



Alpha EV Classic Model

Owner's Manual



2+2 Model Pictured

January 2023

Preface

Thank you for choosing the Alpha EV electric golf car produced by our company. The Alpha EV electric golf car is not like an engine-driven electric golf car, it will not pollute the air. In addition to being used on golf courses, Alpha EV electric golf carts can also be used in resorts, private residential areas, hotels, tourist attractions, and safe and purposeful specific places permitted by local and national laws.

WARNING

Warning! Please understand and abide by the laws and regulations of the place where you drive the electric golf car.

Your comfort and safety is of paramount importance to us. We recommend you read line by line these instructions and follow them with strict adherence against possible injury or damage to both personnel and assets. If you rent or lend your car to another person, we advise you to tell them to refer to this instruction before driving.

We hope you keep this owner's manual for your reference and for the next owner so that he or she can have access to information regarding vehicle handling, maintenance and safety NOTE: Refer to local laws and regulations on the legal use of golf cars.

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1. IMPORTANT NOTICE

This vehicle is designed for off-road use in compliance with safety standards for golf cars. It is not equipped from the factory with systems required by automotive industry safety standards (including but not limited to FMVSS 571.500 low-speed vehicle or LSV standard) for use on public streets and highways. All applicable local and federal laws for on-road use must be followed by the end user, including addition of all necessary equipment for legal street use. Under US Federal law, vehicles modified to operate at or in excess of 20mph become LSV's and must adhere to FMVSS 571.500. Pursuant to this standard, the dealer or customer who makes these modifications must affix a Vehicle Identification Number, and is required to register or title the vehicle per state laws. Alpha EV is not liable for any illegal use of this vehicle.

Important safety precautions will be noted by the below symbols. This manual should be read in its entirety before attempting to operate or service the vehicle.



- The CAUTION symbol indicates conditions that can cause minor bodily injury.



- The WARNING symbol indicates conditions that may cause serious injury or death.



- The DANGER symbol indicates conditions that will cause significant harm or death to personnel and/or assets.

2. SAFETY PRECAUTIONS



- **RISK OF ELECTRIC SHOCK.** Ensure charger AC cord is connected to a properly grounded outlet. Always disconnect charger AC plug before servicing vehicle.
- Ensure all battery connections are tight, making good contact, and are free of corrosion. Poor electrical contact can generate heat and create a fire hazard.
- Never attempt to disassemble, modify, or service Lithium-Ion battery or charger. No user serviceable parts are inside. Improper service can result in explosion, fire, or electrical shock. Contact Alpha EV Technical Support for assistance if battery or charger is not working properly.
- This vehicle does not provide protection from major weather hazards such as lightning or high winds/flying debris. Seek immediate shelter if caught in a storm.



- Batteries placed in this vehicle may release explosive gases. To reduce risk of fire, keep away from sparks and/or flames. Always charge vehicle on a non-combustible surface such as concrete.
- Keep vehicle well ventilated during charging. Do not attempt to operate vehicle while charger cord is connected.
- Only qualified technicians should service vehicles. Anyone performing service should be experienced in electrical and mechanical repairs. Always wear proper safety equipment when servicing vehicle, including but not limited to safety goggles and gloves.
- Use insulated tools when making or removing battery connections.

SAFETY PRECAUTIONS(cont'd)



- Any modification to the vehicle that affects stability, handling, or increases speed beyond factory specifications can cause severe injury or death.
Modifications may void vehicle warranty.
- Place run/tow switch into TOW position prior to servicing vehicle.
- When servicing vehicle, make sure key is in OFF position and chock wheels. Use jack stands if vehicle is raised. Getting under a vehicle supported by a jack may lead to serious injury or death.
- Ensure vehicle warning labels are in place. If transferring ownership of vehicle, provide this manual to new owner. Contact your dealer for replacements if necessary.
- Always review vehicle per the operation checklist prior to driving. If any checks are failed, DO NOT OPERATE VEHICLE prior to repairing issue.

