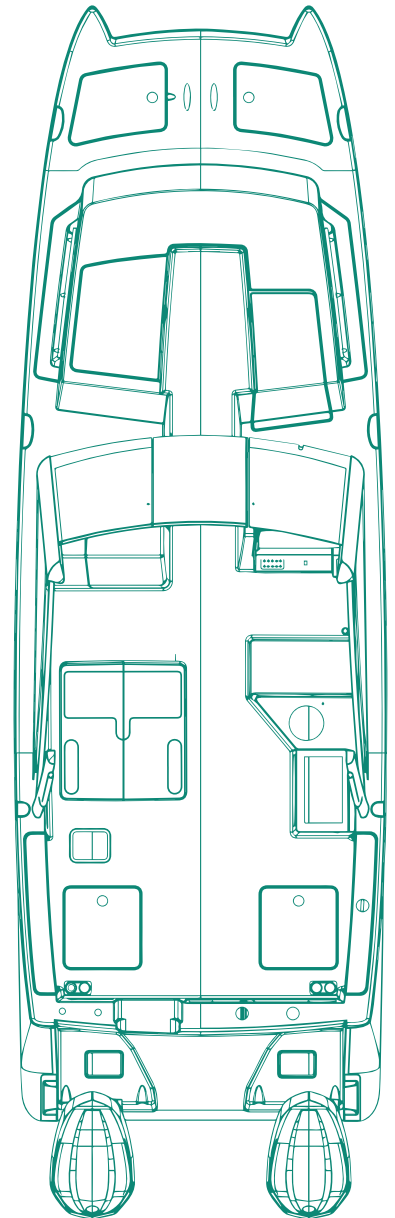


# OWNER'S MANUAL

# 280 DC-X



Dear World Cat Owner:

Thank you for being our customer. Welcome aboard!

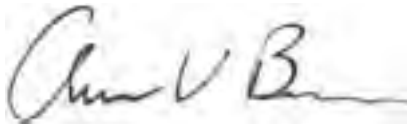
We wish to take this opportunity to sincerely thank you for putting your trust in our boat building team and becoming the newest member of the World Cat Family.

The following manual is designed to ensure you enjoy your new World Cat for many years to come. We have made every effort to ensure you and your family are safe, enjoy the unique features of a World Cat, and continue to love the World Cat ride that no other boat company can offer.

If you should ever need assistance with the care, maintenance, or operation of your boat, then please visit our website at [WorldCat.com](http://WorldCat.com) to find contact information for your nearest Factory Authorized Dealer.

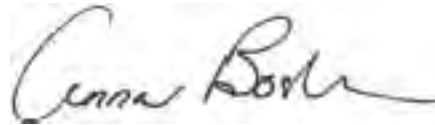
Once again, thank you for becoming a part of our family.

Best Regards,



ANDREW BROWN  
President

Best Regards,



ANNA BOSLER  
Customer Care Representative



1090 West Saint James St., Tarboro, North Carolina 27886

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## Chapter 1: Customer Information

### 1.1 Owner's Portfolio

To help you enjoy the many features, benefits, and accessories on your new World Cat, we have provided you with the following materials:

- World Cat Owner's Manual (model specific)
- Vendor Supplied Manuals for various accessories
- Delivery Checklist
- Warranty Information

We refer to this package as the Owner's Portfolio, and will reference it often throughout this text. The portfolio contains a wealth of information, including advice on safety, operation, performance, maintenance, and warranty. Reading and maintaining this information is extremely important, and could be the difference between a positive and negative experience on the water.

For your convenience, World Cat also provides the NMMA publication *Sportfish, Cruisers, Yachts Owner's Manual*. It will be referenced occasionally in your owner's manual, and provides supplemental information on safety and basic boating practices.

### 1.2 Warranty Information

Upon purchasing your new World Cat, your dealer is responsible for completing the warranty card and returning a copy to the factory. The Dealer should provide you with a copy to keep in a secure place so it can be referenced quickly in the event of a warranty issue. The 10 year limited hull warranty is transferable, and a copy is included at the back of this manual should you decide to sell your boat.

### 1.3 Dealer Responsibilities

Our dealers are an extension of the factory and we expect them to provide you with great customer service to help prepare you for a positive ownership experience. Therefore, we set forth a list of responsibilities for our dealers as follows:

- Provide courteous service and explanation of the product prior to the sale.
- Provide sea trials for potential owners.
- Provide a detailed orientation of your boat's features and general operation upon delivery, including safety and performance.
- Complete and sign delivery checklist.
- Explain, complete, and submit all warranty information in a timely manner after the purchase.
- Provide the customer with the Owner's Portfolio and explain the information included therein.
- Provide service after the sale, or help the customer locate a qualified service shop at home or away.

## 1.4 Owner's Responsibilities

As an owner you should also take an active part in the delivery and safe operation of your new catamaran. Some of your responsibilities are:

- Study and understand the limited warranty information.
- Read all literature in your Owner's Portfolio and operate the vessel in accordance with those instructions.
- Perform a walk through prior to the final delivery and ensure that the systems are functioning properly.
- Maintain the boat and perform service according to the instructions in this manual, including the 20 hour inspection for the vessel and engines.

It is your responsibility to return your boat to an Authorized World Cat Dealer for warranty work. In the event there is no World Cat dealer within a 100 mile radius of your boating location, it is your responsibility to present the boat to a marine professional in your area as directed and approved by World Cat.

Once your warranty information is processed, World Cat will maintain a record of your boat using the Hull Identification Number (HIN), which is located on the starboard side of the transom. Information regarding the dealership, owner, and the factory installed accessories will be recorded to help you should a problem arise. Also, you will receive a survey to rate your purchasing experience and the initial impressions of our company. We ask that you join our family of owners and let us know your feelings about the purchase and the quality of our product.

## 1.5 Manual Legend

Throughout this manual you will encounter signals to alert of important information. Text printed in bold letters and the warning system shown below is of particular importance. Please review this information prior to reading the manual.

### **!!! DANGER**

This symbol alerts you to hazards or unsafe practices which will cause extensive property damage, severe personal injury or death if the warning is ignored.

### **!!! WARNING**

This symbol alerts you to hazards or unsafe practices which can cause extensive property damage, severe personal injury or death if the warning is ignored.

### **!!! CAUTION**

This symbol alerts you to hazards or unsafe practices which can cause personal injury or property damage if the warning is ignored.

### **NOTICE**

This symbol is not hazard related. It contains information on installation, operation, or maintenance which is needed to ensure the proper operation of your boat.

## Chapter 2: Boat Information

Please fill out the following information and leave in this manual for reference. This information will be important for your Authorized Dealer to provide fast and accurate service. To locate an authorized dealer call 866-485-8899 or email [service@worldcat.com](mailto:service@worldcat.com).

<b>BOAT</b>	
Model:	HIN:
Purchase Date:	Delivery Date:
Ignition Key #:	Door Key #:
<b>ENGINES</b>	
Make:	Model:
Serial # Port:	Serial # Sbd:
Propeller Make / Model:	Propeller Diameter / Pitch:
<b>TRAILER</b>	
Make:	Model:
Serial # Port:	Serial # Sbd:
<b>DEALER</b>	
Name:	Salesman:
Dealer Phone:	Service Manager:



# 280DC-X

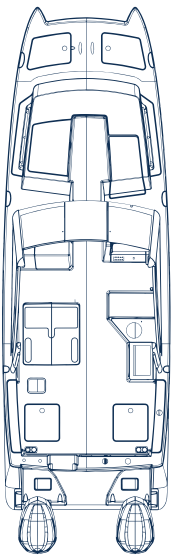
THE DUAL CONSOLE... ELEVATED



LENGTH	BEAM	FUEL CAPACITY	DRY WEIGHT	DRAFT
27' 6"	9' 2"	220 gal	7,250 lbs	14"

## SPECS

- Length: 27' 6"
- Beam: 9' 2"
- Draft: 14"
- Freeboard Aft: 27"
- Transom Height: 25"
- Dry Weight w/ Power (approx): 7,250 lbs
- Max HP Rating: 400 HP (2 x 200 HP)
- Fuel Capacity: 220 gal (2 x 110 gal)
- Livewell Capacity: 20 gal (optional)
- Freshwater Capacity: 16.5 gal
- Wastewater Capacity: 9 gal
- Trailer Height\*: 9' 6"
- Bridge Clearance\*: 8' 4"
- Cockpit Length: 56"
- Typical Cruise: 29.7 mph / 2.0 mpg
- Typical WOT: 45.8 mph / 1.2 mpg
- Passenger Capacity: 11



## HIGHLIGHTS

- Massive step-in bow storage closet w/ space for anything you can imagine
- Frameless windshield & black dash designed to maximize visibility
- Ample bow & cockpit seating

\*Measured keel to top of fiberglass hardtop w/ no outriggers or electronics installed (not including trailer)

# 280DC-X

Experience the Ultimate Sea Trial™ - find your closest dealer at WorldCat.com

## FEATURES

### Power

- Yamaha 200 HP Digital 4-strokes w/ Command Link Plus® gauge, rigging, controls, & props

### Bow

- Aggressive bow styling w/ integrated LED docking lights, surrounding fascia, & World Cat lettering
- Deluxe, extremely comfortable bow seating for 6
- Anchor locker w/ (2) hatches & raw water washdown hose in port locker
- Massive starboard storage area w/ easy-access & space to store anything you can imagine
- Insulated 180 qt. port storage compartment w/ overboard drain
- Port & starboard drink holders & 6 qt. personal storage areas under gunwales
- Integrated through-hull concealed windlass system w/ S.S. breastplate, 300' line, 15' chain, & 22 lb. anchor

### Helm

- Fiberglass top w/ surfboard edge & powdercoated frame; includes radio box, spreader lights, & LED underside lights
- Innovative frameless windshield maximizes visibility – hinged panel leads to bow seats
- Ergonomically-designed fiberglass console enables commanding view; stitched matte vinyl top for high dash visibility in bright light
- Fusion® marine stereo w/ (4) JL Audio speakers, & Bluetooth

- Massive, fiberglass-lined head compartment w/ fresh water head system, 9 gal. holding tank, & overboard discharge
- Head includes Corian® counter, mirror, & toiletries storage
- Available 20 gal. insulated livewell w/ 1,100 gph magnetic drive pump, overboard drain, & clear lid
- Optimus Electronic Steering System

### Cockpit/Stern

- Versatile double-wide cockpit seat that converts from front to rear-facing w/ easily-operated foot pedal
- Huge fishing area, w/ 360° cockpit bolsters
- Twin in-floor mechanical rooms w/ large hatches that allow easy access / service for bilge, pumps, & other equipment
- (4) gunwale-mounted S.S. rod holders
- Additional rod holders on back legs of hardtop frame (3/side)
- Aft fold-down transom seating for 2 w/ adjacent 12v / USB outlets
- Walk-through transom w/ latched door provides easy access to swim platform
- User-friendly On-Ramp™ swim ladder & swim platform

### Misc.

- ProMariner ProSport 20plus 3-bank waterproof charger (20A, 50 / 60Hz 90-135VAC)
- CE Certification

## OPTIONS

### Accessories

- Polished S.S. anchor (replaces standard galvanized anchor)
- Fishing package including 20 gal. livewell w/ clear lid, & (5) rod hardtop-mounted rocket launchers
- Retractable heavy-duty transom-mounted ski pylon
- Bow filler cushion
- Bow table
- Woven Sea Grass cockpit flooring w/ rubber backing & S.S. snaps
- Cockpit grill - 1,300W w/ 2 batteries & inverter charger
- Cockpit refrigerator (replaces standard cooler)
- Helm windshield wiper w/ rinse

### Electronics

- Single Garmin GPSMAP® 8612xsv 12" multi-touch widescreen Chartplotter / Sonar Combo, Airmar B175M transducer, dark-tinted acrylic dash, Garmin 110 VHF w/ 8' antenna
- Stereo upgrade – JL Audio 800W Amp, (4) speakers upgraded to 6.5" JL Audio M-Series speakers, & (2) additional 8.8" M-Series speakers
- LED underwater lights (blue)

### Steering Systems

- Optimus 360 System w/ electronic steering, joystick, SeaStation, & SeaWays auto-pilot
- Edson satin-finish steering wheel w/ power knob

### Top

- Hardtop underside color: Fighting Lady Yellow, Tanglewood Tan, Platinum Gray, Ice Blue
- SureShade® manually retractable hardtop shade w/ Sunbrella® canvas (Cadet Gray)
- Taco Marine® 380 Grand Slam™ XL top-mount outriggers w/ 18' telescoping poles
- Taylor Made Products™ bow shade
- Enclosure tracking on windshield

### Hull Colors

- Full-hull or two-tone hull color
- Fighting Lady Yellow, Tanglewood Tan, Platinum Gray, Ice Blue, Petrol Blue



## Chapter 4: Safety and Regulations

### 4.1 Operator Responsibilities

Prior to enjoying your World Cat, it is important to read and understand all the information detailed in your Owner's Portfolio. Knowing how to operate and maintain the systems on your vessel can make your experiences safe and enjoyable, as well as increase the performance and longevity of your boat. Federal law and most state laws clearly indicate that it is the operator's responsibility to maintain their vessel, and to operate it in a manner which protects the safety of their passengers and others. Reference page 10 of the *Sportfish, Cruisers, Yachts Owner's Manual* for a detailed list of owner responsibilities.

This manual will provide you a basic understanding of boating practices; however, we recommend all owners review federal, state, and local regulations regarding safety and traffic prior to using your World Cat. The U.S. Coast Guard Auxiliary and U.S. Power Squadrons offer excellent educational opportunities on a local level and are open to anyone. If a chapter does not exist in your area, reference page 10 of the *Sportfish, Cruisers, Yachts Owner's Manual* or contact the following numbers for other educational opportunities:

Boating Education Hotline	1-800-336-BOAT (2628)
U.S. Coast Guard Boating Hotline	1-800-368-5647

### 4.2 Registration

Vessels are required by federal and state law to be registered in the state where they are primarily used. Registration numbers and validation stickers must be displayed per regulations, and a certificate of registration must be on board while the vessel is being operated. When traveling away from your home waters, contact authorities at your destination to determine if any additional registration is required. Some areas require permits or temporary registrations to operate in their waters. When completing registration forms you will be asked for the Hull Identification Number (HIN). On your World Cat, the HIN is located on the starboard side of the transom. This number is unique to your boat and will be important for registering your vessel, as well as communicating with your dealer and our service department. Including this information in any correspondence or conversations will help our support network serve you better.

### 4.3 Coast Guard Required Safety Equipment

Once you have reviewed safe boating guidelines and filed for registration, it is time to equip your vessel. The U.S. Coast Guard's (U.S.C.G.) list of required equipment is shown below. To review the guidelines for each item, reference pages 23 and 24 of the *Sportfish, Cruisers, Yachts Owner's Manual* or go to <https://www.uscgboating.org/images/420.PDF>.

- Audible Signaling Device (Bell, Horn, or Whistle)
- Fire Extinguisher
- Navigation / Anchor Lights
- Personal Flotation Devices (PFD's)
- Visual Signaling Devices

## NOTICE

Remember to check with state and local agencies to ensure that additional items are not required to operate your boat in their waterways.

#### 4.4 Recommended Safety Equipment

Although not required, there are several additional items which help to ensure safety, and provide convenience for you and passengers. A list of these items can be found in the *Sportfish, Cruisers, Yachts Owner's Manual* on page 24. Perform an annual inventory to keep tools, spare parts, and safety equipment in good condition. Immediately replace any items that have been removed from the kit.

### !!! CAUTION

Use only marine grade replacement parts. Most automotive and residential parts are not suitable for use in the harsh marine environment. Using them could lead to premature product failure, property damage, or personal injury.

#### 4.4.1 NMMA Yacht Certification

The NMMA seal means your World Cat is certified by the National Marine Manufacturers Association. With this tag, you are assured your fuel system, electrical system, lighting, ventilation, and steering are not only in compliance with US Coast Guard regulations, but also meet the more stringent standards of the NMMA. The NMMA is a national trade organization serving all elements of the recreational boating industry including manufacturers of boating equipment. With this tag, you can have confidence in the safety of your boat.

Pursuant to NMMA certification, all World Cats over 26' in length are "Yacht Certified" and carry an appropriate placard. Person and gear capacities are not predetermined, they are left to the operator's discretion. Therefore, the amount of load allowed onboard should result from considering all safety precautions.

Horsepower ratings, however, are set by World Cat and should not be exceeded. Exceeding the factory recommendation will result in loss of warranty coverage on your vessel.

### !!! WARNING

Exceeding capacity or recommended horsepower can endanger your passengers and vessel, as well as voiding any warranty remaining on the boat should failure occur. The maximum horsepower rating for your 280DC-X is 400 total horse power.

#### 4.5 Pollution Regulations

The Refuse Act of 1899 prohibits throwing, discharging or depositing any refuse matter of any kind (including trash, garbage, oil and other liquid pollutants) into the waters of the United States. This information is provided in a pamphlet that is normally received when registering your boat. Use the information below as a guideline, but study the pamphlet and understand any local regulations regarding pollution control. As the operator, you are also liable for individuals on your vessel disposing of materials in an improper manner.

#### 4.5.1 Oil and Hazardous Substances

The Federal Water Pollution Control Act prohibits the discharge of oil or hazardous substances which may be harmful into U.S. navigable water. Vessels 26' in length and over must display a placard at least 5" x 8", made of durable material. The placard must be installed in a conspicuous place in the rigging compartments or near the bilge pumps and state the following:

#### DISCHARGE OF OIL PROHIBITED

##### The Federal Water Pollution Control Act

prohibits the discharge of oil or oily waste into or upon the navigable waters of the United States, or the waters of the contiguous zone, or which may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States, if such discharge causes a film or discoloration of the surface of the water or causes a sludge or emulsion beneath the surface of the water. Violators are subject to substantial civil penalties and/or criminal sanctions, including fines and imprisonment.



