

# CROSSFIRE E1

## USER MANUAL

READ THIS MANUAL CAREFULLY!  
It contains important safety information



**WARNING**

This UTV should not be ridden by anyone under 16 years of age.

 **CROSSFIRE**

**⚠ WARNING**

Read, understand, and follow all of the instructions and safety precautions in this manual and on all product labels.

Failure to follow the safety precautions could result in serious injury or death.

## **INTRODUCTION**

Congratulations on your purchase of the HS5D-EV. This Owner's / Operator's manual will provide you information regarding safe operation, operational instructions, maintenance and care. Fully understanding this manual and following all of the instructions herein will provide the knowledge needed to have safe and enjoyable HS5D-EV operation.

**For questions regarding this HS5D-EV, please call (972) 446-0760.**

### **IMPORTANT SAFETY MESSAGES**

- **READ THIS MANUAL CAREFULLY AND COMPLETELY BEFORE OPERATING YOUR HS5D-EV. MAKE SURE YOU UNDERSTAND ALL INSTRUCTIONS.**
- **PAY CLOSE ATTENTION TO THE WARNING AND CAUTION LABELS ON THE HS5D-EV.**
- **NEVER OPERATE THE HS5D-EV WITHOUT PROPER TRAINING OR INSTRUCTION.**
- **THIS HS5D-EV SHOULD NOT BE RIDDEN BY ANYONE UNDER 16 YEARS OF AGE.**

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## INTRODUCTION

### IMPORTANT MANUAL INFORMATION

**FAILURE TO FOLLOW THE WARNINGS CONTAINED IN THIS MANUAL CAN RESULT IN SERIOUS INJURY OR DEATH.**

Particularly important information is distinguished in this manual by the following notations:



The Safety Alert Symbol means **ATTENTION!**  
**YOUR SAFETY IS INVOLVED!**



Failure to follow **WARNING** instructions could result in severe injury or death to the machine operator, bystander or a person inspecting or repairing the machine.

**CAUTION:**

**A CAUTION** indicates special precautions that must be taken to avoid damage to the machine.

**NOTE:** **A NOTE** provides key information to make procedures easier clearer.

## INTRODUCTION

### **⚠ WARNING**

Failure to follow the warnings contained in this manual can result in severe injury or death.

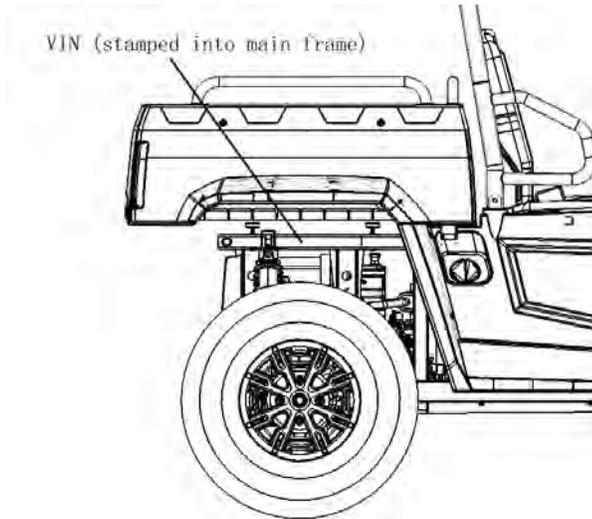
Your HS5D-EV is not a toy and can be hazardous to operate. This vehicle handles differently than other vehicles, such as cars, trucks or other off-road vehicles. A collision or rollover can occur quickly, even during routine maneuvers like turning, or driving on hills or over obstacles, if you fail to take proper precautions.

- Read this owner's manual and review the safety DVD that came with your vehicle. A free extra copy of the DVD can be obtained by contacting your local HSUN dealer. Understand all safety warnings, precautions and operating procedures before operating the vehicle. Keep this manual with the vehicle.
- This vehicle is an ADULT VEHICLE ONLY. You MUST be at least age 16 and have a valid driver's license to operate this vehicle.
- No person under the age of 12 may ride as a passenger in this vehicle. All riders must be able to sit with backs against the seat, both feet flat on the floor and both hands on the steering wheel (if driving) or on a passenger hand hold.
- Never permit a guest to operate this vehicle unless the guest has read this manual and all product labels.
- Always wear a helmet, eye protection, gloves, long-sleeve shirt, long pants and over-the-ankle boots.
- Never use this vehicle with drugs or alcohol, as these conditions impair judgment and reduce operator reaction time.

## INTRODUCTION

### Vehicle Identification Numbers

Record your vehicle's identification numbers in the spaces provided. Remove the spare key and store it in a safe place.



Vehicle Model Number: \_\_\_\_\_

Frame VIN: \_\_\_\_\_

Motor Serial Number (on side of motor): \_\_\_\_\_

## SAFETY

### Safe Riding Gear

The driver and all passengers must wear helmet, eye protection, gloves, long-sleeve shirt, long pants, over-the-ankle boots and seat belt at all times. Protective gear reduces the chance of injury.

### Helmet

Wearing a helmet can prevent a severe head injury. Whenever riding this HSUN vehicle, always wear a helmet that meets or exceeds established safety standards.

Approved helmets in the USA and Canada bear a U.S. Department of Transportation (DOT) label.

Approved helmets in Europe, Asia and Oceania bear the ECE 22.05 label. The ECE mark consists of a circle surrounding the letter E, followed by the distinguishing number of the country which has granted approval. The approval number and serial number will also be displayed on the label.

### Eye Protection

Do not depend on eyeglasses or sunglasses for eye protection. Whenever riding this HSUN vehicle, always wear shatterproof goggles or use a shatterproof helmet face shield. HSUN recommends wearing approved Personal Protective Equipment (PPE) bearing markings such as VESC 8, V-8, Z87.1, or CE. Make sure protective eye wear is kept clean.

### Gloves

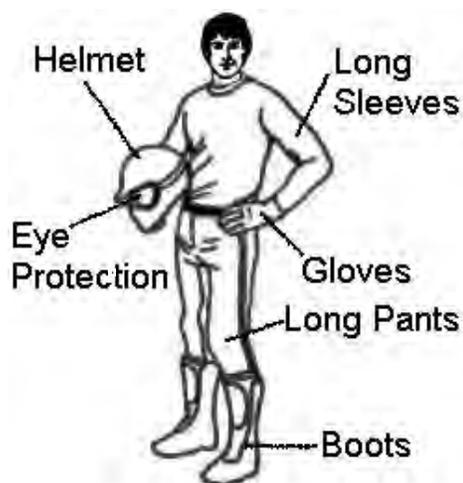
Wear gloves for comfort and for protection from sun, cold weather and other elements.

### Boots

Wear sturdy over-the-ankle boots for support and protection. Never ride a HSUN vehicle with bare feet or sandals.

### Clothing

Wear long sleeves and long pants to protect arms and legs.



## SAFETY

### Safety Labels and Locations

Warning labels have been placed on the vehicle for your protection. Read and follow the instructions of the labels on the vehicle carefully. If any of the labels depicted in this manual differ from the labels on your vehicle, always read and follow the instructions of the labels *on the vehicle*.

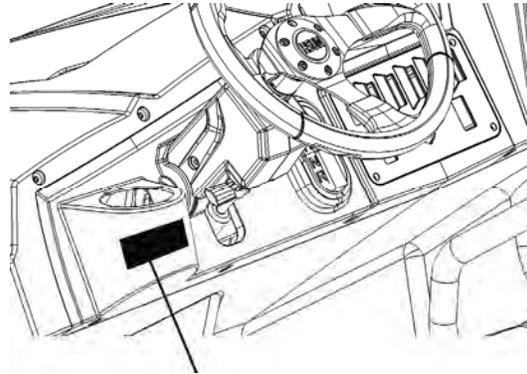
If any label becomes illegible or comes off, contact your HSUN dealer to purchase a replacement. Replacement *safety* labels are provided by HSUN at no charge. The part number is printed on the label.

### Proper Use Warning

Require Proper Use of Your Vehicle

Do your part to prevent injuries:

- Do not allow careless or reckless driving.
- Make sure operators are 16 or older with a valid driver's license.
- Do not let people drive or ride after using alcohol or drugs.
- Do not allow operation on public roads (unless designated for off-highway vehicle access) - collisions with cars and trucks can occur.
- Do not exceed seating capacity: 2 occupants.



Proper Use Warning

## SAFETY

### Safety Labels and Locations Seat Belt, tumbling and age Tags WARNING

Improper vehicle use can result in SEVERE INJURY or DEATH

#### Be Prepared

- Fasten seat belts.
- Wear an approved helmet and protective gear.
- ALWAYS use vehicle cab nets and/or doors.
- Each rider must be able to sit with back against seat, feet flat on the floor, and hands on steering wheel or hand holds. Stay completely inside the vehicle.

#### Drive Responsibly

Avoid loss of control and rollovers:

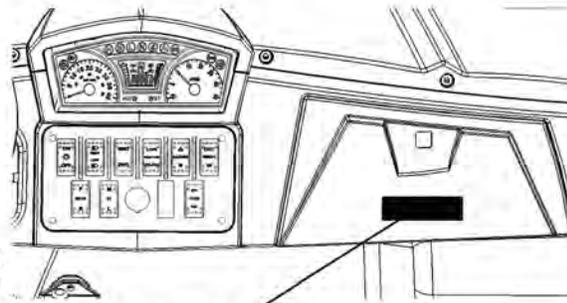
- Avoid abrupt maneuvers, sideways sliding, skidding or fishtailing, and never do donuts.
- Slow down before entering a turn.
- Avoid hard acceleration when turning, even from a stop.
- Plan for hills, rough terrain, ruts and other changes in traction and terrain. Avoid paved surfaces.
- Avoid sidehilling (riding across slopes).

#### Be Sure Riders Pay Attention and Plan Ahead

If you think or feel the vehicle may tip or roll, reduce your risk to injury:

- Keep a firm grip on the steering wheel or hand holds and brace yourself.
- Do not put any part of your body outside of the vehicle for any reason.

LOCATE AND READ OWNER'S MANUAL. FOLLOW ALL INSTRUCTIONS AND WARNINGS. ALWAYS REVIEW SAFETY VIDEO AND TAKE ROHVA TRAINING ([rohva.org](http://rohva.org)).



Seat Belt, tumbling and age Tags



Rollovers have caused severe injuries and death, even on flat, open areas.



# SAFETY

## Safety Labels and Locations

### Passenger/Tire Pressure Warning

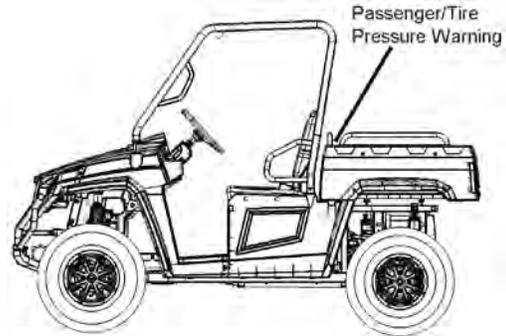
#### WARNING

- Passengers can be thrown off. This can cause serious injury or death.
- Never carry passengers in cargo box.

#### WARNING

IMPROPER TIRE PRESSURE OR OVERLOADING CAN CAUSE LOSS OF CONTROL RESULTING IN SERIOUS INJURY OR DEATH.

- Reduce speed and allow greater distance for braking when carrying cargo.
- Overloading or carrying tall, off-center, or unsecured loads will increase your risk of losing control. Loads should be centered and carried as low as possible in box.
- For stability on rough or hilly terrain, reduce speed and cargo.



Item	Specification
<b>MAXIMUM CARGO BOX LOAD</b>	350 lbs.(159 kg)
<b>TIRE PRESSURE IN PSI (KPa)</b>	FRONT 20 (138) REAR 20 (138)
<b>MAXIMUM WEIGHT CAPACITY INCLUDES WEIGHT OF OPERATOR, PASSENGER, CARGO AND ACCESSORIES</b>	855 lbs. (389 kg)
Read Operation & Maintenance Manual for more detailed loading information.	

- Be careful if load extends over the side of the box.

## Safety Labels



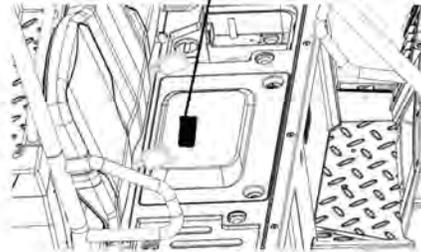
## SAFETY

### Battery Warning Label

#### WARNING

- SULFURIC ACID in batteries will burn skin, eyes, and clothing. Do not tip batteries. Keep vent caps tight and level. In event of injury, flush with water and call physician immediately.
- HIGH VOLTAGE CABLES and terminals are contained within this compartment. Improper contact between battery terminals can result in electrical shorts. ELECTRICAL SHORTS can result in burns.
- Do not use high pressure water to wash the battery compartment. Damage to the vented batteries will result.
- Tampering with or unauthorized modification of this unit could result in serious personal injury, will void the warranty, and can result in permanent damage to the vehicle.
- Refer to your Owner's Manual or contact your local HSUN dealer with any questions.

Battery Warning Label



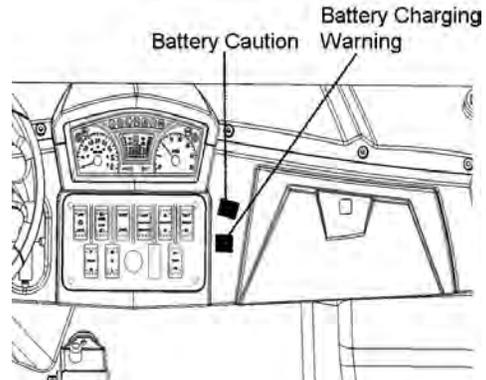
## SAFETY

### Safety Labels and Locations

#### Battery Charging Warning

##### WARNING

- Explosive gases are released when batteries are charged. Keep sparks, flames and cigarettes away. Shield eyes when working near batteries.
- Do not charge batteries in a non-ventilated enclosed area or near flammable materials.
- Do not attempt to charge frozen, leaking, or damaged batteries.
- Connect battery charger to properly rated electrical receptacle with GFCI.
- Do not charge with storage or weather cover on vehicle or with the cab enclosure doors closed, as fire and explosion are possible.
- Refer to Owner's Manual or contact your local HSUN dealer with any questions.



#### TO MAXIMIZE BATTERY LIFE

##### Always keep batteries fully charged.

- For maximum life, charge your vehicle at every opportunity.
- Use only the charger supplied with the vehicle.
- Inspect battery connections regularly.