During Operation:

- Drivers must have a valid driver's license. Operate only in designated areas in accordance with local, state/province, and/or national law.
- Always drive at a speed consistent with terrain and weather conditions.
- When going up or downhill, if possible drive straight up or down the hill, not crossways. Never drive crossways on a grade sharper than 14%.
- Sudden stops or change of direction can lead to a loss of control.
- Never allow more passengers than the vehicle is designed to have (two people per bench seat maximum).
- Never leave children unattended with vehicle. Remove key when exiting the vehicle.
- When backing up, check all directions and drive slowly and carefully. Never disconnect the reverse alarm.
- NEVER operate vehicle under the influence of alcohol or drugs of any kind. Serious injury or death may occur.

3. OPERATION SYSTEM

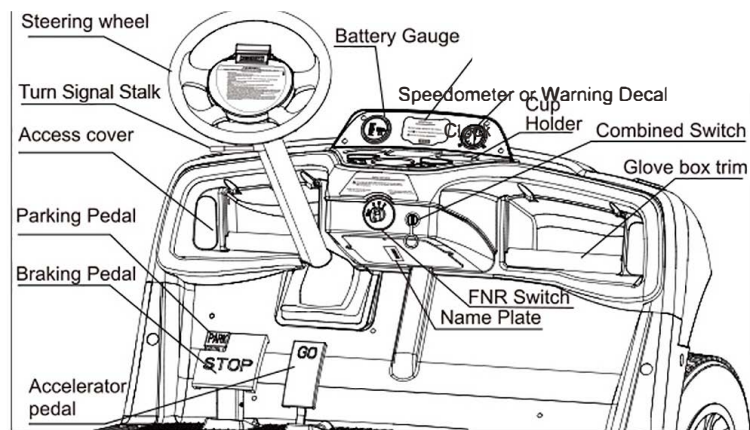


Figure 1

Power-on Key-----Insert key and turn clockwise to “F” for forward drive or “R” for backward drive and then the car is ready to go. In case you wish to stop in the middle of the drive, turn the key to “N”. When you come to a complete rest, turn the key counterclockwise to “OFF” for power shutdown.

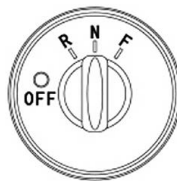


Figure 2

Battery Gauge-----There are ten bars on the gauge indicating battery remaining power. As the discharge reaches 30 %(three bars), the red light begins to flash reminding you for a recharge. Please refer to battery charger instruction manual for details (Figure 3).

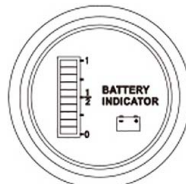


Figure 3

Speed Meter:

- 1) Speedometer displays the speed real-time
- 2) Milometer for single trip(record single trip
- 3) Milometer for total distance (record total distance)
- 4) KMH/MPH Switching (KMH/MPH)