Report all discharges to the  
National Response Center at 1-800-424-8802  
or to your local U.S. Coast Guard office  
by phone or VHF radio, Channel 16.



#### 4.5.2 Disposal of Plastics / Dunnage / Garbage

Boats 26' in length and over must display a Save Our Seas Placard which outlines the rules for dumping waste offshore. The placards must be at least 4" x 9" and should be displayed in an area visible during normal operation. They can be purchased from your dealer or marine equipment suppliers.



#### 4.6 Boating Safety Guidelines

As an owner / operator you should be prepared to handle any situation which arises before departure, while underway, or upon return to dock. Careful planning will add safety and pleasure to your experience and give you the confidence to handle emergencies if they develop. Listed below are some general guidelines which you should follow before any trip:

##### 4.6.1 Pre-Departure

- Establish a float plan and provide it to a person whom you trust. The plan should give the details of your trip, including where you are going and when you expect to return. If you deviate from the plan, notify that person as soon as possible.
- If you anticipate operating in a new area, understand the local rules and request charts or information on any hazards you may not be aware of.
- If you are towing the boat, inspect the trailer including tires, lights, brakes, winch, and overall mechanical appearance. See *Sportfish, Cruisers, Yachts Owner's Manual*, page 105.
- Verify that you have all necessary safety equipment. This should include all the USCG required equipment as well as spare parts or other items you decided to include.
- Check fuel levels and determine if you require additional fuel for your trip.
- Examine the weight of the gear on your vessel and make sure you are not overloaded. Distribute the weight evenly on your vessel to ensure predictable performance.

##### 4.6.2 Launching

- Prepare your boat prior to backing down, (i.e. secure all loose items, install garboard drain), then launch your vessel and move away quickly.
- Move your vessel away from the dock and complete a full system check. Ensure that electronics, pumps, and safety equipment are in working order.
- Instruct a passenger on the operation of the boat, and the location and function of all safety equipment onboard. You should never be the only person capable of safely operating your vessel.

##### 4.6.3 Underway (See Chapter 5 on Performance)

- Obey all "Rules of the Road" and any local regulations. Use the information located on page 25 of the *Sportfish, Cruisers, Yachts Owner's Manual* to understand right-of-way and the various navigational and hazard indicators you will see on the water.
- Never operate a boat under the influence of alcohol or drugs.
- Do not allow individuals under the age of 16 to operate the vessel. Maintain direct supervision of inexperienced operators.
- Ensure that all passengers are safely seated while underway, and are using the hand rails World Cat has provided to remain securely in their seats.

- Use your electronics and judgment to remain abreast of changing weather. Storms develop quickly and you should be prepared to protect your passengers and vessel. See page 22 of the *Sportfish, Cruisers, Yachts Owner's Manual* for more tips on weather.
- Maintain a safe speed and respect other boaters as well as those on land. Obey all “No Wake Zones” and be aware of smaller vessels. The wake you produce could endanger other crafts and their passengers.
- Know the limitations of your craft and your experience. Understand the boat’s handling characteristics and do not attempt to operate the vessel in conditions that are unsafe or beyond your experience level.

#### 4.6.4 Returning

- Obey navigational markers and be aware of any tidal changes since departure.
- Collect and dispose of refuse properly to maintain our waters for future generations.
- Prepare your boat for loading before moving to the dock. Quickly pull your vessel from the water and move away from the ramp to complete the preparation for trailering.
- Verify that trailer systems are working properly and all items are secured before leaving.
- Wash the boat and perform general maintenance upon returning home. (See instructions in Chapter 5).

As stated above, these are only general guidelines for safe boating. We recommend using these and any other available resources to protect your passengers as well as your vessel. Checklists can be an important tool in accomplishing this; see the example on pages 44 & 45 of the *Sportfish, Cruisers, Yachts Owner's Manual*.

#### 4.7 Trailering

Due to the nature of the hull, catamarans require specialized trailers. Your dealer will be able to provide one, as well as information on safe trailering practices. Tow vehicles should be rated to handle the load and stresses which accompany trailering your boat. A properly matched trailer should carry 5-10% of the total vessel weight on the tongue. Routine inspections should be performed on the vehicle and trailer prior to each trip, and thorough checks scheduled on an annual basis.

#### 4.8 Anchoring

World Cat supplies an anchor and anchor windlass as standard equipment on the 280DC-X. The anchor we supply is known as a plow style. However, there are several types of anchors available, each designed to operate in specific bottom conditions. Your dealer can provide information on which styles are most effective in your area. See page 56 of the *Sportfish, Cruisers, Yachts Owner's Manual* for more information and tips concerning anchoring.

### !!! CAUTION

Never anchor your boat off the stern. The weight at the transom, combined with adverse sea conditions could allow water to enter the boat over the transom wall.

#### 4.9 Shallow Water

Although your World Cat draws a small amount of water for its size, shallow water should be a concern of all boaters. To avoid this hazard, pay particular attention to navigational markers and know the area you are operating in. Be aware of tidal changes, including those that have occurred during your trip. Rocks, stumps, or other hazards are more prevalent in shallow water and can cause major damage to your hull bottom. Engines can also suffer damage if they are allowed to run in the sand or mud.

If you do become grounded, tilt the motors up to reduce the draft at the transom. Often this will solve the problem; however, it may be necessary to rock the boat from side to side to break the suction along the keel. If you are grounded on an incoming tide, allowing the water to rise can help. Being grounded on an outgoing tide is a larger issue, you need to act quickly to free your boat and avoid being driven further aground. Use the anchor to secure the boat and await the incoming tide, or use it to pull yourself free.

#### 4.10 Emergency Situations

Unfortunately, even the safest boating practices cannot eliminate the potential of emergency situations developing. Therefore you should prepare yourself, and your crew, to handle any problems that may arise. Establish specific plans for fires, man overboard, collision, etc., and review them with your passengers prior to departing. Planning allows people to remain calm, and gives everyone the confidence to resolve the problem. Section 4 of the *Sportfish, Cruisers, Yachts Owner's Manual* provides information on emergency procedures. Below is important information which all owners should be aware.

##### 4.10.1 Emergency Stop Switch

Lanyard clips are provided on all World Cats and when used properly, provide an emergency stop for the engines should the driver fall from the helm position, or need to perform an emergency shutdown to respond to or avoid an accident. The clip attaches the driver to the ignition panel using a cord. A pull on the cord will release the clip from the shut-off switch on the panel and shut down the engines. To restart the engines, turn ignition switches to the off position, return binnacle to neutral position, insert safety lanyard back into clip, and then turn ignition switches back on. This should only be used to prevent or react to accidents, and the operator is solely responsible for the decision.



##### 4.10.2 Communication

If you witness an emergency or become involved in one, you should request assistance via radio communication or visual signals. Review the information in Section 4 of the *Sportfish, Cruisers, Yachts Owner's Manual* for detailed information on how and when to request assistance.

##### 4.10.3 Rendering Assistance

Owners are required by law to render assistance to other boaters involved in an emergency situation such as fire, collision, casualty, etc., as long as it does not endanger your vessel or its passengers.

##### 4.10.4 Reporting Accidents

Federal regulations require that operators involved in an accident file a written account of the situation within 48 hours. Reports should be submitted to the State Boating Law Administrator. You can obtain forms through the USCG or local authorities (i.e. harbor patrol, sheriff or police offices). In the event that a casualty or disappearance occurs as the result of an accident, you must notify the authorities immediately by phone or radio and fill out a written statement.

#### 4.10.5 Weather

Pay attention to weather patterns. If you find yourself in the path of a storm, seek shelter immediately. If you cannot reach a dock, seek refuge inside the boat while the storm advances. Never get in the water and stay clear of metal components on your boat. If lightning strikes, it would likely pass through metal objects seeking a ground.

#### 4.10.6 Towing

Due to an accident or loss of power, it may become necessary to tow another vessel or have your boat towed. If you are providing assistance, never attempt to tow a boat larger than your own. Be certain to use proper lines (ropes) and rational judgment to prevent further damage. Tow lines are under heavy strain, therefore passengers should remain clear of the lines to protect themselves from injury. For more information on towing, reference page 39 of the *Sportfish, Cruisers, Yachts Owner's Manual*.

#### 4.11 Carbon Monoxide (CO)

### !!! DANGER

Carbon Monoxide (CO) is a colorless, odorless, and tasteless gas produced by the exhaust system of any combustible engine. CO can cause brain damage or death if inhaled over an extended period of time. To protect yourself and your passengers, never block the ventilation outlets in cabins, consoles, or other enclosed spaces.

One of the most important considerations when dealing with boating safety is carbon monoxide. Commonly referred to as CO, carbon monoxide is a colorless, odorless, and tasteless gas emitted from any engine exhaust. Including inboards and outboards. A CO particle is close in weight to the air we consume; therefore it does not rise or fall in the atmosphere, but accumulates in enclosed spaces. Boat owners with enclosed heads, cabins, or canvas enclosures should pay particular attention to CO. Be aware that fumes produced on your boat can affect other vessels and other boats can affect you. A primary concern is the use of generators when boats are moored adjacent to each other.

Carbon Monoxide is poisonous and potentially fatal if inhaled over an extended period of time. Symptoms of CO poisoning include:

- Dizziness
- Nausea / Vomiting
- Headache / Throbbing in the temples
- Fatigue
- Muscular twitching
- Inability to focus or think clearly

If you or any of passengers experience any of these symptoms, leave the area and find a source of fresh air immediately. If your symptoms persist, seek medical attention.



## Chapter 5: Performance

### 5.1 Overview

This chapter will provide information on the performance characteristics of your catamaran. This is not a substitute for seamanship training or hands-on experience. First time boat owners should use the resources detailed in Chapter 4 to learn proper methods of boat operation. Experienced boaters who have never owned a catamaran should study this chapter completely. Do not assume that previous boating experience will apply to all situations, as there are several subtle differences in the handling characteristics of twin hulled boats. For experienced catamaran owners, this chapter should be a reference.

### 5.2 Motor Trim

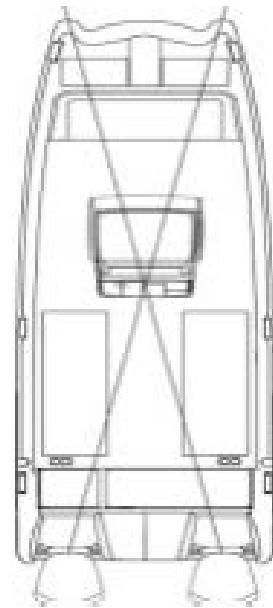
The smooth riding characteristics of a catamaran are a result of the twin hull design. Their ability to slice through oncoming waves is far superior to the pounding characteristics seen on conventional vessels. Motor trim plays an integral part in how your catamaran accomplishes this. In a level or bow down attitude, your boat will slice through larger chop but you may experience sluggish performance, a wetter ride and increased bow steering in a following sea. In a bow up attitude the boat will perform better, but may ride less smoothly. Experiment with the trim settings in various sea conditions to determine what you are most comfortable with. When using the trim to correct a listing condition, imagine an "X" connecting the starboard engine to the port bow, and port engine to the starboard bow (see drawing below).

#### 5.2.1 Bow Up Condition

To correct a bow up condition on the port sponson, adjust the motor trim "down" on the starboard engine. This will help the starboard sponson to rise and level the vessel. If moving to the lowest trim setting on the starboard engine does not correct the list, trim the port engine "up" to assist the change. Reverse the instructions to accommodate for a bow up condition on the starboard sponson.

#### 5.2.2 Bow Down Condition

To correct a bow down condition on the port sponson, adjust the motor trim "up" on the starboard engine. This will help the starboard sponson to fall and level the vessel. If cavitation occurs on the starboard engine, lower it to correct the problem, then trim the port engine "down" to assist the change. Reverse the instructions to accommodate for a bow down condition on the starboard sponson.



### 5.3 Engine Controls

All factory rigged boats will come equipped with a binnacle control specific to your type of engine. Located at the helm, the binnacle controls the throttle, shift, and trim mechanisms for your engine. For diagrams and general information about this system, review pages 80 thru 83 of the *Sportfish, Cruisers, Yachts Owner's Manual*. Also read the owner's manual provided by your engine manufacturer to determine how to operate the features on your binnacle. If any components of this system need to be replaced, be certain to use the same style and length as the original equipment.



## 5.4 Steering Controls

Catamarans offer unsurpassed steering control. The wide spacing of the engines, advanced steering components, and handling characteristics of the World Cat hull give operators exceptional maneuverability in even the tightest spaces.

Because of the superior tracking abilities of the World Cat hull, over-steering can present a problem, especially for owners accustomed to operating conventional boats. Conventional vessels have a tendency to lose tracking abilities in rough and following sea conditions, making constant course corrections necessary. However, catamarans do not exhibit those traits and require operators to take a “hands off” approach. To do so, relax your grip and resist the urge to make constant corrections.

## 5.5 Steering Maintenance - Twin Engines

The design of a catamaran hull requires a special steering system which features a “liquid tie-bar”, as opposed to the mechanical version used in conventional boats. For this reason your World Cat is equipped with a hydraulic steering system, featuring steering cylinders mounted on each engine and a steering system valve. This system enables both engines to respond in unison to adjustments at the helm.

In order to maintain the excellent steering characteristics of your boat, occasionally you will need to adjust the steering system to realign the motors (known as motor toe). To do so, follow these instructions:

- Using the helm, center the starboard motor.
- Find the steering system valve, located under the inspection port on the center of the transom.
- Open the valve by rotating it 90 degrees (the handle will be parallel to the valve body when open). This will isolate the port engine, so that it can be adjusted manually.
- Center the port motor manually; then close the steering system ball valve and reinstall the inspection port.

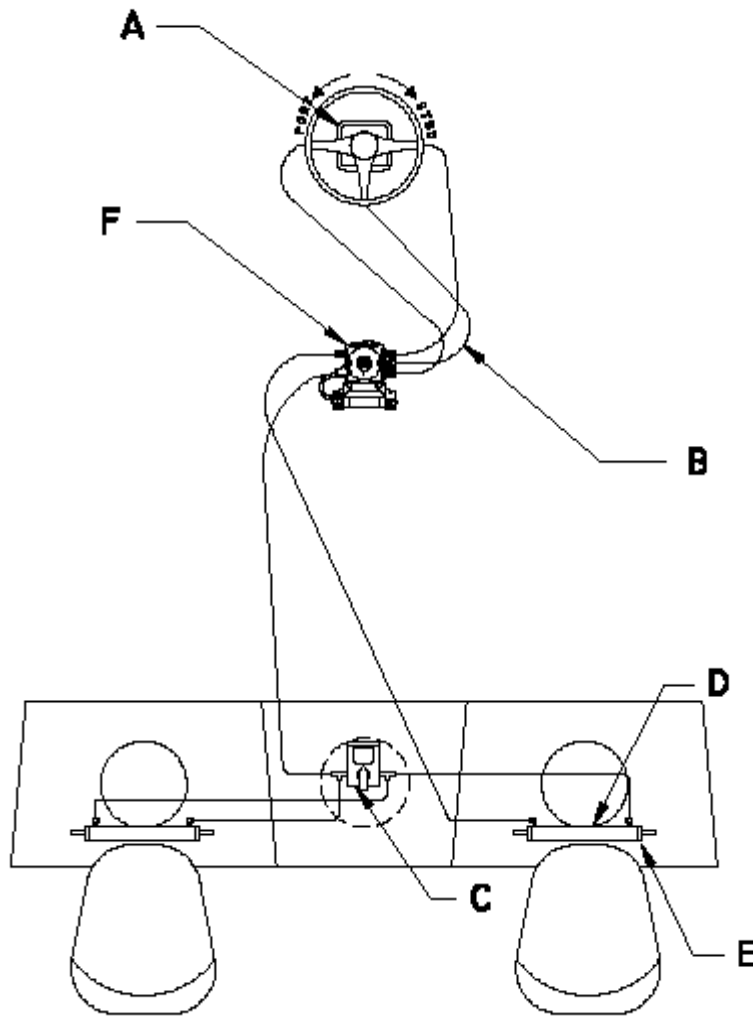
Similar to hydraulic braking systems in an automobile, it may become necessary to bleed the steering system occasionally to remove air from the lines. We have provided diagrams of the steering system in section 5.6 and 5.7, and the Teleflex™ owner’s manual in your Owner’s Portfolio. Use these resources, and your dealer, to keep the steering system in excellent working order. Be aware, these are routine maintenance procedures and are not covered under warranty by World Cat.

### **!!! CAUTION**

Routinely check hydraulic fluid levels and all connections for leaks or any sign of mechanical failure. Lubricate all mechanical parts at least annually with high quality marine grease. Failure to do so may result in impaired or unresponsive steering.

### 5.6 Power Steering System Diagram

This is a representation of a typical World Cat power steering system. The lengths of the steering hoses and pigtails will vary depending on the model.