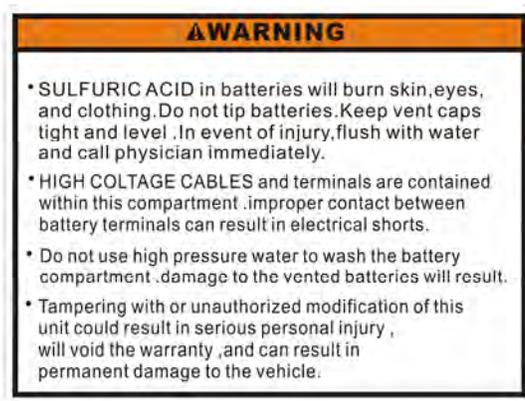
**Failure to properly maintain your batteries will void warranty coverage.**

# SAFETY

## Battery Caution

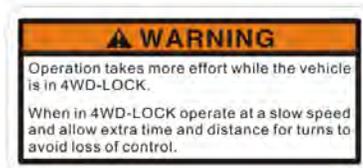
### CAUTION

- Do not drive through water above the floor of the vehicle. Battery damage will occur.
- Batteries require regular maintenance.
- Failure to maintain batteries in accordance with the owners manual can result in battery damage, vehicle malfunction, fire and/or severe injury or death.
- Max towing speed 10 MPH (16 km/h) - drivetrain damage will occur if towed faster than 10 MPH (16 km/h).
- Set parking brake before leaving vehicle.
- Turn Power On key to "Off" position and remove when not in use.
- When towing vehicle, turn Power On key to "Off" position.



## Warning and caution labels

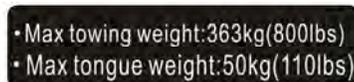
(1)



(2)



(3)



(4)



(5)



(6)



(7)



(8)



# SAFETY

## Operator Safety

### **⚠ WARNING**

Serious injury or death can result if you do not follow these instructions and procedures, which are outlined in further detail within your owner's manual.

- Read this entire manual and all labels carefully. Follow the operating procedures described.
- Never allow anyone under the age of 16 to operate this vehicle and never allow anyone without a valid driver's license to operate this vehicle.
- Do not carry a passenger until you have at least two hours of driving experience with this vehicle.
- No person under the age of 12 may ride as a passenger in this vehicle. All riders must be able to sit with backs against the seat, both feet flat on the floor and both hands on the steering wheel (if driving) or on a passenger hand hold.
- The driver and all passengers must wear helmet, eye protection, gloves, long-sleeve shirt, long pants, over-the-ankle boots and seat belt at all times.
- Always keep hands and feet inside the vehicle at all times. Always keep both hands on the steering wheel and both feet on the floorboards of the vehicle during operation.
- Never permit a guest to operate this vehicle unless the guest has read this manual and all product labels.
- To reduce rollover risk, be especially careful when encountering obstacles and slopes and when braking on hills or during turns.
- This vehicle is for off-road use only. Never operate on public roads (unless marked for off-road use). Always avoid paved surfaces.
- Never consume alcohol or drugs before or while operating this vehicle.
- Never operate at excessive speeds. Always travel at a speed proper for the terrain, visibility and operating conditions, and your experience.
- Never attempt jumps or other stunts.
- Always inspect the vehicle before each use to make sure it's in safe operating condition. Always follow the inspection procedures described in this manual.
- Always travel slowly and use extra caution when operating on unfamiliar terrain. Be alert to changing terrain.
- Never operate on excessively rough, slippery or loose terrain.
- Always follow proper procedures for turning. Practice turning at slow speeds before attempting to turn at faster speeds. Never turn at excessive speeds.
- Always have this vehicle checked by an authorized HSUN dealer if it has been involved in an accident.
- Never operate this vehicle on hills too steep for the vehicle or for your abilities. Practice on smaller hills before attempting larger hills.
- Never allow unauthorized persons to repair this UTV. This may affect vehicle performance and cause injury.
- Do not wear loose articles of clothing during operation, as these can be drawn into moving parts on the vehicle and could cause a severe injury to occur.

# SAFETY

## Operator Safety

- Always follow proper procedures for climbing hills as described in this manual. See page 50. Check the terrain carefully before attempting to climb a hill. Never climb hills with excessively slippery or loose surfaces. Never go over the top of a hill at high speed.
- Always follow the proper procedures outlined in this manual for traveling downhill and for braking on hills. See page 50. Check the terrain carefully before descending a hill. Never travel downhill at high speed. Avoid going downhill at an angle, which would cause the vehicle to lean sharply to one side. Travel straight down the hill where possible.
- Always check for obstacles before operating in a new area. Never attempt to operate over large obstacles such as large rocks or fallen trees. Always follow the proper procedures outlined in this manual when operating over obstacles. See page 51.
- Always be careful of skidding or sliding. On slippery surfaces such as ice, travel slowly and exercise caution to reduce the chance of skidding or sliding out of control.
- Never operate your vehicle in fast-flowing water or in water deeper than that specified in this manual. See page 37. Wet brakes may have reduced stopping ability. Test your brakes after leaving water. If necessary, apply them lightly several times to let friction dry out the pads.
- Always be sure there are no obstacles or people behind your vehicle when operating in reverse. When it's safe to proceed in reverse, move slowly. Avoid turning at sharp angles in reverse.
- Always use the proper size and type of tires specified in this manual. Always maintain proper tire pressure as specified on safety labels.
- Never modify this vehicle through improper installation or use of non- HSUN -approved accessories.
- Never exceed the stated load capacity for this vehicle. Cargo should be properly distributed and securely attached. Reduce speed and follow the instructions in this manual for hauling cargo or pulling a trailer. Allow a greater distance for braking.
- Always set the park brake and remove the key when leaving the vehicle unattended.

## Equipment Modifications

Never install any accessory that grounds to the vehicle chassis. The chassis is a floating ground to protect against electrical short circuits and hazards.

Do not install any non- HSUN -approved accessory or modify the vehicle for the purpose of increasing speed or power. Any modifications or installation of non- HSUN S-approved accessories could create a substantial safety hazard and increase the risk of bodily injury.

The warranty on your HSUN vehicle will be terminated if any non- HSUN -approved equipment and/or modifications have been added to the vehicle that increase speed or power.

The addition of certain accessories, including (but not limited to) mowers, blades, tires, sprayers, or large racks, may change the handling characteristics of the vehicle. Use only HSUN -approved accessories, and familiarize yourself with their function and effect on the vehicle.

# SAFETY

## Operator Safety

### **⚠ WARNING**

Failure to operate the HS5D-EV properly can result in a collision, loss of control, accident or rollover, which may result in serious injury or death. Heed all safety warnings outlined in this section of the owner's manual. See the OPERATION section of the owner's manual for proper operating procedures.

### Age Restrictions

This vehicle is an ADULT VEHICLE ONLY. NEVER operate this vehicle if you are under age 16 and NEVER operate without a valid driver's license.

Never operate with a passenger under the age of 12. All riders must be able to sit with backs against the seat, both feet flat on the floor and both hands on the steering wheel (if driving) or on a passenger hand hold.

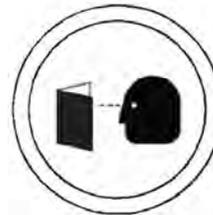


### Operating Without Instruction

Operating this vehicle without proper instruction increases the risk of an accident. The operator must understand how to operate the vehicle properly in different situations and on different types of terrain.

All operators must read and understand the Owner's Manual and all warning and instruction labels before operating the vehicle.

All operators should review the safety DVD provided with this vehicle and take a ROHVA training course ([www.rohva.org](http://www.rohva.org)).



### Using Alcohol or Drugs

Operating the vehicle after consuming alcohol or drugs could adversely affect operator judgment, reaction time, balance and perception.

Never drink alcohol or use drugs or medications before or while operating this vehicle.



### Seat Belts

Riding in this vehicle without wearing the seat belt increases the risk of serious injury in the event of rollover, loss of control, other accident or sudden stop. Seat belts may reduce the severity of injury in these circumstances.

All riders *must* wear seat belts at all times.

### Protective Apparel

Riding in this vehicle without wearing an approved helmet and protective eyewear increases the risk of a serious injuries in the event of an accident.

Operator and passenger must always wear an approved helmet that fits properly and eye protection (goggles or face shield).

# SAFETY

## Operator Safety

### Ventilation When Charging Batteries

Failure to provide adequate ventilation while charging batteries can result in an explosion. Volatile hydrogen gas is emitted during charging and may accumulate in pockets at the ceiling.

- Always ensure a minimum of 5 air changes per hour in the charging area.
- Always remove any storage covers from the vehicle and open any cab doors (if equipped) before charging.

### Failure to Inspect Before Operating

Failure to inspect and verify that the vehicle is in safe operating condition before operating increases the risk of an accident. Always perform the pre-ride inspection before each use of your HS5D-EV to make sure it's in safe operating condition. See page 47.

Always follow all inspection and maintenance procedures and schedules described in this owner's manual. See page 59.

### Operating With a Load on the Vehicle

The weight of both cargo and passengers impacts vehicle operation. For your safety and the safety of others, carefully consider how your vehicle is loaded and how to safely operate the vehicle. Follow the instructions in this manual for loading, tire pressure, gear selection and speed.

- **Do not exceed vehicle weight capacities.** The vehicle's maximum weight capacity is listed in the specifications section of this manual and on a label on the vehicle. When more passenger weight is added, cargo weight may need to be reduced accordingly.
- The recommended tire pressures are listed in the specifications section of this manual and on a label on the vehicle.

#### ***Always follow these guidelines:***

#### ***• Be careful, slow down and check tyre pressure under the following 5 conditions:***

- Passenger and/or cargo exceeds half the maximum weight capacity.
- Operating in rough terrain.
- Operating over obstacles.
- Climbing an incline.
- Towing.

### Operating a Damaged Vehicle

Operating a damaged vehicle can result in an accident. After any rollover or accident, have a qualified service dealer inspect the entire machine for possible damage, including (but not limited to) seat belts, rollover protection devices, brakes, accelerator, steering system and electrical system.

### Operating at Excessive Speeds

Operating this vehicle at excessive speeds increases the operator's risk of losing control. Always operate at a speed that's appropriate for the terrain, the visibility and operating conditions, your skills and experience and your passengers' skills and experience.

# SAFETY

## **Operator Safety**

### **Operating on Pavement**

This vehicle's tires are designed for off-road use only, not for use on pavement. Operating this vehicle on paved surfaces (including sidewalks, paths, parking lots and driveways) may adversely affect the handling of the vehicle and may increase the risk of loss of control and accident or rollover. Avoid operating the vehicle on pavement. If it's unavoidable, travel slowly, travel short distances and avoid sudden turns or stops.

### **Operating on Public Roads**

Operating this vehicle on public streets, roads or highways could result in a collision with another vehicle. Never operate this vehicle on any public street, road or highway, including dirt and gravel roads (unless designated for off-highway use). In some areas it's unlawful to operate this vehicle on public streets, roads and highways.

### **Turning Improperly**

Turning improperly could cause loss of traction, loss of control, accident or rollover. Always follow proper procedures for turning as described in this owner's manual. Never turn abruptly or at sharp angles. Never turn at high speeds. Practice turning at slow speeds before attempting to turn at faster speeds.

### **Jumps and Stunts**

Attempting wheelies, jumps and other stunts increases the risk of an accident or rollover. Never attempt wheelies, jumps, or other stunts. Avoid exhibition driving.

### **Operating in Unfamiliar Terrain**

Failure to use extra caution when operating on unfamiliar terrain could result in an accident or rollover. Unfamiliar terrain may contain hidden rocks, bumps, or holes that could cause loss of control or rollover. Travel slowly and use extra caution when operating on unfamiliar terrain. Always be alert to changing terrain conditions.

### **Operating on Slippery Terrain**

Failure to use extra caution when operating on excessively rough, slippery or loose terrain could cause loss of traction, loss of control, accident or rollover. Do not operate on excessively slippery surfaces. Always slow down and use additional caution when operating on slippery surfaces. Skidding or sliding due to loss of traction can cause loss of control or rollover (if tires regain traction unexpectedly). Always follow proper procedures for operating on slippery surfaces as described in this owner's manual. See page 49.

# SAFETY

## Operator Safety

### Improper Hill Climbing

Climbing hills improperly can cause loss of control or vehicle rollover. Always follow proper procedures for climbing hills as described in this owner's manual. See page 50.

### Descending Hills Improperly

Improperly descending a hill could cause loss of control or rollover. Always follow proper procedures for traveling down hills as described in the owner's manual. See page 50.

### Stalling While Climbing a Hill

Stalling or rolling backwards while climbing a hill could cause a rollover. Always maintain a steady speed when climbing a hill.

If all forward speed is lost:

- Apply the brakes.
- Switch to reverse and slowly allow the vehicle to roll straight downhill while applying light brake pressure to control speed.

If you begin rolling downhill:

- Never press the accelerator.
- Apply the brakes gradually until the vehicle is fully stopped.
- Switch to reverse and slowly allow the vehicle to roll straight downhill while applying light brake pressure to control speed.

### Improper Tire Maintenance

Operating this vehicle with improper tires or with improper or uneven tire pressure could cause loss of control or accident. Always use the size and type of tires specified for your vehicle. Always maintain proper tire pressure as described in the owner's manual and on safety labels.

### Operating on Frozen Bodies of Water

Severe injury or death can result if the vehicle and/or the operator fall through the ice. Never operate the vehicle on a frozen body of water unless you have first verified that the ice is sufficiently thick to support the weight and moving force of the vehicle, you and your passengers, and your cargo, together with any other vehicles in your party.

Always check with local authorities and residents to confirm ice conditions and thickness over your entire route. Vehicle operators assume all risk associated with ice conditions on frozen bodies of water.

# SAFETY

## Operator Safety

### Unauthorized Use of the Vehicle

Leaving the keys in the vehicle can lead to unauthorized use of the vehicle by someone under the age of 16, without a drivers license, or without proper training. This could result in an accident or rollover. Always remove the key when the vehicle is not in use.

### Hot Drive Systems

The motor and controller are very hot during and after use of the vehicle. Hot components can cause burns and fire. Do not touch hot drive system components. Always keep combustible materials away from the drive system. Use caution when traveling through tall grass, especially dry grass. Always inspect areas near the drive system after driving through tall grass, weeds, brush and other tall ground cover. Promptly remove any grass or debris clinging to the vehicle.