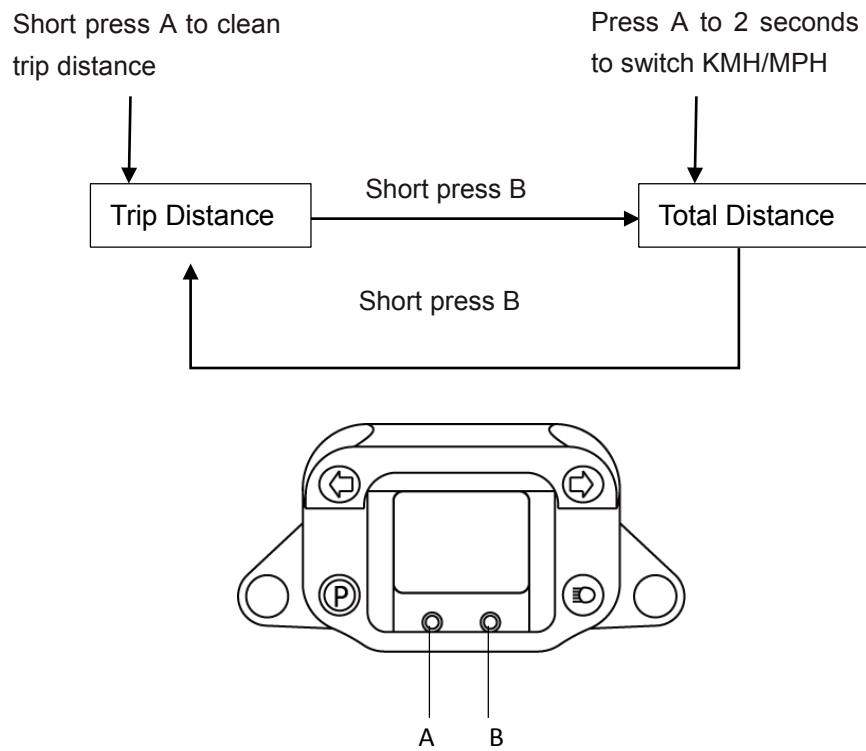


Figure 4

Accelerator Pedal---Located right of the braking pedal. Slowly apply pressure until full speed can be achieved. Release the pedal steadily for vehicle speed deceleration.

Brake Pedal--- Located left of the accelerator pedal. It serves to stop the vehicle within a short distance. Slowly apply pressure for a smooth stop.

Parking Brake Pedal---Small pedal located on the upper left of the braking pedal. It serves to hold the car at a total standstill. Whenever you wish to stop the car, first you need to fully press the braking pedal and then press the parking braking pedal. In this way, car's brakes are totally locked. If you observe the parking pedal not pointing in the downward position, it means the parking pedal is not properly locked. Repeat the above steps until parking pedal is in the braking position. To unlock parking brake pedal, simply apply pressure onto the brake pedal until braking pedal is back to its normal position.

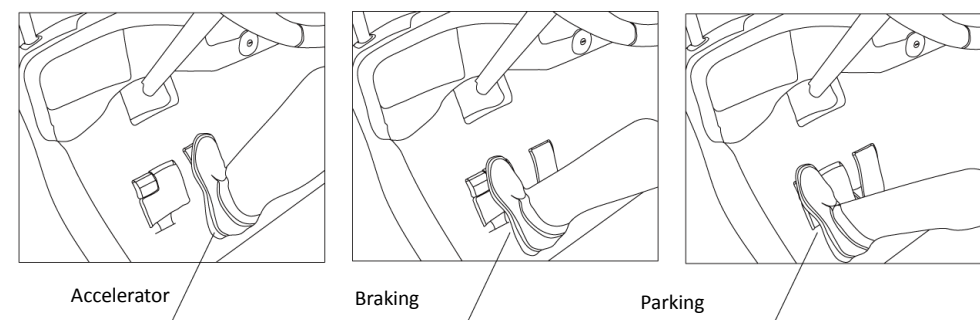


Figure 5

Steering Wheel---Controls vehicle direction

Multi-Function Switch---Located lower left of the driving wheel. Similar to headlamp switch, it also incorporates control switch for headlamp and for horns. This is used to replace headlamp switch and horn switch in cars use in golf course. (Figure 6)

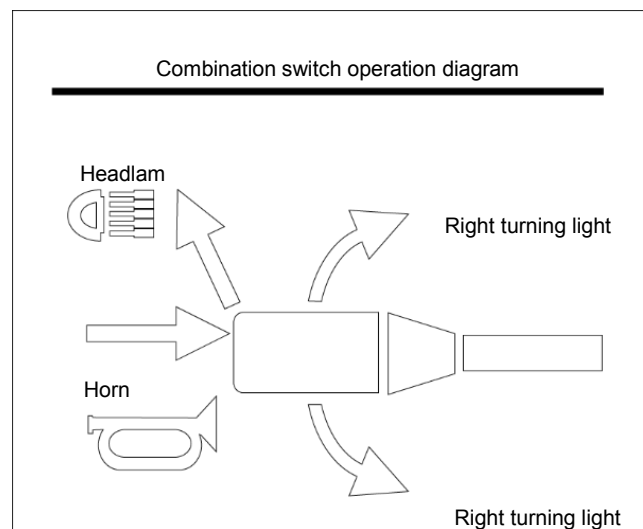


Figure 6

4. VEHICLE OPERATION PROCEDURE

- Insert the key
- Turn right to "F" position for forward drive
- Press braking pedal and release parking pedal
- Slowly press accelerator pedal



If you press accelerator pedal, before turning the key, do not press accelerator pedal until after key has been turned to forward "F" and reverse "R" position. Under this scenario, release the accelerator pedal first and turn the key to forward "F" position and reverse "R" position and then press the accelerator pedal and the cart is ready for operation.

