SOLANA

Owner's Manual

# VALLEY 40X

## LITHIUM




https://solanaev.com/

# OWNER’S MANUAL

**WARNING**

Before operating this vehicle, carefully read this manual and any owner’s manual supplements.

**THIS VEHICLE IS NOT INTENDED FOR USE ON RENTAL TRACKS OR FOR RACING.**

**OFF-ROAD USE ONLY. THIS VEHICLE IS NOT A LOW-SPEED VEHICLE (LSV) AND MUST NOT BE OPERATED ON PUBLIC STREETS, ROADS, OR HIGHWAYS.**

## SOLANA VALLEY 40X Electric Golf Cart

**For off-road use only. Not for use on public streets, roads, or highways.**

**Before operating this vehicle, the owner and anyone permitted to operate the vehicle must read and understand all instructions for safe operation of the vehicle, as specified in this owner’s manual.**

SOLANA

Solana EV, LLC
Carrollton, TX 75006, United States
Phone: +1 972-268-6160
Email: support@solanaev.com

**NOTE:**

Please keep this manual in a safe place so that it is easily accessible and can be found and referenced when needed.

# CONTENTS

1. Introduction ..... 6
1.1 Important Safety Notices ..... 7
1.2 Operating Procedures ..... 9
1.3 Safe Operating Procedures ..... 14
Turning ..... 14
Climbing Hills ..... 14
Descending Hills ..... 14
Traveling Across a Slope ..... 14
If the Vehicle Stops or Rolls Backward on a Hill ..... 15
Driving Over Obstacles ..... 15
Driving in Reverse ..... 15
Slippery Surfaces ..... 15
Driving Through Water ..... 15
Carrying Cargo ..... 15
Pulling a Trailer ..... 16
Parking ..... 16
2. Understanding Safety Warnings ..... 17
2.1 Safety Alert Symbols ..... 18
3. Vehicle Warning Decals ..... 19
4. Vehicle Safety Alerts ..... 21
5. Vehicle Identification Number (VIN) ..... 31
6. Vehicle Display ..... 32
6.1 Instrument Panel ..... 32
Instrument Panel Feature Diagram ..... 32
Multimedia Menu ..... 33
7. Vehicle Controls & Parts ..... 34
7.1 Instrument Panel Switches ..... 34

1. Gear switch ..... 34
2. START/STOP Button ..... 34
3. Hazard warning switch ..... 35
4. USB Charging Port ..... 35
7.2 Steering Column ..... 35
Turn Signal Combination Switch ..... 36
7.3 Pedals ..... 37
Accelerator & Brake Pedals ..... 37
7.4 Seat belts ..... 38
Proper Use of the Seat belt ..... 38
7.5 Trailer Hitch Receiver Bracket (Optional) ..... 39
7.6 Warning Buzzer and Pedestrian Alert System ..... 39
7.7 Regenerative Braking ..... 40
8. Safety Gear ..... 41
8.1 Helmets ..... 41
8.2 Eye Protection ..... 41
8.3 Gloves ..... 41
8.4 Boots ..... 41
8.5 Clothing ..... 41
9. Battery ..... 42
9.1 Examining the Batteries ..... 42
9.2 Avoiding Short Circuits ..... 42
9.3 Charging ..... 43
9.4 Lithium-ion (LiFePO4) Battery ..... 44
10. Maintenance ..... 46
10.1 Pre-ride Inspection ..... 46
10.2 Periodic Maintenance ..... 49
10.3 Periodic Maintenance Schedule ..... 50
10.4 Lubrication Recommendations ..... 52
10.5 Periodic Maintenance Record ..... 53

10.6 Maintenance Specifications ..... 56
Torque Specifications for Lug Nuts ..... 56
Steering ..... 56
10.7 Camber and Caster ..... 57
10.8 Toe Alignment Check ..... 57
10.9 EM Braking ..... 58
Front Brakes ..... 60
Rear Brakes ..... 60
Parking Brake ..... 60
10.10 Storage ..... 61
11. Cleaning the Vehicle ..... 62
11.1 Exterior Body Panels ..... 62
11.2 Seats and Floorboard ..... 62
11.3 Windshield and Lights ..... 62
11.4 Wheels and Tires ..... 63
11.5 Front Basket ..... 63
11.6 Under-Seat Compartments ..... 63
12. Transporting the Vehicle ..... 64
12.1 Strap Down the Roof ..... 64
12.2 Protect the Windshield ..... 64
13. Troubleshooting ..... 65
13.1 Contacting an Authorized Dealer or Service Center ..... 65
13.2 Symptoms and Possible Causes ..... 65
Symptom: Alarm sounds and the vehicle will not drive ..... 65
Symptom: Vehicle won’t move ..... 66
Symptom: Poor charging performance ..... 67
Symptom: Poor braking ..... 67
Operating performance issues ..... 67
13.3 Fault Codes ..... 68
14. Vehicle Specifications ..... 71

# 1. Introduction

Congratulations on the purchase of your SOLANA VALLEY 40X Electric Golf Cart. We take pride in offering you a product that is engineered and manufactured to the highest performance and quality standards. We are certain that you will enjoy its superior levels of performance, reliability, riding comfort, and safety.

This manual is provided to help owners and drivers become familiar with the operation of this vehicle and with its many features. This manual also covers information on the care and maintenance of your vehicle.

Please read this manual carefully. The information contained in this owner’s manual, and the warning labels on the vehicle will help you to understand the safe use and maintenance of your vehicle. Make sure that you understand and follow all warnings and instructions.

If you did not receive this owner’s manual, or if any warning label on the vehicle is missing or illegible, please contact your dealer to request a replacement.

Product features and specifications are subject to change without notice.

This vehicle is intended for off-road use only. It must not be operated on public streets, roads, or highways. Read Section 1.1 Important Safety Notices before operating this vehicle.

For customer service, please email support@solanaev.com

## 1.1 Important Safety Notices

| | |
|---|---|
| **WARNING** | OFF-ROAD USE ONLY. This vehicle is not a Low-Speed Vehicle (LSV) and is not designed, equipped, or certified for use on public streets, roads, or highways. Operating this vehicle on public roads could result in a collision with other motor vehicles, causing serious injury or death. |

This vehicle is designed and manufactured for off-road use only. It is not a Low-Speed Vehicle (LSV) as defined in 49 CFR 571.3, it is not certified to comply with the Federal Motor Vehicle Safety Standards (FMVSS), including FMVSS No. 500, and it is not designed or equipped for use on public streets, roads, or highways.

DO NOT operate this vehicle on any public street, road, or highway, and do not use it to travel between off-road locations by way of a public road. Even where a state or local law may allow golf carts on certain roads, this vehicle is not designed for such use, and SOLANA does not authorize it. Any operator who uses this vehicle on a public road does so at their own risk.

The headlights, turn signals, horn, mirrors, windshield, and seat belts on this vehicle are provided for safety and convenience during off-road use. Their presence does not make this vehicle suitable for, or compliant with the requirements for, operation on public roads.

Approved operating areas include golf courses, private property, and private communities, trails, and facilities where operation of this type of vehicle is permitted, with the permission of the property owner.

Consult applicable laws and regulations before choosing a location to operate this vehicle. Do not operate this vehicle on public lands where vehicles of this type are prohibited.

**DO NOT** modify the motor, drive system, mechanical or electrical systems of this vehicle. **DO NOT** install aftermarket parts or accessories intended to increase the speed or power of this vehicle.

Failure to follow these warnings will void the warranty on this vehicle and could result in DEATH or SERIOUS INJURY. SOLANA is not responsible for injury, death, or property damage resulting from operation of this vehicle on public roads, from failure to follow the instructions and warnings in this manual and on the vehicle labels, or from unauthorized modifications or accessories.

The addition and use of certain accessories including, but not limited to, mowers, blades, sprayers, winches and windshields will change the handling characteristics and the performance of this vehicle.

**Practice Responsible Vehicle Operation**

Ensure that you understand and comply with all applicable local, state, provincial, and federal laws and requirements.

Remember to respect your vehicle, respect the environment, and respect the property of others. When operating this vehicle, you are responsible for your own safety and the safety of others around you.

**The SOLANA VALLEY 40X Electric Golf Cart can be hazardous to operate.**

This vehicle handles differently from other vehicles such as cars, motorcycles, and ATVs. If proper precautions are not taken, rollover can occur even during routine maneuvers such as turning, driving on a hill, or driving over an obstacle.



**WARNING**

California Proposition 65: This product can expose you to chemicals including lead and Di(2-ethylhexyl)phthalate (DEHP), which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.

## 1.2 Operating Procedures



**WARNING** Ignoring the following instructions could result in serious injury or death.

Ensure that all drivers carefully read this owner’s manual and all product labels and follow the operating procedures.

1. This vehicle is for off-road use only. Never operate it on public streets, roads, or highways, or anywhere it may encounter other motor vehicle traffic.

2. This vehicle is designed to carry a maximum of 1 driver and 3 passengers. Do not operate this vehicle with more than 3 passengers, and never carry more people than there are seating positions.

3. The driver and all passengers **must** wear seat belts while the vehicle is in motion.

4. All drivers must be at least 18 years of age and hold a valid driver’s license. Never allow children to operate this vehicle.

5. Before permitting a guest to operate this vehicle, ensure that the guest has read this owner’s manual and all product labels.

6. For their own personal safety, the driver and all passengers should wear eye protection. When operating on rough or unpaved terrain, a properly fitting helmet that meets U.S. Department of Transportation (DOT) standards, gloves, boots, a long-sleeved shirt or jacket, and long pants are also recommended. See Chapter 8 Safety Gear.

7. There is a risk of rollover under certain conditions. The risk of rollover can be increased by uneven terrain or slopes that pitch the vehicle sideways, by turning too fast or sharply, or by a combination of these conditions.

8. Persons inside the vehicle while it is rolling over **must** keep their arms and legs inside the vehicle and **must not** attempt to use their arms or legs to stop the

vehicle from rolling over, as doing so could lead to serious injury. Hands, arms, legs, and feet can easily be crushed by the vehicle. Arms and legs must be kept inside the vehicle until it comes to a complete stop.

9. The driver must not consume alcohol or drugs before or while operating this vehicle, and must not operate the vehicle when tired, ill, or taking any medication that may impair judgment, vision, or reaction time.

10. **Do not** drive this vehicle at excessive speeds. The driver must always operate the vehicle at a speed that is suitable for their level of experience, the terrain, visibility and operating conditions.

11. **Do not** attempt wheelies, jumps or any other stunts with this vehicle.

12. Drivers **must** always conduct a pre-ride inspection on the vehicle to make sure it is in safe operating condition. Make sure to follow the maintenance schedule, and the inspection and maintenance procedures described in this manual.

13. Keep hands, arms, feet, and legs inside the vehicle and feet on the floorboard **at all times** while the vehicle is in motion. Use the grab handle inside the vehicle when necessary. **Do not** hold onto the exterior of the vehicle. Hands holding onto the exterior of the vehicle can easily be crushed between the vehicle and an outside obstruction.

