# WaterCar EV

## OWNER'S MANUAL

LSV Road Operation · Marine Module Operation · Amphibious Transition Operation - 2026

081426G

WaterCar Inc. | 17403 Newhope St., Fountain Valley, CA 92708
info@watercar.com | www.watercar.com | (714) 253-7186

# A Note from the WaterCar Team

Every WaterCar EV is assembled by hand, in small numbers, by the people whose names appear below. Yours is one of a very small number built this year.

Welcome to a short list of owners. We build these vehicles to be driven, and we want you to get the most out of yours - which starts with reading this manual and following the operating and care guidance in it. A vehicle that lives in both water and on the road asks more of its owner than either alone, and this manual is how we hand that knowledge to you.

Thank you for choosing WaterCar.

**Dave March**
Founder / CEO

**Michael March**
COO

**Jim Riley**
CFO

**Trevor Rock**
Shop Production Manager

**Cory Grubs**
Lead Fabricator

**Chad March**
Chief Electronics Engineer

### Four generations in.

Monte is the fourth generation of the March family to grow up around boats and cars. The same instinct that started this company is still being handed down, one grandkid on the shoulders at a time.

*Dave March with his grandson Monte at Catalina.*

# Important Notice to Owners

This manual covers the WaterCar EV as configured at the time of delivery. WaterCar Inc. reserves the right to make improvements, modifications, or specification changes at any time without prior notice and without obligation to update previously delivered vehicles.

This vehicle is manufactured in conformance with applicable federal Low Speed Vehicle requirements under 49 CFR Part 571.500 (FMVSS 500). A 17-character Vehicle Identification Number (VIN) is assigned at manufacture pursuant to 49 CFR Part 565. Road operation requirements vary by jurisdiction. The owner is responsible for verifying compliance with all applicable state and local laws prior to operation.

Any modifications made after delivery are the sole responsibility of the vehicle owner and may affect road legality, warranty coverage, and safe operation.

WaterCar Inc. assumes no liability for injury, death, or damage resulting from the owner's failure to comply with applicable federal, state, or local laws, or from operation outside the vehicle's rated capabilities, configuration, or intended use.

Current owner resources - including the most recent version of this manual, how-to videos, and updated procedures - are available at **www.watercar.com/owner**. If this printed manual conflicts with content at that address, the online version governs.

**WaterCar Inc. | info@watercar.com | www.watercar.com | (714) 253-7186**

# Vehicle & Vessel Registration Information

Complete this page at delivery and retain for your records.

| Field | Value |
|---|---|
| **OWNER NAME** | |
| **ADDRESS** | |
| **PHONE** | |
| **EMAIL** | |
| **DATE OF DELIVERY** | |
| **DEALER NAME** | |
| **DEALER PHONE** | |
| **VIN (VEHICLE SERIAL NO.)** | |
| **HIN (HULL ID - Marine Package)** | |
| **OUTBOARD ENGINE SERIAL NO.** | |
| **ECO BATTERY SERIAL NO.** | |
| **EPOCH BATTERY SERIAL NO.** | |
| **TRAILER VIN** | |
| **STATE REGISTRATION NO.** | |
| **USCG DOCUMENTATION NO.** | |

# Delivery Acknowledgment Form

Complete at time of vehicle delivery and retain for your records.

| Field | Value |
|---|---|
| **OWNER NAME** | |
| **DATE OF DELIVERY** | |
| **VIN (VEHICLE SERIAL NO.)** | |
| **HIN (HULL ID - Marine Package)** | |
| **OUTBOARD ENGINE SERIAL NO.** | |
| **ECO BATTERY SERIAL NO.** | |
| **EPOCH BATTERY SERIAL NO.** | |
| **DELIVERY LOCATION** | |
| **DELIVERED BY (WaterCar Rep)** | |

**Owner Acknowledgment:**

- I have received and reviewed this Owner's Manual in its entirety.
- I have received a complete vehicle orientation and demonstration from an authorized WaterCar representative.
- I understand this vehicle is classified as a Low Speed Vehicle (LSV) limited to 25 MPH on public roads.
- I understand that any modifications made after delivery are my sole responsibility and may affect road legality, warranty coverage, and safe operation.
- I have received all applicable OEM manuals (Mercury Marine, Eco Battery, Epoch® Battery).
- I confirm the vehicle was delivered in factory configuration in conformance with applicable federal LSV requirements.

If this vehicle includes the Marine Package: I understand it is also a federally registered recreational vessel identified by a Hull Identification Number (HIN) and subject to U.S. Coast Guard regulations. I am responsible for complying with all applicable federal, state, and local boating laws, vessel registration requirements, and operator licensing. I have been briefed on the dual-environment nature of this vehicle and the operational differences between road and water modes.

| | |
|---|---|
| OWNER SIGNATURE:<br><br>_____<br>DATE: _____ | WATERCAR REPRESENTATIVE:<br><br>_____<br>DATE: _____ |

# Owner Resources - Current Manual & How-To Videos

WaterCar maintains a dedicated owner resources page at:

**www.watercar.com/owner**

This page is updated as the vehicle evolves. It contains resources not possible to include in a printed manual.

**What you will find there:**

• **Current Owner's Manual** - The most recent version of this manual, incorporating any updates, corrections, or new procedures issued after the date printed on your copy. Check this periodically and after any factory service visit.

• **How-To Videos** - Step-by-step video guidance for key procedures including water entry and exit, Tow Mode connection, hydraulic lockout installation, transition checklist, battery operation, and maintenance tasks. Video guidance is recommended for first-time operators before attempting any procedure for the first time.

• **Support Contact** - Direct contact options for WaterCar owner support: General (714) 253-7186 | Sales/Service (714) 251-6687 | info@watercar.com.

**NOTICE - ALWAYS VERIFY YOU ARE USING THE CURRENT MANUAL**

This manual was current as of its issue date. WaterCar reserves the right to update procedures, specifications, and safety guidance at any time. Before performing any procedure for the first time - particularly water entry, Tow Mode towing, hydraulic lockout installation, or battery service - confirm you have the current version at www.watercar.com/owner. If this printed copy conflicts with the online version, the online version governs.

SECTION 1
# Introduction & Welcome

## 1. Introduction & Welcome

### 1.1 Welcome to the WaterCar Family

Welcome to the family of WaterCar owners and congratulations on your purchase of your new WaterCar EV. The WaterCar EV represents over two decades of innovation - beginning with Dave March's restoration of a 1964 Amphicar in 2000, the Guinness World Record Python in 2010, the globally celebrated Panther in 2014, and now the world's most advanced production dual-mode vehicle: the WaterCar EV.

Every WaterCar EV is precision-engineered and hand-assembled at our facility in Fountain Valley, California. Your vehicle has been individually inspected and tested before delivery. We take immense pride in what we build, and we stand behind it completely.

Please take time to read this manual completely before operating your WaterCar EV. If you were unable to visit our facility in Fountain Valley, California before taking delivery, please be aware that hands-on orientation at our factory is strongly recommended and may be required depending on your boating experience level. Operating the WaterCar EV - particularly on water - requires a skill set that differs from both conventional vehicles and conventional boats. Do not get frustrated: depending on your level of boating experience, water operation may be easier for some than others. If you encounter challenges, a visit to our facility for in-person training may be required even after purchase. Operators unfamiliar with boating or amphibious operation are encouraged to seek additional training before operation. Boating training and experience are essential for safe water operation of this vehicle. Understanding your vehicle fully will maximize your enjoyment and ensure you operate it safely, legally, and with confidence in every mode - on the road, on the water, and in the transition between the two.

### 1.2 About the WaterCar EV

The WaterCar EV platform supports both LSV road operation and marine vessel operation when properly configured and equipped. It operates in two independent modes:

- LSV Road Mode - powered by a 48V LiFePO4 electric land drive, certified as a Low Speed Vehicle (LSV) under 49 CFR Part 571.500 (FMVSS 500). Road operation is subject to applicable state and local laws governing Low Speed Vehicles. The vehicle is governed to a maximum speed of 25 MPH.
- Marine Water Mode - when equipped with a compatible outboard engine, the marine configuration is built in accordance with applicable recreational vessel manufacturing standards. Water operation is registered and regulated under U.S. Coast Guard authority.

A patented hydraulic transition system allows the vehicle to transition between modes at the water's edge. No trailer, crane, or external equipment is required. The WaterCar EV is its own launch and retrieval platform.

## 1.3 Regulatory Classification and Owner Responsibility

### Owner Judgment and Familiarity

The WaterCar EV is a unique vehicle with no direct equivalent. It operates in conditions and combinations of use that no standard vehicle encounters, and no manual can anticipate every situation, environment, or manner of use an owner may experience. The guidance in this manual establishes a baseline of recommended practice; it is a starting point, not a complete or sufficient set of instructions for every circumstance.

Owners are responsible for becoming familiar with their own vehicle and how they use it - including their operating environment, water conditions, frequency and intensity of use, storage situation, and any accessories or equipment they add - and for exercising their own judgment in operating, maintaining, and caring for the vehicle accordingly. A use that is more demanding than typical - extended operation, hard use, salt or brackish water, or harsh environmental conditions - may require care beyond the baseline practices described here.

Following the guidance in this manual does not relieve the owner of the responsibility to exercise sound judgment based on their own vehicle and use. This manual provides recommendations and general practice; it does not and cannot guarantee a particular outcome, and it is not a substitute for the owner's attention, judgment, and familiarity with their own vehicle.

### Regulatory Classification

The WaterCar EV is a dual-purpose vehicle designed for operation both as a Low Speed Vehicle on land and as a recreational vessel on water. No single regulatory or industry standard governs vehicles of this type. Existing automotive standards assume road-only use, and existing marine standards assume water-only use. These bodies of standards were developed independently and, in some areas, contain requirements that cannot be simultaneously applied to a single amphibious vehicle.

In designing the WaterCar EV, WaterCar drew on recognized practices from both the automotive and marine fields, selecting components and design approaches intended to address the requirements applicable to each mode of operation. In some areas, the WaterCar EV meets or exceeds relevant practices from one or both fields; in some areas, design requirements from one mode of operation resulted in specifications exceeding what either field would require on its own.

Because the WaterCar EV operates in both environments, and because no single standard governs its configuration, the owner is responsible for ensuring the vehicle - including any owner-added accessories, chargers, or equipment - is operated, maintained, and serviced in accordance with the practices applicable to its actual use and jurisdiction. Marine systems, road equipment requirements, registration, licensing, and operation may each be subject to different requirements depending on where and how the vehicle is used. Owners should consult qualified professionals familiar with marine and automotive systems, and confirm the requirements applicable in their jurisdiction, before operation and when servicing or modifying the vehicle.

### Post-Use Care - This Vehicle Requires Boat Maintenance

The WaterCar EV is the only vehicle of its kind that can be driven out of the water and parked like an automobile, with no trailer and no launch ramp. This convenience creates a specific risk the owner must actively manage: because the vehicle parks in a garage or driveway like a car, it is easy to forget that it is also a boat and requires the same post-use marine care as any other vessel.

A boat kept on a trailer serves as a constant reminder that it was in the water and needs attention. The WaterCar EV offers no such reminder. An experienced boater who would never skip rinsing, flushing, and inspecting a trailered boat can easily overlook the same steps simply because this vehicle is parked in a driveway.

Operating the vehicle in water - particularly salt or brackish water - and then storing it without proper care will cause corrosion and accelerated wear, the same as it would with any boat. This is well-understood marine practice, and it is the owner's responsibility. Corrosion, salt damage, and wear resulting from inadequate post-use care are consequences of maintenance practice, not defects in the vehicle.

Because the WaterCar EV operates in both environments, the owner is responsible for performing the routine care applicable to both automotive and marine use. After every water use, and particularly after use in salt or brackish water, the vehicle requires rinsing, flushing, drying, and inspection consistent with recognized marine practice. Refer to Section 7 for post-use care and maintenance procedures.

## 1.4 Two Operating Environments, Two Sets of Rules

This vehicle operates in two environments, and a different body of law applies in each. The vehicle does not change when it enters the water. The rules that apply to it do.

| | On Land | On Water |
|---|---|---|
| **The vehicle is** | A Low Speed Vehicle (motor vehicle) | A recreational vessel |
| **Primary federal framework** | NHTSA / Federal Motor Vehicle Safety Standards | U.S. Coast Guard |
| **State and local authority** | State DMV, vehicle code, local traffic rules | State boating agency, local waterway rules |
| **Occupancy limit** | Designated seating positions equipped with seat belts | Capacity plate (Section 5.5) |
| **Weight limit** | GVWR, 2,995 lbs (Section 2.3) | Capacity plate (Section 5.5) |
| **Seat belts** | Required (Section 2.4) | Not worn (Section 2.4) |
| **Children** | State child passenger safety law | Personal flotation device requirements (Section 2.4) |
| **Registration** | Vehicle registration and license plate | Vessel registration and HIN (Section 5.2) |
| **Speed** | 25 MPH maximum | Conditions, posted limits, and no-wake zones |
| **Operator credential** | Driver's license | Boater education card in many states |

Requirements differ by jurisdiction. Whether this vehicle may be operated on a particular road, at what speed, with what registration, and with what occupancy is determined by the state and locality where it is operated. The same is true on water: registration, required equipment, operator credentials, and child flotation requirements are set by the state and by the authority controlling that waterway.

The stricter limit always governs. When a land limit and a water limit both apply to the same trip, the lower of the two controls. The vehicle must be within GVWR the moment it is operated on land, regardless of the capacity shown on the capacity plate for water operation.

The operator is responsible for determining and complying with the requirements that apply where the vehicle is operated. WaterCar does not determine those requirements and does not represent that any particular configuration or use is permitted in any jurisdiction.

Section 2.3 states the occupancy and weight limits for each environment. Section 6.4 states what must happen before the vehicle is driven on land after water operation.

## 1.5 How to Use This Manual

This manual is organized into self-contained sections by operating mode. If you have purchased the LSV-only configuration, Sections 1–4 and 7 apply to your vehicle. If you have purchased the Marine Package, all sections apply. Section 6 - Amphibious Operation - requires familiarity with both Sections 4 and 5 before reading.

| Section | Topic | Applies To |
|---|---|---|
| **1** | Introduction & Welcome | All |
| **2** | Safety Information & Labels | All |
| **3** | Battery Systems | All |
| **4** | LSV Road Operation | All |
| **5** | Marine Water Operation | Marine Package only |
| **6** | Amphibious Operation | Marine Package only |
| **7** | Care & Maintenance | All |
| **Appendices** | Delivery, Legal, Warranty | All |

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*Page numbers are approximate and may shift between versions.*

## 1.6 WaterCar Contact Information

| Contact | Details |
|---|---|
| **Main Line** | (714) 253-7186 - General inquiries |
| **Direct Line** | (714) 251-6687 - Sales/Service Department |
| **Email** | info@watercar.com |
| **Website** | www.watercar.com |
| **Address** | 17403 Newhope St., Fountain Valley, CA 92708 |
| **Instructional Video** | https://www.youtube.com/watch?v=wdKs5TyZWGE |
| **Label & Parts Orders** | info@watercar.com - reference your VIN |

**⚠ NOTICE**

WaterCar provides direct, real-time remote support via phone and video for all owners worldwide. Most service questions are resolved remotely. Call or text the Sales/Service Department at (714) 251-6687 for any operational or service question.

SECTION 2
# Safety Information & Labels

## 2. Safety Information & Labels

### 2.1 Safety Alert Definitions

The following alert levels are used throughout this manual. Read and understand each level before operating.

| | |
|---|---|
| ⚠ DANGER | Indicates a hazardous situation which, if not avoided, WILL result in death or serious injury. |
| ⚠ WARNING | Indicates a hazardous situation which, if not avoided, COULD result in death or serious injury. |
| ⚠ CAUTION | Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. |
| ⚠ NOTICE | Indicates a potentially hazardous situation which, if not avoided, may result in property damage. |

### 2.2 Owner / Operator Responsibilities

| Requirement | Details |
|---|---|
| **READ FIRST** | READ THIS MANUAL AND ALL LABELS CAREFULLY BEFORE OPERATING. |
| **INSPECT** | INSPECT THE VEHICLE EACH TIME BEFORE USE. |
| **MAINTENANCE** | FOLLOW ALL INSPECTION AND MAINTENANCE PROCEDURES IN THIS MANUAL. |
| **LIMITATIONS** | UNDERSTAND AND NEVER EXCEED THE VEHICLE'S LIMITATIONS. |
| **LAWS** | COMPLY WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS. |
| **LICENSED DRIVER** | NEVER ALLOW ANYONE WITHOUT A VALID DRIVER'S LICENSE TO OPERATE ON LAND. |
| **SEAT BELTS** | ENSURE ALL SEAT BELTS ARE SECURED BEFORE OPERATING ON LAND. DO NOT WEAR SEAT BELTS DURING WATER OPERATION. |
| **CAPACITY** | NEVER EXCEED THE MAXIMUM OCCUPANT CAPACITY. |
| **GVWR** | NEVER EXCEED THE GROSS VEHICLE WEIGHT RATING. |
| **ROLLOVER** | THE CAB FRAME IS NOT DESIGNED TO PROVIDE ROLLOVER PROTECTION. AVOID ROLLOVER SITUATIONS. |
| **NO MODIFICATIONS** | NEVER MODIFY WITH NON-APPROVED PARTS OR ACCESSORIES. |
| **ELECTRICAL HAZARD** | THE BATTERY VOLTAGE IS SUFFICIENT TO CAUSE DEATH. NEVER SERVICE THE ELECTRIC DRIVE SYSTEM UNLESS PROPERLY TRAINED. |
| **ACCESSORIES** | NEVER GROUND ANY ACCESSORY DIRECTLY TO THE VEHICLE |

| | |
|---|---|
| | CHASSIS. CONNECT ONLY TO THE DESIGNATED ACCESSORY TERMINAL BOARD. |
| **PARK BRAKE** | ALWAYS SET THE PARK BRAKE AND REMOVE THE KEY WHEN LEAVING THE VEHICLE UNATTENDED. |
| **ACCIDENT** | ALWAYS HAVE THE VEHICLE INSPECTED BY AN AUTHORIZED TECHNICIAN AFTER ANY ACCIDENT. |
| **PASSENGERS** | DO NOT CARRY A PASSENGER UNTIL YOU HAVE AT LEAST TWO HOURS OF DRIVING EXPERIENCE WITH THIS VEHICLE. |
| **STAY SOBER** | NEVER OPERATE UNDER THE INFLUENCE OF DRUGS OR ALCOHOL. |
| **BOATING EXPERIENCE** | THE WATERCAR EV REQUIRES PRIOR BOATING EXPERIENCE FOR MARINE OPERATION. DO NOT OPERATE ON WATER WITHOUT PRIOR BOATING PROFICIENCY. |

## 2.3 GVWR, GAWR & Payload Capacity

These ratings apply to all WaterCar EV configurations regardless of operating mode.

> ⚠ **WARNING**
> THE GROSS VEHICLE WEIGHT RATING (GVWR) OF YOUR WATERCAR EV IS 2,995 POUNDS. THIS IS THE MAXIMUM ALLOWABLE TOTAL WEIGHT INCLUDING THE VEHICLE ITSELF, PASSENGERS, CARGO, AND ACCESSORIES. NEVER EXCEED THE GVWR.

### Payload Accounting - What Counts Toward GVWR

Payload is the difference between the GVWR (2,995 lbs) and the curb weight of your specific vehicle as shown on the VIN plate. Available payload depends on your vehicle's as-delivered configuration and any accessories or equipment added after delivery. The owner is responsible for ensuring the total of all items below does not exceed available payload at any time during operation.

Items the owner must include when calculating total loaded weight:

| Item | Notes |
|---|---|
| **All passengers** | Use actual passenger weights, not assumed averages. |
| **Fuel weight** | Gasoline weighs approximately 6 lbs per U.S. gallon. A full 18-gallon tank adds approximately 108 lbs. |
| **Outboard engine** | Outboard engines are heavy and vary widely by model. Confirm dry weight from the engine manufacturer's specifications and include this weight in payload calculations whenever the outboard is mounted on the vehicle. |
| **Gear and personal effects** | Coolers, anchors, life jackets beyond required minimums, fishing gear, water sports equipment, tools, and other items carried onboard. Cooler weight grows quickly with ice and contents. |
| **Owner-installed accessories** | Bimini tops, additional seating, sound systems, batteries, lighting, navigation electronics, and any other equipment added after delivery. These items reduce remaining payload available for passengers and gear. |
| **Trailer hitch tongue load (if towing)** | The WaterCar EV is not rated for towing trailers. Do not tow loads with this vehicle. |

Available payload margin on this vehicle is limited. Operators are responsible for performing this calculation before each operation and adjusting passenger count, fuel level, or carried gear as needed to remain within GVWR. Marine operation has additional capacity limits shown on the U.S. Coast Guard capacity plate (Section 5.5); the lower of the two applicable limits governs.

**⚠ WARNING**

EXCEEDING GVWR OR THE U.S. COAST GUARD CAPACITY PLATE LIMITS CAN CAUSE LOSS OF VEHICLE CONTROL ON LAND, LOSS OF VESSEL STABILITY ON WATER, INCREASED RISK OF SWAMPING OR CAPSIZING, AND DAMAGE TO STRUCTURAL AND DRIVETRAIN COMPONENTS. THE OPERATOR IS RESPONSIBLE FOR ENSURING TOTAL LOADED WEIGHT REMAINS WITHIN BOTH RATINGS AT ALL TIMES.

**⚠ WARNING**

THE GROSS AXLE WEIGHT RATING (GAWR) IS THE MAXIMUM PERMISSIBLE WEIGHT THAT CAN BE SUPPORTED BY A SINGLE AXLE. GAWR FRONT: 1,438 LBS. GAWR REAR: 1,557 LBS. NEVER LOAD THE VEHICLE IN A WAY THAT PUTS EXCESSIVE WEIGHT ON EITHER AXLE. DISTRIBUTE CARGO AND PASSENGERS EVENLY.

| Item | Value |
|---|---|
| **GVWR** | 2,995 lbs / 1,356 kg |
| **Curb Weight - LSV Package (est.)** | Refer to VIN plate affixed to your vehicle |
| **Available Payload (est.)** | GVWR minus curb weight as shown on VIN plate |
| **Maximum Occupants - Land** | Designated seating positions equipped with seat belts. Total loaded weight must not exceed GVWR (2,995 lbs). |
| **Maximum Occupants - Water** | 6 persons / 990 lbs (see capacity plate, Section 5.5) |

### Occupancy - Land and Water

Occupancy limits are different on land and on water. Confirm the correct limit for the mode you are operating in.

Land: Occupancy is limited to the designated seating positions equipped with seat belts. Every occupant must be seated in a designated seating position with the seat belt fastened. Positions marked NOT PASSENGER SEATS are not occupant positions on land. Total loaded weight must not exceed the GVWR shown in this section and on the VIN plate.

Water: The maximum number of persons and the maximum weight capacity are shown on the capacity plate (Section 5.5). Seat belts are not worn during water operation (Section 2.4).

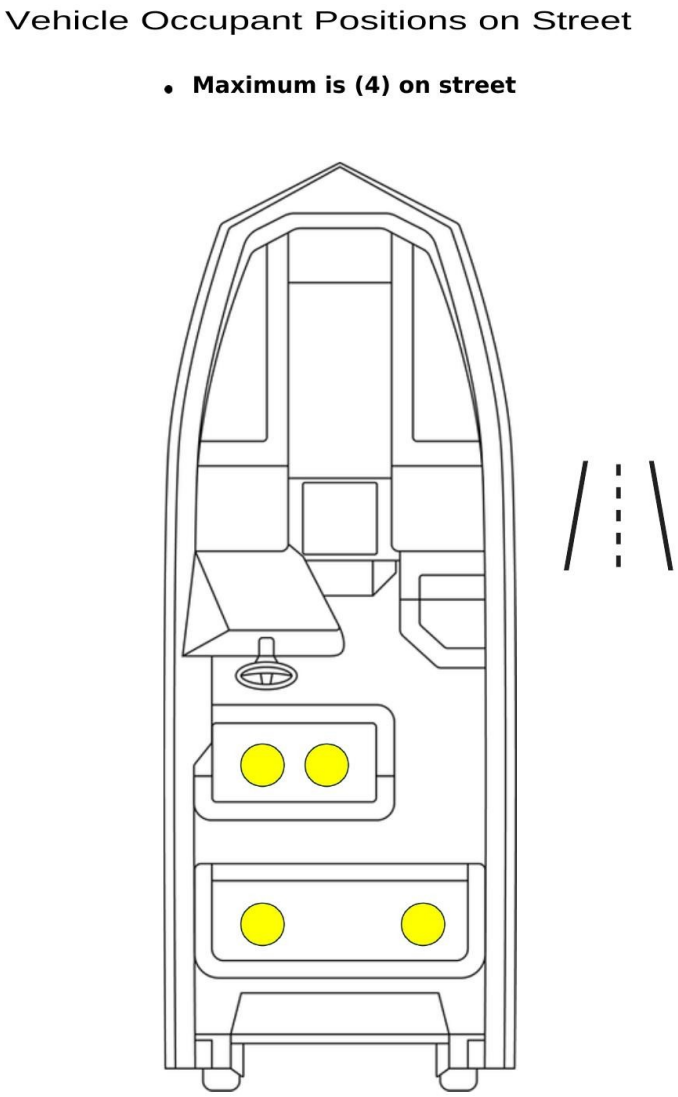
**BEFORE ANY LAND OPERATION, INCLUDING DRIVING ON A RAMP OR IN A PARKING AREA, ALL OCCUPANTS BEYOND THE DESIGNATED SEATING POSITIONS MUST EXIT THE VEHICLE. DO NOT DRIVE ON LAND WITH OCCUPANTS IN NON-DESIGNATED POSITIONS.**

### Occupant Seating Positions

The diagrams below show occupant positions for each operating environment. Occupancy limits differ on land and on water (Section 1.4).

## Vehicle Occupant Positions on Street

On land, occupants may ride only in designated seating positions equipped with seat belts. Every occupant must be seated in a designated seating position with the seat belt fastened. Total loaded weight must not exceed GVWR.

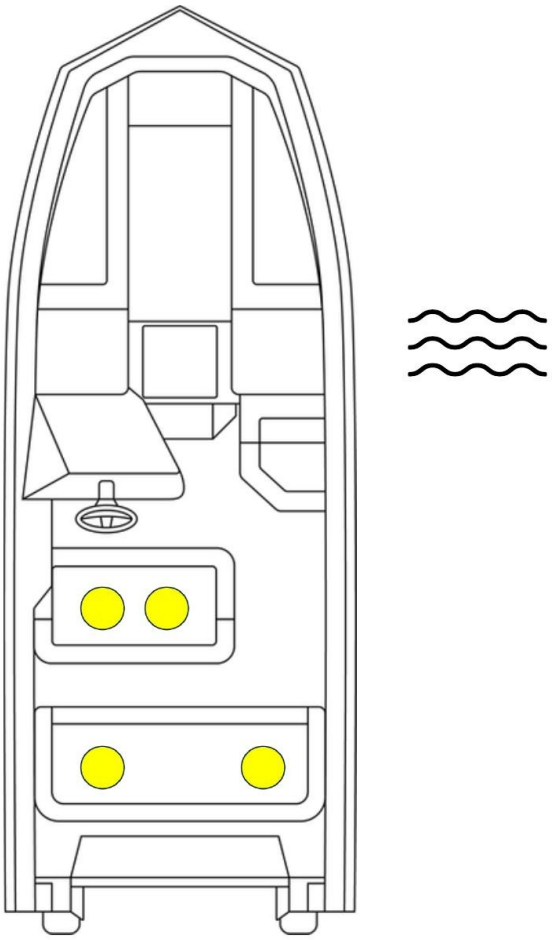



## Boat Occupant Positions on Water

On water, the maximum number of persons and the maximum weight are shown on the capacity plate (Section 5.5). Seat belts are not worn during water operation. Every occupant must have a properly fitted, USCG-approved personal flotation device (Section 2.4).

Boat Occupant Positions on Water

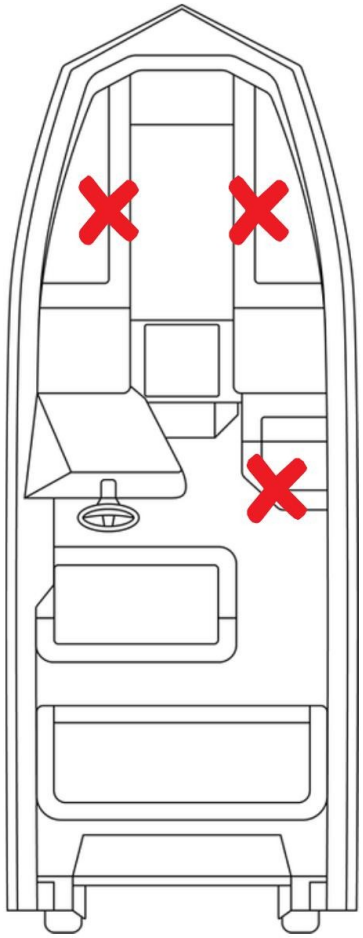
- **Limit is (4) occupants**
- **Maximum is 850 lbs on water**



### Non-Passenger Seating Areas

Areas marked NOT PASSENGER SEATS are not occupant positions on land. Before the vehicle is driven on land, including on a ramp or in a parking area, all occupants beyond the designated seating positions must exit the vehicle (Section 6.4).

