400CC-X

OWNER'S MANUAL
2023 MODEL YEAR

WORLDCAT
A BETTER WAY TO BOAT™

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 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

WORLDCAT

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

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HOW TO USE THIS MANUAL

This manual is designed to assist the user in operation of the yacht's systems as built by World Cat Yachts. Thus the structure of the manual is yacht system based rather than yacht component based. It is the intention to describe the location and interrelation of subcomponents into total systems that are not covered in the subcomponent literature supplied by the manufacturers' of those subcomponents. The topics are organized in an order prioritized based upon safety and the perceived order of need that a new operator or person totally unfamiliar with the yacht would have.

The "Introduction" includes preliminary information about the yacht and items of a regulatory nature.

The "Specifications Section" contains important dimensional information about the overall yacht, weights, and measures and other vital statistics including a summary of equipment serial #s.

Sections are annotated by statements as necessary indicating danger and precautionary degrees with corresponding labels to alert the user. Those are indicated as follows:

Denotes an immediately hazardous situation. If the hazardous situation is not avoided, death or serious injury will occur.

Denotes a potentially hazardous situation. If the hazardous situation is not avoided, death or serious injury could occur.

Denotes a potentially hazardous situation. If the hazardous situation is not avoided, minor or moderate injury could occur.

Denotes a property-damage-only hazard, meaning no personal injury is possible.

The "Operations Section" is a list of step by step "menus" or checklists on how to carry out every important operation on the yacht that is not listed in the subcomponent literature file supplied by that subcomponent's manufacturer and delivered with the yacht. This section is illustrated with photos that correspond to the steps as necessary in order to have a clear understanding of the items within the various yacht systems referenced.

The "Figures Section" is a group of engineering drawings, figures, and illustrations of the yacht providing general information about the yacht's systems, dimensions, and locations of equipment and components.

The "Troubleshooting Section" is a set of tables broken down by system of potentially common problem situations with their probable solutions.

The “Maintenance Section” is a spreadsheet of all of the suggested routine maintenance actions that should be carried out on the yacht broken down into *Systems* (ex.- “Propulsion”), *Items* (ex.- “Port Engine”), *Actions* (ex. “Change oil”), *Intervals* (ex. “200 hr.s”), and *Alternate Intervals* -(ex. “1 year”).

The "Spare Parts Section" is a summary list of suggested spare parts for the specific yacht.

***This manual does not attempt to teach navigation, piloting, seamanship, or marine engineering. The user should not attempt to operate the yacht without competence in those areas of skill.**

SPECIFICATIONS
2.0

SPECIFICATIONS

Length Overall (Hull)	39’8”
Beam	12’8”
Draft	21”
Bridge Clearance (keel to top of hard top)	8’6”
Dry Weight w/Power (approx.)	14,500 lbs
Fuel Capacity (2 x 302)	604 gallons
Fresh Water Capacity	30 gallons
Holding Tank Capacity	13 gallons
Main Engines (standard)	425 Hp ea. Yamaha XF-425 4S
D.C. Circuits	12 Volts
A.C. Circuits	120 Volts

SAFETY OPERATIONS
3.1

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 National Marine Manufacturer's Association (NMMA) publication *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

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.

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 page 23 of the *Sportfish, Cruisers, Yachts Owner's Manual*.

- 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.

RECOMMENDED SAFETY EQUIPMENT

Although not required, there are several additional items which help to ensure safety, and provide convenience for you and your 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.

CAPACITY INFORMATION

As an owner you should be aware of the weight on board. Exceeding capacity can endanger your passengers and vessel, as well as void any warranty remaining on the boat should a failure occur. Remember that this is a guideline for normal operation, and does not release you from responsibility should an accident occur. You must use rational judgment when adverse conditions are expected, and reduce your loads to create a margin of safety.

This label means your World Cat is certified by the NMMA. With this tag, you are assured your fuel system, electrical system, lighting, ventilation, and steering are not only in compliance with the US Coast Guard regulations, but also meet the more stringent standards of the NMMA. The National Marine Manufacturer's Association 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 the placard shown here. 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.

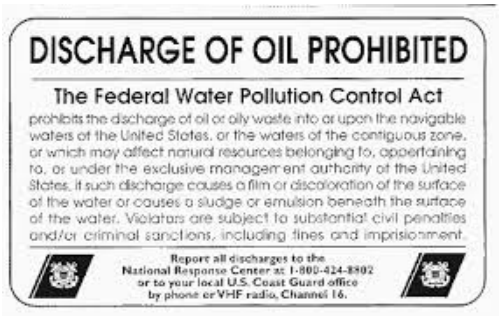
Horsepower ratings, however, are set by World Cat and *should not be exceeded.* Exceeding the factory recommendation stated on the tag on your model will result in loss of warranty coverage on your vessel.

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.

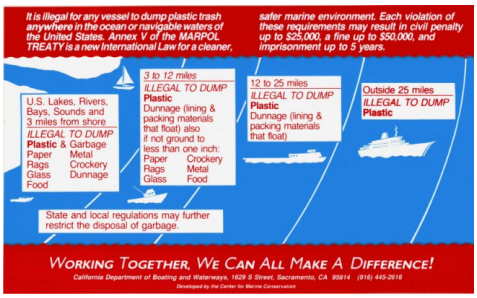
OIL AND HAZARDOUS SUBSTANCES

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:



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.



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:

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.

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.

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.

Underway (See Propulsion Operations Section on Performance)

Obey all “Rules of the Road” and any local regulations. Use the information located on page 13 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.

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.

Wash the boat and perform general maintenance upon returning. (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*.

Trailering Due to the nature of the hull, catamarans require specialized trailers. Your dealer will be able to provide them, as well as information on safe trailering practices.

Anchoring 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.**

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.

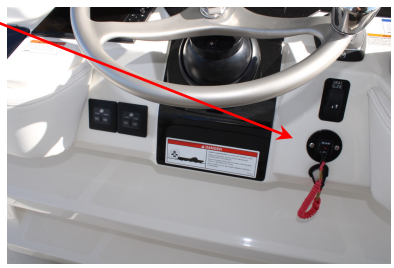
If you do become grounded, tilt the motors up to reduce the draft at the transom. Often this will solve the problem; however, it may be necessary to rock the boat from side to side to break the suction along the keel. If you are grounded on an incoming tide, allowing the water to rise can help. Being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

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. Below is important information which all owners should be aware.

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 switch 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.



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.

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.

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.

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.

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.*

Carbon Monoxide (CO)

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.

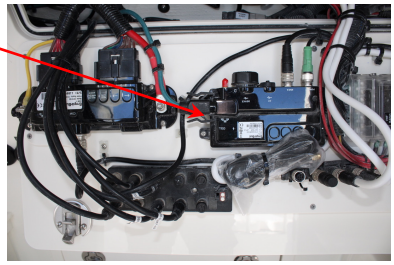
ABOUT THE GARMIN EMPIRBUS SYSTEM

DESCRIPTION: This section is included here in the beginning in the Safety section because the Garmin Empirbus system also controls the monitoring and alarm functions. It will also be included in the Electrical section.

The Garmin Empirbus system on the World Cat 400 CC-X is a state of the art monitoring and control system that integrates the ability to connect, protect, monitor and distribute D.C. electrical sources to loads (consuming devices) and to monitor the status of onboard systems. The system facilitates the use of wireless Bluetooth FOBs to operate devices in the system (such as battery switches) from a distance remotely. The architecture of the system consists of the D.C. wiring to feed the load carrying devices; digitally controlled D.C. controllers to act as circuit protection, switches, and status indication, two push button switch pads, and a 12 volt D.C. NMEA 2000 data bus interconnecting all of the devices for monitoring and control with the touch screens as a user interface. All of the devices have manual override capabilities.

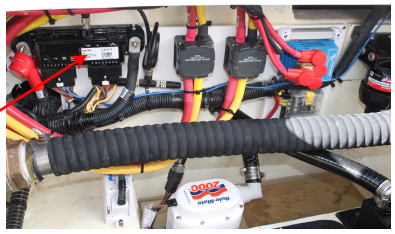
Components of the Empirbus system include:

Garmin touch screen monitors that comprise the user interface to monitor the state of and control the system. Those units are on the console dash.

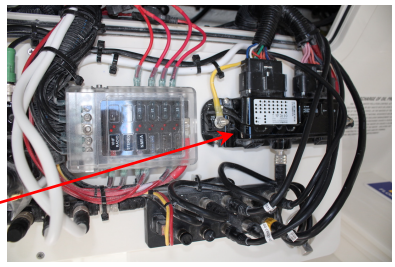


Web Display Unit (WDU) - This unit controls the interface of the system to the Garmin touch screen displays enabling programing, user operation, and system status feedback via a graphic interface. This unit also has the capability for wireless connection of the system to Bluetooth remote control FOBs and outside networks via WiFi. A USB port on the WDU allows for easy system upgrades. The WDU is mounted under the center of the dash accessed via the drop down panel in the head.

DCMs - These are 100 amp capacity electronic devices that combine 16 input and output D.C. device channels into single modules, offering a compact and intelligent replacement for traditional D.C. fuse boxes and circuit breaker panels with digital switching technology. There are three DCMs in the World Cat 400 CC-X Empirbus system. There is one DCM mounted under the stbd. side of the dash accessed via the drop down panel in the head, one mounted on the inside of the port transom, and one mounted on the inside of the stbd. transom.



Connect 50s - These are 50 amp capacity electronic devices that combine 11 input and 20 output D.C. device channels into single modules, offering a compact and intelligent replacement for traditional D.C. fuse boxes and circuit breaker panels with digital switching technology. There are two Connect 50s in the World Cat 400 CC-X Empirbus system. There is one Connect 50 mounted under the port side of the dash accessed via the drop down panel in the head and one mounted on the port side of the overhead of the hardtop instrument box.



SP8s - These are waterproof electronic touch switch pads each containing 8 switches to control devices in the system. There are two Switch Control Interfaces (SCIs) to integrate more traditional “hard” switches. These two switch pads are mounted on the console dash forward of the helm.

The dash console Garmin monitor touch screens are used to operate the system centrally, and as the ABYC and CE safety authorities require every circuit to have both overload protection and a bypass, this is provided by manual buttons on the DCMs and Connect 50s. The DCMs and Connect 50s have channel designation labels on them and status LEDs for each channel. A manually switched on channel is in normal running mode indicated by a flashing green channel indicator. A manually switched off channel is in normal running mode indicated by a flashing red channel indicator. A channel with tripped fuse is in normal running mode indicated by a red continuous channel indicator. A channel can be reset to normal operation using controls on the device, see the Empirbus Manuals in the subcomponent literature file and the Empirbus System Layout drawings in this manual for the channel designation numbers.

The DCMs and Connect 50s are supplied D.C. load power from the house battery bank to power the D.C. loads and the NMEA 2000 data network integrating the system is powered by 12 volt power from the house battery system all fed from conventional manual circuit breakers on the main D.C. panel and fuses.

Devices that are NOT circuit protected by the Empirbus system are:

- Automatic bilge pumps load
- Battery switch remote control power
- The electric toilet load
- The windlass motor load
- The speakers' amplifier load
- The subwoofer amplifier load
- The feeds to the port and stbd. mechanical room fuse boxes mounted inside the transoms
- Electronics power feeds

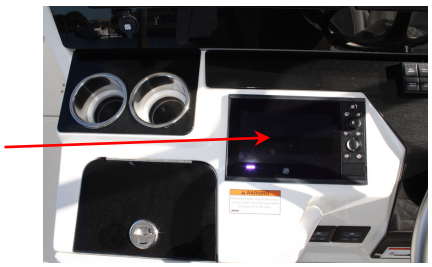
- A.C. circuits

These items are fed and protected by "hard" circuit breakers or fuses.

The yacht's A.C. sources (shore power and inverter output) are not switched by the Empirbus system and are fed via the hard wired distribution panel in the head through traditional manual source selector circuit breakers from the 30 amp 125 volt shore power cable.

NOTICE **The engines are also fitted with standalone Yamaha NMEA 2000 electronic monitoring (CL7 display) or Mercury (VesselView) as applicable.**

Engine information is displayed for each engine on the Yamaha CL7 or Mercury VesselView standalone displays (as applicable) which also display alarms, trouble codes, maintenance logs, and trip information such as distance and hours; and allow for reset of these values. Engine maintenance information is displayed, and maintenance intervals can be set, as well as the time elapsed since the previous maintenance can be reset.



Tank level sensor information, trim angle of the engines, active alarms for the engines, and trouble codes for active engine alarms are displayed. This information is useful to Yamaha or Mercury (as may apply) dealers for diagnosis. The following vessel system components are integrated into the data bus:

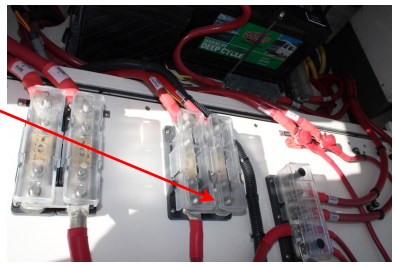
- Battery switch remote operation.
- D.C. power monitoring and low voltage alarms.
- A.C. power monitoring of the shore power and inverter output.
- The Yamaha CL7 or Mercury VesselView display.
- Fuel tank level sensors.
- Fresh water and sewage tank level sensors.
- Garmin multifunction touch screen monitors.
- Depth transducer.
- Stereo.
- GPSs.
- Lighting.
- Bilge pumps' operational status and high water alarms.
- Wipers.
- Freshwater, sewage discharge, live well, fish box discharge, and washdown pumps' control and operational status.

LOCATION: The house batteries are under the helm bench. The main D.C. panel is aft on the back wall of the head. The remote controlled 12 volt house battery isolator switch which feeds power to the main D.C. panel is mounted on the inside of the forward drop down panel for access to the house battery storage under the helm bench.

- The Empirbus wiring is built into the yacht.
- The WDU is mounted under the center of the dash accessed via the drop down panel aft in the head.
- There is one DCM mounted under the stbd. side of the dash accessed via the drop down panel aft in the head, one mounted on the inside of the port transom, and one mounted on the inside of the stbd. transom.
- There is one Connect 50 mounted under the port side of the dash accessed via the drop down panel aft in the head and one mounted on the port side of the overhead of the hardtop instrument box.

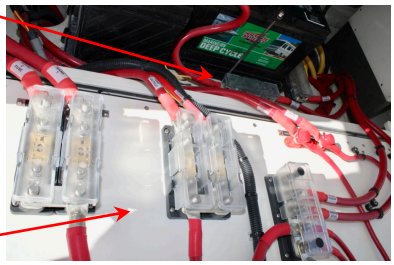
1 Ensure that the 12 volt “House” battery voltage is adequate (at least 12 volts).

2 Ensure that the “24 Hour Power” fuse in the compartment under the helm bench is intact.



3 Ensure that all of the bilge pump and alarm float push in circuit breakers in the “DC Constant Power” section of the main D.C. panel in the head are on. These supply D.C. power to the automatic functions of the bilge pumps independent of the Empirbus system.

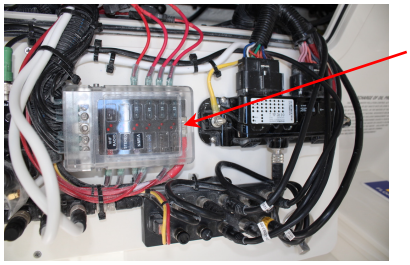
4 Ensure that the 200 amp house battery bank bus fuses in the compartment under the helm bench are intact.



5 Ensure that the 300 amp house battery bank switch output fuses in the compartment under the helm bench are intact.

6 Ensure that the “House Systems Battery Switch” remote battery switch control pop out circuit breaker is on at the main D.C. panel and that the remote controlled house battery switch is on.

7 Ensure that the “Helm Main”, "Stbd Helm", "Port Helm", "Stbd. Aft", "Port Aft", and "Hard Top" manual circuit breakers are on at the main D.C. panel in the head. These circuit breakers feed the D.C. load power to supply the fuse box under the console for the electronics and monitors, and also feed the Empirbus system WDU, DCMs, and Connect 50s, and thence the devices they serve.



8 Ensure that the fuses in the fuse block under the console at the back of the head are intact.

9 Turn on the multifunction Garmin touch screen displays on the dash.

10 You may now use the Garmin touch screens or switches on the dash and Bluetooth remote control fobs to operate the equipment as follows:

- The wireless remote button 1 will power on the boat if the breakers in the head are turned on.
- The wireless remote button 2 (press and hold) will start the "exit boat" count down on the Empirbus to turn everything off when leaving.
- The wireless remote button 3 will turn on the halo light on the hardtop.
- The wireless remote button 4 Currently isn't used.

11 The green power LEDs on the Empirbus DCMs and Connect 50s for feeding the devices that are turned on and operating normally will be blinking.

12 As long as the “Helm Main”, "Stbd Helm", "Port Helm", "Stbd. Aft", "Port Aft", and "Hard Top" manual circuit breakers are on at the main D.C. panel in the head are on when the house battery switch is turned on (can be done by wireless FOB button 1) the system is programed so that the Yamaha CL7 or Mercury VesselView (if the key switches for each engine are on), Garmin displays, Empirbus system, and starting battery switches (unless they have been turned off manually at the switches) will all turn on at the same time.

13 The Empirbus system is preprogramed with an "Exit Boat" mode that can be selected on the Garmin screens or the wireless FOB button 2 to shut down all systems at once.

TO USE THE ELECTRONICS

DESCRIPTION: The electronics installed on the World Cat 400CC-X are an all Garmin integrated system which may include: Garmin touch screens, transducer color fathometer/fish finder/ advanced sonar module, radar, autopilot for Helm Master, VHF radiotelephone, and AIS.

The Garmin system is interfaced with the Empirbus system and the Yamaha CL7 or Helm Master system and/or the Mercury VesselView as applicable.

All of the devices use the Garmin touch screens as a user interface.

NOTICE The engines are also fitted with Yamaha or Mercury (as applicable) NMEA 2000 electronic monitoring interfaced into the Empirbus system as well.

Engine information is displayed for each engine redundant to the Yamaha CL7 or Mercury VesselView (as applicable) standalone display which also displays alarms, trouble codes, maintenance logs, and trip information such as distance and hours, and allows for reset of these values. The Yamaha CL7 or Mercury VesselView (as applicable) display acts as the master display.

LOCATION:

- The Empirbus wiring is built into the yacht.
- The WDU is mounted under the center of the dash accessed via the drop down panel aft in the head.
- There is one DCM mounted under the stbd. side of the dash accessed via the drop down panel aft in the head, one mounted on the inside of the port transom, and one mounted on the inside of the stbd. transom.
- There is one Connect 50 mounted under the port side of the dash accessed via the drop down panel aft in the head and one mounted on the port side of the overhead of the hardtop instrument box.
- A fuse block for the Garmin displays, VHF radio, Radar, NMEA bus (The “NMEA” fuse feeds the entire data bus that interconnects everything, its integrity is vital to the entire system), Sonar, and Engine Screen (Yamaha CL7 or Mercury VesselView) is mounted under the dash accessed via the drop down panel aft in the head.

The various Garmin gateway and interface boxes (GPS, Autopilot, AIS, Sonar) are mounted under the console or in the hard top overhead.

1 Ensure that the 12 volt “House” battery voltage is adequate (at least 12 volts).

2 Ensure that the “24 Hour Power” fuse in the compartment under the helm bench is intact.

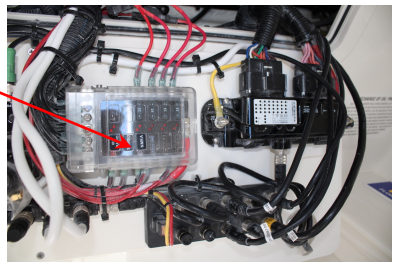
3 Ensure that the house battery bank bus feed fuses in the compartment under the helm bench are intact.

4 Ensure that the house battery bank switch output fuses in the compartment under the helm bench are intact.

5 Ensure that the “House Systems Battery Switch” remote battery switch control pop out circuit breaker is on at the main D.C. panel and that the remote controlled house battery switch is on.

6 Ensure that the “Helm Main”, "Stbd Helm", "Port Helm", "Stbd. Aft", "Port Aft", and "Hard Top" manual circuit breakers are on at the main D.C. panel in the head. These circuit breakers feed the D.C. load power to supply the fuse box under the console for the electronics, monitors, and also feed the Empirbus system WDU, DCMs, and Connect 50s and thence the devices they serve.

7 Ensure that the fuses in the fuse block under the console at the back of the head are intact. The “NMEA” fuse feeds the entire data bus that interconnects everything, its integrity is vital to the entire system. The “Engine Screen” fuse feeds the Yamaha CL7 or Mercury VesselView as applicable which is the master so it is vital too.



8 Turn on the multifunction Garmin touch screen displays on the dash.

9 You may now use the Garmin touch screens or switches on the dash to operate the electronics as desired.

10 Ensure that the green power LEDs on the Empirbus DCMs and Connect 50s for feeding the devices that are turned on are blinking.

11 Read and understand the detailed operating instructions for each electronic component (radar, GPS, VHF, plotter, etc.) for details of operation.

TO USE THE HORN

DESCRIPTION: There is a 12 volt D.C. powered horn.

LOCATION: The horn is on top of the hard top stbd.. The horn button is in the switch group on the dash and on the Garmin system "Helm" and "Lights" screens.

1 Ensure that the Empirbus system is up and running.

2 Turn on the multifunction Garmin touch screen displays on the dash.

3 You may now use the Garmin "Helm" or "Lights" touch screens or switch on the dash to operate the horn as desired.

NOTICE **Do not blow the horn without reason. Horn blasts are considered signals by other vessels!**

TO USE THE NAVIGATION AND ANCHOR LIGHTS

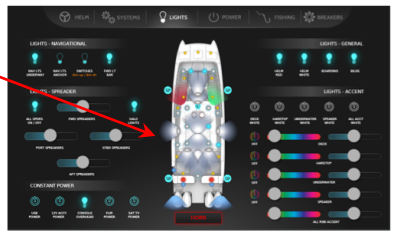
DESCRIPTION: The navigation and anchor lights are 12 volt D.C. LED lights.

