E20FX, E40FX & E60FX Service Manual

EPIC FX

2/7/2026

Note:

CONTENT

1. How to Use This Manual

1.1 Manual Overview

This manual serves as the maintenance guide for the E40FX model. It is designed to:

- Provide technical support that meets the professional standards of the user
- Anticipate your needs to simplify the maintenance decision-making process.
- Reduce the need for page-turning by adopting a one-stop service concept.

The instructions, diagrams, and specifications included in this manual apply to the E40FX model with serial numbers effective from the date of printing.

When repairing the E40FX model, carefully read the manual and familiarize yourself with all instructions.

The manufacturer reserves the right to modify specifications or designs without prior notice and without obligation.

1.2 Manual Usage

Warning

Before servicing the E40FX model, read this manual thoroughly. Store the manual in a safe, dry place for future reference.

Failure to fully understand the E40FX model and the maintenance instructions may result in serious accidents during the maintenance process.

Warning

Untrained personnel are strictly prohibited from operating this vehicle.

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Explanation of Symbols

The content specified by these symbols is crucial for your safety and the safety of others. Please adhere to these instructions.

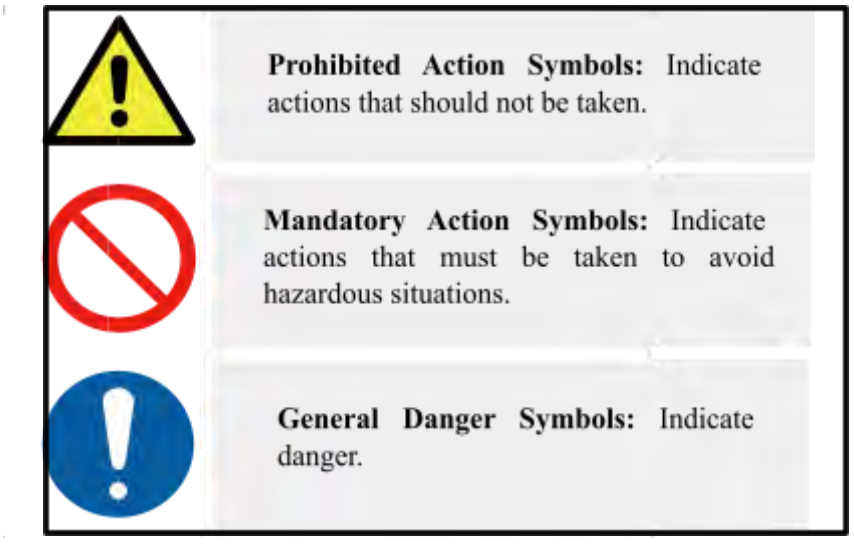
	Danger:	Indicates a high level of risk.

	Warning:	Indicates a moderate level of risk.
	Caution:	Indicates a low level of risk.
	Notice:	Statements directly or indirectly related to personnel safety that should capture your attention.

2. Safety Instructions

2.1 Safety and Warning Signs

ISO 3864-1 specifies the general shapes and colors used for safety symbols indicating danger, warning, and caution12.



2.1.1 Safety Categories

The ISO 3864-1 standard specifies the general shapes and colors for safety symbols indicating danger, warning, and caution.

In this document, danger, warning, and caution are used when special precautions need to be taken to avoid potential hazards.

According to the ISO 3864 standard, warning information is divided into the following three groups based on the severity and degree of hazard:

2.1.2 Hazard Symbols

2.1.3 Prohibited Symbols

No Smoking

No Unauthorized Changes Be Made

Authorized Personnel Only

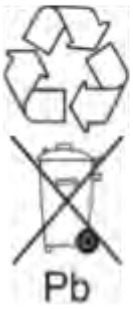
No Touching

2.1.4 Instruction Symbols

Read Instruction

Go Hospital

Turn off the Key



Recyle Battery

2.2 Safety Information

2.2.1 General

WARNING

- The vehicle shall not exceed the rated capacity specified by the

manufacturer during use.

- Without the confirmation of the manufacturer, no design modification shall be made, and no object shall be attached to the vehicle, so as not to affect the capability and operation safety of the vehicle.
- Modifications caused by replacement of different component configurations (such as battery pack, tires, seats, etc.) shall not reduce safety and conform to the requirements of this specification.
- The running road must have sufficient bearing capacity, and its maintenance must be strengthened so that it does not affect the running safety of vehicles.
- The driving road of vehicles must have a good vision and be easy to turn, and no slope, steep slope or narrow channel is allowed.
- In a road where pedestrians or other vehicles may be encountered, the road must have sufficient width.
- It is recommended that the gradient of the driving road should not exceed 15%, and the top and bottom of the slope must be smoothly transited to avoid collision between the bottom of the vehicle and the road. When the gradient exceeds 15%, it is recommended to install a sign. At this time, the vehicle must be driven with extreme care.

2.2.2 Safety Operation Instruction

For drivers

The braking, acceleration, and other characteristics of each vehicle with the same technical parameters may be different. Drive the vehicle after being familiar with various operations.

- Wear safety hat;
- Do not drive when you are tired, have used narcotics or drunk

Workplace Safety

Electric vehicles shall not be used in flammable, explosive, acid, alkali, and other corrosive environments.

- Road should be in good condition and unblocked.
- Obey the traffic rules.
- Fire fighting equipment must be available at the place where the vehicle is used and charged, and the fire extinguisher must comply with.
- The value of vehicle noise in the manual refers to the value measured on the level, smooth and hard road surface of a new car. If your road surface condition is bad or your wheels are damaged, the noise of the car may become greater.
- Ensure the integrity of the vehicle

WARNING Do not modify the vehicle.

- Please observe the traffic safety rules when operating, checking,

and repairing the vehicle.

- Without the written permission of our company, it is not allowed to modify or add any device to the car. Modifying the car may affect the safe operation of the car.
- Before using the car, please formulate safe operation procedures according to the actual situation, and fully consider safety when formulating work procedures.
- Never operate the vehicle under unsafe condition.
- It is strictly forbidden to use the vehicle in places where unsafe factors exist.
- It is strictly forbidden to use a faulty car.
- Make sure to check the car every day. If any abnormality is found, please repair, or replace it.

 **WARNING**: **Overload is prohibited.**

- Overload will damage the vehicle or cause injury.

 Electrical System Inspection

- Turn off the key switch and the emergency isolating switch when checking the electrical system.

2.2.3 Safety Driving Operation

Starting

Press the F/R to the neutral if it's not;

- Insert the ignition key and turn it to ;
- Press the F/R switch and lock it to the desired gear;
- Step down accelerator pedal slowly and smoothly, and the EMB park brake will release automatically. The vehicle will start to move.
- When parking, release the accelerator pedal and step down park brake. The EMB will release after the vehicle is stopped.

While Driving

- Keep your hands on the steering wheel and your eyes on the path you are going.
- Keep your entire body inside the vehicle, keep seated and hold on while the vehicle is moving.
- Drive the vehicle ONLY in areas where it is allowed to use by law or local regulations and the conditions are safe to do so.
- Avoid starting or stopping suddenly. Always drive slowly up or down on the incline.
- Avoid driving the vehicle over soft objects to avoid damage to the vehicle, personal injury, or damage to the surrounding environment.

- Avoid holding the vehicle on an incline with the accelerator, please use the brake.

Driving on Slope

- Avoid turning on the slope or run across the slope
- Avoid coasting in neutral when going downhill.

Stopping

- Stop the vehicle, gradually press down on the brake pedal.
- When the vehicle stops, apply the park brake, and turn the power key to OFF position and pull out the key, press the F/R switch to the neutral position.
- When parked on a slope, wheels shall be fixed.
- In rainy and snowy days, the vehicle shall be parked indoors.

2.2.4 Maintenance and Inspection

Cleaning

Use compressed air instead of water to clean the electrical system

Charging

WARNING No open flame at the charging point.

● After cleaning, the dirt on the vehicle should be wiped out, and the vehicle should be checked in the following aspects:

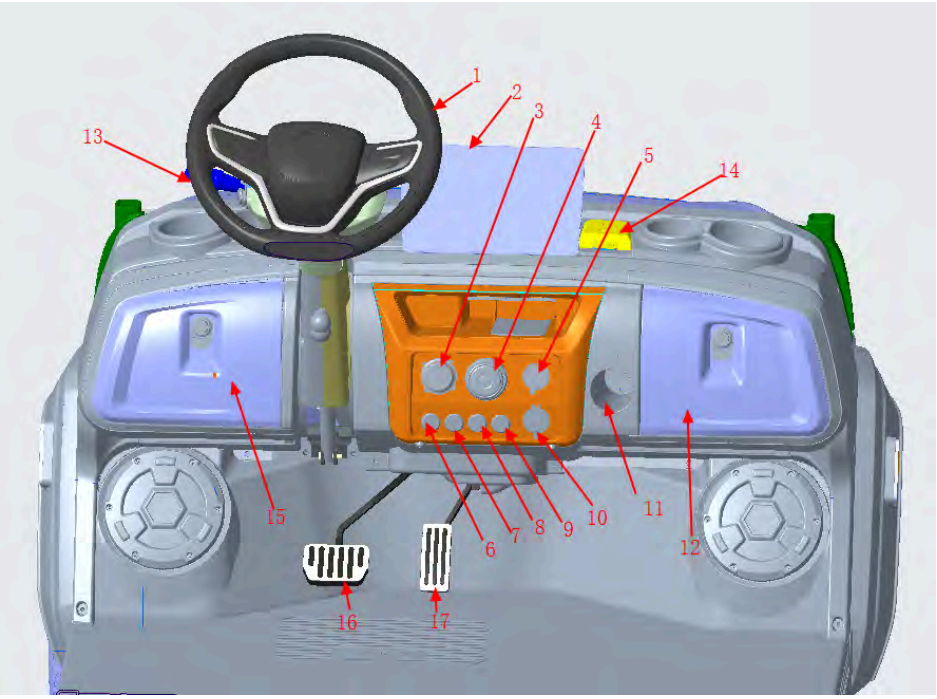
a. Keep all warning signs, nameplates, warning plates and other graphic and textual marks of the vehicle complete and clear.

b. Check for deformation, distortion, damages, or breakage.

c. Add lubricant as appropriate.

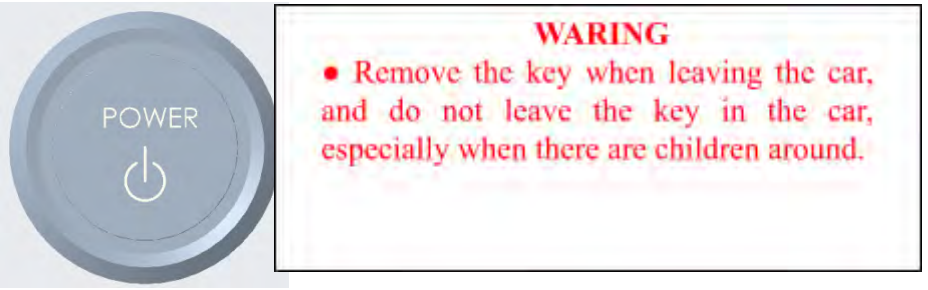
d. Replace faulty parts.

2.3 Dashboard



1. Steering Wheel 2. Speedometer 3. One-push Buttom 4. Gear Switch 5.USB
6. Double-flash Switch 7. Hood Switch 8. Canopy LED Light Switch 9. Side Skirt LED Light Switch 10.USB 11. Umbrella Bucket 12. Right Glove Box Cover
13. Combination Switch 14. Oil Reservoir Lid 15. Left Glove Box Lid Cover
16. Brake Pedal 17. Accelerator Pedal

One-push Bottum



Press once—blue light on means the vehicle is powered. Press again—blue light off means the vehicle is powered down.

2.4 Running-in of New Carts

The lifespan, reliability, and cost-effectiveness of a golf cart greatly depend on the initial run-in period. The recommended run-in distance is 800 kilometers, but, if possible, it's best to extend it to 1500 kilometers. Before the new vehicle is officially used, it must undergo a run-in period. During this time, the cart should be operated at lower speeds, generally not fully loaded, and not overloaded. The purpose of the run-in is to allow the components to break in and improve their surface quality and fitting precision, thereby avoiding early wear and tear on the vehicle.

During the run-in period, the following guidelines should be observed:

- Avoid rapid starts, sudden acceleration, and unnecessary hard braking.
- During the run-in period, strictly control the speed within 20 Km/h.
- Frequently check if the battery, controller, and motor connection wires are heating up or becoming loose. Regularly check the temperature of the reducer, rear axle, wheel hub, and brake drum. If there is overheating (greater than 60℃), inspect and resolve the issue.
- After running-in for 500 Km, check the tightening of the steering system, front suspension, and wheel nuts. Tighten if necessary. After the run-in period, the user should replace the transmission lubrication oil and rear axle gear oil.

● During the run-in period, avoid deep discharging the battery. Even after the run-in period, over-discharging is not allowed, as it can quickly damage the battery.

● If the vehicle's mileage is less than 60% of the rated range during initial use, stop using the vehicle immediately and contact the company's after-sales department to determine the cause.

2.5 Caution

1. The vehicle must be driven by professionally trained and qualified drivers.
2. Before driving, remind passengers to sit firmly and hold onto the handrails. Passengers should not extend their bodies out of the vehicle while it is in motion.
3. Overloading or driving under the influence of alcohol or narcotics is strictly prohibited.
4. Do not drive if the water level is at or near the bottom of the motor. When driving through water, reduce speed and proceed slowly.

To ensure safe charging and prevent accidents such as fires or damage, the AC power supply for the charger should meet the following requirements:

1. The voltage of the AC power source should be within ±5% of the

charger's rated input voltage, and the frequency should match the charger's input frequency.

2. The AC power source should support a current capacity of no less than 16A at the rated voltage, and a matching circuit breaker should be installed to cut off the power in case of overload, short circuit, or leakage.

3. The AC socket should fully match the input plug of the charger.

4. The AC socket specifications should be for a 16A current at the rated voltage, and the power wire cross-sectional area should be no less than 2.5mm², with voltage loss not exceeding 1% at the rated voltage and current.

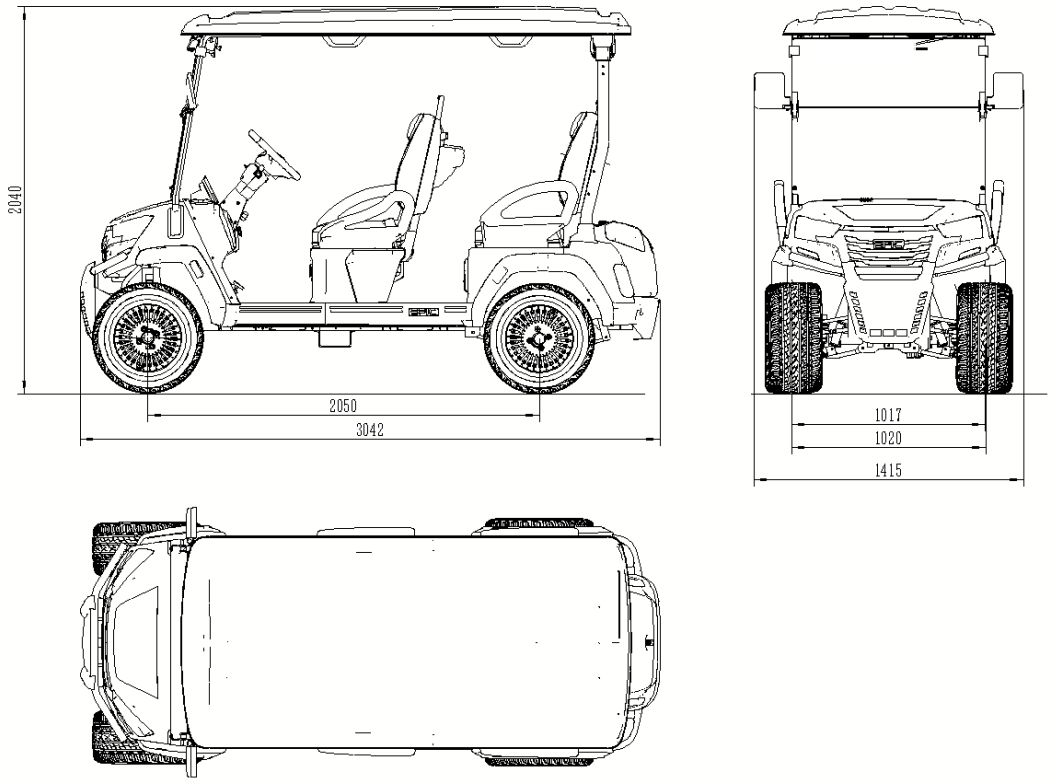
5. The AC socket should have a grounding wire with a cross-sectional area of no less than 16AWG.

6. The AC socket should be installed in a ventilated, rain-sheltered, dry place without flammable or explosive materials, and should comply with local or regional standards.

3. General Specifications

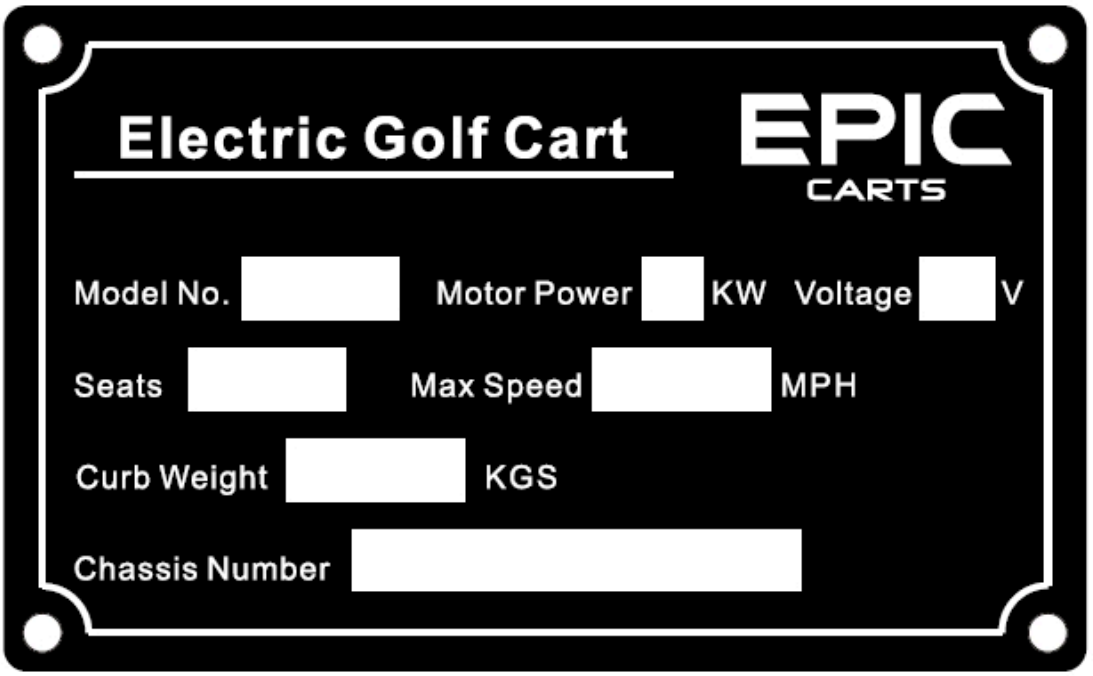
3.1 Vehicle Dimensions

3.1.1 e40FX



Specification			
Curb Weight (kg)	580	Carrying Capacity (kg)	340
Overall Dimension (mm) (L*W*H)	3042*1415(include rear mirror) *2040mm	Wheel Base (mm)	2050
Front Wheel Tread (mm)	1017	Rear Wheel Tread (mm)	1020
Min.Ground Clearance (mm)	170	Min Turning Radius (m)	3.8
Max.Speed (km/h)	30	Max. Grade Ability (%)	25 (fully loaded)/ 30 (empty loaded)
Endurance Mileage (km)	50 (fully loaded)/ 55 (empty loaded)	Brake Distance (m)	3.5

3.2 Nameplate Information



After you receive the vehicle, please check whether the information on the nameplate is consistent with the vehicle you ordered.

● The configuration of each vehicle is not the same. Please check the nameplate to confirm its properties before use.

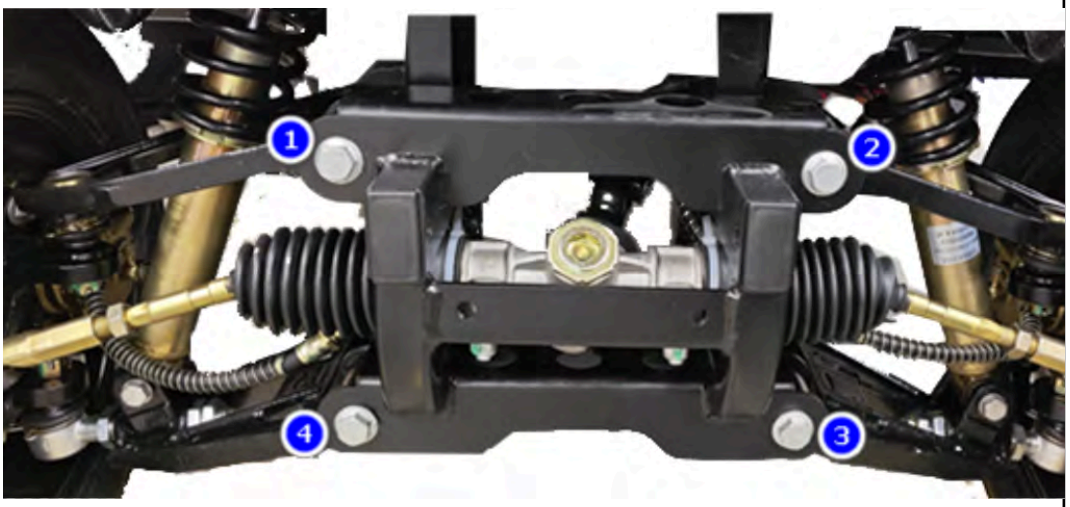
● When carrying passengers, the weight and number of passengers shall not exceed the rated lifting capacity and rated number of passengers. Please check and confirm.

4. Maintenance

4.1 Front Suspension and Steering System

4.1.1 Control Arm

●Installation of upper and lower control arm, fixed with M12*75 hex bolt, flange, and locked. Torque 50N.m, as shown ①②③④。



· ②③④:M12*75 hex bolt, flange+flat washer+nut

Tool:

1.torque wrench

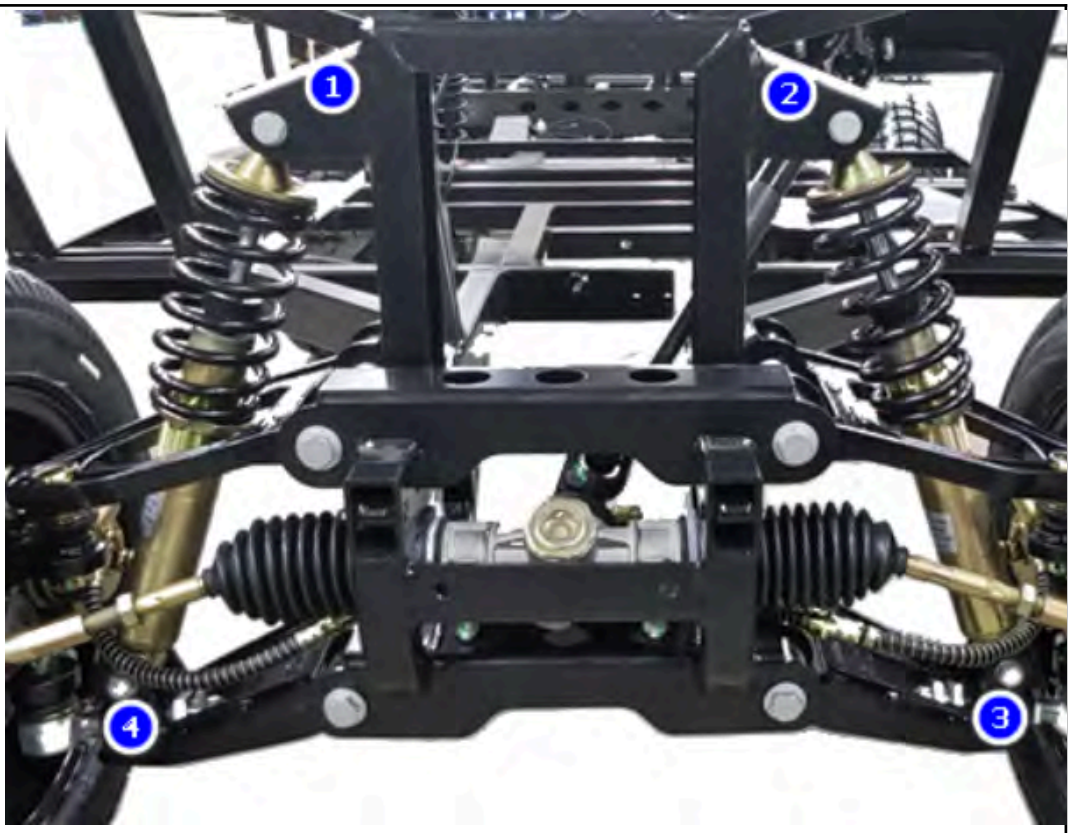
2.19mm sleeve

3.19mm open-end spanner

4.1.2 Front Shock Absorbers.

● First determine the direction of the front shock absorber, with one end of the spring above.

● Install shock absorber, lock with M10*65 hex bolt. Torque 34N.m.



①②③④：M10*65 hex bolt +flat washer+flange nut

Tool:

1.torque wrench

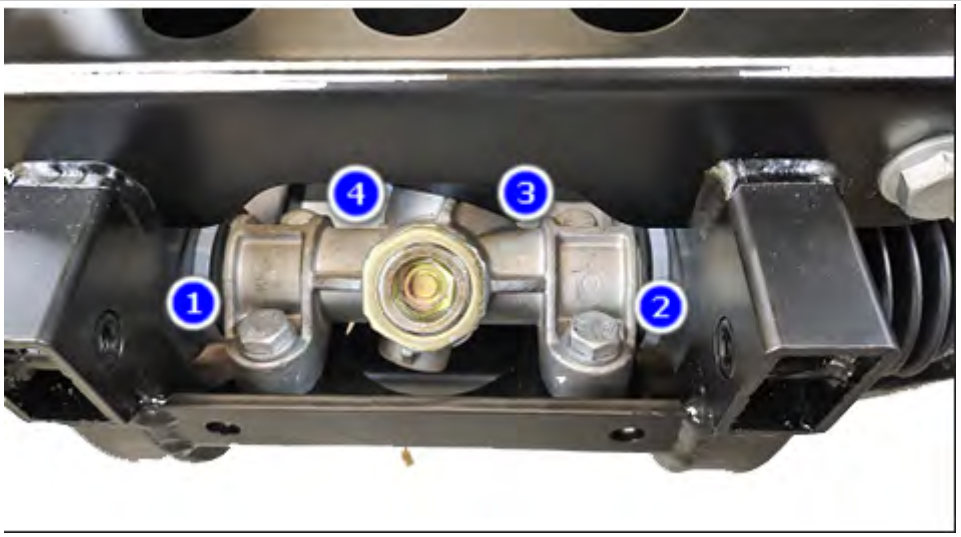
2.17mm sleeve

3.14mm open-end spanner

4.1.3 Steering Rack

● Mounting steering rack, M10*40 hexagon flange bolt lock fixed, like figure①②③.

Note: Adjust the steering rack, make the rack as horizontal as possible, and then use the torque wrench to lock. Torque: 50N.m.



1 ②③：M10*40 hexagon flange bolt + hexagon flange nut

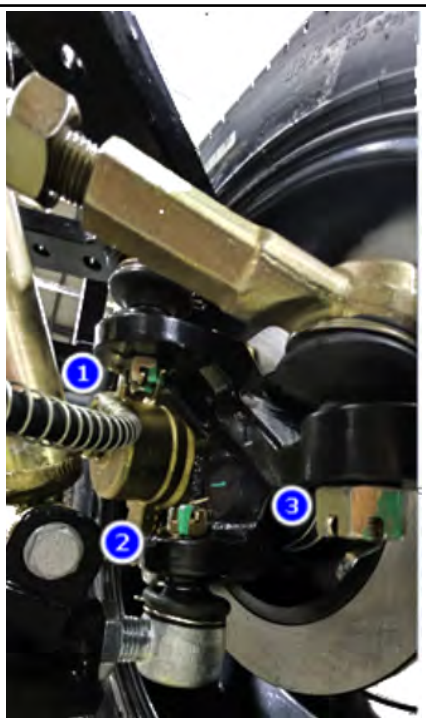
Tool:

1. torque wrench
2. 14mm sleeve
3. 14mm open-end spanner

4.1.4 Left Spindle

● Put the left spindle assembly, connect the upper and lower control arms and fix them with slotted nuts + cotter pins.After locking nut, use the nipper plier to reverse bend the cotter pin in place, like figure①②.

● Left spindle assembly, connected the steering rack. Use slotted nut+M12 flat washer+cotter pin fixed. After locking nut, use nipper plier, bend the cotter pin backwards to secure it, like figure③.



· ②: Slotted nut+cotter pin

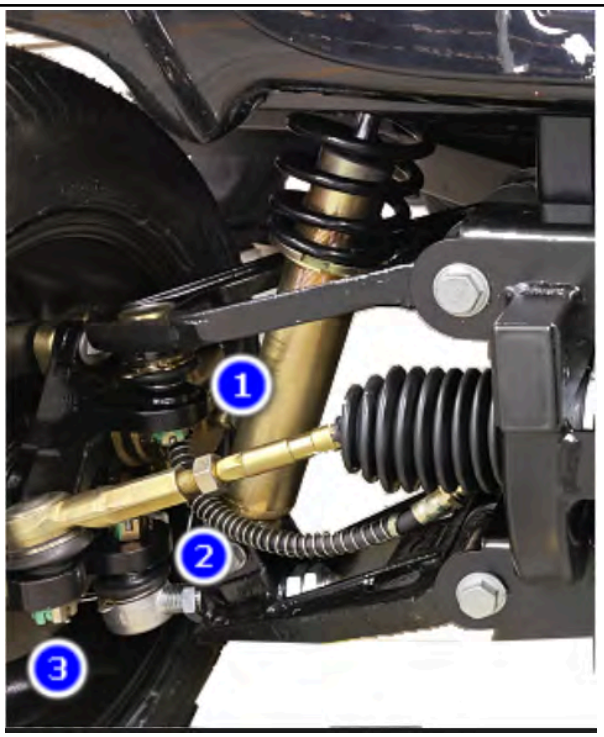
③ : Slotted nut+M12 flat washer+cotter pin

 	Tool: 1. 19mm sleeve 2. nipper plier

4.1.5 Right Spindle

● Attach the right spindle assembly to the upper and lower control arms and secure them with a slotted nut+cotter pin. After locking the nut, reverse bend the cotter pin with the nipper plier to secure it, like figure①②.

● Connect the right spindle assembly to the steering rack and fix it with slotted nut+M12 flat washer+cotter pin. After locking the nut, reverse bend the cotter pin with the nipper plier to secure it, like figure③



· ②: slotted nut+cotter pin

③ : slotted nut+M12 flat washer+cotter pin

Tool:

1. 19mm sleeve

2. nipper plier

4.1.6 Left Spindle

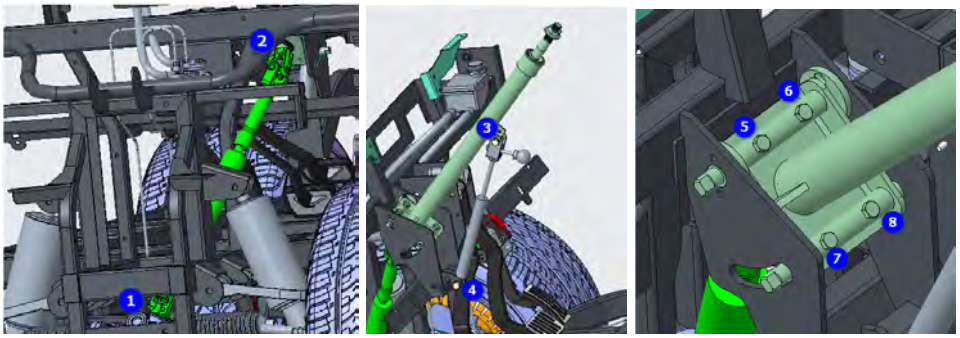
● The spindle assembly is quite complex. If you need to replace any parts, please refer to the parts list in the part manual.

4.1.7 Steering Column, Universal Joint, and Adjustable Gas Spring

● Secure the steering column to the frame, align the pin with the hole, and use a 10mm wrench to install 4 M6*16 external hex screws, tightening to 9-12 N.m.

● Attach the gas spring to the frame ④ and the steering column ③, using a torque wrench and 13mm socket to install 2 M840 external hex screws, tightening to 22-29 N.m.

● Connect the universal joint spline to the steering gear ① and the steering column ②, using a torque wrench and 13mm socket to install 2 M8*25 external hex screws, tightening to 22-29 N.m.



①②：M8*25 hex bolt +spring washer+flat washer

③④：M8*40 hex bolt+spring washer+flat washer+ non-metallic lock nut

⑤⑥⑦⑧：M6*16 hex bolt +spring washer+flat washer

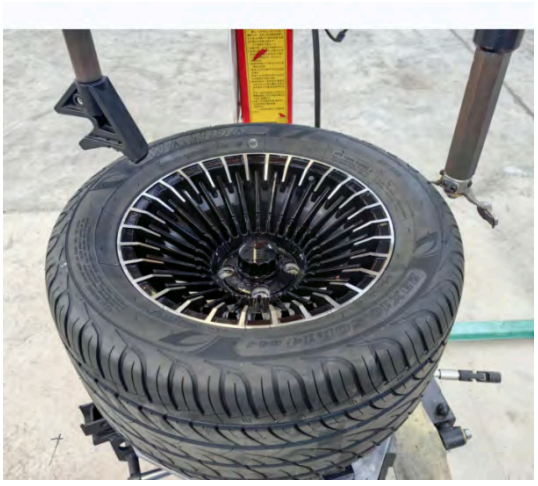
	Tool: 1. Torque wrench 2. 12mm socket

4.1.8 Front Wheel

● Using a professional tire mounting machine, use tire assembly and disassembly grease to reduce installation difficulty.

● Use an air inflation gun to inflate the tire; the air inflation gun can display the air pressure value in real time. Inflation pressure = (85% ~ 90%) x rated maximum pressure.

⚠ Warning: The maximum rated tire pressure for this vehicle is 30 PSI. Do not inflate the tires beyond 30 PSI, as it may cause a tire burst.

	Tool: 1. Tire assembly and disassembly grease 2. Tire mounting machine 3. Air inflation gun

● First, hand-tighten the 4 wheel nuts onto the wheel studs of the steering knuckle. Pre-tightening helps protect the wheel bolt threads from damage.

● Set the torque wrench to 95N.m.

● Then, use the torque wrench and socket to tighten the wheel nuts in the sequence of ①→②→③→④.

Warning: Do not use pneumatic torque tools to install wheel nuts, as these tools cannot control the torque value accurately. Excessive torque may cause the rim to crack or damage the wheel bolt threads, while insufficient torque may result in the wheel nuts not being securely tightened.

<table>
<tr>
<td> 
</td>
<td rowspan="2">Tool:
1. Torque wrench
2. 19mm socket</td>
</tr>
<tr>
<td>  </td>
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</table>

4.2 Rear Suspension

4.2.1 Rear Axle Oil-adding

● Locate the oil fill and drain ports of the rear axle, and place an oil drain pan underneath the drain port.

● Use a torque wrench to loosen the oil fill and drain bolts of the rear axle.

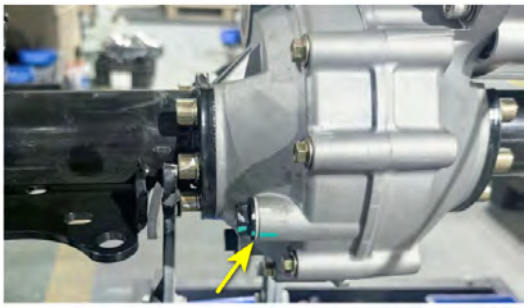
● Drain the expired gear oil from the rear axle, then re-tighten the drain bolt.

●Use an oil injector to add oil to the rear axle, setting the injector to 650ML.

● Re-tighten the oil fill bolt with a torque wrench to 80N.m.

● Wipe the area around the oil fill port with a clean towel to remove any oil residue.

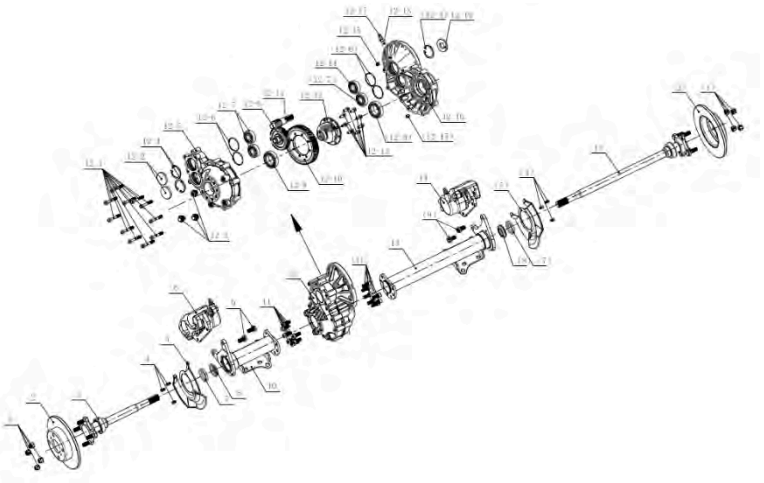
⚠ Warning: Use GL-5 85W-90 gear oil. Do not mix different types of gear oil together.



	Tool: 1. Automatic oil injector 2. Torque wrench 3. 19mm socket 4. GL-5 85W-90 gear oil

4.2.2 Rear Axle Components

● The axle assembly is quite complex. If you need to replace any parts, please carefully compare the parts with the exploded view diagram to identify the correct components, and then purchase the parts through your dealer.

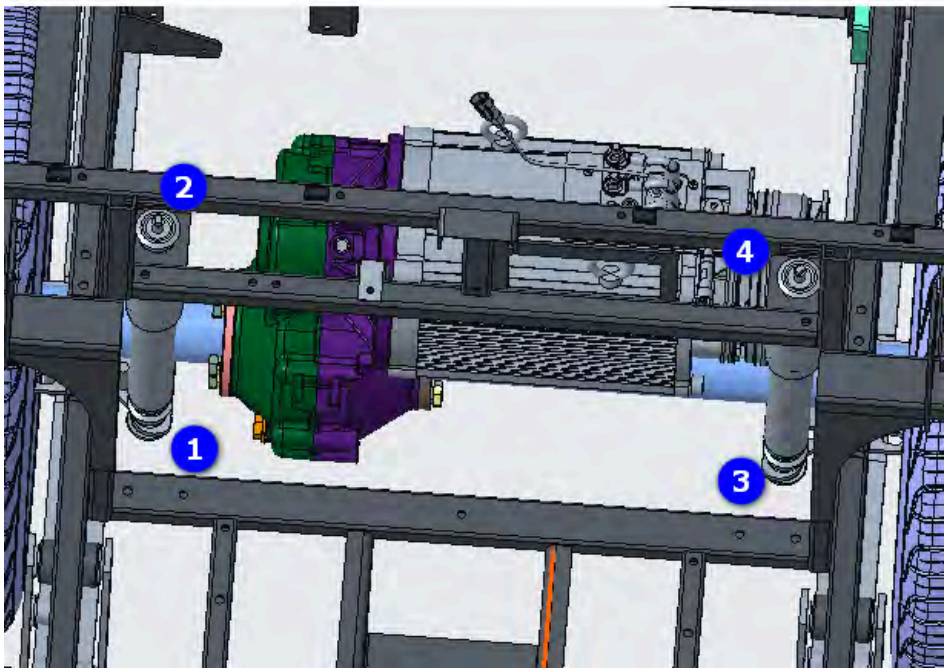


4.2.3 Rear Shock Absorber

● First, remove the nuts from both ends of the shock absorber and compress it.

● To install the shock absorber, first place one end of the shock absorber into the positions on the rear axle (①③). Then, align it with the positions

on the frame (②④). Extend the shock absorber and secure it with the nuts provided with the shock absorber, tightening to 44N.m.



1 ②③④: M10 hex nut

Tool:

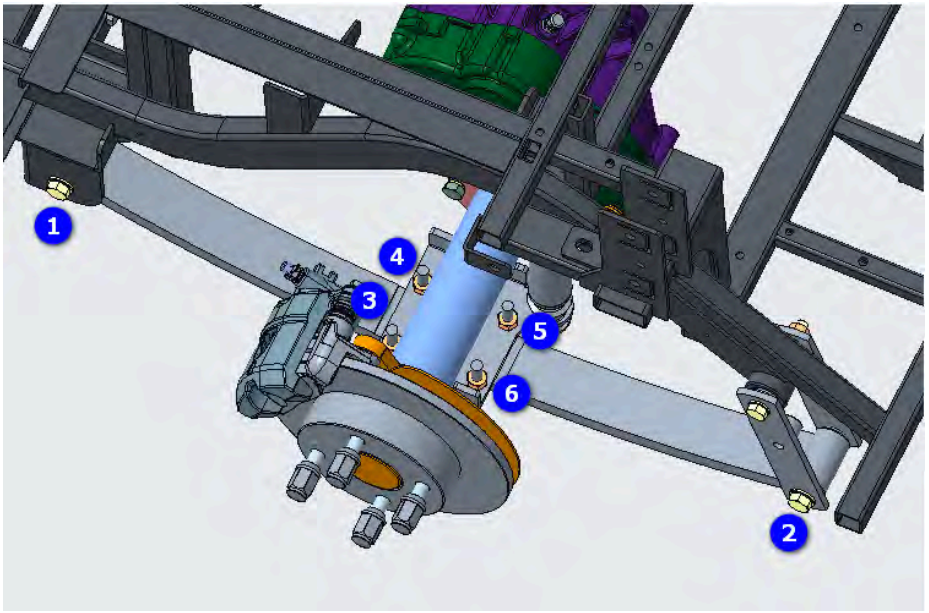
1. Torque wrench
2. 15mm socket
3. 15mm open-end wrench

4.2.4 Leaf Spring Installation

●Install the leaf spring at positions ①② using ribbed bolts and M10 lock nuts. Torque to 58N.m. The installation method is the same for both sides.

●Place the rear axle onto the leaf spring, aligning it with the central positioning hole. Secure it with U-bolts (as shown in diagrams ③④⑤⑥)

and M10 flange nuts, torquing to 58N.m.



①②:rib bolt+flat washer+ M10jam nut

③④⑤⑥:U bolt+ M10 nut

Tool:

1. Torque wrench
2. 15mm socket
3. 17mm open-end wrench
4. 19mm open-end wrench

4.2.5 Rear Wheel

● First, hand-tighten the 4 wheel nuts onto the wheel studs to protect the threads from damage.

● Set the torque wrench to 80N.m.

● Then, using the torque wrench and socket, tighten the wheel nuts in the sequence ①→②→③→④.

Warning: Do not use pneumatic torque tools to install wheel nuts. These tools cannot accurately control the torque value, which might result in excessive torque causing rim cracks or damage to the wheel bolt threads, or insufficient torque leading to improperly tightened wheel nuts.

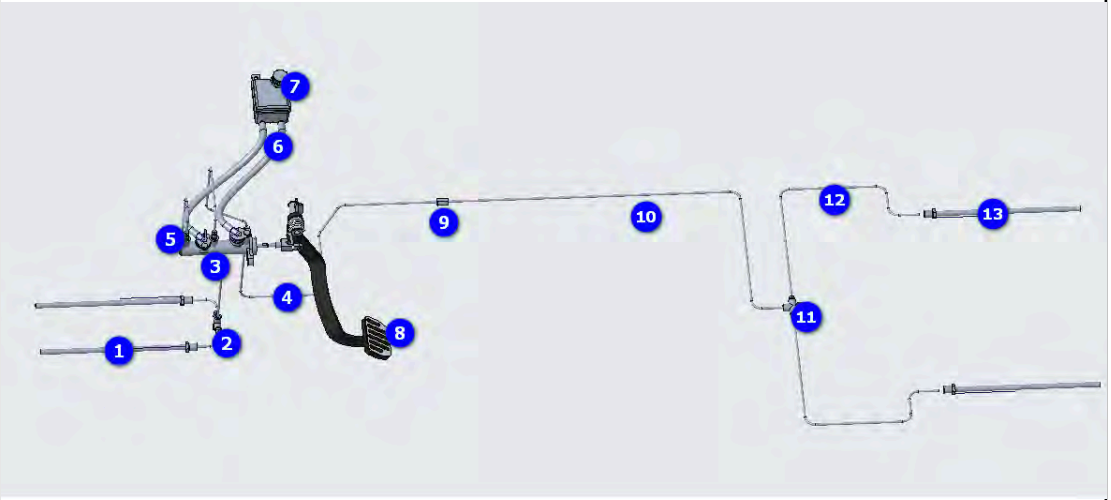
Tool:

1. Torque wrench
2. 19mm socket

4.3 Braking System

4.3.1 Overview

●This vehicle uses a hydraulic braking system. Apart from the front and rear disc brakes, the middle section of the entire disc brake system can be divided into 13 components, as shown in the diagram:



①	Disc Brake Assembly Oil Pipe
2	Front Hard Oil Pipe
3	Front Upper Hard Oil Pipe
4	Middle Hard Oil Pipe
5	Master Cylinder
6	Oil Resistant Pipe
7	Oil Cup
8	Brake Pedal
⑫	Rear Hard Oil Pipe
⑬	Rear Disc Brake Oil Pipe Assembly

9	Straight Through Pipe
10	Straight Through Pipe
⑪	Tee Connector

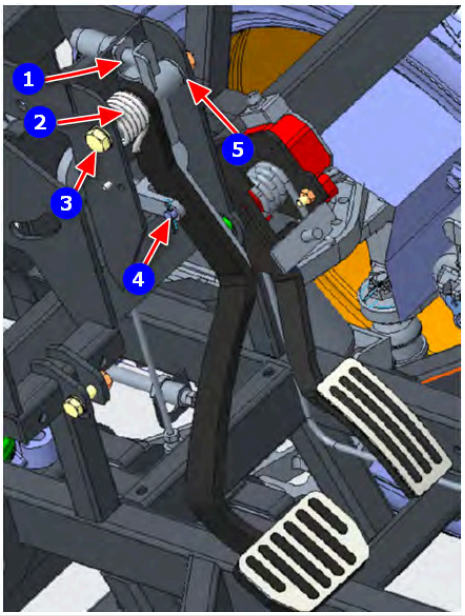
4.3.2 Brake Pedal Assembly Ⅰ

●First, at position ①, secure the brake pedal stop plate and the brake micro switch.

●At position ②, insert the torsion spring onto the brake pedal axle. At position ⑤, place the step shaft sleeves onto both ends of the axle, then place the brake pedal between the two fixed plates of the frame. At position ③, fix with M12*110 bolts and tighten to 76N.m. Use needle-nose pliers to hook the torsion spring onto the frame.

Finally, fix the master cylinder push rod to the brake pedal at position ④ using a pin and cotter pin.

Note: Before installation, apply grease at position ⑥ and also lubricate the step shaft sleeves before mounting.



Tool:

1. 13mm open-end wrench
2. Needle-nose pliers
3. 19mmopen-end wrench
4. 19mm socket

4.3.5 Master Cylinder

●Install the master cylinder by inserting the push rod from the brake pedal assembly into it.

●Secure the master cylinder with two M8*30 hex head bolts, tightening to 25N.m, as shown in diagrams ① and ②.