THESE AREAS ARE NOT DESIGNED FOR PASSENGER SEATING WHILE THE VEHICLE IS IN MOTION ON LAND OR WATER. REMAIN SEATED ONLY IN DESIGNATED SEATING POSITIONS.



## 2.4 Seat Belt Use, Water Operation & Child Passengers

This vehicle is equipped with 2-point lap seat belts. Seat belts are for road operation only. Always make sure seat belts are secured for the operator and all passengers before operating on land. Do not wear seat belts during water operation.

**⚠ WARNING**

Always wear your seat belt during road operation. Failure to wear a seat belt may result in serious injury or death. Position the lap belt low across the hips, not across the abdomen.

1. Push the latch plate into the buckle until it clicks securely.

2. Press the release button to confirm the belt releases freely.
3. Pull each belt fully and inspect for cuts, wear, fraying, or stiffness.
4. If any damage is found, do not operate until the seat belt is replaced.
5. To clean: sponge with mild soap and water. Do not use bleach, dye, or household detergents.

### Seat Belt Fitting Instructions

This vehicle is equipped with 2-point lap seat belts designed to distribute the force of a collision across the pelvic bones, which are better suited to absorb impact than the abdomen.

To properly fit and secure the seat belt:

• Locate the seat belt for your seating position. Each seat is equipped with a belt.

• Grasp the metal latch plate and pull the seat belt across your body. Ensure the belt is not twisted.

• Position the lap belt LOW across your hips, NOT across your stomach. This distributes impact force across the pelvic bones.

• Insert the metal latch plate into the buckle until you hear a distinct click. Tug gently to confirm it is securely fastened.

• Adjust for comfort if necessary. The belt should be snug but not restrictive.

• Before driving on land, verify that all occupants have properly fitted and secured seat belts.

Consistent use of seat belts is one of the most effective measures to protect yourself and your passengers. Adhering to these instructions significantly reduces the risk of injury during road operation.

### Seat Belts and Water Operation

Seat belts are for road operation only. Do not wear seat belts during water operation.

On water, a fastened seat belt can prevent an occupant from exiting the vehicle. If the vehicle swamps, capsizes, or takes on water, a fastened seat belt can hold an occupant below the waterline. Recreational vessels are not equipped with seat belts for this reason.

**DO NOT WEAR SEAT BELTS DURING WATER OPERATION. UNFASTEN ALL SEAT BELTS BEFORE ENTERING THE WATER. CONFIRM ALL OCCUPANTS ARE UNFASTENED AS PART OF THE PRE-LAUNCH INSPECTION.**

On water, a properly fitted, USCG-approved personal flotation device is the appropriate protection for every occupant. See Section 5 for personal flotation device requirements.

### Child Restraint Systems

Do not install or use a child safety seat, booster seat, or infant carrier in this vehicle.

This vehicle is equipped with 2-point lap seat belts and is not designed, equipped, or tested for the installation of child restraint systems. It does not have child restraint anchorage. A booster seat positions a shoulder belt and provides no benefit with a lap-only belt.

Child passenger safety laws in your jurisdiction may require children below a certain age, weight, or height to be secured in a child restraint system when riding in a motor vehicle. The operator is responsible for determining and complying with applicable requirements.

### Child Passengers - Land Operation

This vehicle is equipped with 2-point lap seat belts only. It has no shoulder belts and no child restraint anchorage. State child passenger safety laws govern whether, and under what conditions, a child may ride in a motor vehicle, and what restraint is required. These requirements vary by state and are based on the child's age, weight, or height. The operator is responsible for determining and complying with the

requirements that apply where the vehicle is operated. A lap seat belt provides protection only when it fits correctly. If a child rides in this vehicle on land, confirm all of the following:

- The child can sit all the way back against the seat back with knees bending comfortably at the front edge of the seat.
- The lap belt lies low and flat across the hips and upper thighs, not across the abdomen.
- The child can keep the belt correctly positioned for the entire ride without repositioning it or placing it under an arm.

If the lap belt cannot be positioned low across the hips and upper thighs, the belt does not fit and cannot provide the protection it is designed to provide.

On water, no occupant wears a seat belt, including children. Every occupant must have a properly fitted, USCG-approved personal flotation device. Under federal regulation, a recreational vessel may not be operated underway with any child under 13 years old aboard unless that child is wearing an appropriate USCG-approved personal flotation device, subject to limited exceptions. Where a state has established its own child personal flotation device wear requirement, that state requirement applies on waters under that state's jurisdiction. The operator is responsible for determining and complying with the requirements that apply where the vehicle is operated.

Keep a watchful eye on child passengers at all times, on land and on water.

## 2.5 Battery Safety

**⚠ DANGER**

Do NOT charge indoors without ventilation or near open flames. Always charge in a well-ventilated area free of flammable materials. Do not charge with a damaged cord or connector. Use only approved chargers. See Section 3. Failure to follow charging instructions may result in FIRE, SERIOUS INJURY, OR DEATH.

## 2.6 Equipment Modifications

Never install any accessory that grounds to the vehicle chassis. Do not install any non-approved accessory or modify the vehicle, including for the purpose of increasing speed or power.

**⚠ WARNING**

The addition of certain accessories may change the handling characteristics of the vehicle and affect GVWR compliance. Use only WaterCar-approved accessories.

## 2.7 Hot Components & Exhibition Driving

### Hot Drive System Components

The electric motor, Curtis® controller, and associated drive system components become very hot during and after use of the vehicle. Hot components can cause burns and create a fire risk if combustible materials come into contact with them.

**⚠ WARNING**

Do not touch drive system components after use - allow them to cool. Always keep combustible materials away from the drive system. Use caution when operating near dry grass, brush, leaves, or other flammable debris. Inspect the vehicle for any debris clinging near the drive system after use and remove it promptly.

### Exhibition Driving & Improper Operation

The WaterCar EV is designed for normal road and water operation at or below its rated speeds. It is not designed for stunts, exhibition driving, or aggressive maneuvers. Improper operation increases the risk of accident, rollover, or loss of control.

> ⚠ **WARNING**
>
> Never attempt wheelies, jumps, doughnuts, or other stunts. Never turn abruptly or at sharp angles at speed. Never operate at excessive speeds for the conditions. Never operate while under the influence of alcohol, drugs, or medication. Never leave the key in the vehicle when unattended - this could result in unauthorized use by someone without a valid driver's license. After any rollover or accident, have the vehicle inspected by a qualified service technician before returning to operation.

## 2.8 Safety Labels - Complete Reference

Before operating your vehicle, ensure that you and all operators have read, understood, and complied with every label and decal affixed to the WaterCar EV. These safety labels contain critical information regarding operation, maintenance, and hazard awareness. They are designed to reduce the risk of injury, damage, or unsafe operation by alerting the operator to specific dangers and reminding users of essential precautions.

All labels are considered part of the vehicle's safety system and must remain clean, legible, and securely attached at all times. Never modify, cover, or remove a label for any reason. If a label becomes damaged, unreadable, or missing, it must be replaced immediately before further operation.

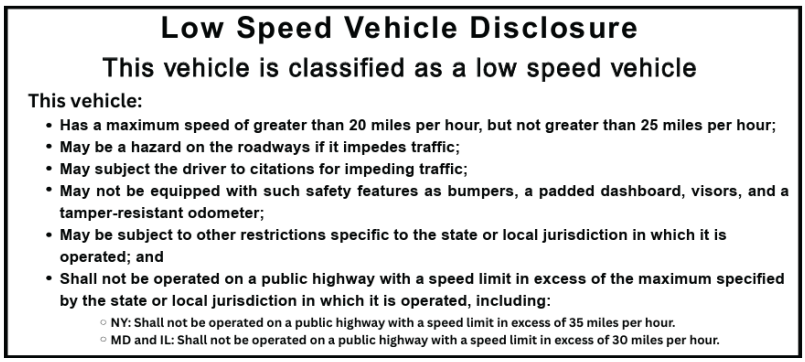
Labels are placed in specific locations on the vehicle to provide warnings near relevant components or operating controls. Refer to the diagrams in this section for the locations of all required labels. Replacement labels identical to the originals can be ordered directly from WaterCar Corporate Headquarters. Use only genuine WaterCar labels to maintain compliance with federal and marine safety standards.

> ⚠ **WARNING**
>
> Failure to follow the warnings or instructions provided on these labels - or to replace missing or illegible labels - may result in serious injury, death, or property damage. WaterCar Inc. assumes no responsibility for accidents, injuries, or damage resulting from the removal, alteration, or disregard of any safety label or warning decal.

### Vehicle Safety Labels

**LOW SPEED VEHICLE DISCLOSURE**

Location: Center Port Beneath Control Panel



**Low Speed Vehicle Disclosure**

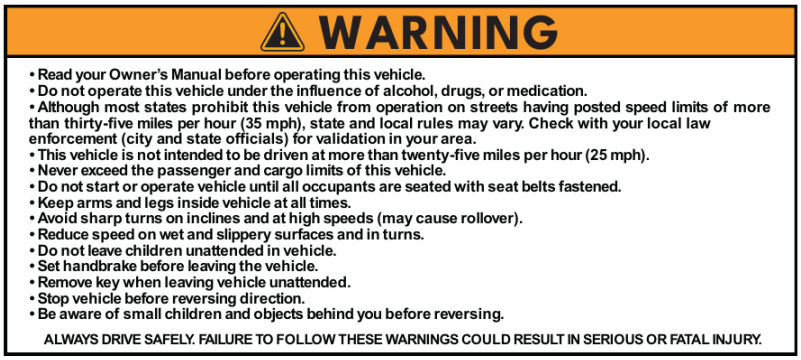
**This vehicle is classified as a low speed vehicle**

**This vehicle:**

- **Has a maximum speed of greater than 20 miles per hour, but not greater than 25 miles per hour;**
- **May be a hazard on the roadways if it impedes traffic;**
- **May subject the driver to citations for impeding traffic;**
- **May not be equipped with such safety features as bumpers, a padded dashboard, visors, and a tamper-resistant odometer;**
- **May be subject to other restrictions specific to the state or local jurisdiction in which it is operated; and**
- **Shall not be operated on a public highway with a speed limit in excess of the maximum specified by the state or local jurisdiction in which it is operated, including:**
  - **NY: Shall not be operated on a public highway with a speed limit in excess of 35 miles per hour.**
  - **MD and IL: Shall not be operated on a public highway with a speed limit in excess of 30 miles per hour.**

**WARNING: GENERAL USE - OPERATING RULES**

Location: Center Port Beneath Control Panel




**WARNING: ROLLOVER RISK & SEATBELT WARNING**

Location: Center Port Beneath Control Panel

**WARNING: SEAT BELTS REQUIRED WHILE ON LAND**

Location: Dash / Center Port Panel

**WARNING: REMAIN FULLY SEATED AND HOLD ON**

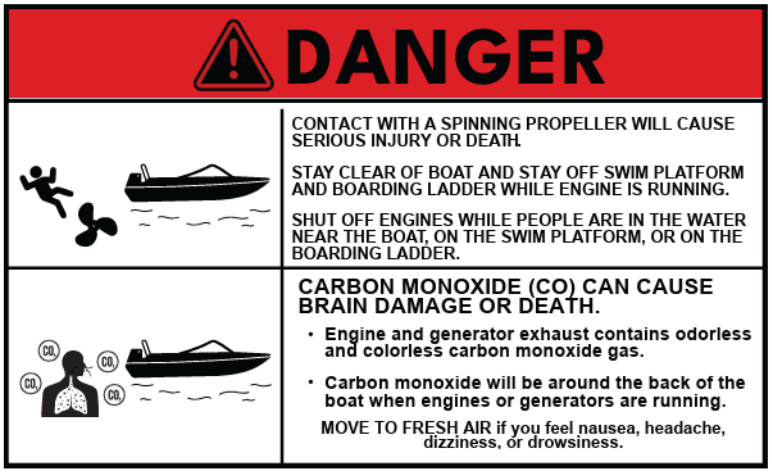
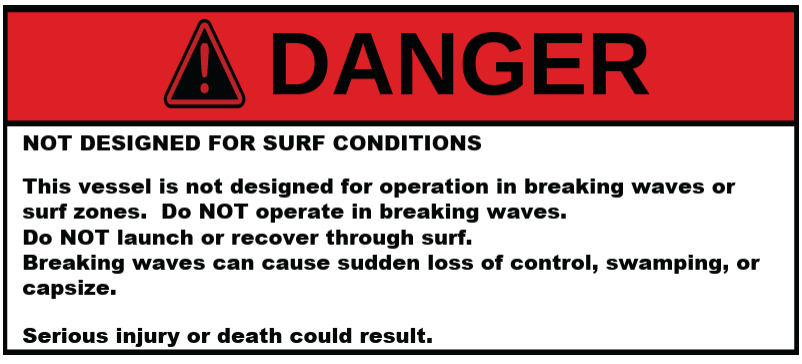
Location: Cockpit Interior

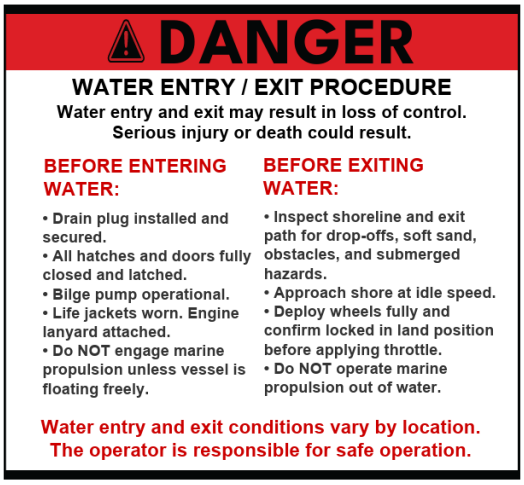
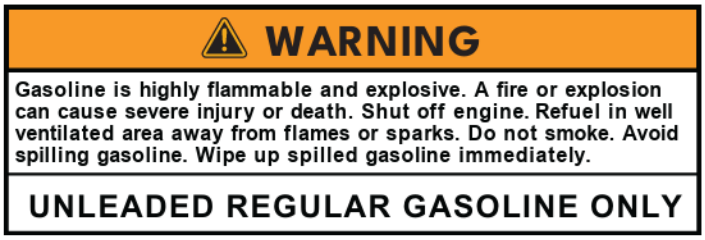
**DANGER: THESE ARE NOT PASSENGER SEATS**

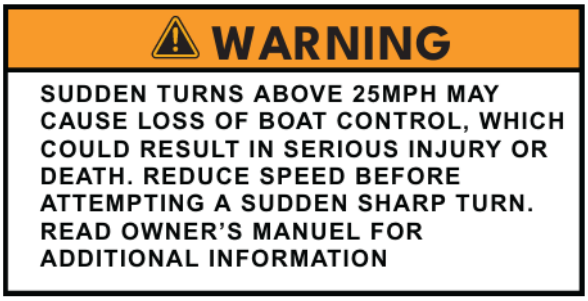
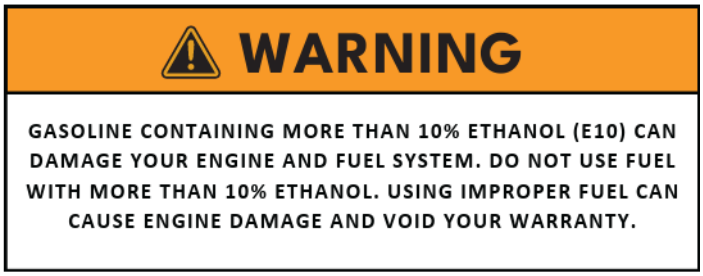
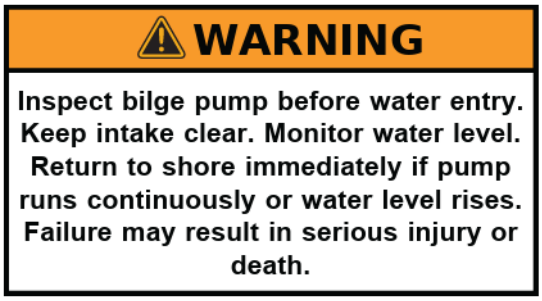
Location: Non-Designated Seating Areas

| | |
|---|---|
| **PARKING BRAKE RELEASE / DIRECTIONAL SWITCH**<br>Location: Parking Brake Area / Dash | **Parking Brake Release button**<br><br>**Directional Switch Must be in Neutral** |

## Boat Safety Labels

| | |
|---|---|
| **DANGER: MOVING PROPELLERS / CARBON MONOXIDE**<br>Location: Center Port Beneath Outboard F/R Shifter |  |
| **DANGER: DO NOT CONNECT TO SHORE POWER WHILE VESSEL IS IN WATER**<br>Location: Charger Hatch Cover on Starboard Side | |
| **DANGER: ATTACH ENGINE SHUT-OFF LANYARD**<br>Location: Helm / Transom Area | |
| **DANGER: NOT DESIGNED FOR SURF CONDITIONS**<br>Location: Hull Exterior / Helm Console |  |

| | |
|---|---|
| **DANGER: WATER ENTRY / EXIT PROCEDURE**<br>Location: Helm Console |  |
| **WARNING: VISIBILITY FROM HELM STATION IS LIMITED**<br>Location: Helm Console | |
| **WARNING: READ OWNER'S MANUAL BEFORE TOWING OR USING BOAT**<br>Location: Helm Area | |
| **WARNING: LEAKING FUEL - FIRE / EXPLOSION RISK**<br>Location: Fuel Fill | |
| **WARNING: GASOLINE IS HIGHLY FLAMMABLE AND EXPLOSIVE**<br>Location: Fuel Fill |  |

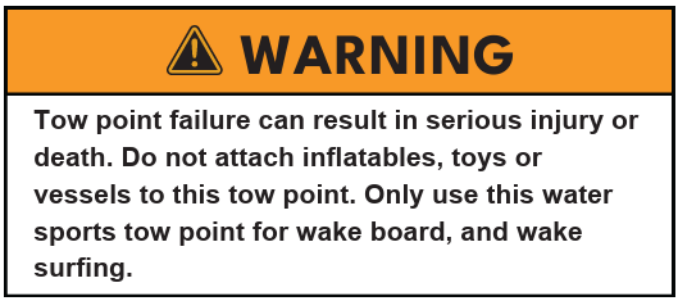
| | |
|---|---|
| **WARNING: HAZARDOUS VOLTAGE - GFCI REQUIRED**<br>Location: Charger Hatch Cover on Starboard Side | |
| **WARNING: SUDDEN TURNS ABOVE 25 MPH**<br>Location: Center Port Beneath Outboard F/R Shifter |  |
| **WARNING: ETHANOL CONTENT - DO NOT EXCEED 10%**<br>Location: Fuel Fill Area |  |
| **WARNING: INSPECT BILGE PUMP BEFORE WATER ENTRY**<br>Location: Helm / Bilge Area |  |
| **WARNING: KEEP DOOR CLOSED - RISK OF FLOODING OR EJECTION**<br>Location: Door / Side Panel | |
| **WARNING: MAKE SURE DASH HATCH IS SECURELY SHUT**<br>Location: Dash Hatch Area | |

**WARNING: BATTERY COMPARTMENT HATCH MUST REMAIN CLOSED**

Location: Battery Compartment Hatch

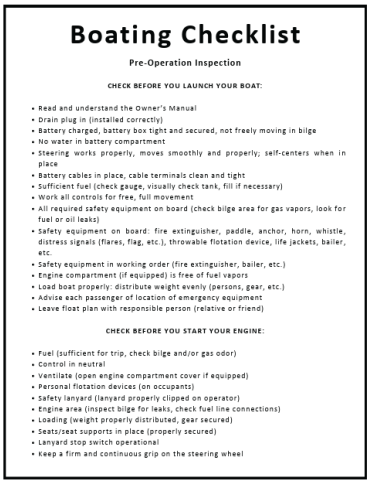
**WARNING: TOW POINT - WATER SPORTS USE ONLY**

Location: Transom Tow Point




**BOATING CHECKLIST - PRE-OPERATION INSPECTION**

Location: Helm Area / Cockpit



Boating Checklist

Pre-Operation Inspection

CHECK BEFORE YOU LAUNCH YOUR BOAT:

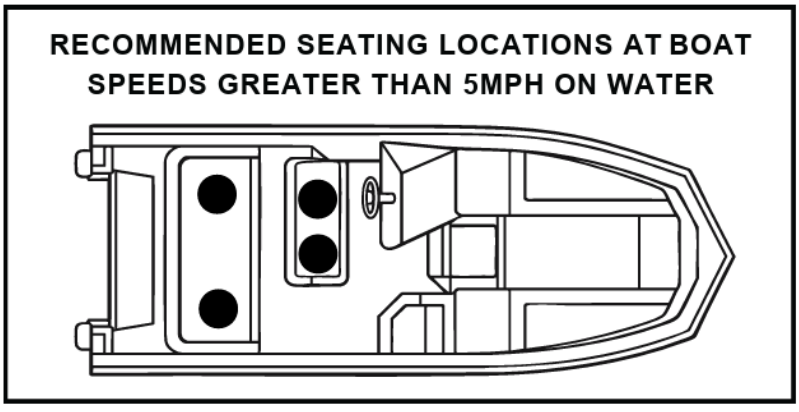
- Read and understand the Owner's Manual
- Drain plug in (installed correctly)
- Battery charged, battery box tight and secured, not freely moving in bilge
- No water in battery compartment
- Steering works properly, moves smoothly and properly; self-centers when in place
- Battery cables in place, cable terminals clean and tight
- Sufficient fuel (check gauge, visually check tank, fill if necessary)
- Work all controls for free, full movement
- All required safety equipment on board (check bilge area for gas vapors, look for fuel or oil leaks)
- Safety equipment on board: fire extinguisher, paddle, anchor, horn, whistle, distress signals (flares, flag, etc.), throwable flotation device, life jackets, bailer, etc.
- Safety equipment in working order (fire extinguisher, bailer, etc.)
- Engine compartment (if equipped) is free of fuel vapors
- Load boat properly: distribute weight evenly (persons, gear, etc.)
- Advise each passenger of location of emergency equipment
- Leave float plan with responsible person (relative or friend)

CHECK BEFORE YOU START YOUR ENGINE:

- Fuel (sufficient for trip, check bilge and/or gas odor)
- Control in neutral
- Ventilate (open engine compartment cover if equipped)
- Personal flotation devices (on occupants)
- Safety lanyard (lanyard properly clipped on operator)
- Engine area (inspect bilge for leaks, check fuel line connections)
- Loading (weight properly distributed, gear secured)
- Seats/seat supports in place (properly secured)
- Lanyard stop switch operational
- Keep a firm and continuous grip on the steering wheel

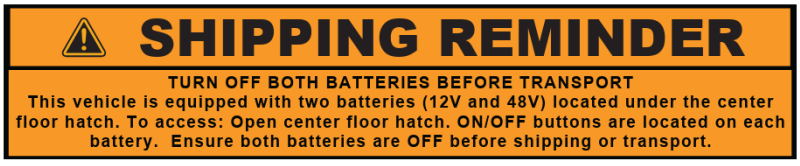
**RECOMMENDED SEATING LOCATIONS ON WATER**

Location: Cockpit Interior




**SHIPPING REMINDER - TURN OFF BOTH BATTERIES**

Location: Transport Reminder Panel



**⚠ CAUTION**

**Do not remove or obstruct any safety label. Replace any label which becomes illegible. Replacement labels can be ordered from WaterCar Corporate Headquarters.**

## 2.9 Safety Label Location Summary

| | | |
|---|---|---|
| **Boating Checklist - Pre-Operation Inspection** | NOTICE | Helm area / cockpit |
| **DANGER: Do NOT connect to shore power while vessel is in water** | DANGER | Helm / charge port vicinity |
| **12 Volt Battery ON/OFF** | NOTICE | Battery compartment hatch |
| **48 Volt Battery ON/OFF** | NOTICE | Battery compartment hatch |
| **WARNING: Visibility from helm station is limited** | WARNING | Helm console |
| **WARNING: Seat Belts Required While on Land** | WARNING | Dash / center port panel |
| **WARNING: Read Owner's Manual before towing or using boat** | WARNING | Helm area |
| **WARNING: Inspect bilge pump before water entry** | WARNING | Helm / bilge area |
| **WARNING: Make sure dash hatch is securely shut** | WARNING | Dash hatch area |
| **WARNING: Risk of Flooding or Ejection - Keep Door Closed** | WARNING | Door / side panel |
| **WARNING: Keep entire body inside vehicle when in motion** | WARNING | Cockpit interior |
| **WARNING: Sudden turns above 25 MPH may cause loss of control** | WARNING | Helm console |
| **WARNING: Gasoline more than 10% ethanol will damage engine** | WARNING | Fuel fill area |
| **WARNING: Tow point - water sports use only** | WARNING | Transom tow point |
| **WARNING: Battery compartment hatch must remain closed** | WARNING | Battery compartment hatch |
| **BATTERY COMPARTMENT (location marker)** | NOTICE | Battery hatch / access panel |
| **GREASE ZERKS REGULARLY LOCATED HERE** | NOTICE | Hydraulic pivot points |
| **HYDRAULIC PUMPS LOCATED HERE** | NOTICE | Hydraulic pump access |
| **12V FUSE LOCATED HERE** | NOTICE | 12V fuse panel |
| **PARKING BRAKE MANUAL RELEASE** | NOTICE | Parking brake area |

| | | |
|---|---|---|
| **48V FUSE LOCATED HERE** | NOTICE | 48V fuse panel |
| | | Non-designated seating areas |
| **Recommended Seating Locations at boat speeds greater than 5 MPH** | NOTICE | Cockpit interior |
| **WARNING: Fuel system - fire or explosion from leaking fuel** | WARNING | Fuel system access |
| **Parking Brake Release Button (label)** | NOTICE | Parking brake lever area |
| **Directional Switch - Must be in Neutral (label)** | NOTICE | FNR switch area |
| | | Helm / ignition area |
| **QR Code: Scan to download User Manual - WaterCar.com/owner** | NOTICE | Battery compartment / dash |
| | | Transom / stern |
| | | Transom / stern |
| **FIRE EXTINGUISHER ON BOARD (location marker)** | NOTICE | Fire extinguisher mounting area |
| **WARNING: GFCI charging - fire, explosion, electrical shock** | WARNING | Charging port area |
| **SHIPPING REMINDER: Turn off both batteries before transport** | NOTICE | Battery compartment / transport |
| **Low Speed Vehicle Disclosure (full legal text)** | LEGAL | Center port, beneath control panel |
| **WARNING: LSV operational warnings (full text)** | WARNING | Center port, beneath control panel |
| **UNLEADED REGULAR GASOLINE ONLY** | NOTICE | Fuel fill cap area |
| | | Helm console |
| **WARNING: Dual Battery System - 12V and 48V** | WARNING | Battery compartment / dash |
| **WARNING: Rollover Risk** | WARNING | Non-passenger seating areas |
| | | Exterior hull / transom |

SECTION 3
# Battery Systems
48V Eco Battery® Gen3 • 12V Epoch DP12120H

## 3. Battery Systems

The WaterCar EV uses two independent battery systems that must both be operational for normal vehicle function. Understanding both systems is essential before operating in any mode.

On the electric-drive side, the battery system is the most important system you maintain. It provides propulsion on land and power for the vehicle's electrical systems - it is the equivalent of the engine in a conventional vehicle, and like an engine it is not maintenance-free. An engine needs oil changes and regular service; the battery system needs charging discipline, periodic inspection, and attention throughout its service life.
This vehicle is easy to own, and that is the risk. It asks for little from day to day, and it is easy to forget the batteries until a neglected battery system becomes a costly replacement instead of a routine service item. Consistent, low-effort attention is what prevents that.
Two habits carry most of the value: inspect inside the battery compartment regularly, and keep the batteries charged and stored as described in Sections 3.2 and 3.3 and in the instructions provided by the battery manufacturer for your specific batteries. The routine is simple, but this is not a set-and-forget system - it requires attention.

### 3.1 Dual Battery System Overview

#### Battery System - Owner Responsibility and Marine Electrical Practice

The battery is one component of a complete electrical system. The safety and performance of the battery system depend on the design, installation, wiring, charging equipment, and maintenance of the entire electrical system, not on the battery alone. Conditions arising from installation, wiring, environmental exposure, incompatible equipment, or lack of maintenance may create issues that are not related to the battery itself.

Marine electrical systems are subject to vibration, moisture, temperature change, and corrosion over time. Recognized marine and automotive electrical practices call for the total electrical system - including any owner-added accessories - to be installed and maintained by qualified individuals familiar with the practices applicable to the vehicle's configuration and use.

The battery management system (BMS) built into each battery is designed to protect the battery from unsafe operating conditions and may temporarily disconnect the battery if it detects an abnormal condition. A BMS protection event typically indicates a condition in the surrounding electrical system that should be inspected and corrected, rather than a fault in the battery itself.

Improper wiring, loose electrical connections, corrosion, or incorrectly installed electrical equipment anywhere in the system can create high-resistance faults that generate heat, and in severe cases can result in equipment damage or fire. Safe operation depends on proper installation and maintenance of the entire electrical system. Owners are responsible for ensuring the electrical system is inspected periodically and maintained in serviceable condition.

| System | Specification | Function |
|---|---|---|
| **48V Drive Battery** | Eco Battery® Gen3 LiFePO4 - 160Ah / 7.68 kWh | Electric land drive system (road propulsion) |
| **12V Auxiliary Battery** | Epoch DP12120H LiFePO4 - 120Ah / 1.536 kWh | Outboard ignition, nav lights, accessories, controls |

| | | |
|---|---|---|
| **DC-DC Converter** | Bidirectional 12V ↔ 48V - up to 900W | Outboard alternator charges drive battery during marine operation |
| **Marine Alternator** | Mercury® outboard - 35A / 441W | Charges 12V battery; feeds DC-DC converter during water operation |

**⚠ WARNING**

BOTH battery systems must be powered ON before operating in any mode. Both must be turned OFF before shipping or transport. Failure to follow these instructions may result in battery damage, electrical faults, or fire.