14. Drivers **must** keep both hands on the steering wheel when driving.

15. Drivers **must not** wrap their thumbs around the steering wheel. The steering wheel should be held with thumbs pointing up. This is particularly important when driving in rough terrain, as the front wheels will travel side to side as they respond to the terrain, and this movement will be felt in the steering wheel. A sudden jolt could wrench the steering wheel, and serious injury could occur.

16. When operating this vehicle on unfamiliar terrain, drivers **must** operate the vehicle slowly and exercise extra caution.

17. Stay aware of changing terrain conditions when operating this vehicle. **Do not** operate this vehicle on excessively rough, slippery or loose terrain.

18. Drivers must follow proper turning procedures as described in Section 1.3. Practice turning at low speeds before attempting to turn at higher speeds. **Do not** attempt to turn at excessive speeds.

19. If this vehicle is involved in an accident, it **must** be inspected and serviced by an authorized dealer.

20. **Do not** operate this vehicle on hills that exceed the driver's ability to navigate or are too steep for the vehicle. Practice on smaller hills before attempting to operate this vehicle on larger hills.

21. Drivers **must** follow proper procedures for climbing hills as described in Section 1.3. **Always** check the terrain carefully before attempting to ascend any hill. **Do not** attempt to ascend hills that have excessively slippery or loose surfaces. **Do not accelerate suddenly, and never shift between D and R while the vehicle is moving. Do not** drive over the top of any hill at high speeds.

22. Drivers **must** follow proper procedures for descending and braking on hills, as described in Section 1.3. Check the terrain carefully before descending any hill. **Do not** descend hills at high speed or at an angle which would cause the vehicle to lean sharply to one side. When possible, go straight down the hill.

23. Drivers **must** follow proper procedures for traveling across the side of a hill, as described in Section 1.3. Avoid hills with excessively slippery or loose surfaces. While on a hill, **do not** attempt to turn this vehicle around. When possible, avoid traveling across the side of a steep hill.

24. If the vehicle stops or begins to roll backward while climbing a hill, follow the procedure described in Section 1.3. To avoid losing momentum, maintain a steady speed when ascending.

25. Drivers **must** always check for obstacles before operating on new terrain. **Do not** attempt to drive over large obstacles, such as large rocks or fallen trees. Drivers **must** follow proper procedures when driving over obstacles, as described in Section 1.3.

26. Drivers **must** take precautions to avoid skidding or sliding. On slippery surfaces, such as ice, operate the vehicle slowly and cautiously in order to reduce the chance of skidding or sliding.

27. Avoid driving through water. Never drive through fast-flowing water or water deep enough to reach the motor, controller, battery, or any other electrical component. If you must cross shallow water, drive slowly and steadily, and do not make sudden turns, stops, or changes in speed.

28. Wet brakes may have reduced stopping ability. Brakes **must** be tested after leaving water. If necessary, apply the brakes lightly several times to allow friction to dry out the brake pads.

29. Drivers **must** ensure that there are no obstacles or people behind the vehicle when driving in reverse. When it is safe to drive in reverse, drive slowly. Avoid turning at sharp angles while driving in reverse.

30. This vehicle **must** be equipped with the proper size and type of tires specified in this manual. Always maintain proper tire pressure, as listed in Vehicle Specifications.

31. Vehicle accessories **must** be installed properly. **Do not** attempt to use this vehicle with accessories that are installed or used improperly.

32. Do not exceed the load capacity of the vehicle listed in Vehicle Specifications. Cargo should be distributed evenly from side to side and secured so that it cannot move during operation. Reduce speed, allow greater distance for braking, and follow the instructions in Section 1.3 for carrying cargo or pulling a trailer.

33. All occupants must remain seated with their backs against the seat back while the vehicle is moving. Never stand in the vehicle or ride on the cargo area, rear footrest, roof, bumpers, or sides of the vehicle.

34. Passengers on the rear seat must hold the grab handle and keep their feet on the footrest at all times.

35. Children may ride only if they can sit fully back in the seat with their feet on the floor, wear the seat belt properly, and hold the grab handle, and only under adult supervision. Never leave children unattended in the vehicle.

36. The roof is not a rollover protective structure (ROPS) and will not protect occupants in a rollover. The windshield will not protect occupants from flying objects or in a collision.

37. Do not use a phone, text, or operate the multimedia display while driving. Stop the vehicle in a safe location before using these features.

38. Always yield to pedestrians. Drive slowly and with extra caution around pedestrians, buildings, golf course hazards, parking areas, blind corners, and paths with limited visibility.

39. Do not operate the vehicle at night or in conditions of poor visibility unless the headlights and taillights are on and working properly. Reduce speed accordingly.

40. Do not operate the vehicle during thunderstorms or lightning. The vehicle does not provide protection from lightning.

41. Come to a complete stop before shifting between D, N, and R.

42. Before leaving the vehicle, stop on level ground, select N, turn the vehicle off with the START/STOP button, and take the key fob (if equipped) with you so that the vehicle cannot be operated by unauthorized persons or children.

43. Do not use this vehicle to push or tow other vehicles. Do not tow this vehicle behind another vehicle; transport it on a trailer as described in Chapter 12.

44. Do not carry flammable or explosive materials in or on the vehicle.

45. Do not operate the vehicle with any seat, body panel, guard, or cover removed.

## 1.3 Safe Operating Procedures

The following procedures apply to the operating rules in Section 1.2 and the safety alerts in Chapter 4. Practice these procedures at low speed in an open, level area before operating on hills, rough terrain, or unfamiliar ground.

### Turning

- Slow down before entering a turn. Never turn sharply at speed.
- Avoid turning on hills or on uneven ground whenever possible.
- Keep both hands on the steering wheel and make sure all occupants are seated and holding on.

### Climbing Hills

- Check the terrain carefully before climbing. Avoid hills with slippery or loose surfaces.
- Avoid slopes steeper than 20% (11°). Never climb a hill that is too steep for the vehicle or for your skill level.
- Drive straight up the hill at a steady speed. Do not accelerate suddenly.
- Slow down near the top of a hill and be prepared for obstacles, people, or a drop-off on the other side.

### Descending Hills

- Drive straight down the hill at a slow speed. Do not descend at an angle that causes the vehicle to lean to one side.
- Use the brake pedal to control speed. Regenerative braking alone cannot hold speed on steep grades or when the battery is fully charged (see Section 7.7).
- Avoid sudden braking or turning while going downhill.

### Traveling Across a Slope

- Avoid traveling across the side of a hill whenever possible. Never turn around on a hill.

- If you must cross a slope, drive slowly, keep the vehicle level as much as possible, and have all occupants lean toward the uphill side.

### If the Vehicle Stops or Rolls Backward on a Hill

- Release the accelerator pedal and apply the brake pedal firmly to stop the vehicle.
- Do not attempt to turn the vehicle around. With the brake applied, select R and slowly back straight down the hill, using the brake to control speed.
- Never get out of the vehicle on the downhill side.

### Driving Over Obstacles

- Check for obstacles before driving in a new area. Avoid large obstacles such as rocks, curbs, logs, and holes.
- If an obstacle cannot be avoided, approach it slowly and straight on, and make sure all occupants are seated and holding on.

### Driving in Reverse

- Stop completely before selecting R. Check that no people or obstacles are behind the vehicle; use the backup camera and look behind you.
- Reverse slowly and avoid sharp turns while reversing.

### Slippery Surfaces

- On wet grass, mud, gravel, sand, ice, or snow, reduce speed, increase braking distance, and avoid sudden steering, acceleration, or braking.

### Driving Through Water

- Avoid driving through water. Never enter fast-flowing water or water that could reach the motor, controller, battery, or other electrical components.
- After leaving water, test the brakes and apply them lightly several times to dry them out.

### Carrying Cargo

- Never exceed the load capacity listed in Vehicle Specifications. The total load includes the driver, passengers, cargo, and accessories.

- Distribute cargo evenly, keep it low, and secure it so it cannot shift. Do not carry cargo that blocks the driver’s view.
- Reduce speed and allow extra braking distance when carrying cargo.

**Pulling a Trailer**

- Use only the optional SOLANA trailer hitch receiver bracket, and never exceed the towing capacity listed in Vehicle Specifications or the rating of the hitch or trailer, whichever is lower.
- Never allow anyone to ride on a trailer. Drive slowly, allow extra braking distance, and avoid hills and sharp turns when towing.

**Parking**

- Park on level ground away from traffic areas. Avoid parking on hills. If you must park on a slope, park across the slope and block the wheels.
- Select N, turn the vehicle off with the START/STOP button, and take the key fob (if equipped) with you.

# 2. Understanding Safety Warnings

ATTENTION:

This vehicle is intended for off-road use only, and only for use by adults. This vehicle is not a toy.

**READ AND UNDERSTAND THE OWNER’S MANUAL AND ALL WARNINGS BEFORE ATTEMPTING TO OPERATE THIS VEHICLE.**



**WARNING** Drivers must ensure that they fully understand this vehicle before attempting to operate it.

Drivers **must** read this manual thoroughly and reference the parts of the vehicle that are under discussion in each section. Operating this vehicle carries a responsibility for ensuring your own personal safety, the safety of others, and the protection of our environment.

**NOTE:** Illustrations used in this manual are intended for reference only. Features on the vehicle are subject to change at any time without notice.

## 2.1 Safety Alert Symbols

Safety alerts identify special instructions or procedures which, if not correctly followed, could result in personal injury or loss of life. In order to remain safe, owners and drivers must read all safety alerts in this manual carefully.



This is the safety alert symbol. When this symbol is present on the vehicle or in this owner's manual, it signals the potential for personal injury. **Pay attention. Your safety and the safety of others is at stake.**

"WARNING" indicates a potential hazard that could result in serious injury or death:



**WARNING**

"CAUTION" indicates a potential hazard that could result in minor personal injury or damage to the vehicle:



**CAUTION**

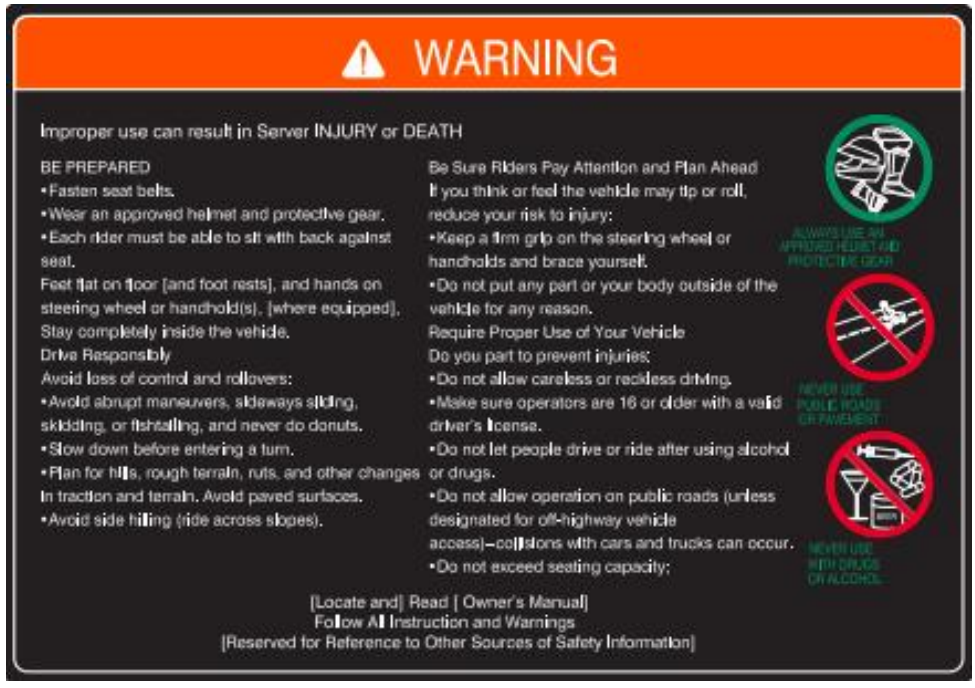
**NOTE:** In this owner's manual, the word "NOTE" highlights key information and instructions.