5. SAFETY OPERATION PROCEDURE

The driver shall have a good understanding of the car's performance and follow the following safety procedures:



Only drive in a legally permissible place and only drive when the car is in a safe condition. Do not overload. Otherwise, the motor may incur damage and the out-of-control car may endanger passengers and drivers.

- No driving is allowed for unlicensed personnel.
- Do not allow climbing more than 25% grade.
- Do not exceed 14% grade while travelling across hills.
- Do not chase other cars at cross roads or unspecified road conditions.

6. BATTERY MAINTENANCE

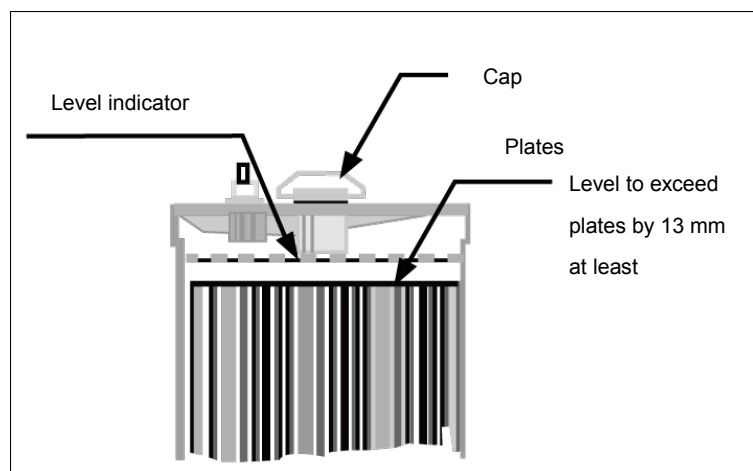


Figure 7



Only use purified water. Do not use tap water or mineral water. Perform regular maintenance on the batteries to increase vehicle performance and battery duration. Recommended hardware for battery maintenance includes: Spanner, clean cloth, goggles, lubrication.

- Check all vent caps for tightness. Keep cables and connections clean and dry. If there is any sign of leakage, please brush with baking soda on the top of the battery until a clear finish appears on the connections. Reconnect the connections and apply a thin film of lubrication against possible corrosion. Check every week. Do not let water ingress into the battery while cleaning the outside of the battery.
- Check on a regular basis the battery's connection to make sure there are not any loose connections. The recommended torque is 10.7 to 11.9 N.M.



- Do not over-tighten the connection or a potential battery post break-down or battery combustion could occur.
- Do not place any object on the battery and do not connect individual battery positive and negative terminals
- Watering the battery (applicable to open acid battery only) is a routine job with the frequency being largely determined by your local climate, charging method and battery use frequency. Water the battery only after a complete charge. Before the battery charge, make sure there is enough water to cover the plates. Even if the battery is discharged (partially or completely), the water level shall be above the plates but make sure not to over fill.

Watering Procedure:

- Open the vent cap and check electrolyte level. Add purified water if necessary.
- Before the next watering session, recharge the battery.
- After the charging is complete, check water level. Add water until there is 1/8" or 3mm between the water level and the bottom of the watering well.
- Clean the residue water and tighten vent cap.
- Monitor the battery indicator on the vehicle to determine remaining time available to go back to charging station for recharge.
- If the vehicle is not in use for a period of time, battery will self-discharge, the ratio standing at 13% every month at a temperature 25°C. It is recommended that before putting the vehicle in storage, fully charge the battery. Unplug the power and put the controller switch to "TOW". IF the vehicle is stored at -7°C, the minimum amount of battery energy shall be not less than 30%. Otherwise, charging operation shall be carried out.
- Use proper lifting tool to replace battery. Only use battery of the same specification.