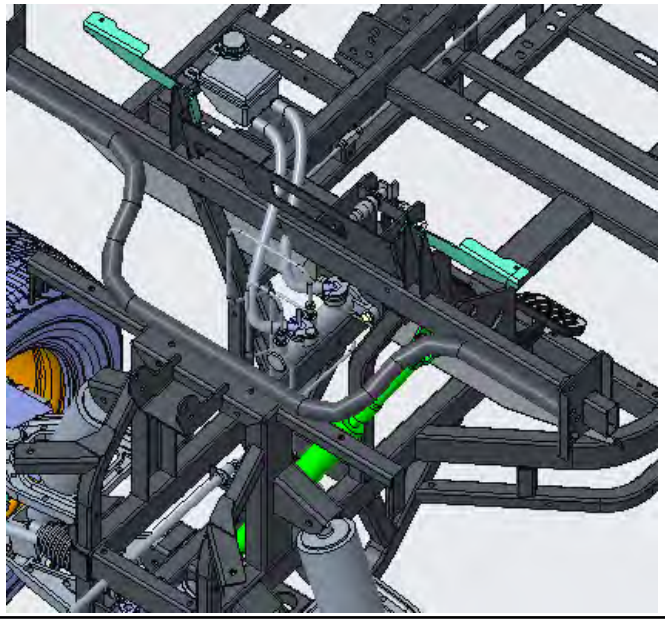
●Install the front upper hard oil pipe. Connect the oil pipe fitting to the master cylinder, hand-tighten 4-5 turns, then use a specialized wrench to fully tighten the oil pipe fitting to 21N.m, as shown in diagram ③.

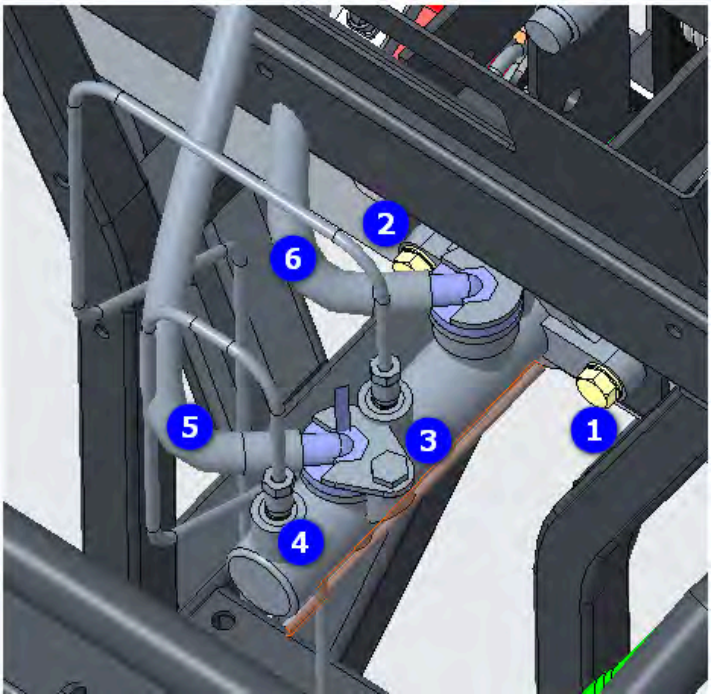
●Install the rear hard oil pipe. Connect the oil pipe fitting to the master

cylinder, hand-tighten 4-5 turns, then use a specialized wrench to fully tighten the oil pipe fitting to 21N.m, as shown in diagram ④.

Warning: When installing the oil pipe fittings, always hand-tighten 4-5 turns first before using a wrench to avoid damaging the threads, which can cause leaks.

●Install the soft oil pipe. Connect the soft oil pipe to the master cylinder, then use a Phillips screwdriver to tighten the hose clight, as shown in diagrams ⑤ and ⑥.





1 ②: M8*30hex bolt+flat washer+flat washer+jam nut

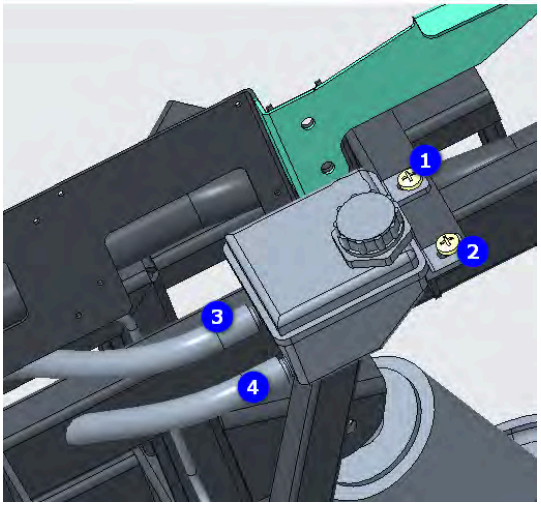
Tool:

1. Torque wrench
2. 13mm socket
3. 13mm open-end wrench
4. Phillips screwdriver
5. Specialized wrench for oil pipes

4.3.6 Oil Reservoir

●Install the oil reservoir by using a power drill to secure it with two M6*20 Phillips pan head bolts, as shown in diagrams ① and ②.

●Connect the soft oil pipe and secure the hose clight with a Phillips screwdriver, as shown in diagrams ③ and ④.



1 ②:M6*16 Phillips pan head bolt

2 ④:Clight

Tool:

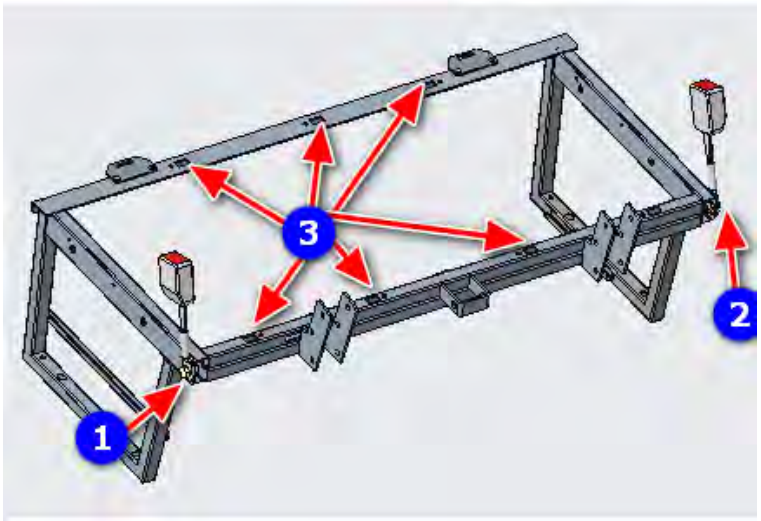
1. Electric drill
2. Phillips drill bit
3. Phillips screwdriver

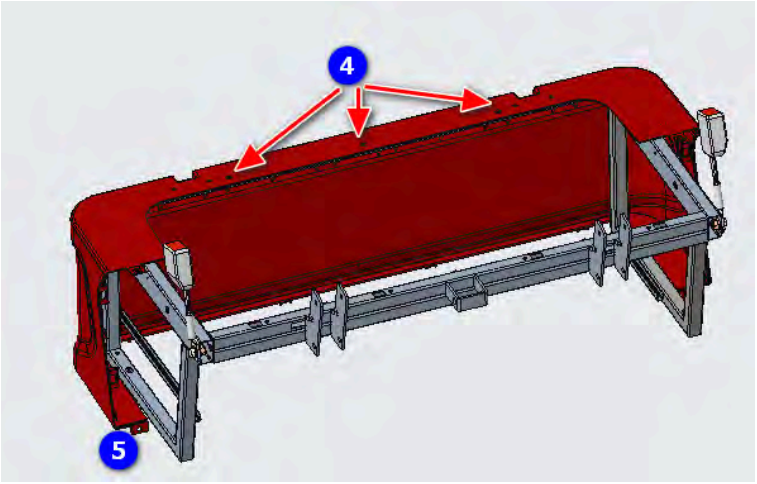
4.3.7 Seat Bucket

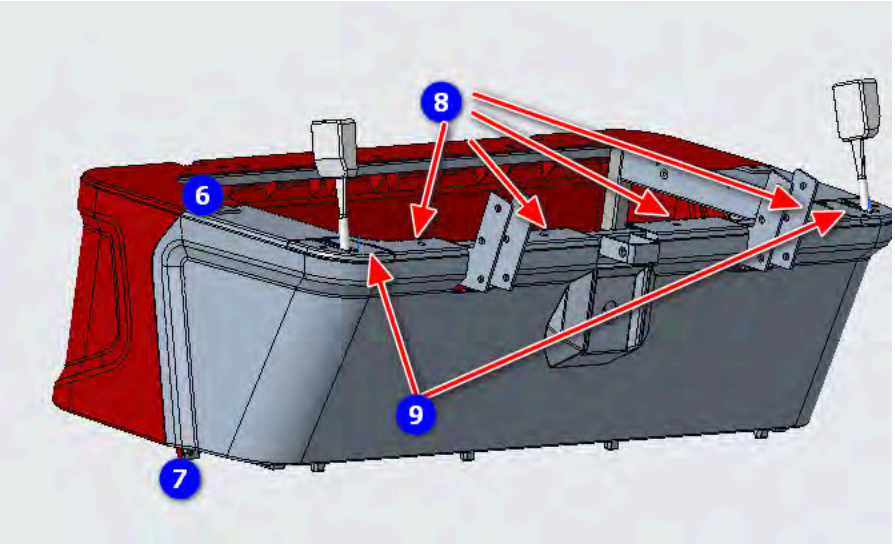
●First, install the seatbelt buckle for the middle row seats at positions ①②, securing it with M8*20 hex head bolts, tightened to 25 N.m. Then, clip the M6 clip nuts at position ③.

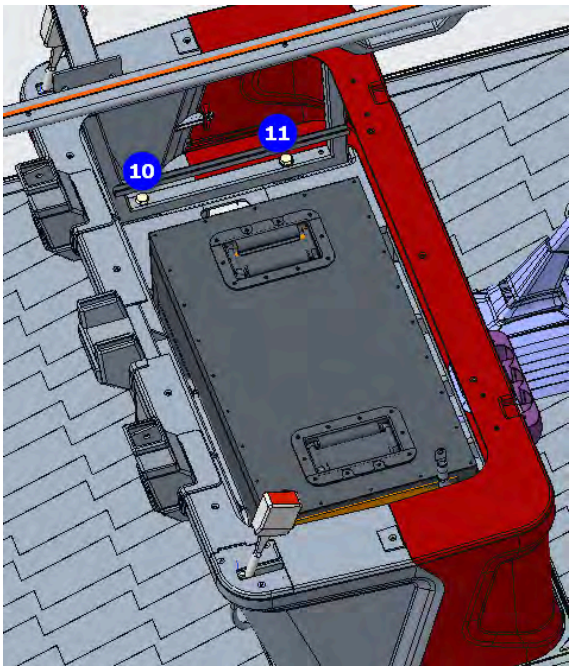
●Place the front panel of the front seat bucket onto the middle row seat frame assembly. Secure it with countersunk screws at position ④, and clip M6 clip nuts at positions ⑥⑦. Place the rear panel of the front seat bucket onto the middle row seat frame assembly. Secure it with countersunk screws at position ⑥⑧ and with Phillips pan head screws at position ⑦.

●Finally, place the pre-assembled middle row seat bucket onto the vehicle and secure it with M10*40 bolts at positions ⑩⑪, tightened to 44 N.m.









1 ②③④：M8*50 hex bolt+flat washer+flat washer+nuts

	Tool: 1. Torque wrench 2. 13mm socket 3. 13mmopen-end wrench 4. Electric drill 5. Phillips bit

4.3.11 Front Disc Brake Oil Pipe

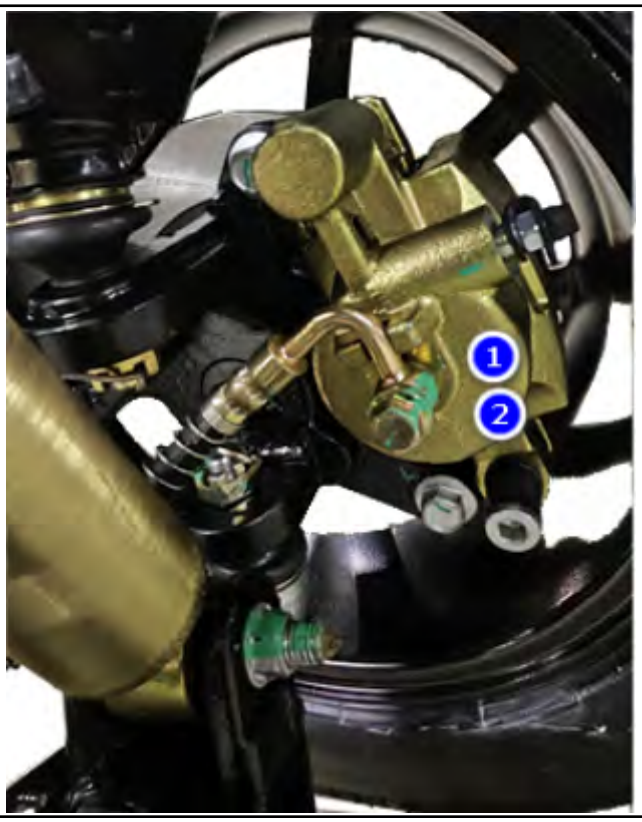
●Install the front disc brake oil pipe using a torque wrench to secure the banjo bolts. Ensure to add a sealing washer on each side of the banjo bolts, as shown in diagrams ① and ②

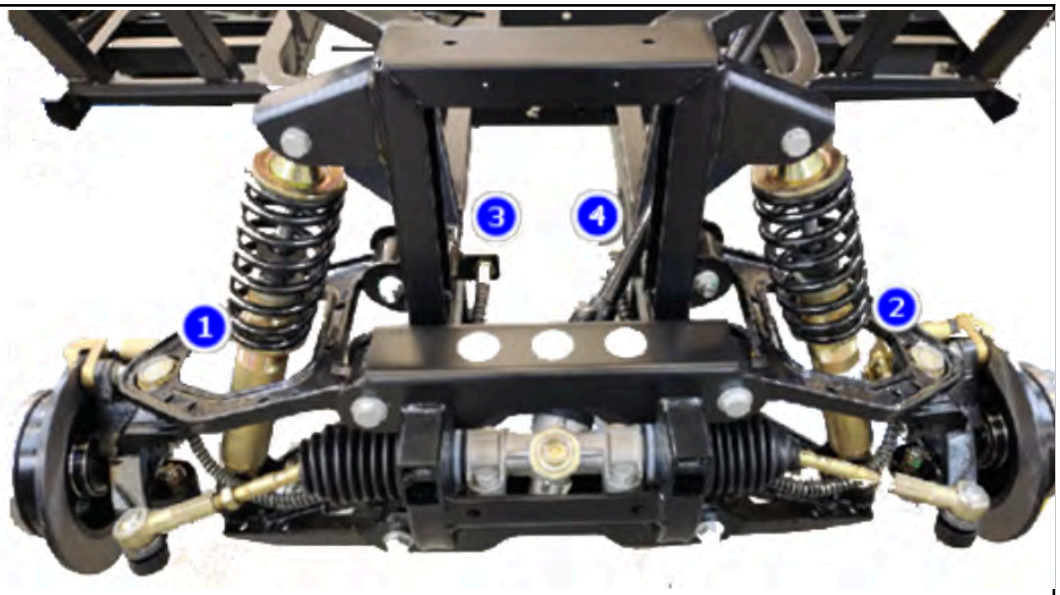
●Use spring clips to fix the disc brake oil pipe to the oil pipe ears on the frame, and tighten the nuts with a 24mm open-end wrench, as shown in diagrams ③ and ④.

⚠ Warning: Banjo bolts must be used with sealing washers. These sealing washers cannot be substituted with ordinary flat washers or rubber washers, as doing so may lead to oil leaks.

⚠ Warning: The front disc brake oil pipe must not rub against the tire. Continuous rubbing will cause the oil pipe to wear out, leading to brake

failure.





①②：sealing washer + banjo bolt + sealing washer

③④：M16 hex nut

Tool:

1. Torque wrench
2. 12mm socket
3. 24mm open-end wrench

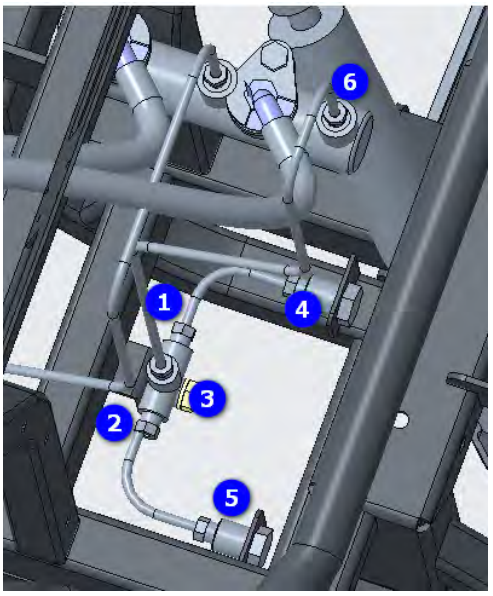
4.3.12 Front Hard Oil Pipe

●Connect the left front hard oil pipe, right front hard oil pipe, and middle front hard oil pipe to the tee valve. Hand-tighten first, then use an oil pipe wrench to tighten to 21N.m, as shown in diagrams ①, ②, ③, and ⑥.

●Use a torque wrench to securely fasten the tee valve.

●Connect the left front hard oil pipe and right front hard oil pipe to the front disc brake oil pipe interface. Hand-tighten first, then use an oil pipe wrench to tighten to 21N.m, as shown in diagrams ④ and ⑤.

⚠ Warning: When installing oil pipe fittings, always hand-tighten 4-5 turns first before using a wrench. Starting with a wrench can easily damage the threads, leading to oil leaks



	Tool: 1. Torque wrench 2. 13mm socket 3. Oil pipe wrench

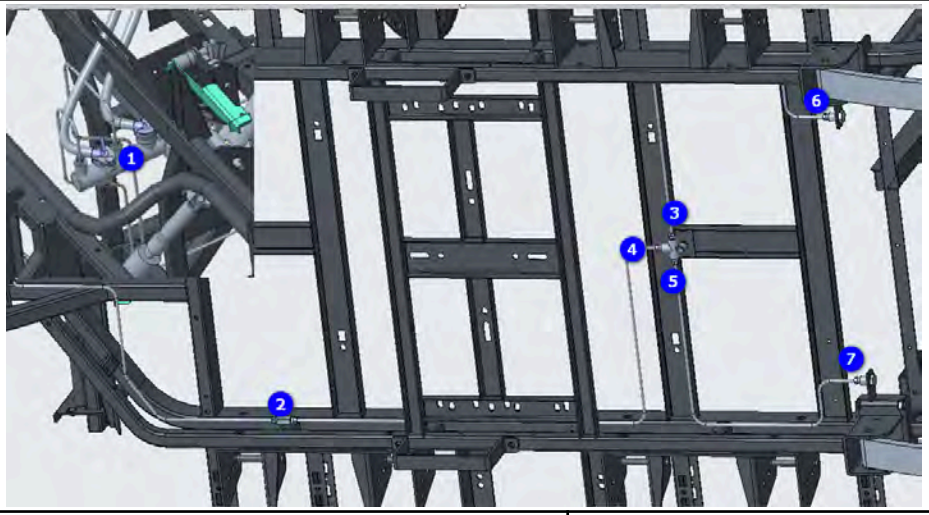
4.3.13 Rear Hard Oil Pipe

●Secure the middle hard oil pipe to the master cylinder at the position shown in diagram ①. Then, use a straight-through connector to join the middle rear hard oil pipe (①) and the middle hard oil pipe, and tighten with a wrench to 21N.m, as shown in diagrams ① and ②.

●Connect the middle rear hard oil pipe and the rear hard oil pipe using a tee connector. Tighten with a wrench to 21N.m, as shown in diagrams ③, ④, and ⑤. Then secure the tee connector to the frame.

●Connect the left rear hard oil pipe and right rear hard oil pipe to the disc brake oil pipe interface on the frame. Hand-tighten first, then use an oil pipe wrench to tighten to 21N.m, as shown in diagrams ⑥ and ⑦.

⚠ Warning: When installing oil pipe fittings, always hand-tighten 4-5 turns first before using a wrench. Starting with a wrench can easily damage the threads, leading to oil leaks.



Tool:

1. Torque wrench
2. 13mm socket
3. Oil pipe wrench

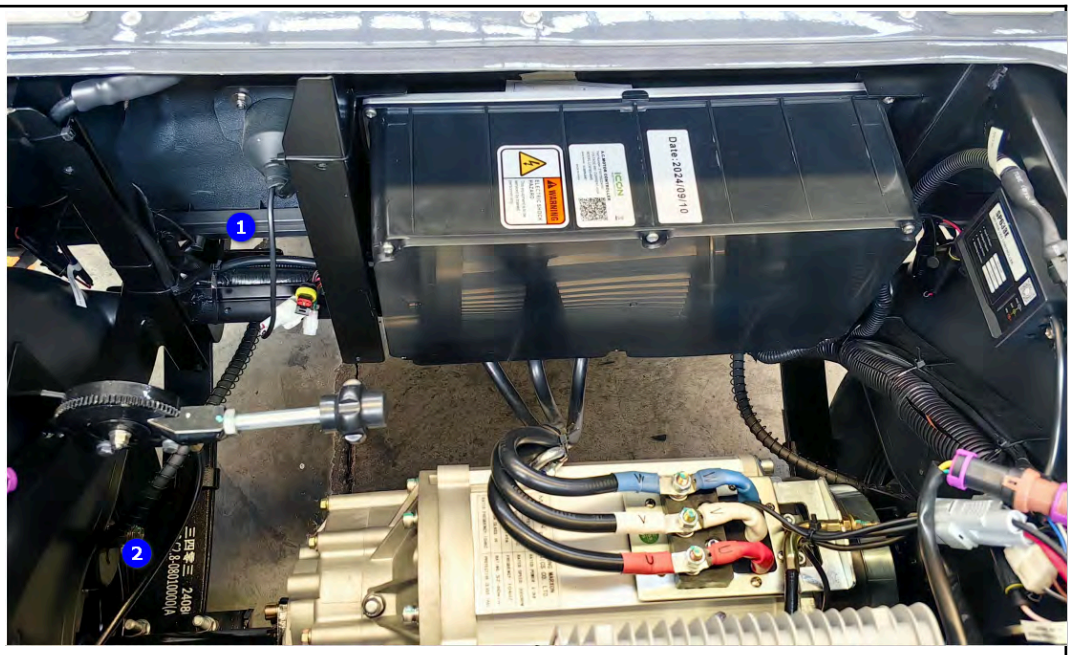
4.3.14 Rear Disc Brake Oil Pipe

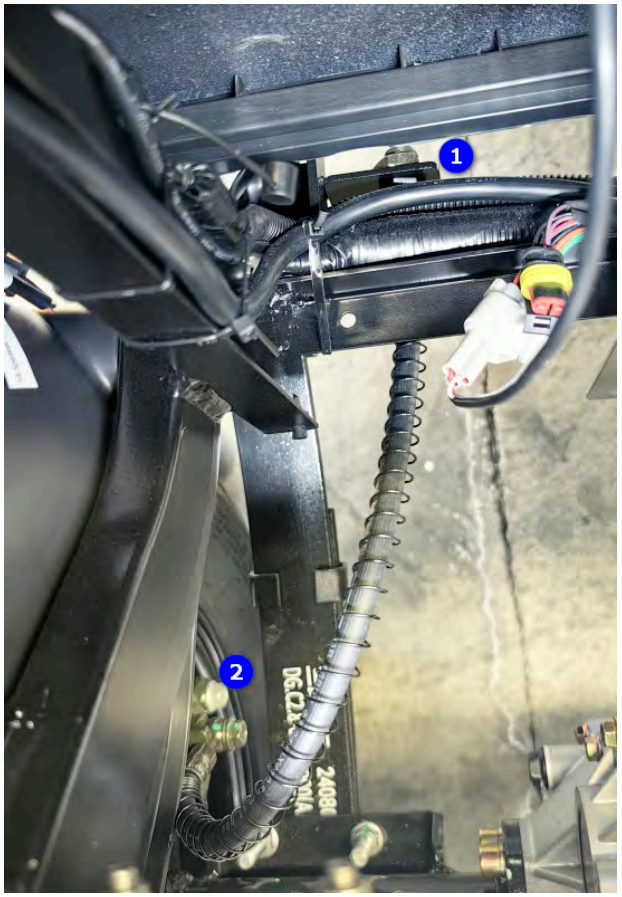
●Use a torque wrench to install the banjo bolts and secure the disc brake oil pipe to the rear axle disc brake. Ensure to add a sealing washer on each side of the banjo bolts, as shown in diagram ②. Follow the same installation method for both sides.

●Secure the disc brake oil pipe to the oil pipe ear clips on the frame using spring clips. Tighten the nuts with a 24mm open-end wrench, as shown in diagram ①.

⚠ Warning: Banjo bolts must be used with sealing washers. These sealing washers cannot be substituted with ordinary flat washers or rubber washers, as doing so may lead to oil leaks.

⚠ Warning: The rear disc brake oil pipe must not rub against the tire. Continuous rubbing can cause the oil pipe to wear out and lead to brake failure.





②: sealing washer+banjo bolt+sealing washer ①: M16hex nut	
	Tool: 1. Torque wrench 2. 12mm socket 3. 24mm open-end wrench

4.4 Car Body

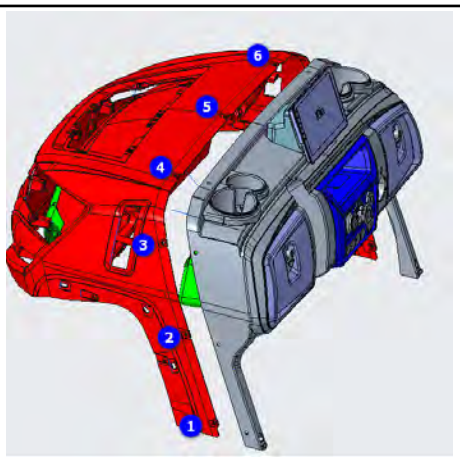
4.4.1 Front Hood and Dashboard

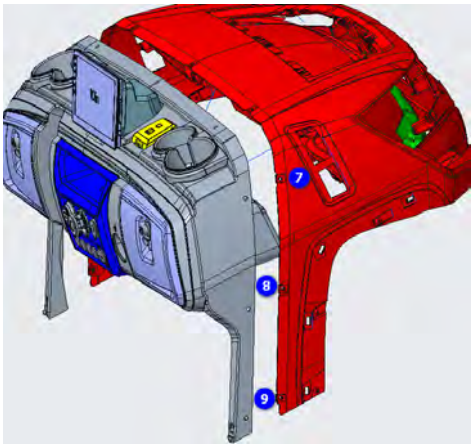
4.4.1.1 Front Hood and Dashboard Ⅰ

●This step requires two people to complete

●First, place M6 clip nuts at positions ①②③⑦⑧⑨

●At positions ④⑤⑥, secure using black M6*20 Phillips pan head screws and M6 nuts.

<table>
<tr><td colspan="2"> 


</td></tr>
<tr><td>  </td><td>Tool:
1. Electric drill
2. Phillips electric drill
3. 10mmopen-end wrench</td></tr>
</table>

4.4.1.2 Front Hood and Dashboard Ⅱ

●Align the front cover with the frame holes at positions ① and ②, then secure it with M6×20 Phillips pan head screws, as shown in diagrams ① and ②.

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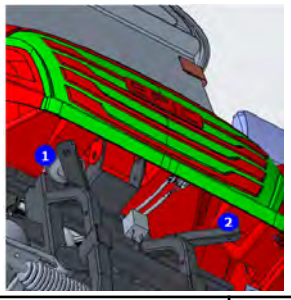
<tr><td colspan="2">  </td></tr>
<tr><td>  </td><td>Tool:
1. Electric drill
2. Phillips electric drill
3. 10mm open-end wrench</td></tr>
</table>

●At positions ① and ⑥, clip M6 clip nuts onto the front bottom plate.At positions ② and ⑤, clip M6 clip nuts onto the frame. Secure positions ①, ②, ⑤, and ⑥ with M6*20 Phillips pan head screws.

●For positions ③ and ④, secure directly with M6*20 Phillips pan head screws.

●Positions ⑦ and ⑧ are for securing the speedometer 's lower shield. First, fix the clip nuts onto the panel, then secure with M6×20 Phillips pan head screws.

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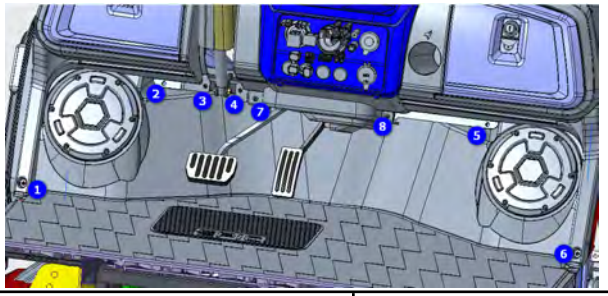
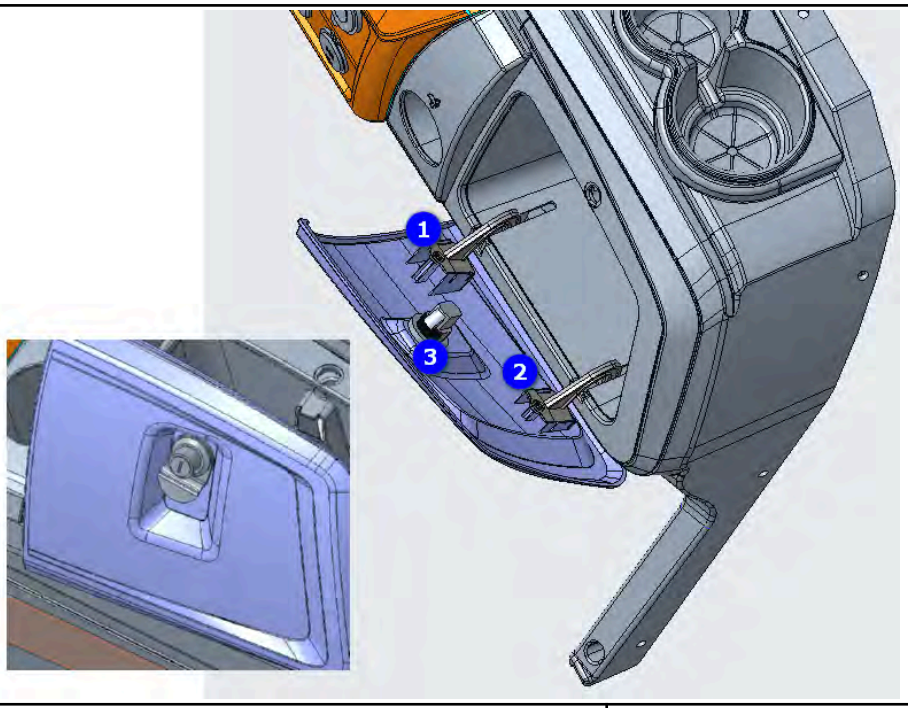
<tr><td colspan="2">  </td></tr>
<tr><td>  </td><td>Tool:
1. Electric drill
2. Phillips electric drill
3.10mm open-end wrench</td></tr>
</table>

4.4.1.3 Glove Box Cover LH & RH

●First, install the storage box lock onto the glove box cover, then use an adjustable wrench to tighten it at position ③.

●Fix the left/right side of the glove box cover to the hinge, align the holes, and use an electric drill to install 2 ST4.2×16 Phillips pan head self-tapping screws, as shown in diagrams ① and ②.

Note: When securing the lock, ensure the handle is facing downward.



Tool:

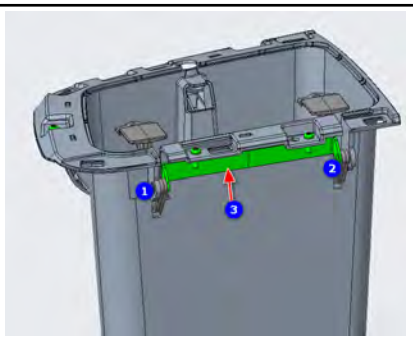
1. Electric drill

2. Phillips drill bit

4.4.1.4 Glove Box, Decorative Strip, and Hinge

●Install the hinges onto the glove box, noting that there are left and right hinges. Align with the pivot holes of the glove box. Place the storage box pivot reinforcement plate in the middle.Secure each side with M4*20 Phillips pan head screws, M4 lock nuts, and large washers, as shown in diagrams ①, ②, and ③.

Note: When securing, do not overtighten to ensure the hinge can still rotate.



①②：M4×20 Phillips pan head screw

 	Tool: 1. Electric drill 2. Phillips drill bit

●Install the glove box by aligning it with the dashboard holes at positions ①②③④⑤⑥⑦⑧⑨⑩. Secure it with ST4.2×16 Phillips pan head self-tapping screws.

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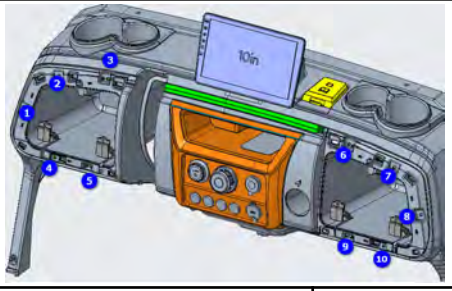
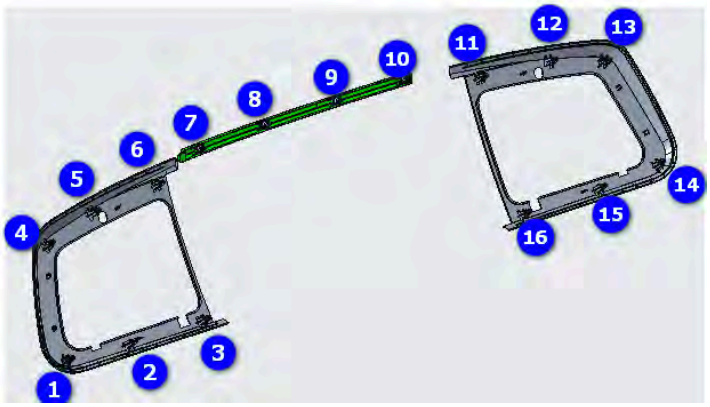
<tr><td colspan="2">  </td></tr>
<tr><td>  </td><td>Tool:
1. Electric drill
2. Phillips drill bit</td></tr>
</table>

2 Attach the spring clips to the left, middle, and right sides of the decorative strips, as shown in diagrams ① to .First, install the middle decorative strip onto the dashboard. Then, install the left and right decorative strips onto the dashboard. shows the spring clips.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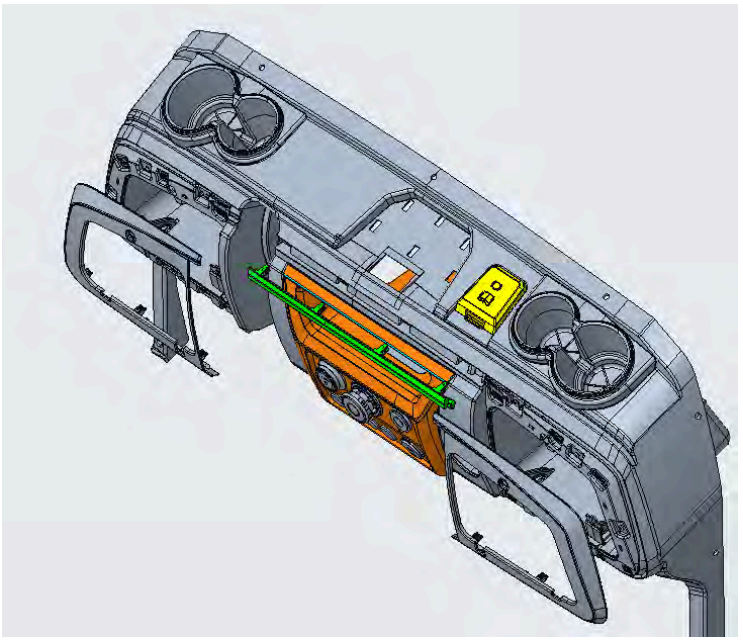


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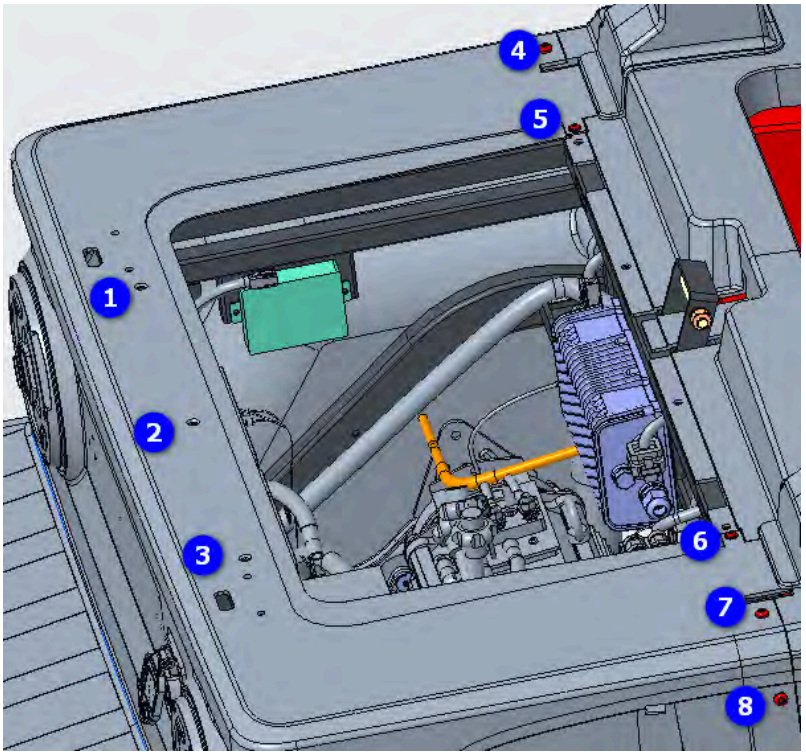
4.4.2 Rear Hood

4.4.2.1 Rear Hood Front Panel

●Ensure there's no color difference between the rear cover front panel and the rear hood before proceeding with installation.

●Install the rear hood battery cover plate using an electric drill and secure it with 7 M6×20 Phillips countersunk screws, as shown in diagrams ①②③④⑦. Ensure to install M6 clip nuts in the corresponding positions.At positions ⑤⑥, secure with ST4.8×16 Phillips countersunk self-tapping screws. At the left position ⑧, secure with M6×20 Phillips pan head screws. Do the same for the right side.

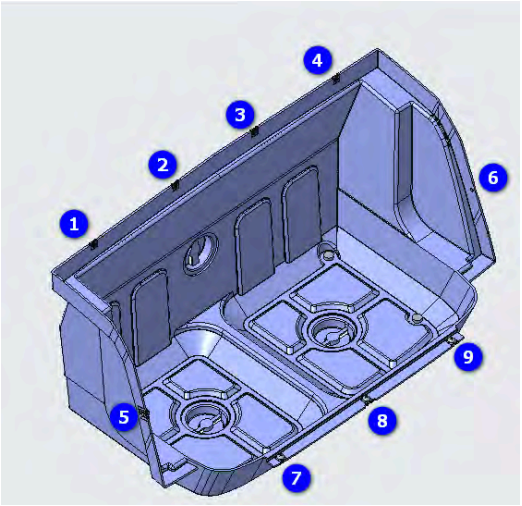


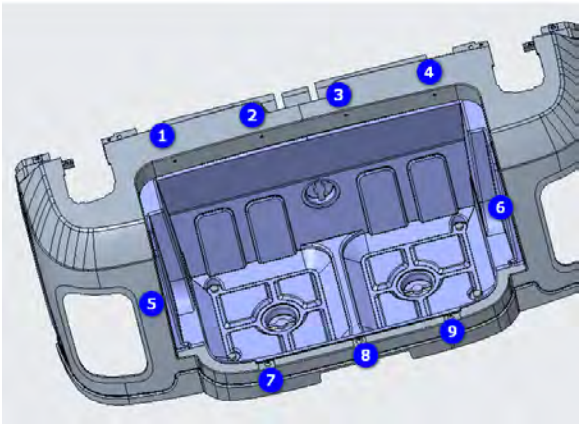
	Tool: 1. Electric drill 2. Phillips drill bit

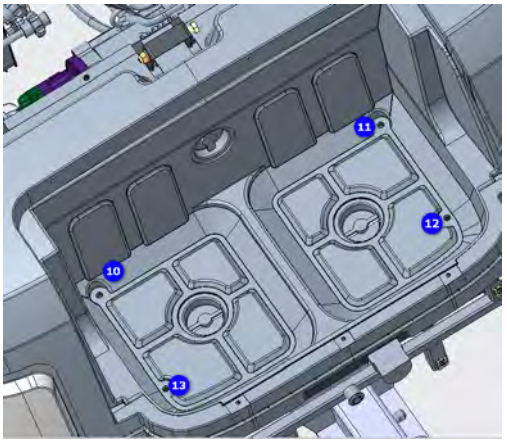
4.4.2.2 Rear Hood Installation

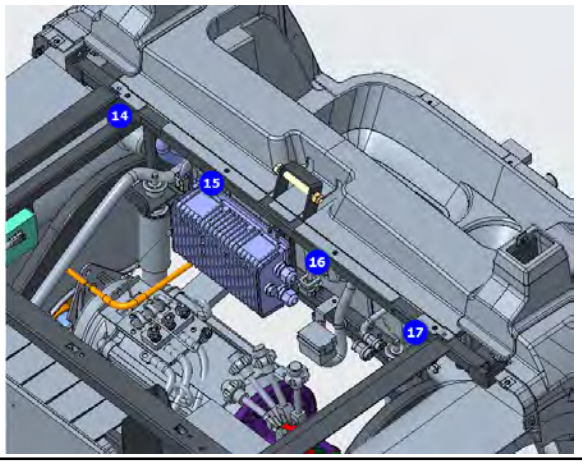
●First, install clip nuts at positions ① to ⑨ on the golf bag compartment protection liner. Secure the liner to the rear cover, fixing it with ST4.2×12 Phillips pan head self-tapping screws at positions ① to ⑨.

●Place the pre-assembled rear cover onto the frame, aligning the holes. At positions ⑩ to , use an electric drill to install 7 M6×35 Phillips pan head screws. At positions to on the frame, secure with M6 clip nuts, then fix the rear cover with M6×20 Phillips countersunk screws.









Tool:

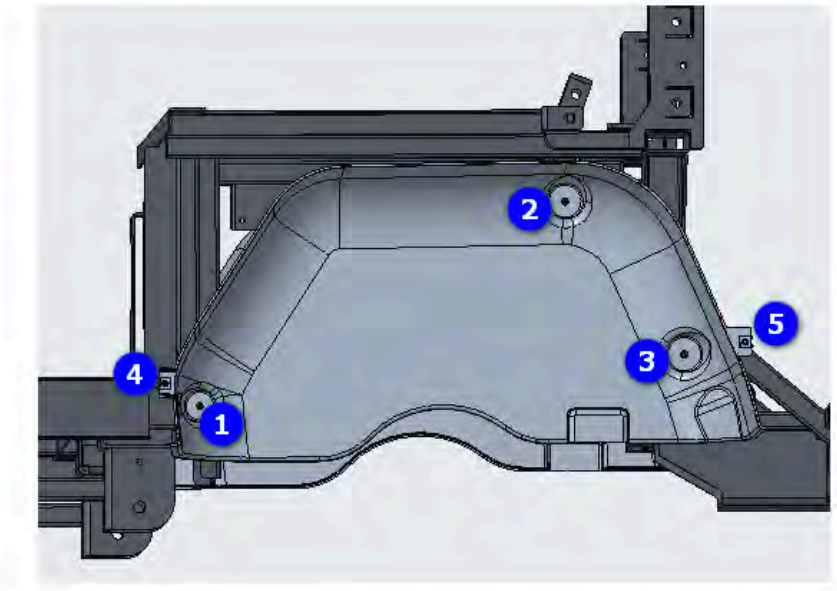
1. Electric drill

2. Phillips drill bit

4.4.3 Rear Fender Liner

●Place clip nuts at positions ④ and ⑤.

●Align the left mudguard with the frame holes at positions ①②③, and secure it with M4.8*16 hex head self-drilling screws. The installation method is the same for both sides.



Tool:

1. 10mm socket

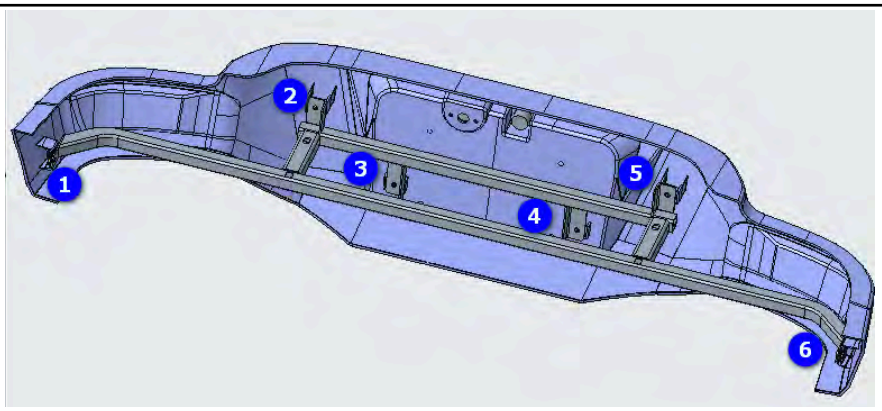
4.4.4 Rear Bumper

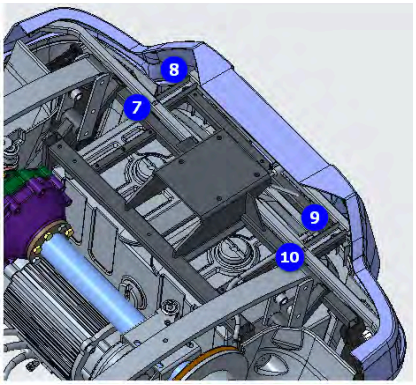
●First, pre-install the rear bumper and bumper bracket. Clip M6 clip nuts at positions ① to ⑥ on the rear bumper. Secure with M616 Phillips pan head screws at positions ②③④⑤, and with M612 Phillips pan head

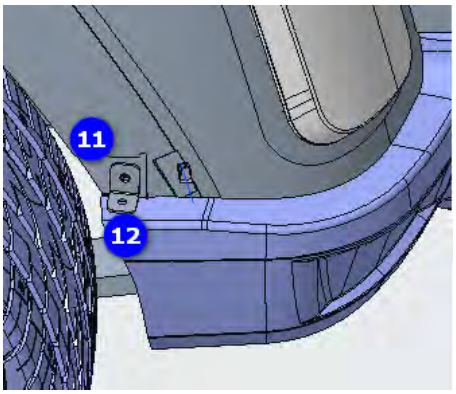
screws at positions ① and ⑥.

●Install the rear bumper by aligning it with the four holes on the frame, as shown in diagrams ⑦-⑩. Secure with M6×35 coarse-thread full-thread hex head bolts.

●Connect the rear bumper with the rear bumper mounting bracket. For the left side at positions and , secure with M6*16 Phillips pan head screws.