## 3.2 Battery Performance Tips

- New batteries will not perform to their fullest capacity until they have completed several full discharge and recharge cycles.
- Recharge the batteries after each use. Charge to 100% whenever possible.
- Avoid short charging - disconnecting before the charge cycle completes reduces battery life.
- For best battery life, avoid discharging below 20% state of charge.
- Batteries perform best at room temperature. Do not charge at temperatures above 110°F (43°C).
- Range is affected by road conditions, terrain, temperature, payload, and driving style.
- If the vehicle will not be used for more than 15 days, charge above 50% and turn off the battery.
- Charge at least once every 6 months during long-term storage.
- Do not leave the batteries connected to the charger for extended periods. When the batteries are turned off, self-discharge is minimal, so continuous charging provides no benefit - charge as needed, and turn the batteries off for storage as described above.
- Use each charging session as a reminder to inspect the battery compartment for water, corrosion, or loose connections (Section 7.5).

## 3.3 Cold Weather Operation

Cold weather reduces battery performance and available range for both battery systems.

| Condition | Temperature | Effect |
|---|---|---|
| **48V - Charge cutoff** | Below 32°F (0°C) | Battery will NOT accept any charge - including regenerative braking |
| **48V - Shutdown** | Below -4°F (-20°C) | Battery automatically shuts down to protect cells |
| **12V - Charge cutoff** | Below 32°F (0°C) | Built-in heater activates; warms to 8°C before charging begins |
| **Both - Performance** | Any cold temp | Reduced range, slower acceleration, larger voltage drops - normal |

**⚠ CAUTION**

Do not operate the vehicle at speeds that engage regenerative braking when overnight low temperatures are below 32°F (0°C). Regenerative charging at sub-freezing battery temperatures can engage battery self-protection mode and may cause braking system faults.

## 3.4 Eco Battery - 48V Lithium Gen3

The WaterCar EV primary drive system is powered by an Eco Battery® Gen3 LiFePO4 (Lithium Iron Phosphate) 48-volt battery. LiFePO4 chemistry provides excellent thermal stability and an extended service life compared to other lithium chemistries.

**⚠ NOTICE**

The Eco Battery® Gen3 unit carries a manufacturer-level ingress protection rating of IP67 when installed in the WaterCar EV sealed battery enclosure. Do not remove or modify the battery enclosure.

**⚠ NOTICE**

Register your Eco Battery within 60 days of purchase to activate the full warranty. Batteries not registered within 60 days carry a 1-year limited warranty only. Register at: www.ecobattery.com/register

### Powering On and Off

- To power ON: Press and hold the button until the green LED illuminates (approximately 1 second), then release. The LED stays illuminated whenever the battery is powered on.
- To power OFF: Press and hold the power button until the LED indicator begins to flash (approximately 3 seconds), then release. The LED will continue to flash until the battery is completely powered down.
- The battery does not need to be turned off after each use. If the vehicle will be unused for longer than 15 days, charge the battery above 50%, disconnect the charger AC power cord, and turn the battery off.

### Wake-Up Button

The Remote Wake-Up Button (dash-mounted) powers on or awakens a battery that has entered Power Save Mode. The wake-up button CANNOT turn the battery OFF - it can only turn it ON. To wake a battery in Power Save Mode, simply press and release the wake-up button.

### Charging the 48V Battery

**⚠ WARNING**

DO NOT USE UNAPPROVED BATTERY CHARGERS OR TENDERS. DO NOT CONNECT DC OUTPUT CABLES WITH REVERSE POLARITY. Use only genuine Eco Battery lithium chargers. Battery must be powered ON with the power button illuminated to accept a charge.

1. Connect the DC output ring terminals to the battery terminals.
2. Connect AC input to AC power. All Eco Battery chargers accept 100–250 VAC, single phase, 50 or 60 Hz.

3. Charger LED will blink red when charging and will be solid green when complete. Charger Fuses: The 12V battery charger has an inline 15-amp fuse located within 6 inches of the 12V positive battery terminal. The 48V battery charger has a terminal-mounted 30-amp fuse on the 48V battery. If either charger does not operate, check the corresponding fuse first. Inspect for other electrical issues before replacing a blown fuse - a blown charger fuse may indicate a wiring fault, short circuit, or charger malfunction.
4. When fully charged, disconnect DC cord from vehicle first, then disconnect AC cord.

Extension cord: Up to 15 ft = 12–14 AWG | 10–25 ft = 10–12 AWG | Over 25 ft = not recommended.

Charge time: Battery Ah ÷ Charger Amps = Hours. Example: 160 Ah ÷ 20A charger = 8 hours. If the batteries have been deeply discharged, it is recommended to open the charger compartment hatch during charging to allow additional air circulation and cooling of the chargers. Only open the hatch when charging in a dry, covered location - never where rain or water can reach the compartment. Chargers generate more heat during recovery from deep discharge. Close the compartment hatch when charging is complete.

CAN Communications: The two connectors on the meter cable are CAN communication ports. The Eco Battery system requires 60-120Ω of resistance on the CAN network. If CAN communication is unstable, add an Eco Battery 120Ω CAN Resistor Pass-Through (part #A-4209).

### 48V Charging Specifications

The approved charging method for the Eco Battery 48V pack is CC/CV (constant current / constant voltage). If the charger has an adjustable absorption setting, set it to 1 hour maximum. If the charger has an adjustable float setting, set it to 54.0V or off - float charging above 54.0V reduces battery pack lifespan. Charging regularly above the recommended charge rate also reduces lifespan; occasional charging at the maximum rate does not significantly affect lifespan.

| Charging Parameter (48V Pack) | Value |
|---|---|
| **Charging Method** | CC/CV (constant current / constant voltage) |
| **Bulk Voltage - Recommended** | 57.0V |
| **Bulk Voltage - Maximum** | 58.4V |
| **Float Voltage** | 54.0V (or off) |
| **Max Continuous Charge (160Ah)** | Less than 52A |
| **Max Charge - 30 Second Surge (160Ah)** | 200A |
| **Absorption Time (if adjustable)** | 1 hour maximum |

*Source: Eco Battery GEN3 51.2V 160Ah data sheet (part 051160-06). Use only genuine Eco Battery lithium chargers configured to these values.*

### SOC Meter Display

| Display | Meaning |
|---|---|
| **State of Charge** | Displayed in percent. 0% = empty \| 100% = full |
| **Color - Green** | 100–50% SOC - Normal operating range |
| **Color - White** | 49–20% SOC - Plan to charge soon |
| **Color - Red** | 19–0% SOC - Charge immediately |
| **Battery Current** | Discharge = negative. Charging = positive. |

| | |
|---|---|
| **Calibration** | BMS self-calibrates at end of each full charge cycle. Accuracy +/- 5%. |
| **Sleep Timer** | Meter may power off after inactivity. Press wake-up button to activate. |
| **Trouble Codes** | Displays DTCs if battery fault detected. Record code and contact WaterCar. |

### Power Save Mode

The battery automatically enters Power Save Mode after extended periods of inactivity. All LEDs power down completely.

| SOC Range | Power Save Activates After |
|---|---|
| **0% – 19%** | Several hours of inactivity |
| **20% – 100%** | Several days of inactivity |

To exit Power Save Mode: Press and release the remote wake-up button or the battery power button.

### Heated Battery (Select Configurations)

Select Eco Battery® Gen3 units are equipped with an internal automatic heater. The heater is fully automatic - it activates when the battery charger is plugged in and CAN communication is established. The heater warms the cells until they reach a safe charging temperature, at which point charging begins automatically. No user input is required. Refer to Eco Battery documentation for current heated-battery specifications.

### BMS Error Codes

| Code | Description | Level | Required Action |
|---|---|---|---|
| **E01** | MOS Error | 1 - Serious | Will not self-resolve. Contact Eco Battery immediately. |
| **E02** | External Short Circuit | 1 - Serious | Will not self-resolve. Contact Eco Battery immediately. |
| **E03** | Cell Differential | 1 - Serious | Will not self-resolve. Contact Eco Battery immediately. |
| **E04** | Cell Over Voltage | 2 - Major | Will self-resolve if conditions allow. |
| **E05** | Cell Under Voltage | 2 - Major | Will self-resolve if conditions allow. |
| **E06** | Pack Over Voltage | 2 - Major | Will self-resolve if conditions allow. |
| **E07** | Pack Under Voltage | 2 - Major | Will self-resolve if conditions allow. |
| **E08** | Discharge Over Current | 3 - Minor | Will self-resolve if conditions allow. |
| **E09** | Charge Over Current | 3 - Minor | Will self-resolve if conditions allow. |
| **E10** | Discharge Temp High | 3 - Minor | Allow battery to cool. |
| **E11** | Charge Temp High | 3 - Minor | Allow battery to cool before charging. |
| **E12** | Charge Temp Low | 3 - Minor | Allow battery to warm before charging. |
| **E13** | Discharge Temp Low | 3 - Minor | Allow battery to warm before use. |

| | | | |
|---|---|---|---|
| **E14** | MOS Temp High | 3 - Minor | Allow system to cool. |
| **E15** | SOC Low | 3 - Minor | Charge immediately. |
| **E16** | External Communication Error | 1 - Serious | Will not self-resolve. Contact Eco Battery immediately. |
| **E17** | Internal Communication Error | 1 - Serious | Will not self-resolve. Contact Eco Battery immediately. |

Eco Battery Support: 877-326-2288 | support@ecobattery.com | ecobattery.com

### Long-Term Storage - 48V Battery

- For storage longer than 15 days: charge battery above 50%, disconnect charger AC power cord, and turn battery off.
- Charge the battery at least once every 6 months.
- If storing in temperatures below -4°F (-20°C): remove the battery and store above -4°F.
- Do not use non-approved third party battery chargers or tenders.

## 3.5 Epoch® Battery - 12V Lithium (DP12120H)

The WaterCar EV auxiliary systems and electronics are powered by an Epoch DP12120H Dual-Purpose 12V Lithium Iron Phosphate (LiFePO4) battery with Smart Monitoring.

| Specification | Value - Epoch DP12120H |
|---|---|
| **Chemistry** | Lithium Iron Phosphate (LiFePO4) |
| **Nominal Voltage** | 12.8V |
| **Nominal Capacity** | 120 Ah |
| **Nominal Energy** | 1,536 Wh |
| **Ingress Protection** | IP67 - factory rated |
| **Max Charge Current** | 100A |
| **Recommended Charge Current** | 50A |
| **Recommended Charge Voltage** | 14.4V |
| **Float Voltage** | 13.6V |
| **Cut-Off Voltage** | 11.2V |
| **Charge Temperature Range** | 32°F to 113°F (0°C to 45°C) |
| **Discharge Temperature Range** | -4°F to 149°F (-20°C to 65°C) |
| **Cold Weather Heater** | Built-in; auto-activates on charge input; warms to 8°C before charging |

### First Use - Activation Required

1. Place the battery power switch in the ON position.
2. Short-press the reset button for 1 second - SOC LED indicators illuminate for 10 seconds.
3. Long-press and hold the reset button for 10 seconds to activate the battery. After activation, the LED indicators will display battery SOC and the RUN light will flash yellow.

> ⚠ **CAUTION**
> The battery cannot be used normally until it is activated. BMS self-check on power-on takes up to 10 seconds - do not interrupt power during self-check.

### SOC Indicator Lights

| SOC Range | Discharge Indication (L1→L4) | Notes |
|---|---|---|
| **0–25%** | Off / Off / Off / Blink | L4 blinks |
| **25–50%** | Off / Off / Blink / On | L3 blinks, L4 steady |
| **50–75%** | Off / Blink / On / On | L2 blinks, L3–L4 steady |
| **75–100%** | Blink / On / On / On | L1 blinks, L2–L4 steady |

### Charging the 12V Battery

> ⚠ **WARNING**
> Use only a dedicated lithium battery charger with correct lithium charging settings. Do not use lead-acid chargers. Do not invert the positive and negative terminals.

| Specification | Value |
|---|---|
| **Recommended Charge Voltage** | 14.4V |
| **Float Voltage** | 13.6V |
| **Recommended Charge Current** | 50A (0.3C) |
| **Maximum Charge Current** | 100A (1C) |
| **Cut-Off Voltage** | 11.2V |
| **Charge Temperature** | 32°F to 113°F |

### Routine Maintenance - 12V Battery

- Check battery terminals monthly for corrosion. Clean with baking soda and water if corrosion is found.
- Inspect for physical damage, swelling, or leakage. Do not operate if damage is found - replace immediately.
- Keep the battery area clean and dry. Do not clean with water under pressure.
- Fully charge the battery at least once per month to maintain SOC calibration accuracy.

### Storage - 12V Battery

- Store battery at approximately 50% SOC in a dry, clean, well-ventilated environment at 59–95°F (15–35°C).
- For long-term storage: charge the battery every 6 months.
- If the vehicle will be stored for a prolonged period, turn the battery power switch to OFF to minimize self-discharge.
- Reconnect and fully charge before use after any extended storage period.

Epoch Batteries Support: support@epochbatteries.com | www.epochbatteries.com

## 3.6 Disconnecting and Reconnecting Power (Service)

### Disconnecting Power

1. Position the vehicle on a dry, firm, level surface. Place the directional switch in neutral. Turn the key off. Set the parking brake.
2. Press and hold the 48V battery power button until the LED begins to flash (~3 sec), then release. Wait for LED to turn off completely.
3. Turn the 12V battery switch to the Off position. Confirm both battery indicators are off before proceeding.

### Reconnecting Power

1. Confirm service is complete and all connections are properly secured.

2. Turn the 12V battery switch to the On position.
3. Press and hold the 48V battery power button until the green LED illuminates (~1 sec).
4. Turn the key to the On position and confirm all indicators display normal operating status.

### Battery Terminal Service Specifications

The following manufacturer specifications apply when servicing battery terminal connections. These apply to the Eco Battery 48V pack and Epoch 12V battery terminal hardware.

• Use only M8 or 5/16" ring terminals on the battery posts.

• Torque terminal bolts to 120 in-lb (10 ft-lb) for the Gen 3 battery. Do not over-tighten. This value reflects the manufacturer's direct guidance for the Gen 3 pack current at the time of publication. Battery manufacturer specifications may be updated; before servicing terminals, confirm the current torque specification directly with Eco Battery. Use this manual as a guide - the manufacturer's current specification governs.

• Epoch 12V (DP12120H): torque terminal bolts to 71-106 in-lb (8-12 N·m) per Epoch specification sheet V01. Do not apply the 48V torque value to the 12V battery - each battery has its own manufacturer specification.

• Do not connect battery terminals with reverse polarity. Do not short-circuit the terminals.

**NOTICE - CONNECT BATTERY TERMINALS BEFORE THE DC-DC CONVERTER**

The WaterCar EV uses a bidirectional DC-DC converter between the 12V and 48V systems. When reconnecting power during service, connect the battery terminals before connecting any inverter or DC-DC converter. Connecting the converter first can cause a terminal arc at the battery post. Per the battery manufacturer, terminal arc damage is not covered under warranty.

**DANGER**

THE BATTERY VOLTAGE IS SUFFICIENT TO CAUSE DEATH BY ELECTROCUTION. ALWAYS FOLLOW THE POWER DISCONNECT PROCEDURE BEFORE PERFORMING ANY SERVICE. NEVER SERVICE THE ELECTRIC DRIVE SYSTEM UNLESS PROPERLY TRAINED.

SECTION 4
# LSV Road Operation
Standalone - applies to LSV and Marine Package configurations

## 4. LSV Road Operation

This section covers all aspects of operating the WaterCar EV as a Low Speed Vehicle (LSV) on public roads. This section is self-contained - LSV-only owners will find everything needed for safe road operation here. Marine Package owners must also read Sections 5 and 6.

**⚠ WARNING - PAYLOAD CAPACITY**

Vehicle payload capacity varies depending on installed equipment, occupants, fuel load, cargo, and post-sale modifications. The operator is responsible for ensuring the vehicle is operated within applicable weight limits and manufacturer ratings at all times. Refer to Section 2.3 for payload accounting and the VIN plate for weight data specific to your unit.

### 4.1 LSV Regulatory Classification

The WaterCar EV is manufactured in conformance with 49 CFR Part 571.500 (Federal Motor Vehicle Safety Standard 500 - Low Speed Vehicles). A 17-character Vehicle Identification Number (VIN) is assigned at manufacture pursuant to 49 CFR Part 565. A Manufacturer's Certificate of Origin (MCO) accompanies each vehicle.

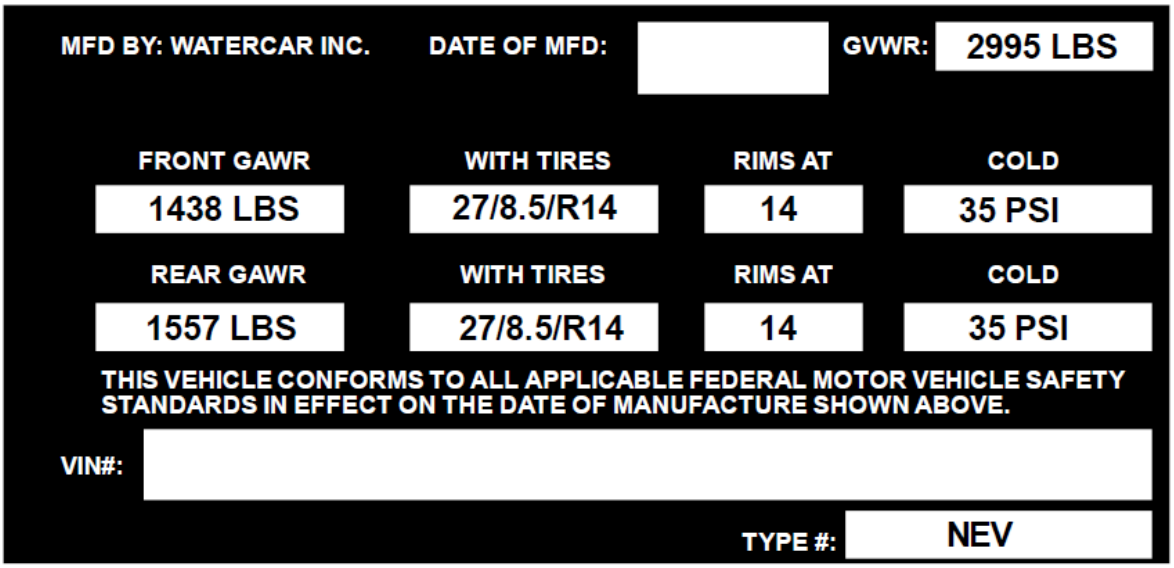
As an LSV, this vehicle is subject to a maximum on-road speed of 25 MPH. Operation on roads with posted speed limits above the applicable state maximum for LSVs is prohibited.

**⚠ WARNING**

The WaterCar EV is governed to a maximum of 25 MPH in compliance with FMVSS 500. Operation on roadways with posted speed limits above the applicable LSV maximum (35 MPH in most U.S. jurisdictions) is prohibited and dangerous. A valid driver's license is required for all operators where required by applicable law.

### 4.2 Vehicle Identification Number (VIN) Plate

The VIN is located on an aluminum plate affixed under the dash. This plate contains weight ratings including GVWR and GAWR. Always refer to the VIN plate for the authoritative weight data specific to your unit. Record your VIN in the space provided on the Delivery Acknowledgment Form.




## 4.3 Acoustic Vehicle Alerting System (AVAS)

The WaterCar EV is an electric vehicle subject to FMVSS 141 (Minimum Sound Requirements for Hybrid and Electric Vehicles). The vehicle is equipped with an AVAS to provide an audible alert to pedestrians and other road users at low speeds.

✓ **CONFIRMED**

The Acoustic Vehicle Alerting System (AVAS) emits an audible pedestrian alert when the vehicle is traveling below 20 mph in both forward and reverse. The system is designed to meet FMVSS 141 requirements for minimum sound levels at pedestrian-relevant speeds. The AVAS activates automatically and requires no operator action.

## 4.4 FCC / Radio Compliance

The WaterCar EV touchscreen display and infotainment system contain radio components. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

## 4.5 Vehicle Description & Controls

The WaterCar EV is a battery-powered Low Speed Vehicle (LSV). On land, propulsion is provided by a 48V electric motor. On land, occupancy is limited to the designated seating positions equipped with seat belts, and the vehicle is limited to a maximum on-road speed of 25 MPH per federal LSV regulations. Water capacity is shown on the capacity plate (Section 5.5).

*Vehicle overview diagram - labeled side view and top-down plan showing key component locations: 48V battery, 12V battery, hydraulic pump, helm controls, drain plug, VIN plate, D-ring tie-down points, zerk fitting locations*

### Console Controls

| Ref | Control | Description |
|---|---|---|
| **B** | On / Off Batt Disconnect | Large red Batt Turn Switch - immediately stops electric motor |
| **E** | Curtis Display | Shows battery state, motor status, and fault codes |
| **F** | Motor Key Switch | Powers on/off the 48V electric drive system |
| **G** | Touchscreen | Speed display + Apple CarPlay infotainment |
| **H** | Push Button Panel | 8 buttons: display, headlights, nav lights, anchor light, front bilge, rear bilge, horn, rear camera |
| **I** | Fwd/Neutral/Rev Switch | Controls electric motor direction |
| **J** | Turn Signal / Hazard | Left/right turn signals; both simultaneously = hazard lights |

*Console control diagram - labeled photograph or engineering illustration of helm console identifying controls B, E, F, G, H, I, J. PORT (marine) and STARBOARD (road) control zones clearly labeled.*

### Dashboard Indicator Lamps

| Indicator | Condition | Required Action |
|---|---|---|
| **Battery - Green (100–50%)** | Normal operating range | No action required |
| **Battery - White (49–20%)** | Moderate discharge | Plan for recharge; monitor closely |
| **Battery - Red (19–0%)** | Low battery | Return to charging location immediately |
| **Fault Code** | Controller detected fault | Stop safely; note code; contact WaterCar |
| **Park Brake** | Parking brake applied | Disengage before driving |
| **Seat Belt** | Seat belt not fastened | Fasten seat belt before operating |
| **Direction (F/N/R)** | Current drive mode | Confirm direction before accelerating |

✓ **CONFIRMED**

The Curtis® controller enters sleep mode after approximately 30 minutes of inactivity when the key is left in the ON position (2026 and later models). Pre-2026 models may not include an automatic timeout. To exit sleep mode, cycle the key switch OFF and back to ON. At critically low state of charge, the controller will progressively limit vehicle speed. Refer to the Eco Battery BMS codes (Section 3.4) for low-SOC behavior indicators. Controller Fuse: The Curtis® controller has an inline 5-amp blade fuse located near the solenoid/contactor, between the contactor and the controller. The fuse location is marked with a red tag. If the controller does not power on, check this fuse first. Replace with a 5-amp blade fuse only. Investigate and resolve the cause of any blown fuse before replacing - a blown fuse may indicate a wiring fault or short circuit.

### Push Button Panel

| Button | Function |
|---|---|
| **Button 1** | Display Power |
| **Button 2** | Headlights |
| **Button 3** | Navigation Lights (Port/Starboard/Stern) |

| | |
|---|---|
| **Button 4** | Anchor Light (all-round white) |
| **Button 5** | Front Bilge Pump |
| **Button 6** | Rear Bilge Pump |
| **Button 7** | Horn |
| **Button 8** | Rear View Camera |

### Dash Layout - PORT vs. STARBOARD

- PORT (left) side - Marine controls: Mercury ignition key, throttle/shift lever, Mercury display screen, hydraulic wheel switches (FRONT and REAR rockers), navigation lights, bilge pump, horn.
- STARBOARD (right) side - Road/Land controls: FNR toggle, turn signal buttons, electric motor key switch, 48V state of charge gauge.
- CENTER - Touchscreen infotainment display (Apple CarPlay), speedometer.

### Reverse Camera

The WaterCar EV is equipped with a reverse camera. The camera activates automatically when the Drive Forward/Reverse Switch is placed in the Reverse position and the display is powered on.

> ⚠ **WARNING**
> The reverse camera is an aid only. Always visually check your surroundings and physically inspect the area behind the vehicle before reversing. The camera has blind spots and does not replace a physical inspection.

### Hub Bearing Health Check

- Step 1 - Visual & Touch: After an extended drive, touch each rear hub. Compare both sides - a failing bearing may feel noticeably hotter. Check for grease leaks near the seal.
- Step 2 - Spin & Listen: Jack up one rear wheel. Spin by hand. It should feel smooth and silent. Grinding or roughness means replacement is required.
- Step 3 - Rock Test: Grab the tire at 12 and 6 o'clock and rock it. Any looseness indicates bearing wear.
- Step 4 - Road Noise Test: Drive at 25 MPH with windows down. Listen for rumbling or humming that changes with speed or turns.

> ⚠ **WARNING**
> Replace bearing immediately if: hub is hotter than the other side - grinding, whirring, or knocking sounds - visible grease leaking - any wheel play during the rock test.

## 4.6 Pre-Ride Inspection Checklist

Perform before each use. Do not operate if any item does not pass.

| Item | Check | Ref |
|---|---|---|
| **Tire pressure** | Check and adjust to 35 PSI | 4.18 |
| **Tire condition** | Inspect for cuts, punctures, cracks, bulges | 4.18 |
| **Wheel nuts** | Confirm tight; no looseness or wobble | 4.18 |

| | | |
|---|---|---|
| **Brake pedal** | Firm travel; no spongy feel | 4.19 |
| **Brake fluid** | Check reservoir level; inspect for leaks | 4.19 |
| **Brake lights** | Confirm illuminate when pedal is pressed | - |
| **Parking brake** | Confirm disengaged before driving - no dragging or rubbing | 4.13 |
| **Seat belts** | Inspect for damage; confirm latch operates | Sec. 2 |
| **Headlights** | Confirm operation | 4.20 |
| **Turn signals** | Confirm all signal lights operate correctly | - |
| **Horn** | Confirm operation | - |
| **Steering** | Smooth operation; no excessive freeplay | 4.20 |
| **Accelerator pedal** | Proper operation; returns to rest position | - |
| **48V battery** | Check state of charge; power-on indicator lit | Sec. 3 |
| **12V battery** | Check charge; terminals clean and tight | Sec. 3 |
| **Battery compartments** | Inspect for moisture, corrosion, damage; lids secured | Sec. 3 |
| **Mirrors** | Adjust for clear side and rear view | - |
| **Surroundings**<br>• Hydraulic wheels - confirm all four wheels are fully deployed and locked in the down position. No rubbing or contact during full steering lock left and right. | Clear path; no obstacles; route confirmed | - |
| **Door latch** | Confirm door latch engages securely; door fully closed before operation | - |
| **Hydraulic fluid** | Check fluid levels in both hydraulic pumps with wheels in the UP position; verify within recommended range. Inspect fluid for foam - if foamy, perform the defoaming procedure (see Section 7 Hydraulic Maintenance) before operating. Inspect for leaks at fittings and hose connections. All suspension nuts and hydraulic connection fittings should have a torque verification tick mark (paint or marker line across the fastener and mating surface). If any adjustment is made, re-torque to specification and apply a new tick mark for visual confirmation of proper torque. | - |
| **Outboard kill switch [Marine Package]** | Confirm safety lanyard bungee cord is fitted and operational; switch in RUN position | Sec. 5 |
| **Rear axle nut safety wire** | Visually verify present and intact on both rear axles. If missing or damaged, do not operate; have a qualified mechanic verify torque and re-install. | 4.18 |
| **Hydraulic suspension lockouts (post-tow only)** | If the vehicle has been towed in Tow Mode, confirm both rear hydraulic suspension lockouts have been removed and stowed before operation. Do not operate the vehicle with lockouts installed. | 4.14 |

## 4.7 Power-On Sequence

1. Press and hold the 48V battery power button until the green LED illuminates (approximately 1 second), then release.
2. Turn BOTH large red battery master switches (beside the driver's seat panel) to the ON position.
3. Confirm the 48V state of charge gauge illuminates.
4. Confirm the 12V gauge reads approximately 13V.
5. Turn the Electric Motor Key Switch to the ON position - you will hear a relay click.

**⚠ NOTICE**

If the vehicle arrives by transport carrier with low or dead batteries, this is normal. Both batteries fully recover with a standard charge. Contact WaterCar if a battery does not recover after a full charge cycle. WaterCar Sales/Service: (714) 251-6687.

## 4.8 Driving Procedure

1. Confirm the pre-ride inspection is complete and all items pass.
2. Sit in the driver's seat. Fasten your seat belt. Ensure all passengers are seated with seat belts secured.
3. Activate the 48V battery by pressing the power button - confirm green LED illuminates.
4. Engage both red battery master switches to the ON position.
5. Turn the Electric Motor Key Switch to ON.
6. Apply the brake pedal.
7. Confirm the parking brake is disengaged before driving (see Section 4.13).
8. Move the Drive Forward/Reverse Switch to the Forward (F) position.
9. Check your surroundings and confirm your path of travel is clear.
10. Keeping both hands on the steering wheel, gradually depress the accelerator pedal to begin driving.
11. Use turn signals before every turn or lane change.
12. To stop: release the accelerator and apply the brake to a complete stop.
13. Place the directional switch in neutral. Turn the key off. Set the parking brake. Remove the key if leaving the vehicle. On a slope, see Section 4.13 for required slope-parking steps.
14. Recharge the batteries after each use.