7. BATTERY CHARGER

- This charger is only applicable to lead acid battery
- Do not blend battery chargers of different specifications Operation Instructions:
- Battery charger shall be placed in a dry and clean environment and well ventilated.
- Check charger input voltage and check for proper grounding.
- Put the charger plug into vehicle socket and then connect the charger to AC power. When the indication light is on and the fan is on, it means the charger is ready to go.
- When the charger is complete, disconnect the power supply and unplug charger from the socket.
- Do not open the charger cover. Leave it to qualified electrical technician.

Charger Troubleshooting Guide:

Problem	Cause	Troubleshooting
Battery heats up and foaming	Damaged battery	Check and replace battery if possible
Battery power loss even if completely charged	Battery ageing	Replace
	Output wire more than 5 meters in length	Decrease to 3 meters
Charger shutdown shortly after battery charging comments	Mistake earth wire with null line and shut off when exposed to over-current	Connect null line right
	Check for whether overheat protected	Eliminate foreign material and check for fan condition
Power light is on but not actually charging	Check for connector polarity	Charge after connection is right
	Battery damaged	Replace battery
Power light is not on	plug	Charge after connector plug is complete

Safety Precautions:

- Do not open the charger to carry out repairs or testing. Do not modify the wiring without approval.
- Choose 3-wire wiring with proper grounding. Wiring diameter shall be over 2.5mm². Use plug compatible with the charger (1 OA or 16A).

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- Do not expose the charger to rain.
 - Connection between the plug and the socket shall be tight. Replace if the connection is found loose.
 - Disconnect the charger immediately if there is any abnormal sound or smell
 - Do not lengthen or replace output cables
 - Do not seal the inlet vent and outlet vent
 - Disconnect power and charging plug when moving the charger around.
 - Battery voltage and Charger nominal voltage shall be identical.
 - Do not twist the cable.

Maintenance:

- Place the charger in a ventilated area against rain and dirt
- Do not open the charger cover during battery charge
- Do not open the charger cover by unqualified personnel
- Pack the charger if left unused for a long time
- Disconnect the charger even if it is originally designed to be capable of repairing lead acid batteries.
- Do not discharge the battery while charging operation is underway.
- During battery charge, the electrolyte temperature shall be less than 55 C°. Otherwise, means shall be taken to decrease the temperature or temporarily discontinue charging
- Do not use the charger for power supply purpose other than battery charge.

8. MOTOR MAINTENANCE

- Do not idle the motor
- Clean the motor for dirt and other foreign material on a regular basis.
- We recommend you contact your local dealer and send motor technician to handle.



Motor is a critical source to the normal operation of the vehicle.

Please refer to the following instructions for proper vehicle care.

Vehicle Normal Conditions

No	Item	Normal Condition	Abnormal Condition	Possible Result if not properly used
1	Power configuration	A. Vehicle power calculation done, power distribution adequate B. Motor actual, current no more than 70% of nominal current at full load on level ground	Power calculation not done. Experiment data exceeds normal permissible value	A. Commutator spark B. Motor stator or rotor wiring overheat C. Motor burn-out D. Output spline key worn out prematurely
2	Load condition	Operate at permissible load condition	A. Regular overload B. Brake not tuned well	Same as above
3	Service mode	A. Adhere to required service mode B. Or 40% load	In heavy season, continuous Full load operation will cause motor to overheat	Same as above
4	Vehicle power-up	A. Normal accelerated start B. Set the soft start time to 3-5 seconds	A. non-smooth accelerating B. No time set for soft starting at the controller	Same as above
5	Vehicle power-up	Balanced driving	Push hard accelerating pedal or brake suddenly	Same as above
		Drive at normal speed	Speed exceeds value	Damaged motor
		Use electrical brake No braking is for down slope driving	No braking is provided. Speed exceeds allowable	
6	Motor protection	No water and sludge into the motor	No protection	A. Water ingress into the motor B. Bad contact between brush and commutator C. Foreign material inside