Tool:

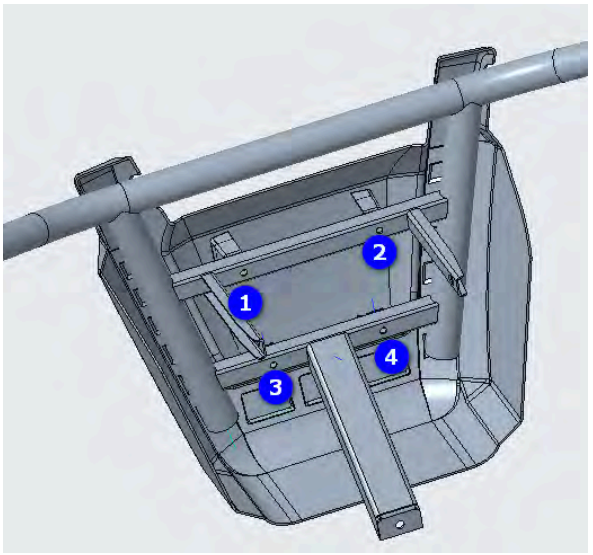
1. 10mm socket
2. Electric drill
3. Wrench socket
4. Phillips drill bit

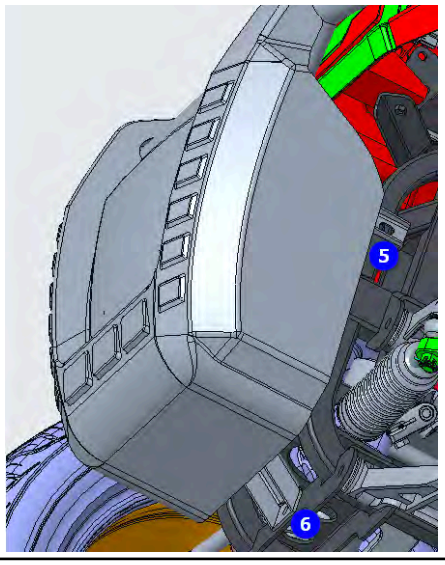
	5. 10mm open-end wrench

4.4.5 Front Bumper

●First, pre-install the bumper and iron bumper. Secure the plastic bumper at positions ① to ④ with M6 clip nuts, then fix with M6*40 Phillips head bolts.

●Then, install the pre-assembled bumper onto the frame. Secure at positions ⑤ and ⑥, and the opposite side of ⑤, with M8*25 hex head bolts.



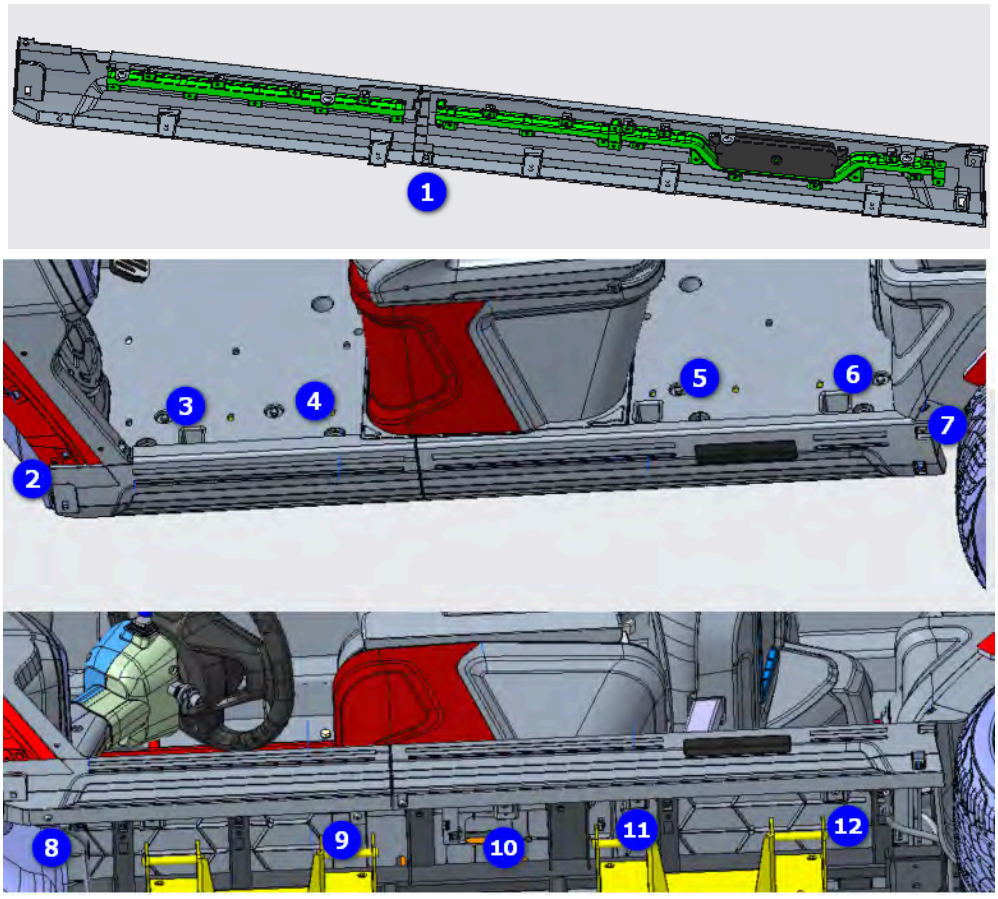


	Tool: 1. Torque wrench 2. 13mm socket 3. Electric drill 4. Phillips bit

4.4.6 Side Skirt

●Install the pre-assembled front and rear trim strips by securing them with M6 clip nuts and M6*20 Phillips bolts at position ①, as shown in the diagram. For installing the light strip and side skirt logo lights, refer to the electrical maintenance section.

●Install the pre-assembled guardrail onto the vehicle. Secure positions ② to ⑦ with M6*20 Phillips bolts and positions ⑧ to with ST4.8×15 Phillips self-tapping screws. The installation method is the same for both sides.



①②④: M6*20 Phillips pan head screw +flat washer+ nut

③：M6*20 Phillips pan head screw +flat washer	
	Tool: 1. Electric drill 2. Phillips drill bit

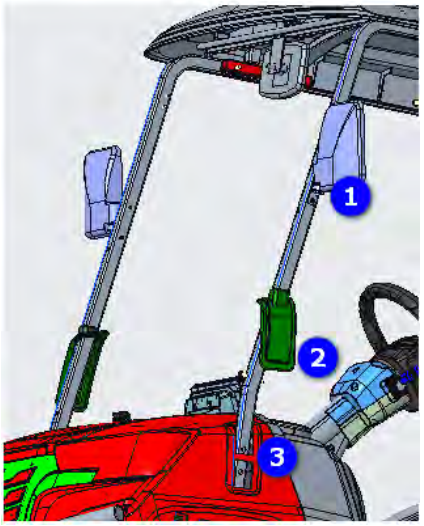
4.4.7 Front Post

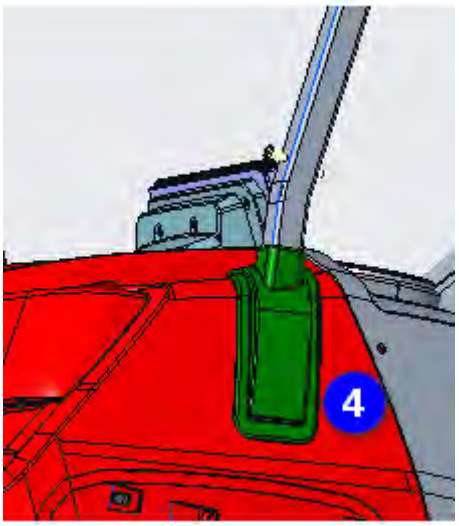
●First, pre-install the side mirror by threading the side mirror's wire through the post using a thin, stiff wire, then secure with M6×50 screws, as shown in diagram ①.

●Install the lower cover of the A-post by fitting it into the A-post, ensuring the correct side, as shown in diagram ②.

●Mount the A-post onto the frame using M10×50 bolts, as shown in diagram ③. Then, tuck the lower cover of the A-post into the front cover, as shown in diagram ④.

●The installation method is the same for both left and right posts.





①②:M8*40hex bolt+spring washer+flat washer

③:M4*18 Phillips screw

Tool:

1. 10mm open-end wrench
2. 13mm socket
3. Electric drill
4. Phillips drill bit

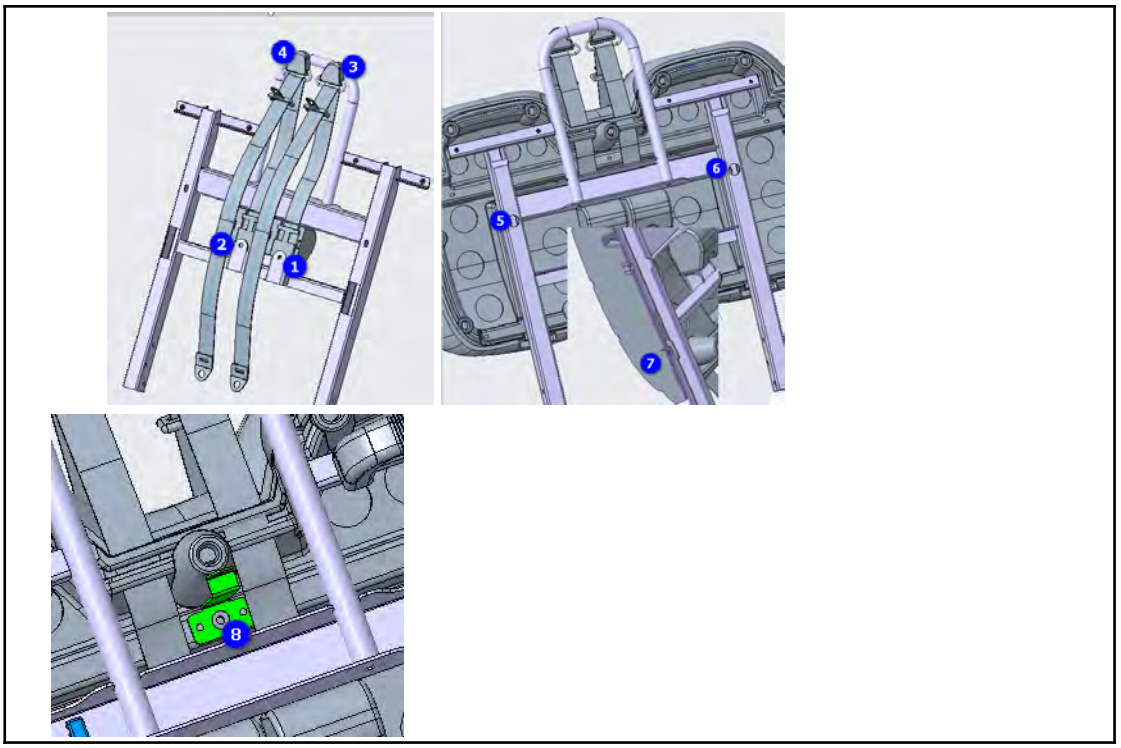
4.4.8 Backrest and Seat Belt

●First, pre-install the seatbelt onto the front seat backrest bracket using M10×25 hex head bolts at positions ① and ②. At positions ③ and ④, place the seatbelt bushings first, then secure with M10×25 hex head bolts.

●Install the front seat backrest bracket assembly onto the backrest by sliding the backrest down. Hook it onto the bracket at position ⑦, then secure with M8×25 hex head bolts at positions ⑤ and ⑥.

●Install the left backrest bracket using the same method.

●At position ⑧, install the front row cup holder reinforcement plate using ST4.2*19 self-tapping screws.

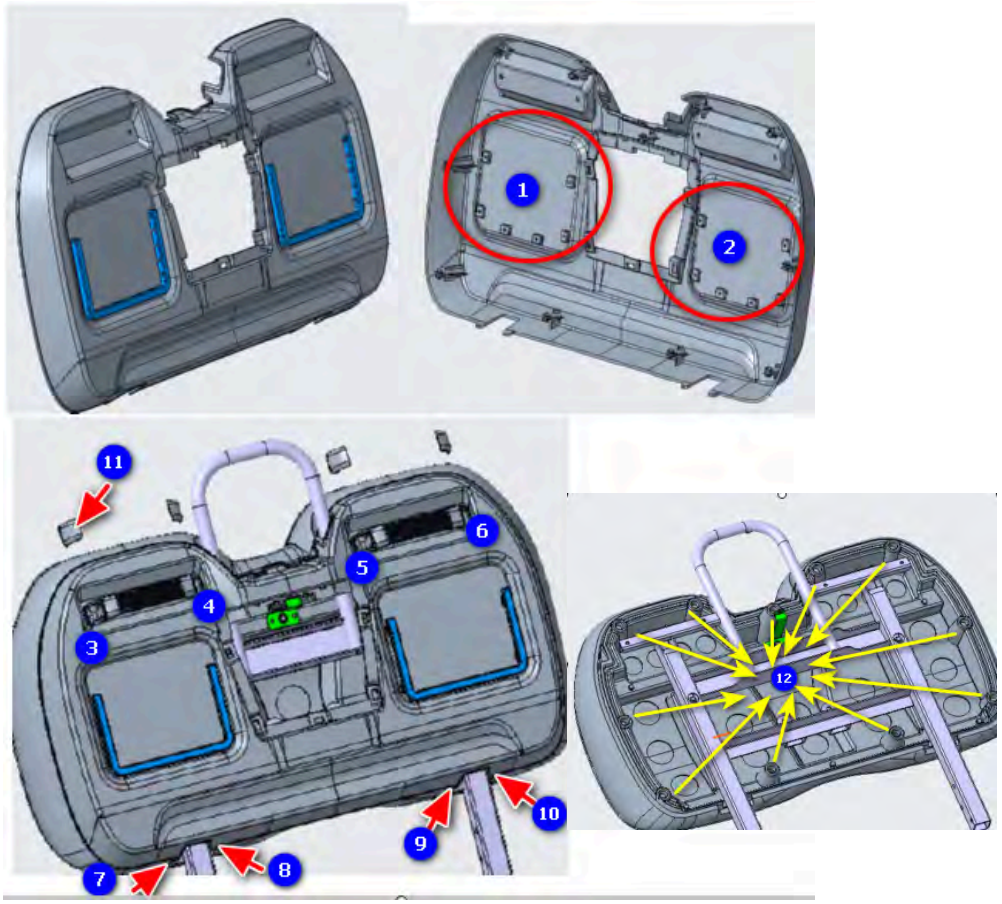


	Tool: 1. Torque wrench 2. 13mm socket 3. Torque wrench 4. 5mm Allen wrench 5.13mm open-end wrench

●Align the net pocket with the holes in the backrest cover at positions ① and ②, then secure with ST4.2×12 screws

●Align the backrest cover with the holes in the backrest frame as shown in diagram . Install the backrest handle using M6×30 bolts and secure from positions ③ to ⑥, then cover with plugs as shown in diagram

●Secure positions ⑦ to ⑩ with ST4.2×16 self-tapping screws.



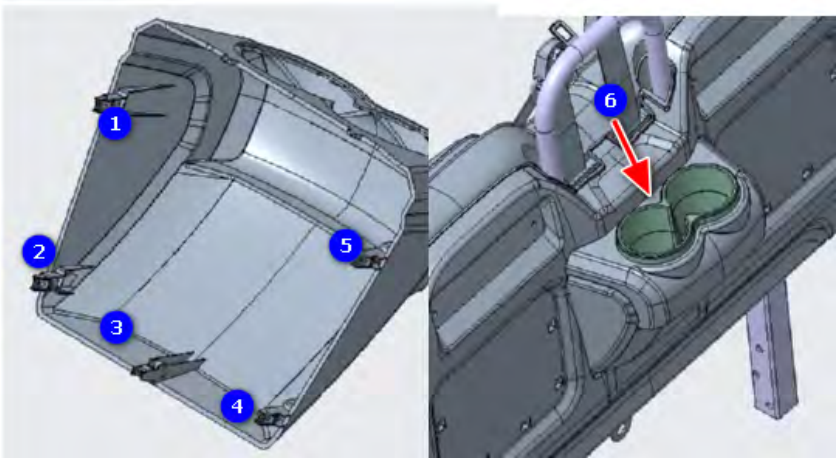
Tool:

1. Electric drill

2. Phillips drill bit

●First, attach the spring clips to the front seatbelt inspection positions ① to ⑤. Secure it to the rear cover, then fix it at position ⑥ with M5×16 Phillips pan head screws.

●Finally, attach the cup holder to the front seatbelt inspection plate.

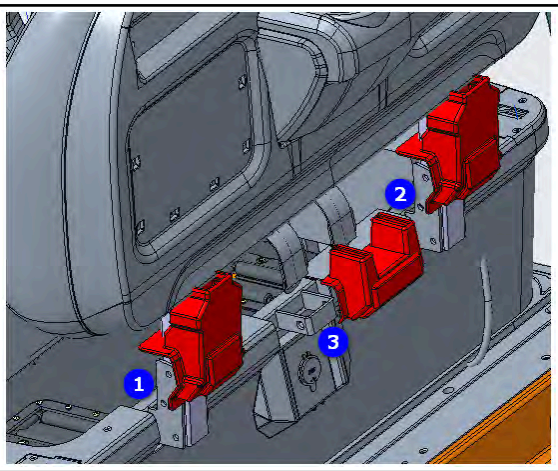


Tool:

1. Electric drill
2. Phillips drill bit
3. 8mm open-end wrench

●First, insert the seat post rubber sleeve into the front seat backrest bracket, then secure it to the seat bracket using M10×65 hex head bolts, as shown in diagrams ① and ②.

●Thread the lower ends of the seatbelt through the seatbelt rubber sleeves, then secure with M10×25 Allen bolts, as shown in diagram ③.

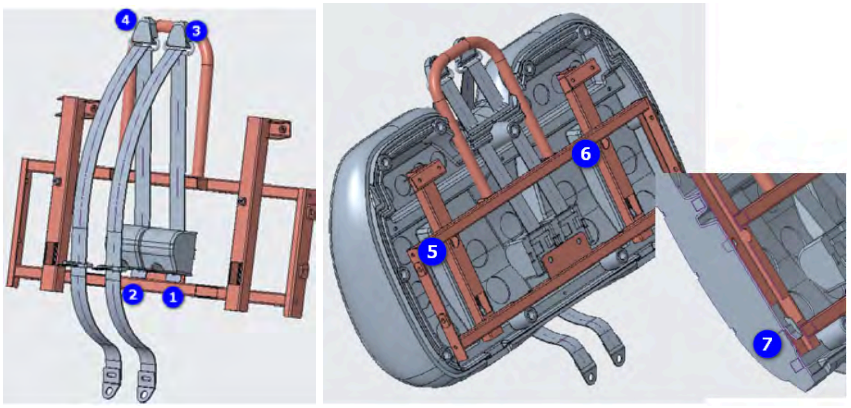


	Tool: 1. Torque wrench 2. 6mm Allen wrench 3. 15mm open-end wrench 4. 15mm socket

●First, pre-install the seatbelt onto the front seat backrest bracket using M10×25 hex head bolts at positions ① and ②. At positions ③ and ④, place the seatbelt bushings first, then secure with M10×25 hex head bolts.

●Install the front seat backrest bracket assembly onto the backrest by sliding the backrest down. Hook it onto the bracket at position ⑦, then secure with M8×25 Allen bolts at positions ⑤ and ⑥.

●Install the left backrest bracket using the same method.



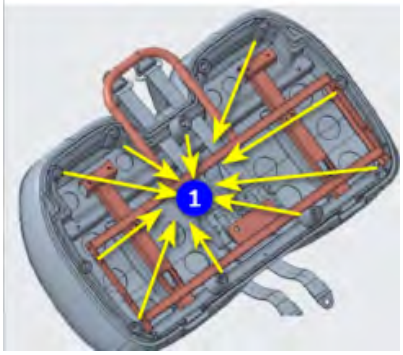
	Tool: 1. Torque wrench 2. 5mm Allen wrench 3. 8mm Allen wrench

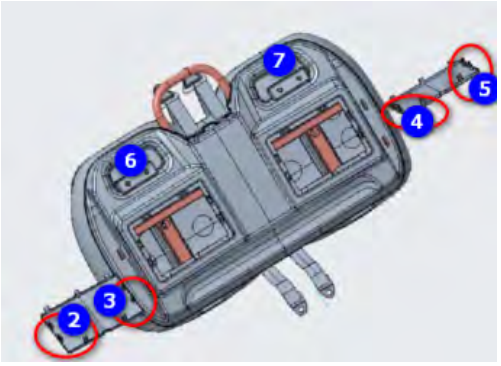
●Align the backrest cover with the holes in the backrest frame as shown

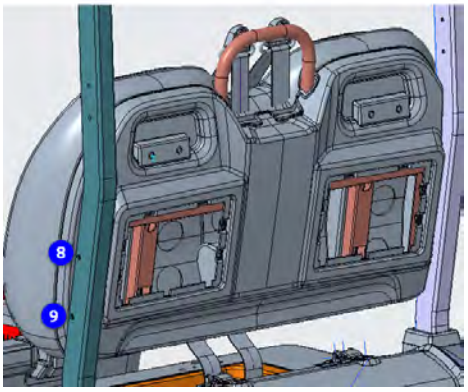
in diagram ①. Secure with M6×30 bolts at positions ⑥ and ⑦.

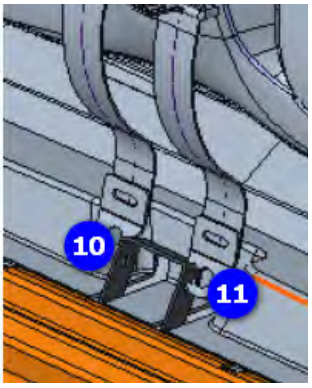
●Attach the plastic clips to the left and right sides of the rear maintenance cover at positions ②, ③, ④, and ⑤. Install the backrest onto the B-post, aligning the holes, and secure with M8×65 Allen bolts at positions ⑧ and ⑨ (same on both sides). Clip the maintenance cover onto the backrest cover.

●Finally, secure the lower seatbelt attachment points with M10×25 Allen bolts at positions ⑩ and .









Tool:

1. Torque wrench
2. 10mm socket
3. 8mm Allen wrench
4. 15mm open-end wrench

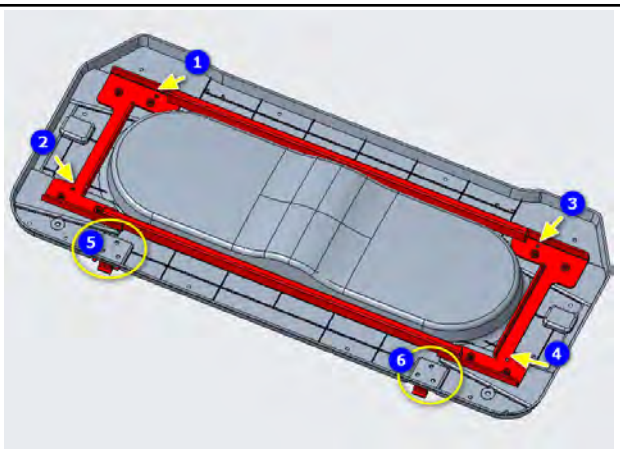
4.4.9 Seat Armrest Installation

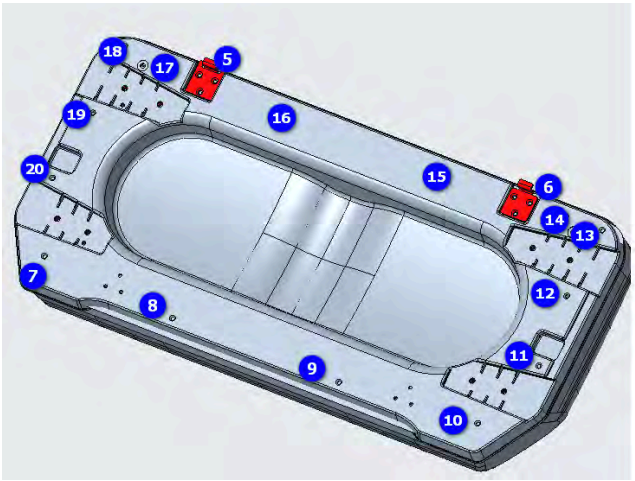
●First, secure the seat frame to the seat cushion base using M5*16 screws at positions ① to ④ (ensure the armrest holes are aligned).

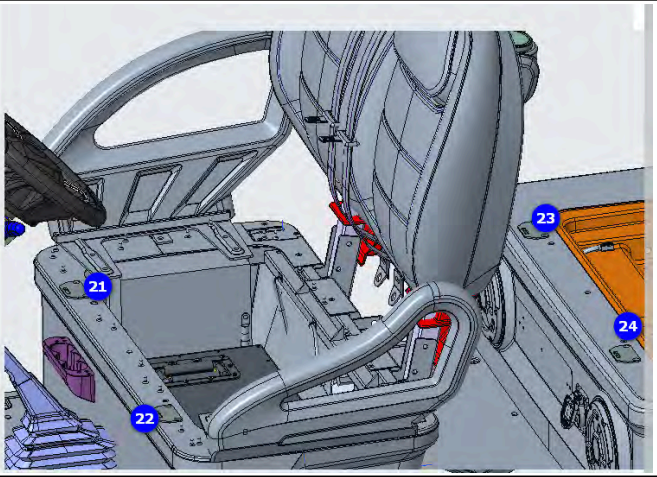
●Install the male seat hinges onto the seat cushion base using M6*16 Phillips countersunk screws at positions ⑤ and ⑥.

●Place the cushion onto the seat cushion base and secure with ST4.8×25 Phillips countersunk screws at positions ⑦ to , ensuring there is a proper gap between the cushion and the base during installation.

●Secure the female hinges with M6×20 Phillips countersunk screws to both the front and rear seat buckets at positions to .





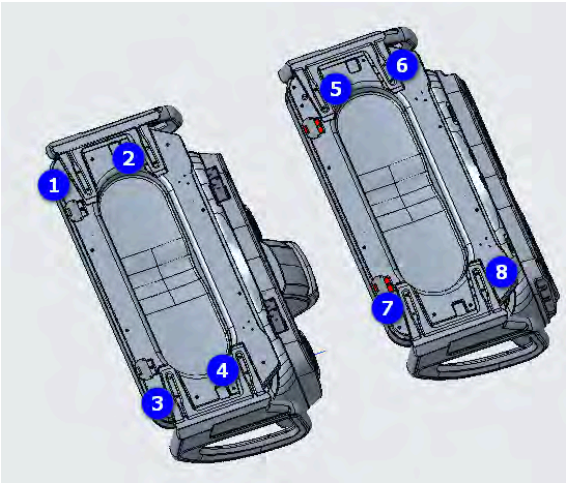


Tool:

1. Electric drill

2. Phillips drill bit

●Attach the armrests to the seat cushion, securing them with M8*20 Allen pan head screws at positions ① to ⑧, as shown in the diagram.Note that position ⑨ is for the left small armrest.

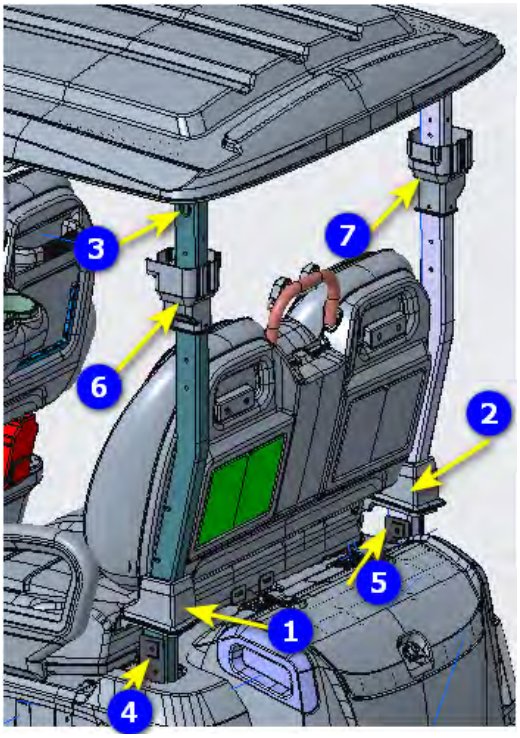


<table>
<tr><td colspan="2">  </td></tr>
<tr><td>  </td><td>Tool:
1. Torque wrench
2. 5mm Allen wrench</td></tr>
</table>

4.4.10 B Post

●First, slide the lower covers of the B-post onto the left and right sides of the B-post, ensuring correct placement (as shown in diagrams ① and ②). Then, thread the upper rubber sleeves onto the tops of the left and right B-post sections (as shown in diagrams ⑥ and ⑦). Pass the light strip harness through position ③ on the left B-post.

●Secure the B-post to the frame using M10×65 hex head bolts at positions ④ and ⑤. Note that the B-post with the hole at position ③ is for the left side.



Tool:

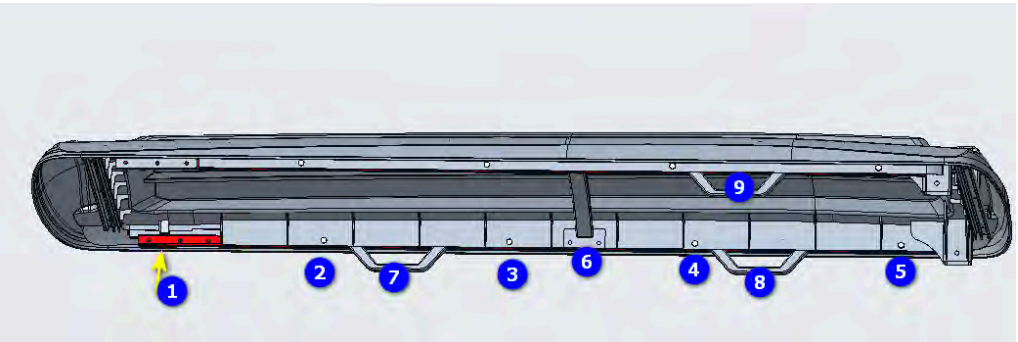
1. Torque wrench
2. 17mm socket
3. 17mm open-end wrench

4.4.11 Canopy Installation

●Clip the canopy liner rod into the U-shaped slot of the canopy, noting the difference between the front and rear rods. Align the holes and secure with M6×35 Phillips screws at position ①. Use M8*45 Allen bolts to secure positions ② to ⑤. The installation method is the same for both sides.

●Install the middle crossbar of the liner onto the canopy, aligning the holes at position ⑥, and secure with M8*50 Allen bolts.

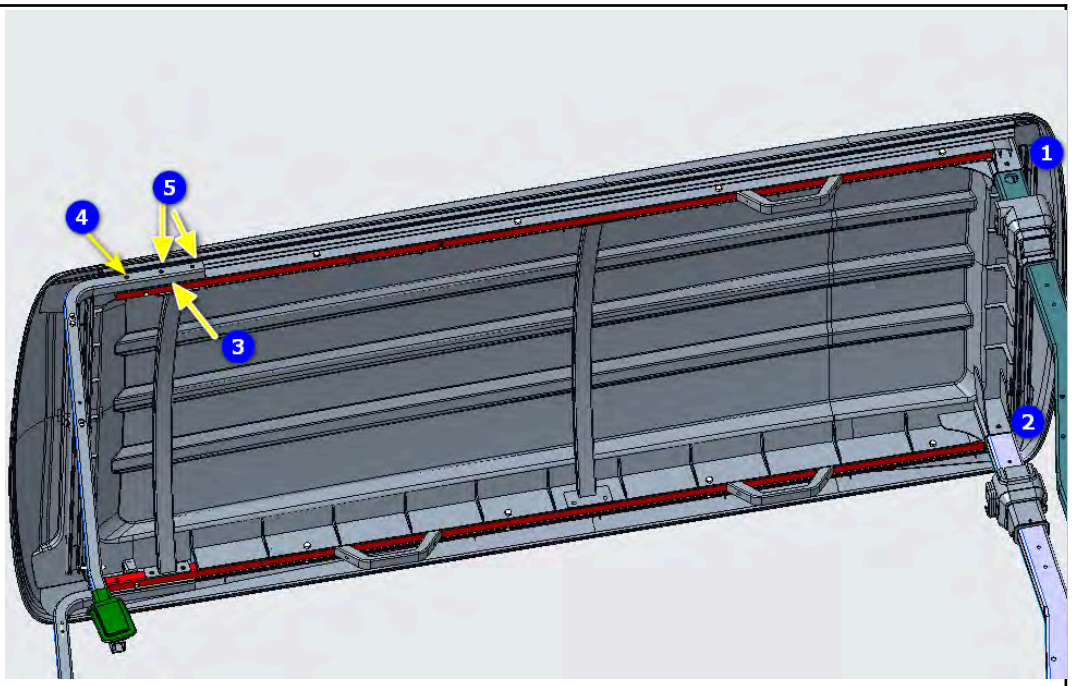
●Install the handle by aligning it with the holes in the canopy liner rod at positions ⑦, ⑧, and ⑨. Secure with M6*20 Phillips screws. Note that the driver's position does not have a handle.



Tool:

1. Torque wrench
2. 5mmAllen wrench
3. 13mmopen-end wrench
4. Phillips bit
5. Electric drill

●Place the ceiling onto the B-pillar and A-pillar with two people. First, secure it with M10×60 hex head bolts at positions ① and ②, as shown in the diagram. Then, place the liner pad between the ceiling liner and the A-pillar. Secure position ④ with M875 Allen bolts. Align the crossbar of the liner with the holes at position ⑤ and secure with M880 Allen bolts.



Tool:

1. Torque wrench
2. 13mm socket
3. 5mmAllen wrench

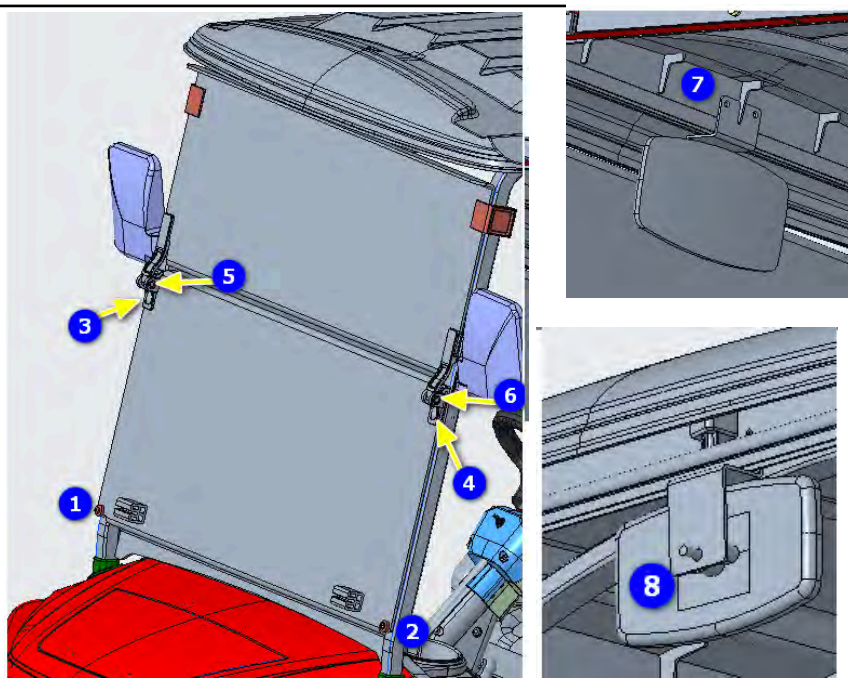
4.4.12 Folding Windshield and Rear Mirror

●First, secure the limit post for the strip with M6×55 screws to the A-pillar. Then, clip the lower glass to the limit post on the strip at

positions ① and ②. Use the bolts provided with the glass to secure it to positions ③ and ④ on the A-pillar. Next, clip the upper glass onto the lower glass at positions ⑤ and ⑥, and secure using the bolts that come with the glass.

●Secure the inner rearview mirror mounting base to position ⑦ on the ceiling with M6*20 Phillips screws, then attach the inner rearview mirror to the mounting base at position ⑧.

●Ensure to attach vibration damping pads between the glass and the A-pillar to prevent noise from contact.



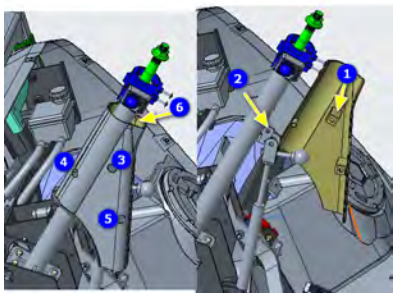
Tool:

1. 10mm open-end wrench
2. Electric drill
3. Phillips bit

4.4.13 Steering Wheel, Steering Column Cover and Combination Switch Cover

●Install the steering column cover as shown in the diagram. First, clip the M5 clip nut onto the right side of the steering column cover at position ①.Align the right side of the steering column cover at position ① with the hole at position ②.Next, cover it with the left side of the steering column cover.Secure with M5*40 Phillips bolts at positions ③ and ⑤.Secure with M5*25 Phillips bolts at position ④.

Note: Ensure the wiring harness passes through position ⑥ of the steering column cover before securing the bolts.

<table>
<tr><td colspan="2">  </td></tr>
<tr><td>  </td><td>Tool:
1. Electric drill
2. Phillips bit</td></tr>
</table>

●First, clip M6 clip nuts onto the left lower cover of the combination switch at positions ①, ②, and ③. Align with the holes of the combination switch as indicated by the yellow arrow, then secure with M5*25 pan head screws at positions ④ and ⑤.

●Install the pickup seat at position ⑨. Align the right cover of the combination switch with positions ①, ②, and ③, then secure with M6*60 Phillips bolts at positions ⑥, ⑦, and ⑧.

●Align the wheels, then fit the steering wheel onto the steering column at position ⑩ and tighten with a nut. Cover with the steering wheel cover.

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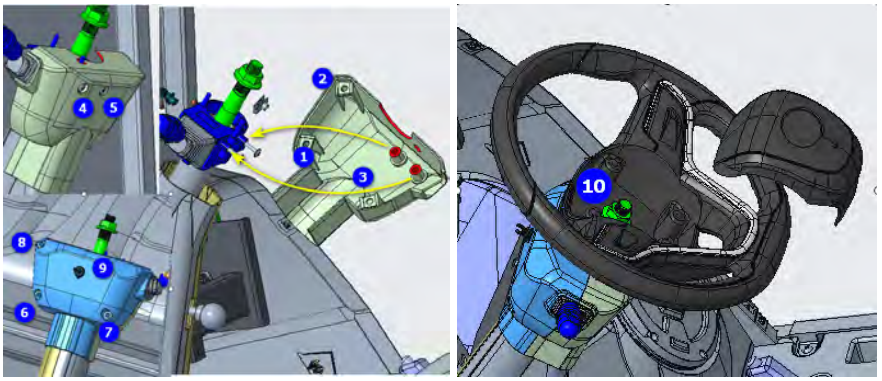
<tr><td colspan="2"> 
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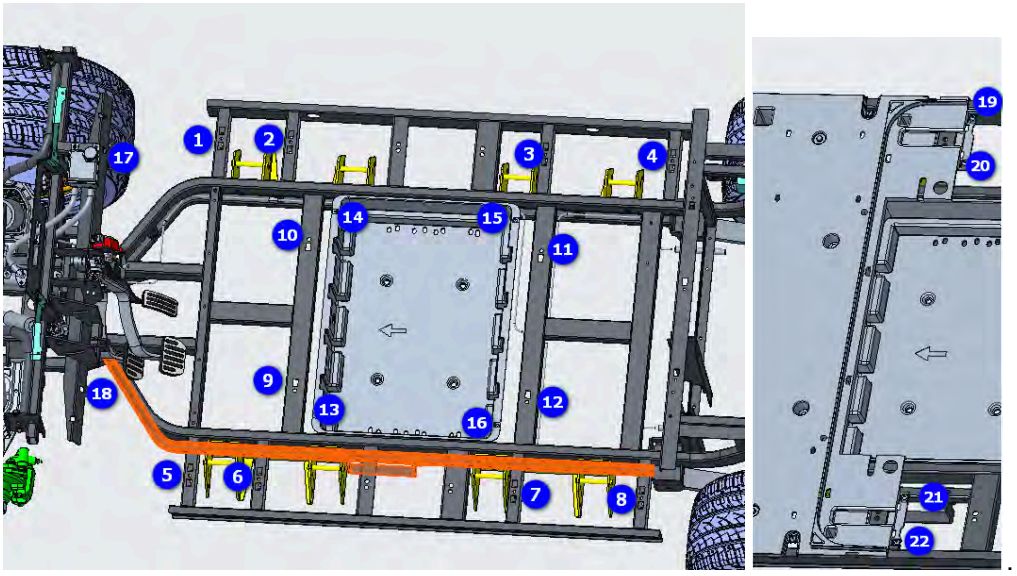
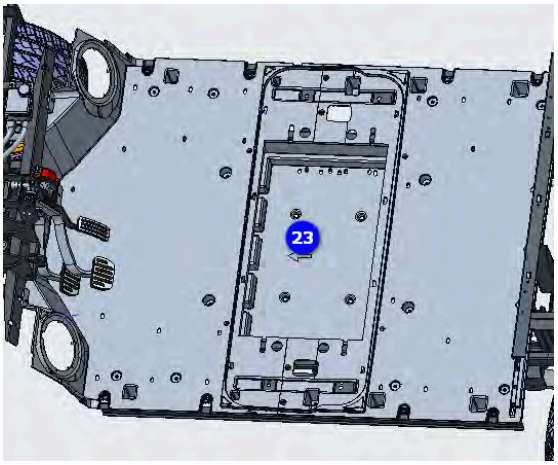
<tr><td>  </td><td>Tool:
1. Electric drill
2. Phillips bit
3. 24mm open-end wrench</td></tr>
</table>

4.4.14 Front and Rear Floorboard

●Clip M6 clip nuts onto the frame and battery box at positions ① to 18, as shown in the diagram. Clip M6 clip nuts onto the front floorboard at positions 19 to 22, as shown in the diagram.

●Place the front and rear floorboards onto the frame, aligning the holes. Secure them with M6×20 Phillips screws, as shown in diagram 23.

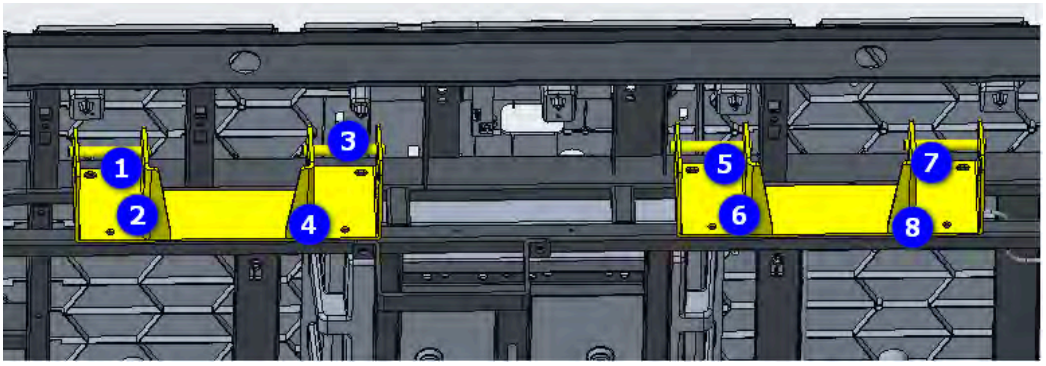




	Tool: 1. Electric drill 2. Phillips bit

4.4.15 Nerf Bar Mounting Seat

●Align the mounting bracket of the step board with the holes on the frame, as shown in positions ① to ⑧ in the diagram. Secure it with M8×20 hex head bolts.



Tool:

1. Torque wrench
2. 13mm socket
3. 13mmopen-end wrench

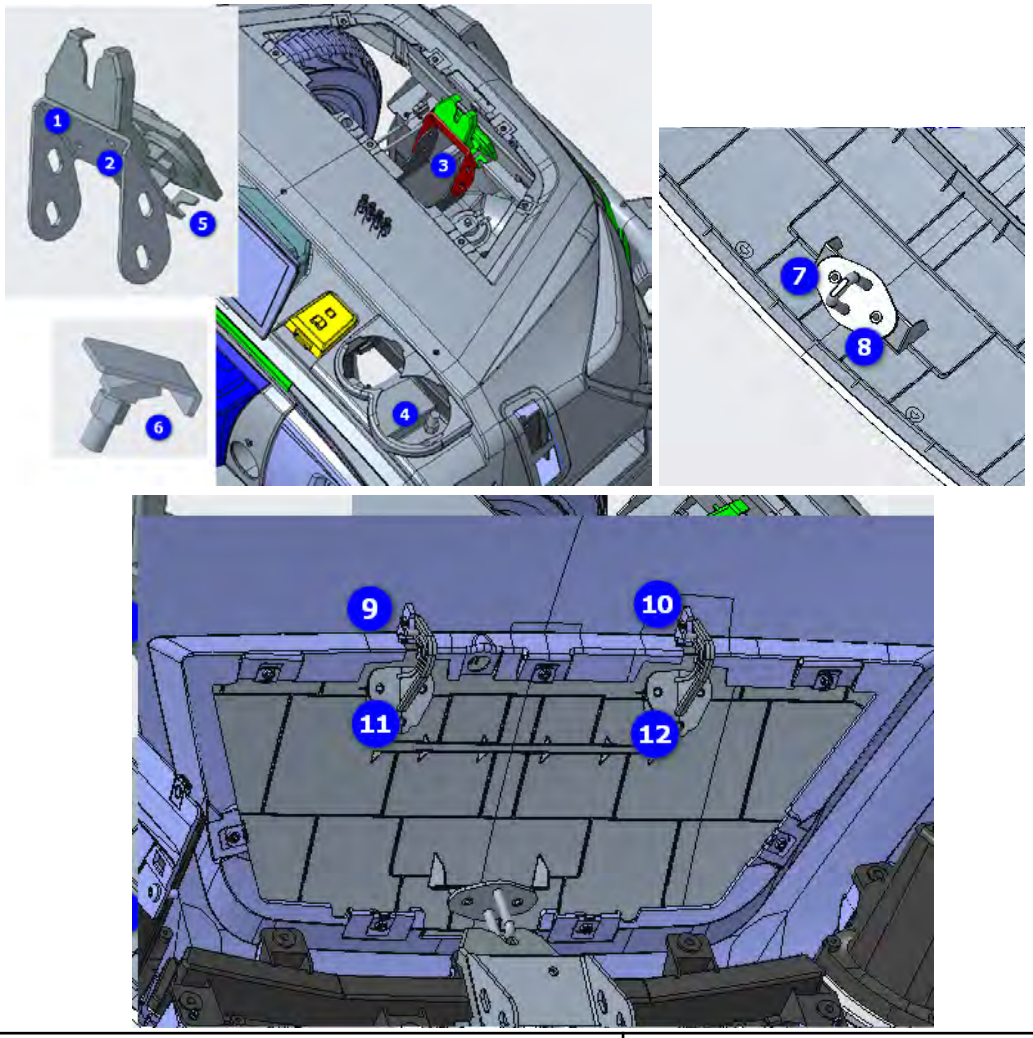
4.4.16 Front Hood, Front Hood Lock and Front Storage Box

●Secure the front hood lock to the central control door lock fixing plate at positions ① and ② with M6×16 hex head bolts. Then, secure the pre-installed lock at position ③ with M6×20 Phillips bolts. Attach one end of the brake cable assembly to the latch release cable loop, and fix the latch release cable loop to position ④ of the front storage at position ⑥. Finally, attach the other end of the brake cable assembly to position ⑤.

●Secure the lock block to positions ⑦ and ⑧ of the front hood with

MST4.2×16 Phillips countersunk self-tapping screws.

●Install the hinges to positions ⑨ and ⑩ of the front cover, securing with ST4.2×16 Phillips pan head self-tapping screws. Then, fix the front hood to the hinges at positions and with ST4.2×16 Phillips countersunk self-tapping screws. If there is a gap between the front hood and the front cover after installation, adjust the bolts at position ③.