**⚠ WARNING**

Never turn the Key Switch to the OFF position while the vehicle is in motion. Doing so can lead to loss of speed control, potentially resulting in serious injury or death.

## 4.9 Throttle Fault - Curtis Controller

The WaterCar EV uses a Curtis electronic motor controller with built-in safety logic. A throttle fault may occur if the accelerator pedal is pressed with very light, short, or hesitant inputs.

- Symptom: vehicle does not respond to accelerator pedal, may display a fault code.
- Resolution: fully release the accelerator pedal completely, then re-apply with a smooth, deliberate motion.
- Directional fault: can also occur if Forward and Reverse are toggled too quickly - clear by cycling key OFF, wait 3 seconds, then ON.

**⚠ NOTICE**

Throttle faults are normal behavior of the self-protecting electronic controller - not a vehicle malfunction. Always apply the accelerator with smooth, intentional pressure.

## 4.10 Driving in Reverse

Always come to a complete stop before reversing direction. Move the Drive Forward/Reverse Switch to the Reverse (R) position. The reverse camera activates automatically.

1. Physically check behind the vehicle before reversing. Do not rely solely on the camera.
2. Avoid backing downhill. Back slowly. Apply brakes lightly for stopping.
3. Avoid turning at sharp angles in reverse. Never accelerate suddenly.

**⚠ WARNING**

Always physically confirm no obstacles or people are behind the vehicle before reversing.

## 4.11 Driving on Slippery Surfaces

- Do not operate on excessively slippery surfaces.
- Slow down before driving onto a slippery surface.
- Avoid quick, sharp turns, which can cause skids.
- Correct a skid by turning the steering wheel in the direction of the skid. Never apply the brakes during a skid.
- Regenerative braking increases the chances of traction loss on slippery surfaces. Reduce speed and allow extra stopping distance.

### Operating Surfaces and Slopes

The WaterCar EV is a Low Speed Vehicle intended for paved and improved surfaces and for accessing the water. It is not an off-road, all-terrain, or trail vehicle. Reaching a launch site may require driving on an unpaved ramp, gravel, or shoreline; this is not off-road use, and the vehicle is not intended for off-road, trail, or all-terrain operation. On any incline, keep the vehicle pointed straight up or straight down the slope. Do not drive across a slope. Observe the slope limits in Section 4.12.

## 4.12 Parking & Braking

### Parking on a Level Surface

1. Apply the brakes and stop the vehicle on a level surface.
2. Move the directional switch to neutral. Turn the key off. Set the parking brake.
3. Turn the key off and remove it.

### Parking on an Incline

1. Apply the brakes and bring the vehicle to a complete stop. Place the directional switch in neutral.
2. Lower the front bow of the vehicle onto its belly so the front wheels are slightly off the ground and the hull rests on the surface. This is the primary method for securing the vehicle on a slope (see the warning below).
3. As additional precautions, turn the front wheels toward the downhill side and block the wheels on the downhill side of the vehicle.

4. Turn the key off. Remove the key if leaving the vehicle.

**⚠ DANGER**

Do not use the vehicle on slopes greater than 1:5 (20%). Do not drive the vehicle across slopes. A rolling vehicle can cause serious injury or death.

## 4.13 Electronic Parking Brake

The WaterCar EV is equipped with an electronic parking brake integrated into the powertrain. The parking brake must be set when the vehicle is parked and confirmed disengaged before driving. Refer to the release procedure below and to your vehicle-specific orientation from WaterCar.

### How the System Works

The parking brake is a spring-applied, electrically-released design - the same fail-safe type used on many utility and powertrain-driven vehicles. Spring force applies the brake mechanically. With battery power ON, the controller holds the brake released while you drive. This means:

- When the battery is turned OFF, the parking brake applies automatically.
- The brake cannot be held in the released position without battery power and an active controller.
- This is a safety feature: a loss of power results in the brake applying, not releasing.

**The parking brake locks the FRONT wheels only.** Because only the front wheels are locked, additional care is required when leaving the vehicle unattended on any slope.

**⚠ WARNING - FRONT-WHEEL-ONLY HOLDING ON SLOPES**

The parking brake locks the front wheels only. On a slope, the unlocked rear wheels can still allow the vehicle to slide.

**When parking on a slope or leaving the vehicle unattended on any incline, lower the front bow of the vehicle onto its belly (front wheels slightly off the ground) so the hull rests on the surface. This is the required method for securing the vehicle on a slope and prevents it from sliding.**

Lowering the bow is the primary action - not an alternative to other precautions. As added precautions on top of the lowered bow, turn the front wheels toward the downhill side and place wheel chocks on the downhill side. Do not rely on the directional switch to hold the vehicle.

**Normal sounds:** A click or mechanical sound when the parking brake applies or releases is normal and indicates the system is functioning correctly.

### Manually Releasing the Parking Brake

There are two ways to manually release the parking brake. Before using either method, read the following warning.

**⚠ WARNING - CONFIRM LEVEL GROUND BEFORE MANUAL RELEASE**

Releasing the parking brake on any slope will allow the vehicle to move, exactly as it would in any vehicle with the brake released. Before manually releasing the parking brake by either method below, confirm the vehicle is on level ground, confirm no people or obstacles are in the vehicle's path, and be prepared to control the vehicle. Failure to do so can result in a runaway vehicle, property damage, serious injury, or death.

#### Method 1 - Controller-Mediated Release (battery ON)

This method uses the controller to release the brake and requires three intentional steps, in order:

1. Turn the key ON.

2. Place the directional switch in NEUTRAL.
3. Press the "PARKING BRAKE" push button on the left side panel beside the driver.

The controller will then release the parking brake. The three-step sequence is intentional. It is designed with multiple layers so the brake cannot be released accidentally - all three conditions must be met before the controller will release the brake. If the throttle is pressed, the release button is pressed again, or the key or directional switch is moved to another position, the parking brake automatically re-engages and returns to normal operation.

**Method 2 - Complete Manual Override (for a dead battery only)**

If the battery is dead and the vehicle must be moved, a complete mechanical override is available. This override is fully separate from the controller and does not require battery power.

The override lever is located in the front of the vehicle, in the center step front vent area. The lever is secured by a guard. To engage the override:

1. Release the guard that secures the lever.
2. Twist the lever to the release position. The brake will remain released until the lever is twisted back to its original position.

This mechanically overrides the spring and holds the brake released. The brake will remain released until the lever is twisted back to its original position, at which point control returns to the controller.

**⚠ WARNING - MANUAL OVERRIDE IS FOR MOVING A DEAD-BATTERY VEHICLE ONLY. IT IS NOT FOR TOWING.**

The manual override is intended for one purpose: allowing the vehicle to be pushed by hand when the battery is dead. Do NOT use the manual override to flat-tow (tow with wheels on the ground) the WaterCar EV. The vehicle is not rated for flat-towing. There is no way to disconnect the parking brake - this is a complete manual override that holds the spring open. When transport is required, refer to the towing instructions in Section 4.14 and transport the vehicle on a flatbed or trailer. After moving the vehicle, twist the override lever back to its original position so the parking brake can function normally.

**⚠ NOTICE**

Be sure the parking brake is fully released before driving. Driving with the parking brake engaged causes brake overheating and can damage drivetrain and suspension components. After release, listen for any rubbing or dragging during the first few seconds of driving; if present, stop and confirm the brake is fully released.

If you leave the vehicle with anyone unfamiliar with its operation, such as a parking or valet attendant, inform them how the parking brake operates. If the brake does not engage or release smoothly, or you notice a lack of holding power or unusual sounds, have the vehicle inspected by a qualified technician before further operation. In coastal or saltwater environments, inspect the parking brake components more frequently, as moisture accelerates corrosion.

## 4.14 Transporting by trailer & Towing

### Transporting the WaterCar EV for Shipping ON TRAILER.

1. Turn the key off. Turn off both battery systems.
2. Secure the vehicle using tie-down straps of sufficient WLL attached to the designated D-ring tie-down points.

**⚠ WARNING**

Do not add additional weight to the vehicle during transport. The vehicle is designed to be transported empty.

## Tow Mode - Towing the WaterCar EV - NO TRAILER NEEDED

### Tongue Weight and Hitch Rating

In Tow Mode, with the front wheels raised, the WaterCar EV places a tongue weight of approximately 1,000 lbs on the tow vehicle's hitch ball. Before towing, confirm that the tow vehicle's hitch receiver, ball mount, and hitch ball are each rated for a tongue weight of at least 1,000 lbs. A hitch, ball mount, or ball rated below this value can fail under road load and vibration and result in loss of the vehicle in transit.

- Use the Rear Wheel Hydraulic Switch to adjust the front height to align with your towing vehicle's hitch ball.
- Locate the hitch pin inside the front bow. Pull out the hitch pin, align and insert the trailer hitch into the mount, reinsert the hitch pin to lock.
- Once vehicle is attached to vehicle – raise the front wheels – VERY IMPORTANT – DO NOT TOW WITH FRONT WHEELS IN DOWN POSITION. The WaterCar EV MUST be towed with front wheels raised at all times. Towing with front wheels down will cause severe damage to the front suspension, steering, and drivetrain components. Before towing, confirm the rear axle nut safety wire is in place and intact.

### Install Rear Hydraulic Suspension Lockouts Before Towing

The WaterCar EV is supplied with two aluminum channel suspension lockouts with lock pins (stored in the care package). They install over the extended rear hydraulic cylinder rods to mechanically lock the rear suspension in the down position during Tow Mode towing. The lockouts function as a mechanical fail-safe - independent of hydraulic pressure - and prevent rear suspension collapse from hydraulic drift, leakage, or system failure during transit.

**Installation (before towing):** With the rear wheels in the fully extended (down) position, install one aluminum channel lockout over each exposed rear hydraulic cylinder rod and secure with the supplied lock pin. Verify each lockout is fully seated and the lock pin is fully engaged before towing.

**Removal (before operation):** Remove both rear lockouts and stow them in the care package before driving the vehicle off-tow.

**⚠ WARNING**

DO NOT TOW THE WATERCAR EV VIA TOWLINK WITHOUT BOTH REAR HYDRAULIC SUSPENSION LOCKOUTS INSTALLED AND PINNED. HYDRAULIC PRESSURE ALONE WILL NOT MAINTAIN REAR SUSPENSION POSITION UNDER ROAD LOAD AND VIBRATION. UNCONTROLLED REAR SUSPENSION MOVEMENT DURING TOWING MAY CAUSE LOSS OF VEHICLE CONTROL, DAMAGE TO THE HYDRAULIC SYSTEM, AND HAZARD TO OTHER MOTORISTS.

**⚠ WARNING**

DO NOT OPERATE THE WATERCAR EV WITH HYDRAULIC SUSPENSION LOCKOUTS INSTALLED. BOTH LOCKOUTS MUST BE REMOVED BEFORE OPERATING ON LAND OR ENTERING THE WATER. ATTEMPTING TO OPERATE WITH LOCKOUTS INSTALLED WILL DAMAGE THE HYDRAULIC SYSTEM, THE LOCKOUTS, AND THE SUSPENSION.

- The WaterCar EV tows on its rear wheels.

- Confirm brake lights, turn signals, and safety chains are properly connected. Attach safety tow cables to the D-ring.

**ℹ️ NOTICE - STATE TOWING LAW COMPLIANCE IS THE OWNER'S RESPONSIBILITY**

Towing laws vary by state. Requirements for supplemental braking systems, break-away brakes, lighting, safety chains, tow weight limits, and other equipment differ across jurisdictions. Some states require a supplemental braking system or trailer brakes when the towed weight exceeds a specified threshold. The WaterCar EV's towed weight may exceed those thresholds in some states depending on configuration.

**Before towing, the owner is solely responsible for:**

• Determining the applicable towing laws in the state(s) where towing will occur, including any supplemental braking or break-away brake requirements.

• Verifying that the tow vehicle has the rated capacity to safely tow the loaded WaterCar EV, including all installed equipment, fuel, and cargo.

• Installing any supplemental braking system, break-away brake, or other equipment required by applicable law before towing.

• Complying with any permit, registration, lighting, or equipment requirements applicable to the towing configuration and states traveled through.

WaterCar Inc. makes no representation that Tow Mode towing, without supplemental equipment, satisfies the towing laws of any particular jurisdiction. WaterCar Inc. assumes no liability for citations, accidents, injuries, or damages arising from the owner's failure to comply with applicable towing laws or to use equipment required by law.

### Out-of-Water Lifting

When lifting the WaterCar EV out of the water using a crane, hoist, or marine travel lift, observe the following:

- Use wide, flat, belted slings to minimize stress on the hull. Do not use narrow straps or cables that concentrate load on a small area.
- Position slings carefully. Do not place slings where they will contact underwater fittings, drain plugs, or the outboard engine.
- If using a lifting hook, attach to the designated bow eye and transom tow eyes. Use a spreader bar on the transom eyes. Use chafe protection on the top of the transom.
- Remove the hull drain plug after lifting. If the battery box is equipped with a removable drain plug, remove it as well (Section 7.5). Keep the vessel level while draining - do not elevate the bow, which pools water in the battery box.
- If using a professional lifting service, verify credentials and proof of insurance.
- Do not use the bow eye or stern eyes for long-term suspension. Extended lifting with these points can stress the hull and surrounding structure.

**⚠ CAUTION**

Long-term lifting or suspension by the bow and stern eyes can cause stress on the hull structure and is not recommended. For storage, support the vessel on a bunk-style trailer or cradle that distributes weight evenly along the keel.

## 4.15 LSV Specifications

**⚠️ NOTICE**

Subject to change without notice. Verify against VIN plate for your specific unit.

| Specification | Value |
|---|---|

| | |
|---|---|
| **Classification** | Low Speed Vehicle - 49 CFR Part 571.500 (FMVSS 500) |
| **Top Speed (LSV Limited)** | 25 MPH / 40 KM/H |
| **Overall Length** | 19.5 FT / 6 M |
| **Width** | 6.5 FT / 1.98 M |
| **Height Without Top** | 5.66 FT / 1.73 M |
| **Height With Top** | 6.58 FT / 2.0 M |
| **Wheels** | 14 IN / Aluminum |
| **Tires** | 27 x 8.50 R14/6 |
| **Turning Circle Radius** | 24 FT / 7.32 M |
| **GVWR** | 2,995 LBS / 1,356 KG |
| **GAWR** | Front: 1,438 LBS / Rear: 1,557 LBS |
| **Curb Weight - LSV (est.)** | Refer to VIN plate |
| **Seating** | Designated seating positions equipped with seat belts (land). Water capacity per capacity plate. |
| **Battery - Primary Drive** | 48V / 160 AH / Eco Battery® Gen3 LiFePO4 |
| **Battery - Auxiliary** | 12.8V / 120 AH / Epoch DP12120H LiFePO4 |
| **Range on Land** | 18+ Miles / 29 KM |
| **Hydraulic Pump** | Mercury/Quicksilver 865380A25 |

## 4.16 Wiring Diagrams, Hydraulic Schematics & Fitting Reference

All wiring diagrams, hydraulic schematics, and hydraulic fitting reference information have been consolidated in Appendix B - Schematics & Technical Reference at the end of this manual.

## 4.17 Land Maintenance Schedule

| Interval | Item | Action |
|---|---|---|
| **Before each use** | Pre-ride inspection | Complete checklist (Section 4.6) |
| **Before each use** | Tire pressure | Check and adjust to 35 PSI |
| **Before each use** | Battery charge | Verify 48V and 12V charge levels |
| **Before each use** | Seat belts | Inspect for damage; confirm latch operates |
| **Monthly** | Battery cables & terminals | Check for corrosion, frayed wires, tight connections |
| **Monthly** | Brake fluid level | Inspect reservoir; check for leaks |
| **Monthly** | Steering freeplay | Turn wheel lightly; confirm freeplay within spec |
| **Monthly** | Lights & signals | Confirm headlights, brake lights, turn signals, horn |
| **Monthly** | Wheel nuts | Inspect for tightness |

| | | |
|---|---|---|
| **Monthly** | Zerk fittings | Grease all hydraulic pivot points - use included grease gun |
| **Every 5,000 mi** | Tire rotation | Rotate all four tires |
| **After 1st 100 mi** | Wheel nut torque | Re-torque after first 100 miles and after any wheel removal |
| **Twice yearly** | Battery inspection | Full removal; inspect for corrosion and case damage |
| **Twice yearly** | Hydraulic fluid | Check levels in both pumps; top off if needed |
| **Every 2 years** | Brake fluid | Replace with specified fluid; replace sooner if contaminated |
| **Annually** | Fire extinguisher | Check expiration date and condition |
| **As needed** | Tread depth | Replace tires at or below 1/8 in (3 mm) |
| **As needed** | Brake pads/discs | Inspect for wear; replace at minimum thickness |
| **Each service / pre-ride** | Rear axle nut safety wire | Visually verify present and intact. If missing or damaged, do not operate; have torque verified and safety wire re-installed by a qualified mechanic. Owner re-installation is not authorized. |

## 4.18 Tires & Wheels

| Specification | Value |
|---|---|
| **Tire Size** | 27 x 8.50 R14/6 |
| **Wheel Size** | 14 in / Aluminum |
| **Wheel Nut Torque** | 85 foot lbs. Lug nuts are recommended for one-time use. If removed, they may be reused temporarily if replacements are not readily available - inspect carefully for galling before reinstalling. Replace lug nuts at the earliest opportunity after removal. Apply anti-seize to threads before installation. |
| **Inflate rear tires to the pressure specification printed on the tire sidewall. Rear tire pressure is critical for proper handling, braking, and towing stability. Check tire pressure when tires are cold (before driving). Do not exceed the maximum pressure rating on the sidewall.**<br>Tread Depth Minimum<br>Recommended Tire Pressure (refer to tire sidewall for maximum rated pressure): 35 PSI | 1/8 in (3 mm) |

**⚠ WARNING**

Driving with worn, improperly inflated, non-standard, or incorrectly installed tires can impair vehicle handling and lead to accidents. Always use the original equipment tire size and type.

### Wheel Removal

1. Position the vehicle on a dry, firm, level surface. Place the directional switch in neutral. Turn the key off. Set the parking brake.
2. Block front and rear of the tire diagonally opposite the jacking position.
3. Use only a small floor jack or low-profile scissor jack. Lift from the main frame rail.
4. Remove wheel nuts and take off the wheel.

### Wheel Installation

1. Set parking brake. Place wheel in position - valve stem facing outward, rotation arrows pointing forward.
2. Attach wheel nuts and finger-tighten. Lower vehicle to ground.
3. Torque wheel nuts to specification in a crisscross pattern. Apply anti-seize to threads before installation. Re-torque after first 100 miles.

**⚠ WARNING**

A falling vehicle can cause serious injury or death. Never place any part of your body under a raised vehicle. Use automotive jack stands.

### Axle and Differential Service Specifications

The following specifications are provided for qualified service technicians. Do not attempt axle or differential service unless properly trained and equipped.

• Rear axle nut: 200 ft-lbs with blue Loctite. Safety wire must be in place on rear axle nuts at all times. Confirm safety wire is intact and secure prior to towing. Safety wire prevents nut rotation - inspect any time rear wheels are serviced or before towing.

• Front axle nut: Peened axle nut type. Confirm the nut is properly peened over into the axle groove. Verify no movement on the front axle nut by checking the torque tick mark alignment. If the tick mark has shifted or the peen is not fully seated in the groove, do not operate - have the front axle inspected and re-torqued by a qualified technician.

• Rear hub torque: per WaterCar specification with safety wire installed. Confirm safety wire prior to every tow.

• Differential oil capacity: limited slip differential - 22 oz gear oil + 2 oz limited slip additive. Non-limited-slip differential - 24 oz gear oil total. Record date and technician name at each service.

• Confirm whether your vehicle has a limited slip differential - this determines the correct oil fill procedure. Contact WaterCar if unsure.

## Rear Axle Nut Safety Wire

The rear axle nuts on the WaterCar EV are secured with safety wire as a tamper-evident fastener security feature. The safety wire is intended to remain in place at all times during the operational life of the vehicle and provides visual indication that the rear axle nuts have not loosened or been disturbed.

Do not remove or modify the rear axle nut safety wire. Visually verify the safety wire is present and intact as part of the Pre-Ride Inspection (Section 4.6). If the safety wire is missing, broken, or damaged, the vehicle must not be operated

until rear axle nut torque has been verified and the safety wire re-installed by a qualified mechanic following correct safety wire installation technique. Owner re-installation is not authorized.

## 4.19 Brakes

Wilwood® manual disc brakes provide reliable stopping power through a mechanical linkage that applies pressure to brake pads, which clamp onto the brake discs (rotors). Replace brake pads when worn to 2mm (0.08 in) minimum thickness. This frictional force slows and stops the vehicle. Manual disc brakes are known for simplicity, reliability, and ease of maintenance.

When operating, always apply steady and even pressure to the brake pedal for smooth, controlled braking. Avoid sudden or harsh braking, as this causes premature wear of brake pads and discs. Familiarize yourself with the feel and responsiveness of your brakes. Braking performance is affected by vehicle load, road conditions, and weather - always adjust your braking accordingly.

Brake pads should be replaced when they show signs of excessive wear or when braking efficiency is noticeably reduced. Brake discs should be checked for scoring or warping, which can affect performance. Regular maintenance and timely replacement of these components maintains braking safety.

Brake Inspection - check before each use:

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. Inspect the brake disc surface for excessive wear or scoring.

Inspect brake fluid level before each operation. Use DOT 4 brake fluid only. Level should be between MAX and MIN lines on reservoir. Replace brake fluid every two years and any time the fluid becomes contaminated.

## 4.20 Steering & Headlight Inspection

The WaterCar EV uses a Unisteer® rack-and-pinion steering unit with electric power steering assist. The electric power steering system is maintenance-free and requires no hydraulic fluid checks or adjustments. Steering should operate smoothly without binding or excessive play.

1. Position vehicle on level surface with wheels pointing straight ahead.
2. Lightly turn the steering wheel left and right to check freeplay at the outer rim.
3. If there is excessive freeplay, strange noises, or rough feel, do not operate until inspected by a qualified technician.

Keep headlight and taillight lenses clean. Replace LED lamps promptly. To verify headlight aim: place the vehicle 25 feet from a wall on a level surface, turn on the headlights, and confirm the beam is aimed below the height of the headlight center.

## 4.21 State Regulatory Reference - LSV

**⚠ WARNING**

This table may not reflect the most current state laws. The owner is responsible for verifying current registration, titling, insurance, and operator licensing requirements in each state of operation.

| State | LSV Road Operation | Notes |
|---|---|---|
| **California** | Permitted on roads 35 mph or less | LSV sticker required; verify DMV requirements |
| **Florida** | Permitted on roads 35 mph or less | Boater safety education may be required for vessel registration |
| **Texas** | Permitted on roads 35 mph or less | Verify county-specific regulations |
| **Arizona** | Permitted on designated roads | Contact AZ MVD for current requirements |
| **Nevada** | Permitted on roads 35 mph or less | Contact NV DMV for current requirements |
| **New York** | Shall not operate on roads with speed limit greater than 35 mph | Contact NY DMV |
| **Maryland / Illinois** | Shall not operate on roads with speed limit greater than 30 mph | Contact state DMV |
| **All Other States** | Operator must verify local laws | Contact WaterCar or state DMV |

For current federal LSV regulations: www.nhtsa.gov

SECTION 5
# Marine Water Operation
Standalone - applies to Marine Package configuration only

## 5. Marine Water Operation

This section covers all aspects of operating the WaterCar EV as a recreational vessel on water. This section is self-contained - Marine Package owners will find everything needed for safe water operation here. Read this section completely before any water operation.

**⚠ NOTICE**

This section provides operational guidance specific to the WaterCar EV vessel configuration. It does not replace a formal boating safety course. WaterCar strongly recommends that every operator complete a USCG-approved boating safety course before operating this vessel for the first time.

**⚠ WARNING - PAYLOAD & CAPACITY**

Vessel capacity varies depending on installed equipment, occupants, fuel load, cargo, outboard engine, and post-sale modifications. The operator is responsible for ensuring the vessel is operated within both the GVWR (Section 2.3) and the U.S. Coast Guard capacity plate limits (Section 5.5) at all times. The lower of the two applicable limits governs.

### 5.1 Marine Regulatory Classification

The WaterCar EV in its Marine Package configuration is a federally regulated recreational vessel subject to U.S. Coast Guard authority under 46 USC §4307/4311 and applicable manufacturing standards under 33 CFR Parts 181 and 183.

| Regulation | Subject |
|---|---|
| **33 CFR Part 181** | Manufacturer requirements for recreational vessels - HIN, capacity labeling, certification |
| **33 CFR Part 183** | Equipment standards - flotation, fuel systems, electrical, ventilation |
| **46 USC §4307/4311** | USCG enforcement authority; penalties for violation |
| **33 CFR Part 175** | Equipment requirements - PFDs, fire extinguishers, signals |
| **33 CFR Parts 84–90** | Navigation rules (ColRegs) applicable to U.S. waters |
| **State Law** | Vessel registration, titling, operator licensing, and equipment requirements vary by state |

#### Design Category Reference (CE Certification In Process)

Recreational vessels are assigned design categories based on wind and wave conditions for which they are designed. These categories are used for CE (international) certification and inform operators of the vessel's intended operating envelope:

**Category A (Ocean):**
Designed for winds exceeding Beaufort Force 8 and significant wave heights above 4 meters, excluding abnormal conditions such as hurricanes or rogue waves.
**Category B (Offshore):**
Designed for winds up to and including Beaufort Force 8 and significant wave heights up to and including 4 meters.
**Category C (Inshore):**
Designed for winds up to and including Beaufort Force 6 and significant wave heights up to and including 2 meters.
**Category D (Sheltered Waters):**
Designed for winds up to and including Beaufort Force 4 and significant wave heights up to and including 0.3 meters, with occasional waves of 0.5 meters maximum height.

> ⚠ **NOTICE**
> The WaterCar EV's design category is documented on the capacity plate (Section 5.5). The operator is responsible for not exceeding the conditions specified by the assigned design category. Reduce passenger count and cargo in adverse weather regardless of the rated capacity.

## 5.2 Hull Identification Number (HIN)

A permanent HIN is affixed to your vessel at manufacture in accordance with 33 CFR Part 181, Subpart C. The HIN is a 12-character identifier used for vessel registration and Coast Guard identification.

HIN Location: The primary HIN is located on the transom of the vessel, on the starboard side, within two inches of the top of the transom. A duplicate HIN is located in a concealed location on the interior of the hull.

> ⚠ **NOTICE**
> The HIN must never be removed, altered, or obscured. It is a federal offense to alter or remove a HIN under 46 USC §4311. Record your HIN on the Delivery Acknowledgment Form.

## 5.3 NMMA Certification

WaterCar Inc. is an NMMA-certified manufacturer. Marine configurations are built in accordance with applicable National Marine Manufacturers Association (NMMA), ABYC, NFPA, and USCG standards for recreational vessel manufacturing, as verified through NMMA certification.

## 5.4 USCG Vessel Registration

The vessel must be registered with the appropriate state boating agency prior to water operation in most jurisdictions. The owner is responsible for determining applicable registration requirements in each state of intended operation.

> ⚠ **NOTICE**
> Federal law does not require vessel registration for all recreational vessels, but most states do. Always verify current state requirements before operating on state waters.

## 5.5 Capacity Plate

A capacity plate is affixed to the vessel in a location visible to the operator at the helm. The capacity plate displays the maximum persons capacity, maximum weight capacity, and maximum horsepower rating. Never exceed the values shown.

**⚠ WARNING**

NEVER EXCEED THE CAPACITY PLATE VALUES. Overloading or exceeding the rated horsepower creates a risk of swamping, capsizing, or loss of control.

## 5.6 Marine Safety

**⚠ DANGER**

CARBON MONOXIDE (CO) POISONING CAN KILL YOU. Carbon monoxide is a colorless, odorless gas produced by the outboard engine. CO can accumulate in enclosed or semi-enclosed spaces including the cockpit area, especially at idle or low speed with following wind conditions. SYMPTOMS: Headache, dizziness, nausea, confusion, loss of consciousness. If symptoms occur: move immediately to fresh air, shut down the engine, and seek medical attention. NEVER run the engine in an enclosed space. NEVER allow passengers to ride in downwind positions at the stern while underway at idle.

**⚠ DANGER**

ROTATING PROPELLER CAUSES SEVERE INJURY OR DEATH. Keep all persons clear of the propeller at all times. SHUT DOWN THE OUTBOARD ENGINE completely before any person enters the water, approaches the stern, or handles lines near the propeller. Confirm the engine is off and the propeller has stopped rotating before boarding or exiting the vessel.

### Risk of Loss of Stability

Stability is a critical aspect of boat safety. Stability refers to the vessel's ability to return to an upright position after being tilted by waves, wind, or other forces. Loss of stability can lead to capsizing, swamping, or sinking. It is important to recognize and mitigate the factors that can compromise stability to ensure safe operation.

The distribution of weight is one of the primary concerns. Uneven weight distribution - whether from passengers, gear, or fuel - can cause the vessel to list to one side, increasing the risk of capsizing. Balance the load evenly and avoid sudden shifts in weight. Overloading the vessel beyond the rated capacity lowers the freeboard (the distance from the waterline to the deck), making the vessel more susceptible to taking on water in rough conditions.

Environmental conditions also play a significant role. High winds, large waves, and strong currents can challenge stability. Operators must adjust speed and heading to minimize the impact of these forces. Avoid navigating in adverse weather whenever possible. Stay informed about weather forecasts and water conditions before departure.