**NOTE:** Warning decals have been placed on the vehicle for your protection. Read and follow the instructions on each decal carefully. In the event any decal becomes illegible or becomes detached from the vehicle, contact your dealer to order a replacement.

# 3. Vehicle Warning Decals

Below are the warning decals that have been affixed to this vehicle.

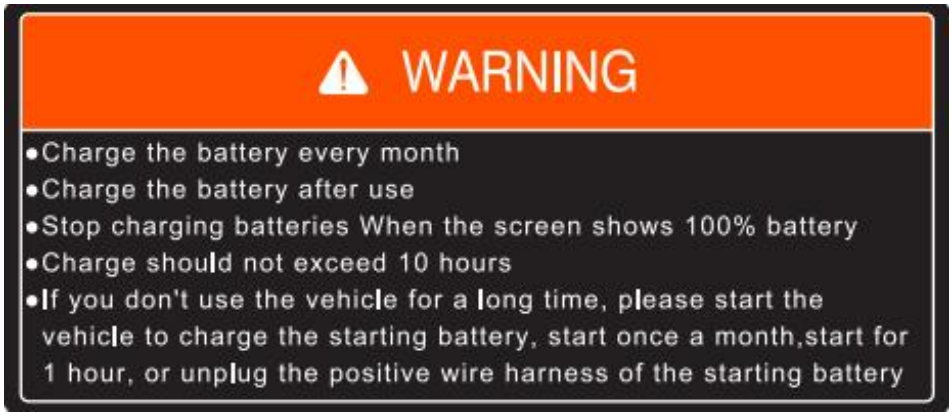
**1.**




**2.**



**3.**


WARNING
•Charge the battery every month
•Charge the battery after use
•Stop charging batteries When the screen shows 100% battery
•Charge should not exceed 10 hours
•If you don't use the vehicle for a long time, please start the vehicle to charge the starting battery, start once a month,start for 1 hour, or unplug the positive wire harness of the starting battery

**4.**


OPERATING INSTRUCTIONS
• Read owner's manual and dash-mounted safety warnings prior to driving.
• Study and understand controls.
TO OPERATE
• Turn wheels to desired direction and ensure path is clear.
• Press the START/STOP button once to activate the vehicle system.
• While stopped, place Forward/Reverse switch in desired position:
D-Drive N-Neutral R-Reverse(Buzzer will sound)
• Press accelerator pedal to release parking brake.
• Slowly press accelerator pedal to increase speed.
• To stop, release accelerator pedal and press brake pedal.
BEFORE LEAVING
• Press parking brake pedal until it locks and holds vehicle.
• Place Forward/Reverse switch in NEUTRAL position.
• Press the START/STOP button once to turn off the power.
MOTOR BRAKING
• Electric motor braking provides speed regulation functions.
• Apply brakes to control vehicle speed as required.
• System is activated only when switch is in the DRIVE position.
• When towing this vehicle, switch must be in the MANUAL EMB position.

# 4. Vehicle Safety Alerts

The following vehicle safety alerts address many common issues that may arise during the operation and maintenance of this vehicle. Ensure that all drivers read and understand these alerts before attempting to operate the vehicle. Failure to do so could potentially result in serious injury or death.

1.

| | |
|---|---|
| **WARNING** | After a rollover or accident, this vehicle must be inspected and serviced by an authorized dealership or service center. |

2.

| | |
|---|---|
| **WARNING** | Operating this vehicle requires strong judgement and physical skills. Persons with cognitive or physical disabilities who operate the vehicle are at increased risk of overturning or losing control of the vehicle, which could result in serious injury or death. |

3.

| | |
|---|---|
| **WARNING** | Do not plug in or unplug electrical components while the vehicle is turned on. Failure to follow this instruction could result in serious injury or death. |

Installing or removing electrical components while the vehicle is turned on can cause

poor contact or an arc fault, which may cause signal interference or damage to the electrical components or cause the driver to lose control of the vehicle, which could result in serious injury or death.

4.

| | |
|---|---|
| **WARNING** | Washing the vehicle with a large amount of water or using a wet cloth to clean electrical components or batteries could result in serious injury or death. |

Excessive water droplets on electrical components could cause short circuits, burn electrical circuits or components, cause fire or leakages, or cause other issues that could result in serious injury or death. A hose on shower setting using residential water pressure may be used on the exterior of the vehicle. Do not open the battery compartment while washing the vehicle or attempt to wash or rinse the battery or the inside of the battery compartment.

5.

| | |
|---|---|
| **WARNING** | Driving a vehicle with a malfunctioning accelerator pedal could result in accident or injury. |

A malfunctioning accelerator pedal may become difficult to operate, affecting the driver’s ability to speed up or slow down when necessary, and could lead to an accident or injury. Drivers must always check the operation of the accelerator pedal before turning on the vehicle. If the accelerator pedal is not working smoothly, correct the issue before operating the vehicle. If you are unable to locate or solve the problem on your own, contact an authorized dealer or service center for assistance.

6.

| | |
|---|---|
| **WARNING** | Failure to wear a seat belt or failure to wear the seat belt properly could result in serious injury or death. |

Always ensure that the driver and all passengers wear their seat belt properly when riding in the vehicle. A properly fitting seat belt is close fitting across the hips and chest and is latched securely. In the event of an accident, failure to wear a seat belt or failure to wear the seat belt properly increases the risk of serious injury and death.

7.



**WARNING** Attempting to stop the vehicle from rolling over could result in serious injury.

This vehicle is at risk of rollover in certain conditions. Uneven terrain or slopes that pitch the vehicle sideways, turning too fast or too sharply, or a combination of these conditions, can increase the risk of vehicle rollover. If the vehicle is tipping, do not attempt to put your arms or legs outside the vehicle or try to use your arms or legs to stop the vehicle from tipping over. Doing so could lead to crushed hands, feet, arms, or legs, or other serious injury. All occupants must keep their arms and legs inside the vehicle until it stops moving.

8.



**WARNING** Attempting to drive the vehicle with malfunctioning brakes could result in accident or injury.

Always check the brakes before operating the vehicle. Do not attempt to operate a vehicle that has brakes that are functioning improperly. If the brake function cannot be corrected using the adjustment procedures provided in this owner’s manual, the vehicle must be inspected and serviced by an authorized dealer or service center.

9.



**WARNING** Operating the vehicle without being familiar with all controls could lead to a loss of control, resulting in accident or injury.

Read the owner’s manual carefully. If there is any aspect of the vehicle or vehicle operation that you do not understand, please contact an authorized dealer or SOLANA customer service.

10.

**WARNING** Improper charging could result in serious injury.

Charge the battery using the supplied charging cable. Disconnect the power supply when the charging indicator turns green or the display shows that the battery has reached 100%. If the charging indicator, charging socket, or charging cable are faulty and will not charge the vehicle battery, please contact an authorized dealer or service center.

11.

**WARNING** Improperly installed accessories and improper modifications can change the way this vehicle handles, which could lead to an accident.

Do not attempt to operate this vehicle if it has improperly installed accessories or improper modifications. All parts and accessories on this vehicle must be genuine parts or equivalent components specifically intended for use on this vehicle and must be installed and used according to manufacturer instructions. If you have any questions, please contact an authorized dealer or service center.

12.

| | |
|---|---|
| **WARNING** | Operating or riding in this vehicle on rough or unpaved terrain without a helmet, eye protection, and protective clothing increases the risk of serious injury or death. |

Solana recommends that the driver and all passengers wear eye protection at all times and, when operating on rough or unpaved terrain, a properly fitting DOT-compliant helmet, gloves, boots, a long-sleeved shirt or jacket, and long pants. A helmet can help prevent severe head injury in the event of an accident.

13.

| | |
|---|---|
| **WARNING** | Consuming drugs or alcohol before or while operating this vehicle could result in serious injury or death. |

Never consume drugs or alcohol before or while operating this vehicle. Drugs and alcohol can seriously affect the driver’s judgement, slow their reaction time, affect their balance and perception, and could result in an accident.

14.

| | |
|---|---|
| **WARNING** | Operating this vehicle at excessive speeds increases the chance of losing control of the vehicle and could result in an accident. |

Always travel at a speed that is suitable for your level of experience, the terrain, visibility, and operating conditions.

15.

| | |
|---|---|
| **WARNING** | Failure to properly maintain the vehicle or inspect the vehicle before operation increases the possibility of vehicle damage and accidents. |

Always follow the procedures and schedules for inspection and maintenance that are described in this owner’s manual. Always inspect the vehicle before operation to ensure that it is in safe operating condition.

16.

| | |
|---|---|
| **WARNING** | Removing your hands from the steering wheel or placing any part of your body outside the vehicle during operation can result in accident or injury. |

Removing even one hand from the steering wheel can reduce the driver’s ability to control the vehicle. Placing an arm or leg outside the vehicle could cause the occupant to lose their balance and fall out of the vehicle, or to be struck by an obstacle. Always keep both hands on the steering wheel and keep your feet inside the vehicle during operation.

17.

| | |
|---|---|
| **WARNING** | Failure to use extra caution when operating this vehicle on unfamiliar terrain can cause the vehicle to overturn or cause the driver to lose control. |

When operating the vehicle on unfamiliar terrain, go slowly and exercise caution. It is easy to encounter hidden rocks, bumps, or holes without enough time to properly react. Always be aware of changing terrain conditions when operating the vehicle.

18.

| | |
|---|---|
| **WARNING** | Turning the vehicle improperly may cause the driver to lose control of the vehicle, which could result in accident or injury. |

Always follow proper turning procedures, as described in Section 1.3. Practice turning at low speed before attempting to turn at higher speeds. Do not turn the vehicle at excessive speeds.

19.

| | |
|---|---|
| **WARNING** | Improperly operating the vehicle over obstacles could cause a loss of control, collision, or cause the vehicle to overturn. |

Check for any obstacles before operating the vehicle in a new area. Do not attempt to drive this vehicle over large obstacles, such as large rocks or fallen trees. If you are unable to avoid an obstacle, always follow the proper procedures as described in Section 1.3.