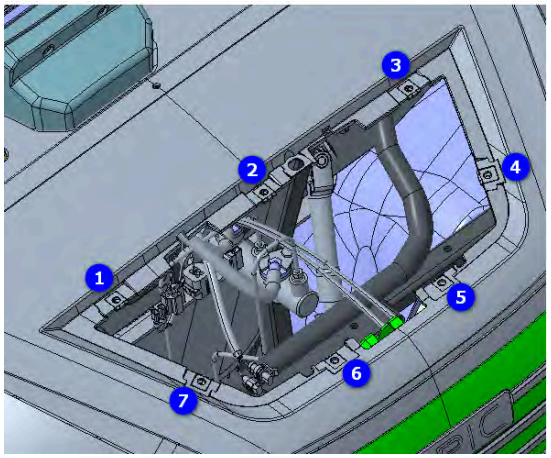


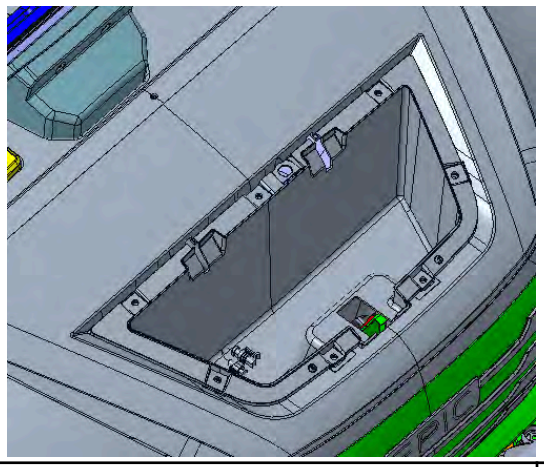
Tool:

1. Electric drill
2. Phillips bit
3. 10mmopen-end wrench

●Front Storage Box

Attach M6 clip nuts to positions ① to ⑦ on the front cover. Place the front storage box in the middle of the front cover as shown in the diagram. Secure it with M6×20 Phillips pan head screws.





Tool:

1. Electric drill
2. Phillips drill bit

4.4.17 Front and Rear Fender Flare

4.4.17.1 Front Fender Flare Installation

●First, secure the side reflectors to the left and right fender flares, as

shown in diagram ⑦.Clip the spring clips to positions ① to ⑤ on the fender flares.Use M6×20 Phillips bolts to secure the fender flare mounting bracket at position ⑥.Align the fender flares with the mounting holes on the front cover and snap them into place.At position ⑧, connect the fender flares to the fender flare mounting brackets with M6×20 Phillips bolts and M6 clip nuts.

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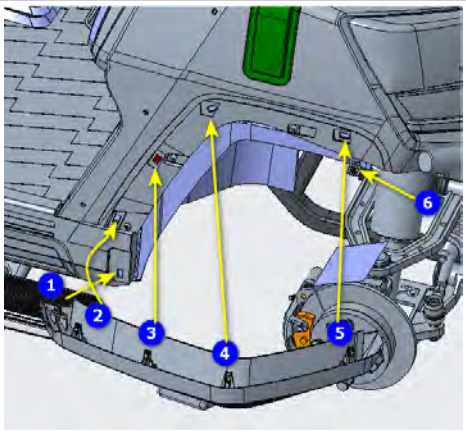
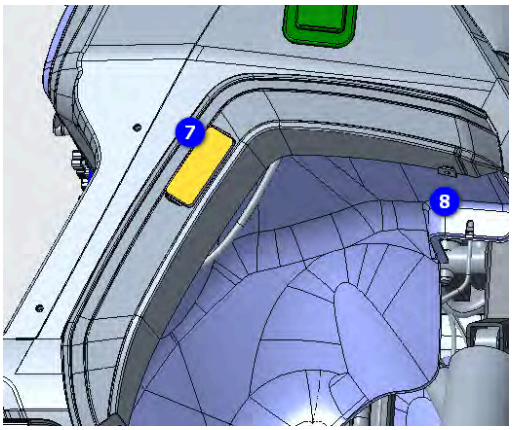
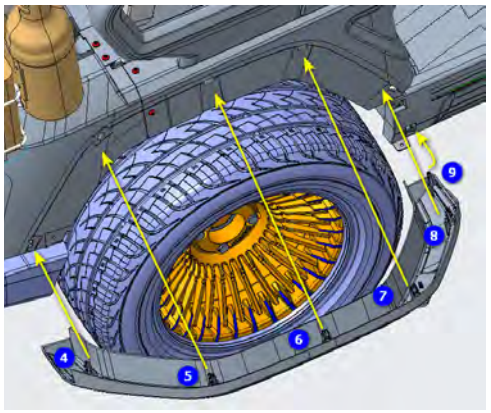
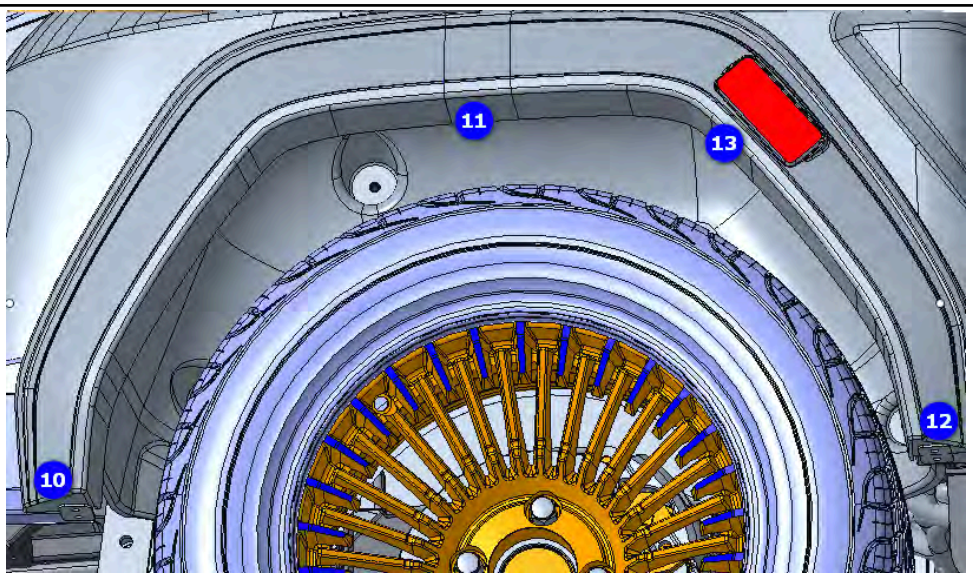
<tr><td colspan="2"> 


</td></tr>
<tr><td>  </td><td>Tool:
1. Electric drill
2. Phillips drill bit
3. 10mmopen-end wrench</td></tr>
</table>

4.4.17.2 Rear Fender Flare Installation

●Use M6*20 Phillips bolts to install the rear fender flare fasteners at positions ① and ②.Install the fender flare mounting bracket with M6*20 Phillips bolts at position ③.Attach the red side reflector at position .Clip the spring clips to positions ④ to ⑨.Snap the fender flares onto the rear cover following the arrows, then secure with ST4.8×20 Phillips pan head self-tapping screws.





Tool:

1. Electric drill
2. Phillips drill bit
3. 10mmopen-end wrench

4.5 Adjustment

4.5.1 Change Brake Fluid

●Raise the Vehicle: Use a lift to elevate the vehicle. Ensure the vehicle is stable and secure as technicians will be working underneath.

●Inspect Valves and Joints: Check all three-way valves and oil pipe joints under the chassis. If any are loose or leaking, tighten the joints or replace the three-way valves or oil pipes if necessary.

●Connect Drain Bottles: Attach four drain bottles to the bleed bolts of the front and rear wheel brake calipers.

●Open the Oil Reservoir: Open the oil reservoir and connect the hydraulic brake fluid replacement machine's supply hose to the reservoir.

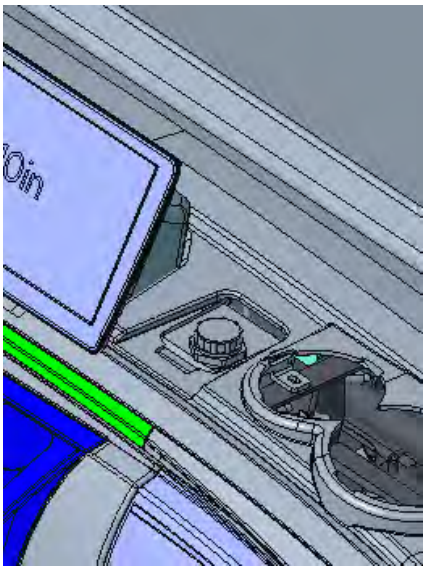
●Activate the Replacement Machine: Start the hydraulic brake fluid replacement machine and pressurize the oil reservoir. This will force the old brake fluid out of the brake pump and oil pipes.

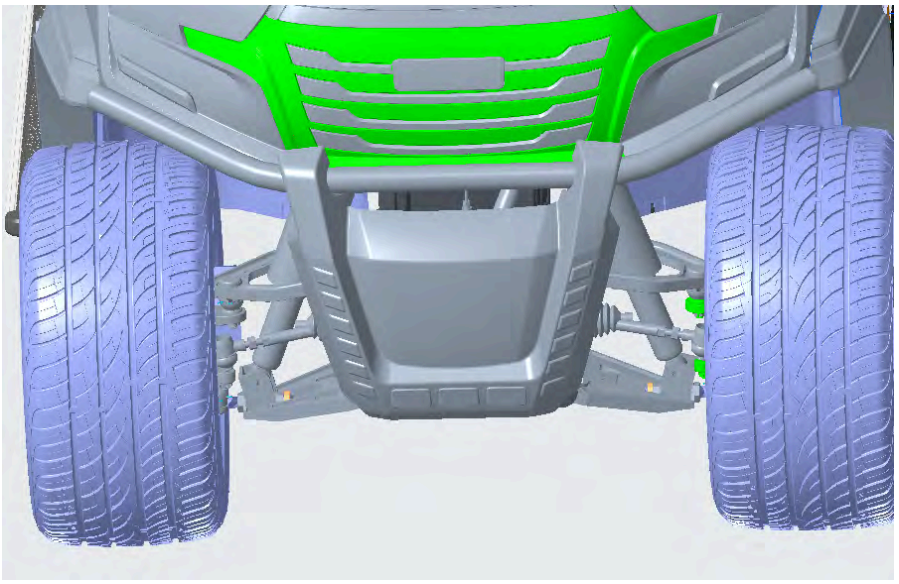
⚠ Warning: Pay close attention to the oil pressure. The pressure should not exceed 4 KG/cm², as this could cause the oil reservoir to explode.

●Drainage Tips: While draining, keep an eye on the drain bottles. If you notice a lot of bubbles in the bottles, it indicates that air is being expelled from the system. Continue draining until there are no more bubbles, which means the air has been fully purged from the brake lines.

●Remove the drain bottles from the bleed bolts. Securely fasten the oil reservoir cap. Lower the vehicle back to the ground.

⚠ Warning: This vehicle uses DOT4 brake fluid. Do not use any other types of brake fluid and strictly avoid mixing different types of brake fluid.





Tool:

1. Brake fluid replacement machine
2. Specialized wrench for oil pipes

4.5.2 Toe-in

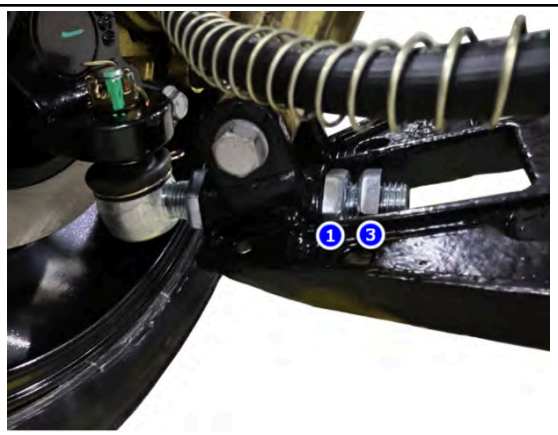
4.5.2.1 Adjust Front Wheel Camber

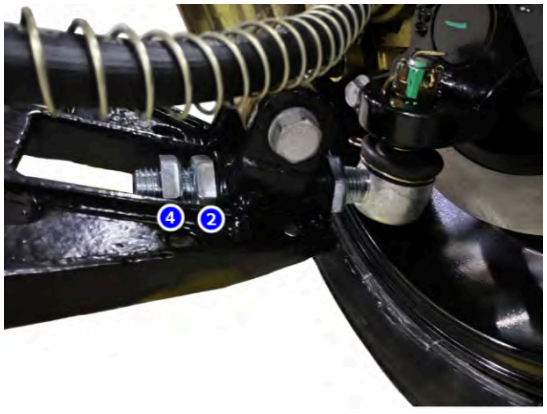
●Drive the vehicle onto the testing platform and straighten the steering.

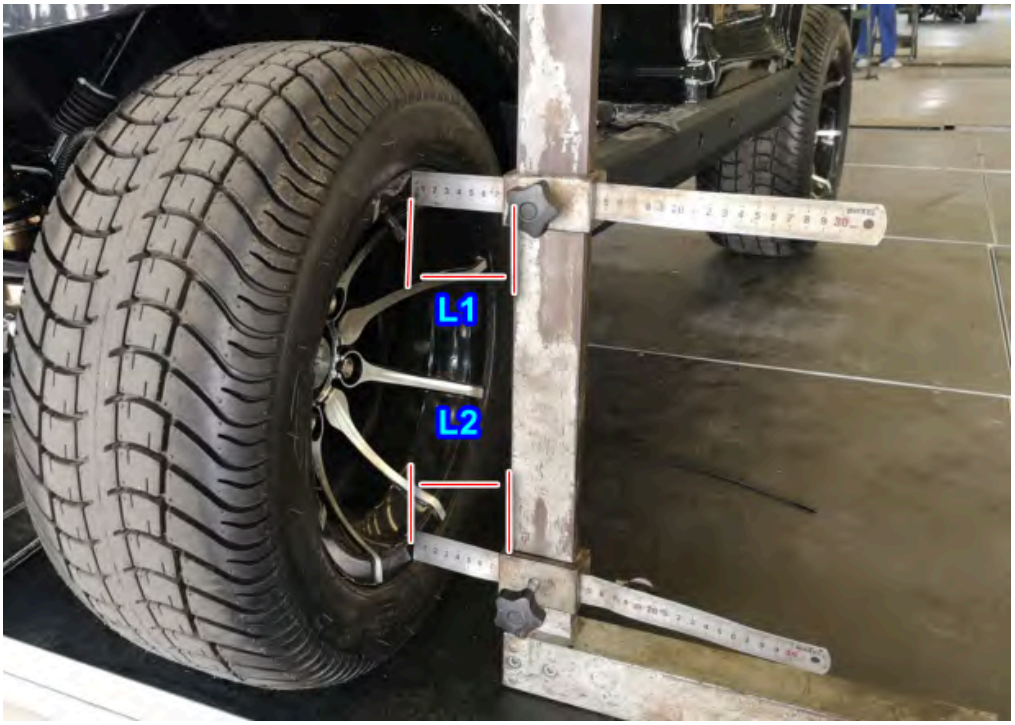
●Use a square ruler to measure the front wheel camber.

●Based on the measured camber values, adjust the corresponding lower control arm adjustment nut. For example, if the left front wheel L2 > L1, tighten the lower control arm ball joint adjustment nut (②) until L2 - L1 = 3mm. Use the same method for the right front wheel.

Note: After completing the adjustment, ensure all the ball joint nuts on the lower control arms are tightly secured, as shown in images ③ and ④.







L1-L2=3mm

Tool:

1. Torque wrench
2. 27mm socket wrench
3. Testing platform

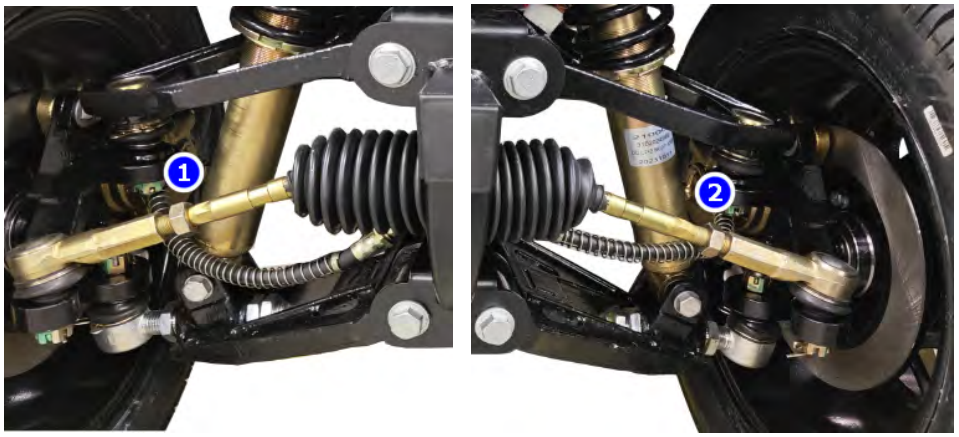
4.5.2.1 Adjust Front Wheel Toe (Wheel Distance)

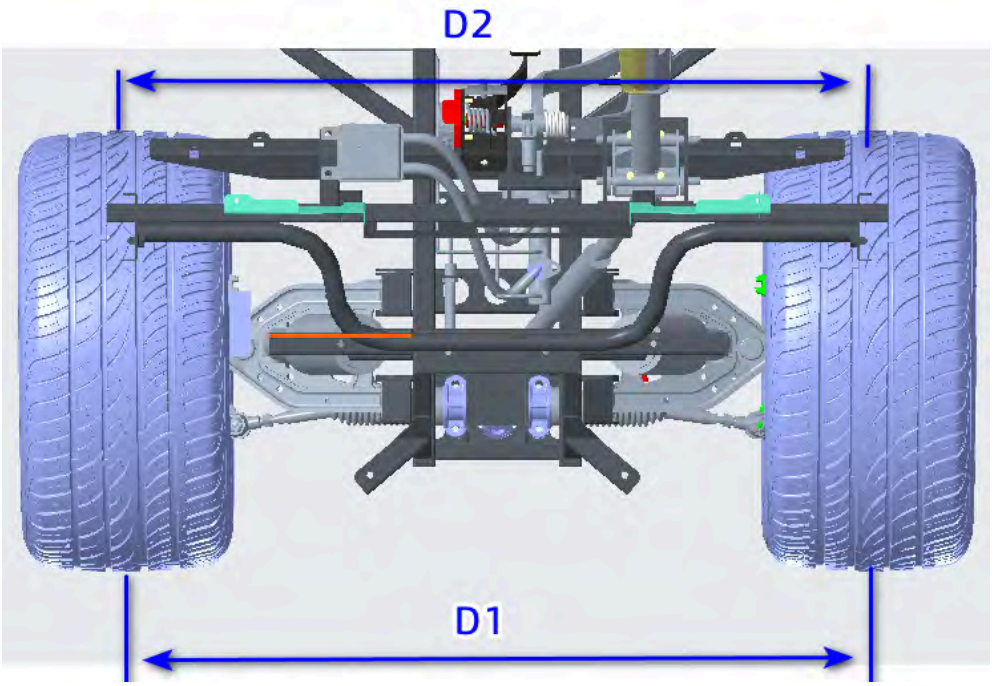
●Measure Wheel Distance:Use a measuring tape to measure the wheel distance of the front wheels, obtaining values for D1 (front side) and D2 (rear side).

●Adjust Tie Rods: Based on the values of D1 and D2, adjust the tie rods at both ends of the steering rack, as shown in images ① and ②.If D2 < D1, adjust the tie rods inward. If D2 > D1, adjust the tie rods outward.

●Fine-Tuning: After adjustments, ensure that D2 - D1 = 1±1mm. Tighten the hex nuts securely. Ensure that the adjustment travel of the tie rods at both ends of the steering rack is consistent, indicating that the front wheel toe adjustment is complete.

Note: Both tie rods must be adjusted simultaneously and the adjustment travel should be similar. Do not adjust only one tie rod while leaving the other untouched.





Front wheel distance-the rear's: D2

Front wheel distance- the front's: D1

Standard: D2-D1=5±1mm

Tool:

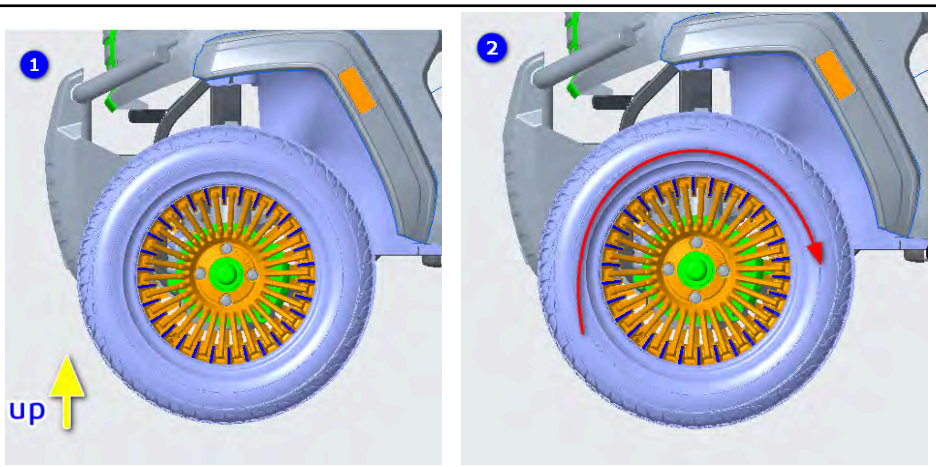
1. 19mm open-end wrench
2. Measuring tape
3. Testing platform

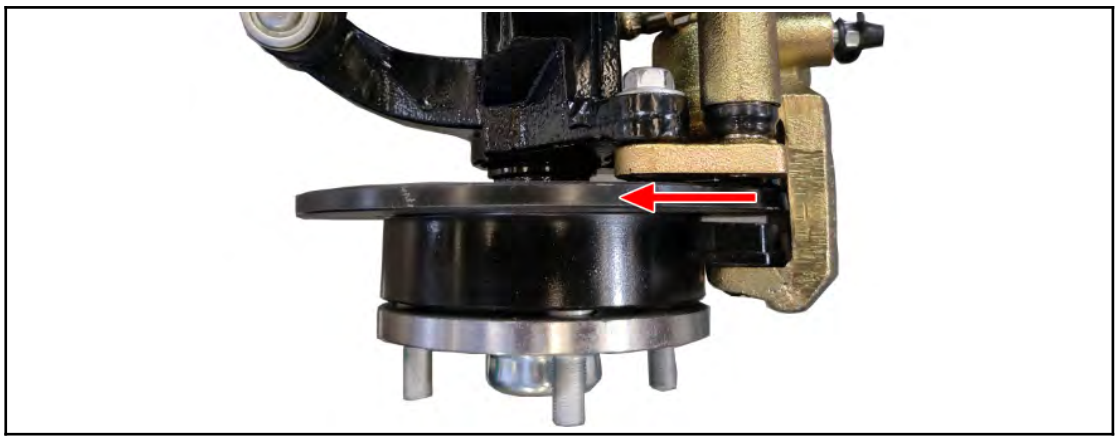
4.6 Troubleshoot Brake Noise

●Move the Vehicle: Drive the vehicle to a quiet location, turn off the engine, and remove the key. Use a lift to raise the vehicle, ensuring the tires are off the ground. If you don't have a lift, you can use a jack to raise the front and rear ends of the vehicle one at a time. When using lifting equipment, confirm it is reliable and has been properly maintained to prevent accidents. This is very important.

●Check Each Wheel: Once the tires are off the ground, manually rotate each wheel and carefully listen for any noise. Inspect all four wheels. For any wheels that produce noise, proceed with further troubleshooting steps.

Warning: If you are using a jack, be cautious not to get too close to the jack while rotating the tires and listening for noise. This is to avoid any risk of knocking the jack and causing an accident.





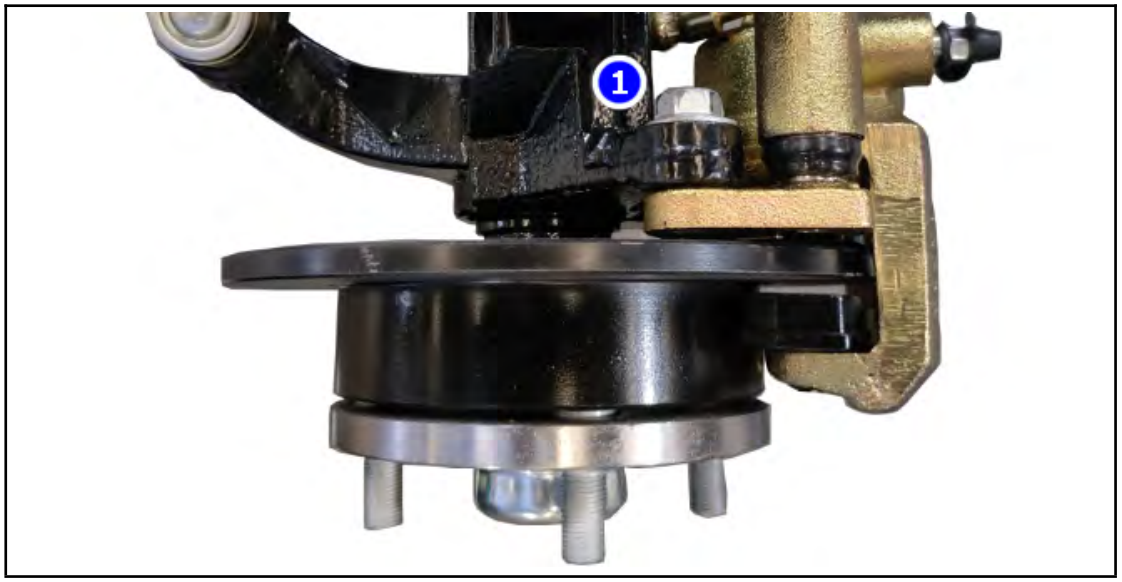
4.6.1 Front Disc Brake Noise

●If the length of the bolt is too long, causing it to scrape the brake disc, follow these steps:

Remove the Bolt: Unscrew and remove the bolt that is too long.

Add Washers: Insert a sufficient number of washers to adjust the length of the bolt.

Tighten the Bolt: Re-insert the bolt and tighten it securely.



	Tool: 1. 16mm open-end wrench

4.6.2 Rear Disc Brake Noise

●Bolt Scraping the Brake Disc:

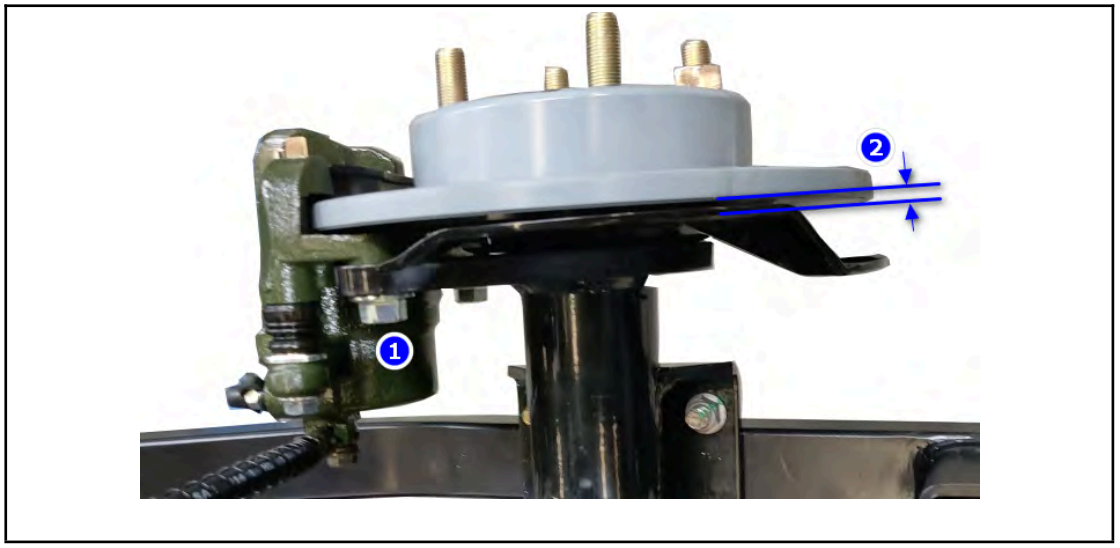
Cause: If the bolt length is too long, it can scrape the brake disc, causing noise.

Solution: Remove the bolt, add washers to adjust its length, and then retighten it, as shown in image ①.

●Brake Disc:

Cause: If the mudguard is scraping the brake disc, it is usually due to the mudguard being deformed.

Solution: Use needle-nose pliers to adjust the mudguard, ensuring a gap of more than 3mm between the mudguard and the brake disc, as shown in image ②.

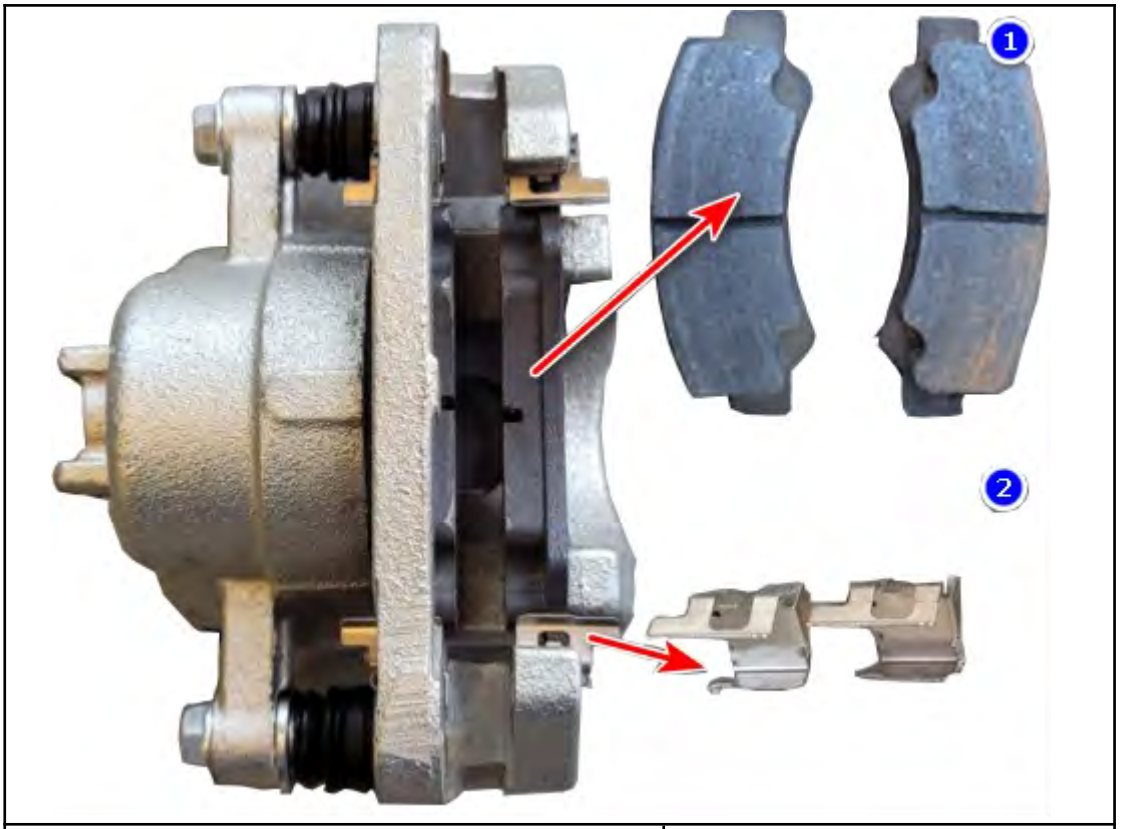


	Tool: 1. 16mm open-end wrench 2. Needle-nose pliers

4.6.3 Brake Caliper Noise

●Brake Caliper Noise Inspection: If the noise originates from the brake caliper itself, disassemble the brake caliper and check if the brake pads and clips are correctly installed, as shown in images ① and ②.

●Replacement:If the brake pads and clips are properly installed but the noise persists, it may be due to defective brake pads. Replacing the brake pads should resolve the issue.



Tool:

1. Needle-nose pliers

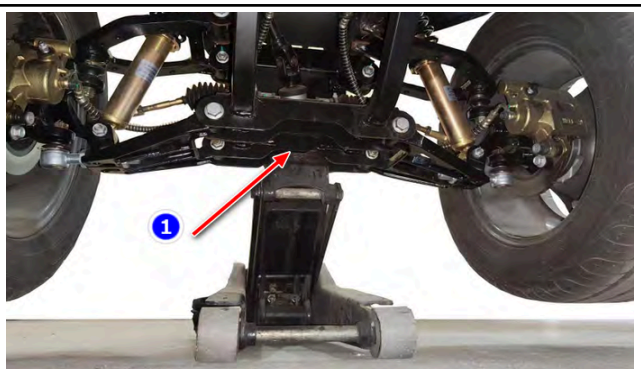
4.6.4 Using a Jack for Chassis Maintenance

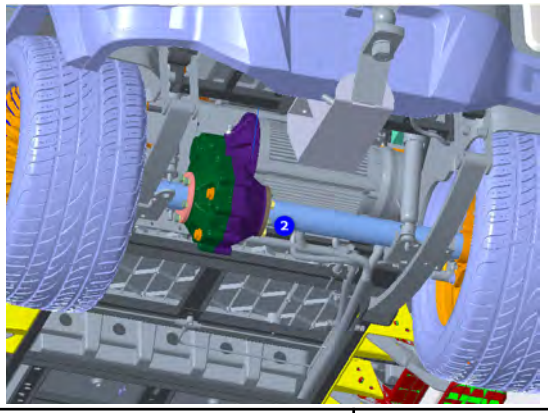
●Park the Vehicle: Ensure the vehicle is parked on a sturdy platform or level ground. Turn off the engine and secure the front and rear wheels with chocks to prevent the vehicle from moving during maintenance.

●Locate the Jacking Points:

Find the lower control arm mounting base on the chassis, as shown in image ①.Alternatively, you can use the long axle tube of the rear axle near the vehicle's transverse center, as shown in image ②.Confirm that the jack is aligned with the support points before lifting the vehicle. Raise the vehicle to the necessary height based on your specific needs.

●Safety Precautions: After completing the maintenance, ensure all personnel are clear of the area under the chassis. Slowly release the jack to lower the vehicle, ensuring there are no safety hazards.



	
	Tool: 1. Jack

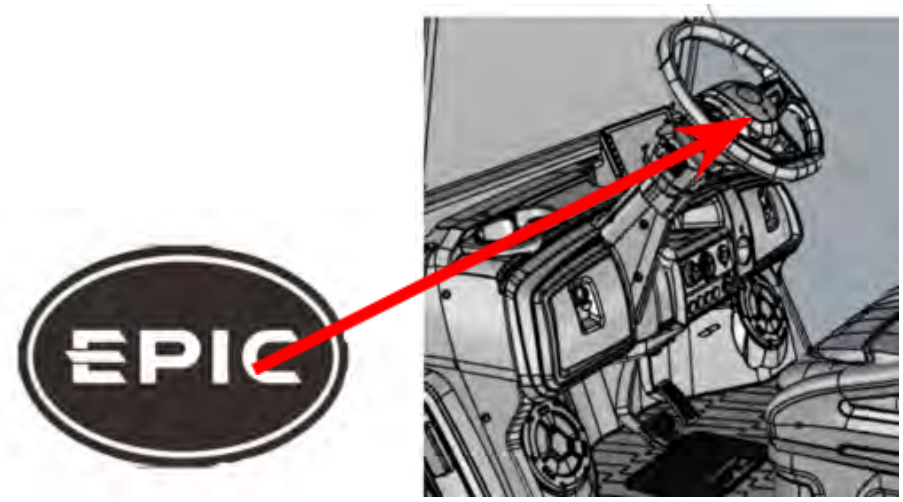
4.7 Labels

4.7.1 Steering Wheel

●Before applying the EPIC steering wheel label, make sure to clean the steering wheel thoroughly to remove any dust and debris. This ensures the label adheres properly and achieves the best possible effect.

4.7.2 Charging

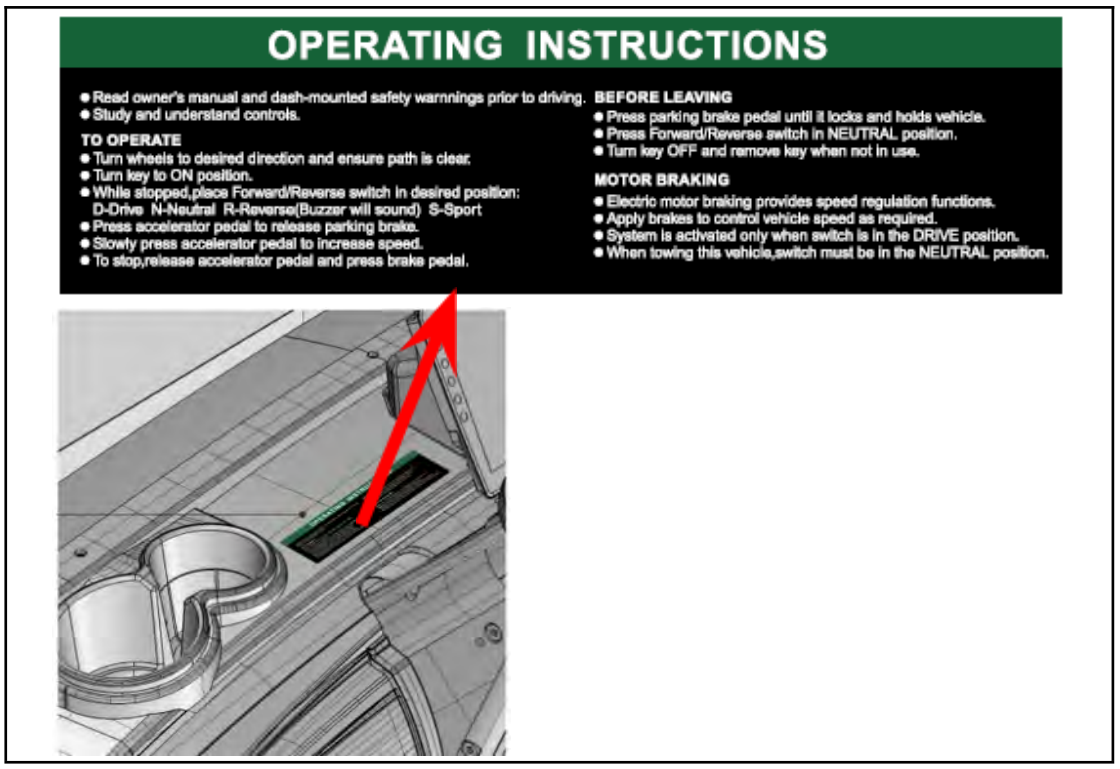
●Use the Provided Charger and Cable: Ensure you use the



charger and input cable that came with your vehicle for charging. Check the Warning Labels: Before starting the charging process, carefully read the warning labels above the charging port to ensure proper and safe charging.

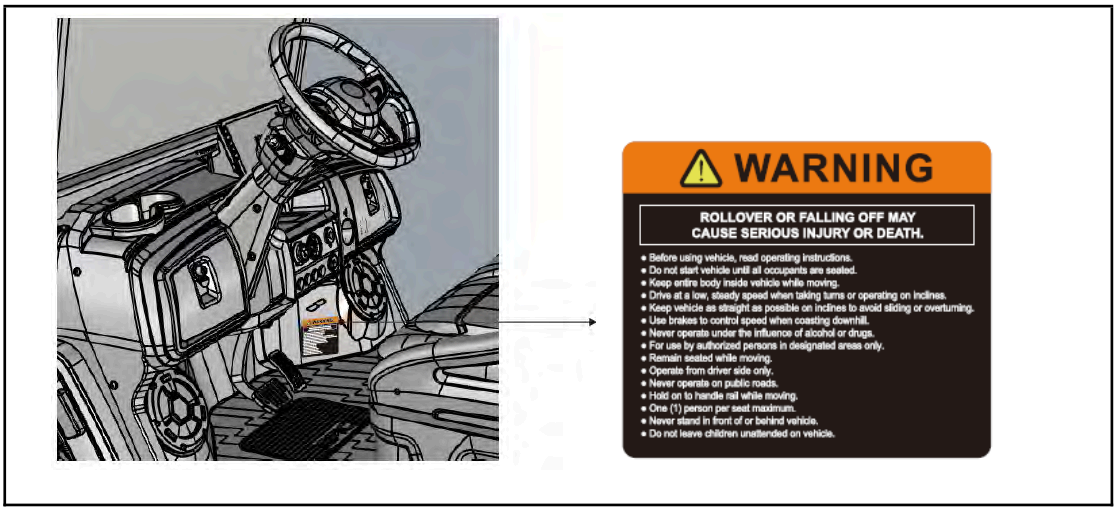
4.7.3 Vehicle Operation Label

●Before operating this vehicle, carefully read the contents of this label to ensure safe usage.



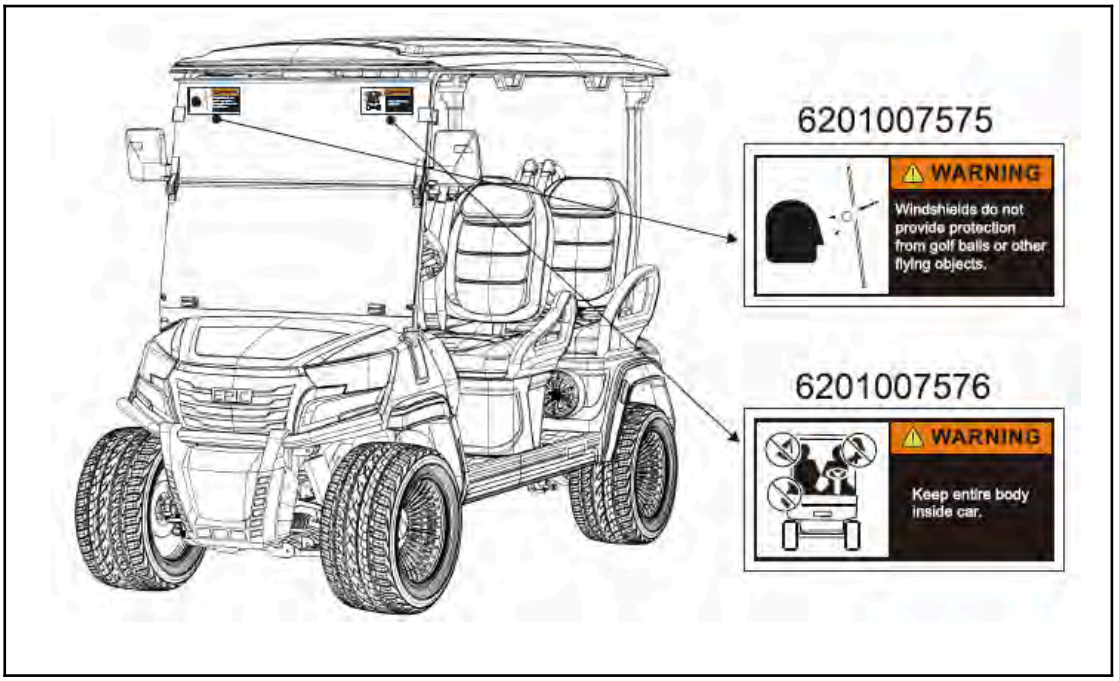
4.7.4 Operational Warning Label

●Before operating this vehicle, carefully read the contents of this label to ensure safe usage.



4.7.5 Windshield Label

●When driving the vehicle, ensure that all passengers, including the driver, comply with the instructions on the label. This is crucial for the safety of everyone.

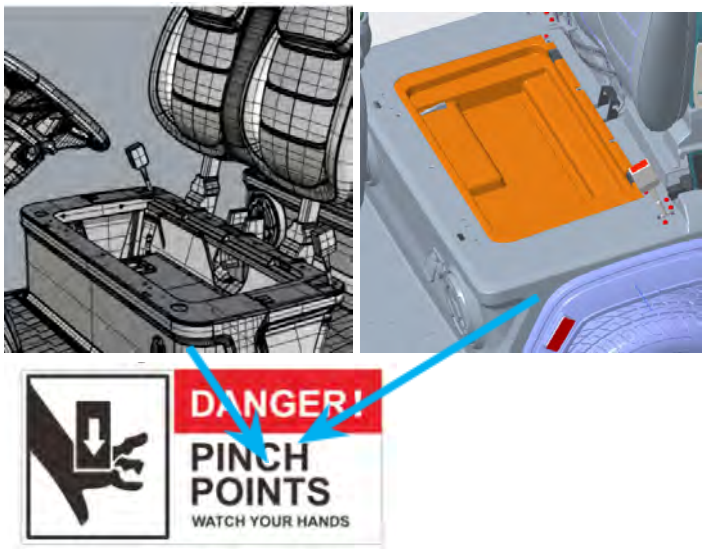


4.7.6 Electric Shock Hazard Warning Label

●This equipment poses a risk of electric shock and should only be serviced by trained professionals. Follow the instructions on the label to ensure everyone's safety, as illustrated in image ①.

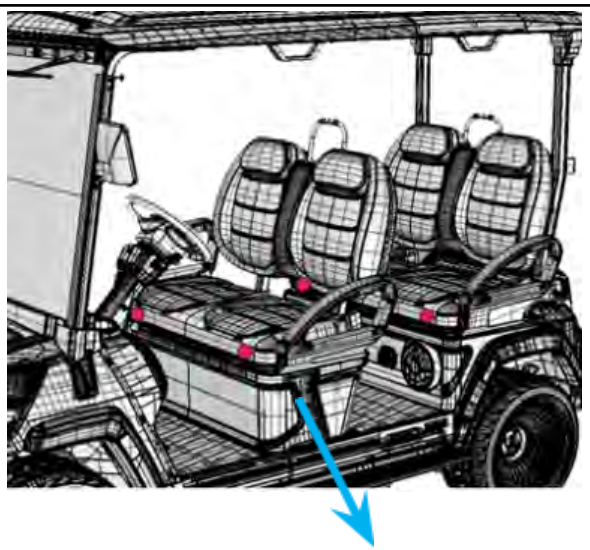
4.7.7 Anti-Crush Hand Warning Label

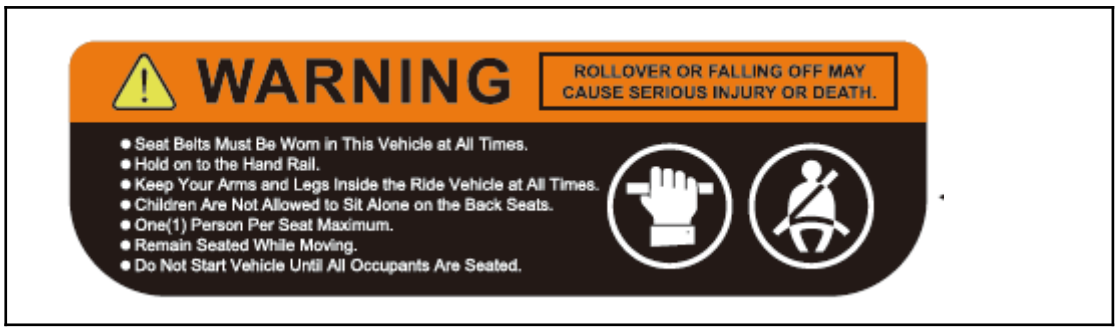
●When flipping the seat cushion, make sure that it does not fall and crush your hand or injure anyone nearby.



4.7.8 Seat Belt

●Reminds users to wear seatbelts before driving the vehicle.