<u>ITEM</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>
A	SEA STAR II HELM	1
B	KEVLAR STEERING HOSE	2
C	STEERING SYSTEM VALVE	1
D	KEVLAR PIGTAIL 4'-6'	3
E	STEERING CYLINDERS	2
F	TELEFLEX POWER STEERING PUMP	1

## 5.7 Power Steering System - Bleeding Instructions

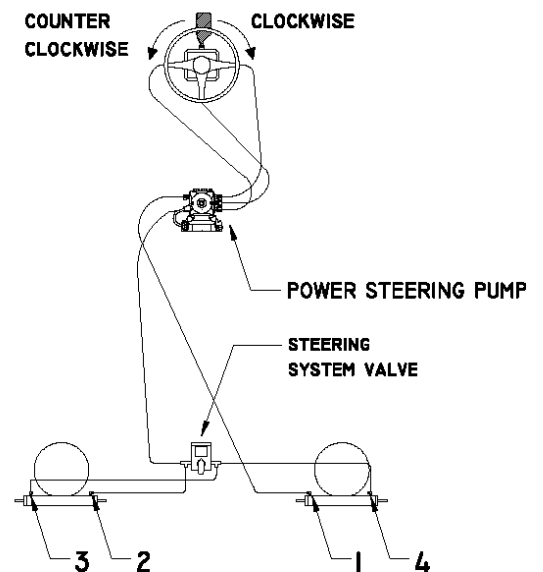
Reference the bleeding instructions provided by the Teleflex™ owner's manual, which is included in your Owner's Portfolio. Use them in conjunction with the instructions and diagram below to bleed the steering system. This should be done annually only by a trained technician; any faulty parts should be replaced immediately.

### NOTICE

World Cat strongly suggests you have your dealer or trained marine technician perform routine maintenance or repairs on your steering system. Improper repairs may result in impaired or unresponsive steering, which could pose risk of damage or injury.

#### 5.7.1 Step 1

- With the Power Purge turned "OFF", attach helm fitting and leads.
- Attach one of the leads to the bleeder valve on the Power Assist Pump.
- Open the bleeder valve using a 5/8" wrench.
- Turn the Power Purge unit "ON".
- Watch for air bubbles in the clear hydraulic lines. Once no more bubbles can be seen and there is a steady flow of hydraulic fluid through the lines, allow the Power Purge to run for an additional 60 seconds.
- The helm is now full of fluid. Turn Power Purge "OFF". Close bleeder valve and dis-connect line from the Power Assist Pump. Place dust cap back on bleeder valve.



#### 5.7.2 Step 2

- Attach the four lines to each of the bleeder valves on the steering cylinders.
- Open each of the four bleeder valves.
- Turn Power Purge "ON".
- Turn the steering wheel slowly 20 times clockwise, then slowly 20 times counter-clockwise.

#### 5.7.3 Step 3

- With Power Purge turned "ON", move both engines through their full range of motion (This will help remove any air bubbles still trapped inside the cylinders).
- As a final precautionary step, pull on the engines firmly at the ends of their normal range of motion (This will also help to insure all of the air is out of the cylinders).

#### 5.7.4 Step 4

- Turn the ignition key for the port engine "ON". This will turn the Power Assist Pump "ON".
- Repeat "Step 2".
- If no more bubbles can be seen then the bleeding is complete. Turn the Power Purge "OFF". Close all four bleeder valves. Disconnect the four lines from the cylinders and both lines from the helm. Remove the helm fitting and replace it with vent cap.
- If bubbles are still present in lines, then bleeding was not successful. Repeat entire process.

## **5.8 Handling Characteristics**

World Cat's patented VectorFlo™ hull is a planing hull, which exhibits characteristics of both planing and displacement hulls. Planing hulls provide speed and economy of operation since a limited amount of the hull is in contact with the water. However, they feature flat sections along the chine which can result in poor handling at low speeds and harder impacts at high speed. Displacement hulls provide superior handling characteristics, even at low speed, and an improved ride in rough water. Speed and economy suffer however, since more of the hull is submerged. World Cat has taken the best characteristics of these two designs and incorporated them in the VectorFlo™ hull. Our proven design provides a superior ride, excellent handling characteristics in a variety of conditions, and speed with economy of operation. To help you experience "The Ultimate Ride", study the following sections.

### **5.8.1 Turning Characteristics**

Turning a catamaran is slightly different than cornering on a conventional vessel. Imagine the difference between an automobile and a motorcycle. Automobiles take turns in a flatter, more stable manner similar to catamaran hulls, while motorcycles pitch hard into a turn similar to a monohull. Do not underestimate a catamaran's cornering ability, however; hard adjustments to the steering wheel can make a World Cat bite quickly and execute tight radius turns. Experiment with the handling ability of your cat so you are prepared for any situation on the water.

### **5.8.2 Adverse Sea Conditions**

Catamarans are designed to handle some of the roughest waters in the world, but that is no substitute for common sense. As an operator you are responsible for the safety of your passengers and vessel; therefore, your trips should be limited by your level of experience. Planning and paying constant attention to the weather and sea conditions is paramount. If you are forced to operate in dangerous seas, however, you can be confident that your World Cat, when operated properly, can handle them safely.

Following are some tips on how to handle your boat in adverse sea conditions:

- When traveling into the wind, changing your direction a few degrees to allow one sponson to settle before the other, can make the ride smoother and allow for increased speed.
- In a rough chop with short wave intervals, increasing your speed may allow the boat to skim across the tops of each wave. This will result in a smoother ride.
- Steer to avoid larger swells and breaking waves.
- In a following sea, position your vessel on the back of a wave and match its speed to remain ahead of the trough. Speed is paramount. Work the throttle to avoid going over the wave or being thrown down the face of a following wave.

### **5.8.3 Cross-Clutching - Twin Engines**

World Cats have their twin engines mounted 64 inches apart. This allows you to cross-clutch (one motor in forward while one in reverse). To dock, reverse the boat into a slip: put the outside motor in reverse and turn to face aft. Keeping the wheel straight, steer with the inside motor putting it in forward and reverse to guide you into the slip. Keep it simple and slow.

### **5.8.4 Get the Boat on Plane**

- Trim both engines down (the motors act as trim tabs forcing the bow down). This is a big advantage when operating in shallow water (roughly 14" draft for the 280DC-X).
- Quickly increase speed to get the boat on plane then slow down to 3500 RPM's.
- Adjust trim out until the motors cavitate, then tap trim in.
- Feel / hear the motors and do not watch the trim gauges.
- A smooth ride is more important than having your engine RPM's synchronized.

### **5.8.5 Keep the Boat Level** (if the seas change or people move on the boat)

Trim the **High-Side-High**. When one side of the bow is high compared to the horizon, simply trim the high-side motor up. (If it cavitates then trim the **low-side-low**). Different models have different sensitivity to trim (do not over-correct as this may cause the boat to pitch in flat calm water at high speeds).

### **5.8.6 Handling Different Sea Conditions**

- **Head Sea:** trim motors in to keep the bow down
- **Following Sea:** trim out to keep the bow out of the water
- **Calm water:** trim engines up to run on the back of the hull

### **5.8.7 Boating Tips**

Experience is the best way to determine the handling characteristics of your catamaran. Operating the boat in multiple sea conditions and under various loads will help you predict how the boat will perform in any situation. World Cat provides the following recommendations regarding the performance of your catamaran:

- Establish an RPM chart which details the speed and fuel consumption at various RPM levels to achieve the most economical operation.
- Monitor fuel gauges to determine the amount of operating time remaining at a given reading.
- Determine minimum speed for effective steering in close quarters.
- Determine the turning radius required at various speeds.
- Determine the rates of acceleration and deceleration with various load conditions. Include the distance required to stop the boat at various speeds.

Use the information provided in section 6 of the *Sportfish, Cruisers, Yachts Owner's Manual* for more information on boat handling.

## **5.9 Performance Factors**

Proper setup and maintenance of the systems on your boat is important to ensuring proper performance, but be aware they are not the only factors which affect it. Several things which contribute to the level of performance of your catamaran can change between or during trips.

### **5.9.1 Engine Efficiency**

Without proper maintenance, your Yamaha engines will gradually lose power, resulting in a loss of speed. Use the recommendations in the engine's owners manual to schedule routine maintenance procedures and as a guide for the correct RPM range for your engines. Neglecting to do so may result in loss of performance and an increased risk of failure.

### **5.9.2 Propeller Condition**

The size and condition of your prop also plays a major role in the performance of your catamaran. A damaged prop can result in lower speeds, sudden drops in RPM, increased fuel consumption, and severe vibration while running. Improperly sized props can cause damage to your engine as a result of exceeding the maximum or minimum RPM levels.

### **5.9.3 Weather Conditions**

Barometric pressure and humidity can affect the output of your engines. For example, on an extremely hot and humid day, your engine can experience as much as a 10 percent loss in horsepower. Although you should monitor your engines' performance, be aware that the weather could be a major factor in your boat's performance.

### **5.9.4 Load**

Increased load can obviously affect performance, especially if the load is unbalanced. Passengers, gear, and fuel are all examples of things which can affect your vessel. Fuel levels change through the day, and greatly affect the attitude of your boat. When necessary, make adjustments to engine trim and load distribution to compensate for fuel usage.

### **5.9.5 Marine Growth**

If you store your boat in the water or fail to clean it after each trip, the existence of marine growth can contribute to a loss of performance. A decline in speed or increased fuel consumption can occur. Prevent this by applying a marine growth inhibitor or by cleaning your boat thoroughly after each trip.

### **5.9.6 Bottom Paint**

Bottom painting your catamaran will also change the performance. Although not significant, you can expect a drop in speed between 1 and 5 miles per hour.

## Chapter 6: Systems Information

### 6.1 Overview

This chapter will provide you with basic information for all the systems on your boat. Understanding this information is imperative, as it directly contributes to the safety and enjoyment of your trips on the water. If you need further information on any of these systems talk with your dealer.

### 6.2 Fueling Guidelines

Study the following guidelines thoroughly, and consult your dealer if you have questions. Be sure to read the Yamaha Owner's Manual regarding the type and grade of fuel to use for your engines.

#### **!!! WARNING**

Avoid methanol or other alcohol based fuels or additives which can deteriorate fuel hoses. Alcohol-based fuels also absorb water which can lead to engine damage.

#### **!!! DANGER**

Follow all safety guidelines while fueling. Leaking or spilled fuel is an explosion hazard. Regular checks of the fuel system are needed to protect you and the vessel.

#### **!!! DANGER**

Static electricity can ignite gasoline vapors causing serious injury, death and /or destruction of property.

#### 6.2.1 Before Fueling

- Shut down the engines and turn off all electrical devices including the batteries.
- Close all hatches, port lights, and doors to prevent accumulation of fuel vapors.
- Extinguish cigarettes or other lighted materials.
- Keep a properly charged and correctly rated fire extinguisher nearby.

#### 6.2.2 During Fueling

- Use common sense and obey all safety regulations related to fuel handling.
- Avoid static sparks by maintaining contact between the fuel nozzle and fuel fill.

#### 6.2.3 After Fueling

- Secure the fuel cap and inspect for leaks.
- Clean up any spilled fuel and dispose of the cleaning material accordingly. Do not store fuel-soaked material on your boat.
- Open all hatches, port lights, and doors to allow for ventilation.
- Check for fuel vapors using a "sniff test" and do not turn on electrical devices, including batteries, until you are certain the fumes have dissipated.



## 6.3 Fuel System

Due to the nature of the hull design, your World Cat is equipped with a port and starboard fuel system. These systems act independently, providing fuel to the engine on their respective side. Tanks are constructed of polyethylene material to prevent corrosion.

All hoses are NMMA certified, with all fittings clamped securely against leaks. However, a comprehensive check of all hoses and fittings should be completed at least annually, including those normally hidden from view. Tighten all connections, and replace deteriorated hoses, clamps, or fittings. The fuel / water separators should also be replaced in accordance with the Yamaha owner's manual maintenance schedule, or at least annually. World Cat has provided inspection access through removable inspection ports in the cockpit sole, in the cockpit liner below the fuel fills, and in the port and starboard mechanical rooms.

The fuel / water separators are located in the port and starboard aft mechanical rooms. Inspect these filters regularly, and replace when needed, or in accordance with the Yamaha owner's manual maintenance schedule. World Cat recommends that every boat carry a spare filter onboard for each motor. When purchasing fuel from remote or unfamiliar sources, special attention should be paid to the condition of the fuel / water separators.

### 6.3.1 Fuel System Benefits

- Automotive-style refueling
- Automotive Nozzle shut-off – system sends signal to the pump nozzle to shut off before there is any spit-back through the fill opening
- Fuel nozzle retention
- Overfill protection – reduces the possibility of accidental fuel spills
- Reduces hydrocarbon emission through the use of specially designed fuel fill. The fuel fill has a permanently attached cap incorporating a positive closure mechanism with an audible click, to let you know when the cap is sealed.

### 6.3.2 Fuel Tank

Your boat is equipped with two low permeation crosslink Polyethylene fuel tanks with a usable fuel capacity of 110 gallons per tank. The usable capacity of the fuel tank is different from the tank capacity marked on the tank from the manufacturer. The difference is the non-usable portion of the tank which results from the fuel in the tank that is below the pickup tube and the ullage area that has been incorporated into your tank. It is recommended that you follow all the instructions regarding the filling of fuel tanks. Fuel tanks with levels less than  $\frac{1}{4}$  full can cause engine stalling problems due to fuel starvation or by allowing sediment and dirt to enter the fuel supply lines. Keep the tank full and monitor the fuel level often to prevent this from happening.

### 6.3.3 Fuel Vent

The fuel tank vent is integrated into the fuel fill deck fitting (See fig. 6.3.6) The vent serves as an over pressure / vacuum release with anti-surge and flame / spark arresting protection. The fuel vent system also plays an important role in controlling the "FULL" level of fuel with the use of FLVV (Fill Limit Vent Valve). Grade Valves have been added to the tank which allows proper ventilation of the tank when the boat is stored, or trailered, on a moderate incline, without fuel. Always inspect to insure that the fuel fill deck fitting is free of debris and in proper working condition.

### 6.3.4 Fuel Distribution System

The fuel is delivered from the tank to the engine through the “Integrated Fuel Demand Valve” (IFDV), anti-siphon valve, and the fuel line. The IFDV prevents the built up pressure inside the tank from being transferred to the engine while still allowing fuel to flow as the engine requires it for operation. The anti-siphon valve is a safety feature designed to prevent the fuel from siphoning out of the tank if the fuel line were to be cut or broken below the level of the fuel in the tank. In this case, some fuel would leak from the line, but would not allow the entire contents of the tank to siphon into the boat. (See fig 6.3.6)

#### What does the IFDV do?

The integrated fuel demand valve, used in conjunction with integrated fuel systems, is for below-deck use, eliminates pressurized fuel from reaching fuel distribution lines / the engine, and ensures that fuel is provided to the engine on demand rather than as a result of pressure in the tank. Additional features include:

- Compatible with Ethanol-blended fuels
- Eliminates the need for rigid fuel distribution lines in pressure relief systems (per ABYC H-24, 15.9)
- 2-year warranty

### 6.3.5 Filling Fuel Tanks

The fuel system is designed to automatically shut off the fuel nozzle when the tank is full by the “Inlet Control Valve” (See Fig 6.3.6) similar to an automotive fuel system. The tank is filled when the fuel fill nozzle has shut itself off the second time. Attempting to fill the tank past this point may cause some of the components to not function properly, or malfunction.

Never leave the fuel nozzle unattended while filling your boat with fuel. Unattended fuel pump nozzles may lead to unintended spill of fuel into your boat, or into the water. Accidental fuel spills into the water, even at seemingly insignificant amounts, can expose the boat owner to potential remediation costs and fines from the U.S. Coast Guard and / or local authorities.

## !!! WARNING

The use of a portable fuel tank to fill your fuel tanks can result in overfilling and circumvent the safe features designed into our fuel tank system.

## !!! WARNING

Modification of any of the fuel system components or the replacement of these components with unauthorized parts may result in over-pressurization of the fuel system and circumvent the safety features designed into your fuel system.

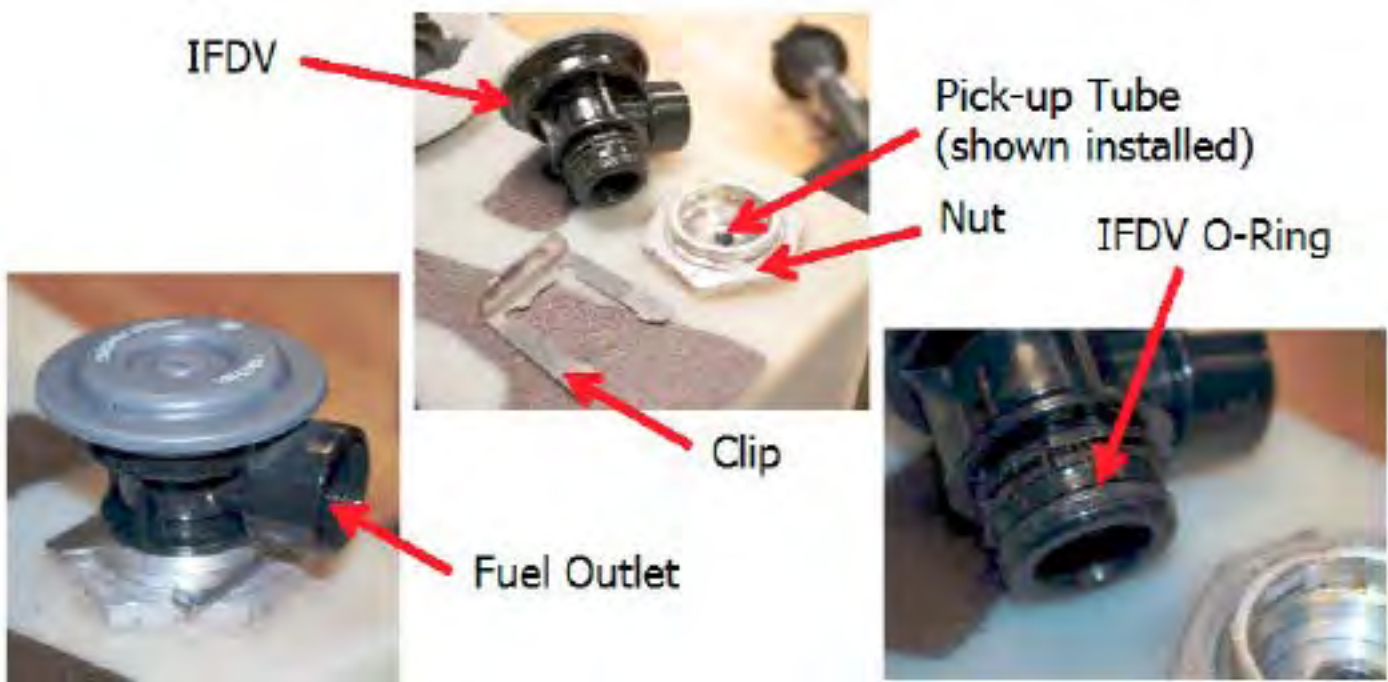
### 6.3.6 Pressure Relief Fuel System Diagram



### 6.3.7 Troubleshooting Tips

Possible Failures
Loss of prime on the engine and / or fuel starvation: <ul style="list-style-type: none"><li>• Engine stalls out</li><li>• Engine runs lean</li><li>• Engine does not draw fuel properly</li></ul>
Find possible leakage points and take corrective action: <ul style="list-style-type: none"><li>• Fuel line leak from tank to engine—replace components as needed</li><li>• IFDV O-Ring—replace O-Ring</li><li>• Pick-up Tube O-Ring—replace O-Ring</li><li>• IFDV—replace IFDV</li></ul>

### 6.3.8 Integrated Fuel Demand Valve Components



## 6.4 Ethanol-blended Fuel

Ethanol is an oxygenated hydrocarbon compound that has a high octane rating, therefore it is useful in increasing the octane level of unleaded gasoline.