Motor problem cause and problem-solving

No	Phenomenon	Cause	Problem-solving
1	Motor not running	Faulty Circuit	Check circuit integrity and fuse condition and overload protector
		Rotor lock and motor overload	Decrease load and eliminate rotor lock
		Motor burnt	Replace new motor
2	Transmission noise	Motor bearing damaged	Check motor
		Transaxle or gearbox noise	Check axle and gearbox separately
		Motor and gearbox misalignment, assembly not done well	Make them align
		Electrical control for motor not tuned well	Refer to professional
3	Motor spline wear prematurely and key over worn	Motor shaft not Q&T	Check shaft or bushing hardness
		Gearbox not mounted with motor, motor shaft bent	Choose vertical mounting to avoid bending
		Gearbox input shaft and mounting spigot not aligned	Check gearbox run out
		Overload for long time	Revert to normal operation
4	Commutator damage	No regular check	Do regular check
		Over load current too high	Over-load current within normal range
		Motor water ingress. Sludge sticks to brush holder	Clear foreign material
		Unclean commutator surface	Clean Commutator surface
5	Smoke issuing from the motor or motor burning	Serious overload	Decrease to normal range
		Full load time exceeds half an hour	Proceed acc. To nonnal service mode
		Climbing too steep a hill or the ramp length is too long	Proceed within normal range
		Brake nor tuned properly	Tune the brake

Motor maintenance and repair

- Check the motor every half an year
 - Check for foreign matter on the motor to guarantee normal working and ventilation
 - Check for carbon brush and replace if necessary
- Carry out the scheduled inspection once a year or after 2400 hours.
- Motor Off-Vehicle Inspection
 - Unload the motor from the vehicle
 - Use 250V megohmmeter to test motor cold resistance. The value shall be over 0.5MO
 - Manually rotate the shaft to check for seizure
 - Open guard cover to check commutator brush wear. If one of the four brushes heights is less than 1200mm, then all 4 brushes shall be replaced.
 - Check for commutator surface roughness. Resurface if necessary.

9. CONTROLLER MAINTENANCE

The controller is used for controlling vehicle speed, torque, and serves to slow down the vehicle. While towing the vehicle, please take the following steps against possible damages to the vehicle.

- Turn the key to "OFF" position.
- Flip open the seat and switch the controller to "TOW" position. (See Figure 8)

Now it is safe to tow the vehicle. Motor and rotating parts are free from damage.

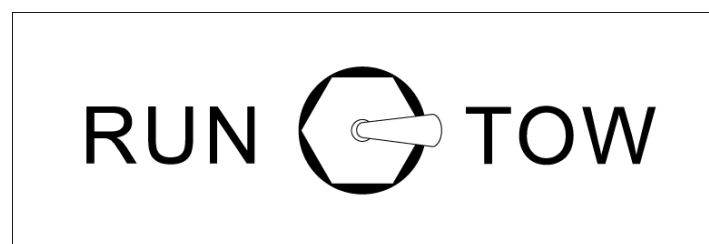


Figure 8

Regular Maintenance

- Make sure all contacts are in good condition
- Make sure the micro switch for the accelerator opens/closes successfully.
- Make sure the key turns smoothly
- Make sure the connections between motor, battery and controller components are correct.



Carry the above-mentioned checks only after the battery is disconnected. First disconnect negative output wire when disconnecting battery wire. Carry out those checks every three months.

Problems	Troubleshooting
Vehicle will not start	A. Controller not connected to power, battery or wire not working properly B.No signal input into the controller <ul style="list-style-type: none">● Damaged power or faulty wire● Accelerator pedal damaged C. Major connectors broken or short-circuited D. Controller damaged
Maximum Speed Not Attainable	A. Battery partial charging B.Accelerator pedal not working properly C. Controller not working properly D. Speed sensor not connected or connector faulty connection

We recommend you contact local Alpha EV dealers or qualified repair shop to deal with the above-mentioned problems.



Any modifications, repair done outside the pre-set value will cause serious damages to personal safety.