### Precautions During Maintenance

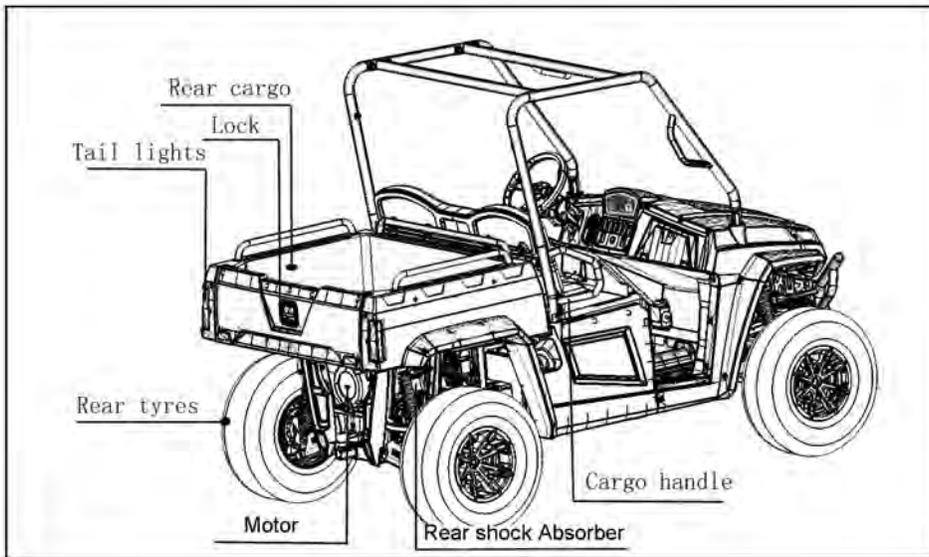
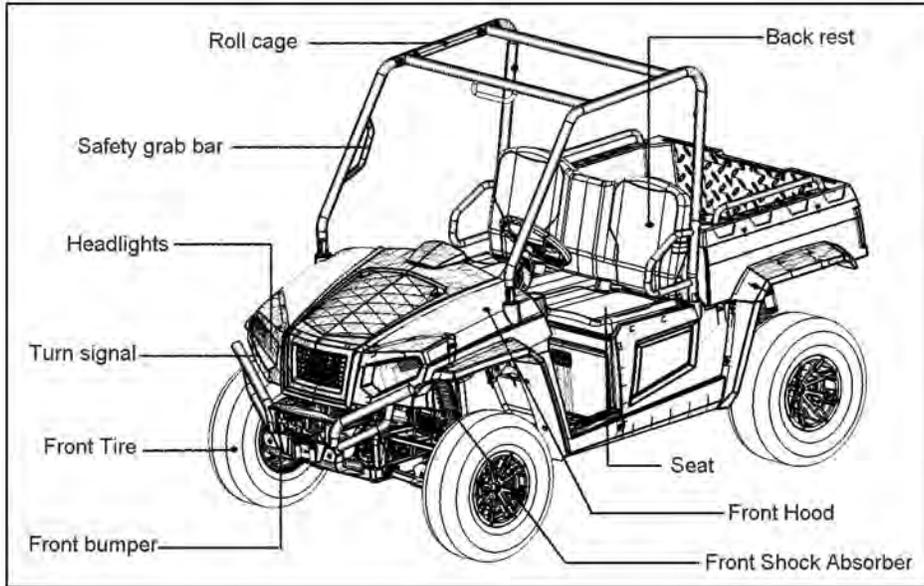
**WARNING!** Do not work in or near the battery compartment or on any other electrical component of the vehicle while charging the batteries. Always disconnect the main power connector before servicing or unplugging any electrical components. See page 43.

Always follow all safety instructions in the maintenance portion of this owner's manual, as well as the following:

- Make sure the vehicle is properly immobilized before beginning any maintenance.
- Always block the chassis securely before working under the vehicle.
- Turn the key off and remove it from the vehicle.
- Insulate any tools used within the battery area to prevent sparks or battery explosion caused by shorting the battery terminals or wiring. Remove the batteries, or cover the exposed terminals with an insulating material.

# FEATURES AND CONTROLS

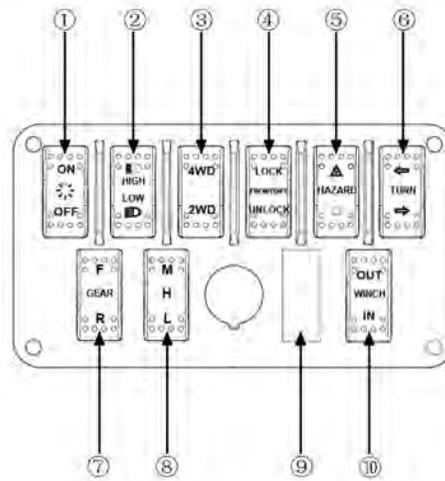
## Component Locations



## FEATURES AND CONTROLS

### Switch

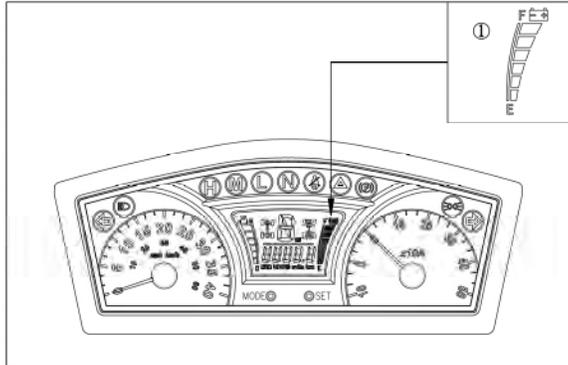
- ① Lighting switch
- ② The distance light switch
- ③ Two four-wheel drive switch
- ④ Front axle differential switch
- ⑤ Emergency lights switch
- ⑥ Left & right change Switch
- ⑦ Steering gear switch
- ⑧ Steering mode switch
- ⑨ Switch decorative cover
- ⑩ Winch switch



## FEATURES AND CONTROLS

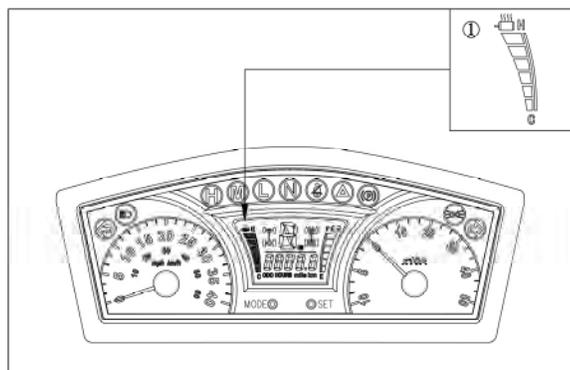
### Meter

Battery energy meter, indicates the current, remaining energy.



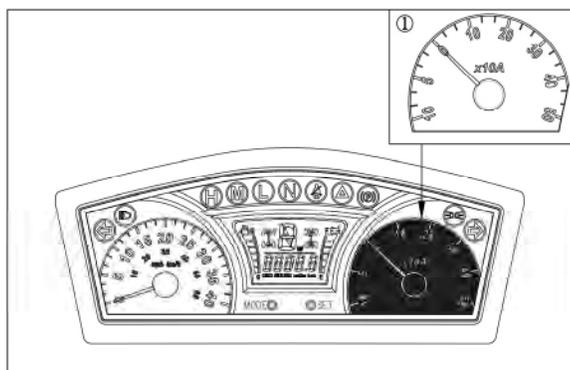
① battery energy indicator

Motor temperature meter, indicates the temperature values inside motor.



① motor temperature indicator

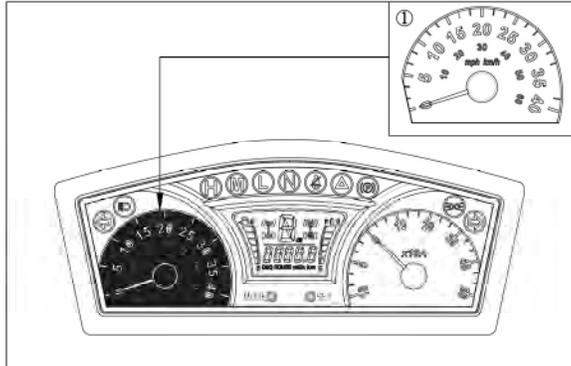
Current meter, indicates the current values of working motor.



① motor current reading

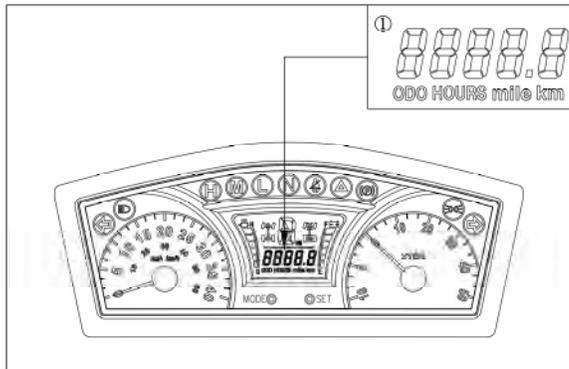
## FEATURES AND CONTROLS

The speedometer indicates the traveling speed



### ① Speed Meter

The hour meter indicates in five digits the hours the vehicle has been used; the last digit indicates 1/10 of an hour.

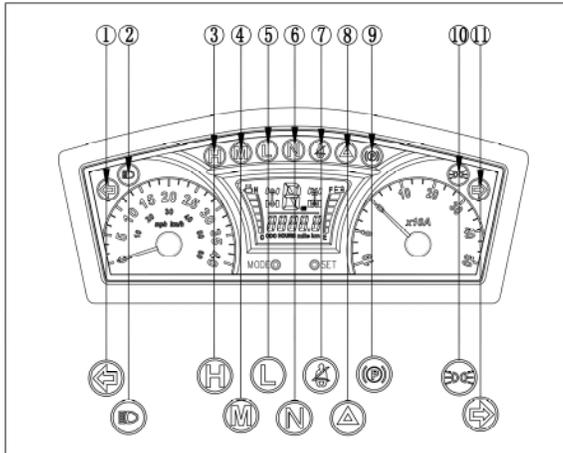


### ① Hour meter

Note: this meter also indicates accumulated mileages and electric drive system's failure codes. See page 32-40.

## FEATURES AND CONTROLS

### INDICATOR



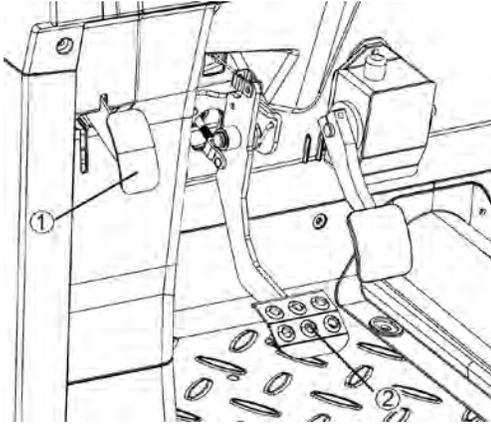
- ① Left turn indicator
- ② Beam indicator
- ③ High-speed mode indicator
- ④ Saving mode indicator
- ⑤ Climbing mode indicator
- ⑥ Neutral mode indicator
- ⑦ safety belt indicator
- ⑧ Emergency indicator
- ⑨ Mechanical parking lights
- ⑩ Position indicator
- 11 Right turn indicator

## FEATURES AND CONTROLS

### Console

#### Parking Release

1. Set the direction switch to the "N" position and To release the parking brake, depress the brake pedal.



① Parking brake.

② Brake pedal.

2. Avoid stopping the vehicle on a slope. If stopping on a slope make sure the vehicle is stationary before exiting.

#### Charge Status Indicator

Charger status indicator, please check the charger's manual inside the vehicle.

#### key switch

Set the key switch to the ON position, connect battery, conduct operations and drive the vehicle. When leave the vehicle, set the key switch to the OFF position.

#### Note:

Set the key switch to the OFF position when charge.

## FEATURES AND CONTROLS

### Console

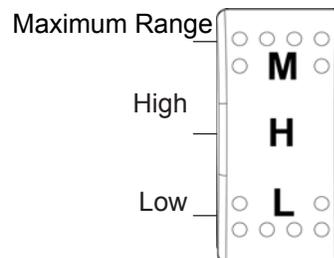
#### Drive Mode Switch

**CAUTION!** Changing the drive mode switch position while driving could result in an automatic increase or decrease in speed without a change to accelerator pedal pressure.

Press the top of the switch to select high mode. Use high mode for most trail-riding conditions. The vehicle will operate at speeds up to 25 MPH (40 km/h).

Press the bottom of the switch to select low mode. Low mode is recommended for short-term operation in extreme load conditions. Use low mode when towing, hauling loads or maneuvering over obstacles. Speed will be limited to a maximum of 10 MPH (16 km/h) and regenerative braking increases to improve control in aggressive terrain. Return the mode switch to high mode for normal operation.

Move the switch to the center position to select the maximum range mode. Use this mode to operate the vehicle a greater distance or for a longer time period. This mode limits both speed and torque to obtain the maximum driving range.



Mode	Maximum Speed	Torque (percent of maximum torque)	Deceleration (regenerative braking)	Application
High	25 MPH (40 km/h)	70%	Minimum	Trail riding
Max Range	15 MPH (24 km/h)	50%	Minimum	Whenever possible, to maximum driving range of battery pack
Low	10 MPH (16 km/h)	100%	Maximum	Towing, hauling loads, driving on steep hills or aggressive terrain

## FEATURES AND CONTROLS

### Console

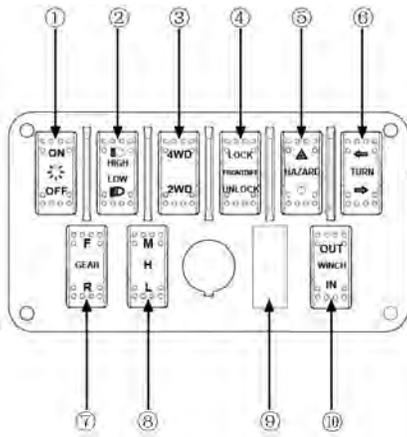
#### Direction Selector Switch

When the direction selector is in the center position, the vehicle is in gear. The vehicle will not move if the accelerator pedal is depressed.

Push the top of the switch to choose forward operation. Push the bottom of the switch to choose reverse operation.

If the switch is changed while the accelerator pedal is depressed, the vehicle will not move in the new direction until the pedal is released, then depressed again.

**Tip:** The malfunction light will illuminate after reversing direction if you fail to release the throttle pedal after changing the switch.



- ① Lighting switch
- ② The distance light switch
- ③ Two four-wheel drive switch
- ④ Front axle differential switch
- ⑤ Emergency lights switch
- ⑥ Left & right change Switch
- ⑦ Steering gear switch
- ⑧ Steering mode switch
- ⑨ Switch decorative cover
- ⑩ Winch switch

#### switch functions

2WD/4WD operation of switch and front axle differential operation of switch:

When 2WD/4WD switch is set to the 2WD position, the vehicle keeps 2WD status; At this moment, front axle differential switch doesn't work.