LOCATION: On the hard top and transom. Switches are on the dash and on the Garmin "Lights" screen.

1 Ensure that the Empirbus system is up and running.

2 Turn on the multifunction Garmin touch screen displays on the dash.

3 You may now use the Garmin "Lights" touch screen or switches on the dash to operate the lights as desired.



NOTICE **Observe Colregs (rules of the nautical road) pertaining to when and where navigation lights must be displayed!**

TO USE THE WINDSHIELD WIPER AND WASHER

DESCRIPTION: There is a 12 volt windshield wiper and washer for the console window. There is a 12 volt electric water valve on the freshwater connection to the windshield washer system.

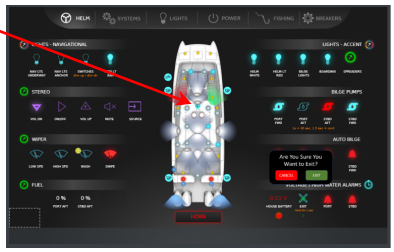
LOCATION: On the console window. The wiper and washer switches are on the console forward of the helm. The 12 volt electric washer water valve is in the port-side of the vanity in the head in an access hole that you reach downward into.

1 Ensure that the Empirbus system is up and running.

2 Turn on the multifunction Garmin touch screen displays on the dash.

3 Ensure that the freshwater pump circuit breaker is on and that there is water pressure (See the Fresh Water topics).

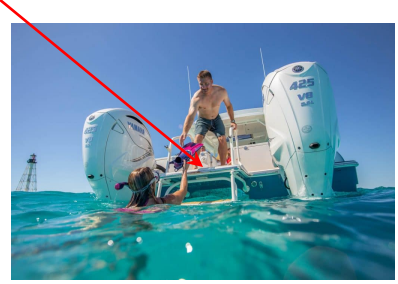
4 You may now use the Garmin "Helm" touch screen or switch on the dash to operate the wipers as desired.



MEANS OF REBOARDING

DESCRIPTION: Unassisted reboarding from the water (means and location).

LOCATION: Drop down hinged dive ladder on the swim platform centerline between the engines.



DANGER Ensure that the engines are off!

1 The ladder hinges back and down into the water.

2 Release the ladder retainer straps while hanging on to the side rails and taking care not to allow the ladder to drop back onto to you.

3 Ease the ladder back and down until the hinged portion is fully lowered into the water.

DANGER Reboard the vessel using the ladder only. Do not stand on or grab the engines!

4 Grasp the hand rails on each side of the ladder and climb the ladder.

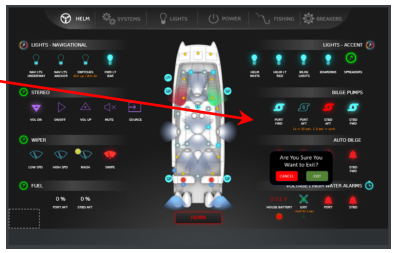
WARNING Swimming near the transom while engines or generator is running may led to carbon monoxide poisoning! Shut of engines and generator while persons are in the water!

WARNING Do not start the engines or get underway unless the ladder is fully retracted out of the water a secured!

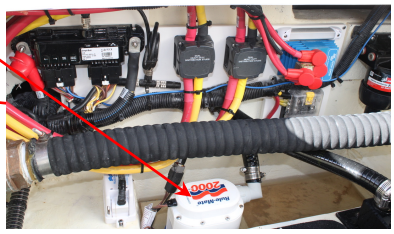
BILGE PUMP OPERATIONS
3.2

TO USE THE 12 VOLT BILGE PUMPS

DESCRIPTION: There are four bilge zones in the World Cat 400CC-X. They are the port forward zone which is in the port hull from the bow to the aft end of the port forward fish box, the port aft bilge zone which is in the port hull from the console area to the transom, the stbd. forward bilge zone which is in the stbd. hull from the bow to aft end of the stbd. forward fish box, and the stbd. aft bilge zone which is in the stbd. hull from the console area to the transom. Each zone contains a 2000 GPH 12 volt manual/automatic submersible bilge pump with an automatic internal switch and manual switching on the dash controlled by the Empirbus system. The automatic function of each pump receives power from a dedicated manual circuit breaker fed from the 12 volt house battery system off of the “Continuous Power” section of the main D.C. panel which is unswitched by the house battery switch. The aft two bilges have separate Rule-A-Matic Plus 40 A level alarm switches also fed from dedicated manual circuit breakers by the 12 volt house battery system off of the “Continuous Power” section of the main D.C. panel also unswitched by the house battery switch. The pumps are controlled manually by the Empirbus system dash buttons and the "System" and "Helm" touch screen buttons. The high level alarms and run status indicate on the Empirbus system screens with visual alarms only.



LOCATION: The port forward bilge pump is in the port hull bilge forward under an access plate in the bottom of the port forward fish box and discharges out the port hull side forward, the port aft bilge pump is in the port hull bilge (mechanical room) just forward of the transom and discharges out the port hull side aft, the stbd. forward bilge pump is in the stbd. hull bilge under an access plate in the bottom of the stbd. forward fish box and discharges out the stbd. hull side forward, and the stbd. aft bilge pump is in the stbd. hull bilge (mechanical room) just forward of the transom and discharges out the stbd. hull side aft. The bilge level alarm switches are beside the aft pumps only.



The port forward bilge zone contains the freshwater tank compartment and the port forward discharge thru hulls. The port aft bilge zone contains the port gasoline tank, the sea chest raw water suction, and the port aft discharge thru hulls. The stbd. forward bilge zone contains the sewage tank compartment and the stbd. forward discharge thru hulls, the sewage tank discharge pump and thru hull. The stbd. aft bilge zone contains

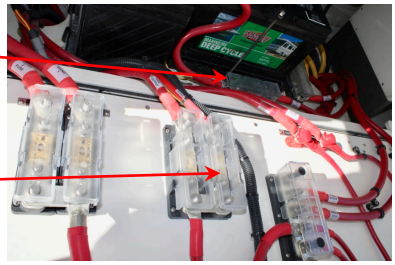
the stbd. gasoline tank and the stbd. aft discharge thru hulls.

The manual bilge pump switches are on the console dash forward of the helm.

FOR AUTO OPERATION:

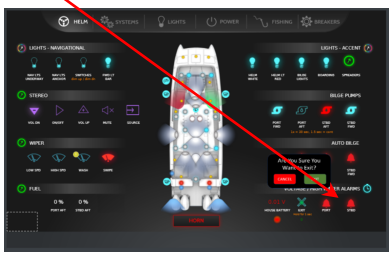
1 Ensure that the 12 volt “House” battery voltage is adequate (at least 12 volts).

2 Ensure that the house battery bank bus feed fuses in the compartment under the helm bench are intact.



3 Ensure that the “24 Hour Power” fuse in the compartment under the helm bench is intact.

4 Ensure that the bilge pump and alarm float manual push type circuit breakers on the "D.C. Constant Power" panel in the head are on. These supply D.C. power to the automatic functions of the bilge pumps independent of the Garmin Empirbus system and the position of the battery switches. If bilge water levels rise high enough to activate any of the pumps the corresponding pump will go on and pump until the level drops. A “running” indicator on the Garmin Empirbus screens will come on while the pump is running. If the water level in the either aft bilge rises to the level of the alarm float switch the alarm will go off.



FOR MANUAL OPERATION:

1 Ensure that the Empirbus system is up and running.

2 Turn on the multifunction Garmin touch screen displays on the dash.

3 You may now use the Garmin touch screens or the bilge pump switches on the dash to turn on any of the Rule submersible pumps manually. These manual switches operate their pumps for 10 minutes and turn off automatically if there is no more water to pump.

(See also *Garmin Empirbus* topics).

NOTICE **Observe and obey local water pollution laws!**

NOTICE **Check function of all bilge pumps at regular intervals. Clear pump inlets from debris!**

NOTICE **The combined capacity of the system is not intended to drain the craft in the case of damage!**

FUEL SYSTEM OPERATIONS
3.3

TO MEASURE THE LEVEL OF FUEL IN THE FUEL TANKS

DESCRIPTION: There are two 302 USG welded aluminum gasoline tanks in the standard configuration with an optional two additional 54 USG welded aluminum gasoline tanks. Fuel tank level is sensed by 12 volt sending units in the tank tops and sent to the Yamaha CL7 or Mercury VesselView (as applicable) and the Garmin Empirbus system digital display via the NMEA 2000 bus.

LOCATION: The main gasoline fuel tanks are port and stbd. under the mid side decks. The optional tanks are port and stbd. under the deck alongside of the console. The tank sending units are in the tank tops. The optional tanks replace the oversized fish boxes.

1 Ensure that all of the battery swicthes are on.

2 Ensure that the engine ignitions are on.

3 Ensure that "Engine Screens" fuse in the fuse block under the console is intact.

4 Ensure that the Empirbus system is up and running.

5 Turn on the multifunction Garmin touch screen displays on the dash.

6 You may now use the Garmin touch screens, Yamaha CL7, or Mercury VesselView screens (as applicable) to view the fuel tank levels.

TO FILL THE FUEL TANKS

DESCRIPTION: There are two 302 USG welded aluminum gasoline tanks in the standard configuration with an optional two additional 54 USG welded aluminum gasoline tanks. Fuel tank level is sensed by 12 volt sending units in the tank tops and sent to the Garmin Empirbus system digital display and Yamaha CL7 or Mercury VesselView screens (as applicable). Each tank has a fill and vent.

LOCATION: The main gasoline fuel tanks are port and stbd. under the mid side decks. The optional tanks are port and stbd. under the deck alongside of the console. The tank sending units are on the tank tops. The fills are on the quarter decks and the vents are to the respective hull sides.

NOTICE **Ensure that fuel source meets Yamaha or Mercury (as applicable) specifications and that the fuel is clean and free of water! Do not use leaded gasoline or gasoline that contains more than 10% Ethanol!**

NOTICE **Do not use fuel additives unless approved by Yamaha or Mercury (as applicable)!**

1 Check the present level of fuel in the tanks on the Garmin display, Yamaha CL7 or Mercury VesselView screens (as applicable) to determine how much fuel will be required. Allow some room for expansion.

⚠WARNING **Gasoline and its vapors are highly flammable and explosive. Always refuel with this procedure to reduce risk of fire and explosion. Gasoline is poisonous an can cause injury or death. Handle gasoline with care!**

NOTICE **Ensure that the vessel is securely moored to a pier or on a trailer with the engines stopped in a well ventilated outdoor area and that the incoming fuel hose nozzle will be clear of lines, piers, etc.! Make sure that no one is smoking nearby and that there are no open flames, static discharge, or other sources of ignition. Touch the fuel nozzle to the filler opening to help prevent electrostatic sparks!**

2 Open the deck cap and place the fuel nozzle in the correct fill pipe.

3 Fill while having someone report on level changes by monitoring the Garmin digital display, Yamaha CL7 or Mercury VesselView screens (as applicable).

NOTICE **Never leave the fuel hose shut off nozzle unattended while filling!**

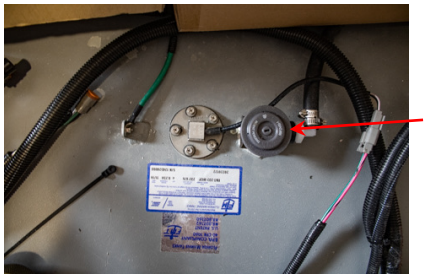
NOTICE **Allow room for expansion after filling!**

4 When finished close fill caps securely.

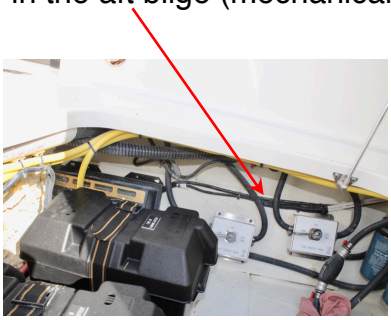
NOTICE **Obey all local laws concerning fuel spillage!**

TO OPERATE THE ENGINE/FUEL TANK SELECTOR VALVES

DESCRIPTION: The World Cat 400 CC-X has one or two (with the extra tank option) gasoline tanks that the port side engine(s) can draw from and one or two (with the extra tank option) gasoline tanks that the stbd. side engine(s) can draw from . On vessels with the extra tank option only there are fuel tank selector valves for selecting which tank the engine(s) on each side will draw from. Each tank is also fitted with an inline fuel demand valve that does not open until there is suction from the engine side. These are in the system to prevent any pressure built up in the tank from flowing toward the engine when it is off potentially causing a leak. The fuel demand valves have manual override capabilities built in.



LOCATION: The engine(s)' fuel tank selector valves are in the aft bilge (mechanical room) equipment areas.



1 Ensure that there is sufficient gasoline in the engine fuel tanks.

2 Locate the fuel tank selector valve for the engine (Port inboard and/or outboard, Stbd. inboard and/or outboard) that you wish to select the source tank for.

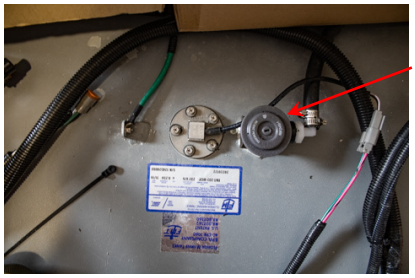
3 Rotate the tank selector valve for the desired engine so that it points to the label on the face of the valve assembly for the tank "Main" (aft) or "Aux." (fwd.) as desired.

4 By selecting the "Off" position of a valve, the fuel supply to that engine will be shut off up stream of (or on the feed side) of the fuel/water separator for that engine. Selecting the "Off" position will shut down that engine.

NOTICE **It is best to balance the draw down of the gasoline from the tanks in order to maintain trim of the vessel by the tank selection for each engine.**

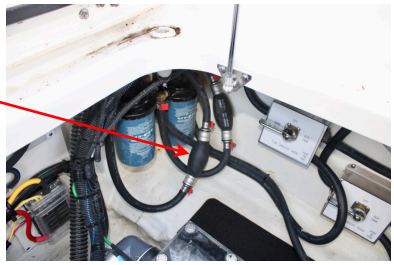
TO PRIME THE ENGINE FUEL SYSTEMS

DESCRIPTION: The Mercury engines have priming systems built in. The Yamaha main engines have hand priming bulbs in the fuel supply lines to prime the engines before starting.



Each tank is also fitted with an Attwood inline fuel demand valve that does not open until there is suction from the engine side. These are in the system to prevent any pressure built up in the tank from flowing toward the engine when it is off potentially causing a leak. The fuel demand valves have manual override capabilities built in.

LOCATION: The Yamaha priming bulbs are in the fuel hoses forward of the engines on the downstream (discharge to the engines) side of the fuel/water separator filters. The demand valves are on the fuel tank top suction connections under the deck.



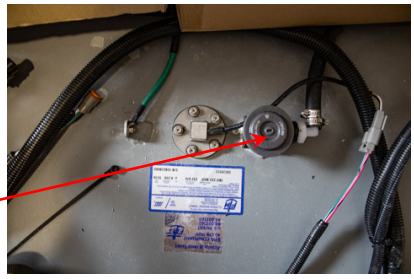
1 Ensure that there is sufficient gasoline in the engine fuel tanks.

2 Ensure that a tank with gasoline in it is selected by the tank selector valve for selecting which tank the engine that you wish to prime will draw from. See the *To Operate the Engine/Fuel Tank Selector Valves* topic.

3 Squeeze the fuel priming bulbs (Yamaha installation only) with the arrow molded on them pointing up until they resist squeezing. The Mercury installation engines will prime themselves while cranking unless the engine has been run out of fuel.

NOTICE **In the event a Mercury engine is run out of fuel the fuel system must be primed after fuel supply is restored. The Mercury fuel supply module (FSM) is not vented and in order to prime the system the air must be purged while operating the fuel pumps. Repeated key ON events without purging air can damage the fuel pumps and is not effective in priming the Mercury fuel system. Follow the *Ran Out of Fuel Condition—Priming the Fuel System* procedure in the Mercury engine owner's manual.**

NOTICE **If the fuel tank has fuel in it and the Yamaha hand priming bulb or Mercury cannot pull suction the demand valve can be overridden if stuck by pressing the end of a flat blade screwdriver into the override slot on the top of the valve.**



TO SERVICE THE ENGINE FUEL/WATER FILTER ELEMENTS

DESCRIPTION: Each engine has a closed canister type disposable water/gasoline prefilter on the supply from the tank to the engine.

LOCATION: The canister filters are (on the suction side of the priming squeeze bulbs Yamaha Installation only) and on the downstream side of the engine/fuel tank selector valves on the inside of the transom in the bilge (mechanical room) for each engine on their respective side.

WARNING Gasoline and its vapors are highly flammable and explosive. Make sure that no one is smoking nearby and that there are no open flames, static discharge, or other sources of ignition when carrying out this procedure. Gasoline is poisonous an can cause injury or death. Handle gasoline with care!

1 The engine must be shut down to change these filters.

2 On vessels with the extra tank option turn off the fuel tank selector valve for the engine whose filter you wish to service .

3 See the Yamaha or Mercury OEM engine manuals for specific instructions.

4 When you have completed the filter service on vessels with the extra tank option turn back on the fuel tank selector valve for the engine whose filter you have serviced.

NOTICE Dispose of old filter elements and any spilled or discarded gasoline and saturated rags properly ashore!

ELECTRICAL SYSTEM OPERATIONS 3.4

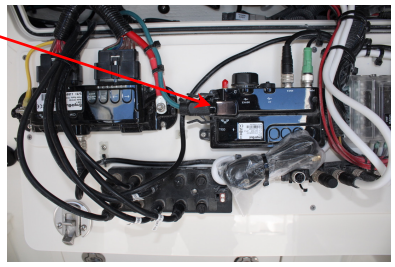
ABOUT THE GARMIN EMPIRBUS SYSTEM

DESCRIPTION: This section is included in the Safety section as well because the Garmin Empirbus system also controls monitoring and alarm functions.

The Garmin Empirbus system on the World Cat 400CC-X is a state of the art monitoring and control system that integrates the ability to connect, protect, monitor and distribute D.C. electrical sources to loads (consuming devices) and to monitor the status of onboard systems. The system facilitates the use of wireless Bluetooth FOBs to operate devices in the system (such as battery switches) from a distance remotely. The architecture of the system consists of the D.C. wiring to feed the load carrying devices, digitally controlled D.C. controllers to act as circuit protection, switches, and status indication, two waterproof push button switch pads, and a 12 volt D.C. NMEA 2000 data bus interconnecting all of the devices for monitoring and control with the touch screens as a user interface. All of the devices have manual override capabilities.

Components of the Empirbus system include:

Garmin touch screen monitors that comprise the user interface to monitor the state of and control the system. The units are on the console dash.

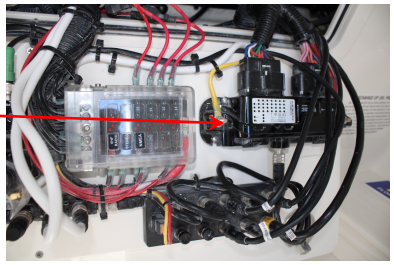


Web Display Unit (WDU) - This unit controls the interface of the system to the Garmin touch screen displays enabling programing, user operation, and system status feedback via a graphic interface. This unit also has the capability for wireless connection of the system to Bluetooth remote control FOBs and outside networks via WiFi. A USB port on the WDU allows for easy system upgrades. The WDU is mounted under the center of the dash accessed via the drop down panel in the head.

DCMs - These are 100 amp capacity electronic devices that combine 16 input and output D.C. device channels into single modules, offering a compact and intelligent replacement for traditional D.C. fuse boxes and circuit breaker panels with digital switching technology. There are three DCMs in the World Cat 400CC-X Empirbus system. There is one DCM mounted under the stbd. side of the dash accessed via the drop down panel in the head, one mounted on the inside of the port transom, and one mounted on the inside of the stbd. transom.

Connect 50s - These are 50 amp capacity electronic devices that combine 11 input and 20 output D.C. device channels into single modules, offering a compact and intelligent replacement for traditional D.C. fuse boxes and circuit breaker panels with digital

switching technology. There are two Connect 50s in the World Cat 400CC-X Empirbus system. There is one Connect 50 mounted under the port side of the dash accessed via the drop down panel in the head and one mounted on the port side of the overhead of the hardtop instrument box.



SP8s - These are waterproof electronic touch switch pads each containing 8 switches to control devices in the system. There are two Switch Control Interfaces (SCIs) to integrate the more traditional “hard” switches. These two switch pads are mounted on the console dash forward of the helm.

The dash console Garmin monitor touch screens are used to operate the system centrally, and as the ABYC and CE safety authorities require every circuit to have both overload protection and a bypass, this is provided by manual buttons on the DCMs and Connect 50s. The DCMs and Connect 50s have channel designation labels on them and status LEDs for each channel. A manually switched on channel is in normal running mode indicated by a flashing green channel indicator. A manually switched off channel is in normal running mode indicated by a flashing red channel indicator. A channel with tripped fuse is in normal running mode indicated by a red continuous channel indicator. A channel can be reset to normal operation using controls on the device, see the Empirbus Manuals in the subcomponent literature file and the Empirbus System Layout drawing in the Figures Section of this manual for the channel designation numbers.

The DCMs and Connect 50s are supplied D.C. load power from the house battery bank to power the D.C. loads and the NMEA 2000 data network integrating the system is also powered by 12 volt power from the house battery system all fed from conventional manual circuit breakers on the main D.C. panel and fuses.

Devices that are NOT circuit protected by the Empirbus system are:

- Automatic bilge pumps load
- Battery switch remote control power
- The electric toilet load
- SeaKeeper loads
- The windlass motor load
- The stereo speakers' amplifier load
- The stereo subwoofer amplifier load
- The feeds to the port and stbd. mechanical room fuse boxes mounted inside the transoms
- Electronics power feeds
- The Yamaha CL7 or Mercury VesselView (as applicable) engine displays.
- A.C. circuits

These items are fed and protected by "hard" circuit breakers or fuses.