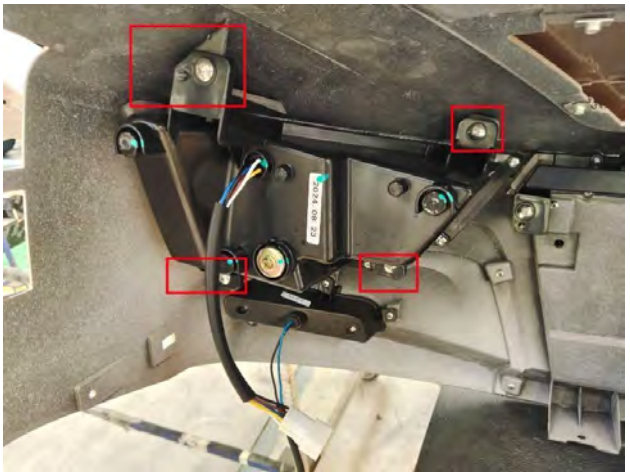
5. Electrical System

5.1 Lighting

5.1.1 Headlight

●Use Electric Screwdriver: Use an electric screwdriver and Phillips head screws to securely fasten the headlights in the areas marked in red.

Note: Before installing the headlights, use testing equipment to check the functionality of the headlights. Ensure they are working properly before proceeding with the installation.



Phillips pan head bolt

Tool:

1. Phillips electric drill

5.1.2 Taillight

●Use an electric screwdriver with Phillips head screws to securely fasten the taillights in the areas marked in red.

Note: Before installing the taillights, use testing equipment to check their functionality. Ensure the taillights are working properly before proceeding with the installation.

Phillips pan head bolt+M5 flat washer

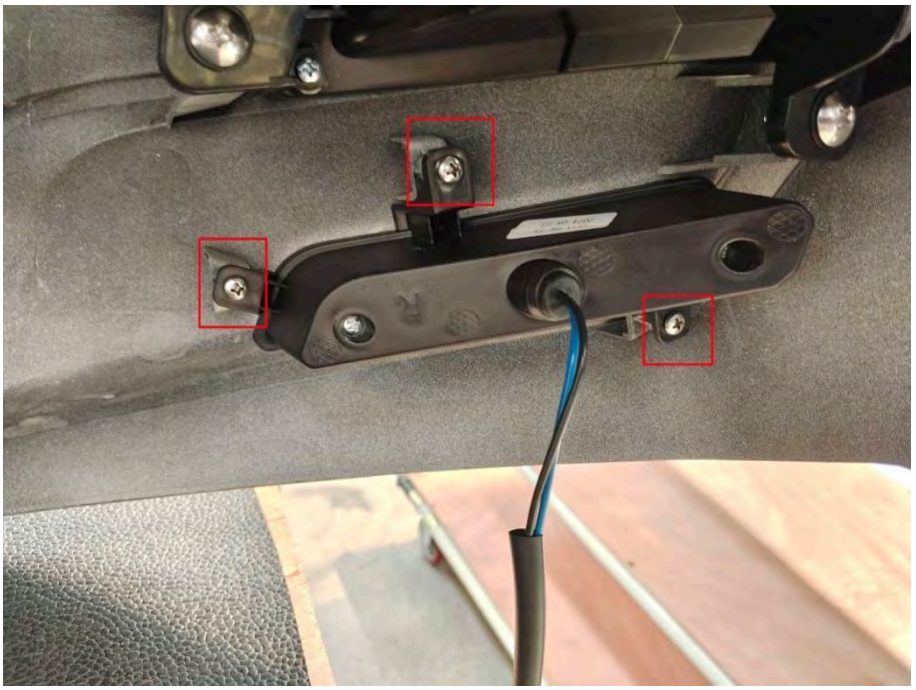
Tool:

1. Phillips electric drill

5.1.3 Daytime Running Lights

●Use an electric screwdriver with Phillips head screws to securely fasten the daytime running lights (DRL) in the areas marked in red.

Note: Before installing the daytime running lights (DRL), use testing equipment to check their functionality. Ensure the DRLs are working properly before proceeding with the installation.



Phillips pan head bolt

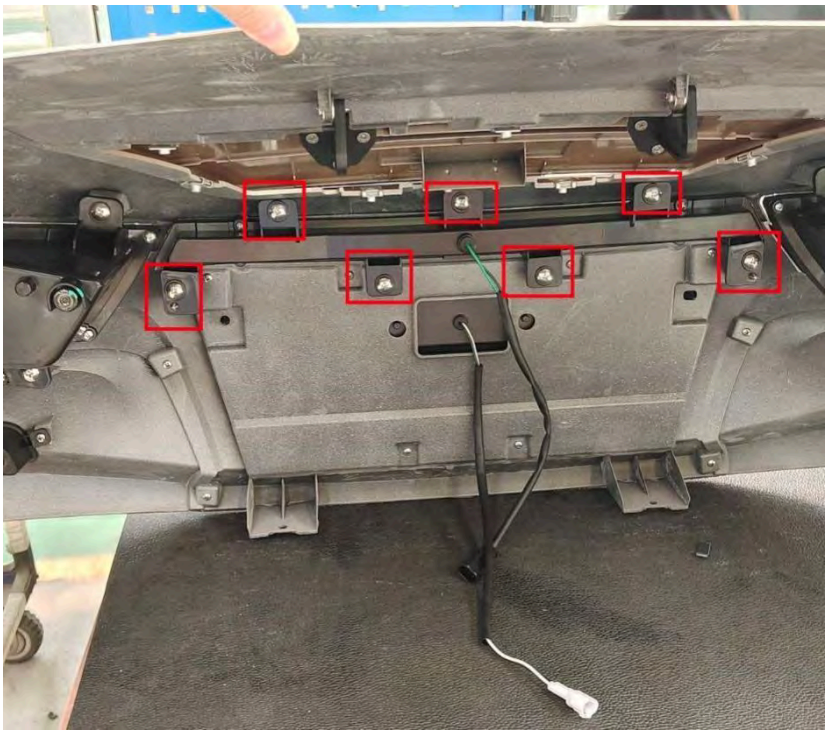
Tool:

1. Phillips electric drill

5.1.4 Light Bars

●Secure the light bars using an electric screwdriver with Phillips head screws in the areas marked in red.

Note: Before installing the light bars, use testing equipment to verify their functionality. Ensure the light bars are working properly before proceeding with the installation.



Phillips pan head bolt

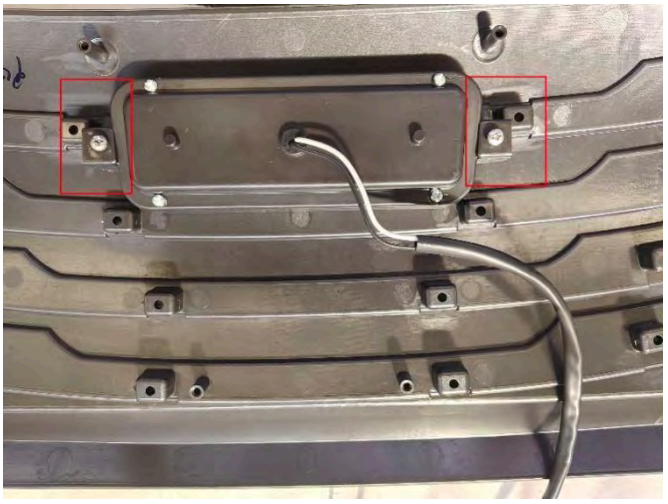
Tool:

1. Phillips electric drill

5.1.5 Front Logo Light

●Use Electric Screwdriver: Secure the front logo light using an electric screwdriver with Phillips head screws in the areas marked in red.

Note: Before installing the front logo light, use testing equipment to check its functionality. Ensure the front logo light is working properly before proceeding with the installation.



Phillips pan head bolt

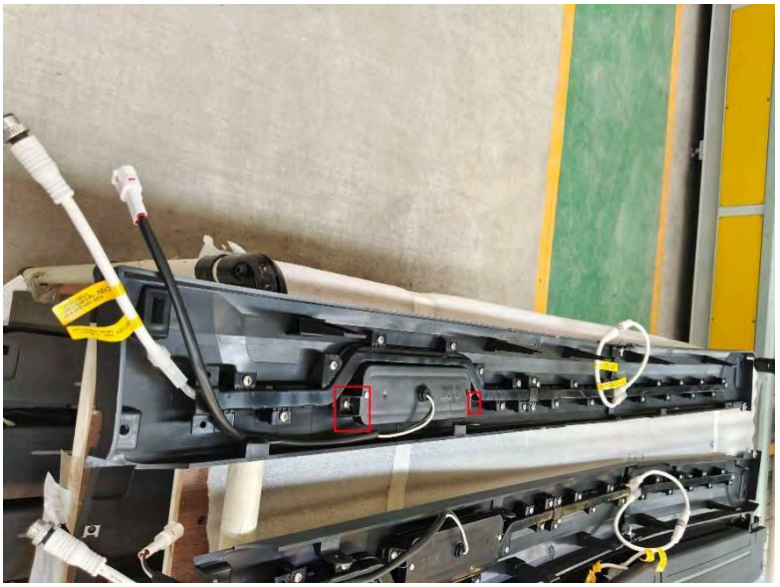
Tool:

1. Phillips electric drill

5.1.6 Side Skirt Logo Light

●Use Electric Screwdriver: Secure the side skirt logo light using an electric screwdriver with Phillips head screws in the areas marked in red.

Note: Before installing the side skirt logo light, use testing equipment to check its functionality. Ensure the side skirt logo light is working properly before proceeding with the installation.



Phillips pan head bolt

Tool:

1. Phillips electric drill

5.1.7 Side Skirt LED Light Strip

●Secure the Light Strip: Use an electric screwdriver with Phillips head screws to secure the side skirt light strip.Install the Side skirt: Once the light strip is secured, proceed to install the side skirt using the Phillips head screws in the areas marked in red.

Note: Before installing the side skirt light strip, use testing equipment to check its functionality. Confirm that the side skirt light strip is working properly before proceeding with the installation.

Installation Instructions:

Handle with Care: During installation, avoid pulling, twisting, or yanking the light strip forcefully.

Gently Tuck: Carefully and gently tuck the light strip into the slots to prevent any damage.

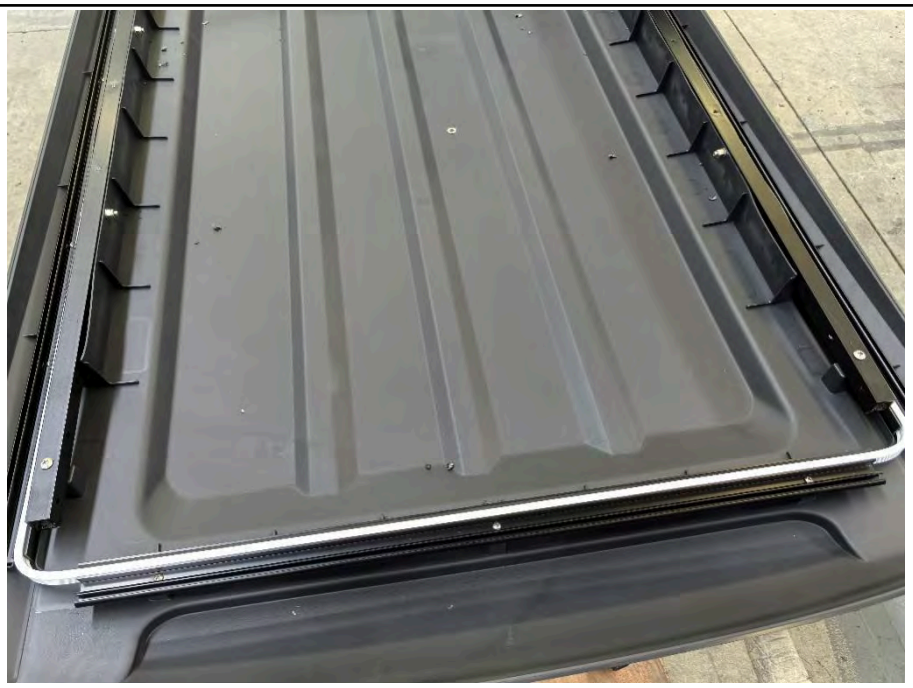
Phillips pan head bolt

	Tool: 1. Phillips electric drill

5.1.8 Canopy Light Strip

●Use Electric Screwdriver: Secure the light strip clips using an electric screwdriver with Phillips head screws. Once the clips are securely in place, attach the light strips to the clips.

Note: Before installing the ceiling light strip, use testing equipment to check its functionality. Confirm the light strip is working properly before proceeding with the installation. During Installation: Do not pull, twist, or yank the light strip forcefully. Gently tuck the light strip into the slots to avoid damaging it.



Phillips pan head bolt

Tool:

1. Phillips electric drill

5.2 Electrical System

5.2.1 Overview

The electrical system includes both drive and lighting electrical components. Drive Electrical Components: Controller assembly, Battery pack, AC motor, Pedal accelerator, Control dashboard, Power control harness, Charging port, Charger). Lighting Electrical Components: DC converter, Light strip, Turn signal combination switch, Front headlights,

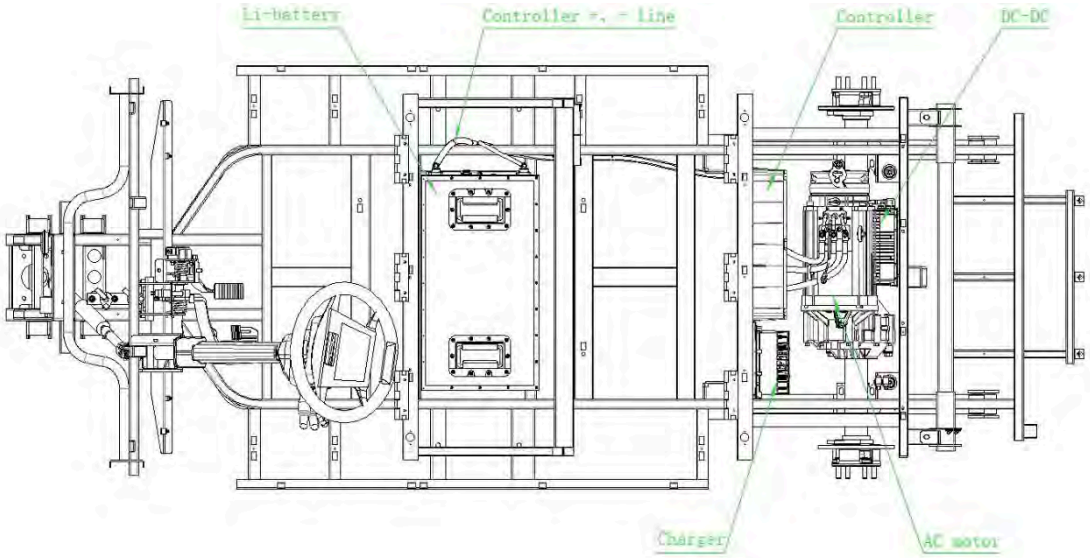
Front turn signal lights, Rear light assembly, Brake light switch, Flasher unit, Electric horn, Combination meter, Lighting control harness.

This vehicle utilizes a low voltage AC control system, applied in low-voltage AC electric vehicle drives, with a top-tier AC motor control algorithm. This achieves precise control of the AC motor's torque across a wide speed range, allowing for a broader motor speed range and increasing the vehicle's driving speed. The brushless, fully enclosed AC motor is maintenance-free, greatly enhancing system reliability. The AC system achieves higher efficiency with flexible energy feedback control, effectively improving driving range. The system has the following features:

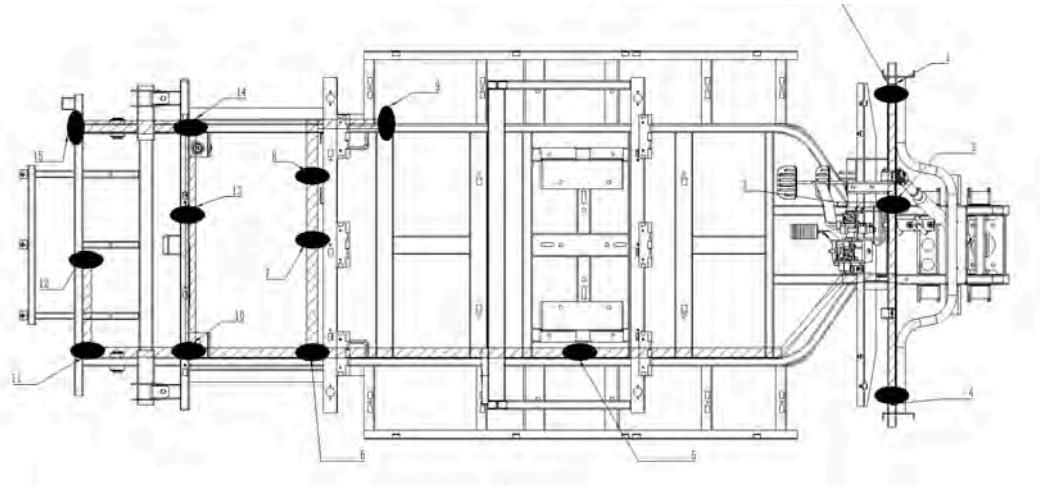
- Closed-loop control system: Real-time control of the vehicle's maximum speed to prevent overspeeding.
- Regenerative braking: During braking, energy is fed back to the battery, extending battery life and driving range while reducing mechanical brake wear.
- Parameter modification and fault diagnosis: Can connect to the controller via computer and CAN box to modify parameters and diagnose faults comprehensively.
- Enhanced braking performance: Releasing the accelerator initiates smooth braking to prevent forward and backward skidding.

- High Pedal Disable (HPD) protection: If the controller detects pedal input signal greater than 25% at startup, the controller protection function is triggered, preventing runaway at startup.
- Microprocessor power-on self-check: Continuously diagnoses during operation. If a fault occurs, the controller immediately stops output, fully protecting the operator and vehicle.
- Magnetic brake system. As acceleration decreases and the pedal is fully released, the magnetic brake system automatically locks when the vehicle comes to a stop, completing the parking process.

5.2.2 Battery and Motor Wiring Harness Assembly Diagram



5.2.3 Main Cable Wiring Harness Assembly Diagram



Position 1: Left front headlight, wiper power supply, side mirror turn signal, left glove box light strip power supply, left dashboard ambient light power supply.

Position 2: Combination switch, accelerator, brake switch, front storage box switch, front storage box light strip, horn, flasher, front light bar, front auxiliary power supply.

Position 3: Gear switch, reverse beeper, CAN line, USB, central ambient light power supply, reversing camera, one-push bottum, speaker audio line, canopy light strip switch, side skirt light strip switch, hazard warning switch, front storage box switch, instrument cluster, amplifier, speaker ambient light controller connector.

Position 4: Right position light, right front headlight, right side mirror turn signal, right ambient light power supply, right glove box light strip power supply, front right speaker audio line connector.

Position 5: Battery CAN, seat bucket USB connector.

Position 6: Right speaker audio line, controller debugging CAN, right side skirt light strip power supply, right side skirt logo light power supply connector.

Position 7: Controller connector.

Position 8: Charging protection, charger CAN connector.

Position 9: Right side skirt LED, right side skirt logo light power supply, right speaker audio line connector.

Position 10: Motor electromagnetic brake, motor encoder, motor temperature control, DC connector.

Position 11: Rear tail light power supply connector.

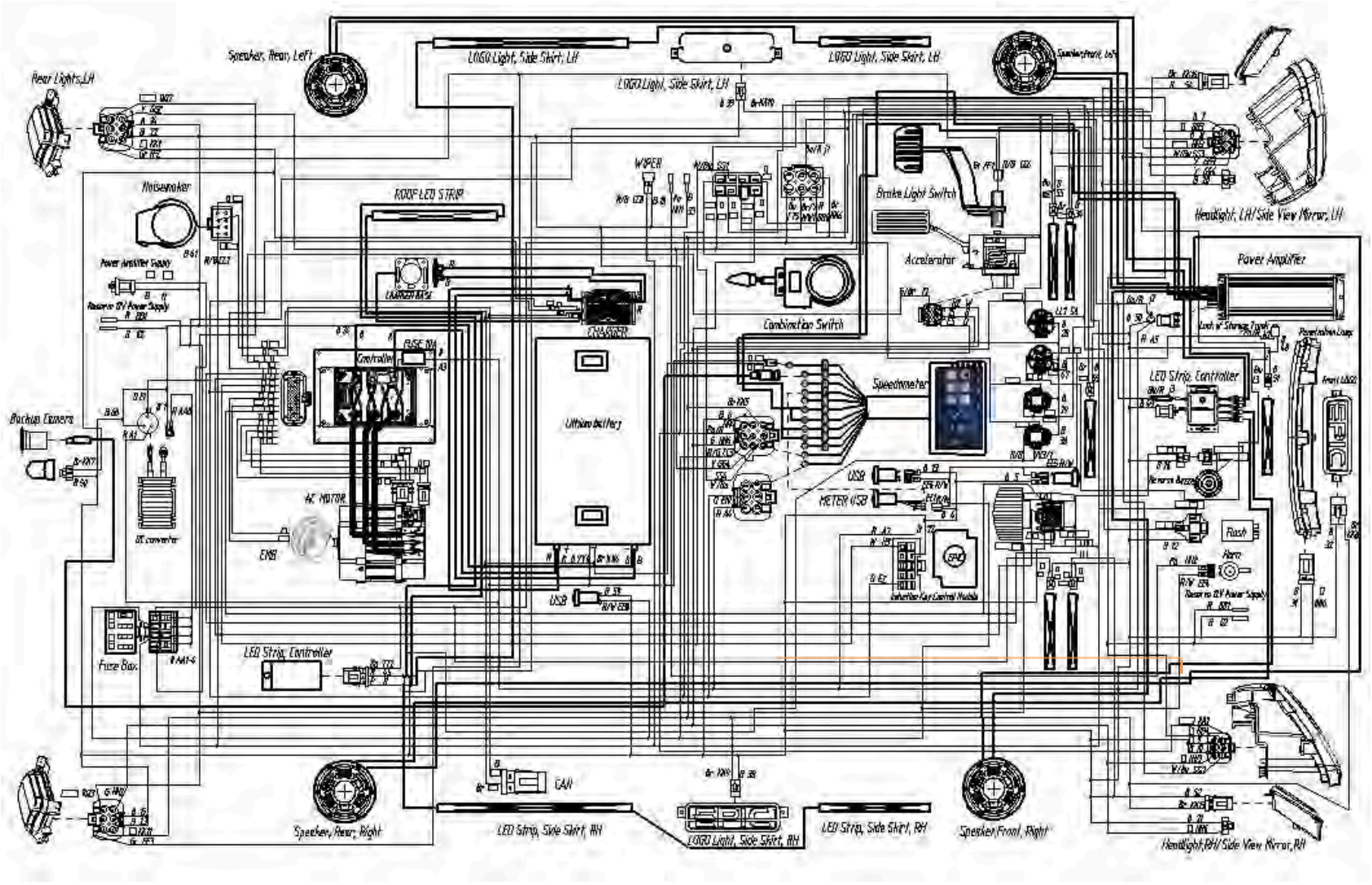
Position 12: License plate light, reversing camera connector.

Position 13: Light strip controller power supply, noise filter, fuse connector.

Position 14: Ceiling light strip power supply, soundbar power supply, auxiliary power supply connector.

Position 15: Rear tail light power supply connector.

5.2.4 Vehicle Wiring Diagram



6. Electrical Components Installation (Drive Section)

The drive section includes the controller assembly, lithium battery, AC motor, pedal accelerator, control dashboard (including electronic lock and gear switch), charging port, charger, and power control harness.

When the vehicle is shipped from the factory, the positive and negative battery power cables are disconnected to prevent any potential leakage. Upon receiving the new vehicle, you need to connect these power cables by following the steps below:

6.1 Controller

Model: LC6183-48450

Operating Voltage Range: 35V-60V (DC/V)

Rated Output Current: 130A (AC/A)

Maximum Output Current: 450A (AC/A)

Power Reduction (Output Reduction) Voltage:

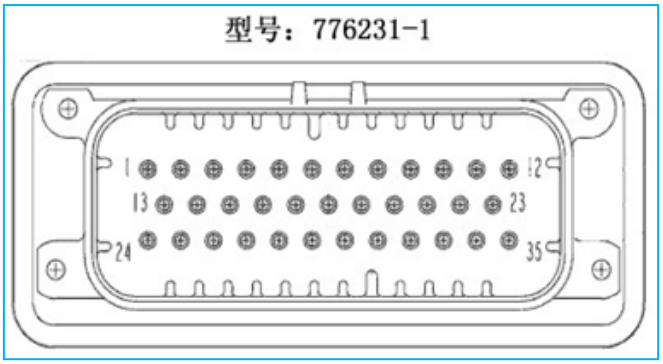
- Golf Cart: 43V
- Lifted Cart: 42V

Under-Voltage Protection (Shutdown) Voltage:

- Golf Cart: 40V
- Hunting Vehicle: 39V

Reduced Power to Protect Driving Range: Approximately 5 kilometers (≈5KM)

Definitions for the controller



PIN	Definition	Type	Voltage	Remark
1	Ignition key switch	Power input	48V	Controller auxiliary power input
2	Magnetic brake drive output	Switch signal output		Negative of the magnetic brake coil
3	\	\	\	\
4	\		\	
5	\		\	
6	\		\	
7	Motor temperature sensor negative	Analog signal negative	\	Ground for motor temperature

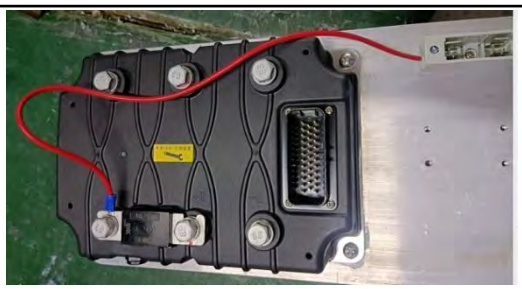
PIN	Definition	Type	Voltage	Remark
				sensor / quadrature encoder
8	Motor temperature sensor positive	Analog signal input	\	\
9	Throttle switch signal	Switch signal input	48V	\
10	Charging prohibition	Switch signal input	48V	\
11	\	\	\	\
12	Sport mode switch	Switch signal input	48V	\
13	Coil return	Power output	\	Connects to the other end of the magnetic brake coil
14	\	\	\	\
15	\	\	\	
16	Throttle input signal	Analog signal input	0-4.6V	\
17	\	\	\	\
18	\	\	\	\
19	\	\	\	\
20	\	\	\	\
21	\	\	\	\
22	Forward gear	Switch signal input	48V	Connects to forward gear signal
23	CAN-H	CAN communication signal	\	\
24	\	\	\	\
25	\	\	\	\
26	5V+	Power output	\	NC / Supplies power to the quadrature encoder
27	\	\	\	\
28	\	\	\	\
29	\	\	\	\
30	\	\	\	\
31	Encoder A	Encoder input		Quadrature encoder A
32	Encoder B	Encoder input		Quadrature encoder B
33	Reverse gear	Switch signal input	48V	Connects to reverse gear signal
34	\	\	\	\
35	CAN-L	CANcommunication signal	\	\

6.1.1 Controller Assembly

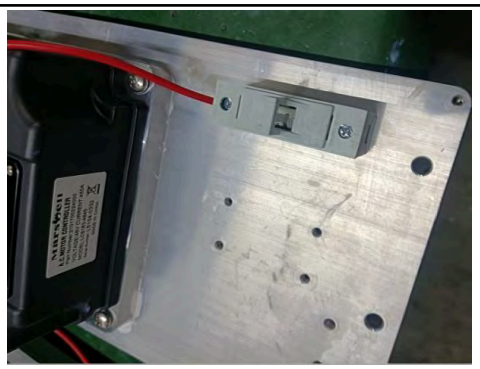
The assembly includes the following materials: controller, heat sin, fuse (with support base), assembly connecting wire.

	
Applying thermal grease to the controller base	Use 4 M6*35 Phillips head screws to secure the controller to the heat sink.
	Tool: 1. Phillips screwdriver

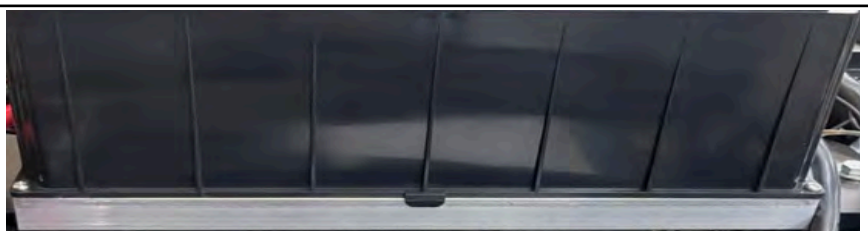
● Use M4*12 Phillips head screws to secure the fuse holder to the heat sink, and fix the red power cable to the indicated position on the controller.

	
	Tool: 1. Phillips screwdriver

● Fix the 10A ceramic fuse to the fuse holder.

● Use M5*10 Phillips head screws to install the main cover of the controller onto the assembly.

	
	Tool: 1. Phillips screwdriver QTY : 1PCS

6.1.2 Controller Assembly Wiring

● Pass the 35-pin controller plug through the waterproof cable gland, then plug it into the controller. Connect the red wire to the fuse holder.

● Pass the positive (red) and negative (black) power cables through the waterproof cable gland, then connect them to the controller.

● Pass the U, V, W motor phase wires through the waterproof cable gland, then connect them to the motor according to the corresponding numbers.

⚠ Warning: Pay attention to the correct installation positions of the positive and negative power cables. Connect the red wire to the fuse, and the black wire to B-. Incorrect wiring may cause damage to the controller and burn the wiring harness.

<table>
<tr><td colspan="2">  </td></tr>
<tr><td>  </td><td>Tool:
1. 13mm Allen screwdriver bits
2. Electric Screwdriver</td></tr>
</table>

● Use 6 M5*10 Phillips head screws to secure the controller cover

<table>
<tr><td colspan="2">  </td></tr>
<tr><td>  </td><td>Tool:
1. Phillips screwdriver</td></tr>
</table>

6.2 Lithium Battery

1. **Lithium Battery Technical Requirements**:
2. **Applicable Temperature Range for Lithium Batteries**:

- Suitable temperature range: -15℃ to 40℃.
- Optimal temperature range: 10℃ to 30℃.
- Extreme ambient temperatures can shorten the battery's lifespan.

3. **Electric Vehicles Must Not Overload**:

- Overloading increases the running current and decreases the range.
- The greater the overload, the shorter the battery life.

4. **Usage Conditions**:

- Conditions such as climbing, headwinds, and uneven surfaces increase the running current and affect the vehicle's range.
- Frequent use under such conditions can shorten the battery life.

5. **Battery Storage**:

- Always fully charge the battery before storage.
- Storing a discharged battery can significantly affect its lifespan.

6. **Battery Discharge End Point**:

- The discharge end point is 5% (charge when below 5%).

7. **When the Vehicle is Not in Use**:

- Turn off the electric lock.

8. **Charging Conditions**:

- Charge the battery indoors with good ventilation.

- Avoid excessively high or low temperatures during charging.
- Do not expose the battery to direct sunlight or charge it when it's too hot.

9. **Charging Method**:

- Use the vehicle's designated charger.
- Do not use other chargers for the battery pack.

10. **Battery Maintenance**:

- For installed batteries in unused vehicles, check the battery status every two weeks.
- Charge with the vehicle's designated charger until the light turns green, then continue for about 2 hours.

- **51.2V105AH Battery Specification**:

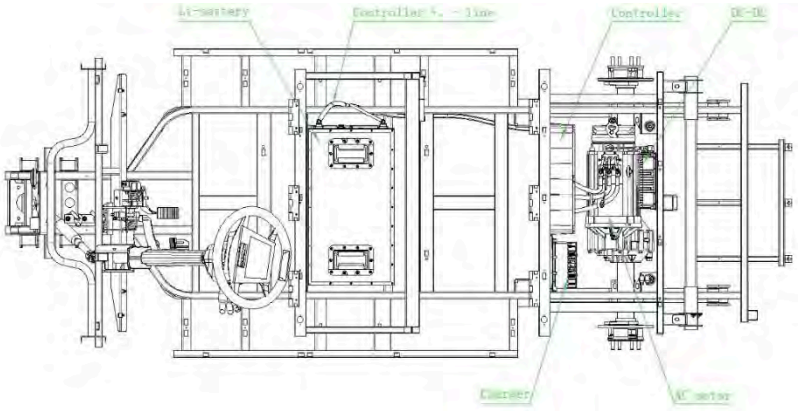
Guangdong Marxon Electronics Co.,LTD. MARXON®

MKS-GP51105A (51.2V105Ah)

General	
Nominal Voltage	51.2v
Working Voltage	42.4V-58.4V
Recommended Voltage	48.0V-57.0V
Cell Count	16
Nominal Capacity	105Ah
Energy	5,376Wh
Reserve @25A	252 Minutes
Self Discharge	1% Per Month
IP Rating	IP65

Physical	
Cell Chemistry	Lithium Iron Phosphate
Cell Type	square
Cell Configuration	16S1P
Series Connectable	No
Parallel Connectable	Yes, up to 2
Weight	99.2±2.2 lbs (45±1Kg)
Dimension LxWxH	559*248*264mm
Terminal Type	M8 Female
Shell Type	Powder Coated Steel
UN Shipping Class	UN 3480

- **Placement of the lithium battery**:



 	Tool: 1. 13mm inner hex bit 2. Electric screwdriver 3. Torque wrench

Do not short-circuit the positive and negative terminals of the battery, as this can cause an explosion or fire.

- Battery Maintenance and Care

1. Regular Maintenance (before and after each use):

Check Terminal Nuts: Ensure the nuts on the battery terminals are not loose. Tighten them promptly if any looseness is found.

Inspect Battery Shell and Cover: Look for any swelling, acid leakage, or damage. Replace the battery if these issues are found as they may affect usage.

2. The upper part of the battery is the power output terminal. It should be

kept clean and dry, free from debris and excessive dust. Otherwise, leakage or short circuits may occur, which is extremely detrimental to the battery and can shorten its lifespan or even burn it out.

 **Note:** Use a damp cloth to wipe off dust and dirt from the surface of the battery. Do not wash it directly with water.

3. After the battery discharges, it must be charged on the same day. Charging the battery on the next day or after more than 24 hours is not allowed, as it can affect the battery's lifespan. Batteries that have been stored for a long time or are insufficiently charged should be recharged promptly.

4. The connections of the lithium battery must be secure, especially for new vehicles. After 2-3 days of use, thoroughly reinforce the connections. Thereafter, conduct a comprehensive inspection of the lithium battery connections weekly. Address any loose, discolored, or corroded (oxidized copper) connections. Prevent high heat generation due to poor contact, which can damage terminal posts, cause melting, or result in a hydrogen explosion.

 **Note:** Over-tightening can also damage the battery terminals.

5. This vehicle uses a lithium battery, so there is no need to add or check the electrolyte.

6. If the vehicle is not used for an extended period, disconnect the positive and negative terminals of the battery and store it fully charged. Check the battery at least once every two months.

Lithium Battery Replacement

When the lithium battery is nearing the end of its lifespan, its capacity will significantly decrease, and the vehicle's range will no longer meet the requirements. At this point, the battery should be replaced promptly. For battery replacement methods, please consult the manufacturer.

Charging

- Use the intelligent charger provided with the vehicle to charge the battery to ensure its longevity.

- The key switch must be in the off position during charging.

- The charger generates some heat while working, so place it slightly above ground level to allow air to flow beneath and around it to dissipate heat.

- Do not block or obstruct the air passages of the charger's cooling

vents, as high temperatures can seriously damage the charger and may cause a fire. If using the charger outdoors, protect it from rain and direct sunlight.

- Avoid overcharging the battery, as it can cause the electrolyte solution to leak from the battery, damaging both the vehicle and the battery's capacity to store charge.

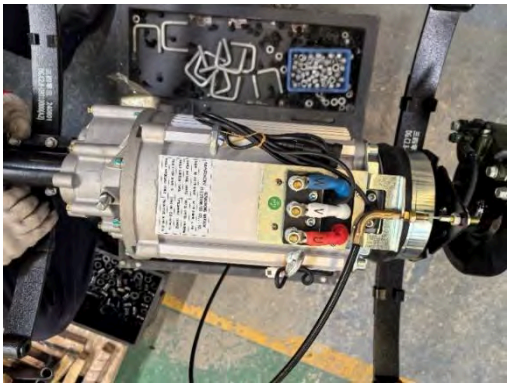
- It is strictly forbidden to charge the battery under direct sunlight. If the vehicle has just been used, especially in high temperatures, do not charge the battery immediately. Wait until it cools down to prevent swelling.

- When charging, first confirm that the AC power source matches the input power specified by the charger. Once confirmed, connect the output end to the vehicle's charging socket, then plug the input end into a rated AC power socket, ensuring a reliable connection. The green indicator light will stay on to indicate charging is complete. The charger will automatically cut off the power to prevent overcharging. After charging is complete, unplug the input plug from the wall socket first, then disconnect it from the vehicle's charging socket.

Note
● When the AC power plug is not unplugged, do not disconnect the plug from the electric vehicle, as this will produce an

electric arc, damaging the plug.

6.3 Motor



The model of the motor for this vehicle is: LK-YS175-H4850QD (63), large flange, with electromagnetic brake.

Specification:

A, The motor uses an AC (alternating current) motor

B, The insulation class of the motor should be no less than Class H.

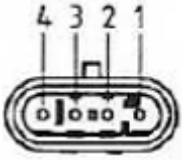
C, Cooling method: natural cooling.

D, Enclosure protection rating: no less than IP54.

E, The motor operates with an $S_2$60min duty cycle。

F, Rated voltage: AC 32V.

G, Rated current: 119A



H, Encoder interface definition

Pin 1: V+ (Red)

Pin 2: GND (Black)

Pin 3: Signal A (White)

Pin 4: Signal B (Blue)

I, Temperature sensor interface:

Pin 1: Positive (Red)

Pin 2: Negative (Black)

J, The encoder outputs 64 pulses per revolution.

K, Brake parameters:

Static Friction Torque (N.m)	Min46
Rated Power (W)	40±10%
Voltage (V)	DC42±10%
Maximum Speed (RPM)	3000
Weight (kg)	6

6.3.1 Motor Installation

Preparation Before Installation:

Verify Data: Ensure that all data on the nameplate matches the actual requirements.

Check Compatibility:

Confirm that the motor's spline fits the actual axle requirements.

Verify that the motor flange matches the axle.

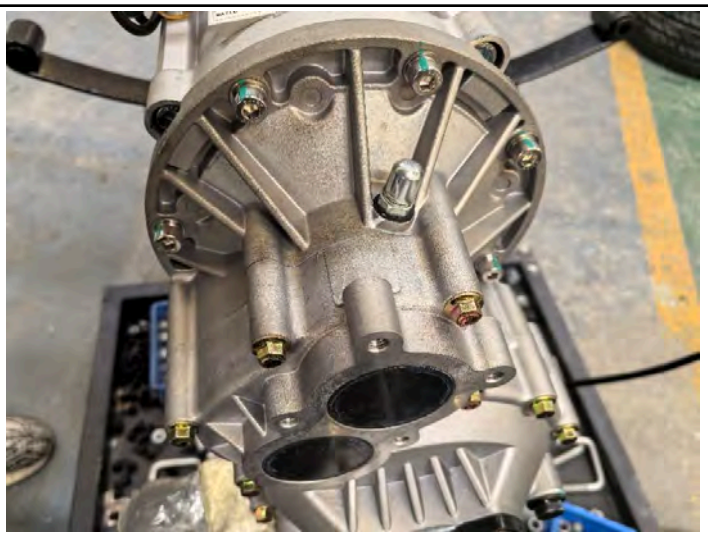
Inspect Unused Motors:

Check the condition of the spline lubricant. If it has deteriorated, clean the spline and replace the lubricant.

Inspect Motor Components: Carefully check all motor parts for good condition and ensure that fasteners are not loose.

Manual Rotation: Rotate the motor by hand to ensure it moves freely and smoothly.

- Use M8*30 external hex bolts with spring washers and flat washers to secure the motor to the rear axle.



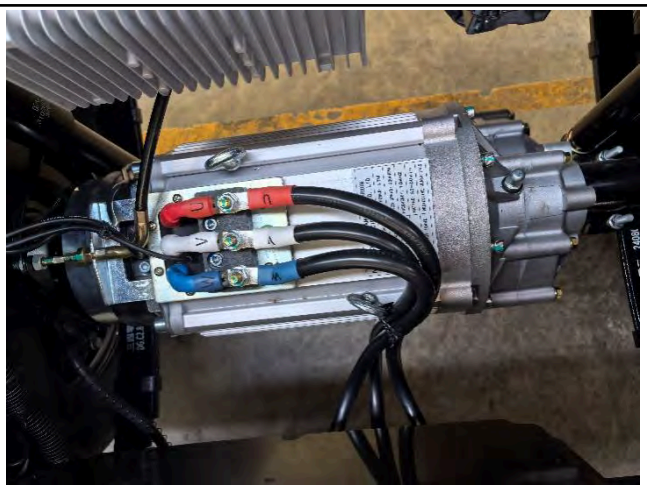
M8*30hex bolt+spring washer+flat washer Torque:25±2N.m

	Tool: 1. Torque wrench 2. 13mm socket 3. 13mmopen-end wrench

6.3.2 Motor Wiring

● Connect Motor Wires: As shown in the diagram, connect the motor wires to the motor terminals labeled U, V, W. Tighten the nuts securely.

● Connect Encoder and Temperature Sensor Plugs: As shown in the diagram, connect the motor encoder plug and the temperature sensor plug to the wiring harness. Organize the wiring harness and secure it with cable ties.

<table>
<tr><td colspan="2">  </td></tr>
<tr><td>  </td><td>Tool:
1. Torque wrench
2. 13mm socket
3. 13mmopen-end wrench</td></tr>
</table>

Notes:

1. Over-tightening can also damage the motor terminals (tightening torque: 15±1 Nm).

2. When connecting the motor wiring harness plug, ensure the pins match. Do not force the connection, as it can cause short circuits or damage the plug terminals.

6.3.3 Motor Maintenance

Proper maintenance of the motor can extend its lifespan. To ensure the normal operation of the motor and prevent malfunctions, it should be

inspected regularly. When any adverse conditions are discovered, they should be corrected promptly. Regularly check the connection status between the motor and the rear axle, and tighten the fastening bolts.

6.3.4 EMB

This vehicle's motor is equipped with an electromagnetic brake, which is used in place of a parking brake when the vehicle is stationary.

When the motor is powered on, the brake's DC power is also activated. At this moment, the armature is immediately attracted, overcoming the spring pressure, and the brake pads disengage from the brake disc, allowing the motor to rotate. When the controller stops output and detects that the motor has ceased rotating (indicating that the vehicle has stopped moving and is in a stationary state), it cuts off the brake's power. The brake loses its electromagnetic force, causing the brake pads to re-engage with the brake disc, preventing the motor from rotating and thereby ensuring the vehicle is parked.

6. 3. 4. 1 Electromagnetic Brake Maintenance and Replacement

The electromagnetic brake is a crucial component for parking and requires regular maintenance. It should be inspected at least every six months or every 1500 kilometers. The inspection should include:

🎬 **Foreign Objects**:

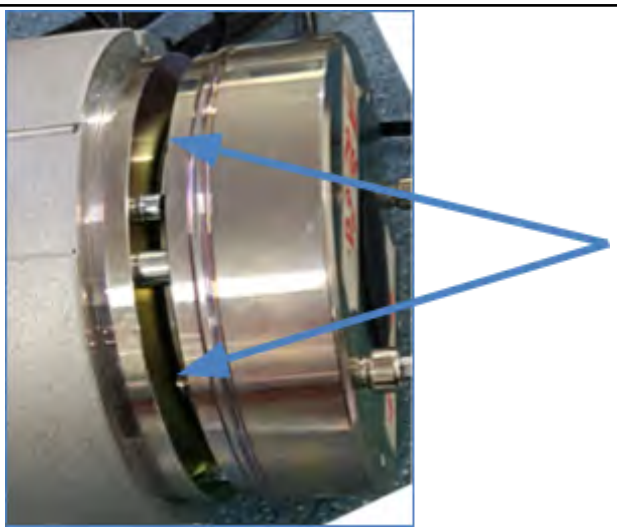
- Check the exterior of the magnetic brake for any foreign objects that could interfere with its operation.

🎬 **Brake Pad Wear**:

- Inspect the brake pads for signs of wear and tear.
- Replace the brake pads if they are worn beyond the recommended limits to ensure optimal braking performance.

● Check the exterior of the magnetic brake for any foreign objects that could interfere with its operation

Lift the rubber cover on the electromagnetic brake to inspect for dust, stones, iron filings, or any other foreign objects. If any debris is found, clean it thoroughly to ensure the brake operates smoothly.



Inspect for foreign objects at the arrow position of the electromagnetic brake. After cleaning, ensure to replace the rubber cover to its original position.

Note: Close the car lock and turn off the lithium battery during operation

● Check the wear condition of the electromagnetic brake pads.

Use a feeler gauge to measure the gap between the electromagnetic brake pad and the metal body to assess brake pad wear. If the wear is significant, the brake pads need to be replaced. The standard for replacement is a gap greater than 0.5mm, which requires replacing the brake pads.

	Tool: 1. Feeler gauge
Feeler Gauge Measurement Method: **As illustrated above, use a 0.5mm feeler gauge and insert it into the indicated position. If the gauge does not fit, it indicates that the brake pad wear is minimal and replacement is not necessary. However, if the gauge easily fits, it signifies significant wear, and the brake pads need to be replaced.**	

Note: During operation, ensure to turn off the car lock and also disconnect the lithium battery

- **How to Remove Brake Pads**

For brake pads with severe wear (gap exceeding 0.5mm), it will affect parking, especially on slopes, potentially causing the vehicle to slide and posing a safety hazard. Therefore, the brake pads need to be replaced.

Tools needed for replacing brake pads:6mm Allen wrench, 4mm Allen wrench, dryer, thread locker

Note: During operation, ensure to turn off the car lock and also disconnect the lithium battery

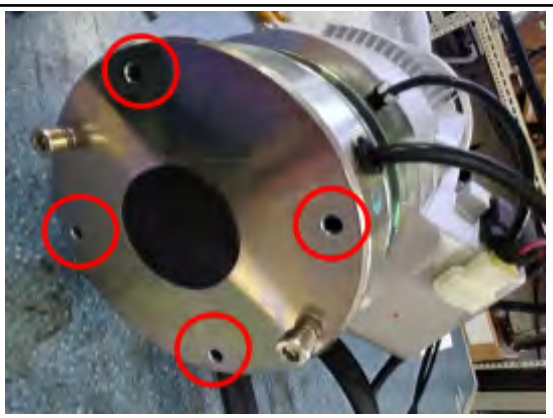
During the disassembly process, ensure that small parts like screws, bushings, gears, and keys are not misplaced.

● First, disconnect the electromagnetic brake harness from the power harness. Use a 6mm Allen wrench to tighten the two screws on the outside of the magnetic brake body (turn the wrench in the direction of the arrow), ensuring that the brake pad remains separate from the magnetic brake body (allowing the vehicle to move freely).

<table>
<tr><td colspan="2">  </td></tr>
<tr><td>  </td><td>Tool:

1.6mm Allen wrench</td></tr>
</table>

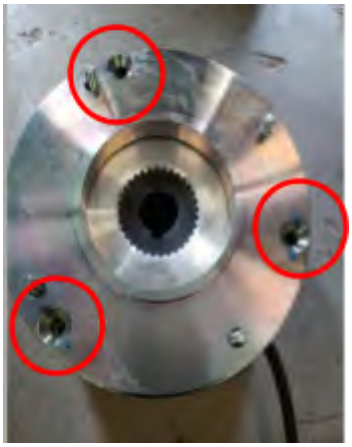
● Use a 4mm wrench to loosen the four screws in the red circles in the image.



	Tool: 1. 4mm Allen wrench

●Remove the three screws on the magnetic brake body.

Since thread locker has been applied, the screws can be difficult to remove. Use a hair dryer to heat the bolts for 1-2 minutes, then use a 4mm Allen wrench to loosen the bolts.