When 2WD/4WD switch is set to the 4WD position, the vehicle keeps 4WD status; At this moment, if front axle differential switch is set to the Front axle differential unlock position, the front differential has its diff lock unlocked, two front wheels work respectively. The rear axle differential in the vehicle keeps unlocked, two rear wheels always work respectively.

## FEATURES AND CONTROLS

### Headlight Switch

Turn on the key switch and toggle the head light switch to the “ON” position.

Toggle the head light switch to the “OFF” position to turn off the head light.

#### **NOTE:**

Turning the head light switch to the “ON” position causes the following lamps to light simultaneously.

1. Tail lights (lamps at the rear portions of the vehicle)
2. Lamp built in the coolant temperature gauge
3. Lamp built in the fuel gauge
4. Lamp built in the speedometer
5. Front left and right position lights

#### ■ **Emergency Light Switch**

##### **[if equipped]**

Press the top half of the emergency light switch, the light flash along with the indicator on the instrument panel. Press the bottom half of the emergency light switch to turn off the light.

#### **Note:**

The emergency light switch will operate when the key switch is in the “ON” position. Be careful that keeping the switch “ON” causes the battery to run out.

#### ■ **Turn Signal Light Switch**

##### **[if equipped]**

To indicate a right turn, push on the lower half of the turn toggle switch.

To indicate a left turn, push on the upper half of the turn toggle switch.

When the left or right signal is activated, the indicated turning light will flash and the other will stay on.

The indicator lamp at the instrument panel also flashes indicating the direction of the turn.

#### **NOTE:**

- The turn signal light switch is only operative when the key switch is in the “ON” position. If the emergency light switch is pressed to the “ON” position while the turn signal is.

## FAULT CODE

failure code	Message	Description
4481	Handbrake Fault	Handbrake is active when direction selected.
4541	Fan Fault	No speed feedback from external heatsink fans
4542	Low Oil	Low Oil
4543	Hydraulic filter	Hydraulic Filter
4544	Pump Current Low	Pump motor is not drawing sufficient current
4545	Isolation Fault	Isolation fault detected between logic and power frame
4546	No Motor Speed Signal	No speed feedback from motor
4547	Tow Mode	Tow mode has been activated
4548	Steer Sensor Warning	Invalid steer sensor state
4549	Pulsed Enable	Pulsed enable signal not present, unable to enable bridge
454A	Bridge Enable Delayed	Unable to complete power on checks to allow the bridge to enable
454B	MOSFET s/c tests waiting	MOSFET / IGBT s/c tests at power up are being held off
454C	Electrolyte Low Level	Battery Electrolyte Low Level detected
454D	Electrolyte Cutout Level	Battery Electrolyte Low Level detected and cutback
4581	Throttle Fault (Warn)	Warning level throttle fault. Used for Renault Twizy
4582	Safety Case 1	Throttle appears to be stuck. This fault will clear if throttle starts to work again.
4583	Safety Case 2	Throttle appears to be stuck. This fault will latch and can only be cleared by repairing the throttle and recycling power.
4584	Analogue Output Over Current (warn)	Contactora driver over current
4585	Analogue Output Off with Failsafe (warn)	Contactora driver not working
4586	Analogue Output Over Temperature (warn)	Contactora driver over temperature
4587	Analogue Output Under Current (warn)	Contactora driver unable to achieve current target in current mode
4588	Analogue Output Short Circuit (warn)	Contactora driver MOSFET short circuit detected
4589	Analogue supply (warn)	Analogue supply is >10% out of range
458A	Seat (warning)	seat regen settings applied
45C1	BDI Warning	BDI remaining charge (0x2790,1) is less than BDI Warning level (0x2C30,5)
45C2	BDI Cutout	BDI remaining charge

		(0x2790,1) is less than BDI Cutout level (0x2C30,4)
45C3	Low Battery Cut	Battery voltage (0x5100,1) is less than Under Voltage limit (0x2C02,2) for longer than the protection delay (0x2C03,0)
45C4	High Battery Cut	Battery voltage (0x5100,1) is greater than Over Voltage limit (0x2C01,2) for longer than the protection delay (0x2C03,0)
45C5	High Capacitor Cut	Capacitor voltage (0x5100,3) is greater than Over Voltage limit (0x2C01,2) for longer than the protection delay (0x2C03,0)
45C6	Vbat below rated min	Battery voltage (0x5100,1) is less than rated minimum voltage for controller for longer than 1s.  NOTE: This fault is sometimes seen at power down.
45C7	Vbat above rated max	Battery voltage (0x5100,1) is greater than rated maximum voltage for controller for longer than 1s.
45C8	Vcap above rated max	Capacitor voltage (0x5100,3) is greater than rated maximum voltage for controller for longer than 1s.
45C9	Motor in low voltage cutback	Motor control (DC link) has entered low voltage cutback region.
45CA	Motor in high voltage cutback	Motor control (DC link) has entered high voltage cutback region.
45CD	KL15/30 Too Low	The voltage applied to the KL15/30 is below the controller rated minimum
4601	Device too cold	Low heatsink temperature (0x5100,4) has reduced power to motor
4602	Device too hot	High heatsink temperature (0x5100,4) has reduced power to motor
0x4603	Motor in thermal cutback	High measured (0x4600,3) or estimated (0x4602,8) motor temperature has reduced power to motor
4604	Motor too cold	Low Measured temperature has reached -30deg
4681	Unit in preoperational	Controller is in pre-operational state
4682	IO can't init	Controller has not received all configured RPDOs at power up
4683	RPDO Timeout (warning)	One or more configured RPDOs not received with 3s at start up or 500ms during normal

		operation.
46C1	Encoder Alignment Warning	Encoder is not aligned properly.
46C2	SinCos Tracking Warning	SinCos Encoder Min Max Values are heading towards a voltage rail or converging together.
46C3	Fault Ride Through	A fault ride through event has been encountered, but operation is allowed to continue although the system may be derated
46C4	Motor Pull-Out Warning	The open loop VF induction motor software has detected a pulled-out condition, it will automatically attempt to restart.
46C5	Stator Resistance Error	Stator resistance thermal compensation has failed due to the estimated value being too different from the configured value
46C6	Encoder PLL Deactivated Warning	Encoder PLL has turned off due to poor tracking
4701	CAN warning	Vehicle is operating in reduced power mode as some CAN messages are not being received (Renault only)
4741	Scheduler stack overflow warning	This warning is set if any task has between 10% and 20% of its stack free.
4742	Internal supply out of range warning	An internal logic supply rail has gone out of range
4781	CANopen anon EMCY level 1	EMCY message received from non-Sevcon node and anonymous EMCY level (0x2830,0) is set to 1.
4782	24V Supply Low	
4783	24V Supply High	
47C1	Vehicle Service Required	Vehicle service next due time (0x2850,5) has expired. If supported Service driveability profile (0x2925) will activate.
4881	Seat Fault	Valid direction selected with operator not seated or operator is not seated for a user configurable time in drive.
4882	Two Direction Fault	Both the forward and reverse switches have been active simultaneously for greater than 200 ms.
4883	SRO Fault	FS1 active for user configurable delay (0x2914,2) without a direction selected.
4884	Sequence Fault	Any drive switch active at power up.
4885	FS1 Recycle Fault	FS1 active after a direction change and FS1 recycle function enabled (0x2914,1 bit

		1)
0x4886	Inch Fault	Inch switch active along with any drive switch active (excluding inch switches), seat switch indicating operator present or handbrake switch active.
4887	Overload Fault	Vehicle overloaded
4888	Raised and Tilted Fault	Scissor lift platform raised and tilted
4889	Pothole Fault	Scissor lift pothole protection active
488A	Traction Inhibit Fault	Traction function inhibited using traction inhibit switch (0x2137)
488B	Illegal Mode Change Fault	Vehicle changed from traction mode to pump mode (or vice versa) when direction selected
488C	Tilt Sensor Fault	Aichi error code (0x3802,0) set to 0x02
488D	Belly fault	Belly function has activated.
488E	Mom dir fault	Fault with momentary direction selection switch
4941	Motor Overspeed	
4942	PST Fault	An issue has occurred with the PST unit
4981	Throttle Fault	Throttle value (0x2620,0) is greater than 20% at power up.
4982	E-Brake Wire off	Wire-off detected in electrobrake circuit
4983	Direction Change	Direction is changed and vehicle speed is greater than allowed in 0x2929,2
49C2	Entering Cutback	Controller has entered thermal or voltage cutback region
4A01	Cutback	Thermal or voltage cutback factors have reduced below user defined levels.
4A81	RPDO Timeout (drive inhibit)	One or more configured RPDOs not received with 3s at start up or 500ms during normal operation.
4B01	CAN off bus (drive inhibit)	CANbus off fault condition detected on multinode system. NOTE: This fault was added for Aichi, to replace Very Severe CAN off fault
4B02	Ren Data	Data missing from CAN (Renault only)
4B03	IO Data Error	Vehicle application subsystem is not receiving control or status information.
4B81	CANopen anon EMCY level 2	EMCY message received from non-Sevcon node and anonymous EMCY level (0x2830,0) is set to 2.
4C41	Too many slaves	Number of slaves (0x2810,0) set higher than maximum

		allowed number of slaves
4D01	Circuit Breaker Open	
4D02	Circuit Breaker Welded	
4D03	DC Link Collapsed	
4D04	Circuit Breaker Timeout	Time to close breaker of GpAC has expired
4D41	Motor Isolation Fault	Motor isolation contactor is open circuit
4D42	Motor Open Circuit Fault	Motor terminal is open circuit or disconnected from controller
4D43	Motor stalled	No speed feedback from motor
4DC3	Power Supply Critical	Battery voltage has dropped below critical level
4E81	RPDO Timeout (severe)	One or more configured RPDOs not received with 3s at start up or 500ms during normal operation.
4EC1	Cant Establish Fld Curr	Controller is unable to control a current in the field winding
4EC2	Pulsing Disabled	The motor control protection subsystem unexpectedly disabled the PWM
4F01	Unexpected slave state	CANopen slave has changed to unexpected state
4F02	EMCY send failed	Unable to transmit EMCY message
4F41	Internal Fault	Internal software fault
4F42	Out of memory	Out of memory
4F43	General DSP error	Unknown error raised by motor model code
4F44	Timer Failed	Unable to allocate timer
4F45	Queue Error	Unable to post message to queue
4F46	Scheduler Error	Unable to create task in scheduler
4F47	DSP Heartbeat Error	Communication lost between host and DSP processors
4F48	I/O SS Error	Internal software fault
4F49	GIO SS Error	Internal software fault
4F4A	LCM SS Error	Internal software fault
4F4B	LCP SS Error	Internal software fault
4F4C	OBD SS Error	Internal software fault
4F4D	VA SS Error	Internal software fault
4F4E	DMC SS Error	Internal software fault
4F4F	TracApp SS Error	Internal software fault
4F50	New Powerframe Detected	New power frame detected.
4F51	DSP Not Detected	Communication lost between host and DSP processors
4F52	DSP Comms Error	Communication lost between host and DSP processors (or IOP and MCP)
4F53	App Manager SS Error	Internal software fault
4F54	Autozero range error	Current sensor auto-zero current out of range
4F55	DSP parameter error	Communication error between host and DSP processors

4F56	Motor in wrong direction	Motor rotation detected as wrong direction. No longer supported
4F57	Motor stalled	Motor rotation stalled. No longer supported
4F81	CANopen anon EMCY level 3	EMCY message received from non-Sevcon node and anonymous EMCY level (0x2830,0) is set to 3.
5041	Bad NVM Data	EEPROM or flash configuration data corrupted and data can not be recovered.
5042	VPDO Out of Range	VPDO mapped to non-existent or invalid object
5043	Static Range Error	At least one configuration object is out of range
5044	Dynamic Range Error	At least one configuration object is out of dynamic range. This is where one objects range depends on another object.
5045	Auto-configuration Fault	Unable to automatically configure I/O and vehicle setup.
5046	Voltage autoconfig error	Unable to set battery voltage
5081	Invalid Steer Switches	Steering switches are in an invalid state
5101	Line Contactor o/c	Line contactor did not close when coil is energized.
5102	Line Contactor welded	Line contactor closed when coil is deenergized.
5141	Beltloader Fault	Unable to change between traction and pump motors on beltloader.
5142	Ren Signal	Fault signalled by Renault vehicle network
5143	VERLOG	VERLOG signal failure
5181	Digital Input Wire Off	Digital input wire-off
5182	Analogue Input Wire Off	Analogue input outside of allowed range (0x46cX)
5183	Analogue Output Over Current	Contactor driver over current
5184	Analogue Output On with No Failsafe	Internal hardware failsafe circuitry not working
5185	Analogue Output Off with Failsafe	Contactor driver not working
5186	Analogue Output Over Temperature	Contactor driver over temperature
5187	Analogue Output Under Current	Contactor driver unable to achieve current target in current mode
5188	Analogue Output Short Circuit	Contactor driver MOSFET short circuit detected
51C1	Power Supply Interrupt	Not used
51C2	Capacitor Precharge Failure	Capacitor voltage (0x5100,3) did not rise above 5V at power up
51C3	KL15/30 Too High	The voltage applied to the KL15/30 is above the controller rated maximum

5201	Heatsink overtemp	Controller heat sink has reached critical high temperature, and has shut down.
52C1	Encoder Fault	Encoder input wire-off is detected.
52C2	Motor Overcurrent Fault	Motor current exceeded controller rated maximum
52C3	Current Control Fault	Motor controller unable to maintain control of motor currents
52C4	Motor Overspeed Fault	Motor control tripped due to motor overspeed
52C5	Encoder Alignment Severe	Encoder is not aligned properly.
52C6	di/dt fault (suspected s/c)	Large rate of change of current detected multiple times. Suspected MOSFET, motor or wiring short circuit.
52C7	Vcap Overvoltage (software overvoltage)	Measured capacitor voltage has exceeded controller maximum.
5301	CANBUS Fault	CANbus fault condition detected on multinode system.
5302	Bootup not received	CANopen slave has not transmitted boot up message at power up
5303	LPRX queue overrun	CANbus fault condition detected on multinode system.
5304	LPTX queue overrun	CANbus fault condition detected on multinode system.
5305	HPRX queue overrun	CANbus fault condition detected on multinode system.
5306	HPTX queue overrun	CANbus fault condition detected on multinode system.
5307	CAN overrun	CANbus fault condition detected on multinode system.
5308	CAN off bus	CANbus fault condition detected on multinode system.
5309	Nodeguarding Failed	Not used
530A	Short PDO received	Received RPDO doesn't contain enough bytes
530B	CANopen Heartbeat Failed	Heartbeat not received within configured time out (0x1016)
530C	CANopen slave in wrong state	CANopen slave has changed to unexpected state
530D	CAN ESTAT set	Internal CANbus fault
530E	SDO HDL Error	Internal CANbus fault
530F	SDO Timeout Error	Internal CANbus fault
5310	SDO Abort Error	Internal CANbus fault
5311	SDO State Error	Internal CANbus fault
5312	SDO Toggle Error	Internal CANbus fault
5313	SDO Rec Error	Internal CANbus fault
5314	SDO Len Error	Internal CANbus fault
5315	SDO Send Error	Internal CANbus fault
5316	SDO unknown event	Internal CANbus fault
5317	SDO Bad SRC	Internal CANbus fault
5318	SDO bad error number	Internal CANbus fault