The vessel's condition is fundamental to its stability. Conduct regular maintenance checks to ensure all components - including the hull, bilge pumps, and drainage systems - are in good working order. Any modifications or repairs must be performed according to WaterCar specifications. Operators should familiarize themselves with the vessel's design limitations and performance characteristics.

**⚠ WARNING**

Maintaining stability is paramount for safe operation. Pay attention to weight distribution, environmental conditions, and vessel maintenance. Never exceed the capacity plate values. Sudden shifts in passenger or cargo weight while underway can cause loss of stability without warning.

### Risk of Flooding

The WaterCar EV is designed for water operation, but uncontrolled water ingress can compromise stability, damage electrical systems, and create a life-threatening emergency. The following openings and access points must be properly secured before water entry and monitored during water operation:

- Door - must be fully closed and latched before water entry. An unlatched door can allow rapid flooding.
- Dash hatch - must be securely shut and inspected for proper seal. Water entering through the dash hatch can reach electrical components.
- Battery compartment hatch - must remain closed at all times during water operation. Inspect for water in the battery compartment before each use.
- Hull drain plug - must be installed and fully seated before water entry. A missing or loose drain plug will cause immediate flooding. Battery box drain - confirm per your vehicle's configuration (Section 7.5).
- Cockpit drains - ensure drains are not blocked and the cockpit can drain freely. Debris in the cockpit drains can cause water to accumulate.

**⚠ WARNING**

In rough weather or when operating in waves, keep all hatches and compartments closed to minimize water ingress. Check the function of bilge pumps regularly, clear debris from their inlets, and test operation before each water use. If the bilge pump runs continuously or water level rises during operation, return to shore immediately.

## 5.7 USCG Required Equipment

| Equipment | Requirement | Note |
|---|---|---|
| **Personal Flotation Devices** | One USCG-approved wearable PFD for each person onboard (Type I, II, III, or V). At least one USCG-approved throwable device (Type IV). | Stowed and accessible - not buried in storage |
| **Fire Extinguisher** | At least one USCG-approved 5-B rated marine-type fire extinguisher (model year 2018+ requirement). Must not be more than 12 years old from date of manufacture. | Fully charged, accessible, inspected annually |
| **Sound-Producing Device** | Horn, whistle, or bell audible at least 0.5 | Onboard and functional |

| | | |
|---|---|---|
| | nautical miles. | |
| **Navigation Lights** | Red/green bow lights, white stern light - required from sunset to sunrise and in restricted visibility. | Test before each night operation |
| **Visual Distress Signals** | Required on coastal waters, Great Lakes, and territorial seas. | Check expiration dates |
| **Kill Switch Lanyard** | WaterCar requires the operator to attach the kill switch lanyard to their person, PFD, or wrist at all times when the engine is running. | Attached before engine start |

**⚠ WARNING**

THE OPERATOR MUST ATTACH THE KILL SWITCH LANYARD TO THEIR PERSON, PFD, OR WRIST AT ALL TIMES WHILE THE ENGINE IS RUNNING. Failure to use the kill switch lanyard as required may result in serious injury or death.

## 5.8 Navigation Lights

| Light | Arc of Visibility |
|---|---|
| **Red (port bow)** | Visible from dead ahead to 112.5° to port |
| **Green (starboard bow)** | Visible from dead ahead to 112.5° to starboard |
| **White (stern)** | Visible from astern through 135° arc |

| | |
|---|---|
| **White (anchor light)** | All-round light required when at anchor in a navigable waterway<br>Navigational lights are essential for safe boating during low visibility conditions - at night, during fog, or in heavy rain. They help other boaters identify your vessel's size, direction, and activity, reducing the risk of collisions.<br><br>The bow is equipped with a bi-colored light: green on the starboard (right) side and red on the port (left) side. These lights indicate the vessel's direction to other vessels. When another boat sees the green light, it knows it is seeing the starboard side. The red light indicates the port side.<br><br>At the stern, an all-round white light serves as both a stern light and an anchor light. This light is visible from all directions (360 degrees), ensuring visibility in crowded or poorly lit areas.<br><br>**Using Lights While Anchored**<br><br>When anchored, only the all-round white (anchor) light should be illuminated. This signals to other boaters that your vessel is stationary. Activate the anchor light using Button 4 on the push button panel. Check that the light is functioning before nightfall.<br><br>**⚠ CAUTION**<br>Before setting out, ensure all navigation lights are functioning properly. Carry spare bulbs for each light. Always replace bulbs with ones of the same wattage. Proper use of navigational lights is both a safety measure and a legal requirement. |

### Steering Position Visibility

The steering position has been located to provide the operator with an optimal field of view. The height and angle of the steering console accommodate operators of various heights.

Regular maintenance and inspection of the windshield is essential. Clean the windshield regularly to remove dirt, salt, or water spots. All navigational instruments are arranged to be readable at a glance without diverting attention from the water.

- Keep the area around the steering position clear of loose items and clutter that could obstruct visibility.
- In adverse weather (fog, rain, heavy seas), exercise extra caution and reduce speed.
- Ensure passengers understand the importance of keeping the helm area clear during operation.

## 5.9 Float Plan

Before every water operation, file a float plan with a responsible person ashore. Include: vessel description and registration number, HIN, names of all persons onboard, intended destination and route, expected return time, and emergency contact information.

**⚠ NOTICE**

USCG Boating Safety: 1-800-368-5647 | www.uscgboating.org

## 5.10 Charging Prohibition - In Water

**⚠ DANGER**

NEVER CONNECT SHORE POWER OR CHARGE EITHER BATTERY WHILE THE VESSEL IS IN THE WATER. Charging in water creates risk of electric shock drowning (ESD) - an invisible current in the water around the vessel that can incapacitate or kill swimmers. ALWAYS retrieve the vessel from the water and charge on dry land using a GFCI-protected outlet only.

## 5.11 Fueling Safety

**⚠ WARNING**

GASOLINE IS EXTREMELY FLAMMABLE AND EXPLOSIVE. Before fueling: stop the engine, extinguish all open flames and smoking materials, turn off all electrical switches. Do not overfill. Wipe up all spills immediately. After fueling: ventilate the bilge and engine compartment for at least 5 minutes before starting the engine. Sniff the bilge before starting - if you smell fuel, do not start the engine.

### Static Electricity & the Fuel System

Static electricity can ignite gasoline vapors that have not been ventilated from enclosed spaces. The vessel's bonding system is designed to protect against static discharge, but only functions when the vessel is in contact with the water or a land-based grounding system. The following precautions must be observed during all fueling operations:

- Never fuel the vessel while suspended on a sling, lift, or in any configuration where the hull is not grounded.
- Never use homemade or unapproved containers to fill fuel tanks.
- Keep the fuel nozzle in contact with the fuel tank opening or fill plate throughout the fueling process to prevent static discharge.
- Shut down all engines, motors, and electrical equipment before fueling. Extinguish all ignition sources.
- Allow enclosed spaces where gasoline vapors could collect to ventilate before starting the engine.
- Wipe any spillage completely and dispose of rags on shore.

**⚠ DANGER**

Static electricity can ignite gasoline vapors, causing serious injury, death, and destruction of property. Always maintain metallic contact between the fuel nozzle and the tank opening during fueling. Never fuel in ungrounded conditions.

## 5.12 Operator Responsibilities - Water

| Requirement | Details |
|---|---|
| **FLOAT PLAN** | File a float plan with a responsible person ashore before every water operation. |
| **EQUIPMENT** | Verify all USCG-required equipment is onboard and serviceable before departing. |
| **KILL LANYARD** | Attach kill switch lanyard to person before starting engine. Required at all times underway. |
| **PFDs** | Ensure all persons have access to an appropriately sized, USCG-approved PFD. |
| **WEATHER** | Check weather forecast before departure. Do not operate in conditions that exceed skill level or vessel capability. |
| **SOBER** | Never operate under the influence of alcohol or drugs. BAC limits apply to vessel operation. |

| | |
|---|---|
| **RULES OF THE ROAD** | Know and follow the Navigation Rules (ColRegs) applicable to your operating area. |
| **STATE LAW** | Verify applicable state boating laws for each state of operation before departure. |
| **INSPECTION** | Inspect the vessel before every water operation. |

## Swimming, Diving & Water Activities

When the WaterCar EV is used in navigable waters, the operator must be aware of swimmers, divers, and persons engaged in water sports in the vicinity. Federal and state laws impose strict obligations on vessel operators to protect persons in the water.

**Swimming from the Vessel**

- Do not swim from or near the vessel while the outboard engine is running. Shut off the engine and remove the key before anyone enters the water.
- Turn off the engine in gear (to prevent propeller windmilling) before approaching or picking up any person in the water.
- Never allow anyone to board or exit the vessel from the water while the engine is running.
- Many jurisdictions prohibit swimming from a vessel except in designated areas. Know and comply with local restrictions.

**Diver Recognition**

- A red flag with a diagonal white stripe (Sport Diver's Flag) marks a diver in the water. Keep at least 100 feet (30 meters) away.
- A blue-and-white pennant (Code Alpha Flag) designates a vessel engaged in dive operations.

**Water Skiing & Towed Water Sports**

If towing skiers, tubers, or other water sports participants using the transom tow point:

- Always have at least two persons in the vessel: one at the controls and one observer watching the person being towed at all times.
- All persons being towed must wear a USCG-approved personal flotation device (PFD).
- Tow only during daylight hours when visibility is good.
- Never drive directly behind a person being towed. At 25 mph, it takes only 5 seconds to overtake a fallen skier who was 200 feet ahead.
- Use the transom tow point only for towing water skiers and wakeboarders. Do not use for parasailing, towing other vessels, or any use that exceeds the rated capacity of the tow point.
- Keep a downed skier in sight at all times. Turn off the engine in gear before approaching any person in the water.
- If a skier releases the tow rope, it may backlash into the cockpit. The observer must be aware of this hazard.

**⚠ WARNING**

USE THE TRANSOM TOW POINT ONLY FOR TOWING WATER SKIERS AND WAKEBOARDERS. Using the tow point to tow boats, parasails, or other loads exceeding its rated capacity may result in structural failure, serious injury, or death.

**Water Skiing Hand Signals**

The skier communicates with the vessel operator through standardized hand signals: Faster (thumb up), Slower (thumb down), Speed OK (circle with thumb and index finger), Turn (arm raised, circle with finger), Stop (palm forward), OK After Fall (hands clasped overhead), Skier in Water (one ski vertical), Cut Motor (finger across throat), Back to Dock (pat top of head). Learn and use these signals before towing.

## Homeland Security Restrictions

Recreational vessel operators must observe federal homeland security restrictions. Do not approach within 100 yards of any U.S. Naval vessel, and slow to minimum speed within 500 yards. If safe passage requires passing within 100 yards, contact the naval vessel or Coast Guard escort on VHF-FM Channel 16. Observe and avoid all marked security zones,

especially near military, cruise line, or petroleum facilities. Do not stop or anchor beneath bridges or in navigable channels. Report suspicious activity on America's Waterway Watch hotline: 877-24WATCH (877-249-2824).

**⚠ DANGER**

DO NOT approach within 100 yards of any U.S. Naval vessel without first contacting the vessel on VHF-FM Channel 16. Failure to comply will result in a quick and severe response.

## 5.13 Water Controls & Helm

*Helm control diagram - labeled photograph or engineering illustration of the WaterCar EV helm showing: throttle/shift lever, trim switch, kill switch, instrument panel, push button panel, hydraulic wheel switches (front/rear rockers), PORT marine controls vs. STARBOARD road controls*

### Outboard Engine Controls

| Control | Description |
|---|---|
| **Throttle/Shift Lever** | Single lever controls both gear (Forward/Neutral/Reverse) and throttle. Forward = push, Reverse = pull. Neutral = center detent. |
| **Engine Trim Switch** | Adjusts outboard angle. Trim up = raise, Trim down = lower. To get on plane, set trim to approximately 35-40 on the Mercury display screen while at idle, then apply full throttle. Once on plane at 5,500–6,000 RPM, back off throttle to cruise speed and adjust trim to approximately 60–65 for optimal ride angle. Higher trim numbers raise the bow for a drier ride in choppy conditions. Trim settings are dependent on water conditions, passenger/cargo weight, and operator preference. |
| **Engine Tilt (Full)** | Raises outboard fully for shallow water, launching, and retrieval. Do not run engine at full tilt angle. |
| **Kill Switch** | Stops engine immediately. Always attach kill switch lanyard to person before starting. |
| **Engine Start / Stop** | Located at helm console. Refer to outboard manufacturer's owner's manual for starting procedure. |

### Bilge Pump

The vessel is equipped with an automatic bilge pump that activates when water accumulates in the bilge to a preset level. A manual override switch is located at the helm console. Check bilge pump operation as part of the pre-launch checklist.

**⚠ WARNING**

If the bilge pump runs continuously or frequently, the vessel may be taking on water. Stop operation, investigate the source, and return to shore immediately.

### Electric Land Drive - Water Lockout

**⚠ WARNING**

DO NOT ENGAGE THE ELECTRIC DRIVE MOTOR WHILE THE VESSEL IS IN THE WATER. The electric motor is designed for on-road operation only. Engaging the electric drive on water may result in drivetrain damage, electrical hazards, or loss of control.

## VesselView 903 Display - Dual-Screen Helm

The WaterCar EV is equipped with a Mercury® VesselView 903 multi-function touchscreen display at the helm as part of the dual-screen helm. The steering stays connected across all four modes. The VesselView 903 provides real-time engine data from the SmartCraft network - RPM, engine temperature, oil pressure, battery voltage, fuel flow, and diagnostic fault codes - along with GPS navigation, mapping, and maintenance reminders.

> ⚠ **NOTICE**
>
> This section is a quick-reference summary only. Refer to the Mercury VesselView 903 User Manual supplied with your vehicle for complete operation, menu navigation, configuration, and software updates. Available features depend on engine model, equipped accessories, and software version. Not all features described in Mercury reference material are active on every vehicle.

### Display Controls

| Control | Function |
|---|---|
| **Touch Screen** | Primary input. Tap, swipe, and drag to navigate. |
| **Power Button** | Press and hold to turn unit ON or OFF. Press once to open the System Control Dialog. |
| **Card Reader** | Dual SD card slots for chart updates and data storage. |
| **Rear Connections** | Radar (Ethernet), NMEA 2000 (data input/output), 12 V DC power, and Sonar (CHIRP / Broadband / DownScan / SideScan, transducer dependent). |

### System Control Dialog

The System Control Dialog provides quick access to brightness, day/night mode, audio settings, and other system options. Open it by pressing the Power button once, or by swiping down from the top edge of any application screen.

### Home Page

The Home page is the main navigation hub, providing access to Tools, Applications, Favorites, the Close button (returns to the previous screen), and the **MOB (Man Over Board) button**.

> ⚠ **WARNING**
>
> THE MOB BUTTON MARKS THE CURRENT GPS POSITION ONLY. IT DOES NOT INITIATE RESCUE OR ALERT EXTERNAL AUTHORITIES. THE OPERATOR REMAINS SOLELY RESPONSIBLE FOR EXECUTING OVERBOARD RESCUE PROCEDURES, HAILING ASSISTANCE, AND CONTACTING THE U.S. COAST GUARD OR LOCAL AUTHORITIES. SEE SECTION 5.6 - MARINE SAFETY.

### Engine Page - Touch Zones

The Engine page is the primary operational screen during water operation. Five touch zones provide direct full-screen access to vessel data:

| Zone | Display |
|---|---|
| **1 - Engine** | Custom list of engine values (RPM, voltage, coolant temperature, coolant pressure, oil pressure). |
| **2 - Battery** | Battery voltage and graphs. |
| **3 - Fuel** | Individual fuel tank values, total fuel, and fuel-flow graphs. |
| **4 - Trim** | Trim scale display with numeric position values. |
| **5 - Speed** | Large speed gauge with supplementary engine information. |

### Control Bars

Three control bars are accessible from the side of the screen:

**Mercury -** At-a-glance engine data (RPM, volts, coolant temperature, oil pressure, fuel, speed, trim/tabs) without leaving the current screen.

**Vessel Control -** Mercury engine control features, which may include Cruise Control, Troll Control, Smart Tow, and Active Trim. Available features depend on your engine and equipped accessories. Unsupported features will appear grayed out.

**Auto Pilot -** Mercury Auto Pilot features (Skyhook, Drifthook, Bowhook, Heading Adjust). These features require specific engine, joystick, and control-module configurations and may not be supported on your vehicle.

**NOTICE**

Do not assume any feature shown in Mercury reference material is supported on your vehicle. Verify available features through the on-screen interface, or consult the Mercury VesselView 903 User Manual.

**Operator Responsibility**

**WARNING**

THE VESSELVIEW 903 IS A SUPPLEMENTARY OPERATOR INFORMATION DISPLAY. IT DOES NOT REPLACE PROPER LOOKOUT, NAVIGATIONAL JUDGMENT, OR COMPLIANCE WITH ALL APPLICABLE NAVIGATION RULES (33 CFR PARTS 81–88). THE OPERATOR REMAINS RESPONSIBLE AT ALL TIMES FOR SAFE OPERATION OF THE VESSEL.

For complete operation, configuration, software updates, and Mercury feature details, refer to the Mercury VesselView 903 User Manual supplied with your vehicle or visit www.mercurymarine.com/vesselview. The VesselView 903 is covered under the Mercury engine warranty - not the WaterCar vessel warranty.

## Swim Ladder

The WaterCar EV is equipped with a flip-down step near the transom for exiting the water if needed. A removable swim ladder is available as an accessory and mounts near the side door. The side door must remain closed and latched at all times while the vessel is in the water.

**DANGER**

NEVER use the exit step or swim ladder while the outboard engine is running. Shut off the engine and remove the key before anyone enters or exits the water. Contact with a spinning propeller will cause serious injury or death. DO NOT open the side door while the vessel is in the water - opening the door while afloat creates an immediate flooding and capsize hazard.

## Hinged Bow Cushions

The WaterCar EV is equipped with hinged bow cushions that provide seating and lounging area when the vessel is at rest or at idle. The bow cushions are hinged for easy access to the bow storage compartment beneath. Always close and secure the bow cushions before operating the vessel.

**WARNING**

The bow area is a working deck - it is intended for use only while mooring, anchoring, loading, or when the vessel is at rest. NEVER allow passengers to occupy the bow area while the vessel is underway. Passengers in the bow are at risk of being thrown overboard by sudden changes in speed or direction.

## Canopy Top

An optional canopy top is available for the WaterCar EV, providing shade and light weather protection for cockpit occupants. When installing or removing the canopy top, follow the manufacturer's instructions included with the accessory. Ensure all support straps are taut and secure before operating the vessel. A loose canopy frame can damage navigation lights and other equipment. Remove the canopy top before trailering at highway speeds unless specifically rated for trailering.

## 5.14 Pre-Launch Checklist

Complete this checklist before every water operation. Do not launch if any item fails.

### Vessel & Equipment

- Hull condition - inspect for cracks, damage, or abnormal wear
- Seat belts: all occupants unfastened (Section 2.4). Drain plug: installed and tight (Section 5.15). Battery box drain: confirm per your vehicle's configuration (Section 7.5)

• Transfer tube drainage - confirm water can flow freely through the transfer tube and is not blocked. Check at both ends.

- Bilge - dry or minimal water; bilge pump functional
- All hatches and access covers - closed and secured
- Windshield - clean and undamaged
- All safety labels visible and legible
- Fire extinguisher - gauge in green zone, pin intact
- Visual distress signals - onboard and within expiration date
- Sound device (horn/whistle) - functional
- Anchor and line - onboard if required
- First aid kit - onboard and stocked

### PFDs & Safety Equipment

- One USCG-approved PFD for each person onboard - correct size, accessible
- At least one throwable Type IV PFD onboard
- Kill switch lanyard - present and attached to operator
- Float plan filed with responsible person ashore
- VHF radio or cell phone onboard for emergency communication

### Outboard Engine

- Engine oil level - within spec (refer to the outboard manufacturer's manual)
- Fuel level - sufficient for planned operation plus reserve
- No fuel leaks - inspect fuel line, fittings, tank
- Propeller - undamaged, securely attached, prop nut/cotter pin intact
- Propeller area - clear of debris, lines, and obstructions
- Engine tilt - positioned correctly for launch depth
- Kill switch - functional; lanyard attached to operator

### Electrical & Battery Systems

- 48V battery - charged and powered ON
- 12V battery - charged; terminals clean and tight
- Navigation lights - test all lights (port, starboard, stern, anchor)
- Bilge pump - test manual override

• Transfer tube - confirm free water flow through the transfer tube. Clear any blockage before water operation.

- Horn - functional
- Shore power disconnected - vessel fully unplugged before launch

### Launch Site Assessment

- Launch site - assessed for depth, obstacles, current, and traffic
- Wind and weather - checked; conditions appropriate for operation
- Other vessel traffic - observed; launch approach is clear
- No-wake zones, speed limits, and restricted areas - identified

> ⚠ **WARNING**
> This checklist does not replace operator judgment. If any condition creates doubt about safety, do not launch.

## 5.15 Water Operation

### Drain Plug

The drain plug must be installed and fully seated before the vehicle enters water.

Operating in water without the drain plug installed allows water to enter the hull. Water in the hull can damage electrical and drive components, cause loss of buoyancy, and cause the vehicle to sink. Sinking can result in serious injury or death.

Confirm the drain plug is installed and tight before every entry into water.

Do not rely on the bilge pump to compensate for a missing or loose drain plug.

**AN INSTALLED DRAIN PLUG DOES NOT MAKE THE VEHICLE WATERTIGHT. WATER CAN ENTER THE HULL FROM OTHER SOURCES. THE OPERATOR IS RESPONSIBLE FOR INSPECTING THE VEHICLE BEFORE EVERY USE.**

For battery box drainage and storage practice, see Section 7.5.

### Navigation Rules - Overview

| Situation | Rule |
|---|---|
| **Meeting head-on** | Both vessels alter course to starboard (right). Pass port-to-port. |
| **Crossing situation** | Vessel with the other on its starboard side gives way. |
| **Overtaking** | Overtaking vessel gives way. Stand-on vessel maintains course and speed. |
| **Sound signals - 1 blast** | I am altering course to starboard. |
| **Sound signals - 2 blasts** | I am altering course to port. |
| **5 or more short blasts** | Danger signal - intent or action of other vessel not understood. |
| **Restricted visibility** | Proceed at safe speed. Sound fog signal - one prolonged blast every 2 minutes. |

Full Navigation Rules: www.navcen.uscg.gov

### Speed & Wake

Operate at safe speed at all times. Observe all posted speed limits and no-wake zones.

**⚠ CAUTION**

Excessive wake can damage other vessels, docks, and shoreline property. You are responsible for your wake.

### Weather Assessment

**⚠ DANGER**

DO NOT operate in severe weather conditions. Seek safe harbor before weather deteriorates. A sudden change in wind direction or speed, or an increase in wave height, indicates deteriorating conditions - return to shore immediately.

Before departure: Check NOAA weather radio, VHF Channel 16, or a marine weather service. Confirm wind speed, direction, wave height, and visibility forecast for the duration of your planned operation.

While underway: Monitor conditions continuously. If fog: slow down, post a lookout, sound one prolonged blast on horn every 2 minutes. If lightning approaches: return to shore immediately.

### Passenger Safety on Water

**⚠ WARNING**

Never allow passengers to sit on the bow, gunwales, or any non-designated seating area while underway. All passengers must remain fully seated in designated seating positions at all times.

### Outboard Throttle & Trim

The Mercury® outboard throttle/shift lever controls both direction and engine speed. Always shift to Neutral completely before reversing direction. Never shift from Forward to Reverse at high speed.

Trim adjustment: Trim down to help the vessel get on plane, then trim up gradually as speed increases to reduce drag. Too much trim up = bow rises, stern squats, rough ride. Too much trim down = bow plows, spray over bow. Refer to the outboard manufacturer's owner's manual for detailed trim guidance.

### Understanding Trim Angle Adjustments

The correct trim angle depends on boat speed and environmental conditions. Adjusting the trim angle affects how the vessel rides through the water.

Trimming In (Down): Brings the propeller closer to the transom. Pushes the bow down and raises the stern. Useful at lower speeds for better control and in rough water.

Trimming Out (Up): Raises the bow and lowers the stern. Increases speed and fuel efficiency at cruise. Be cautious - trimming out too far can lift the bow excessively, reducing control and visibility.

Neutral Trim: Flattens the hull for a balanced ride. Ideal for cruising at moderate speeds.

**⚠ CAUTION**

Avoid extreme trim adjustments. Trimming too far in pushes the bow into the water, making handling difficult and causing spray. Excessive trimming out lifts the bow too high, reducing control. Both extremes significantly alter handling.

### Setting Trim in Calm Conditions

- Start with trim at approximately 40-50% on the Mercury display.

• Begin by trimming the engine all the way in, then slowly trim up as speed increases.

• Boat speed will increase as the most efficient trim angle is found.

• If the boat starts porpoising (bow moving rhythmically up and down), speed decreases, or cavitation occurs (air around the propeller causing erratic speed changes), the outboard is trimmed out too far. Trim in slightly.

### Adjusting Trim in Choppy Waters

• In rougher conditions, trim in to flatten the hull angle for better control and passenger comfort.

• If conditions worsen, reduce throttle and adjust trim to maintain control.

### Anchoring

1. Select anchorage - confirm adequate depth and swinging room.
2. Approach at slow speed, heading into wind or current. Shift to Neutral.
3. Shut down the engine before going forward to deploy anchor.
4. Lower anchor slowly - do not throw. Let out scope at minimum 5:1 ratio - increase to 7:1 in wind or current.
5. Confirm anchor is set - apply reverse to drag anchor gently into seabed.
6. Display anchor light if remaining at anchor after sunset in a navigable waterway.

### Mooring

When mooring to a dock, float, or mooring buoy, approach at slow speed from downwind or down-current. Have lines and fenders ready before approach. Never step from a moving vessel to a dock.

**⚠ CAUTION**

Shut down the engine before any person steps off the vessel. Never allow passengers to step off while the engine is running or the vessel is still moving.

### Man Overboard (MOB) Procedure

**⚠ DANGER**

IF ANYONE FALLS OVERBOARD: Shout "MAN OVERBOARD" - assign a lookout to keep continuous visual contact. Throw a throwable PFD immediately. Shut down the engine. Approach the person carefully from downwind. Stop engine completely before the person is within propeller reach. Recover the person - check for injury. Contact emergency services if needed. NEVER approach a person in the water with the engine running.

USCG Emergency: VHF Channel 16 | Call or text 911 | USCG Rescue Coordination: 1-800-368-5647

### Risk of Loss of Stability

Stability is the vessel's ability to return to an upright position after being tilted by waves, wind, or other forces. Loss of stability can lead to capsizing, swamping, or sinking. Understanding the factors that affect stability is essential for safe operation.

Weight distribution is a primary concern. Uneven weight distribution - whether from passengers, gear, or fuel - can cause the vessel to list to one side, increasing the risk of capsizing. Balance the load evenly and avoid sudden shifts in weight. Overloading the vessel beyond its rated capacity lowers the

freeboard (the distance from the waterline to the deck), making it more susceptible to taking on water in rough conditions.

Environmental conditions play a significant role. High winds, large waves, and strong currents can challenge stability even in well-designed vessels. Adjust speed and heading to minimize the impact of these forces. Avoid operating in adverse weather whenever possible. Stay informed about weather forecasts and water conditions.

The vessel's design and condition are fundamental to stability. Conduct regular maintenance checks to ensure the hull, bilge pumps, and drainage systems are in good working order. Any modifications or repairs should be performed according to WaterCar specifications to avoid compromising stability. Familiarize yourself with the vessel's performance characteristics and design limitations.

**⚠ WARNING**

Always adhere to the recommended load limits. Ensure the load is evenly distributed, with particular attention to keeping weight low in the vessel. Stability is significantly compromised by any weight added higher up.

### Protection from Falling Overboard

Falling overboard is one of the most common and potentially dangerous boating accidents. Implementing prevention measures is essential for the safety of all persons onboard.

• Always ensure everyone onboard wears a properly fitted life jacket.

• Maintain a clutter-free deck. Stow loose gear securely to avoid tripping hazards.

• All passengers must remain seated while underway. No standing, sitting on gunwales, or leaning over the side.

• Brief all passengers on safety procedures before departure, including MOB response and emergency equipment location.

• The operator must avoid sudden or sharp maneuvers that could cause passengers to lose balance.

• Keep a watchful eye on all passengers, especially children and those less experienced on the water.

### Environmental Responsibilities

**⚠ WARNING**

Federal law prohibits the discharge of fuel, oil, or oily waste into U.S. navigable waters. Violators are subject to substantial civil and criminal penalties.

- Use rags or absorbent materials to clean up any fuel or oil spill - never rinse into the water.
- Do not use the bilge pump to discharge oily bilge water overboard.
- Avoid overfilling the fuel tank - stop before full to allow for thermal expansion.
- Observe all posted no-wake zones. You are responsible for any injury or damage caused by your vessel's wake.

As a WaterCar EV owner, understanding and adhering to environmental protection regulations is essential. These regulations preserve natural habitats and ensure continued access to waterways for all users.

### Responsible Travel

• On land, use designated paths, trails, and roads. Avoid widening trails or causing unnecessary damage. Cross streams only at designated fords.

• On water, use designated waterways and launch areas to minimize environmental impact.

### Respecting Others

• Respect the rights of others, including private property owners and recreational users. Yield as appropriate.