	
	Tool: 1. 4mm Allen wrench 2. Dryer

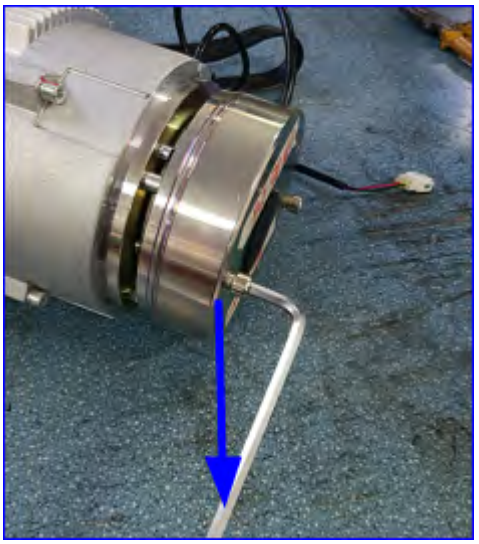
Note: Be careful to avoid burns when using the dryer!

• Reattach the magnetic brake to the end of the motor (be careful not to miss the key), and secure the three screws of the red waterproof plug.

<table>
<tr><td colspan="2">  </td></tr>
<tr><td>  </td><td>Tool:
1. 4mm Allen wrench</td></tr>
</table>

When installing the magnetic brake body, remember to properly place the key on the motor output shaft.

● After reattaching the magnetic brake body to the motor and securing the screws, these two screws need to be loosened (turn the wrench in the direction of the arrow). At this point, the electromagnetic brake will lock the motor, preventing the vehicle from moving.

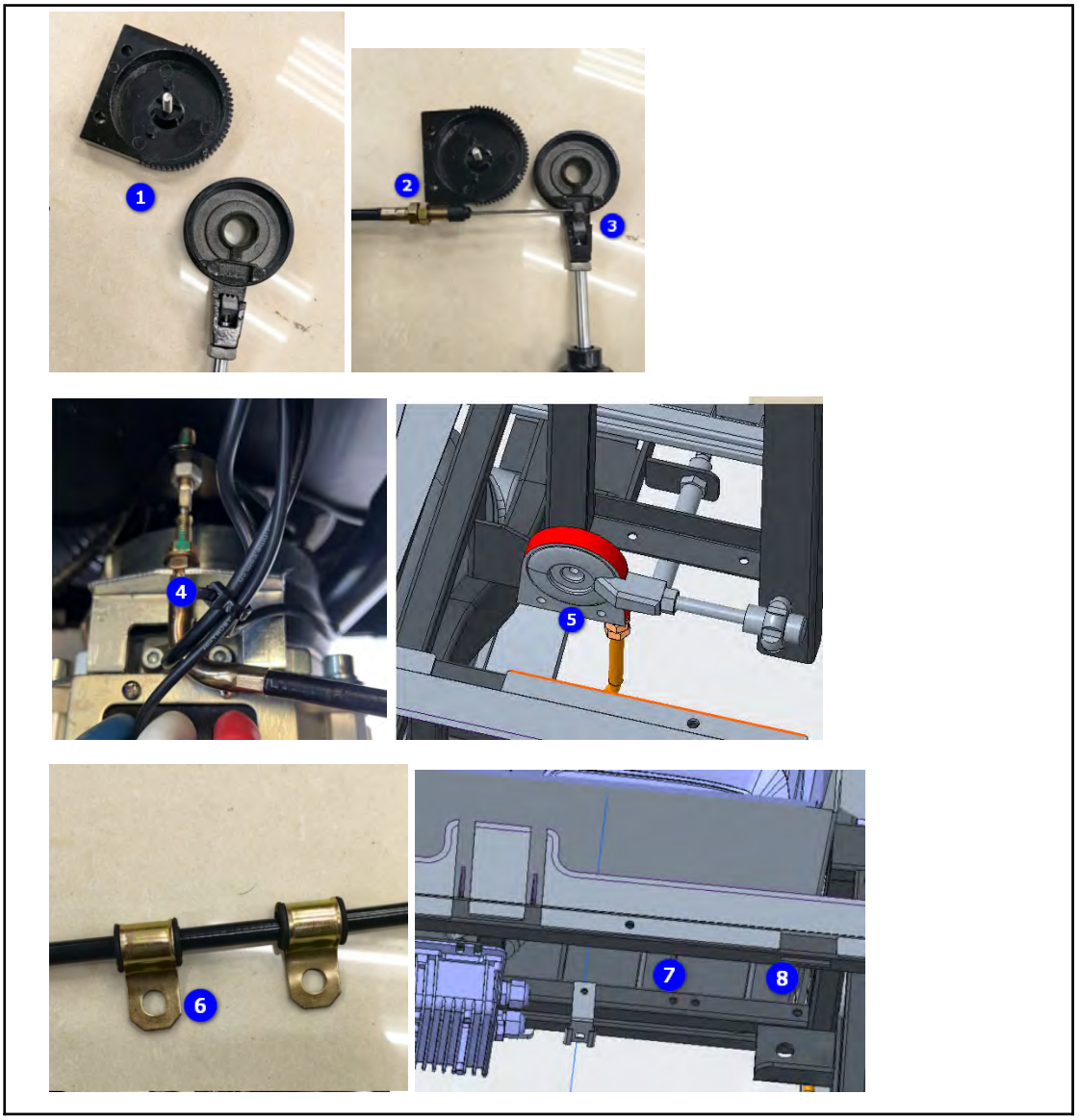


6.3.4 Electromagnetic Brake Cable Maintenance

●First, separate the handle as shown in Figure ①, then thread the cable through position ②, clip it into position ③, and restore the handle.

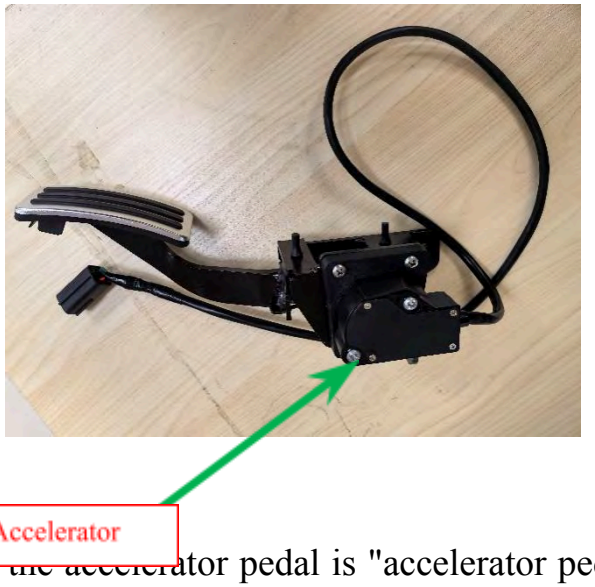
●Secure the other end of the cable to the electromagnetic parking brake as shown in Figure ④. Ensure that the electromagnetic parking brake lever remains free when securing.

● Then, install the handle with the cable into position ⑤ using an M630 hex bolt. Finally, secure the cable fixing ears ⑥ with M640 hex bolts to positions ⑦ and ⑧ on the frame.

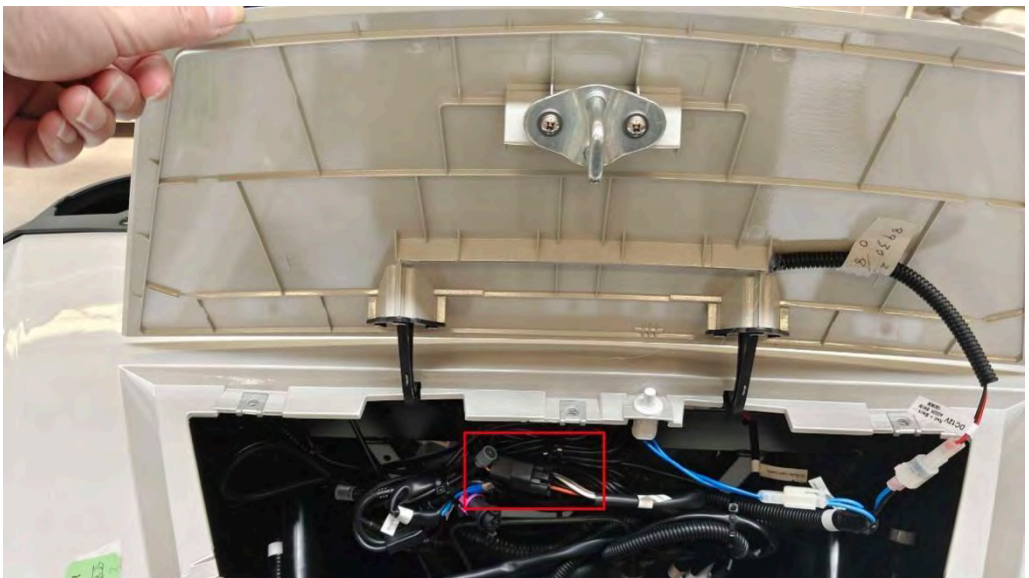


	Tool: 1. 8mm open-end wrench 2. 12 open-end wrench

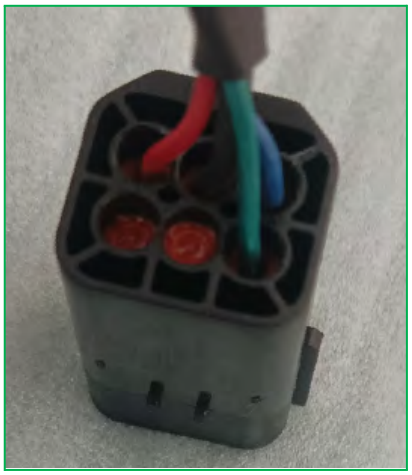
6.4 Accelerator



The full name of the accelerator pedal is "accelerator pedal assembly." It includes two parts: the speed adjustment mechanism and the accelerator pedal. The connector for the accelerator's connection to the wiring harness is located below the storage box at the front of the vehicle.



6.4.1 Accelerator Plugin Wiring Definition



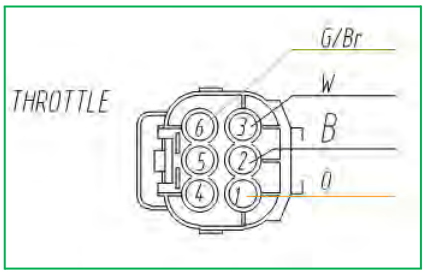
Accelerator Plug (Accelerator Wiring Harness End)

Red: Positive input (lock wire 48V+)

Blue: Pedal switch (output 48V+)

Black: Common negative (BAT-)

Green: Throttle signal (output 0-4.7V)



Accelerator Plug (Power Wiring Harness End)

The relationship between the wire colors of the accelerator plug and the power harness plug:

Accelerator End Wiring:	Power Harness End Wiring
Red: Power 48V+ Positive	Orange
Black: Negative	Black

Blue: Pedal Switch	White
Green: Signal	Green Brown

6.4.2 Replacing the Accelerator

If the accelerator is damaged or the output voltage changes, causing the vehicle to not move or not reach the required speed, the accelerator needs to be replaced. Please follow the steps below:

● Use a screwdriver to remove the two screws securing the accelerator and take out the accelerator.

Tool:

1. Phillips screwdriver

QTY：1PCS

● Align the slot of the new accelerator with the white mark.

● Install the accelerator in this direction (align the pedal rotation seat with the accelerator slot).

●With the accelerator pedal in a natural state, connect the accelerator to a DC power supply (50V), and the accelerator output voltage will be 0.01V. If there is no regulated power supply, vehicle power can be used.

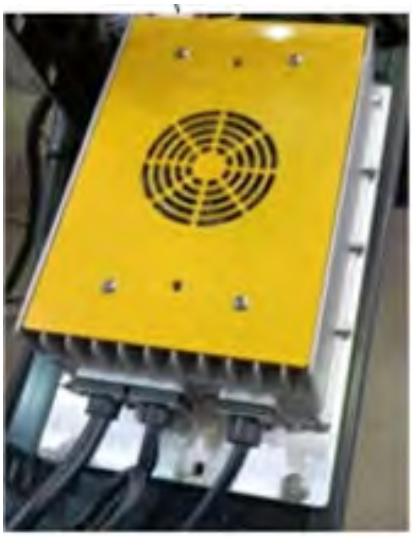
● When the accelerator pedal is fully pressed, the output voltage shows 4.69V

● Secure the accelerator with screws, and during the securing process, observe that the accelerator output voltage does not change.

	Tool: 1. 10mm open-end wrench QTY：1PCS

●After installation, verify the accelerator's voltage output in a stationary state (≈0.01V). When the pedal is fully pressed, the output voltage should be (≈4.7V).

6.5 Charger



6.5.1 Specification

●Charger Model：WT4820ZG
●AC Input Voltage Range：85-270VAC；45-65Hz
●Maximum AC Input Current：11.5A@120VAC；6.1A@220VAC
●Power Factor：≥0.99
●Efficiency：≥95.0%
●Noise Level：≤45dB
●Protection Level：IP67

6.5.2 Charger Protection Features:

●**Over-Temperature Protection**: When the internal temperature of the charger exceeds a set value, the charging current automatically decreases. If the ambient temperature exceeds 65°C, the charger will shut down for protection. Once the temperature returns to normal, charging will automatically resume.
●**Reverse Battery Protection**: If the battery is connected in reverse, the charger's internal circuit will disconnect from the battery, preventing damage to the charger.
●**Short-Circuit Protection**: In the event of an output short circuit, the charger's internal circuit will disconnect from the battery. Charging can only resume after the fault is cleared and the battery is reconnected.
●**No-Load Protection**: There is no output when no battery is connected.
●**Automatic Shutdown After Full Charge**: The charger will automatically shut down once the battery is fully charged.

6.5.3 Charger Safety Precautions (Please Read Before Use)

1. Charger Safety Precautions (Please Read Before Use):

a. AC Input, Charging Output, and Connection Line Precautions

b. AC Input Socket: Select a three-prong socket that meets safety standards, and ensure the socket's over-current capacity can handle the charger's normal working input current. Choose flame-retardant wires that meet the specifications and safety requirements based on the AC input current.

c. Regular Inspection: Frequently check for any poor contact or damage to AC plugs and sockets. Replace them if any issues are found to prevent the charger from malfunctioning or causing fire hazards.

d. Inspect for Wear and Tear: Regularly check if the AC and DC charging lines are aging or damaged. Replace them immediately if found, to prevent electrical shock, fire, or other accidents.

2. Professional Replacement: If power lines, plugs, sockets, or other components are damaged, they must be replaced by the manufacturer or authorized repair personnel to avoid accidents.

3. Keep Away from Flammable and Explosive Materials: During

charging, keep the charger and all connection lines, plugs, and sockets away from clothes, paper, sofas, gasoline, and other flammable and explosive materials, as well as explosive gases. This is to avoid the risk of fire due to aging or poor contact of plugs, sockets, or lines.

4. No Unauthorized Modifications: Users are strictly prohibited from changing wiring, functions, etc., without the company's consent.

5. Over-Current Protection: The charger has an over-current protection device at the power input end. Do not replace it without professional technical knowledge.

6. Do Not Open the Machine: There are high-voltage circuits inside the machine. Non-professional personnel should not open the casing.

7. Heat Management: The charger generates heat during operation and is equipped with a cooling fan. Regularly check the charger surface for dust and debris. Do not block or obstruct the air pathways of the cooling vents. Clean the surface with a dry cloth. It is recommended that users perform a dust removal treatment on the charger casing at least every six months.

6.5.4 Instructions for Use

1. Matching the Charger with AC Power Grid and Lithium Battery

- Matching with AC Power Grid: Before using the charger, confirm that the AC power grid voltage and frequency match the charger's specifications.

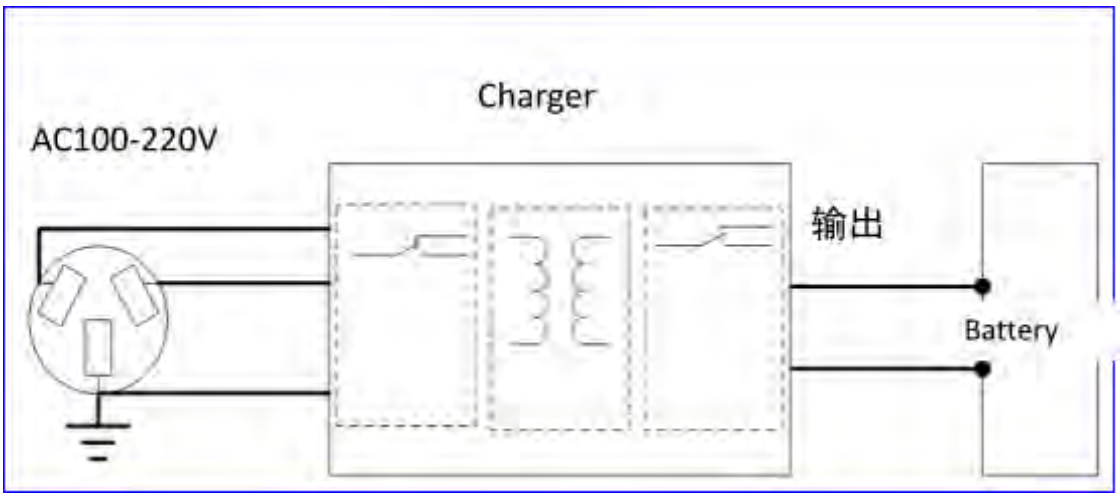
- Battery Compatibility: Only use the charger that matches the battery pack of the vehicle. Using other chargers is not permitted.

2. Usage Instructions

- Connecting for Charging: First, connect the charger's input line plug to the vehicle's charging socket, then connect the AC plug to the AC socket. If all connections are correct, the charger will start outputting after self-check.

- End of Charging: When the charging process is complete, the indicator light will stay green. At this point, disconnect the charger from the AC power socket.

6.5.5 Basic Electrical Circuit Schematic



6.5.6 Troubleshooting Steps

1. LED Indicator Light Status

Indicator Labels		The charging indicator is built into the charging dock. The red circled part in the image is the charging indicator light.
Battery Level Indicators	Red Light Flashing: Battery level < 80% Yellow Light Flashing: Battery level > 80%	Charging: Red light flashing Fully Charged: Green light steady on

	Green Light Flashing: Battery level 100%	
No Load Indicator	Red and green lights alternating	
Fault Indicators (where "-" represents a 1-second pause)	**Over-Voltage (Current) Fault**: Red Green Red - - -	
	Ambient Temperature Too High or Too Low: Red Green Red Green - -	
	Charger Overheating: Green Red - - - -	
	Output Under-Voltage: Red Green - - - -	
	AC Input Abnormal: Red Green Red Green Red -	
	Comprehensive Error: Green Red Green - - -	
Fully Charged Shutdown Indicator	Green Light Steady On	

Noted:

1."※": For chargers with communication capabilities, this indicates a "communication fault".

2. The indicator light statuses in the above table are the default settings of the manufacturer. If the customer specifies the indicator light status, the statement on the sticker on the charger housing takes precedence.

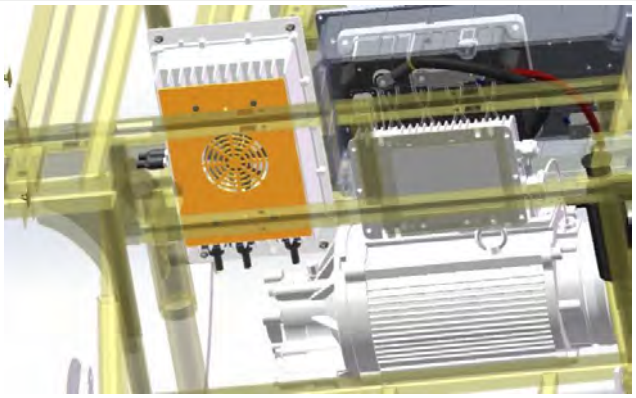
2. Common Faults and Solutions

LED Indicator Light Status: ("-" represents a 1-second pause)		Fault Indication	Solution
1	Red Green Red Green Red Green	No Load	Check if the charger and battery are correctly connected, and if the battery voltage is too low.
2	Red Green Red - - -	Over-Voltage (Current) Fault	Restart the charger. If the fault persists, send it for repair.
3	Red Green Red Green - -	Over-Voltage (Current) Fault※	Check the ambient temperature at the external temperature sensor of the charger.
4	Green Red - - - -	Charger Overheating	Check if the charger's ambient temperature is too high.
5	Red Green - - - -	Output Under-Voltage	Send the charger for repair.
6	Red Green Red Green Red -	AC Input Abnormal	Check if the input voltage meets the requirements and if the plug is properly

			connected.
7	Green Red Green - - -	Any of the above five errors repeats five times	Power the charger back on and observe which of the 1-5 error statuses it indicates. Resolve according to the corresponding solution.

6.5.7 Charger Installation Instructions

Position the charger with the yellow side facing the rear of the vehicle. Use the 4 copper studs to secure the charger. Tighten and secure with 4 PCS M8*20 hex bolts, large flat washers, and nuts.



	Fasteners: 1. M8*20hex bolt4PCS

	2. M8(18*6.4*1.6) flat washer 4PCS
	Tool: 1. scissor 2. 10mmopen-end wrench

● Organize the charger wiring harness using cable ties. Route the charger output wires (Red positive, Black negative) to the battery main positive and main negative terminals.

6.6 Electric Lock, Gear Switch

The dashboard has operable rocker switches for the hazard warning switch, headlight switch, high/low speed switch, D R gear switch, and electronic lock.

6.6.1 Switch Installation

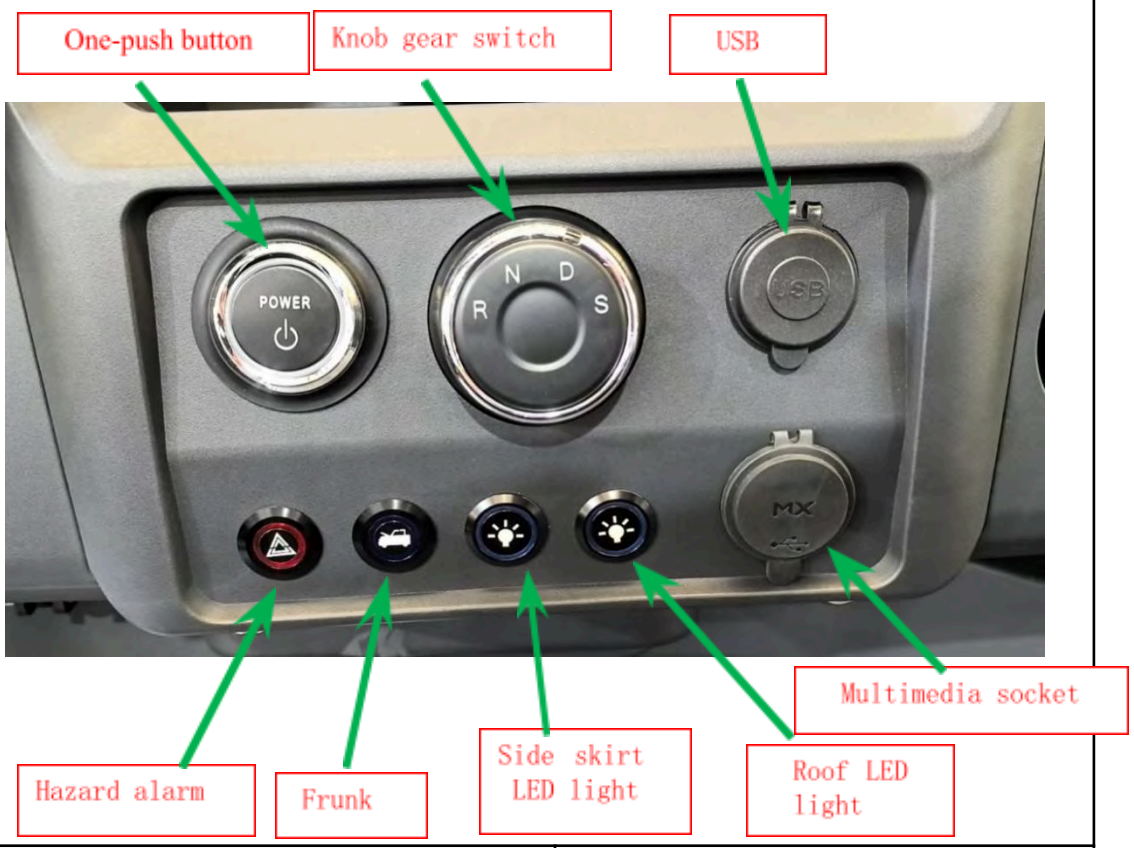
Install the following switches and sockets in sequence on the dashboard switch mounting panel:

1. One-push button
2. Knob gear switch
3. USB port
4. Hazard warning switch
5. Frunk buttom

6. Side skirt light strip switch

7. Roof light strip switch

8. Multimedia socket

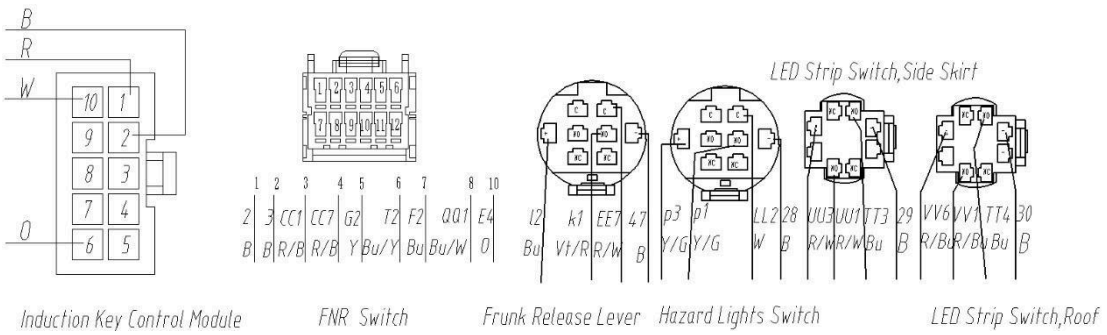


Tool:

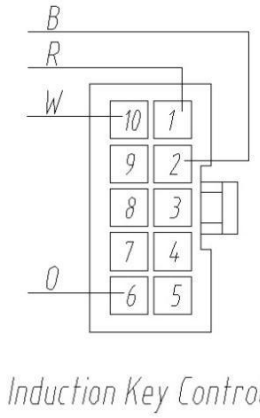
1 : Phillips screwdriver

QTY : 1PCS

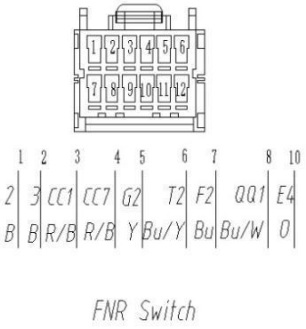
6.6.2 Switch Wiring



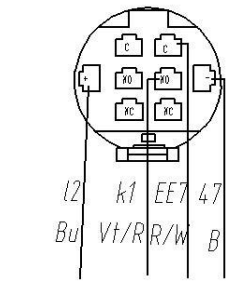
One-Push Button: Key Power Control

 Induction Key Control Module	**Red:48V Positive**	**from the lithium battery 48V+ output**
	Orange:Key switch output,TO:	Knob gear switch
		Dashboard 48V+
		Accelerator power
		DC power (KSI line)
		Charger protection switch
		Controller Pin 1

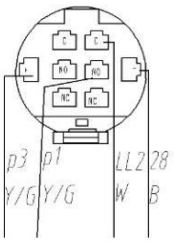
“D”“R”switch:

 FNR Switch	1. 2:Black	12V-(48V-)
	3. 4:Red Black	Gear switch 12V+ power, reverse light 12V+
	5:Yellow	TO: Controller forward gear signal (Pin 22, 48V)
	6:Blue Yellow	TO: Controller drive gear signal (Pin 12, 48V)
	7:Blue	TO: Controller reverse gear signal(Pin33, 48V)
	8:Blue White	TO: Reverse light positive (12V+)
	10:Orange	Controller gear signal power supply (48V)

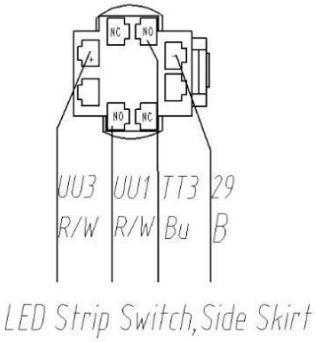
Headlight Switch:

 Frunk Release Lever	Blue	Hood switch indicator light power supply (12V+)
	Purple	TO: Hood switch (12V+)
	Red White	DC-DC output 12V+
	Black	12V-(48V-)

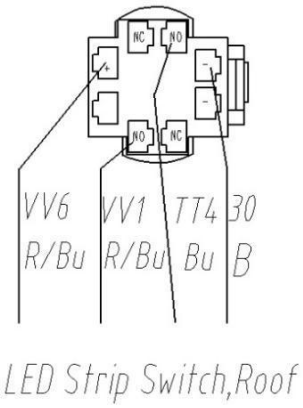
Hazard Warning Switch

 Hazard Lights Switch	White	Flasher output signal (12V+)
	Yellow Green（p3）	Hazard switch indicator light positive power (12V+)
	Yellow Green（p1）	TO: Left and right turn signals (12V+)
	Black	Hazard switch indicator light negative power (12V-)

Side Skirt LED Switch：

	Blue	DC-DC output 12V+
	Red White（UU3）	Side skirt light strip switch indicator light positive power (12V+)
	Red White（UU1）	TO: Left and right side skirt light strip positive power (12V+)
	Black	Side skirt light strip switch indicator light negative power (12V-)

Canopy LED Light Strip Switch：

	Blue	DC-DC output 12V+
	Red Blue（VV6）	Roof light strip switch indicator light positive power (12V+)
	RedBlue（VV1）	TO: Left and right roof light strip positive power (12V+)
	Black	Roof light strip switch indicator light negative power (12V-)

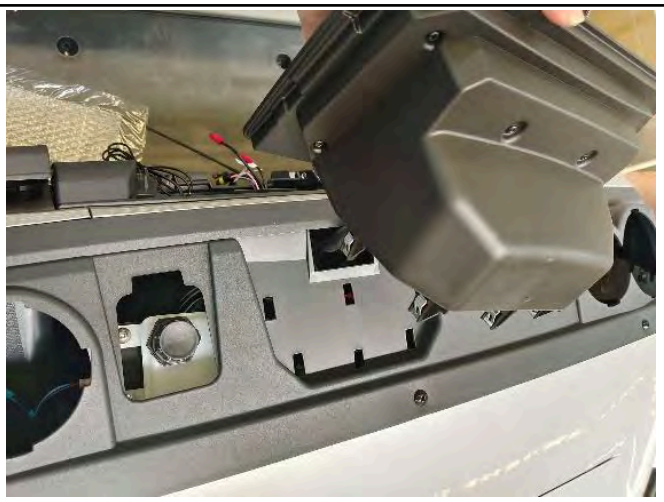
6.7 Speedometer Installation and Maintenance

- Fix the speedometer on the cover

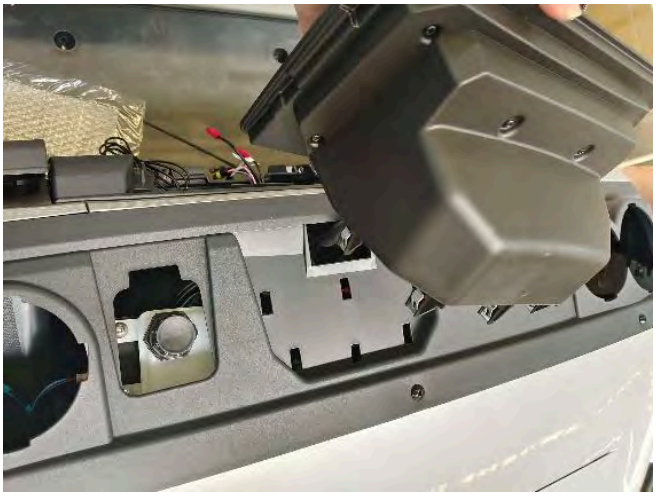
Tool:

1. Phillips screwdriver

●Insert the instrument wiring harness through the opening.

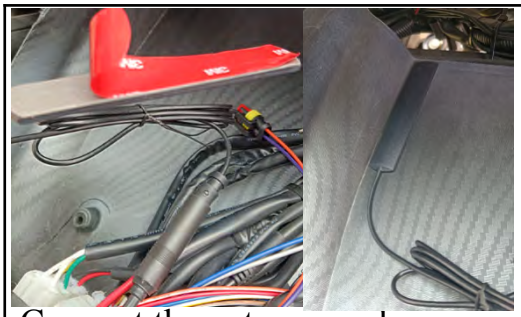
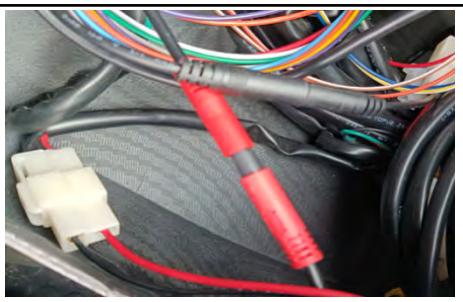


- Secure the base to the functional seat cover.



Speedometer Wire

 Connect the speedometer's 9-pin, 6-pin, and rearview camera plugs.	Connect the four-way speakers.

 Connect the antenna and microphone	 Connect the AUX cable and the head cable of the USB charger

6.8 Camera Installation and Maintenance

The camera works when reversing, and the dashboard displays the rearview image.

● Secure the camera using M3 cross-head stainless steel screws + flat washer + spring washer.

● Connect the camera harness to the extension cable and neatly tie it with zip ties.

	
	Tool: 1. Cross screwdriver

7. Installation of Electrical Components (Lighting and Speaker Section)

This section involves various components that are essential for the vehicle's lighting and sound system. Below is a brief overview of each component and its function: DC Converter, Combination Turn Signal Switch, Headlights (Front), Front Turn Signals, Rear Light Assembly, Brake Light Switch, Light Strips, Light Strip Controller, Signal Generator, Speakers, Flasher, Electric Horn, Combination Switch, Lighting Control Harness

7.1 DC Converter

The DC converter provides the entire vehicle's lighting system with a 12V DC power supply, with input from the 48V lithium battery.

● DC Converter Specifications:

Input Voltage	36-60V
Output Voltage	13.8V
Output Current	Max50A
Protection Rating	IP66

● DC Converter Wiring Harness Definition:

Yellow	Input Positive (BAT+)
Green	Key Switch (48V+)
Gray：	Common Negative (BAT-)
Red（4mm2）：	Output Positive (13.8V+)
Black（4mm2）：	Output Negative (13.8V-)

 Note: Do not connect the output wire as an input wire, or the converter will be damaged!

● Protection Features

Waterproof and Shockproof	Sealed with silicone rings, the converter is waterproof and shockproof, suitable for various environments.
Electronic Lock Control	Built-in electronic switch that can be directly controlled by the key switch, eliminating the need for external relays, making the wiring simple and reliable, and saving

	costs.
Overheat Protection	Instead of stopping the output when overheating, it automatically reduces the output power to ensure continuous 12V power supply to the vehicle.
Short-circuit Protection	Stops output when a short circuit occurs, and automatically restores after the short circuit disappears to ensure the safety of the vehicle wiring harness.

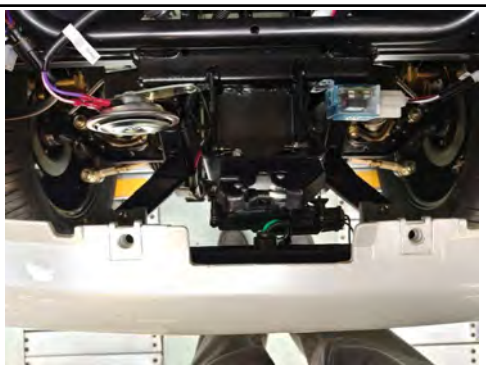
● DC Converter Installation

The DC converter is installed directly above the motor at the rear of the vehicle

 	Tool: 1. Phillips screwdriver 2. 10mm open-end wrench

7.2 Horn and Flasher

● Secure the electric horn and flasher reliably on the frame's fixed bolts using M8 nuts and M8 flat washers.

	
	Tool: 1. Electric screwdriver

Note: The edge of the horn must not touch the frame or any other parts, otherwise the horn will sound muffled or produce abnormal noise.

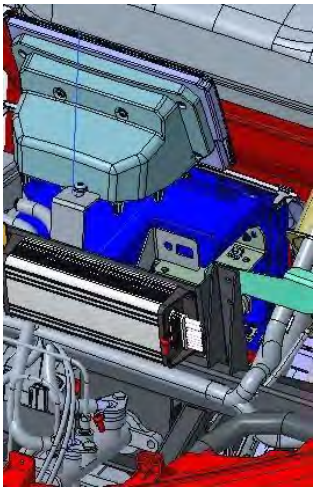
7.3 Combination Switch

The entire vehicle's headlights (high and low beam switching), turn signals, horn, speakers, and speaker ambiance lights are all controlled by the combination switch, with a control voltage of 12V.

●Use a screwdriver to install the combination switch onto the steering column.

<table>
<tr><td colspan="2">  </td></tr>
<tr><td>  </td><td>Tool:
1.Phillips screwdriver</td></tr>
</table>

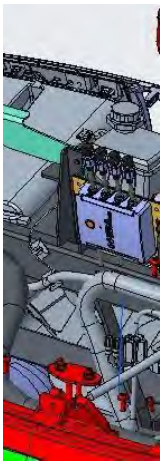
7.4 Amplifier



The audio signal for the vehicle's four-way speakers is output from the speedometer , amplified by the amplifier, and then played through the speakers. The amplifier is controlled by a 12V combination switch.

- Use a Phillips screwdriver and wrench to secure the amplifier in position behind the speedometer .

7.5 Speaker Ambient Light Controller



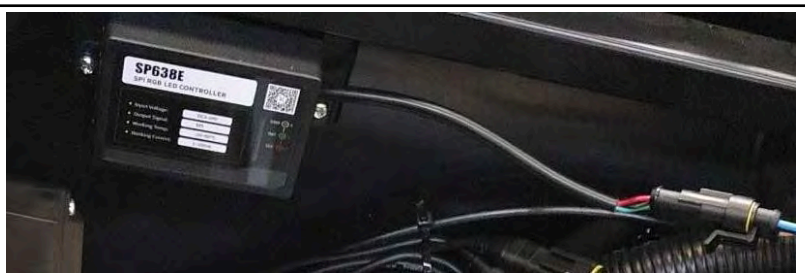
The vehicle's four-way speaker ambient lights are all controlled by the ambient light controller, which is controlled by a 12V combination switch.

● Use a Phillips screwdriver and wrench to secure the speaker ambient light controller in position behind the speedometer .

7.6 LED Strip Controller

The left and right side guardrail light strips and the roof light strip of the vehicle are controlled by the LED strip controller. You can select different modes for the light strips using the remote control that comes with the LED strip controller or by downloading the BanlanX app on your smartphone.

● Use a screwdriver to install the LED strip controller above the motor.

<table>
<tr><td colspan="2"> 
</td></tr>
<tr><td>  </td><td>Tool:
1. Phillips screwdriver</td></tr>
</table>

7.7 Glove Box LED Strips (Left and Right)

The left and right glove box LED strips in the vehicle are controlled by a refrigerator door switch.

● First, install the refrigerator door switch, which controls the on and off of the LED strips.

● Fix the LED strips in the mounting slots of the glove box.

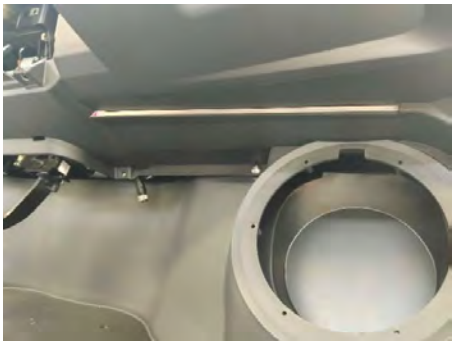
Note: During installation, do not pull, twist, or tug on the LED strip forcefully. Gently push the LED strip into the slot, otherwise, it may be damaged!

7.8 Dashboard LED Strips (Left and Right)

The left and right dashboard panel LED strips of the vehicle are controlled by a 12V combination switch.

● Fix the LED strips in the mounting slots under the dashboard panel.

Note: During installation, do not pull, twist, or tug on the LED strip forcefully. Gently push the LED strip into the slot, otherwise, it may be damaged!

<table>
<tr><td colspan="2">   </td></tr>
<tr><td>  </td><td>Tool:
1. Phillips screwdriver</td></tr>
</table>

7.9 Wireless Charging LED Strip

The vehicle's wireless charging LED strip is controlled by a 12V combination switch.

● Fix the LED strip in the mounting slots of the glove box.

Note: During installation, do not pull, twist, or tug on the LED strip forcefully. Gently push the LED strip into the slot, otherwise, it may be damaged!

Tool:

1. Phillips screwdriver

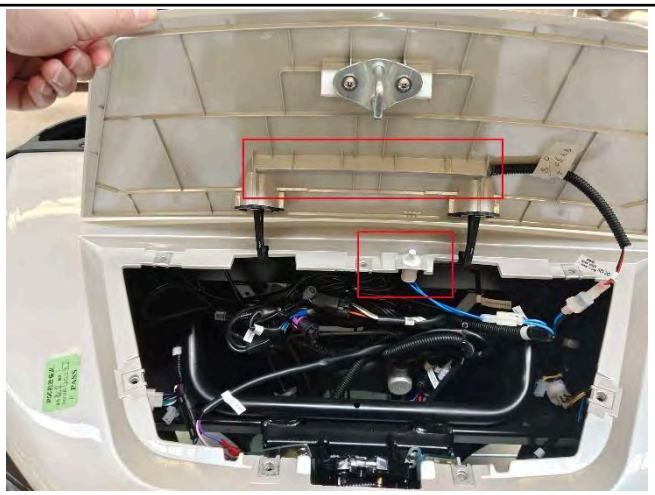
7.10 Frunk LED Strip

The frunk LED strip of the vehicle is controlled by a refrigerator door switch.

● First, install the refrigerator door switch, which controls the on and off of the LED strip.

● Fix the LED strip in the mounting slots under the hood.

Note: During installation, do not pull, twist, or tug on the LED strip forcefully. Gently push the LED strip into the slot, otherwise, it may be damaged!



Tool:

1. Phillips screwdriver

7.11 Speakers and Speaker Ambient Lights

The four vehicle speakers first receive the audio signal output from the speedometer , then amplify the audio signal through the amplifier, and

finally output it to the speakers. The speaker ambient lights are directly controlled by the ambient light controller. Both the amplifier and the speaker ambient light controller are controlled by the MUTE switch on the combination switch. The speaker ambient lights and the speakers are integrated.

● First, connect the audio input wires of the speakers and the power wires of the ambient lights. Then, install the dust cover. After that, connect the audio input wires and the power wires of the ambient lights to the wiring harness, and install them in the speaker slots.

<table>
<tr><td colspan="2">   </td></tr>
<tr><td>  </td><td>Tool:
1. Phillips screwdriver</td></tr>
</table>

7.12 Wireless Charger

After installing the vehicle's wireless phone charger, connect the power input wire to the USB socket of the wireless phone charger.

● Secure the wireless phone charger in place.

Note: It is best to connect the power input wire of the wireless phone charger to a USB port with 5V 2.1A. Otherwise, charging efficiency may be low.

8. Electrical Troubleshooting

Preface

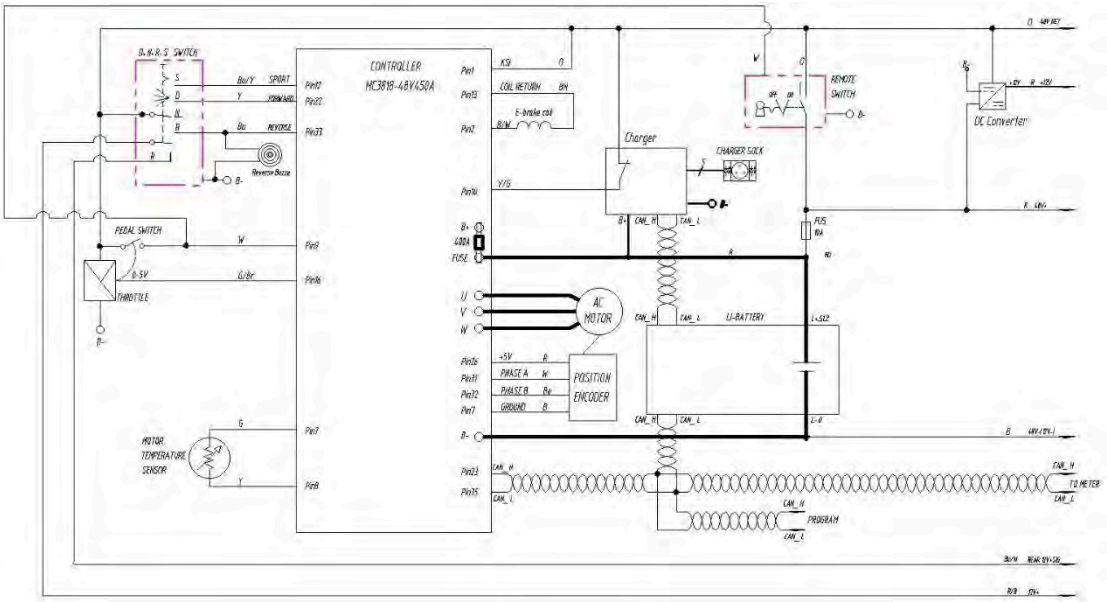
Electrical maintenance personnel must have sufficient professional knowledge and skills. They should be familiar with the performance and electrical principles of the vehicle, as well as the overall electrical layout and the function of each electrical component. Before troubleshooting, analyze the fault phenomenon and necessary technical data, and then proceed with the repair. Avoid being impatient and blind; blind repairs and random changes to circuits and components can expand the fault range and lead to greater losses.

When troubleshooting vehicle electrical faults, the vehicle should be parked in a safe area, ventilated, and in a relatively open environment with suitable lighting. The safest measures generally include lifting the rear wheels off the ground and ensuring the vehicle remains balanced and stable to prevent tipping. No one should be in front of or behind the vehicle. Use insulated wrenches and screwdrivers and other insulated tools. When performing non-electrical testing, adjustments, or replacements, turn off the key switch and disconnect the main power of the battery. Do not place objects on the battery to avoid short circuits and serious accidents. The provided fuses should not have their capacity

arbitrarily changed, and do not remove the fuse to directly short-circuit the circuit.

Note: All voltages mentioned in the text are measured relative to the negative terminal.

Drive Control Schematic Diagram



Understanding the above drive control schematic makes troubleshooting much simpler. According to the schematic, the vehicle's drive workflow is as follows:

1. After starting the lithium battery, the Red line (48V) in the diagram will receive a constant 48V. When the one-key start is pressed, the entire vehicle is powered, and the DC48V input power is connected.

2.Turning the Key:

- The Red line and Orange line conduct — the controller is powered on (Pin 1 is powered), and the gear switch, accelerator power, and 48V charging protection are all active.

- The DC converter Ksi control (Green line) is powered, and the converter starts working.

3.When the Gear Switch is in the Forward Position:

- The Orange line and Yellow line conduct, and the forward gear signal is sent to the controller (Pin 22).

- When the accelerator pedal is pressed: the throttle switch signal (48V) is sent to controller Pin 9, and the throttle output signal (0-4.65V) is sent to controller Pin 16, activating the magnetic brake drive, and the vehicle moves forward.

4.When the Gear Switch is in the Reverse Position ("R"):

- The Orange line and Blue line conduct, and the reverse gear signal is sent to the controller (Pin 33).

- When the accelerator pedal is pressed: the throttle switch signal (48V) is sent to controller Pin 9, and the throttle output signal (0-4.65V) is sent to controller Pin 16, activating the magnetic brake drive, and the vehicle moves in reverse.