5319	Motor slave in wrong state	Motor slave in wrong state
531A	Ren Protocol	CAN device on Renault Twizy not responding
5341	Invalid DSP Protocol	DSP reports invalid protocol version on dual processor platform
5342	OSC Watchdog Fault	Internal hardware fault
5343	Fault List Overflow	Attempting to set too many faults.
5344	DSP SPI Comms Fault	Communication error between host and DSP processors (or gate drive and MCP)
5345	Scheduler stack overflow fault	Less than 10% of the stack is free on one of the RTOS tasks.
5346	Internal supply out of range fault	An internal logic supply rail has gone out of range
5381	CANopen anon EMCY level 4	EMCY message received from non-Sevcon node and anonymous EMCY level (0x2830,0) is set to 4.
5441	Incompatible hardware version	Detected controller hardware version incompatible with software
5442	Calibration Fault	Calibration settings in controller are out of range
54C1	PFOvervoltage	Voltage on B+ terminal exceeds rated maximum for controller
54C2	Powerframe Fault	Motor current exceeded controller rated maximum
54C3	MOSFET s/c M1>B+	MOSFET / IGBT s/c detection on M1 top devices
54C4	MOSFET s/c M1>B-	MOSFET / IGBT s/c detection on M1 bottom devices
54C5	MOSFET s/c M2>B+	MOSFET / IGBT s/c detection on M2 top devices
54C6	MOSFET s/c M2>B-	MOSFET / IGBT s/c detection on M2 bottom devices
54C7	MOSFET s/c M3>B+	MOSFET / IGBT s/c detection on M3 top devices
54C8	MOSFET s/c M3>B-	MOSFET / IGBT s/c detection on M3 bottom devices
54C9	MOSFET s/c checks incomplete	Unable to complete MOSFET / IGBT s/c tests at power up
54CA	Pump Mosfet S/C	MOSFET / IGBT s/c detection Pump Mosfet Devices
54CA	IGBT M1 Low Driver Fail	IGBT driver failure
54CB	IGBT M1 High Driver Fail	IGBT driver failure
54CC	IGBT M2 Low Driver Fail	IGBT driver failure
54CD	IGBT M2 High Driver Fail	IGBT driver failure
54CE	IGBT M3 Low Driver Fail	IGBT driver failure
54CF	IGBT M3 High Driver Fail	IGBT driver failure
5741	Invalid Powerframe Rating	Unable to identify hardware
5781	CANopen anon EMCY level 5	EMCY message received from

		non-Sevcon node and anonymous EMCY level (0x2830,0) is set to 5.
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## FEATURES AND CONTROLS

### Batteries

This vehicle is equipped with eight 6-volt batteries that supply the power needed to operate the vehicle. The batteries are located under the seat. See page 69 for battery access instructions. Always observe all battery safety warnings and safe handling procedures as outlined on vehicle safety labels and in this manual. Refer to the battery maintenance section beginning on page 68.

### Battery Handling Precautions

- Always make sure that all electrical accessories are grounded directly to the negative (-) post on the terminal board. Never use the chassis or body as a ground connection.
- Always keep battery terminals and connections clean and free of corrosion at all times. See page 69.
- Always maintain a full charge on the batteries. For best battery life, avoid discharging the batteries more than 80%.
- Make sure new batteries are fully charged before using.
- New deep cycle batteries need to be cycled several times before reaching full capacity (50-125 cycles, depending on type). Capacity will be limited during this time.
- Make sure vent caps are installed properly and securely during vehicle operation and battery charging.
- Recharge batteries fully at the end of each day the vehicle is operated, allowing adequate time for the charger to complete its charge cycle. The batteries in this vehicle do not have a “memory effect”. Frequent charging will extend their life.
- Avoid charging at temperatures above 120° F. (49° C.) ambient air temperature. Closed, unvented storage buildings often exceed this temperature when exposed to direct sunlight.
- Never connect a 6-volt accessory directly to the batteries. Always connect any powered accessory to a 12-volt auxiliary outlet or terminal board.
- Never connect jumper cables to any of the batteries of this vehicle.
- Use only insulated tools when working in the battery compartment.

## FEATURES AND CONTROLS

### Batteries

#### Battery Conditioning

New batteries cannot initially hold all of their capacity. The approximate capacity of the battery pack increases as the number of charge cycles increases.

<b># of Charge Cycles:</b>	New	15	30	45
<b>Percent of Full Capacity:</b>	80%	90%	95%	100%

#### Ambient Temperature Implications on Batteries

1. Battery range decreases as ambient temperature decreases. This can affect the range by up to 30%.
2. Batteries discharge when left uncharged. They can discharge up to 13% per month (higher rates in warmer climates) with the key off and much faster if the key is left on.
3. Batteries can freeze if left uncharged at low ambient temperatures.

<b>Percent Charged:</b>	100%	50%	0%
<b>Approximate Freezing Point:</b>	-60° F (-51° C)	0° F (-18° C)	25° F (-4° C)

#### Charger Operation

Open the hood and any door enclosures or zippers. This will decrease charger temperature, which allows it to operate more efficiently, and shorten charge times. See pages 68-69 for charging procedures.

1. Always use extension cords with the appropriate ratings for the country in which it is used. In North America this is a UL rating. The cords must also be rated for the conditions in which they are used, such as being rated for protection from oil in a garage or workshop environment.
2. Use the proper cord wire gauges for the cord length used:

<b>Length:</b>	<25 ft (7.5 m)	<50 ft (15 m)	<100 ft (30 m)
<b>Gauge:</b>	16AWG (1.5mm <sup>2</sup> )	14AWG (2.5mm <sup>2</sup> )	10AWG (6.0mm <sup>2</sup> )

#### Battery Operation Range

Range is significantly affected by tire pressure, alignment, terrain and driving style. Always maintain proper tire pressure as specified on safety labels.

## FEATURES AND CONTROLS

### Main Power Connector

**NOTICE:** Damage to electrical connections and components will occur if they are unplugged before the main power connector is disconnected. Always disconnect the main power connector before servicing or unplugging any electrical components.

When disconnected, the main power connector disconnects the battery pack from all electrical components, with the exception of the connector. After servicing the vehicle, the main power connector should be the last connection to be made. The main power connector is located under the seat on the driver's side of the controller tray, adjacent to the main line contactor. To disconnect, unplug the connector.

To disconnect the battery pack from the vehicle completely, disconnect the main power connector, then remove the B+ wire from the battery terminal.

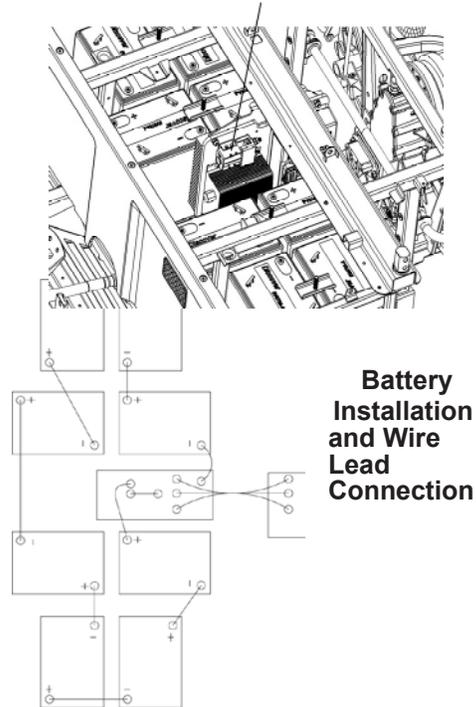
**WARNING!** Insulate any tools used within the battery area to prevent sparks or battery explosion caused by shorting the battery terminals or wiring. Remove the batteries, or cover the exposed terminals with an insulating material.

### Trailer Hitch Bracket

This vehicle is equipped with a receiver hitch bracket for a trailer hitch. Trailer towing equipment is not supplied with this vehicle.

To avoid injury and property damage, always heed the warnings and towing capacities outlined on pages 53-55.

Main Power Connector

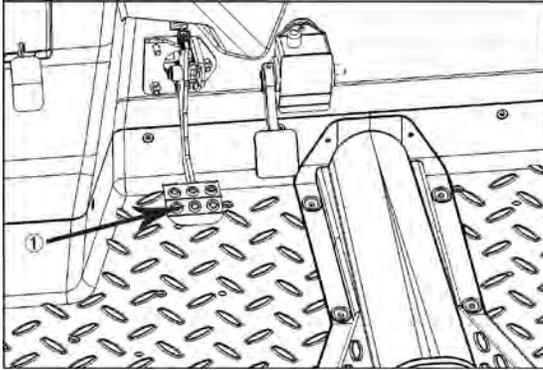


Battery  
Installation  
and Wire  
Lead  
Connection

## FEATURES AND CONTROLS

### Checking the brake pedal.

#### ■ Brake Pedal



① Brake pedal

#### Brake Pedal



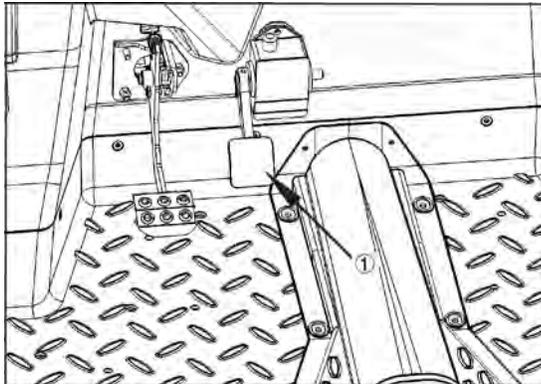
To avoid personal injury:

- If the operator suddenly brakes, an accident may occur due to loss of control or the shifting forward of heavy loads.

When driving on icy, wet or loose surface, make sure the vehicle is correctly loaded to avoid skidding or loss of steering

- The brake pedal is the left pedal on the foot board. Depress the pedal to slow or stop the vehicle.

#### Accelerator Pedal



① Accelerator pedal

## FEATURES AND CONTROLS

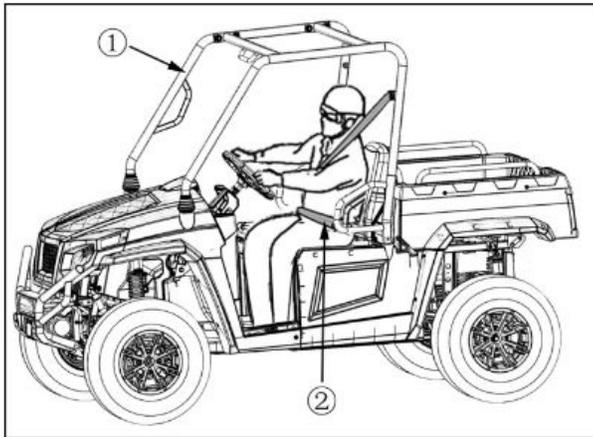
The accelerator pedal will function only when the key is ON and the direction selector switch is set to either forward or reverse. To begin moving or to increase vehicle speed, gradually push the accelerator pedal toward the floor. Holding the accelerator pedal down continuously will accelerate the vehicle to the maximum speed.

To slow the vehicle, release the accelerator pedal.

Electric motor braking provides braking when the pedal is released. For additional speed control or to stop the vehicle, apply the service brakes.

### Roll-over protective structure

Understand completely and learn to use the safety devices (roll-over protective structure, seat belts), and never change original safety devices. If safety devices are damaged, consult your local dealer for replacement. Always use seat belts.



- ① Roll-over protective structure
- ② Seat belts

## FEATURES AND CONTROLS

### Seat Belts

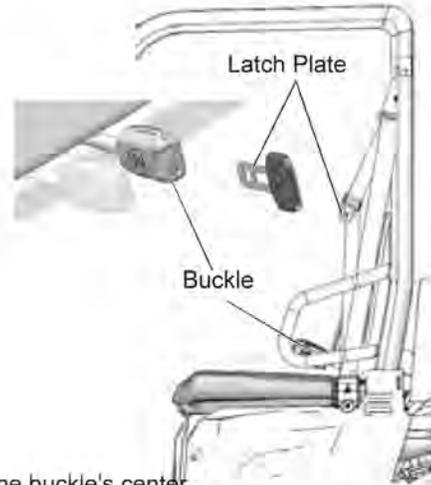
This HSUN vehicle is equipped with three- point lap and diagonal seat belts for the operator and passenger. Always make sure the seat belts are secured for all riders before operating.

The center of the seat is NOT equipped with a seat belt. Never allow a passenger to ride between the operator and passenger seats.

**WARNING!** Falling from a moving vehicle could result in serious injury or death. Always fasten your seat belt securely before operating or riding in the HS5D-EV.

To wear the seat belt properly, follow this procedure:

1. For 3-point belts, pull the seat belt latch downward and across your chest toward the buckle at the inner edge of the seat. The belt should fit snugly across your hips and diagonally across your chest. Make sure the belt is not twisted.
2. Push the latch plate into the buckle until it clicks.
3. Release the strap, it will self tighten.
4. To release the seat belt, press the square red button in the buckle's center.



### Seat Belt Inspection

Inspect all seat belts for proper operation before each use of the vehicle.

1. Push the latch plate into the buckle until it clicks. The latch plate must slide smoothly into the buckle. A click indicates that it's securely latched.
2. Push the red release latch in the middle of the buckle to make sure it releases freely.
3. Pull each seat belt completely out and inspect the full length for any damage, including cuts, wear, fraying or stiffness. If any damage is found, or if the seat belt does not operate properly, have the seat belt system checked and/or replaced by an authorized HSUN dealer.
4. To clean dirt or debris from the seat belts, sponge the straps with mild soap and water. Do not use bleach, dye or household detergents.

## OPERATION

### **⚠ WARNING**

Failure to operate the vehicle properly can result in a collision, loss of control, accident or rollover, which may result in serious injury or death. Read and understand all safety warnings outlined in the safety section of this owner's manual.

### **Pre-Ride Inspection**

Failure to inspect and verify that the vehicle is in safe operating condition before operating increases the risk of an accident. Always inspect the vehicle before each use to make sure it's in safe operating condition.