• On the water, show respect to anglers, swimmers, skiers, divers, and those near shore. Manage your wake.

### Avoiding Sensitive Areas

• Avoid meadows, lakeshores, wetlands, and stream banks at speed. Stay on designated routes.

• Avoid shallow areas and shorelines at high speed to prevent erosion and disturbance to aquatic life.

### Managing Oil and Fuel

• Investigate the source of any oil leak immediately. Always have oil-absorbing cloths onboard to manage spills.

• Never dispose of oil, paint, fuel, or chemicals into the water or on the ground.

• Retain all waste until it can be properly disposed of ashore.

### Minimizing Wake and Noise

• Adjust speed to water conditions. Excessive wake can damage other vessels, docks, and shoreline property.

• Avoid running the engine unnecessarily or at higher speeds than conditions require. Minimize noise pollution for the enjoyment of all waterway users.

## 5.16 Outboard Engine

**⚠ NOTICE**

The Mercury® outboard engine is covered by a separate outboard manufacturer's owner's manual supplied with your vehicle. The outboard manufacturer's manual is the authoritative reference for all engine operation, service, maintenance intervals, and specifications. This section provides operational guidance specific to the WaterCar EV installation.

**✓ CONFIRMED**

The WaterCar EV Marine Package is compatible with Mercury® outboard engines as specified on the capacity plate. The specific engine model and horsepower rating installed on your vessel is documented on the capacity plate (Section 5.5). The Mercury engine serial number is located on the engine mounting bracket. Refer to the outboard manufacturer’s owner’s manual included in your Owner’s Manual Packet for all engine-specific operating procedures, maintenance schedules, and warranty information.

### If the Outboard Is Submerged

If the outboard becomes submerged, do not attempt to start it. A submerged outboard requires service by the outboard manufacturer's authorized dealer before it is returned to use. Attempting to start a submerged engine can force water into the cylinders and cause severe internal damage.

## Fuel System

| | |
|---|---|
| **Fuel Type** | Unleaded gasoline - minimum octane per the outboard manufacturer's specifications |
| **Fuel Tank Capacity** | 18 Gallons |
| **Ethanol Content** | E10 (10% ethanol) maximum. E15 and E85 are NOT approved. |
| **Fuel Fill Location** | Transom-mounted fuel fill - cap must be secured after filling |

**⚠ WARNING**

DO NOT USE E15, E85, OR ANY FUEL BLEND WITH MORE THAN 10% ETHANOL. High-ethanol fuels damage marine engine fuel system components and void the outboard manufacturer's warranty.

### Fuel System Overview

The fuel system delivers fuel from the gas tank to the Mercury® outboard engine. The 18-gallon gas tank is CARB (California Air Resources Board) approved, meeting standards for evaporative emissions. The tank is constructed from high-density polyethylene, which is resistant to corrosion and impact in the marine environment. It features an integrated fuel gauge for monitoring fuel levels from the console.

Fuel system components include the fuel lines, and the built-in fuel pump and fuel filter of the outboard engine. Fuel lines are made of reinforced rubber or marine-grade materials rated for the marine environment.

The fuel filler is located on the transom. When fueling, use unleaded gasoline meeting the outboard manufacturer's octane specifications. Do not fill the tank to maximum capacity - leave room for thermal expansion. Close the fuel cap firmly but avoid over-tightening to prevent damage to seals.

### Fuel System Maintenance

• Regularly inspect fuel lines for signs of wear, cracking, or damage. Replace as necessary.

• The fuel filter and pump are integrated into the Mercury® outboard - follow manufacturer recommendations for inspection and replacement.

• Regularly check for fuel leaks and address any issues immediately.

• At the start of each season, inspect the entire fuel system before first use.

## Engine Starting Procedure

1. Confirm pre-launch checklist complete. Engine in Neutral.
2. Confirm kill switch lanyard attached to operator's wrist or PFD.
3. Confirm vessel floating freely with adequate depth under propeller.
4. Prime fuel system if required by the outboard manufacturer's starting instructions.
5. Start the engine following the outboard manufacturer's starting procedure.
6. Verify cooling water tell-tale flowing within 30 seconds. If not - shut down immediately.
7. Allow engine to warm up at idle for 1–2 minutes before applying throttle.

**⚠ WARNING**

Never start the outboard engine with persons near the propeller or in the water behind the vessel.

### New Engine Break-In

If your vessel is delivered with a new outboard engine, a break-in period is required before operating at full throttle for extended periods. Refer to the outboard manufacturer's owner's manual for the specific break-in procedure and duration.

During the initial break-in period, avoid extended idling. Vary engine speed frequently throughout the break-in.

Use only the fuel grade, oil type, and maintenance intervals specified in the the outboard manufacturer's documentation. Following these steps ensures optimal performance, fuel efficiency, and long-term reliability.

### Freshwater Flushing - After Every Use

1. Remove vessel from water. Connect flush adapter (earmuffs) to engine water inlets.
2. Connect garden hose - do not turn on water yet. Start engine at idle.
3. Turn on freshwater supply - confirm water flow from tell-tale.
4. Run engine at idle with freshwater flowing for a minimum of 5 minutes.
5. Shut down the engine first, then turn off water. Disconnect flushing equipment.

**⚠ CAUTION**

Never run the engine at high RPM during flushing. Always confirm water is flowing before running. Always shut engine down before turning off water supply.

### Engine Shutdown

1. Reduce throttle to idle. Shift to Neutral. Allow to idle for 1–2 minutes.
2. Shut down engine per the outboard manufacturer's procedure.
3. Remove kill switch lanyard only after engine is fully stopped.
4. Tilt engine to transport/storage position as appropriate.

### Engine Service Schedule

Mercury Marine global dealer locator: www.mercurymarine.com

| Service Item | Interval / Notes |
|---|---|
| **Engine oil and filter** | Per the outboard manufacturer's service schedule |
| **Gear lube** | Check before each season; replace per the outboard manufacturer's schedule |
| **Spark plugs** | Per the outboard manufacturer's service schedule |
| **Fuel filter** | Per the outboard manufacturer's schedule or if fuel quality issues arise |
| **Water pump impeller** | Per the outboard manufacturer's service schedule |

| | |
|---|---|
| **Propeller** | Inspect before each use; replace if bent, cracked, or missing material |
| **Anodes (zinc)** | Inspect seasonally; replace when 50% consumed |
| **Winterization** | Required in freezing climates - refer to the outboard manufacturer's manual<br><br>**Whale Tail (Hydrofoil)**<br><br>**Rear Flip Plates**<br>The vessel is equipped with spring-loaded rear flip plates that automatically assist with planing attitude and ride quality. The flip plates are passive and require no operator adjustment - they deploy and retract automatically based on water pressure. No maintenance or inspection is required beyond verifying they are not damaged or obstructed.<br><br>The outboard is equipped with a whale tail hydrofoil mounted on the lower unit anti-cavitation plate. The whale tail improves hole shot performance, helps the vessel get on plane faster, and enhances low-speed stability. No adjustment or maintenance is required. If the whale tail is damaged or missing, contact WaterCar for replacement.<br><br>**Outboard Oil Requirements**<br>The oil reservoir for the Mercury® outboard is located in the rear transom locker. An oil cap is located on the top of the transom, and oil levels can be inspected from the rear hatch on the front face of the transom.<br><br>Recommended oil: Mercury or Quicksilver NMMA FC-W certified 4-Stroke outboard oil. As alternatives: Mercury or Quicksilver SAE 25W-40 Mineral Marine 4-Stroke Engine Oil or SAE 25W-40 Synthetic Blend Marine 4-Stroke Engine Oil.<br><br>If recommended Mercury or Quicksilver oils are not available, a major outboard manufacturer's brand of NMMA FC-W certified 4-Stroke outboard oil of similar viscosity may be used. |

## 5.17 Marine Maintenance Schedule

| Interval | Item | Action |
|---|---|---|
| **After salt/brackish water use** | Outboard flush | Flush with fresh water - Section 5.16 |
| **After every use** | Post-water inspection | Complete full checklist - Section 6.4 |
| **After every use** | Bilge | Pump out bilge; inspect for unusual |

| | | |
|---|---|---|
| | | water intrusion |
| **After every use** | Propeller | Inspect for damage, line wrap, or missing material |
| **After every use** | WD-40 | Spray all exposed metal, hinges, and connections |
| **Monthly** | Hull exterior | Inspect for cracks, blistering, abrasion, or impact damage |
| **Monthly** | Navigation lights | Clean lenses; inspect wiring and connections |
| **Monthly** | Electrical connections | Inspect marine connections for corrosion |
| **Monthly** | Bilge pump | Test automatic and manual operation |
| **Monthly** | Zinc anodes<br>• Bellow clamps - inspect and confirm tight. Loose bellow clamps can allow water intrusion into the hull through wheel openings. | Inspect; replace when 50% consumed |
| **Monthly** | Zerk fittings | Grease all hydraulic pivot points - included grease gun |
| **Seasonally** | Hull bottom | Inspect for fouling, blistering, and coating condition |
| **Annually** | Fire extinguisher | Inspect charge, pin, nozzle; replace if expired or discharged |
| **Annually** | Visual distress signals | Check expiration dates; replace before expiry |
| **Annually** | PFDs | Inspect for damage, fading, mildew; confirm USCG approval |
| **Per the outboard manufacturer's schedule** | Outboard service | Refer to the outboard manufacturer's manual and Section 5.16 |

## 5.18 Hull Inspection & Corrosion Prevention

- Inspect welds, seams, and rivets for cracks or separation.
- Check hull bottom for deep scratches, gouges, or dents.
- Inspect transom area for stress cracks or deformation.
- Check hull-to-deck joint for separation or water intrusion.
- Look for osmotic blistering (bubbles under paint/coating).
- Inspect drain plug fitting for condition and seal integrity.

Corrosion Prevention - Saltwater Operation:

- Flush the entire vessel with fresh water after every salt or brackish water operation.
- Apply WD-40 or corrosion inhibitor to electrical connections, fasteners, and mechanical linkages after each saltwater use. For any fastener that is removed and reinstalled - particularly stainless hardware threading into aluminum - apply marine-grade anti-seize to the threads before reassembly.

- Inspect and replace zinc sacrificial anodes seasonally or when 50% consumed.
- Rinse and dry all seat belts, upholstery, and fabric components after saltwater exposure.

### Bottom Painting & Antifouling

If the WaterCar EV will be kept in the water for extended periods, bottom painting with an appropriate marine antifouling paint may be necessary to control biological growth (fouling) on the hull. Bottom painting is the owner's responsibility and is not covered under the WaterCar warranty.

- Before painting, the hull must be thoroughly cleaned, degreased with a marine surface prep solvent appropriate for aluminum, and sanded with appropriate grit paper. Follow the paint manufacturer's preparation instructions for aluminum substrates.
- Do not paint over zinc anodes or sacrificial metals. This will render them ineffective and accelerate corrosion of underwater metal components.
- Leave a minimum of 3/4 inch unpainted around all outboard engine components. Some antifouling paints contain metals that can cause corrosion of aluminum engine parts.
- If bottom painting a previously painted hull, test compatibility of the new paint with the existing coating before application. Incompatible paints will not adhere or may lift the existing coating.
- Bottom painting may affect vessel performance. If maximum engine RPMs drop below the recommended operating range after painting, re-propping may be required. Consult your outboard dealer.

**⚠ DANGER**

Bottom paint contains toxic chemicals. Follow all manufacturer safety precautions. Use proper respiratory protection, ventilation, and protective equipment. Dispose of all painting materials in accordance with local environmental regulations.

## 5.19 Seasonal Layup

1. Flush outboard with fresh water; winterize per the outboard manufacturer's manual.
2. Charge both batteries to 50% or above; turn batteries off for storage.
3. Drain bilge completely. Flush and rinse hull, wheel wells, and all exterior surfaces.
4. Inspect and treat zinc anodes; replace if significantly consumed.
5. Cover vessel to protect from UV and debris.
6. Check fire extinguisher, VDS expiration dates, and PFD condition.
7. Charge batteries at least once every 6 months during storage period.

**⚠ NOTICE**

Upon returning to service after seasonal layup: charge both batteries fully, inspect all systems, complete the Pre-Launch Checklist (Section 5.14) before any water operation, and verify Mercury annual service is current.

### 5.20 Marine Specifications

**Subject to change without notice. Verify against capacity plate and the outboard manufacturer's documentation for your specific unit.**

| Specification | Value |
|---|---|
| **Speed on Water** | 35 MPH / 56.32 KM/H |
| **Fuel Capacity** | 18 Gallons (Gas) / 68 Liters |
| **Range on Water** | 80 Miles / 130 KM (estimated, conditions dependent) |
| **Overall Length (LOA)** | 19.5 FT / 6 M |
| **Waterline Length (LWL)** | 18 FT / 5.4 M |
| **Beam** | 6.5 FT / 1.98 M |
| **Dry Weight** | Refer to VIN plate and capacity plate (Section 5.5) for weight data specific to your unit |
| **Maximum Persons on Water** | Per capacity plate (see Section 5.5) |
| **Maximum Weight on Water** | Per capacity plate (see Section 5.5) |
| **Outboard** | Owner-supplied. The WaterCar EV is compatible with Mercury outboard engines as specified on the capacity plate. The WaterCar EV may be delivered with or without an outboard engine installed, depending on the purchase configuration. If the outboard is not factory-installed, the owner is responsible for selecting and installing a compatible outboard through a qualified marine installer. |

SECTION 6

# Amphibious Operation

Requires familiarity with both Section 4 (LSV) and Section 5 (Marine)

## 6. Amphibious Operation

This section covers amphibious transition operation of the WaterCar EV - the hydraulic transition system, land-to-water and water-to-land transitions, and operating procedures specific to the amphibious mode. Read Sections 4 and 5 completely before reading this section.

**⚠ WARNING**

Amphibious transition operations require full attention from the operator. Do not attempt transitions in unfamiliar locations, in poor visibility, in rough surf, or in strong tidal currents until you are fully proficient in calm, controlled conditions. Build your skills progressively.

For a video demonstration of the WaterCar EV amphibious transition procedure, visit: https://www.youtube.com/watch?v=wdKs5TyZWGE

## ✉ Letter from the WaterCar Team - Delivery Notes & Quick Start

Congratulations - you are now officially a proud owner of a WaterCar EV and part of the WaterCar family. The following notes are written from our delivery team to help you get started with confidence. Always follow the detailed procedures in this manual for formal operation - these notes are a practical companion, not a replacement.

Please remember: the WaterCar EV is a dual-purpose vehicle - capable of marine operation and Low Speed Vehicle road operation when properly configured. It will sound and drive differently than anything else in the world, and you will be operating it in situations most vehicles cannot handle, such as transitioning in and out of the water.

Think of it like this: you would not jump into a tractor, hovercraft, or helicopter without learning the controls first. The same applies here. If you have no boating experience, we do not recommend operating on water until you gain some. Be sure to follow all applicable laws in your area - a boater's license or driver's license may be required depending on your jurisdiction.

The WaterCar EV has been intentionally engineered to be supported locally anywhere in the world, using proven automotive and marine systems rather than proprietary or dealer-only components. This means routine service and maintenance can be handled by a trusted local automotive or marine mechanic, or by owners who are mechanically inclined. We highly recommend that owners have access to a qualified local mechanic as part of the ownership experience.

WaterCar provides direct, real-time remote support via phone and video, working closely with owners and their selected service providers. In practice, most questions and service needs are resolved this way.

Contact the Sales/Service Department at (714) 251-6687 - call or text.

The WaterCar EV has two lithium batteries: a 48V main drive battery and a 12V accessory battery. Both must be ON for operation.

• Press the button on each battery until lights illuminate. The 12V shows four green lights when full (fewer lights = lower charge). The 48V charge level is displayed on the gauge near the helm.

• Turn the two large red master switches beside the driver's seat to ON.

• The 48V gauge will show percentage remaining. The 12V gauge reads approximately 13V when charged.

Once both batteries and switches are on, the vehicle is powered.

• Right (starboard) side - Road driving controls: Forward/Neutral/Reverse toggle, turn signal buttons, ignition key for electric motor.

• Left (port) side - Marine controls: Mercury ignition key and safety lanyard, throttle/shift lever, Mercury display, accessory buttons (screen, lights, bilge, horn).

• Confirm batteries on, master switches on, ignition key turned on (you will hear the controller click). The outboard must be tilted fully UP while on land.

• Use the Forward/Neutral/Reverse toggle to select direction.

• Confirm the parking brake is disengaged. Select FORWARD on the directional switch. Apply accelerator gradually.

• Use turn signals as needed. Short presses blink briefly; longer presses keep them on until pressed again.

Operation is similar to a golf cart - smooth throttle, gradual stops, stay under 25 MPH.

• Ensure safety lanyard is attached and switch is in RUN position.

• Test the outboard tilt to confirm it has power.

• Approach the water ramp perpendicular (straight in) - never at an angle.

• Drive slowly into the water. Keep light pressure on the throttle so regenerative braking does not stop you on the ramp.

• Confirm the outboard is tilted fully UP before entering the water. Once afloat and in water with adequate depth for safe operation, lower the outboard to operating angle (approximately 45 on the Mercury display). Confirm the propeller is fully submerged. Start the outboard as you would any outboard - never run it dry. Check the cooling water tell-tale stream. If no water stream within 30 seconds, shut down immediately.

• Navigate a safe distance from shore before raising wheels.

• Shut off the land motor (ignition key on right side).

• STRAIGHTEN THE WHEELS - confirm by looking back at the outboard. If it is centered, the wheels are straight.

• Raise REAR wheels first, then FRONT wheels. Hold each switch until the pump tone changes (approximately 20 seconds per axle).

You are now in boat mode.

• To get on plane efficiently: at idle, first confirm all wheels are fully retracted, minimal weight in the bow, and the vessel is not overloaded. Set the trim to approximately 35-40 on the Mercury display while at idle. Then apply full throttle in one motion - the RPMs should climb quickly to 5,500-6,000. Once on plane, back off the throttle and settle into cruise speed. Easing gradually into the throttle is not the efficient way to get on plane; throttle up decisively.

• If the vessel is not getting on plane: check that ALL wheels are fully retracted (this is like an airplane - landing gear must be fully up for efficient operation). Avoid weight in the bow. Minimize gear forward. Do not sit in the forward seats while getting on plane.

When properly configured and loaded, the WaterCar EV handles and planes like a conventional 18-foot recreational boat.

• Line up with the ramp perpendicular (straight on) from a safe distance.

• STRAIGHTEN THE WHEELS - confirm by looking at the outboard.

• Lower FRONT wheels first, then REAR wheels. Hold switches until pump tone changes.

• Raise outboard partially (trim approximately 80-85) - still in water for cooling but high enough to avoid hitting bottom.

• Turn land motor key ON and set Forward on the directional switch before reaching shore.

• Approach slowly using outboard thrust only. DO NOT apply throttle to the electric drive until the wheels have made firm contact with the ramp or shoreline surface.

**⚠ WARNING - DO NOT THROTTLE BEFORE WHEEL CONTACT**

Do not apply throttle to the electric drive while the wheels are deployed but still in the water. When spinning wheels transition from zero resistance in water to full traction on a ramp surface, the instantaneous load spike places extreme torsion stress on the axles and drivetrain - sufficient to cause axle damage or failure.

**Correct procedure:**

• Use outboard thrust only to bring the vehicle to the ramp or shoreline.

• Let the hull's momentum carry the vehicle until the wheels make firm, positive contact with the surface.

• Only after the wheels are gripping the surface: apply gentle, progressive throttle to drive up the ramp.

• Once wheels have traction: turn off the outboard (never run it dry). Continue driving up ramp.

• Batteries - We ship both fully charged, but transport drivers have occasionally left them on during shipping. If batteries arrive low, this is normal - a full charge cycle restores them completely.

• Tires - Tires may rub slightly on very sharp turns. This is normal due to suspension travel and is not a defect.

• Parking on slopes - On steep slopes or when leaving the vehicle unattended, lower the bow so the hull rests on the ground (front wheels slightly off). This prevents rolling and makes entry and exit easier.

• Lowering vehicle on land - Only lower the FRONT hydraulics. Lowering the rear risks the hull contacting the outboard.

• Controller faults - Some faults can be cleared by cycling the key OFF, waiting 3 seconds, then ON. A directional fault can occur if Forward and Reverse are toggled too quickly. This is normal behavior of the self-protecting electronic controller.

• Canopy setup - If your vehicle includes a canopy, contact WaterCar for setup photos. One bar must slide fully down, the other fully up for proper fit.

• WD-40 - Use it generously and often. After every water use, spray all exposed metal components. Multiple cans are included in your care package for a reason.

**⚠ NOTICE**
This quick start guide is a practical companion to the full Owner's Manual. For complete operating procedures, safety warnings, regulatory information, and maintenance schedules, always refer to the applicable sections of this manual.

## 6.1 The Two-Propulsion System

The WaterCar EV operates two completely independent propulsion systems that must be managed in sequence during transitions:

| Mode | Propulsion | Controlled By | Key Rule |
|---|---|---|---|
| **LAND** | 48V electric motor | Accelerator pedal + FNR switch | Electric drive must be OFF before water entry |
| **WATER** | Mercury® outboard engine | Throttle/shift lever at helm | Outboard must not be started until prop is submerged |
| **TRANSITION** | Both systems briefly | Operator coordinates both | Never engage electric drive while floating; never run outboard out of water |

## 6.2 Hydraulic Transition System

The WaterCar EV road wheels retract hydraulically for water operation. The hydraulic system is controlled by two rocker switches on the PORT (far left) side of the dashboard.

### Controls

- FRONT switch - controls the front wheels.
- REAR switch - controls the rear wheels.
- Button UP = Wheels UP (retracted). Button DOWN = Wheels DOWN (deployed).
- Easy mnemonic: "Wheels up, button up."

**⚠ NOTICE**

Each hydraulic cycle takes approximately 20 seconds. Hold the rocker switch continuously until the pump tone changes - this confirms wheels are fully up or fully down. Do not release the switch early. Releasing early leaves wheels in an intermediate position.

**⚠ DANGER**

ALWAYS confirm the steering wheel is centered and wheels are pointed STRAIGHT before operating any hydraulic switch. Verify alignment by looking back at the outboard - if the outboard is centered, the wheels are straight. Raising or lowering with turned wheels will cause the wheels to contact the hull walls and cause structural damage.

### Wheel Position Reference Table

| Operating Mode | Required Wheel Position |
|---|---|
| **Road / Land Driving** | ALL WHEELS FULLY DOWN |
| **Water / Boat Mode** | ALL WHEELS FULLY RETRACTED |
| **Entering Water (ramp)** | Wheels FULLY DOWN until floating - raise REAR first, then FRONT |
| **Exiting Water (ramp)** | Lower FRONT first, then REAR - before hull contacts ramp. Do not apply throttle until wheels are gripping the surface. |
| **Parked on Land - Level** | All wheels fully down. Turn the key off when parked. Set the parking brake. |
| **Parked on Land - Slope** | Lower FRONT hydraulics only so bow hull rests on ground. Rear stays up. Prevents rolling on grades. |

### Wheel Alignment Rule

ALWAYS confirm the steering wheel is centered before raising or lowering wheels. You can verify wheel alignment by looking back at the outboard - if the outboard is centered and straight, the wheels are straight. Never operate hydraulic switches with the steering wheel turned.

### On-Land Rear Hydraulics

When the WaterCar EV is parked on land, only lower the FRONT hydraulics if you want to lower the bow onto the ground (for steep slope parking). Do NOT lower the rear hydraulics while on land - lowering the rear risks the hull contacting the outboard.

### Getting on Plane - Wheel Position

All four wheels must be FULLY RETRACTED before planing is possible. Even one wheel partially down creates significant underwater drag and prevents the hull from rising onto plane.

1. Confirm all wheels are fully retracted - pump tone confirmed on both front and rear.
2. While at idle, confirm minimal weight in the bow and that the vessel is not overloaded. Set outboard trim to approximately 35-40 on the Mercury display screen.
3. Apply full throttle in one decisive motion. The RPMs should climb quickly to 5,500-6,000. Easing gradually into the throttle is not the efficient way to get on plane.
4. Once on plane, back off throttle slightly and settle into cruise speed.
5. Adjust trim as needed for optimal running angle – typically 60-65 trim

Troubleshooting - vehicle not getting on plane:

- Wheels not fully retracted - confirm steering wheel is straight, confirm pump tone, re-run hydraulic cycle on all four wheels.
- Excessive weight in the bow - redistribute passengers and gear rearward.
- Excessive total load - reduce payload.
- Outboard trim incorrect - set trim to 35-40 at idle, then apply full throttle.

## 6.3 Land-to-Water Transition - Full Procedure

**⚠ WARNING**

Complete the Pre-Launch Checklist (Section 5.14) in full before beginning this procedure. Never begin water entry with an incomplete or failed checklist.

### Launch Site Selection

- Gradual, firm, unobstructed entry slope - avoid loose sand, steep drops, or submerged obstacles.
- Adequate water depth at the end of the ramp - sufficient for the outboard engine at operating tilt.
- Clear of vessel traffic, swimmers, and obstructions in the entry path.
- Wind direction and current - assess impact on entry control.
- Confirm exit route before entry.
- A hard slipway or concrete boat ramp is the preferred entry site. If unavailable, ensure the surface is firm and stable - avoid marshy, muddy, or soft ground that could trap the vehicle.
- Check for underwater hazards that could damage the hull or cause the vehicle to become beached - rocks, pilings, debris, or sudden depth changes.
- Avoid sites with undercuts or eroded banks - the edge may collapse under the vehicle’s weight.
- Be aware of tidal range and tidal currents. A site accessible at high tide may be impassable at low tide. Fast tidal currents can push the vehicle off course during entry or exit.

### Water Entry Sequence

Follow this sequence exactly. Each step must be confirmed complete before proceeding to the next.

1. APPROACH: Drive to the water's edge at low speed. Stop completely before any part of the hull contacts the water.
2. ENGINE & DRIVE OFF: Turn the electric motor key switch to OFF. Place the FNR switch in Neutral. Confirm the 48V drive system is off.
3. OCCUPANTS & GEAR: Ensure all occupants are seated and secured. Stow all loose gear. Confirm all persons have PFDs accessible.
4. KILL LANYARD: Operator attaches kill switch lanyard to wrist or PFD before proceeding.
5. DRIVE INTO WATER: With all wheels fully down, drive slowly into the water. Maintain steering control. Keep light pressure on the throttle so regenerative braking does not stop you on the ramp.
6. FLOAT FREELY: Continue until the vehicle is fully afloat. Confirm the vessel is floating freely and level before proceeding.
7. OUTBOARD POSITION: Confirm the outboard is tilted fully UP before entering the water. The outboard must be clear of the ramp surface during entry.
8. CONTROLLED ENTRY: Gradually and slowly move the vehicle into the water. Maintain steering control throughout.
9. CHECK BILGE: With vessel floating freely, check bilge for any unexpected water intrusion. If water is entering the hull, return to shore immediately before proceeding.
1. LOWER OUTBOARD: With the vessel floating freely, lower the outboard to operating angle - approximately 45 on the Mercury display. Confirm the propeller is fully submerged before starting the engine. The outboard must have water circulation for cooling.
2. ENGINE START: With vessel floating and stable, start the Mercury® outboard following the procedure in Section 5.16.
3. RETRACT WHEELS: Once safely away from shore, shut off the land motor (electric drive key OFF). Straighten the wheels - confirm by looking at the outboard (if centered, wheels are straight). Raise REAR wheels first, then FRONT wheels. Hold each switch until the pump tone changes (approximately 20 seconds per axle). You are now in boat mode.
4. COOLING WATER CHECK: Verify the engine cooling water tell-tale is producing a steady stream within 30 seconds. If not - shut down immediately.
5. CAST OFF: Release any mooring lines. Confirm path ahead is clear before engaging throttle.

**⚠ DANGER**

NEVER start the outboard engine with the propeller out of the water. This causes immediate cavitation damage and will destroy the lower unit. Confirm the prop is fully submerged before starting.

**⚠ CAUTION**

If the vessel does not float level, lists to one side, or takes on water during entry, return to the launch site immediately. Investigate and correct before attempting water operation.

## 6.4 Water-to-Land Transition - Full Procedure

**BEFORE DRIVING ON LAND, INCLUDING ON THE RAMP OR IN A PARKING AREA, ALL OCCUPANTS BEYOND THE DESIGNATED SEATING POSITIONS MUST EXIT THE VEHICLE. ALL REMAINING OCCUPANTS MUST BE SEATED IN A DESIGNATED SEATING POSITION WITH THE SEAT BELT FASTENED (SECTION 2.3).**

Water exit is the transition from vessel operation back to road/land operation. Select the exit site before approaching - confirm it is clear, firm, and of appropriate grade before committing to the exit.

### Exit Site Assessment

- Firm, stable, gradual surface - no loose sand, soft ground, or steep grade.
- Adequate approach depth - no submerged obstructions.
- Clear of other vessels, swimmers, and pedestrians.
- Road surface above exit is clear.