The yacht's A.C. sources (shore power and inverter output) are not switched by the Empirbus system and are fed via the hard wired distribution panel in the head through traditional manual source selector circuit breakers from the 30 amp 125 volt shore power cable or inverter output.

NOTICE **The engines are also fitted with Yamaha NMEA 2000 electronic monitoring (CL7 display) or Mercury (VesselView) as applicable interfaced into the Garmin displays as well.**

Engine information is displayed for each engine redundant to the Yamaha CL7 or Mercury VesselView standalone displays (as applicable) which also display alarms, trouble codes, maintenance logs, and trip information such as distance and hours; and allows for reset of these values. Engine maintenance information is displayed, and maintenance intervals can be set, as well as the time elapsed since the previous maintenance can be reset.

Tank level sensor information, trim angle of the engines, active alarms for the engines, and trouble codes for active engine alarms are displayed. This information is useful to Yamaha or Mercury (as may apply) dealers for diagnosis.

The following vessel system components are integrated into the overall Empirbus data bus:

- Battery switch remote operation.
- D.C. power monitoring and low voltage alarms.
- A.C. power monitoring of the shore power and inverter output.
- The Yamaha CL7 or Mercury VesselView display.
- Fuel tank level sensors.
- Fresh water and sewage tank level sensors.
- Garmin multi function touch screen monitors.
- Depth transducer.
- Stereo.
- GPSs.
- Lighting.
- Bilge pumps' operational status and high water alarms.
- Wipers.
- Fresh water, sewage discharge, live well, fish box discharge, and wash down pumps.

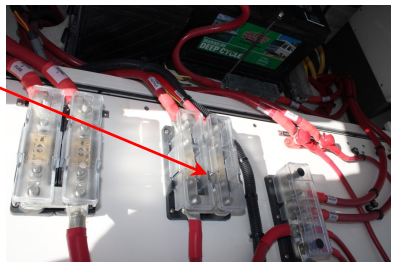
LOCATION: The house batteries are under the helm bench. The main D.C. panel is aft

on the back wall of the head. The remote controlled 12 volt house battery isolator switch which feeds power to the main D.C. panel is mounted on the inside of the forward drop down access panel for the house battery storage under the helm bench.

- The Empirbus wiring is built into the yacht.
- The WDU is mounted under the center of the dash accessed via the drop down panel aft in the head.
- There is one DCM mounted under the stbd. side under the dash accessed via the drop down panel aft in the head, one mounted on the inside of the port transom, and one mounted on the inside of the stbd. transom.
- There is one Connect 50 mounted under the port side of the dash accessed via the drop down panel aft in the head and one mounted on the port side of the overhead of the hardtop instrument box.

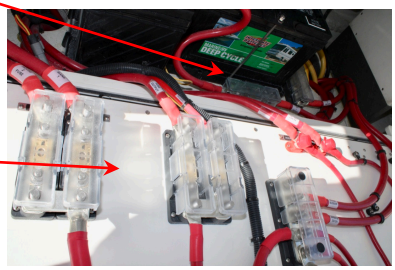
1 Ensure that the 12 volt “House” battery voltage is adequate (at least 12 volts).

2 Ensure that the “24 Hour Power” fuse in the compartment under the helm bench is intact.



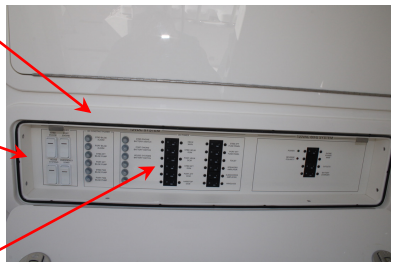
3 Ensure that all of the bilge pump and alarm float push in circuit breakers in the “DC Constant Power” section of the main D.C. panel in the head are on. These supply D.C. power to the automatic functions of the bilge pumps independent of the Empirbus system.

4 Ensure that the house battery bank bus feed fuses in the compartment under the helm bench are intact.



5 Ensure that the house battery bank switch output fuses in the compartment under the helm bench are intact.

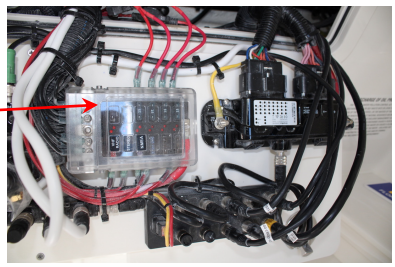
6 Ensure that the “House Systems Battery Switch” remote battery switch control pop out circuit breaker is on at the main D.C. panel and that the remote controlled house battery switch is on.



7 Ensure that the “Helm Main”, "Stbd Helm", "Port Helm", "Stbd. Aft", "Port Aft", and "Hard Top" manual circuit breakers are on at the main D.C. panel in the

head. These circuit breakers feed the D.C. load power to supply the fuse box under the console for the electronics and monitors, and also feed the Empirbus system WDU, DCMs, and Connect 50s, and thence the devices they serve.

8 Ensure that the "NMEA", "Display" 1,2, and 3; and "Engine Screen" fuses in the fuse block under the console at the back of the head are intact.



9 Turn on the multifunction Garmin touch screen displays on the dash.

10 You may now use the Garmin touch screens or switches on the dash to operate equipment and monitor the system. The "Breakers" screen is used to observe any tripped circuit breakers. Tripped circuit breakers must be reset manually on the electric panels in the head if indicating a tripped status on the screen.

11 The Bluetooth remote control fobs can be used to operate equipment through the Empirbus system as follows:

- The wireless remote button 1 will power on the boat if the breakers in the head are turned on.
- The wireless remote button 2 (press and hold) will start the "exit boat" count down on the Empirbus to turn everything off when leaving.
- The wireless remote button 3 will turn on the halo light on the hardtop.
- The wireless remote button 4 Currently isn't used.

12 The green power LEDs on the Empirbus DCMs and Connect 50s for feeding the devices that are turned on and operating normally will be blinking.

13 As long as the “Helm Main”, "Stbd Helm", "Port Helm", "Stbd. Aft", "Port Aft", and "Hard Top" manual circuit breakers in the main D.C. panel in the head are on when the house battery switch is turned on (can be done by wireless FOB button 1) the system is programed so that the Yamaha CL7 (or Mercury VesselView) if the key switches in the head for each engine are on, the Garmin displays, Empirbus system, and starting battery switches (unless they have been turned off manually at the switches) will all turn on too.

14 The Empirbus system is preprogramed with an "Exit Boat" mode that can be selected on the Garmin screens or the wireless FOB button 2 to shut down all systems at once.

TO MONITOR THE D.C. SYSTEM

DESCRIPTION: The Empirbus system "Power" screen monitors and displays the main DC panel house battery bank voltage, Amperage draw (discharge), battery temperature, and house battery bank % state of charge.

The battery chargers are also equipped with status indicators for monitoring D.C. power parameters and battery status.

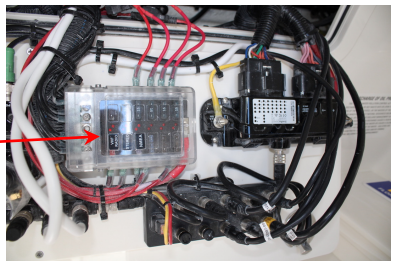
As long as the engine ignitions are on the Yamaha CL7 and Mercury VesselView (as applicable) dedicated digital engine monitoring devices also monitor engine battery condition and display it as well as indicating low voltage alarms and logging trouble codes.

LOCATION: The Garmin Empirbus system (see that topic) components are below the control console, in the aft mechanical rooms, and in the hard top. The data monitored by the Garmin Empirbus system can be selected from and displayed on the Garmin touch screens on the dash. The battery charger is on the stbd. hull side in the stbd. aft bilge (mechanical room) for the starting batteries and under the helm bench for the house bank. The Yamaha CL7 or Mercury VesselView (as applicable) monitoring screens are on the dash.

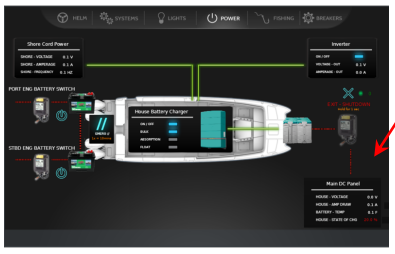
1 Ensure that all of the battery switches are on.

2 Ensure that the Empirbus system is up and running.

3 Ensure that the "Engine Screen" fuse in the fuse block under the console is intact.



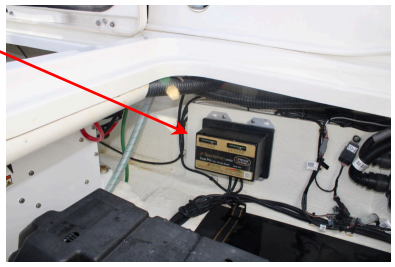
4 Ensure that the DC circuit breakers on the main DC panel in the head are on.



5 Turn on the multifunction Garmin touch screen displays on the dash and observe the D.C. system status on the "Power" screen.

6 The house battery charger displays house battery charge information on itself as well. See the *Mastervolt* charger literature.

7 The starting battery charger displays battery % of charge on itself for each engine starting battery. See the starting battery charger literature.



8 The Yamaha CL7 and Mercury VesselView (as applicable) monitors are on the dash. As long as the engine ignitions are on use the buttons on the unit to change the display to indicate the battery information. See the *Yamaha and/or Mercury* engine literature (as applicable).

TO CHARGE THE BATTERIES

DESCRIPTION: There are two or four 12 volt engine starting batteries (one for each engine) and two AGM (or Lithium ion with the SeaKeeper option) 12 volt house batteries to supply additional on board equipment. The Lithium ion battery option is included on vessels fitted with the optional SeaKeepers and/or the air conditioning.

There is a 100 amp Mastervolt Combimaster inverter/charger combination unit that charges the AGM house batteries from 120 volt shore power on that standard vessel or a 160 amp unit included on vessels fitted with the optional Lithium ion house bank, SeaKeepers, and/or the air conditioning. There is a fuse on the D.C. charging connection to the house batteries direct from the Mastervolt Combimaster charger.

There is a 120 volt A.C. battery charger to charge the starting batteries from shore power. There are inline fuses on top of each starting battery on the charger input from the starting battery charger.

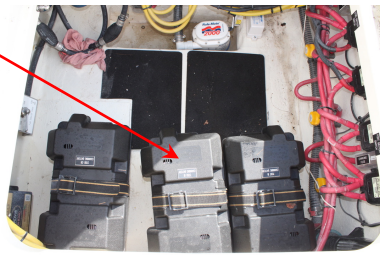
The engines' alternators send a charge through their start battery switches to their respective starting battery via an inline fuse when they are running and to the House Batteries via DVSRs or battery combiners. The DVSRs or combiners are connected between the starting and house battery banks. When a DVSR senses a charging voltage (13.4 VDC) on either of the banks, it automatically activates and joins the two battery banks after a short delay (5 seconds), so they are charged as one battery bank. When the DVSRs sense that batteries are not being charged (voltage drops to 12.8V DC) that DVSR deactivates following a 20 second delay, separating the combined battery banks into two isolated banks so that they do not cross discharge.

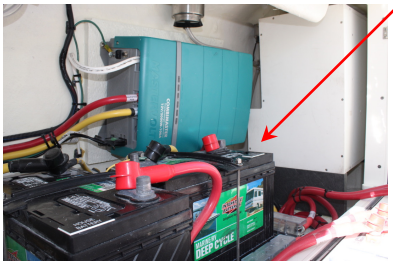
In the Yamaha installation a 200 amp circuit breaker or fuse is fed from each engine (or pair of engines) and to the House Batteries. In this way each engine charges its own respective starting batteries and the house batteries when it is running.

See the Mastervolt battery charger, DVSR, and Yamaha engine literature first.

LOCATION: The port outboard (or port only for a dual) engine starting battery is in the port aft bilge (mechanical room).

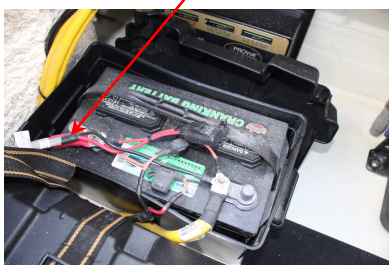
The port inboard, stbd. inboard, and stbd. outboard (or stbd. only for a dual) engine starting batteries are in the stbd. aft bilge (mechanical room). The house batteries are under the helm bench.

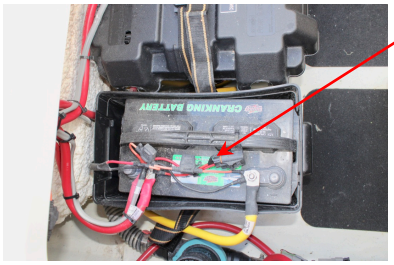




The Mastervolt Combimaster inverter/charger combination unit is under the helm seat with the house batteries. The fuse on the charging connection to the house batteries direct from the Mastervolt Combimaster charger is on the drop down door access to under the helm bench.

The 120 volt starting battery charger is in the stbd. aft bilge (mechanical room) area. The fuses on the cable connections from the starting battery charger to each battery are on the positive lead terminal connections to each starting battery at the battery tops. The 200 amp (Yamaha option) fuses or circuit breakers on the engine alternator charge outputs to the house batteries are in the hull aft bilge areas (mechanical rooms). The (Mercury option) 5 amp Clean Power fuses are in inline fuse holders on top of each starting battery.





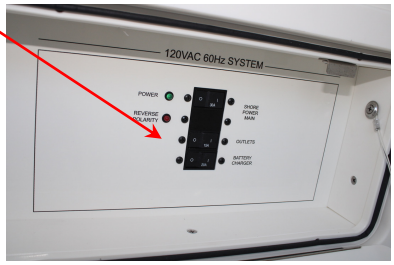
The engine fuse box is on top of each engine (Yamaha option) under the cowling.

NOTICE **Do not turn any of the battery switches off with the engines running or the ignitions on!**

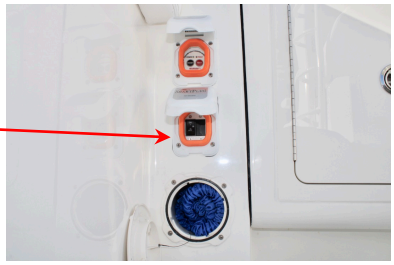
FOR CHARGING WITH THE A.C. POWERED BATTERY CHARGERS:

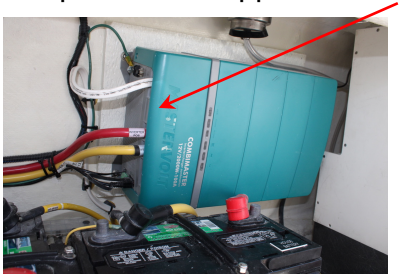
1 Ensure that A.C. power from shore power is connected to the main A.C. panel in the head.

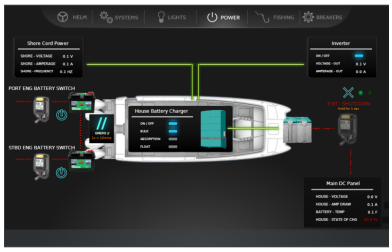
2 Ensure that the Battery Charger circuit breaker on the A.C. panel in the head is on to feed the starting battery charger. **NOTE: Charging indications may not start immediately, there may be a time delay of up to 3 minutes before an audible click may be observed followed by an LED indication that the charge cycle has begun.** You should now observe a red LED indication on each bank of the charger representing each individual battery being charged. The voltage of each battery will reflect the number of LED indicators illuminated. Operation may vary depending on the starting battery charger installed.



3 The A.C. feed for the Combimaster inverter/charger comes directly into it from the shore power connection circuit breaker. Turn on the Mastervolt Combimaster inverter/charger combination unit on its case to charge the house batteries from shore power. The Mastervolt Combimaster inverter/charger combination unit is activated by holding the POWER switch on it pressed for approx. 5 seconds. The POWER switch will illuminate green. The state of charge (which is stored in the memory of the ChargeMaster) will be displayed. If necessary and if A.C. power is available, the ChargeMaster will start to charge the batteries. Once switched on, the ChargeMaster automatically resumes operation after it has been disconnected from an A.C. source temporarily. By pressing the POWER button again for approx. 5 seconds, the ChargeMaster will switch back to stand-by: the ChargeMaster stops and the POWER switch illuminates red. The inverter's function status and its function as the house battery charger is indicated on the "Power" Empirbus touch screen.







4 The house battery condition and house battery charger charging status can be monitored on the Garmin Empirbus "Power" screens and the starting battery

condition can be monitored on the Yamaha CL7 or Mercury VesselView instruments (as applicable).

FOR CHARGING WITH THE ENGINES:

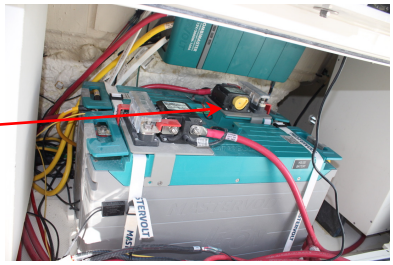
1 For the Yamaha installation ensure that the 200 amp circuit breakers or fuses on the output side of each engine are closed (or the fuses are intact) in order for the engines to charge the house batteries. Either or both engines running (Yamaha installation only) will charge *the house bank*.

2 For the Mercury installation ensure that the fuses in the inline fuse holders on the top of each starting battery are intact.

3 Ensure that the fuses in the fuse blocks on top of the engines under the cowlings are also intact.

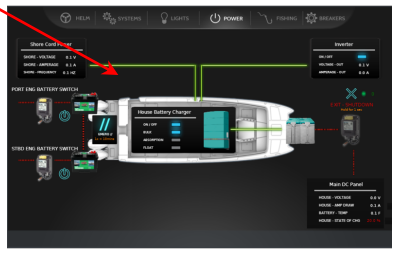
4 Ensure that the engine start battery switches are on.

5 On the Lithium Ion battery option boat ensure that the remote Lithium house battery isolator switches (on the battery tops) and that the manual "Service Disconnect" switch are all on.



6 Run any or all engines.

7 The Garmin screens will display the condition and charge information for the house batteries and the Mercury VesselView or Yanmar CL7 (as applicable) screens will display engine start battery state of charge information as long as the ignitions are on.



See also the *battery chargers' and engine literature*.

TO USE THE BATTERY SWITCHES

DESCRIPTION: There are two or four 12 volt engine starting batteries (one for each engine) and two AGM (or Lithium ion with the SeaKeeper option) 12 volt house batteries to supply additional on board equipment.

The battery switches are all of the 2 position on/off type to isolate the supply from the batteries to/from each engine/alternator, the “House” supply, as well as paralleling switches to enable paralleling of the engine start batteries.

On the standard vessel a single remote controlled “House” battery switch switches only the load being fed from the house batteries to the DC circuit breaker panel in the head. On the vessels equipped with the Lithium ion battery option and fitted with the optional SeaKeepers and/or the air conditioning there are two remote controlled house battery isolator switches (one for each Lithium ion battery to close automatically if the voltage drops low enough to damage the batteries) on the feed to the house bus, one manual only controlled house battery switch ("Service Disconnect" which shuts down the output of the Lithium ion batteries to the house bus) and one remote controlled house battery switch that switches the supply from the house bus to the DC circuit breaker panel in the head. The engine alternator output (charge) into the *House* batteries is enabled by the DVSRs or battery combiners independent of the house battery switch position(s) on the standard boat but IS routed through the "Service Disconnect" and remote battery isolator switches on top of the Lithium ion house batteries. The battery switches can all be manually operated or remotely controlled by the rocker switches in the electrical panel at the back of the head compartment or the Garmin Empirbus "Power" touch screen.

The Garmin Empirbus touch screen button for "Stbd Eng Battery Switch" remotely opens and closes the stbd. side engines' start battery switches (1 or both) and the "Port Eng Battery Switch" remotely opens and closes the port side engines' start battery switches (1 or both).

The Garmin Empirbus touch screen button for the House battery switch operates the house battery switch(es) and can also be operated remotely by one of the Bluetooth Empirbus (but not the Yamaha EKS) key fobs.

The start paralleling switches also can be operated manually with the knobs on them or remotely by the Empirbus system via the "Power" touch screen "EMERG II" button and/or the Emergency Start (parallel) battery rocker switch in the electrical panel at the back of the head compartment.

LOCATION: The port outboard engine starting battery is in the port aft bilge

(mechanical room).

The port inboard engine starting battery, stbd. inboard engine starting battery, and stbd. outboard engine starting battery. are in the stbd. aft bilge (mechanical room).

The engine starting battery paralleling switches are mounted in the stbd. aft bilge (mechanical room).

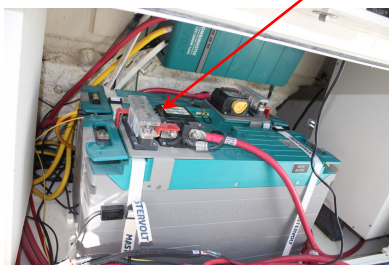
The paralleling switches connect the engine starting batteries together. For details of operation contact Worldcat customer support or your dealer.

The house battery switch(es) is/are mounted on the drop down panel under the helm bench seat and for the Lithium Ion option additionally on top of the house batteries.

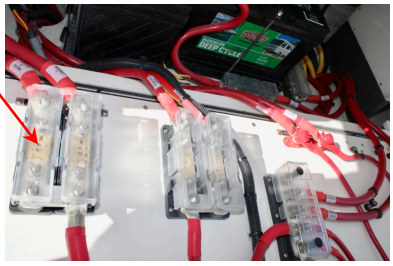
NOTICE **Do not turn the engine battery switches off with the engines running or with the ignitions on! The battery switches switch both the load and the charge (only for the starting batteries) coming into the batteries from the engine alternators!**

1 Ensure that the 12 volt “House” battery voltage is adequate (at least 12 volts).

2 Ensure that the house battery bank bus feed fuses in the compartment under the helm bench (and for the Lithium Ion boat that the fuses on top of the Lithium batteries) are intact.