### NOTICE

The use of improper gasoline or additives can damage your fuel system and is considered mis-use of the system. Damage caused by improper gasoline or additives WILL NOT be covered under warranty.

### 6.4.1 Additives

Phase separation occurs when water enters a tank that contains an ethanol / gasoline blended fuel. When gasoline becomes saturated, a mixture of ethanol and water, known as phase separation, can form in the tank, in the form of two layers: an upper ethanol-deficit gasoline layer and a lower ethanol-rich water layer. This may cause knocking in an engine running on the gasoline layer, while the engine will not run at all on the ethanol / water layer.

While it is impossible to absolutely guarantee avoidance of phase separation, there are a few preventative steps that could help. Installing a 10-micron fuel / water separating filter in the fuel line between your fuel tank and your outboard filters the gas and allows any water (which is heavier than gas) to safely sink to the bottom of the filter and out of the fuel.

Adding a quality marine-specific non-alcohol-based fuel stabilizer and conditioner (like Yamalube® Fuel Stabilizer & Conditioner PLUS) to each tank can also help. Before proceeding with any steps, please first consult with an authorized servicer of your brand of outboard.

If phase separation does occur, your only remedy is to drain your fuel tanks, clean and dry the tank completely and refill with fresh fuel.

## 6.5 Electrical System

The electrical system on your catamaran consists of three major components: the battery wiring system, the component wiring system with circuit protection, and accessories. It is important that you understand the principles of the electrical system, so that you can protect the components and troubleshoot any problems you experience.

## 6.6 Battery System

Your World Cat is equipped with three standard batteries. Two additional batteries are optional, depending on accessories. Two of the batteries are Type 27 “cranking batteries”; the third is a Type 31 “house” battery. The two cranking batteries each control one engine and provide the initial current to start the engines. The house battery controls all other electrical components on the boat. The two optional batteries are Type 31 house batteries and control only those options.

To help maintain your batteries, a management system is installed on your boat, beneath the helm seat. This system, controlled by a panel similar to the one shown below, enables you to engage or disengage the batteries, distribute electrical current, and parallel batteries in the event of a failure. Chapter 10 of this manual will provide details regarding the location and wiring of your batteries and management panel.

### 6.6.1 Battery Distribution

The distribution panel controls the flow of current from the batteries to the engines and on-board functions through three main switches. Each switch is red and labeled ‘Port Start’, ‘STBD Start’, and ‘House’. There are two yellow parallel switches labeled ‘Emerg Parallel’. The house components are protected by an 80 amp breaker labeled ‘DC Main 1’. When leaving the boat, all switches should be turned to the “OFF” position, while the DC Main breaker can remain on.



### 6.6.2 Voltage Sensitive Relays (VSR)

There are two voltage sensitive relays (VSR) on the distribution panel. Once the engines are cranked, the alternator sends electrical current back to the cranking batteries to recharge them. Once the cranking battery is fully charged (13.6 volts), the VSR closes to protect the batteries from overcharging. When the VSR is operating, the LED indicator located on the switch will be lit. It will remain lit until the battery is fully charged, or the cranking battery voltage falls below 12.8 volts. It is common for the VSR to cycle "ON" and "OFF" during operation. However, constant cycling could indicate a problem in the system and should be checked by your dealer. The functions of these switches are more thoroughly explained in the manufacturer's Operation and Installation Instructions included in your Owner's Portfolio.



### 6.6.3 Emergency Parallel

In the event of a battery failure, the "EMERG PARALLEL" switch allows you to manually mechanically link the port and / or starboard "cranking" engine batteries. These switches should remain in the "OFF" position when not needed, to keep the batteries separate. To prevent voltage spikes or drops which can damage electrical components, the "EMERG PARALLEL" switches are not connected to the house battery.

### 6.6.4 24 Hour Circuits

These push-to-reset style of breakers are located on the battery management panel. Per NMMA and USCG guidelines, these breakers are constantly energized by a direct wire from the hot side of the switch, to provide power for bilge pumps and memory functions. This enables these devices to be activated to protect your vessel even when you are not available. The "HOUSE" switch does not need to be "ON" for these breakers to have power. Inspect the breakers regularly, and push-in to reset. If a breaker trips constantly, have your dealer investigate the problem as soon as possible to prevent damage to your boat.



## NOTICE

Windlasses used incorrectly could cause harm to equipment or crew. Windlasses should be used with care and treated with respect. Windlasses are designed and supplied for anchor control in marine applications and are not to be used in conjunction with any other use. It is the unavoidable responsibility of the owner or master or other responsible party to assess the risk of any operation on the vessel.

### 6.6.5 Anchor Windlass

A 50 amp breaker is installed at the factory on the battery management panel for circuit protection of the anchor windlass. For Windlass Deck Switch Maintenance Refer to section 7.13.

## !!! DANGER

Disconnect the battery cables from the batteries prior to removing or working on the battery management panel. Failure to do so could result in electric shock. Reference the NMMA pamphlet in your Owner's Portfolio for more information.

## 6.6 Battery Selection

World Cat supplies the original batteries onboard your vessel. For this model we use both Group 27 and Group 31 batteries. In the event of a failure, replacements must be of equal size and specifications (see below):

### GROUP 27 (27M-XHD)

CCA:800

MCA: 1000

RESERVE CAPACITY: 182 Min @ 25A

### GROUP 31 (SRM-31)

CCA:675

MCA: 845

RESERVE CAPACITY: 210 Min @ 25A

## 6.7 Battery Care

Batteries should be secured in a non-metallic tray and insulated boots should cover the terminals. Depending on the style of battery you choose, inspect the electrolyte and perform routine maintenance as suggested by the manufacturer. Remove corrosion from the terminals quickly to prevent failure. Use a stiff brush and a solution of water and baking soda to remove corrosion, then grease the terminals to prevent further build-up. Be careful to clean up thoroughly to avoid contaminating the electrolyte.

When servicing the batteries, follow the safety procedures shown below and work to avoid electrolyte spills which can harm you and your vessel.

## !!! DANGER

All batteries contain an electrolyte, commonly sulfuric acid, which is a caustic and volatile chemical. Use extreme caution when charging or servicing.

### 6.7.1 Safety

- Use protective clothing and accessories such as aprons, gloves, and eye wear to protect yourself while servicing batteries.
- Avoid cigarettes, open flames, and sparks. Batteries can produce toxic and explosive gases; therefore, store or charge them in a well-ventilated space.
- Keep batteries out of the reach of children and pets.

### 6.7.2 Exposure

If you are exposed to the electrolyte solution, follow these procedures and seek immediate medical attention.

**EXTERNAL** - Flush with large amounts of water for contact with the skin. If severe irritation occurs or it contacts your eyes. Seek medical attention immediately.

**INTERNAL** - Consume large amounts of water or milk, coupled with milk of magnesia, a beaten egg, or vegetable oil. Seek medical attention immediately.

The guidelines above are basic and do not alleviate the owner of responsibility should an accident occur. Use good judgment and common sense to avoid an accident.

## !!! CAUTION

When reconnecting your batteries, always connect the red cable to the positive terminal and the black cable to the negative terminal (in that order). Reversing them can damage your electrical system and create the potential for electric shock.

## !!! CAUTION

Never disconnect a battery while underway. Doing so may result in damage to your boat's electrical system and the engine's alternator.

## 6.8 Wiring and Circuit Protection

Your World Cat is wired using marine grade tin coated copper wire, instead of standard copper wire. Tin coated copper is manufactured to withstand the harsh saltwater environment better than standard copper, which is used for residential applications. Environmentally sealed Deutsch™ connectors are installed on all accessories located below the waterline to ensure watertight connections. The remaining devices are installed with high quality splices and terminals, which are heat shrink sealed to protect the integrity of the connection. Harnesses are routed through PVC rigging tubes to prevent chaffing and covered with sheathing when necessary.

## 6.9 Control System

Your World Cat is equipped with a DC system controlled by mechanical push switches. Each mechanical switch is labeled for function. In the event of a component failure, contact your dealer for repair or replacement. If dealer service is unavailable or impractical, be certain to use only identical replacement parts and components to ensure the integrity of the system.

### **!!! CAUTION**

Failing to use the correct replacement breaker could result in failure of the device or damage to the electrical system. Contact your dealer for repair information.

Accessories not integrated into the main labeled switch panel can include lights with integrated switches, marine head controls, stereos, aftermarket electronics and 12V or USB outlets. These devices draw current from the accessory fuse blocks located in the starboard helm storage. The fuse blocks use blade style fuses for each circuit. Replacement fuses can be obtained from your dealer or local auto parts store. Always replace a damaged fuse with one of equal rating.

Ground blocks are another integral part of your electrical system. These are connected across all batteries and individual appliances, to provide a common shared ground to allow a path for current to flow back to the batteries.

### **!!! CAUTION**

When working on your electrical system, disconnect the batteries to prevent shock, or damage to your electrical system. If possible, have an electrician perform repairs.

## 6.10 Accessories

Electrical accessories include all lights, pumps, and gauges assembled into your catamaran. Certain accessories are standard to each model, while others are optional equipment. Below is a list of accessories and their function. For information on optional equipment see Chapter 10 in this manual.

### 6.10.1 Navigational Lights

Per USCG guidelines, all powered vessels must have navigational and anchor lights. Every World Cat is equipped with navigational lights at the bow (red on port side, green on starboard side). The anchor light will be located either on the hardtop or on a pole light near the stern. These lights must be used in accordance with USCG regulations when anchored or underway.

### 6.10.2 Cockpit Lights

Cockpit lights are located at floor level throughout the deck to provide light while operating in low light conditions. Cockpit lights can function either on a white setting or a red setting.

### 6.10.3 Cabin / Console Lights

Lights located in the cabin or in consoles have an integrated power switch and are tied directly into the fuse block. Operate them with the switch located at the base of the light.

### 6.10.4 Spreader Lights

Spreader lights are integrated in to the hardtop and illuminate the cockpit in low light conditions. They are controlled through the mechanical push button switches on the dash panel.

### 6.10.5 Dome Lights

Dome lights are integrated into the hardtop and feature both white and red lamps for nighttime operation. They are controlled through the mechanical push button switches on the dash panel.

### 6.10.6 Docking Lights

The bow of your World Cat 280DC-X is equipped with integrated high-intensity LED docking lights, which are operated from the main dash control panel. These lights can help with maneuverability in low-light conditions while docking.

### 6.10.7 Bilge Pump / Float Switch

Bilge pumps evacuate standing water in two aft and two forward bilge areas. They can be operated manually by pressing the switches on at the dash panel, or automatically by the float switch. The float switches are connected to a breaker on the battery management panel.

### 6.10.8 Raw Water Pump

The raw water pump supplies pressure to the raw water system. It contains a pressure switch similar to a residential well pump. The pump has a switch at the dash and can be left on at all times while underway. The pump is located in the port aft mechanical compartment.



### 6.10.9 Freshwater Pump

The freshwater pump supplies pressure to the freshwater system, and is located in the port mechanical room. It contains a pressure switch similar to a residential well pump. You can leave this appliance on at all times while underway.

### 6.10.10 Macerator Pump

Used to evacuate waste from the marine head holding tanks. The pump is located under the sink in the port head area.



### 6.10.11 12V / USB Outlet

Located strategically throughout the boat, these outlets provide power to aftermarket accessories such as cell phones, electric reels, and spotlights. Each outlet is independently wired to the fuse panel.





### 6.10.12 Marine Head Switch

The marine head is powered by the fuse panel, and the head switch is located at the outboard side of the head. The control switch operates a fill and / or flush function. A macerator pump is incorporated into the head. The macerator pump is operated off the mechanical switches in the dash.



### 6.10.13 Anchor Windlass

The windlass is used to deploy and retrieve the anchor. This accessory is controlled by a switch at the helm, and can also be controlled at the bow with up and down switches located in the starboard bow anchor locker. The windlass breaker is located on the battery management panel.

The 280DC-X integrated windlass system is made possible by an advanced feed system for the anchor rode. Once entering the bow of the boat, the anchor rode is routed to the starboard side of the boat into a hidden windlass. Extra care must be taken to ensure the anchor rode feeds into the system without knots or debris. The feed of the anchor rode in or out of the system should be monitored any time the system is in use.

## !!! CAUTION

When operating the windlass, extra care must be taken to keep hands free of situations where the rode could catch and restrict movement.

### 6.10.14 Fusion® Marine Entertainment System MS-RA70N

Similar to an automotive stereo, the unit can be operated using the faceplate. It is powered by the fuse block, and the memory wire is connected to a 24 hour circuit.



### 6.10.15 Windshield Wiper

The wiper is operated by a dedicated wiper switch on the main dash. The wiper functions identically to those found on passenger automobiles.

### 6.10.16 Horn

Functions identically to those found on passenger automobiles and is operated by a red push button switch on the main dash panel.

### 6.10.17 Accessory Switches

The accessory switches are located on the dash panel. "ACC 1" is usually reserved for the underwater lights installed at the factory. The remaining "ACC" switches can be used to operate aftermarket products. **Be aware of the power requirements for any add-on products so you do not exceed the capacity of the breaker supplying the switch.** Failure to do so could damage the appliance and / or the electrical system.

### 6.10.18 Power Steering

The power assist unit provides automobile-like steering on your catamaran. The unit is installed in the console between the helm and steering rams. The power for the unit is connected to the port and starboard key switch. If you should decide to troll with one engine, your power assist will still be operational.



### 6.11 Engine / Gauges

Your World Cat 280DC-X comes with twin Yamaha® 200 HP 4-strokes with Command Link® Plus. Operating instructions for your engines and gauges will be in a separate Yamaha Owner's Manual and your Command Link® Plus Owner's Manual delivered with your boat.

### 6.12 Plumbing System

The intake and discharge of water is integral to several of the features and accessories provided on your boat, including livewells, fishboxes, sanitation devices, and water systems. World Cat installs the plumbing components for these systems using high quality marine hoses and stainless clamps. However, this does not eliminate the need for routine checks of plumbing components or connections. A failure resulting from a deteriorated hose or connection could cause your boat to take on water or become swamped. Information is provided in Chapter 10 of this manual, regarding the location, function, and routing for the plumbing components on your boat. Review these materials and talk with your dealer should you have a question.

#### **NOTICE**

While underway, leaving your livewell seacock open could result in inadvertently filling your livewell. To prevent this, close the seacock when the pump is not in operation.

#### **NOTICE**

Operating the engines in reverse can cause excessive ventilation near the livewell intake, causing the pump to airlock. To prevent this, turn the pumps "OFF" prior to any continuous or high speed reverse operation. If your pump does become air locked, turn the pump "OFF" for 15 to 30 seconds to correct the problem.

## Chapter 7: Maintenance and Service

### 7.1 Overview

This chapter provides basic information for maintaining the original appearance and dependable performance of your World Cat. Although your vessel is constructed of the finest materials available, the harsh saltwater environment and other factors, including geography and usage rate, will affect its finish and function over time. It is imperative that you understand how to care for your catamaran properly. Some simple steps will help maintain its aesthetics, value, and reliability.

### 7.2 Gelcoat Maintenance

Gelcoat is a thin layer of resin mixed with colored pigments, which provides the exterior finish on your boat. Gelcoat provides a smooth durable surface to protect the fiberglass construction of the hull, but is still flexible enough to absorb the pressure exerted upon it during operation. Mainly used for cosmetics, gelcoat is relatively simple to maintain. However, without routine cleaning, it will discolor due to the microscopic pores in the surface. Following are some instructions for maintaining your gelcoat.

#### 7.2.1 Cleaning

After each trip on the water, or after trailering long distances, you should clean the boat immediately. Washing the boat with mild detergents, such as dishwashing soaps, and fresh water will help eliminate build up or discoloration resulting from environmental pollutants. Use a sponge or other soft cleaning device on the smooth exterior surfaces of the hull and deck. A soft brush can be used when cleaning nonskid portions of the deck. Make sure to rinse the boat thoroughly after cleaning.

### !!! CAUTION

Using strong or caustic cleaning agents, such as bleach, citrus based cleaners, or one containing ammonia, will damage the appearance and strength of your gelcoat.