Key Points for Circuit Troubleshooting

Mastering the following key points can significantly aid in vehicle fault diagnosis and repair, making challenging tasks more manageable:

- Turn the key and confirm the voltage at Pin 1 of the controller is normal (48V).

- Turn the key and confirm the voltage at Pin 10 of the controller is normal (charging protection 48V).

- Turn on the "D" gear switch and confirm the voltage at Pin 22 of the controller is normal (48V).

- Turn on the "R" gear switch and confirm the voltage at Pin 33 of the controller is normal (48V).

- Turn on the sport mode switch and confirm the voltage at Pin 12 of the controller is normal (48V).

- Lightly press the accelerator pedal and confirm the voltage at Pin 9 of the controller is normal (48V).

- Press the accelerator pedal fully and confirm the voltage at Pin 16 of the controller is normal (0-4.7±0.1V).

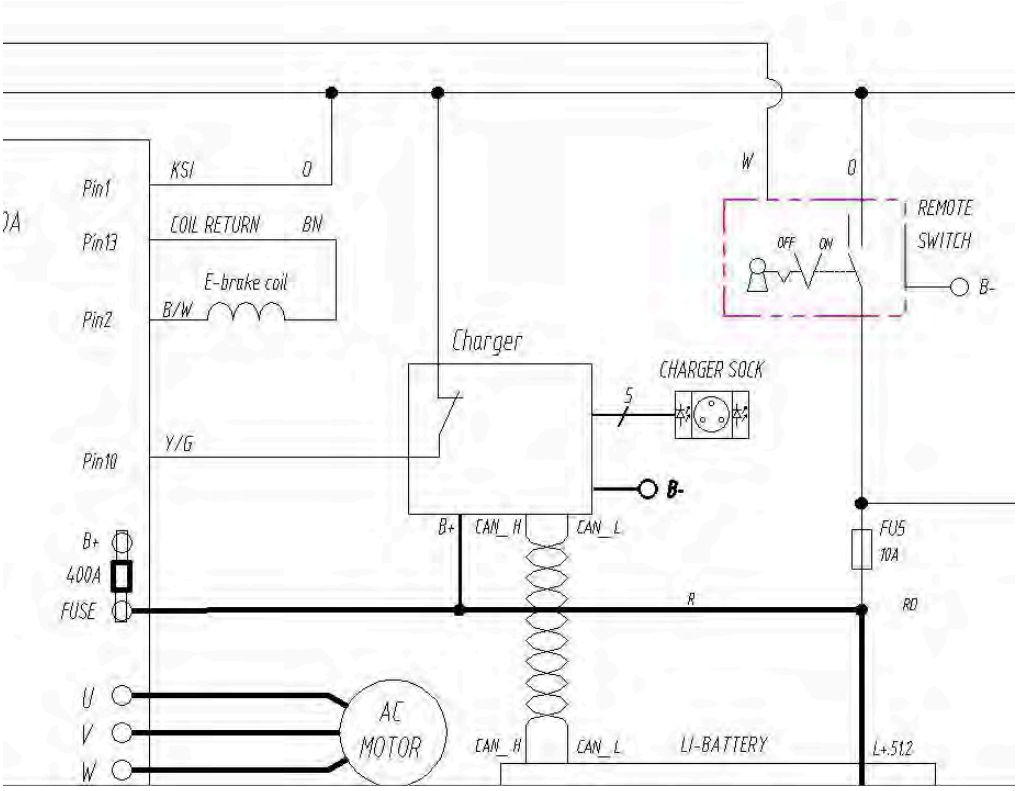
Note: The mentioned 48V refers to the system battery voltage. If the battery voltage is 50V, then the corresponding voltages should also be 50V or close to 50V.

In addition to understanding the circuit schematic, troubleshooting faults also requires checking the wiring diagram to inspect the connection status of each corresponding connector, ensuring that terminals are not loose, deformed, or experiencing poor contact.

Typical Fault Cases:

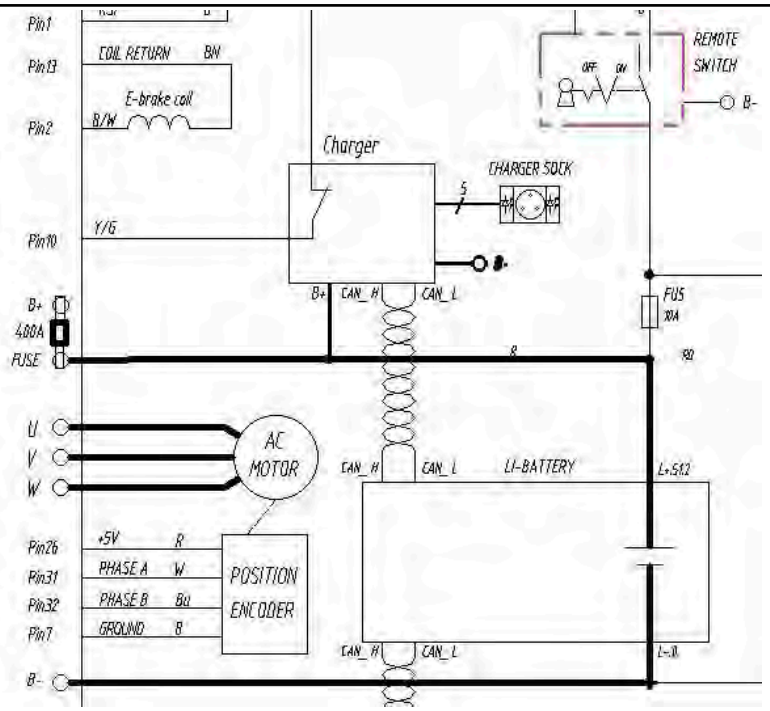
8.1 The car does not move, and the entire vehicle has no power

Fault Symptoms: The car has no power, the dashboard does not display when the key is turned on, and pressing the pedal does not move the car.



According to the schematic, the lack of power is mainly due to issues with the 48V power supply or power control section. The 48V power supply is provided by the battery pack through a 400A blade fuse and a 10A fuse. The control circuit includes a charging micro switch and an electronic lock. Therefore, focus on checking these aspects:

● Use a multimeter to measure the lithium battery voltage. If it is greater than 40V, turn on the key, and the speedometer should light up.



Tool:

1. Digital multimeter

● If the battery output voltage is normal, then use a screwdriver to open the controller cover.

● Use the resistance setting on the multimeter to measure the 400A blade fuse and the 10A control fuse. If they are continuous, they are normal; otherwise, replace them.

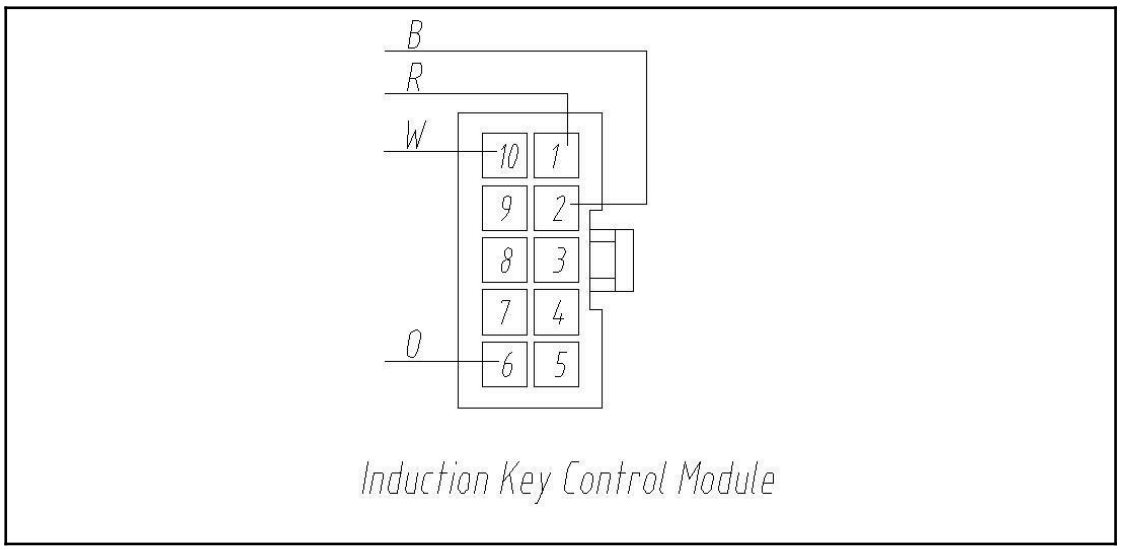
Tool:

1. Digital multimeter
2. Phillips screwdriver

● Use a screwdriver to remove the instrument switch mounting plate and check the electronic lock, ensuring that the terminals and connectors are normal.

● Disconnect the electronic lock from the wiring harness. Use a multimeter to measure the voltage between the Red line on the electronic lock connector and the battery negative terminal. The voltage should match the battery voltage. If it matches,

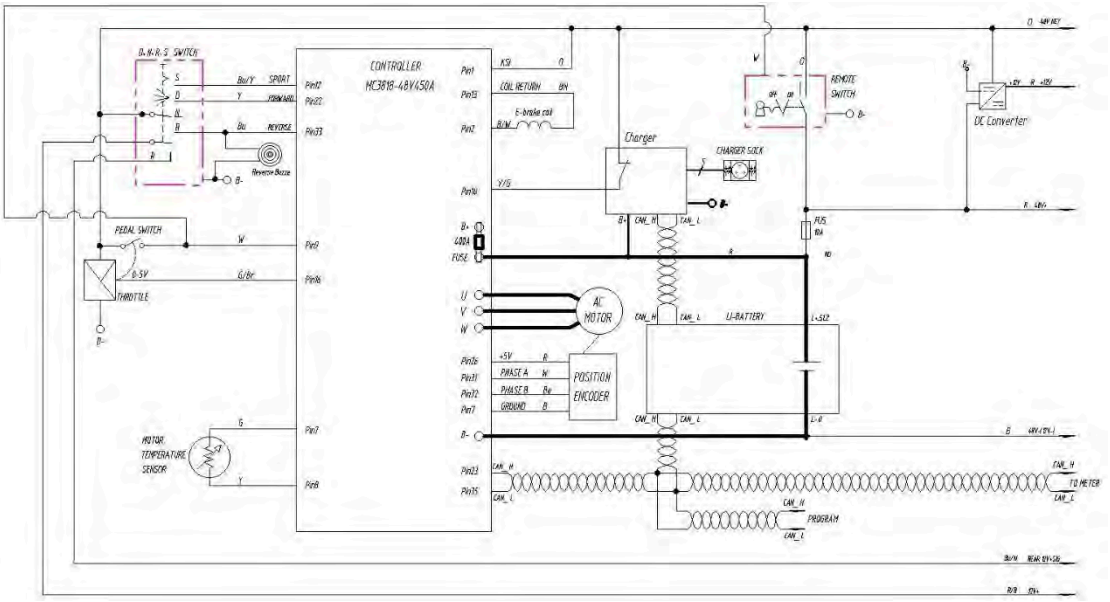
reconnect the electronic lock to the wiring harness, then press the one-key start. Use the multimeter to measure the voltage between the Orange line on the electronic lock and the battery negative terminal. If the voltage matches, the lock is normal; otherwise, replace the electronic lock.



 	Tool: 1. Digital multimeter 2. Phillips screwdriver

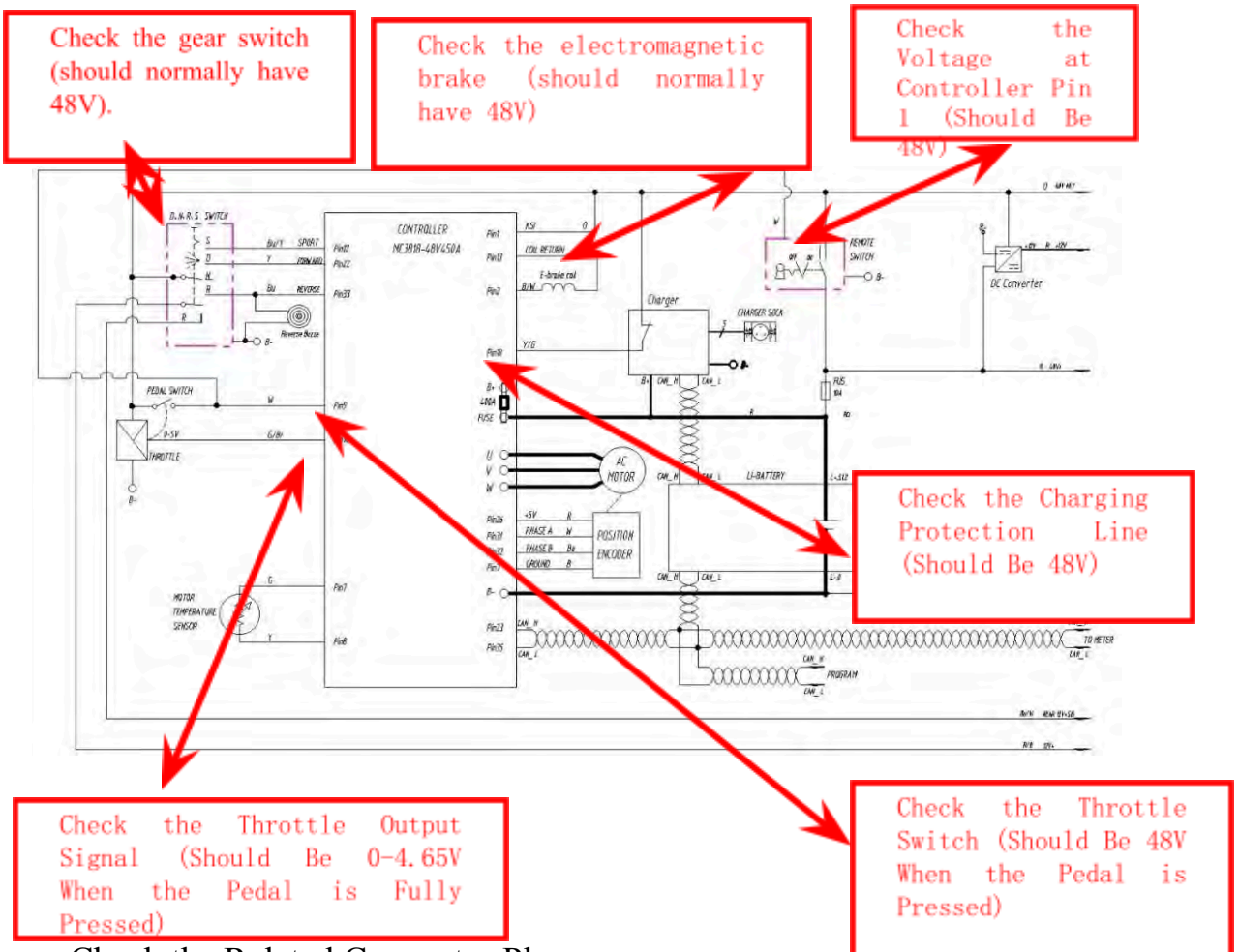
8.2 When the key is turned on, the speedometer displays, and the lights are normal, but the car doesn't move when the accelerator is pressed (wiring issue).

Fault Symptoms: The car has power, the dashboard displays when the key is turned on, the lights are normal, but the car doesn't move when the pedal is pressed.

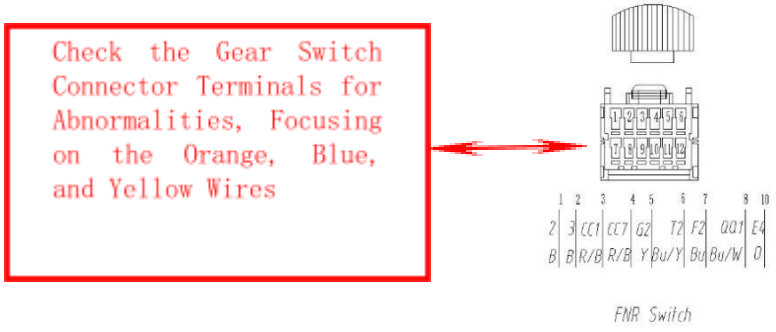


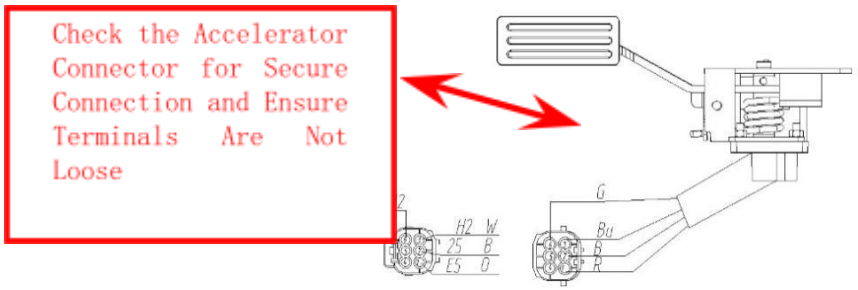
First, look at the schematic. According to the fault symptoms of the car, the speedometer shows that the power part is not a problem, the 10A fuse and the electronic lock are working normally. The car does not move, so mainly check the controller's power Pin 1 voltage (this voltage determines whether the controller can work normally), gear switch signal, accelerator switch and throttle signal, and whether the charging protection power is normal.

Key Areas to Check When the Car Has Power But Does Not Move:



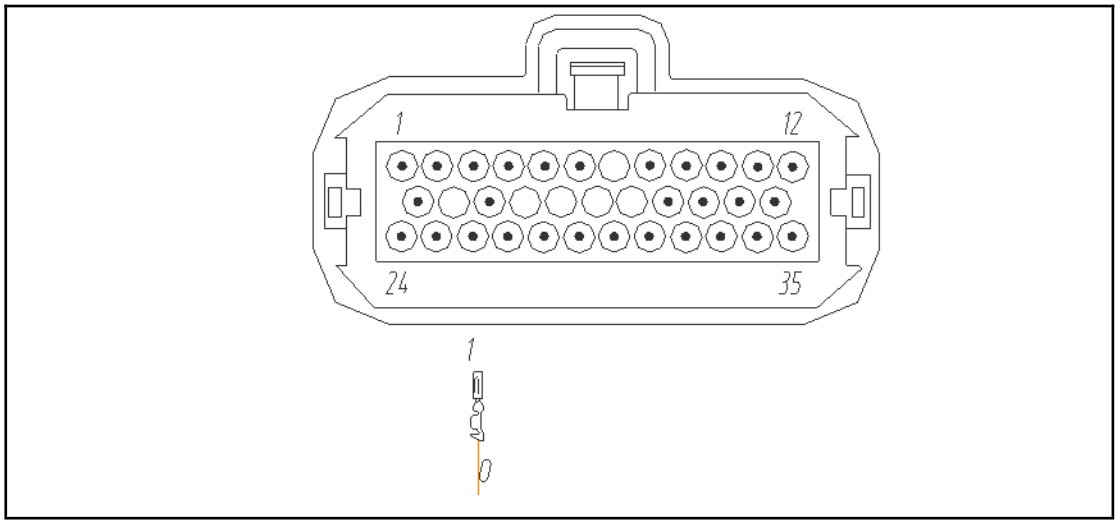
Check the Related Connector Plugs:





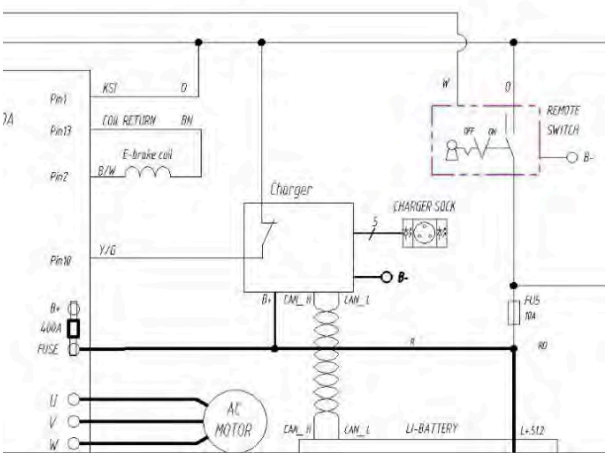
Checking the Voltage at Controller Pin 1

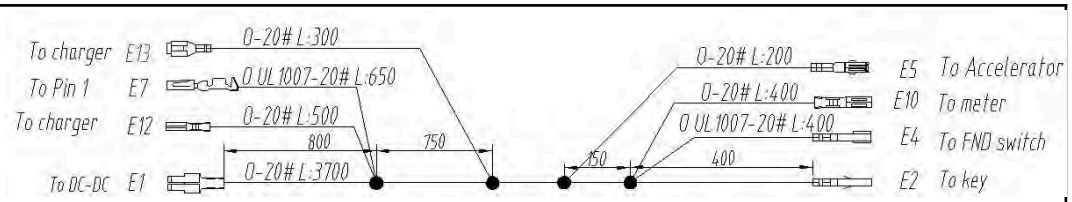
● Turn on the key, check the voltage at Pin 1 of the controller. Measurement method: Use the red probe of the multimeter to connect to the positive terminal (Orange line), and the black probe to connect to the battery negative terminal (controller B- position). The normal voltage should be close to the battery voltage (or slightly lower). If the voltage is more than 2V lower than the battery voltage, further inspection is required (next step).



	Tool: 1. Digital multimeter

The speedometer lights are all on, indicating the key switch to the DC circuit is normal. The voltage at controller Pin 1 is much lower than the battery voltage (more than 2V lower). First, determine if the terminal is deformed or if there's a broken wire. If there are any abnormalities, please fix them. If the terminal is intact but the voltage is still low, check the Orange wire from the terminal to the controller, specifically the connection points in the wiring harness. The wiring harness connection point is located 500mm from the Pin 1 terminal. Open the corrugated tube of the wiring harness, inspect the Orange wire connection point, and address any issues.





Tool:

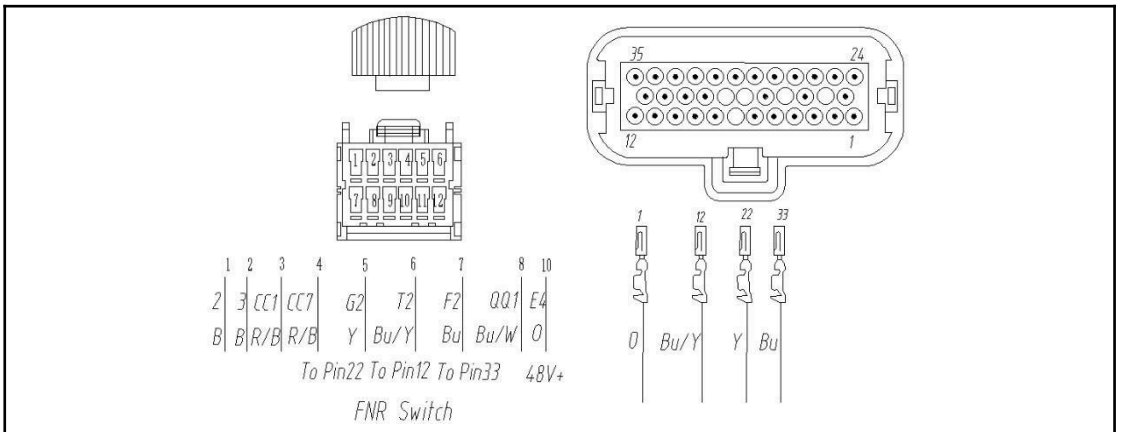
1. Digital multimeter

Measuring Gear Switch Signals

●Turn on the key and set the gear switch to 'D' gear. Use a multimeter to measure the voltage between the Yellow wire and the negative terminal (48V) to ensure it is normal, and check if the controller Pin 22 terminal is loose. Repair any deformations or looseness in the terminal.

● Turn on the key and set the gear switch to 'R' gear. Use a multimeter to measure the voltage between the Blue wire and the negative terminal (48V) to ensure it is normal, and check if the controller Pin 33 terminal is loose. Repair any deformations or looseness in the terminal.

●Turn on the key and set the gear switch to 'S' gear. Use a multimeter to measure the voltage between the Blue Yellow wire and the negative terminal (48V) to ensure it is normal, and check if the controller Pin 12 terminal is loose. Repair any deformations or looseness in the terminal.

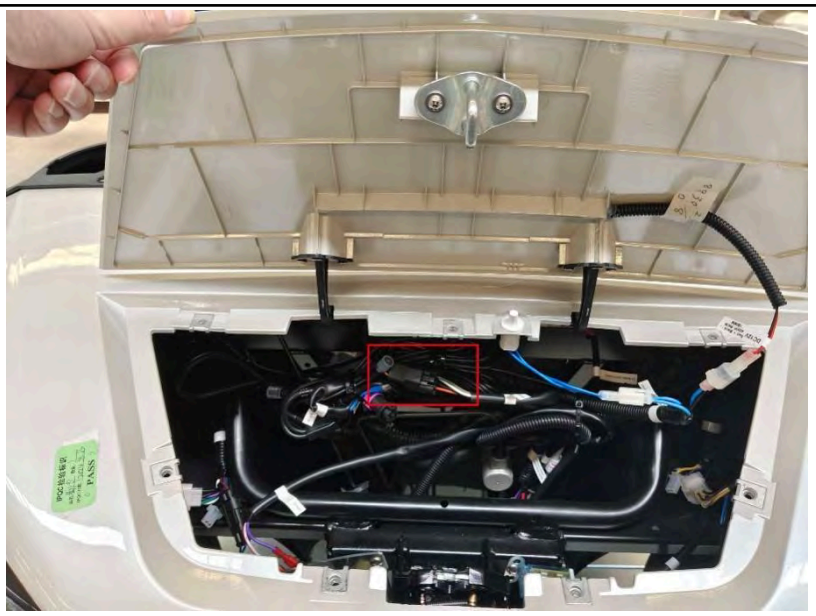


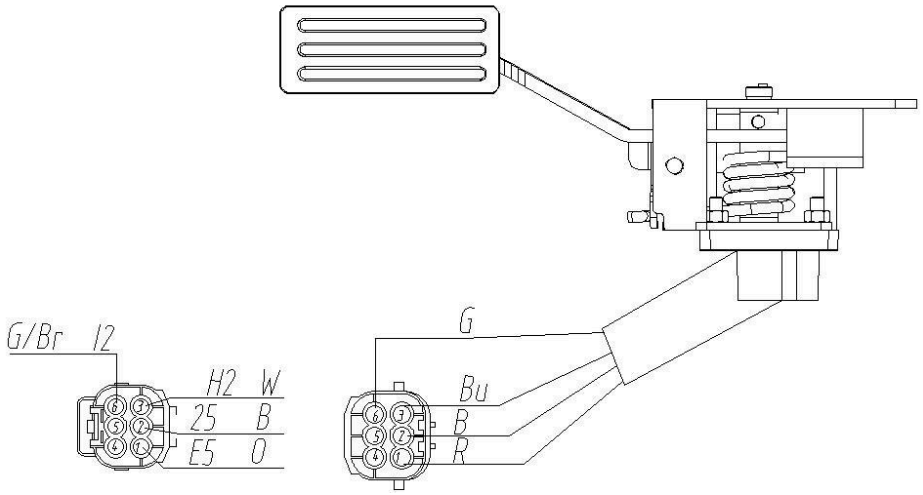
Tool:

1. Digital multimeter

Check the Accelerator Switch and Throttle Signal

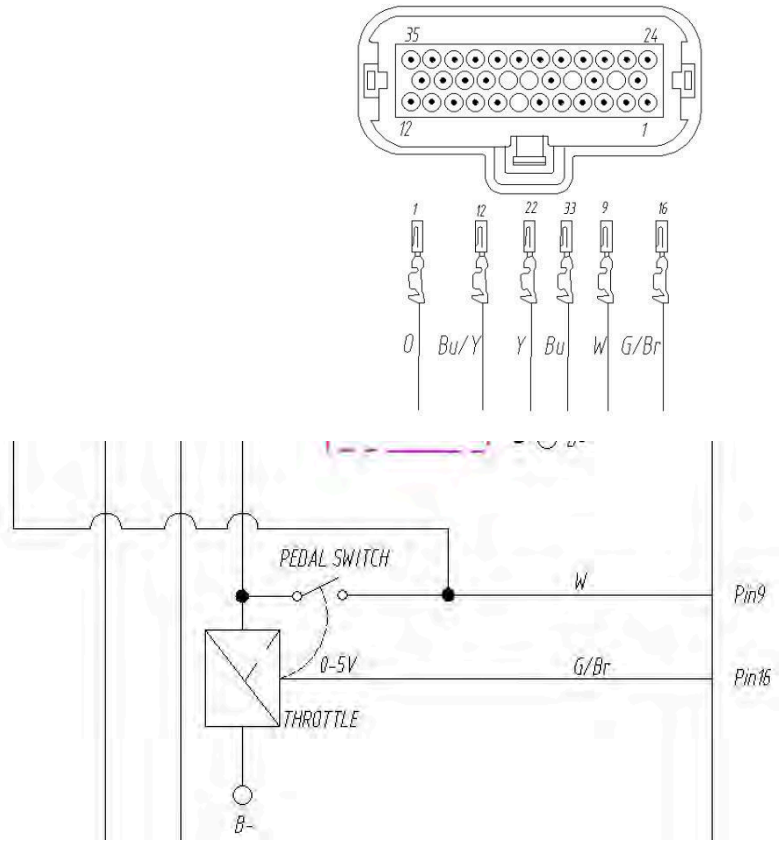
● First, check whether the connector plug between the accelerator and the power harness is loose or has fallen off. Repair any abnormalities. If the plug is not abnormal, proceed to the next step.





● Turn on the key and set the gear switch to 'N' (neutral). Lightly press the accelerator pedal and use a multimeter to measure the voltage on the White wire (controller Pin 9). If it shows 48V, it is normal. Check if the controller Pin 9 terminal is loose. Repair any deformations or looseness in the terminal.

●If the Pin 9 terminal and harness are normal, but the White wire has no voltage, check or replace the accelerator.



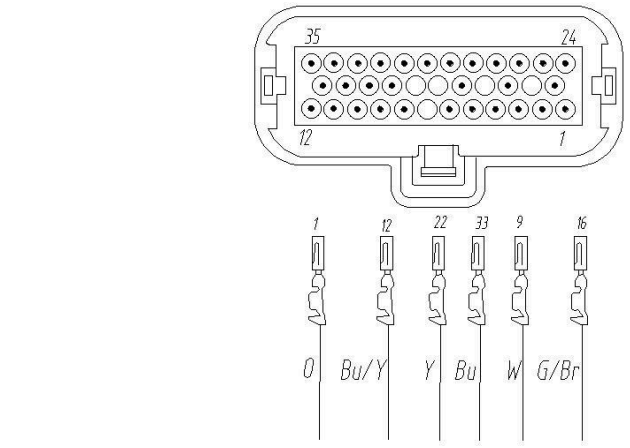
Tool:

1. Digital multimeter

●Turn on the key, set the gear switch to 'N' (neutral), lightly press the accelerator pedal, and use a multimeter to measure the voltage on the Green/Brown wire (controller Pin 16). A range of 0-4.7V indicates

normal operation. Additionally, check if the controller Pin 16 terminal is loose. Repair any deformations or looseness in the terminal.

● If the Green/Brown wire at Pin 16 has no voltage, and the terminal and harness are normal, inspect or replace the accelerator for testing.



Tool:

1. Digital multimeter

Controller 35-Pin Connector Terminal Repair

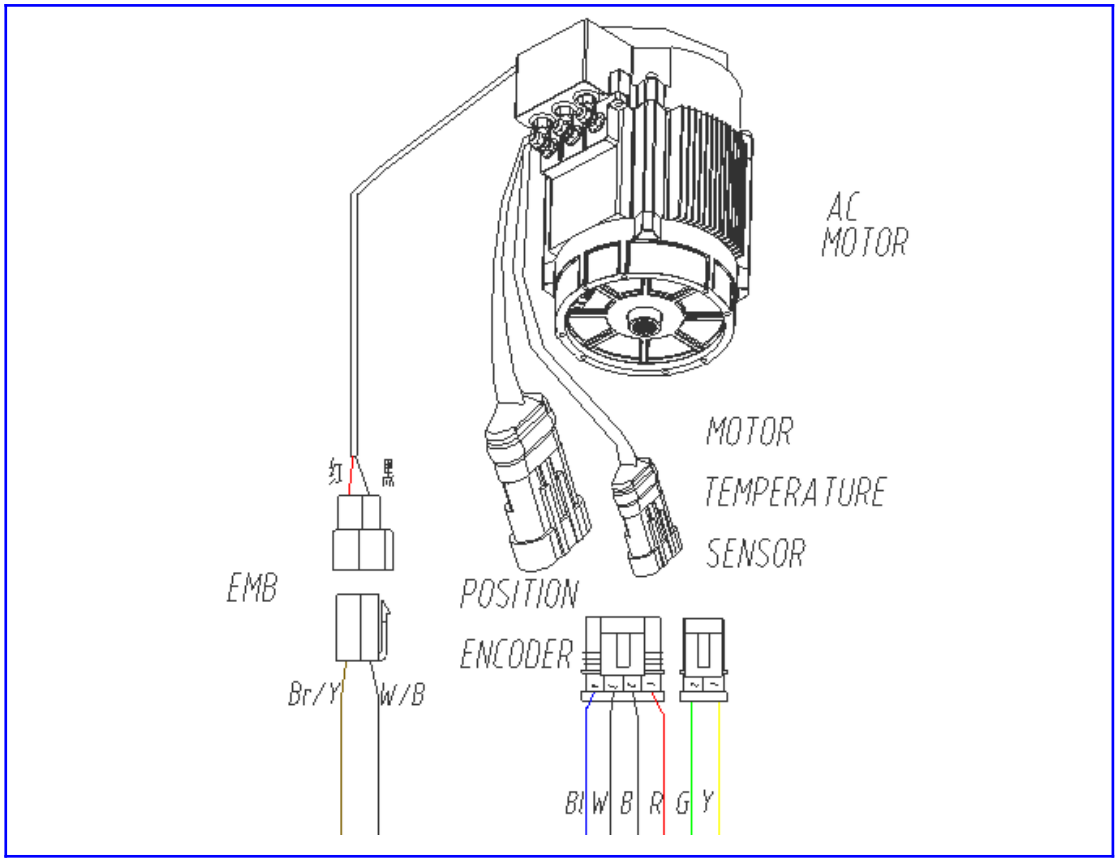
● When terminal contact is poor, we can use a cone to repair the terminal (the key needs to be turned off or the battery disconnected). Remove the casing and gently pull the corresponding terminal clips inward on all three sides. Be careful not to use too much force to avoid damaging the terminals and the casing.

<table>
<tr>
<td>Controller:
Pin1: Key Switch
Pin9: Pedal Switch
Pin10: Charging Protection Switch
Pin22: "D" Gear
Pin33: "R" Gear</td>
<td>  </td>
</tr>
<tr>
<td>  </td>
<td>Tool:
1. Cone</td>
</tr>
</table>

8.3 Turn on the key, the Speedometer lights up, and the headlights are also normal, but when pressing the accelerator, the car doesn't move (motor-related issue).

If there are issues with the electromagnetic brake, motor encoder, or temperature sensor, the car may not operate normally. Please perform the following checks:

● Check the motor brake wire connector, motor encoder connector, and temperature sensor connection. If any are loose, reconnect them securely.



● **Check the controller plug motor harness corresponding terminals.**

When terminal contact is poor, we can use a cone to repair the terminal (the key needs to be turned off or the battery disconnected). Remove the casing and gently pull the corresponding terminal clips inward on all three sides. Be careful not to use too much force to avoid damaging the terminals and the casing.

Controller (for Motor):

Pin 2: Electromagnetic Brake Coil

Pin 13: Electromagnetic Brake Coil

Pin 7: Temperature Sensor Ground / Encoder Ground

Pin 8: Temperature Sensor Positive

Pin 26: Encoder 5V+

Pin 31: Encoder A

Pin 32: Encoder B

Tool:

1. cone

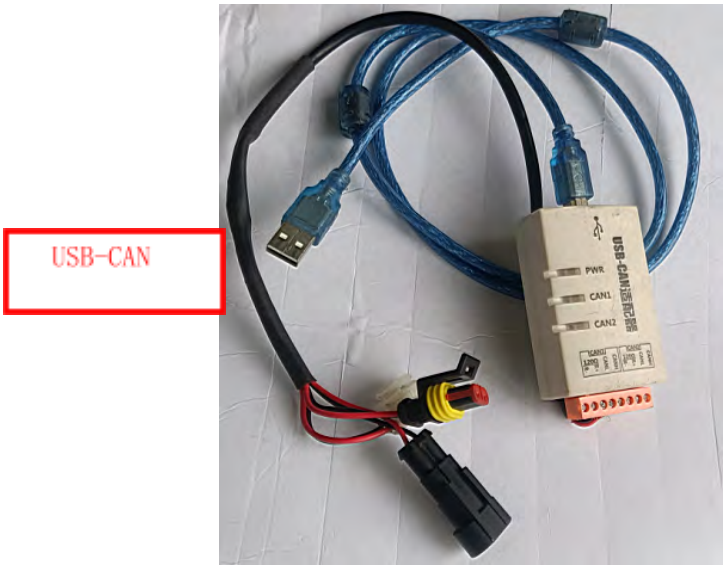
8.4 Diagnose Computer Issues

The controller outputs under the condition that: there is KSI signal input (key switch); there is direction signal ('D' or 'R'); there is an accelerator switch signal and throttle output; and there is a charging protection switch signal.

Manually checking vehicle faults is time-consuming. Using a computer with upper machine software to check the direction signal, brake signal, accelerator switch signal and throttle signal, and charging protection switch signal can quickly identify the fault point. This enables the problem to be found and resolved quickly, making maintenance work more convenient.

Tools Needed for Computer Connection:

1. Computer with Appropriate Software Installed:
2. USB-CAN Adapter



Controller Fault Code Table:

Code	Fault	Cause/Solution
1	HPD	The operation sequence is wrong, usually the gear switch is not in the neutral position, reset the gear switch
4	Controller overheating	Continuous overload or climbing, the controller temperature exceeds 85 °, and rest until the controller temperature drops
5	Power failure of main circuit	Disconnect the main fuse of the controller, check or replace it
6	Current sampling fault	Controller problem, replace the controller
7	Encoder fault/locked rotor fault	There is a problem with the motor encoder or the wiring is wrong. Check whether the encoder harness plug is loose or the harness has an open circuit
9	Undervoltage of battery pack	The battery voltage is insufficient, please charge
10	Overvoltage of Battery pack	The battery pack voltage is too high or the controller voltage is set incorrectly. Check the battery or reset the controller voltage parameters
11	Motor overheating	Continuous overload or climbing, the motor temperature exceeds 135 ° or the

		motor temperature sensor has problems or the harness is disconnected. Wait until the motor temperature drops, and check the connection status of the motor temperature sensor harness plug
13	Accelerator failure	Before opening the key, the accelerator pedal is not reset, or the pedal output is ＞ 0.5V
15	Electromagnetic brake failure	Open circuit of electromagnetic brake coil. Check the connection status of electromagnetic brake harness and plug
23	Output current overcurrent fault	The motor output is short circuited, please check the motor connecting wire.

Check the working status of the controller through the computer controller monitoring menu:

F49. Motor current: the working current when the motor is running

F50. Motor running speed

F51. Controller temperature

F52. Motor temperature

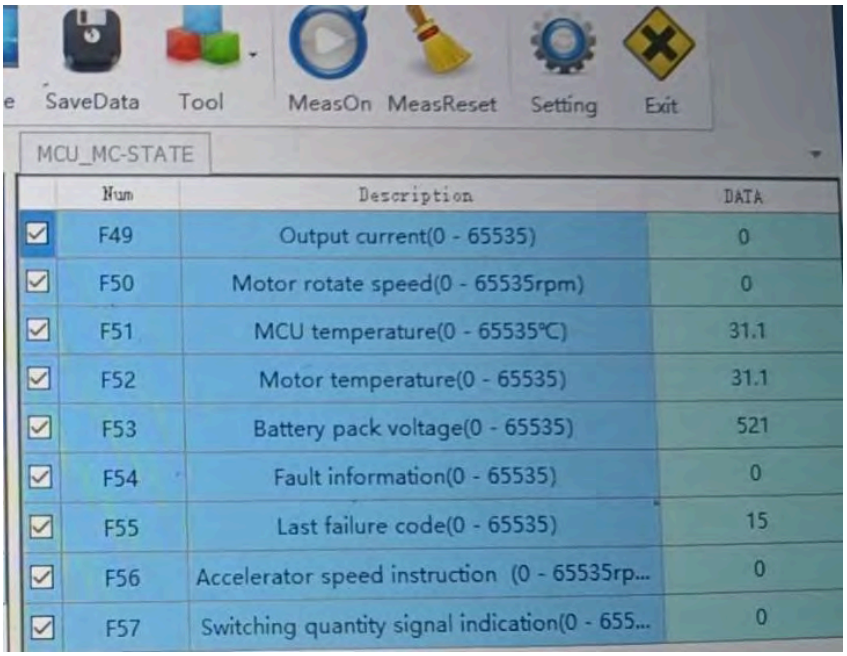
F53. Battery pack voltage

F54. Current fault

F55. Historical fault

F56. Accelerator signal: accelerator 0-4.7V output signal

F57. Switch signal: sum of switch signal codes



Monitoring parameter identification:

F56：Accelerator throttle signal (representing throttle 0-4.7V output voltage)

F56 does not display the output voltage value of the accelerator, but the setting value of the highest speed parameter F7. For example, if the controller F7 setting value is 3500, when the accelerator is fully depressed under normal conditions, the F56 display value will be close to or reach 3500. If F56 displays 3000 or lower when the accelerator is fully depressed, it means that the output voltage of the accelerator is reduced, and it does not meet the requirements of 4.65V or above. At this time, the maximum speed of the car cannot reach the preset speed. The accelerator needs to be checked or replaced.

F57：Switching value signal

The signal here is the sum of all operating switching signals. If the car is moving forward in high speed mode, the switching value here includes: the sum of gear switch and pedal switch signals, showing 33.

If the car moves forward in low speed mode, the switching value here includes: gear switch, low speed mode switch, pedal switch signal sum, and the display is 41.

Switch signal code:

Type	Code
“D”gear	1
“R" gear	2
Low speed switch	8
Accelerator pedal switch	32
Charging protection switch	16

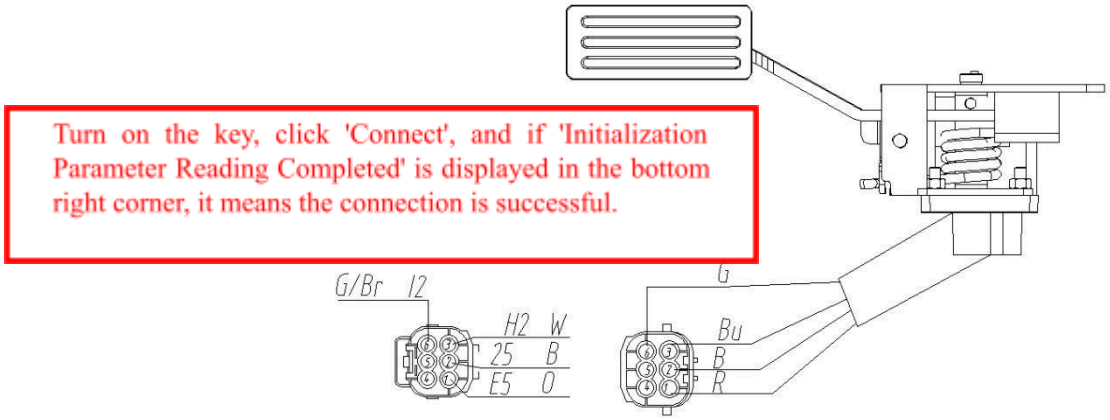
It should be noted here that other switches display codes only when they are connected (normally connected when the switch is open).

When the charging protection wire is disconnected, the code displays 16, and if it is connected normally, it is 0.

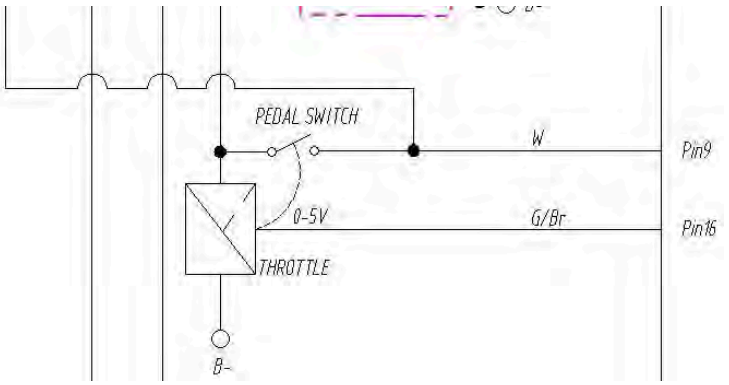
- **How does the computer find fault information**

Turn on the key, shift the gear switch to "D", set the speed mode to "Rabbit", step on the accelerator, the car does not move, check F56 and F57 to find the fault point:

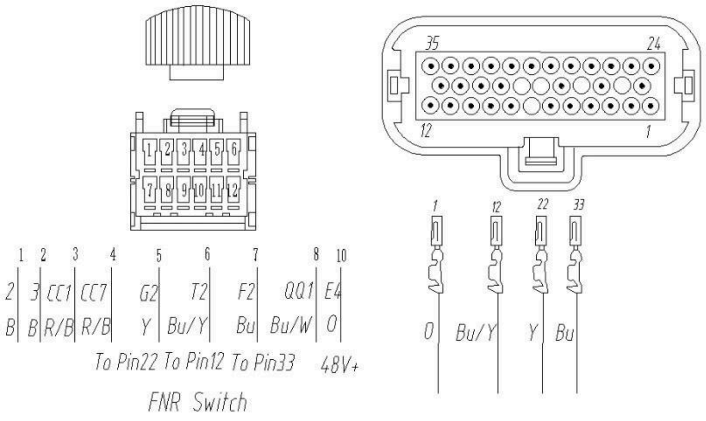
First check the F56 display value, if the display value is large (golf carts F7 is 3000), basically the accelerator throttle signal is fine, if the display value is 0, the controller does not receive the throttle signal, you need to check the accelerator and controller Pin 16 terminal status, if there is any abnormality, repair or replace it.



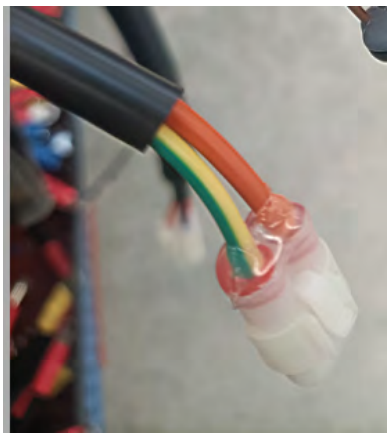
Check the F57 display value: The digital switch signals here should include the sum of the working switch signals, gear switch '1', and pedal switch signal '32', showing 33. If it only shows 1, there is a problem with the accelerator switch or the controller Pin 9 terminal or the corresponding line, which needs to be repaired or replaced.



If it only displays 32, there is a problem with the 'D' gear switch or the controller Pin 22 terminal or the corresponding wiring, which needs to be repaired or replaced.



If the F57 display shows 49, then there is no problem with the 'D' gear switch circuit, and the accelerator switch signal is normal. The issue is with the charging protection switch (switch signal +16). You need to check the connection status between the charging protection circuit plug and the charger, and repair or replace any abnormal plugs or terminal connections.