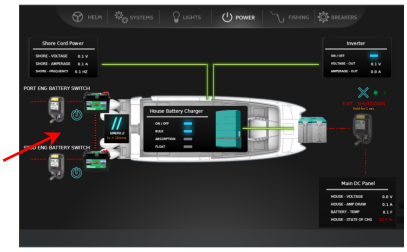
3 Ensure that the house battery bank switch output fuses in the compartment under the helm bench are intact.



4 Ensure that the “House Systems Battery Switch”, "Port Engine Battery Switch", and "Stbd Engine Battery Switch" remote battery switch control pop out circuit breakers are on at the main D.C. panel in the head and that the house battery switch is on.

5 The House Systems, Port Engine, Stbd Engine, and Emergency Start (parallel) battery switches can be remotely operated by the rocker switches in the electrical panel at the back of the head compartment.

6 On the Lithium Ion battery option boat the remote Lithium house battery isolator switches (on the battery tops) can be remotely operated by the rocker switches in the electrical panel at the back of the head compartment but the manual "Service Disconnect" switch must be manually turned on to feed the house loads panel in the head.



7 To operate the switches remotely from the Empirbus "Power" touch screen ensure that the Empirbus system is on (see that topic at the beginning of this section).

THE DEFAULT POSITION OF THE BATTERY SWITCHES ARE AS FOLLOWS:

Normal running days:

- All start battery switches ON before starting and while running engines.
- “House” battery switch(es) ON (and the manual "Service Disconnect" switch on the Lithium Ion option boat must be manually turned on) to run all systems onboard normally.
- All parallel switches off.
- All batteries will still charge as necessary if the A.C. battery chargers are on.
- Any or all engines running will charge the house bank.

NOTICE **Do not turn the engine battery switches off with the engines running or with the ignitions on!**

During shut down times:

- Start battery switches OFF while shut down.
- “House” battery switch(es) ON to run all systems onboard normally or OFF to run only “Constant Power” group or still supply D.C. power to the inverter on the standard boat.
- All parallel switches off.
- All batteries will still charge as necessary if A.C. power is connected, the start battery charger and house charger/inverter are on (leave on while connected to shore power).

ADDITIONAL COMMON USAGE SCENARIOS:

A Start switch ON

- Enables power to that engine starter and charge of that start battery from that engine's alternator.
- Any engine(s) running will charge the house bank (on the Lithium Ion option boat the “House” battery switch(es) must be ON and the manual "Service Disconnect" switch must be manually turned on) .
- All batteries will still charge as necessary if the A.C. battery chargers are on.

A Start switch OFF

- No power to that engine's starter or charge to that engine's start battery from that engine's alternator.
- Any engine(s) running will charge the house bank (on the Lithium Ion option boat the “House” battery switch(es) must be ON and the manual "Service Disconnect" switch must be manually turned on)
- All batteries will still charge as necessary if the A.C. battery chargers are on.

House battery switch(es) ON

- Enables power feed to the main D.C. panel distribution circuit breakers except the “Constant Power” group which are fed directly from “House” battery bank via a 200 amp fuse.
- Any engines running will charge the house bank.
- All batteries will still charge as necessary if A.C. battery charger and House inverter/charger is on.

House battery switch(es) OFF

- No power is fed to main D.C. panel distribution circuit breakers (or the 12 volt devices they feed) except the “Constant Power” group which are always fed directly from “House” battery bank via a 200 amp fuse (except on the Lithium Ion boat where the House switches must be on and the "Service Disconnect" switch must be on).
- All start batteries will still charge if the A.C. start battery charger is on.
- The house batteries will charge if the House Inverter/charger is on.
- Any or all engines running will charge the House bank (except on the Lithium Ion boat where the House switches must be on and the "Service Disconnect" switch must be on).
-

Engine Start battery paralleling switch turned ON at the Empirbus "POWER" touch screen

- When activated from the Empirbus touch screen all starting batteries will remain connected together for 10 minutes (to allow time to start engines) and then disconnect from each other.

Engine Start battery paralleling switch ON manually at the switch itself

- The paralleling switches in the row connect the two engine's starting battery switches adjacent to them together.
- When switched on these switches remain on until manually turned off.
- Any engine running will charge (or can drain) all starting batteries connected in parallel.
- All starting batteries could become totally discharged if left connected by these manual parallel switches.
- All batteries will charge if the A.C. start battery charger and House inverter/charger are on.

All battery switches ON

- Engines will start off of their dedicated batteries.
- House and engine batteries will be connected together unless voltage drops to 12.8V DC at which time the DVSRs will disconnect the house from the start batteries (except on the Lithium Ion boat where the House switches must be on and the "Service Disconnect" switch must be on as well).
- Any engine will charge its own starting and the house batteries (except on the Lithium Ion boat where the House switches must be on and the "Service Disconnect" switch must be on as well).
- All batteries will charge if the A.C. start battery charger and House inverter/charger are on.

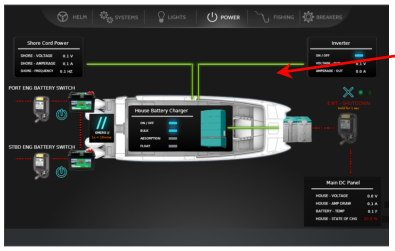
All battery switches OFF

- Engines will not start.
- All other devices will not run other than the items powered by the circuit breakers in the “Constant Power” group on the main D.C. panel (except on the Lithium Ion boat where the House switches must be on and the "Service Disconnect" switch must be on)..
- The 120 volt start battery charger and House inverter/charger can still charge all of the batteries.
- Only the “House” batteries can discharge fully.

The “House” battery switch(es) can also be operated remotely using one of the Empirbus Bluetooth fobs. (See the Empirbus section).

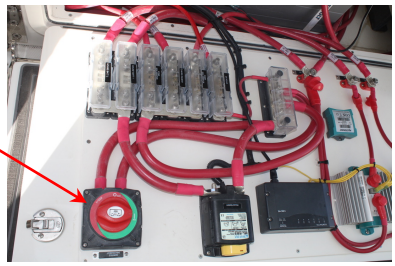
⚠CAUTION **Do not stow items on top of the battery boxes!**

NOTICE **Do not close the parallel switches manually unless you are doing so only to do an emergency parallel start! Leaving the switches closed can cause the possibility for the discharge of all of the starting batteries! When the parallel switches are closed remotely from the touch screens they will close for a ten minute period only to enable an emergency engine start and then reopen preventing an inadvertent total discharge.**



NOTICE **For normal operation the parallel switches should be off and the other battery switches should be on!**

NOTICE **For normal operation of the Lithium Ion option boat the manually operated "Service Disconnect" house battery bus feed switch should be left on and the output from the Lithium Ion house batteries should be switched using the remote controlled isolator switches on the battery tops. The isolator switches on the Lithium Ion battery tops will close automatically if the voltage drops low enough to damage the Lithium batteries.**



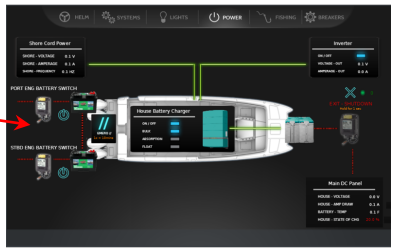
TO MONITOR THE A.C. LOADS

DESCRIPTION: The Garmin Empirbus system "Power" screen monitors the A.C. shore power voltage, amperage, and frequency (Hz), with programmable alarms as well as the inverter output voltage and amperage. The Garmin Empirbus system "Breaker" screen indicates any circuit breakers that are tripped. The on board A.C. system is a 125 volt 30 amp 60 Hz system capable of being supplied by either a 30 amp 125 volt shore power cable or the 2000 Watt (standard system) or (3000 Watt optional Lithium ion House bank, SeaKeepers, and/or the air conditioning) inverter/charger. There are green LEDs on the main A.C. panel to indicate their connected status, and a red LED to indicate a reverse polarity shore connection.

LOCATION: The main A.C. electrical panel is in the head.

1 See the "About the Garmin Empirbus System" at the beginning of this section to ensure that the Empirbus system is operating.

2 You may now use the Garmin touch screens to observe the Empirbus "Power" screen to monitor the A.C. loads.



3 The Garmin Empirbus Volts display indicates the total voltage coming through to all the circuit groups on the A.C. panel. The voltage should read between 110 and 120 Volts to safely operate the 120 volt equipment.

4 The Amps displays indicate the current being consumed by all the circuit groups on the A.C. panel. When this value equals 30 amps on shore power or 15 amps (standard) or 25 amps (Lithium Ion option) on inverter power the maximum allowable has been reached and an overload condition could cause the main circuit breakers or inverter circuit breakers to trip shutting off the connection of that source to the vessel.

5 The Hertz display indicates the frequency of the power supplying the panel from the source. This should read 60 Hz. In North America shore power frequency is controlled by the output of the utility company and should remain stable at 60 Hz.

⚠CAUTION If these values are exceeded A.C. powered items should be turned off until the values are back in accepted range!

6 The Garmin Empirbus system is preset by Worldcat to give alarms for A.C. high voltage, low voltage, and high current. High voltage and low voltage can damage

equipment. High current can cause overloads making circuits trip off and other issues that may damage equipment. If an alarm occurs, the audible alarm will sound and the display will indicate. Silence the alarm, reduce the load by turning off A.C. equipment, and investigate the cause.

TO CONNECT SHORE POWER TO SUPPLY THE VESSEL

DESCRIPTION: There is a 50' 30 amp 120 volt shore power cable that attaches at the stern to supply shore power to the vessel. The charger/inverter when on passes through the A.C. power from the shore when shore power is connected to supply the A.C. panel in the head.

There is a red reversed polarity indicator LED on the A.C. panel in the head to warn if the shore power source has reversed polarity.

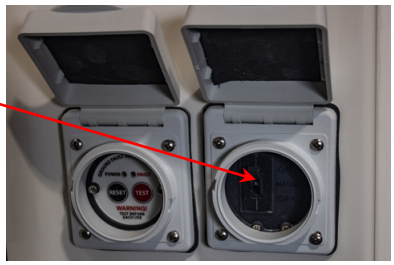
There is an ELCI ground fault circuit interrupter sensing module connected to the 30 amp circuit breaker on the incoming hot (black) and neutral (white) wires of the shore power connection for safety. This device will trip off the shore power 30 amp inlet breaker if there is an imbalance (leak) of more than 30 mA between the hot and neutral wires. The green equipment ground wire is connected direct through a galvanic isolator to prevent galvanic corrosion currents from passing between the vessel's system and the shore while allowing A.C. fault currents to travel back to shore.

LOCATION: The cable entrance cap is on the stbd. transom, the ELCI sensor with test and reset buttons, and the 30 amp shore power incoming circuit breaker are in the stbd. aft deck corner. The galvanic isolator is inside the hull aft.

NOTICE A.C. power parameters on the Garmin Empirbus screen indicate once A.C. sources are on line!

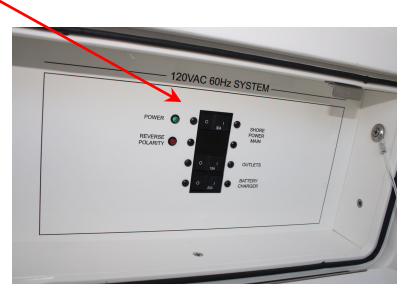
1 Ensure that the vessel is securely moored.

2 Ensure that the incoming shore power circuit breaker in the stbd. aft deck corner is off.



3 Ensure that the Shore Power Main circuit breaker in the head is off.

4 Open the cap on the transom for the shore power cable and plug in the cable end on the boat.



⚠CAUTION If the cable's end plug touches the water do not plug it in until it is fully disassembled and dried or replaced !

5 Ensure that the circuit breaker for the shore mounted receptacle box is off.

6 Plug in the other end of the shore power cable into a 30 amp 120 volt shore connection box.

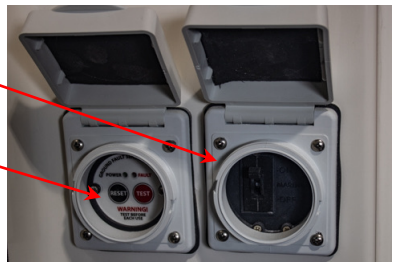
⚠CAUTION **If the shore mounted receptacle is loose or appears burnt do not use it. Select a different one!**

⚠CAUTION **Do not "tie up the boat" with the shore power cable and ensure that it is lead clear of any hazards of pinching, hooking on objects, or dangling in the water!**

7 Turn on the circuit breaker on the shore mounted receptacle box.

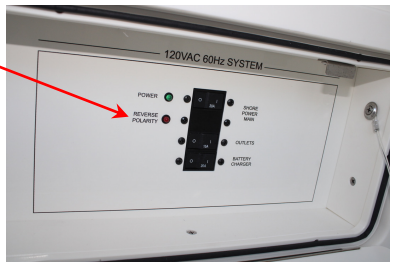
8 Turn on the main incoming 30 amp shore power circuit breaker by the inlet connection at the stern.

9 Press the "Test" button on the ELCI to ensure that it trips the boat inlet breaker during the test. If it trips then press the "Reset" on the ELCI and reset the 30 amp inlet circuit breaker.



⚠CAUTION **If the ELCI does not trip the circuit breaker during the test don't connect to shore power and have a qualified electrician investigate for a fault!**

⚠CAUTION **If the red Reversed Polarity indicator LED is on at the circuit breaker panel in the head don't connect to shore power and have a qualified electrician investigate why or try a different outlet on shore!**



10 If power is available from shore to the A.C. panel the green LED by the Shore Power Main circuit breaker of the A.C. panel in the head will light and you may turn on the Shore Power Main circuit breaker.

11 Observe the Garmin Empirbus "Power" screen monitor for the Shore Power and check that the Hertz meter reads 60 and that the Volts read between 110 and 120.

12 If the Volts are between 110-125 and the Hertz are 59-61 you may turn on the circuit breakers for desired devices on the 120VAC 60HZ panel in the head.

13 You may now monitor and manage the load being supplied by the shore power cable. (See *TO MONITOR THE A.C. LOADS*).

14 To disconnect from shore power turn off the circuit breakers on the 120VAC 60HZ panel in the head, turn off the main incoming 30 amp shore power circuit breaker by the inlet connection at the stern, turn off the circuit breaker on the shore mounted receptacle box, and unplug the end of the shore power cable from the shore connection box.

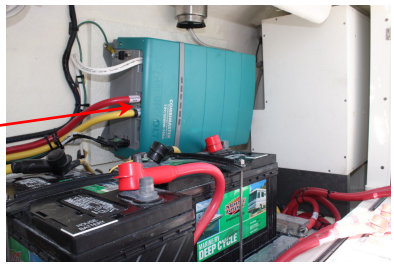
15 Disconnect the cord from the boat entrance connection, coil and stow it away, and close the cap on the transom entrance connection securely.

⚠CAUTION **If the end plug of the shore power cable touches the water do not use it again until it is fully disassembled, flushed with fresh water, and dried or replaced!**

TO USE THE INVERTER TO SUPPLY THE VESSEL

DESCRIPTION: There is a 2000 Watt Mastervolt Combimaster inverter/charger (standard system) or an optional (3000 Watt Lithium ion House bank, SeaKeepers, and/or the air conditioning) combination unit that charges the house 12 volt batteries from 120 volt shore power and can create A.C. power from the house batteries if no other source of A.C. power is available. The A.C. output produced by the inverter function feeds the main A.C. panel in the head. When normal A.C. is available the source A.C. from connected shore power "passes thru" to the panel's circuit breakers so the inverter function does not turn on and does not discharge the batteries. The charger/inverter is controlled by the controls on the unit. The inverter's function status and its other function as the house battery charger is indicated on the "Power" Empirbus touch screen.

LOCATION: The Mastervolt Combimaster inverter/charger combination unit is mounted under the helm bench seat with the house batteries.

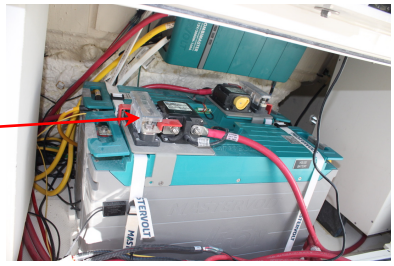


NOTICE **The Garmin Empirbus "Power" screen indicates inverter and house battery status.**

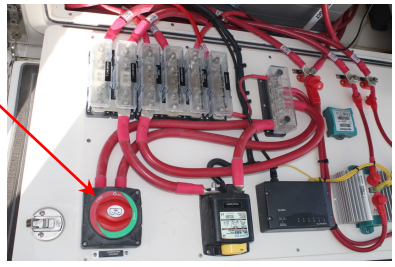
NOTICE **Consult the charger/inverter literature first!**

1 Ensure that there is sufficient voltage (at least 12 volts) in the house battery system. The house battery system status is monitored and indicated on the Garmin Empirbus system POWER screen.

2 Ensure that the house battery bank bus feed fuses in the compartment under the helm bench (and for the Lithium Ion boat that the fuses on top of the Lithium batteries) are intact.

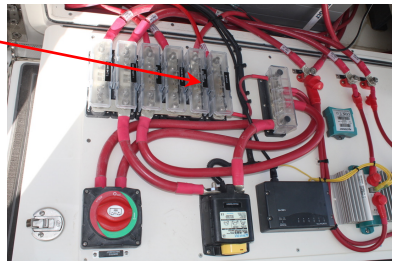


3 For vessels with the Lithium Ion battery option ensure that the manual house battery "Service Disconnect" switch is on under the helm bench.



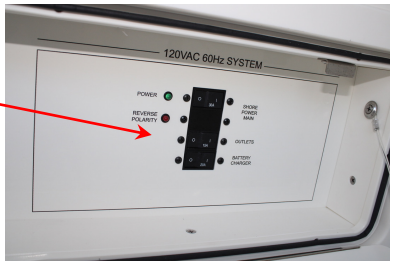
4 Ensure that the house battery switch is on (all vessels).

5 Ensure that the D.C. fuse under the helm bench that feeds source D.C. power from the house battery bus to the inverter is intact.



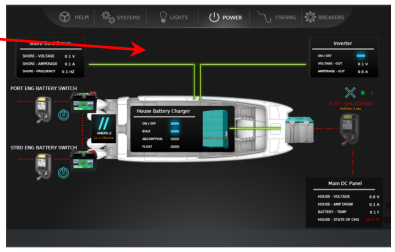
6 Ensure that the charger/inverter is set on the unit to power on.

7 Ensure that the Inverter Main circuit breaker on the main A.C. panel in the head is on.



8 Ensure that the A.C. circuit breakers on the main A.C. panel in the head are on to feed A.C. devices desired. The inverter will supply items connected to these items with regular A.C. current.

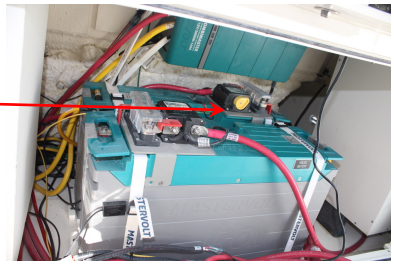
9 The inverter status and the condition of the House batteries can be monitored on the Garmin Empirbus "POWER" screen. The batteries will discharge as power is used unless the engines are running. Running the engines will help the batteries charge to keep up with the demand from the inverter.



NOTICE **At no time should the A.C. load (Amps) while on inverter only power exceed 40 amps or damage to the inverter may result.**

NOTICE **Discontinue use of the inverter to supply A.C. to the vessel or start up the engines to charge the house batteries if the house battery voltage drops below 12 volts. The inverter is set to cease inverter A.C. output if the house battery voltage drops below 10.2 volts to prevent killing the house batteries.**

NOTICE **On the Lithium Ion option boat the Lithium battery remote controlled isolator switches on the battery tops will close if the Lithium battery voltage drops low enough to damage the batteries.**



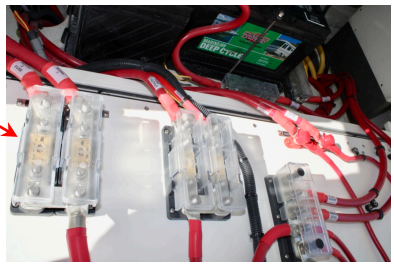
TO USE THE LOW VOLTAGE LIGHTING

DESCRIPTION: The lighting on the 400 CC-X is 12 volt D.C. variable multicolored including underwater. The lighting circuits get their power from the Empirbus system.

LOCATION: Lighting is installed throughout.

1 Ensure that the 12 volt “House” battery voltage is adequate (at least 12 volts).

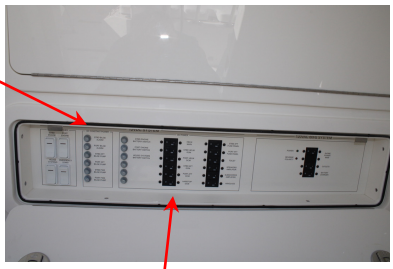
2 Ensure that the “24 Hour Power” fuse in the compartment under the helm bench is intact.

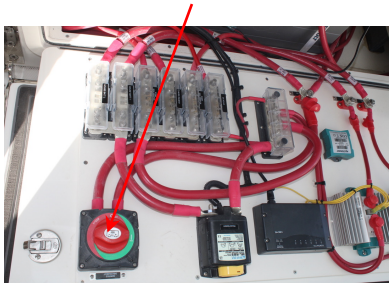


3 Ensure that the house battery bank bus feed fuses in the compartment under the helm bench are intact.

4 Ensure that the house battery bank switch output fuses in the compartment under the helm bench are intact.

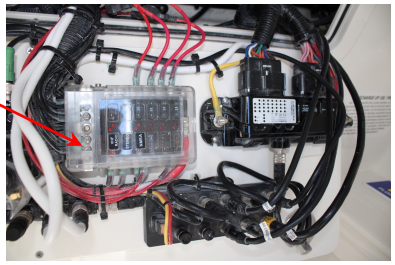
5 Ensure that the “House Systems Battery Switch” remote battery switch control pop out circuit breaker is on at the main D.C. panel and that the remote controlled house battery switch is on. For vessels with the Lithium Ion battery option ensure that the manual house battery "Service Disconnect" switch is also on under the helm bench.