#### 7.2.2 Waxing

Similar to automotive finishes, gelcoat will begin to fade over an extended period of time. Constant exposure to environmental pollutants and this aging process will result in a loss of shine. However, it is possible to restore the original luster and color using a polishing compound (mild abrasive) or a rubbing compound (harsh abrasive). Each will remove scratches, discoloration, and help restore weathered gelcoat surfaces but you should select what to use based on the severity of the problem.

#### Use the following steps to restore the finish of your gelcoat.

Note that these procedures assume a moderate level of expertise of the person performing the work. If there is any doubt about ability to successfully accomplish the procedure, for best results it may be best to turn the process over to a professional.

- Clean the affected area completely using a mild detergent.
- Gently wet sand the affected area using a fine sandpaper (600 grit) to remove any stains. Use plenty of water and always sand in one direction using curved strokes. Sanding in alternating directions could result in damage to the finish.
- Apply polishing compound to a buffing pad and follow the manufacturers instructions. If you apply the compound mechanically, we recommend a lamb wool buffing pad and a electric buffer capable of 1750 to 1800 RPM.
- When you have completely buffed the area, wash away any remaining compound using clean water.
- After thoroughly cleaning the surface, wax the affected area. This will help restore the finish and provide a seal against future discoloration.

### **!!! CAUTION**

Protect metal surfaces when using abrasive cleaners, polishing compounds or rubbing compounds. They can damage the metal's protective finish leading to rust.

### **!!! CAUTION**

When using an electric buffer, maintain constant motion. Allowing the pad to rest on an isolated spot can cause heat buildup, which can damage the gelcoat.

### **!!! CAUTION**

Routinely clean and wax your catamaran to help prevent the need for excessive use of rubbing and polishing compounds, which over time can deteriorate the gelcoat.

By following the instructions listed above you can guarantee that your catamaran will remain in near showroom condition and remain a source of pride for years to come.

#### **7.2.3 Repair**

Although gelcoat is a flexible material capable of handling environmental punishment and extended use, it is susceptible to scratches, blistering and cracking over time. Gelcoat distortion or cracking is unappealing, but rarely represents any structural failure. Have your dealer inspect any damage to your gelcoat to determine the nature of the failure. If it is only cosmetic, they can provide color matched kits, instructions, and any chemicals you need for application or cleanup. Structural damage should be repaired by your dealer or a trained fiberglass repair shop.

### **!!! WARNING**

Gelcoat and the chemicals used for its application and cleanup are extremely flammable and toxic. Follow all handling and mixing instructions, provide for proper ventilation, and keep water containers nearby to submerge catalyzed materials.

#### **7.3 Bottom Paint**

If you intend to leave your boat in wet storage, or routinely dock it for more than a few days, you should coat the hull beneath the water line with anti-fouling paint. This will help prevent marine growth, such as barnacles, which damage the gelcoat and affect performance. World Cat recommends using an epoxy barrier coat prior to painting a new vessel. This will help to prevent, but not eliminate, gelcoat blistering on the hull, which is not warranted by World Cat. Your dealer can provide information on bottom painting to protect against environmental toxins in your area. Anti-fouling paints are made to dissolve over time, so inspect and clean the hull bottom annually and recoat when necessary.

## 7.4 Upholstery



Remove most stains with one of the following steps:

<b>Step 1</b>	eye shadow, mascara, grease, black felt tip pen, crayon, chocolate, suntan lotion and hair/body oils*
<b>Step 2</b>	red lipstick
<b>Step 3</b>	blood, urine, feces, oil base paint, tar and asphalt
<b>Steps 4</b>	all other tough stains

**Step 1:** Remove excess spill with a damp cloth. Clean with a 1:1 mix of Ivory® soap and water. Next, rinse with clean water and dry.

**Step 2:** Use a straight application of concentrated cleaners such as Formula 409® or Fantastik® spray cleaner. Wipe with a clean cloth, rinse with water and dry.

**Step 3:** Use a 1:1 mix of ammonia and water, or a 1:10 mix of bleach and water. Rinse with clean water and dry.

**Step 4:** Use a 1:1 mix of isopropyl alcohol and water. If the stain persists, use straight alcohol. Rinse thoroughly with clean water and pat dry.

**Note:** For cleaning that requires step 4, use a soft cotton cloth saturated with the cleaning material and rub the stain in circles 10 times. Pat dry with another soft cotton cloth and check the results.

\*Must be cleaned after each instance of exposure to hair and body oils

The information published in this care guide refers to the performance of PermaBlok® products in specific tests conducted under laboratory conditions. Results may vary under actual conditions. This information is not a guarantee and does not relieve the user from the responsibility of the proper and safe use of the product and all cleaning agents. The use of certain agents can be harmful to the surface appearance and lifespan of vinyl. Spradling, its agents and assigns assume no responsibility resulting from the use of such cleaning agents to the vinyl.

Certain clothing and accessory dyes (such as those used on denim jeans) may migrate to lighter colors. This phenomenon is increased by humidity and temperature and is irreversible. Spradling will not assume responsibility for dye transfer caused by external contaminants. Please check compatibility when using this product in combination with painted or varnished surfaces.

Formula 409® is a registered trademark of the Clorox Company.  
 Fantastik® is a registered trademark of DowBrands, Inc.®, registered trademark of the Dow Chemical Co.  
 Ivory® is a registered trademark of Procter and Gamble.  
 PERMABLOK3® is a registered trademark of Spradling International, Inc.



## **7.5 Trim / Plexiglass / Polyethylene**

World Cat uses vinyl, plexiglass, and polyethylene material (Starboard™) throughout the interior of our catamarans.

### **Use the following instructions to care for these items:**

- Use mild detergents to clean vinyl trim commonly used in cabins and helm. Routinely use a commercially available surface protector to seal the vinyl.
- Surface or glass cleaners can be used to clean plexiglass. It is commonly used for radio boxes and as a protective material for instrument panels.
- Starboard™ can be cleaned using surface cleaners such as 409™.

## **7.6 Stainless Steel**

Stainless steel is used throughout your vessel. World Cat uses only 316 marine grade stainless hardware to provide you with years of service; however, these metals can deteriorate and fail if improperly cared for. Upon returning, clean all hardware using a mild detergent and rinse thoroughly with fresh water. Avoid using abrasive cleaners or chlorine based products, as they will remove the metal's protective coating and lead to pitting or rust. Throughout the year, coat the metal using a non-abrasive metal protector to help displace moisture, remove contaminants, and shield the metal. World Cat recommends high quality sealants such as Boeshield T-9™ developed by Boeing™ Aviation. If you cannot find it locally, call PMS Products Inc. at 800-962-1732.

## **7.7 Powder Coating**

Powder coating on T-Top Frame should be cleaned upon returning. Use a mild detergent and rinse thoroughly with fresh water. Avoid using any kind of abrasive cleaners or chlorine based products. If chipping or scratches occurs we recommend that you make the necessary repairs with color match touch-up paint which has been included in your owner's bag.

## **7.8 Bilge Compartments**

Routinely check the condition of the bilge compartments in your boat. This will help identify potential problems and eliminate odors associated with stagnant water and the buildup of residue. Clean the compartments using a freshwater rinse. This will also enable you to check the function of your drain system and the operation of the bilge pumps.

## **7.9 Cockpit Drains**

Your World Cat has five drains located in the cockpit, two on both the starboard and port sides and one forward of the helm seat. These drains are designed to quickly evacuate the cockpit should the boat become swamped. Flushing these drains routinely will ensure the safety of your crew and vessel, as well as eliminate the potential for odors associated with fish residue. These drains are evacuated through the scuppers located on the hullside. Each scupper has a rubber flap to prevent water from entering the boat. Check this material occasionally to keep them free of debris and in good working condition.

## **7.10 Bow Fascia**

The distinctive bow of the 280DC-X features fascia on either side of the thru-hull anchor opening. Please be aware that these fascia are for decorative, not structural purposes, and could be damaged by direct contact with sharp or heavy objects. Additionally, in the event your boat needs to be lifted using straps, it is important to avoid direct contact with the fascia, to ensure that they are not damaged. Consult with your World Cat dealer regarding proper sling or strap placement.

## 7.11 Winterization

- Routine maintenance checks should be performed prior to each trip in accordance with Chapter 1, but a broader assessment should be done before winterizing your catamaran and prior to the first trip of the season. If your local climate does not require winter storage, complete the following steps at least annually to ensure the safe operation of your boat.
- Do not leave loose items or personal effects onboard during storage. Remove all trash and debris prior to cleaning the boat.
- Before storage clean the boat thoroughly, including exterior surfaces, fishboxes, livewells, and thru hull fittings. If possible leave lids open slightly to allow fresh air exchange. Remove the garboard drains and store the boat with the bow up to allow drainage.
- Inspect all electrical connections and the operation of pumps or other electrical devices. Perform repairs if necessary. Coat electrical panels with an anti-corrosive spray, available from your dealer.
- Inspect the batteries and charge fully to prevent damage during storage. Disconnect the cables and apply a coat of grease to the terminals to prohibit corrosion.
- Inspect all plumbing components and connections to prevent leaks. Replace any damaged hoses. Drain all lines and devices to prevent damage from freezing. Lubricate valves to maintain proper operation. Use the manufacturers recommendations for portable and marine heads.
- Inspect fuel system components and replace fuel / water separators. You can keep the system full but do not overfill, and use a fuel additive to prevent condensation.
- Lubricate hinges and coat all metal surfaces with Boeshield T-9™ or other metal protector. Tighten down hardware if necessary.
- Inspect caulking around hardware, windows, hatches, etc. to prevent water damage. Normal use will break down sealants and can lead to costly repairs if not maintained.
- Remove or cover all electrical devices to prevent damage from UV rays. The rays will cloud electrical displays and make them hard to read.
- Remove cushions and store indoors to prevent damage.
- Winterize the engines and controls per manufacturer's recommendations and inspect all connections, filters, and parts thoroughly. Replace parts as needed.

## 7.12 Maintenance Schedule

Maintenance	Each Use	Weekly	Monthly	Quarterly	Yearly	As Needed
Clean hull below the waterline				X		X
Bottom paint the hull					X	X
Check / replace sacrificial anodes			X			
Wash boat hardware and canvas	X		X			
Wax exterior gelcoat				X		X
Clean & protect hardware						X
Clean exterior upholstery	X					X
Clean cabin & interior upholstery						X
Flush engines with fresh water	X					
Spray metal components in bilges			X			
Clean bilge				X		X
Check bilge for leaks	X		X			
Inspect steering & controls	X					
Inspect fuel systems for leaks	X					
Replace fuel filters					X	X
Lubricate fuel fill o-rings			X			
Inspect fire extinguisher			X			
Test bilge pump auto switches	X		X			
Check battery electrolyte & service			X			
Check proper functioning of pumps	X					
Replace pumps					X	X
Replace gaskets						X
Inspect & operate thru-hull valves			X			



### **7.13 Windlass (Winch) Safety Guidelines**

This section provides some universal guidelines on winch safety and correct anchoring procedures. Only persons who are completely familiar with the controls and those who have been fully made aware of the correct use of the windlass should be allowed to use it. If there is any doubt of how to operate the unit delivered with your boat, please seek advice from your dealer or a suitably qualified engineer.

#### Tips and Guidelines:

- Windlasses used incorrectly could cause harm to equipment or crew.
- Windlasses should be used with care and treated with respect.
- The windlass should always be used in conjunction with a chainstopper of the appropriate size.
- Run the boat engine while raising or lowering the anchor. Not only is this a safety precaution, it also helps minimize the drain on the batteries.
- Always motor up to the anchor while retrieving the rode. Do not use the windlass to pull the boat to the anchor.
- If the anchor is fouled, do not use the windlass to break it out. With the chainstopper taking the load, use the boat's engine to break the anchor loose.
- Do not use the windlass as a bollard! In all but the lightest conditions, engage the chainstopper or bollard after completing the anchoring maneuver. This will avoid damage to the gearbox and possible bending of the stainless steel shaft.
- In heavy weather conditions, always use a heavy anchor snub or stop from the chain directly to a bollard or firmly fixed deck cleat.
- NEVER use the windlass or chainstopper as a mooring point.
- Always turn the isolator switch "OFF" before leaving the boat.
- When using the windlass do not switch immediately from one direction to the other without waiting for the windlass to stop as this could damage the windlass.
- Do not depend on the windlass to hold the anchor in its bow roller. A nylon line or an alternative anchor tension system should be used to secure the anchor to its stowed position when underway and will need to be removed before operation of the windlass. Alternatively, a pin through the bow roller and the shank can be used for securing.
- Correct fit of chain to chain wheel is essential for the windlass to operate properly.

## 7.14 Anchoring Procedures

Books on seamanship all have a section on how to properly and safely anchor your boat. The summary below is intended only as a basic guide to acceptable anchoring technique. Leading windlass manufacturers recommend that correct anchoring technique be researched and understood thoroughly before going to sea.

Tips and Guidelines:

- Before deciding where you want to anchor, slowly cruise around the anchoring site and check the boats already at anchor, to ensure you have enough room to swing.
- Allow adequate room around the spot where you wish to anchor. Remember that power vessels swing differently than yachts. Boats on rope rodes swing around more than those on chain.
- Slow down and keep the bow into the wind, or current, whichever is stronger and as the boat comes to a complete stop, start to lower the anchor.
- After lowering the anchor, either drift back or slowly reverse while paying out the anchor rode, in order to ensure the anchor is set (holding firm).
- The amount of anchor rode you pay out should always be at least three times the depth of water in which you are anchoring.
- In case the engine fails to restart, do not switch off the engine until you are sure the anchor is set (holding firm). Use buoys as reference points if they are available or, if close to shore, use prominent landmarks to check you are holding your position.
- Once anchored, secure your anchor rode with the chain stopper or secure to a deck cleat or bollard with a hitch that is easy to cast off. Do not anchor off your winch.
- Have a small buoy handy, which you can tie to the end of your anchor rode in case you have to slip your anchor. You will then be able to recover your anchor & rode later.
- Always anchor your boat via the bow.
- Check your position frequently when at anchor to monitor drag.

**7.15 Maintenance Log**

Service Date	Engine Hours	Dealer	Service / Repairs

## Chapter 8: Hurricane Preparedness Customer Checklist

### Equipment To Be Kept On Board:

- Chafing gear
- Fenders
- Flashlight with spare batteries
- Two sufficient anchors with 300' or more oversized rode
- Battery-operated radio

### Check Monthly:

- Exterior lights operable
- Auto bilge pump operating (check battery)
- Hatches are watertight
- Power and electric gear operating
- Engine battery charged
- Flashlight battery charged
- Radio batteries charged

### To Do At A New Marina:

- Learn marina approaches and basin
- Learn the size and type of your mooring
- Ensure mooring and lines are sufficient for all likely wind direction and velocity
- Ensure mooring has enough weight and scope and is properly set
- Learn your moorage lease and rental agreement responsibilities
- Learn responsibilities for your boat's safety when a hurricane is approaching
- Develop a plan for securing your vessel outside the marina if you plan to evacuate
- If evacuating, visit the site by boat and time the trip
- Learn what possible delays you may encounter when evacuating (drawbridges, boat traffic ,etc.)
- Photograph your boat and surroundings
- Keep a list of all equipment on board
- Keep a list of all equipment that will be removed during storm preparations
- Keep a complete set of records for your boat at home
- Give the marina operator the name and number of your absentee skipper
- Give the marina operator a description of your boat, registration number and location

### Docked Boat Preparations:

- Strip all removable items, including spare rigging
- Clear self-bailing cockpit drains
- Close all through-hull fittings
- Set chafing gear where lines will rub (chocks, cross lines, deck edge, dock edge etc.)
- Remove portable fuel and oil storage containers
- Remove ship papers
- Shut off fuel tanks
- Leave anchor light on
- Leave auto bilge pump on
- Check openings to ensure boat is watertight
- Set and check storm anchors
- Consider attaching 3 sets of bow and stern spring lines
- Consider attaching lines to cleats at a 45 degree angle
- Consider tying your boat between two piers or along a pier and anchored off one side

## Moored Boat Preparations

### Make Plans To Have Someone Pick You Up From Your Boat Before The Storm Arrives

- Strip all removable items, including spare rigging
- Clear self-bailing cockpit drains
- Close all through hull fittings
- Remove portable fuel and oil storage containers
- Remove ship papers
- Shut off fuel tanks
- Leave anchor light on
- Leave auto bilge pump on
- Check openings to ensure boat is watertight
- Use storm pennants to increase scope
- Attach chains directly to pennants instead of swivels
- Add an emergency catenary weight at the vessel end of the chain
- Use double or triple chafe protection
- Use chafing gear over entire length of pennants
- Use two pennants
- If no permanent mooring is available, use two storm anchors at 45 degree angles

### Trailerable Boat Preparations

*Store in a garage:*

- Strip all removable items, including spare rigging
- Clear self-bailing cockpit drains
- Close all through-hull fittings
- Remove portable fuel and oil storage containers
- Remove ship papers
- Shut off fuel tanks
- Leave auto bilge pump on
- Check openings to ensure boat is watertight
- 
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- 

*If no garage is available:*

- Secure trailer to a sturdy object
- Let half the air out of the trailer tires
- Put wood blocks between the frame and axle
- Take out the drain plugs
- Cover with tarp
- Use tie-downs
- 
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## Anchored Boat Preparations

### Make Plans To Have Someone Pick You Up From Your Boat Before The Storm Arrives

- Strip all removable items, including spare rigging
- Clear self-bailing cockpit drains
- Close all through-hull fittings
- Remove portable fuel and oil storage containers
- Remove ship papers
- Shut off fuel tanks
- Leave auto bilge pump on
- Check openings to ensure boat is watertight
- Use 3 or 4 substantial anchors and good tie rope
- Tie your boat high on the mainland to a substantial tree or similar structure
- Do not tie parallel to the bank
- Keep a navigable passage at your stern to allow other boats passage
- Use enough line to allow for storm surge
- Leave enough room between your boat and others to allow for swing
- Take valuables off
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## Chapter 9: 2020 Warranty Policy



# 2020 MODEL YEAR LIMITED WARRANTY

Congratulations on the purchase of your World Cat product. We want you to have years of pleasure and fun aboard your new World Cat boat. This document is your Limited Warranty. It describes the terms and conditions of the warranty agreement between us. It applies to all World Cat Products sold under the World Cat or Glacier Bay Edition brands manufactured beginning with the 2020 Model Year. Your Model Year is identified by the Hull Identification Number ("HIN"), which is unique to every boat and is located on the stern.