9. Electrical Troubleshooting (Lighting Section)

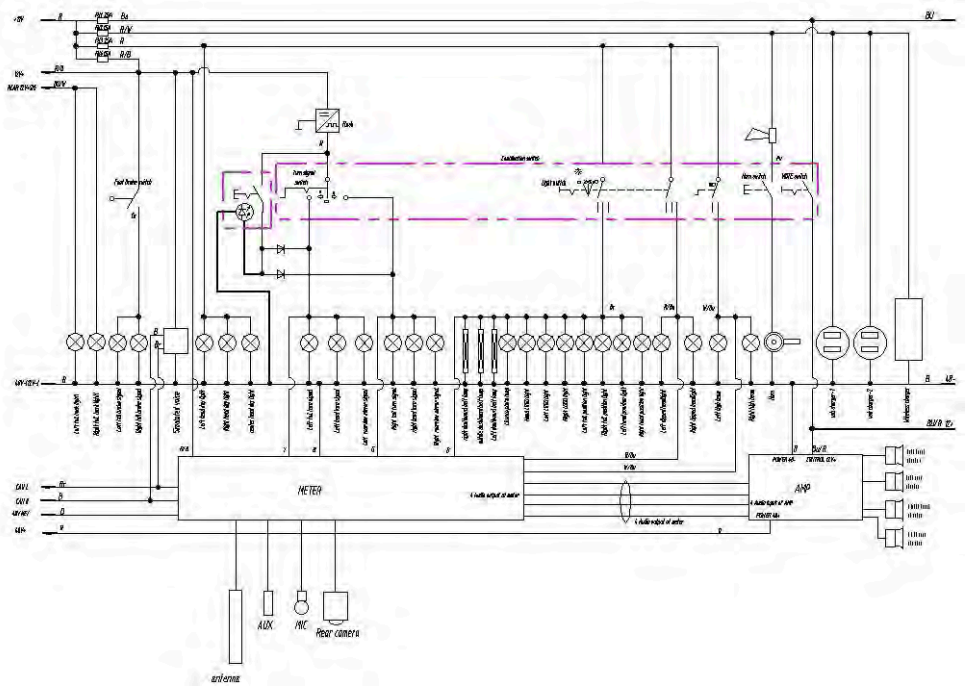
Overview

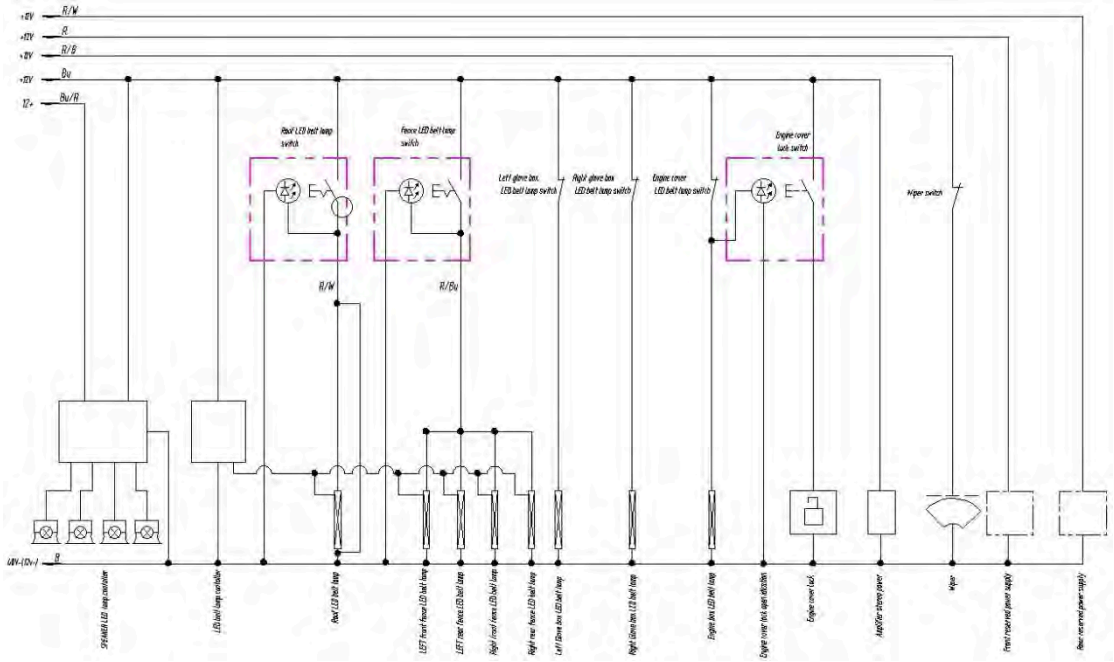
The vehicle's lighting system operates entirely on a 12V power supply, which is provided by a DC-DC converter that converts 48V to 12V.

The lighting system consists of the following components:

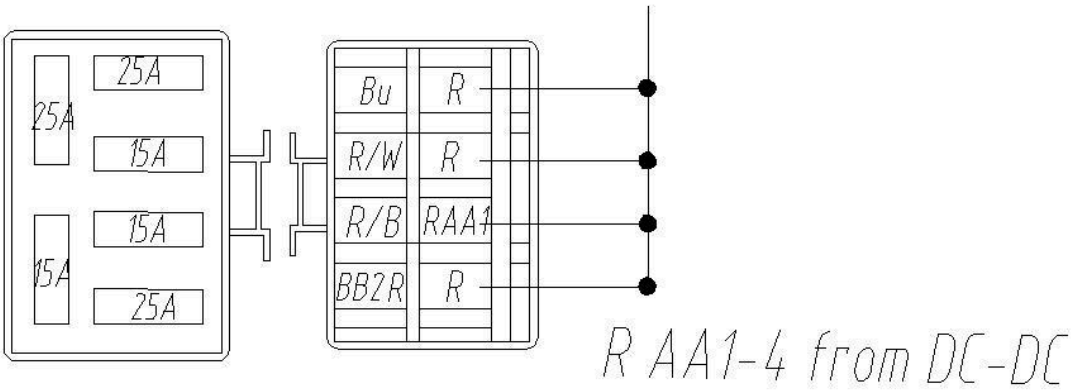
- Wiring harness
- DC converter
- Fuse
- Combination switch
- Headlight switch
- Hazard warning switch
- Flasher
- Headlight
- Cross light

- Logo light
- Rear taillight





Fuse Box Wiring Definitions



Fuse Box Wiring Definitions:

1. **Blue Wire**:
   - The Blue wire in the fuse box is for the light strips and speaker power supply.
2. **R/B Red-Black Wire**:
   - The R/B Red-Black wire provides 12V power to the brake lights, flasher, dashboard, windshield wipers, and gear switch.
3. **White Wire**:
   - The White wire in the fuse box is for the USB charger, horn, and wireless phone charger power supply.
4. **Red Wire**:
   - The Red wire is for the lighting and 12V auxiliary power supply.

9.1 Methods for Diagnosing a Non-Functional Headlight

Headlight Operating Principle:

1.Operating Principle:

- DC Output 12V → 25A Fuse → Headlight Switch → Tail Light On → Front Headlight On (position light on, low beam or high beam on).

2.Troubleshooting Non-Functional Headlight:

Step 1: Turn on the headlight switch and observe if the tail light is on.

- If the tail light is also off, the issue is usually with the 12V power fuse for the headlights. Check if the 25A fuse is blown, and replace it if necessary.

Step 2: If the tail light is functioning but the headlight is not, inspect the front headlight.

- Check if both the left and right headlights are off.
- Inspect the combination switch or the headlight bulb for any issues or if they are blown.

● Combination Switch Wiring Diagram

Left Brown Wire: 12V line through the headlight switch

Output: High beam and low beam 12V through the combination switch

White-Blue Wire: Low beam

Red-Blue Wire: High beam

Red Wire: Horn input

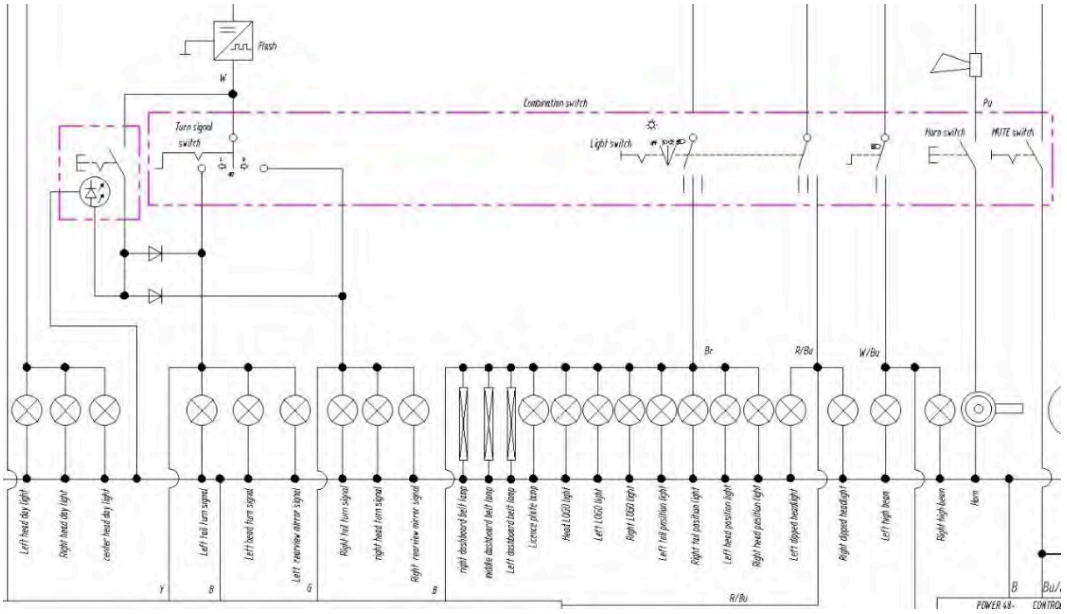
Purple Wire: Connected to the horn

White Wire: Flasher output

Yellow Wire: Left turn signal

Green Wire: Right turn signal

MUTE Switch: Used to control the amplifier, thereby controlling the speaker



10. Electrical Troubleshooting (Audio System Section)

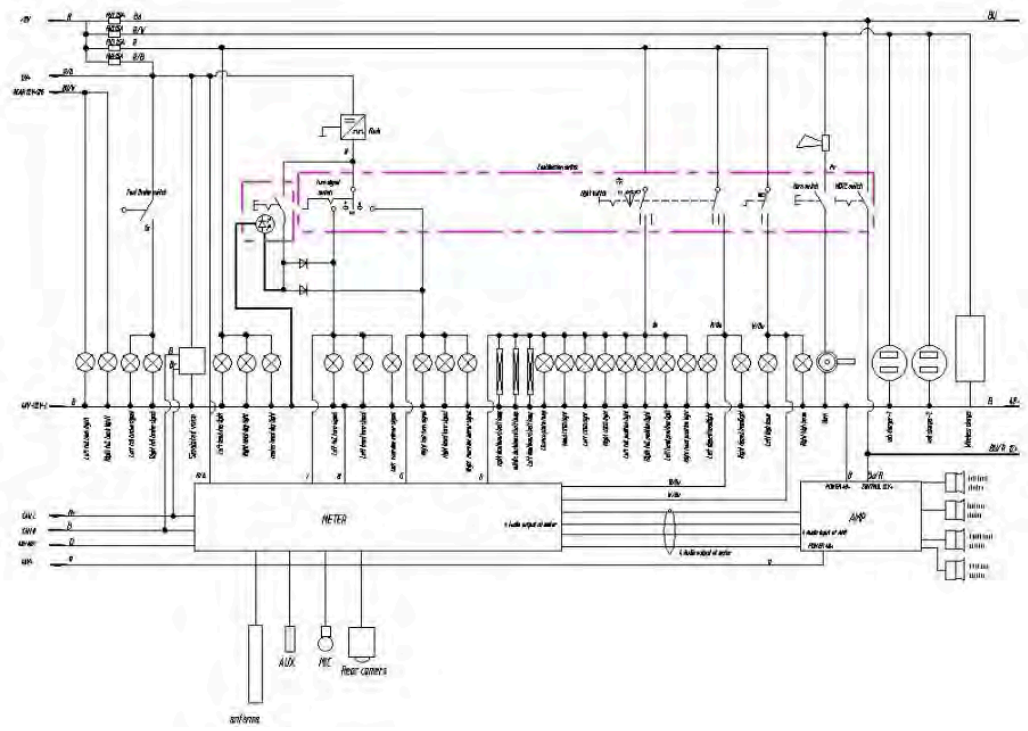
Overview

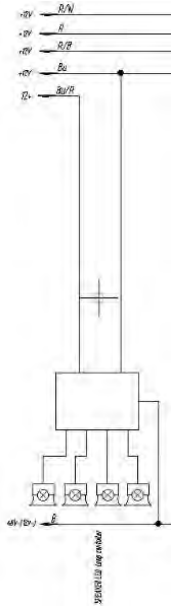
The entire vehicle's audio system, except for the amplifier which operates at 48V (with a 12V control for switching on or off), uses a 12V power

supply. This 12V power is provided by a DC-DC converter that steps down 48V to 12V.

The audio system consists of the following components:

- Amplifier
- Speakers
- Ambient lighting for the audio system
- Ambient lighting controller for the audio system
- DC-DC converter
- Fuse
- Combination switch





10.1 Methods for Diagnosing a Silent Speaker

Speaker Operating Principle:

Operating Principle:

Speedometer audio signal → Amplifier (controlled by combination switch) → Speaker (speaker plays the audio signal output from the Speedometer).

Troubleshooting No Sound Output:

1.Check MUTE Switch:

- First, switch the MUTE switch on the combination switch to the ON position.
- Connect your phone to the Speedometer via Bluetooth and play music.
- Listen to the speaker to see if there is any sound.

2.Check Amplifier Operation:

- If there is no sound, check if the amplifier is working properly (verify if the power indicator light is on).
- If the amplifier is working, inspect the wiring between the Speedometer and the amplifier as well as the wiring from the amplifier to the speaker.
- Ensure that there are no disconnections in the wiring. If there are, reconnect the corresponding harness plugs.

3.Check Speaker Status:

- If two out of four speakers are working and the other two are not, check if the amplifier is functioning.
- If the amplifier's power indicator light is off, inspect the combination switch or the amplifier for any signs of damage or faults.

Additional Troubleshooting for Silent Speakers:

If out of four speakers, two are working and two are not, and there is no sound from the audio system, follow these steps:

Check Amplifier Operation:

- Ensure that the amplifier is functioning properly. Look at the power indicator light on the amplifier.
- If the power indicator light is not illuminated, inspect the combination switch or the amplifier for potential damage or faults.

10.2 Methods for Diagnosing a Non-Functional Speaker Ambient Light

Operating Principle:

DC Output 12V → Speaker Ambient Light Controller (controlled by combination switch) → **Speaker Ambient Light**

Troubleshooting Non-Functional Speaker Ambient Light:

1. **Switch MUTE ON**: First, switch the MUTE switch on the combination switch to the ON position.
2. **Check Power Indicator**:

- Observe if the power indicator light on the speaker ambient light controller is illuminated.
- If the power indicator light is not on, check the combination switch or the speaker ambient light controller for any signs of damage or faults.

11. Electrical Troubleshooting (Light Strip System Section)

Overview

The entire vehicle's light strips use a 12V power supply, provided by a DC-DC converter that steps down 48V to 12V. Apart from the left and right side guard light strips and the roof light strips, which are controlled

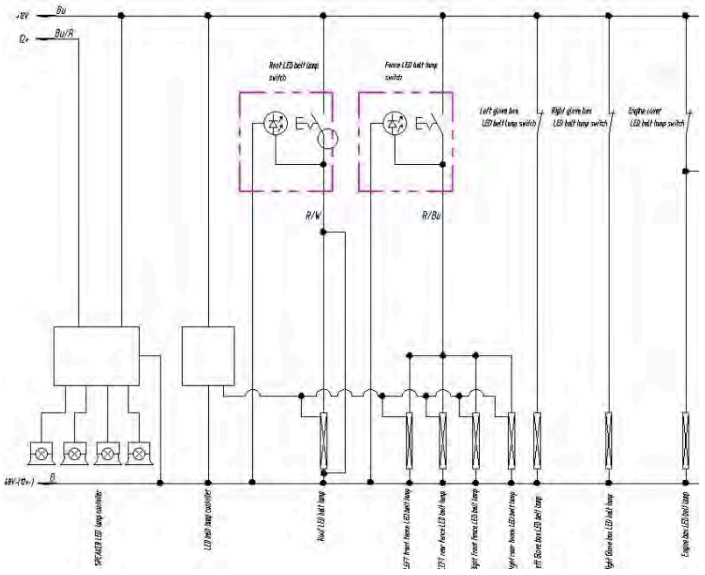
by the light strip controller for different modes, all other light strips operate in a single brightness mode.

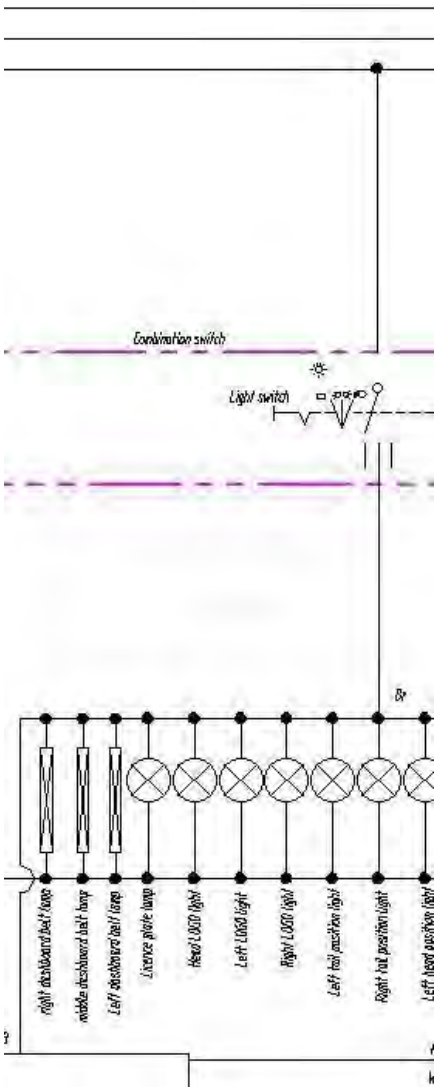
The Light Strip System Consists Of:

- Light Strip Controller
- Light Strips
- DC-DC Converter
- Fuse
- Combination Switch

Control Principle:

- **Power Source**: All light strips are powered by 12V, supplied through the DC-DC converter that converts 48V to 12V.
- **Light Strip Controller**: Manages the side guard light strips and roof light strips, allowing for different lighting modes.
- **Single Brightness Mode**: All other light strips operate with a constant brightness.





Troubleshooting Non-Functional Side Guard and Roof Light Strips:

If the side guard light strips or roof light strips controlled by the light strip controller are not working, follow these steps to diagnose the issue:

1. **Inspect Wiring Connections**:

- Check the connections between the light strips and the light strip controller to ensure there are no disconnections or loose wires.
- Ensure all wiring harnesses are securely plugged in.

2. **Check the Light Strip Controller**:

- If both the side guard light strips and roof light strips are not working, inspect the light strip controller to determine if it has failed or burned out.

Appendix 1 Controller Setting

F0	Motor type(0-65535)	0	0
F1	Rated moter power(0-65535KW)	4	4
F2	Rated moter voltage(0-65535V)	48	48
F3	Rated moter current(0-65535A)	120	135
F4	Rated moter frequency(0-65535HZ)	100	100
F5	Maximum moter frequency(0-65535rpm)	300	300
F6	Rated moter torque(0-65535rpm)	3000	3000
F7	Maximum speed limit(0-65535rpm)	5454	5454
F8	No-load current of asynchronous motor(0 - 65535% Rated motor current)	10	10
F9	Rotor time constant(0 - 65535)	550	600
F10	Rotor time constant 2(0 - 65535)	550	700
F11	No-load current switching frequency(0 - 65535Hz)	50	50
F12	Encoder pulse number(0 - 65535)	64	64
F13	Encoder direction(0 - 65535)	0	0
F14	Speed adjustment coefficient is displayed(0 - 65535°)	1370	1370
F15	Set the lead acid battery discharge time(0 - 65535min)	0	60
F16	Economy speed limit(0 - 65535rpm)	3100	3100

F17	Retention parameter(0 - 65535)	514	514
F18	First acceleration(0 - 65535)	600	600
F19	Secondary acceleration(0 - 65535)	600	600
F20	Reverse acceleration(0 - 65535)	200	200
F21	Deceleration(0 - 65535)	400	300
F22	Brake deceleration(0 - 65535)	5000	5000
F23	Speed ring KP(0 - 65535)	2000	2000
F24	Speed ring KI(0 - 65535)	780	780
F25	Brake start delay(0 - 65535ms)	80	80
F26	Brake opening voltage(0 - 65535V)	400	400
F27	Filter coefficient of measuring rotate speed(0 - 65535)	2	2
F28	Internal control parameters(0 - 65535)	1	1
F29	Battery SOC(0 - 65535%)	80	95
F30	Reservation(0 - 65535%)	100	100
F31	The switch maintains the opening voltage(0 - 65535V)	32	32
F32	Brake start speed(0 - 65535rpm)	15	15
F33	Torque KP(0 - 65535)	250	250
F34	Torque KI(0 - 65535)	1500	1500
F35	Exciting KP(0 - 65535)	250	250
F36	Exciting KI(0 - 65535)	1500	1500
F37	Driving torque current limit(0 - 65535%)	330	330
F38	Braking torque current limit(0 - 65535%)	330	330

F39	Voltage compensation coefficient(0 - 65535%)	101	100
F40	Current compensation coefficient(0 - 65535%)	100	100
F41	Undervoltage set point(0 - 65535V)	40	40
F42	Overvoltage set point(0 - 65535V)	70	70
F43	Manufacturer parameter 1(0 - 65535)	0	0
F44	Reservation(0 - 65535)	0	0
F45	High speed drive torque current limitation(0 - 65535%)	270	270
F46	Voltage of derating power dissipation(0 - 65535V)	43	43
F47	Reservation(0 - 65535)	3100	3100
F48	Rotate speed limit of reversing(0 - 65535rpm)	2200	1750

Appendix 2 Controller Parameter

Code	Specification	Description
F0	Motor type(0-65535)	This value has been adjusted at the factory and cannot be modified. Otherwise, the vehicle will fail to operate.
F1	Rated moter power(0-65535KW)	This value has been adjusted at the factory and cannot be modified. Otherwise, the vehicle will fail to operate.
F2	Rated moter voltage(0-65535V)	This value has been adjusted at the factory and cannot be modified. Otherwise, the vehicle will fail to operate.
F3	Rated moter current(0-65535A)	2-seater：set value = 120 indicates the maximum output current of the controller is 400A； 4-seater：set value = 135 indicates the maximum output current of the controller is 450A
F4	Rated moter frequency(0-65535HZ)	This value has been adjusted at the factory and cannot be modified. Otherwise, the vehicle will fail to operate.
F5	Maximum moter frequency(0-65535rpm)	Motor maximum frequency parameter value, which has been adjusted at the factory and cannot be modified. Otherwise, the vehicle will fail to operate.
F6	Rated moter torque(0-65535rpm)	This value has been adjusted at the factory and cannot be modified. Otherwise, the vehicle will fail to operate.
F7	Maximum speed limit(0-65535rpm)	Maximum motor speed. Modify the motor speed, thereby modifying the vehicle speed. The change range is 0-6000rpm. Customers can set the speed according to actual needs.

F8	No-load current of asynchronous motor(0 - 65535% Rated motor current)	This parameter affects the motor phase current output. It has been set at the factory and cannot be modified. Modification will cause the vehicle to run unsmoothly.
F9	Rotor time constant(0 - 65535)	This parameter affects the torque of the motor, can be in the range of 550-850; Generally, this parameter will be modified only when the motor of different power is replaced. It can not be modified because it has been adjusted at the factory. After modification, the vehicle will be unable to climb the hill or run smoothly.
F10	Rotor time constant 2(0 - 65535)	This parameter needs to be adjusted with F9, generally 100 or 150 larger than F9; when the motor of different power is replaced. It can not be modified because it has been adjusted at the factory. After modification, the vehicle will be unable to climb the hill or run smoothly.
F11	No-load current switching frequency(0 - 65535Hz)	The value has been adjusted at the factory which cannot be modified. Otherwise, the vehicle will fail to operate.
F12	Encoder pulse number(0 - 65535)	The encoder pulse, which is filled in according to the motor encoder pulse number. We use the motor is 64 one. The value has been adjusted at the factory which cannot be modified. Otherwise, the vehicle will fail to operate.
F13	Encoder direction(0 - 65535)	Encoder direction, its adjustable range is "0" or "1"; When the motor is changed, if the motor jitters seriously, it needs to be switched. The factory has been adjusted, and the normal operation of the vehicle cannot be modified, which will lead to continuous jitter of the vehicle and even burn out the controller.

F14	Speed adjustment coefficient is displayed(0 - 65535°)	Speedometers: Non-Lifted Cart: Set 1370 Lifted Cart: Set 1540 When the tire diameter or the number of rear axle ratio changes, it needs to be adjusted, or the instrument speed does not match the actual speed
F15	Set the lead acid battery discharge time(0 - 65535min)	Invalid
F16	Economy speed limit(0 - 65535rpm)	Low Speed Setting (Turtle); Motor low-speed gear can be used to change the motor speed rate so as to change the low-speed gear speed. It is ranged from 0 to 6000 rpm which is slower than the speed of F3 fast gear. It can adjust according to the demand.
F17	Retention parameter(0 - 65535)	Controller MCU Version Code, When the firmware change, this value will update accordingly;
F18	First acceleration(0 - 65535)	Accelerator Pedal First Apply Reponse Time, Initial acceleration, this parameter affects the reaction time of acceleration, whose adjustable range is 400-1000; The greater the value, the shorter the time for acceleration is. The speed can be adjusted according to the demand
F19	Secondary acceleration(0 - 65535)	Controller MCU Version Code, When the firmware change, this value will update accordingly;
F20	Reverse acceleration(0 - 65535)	Reverse acceleration, This parameter affects the reaction time of reverse acceleration, generally adjustable range is 400-1000; The greater the value, the faster the response is. It can be adjusted according to the demand
F21	Deceleration(0 - 65535)	Deceleration, This parameter affects the time when the speed drops from the fastest to zero after feeding the throttle, and the adjustable range is 200-1000; The greater the value, the faster the deceleration (that is, the time from fast

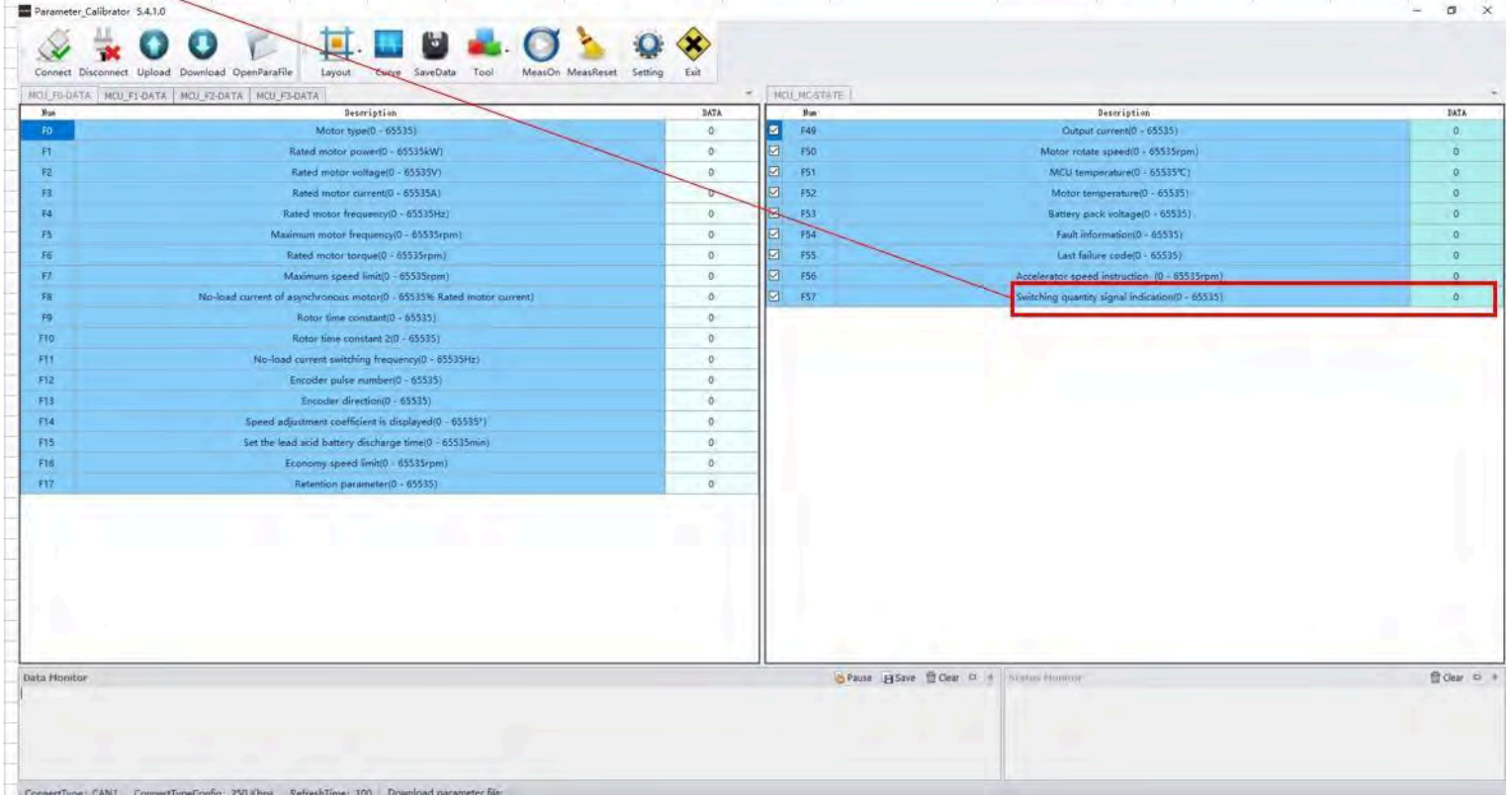
		to zero is about short). It can be adjusted according to the demand
F22	Brake deceleration(0 - 65535)	Invalid
F23	Speed ring KP(0 - 65535)	Speed ring KP：It can not be modified because it has been adjusted at the factory. After modification, the vehicle will be unable to climb the hill or run smoothly.
F24	Speed ring KI(0 - 65535)	Speed ring KI：It can not be modified because it has been adjusted at the factory. After modification, the vehicle will be unable to climb the hill or run smoothly.
F25	Brake start delay(0 - 65535ms)	EMB start delay, adjustable range: 0~1000ms: This parameter adjusts the start delay time of EMB. It has been adjusted before factory, and can not be modified. After modification, it will cause the drag brake and EMB wear
F26	Brake opening voltage(0 - 65535V)	EMB activation requires voltage. It can not be modified because it has been adjusted at the factory. After modification, the vehicle will be unable to climb the hill or run smoothly.
F27	Filter coefficient of measuring rotate speed(0 - 65535)	Filter coefficient of measuring rotate speed. The value has been adjusted at the factory which cannot be modified. Otherwise, the vehicle will fail to operate.
F28	Internal control parameters(0 - 65535)	The internal parameters of the controller can be changed when the vehicle running direction is reversed to change the U\V phase line, generally with F13 adjustment; Adjustable to "0" or "1"
F29	Battery SOC(0 - 65535%)	Invalid
F30	Reservation(0 - 65535%)	The start time of EMB is set before delivery. Modification is not allowed, otherwise, the life span of EMB will be shortened and brake drag will occur.
F31	The switch maintains the opening voltage(0 - 65535V)	The opening voltage is set before delivery. Modification is not allowed,

		otherwise, the life span of EMB will be shortened and brake drag will occur.
F32	Brake start speed(0 - 65535rpm）	This value is set before delivery. Modification is not allowed, otherwise, the life span of EMB will be shortened and brake drag will occur.
F33	Torque KP(0 - 65535）	Torque KP has been set before delivery, which can not be modified, otherwise the vehicle will fail to operate.
F34	Torque KI(0 - 65535）	Torque KI has been set before delivery, which can not be modified, otherwise the vehicle will fail to operate.
F35	Exciting KP(0 - 65535）	Exciting KP has been set before delivery, which can not be modified, otherwise the vehicle will fail to operate.
F36	Exciting KI(0 - 65535）	Exciting KI has been set before delivery, which can not be modified, otherwise the vehicle will fail to operate.
F37	Driving torque current limit(0 - 65535%）	Driving torque current limit. As the value increases, the horsepower can increase accordingly, namely acceleration. Its value can not be modified.
F38	Braking torque current limit(0 - 65535%）	Braking torque limit is used to set the braking force of the motor. The greater the value, the stronger the regenerative braking is.
F39	Voltage compensation coefficient(0 - 65535%）	This value is the calibration parameter between the collected voltage of the controller and the actual voltage, and cannot be modified. Otherwise, the collection of the controller will be inaccurate
F40	Current compensation coefficient(0 - 65535%）	This value is the calibration parameter between the collected voltage of the controller and the actual voltage, and cannot be modified. Otherwise, the collection of the controller will be inaccurate
F41	Undervoltage set point(0 - 65535V）	Set the controller under voltage alarm, when the whole carts' voltage reach to this settle value, the controller will have alarm signal.

		Incorrect setting will lead to the overdischarge of the battery or the reduction of the range
F42	Overvoltage set point(0 - 65535V）	Set the controller over voltage alarm, when the whole carts' voltage reach to this settle value, the controller will have alarm signal. Incorrect setting will lead to the protection of the vehicle during operation or the vehicle cannot run
F43	Manufacturer parameter 1(0 - 65535）	It can not be modified, otherwise the vehicle will fail to operate.
F44	Reservation(0 - 65535）	Invalid
F45	High speed drive torque current limitation(0 - 65535%）	High speed drive torque current limitation：it is used to protect motor. The value is optimized and should not be changed, otherwise the life span of motor will be shortened.
F46	Voltage of derating power dissipation(0 - 65535V）	Voltage of derating power dissipation：When the battery voltage reaches this value for 30 seconds, the controller reduces the power output to protect the battery and remind the customer to charge the battery
F47	Reservation(0 - 65535）	Low power consumption speed limit: Set the speed limit value for the controller/motor to reduce power consumption due to high temperature.
F48	Rotate speed limit of reversing(0 - 65535rpm）	Rotate speed limit of reversing: Set the running speed of reverse gear in sports mode. The larger the value, the faster the speed. The calculation method is the same as that of F7/F16.

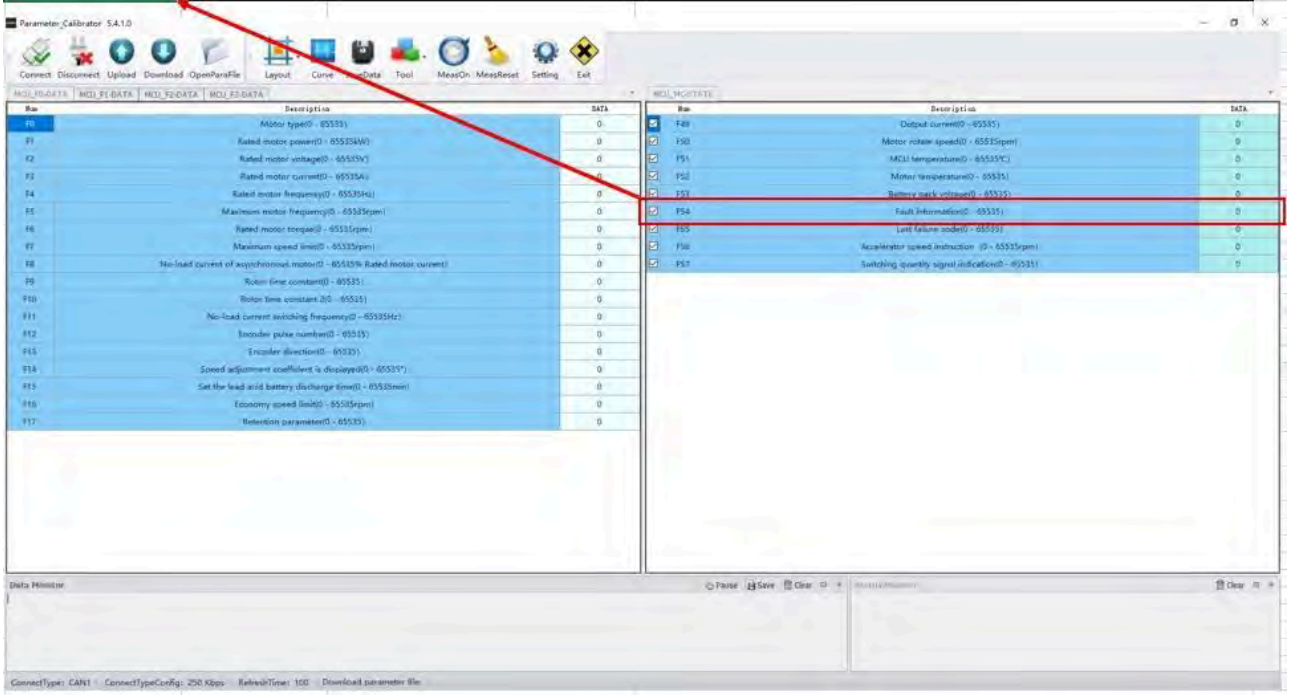
Appendix 3 Controller Switch Quantity (Quickly Find the Switch Working Status)（Using Software）

Value displayed on Software (decimal) (manual input)	Forward	Backward	Brake	At a low speed	Charging protection	Throttle signal	Anti backward sliding	Sport Mode
128	ON	OFF	OFF	OFF	NO CHARGIGN	OFF	OFF	ON



Appendix 4 Fault Indication（Quickly Find the Cause/Solution）（Using Software）

Fault code (manual selection)	Fault Name:	Fault Cause:	Solutions:
09	Undervoltage	1. Battery voltage too low 2. Battery rated voltage does not match the controller 3. Battery parameter setting error 4. The internal resistance of the battery is too high 5. Abnormal battery connection	1. Check battery pack voltage 2. Check single battery voltage 3. Check the battery connection line



Appendix 5 Speed Calculation (using software)

F7/F16 (Maximum speed limit/Economy speed limit)

Maximum Speed (Manual Input) (MPH)	Maximum Speed (Automatic Computation) (KM/H)	Tire Diameter (Manual Input) (M)	Rear Axle Speed Ratio (Manual Input)	Parameters of F7 (Automatic Computation)
25	40.2336	0.508	12.31	**5175**

F14(Speed adjustment coefficient is displayed)

Parameters of F14 (Manual Input)	GPS Test Speed (Manual Input) (KM/H)	Speed Displayed (Manual Input) (mph)	F14 parameter value to be modified to (Automatic Computation)
1370	20	15	**1827**

Appendix 6 Tire Calculation (Using Software)

Tire diameters auto caculation form

NO	Tire Type	Example					Auto Caculation			
		Tire Spec	Spec description	Outer Diameter of Tire(mm)	Width of Tire (mm)	Wheel Diameter (mm)	Tire Spec (Manual Input)	Outer Diameter of Tire(mm)	Width of Tire (mm)	Wheel Diameter (mm)
1	Diagonal Tire/ Bias Tire	20*09.0-12	20: Tire diameter (Inch) 9: Width of Tire (Inch) 12:Wheel Diameters (Inch)	508	228.6	304.8	23*09.0-10	584.2	228.6	254
2	Radial Tire	215-50-R12	215: Width of Tire (mm) 50: Flattening (Height/Width) (%) R12: Wheel Diameters (Inch)	519.8	215	304.8	220-50-R14	575.6	220	355.6

Noted:
1) This Tire spec input should exactly same as the sample input, even the comma should not miss;

2) The letter * - R should also follow the sample

Appendix 7 Fault Data Base

Fault code:	Fault Name:	Causes	Solutions
01	HPD Alarm	1. The starting gear switch is not operated in the required sequence; 2. Turn on the ignition key switch while stepping on the accelerator.	1. Correct operation sequence: the accelerator pedal is released, the gear switch is in neutral, the key is turned on, the gear is engaged, and the accelerator pedal is pressed; 2. Check whether the accelerator plug is connected in place and whether the terminal is loose
04	Controller Overheating	1. The controller temperature is too high; 2. The surrounding temperature is too high; 3. The car is overloaded.	1. Check whether there is too much dust or mud on the controller cooling plate, and clean the its surface; 2. After a short rest, the controller temperature drops below 85 ° and the key switch is restarted.
05	Power failure of main circuit	1. Main contactor fault; 2. B + terminal bolt is not tightened; 3. B + main fuse blown	1. Check whether the positive and negative bolts of the controller are tightened; 2. Check the fuse: measure the resistance of the fuse with a multimeter. It is normal if the resistance is close to or equal to 0 Ω. 3. If there is no problem in the above inspection, please replace the controller.
06	Current sampling circuit fault	1. Controller failure.	1. Restart the key switch; 2. Replace the controller.
07	Encoder fault / locked rotor fault	1. Motor stalling; 2. Encoder fault; 3. Motor wiring fault; 4. Encoder power supply is unstable.	1. Check whether the encoder plug is well connected and whether the terminal is deformed and loose; 2. Check whether the pin on the controller plug is deformed or has poor contact (the position number of the encoder wire plug of the controller: 26 (red), 7 positive and negative poles, 31, 32 (white and blue wires); 3. Check and measure whether there is open circuit in the harness from the controller end to the encoder plug; 4. Remove the red rubber cover of the plug, and pull several terminal elastic pieces of the encoder harness inward (all three sides are required). Be careful not to use too much force to avoid damaging the terminal and the rubber shell; 5. If the above processing is still invalid, please replace the encoder.

09	Undervoltage	1. Battery voltage too low 2. Battery rated voltage does not match the controller 3. Battery parameter setting error 4. The internal resistance of the battery is too high 5. Abnormal battery connection	1. Check battery pack voltage 2. Check single battery voltage 3. Check the battery connection line
10	Overvoltage	1. Battery voltage too high 2. Battery rated voltage does not match the controller 3. Battery parameter setting error 4. The internal resistance of the battery is too high 5. Abnormal battery connection	1. Check the voltage of the battery pack; 2. Check single battery voltage 3. Check the battery connection line
11	Motor overtemperature	Motor temperature too high Motor temperature threshold setting error The temperature sensor does not match the controller	1. Check the connecting wire of motor temperature sensor; 2. Check pin7 and pin8 of the controller
12	EEPROM	Controller internal fault	Replace the controller
13	Accelerator failure	Accelerator connection error; Poor accelerator connection; The accelerator does not match the controller; Accelerator failure;	1. Check the accelerator connector Standard: the rubber shell is firmly connected without looseness 2. Check the voltage between terminals Standard: When the accelerator is not pressed: 48V between orange and black; 0V between white and black; 0-0.5v between green, brown and black When stepping on the accelerator: 48V between orange and black; 48V between white and black; 0-4.65v between green, brown and black 3. Check pin9 and pin16 of the controller Standard: the rubber shell is firmly connected without looseness
15	EMB open / short circuit	Electromagnetic fault Poor connection EMB circuit short circuit	1. Check the EMB connector Standard: the rubber shell is firmly connected without looseness 2. Check the EMB Standard: the resistance value between the EMBs cannot be infinite. When it is infinite, it means that the internal coil of the EMB is open or the line is open 3. Check pin13 and Pin2 of the controller Standard: the rubber shell is firmly connected without looseness

23	Overcurrency	UVW has short circuit Motor failure	1. Check whether there is foreign matter or short circuit between the motor uvws Standard: the interval between UVW terminal blocks is good and there is no short-circuit foreign matter 2. Check whether there is foreign matter or short circuit between the controller UVW Standard: the interval between UVW terminal blocks is good and there is no short-circuit foreign matter

12. PERIODIC SERVICE SCHEDULE

12.1 Checking List

●The purpose of regular maintenance is to check for vehicle abnormalities and perform maintenance in a timely manner to eliminate driving hazards and extend the service life of the vehicle. Regular maintenance is divided into general maintenance and advanced maintenance.

▲General maintenance items ★Advanced maintenance items

PERIODIC SERVICE SHECHEDULE					
ITEMS	WEEKLY（20H）	MONTHLY（80H）	QUARTERLY (250H)	SEMI-ANNUAL（500H）	ANNUALY（1000H）
Check tire pressure	▲				
Check tire wear	▲				
Check the tightness of half-axle bolts and wheel nuts	▲				
Rotate tires			▲		
Check the effectiveness of driving and parking brakes		▲			

Check the wear of brake pads			▲		
Check the stroke and operation of the steering wheel			▲		
Check whether the rod ends of the steering gear are tight		▲			
Check the tightness of nuts of steering rack		▲			
Check the tightness of the steering mechanism and bracket		▲			
Check harness of front tire			▲		
Check the connection and tightness of the steering components			▲		
Check the tightness of the rear support arm U-bolts			▲		
Check the tightness of the front shock absorber			▲		
Check whether the battery pole is loose		▲			
Clean the battery pole with water		▲			

Check the operation of the controller and accelerator		▲			
Clean and fix the line connectors		▲			
Check the wear of the brake friction lining			▲		
Check whether the front wheel bearing is loose		▲			
Check and replace the rear axle gear grease		▲First month or after running-in period			★
Check the operation of the rear axle main reducer and bearings		▲First month or after running-in period			★
Check whether the bolts and nuts of the motor are loose			▲		
Clean and lubricate the front wheel bearing (with gear lubricant)					★
Check EMB			▲		
Lubricate other parts				★	

12.2 Maintenance Operation Guidelines

● Before operation, disconnect the power supply and remove the key.

● For underbody operation, please use a jack and block the front and rear wheels with a wedge to prevent the vehicle from sliding during maintenance.

● The maintenance site shall be clean and safe.

● Please start the vehicle according to the safety operation rules.

● The workplace shall be free from sparks and equipped with fire protection equipment. Do not use open flame to detect the battery. Do not use open fuel or flammable liquid to clean the parts so as to prevent fire.

● Keep the workplace properly ventilated.

● Carry out routine inspection and maintenance. Operation should conduct on brake, steering system, warning device, controller, safety protection device, etc.

● Repair the battery cover accordingly.

● Keep the vehicle clean, avoid sparks, and facilitate the inspection of loose and defective parts

● Every 3000KM range or 90 days of use, the front wheel inclination shall be maintained in time.

12.3 Steering System Maintenance

● Check whether the dust cover of each rod joint is cracked. The cracked dust cover is easy to get water and dust, which will cause joint ball wear and inflexible steering. If cracks are found, replace the dust cover immediately;

● Check that the front wheel toe should be 0-3mm. If it exceeds the parameter, adjust the rod screw.

12.4 Motor Maintenance

This electric vehicle uses an AC traction motor as the driving power, and uses a precise electronic controller to logically control the motor working conditions, so that the motor has excellent traction characteristics. As the power output device of the electric vehicle, the performance of the drive motor directly affects the use of the entire vehicle. The drive motor should be maintained on time, the motor surface should be kept clean, and the moisture formed by climatic factors should be removed in time to ensure its heat dissipation during operation.

Regular maintenance and maintenance can be carried out through the following items and the "Regular Inspection and Maintenance List"

● Check whether the motor terminal is firmly fixed;

● Check whether the motor connection line is deformed or discolored;

● Check the motor encoding line. The electromagnetic brake lead wire is intact and firmly fixed;

● Check whether the electromagnetic brake and dust cover are intact, and whether the dust cover completely seals the gap of the electromagnetic brake.

12.5 Lubrication and Maintenance

● Check the fluid once a month and refuel it in time (lack of oil will affect driving safety).

● The lubricant should be applied on front wheel hubs, front wheel bearings, brake pedal and steering system shall be refilled once a year. Oil type: 3 # general lithium base grease.

● Replace the gear grease of the rear axle once a year. Users can select grease with different viscosity levels according to the local climate.

GL-5 90 (summer)

GL-5 80W/90 (- 35 ℃ or winter)

When replacing, first unscrew the drain plug, drain the gear oil, add new gear oil from the filling hole, then clean the drain plug and retighten it with a tightening torque of 80N.m.