20.

| | |
|---|---|
| **WARNING** | Skidding or sliding on slippery surfaces may cause the driver to lose control of the vehicle. While sliding or skidding, the vehicle may suddenly regain traction, which can cause the vehicle to overturn. |

On slippery surfaces, such as ice, go slowly and be very cautious in order to reduce the chance of skidding or sliding out of control. While skidding or sliding, the vehicle may suddenly regain traction, which can cause the vehicle to overturn and could result in serious injury or death.

21.

| | |
|---|---|
| **WARNING** | Operating this vehicle through deep or fast-flowing water could result in accident or injury. |

Never operate the vehicle in fast-flowing water or in water deep enough to reach the motor, controller, battery, or any other electrical component. Water can cause a loss of traction and control, and can damage electrical components. If you cannot avoid shallow water, go slowly, avoid sudden movements, and maintain a slow and steady drive motion. Do not make sudden turns or stops, and do not accelerate suddenly.

**NOTE:** Wet brakes have reduced stopping ability. Always test your brakes after leaving the water and, if necessary, apply the brakes lightly several times to allow friction to dry out the brake pads.

22.

| | |
|---|---|
| **WARNING** | Use of improper tires or tires that have improper or uneven tire pressure could cause a loss of control and increase the risk of an accident. |

Always use the size and type of tires that are listed in Vehicle Specifications. Before operating the vehicle, ensure that the tires are inflated to the pressure listed in Vehicle Specifications. Never exceed the maximum pressure shown on the tire sidewall. When seating the tire beads, use only the pressure specified on the sidewall of the tire. Inflate the tires slowly and carefully, as rapid inflation or over-inflation could cause the tire to burst.

23.

| | |
|---|---|
| **WARNING** | OFF-ROAD USE ONLY. This vehicle is not a Low-Speed Vehicle (LSV) and is not designed, equipped, or certified for use on public streets, roads, or highways. Operating on public roads could result in a collision causing serious injury or death. |

Never operate this vehicle on public streets, roads, or highways. This vehicle does not meet the Federal Motor Vehicle Safety Standards for road vehicles and provides limited protection in a collision with another motor vehicle.

24.

| | |
|---|---|
| **WARNING** | The roof is not a rollover protective structure (ROPS). |

The roof and its supports are designed to provide shade and weather protection only. They will not protect occupants in a rollover. Always wear the seat belt and follow the rollover precautions in this manual.

25.



**WARNING** Allowing children to operate or ride in the vehicle unsupervised could result in serious injury or death.

Never allow children to operate this vehicle. Children may ride only under adult supervision, properly seated with the seat belt worn correctly. Never leave children unattended in or around the vehicle.

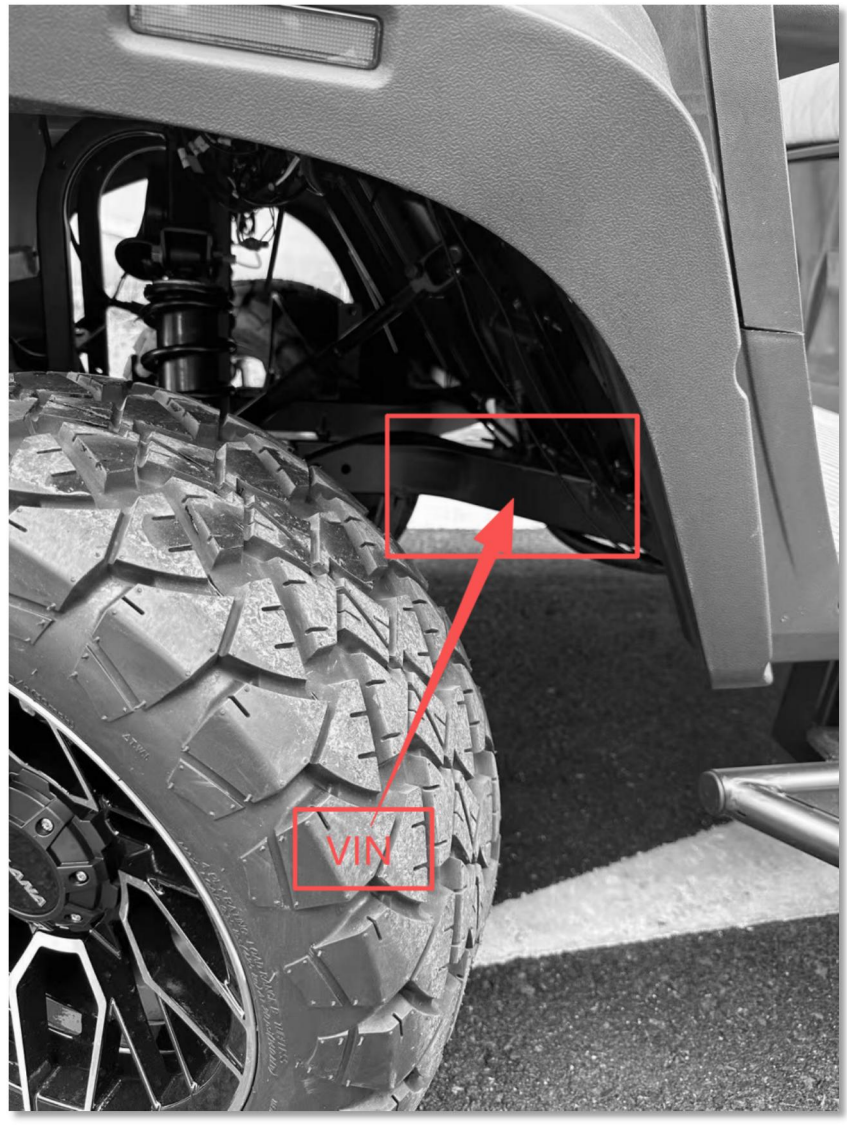
26.



**WARNING** Distracted driving could result in an accident causing serious injury or death.

Do not use a phone, text, or operate the multimedia display while the vehicle is moving. Stop in a safe location before using these features.

# 5. Vehicle Identification Number (VIN)




The frame VIN is found on the front beam of the frame, as indicated in the illustration above.

For your future reference, please record this number in the space provided below:

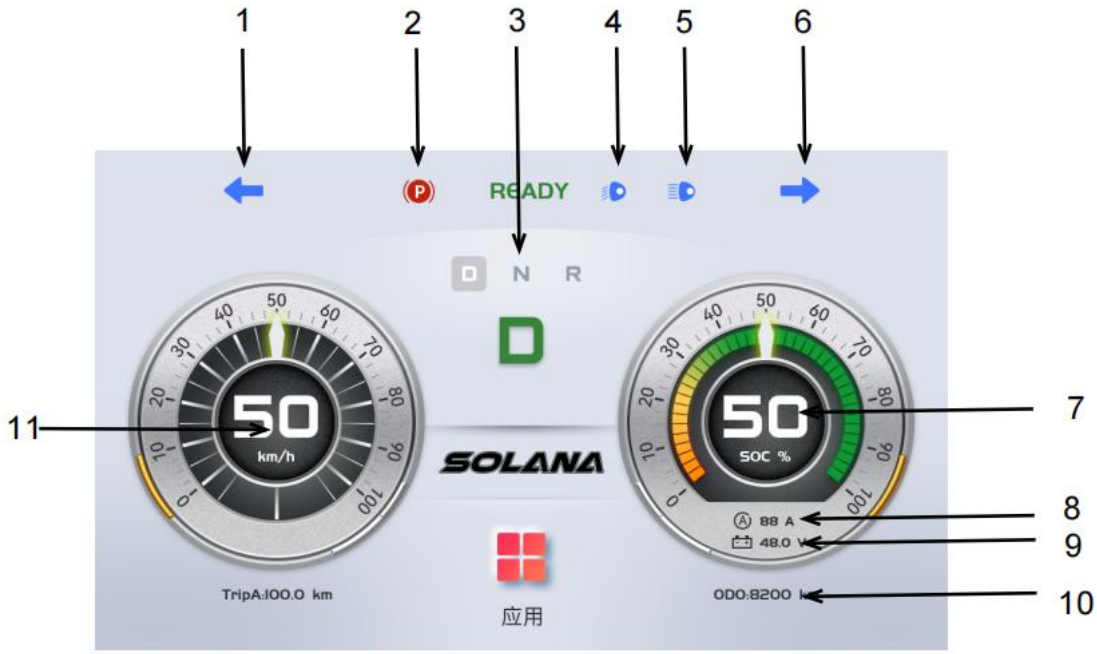
| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | |

# 6. Vehicle Display

## 6.1 Instrument Panel

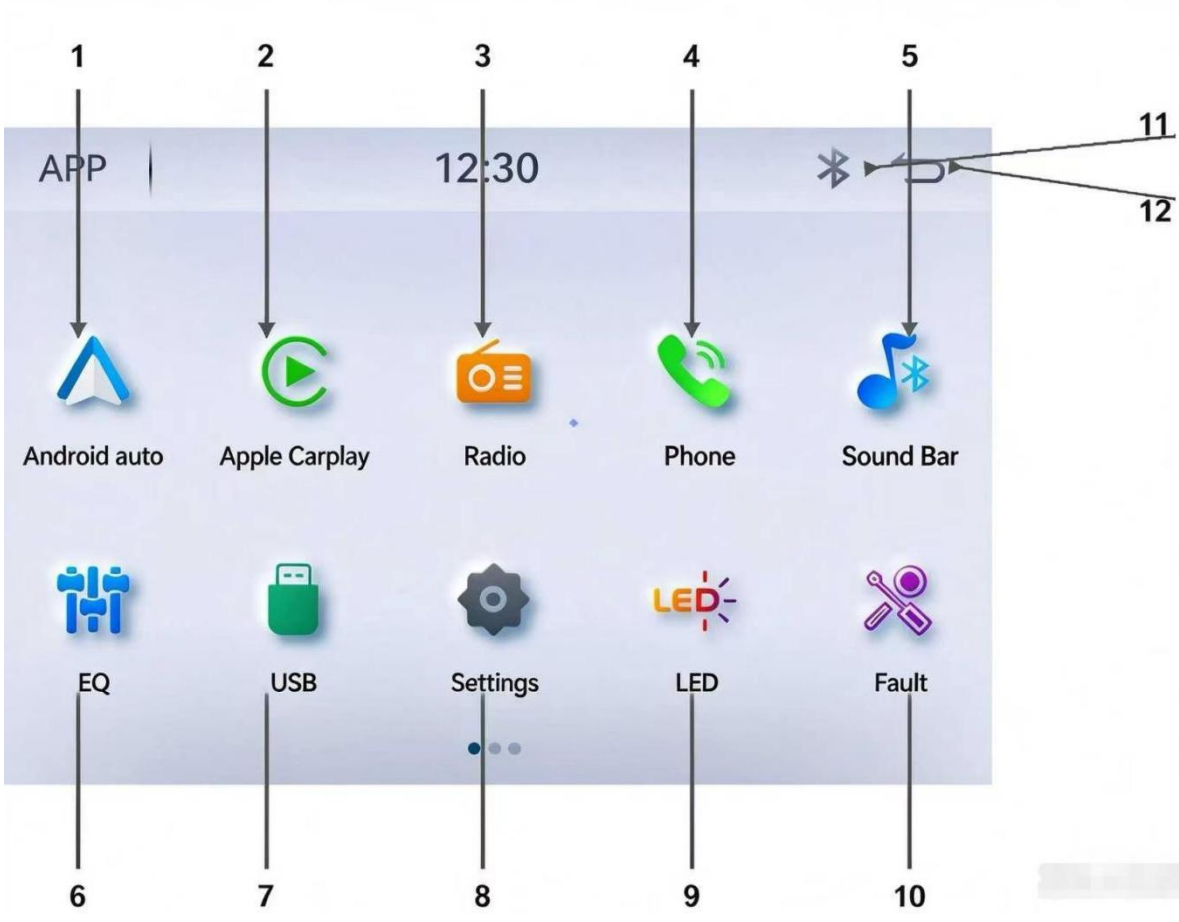
This vehicle has a 9.7-inch display that turns on automatically when the vehicle is started and functions as the instrument panel.