10. BRAKING SYSTEM

Effective braking force is about 66 pounds.

Effective parking force is about 44 pounds.

Some vehicle equipped with E-m brake, The vehicle will be parked automatically while driver stop the vehicle. When driver engage accelerator pedal, E-m brake release automatically.

11. VEHICLE LUBRICATION

No	Lubrication	Recommended Lubrication Oil
1	Spindle (Left and Right)	lithium base grease
2	Transverse gear	lithium base grease

12. VEHICLE REGULAR MAINTENANCE

Maintenance Frequency	Items Checked	
Driver Daily Check	Accelerator pedal	Check
	Accelerator micro switch	Check
	Battery	Check
	Braking System	Check
	Charger and socket	Check
	Parking System	Check
	Backward Drive	Check
	Steering Wheel	Check
	Tire	Check
	Warning decals	Check
Driver Weekly Check	Battery	Check Level and Cleanliness
	Wiring and Connector	Check for tightness
	Vehicle	Check accessory tightness and speed(less than 8 to 24 kilometers)
Driver and qualified Technician monthly check	Check the above-mentioned items	
	Battery	Wash battery top
	Braking System	Check braking line and operation
	Tyre	Check for wear and damage
	Accelerator switch	Check for scratch and damage
Driver or qualified technician quarterly check	Check the above items	
	Accelerator pedal	Check
	Driving System	Lubricate acc. to Section 11
Qualified technician check	Check the above-mentioned items	
	Battery	Check for level and charging
	Braking System	Check for braking clutch
	Wiring	Check
	Front wheel adjustment	Lubricate acc. to Section 11
Annual Check only by qualified technician	Check the above items	
	Accelerator switch	Check for integrity
	Battery	Check for contacts

13. WARRANTY

1) Definition of Warranty

It means that when the vehicle is operated in accordance with the requirements of the owner's manual and within the warranty period, the damaged components due to material or production defects can be replaced or repaired free of charge.

2) Warranty Period

The mechanical parts and wear and tear parts, which are standard components of electric vehicles, are guaranteed according to the contract.