### Water Exit Sequence

1. APPROACH SETUP: Confirm the outboard is raised high enough to clear the ramp bottom (trim approximately 80-85). Turn the land motor key ON and set Forward on the directional switch before reaching shore.
2. APPROACH: Use the outboard at low speed to maintain control and steer toward the ramp. Approach perpendicular (straight on). The outboard provides steering control that drift does not.
3. WHEEL DEPLOYMENT - WHEN WHEELS CONTACT: As the hull contacts the ramp and the vessel is stable, deploy FRONT wheels first using the hydraulic switch. Hold until pump tone changes. Then deploy REAR wheels.
4. WHEEL DEPLOYMENT - FRONT FIRST: When the hull contacts the ramp and the vessel is stable, use the FRONT hydraulic switch to deploy the front wheels. Hold switch until pump tone changes - front wheels fully down.
5. WHEEL DEPLOYMENT - REAR: Using the REAR hydraulic switch, deploy the rear wheels. Hold switch until pump tone changes - rear wheels fully down.
6. CONFIRM ALL WHEELS LOCKED: Visually and physically confirm all four wheels are deployed and locked before engaging electric drive power.
7. ELECTRIC DRIVE ON: Turn the electric motor key switch ON. Power on the 48V battery. Engage the FNR switch to Forward.
8. DRIVE OUT: Slowly drive the vehicle up and off the ramp to the staging area. Maintain low speed.
9. STOP AND ASSESS: Stop the vehicle clear of the ramp and water's edge. Place the directional switch in neutral. Set the parking brake. Perform the post-water inspection below before driving on public roads.

### Post-Water Inspection - Before Road Operation

| | |
|---|---|
| **Bilge** | Check bilge - pump out any accumulated water before road operation. |
| **Hull exterior** | Inspect hull for damage, impact marks, or abnormal wear. |
| **Wheels and tires** | Confirm all four wheels are fully deployed and locked. Inspect tires for damage. |
| **Wheel nuts** | Check wheel nut tightness after any significant water operation. |
| **Brakes** | Test brake pedal - confirm firm feel. Wet brakes may require light application to dry. |
| **Outboard** | Tilt outboard to road travel position. Flush engine with fresh water (Section 5.16). |
| **Electrical connections** | Inspect accessible electrical connections for moisture or corrosion. |
| **Battery compartments** | Check for any moisture intrusion into battery enclosures. |
| **Navigation lights** | Rinse and inspect light housings. |

| | |
|---|---|
| **WD-40 Treatment** | Spray all exposed metal components, hinges, and connections with WD-40.<br>• Seat belt hardware and buckles - spray latch mechanisms and mounting hardware with WD-40 after every water use to prevent corrosion and ensure reliable operation. |

**⚠ CAUTION**

Do not operate the vehicle on public roads until the post-water inspection is complete and all items pass. Wet brakes, loose wheels, or mechanical abnormalities must be corrected before road operation.

## 6.5 Amphibious Operation in Surf & Tidal Conditions

Surf and tidal currents significantly increase the complexity and risk of amphibious transitions. Do not attempt surf launches or retrievals.

**⚠ DANGER**

THIS VESSEL IS NOT DESIGNED FOR OPERATION IN BREAKING WAVES OR SURF ZONES. Do NOT launch or recover through surf. Breaking waves can cause sudden loss of control, swamping, or capsize. Serious injury or death could result.

### Tidal Current

- Strong tidal current creates significant steering challenges, especially during transition.
- Plan your approach to allow for current drift - aim up Current of your intended landing point.
- In strong tidal areas: deploy front wheels first, then rear to minimize steering disruption during exit.

## 6.6 Shallow Water Operation

- Minimum water depth to start outboard: propeller must be fully submerged - approximately 18 inches at the transom.
- If water becomes too shallow while underway, trim the outboard up progressively to prevent grounding.
- If the outboard must be trimmed fully up, the electric wheel drive can be engaged to drive the vehicle in very shallow water or onto a beach.

**⚠ CAUTION**

Operating the outboard in water shallow enough to contact the bottom will damage the propeller and gearcase. Always trim up as depth decreases. If you feel or hear the propeller contacting bottom, immediately trim up fully and engage wheel drive.

## 6.7 Operator Training Progression

WaterCar Inc. recommends all new operators follow this progressive training sequence before operating in challenging conditions.

### Step 1 - Familiarization

1. Learn all dash controls, modes, and indicators before moving the vehicle.

2. Practice electric drive - forward, reverse, parking, throttle fault clearing.
3. Practice outboard starting, stopping, shifting, and trimming while at dock.

### Step 2 - Transition Proficiency

1. Practice land-to-water transition 5 times until the sequence is automatic.
2. Practice water-to-land transition 5 times until the sequence is automatic.
3. Practice ramp approach and departure courtesy procedures.

### Step 3 - Water Proficiency

1. Practice docking maneuvers at idle speed.
2. Practice anchoring and retrieving anchor.
3. Practice man-overboard response procedure.
4. Complete a USCG-approved boating safety course.

### Step 4 - Advanced Operations (after Steps 1–3 demonstrated)

1. Natural beach launches and retrievals in calm conditions.
2. Operation in moderate wind and chop.
3. Night operation (confirm all navigation lights, carry redundant lighting).
4. Saltwater operation (requires diligent post-use rinse and flush protocol).

## 6.8 Pre-Season Amphibious Inspection

Before the first use of each season, conduct a comprehensive inspection of all amphibious-specific systems:

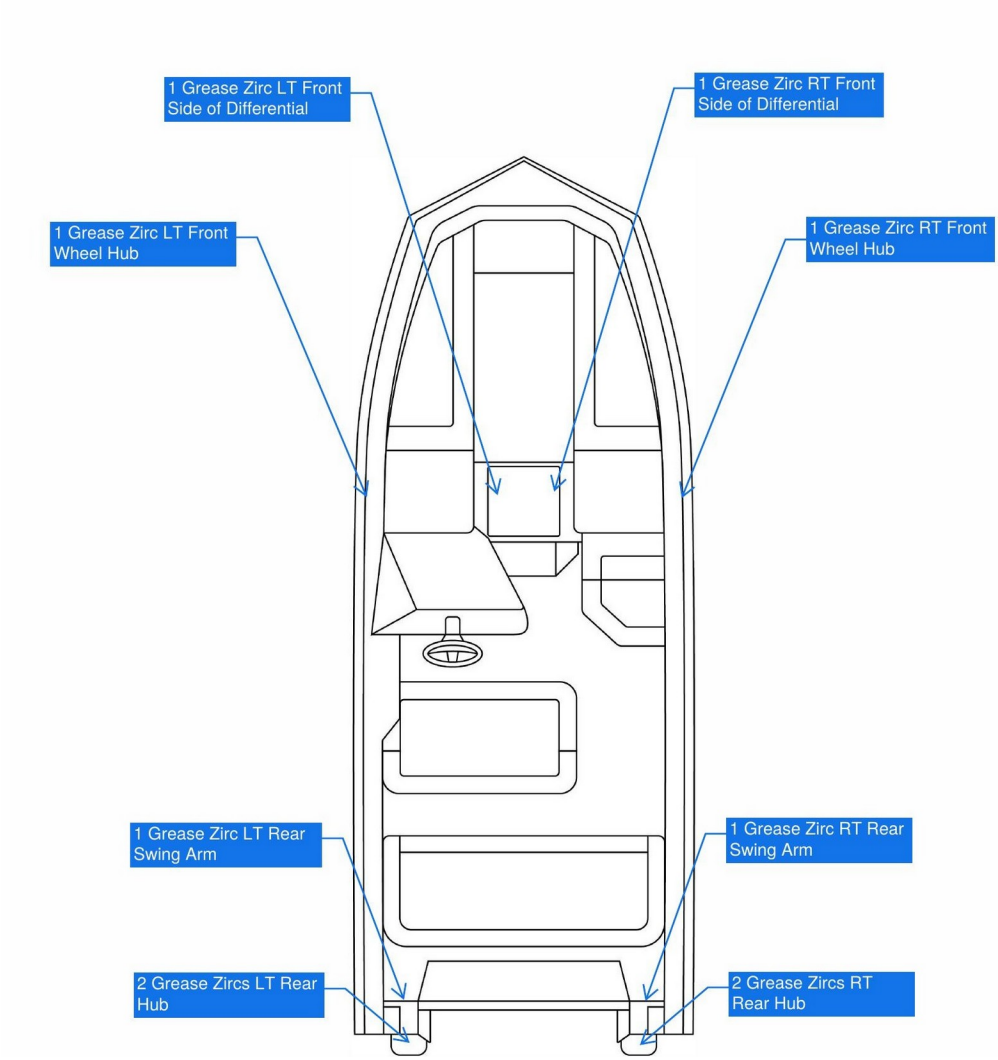
- Hull drain plug: inspect O-ring or gasket - replace if cracked, compressed, or deteriorated.
- All hull penetrations: inspect for cracks, deterioration, or loose fittings, or rubber bellows. If any hull fitting is removed for service, apply marine-grade anti-seize to the threads before reinstallation - stainless fittings threading into aluminum hull structure are vulnerable to galling and galvanic corrosion seizure.
- Outboard tilt/trim system: operate full range - confirm smooth operation and no hydraulic leaks.
- Steering: full left-to-right sweep - confirm freedom of movement, no binding.
- Bilge pump: confirm manual and automatic operation.
- Navigation lights: confirm all operational.
- Kill lanyard: confirm kill switch function - attach lanyard and pull sharply to confirm engine cuts.
- All safety equipment: inspect PFDs, fire extinguisher, flares, sound signal - replace expired items.
- Battery connections: inspect all terminals, clean corrosion, apply dielectric grease.
- Hull exterior: inspect for stress cracks, impact damage, or coating deterioration.
- Zerk fittings: grease all hydraulic pivot points using included grease gun.

### Grease Point Locations

The WaterCar EV has ten (10) zerk (grease) fittings requiring regular lubrication. All fittings are 1/4"-28 SAE thread. Use marine-grade grease for all fittings - salt-water and freshwater exposure require a corrosion-inhibiting marine formulation. If a zerk fitting is ever removed and reinstalled, apply anti-seize to the threads before reinstalling to prevent galling in the aluminum receiving threads.

- Differential - 1 fitting on left front side, 1 fitting on right front side (2 total).
- Front wheel hubs - 1 fitting per hub (2 total).
- Rear swing arms - 1 fitting per arm (2 total).
- Rear wheel hubs - 2 fittings per hub (4 total).

### Zerk Fitting Locations - Top-Down View




Apply grease until fresh grease begins to purge from the fitting seal. Do not over-grease. Wipe excess grease after application.

SECTION 7
# Care & Maintenance
Applies to all configurations

## 7. Care & Maintenance

This section consolidates care and maintenance requirements for all WaterCar EV configurations. Regular maintenance is essential to safe and reliable operation in both LSV and Marine modes.

### 7.1 Master Maintenance Schedule

| Interval | Item | Mode | Action |
|---|---|---|---|
| **After every use** | Fresh water rinse | Both | Rinse entire vehicle - mandatory after saltwater use |
| **After every use** | Outboard flush | Marine | Flush engine with fresh water - Section 5.16 |
| **After every use** | Bilge inspection | Marine | Pump out bilge; inspect for unusual water intrusion |
| **After every use** | Propeller inspection | Marine | Inspect for damage, line wrap, or missing material |
| **After every use** | WD-40 treatment | Both | Spray all exposed metal, hinges, and connections |
| **Before each use** | Pre-ride inspection | LSV | Complete checklist - Section 4.6 |
| **Before each use** | Pre-launch checklist | Marine | Complete checklist - Section 5.14 |
| **Monthly** | Battery terminals | Both | Check for corrosion, tight connections; clean and protect |
| **Monthly** | Brake fluid level | LSV | Inspect reservoir; check for leaks |
| **Monthly** | Steering freeplay | LSV | Turn wheel lightly; confirm freeplay within spec |
| **Monthly** | Lights & signals | Both | Confirm all lights operational |
| **Monthly** | Wheel nuts | LSV | Inspect for tightness |
| **Monthly** | Zerk fittings | Both | Grease all hydraulic pivot points - included grease gun |
| **Monthly** | Hull exterior | Marine | Inspect for cracks, blistering, abrasion, or impact damage |
| **Monthly** | Navigation lights | Marine | Clean lenses; inspect wiring |
| **Monthly** | Zinc anodes | Marine | Inspect; replace when 50% consumed |
| **Monthly** | Bilge pump | Marine | Test automatic and manual operation |

| | | | |
|---|---|---|---|
| **Every 5,000 mi** | Tire rotation | LSV | Rotate all four tires |
| **After 1st 100 mi** | Wheel nut torque | LSV | Re-torque after first 100 miles and after any wheel removal |
| **Twice yearly** | Battery inspection | Both | Full removal; inspect for corrosion and case damage |
| **Twice yearly** | Hydraulic fluid | Both | Check levels in both pumps; top off if needed |
| **Seasonally** | Hull bottom | Marine | Inspect for fouling, blistering, and coating condition |
| **Every 2 years** | Brake fluid | LSV | Replace; replace sooner if contaminated |
| **Annually** | Fire extinguisher | Both | Check expiration date and condition |
| **Annually** | VDS (flares) | Marine | Check expiration dates; replace before expiry |
| **Annually** | PFDs | Marine | Inspect for damage, fading, mildew; confirm USCG approval |
| **Per the outboard manufacturer's schedule** | Outboard service | Marine | Refer to the outboard manufacturer's manual |
| **As needed** | Tread depth | LSV | Replace tires at or below 1/8 in (3 mm) |
| **As needed** | Brake pads/discs | LSV | Inspect for wear; replace at minimum thickness |

### Propeller Care

If you notice any damage to the propeller, address it immediately. A damaged propeller causes significant vibration that disrupts smooth operation and can lead to severe damage to the engine gearcase.

- Inspect the propeller before each water operation for dings, bent blades, cracks, or missing material.
- Check for fishing line, rope, or debris wrapped around the prop shaft.
- On a yearly basis, remove the propeller and lubricate the propeller shaft per the outboard manufacturer's specifications. Apply marine-grade anti-seize to the propeller shaft splines before reinstalling - this prevents galling and corrosion seizure between the stainless shaft and aluminum drive components.
- Replace a damaged propeller immediately - do not operate with a bent or cracked prop.

### Hydraulic Transition System Maintenance

The WaterCar EV is fitted with a hydraulic wheel-lift system powered by two hydraulic pumps - one for the front wheels and one for the rear. Regular maintenance is essential for reliable operation.

- Regularly check all visible hydraulic hoses and fittings for signs of leakage, abrasion, or excess wear.
- Replace any damaged hoses or fittings immediately - do not operate with leaking hydraulics.

• Check the fluid level in both hydraulic pumps monthly and refill if low. Use the manufacturer-recommended hydraulic fluid (Mercury/Quicksilver 865380A25 trim pump assembly).

• Grease all hydraulic pivot points at zerk fittings after every 10 hours of operation, or monthly, whichever comes first.

• After every water use - especially saltwater - grease all fittings, as salt accelerates grease washout.

• Refer to the “Grease Point Locations” diagram in this section for all ten (10) zerk fitting locations. All fittings are 1/4"-28 SAE; use marine-grade grease.

**Hydraulic Troubleshooting - Wheels Not Reaching Full Travel**
If the hydraulic wheels are not traveling all the way up or all the way down, locate the hydraulic pump for the affected axle and inspect the following:
1. Confirm the reservoir contains the proper amount of fluid. IMPORTANT: Always check the fluid level with the wheels in the full UP position - this is when the fluid level is at its highest point in the reservoir. If you check or fill with the wheels down, the reservoir will become overfull when the wheels are raised.
2. If the fluid level is correct, inspect the fluid for foam. Foamy hydraulic fluid contains trapped air and will cause incomplete wheel travel and spongy operation.

### Defoaming Procedure - Removing Trapped Air

Foamy hydraulic fluid contains trapped air and will cause incomplete wheel travel and spongy operation. The procedure below removes trapped air from one hydraulic wheel system at a time.

### Safety Precautions

- Perform this procedure on a level, stable surface with plenty of clearance around all four wheels.
- Keep hands, feet, clothing, and tools away from the wheels, suspension, and other moving components.
- Never position yourself underneath the vehicle unless it is properly supported with approved mechanical supports.
- Do not operate the front and rear hydraulic systems at the same time.
- Do not continue running a hydraulic pump after the wheels have reached the end of their travel.
- If you find a hydraulic leak, the fluid level is low, or the pump makes an abnormal noise, stop and contact WaterCar before continuing.

### Position Terminology

- **Wheels fully down:** The wheels are deployed and the vehicle is raised.
- **Wheels fully up:** The wheels are retracted and the vehicle is lowered onto its hull.

### Hydraulic System Access

- Tilt the rear seat forward.
- Open or remove the hydraulic system access panel.
- Locate the two hydraulic pumps and reservoirs.
- Select either the front or rear wheel system. Complete the entire procedure on one system before starting the other.
- The pump located closest to the center of the vehicle operates the front wheels.

### Bleeding Procedure

- Begin with all four wheels fully down and the vehicle fully raised.
- Select the hydraulic switch for the system you are bleeding. For this example, begin with the front wheels.
- While watching the front hydraulic reservoir, begin raising the front wheels.

- Continue raising the wheels until the hydraulic fluid begins to look cloudy, murky, or foamy. Stop the pump promptly once consistent foam appears. Do not allow heavily aerated fluid to be drawn back into the hydraulic system.
- Allow the fluid to sit undisturbed until the foam completely disappears and the fluid becomes clear again. This will typically take approximately 15 minutes, but heavily aerated fluid may require longer.
- Raise the wheels farther while continuing to watch the reservoir. Stop again when the fluid becomes foamy, and allow it to settle completely.
- Repeat this process in short stages until the front wheels are fully raised. Do not hold the switch after the wheels reach their fully raised position.
- Leave the front wheels fully raised and allow the vehicle to rest on its hull for approximately one hour. Before continuing, confirm that the hydraulic fluid is clear and contains no visible foam.
- Lower the front wheels completely, which will raise the front of the vehicle.
- Repeat the procedure by raising the front wheels again while watching the reservoir. The fluid should develop less foam than it did during the first cycle.
- Each time consistent foam appears, stop the pump and allow the fluid to settle completely before continuing.
- Continue cycling the front wheels up and down until you can complete a full cycle in both directions without producing visible foam.
- Once the front system operates through a complete cycle without foaming, repeat the entire procedure for the rear hydraulic system.

Depending on how much air is in the system, this procedure may take an hour or longer. Do not rush the settling periods. Repeatedly cycling the wheels without allowing the foam to clear can draw aerated fluid back into the hydraulic system and extend the process.

Foam can make the reservoir appear overfull. Check and adjust the fluid level only after the foam has fully dissipated and the true level is visible, with the wheels in the fully up position.

After completing both systems, confirm that all four wheels travel smoothly through their complete range and that no hydraulic leaks are visible.

Contact WaterCar if you need help with this procedure or have any questions.

### Upholstery Care

Proper care of the marine-grade upholstery extends its life and maintains appearance.

• Remove loose dirt and debris using a soft brush or vacuum with a brush attachment before cleaning.

• Mix a solution of mild soap and water - preferably a marine-specific upholstery cleaner. Avoid harsh chemicals that can damage the fabric or stitching.

• Gently scrub with a soft cloth or sponge, paying extra attention to heavily soiled areas. Wring out excess water to prevent soaking the fabric.

• Rinse thoroughly with clean water to remove all soap residue.

• Blot with a clean, dry towel to absorb moisture. Allow the upholstery to dry completely before covering or storing - this prevents mold and mildew growth.

• For stubborn stains or mildew, use a marine-grade mildew remover following the product instructions. Apply to the affected area, let sit for the recommended time, scrub gently, and rinse thoroughly.

• Always store the vehicle with a cover when not in use to protect upholstery from UV damage and the elements.

### Hull and Fittings Inspection

Periodic inspection of the hull and fittings is essential to identify damage, leakage, or loose fitment. This inspection should cover:

- Tie points and D-ring anchor points - confirm secure attachment, no cracking or deformation.
- Handles - inspect for looseness or corrosion.
- Console and engine box mountings - confirm all fasteners are tight.
- Through-hull fittings - inspect for cracks, deterioration, or leakage.
- Drain plugs - inspect O-ring or gasket condition. Replace if cracked or compressed.
- Upholstery mounts - confirm secure attachment.
- Windshield mounts - inspect for looseness or cracking.

Any fittings found to be loose or leaking must be corrected before further operation.

> **⚠ NOTICE**
> This vessel is not designed to be left in the water for extended periods. Store on land overnight and during extended periods of non-use to ensure optimal performance and longevity.

## 7.2 Corrosion Prevention Program

Corrosion is the primary long-term threat to the WaterCar EV - particularly after saltwater use. The vehicle's dual land/water operation creates exposure to both road chemicals and marine corrosion. Follow this program consistently.

### After Every Use

- Rinse the entire vehicle with fresh water - hull exterior, wheel wells, undercarriage, and all accessible metal surfaces.
- Apply WD-40 to all exposed metal components, hinges, fasteners, and connections immediately after rinsing and drying. Keep multiple cans of WD-40 in the vehicle at all times - the care package includes 8–10 cans.
- Flush the outboard engine cooling system with fresh water per Section 5.16.

### Monthly

- Apply marine-grade corrosion inhibitor (e.g., CRC 6-56, Corrosion X, or equivalent) to all electrical connections and terminal boards.
- Inspect battery terminals for corrosion - clean with baking soda solution and wire brush if found; apply dielectric grease after cleaning.
- Inspect zinc sacrificial anodes on hull and outboard - replace when 50% consumed. Saltwater use dramatically accelerates anode consumption.
- Inspect wiring harnesses for abrasion, cracking, or chafing.

## 7.3 WD-40 & Lubrication Program

WD-40 is the primary corrosion inhibitor for the WaterCar EV. Multiple cans are included in your care package. Apply generously after every water use and after every wash.

- Spray all hinge points, pivot points, and mechanical linkages.
- Spray all exposed fasteners, bolts, and hardware.

- Spray all electrical connector housings (exterior only - do not spray into open connectors).
- Spray the outboard engine exterior after flushing and before storage. WaterCar recommends applying WD-40 to all exposed metal components, fasteners, hinges, and connection points after every use - particularly after saltwater operation. Several cans of WD-40 are included with your vehicle shipment for this purpose.

Grease Gun - Zerk Fittings:

The WaterCar EV has multiple zerk (grease) fittings at pivot points throughout the hydraulic wheel and suspension system. Use the included grease gun to grease all fittings:

- After every 10 hours of operation - or monthly, whichever comes first.
- After every water use - saltwater use particularly accelerates grease washout.
- After any extended storage period before returning to service.

## 7.4 Seasonal Storage & Winterization

If the vehicle will be stored for 30 days or more:

1. Charge 48V drive battery to 50–80% state of charge - not full, not empty.
2. Fill outboard fuel tank and add stabilizer per the outboard manufacturer's recommendations.
3. Flush and fog outboard engine per the outboard manufacturer's storage procedure.
4. Charge 12V battery to 50% or above; turn battery switch to OFF for storage.
5. Remove the hull drain plug, and the battery box drain plug if your vehicle is equipped with one (Section 7.5). Store the vehicle level. Confirm bilge is completely dry.
6. Clean and dry all upholstery and canvas - prevent mildew.
7. Apply WD-40 to all exposed metal, hinges, and mechanical linkages.
8. Cover vessel with a breathable cover - not plastic or non-breathable material.
9. Place blocks under axles to keep trailer tires off the ground.
10. Charge batteries at least once every 6 months during storage.

**⚠ NOTICE**

Never store the WaterCar EV outdoors with the hull drain plug installed, or with a removable battery box drain plug installed. Rainwater accumulation adds weight, can damage the bilge pump, reaches the batteries, and creates corrosion risk. Remove the drains that your vehicle's configuration requires and store the vehicle level (Section 7.5).

### Battery Winterization

During seasonal storage or any period of non-use exceeding 60 days:

- Charge both the 48V Eco Battery and 12V Epoch® battery to at least 50% state of charge before storage.
- Turn both batteries OFF using their respective power buttons/switches.
- If storing in an area where temperatures will drop below -4°F (-20°C), remove the 12V Epoch® battery from the vessel and store indoors above freezing.
- Recharge batteries at least once every 6 months during extended storage to prevent deep discharge damage.
- Upon returning to service, charge both batteries fully before operating.

### Electrical System Winterization

- Check all electrical connections and tighten if necessary.

- Spray all exposed electrical connections and terminal ends with a marine-grade anti-corrosion spray or dielectric grease.
- Disconnect battery cables (negative cable first) if the vessel will not be used for more than 90 days.
- Clean battery terminal ends with a solution of baking soda and water. Rinse thoroughly with clean water, dry completely, and apply a coat of dielectric grease before reconnecting or storing.

### Fuel System Winterization

For the Mercury® outboard fuel system during seasonal storage:

- Fill the outboard fuel tank to 95% capacity to minimize condensation. Add fuel stabilizer and conditioner per the outboard manufacturer's recommendations.
- Run the engine long enough to circulate stabilized fuel through the entire system including the carburetor or fuel injection components.
- For storage longer than two months, consider draining the fuel system entirely. Consult the outboard manufacturer’s owner’s manual for complete fuel system winterization procedures.
- Ethanol-blended fuels (E10) are particularly susceptible to phase separation during storage. Keep the tank full and treated to minimize water accumulation.

## 7.5 Water Management & Storage - Battery Box, Bilge, Drain Plug

The WaterCar EV is a hybrid platform - it combines automotive materials, marine materials, and electronic systems. Water management follows the same discipline used with any recreational vessel, with additional attention to the electronic and enclosed components. Water can enter or accumulate through several paths: the hull if the rear drain plug is left installed during storage, the battery box if the front drain is left installed or if the lid is not fully latched, the bilge if pumps or drains are neglected, and interior compartments if seals are not maintained. Each is the owner's responsibility to manage before, during, and after every use.

### Battery Box - Weather-Resistant, NOT Waterproof or Watertight

**⚠ WARNING - THE BATTERY BOX IS WEATHER-RESISTANT, NOT WATERPROOF OR WATERTIGHT**

The battery box provides weather resistance to protect the batteries from typical exposure during use. It is NOT waterproof and NOT watertight. Water can enter the box if the lid is not fully latched, if the seal is damaged, or if the vehicle is left open to rain. Depending on your vehicle's battery box drainage configuration, water that enters the box may remain there until it is physically removed (Section 7.5).

**Inspect the battery box for water intrusion BEFORE every use, DURING extended use, and AFTER every use.**

If water is found in the battery box, do not operate the vehicle. Identify the source, dry the box completely, inspect terminals and connections for corrosion, and confirm the lid seal is intact before returning to service. Confirm the lid is fully latched and seated before every use.

The Eco Battery Gen3 pack itself carries a manufacturer IP67 rating and has its own weatherproofing. However, the pack and its terminals can still corrode when exposed to water, salt, and humidity - just as any marine battery does. The IP67 rating does not eliminate the need for corrosion monitoring. Inspect terminals and connections for signs of corrosion, discoloration, or moisture at every scheduled maintenance interval, and after any incident where water may have entered the box. Apply corrosion inhibitor per the Corrosion Prevention Program (Section 7.2) as part of routine maintenance.

### Drain Plug and Battery Box Drainage - Storage Practice

Water management during storage requires attention to the hull drain plug and to the battery box drainage. The hull drain plug is at the rear of the vehicle. Battery box drainage varies by vehicle configuration - identify which configuration your vehicle has before storing or operating it. The two

configurations are visually distinguishable. Water cannot enter through the hull drain plug when it is installed and secured - but water also cannot exit. If the vehicle is stored outdoors with the hull drain plug still installed, or with a removable battery box drain plug still installed, rainwater collects with no path to drain. Over time, accumulated water damages the bilge, saturates interior components, adds structural loading to the hull, and reaches the batteries.

### Battery Box Drainage - Identify Your Configuration

Before storing or operating the vehicle, identify which battery box drainage configuration your vehicle has:

- **Removable drain plug.** The plug must be removed when the vehicle is stored and reinstalled and secured before the vehicle enters water.
- **One-way drain.** The drain is not removed for storage. Inspect it before each use to confirm it is clear. A clogged one-way drain will not drain the battery box.

Regardless of configuration, inspect the battery box for water before each use.

**Storage:** When the vehicle is stored - particularly outdoors, or in any environment where water can reach the hull - remove the hull drain plug at the rear, and the battery box drain plug if your vehicle is equipped with one. Store the vehicle level. Do NOT elevate the bow. Unlike a conventional bass boat, elevating the bow of the WaterCar EV causes water to pool in the battery box, where standing water must not be allowed. Level storage with the required drains pulled provides the correct drainage path.

Position the vehicle so that water drains toward the drain opening. Store the drain plug where it will be found before the next use.

**THE DRAIN PLUG MUST BE REINSTALLED BEFORE THE VEHICLE ENTERS WATER.**

Some jurisdictions require drain plugs to be removed during overland transport. The operator is responsible for determining and complying with applicable state and local requirements.

Store the vehicle in a covered, dry location whenever possible. If it must be stored outdoors, keep it under a breathable cover with the required drains removed, and do not leave it uncovered or exposed to rain and standing water.

**Pre-launch:** Reinstall and secure the hull drain plug before entering the water, and the battery box drain plug if your vehicle is equipped with one. Verify at every pre-launch inspection. A missing or loose drain plug causes immediate flooding and is one of the most common preventable causes of vessel damage.

**Bilge pumps are not a storage strategy:** The bilge pumps are active-use equipment designed to remove water during operation. Do not rely on the bilge pumps to manage water accumulation during storage. Pumps can fail from a discharged battery, a clogged inlet, or a stuck float switch, and they are not designed for continuous unattended operation over a storage period. During storage, the drains do the work.