### Instrument Panel Feature Diagram




1. Left Turn Signal
2. Parking Brake
3. Gear Position
4. Low Beam Headlight
5. High Beam Headlight
6. Right Turn Signal
7. Battery Level
8. Electrical Current
9. Battery Voltage
10. Total Mileage
11. Speed

## Multimedia Menu



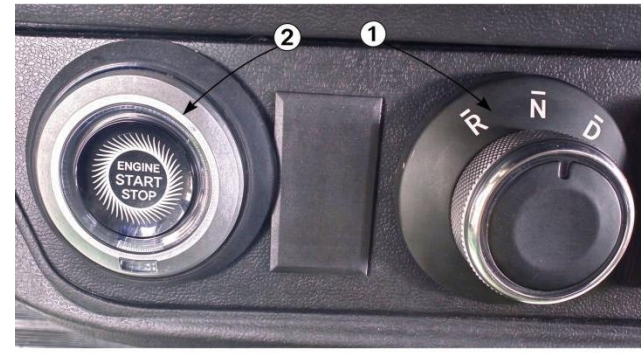

1. Android Auto
2. Apple CarPlay
3. Radio
4. Phone
5. Sound Bar
6. EQ
7. USB
8. Settings
9. LED
10. Fault
11. Bluetooth
12. Return

# 7. Vehicle Controls & Parts

## 7.1 Instrument Panel Switches

### 1. Gear switch

**D**rive**:** When the vehicle is put into drive gear and the accelerator pedal is depressed, the vehicle will move forward.




**N**eutral**:** When the vehicle is put into neutral gear and the accelerator pedal is depressed, the vehicle will not move.

**R**everse**:** When the vehicle is put into reverse gear, the backup camera image will replace the instrument panel display, the warning buzzer will sound, and when the accelerator pedal is depressed, the vehicle will move in reverse.

### 2. START/STOP Button

**START: Turns on the vehicle's 51.2V power system.**

**STOP: Turns off all vehicle circuits.**

### 3. Hazard warning switch

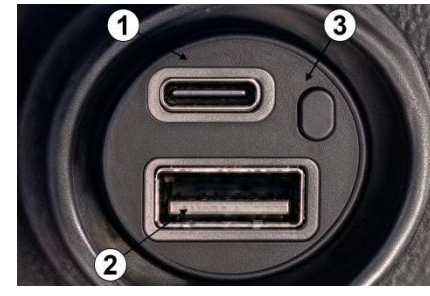


This switch activates the hazard warning lights, which are used when the vehicle could become a potential hazard for other vehicles.

### 4. USB Charging Port

The USB charging ports are located on the passenger side of the dashboard.

Depending on the model year, the vehicle may be equipped with two USB-A charging ports, or one USB-C (1) charging port and one USB-A (2) charging port.



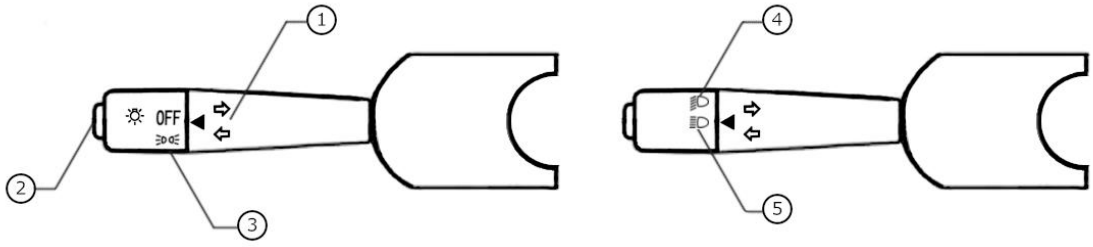

If the vehicle is equipped with one USB-C (1) charging port and one USB-A (2) charging port, press the power button (3) to turn on and supply power to the charging ports. The charging ports are illuminated when turned on.

The charging ports are rated for 5V/2A, and exceeding this rating will trip the fuse.

When washing the vehicle, do not allow water to enter the charging ports.

## 7.2 Steering Column

### Turn Signal Combination Switch




1. **Turn signal**: Pull the switch up to activate the right turn signal or down to activate the left turn signal

2. **Horn switch**: Depress the button on the end of the switch to activate the horn

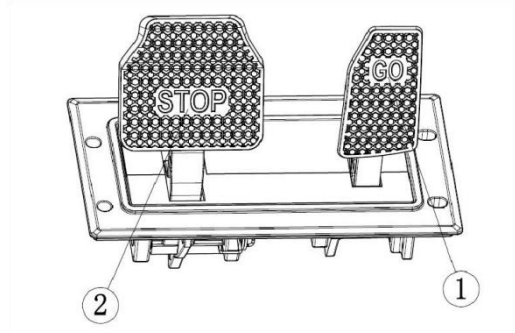
3. **Running light switch**: Twist the switch forward one click to activate the running lights

4. **Low-beam switch**: Twist the switch forward two clicks to activate the low-beam headlights

5. **High-beam switch**: Twist the switch forward three clicks to activate the high-beam headlights

## 7.3 Pedals

### Accelerator & Brake Pedals




**1. Accelerator pedal**

Before turning on the vehicle, depress the accelerator pedal to make sure that it moves smoothly and returns to the idle position when released. Depress the accelerator pedal to increase the speed of the vehicle.

**2. Brake pedal**

Depress the brake pedal to slow or stop the vehicle. When the brake pedal is depressed, the brake lights in the rear of the vehicle light up.

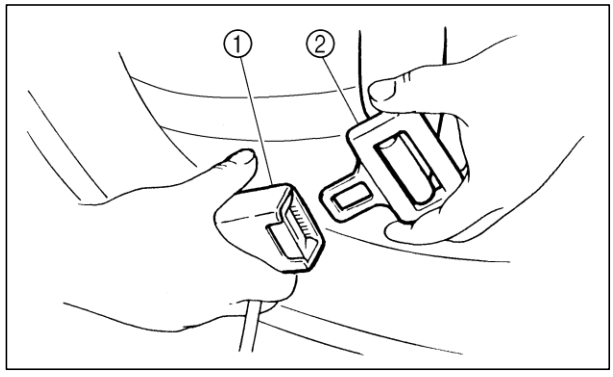
**WARNING**

Spongy-feeling brakes can lose braking power and result in an accident. If the brake pedal feels spongy, do not operate the vehicle. Contact an authorized dealer or service center.

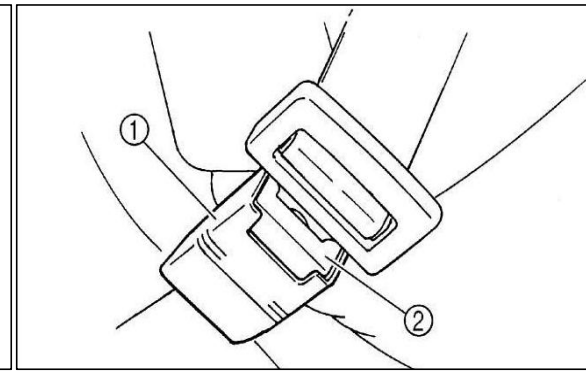


## 7.4 Seat belts

This vehicle is equipped with three-point seat belts for the driver and passengers.




1. Seat belt buckle
2. Latch plate




1. Seat belt buckle
2. Release button

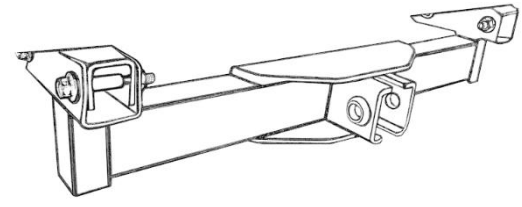
### Proper Use of the Seat belt

1. While holding the latch plate, pull the belt across your lap and chest. Ensure that the seat belt is not twisted or caught on the vehicle, your clothing, or any equipment you are carrying.
2. Push the latch plate into the buckle until you hear an audible click. Pull up on the latch plate to check that it is secure.
3. The lap portion of the seat belt should sit low on your hips. Ensure that the seat belt is snug against your hips by pulling any slack out of the lap portion by pulling up on the shoulder portion of the seat belt.
4. Position the shoulder portion of the seat belt over your shoulder and across your chest. The shoulder portion of the seat belt should fit snugly against your chest. If the shoulder portion of the seat belt still feels loose, pull the seat belt out as far as it can go, then let it retract.
5. To release the buckle, firmly press the release button.

**WARNING** In the event of an accident, failure to wear a seat belt or to wear it properly increases the risk of serious injury or death.

## 7.5 Trailer Hitch Receiver Bracket (Optional)

This vehicle can be fitted with a trailer hitch receiver bracket for a standard trailer hitch. If the rear footrest is not removed, a hitch extender may be required. Never exceed the towing capacity listed in Vehicle Specifications, and follow the trailer instructions in Section 1.3.



**Note:** Removing the rear footrest will also remove supports for the rear flip seat. The rear flip seat should not be used for passengers or cargo without all four supports installed.

## 7.6 Warning Buzzer and Pedestrian Alert System

Warning Buzzer

The vehicle comes equipped with a multi-purpose warning buzzer.

The warning buzzer makes an audible tone when:

The Drive / Neutral / Reverse (DNR) selector is set to D (Drive) or R (Reverse).

Pedestrian Alert System

The vehicle is equipped with a Pedestrian Alert System (PAS), which alerts pedestrians to the vehicle’s presence. The PAS makes an audible tone while the

vehicle is moving at speeds below 19 mph (30.6 km/h). Do not disable or modify the PAS.

## 7.7 Regenerative Braking

Regenerative braking helps maintain the downhill speed of the vehicle in relation to the accelerator pedal position.

Regenerative braking performance decreases when the battery is nearly fully charged, and regenerative braking is not available when the battery charge is above 98%. Regenerative braking cannot maintain the vehicle speed on an excessive grade (more than 20%). Always use the brake pedal to control the vehicle speed.