6 Ensure that the “Helm Main”, "Stbd Helm", "Port Helm", "Stbd. Aft", "Port Aft", and "Hard Top" manual circuit breakers are on at the main D.C. panel in the head. These circuit breakers feed the D.C. load power to supply the Empirbus system WDU, DCMs, and Connect 50s, and thence the devices they serve.

7 Ensure that the fuses in the fuse block under the console in the compartment behind the drop down panel at the back of the head are intact.



8 Turn on the multifunction Garmin touch screen displays on the dash.

9 You may now use the Empirbus Garmin "Lights" touch screens or switches on the dash to operate the lighting.

NOTICE **Do not use the underwater lights with the vessel out of the water!**

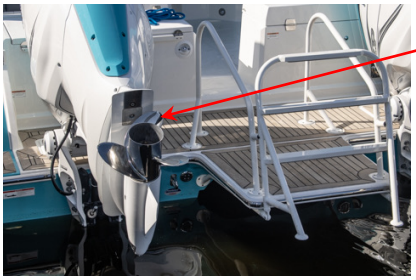
ABOUT THE BONDING SYSTEM

DESCRIPTION: A galvanic corrosion protection bonding system is installed consisting of green insulated wire to tie together all of the underwater metallic hardware, A.C. equipment grounds, D.C. grounds, and raw water carrying metallic parts to sacrificial zinc anodes bolted to the transoms underwater. The zinc anodes being the galvanically least noble metal should waste away before any other metals thus protecting the underwater running gear, fittings, and raw water carrying parts from corrosion. The engines are fitted with zinc anodes on their lower units. The shore power system includes an unswitched galvanic isolator in the green shore power ground wire which breaks the physical bond for corrosion level D.C. current flow between the onboard green A.C. equipment ground and the dockside green ground while still allowing A.C. fault currents to pass back to shore for safety.

LOCATION: The bonding wiring is in the bilge. The sacrificial zinc anodes are on the transoms below the waterline and on the engines. The shore power ground galvanic isolator position may vary.

1 Inspect the anodes on the transom frequently and replace when loose or 50% wasted away.

2 Periodically inspect the bonding jumper (green wires) connections in the bilge to ensure that they are secure and making good contact free of corrosion.



3 Inspect zincs on the outboards' lower units and internally.

PROPULSION SYSTEM OPERATIONS 3.5

TO START THE ENGINES AND GET UNDERWAY (YAMAHA INSTALLATION)

DESCRIPTION: The Yamaha engines are 12 volt electric start raw water cooled 4 stroke gasoline outboards.

The engines are fitted with the Yamaha EKS (Electronic Key Switch) security system which protects against theft and consists of the receiver and handheld remote control transmitters (fobs). The engines cannot be started if the security system is in lock mode. The engines can only be started in the unlock mode.

The engines are fitted with power tilt and trim which adjusts the outboard motor angle in relation to the transom. The trim function can be preset for best vessel performance at select engine speeds. This is done prior to delivery by World Cat. The engine tilt mechanism is fitted with a manual override valve screw to enable manual tilting of the engines in the event of a power tilt system failure or loss of battery voltage (see the *Yamaha* manual for details).

The Yamaha engines are fitted with a Yamaha CL7 monitoring system integrated with the Helm Master steering and control system to display engine status and alert information. This system is tied into the Garmin OneHelm Empirbus system via the NMEA 2000 data bus as well. The system monitors and displays the following information and alerts:

- Current Time
- Tank Levels
- Troll Mode Status
- Shift Position
- Engine Condition (security system on, synchronizer status, warm up status)
- Tachometer and Trim Angle
- Engine Maintenance Alerts
- Engine Information
- GPS Signal Quality
- Trip Info
- Overheat Alert (causes the engine to slow down)
- Low Oil Pressure Alert (the engine speed will decrease to 2000-3500 rpm)
- Water in Water/Gas Separator Alert
- Low Battery Voltage Alert
- Engine Trouble Alert (with code)
- Low Cooling Water Pressure Alert
- Steering Alert (SCU)
- Low Fuel Pressure Alert (this alert will prevent the starter on the engine generating the alert from operating for 7 seconds after the alert. 10 or more start

attempts may be required after this alert. When the engine is restarted let it idle for more than 5 minutes before attempting to resume normal operation).
- Helm Master Control System Alert.
- Engine Emission System Alert.

⚠CAUTION The engines have a Yamaha notification light system that indicates by flashing and strobing a warning to anyone that can see them near the stern of the boat that the engines are running in the Set Point or Stay Point modes (See *Steering and Controls* topics) and that there is a potential propeller injury danger!

LOCATION: On the transom. The notification lights are on the transom of each hull.

NOTICE Read and understand the *Yamaha Operation and Maintenance Manual* before proceeding!

NOTICE Read and understand the *Yamaha Helm Master controls manual* before proceeding!

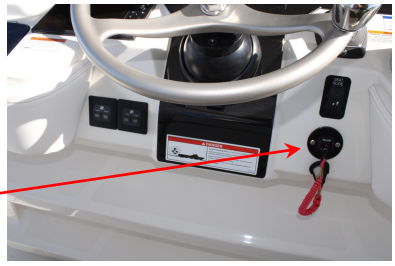
You may use the Garmin/Empirbus system Bluetooth remote control fob button 1 to power on the boat and make it ready if the circuit breakers on the DC panel in the head are on.

1 Conduct the recommended Yamaha prestart checks.

2 Check that the engine shut off clip and cord (lanyard) are free of damage (cuts, breaks, and wear).

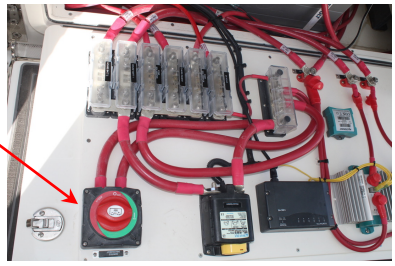
3 Ensure that the engine flushing devices' garden hose connectors are securely screwed to the fittings on the engine cowlings.

4 Securely attach the engine shut-off clip/cord to the shutdown switch.

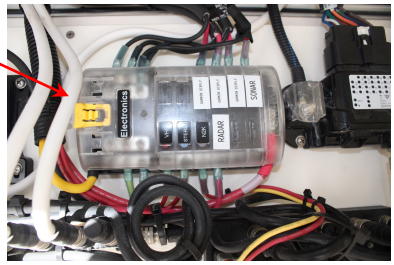


5 Ensure that all of the battery switches are on This can be done remotely from the Garmin Empirbus system.

NOTICE **All of the battery switches are remotely operated (except the Lithium Ion option boat which has a manually operated "Service Disconnect" switch) by switches in the panel in the head. Each switch has a yellow manual override knob on the actual switch.**



6 Ensure that the fuses in the fuse block under the console are intact.



NOTICE **As long as the** “Helm Main”, "Stbd Helm", "Port Helm", "Stbd. Aft", "Port Aft", and "Hard Top" manual circuit breakers are on at the main D.C. panel in the head **when the house battery switch is turned on the Yamaha CL7, Garmin displays, Empirbus system, and starting battery switches will turn on too. This is a normal function of the programing.**

7 Ensure that the Empirbus system is up and running. *See that topic in the Safety or Electrical Operations sections.*

8 Ensure that there is sufficient voltage in all of the batteries (at least 12 volts).

9 Ensure that the bilge pump and bilge alarm manually operated circuit breakers in the “DC Constant Power” section of the main D.C. panel in the head are on. These supply D.C. power to the automatic functions of the bilge pumps independent of the Garmin Empirbus system.

10 Ensure that the internal sea strainer in the raw water intake seachest is clean. Open the thru hull supply valve for the raw water intake sea chest. Ensure that all of the manually operated raw water supply seacocks (for livewells, wash down pump, etc.) on the raw water intake seachest are open (handles aligned with valve bodies).

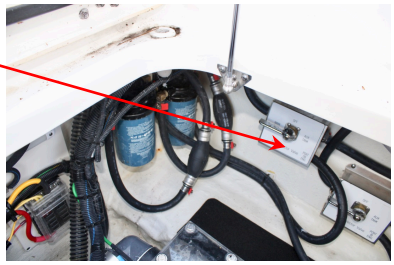
11 Ensure that the 200 amp House battery bank engine charging isolator fuses in the aft bilges (mechanical rooms) are on for the engines to charge the House batteries while running (Yamaha installation only).

12 Turn on the Garmin touch screen multifunction displays on the console with the power switches on the units.

13 Follow the gyro start up procedure if the optional Seakeepers are fitted.

14 Tank levels can be viewed on the CL7 and the Garmin Empirbus system screens. Ensure that there is sufficient fuel in the fuel tanks. See *Fuel System* information.

15 If the additional optional fuel tanks are installed use the fuel tank/engine selector valves to select the fuel tanks that you wish to draw from.



16 Squeeze the gasoline prime bulbs until firm to send gasoline to the engines.

17 Ensure that control levers are in neutral position (straight up detent). See also *Steering & Controls* topics.

18 Place and hold the EKS fob over the lock indicator in the EKS panel at the helm console to unlock the EKS.

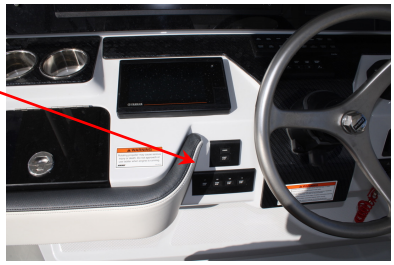
19 When the EKS fob is placed over the lock indicator, the beeper sounds twice. This indicates the unlock mode is selected and the ignition circuits can be turned to “ON”.

20 Pushing the Ignition or Power button turns the power to each engine ON and OFF. When the power is ON, the active indicator will be illuminated. Turning the Ignition buttons or Power button on powers up the Helm Master system.

⚠CAUTION Visually inspect the area around the engines to make sure engines are clear to start!

⚠WARNING Ensure that any swimmers are aboard the yacht, the swim ladder is retracted and stowed, and the all the boarding doors

are shut!

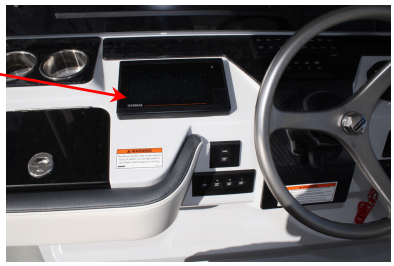


21 While observing the CL7 on the dash press the Start /Stop buttons. If there is one Start/Stop button by the Power button it will start all of the engines. The Helm Master electronics system will automatically start the engine(s). The Active indicator will be illuminated on the remote control lever binnacle when an engine is running.

22 Check that a steady stream of engine cooling water is flowing from the cooling water indicator pilot hole on the stbd. side of the engine.

23 A “Warm Up” indicator appears while an engine is being warmed up and goes off when warming up is finished. Until the engine is warm the idle speed may be higher than normal. Do not shift the engines or get underway until the “Warm Up” indicator is extinguished.

24 Check the shutdown pull clip operation to ensure that it shuts down the engines when pulled. Restart the engines.



25 Observe the Yamaha screens and consult the *Yamaha* literature to ensure that the operating temperatures, pressures, etc. are within limits.

26 See the Yamaha engine and controls literature and follow the guidelines and instructions for operation of the steering and controls.

27 With the vessel tied alongside or anchored securely verify and test control function. See also *Steering & Controls* topics.

⚠CAUTION **Disconnect and stow the shore power cable and close the connection cap securely!** See *Electrical topics*.

⚠CAUTION **The engines have a Yamaha notification light system that indicates by flashing and strobing a warning to anyone that can see them near the stern of the boat that the engines are running in the Set Point or Stay Point modes (See *Steering and Controls* topics) and that there is a potential propeller injury danger!**

28 Ensure that the windlass circuit breaker in the D.C. electric panel is on in case the windlass is needed.

29 NOTICE **Close and secure the forward deck hatches, head door, side boarding gates, and transom door securely prior to getting underway!**

30 Turn on the desired electronics.

31 Cast off the mooring lines or hoist the anchor and get underway.

NOTICE **Main engine alarm states will indicate on the Yamaha CL7. The Yamaha CL7 on the dash must be used to silence alarms!**

32 Engine malfunction alarms will generate explanatory codes and display them on the CL7. See the *Yamaha* literature for an explanation of the codes. The engines store certain engine data to assist in diagnosis of malfunctions which can be downloaded by a Yamaha technician with a special diagnostic tool.

⚠ CAUTION **Do not allow anyone to "bow ride" or ride in a position where they may lose their footing or a safe hand hold putting them in danger of falling or going overboard!**

33 Trim the engines as desired for optimum vessel performance using the Trim Assist function following the Yamaha provided instructions.

NOTICE **Once underway turn off the D.C. windlass control circuit breaker on the Garmin Empirbus "Systems" screen if the windlass is not needed. This will deactivate the remote so that the windlass cannot be unintentionally operated while underway.**

NOTICE **In the event that the vessel must be towed without either engine running be sure to tilt the inoperative motor up. Otherwise water could enter the exhaust pipe due to wave action, causing engine trouble!**

TO START THE ENGINES AND GET UNDERWAY (MERCURY INSTALLATION)

The Mercury main engines are 12 volt electric start raw water cooled Mercury Verado 4 stroke gasoline outboards. The engines are fitted with a Mercury VesselView monitoring system integrated with the JPO steering and control system to display the Mercury engine status and alert information. This system is tied into the Garmin Empirbus OneHelm system via the NMEA 2000 data bus as well. The system can monitor and display the following engine information and alerts:

- Troll Control
- Low Oil Level
- Time
- RPM
- Engine Hours
- Fuel to Waypoint
- Warning (OB)
- Boat Speed
- Engine Alarms
- Trim Pop-Up
- Engine Synchronizer
- Auto Speed
- Horn Fault
- Oil Pressure
- Fuel Used
- Steering Angle
- Sensor Transition
- Ignition Fault
- Battery Voltage
- Fuel Flow
- GPS Speed
- Air/Sea Temp
- Injector fault
- Depth
- Fuel Range
- GPS Course & Speed
- Digital Speed
- Oil System Fault
- Water Pressure
- System Link
- Speed Sensor Fault
- Oil Level

- Reserve Oil (OB)
- Coolant Temp
- Gauge Conn
- Low-Fuel Warning
- Fuel Level
- Coolant Pressure
- Smart Tow**

LOCATION: On the stern.

NOTICE Read and understand the Mercury Manual before proceeding!

NOTICE Read and understand the Mercury JPO controls manual before proceeding!

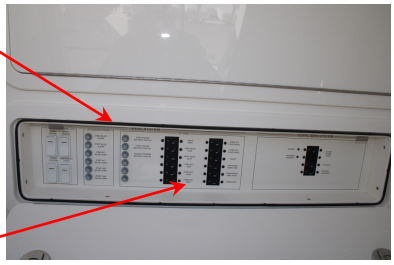
You may use the Garmin/Empirbus system Bluetooth remote control fob button 1 to power on the boat and make it ready if the circuit breakers on the DC panel in the head are on.

1 Conduct all recommended Mercury prechecks.

2 Check that the engine shut off clip and cord (lanyard) are free of damage (cuts, breaks, and wear).

3 Securely attach the engine emergency shut-off clip/cord to the shut down switch on the helm console.

4 Ensure that all of the circuit breakers in the “DC CONSTANT POWER” section of the DC panel in the head are on (and should be left on at all times). These supply D.C. power to the automatic functions of the bilge pumps independent of the position of the battery switches.

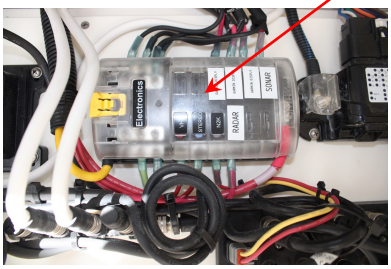


5 Ensure that all of the circuit breakers in the D.C. panel in the head are on.

6 Ensure that all of the battery switches are on.

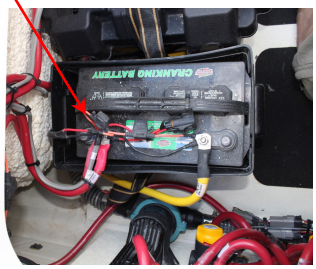
NOTICE **All of the battery switches are remotely operated by switches in the panel in the head. Each switch has a yellow manual override knob on the actual switch.**

7 Ensure that the fuses in the fuse block under the console are intact.



8 Turn on the Garmin monitors on the dash and verify that the Empirbus system is running, observe the "Power" screen to check the house battery voltage. It should be at least 12 volts.

9 Ensure that the Mercury clean power fuses in the fuse holders on the top of the engine starting batteries in the mechanical rooms are intact.



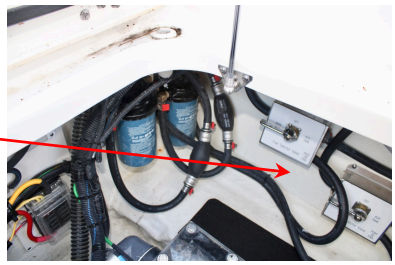
10 Ensure that the hydraulic steering pump fuses in the aft mechanical rooms are intact. On the Verado 600 Hp installation the steering has no hydraulic pumps and the electronic steering fuses are in the engine fuse boxes under the cowlings.

11 Ensure that the internal sea strainer in the raw water intake seachest is clean. Open the thru hull supply valve for the raw water intake sea chest. Ensure that all of the manually operated raw water supply seacocks (for livewells, wash down pump, etc.) on the raw water intake seachest are open (handles aligned with valve bodies).

12 Turn the engine ignition keys to "ON".

13 Once the ignitions are on tank levels can be viewed on the Mercury VesselView screen and the Garmin "Fuel" screens. Ensure that there is sufficient fuel in the fuel tank. See *Fuel System* information.

14 If the additional optional fuel tanks are installed use the fuel tank/engine selector valves to select the fuel tanks that you wish to draw from.



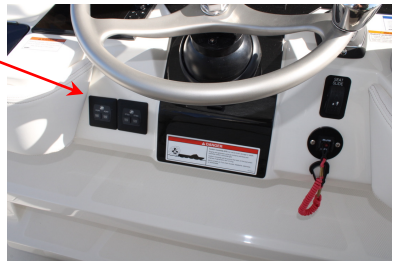
15 Ensure that control levers are in neutral position (straight up detent). See also *Steering & Controls* topics.

16 Follow the gyro start up procedure if the optional Seakeepers are fitted.

⚠CAUTION Visually inspect the area around the engines to make sure engines are clear to start!

⚠WARNING Ensure that swimmers are aboard the yacht (if any), the swim ladder is retracted and stowed, and the boarding gates are shut!

17 While observing the Mercury VesselView screen on the dash press the Start /Stop switches on the console. The JPO electronics system will automatically start that engine.



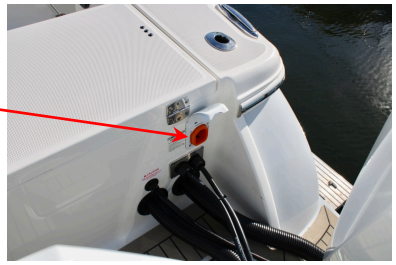
18 Check that a steady stream of engine cooling water is flowing from the cooling water indicator pilot hole on each engine once it starts.

19 Check the emergency shut down pull clip operation to ensure that it shuts down the engines when pulled. The operator should attach the shut down pull clip lanyard to their person and restart the engines.

20 See the Mercury engine and controls literature and follow the guidelines and instructions for operation of the steering and controls.

21 With the vessel still tied alongside or anchored securely verify and test steering function. See also *Steering & Controls* topics.

⚠CAUTION Disconnect and stow the shore power cable and close the connection cap securely! See Electrical topics.



22 Observe the Mercury VesselView screens and consult the *Mercury* literature to ensure that the operating temperatures, pressures, etc. are within limits.

23 Ensure that the windlass circuit breaker in the D.C. electric panel is on in case the windlass is needed.

NOTICE Close and secure the forward deck hatches, head door, side boarding gate, and transom door securely prior to getting underway!

24 Turn on the desired electronics.

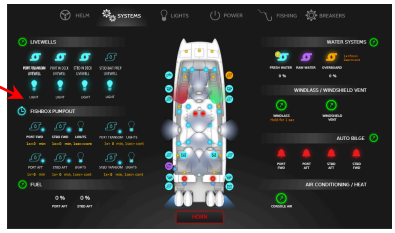
25 Cast off the mooring lines or hoist the anchor and get underway.

NOTICE Engine alarm states will indicate on the Mercury VesselView screen which must be used to silence alarms!

26 Engine malfunction alarms will generate explanatory codes and display them on the VesselView. See the *Mercury* literature for an explanation of the codes. The engines store certain engine data to assist in diagnosis of malfunctions which can be downloaded by a Mercury technician with a special diagnostic tool.

⚠ CAUTION Do not allow anyone to "bow ride" or ride in a position where they may lose their footing or a safe hand hold putting them in danger of falling or going overboard!

NOTICE Once underway turn off the D.C. windlass control circuit breaker on the Garmin "Systems" screen if the windlass is not needed. This will deactivate the foredeck foot switches so that the windlass cannot be unintentionally operated while underway.



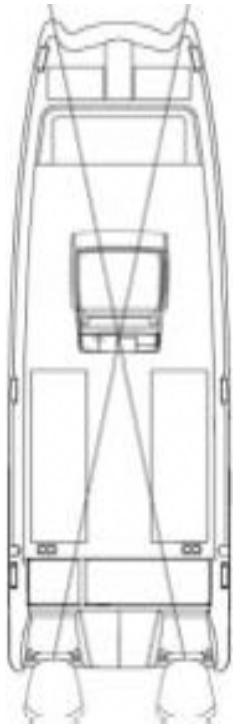
27 Trim the engines as desired for optimum vessel performance.