### Bilge Awareness

The WaterCar EV is equipped with an automatic bilge pump and a manual override at the helm. During operation, inspect the bilge for accumulated water before every use, test the bilge pump operation as part of the pre-launch checklist, keep the pump inlet clear of debris, and monitor bilge level during operation. If the bilge pump runs continuously during operation, or the water level in the bilge rises, return to shore immediately and identify the source. See Section 5 for full bilge pump operating procedures. As noted above, bilge pumps are active-use equipment and are not a substitute for correct storage drainage practice.

### Outdoor Storage - Not Recommended

The WaterCar EV is not designed for prolonged outdoor exposure. Extended exposure to sun, rain, salt air, and freeze-thaw cycling degrades interior materials, electronic connectors, and coated metals. Because the WaterCar EV combines automotive, marine, and electronic systems, it is subject to the

wear factors of all three simultaneously - the same conditions any recreational vessel or automotive vehicle would face if stored outdoors year-round without cover, compounded across all three categories at once.

**Recommended:** Store the vehicle inside a garage, shop, or fully enclosed building whenever possible. If interior storage is not available, use a full breathable marine cover designed for boat storage - not plastic or non-breathable material - and remove the hull drain plug, and the battery box drain plug if your vehicle is equipped with one, so any water that enters can drain out. Store the vehicle level (see the storage procedure above). After any rain or extended use, open interior compartments and storage lids to allow moisture to escape from the hull and interior. Inspect seals around compartments, hatches, and the battery box lid periodically for wear or degradation - even marine-grade seals allow some water intrusion over time, and worn seals allow substantially more. Even with proper cover, drains pulled, and routine seal inspection, outdoor storage over months and seasons accelerates wear on every material system in the vehicle. Treat outdoor storage as a last resort, not a normal state.

### Charging Supervision

**⚠ WARNING - DO NOT LEAVE THE VEHICLE CHARGING UNATTENDED**

Do not leave the WaterCar EV charging unattended for extended periods. Check on the vehicle periodically during any charging cycle. Verify the battery box lid is fully latched and that no water has entered the box. If the box is not latched during charging, moisture or rain can enter and reach the battery terminals with the system energized.

During any charging session, monitor: charger status indicators (blinking red = charging, solid green = complete), the battery compartment for signs of unusual heat or odor, and the battery box interior for any water intrusion. Disconnect the charger from AC power at the outlet if any abnormal condition is observed.

### Battery Terminal Corrosion Monitoring

Battery terminals in any boat require corrosion monitoring. This is not unique to the WaterCar EV - it is standard marine practice. Salt, humidity, and even fresh water can produce corrosion at battery terminals over time. Left unaddressed, terminal corrosion increases electrical resistance, reduces performance, and can lead to intermittent connections or complete failure.

- Inspect all battery terminals monthly during the operating season and before every extended use.
- Look for green, white, or bluish deposits at terminal posts, cable ends, and hardware. Any deposit is early corrosion.
- Clean any corrosion promptly per the Corrosion Prevention Program (Section 7.2). Apply dielectric grease or a marine-grade corrosion inhibitor to terminals after cleaning.
- Retorque terminal hardware after any service - see the Battery Terminal Service Specifications in Section 3.6 for the Gen 3 torque spec, and confirm the current specification with Eco Battery before servicing.

## 7.6 Recommissioning After Storage

1. Charge both batteries fully before any operation.
2. Inspect all systems visually - look for corrosion, pest damage, or deterioration.
3. Replace any expired safety equipment (VDS, fire extinguisher, PFDs).
4. Verify Mercury annual outboard service is current.
5. Test all lights - headlights, brake lights, turn signals, navigation lights.
6. Test bilge pump - manual and automatic.
7. Inspect all zerk fittings and grease before first use.
8. Inspect the battery box interior for water intrusion or terminal corrosion before first use (Section 7.5).

9. Account for both storage drains - the hull drain plug and battery box drain were removed for storage and must be reinstalled before any water entry (Section 7.5).
10. Complete the Pre-Ride Inspection (Section 4.6) before any road operation.
11. Complete the Pre-Launch Checklist (Section 5.14) before any water operation.

## 7.7 Cleaning & Care

Before using any cleaning product or method on any surface of the vehicle, test it first on a small, inconspicuous area and confirm the result before treating the full surface. A product that is safe on one surface or material may damage another.

### Windshield, Windows & Acrylic Surfaces

Use a liquid household glass cleaner to remove normal dust and dirt. To remove oil, grease, or road tar, use isopropyl alcohol, then wash the surface with water. Dry gently with a soft cloth or chamois.

> ⚠ **NOTICE**
> Do not use abrasive cleaners, combination cleaner-and-wax products, or solvents containing ethyl or methyl alcohol on acrylic surfaces. Do not use products containing ammonia, harsh soaps, or abrasives. Never use gasoline or cleaning solvent - these products will scratch or destroy acrylic surfaces.

### Seats & Upholstery

The interior seating and upholstery supplied with your vehicle are marine upholstery, not automotive upholstery. The upholstery manufacturer's cleaning and care instructions are the controlling specification for your seating - refer to the care instructions provided with your vehicle, or contact the upholstery manufacturer directly, for stain-specific cleaning procedures and the list of approved cleaning products for your specific upholstery.
Because the WaterCar EV parks like an automobile, it is easy to reach for automotive cleaning products and equipment. Several common automotive and household cleaners cause permanent, irreversible damage to marine upholstery and must not be used:

- **Do not use pressure washers.** Pressure washers can generate extremely high pressure that damages the surface of the upholstery and interior.
- **Do not use silicone-based protectants.** Silicone-based products extract the plasticizer from marine vinyl, leaving it hard and brittle, and will eventually cause cracking.
- **Do not use gasoline, kerosene, acetone, dry-cleaning fluids, or lacquer solvents.** These strip the protective marine top coat and can remove printed pattern and gloss.
- **Do not use bleach, powdered abrasives, steel wool, or industrial cleaners.** These cause damage and discoloration.
- **Do not use automotive-style protectants or all-purpose cleaners** (such as products marketed for car interiors) unless specifically approved by the upholstery manufacturer. Many contain dyes, solvents, or silicone that damage marine vinyl.

For routine cleaning, mild soap and warm water is generally safe for marine vinyl, followed by a thorough rinse with clean warm water. Remove stains as soon as possible - some substances, including certain suntan lotions and organic materials, contain dyes that stain permanently. For anything beyond routine cleaning, follow the upholstery manufacturer's stain-specific instructions.
Using improper cleaners, or failing to follow the upholstery manufacturer's care instructions, can permanently damage the interior and may affect the upholstery manufacturer's warranty coverage.

### Interior

Use mild liquid detergent and warm water to clean interior surfaces. Remove detergent residue with a clean, damp cloth.

**⚠ NOTICE**

Do not spray liquids directly into the interior of the vehicle - liquids can damage electrical components. Handle liquids with care. Do not spray water directly into the upper or lower console, dash panel, or switch panel. Do not use high-pressure water on seats or any interior components.

### Exterior Hull & Paint

After each water use - particularly after saltwater or brackish water operation - rinse the exterior with fresh water. Focus on the hull, underside, wheel wells, and all metal fittings. Follow with a thorough WD-40 application to all exposed metal components, fasteners, and hardware. WaterCar includes several cans of WD-40 with every vehicle shipment - use them generously and often per the Corrosion Prevention Program (Section 7.2 and 7.3). For general washing, use mild automotive detergent and a soft sponge or cloth. Avoid high-pressure washing of seals, door edges, electrical connectors, and the Mercury® outboard.

# APPENDIX A
# Delivery & New Owner Reference

## Stainless Steel Care

The WaterCar EV uses 316 stainless steel for rails, fittings, fasteners, and hardware throughout the vessel. While stainless steel is corrosion-resistant, it still requires regular maintenance to prevent pitting and surface degradation, particularly in saltwater environments.

- After each use - especially in saltwater - wash all stainless steel surfaces with mild soap and cold or lukewarm water. Hosing alone will not dislodge embedded salt crystals.
- Dry all stainless steel surfaces thoroughly after washing.
- Apply a marine-grade stainless steel cleaning wax or polish with a soft, dry cloth. Allow to dry, then buff.
- Crevice corrosion (brownish discoloration where two stainless steel pieces meet) is caused by trapped moisture and impurities. Clean with a marine-grade metal polish using a sponge or small-bristled brush.
- Never use abrasive cleaners, steel wool, or chlorine-based detergents on stainless steel. On polished finishes, wipe in the direction of the polish lines - never across them.
- Never use silver cleaners on stainless steel.

**ℹ️ NOTICE - ANTI-SEIZE REQUIRED ON ALL STAINLESS STEEL AND ALUMINUM-TO-STAINLESS THREADS**

Stainless steel is prone to galling - a form of cold welding where threads seize together during or after assembly, making removal impossible without damaging the fastener or the receiving thread. This is especially common where stainless fasteners thread into aluminum components, which are prevalent throughout this vehicle.

**Apply marine-grade anti-seize compound to all stainless steel threads and to all stainless fasteners threading into aluminum before assembly.**

Tighten stainless fasteners slowly and evenly - do not use impact tools on stainless threads. If resistance is felt during tightening, stop immediately, back off, reapply anti-seize, and restart. Forcing a galled fastener will destroy both the bolt and the receiving thread.

Marine-grade anti-seize compound is included in the WaterCar EV care package. Specific callouts throughout this manual identify fasteners and fittings where anti-seize is required.

## Aluminum Hull, Paint & Non-Skid Surfaces

The WaterCar EV hull is constructed of an all-welded aluminum unibody using marine-grade 50-series and aircraft-quality 60-series aluminum alloys. The hull is epoxy-coated via a full 360° rotisserie process, with all internal structural cavities, stringers, and welded seams sealed against marine exposure. Despite this protection, aluminum requires specific maintenance practices that differ from fiberglass vessels. Salt particles and moisture are the primary causes of white spots, pitting, and corrosion on aluminum surfaces.

**Aluminum Hull Washing**

After every use - especially in saltwater - wash the entire hull with a soft cloth and mild marine detergent. Hosing alone will not dislodge all embedded salt crystals. Do not allow soap to dry on coated surfaces. Wash and dry the full circumference of all aluminum components. Apply an aluminum protectorant at least twice per year, or more frequently in saltwater environments. Neglect will cause pitting of the surface which cannot be reversed.

**Painted Surfaces**

Painted exterior surfaces should be waxed at least twice per year with a high-quality marine wax to protect against UV degradation, oxidation, and salt exposure. Do not wax over dirt - wash and rinse thoroughly before waxing. Never apply tape or adhesives directly to painted surfaces. Use care when covering painted surfaces - tarps can trap dirt and cause chafing. Use a frame to keep covers elevated and allow air circulation.

**Non-Skid Deck Surfaces**

Clean non-skid deck areas with a marine-safe deck cleaner and a stiff brush. Apply a non-skid deck protectant every two to three months to prevent dirt, soot, and biological matter from adhering. Use care when applying any protectant to ensure walkways are not made slippery.

**General Cleaning Restrictions**

- Never use abrasive cleaners, abrasive pads, acidic cleaners, or harsh chemicals on aluminum or painted surfaces. Even fine cleaning powders can scratch or burnish a mill-rolled aluminum surface.
- If pressure washing, use only the wide fan nozzle and keep the spray head in continuous motion. Never concentrate high-pressure water on a small area. Do not pressure wash the console, electrical connections, caulked seams, or the Mercury® outboard.
- Inspect and replace all damaged nylon bushings, washers, or other hardware designed to prevent contact between dissimilar metals. Galvanic corrosion between dissimilar metals is accelerated in saltwater environments.
- Whenever electrical or electronic changes are made to the vessel, have a qualified marine technician check aluminum components for stray currents. Ensure all electronic equipment is properly grounded with adequately sized wire.

# Appendix A - Delivery & New Owner Reference

## A.1 Care Package Contents

Every WaterCar EV is delivered with a care package. Inspect and confirm all items at delivery:

- Navigation light pole - check local laws for requirements before use
- Lug nut adapter and extra pack of lugs
- Blade fuses: 3x 5-amp, 3x 15-amp
- Spare 48V main fuse (400 amp)
- Spare 12V accessory fuse (300 amp)
- WD-40 - 8–10 cans. Spray all exposed metal components after every use, especially after water use.
- Red and Tacky Spray Grease - 1 can
- Allen wrench for canopy (if applicable)
- Front tow trailer hitch (if applicable)
- Tow bar hydraulic support angle irons - MUST be used while towing the WaterCar EV
- Eco Battery extension cord (green cord)
- Life jackets - 4 units
- Throw buoy
- Moving blanket
- Red bungee cords (2) - for front deflectors; wear items requiring periodic replacement
- Crescent wrench
- Screwdriver
- Grease gun for zerk fittings
- Scissor jack
- Jumper cables
- Extra Mercury lower unit fluid - 1 bottle
- Stereo plugs and wiring pigtails

## A.2 First-Day Startup After Delivery

Batteries may arrive low or fully discharged due to transport. This is normal.

1. Connect the 48V battery charger (green Eco Battery extension cord) to shore power - charge until the LED shows solid green.
2. Connect the 12V battery to a standard lithium-compatible 12V charger if it reads below 12.4V.
3. Once both batteries are charged, follow the Power-On sequence in Section 4.7.
4. Contact us at WaterCar Sales/Service: (714) 251-6687 if you have any difficulty - call or text anytime.

## A.3 Quick-Start - Land Operation

1. Press and hold 48V battery power button until green LED illuminates.
2. Press and hold 12V battery power button until LED blinks.
3. Turn BOTH red master switches (beside driver's seat) to ON.
4. Turn electric motor key switch to ON - listen for relay click.

5. FNR to NEUTRAL. Confirm the parking brake is disengaged. Select FORWARD. Apply accelerator gradually.

### A.4 Quick-Start - Water Entry

1. Complete Pre-Launch Checklist (Section 5.14).
2. Drive to water's edge. Electric drive key to OFF. FNR to NEUTRAL.
3. Attach kill lanyard to wrist.
4. Enter the water
5. Confirm outboard is tilted fully UP. Enter water slowly. Once floating, lower outboard to approximately 45 - confirm prop submerged before starting.
6. Once floating, start outboard. Confirm cooling tell-tale within 30 seconds.
7. Retract REAR wheels first (hold until pump tone), then FRONT wheels.

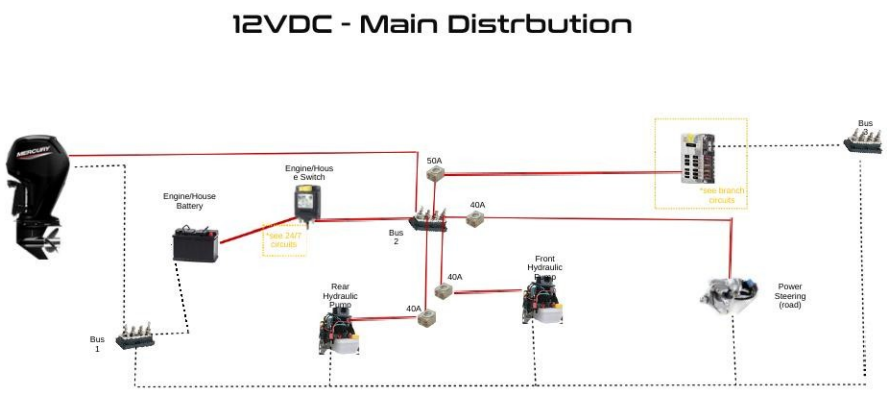
### A.5 Quick-Start - Water Exit

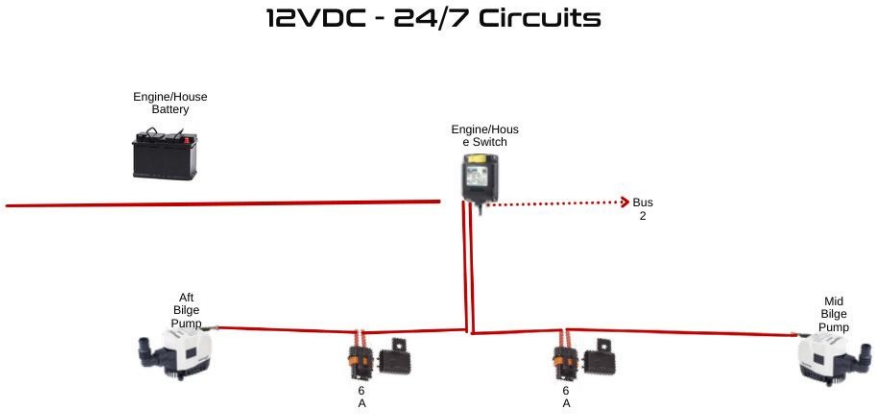
1. Shut down outboard completely. Tilt outboard fully up.
2. Align with ramp. Hull contacts ramp.
3. Deploy FRONT wheels first (hold until pump tone), then REAR wheels.
4. Confirm all wheels fully deployed and locked.
5. Electric drive key ON. FNR to FORWARD. Drive out slowly.
6. Pull clear of ramp and stop. Set the parking brake. Complete post-water inspection (Section 6.4).

## APPENDIX B
# Schematics & Technical Reference

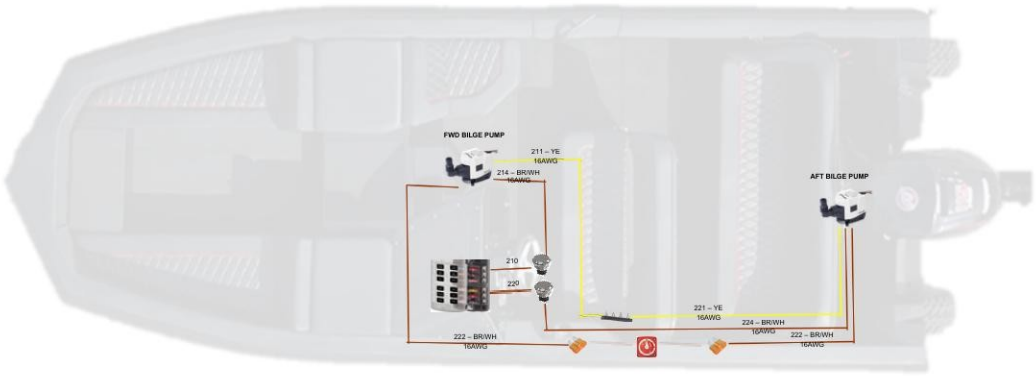
# Appendix B - Schematics & Technical Reference

## Wiring Diagrams

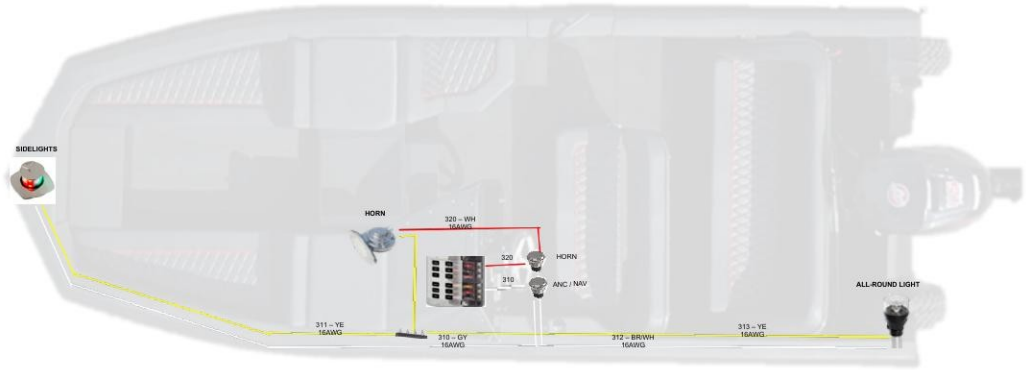


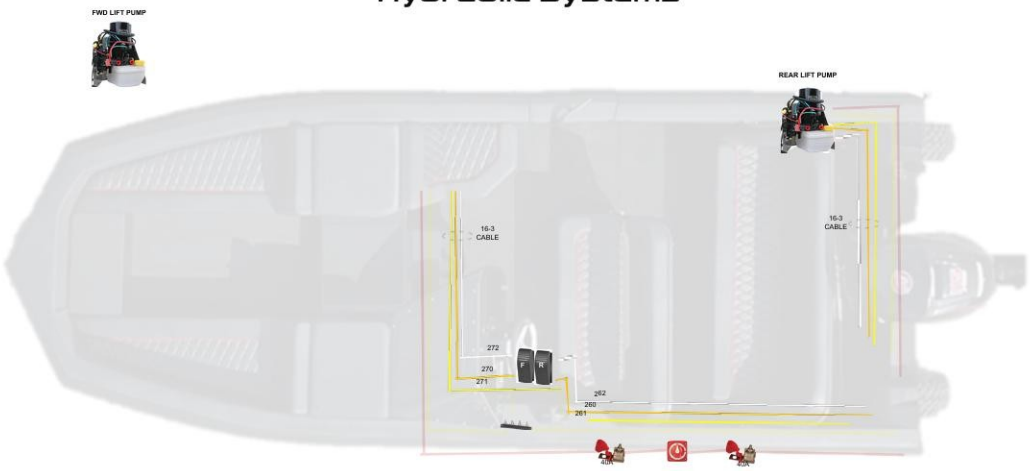
## 12V Branch Circuits - Bilge Pump Systems




## 12V Branch Circuits - Navigation Systems

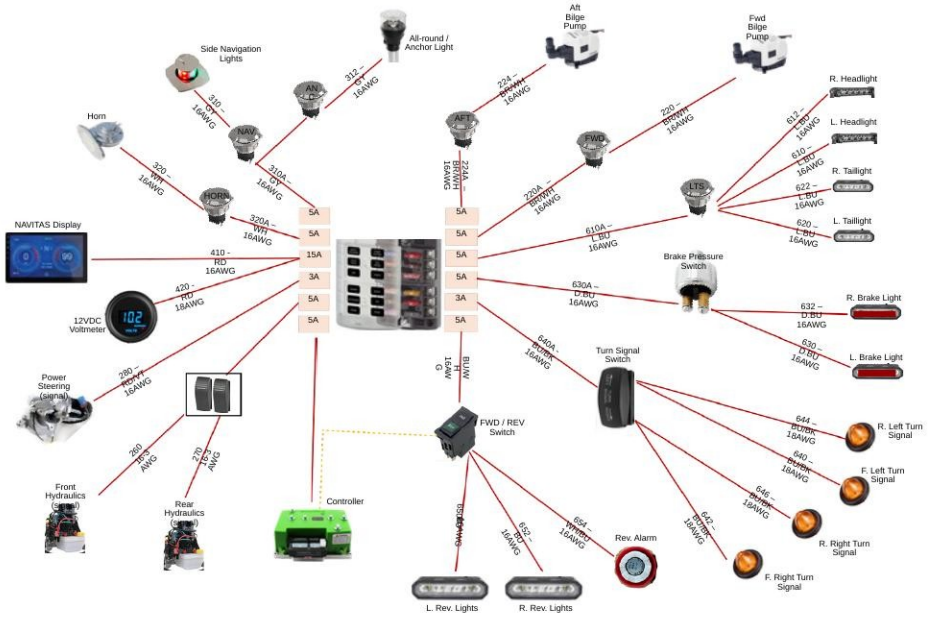


## 12V Branch Circuits - Hydraulic Systems

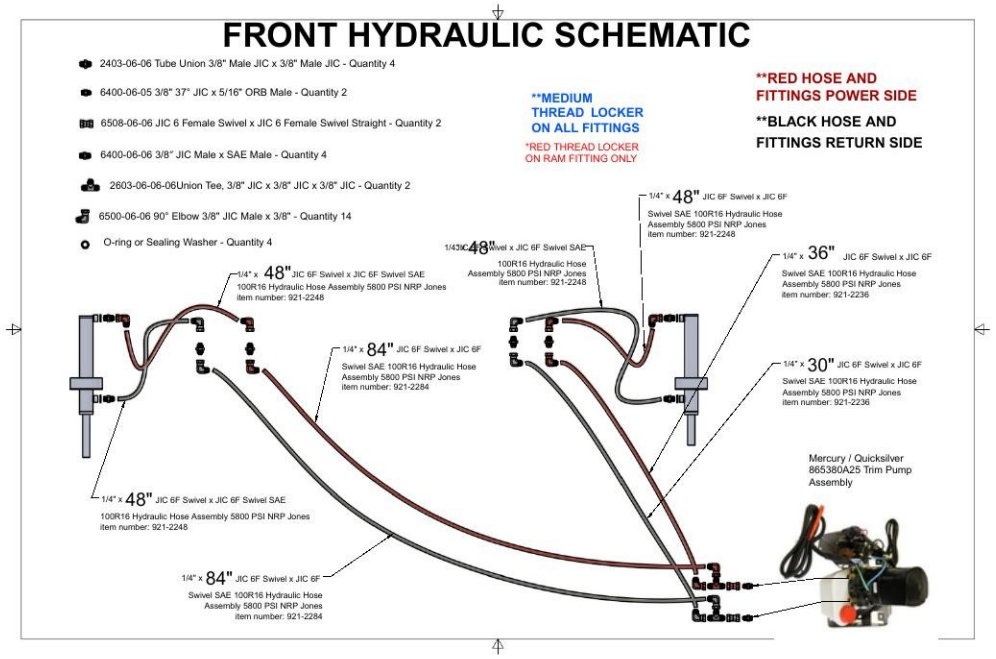


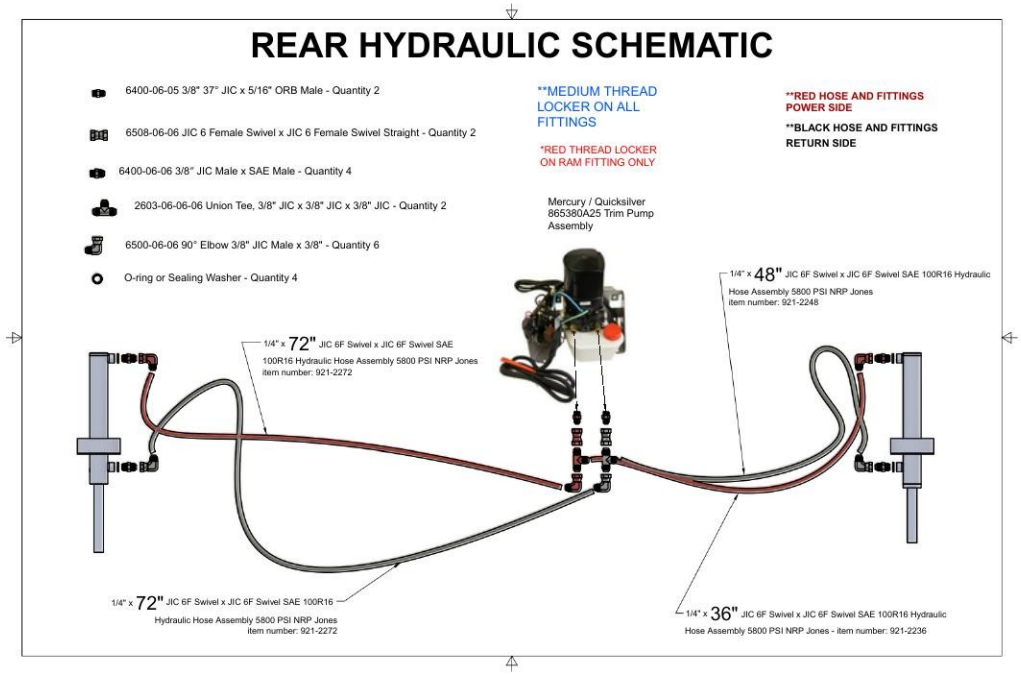

## 12V Branch Circuits - Turn Signals

## 12V Branch Circuits - Helm Fuse Block



## Hydraulic Schematics



**⚠ NOTICE**

Wiring schematics are provided as reference for qualified service technicians only. WaterCar Inc. reserves the right to change or update the electrical system on any unit at any time without prior notice. Contact WaterCar Corporate Headquarters for current electrical schematics applicable to your specific unit's serial number.

- 12VDC - Main Distribution & 24/7 Circuits
- 12V Branch Circuits - Bilge Pump & Auxiliary Systems
- 12V Branch Circuits - Hydraulic Systems & Turn Signals
- 12V Branch Circuits - Helm Fuse Block & Complete Schematic

### Hydraulic Fitting Reference

| Part No. | Description | Qty |
|---|---|---|
| **2403-06-06** | Tube Union 3/8" Male JIC x 3/8" Male JIC | 4 |
| **6400-06-05** | 3/8" 37° JIC x 5/16" ORB Male - Power side | 2 |
| **6508-06-06** | JIC 6 Female Swivel x JIC 6 Female Swivel Straight | 2 |
| **6400-06-06** | 3/8" JIC Male x SAE Male - Return side | 4 |
| **2603-06-06-06** | Union Tee, 3/8" JIC x 3/8" JIC x 3/8" JIC | 2 |
| **6500-06-06 (front)** | 90° Elbow 3/8" JIC Male x 3/8" JIC | 14 |
| **6500-06-06 (rear)** | 90° Elbow 3/8" JIC Male x 3/8" JIC | 6 |

# APPENDIX C
# Warranty & Legal

# Appendix C - Warranty & Legal

## C.1 Warranty

Warranty terms applicable to your WaterCar EV are provided in the purchase documents supplied with your vehicle. Refer to those documents for the controlling warranty terms, coverage, exclusions, duration, and claim procedures. The terms in your purchase documents govern in the event of any conflict with information appearing elsewhere.

For warranty inquiries, contact: WaterCar Inc., 17403 Newhope St., Fountain Valley, CA 92708 - info@watercar.com - (714) 253-7186.

# WaterCar Inc.

17403 Newhope St., Fountain Valley, CA 92708
info@watercar.com | www.watercar.com | (714) 253-7186

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