# 8. Safety Gear

Always wear clothing that is suitable for the manner in which you are using the vehicle. When operating on rough or unpaved off-road terrain, protective gear will help you feel more comfortable and reduce the chance of injury.

## 8.1 Helmets

A helmet is the most important piece of protective equipment that you can wear. Helmets are the best protection against serious head injuries. When selecting a helmet, select a properly fitting helmet that meets U.S. DOT standards.

## 8.2 Eye Protection

Protective goggles or a helmet face shield are the best options for protecting your eyes.

## 8.3 Gloves

Off-road-style gloves provide important protection for your hands.

## 8.4 Boots

Tall, hard-soled boots with tough heels that cover the calf, such as motocross boots, provide important protection for your lower extremities.

## 8.5 Clothing

Long sleeves and pants are recommended when operating or riding in this vehicle on rough terrain. Protective motocross clothing that includes padding for your knees and shoulders offers the best protection.

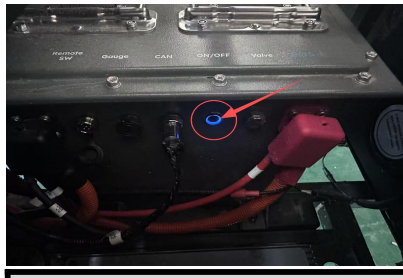


**WARNING**

Operating this vehicle on rough terrain without a DOT-compliant helmet and eye protection could result in serious injury or death.

# 9. Battery

The battery has a power button. Press the button to turn on the battery power (see illustration).



This vehicle is equipped with a 51.2V 105Ah lithium iron phosphate (LiFePO4) battery, housed in a single steel enclosure. The battery is located in the compartment below the front seat. The longevity of the battery is directly related to battery use and maintenance.

**WARNING**

Never attempt to pierce or modify the batteries, as this could result in serious injury or death.

## 9.1 Examining the Batteries

It is important to regularly check the appearance of the battery and the battery connections:

1. Check to make sure that the terminals are secure by grasping the connected cable several inches from any metal parts, and gently moving the cable. Do not attempt to grab the fastener or battery terminal with any tools. **If either battery terminal is loose, do not attempt to turn on or operate the vehicle.** Contact an authorized dealer or service center to have the battery inspected and serviced.

## 9.2 Avoiding Short Circuits

**WARNING**

A short circuit could lead to an explosion that could result in serious injury or death.

The current of a short circuit can reach thousands of amperes and generate high amounts of heat that can damage the battery, cause battery leakage, or even cause an explosion that could result in serious injury or death.

Short circuits can be avoided by exercising extreme caution when installing or removing batteries, and when using battery installation tools. Exercise caution when handling the battery cables, as an improperly placed battery cable could cause a short circuit.

The battery terminals should be covered with an insulating cap, and the battery cables should not be allowed to overlap, as this can produce unwanted pressure on the cables and battery terminals.

## 9.3 Charging

The appropriate charging cable has been provided with this vehicle. Only the original charging cable should be used with this vehicle. If a replacement charging cable is required, use a genuine SOLANA charging cable obtained either from an authorized dealer or service center, or directly from SOLANA.

Depending on the model or year of the vehicle, the charging socket is located either on the outside of the vehicle below the driver’s seat, or on the base of the rear seat on the driver’s side. The vehicle charges from a standard 110V AC household outlet.

Before attempting to charge the vehicle, check the charging socket and charging cable plug for damage, dirt, or moisture. If there are any abnormalities, **do not attempt to charge the vehicle**. Contact an authorized dealer or service center to have the battery inspected and serviced.

When the charging display shows that the battery has reached 100%, the battery is fully charged, and the charging cable should be unplugged.

**Charging safety:**

- Charge only in a dry, well-ventilated area, away from flammable materials, sparks, and open flames.
- Plug the charging cable directly into a properly grounded outlet protected by a ground-fault circuit interrupter (GFCI). Do not use an adapter plug or an ungrounded extension cord.
- Do not charge the vehicle in the rain or when the charging socket, plug, or your hands are wet.
- Keep children and pets away from the vehicle and the charging cable while charging.
- Do not leave the vehicle charging for extended periods unattended.
- Stop charging immediately and contact an authorized dealer or service center if the battery or charging cable becomes unusually hot, smokes, swells, leaks, makes unusual noises, or gives off an odor. If smoke or fire is present, move away from the vehicle and call 911.

## 9.4 Lithium-ion (LiFePO4) Battery

It is not recommended for the vehicle's lithium-ion battery to be stored for an extended period of time without charging. When storing the vehicle, it is important to be mindful of the state of charge (SOC) on the lithium battery and prevent the SOC from dropping below 30%. Before storing the vehicle, ensure that the battery is fully charged.

Storing the vehicle with a battery that is fully depleted will cause **irreversible damage** to the battery. The longer the battery is stored in a fully discharged state, the more serious the damage to the battery. The lithium battery does not need to be connected to a battery maintainer.

The steel enclosure of the lithium-ion battery should be kept clean, and the vehicle should be parked in a location that is cool, dry, and well-ventilated. The lithium-ion battery should not be exposed to the sun. Sun exposure will increase the temperature of the battery and reduce the battery life.

To prolong the life of the battery, avoid fully depressing the accelerator pedal immediately after turning on the vehicle. Doing so can cause the motor current to rapidly increase and cause the battery to discharge too quickly, which can cause a drop in voltage that will result in a reduction in battery life.

It is normal for the battery capacity to decrease as the temperature decreases. At temperatures of -10°C (14°F), the battery capacity will typically be 80%.

Do not attempt to charge lithium (LiFePO4) batteries at temperatures below 0°C (32°F). While the lithium battery can be used in below-freezing temperatures, the internal battery temperature must remain above 0°C (32°F) while the battery is charged. If the vehicle is equipped with a self-heating battery, it can be charged at 0°C (32°F) or below.



**CAUTION**

Charging a LiFePO4 lithium battery at temperatures below 0°C (32°F) will irreparably damage the battery.

# 10. Maintenance

## 10.1 Pre-ride Inspection

| | |
|---|---|
| **WARNING** | Before operation, the vehicle must be inspected to ensure that it is in proper working order. Failure to do so could result in serious injury or death. |

Before attempting to operate this vehicle, use the following checklist to verify that the vehicle is in proper working order:

| | | |
|---|---|---|
| **1.** | **Tires** | Check the condition of the tires and ensure that all tires are inflated to the correct pressure. |
| **2.** | **Battery** | Check for any battery abnormalities, make sure the wiring is secure, and the battery terminals are properly protected. |
| **3.** | **Brakes** | Check the fluid level, operation, and adjustment of all brakes, and confirm that the electromagnetic parking brake holds the vehicle when it is stopped. |
| **3a.** | **Brake pedal** | Check the operation of the brake pedal and ensure that it has the proper amount of free play. The brake pedal should move smoothly and should feel firm when the brakes are applied. If the amount of free play is incorrect or there are any other issues with the brake pedal, the vehicle must be inspected and serviced by an authorized dealer or service center. |

| | | |
|---|---|---|
| **3b.** | **Brake fluid leakage** | Check for any brake fluid leakage from the brake lines, brake hoses, or brake fluid reservoir by applying the brakes firmly for one minute. If there is any leakage, the vehicle must be inspected and serviced by an authorized dealer or service center. |
| **3c.** | **Brake fluid level** | Check the brake fluid level and add brake fluid when necessary. |
| **3d.** | **Brake operation** | Test the brakes at low speed to make sure that they are working properly. If they do not perform properly, inspect the braking system. |
| **4.** | **Accelerator pedal** | Check that the accelerator pedal operates freely with the correct amount of free play. The accelerator pedal must operate smoothly and fully spring back to its idle position when released. If the accelerator pedal does not perform properly, it must be inspected and serviced by an authorized dealer or service center. |
| **5.** | **Lights** | Check that headlights, taillights, and brake lights and their switches are operational. |
| **6.** | **Wheels** | Check that all wheel nuts and axle nuts are tightened to specification and that cotter pins, where fitted, are in place. If there is damage to the wheels, or the bearing assemblies are loose or damaged, the vehicle must be inspected and serviced by an authorized dealer or service center. |

| | | |
|---|---|---|
| **7.** | **Steering** | Check that the steering system operates freely and check for any unusual looseness. Park the vehicle on level ground and turn the steering wheel in both directions. Check for excessive free play, abnormal noises, or a rough feeling. If there are any abnormalities, the vehicle must be inspected and serviced by an authorized dealer or service center. |
| **8.** | **Loose parts** | Visually inspect the vehicle for any damaged components or any loose nuts, bolts, or fasteners. Always check the tightness of the chassis fittings and fasteners before operation. Loose parts must be tightened by a dealer or authorized service center to ensure proper tightening torque. |
| **9.** | **Safety gear** | Ensure that the driver and all passengers are wearing appropriate safety gear (see Chapter 8). |
| **10.** | **Seat belts** | Check that seat belts are worn properly and are not frayed or damaged. Seat belts must move smoothly when pulled and retract on their own when released. The latch plate should click securely into the buckle and release when the release button is pressed firmly. Any dirt or mud must be removed to ensure that it does not interfere with seat belt operation. If there are any abnormalities, the vehicle must be inspected and serviced by an authorized dealer or service center. |

## 10.2 Periodic Maintenance

Careful periodic maintenance will help keep your vehicle in the safest, most reliable condition. The inspection, adjustment, and lubrication intervals for important components are explained in the chart on the following pages.

**Note:**
This maintenance schedule is based on average driving conditions and an average vehicle speed of approximately 19 mph. Vehicles that are stored for an extended length of time should continue to be maintained according to the monthly maintenance intervals.

Vehicles used in severe conditions, such as dirty, dusty, or wet conditions, must be maintained more frequently in order to remove any water or dirt that could affect grease fittings or other critical components.

Inspect, clean, lubricate, adjust, or replace parts as necessary.

**Note:**
Inspection may reveal the need for replacement parts. Always use genuine SOLANA parts, which are available from your dealer and directly from SOLANA.

**Vehicle service and adjustments are critical to the safe operation of this vehicle. If you are not familiar with the procedures necessary to safely service and adjust your vehicle, always have these procedures performed by an authorized dealer or service center.**

## 10.3 Periodic Maintenance Schedule

**WARNING**

It is recommended for inspections and adjustments marked with a "**D**" on the following chart to be completed by an authorized dealer or service center.

**NOTE:** Hours are based on an average of 19 mph.

For items listed with both hours of operation and months, perform maintenance at whichever interval comes first. When performing the monthly service intervals, make sure to also complete items listed in all preceding sections, e.g., daily maintenance items should be included during monthly maintenance.