3) Warranty Conditions

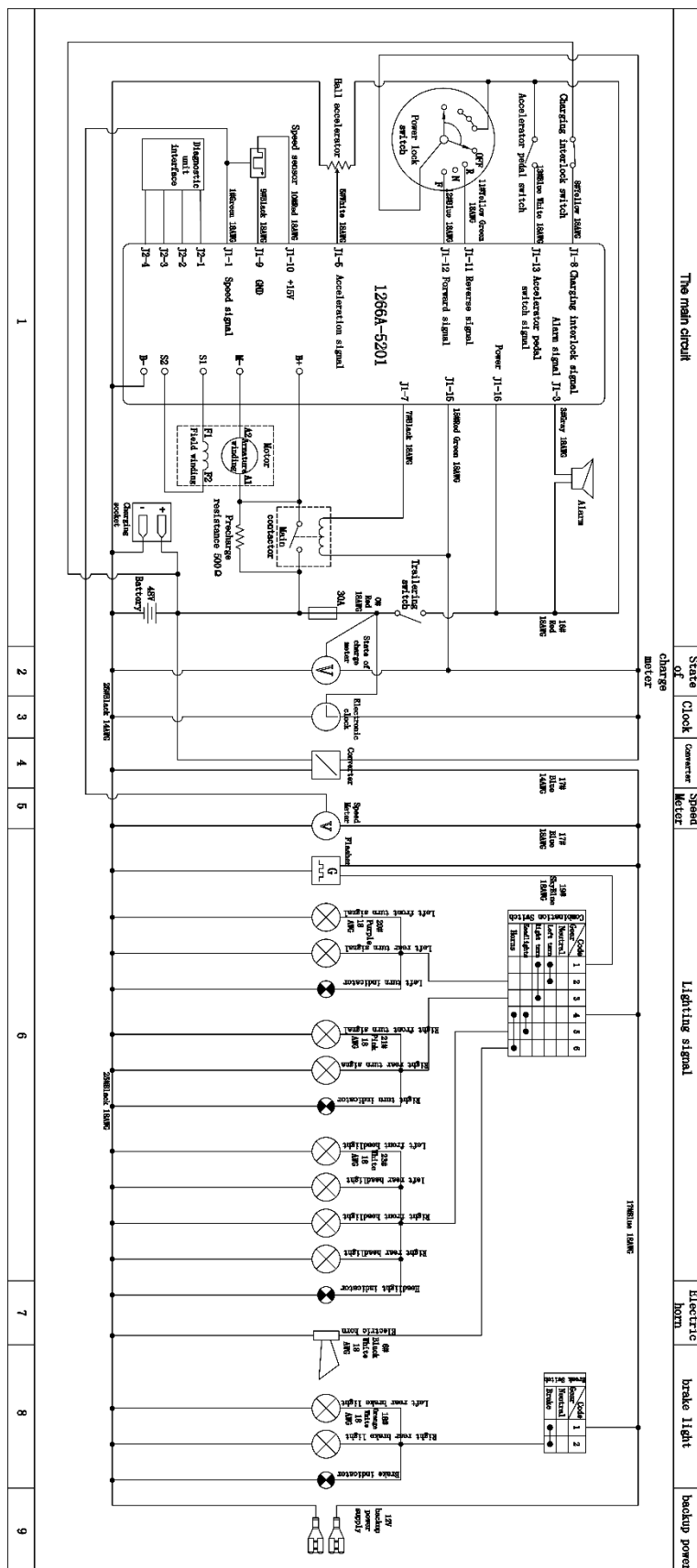
- a) All defective parts must be original and within the warranty period, and must be returned to the original factory for inspection and warranty confirmation.
- b) The following is excluded from the warranty. Damage caused by abnormal operation and neglect, damage caused by natural disasters, accidents or theft or loss of components, etc. Consumable parts are also excluded from the warranty, such as bulbs, fuses, brake pads, front windshield, bearings, spacers, connecting parts, etc.
- c) Warranty period is confirmed by purchase invoice or proof issued by authorized dealer. When applying for warranty, please use pencil and white paper, and copy the frame code on the frame behind the front left wheel of the vehicle to your supplier. (This is to guarantee the authenticity of the product during the after-sales service process)

The warranty period is calculated from the date of purchase or, if the proof of purchase is incomplete, based on the date of manufacture of the vehicle.



Any repairs or modifications to the vehicle beyond those specified in the factory or original design, including affecting the vehicle's gravity distribution, balance or speed, will void the warranty and may result in serious personal injury, death or property damage.

14. CIRCUIT SCHEMATIC



15.CONTROLLER FAULT CODES

If the controller experiences a fault, the LED on the controller will flash the number of times in the “Flash” column below. If the vehicle is equipped with an LCD display, the display will show the code in the “LCD Display” column.

Flash	LCD Display	Fault	Solution
1	F01	High Pedal Disable	Release the accelerator. Turn the key off, then back on without pressing pedal.
4	F04	Controller Overheat	Shutdown vehicle. Wait several minutes for controller to cool down before restarting.
5	F05	Main power outage	Check the battery to controller connection.
6	F06	Current sampling circuit error	Restart controller. If this does not work, replace controller.
7	F07	Encoder failure/ Stall Detected	Check the motor encoder. If this does not work, replace motor.
9	F09	Battery pack undervoltage	Check battery pack for errors.
10	F0A	Battery pack overvoltage	Check battery pack for errors.
11	F0B	Motor overheat	Shutdown vehicle. Wait several minutes before restarting. If error continues, check motor temperature sensor and/or replace motor.
12	F0C	Storage verification error	Restart controller. If this does not work, replace controller.
13	F0D	Accelerator sensor error	Check accelerator pedal connection. Replace pedal if needed.
15	F0F	EM Brake failure	Check Run/Tow switch and EM brake connection
21	F15	Startup sequence error	Restart controller. If this does not work, replace controller.
23	F17	Overcurrent output	Verify that the vehicle is not stuck and check motor wire connections. Check motor and replace if needed.



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