It is important to understand what a limited warranty does. It is an agreement between you and World Cat that your vessel will be free from substantial defects in material and workmanship for a specified length of time. However, if a defect does occur, you and World Cat agree that you will allow World Cat to repair it or, at our discretion, replace it as set forth herein. All products need repairs and maintenance from time to time, especially boats. Boats have a rough life in that they often go long periods between use, and when they are used, boats must perform in a difficult environment. Because of this, you should understand what your limited warranty does and does not cover and the terms and conditions that apply to it. Please note that there are disclaimers and limitations on page two of this Limited Warranty.

### I. LIMITED WARRANTY

1. **Ten Year Limited Hull Warranty.** World Cat warrants that it will repair, or at its sole and exclusive discretion, replace any substantial defect in material or workmanship in the hull (defined as the one-piece fiberglass molded part that acts as the vessel's running surfaces) for the first ten (10) years following the date of purchase by the original retail owner. In the event that World Cat determines that your hull must be replaced, you agree to give us back the original hull and we will put a new hull on your boat. The replacement hull will be an upgraded model if the original model is no longer offered. Transfer of all accessories, including engines and electronics, will be at owner's expense.
2. **One Year Limited Material And Workmanship Warranty.** World Cat warrants that it will repair or, at its sole and exclusive discretion, replace any substantial defect in material or workmanship in any other parts or components of the boat that do not carry their own, separate written warranty, for a period of one (1) year following the date of purchase by the original retail owner. *Under no circumstances will World Cat warrant the engine, trailer or electronics.*

### II. WARRANTY LIMITATIONS

#### **THIS LIMITED WARRANTY DOES NOT COVER THE FOLLOWING:**

1. Defects and/or damage arising out of engines transmissions, running gear and outdrives, metal plating or finishes, windshield breakage, and leakage due to seal and/or caulk shrinkage and/or normal wear and tear;
2. Defects and/or damage to gel coat or painted surfaces including, but not limited to, discoloration, fading, chalking, and/or osmotic blistering;
3. Defects and/or damages related to accessories, alterations, modifications or installations which were not part of the boat when shipped from the World Cat factory, and/or not authorized in writing by World Cat;
4. Damage and/or defects related to misuse, such as groundings and impacts with docks, pilings, navigation buoys, etc.; accidents; reckless, unsafe or improper use relative to existing sea conditions; lack of recommended maintenance, or improper trailering, blocking or lifting; and/or repairs by the owner or other persons without prior, written authorization from World Cat;
5. Use of the boat for competition, racing, or used for rental, business or commercial purposes without the prior written authorization of World Cat. Rental, racing, business or commercial use without prior, written authorization voids this warranty;
6. Defects and/or damage related to operation of the boat in violation of any Coast Guard regulations or other governmental laws, rules, or regulations;
7. Mildew, water damage, dry rot, staining or water absorption on interior materials and/or surfaces including but not limited to upholstery, cushions, cabinets or floor coverings, as a result of sustained exposure to humid conditions.
8. Galvanization and/or electrolysis or and other damage caused or contributed to by stray electrical current.
9. Defects, injury, costs or damages arising out the use of engines with a rated horsepower exceeding the maximum rated horsepower for each model as defined by World Cat Boats or as reflected on the capacity label.

### III. CUSTOMER OBLIGATIONS:

1. You must sign and submit to World Cat the "LIMITED WARRANTY REGISTRATION FORM" within thirty (30) days of the date of delivery. Your dealer can do this for you, but it is up to you to request them to do so. **THE REGISTRATION FORM IS NOT A WARRANTY AND MAY NOT BE USED TO MODIFY OR CONFLICT WITH ANY TERMS OF THIS LIMITED WARRANTY;**
2. In the event you discover a defect, you must first notify the dealer from whom the boat was purchased within a reasonable period of time (not to exceed thirty (30) days) after you know or should know the defect exists;



## 2020 MODEL YEAR LIMITED WARRANTY

- World Cat will not be responsible for damage or to continue to repair or replace your boat or any part of it if your continued use prior to repair causes additional damage;
- If you believe a claim has been denied in error or the dealer has performed the warranty repairs in an unsatisfactory manner, the owner must notify the World Cat Customer Service Department in writing within thirty (30) days of the repair attempt at the address listed below under "Notice." World Cat will then review your claim and take appropriate follow-up action.
- You should keep records of all maintenance services. This record of proper maintenance may be required to determine warranty coverage on certain repairs and should be transferred to each subsequent owner. Please refer to the Owner's Manual that came with your boat for the proper maintenance procedures.
- In the event a repair must be made at a factory authorized repair center or at the World Cat factory, transportation to and from the repair center shall be made at the Customer's expense and not at the expense of World Cat or its authorized dealer.

#### IV. TRANSFERABILITY

You can transfer the unexpired term of this limited warranty once to a new owner, provided that the transfer occurs during the first (5) five years after the date of purchase. A copy of the bill of sale from the original owner is required, as well as completion of the transfer form. The new owner must register the transfer of limited warranty within 30 days of purchase, by sending a written request to the address listed in the **Notice** section below along with a registration fee of \$395. World Cat reserves the right to reject any warranty transfer request for a boat that has been damaged, neglected or otherwise previously excluded from warranty coverage.

#### V. DISPUTE RESOLUTION

##### MANDATORY MEDIATION BEFORE SUIT

IN THE UNLIKELY EVENT WE CANNOT AGREE ON A RESOLUTION OF ANY ISSUE REGARDING YOUR BOAT AND/OR THE TERMS OF THIS AGREEMENT, OR IN FACT OF ANY ISSUE ARISING BETWEEN YOU AND WORLD CAT AND/OR A WORLD CAT DEALER, YOU AND WORLD CAT AGREE TO SUBMIT THE DISPUTE TO MEDIATION. MEDIATION IS A SETTLEMENT CONFERENCE BEFORE A TRAINED MEDIATOR THAT YOU AND A WORLD CAT REPRESENTATIVE WITH AUTHORITY TO RESOLVE OUR DIFFERENCES ARE REQUIRED TO ATTEND. WE WILL PAY THE COSTS OF MEDIATION, BUT WORLD CAT WILL NOT BE RESPONSIBLE FOR TRAVEL EXPENSES, OTHER COSTS OR ATTORNEY FEES. YOU AND WORLD CAT WILL SELECT A MUTUALLY AGREEABLE MEDIATOR TOGETHER. IF WE CANNOT AGREE, THEN ANY JUDGE WITH POTENTIAL JURISDICTION OVER THE CASE WILL SELECT THE MEDIATOR. THE MEDIATION WILL BE AT A MUTUALLY AGREEABLE LOCATION BUT IT WILL ALSO BE WITHIN 100 MILES OF THE PLACE OF PURCHASE UNLESS OTHERWISE AGREED. YOU AGREE THAT NO LAWSUIT OR ARBITRATION OR ADMINISTRATIVE ACTION OF ANY KIND FOR ANY TYPE OF DAMAGE OR REMEDY MAY BE REQUESTED OR FILED UNTIL THIS MEDIATION IS COMPLETED. THE MEDIATION SHALL BE COMPLETED WITHIN SIX MONTHS OF THE FIRST DEMAND BY YOU OR WORLD CAT TO MEDIATE UNLESS OTHERWISE AGREED.

#### VI. DISCLAIMER OF IMPLIED WARRANTIES

THIS IS A LIMITED WARRANTY. WORLD CAT MAKES NO WARRANTY, OTHER THAN AS CONTAINED HEREIN AND NO DECALS, PROMOTIONAL LITERATURE, BROCHURES, WEBSITE MATERIALS AND/OR PRE-DELIVERY SERVICE INSPECTION RECORDS/FORMS OR BROCHURES SHALL BE CONSTRUED AS ANY ADDITIONAL OR SEPARATE WARRANTY. TO THE EXTENT ALLOWED BY LAW, ALL WARRANTIES OF MERCHANTABILITY, WORKMANSHIP, SEAWORTHINESS OR FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED AND EXCLUDED.

#### VII. LIMITATION OF REMEDY AND EXCLUSION OF CERTAIN DAMAGES

ALL INCIDENTAL AND/OR CONSEQUENTIAL DAMAGES ARE EXCLUDED FROM THIS LIMITED WARRANTY. YOU AND WORLD CAT AGREE THAT YOUR SOLE AND EXCLUSIVE REMEDY UNDER THIS LIMITED WARRANTY (AND ANY IMPLIED OR STATUTORY WARRANTY) IS THE REPAIR OR REPLACEMENT OF THE VESSEL OR DEFECTIVE COMPONENT AS SET FORTH ABOVE. NO OTHER LEGAL OR EQUITABLE REMEDIES SHALL BE AVAILABLE TO YOU IN RETURN FOR THE BENEFITS OF THIS LIMITED WARRANTY.

#### VIII. PERFECT TENDER

A "PERFECT TENDER" MEANS THAT WE HAVE A RIGHT TO REPLACE YOUR BOAT IF, IN OUR DISCRETION, THE CLAIMED DEFECT REQUIRES REPLACEMENT AND WE AGREE TO DO SO IMMEDIATELY. FOR THESE PURPOSES, "IMMEDIATELY" MEANS WITHIN NINETY (90) DAYS FROM THE DATE YOU FIRST NOTIFY US THAT YOU BELIEVE THAT WE HAVE FAILED TO HONOR THIS LIMITED (OR ANY OTHER) WARRANTY AND/OR OTHERWISE FAILED TO PROPERLY REMEDY A SUBSTANTIAL DEFECT. IN THE EVENT YOU NOTIFY US IN WRITING, PER THIS AGREEMENT, OF A FAILURE ON OUR PART AND WE AGREE TO REPLACE YOUR BOAT WITH A NEW BOAT AS DESCRIBED IN YOUR ORIGINAL PURCHASE AGREEMENT, THEN IN THE EVENT YOU REJECT THE OFFER OF A NEW BOAT AND FILE A LAWSUIT OR OTHER LEGAL CLAIM, YOU AGREE THAT IN RETURN, WORLD CAT WILL BE NOT RESPONSIBLE FOR YOUR ATTORNEY FEES AND COURT COSTS. IF YOU HAVE FINANCED THE BOAT, YOU MUST EITHER





# 2020 MODEL YEAR LIMITED WARRANTY

PAY OFF THE AMOUNT YOU OWE BEFORE WE DELIVER THE NEW BOAT OR WE WILL ASSIST YOU TO SUBSTITUTE THE NEW BOAT AS COLLATERAL. WE ARE NOT RESPONSIBLE FOR PAYING OFF YOUR PRESENT BOAT

## IX. OTHER TERMS AND CONDITIONS

This limited warranty gives you specific legal rights, and you may also have other rights, which may vary from state to state. Some states and/or federal laws do not allow limitations to implied warranties or as to remedies or certain damages, so the above disclaimers and/or limitations may not apply to you.

World Cat will discharge its obligations under this warranty as quickly as possible, but *we cannot guarantee any specific completion date*. This is due to the potential complexity of the repair or the availability of parts from sources over which World Cat has limited control. You agree that the time for repairs does not include time spent waiting for parts or the time your boat may end up stored at our factory or at a dealer for your convenience or due to scheduling.

World Cat reserves the right to change or improve the design of its boats, without obligation to modify any boat previously manufactured. World Cat shall in no way be responsible for any repairs not PRE-AUTHORIZED by a World Cat Customer Service Manager or repairs performed by a repair shop not PRE-AUTHORIZED by a World Cat Customer Service Manager. "PRE-AUTHORIZED" means that we have prior approval in how the repairs are performed *before* they are performed.

## X. NO WAIVER OF THESE TERMS

The terms, conditions, limitations and disclaimers contained herein cannot be waived except by a management level employee of World Cat. Any waiver we give shall be in writing. Neither the dealer, nor any service, sales and/or warranty representative of World Cat are authorized to waive and/or modify these conditions, limitations and/or disclaimers.

## XI. NOTICE:

All communications and notices from you and/or a new owner requesting a transfer of this limited warranty should be sent to: World Cat Customer Service, 1090 West Saint James Street, Tarboro, NC 27886 or faxed to 919-882-8035. You can also email us at: [service@worldcat.com](mailto:service@worldcat.com), but you must request an acknowledgment that our Customer Service Department actually received it.

### Acknowledgment of Limited Warranty.

By signing below, you agree that you have read this limited warranty in its entirety and understands its terms and conditions. You acknowledge that you have received a copy of this limited warranty at or before the time of the sale.

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### WARRANTY REGISTRATION

_____	_____
Purchaser's Name	Purchaser's Phone Number
_____	_____
Purchaser's Street Address	Date of Delivery
_____	_____
Purchaser's City, State and Zip Code	Hull Identification Number
_____	_____
Purchaser's Email Address	Boat Model
_____	_____
Purchaser's Signature	Selling Dealer
	_____
	Dealer's Sales Representative

Check one:  Original Owner  Second Owner

## Chapter 10: 280DC-X Operation

### 10.1 Operation of Standard Equipment

#### 10.1.1 Battery Layout and Management

Your 280DC-X is equipped with three batteries, which are located in the aft starboard bilge area. A cranking battery is installed on each side, and a dedicated house battery is installed in the center. Wire leads run through the hull harness to the battery management panel which is below the helm seat. See section 6.5 thru 6.6.4 for information regarding the operation of this panel. The engine cranking leads run aft, through a hull rigging tube, from the management panel to a positive stud mounted on the bulkhead in each aft rigging compartment. The negative engine leads are connected to the common battery ground using a negative buss also located in the aft rigging compartment.

The house battery provides the power for a majority of your DC accessories. The main battery lead runs to the "HOUSE" switch on the battery management panel. From there current is routed to the dash and circuit breaker through the 80 amp "DC Main" breaker located in the center of the battery management panel. During normal operation this breaker can remain in the "ON" position, and the "HOUSE" switch can be used to control the flow of current. The main ground for all DC accessories is tied into the common ground on all batteries. For a detailed drawing of the battery management panel connections, see the diagram in section 10.4.1 of this chapter.

#### 10.1.2 Additional Emergency Parallel

As an additional feature, the 280DC-X management panel contains a secondary "EMERG PARALLEL" switch. It allows you to mechanically link the starboard "cranking" battery to the house battery. Furthermore, engaging both "EMERG PARALLEL" switches will connect all three batteries into a single bank. The switches should remain in the "OFF" position when not in use. To prevent voltage spikes or drops which can damage electrical components, you should trip the DC Mains 1 breaker prior to cranking engines with the house battery in parallel. Once you are running, the breaker can be reset to allow the full alternator output to power the electronics. This is a safety feature and should not be used in-lieu of the VSR's to charge batteries while underway. Doing so, could result in premature battery failure and increases the risk of electrical failure while at sea.

#### 10.1.3 Bilge Pumps / Float Switches

Your 280DC-X is equipped with two 1500 GPH bilge pumps located aft and two 500 GPH bilge pumps located forward. Each pump is connected to a float switch which automatically triggers the pump when water comes to rest in the bilge. The float switches are connected to the battery management panel through the hull harness and receive power from the breakers on the right side of the panel. These breakers are constantly energized and ensure the safety of your boat even when the battery switches are in the "off" position. The pumps can be manually engaged using the switch at the dash.

The forward bilge pumps are accessible under the port side sink and under inspector plate in the starboard helm storage area.

Inspect the operation and condition of your bilge pumps regularly. Activate the pump by lifting the float switch. Once the float switch is released the pump should shut off. It is important to keep the bilge area clean and free of debris, which may prevent proper operation of the float switch, and cause damage to the pump.

### 10.1.4 Freshwater System

The freshwater pump is located in the port side mechanical room. The pump is connected to the 17 gallon freshwater tank located aft of the port fuel tank. The tank is filled through a fitting located at the port side transom.

Similar to residential well pumps, the freshwater pump pressurizes the system to 60 psi. then shuts down until the pressure drops below that level. Most owners leave the pump "ON" throughout the day, and use the system when necessary. On the 280DC-X, the freshwater pump feeds the pull out shower located on the aft transom wall, freshwater wiper rinse and the marine head. To view the layout of the water systems see the drawing in section 10.4.5.

### 10.1.5 Seacocks

OPEN



CLOSED



Ball valves (seacocks) are installed on the water intake for both the livewell and raw water system. The seacock must be in the open position for these systems to work. When open, the handle will be parallel to the valve. In the closed position the handle is perpendicular to the valve (see picture above). World Cat recommends that the seacocks remain in the closed position when not in use, or when the boat is left unattended to prevent the vessel from taking on water due to a plumbing failure.

### 10.1.6 Livewell System (Optional with Fishing Package)

The 20 gallon livewell system is supplied by a dual purpose livewell pump. The pump is located in the port mechanical room. The wiring is secured to the pump using a tie-strap, and must be disconnected prior to removing the pump.

The livewell pump draws water through the strainer mounted on the inboard side of the port sponson. A seacock is installed between the pickup and the pump to allow you to seal the system between use, or in the event of a plumbing failure.