✓ Check  ⍟ Clean, adjust  **D** See dealer for service  ■ Replace

| **Daily** (see pre-ride inspection section for additional details) | | |
|---|---|---|
| ✓ | Tires | Check tire condition and inflation |
| ✓ | Battery | Check for abnormalities, loose wiring |
| ✓ | Braking system | Check general operation, fluid level, adjustment for all brakes, including parking brake |
| ✓ | Electronic accelerator pedal | Check for smooth operation, full return to idle position |
| ✓ | Lights | Check that headlights, taillights, brake lights, and light switches are operational |
| ✓ | Wheels | Check that all fasteners are tight |
| ✓ | Steering | Check for free movement, no unusual looseness |
| ✓ | Frame nuts, bolts, and fasteners | Check by visually inspecting for looseness |
| ✓ | Seat belts | Check seat belt condition, retraction of seat belts |
| ✓ | Charging cable | Check that the charging cable and charging socket are operating normally, recharge vehicle after ride |

✓ Check ⍟ Clean, adjust **D** See dealer for service ■ Replace

| | | |
|---|---|---|
| **Monthly or every 10 hours** | | |
| ✓ **D** | Wheel bearings | Check for looseness or damage, tighten if loose, replace if damaged |
| ✓ **D** | Brake pad wear | Inspect periodically |
| ✓ **D** | Front wheel spindles | Check for looseness or damage of bearings and seals |
| ✓ | Rear gear case oil | Check for leaks, check level |
| **Monthly or every 20 hours** | | |
| ✓ | Transmission fluid | Check for leaks, check level |
| ⍟ | Battery | Clean terminals, check for damage or deformation |
| **Every 3 months or every 50 hours** | | |
| ⍟ | General lubrication | Lubricate all fittings, pivots, cables, etc. |
| **Every 6 months or every 50 hours** | | |
| ✓ **D** | Steering system | Check operation, check for looseness, wear, damage, binding feeling, then adjust, repair, or replace, when necessary. Check toe alignment / adjust if necessary |
| ✓ | Rear axle | Inspect bearings, lube |
| ✓⍟ | Front suspension | Inspect, lubricate, tighten fasteners |
| ✓⍟ | Rear suspension | Inspect, tighten fasteners |
| **Every 24 months or every 200 hours** | | |
| **D** | Brake fluid | Change the brake fluid |
| **Change Annually** | | |
| ■ | Transmission fluid | |
| ■ | Rear gear case oil | |
| **As Required** | | |
| ✓ | Headlight focus | Adjust if necessary |

## 10.4 Lubrication Recommendations

For items listed with both hours of operation and months, perform maintenance at whichever interval comes first.

| | Item | Recommended Lube | Method | Frequency |
|---|---|---|---|---|
| | Brake fluid | DOT 3 or DOT 4 | Should be about 2/3 full | As required, every 200 hours or every 2 years |
| | Gearbox oil | SAE 80W-90 GL-5 | Add to proper level on dipstick | Change at 100 hours or annually |
| | Steering system | Grease | Lubricate the pivoting and sliding parts | 50 hours or every 3 months |
| | Tie rods | Grease | Grease tie rods | Semi-annually |
| | Front wheel bearings | Inspect | Inspect and replace bearings if necessary | Semi-annually |
| | Ball joints | Grease | Locate, inspect fittings, grease or replace ball joints if necessary | Semi-annually |
| | Rear axle bearing | Grease | Grease | 50 hours or every 3 months |

## 10.5 Periodic Maintenance Record

| Date | Hours | Technician | Service Performed / Remarks |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

| Date | Hours | Technician | Service Performed / Remarks |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

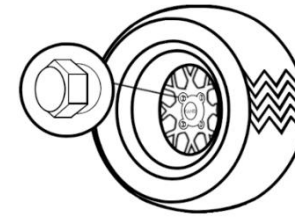
| Date | Hours | Technician | Service Performed / Remarks |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

## 10.6 Maintenance Specifications

The tightness of the following items should be checked both periodically and after being loosened for service, and should always be adjusted to the specifications listed below.

### Torque Specifications for Lug Nuts

**NOTE:** Nuts that have a cotter pin installed must **only** be serviced by an authorized dealer or service center.



| Bolt Size | Specification | |
|---|---|---|
| M12 x 1.25 | 51 ft-lb | 69 N·m |

### Steering

#### Steering Inspection

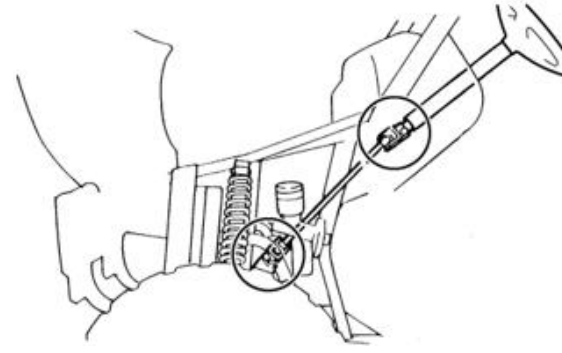
The steering assembly should be checked periodically for loose nuts and bolts, worn tie rod ends, worn boots, and other damage. Check the routing of all cables, hoses, and wires to be sure that the steering mechanism is not restricted or limited. If any abnormalities are found, do not **attempt to operate the vehicle**, contact an authorized dealer or service center to have the vehicle inspected and serviced.

The steering assembly should also be checked periodically to ensure that it moves freely through its entire range of motion without binding.

#### Lubricate the Pivoting Parts

Recommended lubricant:

Lithium soap-based grease



## 10.7 Camber and Caster

The camber and caster are not adjustable on this vehicle.

## 10.8 Toe Alignment Check

The recommended toe alignment is 1/8” to 1/4” (3 to 6 mm) toe out.

1. Set the steering wheel so that the wheels are facing straight ahead.
2. Measure distances A and B. A minus B should be within the recommended toe-out range listed above.
3. If this measurement needs to be adjusted, contact an authorized dealer or service center for service.




**WARNING**

Do not attempt to adjust the tie rod for toe alignment. The toe alignment must be adjusted by an authorized dealer or service center. Improper adjustments could result in serious injury or death.

## 10.9 EM Braking

**Releasing the Electromagnetic Parking Brake (Electronic and Mechanical Release)**

**1.**







2.



1. When the tow mode switch is set to the MANUAL EMB position, the electromagnetic parking brake is electrically released, allowing the vehicle to be moved. Return the switch to RUN before operating the vehicle.
2. When the parking brake release lever is manually actuated, the brake is mechanically released and the vehicle can be moved by hand.

**WARNING**

When the parking brake is released, the vehicle can roll freely. Release the parking brake only on level ground with the wheels blocked, and never release it with anyone in the vehicle or on a slope. Re-engage the parking brake before leaving the vehicle.

**WARNING**

Do not store or use a partial bottle of brake fluid. After using the necessary amount of brake fluid, discard the rest. Brake fluid is hygroscopic, meaning it rapidly absorbs moisture from the air. This lowers the boiling point of the brake fluid, which can cause early brake fade and could result in serious injury.

The following checks are recommended for keeping the braking system in good operating condition. The interval at which these checks should be performed depends on how the vehicle has been driven.

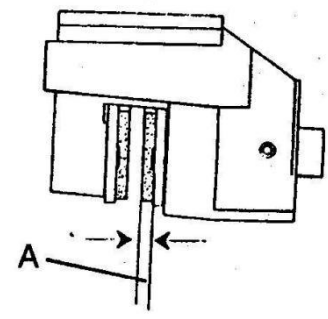
1. Use DOT 3 or DOT 4 brake fluid.
2. The fluid level in the master cylinder reservoir should be kept at the level described in Section 10.4 Lubrication Recommendations. It is normal for the diaphragm to extend into the reservoir as the fluid level drops. If the fluid level is low and the diaphragm is not extended, a leak is indicated, and the diaphragm should be replaced. To ensure proper operation of the diaphragm, the reservoir should be filled to the appropriate level each time after the cover is loosened or removed.
3. Check the braking system for fluid leaks. Depress the brake pedal to check for excessive travel or a spongy feel.

## Front Brakes

The front brakes on this vehicle are hydraulic disc brakes, which are applied simultaneously with the rear brakes by depressing the brake pedal. The front brakes are self-adjusting and therefore do not require adjustment.

### Check the condition of the hydraulic disc brakes

1. Check the brake pads for wear, damage, or looseness.
2. Check that the brake rotor is secure, and its surface is in good condition.
3. Brake pads should be changed when the thickness reaches 3/64" (1 mm). See item A in the diagram to the right.




## Rear Brakes

The rear brakes on this vehicle are hydraulic drum brakes, which are applied simultaneously with the front brakes when the brake pedal is depressed. The rear brakes are self-adjusting and therefore do not require adjustment.

## Parking Brake

The parking brake is an electromagnetic brake integrated into the rear axle drive motor and operates automatically. It releases when the accelerator pedal is depressed, engages automatically when the vehicle comes to a complete stop and the accelerator pedal is released, and engages when the vehicle is turned off.

## 10.10 Storage

To protect the battery, it features an automatic sleep mode. If the vehicle is not in use and the state of charge (SOC) is above 20%, the battery will automatically shut down after seven days; if the SOC is below 20%, the battery will automatically shut down after three days. If the vehicle cannot be turned on, lift the front seat and check whether the battery power button is lit. If it is not, press the button to turn on the battery.

The vehicle should be driven once a week or elevated on blocks to ensure that the tires do not develop flat spots.

Before storing the vehicle, fully charge the battery and follow the storage instructions in Section 9.4. Check the SOC at least once a month during storage and recharge as needed so that it does not fall below 30%. Store the vehicle turned off, with the key fob (if equipped) removed, out of reach of children.

# 11. Cleaning the Vehicle

## 11.1 Exterior Body Panels

The body panels on this vehicle should be hand-washed using a commercially available automotive cleaner and a soft sponge or cloth intended for automotive use. A hose with residential water pressure set to a shower or mist setting may be used to rinse the vehicle.

Before spraying the exterior of the vehicle with water, always ensure that the charging socket cover is firmly in place and the front and rear under-seat compartments are closed. Do not attempt to power wash or pressure wash this vehicle, as the higher water pressure can compromise the seals on the vehicle and allow water to come in contact with electrical components.



**WARNING**

Water that comes in contact with the battery or electrical components could cause short circuits, burn electrical circuits or components, cause fire or leakages, or cause other issues that could result in serious injury or death.

## 11.2 Seats and Floorboard

The seats and floorboard of this vehicle should be wiped down or spot cleaned with a diluted mild detergent and a soft cloth. Excessive or caked dirt should first be removed by using a soft brush. Detergents should be tested in an inconspicuous location before use to ensure that they are compatible with the seat material.

## 11.3 Windshield and Lights

The windshield, headlights, and taillights may be cleaned with a diluted mild detergent and a soft cloth. It is not recommended to use glass cleaner on any clear plastic components, as this can cause irreparable damage to the plastic.

## 11.4 Wheels and Tires

The wheels and tires may be cleaned with commercially available wheel and tire cleaners. When using these cleaners, ensure that they do not come in contact with the plastic components or body panels on the vehicle, as this could cause irreparable damage.

**NOTE:** Wet brakes have reduced stopping ability. Always test the brakes after washing the vehicle and, if necessary, apply the brakes lightly several times to allow friction to dry out the brake pads.

## 11.5 Front Basket

The front basket should be wiped down using a diluted mild detergent and a soft cloth.