NOTICE **In the event that the vessel must be towed without an engine running be sure to tilt the inoperative motor up. Otherwise water could enter the exhaust pipe due to wave action, causing engine trouble!**

PERFORMANCE CHARACTERISTICS THAT THE OPERATOR NEEDS TO KNOW

These topics 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 learn proper methods of boat operation. Experienced boaters who have never owned a catamaran should study this material 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 existing catamaran owners, this material should be a reference.

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 slamming 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).



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.

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.

Handling Characteristics-
World Cat's patented VectroFloTM hull is a semi-displacement 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 negatively affect 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. 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:

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 a catamaran hull, while motorcycles pitch hard into a turn similar to a monohull. Do not underestimate a catamaran's cornering ability. Hard adjustments to the steering wheel can make a World Cat bite quickly and execute high-performance turns. Experiment with the handling ability of your cat so you are prepared for any situation on the water.

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 you can be confident that your World Cat, when operated properly, can handle them safely.

Here are a few 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.

Cross Clutching- Twin Engines
World Cat 400CC-X twin engines are mounted at a specific distance, based on the configuration of the boat, allowing 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. Use the joy stick to make it really simple.

Get the Boat on Plane-

- Trim both engines down (the motors act as trim tabs forcing the bow down).
- Quickly increase speed to get the boat on plane then slow down to 3500 RPM's.
- Adjust trim up until the motors cavitate, then tap trim down.
- Feel / hear the motors and do not watch the trim gauges.
- A smooth ride is more important than having your engine RPM's synchronized.

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).

Handling Different Sea Conditions-

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

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.

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.

Engine Efficiency- Without proper maintenance, your engine(s) 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.

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

Weather Conditions-
Barometric pressure and humidity can affect the output of your engines. For example, on an extremelyhot 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.

Load-
Increased load can 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 throughout 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.

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.

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.

TO STOP THE ENGINES AND SECURE (YAMAHA INSTALLATION)

DESCRIPTION: Engine Start/Stop buttons.

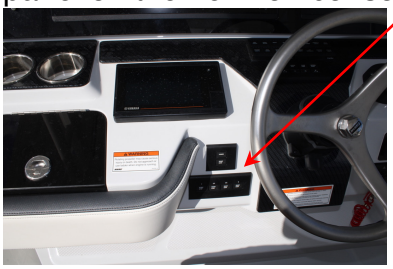
LOCATION: On the console.

1 Secure the vessel moored to a pier or at anchor.

2 Ensure that controls are in neutral positions.

3 Allow engines to run at low idle for at least 3 minutes to reduce and stabilize internal temperatures.

4 Depress the single Start/Stop switch or individual switches for each engine in the panel on the helm on console to stop the engines.



5 Turn off (press) the Ignition switches or Power switch.

6 Inspect the engines under the cowlings for leaks.

7 To lock the engines off place the EKS fob (if provided) over the lock indicator, the beeper sounds once. This indicates the lock mode is selected and the ignition switch cannot be turned to “ON”. When in lock mode, the EKS panel lock indicators blink. When the Ignition switch is OFF, or the Ignition switch is ON and the engines are not running, locking can be performed.

8 Turn off the windlass circuit breaker in the D.C. electric panel if it will not be needed.

9 Connect the A.C. shore power cable as desired (See Electrical topics).

10 Turn off the SeaKeeper on its control head and allow it to spin down if you are not going to need it. Turn off the SeaKeeper circuit breakers. The system will continue to spin down for approximately 16 hours. *See also the optional SeaKeeper literature.*

11 You may use the Garmin/Empirbus Bluetooth remote control fob wireless remote button 2 (press and hold) to start the preprogrammed "exit boat" count down on the Empirbus system to turn everything off when leaving the boat.

NOTICE **See also *Yamaha* literature and follow recommended procedures!**

TO STOP THE ENGINES AND SECURE (MERCURY INSTALLATION)

1 Secure vessel moored to a pier or at anchor.

2 Ensure that controls are in neutral positions.

3 Allow engines to run at low idle for at least 3 minutes to reduce and stabilize internal temperatures.

4 Depress the Start/Stop switch for each engine on the console to stop the engines.

5 Turn off the ignition key switches.

6 Inspect the engines under the cowlings for leaks.

7 Turn off the SeaKeeper on its control head and allow it to spin down if you are not going to need it. Turn off the SeaKeeper circuit breakers. The system will continue to spin down for approximately 16 hours. *See also the optional SeaKeeper literature.*

8 Turn off the windlass circuit breaker in the D.C. electric panel if it will not be needed.

9 Connect the A.C. shore power cable as desired (See Electrical topics).

10 You may use the Garmin/Empirbus Bluetooth remote control fob wireless remote button 2 (press and hold) to start the preprogrammed "exit boat" count down on the Empirbus system to turn everything off when leaving the boat.

NOTICE **See also Mercury literature and follow recommended procedures!**

TO FLUSH THE ENGINES AFTER USE

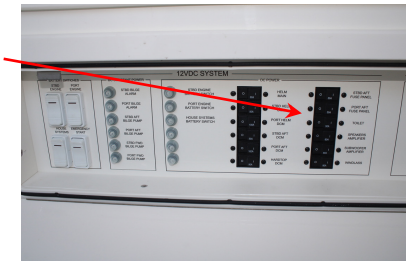
DESCRIPTION: An optional Reverso 12 volt automatic outboard flushing system is fitted to flush the engines' cooling systems with fresh water.

LOCATION: At the stern.

NOTICE **The engines must be off for this procedure.**

1. Ensure that the "House" battery voltage is sufficient (at least 12 volts) and that the "House" battery switch is on at the main D.C. panel to feed power to the manual circuit breakers on the D.C. panel.

2 Ensure that the aft fuse panel feed circuit breakers on the main DC panel in the head are on.



3 Ensure that the Reverso flush system fuse in the fuse block on the inside of the (usually port) transom in the mechanical room is intact.

4 Connect a fresh water hose to the unit and the engine(s).

5 Turn on water. The unit will not work without water pressure.

6 **To activate**:

- Push start button once - **15 minute** cycle per engine.
- LED is solid blue during operation.
- At 14 minute and 55 seconds, the next engine will engage to overlap for 5 seconds.
- Push start button twice - **7.5 minute** cycle per engine.
- LED is blinking blue during operation.

- At 7 minute and 25 seconds, the next engine will engage to overlap for 5 seconds. 7The unit will automatically cycle each engine and shuts off once complete.

7 Disconnect the water hose.

8 To **Stop** Operation:

- Stopping in the middle of a cycle will stop program. The system will reset back to engine.
- If running the **15 minute** cycle per engine, then press the button **twice** to stop.
- If running the **7.5 minute** cycle per engine, then press the button **once** to stop.
- The system can be activated again by following Operation instructions.

9 **Loss of Water Pressure** During Operation:

- The LED will turn solid red.
- If water pressure is restored within 5 minutes, the system will resume operation from the point of pressure loss.
- If water pressure is not restored within 5 minutes, the system will reset. Press the start button to begin the cycles again, starting at the first engine.

STEERING & CONTROL SYSTEM OPERATIONS 3.6

TO USE THE YAMAHA POWER STEERING

DESCRIPTION: The World Cat 400CC-X Yamaha engines are fitted with integrated 12 volt D.C. electronic steering as a part of the Helm Master control system to turn the engines. There is an electronic helm (wheel) and a multifunction control joystick at the control console. If a fault occurs which prevents one or both of the engine's steering from being operated it is also possible to align the engines manually so that the vessel can be steered by alternating the engines' thrust. The autopilot steers the yacht by sending commands to the Helm Master system through a Yamaha/Garmin autopilot gateway interface with an integrated Yamaha/Garmin GPS gateway. There is no separate autopilot pump. A steering system malfunction alert is built into the Yamaha CL7 system.

LOCATION: The electronic helm is at the control console. The 12 volt electronic engine steering actuators are built into the front of the engine clamp brackets. The Garmin autopilot flux gate compass (Reactor) and Yamaha autopilot gateway interface are mounted out of the weather inside the hull.

NOTICE **Read the Yamaha Helm Master steering and control literature first**

1 Ensure that engine starting battery switches are on.

2 Ensure that the engine starting battery voltages are sufficient (12 volts).

3 Ensure that the fuses in the fuse boxes on the top each engine under the cowling are intact.

4 Place and hold the EKS fob over the lock indicator in EKS panel (if installed) beside the helm to unlock the EKS.

5 When the EKS fob is placed over the lock indicator, the beeper sounds twice. This indicates the unlock mode is selected and the ignition switches can be turned to "ON".

6 Pushing the ignition (or Power) switch turns the power to each engine ON and OFF. When the power is ON, the active indicator will be illuminated. Turning the ignition buttons on powers up the Helm Mate system.

7 Turn on the ignitions.

NOTICE Read the Yamaha Helm Master steering and control literature for operational details.

8 Start the engines. (the control levers must be in neutral position for the engines to start).

9 The engines will be centered when the engines are started and when the joystick is first engaged.

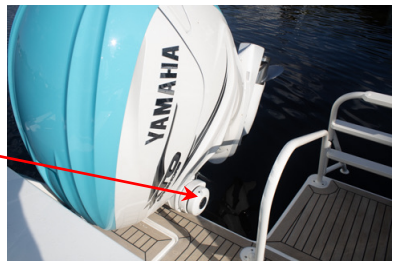
10 Once engaged, using the docking joystick will turn the engines in the direction necessary automatically to maneuver the boat as desired.

11 The steering is very sensitive. Therefore the steering wheel friction “feel” and steering sensitivity is automatically adjusted based upon the speed of the vessel to maximize user control. Go gently until accustomed to the feel of the boat.

12 Steering with the docking joystick while moving forward in the open may impart a yawing and rolling movement in the boat. It is best to use the wheel or autopilot in the open or at higher speeds for steering in normal forward operation.

13 For autopilot steering the autopilot computer commands the Helm Master integrated steering. While autopilot is engaged changing the heading will disengage the autopilot from auto steering.

14 In the event that either of the engines cannot be steered normally there is an emergency alignment procedure outlined in the Yamaha Engine Operation Manual. A manual override lever is provided on each engine’s steering assembly under the end cap to allow it to be released and centered so that the vessel can return to port steering by varying the engine thrust.

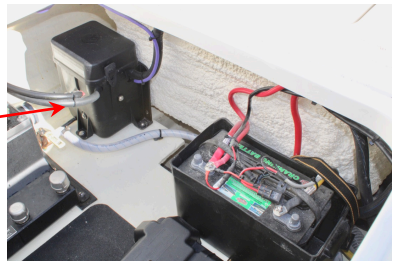


NOTICE Emergency steering is then to be accomplished by judicious use of the twin engine’s thrusts with great loss of control! Use great caution and proceed at slow speed!

TO USE THE MERCURY POWER STEERING

DESCRIPTION: The World Cat 400CC-X Mercury engines are fitted with integrated 12 volt D.C. electric/hydraulic (300 Hp option) or electronic steering (600 Hp option) as a part of the JPO (Joystick Piloting for Outboards) control system to turn the engines. There is a 12 volt powered hydraulic or electronic helm (wheel) powered by the engine starting batteries and a multifunction control joystick at the control console. The autopilot steers the yacht by sending commands to the JPO system through a Mercury/Garmin autopilot gateway interface with an integrated Mercury/Garmin GPS gateway. There is no separate autopilot pump. A steering system malfunction alert is built into the Mercury VesselView system.

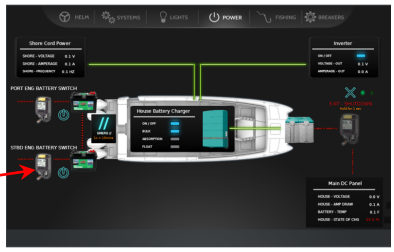
LOCATION: The electronic helm is at the control console. The 12 volt engine steering pumps (300 Hp option) are in the aft mechanical rooms.



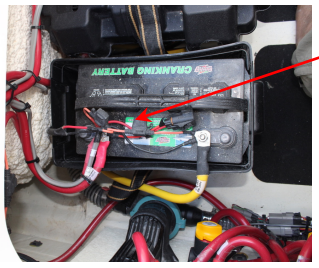
NOTICE **Read the Mercury JPO steering and control literature for operational details.**

1 Ensure that the engine starting battery voltages are sufficient (12 volts).

2 Ensure that engine starting battery switches are on. These can also be operated by remote control from the Garmin Empirbus "Power" system screen.



3 Ensure that the clean power fuses on each starting battery positive terminal are intact.



4 Ensure that the hydraulic steering pump fuses in the mechanical rooms aft (300 Hp option) or in the rigging panel fuse holder under the engine cowls (600 Hp option) are intact.

5 Turn on the ignition keys. The ignition key switches turn the power to each engine ON and OFF. When the power is ON, the active indicator will be illuminated. The ignition keys power up the JPO system.

6 Start the engines by pressing the engine Start/Stop buttons on the console. (the control levers must be in neutral position for the engines to start).

7 The engines will be centered when the engines are started and when the joystick is first engaged.

8 Once engaged, using the docking joystick will turn the engines in the direction necessary automatically to maneuver the boat as desired.

9 For autopilot steering the autopilot computer commands the JPO integrated steering. While autopilot is engaged changing the heading will disengage the autopilot from auto steering.

TO USE THE YAMAHA ENGINE CONTROLS

DESCRIPTION: The Yamaha engines are fitted with integrated electronic traditional style dual side single lever remote control levers, and a control joystick as a part of the Helm Master system for steering the engines and to shift the engines through forward, neutral, and reverse, and to vary the speed of the engines. The remote control lever binnacle has function switches and system indicators. The Helm Master remote controls have additional functions including:

- Engine trim assist (sets engine trim to a predetermined level for a given speed)
- Remote control alert indicator (indicates that control is active for that engine)
- Free throttle switch (allows adjusting throttle without that engine in gear)
- Single lever switch (enables control of throttle and gear selection of both engines simultaneously using only the port side control lever).
- Speed control switch (makes small incremental speed changes while in forward)
- Active indicator (station selector switch active indicator, shows when operation of that engine shift and throttle are possible)
- PTT switch (All) Adjusts both engines power trim and tilt equally.
- PTT switch (STBD) Adjusts STBD. engine power trim and tilt.
- PTT switch (PORT) Adjusts PORT engine power trim and tilt.
- Remote control alert indicator Shows if a steering control system malfunction occurs, remote control alert indicators will blink. The blinking alert indicators show which engine or engine's steering system has a malfunction. A buzzer will also sound (alternating ON/OFF) to alert the operator. Tapping the "Confirm" button on the CL7 Display will stop the buzzer.

The directional joystick enables the vessel to be maneuvered in close quarters by controlling both engines and their steered positions as required to position the vessel as desired. Low speed shifting, throttle operation and steering of all engines can be performed with the joystick lever when activated. Moving the joystick lever left, right, forwards, backwards, or diagonally moves the boat in the corresponding direction.The joystick will return to the neutral (N) position when released. The joystick has two speed modes: normal active, and high with activate buttons and mode indicator lights.

The joystick additionally has four “Set Point” modes:

Stay Point -This mode keeps bow direction and boat position set automatically when activated.This is useful when preparing for docking or waiting near a refueling dock or fishing.

Fish Point Bow -This mode keeps boat position with bow into the wind or current. This is useful for fixed point fishing. Shifting and engine rpm is minimized to help avoiding scaring fish from noise.

Fish Point Stern -This mode keeps boat position with Stern into the wind or current. This mode is useful for fixed point fishing. Shifting and engine rpm is minimized to help avoiding scaring fish from noise.

Drift point -This keeps bow direction only and allows lateral movement according to the wind or/and current.This mode is useful for drift fishing or drift cruising.

⚠CAUTION **The engines have a Yamaha notification light system that indicates by flashing and strobing a warning to anyone that can see them near the stern of the boat that the engines are running in the Set Point or Stay Point modes (See the *Yamaha* Helm Master literature for details on operating Set Point and Stay Point modes) and that a potential propeller injury danger exists!**

LOCATION: The remote control lever binnacle is at the control station on the console. The multifunction joy stick also on the console. The EKS panel and engine shut off switch are also on the console. The Yamaha notification lights are on each transom and the light interface is on the inside of the transom.

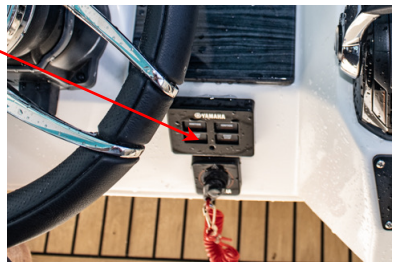
See *Yamaha* engine and *Helm Master* literature before attempting to start engines.

1 Ensure that engine starting battery switches are on. This can be done in the Empirbus system by remote control.

2 Ensure that the fuses in the fuse block on top of each engine under the cowling are intact.

3 Place and hold the EKS fob over the lock indicator in EKS panel stbd. of the helm to unlock the EKS.

4 When the EKS fob is placed over the lock indicator, the beeper sounds twice. This indicates the unlock mode is selected and the ignition switches can be turned to “ON”.



5 Pushing the ignition switch turns the power to each engine ON and OFF. When the power is ON, the active indicator will be illuminated. Turning the ignition buttons on powers up the Helm Mate system.

6 Turn on the ignitions.

7 While observing the CL7 on the dash press the Start /Stop switches. The Helm Master electronics system will automatically start that engine. The active indicator will be illuminated on the remote control lever binnacle when an engine is running.

NOTICE **Main engine alarm states will indicate on the Yamaha CL7. The Yamaha CL7 on the dash must be used to silence alarms!**

8 Engine and Helm Master controls’ malfunction alarms will generate explanatory codes and display them on the CL7. See the Yamaha literature for an explanation of the codes. The engines store certain engine data to assist in diagnosis of malfunctions which can be downloaded by a Yamaha technician with a special diagnostic tool.

NOTICE **Read the Yamaha Helm Master steering and control literature for operational details.**

9 With the vessel tied alongside or anchored securely verify and test control function.

NOTICE **It is normal when using the joystick mode for maneuvering that the engines will make significant clunking noises while engaging and disengaging the gears in response to the joystick commands.**

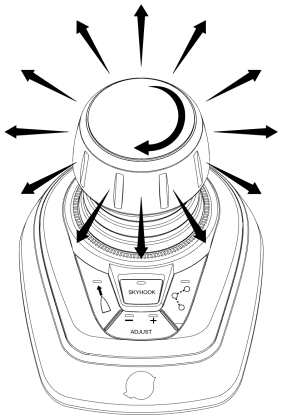
NOTICE **All engines should be running during reversing**

maneuvers, to avoid the risk of water entering the engines via the exhaust pipes! Do not shift into reverse while traveling at planning speeds. Loss of control, swamping, or damage to the boat could occur!

TO USE THE MERCURY ENGINE CONTROLS

DESCRIPTION: The Mercury engines are fitted with integrated electronic traditional style dual engine single lever remote control levers, and a control joystick as a part of the JPO (Joystick Piloting for Outboards) system for steering and shifting the engines through forward, neutral, and reverse, and varying their speed. The remote control lever binnacle has function switches and system indicators. A remote control alert indicator shows if a steering control system malfunction occurs, remote control alert indicators will blink. The blinking alert indicators show which engine or engine's steering system has a malfunction. A buzzer will also sound (alternating ON/OFF) to alert the operator.

With the Mercury JPO feature, you can easily control the movement of your boat when docking or even drifting. Pushing the joystick to the left or right will translate the boat horizontally in the port or starboard direction, respectively. Pushing the joystick to up or down will translate the boat vertically in the forward or reverse direction, respectively. You may also move the boat diagonally by applying these movements simultaneously. The more force you apply on the joystick in either direction, more thrust will be applied by the engines. By twisting the head of the joystick in either a clockwise or counterclockwise direction, the boat will rotate about its axis in the corresponding direction.



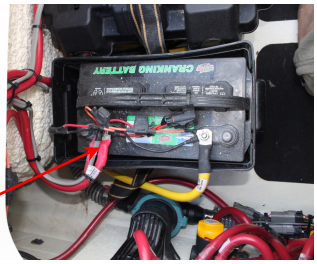
LOCATION: The remote control lever binnacle is at the control station on the console to stbd.. The multifunction joy stick is beside the remote control lever binnacle. The Mercury VesselView is on the console dash.

NOTICE **Read the Mercury JPO steering and control literature for operational details.**

1 Ensure that the engine starting battery voltages are sufficient (12 volts).

2 Ensure that Start and House battery switches are turned on.

3 Ensure that the 90 amp electronic hydraulic steering fuses on the connections to the starting battery terminals are intact (300 Hp Mercury installation) or the 200 amp fuse under the engine cowlings are intact (600 Hp Mercury installation).



4 Ensure that the Mercury clean power fuses on each starting battery positive terminal

are intact.

5 The ignition key switches turn the power to each engine ON and OFF. When the power is ON, the active indicator will be illuminated. The ignition keys power up the JPO system.

6 Turn the ignition keys to the ON position.

7 Start the engines by pressing the engine Start/Stop buttons on the console or turning the key switches to the momentary START position (the control levers must be in neutral position for the engines to start).

8 See the Mercury JPO system manual for complete details and follow the operating instructions. The engines will be centered when the engines are started and when the joystick is first engaged.

9 A button enables the Skyhook feature, a digital anchor that locks in your boat's position and heading via GPS.

NOTICE **Make sure the engine throttle is in the neutral position and stay at the helm while skyhook is activated. SKYHOOK can also be disengaged by putting the throttle in gear or turning the steering wheel.**

WARNING **PROPELLER INJURY HAZARD, DO NOT engage SKYHOOK when swimmers are present or leave the helm while SKYHOOK is engaged.**

NOTICE **It is normal when using the joystick mode for maneuvering that the engines will make significant clunking noises while engaging and disengaging the gears in response to the joystick commands.**

NOTICE **All engines should be running during reversing maneuvers, to avoid the risk of water entering the engines via the exhaust pipes! Do not shift into reverse while traveling at planning speeds. Loss of control, swamping, or damage to the boat could occur!**

TO USE THE YAMAHA POWER TILT/TRIM

DESCRIPTION: Each engine has built in power tilt and power trim with a trim assist function that allows the trim angle of all engines to be automatically adjusted according to the engine speed. You must enter the RPM or boat speed and percentage of trim data for all five preset positions. The RPM or boat speed for position 1 is automatically set to IDLE.