To operate the livewell, first verify that the seacock is open, then install the supplied drain plug in the bottom of the livewell located in the aft portion of the port back-to-back seat. When you have completed these steps, turn the pump on with the dedicated livewell switch located on the port wall beside the back-to-back seat. Water will fill the tank until it is level with the overflow drain in the top corner of the livewell tub which allows the excess water to drain overboard through the port hullside. To clear bait residue that has collected in the bottom of the tub, temporarily pull out the drain plug to allow waste to escape. Put the plug back into position to resume normal operation. When you have finished using the livewell turn the pump off and discard any left-over bait. Pull the plug out of the bottom drain and allow all the remaining water to exit the bottom of the tub. To view the layout of the livewell system see the drawing in section 10.4.6.

#### NOTICE

While underway, leaving your livewell seacock open could result in inadvertently filling your livewell. To prevent this, close the seacock when the pump is not in operation.

#### NOTICE

Operating the engines in reverse can cause excessive ventilation near the livewell intake, causing the pump to airlock. To prevent this, turn the pumps "OFF" prior to any continuous or high speed reverse operation. If your pump does become air locked, turn the pump "OFF" for 15 to 30 seconds to correct the problem.

### 10.1.7 Raw Water System

The raw water pump and strainer are mounted on the rigging wall in the port mechanical room located in the port aft cockpit of the boat. The strainer is connected to a high-speed pickup through the seacock located on the inboard side of the port sponson. The seacock must be in the open position for the system to work. Similar to the freshwater pump, the raw water system is controlled by a built-in pressure switch set at 60psi. The pump will cycle on and off as needed to maintain this pressure. Most owners leave the pump in the on position throughout the day and use the system when necessary. On the 280DC-X the raw water pump is switched on by a push button mechanical switch located on the dash area. The 280DC-X has two raw water outlets, one is located on the port wall beside the back-to-back seat and the other is a hose coil located inside the port anchor locker to allow easy rinsing of the anchor and chain, as well as the bow of the vessel. To view the layout of the raw water system see the drawing in section 10.4.6.

### 10.1.8 Wiper with Rinse (Optional)

The windshield wiper switch on the dash of the 280DC-X allows you to operate the windshield wiper system on the vessel if this optional feature was purchased.

This switch is a pushbutton style switch and has three buttons located on the face of the switch as well as three LED lights that show the user what mode and speed it is currently operating at. Please refer to section 6.10.15 for a detailed user manual explaining the operation and function of this switch.



This switch will activate the rinse system included in the wiper option. The rinse system is tied into the freshwater supply on the vessel. In-order for the rinse system to function properly the fresh water pump must be turned on. The fresh water pump switch is a labeled push button mechanical switch located on the dash of the 280DC-X.

### 10.1.9 Marine Head

Your 280DC-X comes equipped with an electric marine head system. The control panel for the head is located inside the head compartment on the port side, beside the head under the storage shelf. Power is supplied to this panel through a 25 amp breaker located behind the helm, inside the storage room on the starboard side of the vessel. Water is supplied to the system from the freshwater pump; therefore, to operate the toilet the freshwater system must be pressurized. A solenoid installed near the head inlet prevents water from filling the bowl prior to each use. The macerator pump, located at the rear of the toilet, removes the waste from the bowl and pumps it into the 9 gal holding tank.



The holding tank is located under the deck on the port side of the boat under the back-to-back seat. This tank can be evacuated two different ways. First is by using the deck pump-out fitting located on the port side of the deck beside the side windshield. Second is by using the overboard discharge. To discharge overboard, open the access plate located at the top of the step leading down into the head compartment. Reach inside and open the seacock located on the back side of the discharge fitting. Once that is done the operator can activate the switch on the dash labeled "overboard discharge" to turn on the macerator pump and pump overboard. To view the layout of the marine head water system see the drawing in section 10.4.5.

## !!! WARNING

If the solenoid fails or becomes locked in the open position, shut off the supply system quickly and evacuate the bowl.

### 10.1.9.1 Initial Start Up

On each trip, prior to using the head, complete the following steps:

- Turn on the freshwater system.
- Fill 1/3 of the bowl with water using the lower switch on the control panel.
- Hold down the flush switch for 5 seconds to evacuate the bowl and refill with water.

### 10.1.9.2 Normal Use

Use the steps below for normal operation:

- Hold the upper switch on the panel down for 5 seconds. This will purge the bowl and refill it with water.
- In the event of inclement weather or rough seas, use the lower switch to remove water from the bowl and prevent sloshing.

## !!! CAUTION

Large quantities of waste or paper can clog the head and cause odor issues. To prevent this, flush often and if necessary perform an extra flush to purge the discharge line.

## !!! CAUTION

Do not dispose of foreign objects in the head. Doing so may damage the macerator pump or outlet hoses. Clogging or puncturing these lines will lead to odor problems.

### 10.1.9.3 Deck Pump Out

Upon returning, use the following instruction to empty the holding tank:

- Remove the cap from the deck pump-out fitting located on the port side beside the windshield.
- Use the vacuum hose at the pump-out station to clean the tank, then remove the hose and replace the deck fitting.

### 10.1.9.4 Overboard Discharge

Use the following steps to discharge the contents of the holding tank overboard:

- Open the overboard discharge seacock. To access, open the inspection hatch installed above the step in head area.
- Use the switch located in the dash labeled "overboard discharge".
- Inspect the tank level and repeat step 2 if needed, otherwise close the discharge seacock.

## !!! CAUTION

Discharging waste in inland waters and some coastal areas is illegal. Check with local and state authorities in your region to determine the proper method for waste disposal.

For more instructions on operation, winterization and troubleshooting the marine head, see the Shurflo™ manual supplied in your Owner's Portfolio.

### 10.1.10 Anchor Windlass

World Cat provides a standard anchor windlass. This standard feature comes equipped with windlass, an anchor, anchor rope, and chain which is matched to your vessel's size. The switch to control the windlass is mounted at the helm, and foot switches are installed at the windlass in the starboard anchor locker. The manufacturer's instruction manual is provided, in the Owner's Portfolio, detailing their use.

The circuit breaker for the anchor windlass is mounted on the center of the battery management panel. The panel is connected to the "Stbd Start" battery switch.

## NOTICE

Windlasses used incorrectly could cause harm to equipment or crew. Windlasses should be used with care and treated with respect. Windlasses are designed and supplied for anchor control in marine applications and are not to be used in conjunction with any other use. It is the unavoidable responsibility of the owner or master or other responsible part to assess the risk of any operation on the vessel.

### 10.1.11 Windlass Deck Switch Maintenance

Refer to section 7.12 for details on windlass deck switch maintenance.

## 10.2 Maximum Horsepower Rating

Twin 200 4-Stroke HP (400 HP TOTAL)

## 10.3 Operation of Optional Equipment

### 10.3.1 Outriggers

Outriggers enhance the fishability of your catamaran and can be a great asset when hunting a trophy catch. World Cat offers Taco™ outriggers as an option. The units are mounted on the fiberglass hardtop and operated using the handles above and outboard of the walkthrough. Use the information provided in section 7.6 to maintain the aluminum on the outriggers and grease the telescoping joints frequently to prevent damage from salt spray.

### 10.3.2 Battery Charger (Standard)

Combined with the battery management system, this system helps ensure that your vessel will be ready to fish whenever you are. The charger is located on the port side aft bulkhead, accessed through the drop down door next to the transom walk through.

### 10.3.3 Refrigerator

A stainless steel, 1.75 cu. ft. refrigerator / freezer. The unit is mounted in the starboard side entertainment center behind the helm. This is a 12 volt unit and turns on automatically when the house battery switch is turned on at the battery management center. The unit is protected by a 15 amp fuse that is located in the starboard storage area in front of the helm. Since this refrigerator is on at all times that the house battery switch is on, it is recommended that your battery charger be on as well if you plan on having the refrigerator on overnight when tied up at the dock.

### 10.3.4 Grill and Inverter / Charger

A 1300 watt 120 volt electric grill. This grill is mounted on top of the entertainment center on the starboard side behind the helm. The grill will receive its power from an inverter that is getting its power from two dedicated group 31 batteries. These batteries are mount in parallel under the back to back seat.

The inverter is a combination charger as well. The inverter is mounted inside the starboard storage area in front of the helm area. This inverter will power the grill by taking 12 volt and turning it into 120 volt. It will also charge the two dedicated batteries when the inverter is plugged into a 120 volt shore power source. The plug for the inverter is mounted beside the walk-through door on the back transom wall.

### **10.3.5 Electronics Package**

The electronics package consists of a 12" Chartplotter / Sonar combo unit with a low profile thru-hull transducer, and a VHF radio with marine top mounted VHF Antenna. The 12" Chartplotter / Sonar combo unit is wired to the fuse panel inside the starboard helm storage area and is protected with a 6 amp fuse. The VHF radio is wired in the same location and is protected by an 8 amp fuse. The supplied transducer with this option is a low profile thru-hull style transducer and is mounted inside the bottom of the hull on the starboard aft bilge. It can be accessed from inside the starboard mechanical room in the aft cockpit floor. Also, with this option is a marine VHF antenna that is mounted to the hardtop with a stainless steel ratchet mount. The antenna cable is run through the hardtop frame and hooked to the back side of the VHF radio. Please refer to the Chartplotter and VHF user manual provided with the boat owners bag that came with the vessel.

### **10.3.6 Stereo Upgrade**

The stereo upgrade package consists of four upgraded speakers to replace the four that are standard on the boat. With this option, you also will receive two additional 8.8" speakers for a total of six speakers throughout the vessel. Powering these six speakers is a 100 W x 8-channel class D marine amplifier. The amplifier is hooked up to the standard Fusion radio and receives its power through an 80 amp breaker mounted inside the helm storage area in front of the helm.

### **10.3.7 Optimus Electronic Steering System EPS (Standard)**

The Optimus Electronic Steering system replaces the standard hydraulic helm pump and provides the operator with an electronic helm. This helm gives the user a couple of advantages that the standard hydraulic helm cannot. Some of these advantages are, adjustable speed sensitive wheel effort, and adjustable speed sensitive turns lock to lock. The system consists of an electric helm, hydraulic steering pumps (1 x engine), Smart Cylinder (1 x engine), pump control module (PCM), and a color display. The electric helm is mounted on the dash in the same location the standard helm would be mounted. The hydraulic pumps and the PCM are mounted on the 280DC-X in the starboard aft mechanical room. The PCM is protected by a 50 amp fuse for the port and starboard sides and these are located beside the PCM. The Smart Cylinders are mounted in front of each engine similar to a standard hydraulic steering cylinder. The color display is mounted on the dash close to the helm and within reach of the operator. The color display shows the operator RPM per motor as well as the rudder direction for each engine. The color display also allows the operator to adjust the turns to turn feature as well as the speed sensitive wheel effort. This system is automatically powered up and operational whenever the port or starboard engine ignition switches are turn on at the dash. For more in-depth operation of the option, please refer to the Optimus user manual provided with the boat owners bag that came with the vessel.

### **10.3.8 Optimus 360 with Electronic Steering, SeaStation, Joystick, & SeaWays Autopilot**

Optimus 360 includes the EPS system that is explained in section 10.3.7, as well as joystick and SeaStation. The joystick function allows the operator to maneuver the boat at slow speeds or during a docking situation simply by using the joystick. The joystick takes control of the steering, shift, and throttle allowing the vessel to move in any direction the joystick is pushed. Like the joystick, the SeaStation function takes control of the steering, shift, and throttle. Think of the SeaStation as a GPS anchor. It controls the engines and steering to hold the boat in a certain location. The SeaStation has three modes of operation. Heading hold which holds the heading regardless of the position. Position hold which holds the position regardless of heading. Heading and position hold which hold heading and stay in position. For more in-depth operation of the option, please refer to the Optimus user manual provided with the boat owners bag that came with the vessel.



### 10.3.9 SureShade Pull-Out Boat Shade

The SureShade is mounted underneath the fiberglass hardtop in the aft cockpit of the vessel. To operate the shade, make sure the vessel has come to a complete rest. You will need to rotate the hand crank located in the starboard aft upper corner of the hardtop. This crank extends and retracts the shade to the extended and closed position. The manufacturer recommends that this shade not be extended or retracted while the vessel is in motion. Please make any adjustments only when the vessel has come to a complete rest.

#### **!!! CAUTION**

SureShade pull-out boat shade is not to be operated while boat is underway. Damage to boat, or personal injury, could occur if shade is extended or retracted while underway.

### 10.3.10 Forward Bow Shade

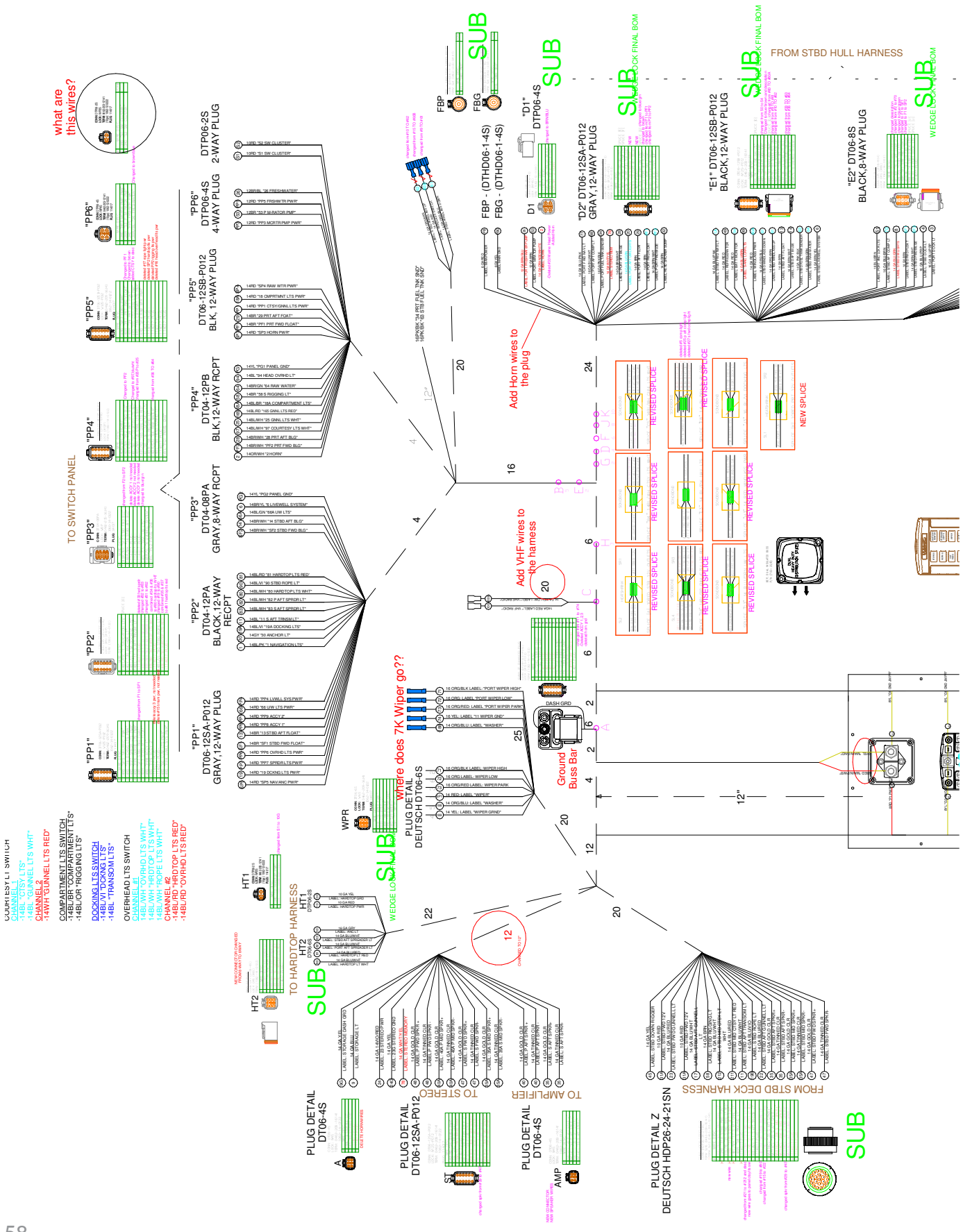
The forward bow shade attaches to the front of the fiberglass hardtop and extends toward the bow by attaching to stainless steel support poles that hold the front of the shade in position. The shade is easily attached with clips on the top and pull strings that attach to the removable stainless steel support legs up front. The middle of the shade is supported by a removable fiberglass pole that slides in and out of a center mounted sleeve in the shade fabric which will support the center of the shade. The manufacturer recommends this shade not to be used while underway.

#### **!!! CAUTION**

UVX Shade is intended to be used while boat is anchored or moored, and not to be used while boat is underway. Damage to boat, or personal injury, could occur if shade is used while underway.