## 11.6 Under-Seat Compartments

Mud, dust, or dirt on the inside walls of the compartments under the front and rear seats should be removed using a stiff brush and wiped down with a dry cloth. Do not spray water in the under-seat compartments, as the water will come in contact with the battery and the vehicle's electrical components, and could cause short circuits, burn electrical circuits or components, cause fire or leakages, or cause other issues that could result in serious injury or death.



**WARNING**

Do not spray water in the compartments under the front or rear seats. Water that comes in contact with the battery or electrical components could cause short circuits, burn electrical circuits or components, cause fire or leakages, or cause other issues that could result in serious injury or death.

# 12. Transporting the Vehicle

**CAUTION**

This vehicle is not designed to be transported on an open trailer at highway speeds. Transporting this vehicle in an enclosed trailer is highly recommended.

If this vehicle is transported on an open trailer, the owner does so at their own risk, and any resulting damage will not be covered under the vehicle warranty. The procedures outlined below are intended to minimize damage to a vehicle transported on an open trailer, but even if these procedures are followed, damage to the vehicle is still possible.

Never transport the vehicle with anyone in it. Turn the vehicle off, make sure the parking brake is engaged, and secure the vehicle to the trailer by its frame or axles with ratchet straps rated for the weight of the vehicle. Never tow this vehicle behind another vehicle with its wheels on the ground.

## 12.1 Strap Down the Roof

Use ratchet straps to secure the roof to the frame of the vehicle in multiple locations.

## 12.2 Protect the Windshield

Removing the windshield while transporting the vehicle on an open trailer is the best practice. If the windshield is not removed, it must be secured to the vehicle using ratchet straps and covered with a padded protective layer in order to minimize damage caused by objects striking the windshield at high speed.

**CAUTION**

Transporting this vehicle on an open trailer without removing the windshield will likely result in damage to the windshield.

# 13. Troubleshooting

The following troubleshooting information is intended only as a reference and does not cover all possible issues that may be encountered. When necessary, please refer to the information provided in this owner's manual for inspection, adjustment, and replacement of parts.

## 13.1 Contacting an Authorized Dealer or Service Center

The Solana EV website (solanaev.com) has a dealer locator that includes authorized dealerships, service centers, and stores that sell SOLANA vehicles. Please use the contact information to schedule any service requests. Please note that any services provided outside of the warranty process are not covered by SOLANA.

## 13.2 Symptoms and Possible Causes

The following list of possible causes of vehicle malfunctions is intended for reference only. Contact an authorized dealer or service center for proper diagnosis of the issue.

### Symptom: Alarm sounds and the vehicle will not drive

The vehicle may have been turned on with the accelerator pedal depressed, or a fault may be present.

1. Release the accelerator pedal, select N, and turn the vehicle off with the START/STOP button.
2. Wait 10 seconds, turn the vehicle back on, select D, and then depress the accelerator pedal. Check the display for a fault code (see Section 13.3).
3. If these steps did not turn off the vehicle alarm, contact an authorized dealer or service center to have the vehicle inspected and serviced.

### Symptom: Vehicle won't move

**Vehicle lights and meter <u>are</u> working properly**

*Possible causes:*

- Faulty DC contactor
- Wiring harness malfunction
- Motor controller malfunction
- Motor malfunction
- Electronic gear shift fault
- Gearbox malfunction
- Accelerator pedal or pedal sensor failure
- Accelerator pedal output signal is not accurate
- Electromagnetic parking brake has not released

## Symptom: Vehicle won’t move

### Vehicle lights and meter <u>are not</u> working

*Possible causes:*

- Battery in sleep mode or battery power button off (see Section 10.10)
- START/STOP button malfunction
- Blown fuse or loose connection
- Wiring harness malfunction
- Battery power shortage or battery malfunction
- Motor controller malfunction
- Poor contact of electronic components or connections

### Symptom: Poor charging performance

*Possible causes:*

- Vehicle charger malfunction
- Charger body, charging cable assembly or socket malfunction
- Unreliable battery connection
- Battery malfunction

### Symptom: Poor braking

*Possible causes:*

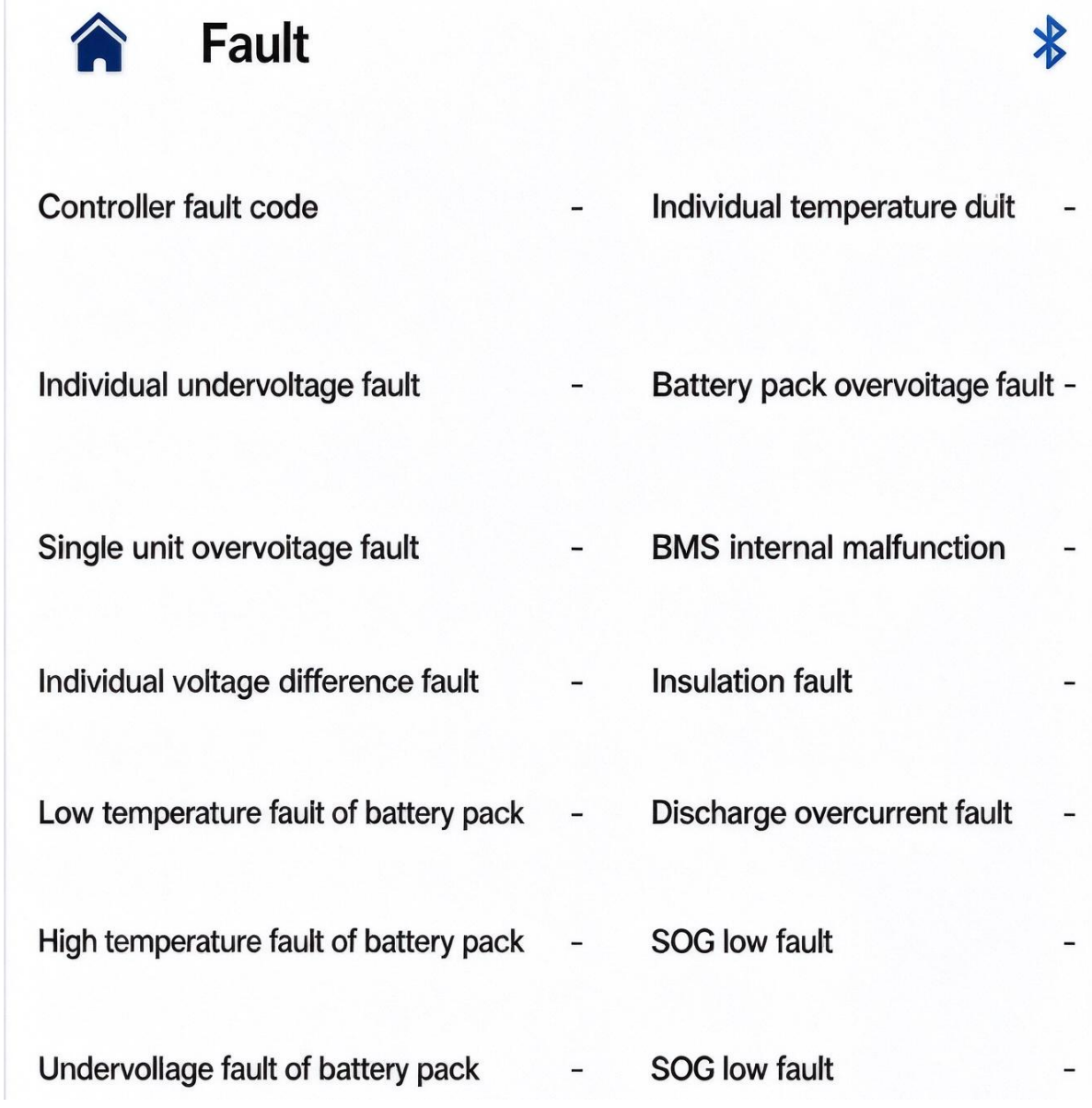
- Worn out front hub bearing
- Worn brake pad
- Worn brake disc
- Air in brake fluid line
- Faulty master cylinder
- Faulty caliper seal
- Loose union bolt
- Broken brake hose
- Oily or greasy brake pad or brake disc

### Operating performance issues

- Accelerator does not return to idle position
- Poor medium and high-speed performance

## 13.3 Fault Codes

The following list of fault code explanations is for reference only. Contact an authorized dealer or service center for proper diagnosis of the issue.



| Fault Code | Description |
|---|---|
| **1** | Battery pack overvoltage |
| **2** | Battery pack under-voltage |
| **3** | The accelerator pedal was already activated before startup |
| **4** | Scheduled maintenance due |
| **5** | Flash memory failure |
| **6** | Controller low-voltage alarm |
| **7** | Overvoltage current limiting activation |
| **8** | Controller output overcurrent |
| **9** | Contactor sticking |
| **12** | Battery pack low-voltage alarm |
| **13** | High-temperature alarm for the drive motor |
| **15** | Motor current leakage |
| **20** | Controller overtemperature alarm |
| **27** | Controller output overload |
| **37** | 5V output power supply failure |
| **38** | 12V output power supply failure |
| **59** | "Emergency reverse" not released |
| **60** | Error in "Emergency Reverse" activation conditions |
| | |
| | |
| | |

| Fault Code | Description |
|---|---|
| **61** | Drive motor overheating shutdown |
| **62** | Directional switch failure |
| **63** | The interlock switch was not closed at startup. |
| **64** | Incorrect startup conditions |
| **66** | Controller overheating shutdown |
| **71** | Controller temperature sensor failure |
| **74** | Motor encoder failure |
| **83** | Default parameter error |
| **84** | Parameter exceeds limit error |
| **85** | Incorrect startup sequence |
| **91** | Steering sensor failure |
| **92** | Accelerator pedal malfunction |
| **95** | Short circuit fault in the motor temperature sensor |
| **97** | Open circuit fault in the motor temperature sensor |
| **98** | The capacitor precharge is too slow. |
| **101** | CAN bus communication timeout |

# 14. Vehicle Specifications

| | | |
|---|---|---|
| Length x Width x Height | 116.14 x 48.82 x 81.89 in | 295 x 124 x 208 cm |
| Wheelbase | 84.06 in | 213.5 cm |
| Ground Clearance | 9.45 in | 24 cm |
| Dry Weight | 1049.4 lbs | 476 kg |
| Max Load Capacity | 1710.8 lbs | 776 kg |
| Towing Capacity | 20% grade: 1720 lbs<br>30% grade: 1320 lbs | 20% grade: 780 kg<br>30% grade: 600 kg |
| Front Tire | 23 x 10-14 | |
| Rear Tire | 23 x 10-14 | |
| Front Brakes | Hydraulic Disc Brake | |
| Rear Brakes | Hydraulic Drum Brake | |
| Front Suspension | Double Wishbone Suspension | |
| Rear Suspension | Trailing-arm solid rear axle | |
| Motor | 5kW | |
| Battery | 51.2V 105Ah LiFePO4 | |
| Seating Capacity | 4 (1 driver + 3 passengers) | |
| Tire Pressure | 20 psi (138 kPa) | |
| Intended Use | Off-road use only. Not for public streets, roads, or highways | |