LOCATION: The power tilt/trim is built into the motor brackets. The power tilt/trim control and trim assist buttons are built into the remote control binnacle and levers. A power tilt button is built into port side front of each engine.

NOTICE **Read the Yamaha Helm Master steering and control literature for operational details.**

1 The PTT system adjusts the position of the engines in relation to the transom.

2 PTT switch “1” (on the top side of the control lever) controls both engines simultaneously. PTT switches “2”, “3” and “4” (across the bottom back of the remote control binnacle) control each engine individually. When the engines are in the fully down position, pressing UP will first move the engine(s) through the trim range then into tilt range. Pressing DN will lower the engine(s). When the switches are released, the engine(s) will stop in its current position.

3 The trim assist function can be activated when the remote control levers are in the forward (F) position. The active indicator will be illuminated during operation. See page 36 of the *Yamaha* Helm Master Operations manual for information on setting engine speeds and the appropriate trim angle settings.

4 The trim assist settings must be setup on the Yamaha CL7 screen in advance in order for the trim assist switch to function. You must enter the RPM or boat speed and percentage of trim data for all five preset positions. The RPM or boat speed for position 1 is automatically set to IDLE.

5 Trim assist mode does not operate in the free throttle mode and joystick mode. Only pushing the trim assist switch exits from trim assist mode. The active indicator will go out. When the trim assist function has been switched ON, it will remain active until cancelled by the operator even when turning the ignition switch OFF and back to ON.

TO USE THE MERCURY POWER TILT/TRIM

DESCRIPTION: Each engine has built in power tilt and power trim with Mercury Active Trim function. Active Trim is Mercury Marine's patented GPS-based automatic trim system. This intuitive, hands-free system continually adjusts engine or drive trim for changes in operating conditions to improve performance, fuel economy, and ease of operation. It responds to boat maneuvers with precision and delivers a better overall driving experience. No knowledge of trimming an engine or drive is needed to take advantage of Active Trim.

- As the boat accelerates, the engine or drive will trim out.
- As the boat decelerates, for example, while making a turn, the engine or drive will trim in.
- Active Trim can be overridden at any time by using the regular, manual trim buttons.
- Active Trim allows the boat operator to compensate for changes in boat load, driver preferences, and weather conditions while maintaining full automatic control.

LOCATION: The power tilt/trim is built into the motor brackets. The power tilt/trim control and trim assist buttons are built into the remote control binnacle and levers. A power tilt button is built into port side front of each engine.

1 Start the engines and engage the controls in the normal way.

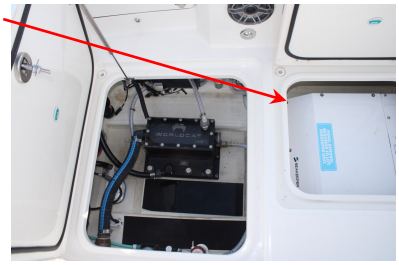
NOTICE **Read the Mercury JPO steering and control literature for operational details of the normal power tilt and Active Trim function.**

STABILIZER SYSTEM OPERATIONS 3.7

TO USE THE SEAKEEPER GYRO STABILZERS

DESCRIPTION: There are one or two optional SeaKeeper model 2 and/or 3 12 volt powered raw water cooled gyro stabilzers that are installed in each hull to stop the yacht from rolling. The SeaKeepers use gyroscopic principles to reduce boat roll motions in waves and wakes independent of boat speed. The SeaKeeper 2 and 3 systems each consist of a gyro assembly, a CAN communications cable, and a display. The units are connected to a N2K bus for sending the signal to their display(s). Each unit has a dedicated 12 volt raw water pump fed by its own sea cock and sea strainer.

LOCATION: The SeaKeepers are in the port and stbd. hulls under the aft deck replacing the 460 quart aft fish boxes on that respective side.

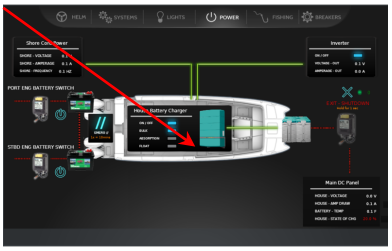


If only one SeaKeeper is installed it will be in the stbd. hull.

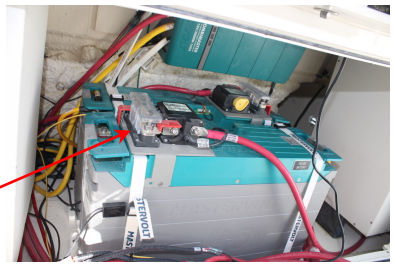
The SeaKeeper's raw water seacocks, sea strainers, and raw water pumps are located inboard in the bilge with them. The control touch screen display (one for each) is/are in the head.

1 Ensure that the Seakeeper raw water pump supply sea cock(s) is/are open and that the sea strainer(s) is/are clean.

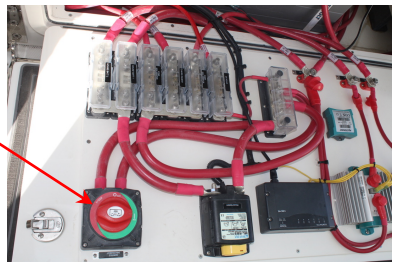
2 Ensure that there is sufficient voltage (at least 12 volts) in the house battery system. The house battery system status is monitored and indicated on the Garmin Empirbus system POWER screen.



3 Ensure that the house battery bank bus feed fuses in the compartment under the helm bench and the fuses on top of the Lithium batteries are intact.



4 Ensure that the manual house battery "Service Disconnect" switch is on under the helm bench.



5 Ensure that the main remote controlled house battery switch is on.

6 Ensure that the Empirbus system is up and running.

7 Ensure that the SeaKeeper rotary isolator switch(es) in the aft bilge compartments is/are on. This can be done from the Empirbus screen.

8 When the DC power is turned on the SeaKeeper main display(s) in the head will initialize and the HOME screen will appear. If a FAULT is present an ALARM screen will appear.

9 To turn the GYRO ON depress the POWER ON/OFF FAULT RESET button on the touch screen controller(s), the button will turn green, the flywheel will spin (or arrow appear), and a red progress bar will appear. The progress bar indicates how soon the gyro will be available for stabilization. When the gyro is initialized and when the gyro is up to minimum operating speed the progress bar will turn from red to green. At this point, the gyro is available for stabilization.

10 The SeaKeeper(s) operation can be monitored and controlled from the SeaKeeper main display(s) in the head and the Garmin/Empirbus touch screen mimics its display(s). See the *SeaKeeper* product literature for details of operation.

NOTICE **If it is necessary to shutoff power to the flywheel motor and slow the flywheel for any reason, press the SeaKeeper ON/OFF button; the button will turn gray and the STABILIZE button will disappear indicating that the command has been accepted. It takes approximately 4+ hours for the speed to drop to zero rpm.**

NOTICE **If it is necessary to stop the SeaKeeper motion for any reason press the STABILIZE button. The STABILZE button will turn gray indicating that the SeaKeeper is locked. Never attempt to work on the gyro until the flywheel has stopped spinning. In the event that the gyro system has automatically locked the gyro due to an alarm or failure, no attempt should be made to bypass the alarm or automatic lock.**

11 Once in port to stop the SeaKeeper press the SeaKeeper ON/OFF button. The

button will turn gray and the unit will begin to spin down. The DC circuit breakers may be turned off while the unit is spinning down.

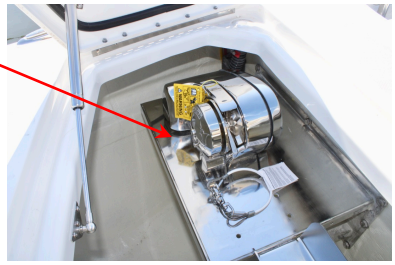
NOTICE **The circuit breakers should be left on as long as possible while the gyro is spinning to remove heat from the gyro. During normal operation, the gyro should be stopped when pulling into port and stabilization is no longer required. This maximizes long term life as it allows the gyro to start the coast down cycle before cooling is shutoff. Once the vessel is secured in the slip and the crew has shut down the engines, the DC breaker that controls the gyro can be switched to the OFF position. The gyro will continue to spool down to zero rpm. No cooling is required during this time. Note gyro will take approximately 4+ hours to coast down to zero rpm from full speed. The display(s) will indicate 0 RPM when the flywheel has stopped.**

GROUND TACKLE OPERATIONS
3.8

TO LET THE ANCHOR FREE FALL

DESCRIPTION: There is a 12 volt combination chain/line windlass with a hand held remote control in the fore deck hatch for in and out hauling of chain and line and a touch switch to raise and lower the windlass on the Empirbus screen. 20' 5/16" G4 chain spliced to 300' 5/8" 8 strand nylon braid line is supplied with the yacht. The anchor is a stainless steel 25# plow type stowed on a bow roller. The anchor can be allowed to free fall if power is not available to the windlass.

LOCATION: The windlass is mounted in the bow locker offset to the side of the bow pulpit with a turning fair lead and anchor roller. The rode locker is to the side below the windlass. The handheld remote with coil cord hangs inside the bow locker. The Empirbus windlass touch switches are on the "Systems" screen.

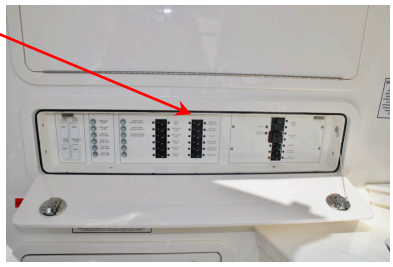


1 See the *Windlass* literature.

2 Ensure that the house battery switch is on.

3 Ensure that the 12 volt stbd. battery voltage is adequate (at least 12 volts).

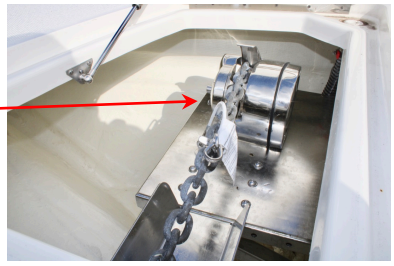
4 Ensure that the Windlass circuit breaker on the main D.C. panel for the windlass load is off.



5 Determine depth of the water and ensure that you have sufficient rode to reach bottom with adequate scope. The yacht is commissioned with 20' 5/16" G4 chain spliced to 300' 5/8" 8 strand nylon line.

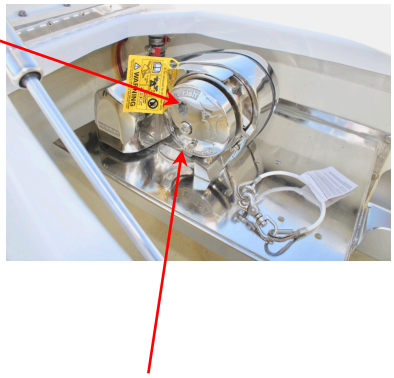
6 Ensure that the yacht does not have way on.

7 Release the chain stopper cable/ snap hook so that the chain can run.



8 Disengage the rode drive by pressing the plunger button on the edge of the free fall cap and press in the locking button on the face of the free fall cap until the plunger remains in the down position.

9 When safe insert the Lewmar wrench into the keyed hole in the face of the free fall cap and rotate clockwise to grip the gypsy and anticlockwise to free the gypsy controlling the rate of descent of the anchor. Once the anchor is deployed adjust to the desired scope. Lock the clutch by turning the free fall cap clockwise and engage the chain stopper.



10 Remove the wrench handle.

11 To return the windlass back to powered operation pull the locking button out disengaging the plunger so that it pops up.

12 Ensure that the Windlass circuit breaker on the main D.C. panel in the head for the windlass load is turned back on and the windlass control circuit is turned on in the Empirbus "System" screen.

13 press the UP/DOWN buttons on the windlass remote to ensure that the windlass resumes power operation.

⚠CAUTION Always keep hands and limbs clear of the chain and windlass!

TO LOWER/RAISE THE ANCHOR WITH THE WINDLASS

DESCRIPTION There is a 12 volt combination chain/line windlass with a hand held remote control in the fore deck hatch for in and out hauling of chain and line and a touch switch to raise and lower the windlass on the Empirbus screen. 20' 5/16" G4 chain spliced to 300' 5/8" 8 strand nylon braid line is supplied with the yacht. The anchor is a stainless steel 25# plow type stowed on a bow roller.

The windlass receives its power from the house battery bank via the Windlass circuit breaker on the main D.C. panel.

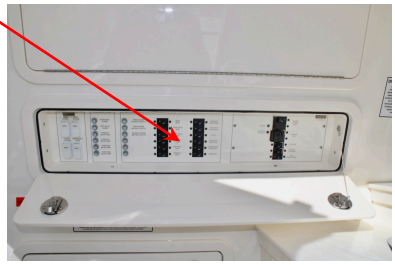
LOCATION: The windlass is mounted in the bow locker offset to the side of the bow pulpit with a turning fair lead and anchor roller. The rode locker is on the side below the windlass. The handheld remote with coil cord hangs inside the bow locker. The Empirbus windlass touch switch to raise and lower is on the "Systems" screen. The up/down directional contactor is mounted inside the bow locker by the windlass on the hull.

1 See the *Windlass* literature.

2 Ensure that the house battery switch is on.

3 Ensure that the 12 volt stbd. battery voltage is adequate (at least 12 volts).

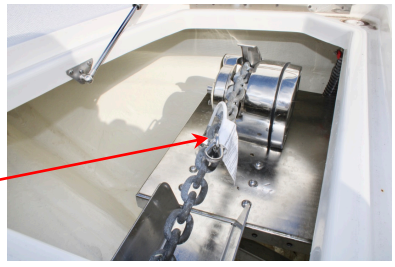
4 Ensure that the Windlass circuit breaker on the main D.C. panel in the head for the windlass load is on and the windlass control circuit is turned on in the Empirbus "System" screen.



5 Determine the depth of the water and ensure that you have sufficient rode to reach bottom with adequate scope. The yacht is commissioned with 20' 5/16" G4 chain spliced to 300' 5/8" 8 part nylon line.

6 Ensure that the yacht does not have way on.

7 Release the chain stopper cable/ snap hook so that the chain can run.

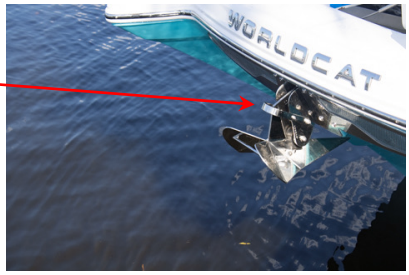


8 Check that the windlass is not in manual mode by ensuring that that the button on the face of the free fall cap is released and the plunger on the edge is extended.

9 When lowering the anchor press the DOWN switch on the remote or the Empirbus screen until the anchor is under free fall. If the clutch was left in a locked position the anchor will start to fall almost immediately. If unlocked it could take several seconds to fully re-engage the internal clutch. NOTE: Pressing the DOWN button for over 5 seconds will result in a longer clutch re-engagement time during the next UP command.

NOTICE Failure to lock the windlass clutch could result in rode creeping out!

10 Press the UP button continuously to raise the anchor until it is stowed snug against the bow roller.



NOTICE To avoid damaging the bow roller, retrieve the last meter (3') of rope/chain slowly and take care when docking the anchor!

NOTICE The windlass is not designed to pull the yacht to the anchor against the wind and tide! The yacht must be gently maneuvered up towards the anchor while the rode/chain slack is retrieved!

11 Once the anchor is stowed reattach the chain stopper cable/ snap hook to stop the chain from running out while underway.

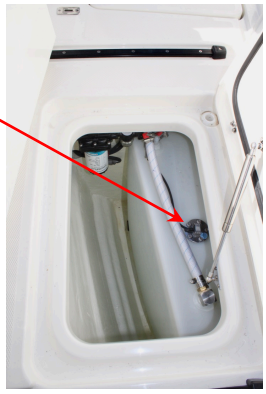
12 Turn off the "Windlass" circuit breaker on the main D.C. panel so that no one can accidentally operate the windlass.

⚠ CAUTION Always keep hands and limbs clear of the chain and windlass!

FRESH WATER SYSTEM OPERATIONS 3.9

TO MEASURE THE LEVEL IN THE WATER TANK

DESCRIPTION: The water tank is a 30 gallon linear polyurethane FDA accepted tank. The water tank level is monitored by a 12 volt sender tied into the Garmin/Empirbus system via the NMEA 2000 bus.

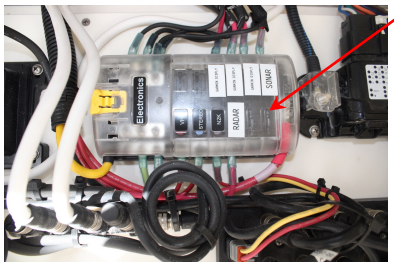


LOCATION: The tank sender is in the water tank top. The water tank level display reads on the Garmin/Empirbus touch screen monitor display.

1 Ensure that the “House” battery switch is on at the main D.C. panel to feed power to all of the manual circuit breakers on the D.C. panel.

2 Ensure that the 12 volt “House” battery voltage is adequate (at least 12 volts).

3 Ensure that the fuses in the fuse block under the console are intact.



4 Ensure that the Garmin/Empirbus system is up and running.

5 The water tank level in % full can be monitored on the Garmin/Empirbus "Systems" screen .

TO FILL THE WATER TANK

DESCRIPTION: The water tank is a 30 gallon linear polyurethane FDA accepted tank.

LOCATION: The tank is under the port forward deck hatch. The tank fill is on the forward port side deck. The vent is on port side of the hull forward.

NOTICE Check the quality and purity of the source water before putting it into the yacht's tank!

1 Check the Garmin/Empirbus "System" screen to determine the water tank level.

2 Locate the water fill cap on the port forward deck and open the cap.

3 Place hose in fill pipe and begin filling.

4 Monitor level while filling on the Garmin/Empirbus screen.

5 Replace cap when finished filling.

See also Garmin/Empirbus topics.

NOTICE To purify the water or sanitize the system use the following procedure:

- Turn off the hot water heater until finished.
- Remove any carbon canisters or micron rated filters. Remove any faucet aerator screens. Wire mesh pump protection strainers should stay in place. The plumbing will very likely slough off a layer of bacteria during later flushing steps.
- Clean and remove the vent screen and flush the vent hose.
- Use either following method to determine the amount of common household bleach needed to sanitize the tank.
- Multiply gallons of tank capacity by 0.13; the result is the ounces of bleach needed to sanitize the tank. This is 1/8 cup of plain bleach (no fragrance) per 10 gallons.

- Mix the proper amount of bleach (7.8 oz. or 3/4 cup) within a 1-gallon container of water. This will provide better mixing.
- Pour the solution (water/bleach) into the tank and fill the tank with potable water.
- If possible, allow some solution to escape though the vent. Prevent any spillage into local waters. This will sanitize the vent line.
- Open all faucets (hot and cold) allowing the water to run until all air is purged and the distinct odor of chlorine is detected. Leave the pressure pump on.
- The standard solution must have four hours of contact time to disinfect completely. Doubling the solution concentration reduces the contact time to one hour.
- When the contact time is completed, drain the tank. Refill with potable water and purge the plumbing of all sanitizing solution. Repeat until bleach is no longer detectable.
- If the smell of bleach persists after two refill and drain cycles, add a teaspoon of hydrogen peroxide per 20 gallons (3 tsp.) and mix. The peroxide will oxidize the hypochlorite to chloride (salt) and oxygen, neutralizing the bleach. Any excess peroxide will be harmless to drink and will have no taste. Peroxides are common ingredients in commercially available water freshening preparations. Don't use vinegar, which can ferment, undoing all of your hard work.

TO USE THE 12 VOLT WATER PRESSURE PUMP

DESCRIPTION: There is a 12 volt Shurflo Pro Blaster II water pressure pump with an inline suction strainer and built in demand pressure switch which draws from the tank and feeds the system. The fresh water system is assembled using the Whale Quick Connect vinyl tubing system.

LOCATION: The pump and suction strainer are mounted under the port side forward deck hatch.

1 Ensure that the 12 volt “House” battery voltage is adequate (at least 12 volts).

2 Ensure that the “House” battery switch is on at the main D.C. panel to feed power to all of the manual circuit breakers on the D.C. panel.

3 Ensure that Empirbus system is up and running.

4 Turn on the multifunction Garmin touch screen displays on the dash.

6 Ensure that the pump suction strainer is clean.

7 Ensure that the “Fresh Water” circuit breaker on the dash switch group or on the Garmin/Empirbus "System" screen is on.

8 The pump will turn on in response to the pressure demand switch mounted on it.

9 Monitor the freshwater tank level with the Garmin/Empirbus system.

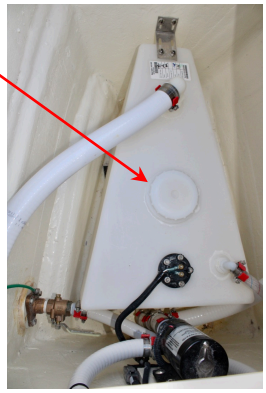
See the *Shurflo* pump literature and Garmin/Empirbus topics.

SEWAGE & DRAINS SYSTEM OPERATIONS 3.10

TO MEASURE THE LEVEL IN THE SEWAGE HOLDING TANK

DESCRIPTION: The toilet discharges only into the 13 gallon polyurethane sewage holding tank which can be emptied by the yacht's own 12 volt D.C. pump or by suction to a shore pump out facility from the deck. The holding tank level is measured by the Garmin/Empirbus system and is displayed only on the Garmin screens. There is a 12 volt sewage tank level sender mounted in the tank top.

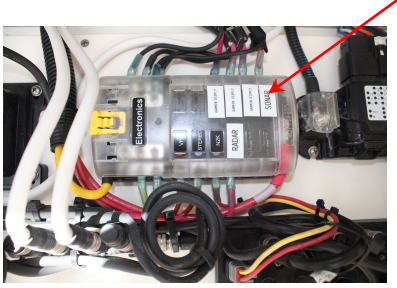
LOCATION: The sewage holding tank is under the stbd. forward deck hatch. The 12 volt sewage tank discharge pump is in the compartment aft of the tank. The deck suction point for the sewage holding tank is on the stbd. forward quarter deck. The sewage tank vent is to the stbd. hull side.