<b>Item</b>	<b>Remarks</b>	<b>Page</b>
Brake system/pedal travel	Ensure proper operation	44
Brake fluid	Ensure proper level	63
Steering	Ensure free operation	68
Tires	Inspect condition and pressure	67
Tires	Checking tire inflation pressure	67
Indicator lights/switches	Ensure operation	30
Seat belts	Check length of belt for damage, check latches for proper operation	46
Latches (hood/tailgate/seat)	Ensure all latches are secure	-
Batteries	Ensure full charges, clean terminals	12-14 41
Battery cables	Inspect for proper cable routing and secure connections	73

## OPERATION

### Driving Procedure

1. Disconnect the charging cable (if connected).
2. Wear a helmet, eye protection, gloves, long-sleeve shirt, long pants and over-the-ankle boots.
3. Sit in the driver's seat and fasten the seat belt.
4. Apply the brakes.
5. Turn the key to the ON position. Wait about a second for the contactor to close before continuing.
6. Move the direction selector to forward or reverse.
7. Move the drive mode switch to the desired setting. See page 42.
8. Release the park brake.
9. Check your surroundings and determine your path of travel.
10. Keeping both hands on the steering wheel, release the brake pedal and gradually push the accelerator toward the floor to begin driving.
11. Drive slowly. Practice maneuvering and using the accelerator and brakes on level surfaces.
12. Do not carry a passenger until you have at least two hours of driving experience with this vehicle. Never carry more than one passenger in this vehicle. Never allow a passenger to ride in the cargo box.
13. To stop the vehicle, release the accelerator pedal completely and brake to a complete stop.
14. Set the park brake.
15. Turn the key off.



**WARNING!** A rolling vehicle can cause serious injury. Always set the park brake when leaving the vehicle unattended.

## OPERATION

### Driving On Slippery Surfaces

#### **⚠ WARNING**

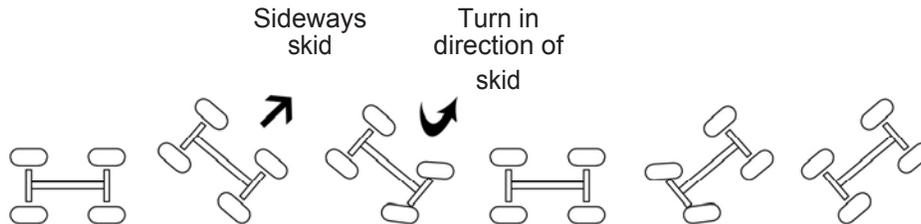
Skidding or sliding can cause loss of control or rollover (if tires regain traction unexpectedly). When operating on slippery surfaces such as ice or loose gravel, reduce speed and use extra caution to reduce the chance of skidding or sliding out of control. Do not operate on excessively slippery surfaces.

Whenever riding on slippery surfaces such as wet trails or loose gravel, or during freezing weather, follow these precautions:

1. Do not operate on excessively rough, slippery or loose terrain.
2. Slow down before entering slippery areas.
3. Maintain a high level of alertness, reading the trail and avoiding quick, sharp turns, which can cause skids
4. Engage all-wheel drive before wheels begin to lose traction.

**NOTICE:** Severe damage to the drive train may occur if the AWD is engaged while the wheels are spinning. Always allow the wheels to stop spinning before engaging AWD.

5. Correct a skid by turning the steering wheel in the direction of the skid. Never apply the brakes during a skid.



## OPERATION

### Driving Uphill

Whenever traveling uphill, follow these precautions:

1. Always travel straight uphill.
2. Avoid excessively steep hills.
3. Keep both feet on the floor.
4. Always check the terrain carefully before ascending any hill. Never climb hills with excessively slippery or loose surfaces.
5. Proceed at a steady rate of speed.
6. Never go over the crest of a hill at high speed. An obstacle, a sharp drop, or another vehicle or person could be on the other side of the hill.
7. If the vehicle stalls while climbing a hill, apply the brakes. Turn the key off and on, then change the drive mode to low mode. Place the direction selector switch in reverse and slowly allow the vehicle to roll straight downhill while applying light brake pressure to control speed.



### Driving on a Sidehill (Sidehilling)

Driving on a sidehill is not recommended. Improper procedure could cause loss of control or rollover. Avoid crossing the side of any hill unless absolutely necessary.

If crossing a sidehill is *unavoidable*, follow these precautions:

1. Slow down.
2. Exercise extreme caution.
3. Avoid crossing the side of a steep hill.

### Driving Downhill

When driving downhill, follow these precautions:

1. Avoid excessively steep hills.
2. Always descend a hill with the direction selector switch on forward. Never descend a hill with the switch on neutral.
3. Drive straight downhill. Avoid descending a hill at an angle, which would cause the vehicle to lean sharply to one side. Travel straight downhill when possible.
4. Slow down.
5. Apply the brakes *slightly* to aid in slowing.



## OPERATION

### Driving Through Water

Your HSUN vehicle can operate through water up to a maximum recommended depth equal to the floorboards.

**NOTICE:** Serious damage can occur to the electrical system and batteries if the vehicle is operated in water deeper than the floorboards.

Follow these procedures when operating through water:

1. Determine water depths and current before entering water.
2. Choose a crossing where both banks have gradual inclines.
3. Proceed slowly, avoiding rocks and obstacles.
4. Avoid operating through deep or fast-flowing water.
5. After leaving water, always dry the brakes by applying light pressure to the pedal repeatedly until braking action is normal.



### Driving Over Obstacles

Follow these precautions when operating over obstacles:

1. Always check for obstacles before operating in a new area.
2. Look ahead and learn to read the terrain. Be constantly alert for hazards such as logs, rocks and low hanging branches.
3. Travel slowly and use extra caution when operating on unfamiliar terrain. Not all obstacles are immediately visible.
4. Move the drive mode switch to low mode if needed. See page 42.
5. Avoid operating over large obstacles such as large rocks and fallen trees. If unavoidable, use extreme caution and operate slowly.
6. Always have all passengers dismount and move away from the vehicle before operating over an obstacle that could cause a rollover.



## OPERATION

### Driving in Reverse

Follow these precautions when operating in reverse:

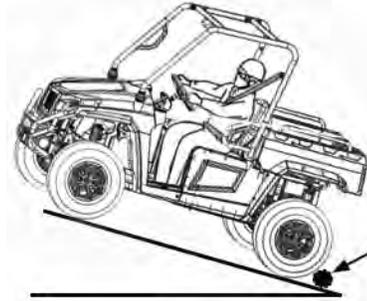
1. Always check for obstacles or people behind the vehicle. Always inspect left and right fields of vision before backing.
2. Always avoid backing downhill.
3. Back slowly.
4. Apply the brakes *lightly* for stopping.
5. Avoid turning at sharp angles.
6. Never accelerate suddenly.



### Parking on an Incline

Avoid parking on an incline if possible. If it's unavoidable, follow these precautions:

1. Apply the brakes.
2. Set the park brake.
3. Turn the key off.
4. Block the rear wheels on the downhill side.



### Parking the HS5D-EV

1. Apply the brakes. Stop the vehicle on a level surface.
2. When parking inside a garage or other structure, be sure that the structure is well ventilated and that the vehicle is not close to any source of flame or sparks, including any appliance with pilot lights.
3. Set the park brake.
4. Turn the key off. Remove the key to prevent unauthorized use.

## OPERATION

### Hauling Cargo

#### **⚠ WARNING**

Hauling cargo improperly can alter vehicle handling and may cause loss of control or brake instability, which can result in serious injury or death. Always follow these precautions when hauling cargo: Never exceed the maximum weight capacity of the vehicle. When determining the weight you are adding to the vehicle, include the weight of the operator, passenger, accessories, loads in the rack or box and the load on the trailer tongue. The combined weight of these items must not exceed the maximum weight capacity.

#### **REDUCE SPEED AND ALLOW GREATER DISTANCES FOR BRAKING WHEN HAULING CARGO.**

Always load the cargo box with the load as far forward and as low as possible.

When operating over rough or hilly terrain, reduce speed and cargo to maintain stable driving conditions.

Always operate the vehicle with extreme care when hauling or towing loads.

Slow down and drive in the lowest gear available.

#### **SECURE ALL LOADS BEFORE OPERATING.**

Unsecured loads can create unstable operating conditions, which could result in loss of control of the vehicle.

#### **OPERATE ONLY WITH STABLE AND SAFELY ARRANGED LOADS.**

When handling off-centered loads that cannot be centered, securely fasten the load and operate with extra caution. Always attach the tow load to the hitch point designated for your vehicle.

#### **HEAVY LOADS CAN CAUSE BRAKING AND CONTROL PROBLEMS.**

Use extreme caution when applying brakes with a loaded vehicle. Avoid terrain or situations that may require backing downhill.

#### **USE EXTREME CAUTION.**

when operating with loads that extend over the rack sides. Stability and maneuverability may be adversely affected, causing a rollover.

#### **DO NOT TRAVEL FASTER THAN THE RECOMMENDED SPEEDS.**

Vehicle should never exceed 10 MPH (16 km/h) while towing a load on a level grass surface. Vehicle speed should never exceed 5 MPH (8 km/h) when towing loads in rough terrain, while cornering, or while ascending or descending a hill.

The HS5D-EV has been designed to carry or tow specific capacities. Always read and understand the load distribution warnings listed on the warning labels. Move the drive mode switch to low mode if needed. See page 24.

The total load (operator, passenger, accessories, cargo and weight on hitch) must not exceed the maximum weight capacity of the vehicle. Never exceed the following capacities.

Maximum Capacities (Level Ground)	Cargo Box
855lbs.(389kg)	350lbs.(159kg)

## OPERATION

**WARNING!** Driving with passengers in the cargo box can result in severe injury or death. Never allow passengers to ride in the cargo box. A passengers must always ride in the cab with seat belt fastened securely.



## OPERATION

### Towing Loads

Towing improperly can alter vehicle handling and may cause loss of control or brake instability. Always follow these precautions when towing:

1. Never load more than 150 lbs. (68.1 kg) tongue weight on the towing bracket.
2. Do not operate the vehicle faster than 10 MPH (16 km/h) when towing. Towing a trailer increases braking distance.
3. Do not tow more than the recommended weight for the vehicle. See the towing capacity chart below and the specifications charts beginning on page 75.
4. Attach a trailer to the trailer hitch bracket only. Do not attach a trailer to any other location or you may lose control of the vehicle.
5. Never tow a trailer on a grade steeper than 15°.

Total Towed Load Weight (Level Ground)	Total Towed Load Weight (15° grade)	Total Hitch Vertical Weight	Maximum Towing Speed
855lbs.(389kg)	500lbs.(227kg)	150 lbs.(68.1 kg)	10 MPH(16 kph)

### Towing the HS5D-EV

**NOTICE:** When towing the vehicle, the key **MUST** be in the OFF position or severe motor damage will occur.

Follow these procedures when towing the vehicle:

1. Turn the key off.
2. Always follow these precautions when towing this vehicle:
  - Do not operate faster than 10 MPH (16 km/h).
  - Do not tow on public streets.
  - Do not allow passengers in the towed vehicle.
  - Avoid abrupt starts and stops.
  - Avoid sharp turns and abrupt steering maneuvers.
  - Avoid towing on a hill.

## OPERATION

### HOW TO RAISE THE CARGO BED

#### **⚠ CAUTION**

##### **To avoid personal injury:**

- When servicing under raised bed, make sure safety support is properly mounted.
- Do not touch muffler or exhaust pipes while they are hot; Otherwise, severe burns could result.

##### ■ Raising and Lowering the Cargo Bed

##### ◆ To raise the cargo bed

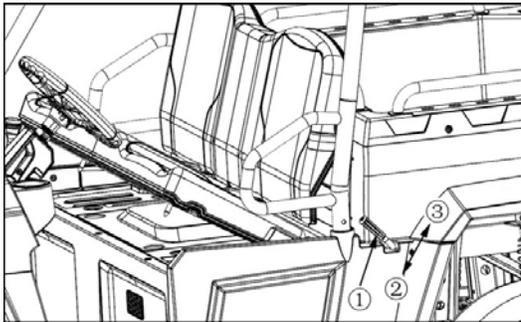
1. Apply the parking brake with the engine off.
2. Pull up the cargo bed handle.

##### ◆ To lower the cargo bed

Press down the cargo bed hard to make the gas spring contractive till it is locked

##### **NOTE:**

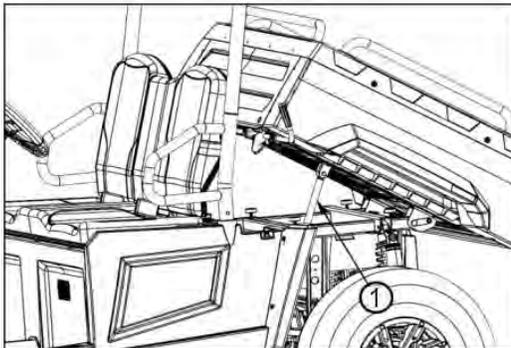
Pull up the cargo bed handle to raise the cargo bed with the gas spring elasticity.



① Cargo bed handle

② UP

③ DOWN



① Gas spring

## OPERATION

### Transporting the HS5D-EV

When transporting the HS5D-EV for a long distance or on public streets, always use a trailer with an approved load rating greater than the HS5D-EV curb vehicle weight of 1700 lbs. (830 kg) plus any installed accessories or cargo.

Follow these guidelines when transporting the HS5D-EV.

1. Set the park brake.
2. Remove the key to prevent loss.
3. Secure the seat, hood and tailgate latches. Ensure that the seats are attached correctly and are not loose.

**WARNING!** Cargo and other loose vehicle parts may fly off while transporting this vehicle. Secure or remove all cargo, and inspect the unit for loose parts prior to transport.

4. Always tie the frame of the HS5D-EV to the transporting unit securely with suitable straps.
5. If using an open trailer, remove the windshield (if equipped).
6. Never allow passengers on a trailer or in a trailered vehicle.
7. Reduce speed and drive with caution.

## OPERATION

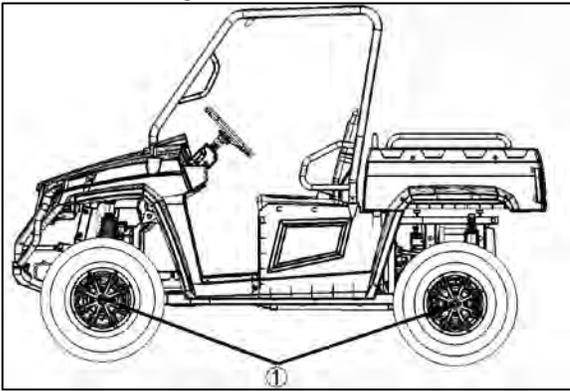
### Checking wheel bolt torque

#### **⚠ CAUTION**

To avoid personal injury

- Never operate vehicle with a loose wheel bolts.
- Any time these bolts are loosened they should be retightened to the specified torque.
- Check all bolts frequently and keep them tight.

