worn, hardware tight & in tact.			✓	✓	✓	
32	Wheels - check lugs for proper torque		✓	✓	✓	✓	
31	Wheels - rotate				✓	✓	
32	Rear Axle - drain & replace fluid						✓

Always follow state and local regulations including registration, titling, insurance, and licensing requirements.

To prevent the risk of serious injury or death, never modify the vehicle in any way that alters the weight distribution of the vehicle, decrease its stability, increase its speed or extends the stopping distance.

MD Carts, Inc. prohibits and disclaims responsibility for all modifications and/or alterations which adversely affect vehicle safety.

MD Carts, Inc. reserves the right to make engineering and design changes without obligation to retrofit previously sold units. The information contained in this manual is subject to change without notice.

MD Carts, Inc. is not liable for errors in this manual or for incidental or consequential damages that result from the use of material in this manual.

Always be extremely cautious when servicing your vehicle. Anyone attempting maintenance, service or repair must be sufficiently skilled and experienced to recognize and protect themselves from potential situations that could result in severe personal injury, death, and/or damage to the vehicle. Refer repairs to a qualified service technician if you do not have proper training, tools or are unsure about the potential risk for damage, accidents, severe injuries or death.

Please contact the authorized dealership where your Beast Electric Transportation was purchased for service, repairs, parts, warranty claims or to obtain a copy of the Limited Warranty agreement.



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