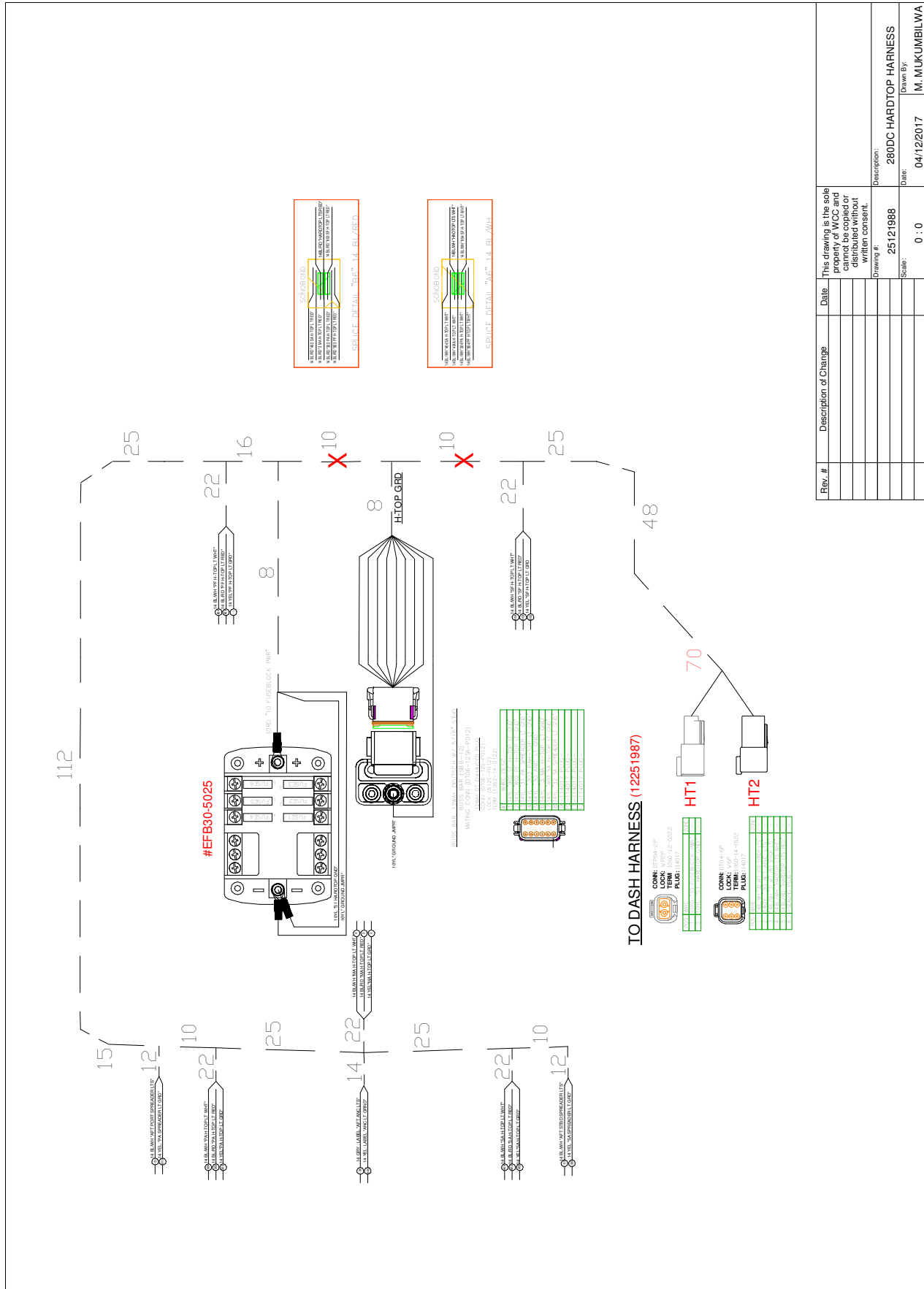


# 10.4.2 Dash Wiring Diagram



- COURTESY L1 SWITCH
- 14BL- 'GUSY' LITS\*
- 14BL-WHT 'GRINNEL'S WHT'
- 14BL-WHT 'GRINNEL'S RED'
- 14WL- 'GRINNEL'S RED'
- 14WL- 'GRINNEL'S WHT'
- COMPARTMENT LITS SWITCH
- 14BL- 'RIGGING LITS'
- 14WL- 'RIGGING LITS'
- DC SOLAR LITS SWITCH
- 14BL- 'DC SOLAR LITS'
- 14BL- 'TRANSOM LITS'
- OVERHEAD LITS SWITCH
- 14BL-WHT 'OV'RH'D LITS WHT'
- 14BL-WHT 'OV'RH'D LITS WHT'
- 14BL-WHT 'OV'RH'D LITS WHT'
- 14BL-RD 'OV'RH'D LITS RED'
- 14BL-RD 'OV'RH'D LITS RED'

10.4.3 Hardtop Panel Wiring Diagram



Rev. #	Description of Change	Date	This drawing is the sole property of WCC and no part of it is to be distributed without written consent.

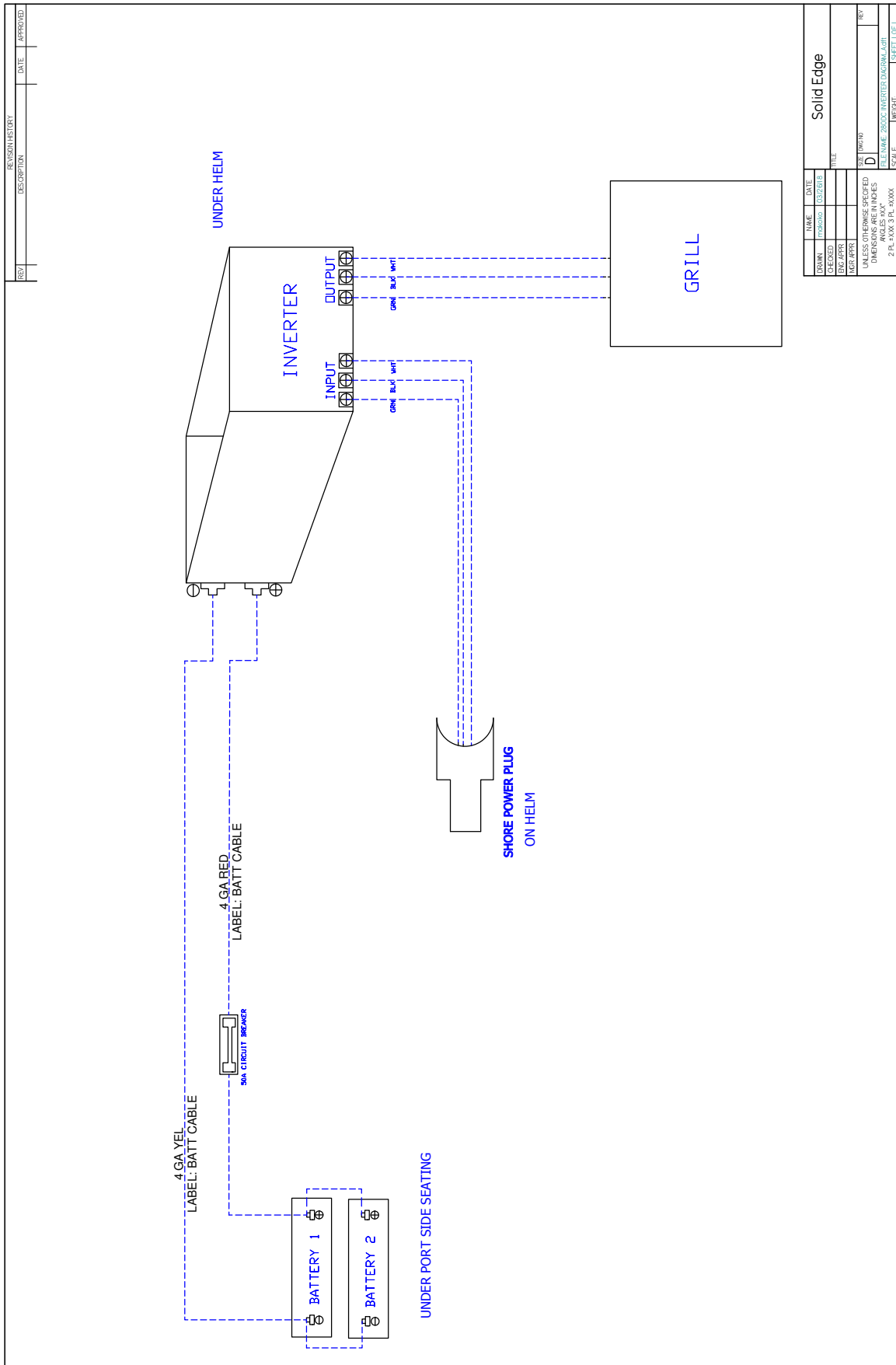
  

Rev. #	Date	Description
0 : 0	04/12/2017	280DC HARDTOP HARNESS

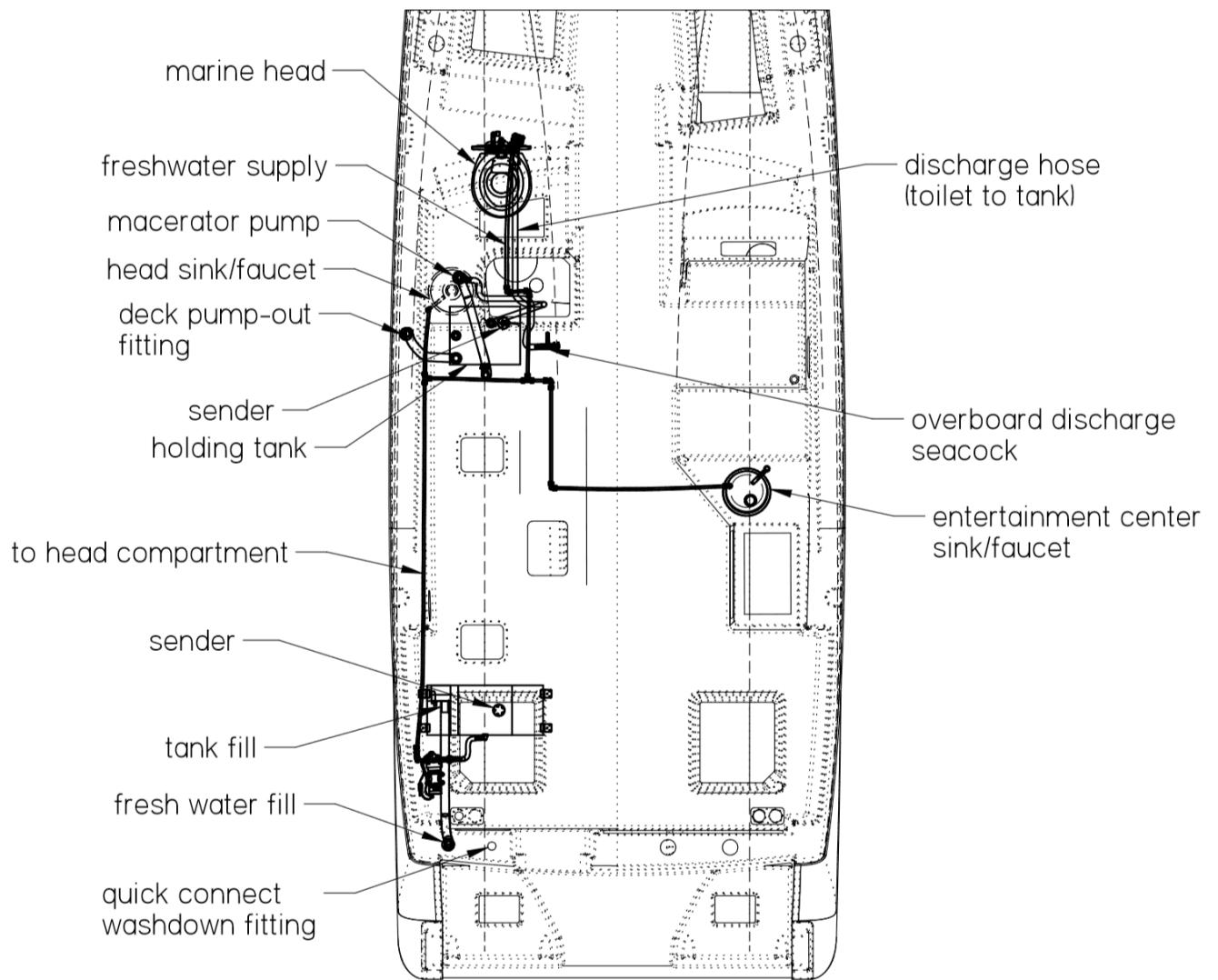
Scale: 0 : 0

Drawn by: M. MUKUMBILWA

### 10.4.4 Inverter Diagram

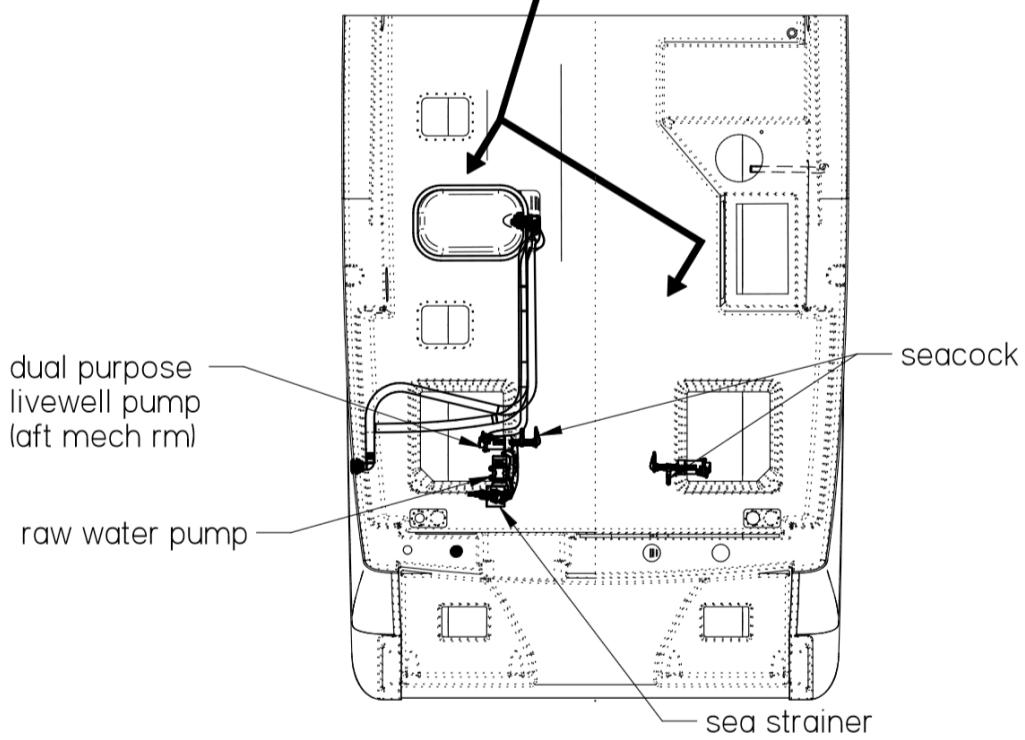
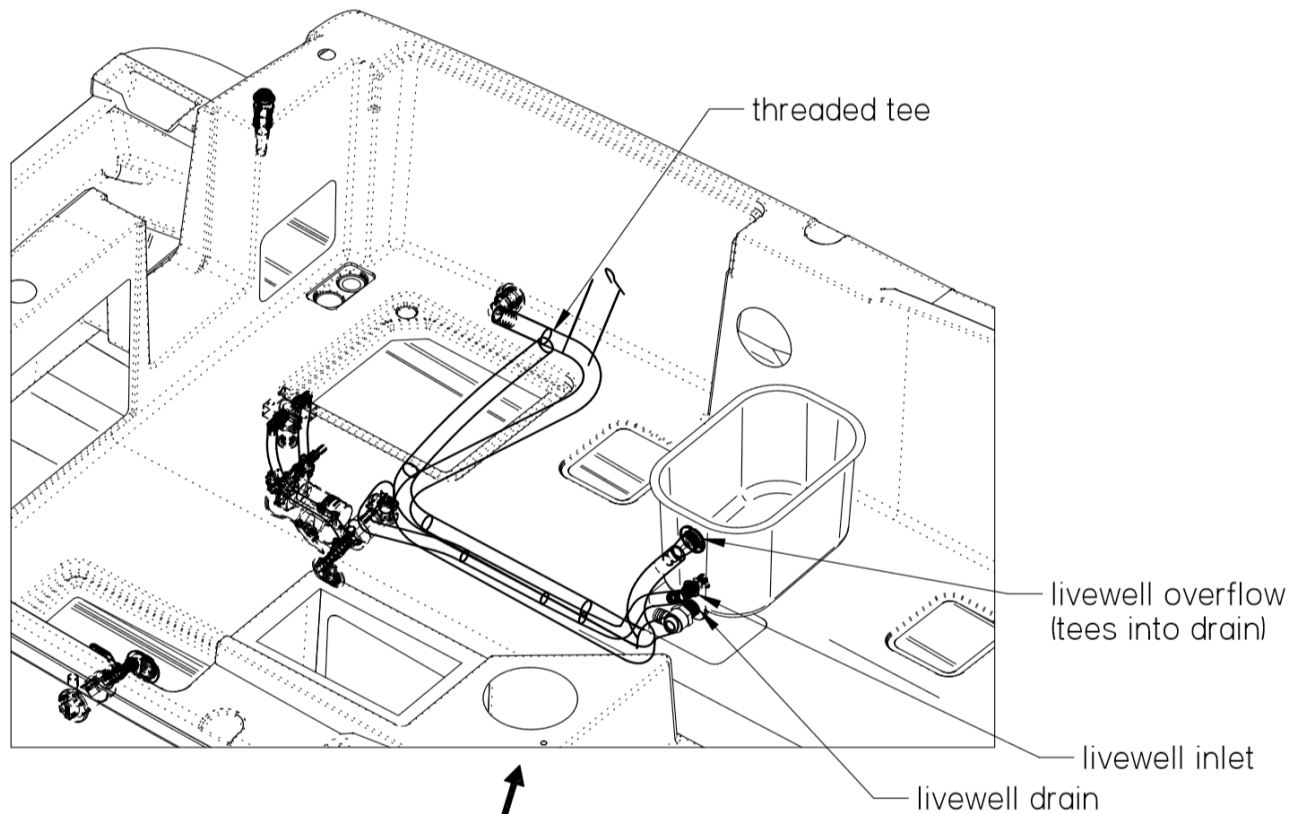


### 10.4.5 Freshwater and Marine Head Systems Diagram



Freshwater and Marine Head Systems

### 10.4.6 Raw Water and Livewell Systems Diagram



Raw Water and Livewell Systems







# 280DC-X

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