Check wheel bolts regularly especially when new if they are loose tighten them as follows:



- ① Torque wheel bolts to 257N.m

## MAINTENANCE

### Periodic Maintenance Chart

Careful periodic maintenance will help keep your vehicle in the safest, most reliable condition. Inspection, adjustment and lubrication of important components are explained in the periodic maintenance chart.

Inspect, clean, lubricate, adjust and replace parts as necessary. When inspection reveals the need for replacement parts, use genuine HSUN parts available from your HSUN dealer.

**Tip:** Service and adjustments are important for proper vehicle operation. If you're not familiar with safe service and adjustment procedures, have a qualified dealer perform these operations.

Vehicles subjected to heavy or severe use patterns must be inspected and serviced more frequently.

### Severe Use Definition

- Frequent immersion in mud, water or sand
- Racing or race-style high RPM use
- Prolonged low speed, heavy load operation

## MAINTENANCE

### Periodic Maintenance Chart

Perform all services at whichever maintenance interval is reached first.

Item	Maintenance Interval (whichever comes first)	Remarks
<b>Calendar</b>		
Headlamp/tail lamp	Daily	Check operation; apply dielectric grease if replacing
Brake pad wear	Monthly	Inspect periodically
Battery terminals	Monthly	Inspect and clean (page 69)
Battery fluid levels	Monthly	Add as needed (page 69)
Battery terminals	Monthly	Inspect; torque to specification
Front gear case oil	1 M	Perform a break-in oil level check
Main gear case oil (Transaxle)	1 M	Perform a break-in oil level check
General lubrication	3 M	Lubricate all fittings, pivots, cables, etc.
Steering	6 M	Lubricate
Front Suspension	6 M	Lubricate
Rear Suspension	6 M	Lubricate
Front gear case oil	12 M	Perform a break-in oil level check
Main gear case oil (Transaxle)	12 M	Perform a break-in oil level check
Wiring	12 M	Inspect for wear, routing, security; apply dielectric grease to connectors subjected to water, mud, etc.
Front wheel bearings	12 M	Inspect; replace as needed
Brake fluid	24 M	Change every two years
Toe adjustment	-	Inspect periodically; adjust when parts are replaced
Headlight aim	-	Adjust as needed

### Lubrication Recommendations

Check and lubricate all components at the intervals outlined in the Periodic Maintenance Chart beginning on page 63, or more often under severe use, such as wet or dusty conditions. Items not listed in the chart should be lubricated at the general lubrication interval.

Item	Lube	Method
Brake Fluid	DOT 4 Brake Fluid	See page 63.
Main Gear case Oil (Transaxle)	SAE80 API GL-4 Hypoid gear oil	See page 61.
Front Gear case Oil	SAE80 API GL-5 Hypoid gear oil	See page 62.

# MAINTENANCE

## Gear cases

### Gear case Specification Chart

Gear case	Lubricant	Capacity	Fill Plug Torque	Drain Plug Torque
Main Gearcase (Transaxle)	ATV Angle Drive Fluid	30.4 oz. (900 ml)	14 ft. Lbs. (19.4 Nm)	14 ft. Lbs. (19.4 Nm)
Front Gearcase	Demand Drive Fluid	5.1 oz. (150 ml)	8-10 ft. lbs. (11-13.6 Nm)	11 ft. lbs. (15 Nm)

### Main Gearcase (Transaxle)

Always check and change the main gearcase oil at the intervals outlined in the Periodic Maintenance Chart beginning on page 59. Maintain the oil level even with the bottom thread of the fill plug hole.

Refer to the Gearcase Specifications Chart for recommended lubricants, capacities and torque specifications. See page 75 for the part numbers of HSUN products.

### Oil Check

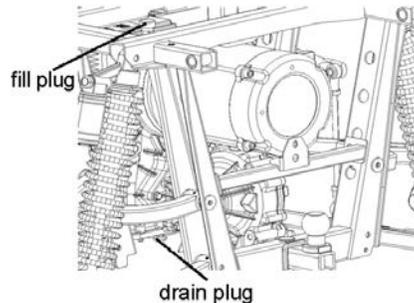
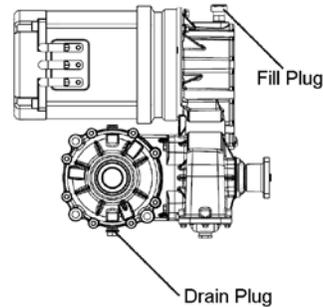
The fill plug is located at the right rear of the vehicle.

1. Position the vehicle on a level surface.
2. Remove the fill plug.
3. Check the oil level.
4. Add the recommended oil as needed.
5. Reinstall the fill plug. Torque to specification.

### Oil Change

The drain plug is located on the lower right side of the main gearcase, near the fill plug. Refer to the Gearcase Specifications Chart for recommended lubricants, capacities and torque specifications.

1. Remove the fill plug.
2. Place a drain pan under the drain plug. Remove the drain plug. Allow the oil to drain completely.
3. Wipe the magnetic end of the drain plug clean to remove accumulated metallic filings.
4. Reinstall the drain plug. Torque to specification.
5. Add the recommended oil as needed. Do not overfill.
6. Reinstall the fill plug. Torque to specification.
7. Check for leaks. Dispose of used oil properly.



## MAINTENANCE

### Gear cases

#### Front Gear case

Always check and change the front gear case oil at the intervals outlined in the Periodic Maintenance Chart beginning on page 59. Maintain the oil level even with the bottom thread of the fill plug hole.

Refer to the Gearcase Specifications Chart on page 54 for recommended lubricants, capacities and torque specifications. See page 70 for the part numbers of HSUN products.

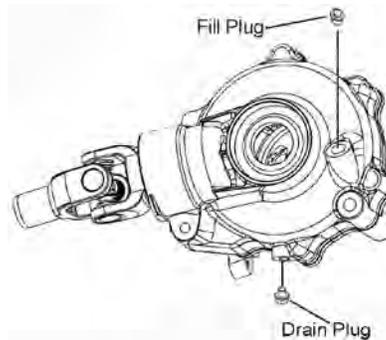
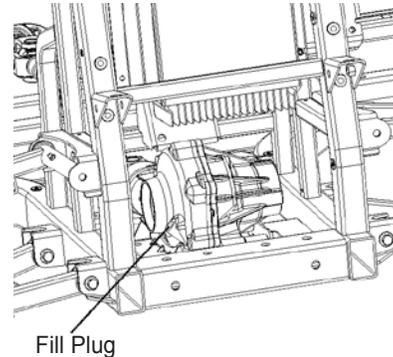
#### Oil Check

The front gear case fill plug is located on the left side of the front gear case.

1. Position the vehicle on a level surface.
2. Remove the fill plug. Check the oil level.
3. Add the recommended oil as needed.
4. Rein stall the fill plug. Torque to specification.

#### Oil Change

1. Support the vehicle securely with a jack stand.
2. Remove the front tire on the driver's side.
3. Remove the fill plug.
4. Place a drain pan under the drain plug.
5. Remove the drain plug. Allow the oil to drain completely.
6. Clean the drain plug. Rein stall the drain plug. Torque to specification.
7. Add the recommended oil.
8. Rein stall the fill plug. Torque to specification.
9. Check for leaks.
10. Discard used oil properly.



## MAINTENANCE

### Brakes

The front and rear brakes are hydraulic disc type brakes. Press down on the brake pedal to engage the brakes. See page 44.

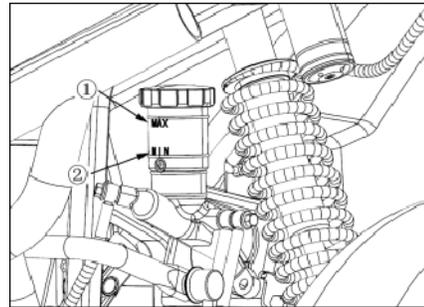
### Brake Fluid

Inspect the brake system routinely. Inspect the level of the brake fluid before each operation.

**WARNING!** After opening a bottle of brake fluid, always discard any unused portion. Never store or use a partial bottle. Brake fluid is hygroscopic, meaning it rapidly absorbs moisture from the air. The moisture causes the boiling temperature of the brake fluid to drop, which can lead to early brake fade and the possibility of accident or severe injury.

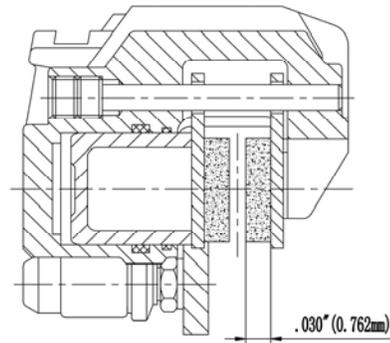
Change the brake fluid every two years and any time the fluid becomes contaminated, the fluid level is below the minimum, or if the type and brand of the fluid in the reservoir are unknown. See page 53 for fluid recommendations.

1. Position the vehicle on a level surface.
2. View the brake fluid level at the reservoir in the driver's side wheel well. The level should be between the upper (MAX) and lower (MIN) level lines.
3. If the fluid level is lower than the upper level line, add brake fluid to the upper (MAX) line.
4. Apply the brake forcefully for a few seconds and check for fluid leakage around the fittings.



### Brake Inspection

1. Check the brake system for fluid leaks.
2. Check the brake pedal for excessive travel or a spongy feel.
3. Check the friction pads for wear, damage and looseness.
4. Check brake discs for signs of cracks, excessive corrosion, warping or other damage. Clean any grease using an approved brake cleaner or alcohol.
5. Inspect the brake disc spline and pad wear surface for excessive wear. Change pads when worn to .030" (0.762 mm).



① MAX

② MIN

## MAINTENANCE

### Steering Wheel Inspection

Check the steering wheel for specified free play and smooth operation at the intervals outlined in the Periodic Maintenance Chart beginning on page 59.

1. Position the vehicle on a level surface.
2. Lightly turn the steering wheel left and right. There should be 0.8"-1.0" (20-25 mm) of free play at the outer rim of the steering wheel.
3. If there is excessive free play or strange noises, or the steering feels rough or "catchy," have the steering system inspected by an authorized HSUN dealer.

### Front and Rear Shock Adjustment

#### **⚠ WARNING**

**These shock absorber assemblies contain highly pressurized nitrogen gas, read and understand the following information before handling the shock absorber assemblies.**

- **Do not tamper with or attempt to open the cylinder assemblies.**
- **Do not subject the shock absorber assemblies to an open flame or other high heat source. This may cause the unit to explode due to excessive gas pressure.**
- **Do not deform or damage the cylinders in any way. Cylinder damage will result in poor damping performance.**
- **Do not dispose of a damaged or worn out shock absorber assembly yourself. Take the shock absorber assembly to a HSUN dealer for any service.**

The spring preload, rebound damping and compression damping forces of the front and rear shock absorber assemblies can be adjusted to suit the operating conditions.

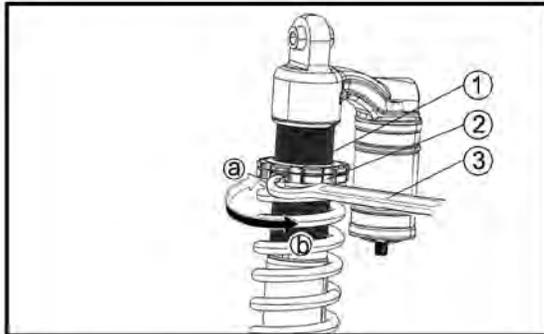
#### **NOTE:**

Never turn an adjusting mechanism beyond the minimum and maximum settings.

#### **Spring preload**

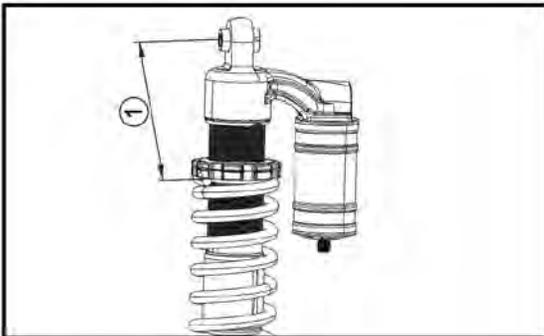
1. Loosen the locknut.
2. Turn the spring preload adjusting nut in direction **(a)** to increase the spring preload and thereby harden the suspension, and in direction **(b)** to decrease the spring preload and thereby soften the suspension.

## MAINTENANCE



- ① Locknut
- ② Spring preload adjusting nut
- ③ Special wrench

- A special wrench can be obtained at a HSUN dealer to make this adjustment.
- The spring preload setting is determined by measuring distance A, shown in the illustration. The shorter distance A is, the lower the spring preload; the longer distance A is, the higher the spring preload. With each complete turn of the adjusting nut.



- ① Distance A

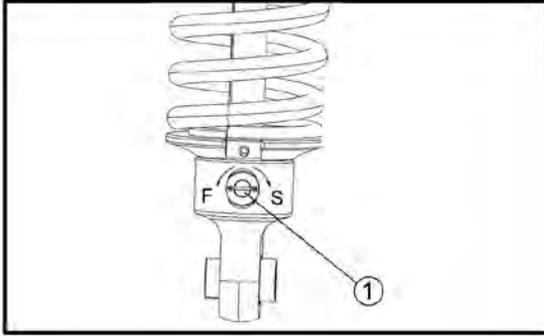
3. Tighten the locknut.

### NOTE:

Always tighten the locknut against the adjusting nut, and then tighten it to the specified torque.

### Rebound damping force

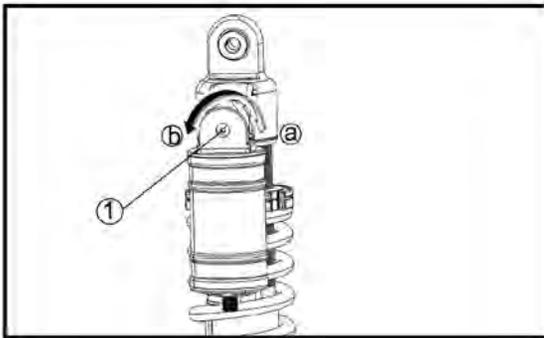
Turn the rebound damping force adjusting screw in direction **S** to increase the rebound damping force and thereby harden the damping, and in direction **F** to decrease the rebound damping force and thereby soften the damping.



① Rebound damping force adjusting screw

### Compression damping force

Turn the compression damping force adjusting screw (use 3.0 allen wrench) in direction ① to increase the compression damping force and thereby harden the damping, and in direction ② to decrease the compression damping force and thereby soften the damping.



① Compression damping force adjusting screw

### ⚠ WARNING

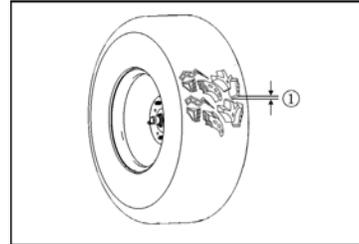
- Suspension components become hot during operation. Never touch the compression damping force adjusting screw, the rebound damping force adjusting screw or the oil reservoir with your bare hand or skin until suspension components have cooled.
- Always adjust the shock absorber assemblies on the left and right side to the same setting. Uneven adjustment can cause poor handling and loss of stability, which could lead to an accident.

## MAINTENANCE

### Tires

#### **⚠ WARNING**

Operating your vehicle with worn tires, improperly inflated tires, non-standard tires or improperly installed tires will affect vehicle handling and could cause an accident resulting in serious injury or death. Always follow all tire maintenance procedures as outlined in this manual and on the labels on the vehicle. Always use HSUN -approved size and type of tires for this vehicle when replacing tires.



① 3mm(0.12in)

### Tire Tread Depth

Always replace the tires when the tread depth is worn to minimum allowable.

### Checking tire inflation pressure

Though the tire pressure is factory-set to the prescribed level, it naturally drops slowly in the course of time, thus check it every day and inflate as necessary.

tire sizes	inflation pressure
Front: 26x9-14	138kPa (1.4kgf/cm <sup>2</sup> , 20psi)
Rear: 26x11-14	138kPa (1.4kgf/cm <sup>2</sup> , 20psi)

Inspect the following items occasionally for tightness, and if they've been loosened for maintenance service. Do not lubricate the stud or the lug nut.

### Wheel Removal

1. Apply the brakes. Set the park brake. Turn the key off.
2. Loosen the wheel nuts slightly.
3. Elevate the side of the vehicle by placing a suitable stand under the frame.
4. Remove the wheel nuts and washers. Remove the wheel.

### Wheel Installation

1. Set the park brake. Place the wheel in the correct position on the wheel hub. Be sure the valve stem is toward the outside and rotation arrows on the tire point toward forward rotation.

**WARNING!** Improperly installed wheels can adversely affect tire wear and vehicle handling, which can result in serious injury or death. Always ensure that all nuts are torqued to specification. Do not service axle nuts that have a cotter pin installed. See your HSUN dealer.

2. Attach the wheel nuts and washers and finger tighten.
3. Carefully lower the vehicle to the ground.
4. Torque the wheel nuts to specification. See page 58.

## MAINTENANCE

### Batteries

#### **⚠ WARNING**

Battery posts, terminals and related components contain lead and lead compounds, chemicals known to cause cancer and reproductive harm. Always wash your hands after touching or handling the batteries.

#### **⚠ WARNING**

Charging a damaged battery can result in serious injury. Never attempt to charge a frozen or bulging battery. Discard the battery appropriately and install a new battery.

#### **⚠ WARNING**

Improperly connecting or disconnecting battery cables can result in an explosion and cause serious injury or death.

#### **⚠ WARNING**

Battery electrolyte is poisonous. It contains sulfuric acid. Serious burns can result from contact with skin, eyes or clothing.

Antidote:

**External:** Flush with water.

**Internal:** Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Call physician immediately.

**Eyes:** Flush with water for 15 minutes and get prompt medical attention.

Batteries produce explosive gases. Keep sparks, flame, cigarettes, etc. away. Ventilate when charging or using in an enclosed space. Always shield eyes when working near batteries. KEEP OUT OF REACH OF CHILDREN.

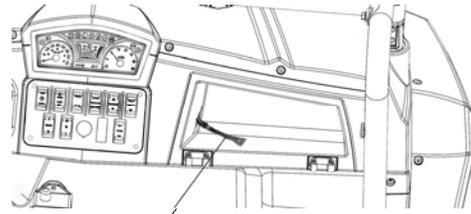
## MAINTENANCE

### Batteries

#### Battery Charging

When not in use, park the vehicle and connect the battery charger. The vehicle's charging cord is located inside the right Storage box .

**WARNING!** Failure to provide adequate ventilation while charging batteries can result in an explosion. Hydrogen gas is emitted during charging and will rise and accumulate at the ceiling. Always ensure a minimum of five (5) air changes per hour in the charging area. Never charge the batteries in an area subject to a flame or spark, including areas containing gas or propane water heaters and furnaces. Do not smoke in the charging area. Always follow these precautions when



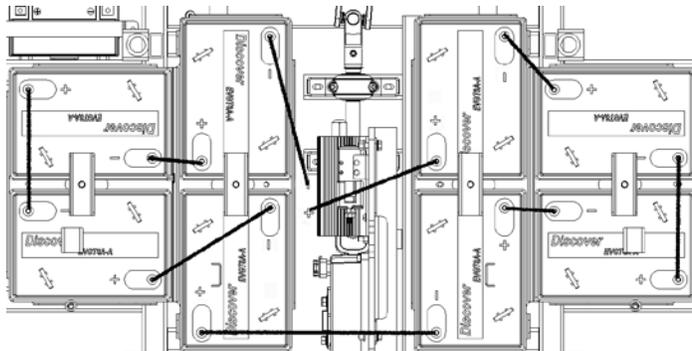
Charging Cord

charging the batteries:

1. Position the vehicle on a level surface.
2. Make sure the charging area is well ventilated.
3. Make sure the key is off.
4. Open the hood and any door enclosures or zippers.
5. Always use a extension cord with a minimum rating of 20 amps.
6. Inspect the charging cord and extension cord for cracks, loose connections and frayed wiring. Replace any damaged components promptly.
7. Always connect the vehicle charger to the extension cord first, then plug the cord into a wall receptacle.
8. Make sure the charger uses a dedicated circuit to prevent overloading. If charging multiple vehicles, each vehicle should use a dedicated circuit.

**Tip:** After the batteries have fully recharged, the battery charger will automatically cycle in and out of the trickle charge mode to maintain the charge.

9. When disconnecting the charger, always disconnect the extension cord from the wall receptacle first, then disconnect the cord from the vehicle's charging cord.



## MAINTENANCE

### Batteries

#### Battery Access

To access the batteries, remove the seat. See page 46. Remove the storage tray (if equipped).

**NOTICE:** Before removing the seat to access the batteries, make sure any wire or metal items (including seat belt latches) remain clear of the battery compartment to avoid causing a short circuit to the electrical system.

#### Battery Inspections

Inspect battery terminal connections monthly. Clean batteries as recommended. Using an insulated wrench, torque bolts to 8 ft. lbs. (11 Nm).

#### Battery Cleaning

Always keep battery terminals and connections free of corrosion. To clean, remove corrosion with a stiff wire brush. Wash with a solution of one tablespoon baking soda and one cup water. Rinse well with tap water and dry off with clean shop towels. Coat battery terminals with dielectric grease or petroleum jelly.

**NOTICE:** Do not allow cleaning solution or tap water to enter the batteries.

#### Battery Replacement

With proper care and maintenance as outlined in this owner's manual, battery life could be extended up to four years or longer, depending on the amount of use. When battery replacement is necessary, please see your authorized HSUN dealer.

**WARNING!** Handling batteries and electrical components improperly can result in serious injury or death. Do not attempt to remove batteries or battery cables. Always see your dealer for battery-related service.

## MAINTENANCE

### Cleaning and Storage

#### Washing the Vehicle

Keeping your HSUN vehicle clean will not only improve its appearance but it can also extend the life of various components.

**NOTICE:** High water pressure may damage components. HSUN recommends washing the vehicle by hand or with a garden hose, using mild soap.

**NOTICE:** Certain products, including insect repellents and chemicals, will damage plastic surfaces. Do not allow these types of products to contact the vehicle.

The best and safest way to clean your HSUN vehicle is with a garden hose and a pail of mild soap and water.

1. Use a professional-type washing cloth, cleaning the upper body first and the lower parts last.
2. Rinse with clean water frequently.
3. Dry surfaces with a chamois to prevent water spots.

#### Washing Tips

- Avoid the use of harsh cleaners, which can scratch the finish.
- Do not use a power washer to clean the vehicle.
- Do not use medium to heavy duty compounds on the finish.
- Always use clean cloths and pads for cleaning and polishing. Old or reused cloths and pads may contain dirt particles that will scratch the finish.
- Avoid directing water toward electrical components, including batteries, wiring and switches.

#### Washing the Vehicle

If a high pressure water system is used for cleaning (not recommended), exercise extreme caution. The water may damage components and could remove paint and labels. Avoid directing the water stream at the following items:

- Wheel bearings
- Main gear case seals
- Brakes
- Cab and body panels
- Labels and decals
- Switches and controls
- Electrical components and wiring

If an informational or graphic label becomes illegible or comes off, contact your HSUN dealer to purchase a replacement. Replacement *safety* labels are provided by HSUN at no charge.

Grease all zerk fittings immediately after washing.

## MAINTENANCE

### Cleaning and Storage

#### Polishing the Vehicle

HSUN recommends the use of common household aerosol furniture polish for polishing the finish on your HSUN vehicle. Follow the instructions on the container.

#### Polishing Tips

- Avoid the use of automotive products, some of which can scratch the finish of your vehicle.
- Always use clean cloths and pads for cleaning and polishing. Old or reused cloths and pads may contain dirt particles that will scratch the finish.

#### Chrome Wheel Care (if equipped)

Proper maintenance will protect chrome wheels from corrosion, preserve wheel life and ensure a “like new” appearance for many years. Chrome wheels exposed to road salt (or salt in the air in coastal areas) are more susceptible to corrosion if not properly cleaned. Clean chrome wheels more often if they’re exposed to salt or other corrosive elements.

1. Wash chrome wheels frequently. Use a mild detergent. Never use abrasive cleaners on plated or painted surfaces.
2. Rinse well with clear water. Soap, detergents, salt, dirt, mud and other elements can cause corrosion.
3. Polish the clean chrome wheels periodically. Use an automotive grade chrome polish.
4. Routinely and liberally apply a weather resistant wax to each polished chrome wheel. Choose a product suitable for chrome finishes. Read and follow the product labels and instructions.

## MAINTENANCE

### Cleaning and Storage

#### Storage Tips

#### Clean the Exterior

Make any necessary repairs and clean the vehicle as recommended. See page 71.

#### Inspect and Lubricate

Inspect all cables and lubricate all areas of the vehicle as recommended in the Periodic Maintenance Chart beginning on page 59.

#### Battery Maintenance

See pages 68-69 for procedures.

#### Fluid Levels

Inspect the fluid levels. Add or change fluids as recommended in the Periodic Maintenance Chart beginning on page 63.

- Front and rear gearcase fluid (if equipped)
- Main gearcase fluid
- Brake fluid (change every two years and any time the fluid looks dark or contaminated)

## MAINTENANCE

### Storing the Vehicle

Any time the vehicle will be parked for more than a few hours, follow the recommended storage procedures:

1. Make any necessary repairs and clean the vehicle. See page 71.
2. Clean the batteries. See page 70.
3. Store the vehicle out of the sun in a cool, dry place.
4. Be sure the storage area is well ventilated.
5. Turn the key off.
6. *Do not* set the park brake.
7. Verify that tire pressure is at specification.
8. Block the wheels to prevent rolling.
9. Fully charge the batteries. Leave the charger connected to maintain a full charge during the storage period, or check battery voltage each month during storage and recharge as needed to maintain a full charge. If the charger remains connected, check it monthly to verify proper operation.

**Tip:** Do not use plastic or coated materials. They do not allow enough ventilation to prevent condensation, and may promote corrosion and oxidation.

**WARNING!** Do not cover the vehicle while the charger is connected. Dangerous levels of hydrogen gas could accumulate.

### Removal from Storage

1. Inspect all battery connections.
2. Verify that batteries are fully charged.
3. Verify that tire pressure is at specification.
4. Perform the pre-ride inspection. See page 19.
5. Inspect and verify the tightness of the bolts, nuts and other fasteners.
6. Lubricate at the intervals outlined in the Periodic Maintenance Chart beginning on page 59.

## SPECIFICATION TABLE

Motor type		AC induction motor		
Motor peak		27HP		
Power battery pack voltage		48VDC 12.4kw/H		
Single battery parameter		6V/280Ah@20hr		
Controller		450 - Amp Sevcon GEN4 controller with multi-mode driving and regenerative braking		
Max.speed		25 MPH (40.2 km/h)		
Range (in Max Range mode on flat ground)		30KM (may vary with driving conditions AND LOAD.)		
On-board charger		Delta Q 120-volt AC input; 48-volt DC output		
Charge time		8 hours (dependent on depth of discharge)		
Main gearcase		Direct drive with low-noise gears		
Wheels, Drive system		2WD or 4WD		
Front Differential lock		Electric control: switch		
Multi-mode switch		L/M/H (Low/Max Range/High)		
Brakes	Front/Rear	Hydraulic disc brake		
	Parking brake	Axis brake, pedal-braking		
Steering		Mechanical		
Suspension	Front	Independent, Dual A-arm type		
	Rear	Independent, Dual A-arm type		
Dimensions	Length	mm(in.)	2720 (107.09)	
	Wide	mm (in.)	1550 (61.02)	
	Height	mm (in.)	1885 (74.21)	
	Front centers tread	mm (in.)	1350 (53.15)	
	Rear centers tread	mm (in.)	1300 (51.18)	
	Wheelbase	mm (in.)	1850 (72.83)	
	Ground Clearance	front axle	mm (in.)	285(11.22)
		rear axle		265(10.43)
Turning diameter	m (ft)	6.84 (22.44)		
Max. rolling weight (Towing Capacity)		kg (lbs.)	363 (800)	
Payload capacity		kg (lbs.)	389 (857.5)	
Weight		kg (lbs.)	824 (1816.6)	

Model		Specification	
Cargo bed	Width	mm (in.)	1305 (51.38)
	Length	mm (in.)	775 (29.72)
	Depth	mm (in.)	285 (11.22)
	Volume	m <sup>3</sup> (cu.ft.)	0.23 (8.11)
	Bed height (unloaded)	mm (in.)	927 (36.50)
	Cargo bed capacity (1 row/2 row)	kg (lbs.)	159 (350)
Tire	Front	26×9-14 6PR 20psi (138kPa)	
	Rear	26×11-14 6PR 20psi (138kPa)	
Body color		Red, Black, White, Blue, Yellow, Orange, Camo	

**NOTE:**

- The values in “Ground clearance” and “Weight” are those of the machine equipped with the tires in the table above.
- The company reserves the right to change the specifications without notice.