No chemicals should be put into the sewage tank other than an organic like *Raritan KO*.

1 Ensure that the “House” battery switch is on at the main D.C. panel to feed power to all of the manual circuit breakers on the D.C. panel.

2 Ensure that the fuses in the fuse block under the console are intact.



3 Ensure that the Empirbus system is up and running.

4 Ensure that the 12 volt “House” battery voltage is adequate (at least 12 volts).

5 Ensure that the “Toilet” circuit breaker on the main D.C. electric panel in the head is on.

6 The sewage tank level can be viewed on the Garmin/Empirbus "Systems" screen.

TO FLUSH THE TOILET

DESCRIPTION: The toilet is a Thetford Tecma Silence Plus 12 volt D.C. fresh water flushed unit. The toilet is supplied freshwater pressure from the yacht's freshwater pressure system.

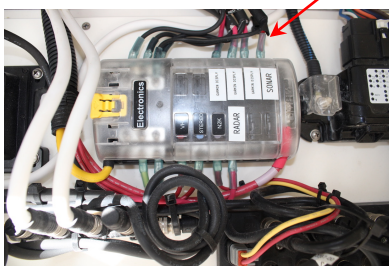
The toilet discharges only into the 13 gallon polyurethane sewage holding tank which can be emptied by the yacht's own 12 volt D.C. pump or by suction to a shore pump out facility from the deck. The holding tank level is measured by the Garmin/Empirbus system and is displayed on the Garmin screens.

LOCATION: The toilet flush switch panel is in the compartment by the toilet. The sewage holding tank is under the stbd. forward deck hatch. The 12 volt sewage tank discharge pump and seacock are in the same compartment aft of the tank. The deck suction point for the sewage holding tank is on the stbd. forward quarter deck. The sewage tank vent is to the stbd. hull side.

NOTICE **Do not clean the toilet with harsh chemicals like bleach! *Raritan C.P.* is a safe product that will not damage the toilet.**

1 Ensure that the “House” battery remote switch is on at the main D.C. panel to feed power to all of the manual circuit breakers on the D.C. panel.

2 Ensure that the fuses in the fuse block under the console are intact.



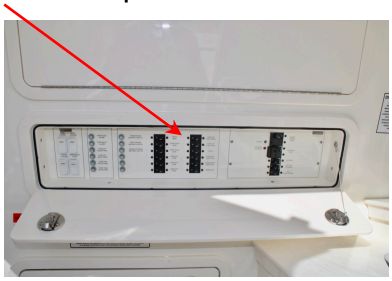
3 Ensure that the Empirbus system is up and running.

4 Ensure that the 12 volt “House” battery voltage is adequate (at least 12 volts).

5 Check the sewage holding tank level on the Garmin/Empirbus "Systems" screen.

6 Ensure that there is adequate water pressure from the water pressure pump.

7 Ensure that the “Toilet” circuit breaker on the main D.C. electric panel is on.



8 ADDING WATER TO TOILET BOWL:
On the toilet flush panel by the toilet press the up arrow button until the desired water level is achieved (Water flow will shut off automatically if switch is pressed too long to avoid overflow.) More water is usually added only when flushing solids.

9 FLUSHING TOILET: Press the down arrow button then release it. This activates a powerful macerator pump that siphons water and waste from the bowl, macerates, and propels the effluent through the discharge line to the holding tank.

NOTICE **Do Not Flush Foreign Objects! Flush only water, bodily wastes and rapid-dissolving toilet tissue. Do not flush wet wipes, sanitary napkins, condoms, diapers, paper cups, cotton swabs, food, hair or liquids such as oils or solvents as clogging or damage to the toilet or toilet system may occur.**

10 On the Tecma toilet flush switch panel, a steady green “Power On” light indicates when electrical power to the toilet is activated. A momentary flashing green light indicates when flush mode is changing.

NOTICE **Fresh water pressure must be on for the toilet to flush properly!**

See also the *Thetford Tecma* toilet literature.

TO PUMP THE SEWAGE TANK FROM A SHORE PUMP OUT FACILITY

DESCRIPTION: The toilet discharges only into the 13 gallon polyurethane sewage holding tank which can be emptied by the yacht's own 12 volt D.C. pump or by suction to a shore pump out facility from the deck. There is a suction T on the tank to enable. suction from the deck or the macerator pump.

LOCATION: The sewage holding tank is under the stbd. forward deck hatch. The deck suction point for the sewage holding tank is on the stbd. forward quarter deck. The sewage tank vent is to the stbd. hull side.

1 Check the level of the sewage holding tank on the Garmin system. (See *Garmin Empirbus* topics).

2 Secure the yacht stbd. side to (unless the hose will reach otherwise) at a pier with a sanitary pump out station.

3 Open the suction hose deck cap on the stbd. forward side deck.

4 Place the hose from the shore pump out facility into the deck connection and begin pumping.

5 Monitor the level on the Garmin/Empirbus "Systems" screen and stop when empty.

6 The tank can be flushed out with fresh water.

NOTICE **No chemicals other than *Raritan KO* should be put into the tank!**

7 Replace the deck cap when finished.

TO PUMP THE SEWAGE TANK WITH THE VESSEL'S OWN PUMP

DESCRIPTION: The toilet discharges only into the 13 gallon polyurethane sewage holding tank which can be emptied by the yacht's own12 volt D.C. macerator pump or by suction to a shore pump out facility from the deck. The macerator pump is operated by a touch button on the Empirbus "System" screen . The holding tank level is measured by the Garmin/Empirbus system and is displayed on the multifunction monitors. The sewage tank level sender is mounted in the tank top. The on board sewage tank discharge pump has a switch on the Garmin/Empirbus screen.

LOCATION: The sewage holding tank is under the stbd. forward deck hatch. The 12 volt sewage tank discharge pump is in the same compartment aft of the tank. The deck suction point for the sewage holding tank is on the stbd. forward quarter deck. The sewage tank vent is to the stbd. hull side. The discharge seacock for the sewage tank discharge macerator pump is in the bilge aft of the tank on the inboard side.

NOTICE **Obey all local laws regarding the discharge of sewage!**

1 Ensure that the sewage tank discharge seacock is open.

2 Ensure that the “House” battery switch is on at the main D.C. panel to feed power to all of the manual circuit breakers on the D.C. panel.

3 Ensure that the fuses under the console bench are intact.

4 Ensure that the Empirbus system is up and running.

5 Ensure that the 12 volt “House” battery voltage is adequate (at least 12 volts).

6 Check the sewage holding tank level on the Garmin/Empirbus "Systems" screen.

7 Turn on the “Overboard” pump switch on the Empirbus "Systems" screen by tapping it once to run it for 5 minutes or touching it for 2 seconds for it to run continuously. Touch it again to turn it off.

8 Check the sewage holding tank level as indicated on the "Systems" screen to see when the tank is empty. (See Garmin Empirbus topics.)

9 Close the sewage tank discharge seacock when finished.

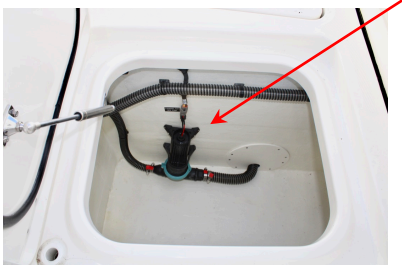
Use an organic based product like *Raritan K.O.* to control odors in the holding tank.

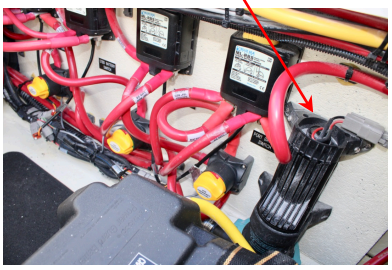
TO DRAIN THE FISH BOXES

DESCRIPTION: The standard boat has 4 in deck fish boxes. If the SeaKeeper option is installed the aft fish boxes are replaced by the SeaKeepers. The fish boxes are each fitted with 12 volt "Gulper" type macerator pumps to drain them to overboard.

Each fish box has a drain hose that is connected to the suction of its macerator pump. The pump in turn sucks from the fish box and discharges into a manifold and then to overboard.

LOCATION: The fish boxes are port and stbd. in the forward and aft deck on the standard boat. Vessels fitted with the SeaKeeper option the SeaKeeper(s) will occupy the space where the aft fish box(es) would be. The macerator pumps are mounted in the compartments aft of the forward fish boxes and in the aft equipment room bilge areas aft of the aft fish boxes for the aft fish boxes.





1 Ensure that the “House” battery switch is on at the main D.C. panel to feed power to all of the manual circuit breakers on the D.C. panel.

2 Ensure that the Empirbus system is up and running.

3 Ensure that the 12 volt “House” battery voltage is adequate (at least 12 volts).

4 Turn on the “FISHBOX PUMPOUT” pump switch on the Empirbus "Systems" screen by tapping it for 1 second to run it for continuously. Touch it again to turn it off.

5 When the fish box is drained rinse fresh water through it while pumping if possible and then turn off the pump.

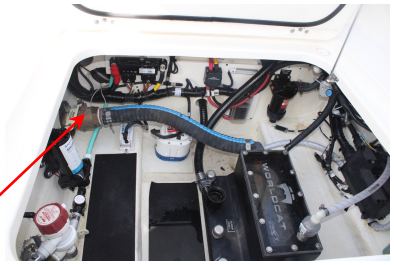
NOTICE **Do not allow the fish box drain pumps to run continuously dry.**

VENTILLATION & AIR CONDITIONING SYSTEM OPERATIONS 3.11

TO USE THE AIR CONDITIONING

DESCRIPTION: There is an optional 120 volt 8,000 BTU self contained raw water cooled air conditioning system to service the head compartment and main deck console area. The unit can be run from shore power or the upgraded inverter with the upgraded Lithium Ion house batteries. The air conditioning unit is fed raw water from the sea chest by a 120 volt raw water pump. The condensate is collected in the pan under the unit which then drains into the bilge. The unit has a lint screen on it and its own thermostatic digital controller.

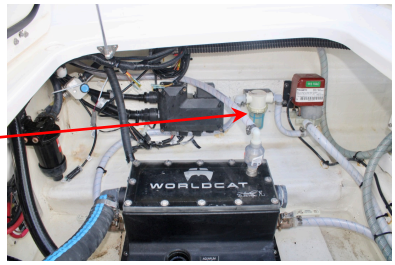
LOCATION: The compressor/air handler unit is under the sink counter cabinet on the port side in the head. The unit's raw water pump suction sea valve and strainer are in the port aft mechanical room bilge. The thermostatic digital controller is in the head on the aft wall.



1 See the air conditioning literature first.

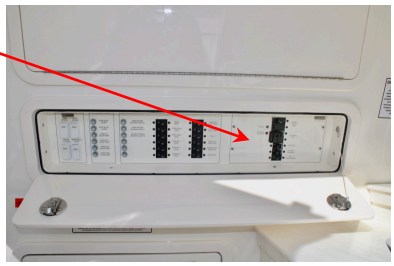
2 The yacht must be in the water.

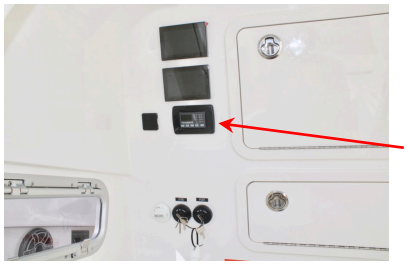
3 Open the sea chest seacock on the inboard side of the port hull aft by the sea chest.



4 Ensure that the air conditioning raw water pump supply seacock on the sea chest is open and the sea strainer is clean.

5 Ensure that A.C. power (from the shore power connection or the inverter, see the Electrical topics) is connected to the main A.C. panel in the head and that the Air Conditioner, and Cooling Pump circuit breakers on that panel are on.





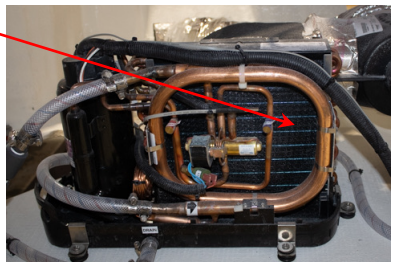
6 Turn on the air conditioning unit at the digital controller. The console air can be turned on from the Empirbus screen.

NOTICE **Do not leave the air conditioning running for long periods with the vessel unattended.**

TO CLEAN THE AIR CONDITIONING AIR FILTER

DESCRIPTION: Flat polymer lint screen filter.

LOCATION: The air handler lint screen is behind the coil on the air handler.



1 Open the access to the air conditioning unit.

2 Lift up and out the lint screen behind the coil on the air handler.

3 Wash the filter and blow dry with air.

4 Reinsert the filter and close up the access.

TO SERVICE THE AIR CONDITIONING CONDENSATE DRAIN

DESCRIPTION: A drain pan is mounted under the air conditioner unit. The condensate is collected in the pan and drained into the bilge.

LOCATION: The compressor/air handler unit is under the sink cabinet on the port side in the head.

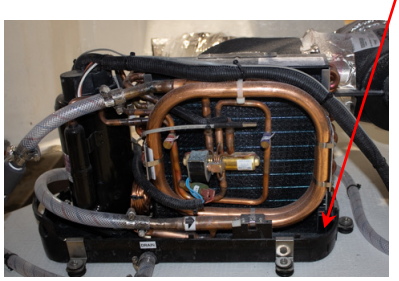
⚠ CAUTION **!CAUTION! The air conditioning circuit breakers should be off first!**

1 Open the access to the air conditioning unit.

2 Clean any lint from the pan and ensure the condensate drain line is open.

3 Pour Hydrogen Peroxide into the open edge of the drain pan.

4 Vacuum dry and clean with a wet dry vacuum after draining.



5 Restart the system and ensure that the pan drains.

6 Repeat until the pan drains freely with the unit running.

NOTICE **Use only Hydrogen Peroxide to clean the condensate pan! Never use bleach it is corrosive!**

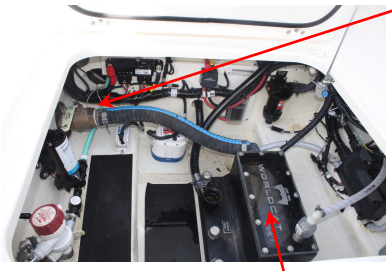
RAW WATER SYSTEM OPERATIONS 3.12

TO USE THE RAW WATER INTAKE SEA CHEST

DESCRIPTION: There is a raw water intake sea chest below the waterline to combine the intake water needed for auxiliary devices that use raw water. A single through hull suction fitting with an external strainer supplies the water coming into a welded box with a removable Lexan see through top. A seacock comes off of the box to feed the raw water wash down pressure pump and optional air conditioning. The baitwell pump suction(s) are submerged into the box and discharge to the baitwell(s). There are spare fittings on the sea chest to supply additional devices if needed. There is an air vent with ball valve on top of the sea chest.

LOCATION: The sea chest is in the port aft bilge ("mechanical room"). The seacock that supplies it raw water is in the port aft hull inboard side (tunnel) in the same compartment. The suction inlet through hull has an external strainer mounted over it inside of the port hull tunnel.

1 Open the seacock on the inboard side of the port hull aft by the sea chest.



2 Open the seacocks coming off of the sea chest for the items that you wish to supply raw water to.

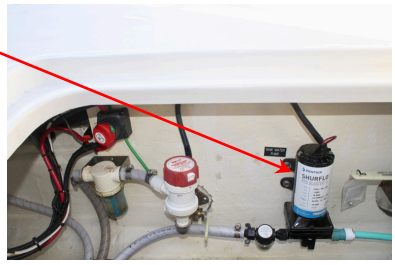
3 Inspect the interior of the sea chest periodically to ensure that it is clean of any debris that could plug pump suctions and is free of marine fouling.

4 Remove the Lexan top to clean any debris from inside the sea chest as necessary.

TO USE THE RAW WATER DECK WASH PUMP

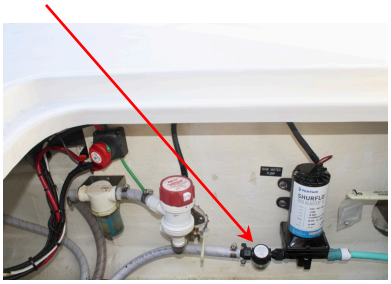
DESCRIPTION: There is a 12 volt deck wash pump with a demand pressure switch to supply raw water pressure for the quick disconnect raw water wash down connections on deck.

LOCATION: The raw water washdown pump is inboard under the port aft deck in the “Mechanical room”. The pump's raw water suction seacock is on the raw water sea chest in the compartment with it. The raw water washdown connections are on the aft deck and in the port bow hatch.



1 Ensure that the raw water sea chest supply seacock in the port aft bilge on the inboard hull side is open to supply the sea chest.

2 Ensure that the raw water deck wash pump suction seacock on the sea chest is open and that its suction strainer is clean.



3 Ensure that the “House” battery switch is on at the main D.C. panel to feed power to all of the manual circuit breakers on the D.C. panel.

4 Ensure that Empirbus system is up and running.

5 Turn on the multifunction Garmin touch screen displays on the dash.

6 Fit the quick disconnect adapter to the hose and plug it into the wash down socket to use the water.

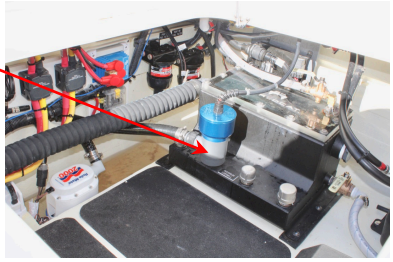
7 Turn on the “Raw Water” pump circuit breaker on the Garmin/Empirbus "System" touch screen (by touching it once for it to run for 5 minutes or by pressing it for 2 seconds for it to run continuously) or use the button panel on the dash.

8 When you are finished using the wash down pump turn off the pump circuit breaker so that the pump cannot be inadvertently turned on with the seacock shut and close the seacock.

TO USE THE LIVE BAIT WELLS

DESCRIPTION: There are 12 volt pumps on the raw water sea chest to serve as live bait well circulating pumps to supply circulating water to up to 4 live bait wells. They draw suction from the sea chest and discharge to the baitwells. The bait wells fill with water and the overflow valves and standpipes allow the water to drain out overboard by gravity causing circulation. The bait wells have lights in them and drains in the bottom to drain them when finished with use.

LOCATION: The pumps are mounted on the sea chest in the port aft bilge (mechanical room). The pumps' and the wells' light buttons are on the "LIVEWELLS" section of the Garmin/Empirbus "Systems" screen.



1 Ensure that the raw water sea chest supply seacock in the port aft bilge on the inboard hull side is open to supply the sea chest.

2 Ensure that the “House” battery switch is on at the main D.C. panel to feed power to all of the manual circuit breakers on the D.C. panel.

3 Ensure that Empirbus system is up and running.

4 Turn on the multifunction Garmin touch screen displays on the dash.

5 Turn on the “Livewell” pumps circuit breakers on the Garmin/Empirbus "System" touch screen.

6 Fit the stand pipe in the drain in the bottom of the baitwell.

7 Regulate the valve in the side of the baitwells to adjust the water flow.

DECK APPLIANCES & OTHER OPERATIONS
3.13

TO USE THE ELECTRIC HELM SEAT

DESCRIPTION: There is a 12 volt electrically operated helm seat for the main control console area.

LOCATION: The helm seat is aft of the console area. The rocker switch for controlling the helm seat is to stbd. of the helm on the main control console.

⚠CAUTION **Ensure that everyone is clear of the sides and bottom of the helm seat before operating it!**

NOTICE **Do not allow clothing or towels etc. to get into the pinch areas of the helm seat mechanism that move!**

1 Ensure that the 12 volt “House” battery voltage is adequate (at least 12 volts).

2 Ensure that the “House” battery switch is on at the main D.C. panel to feed power to all of the manual circuit breakers on the D.C. panel.

3 Ensure that the Empirbus system is up and running and the Helm Bench circuit breaker is on.

4 Operate the helm seat with the rocker switch to stbd. of the helm on the main control console.

TO USE THE WINDSHIELD VENT

DESCRIPTION: There is a 12 volt electrically operated console windshield vent window for the main control console area.

LOCATION: The windshield vent window is at the top of the fixed console window and opens out.

NOTICE **Do not allow any foreign object to get into the pinch areas of the windshield vent window that move!**

1 Ensure that the 12 volt “House” battery voltage is adequate (at least 12 volts).

2 Ensure that the “House” battery switch is on at the main D.C. panel to feed power to all of the manual circuit breakers on the D.C. panel.

3 Ensure that the Empirbus system is up and running and the Windshield Vent circuit breaker is on in the System screen.

4 Operate the Windshield Vent from the Empirbus screen.

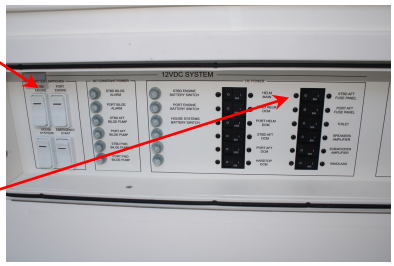
APPLIANCES & ENTERTAINMENT OPERATIONS 3.14

TO USE THE AFT DECK CHILLER BOX

DESCRIPTION: There is a 12 volt air cooled chiller unit for the chiller box in the transom. The chiller power supply comes from the house battery bank via a fuse in the compartment below it. The chiller box has a drain in the bottom.

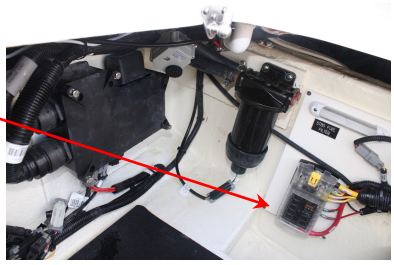
LOCATION: The chiller box is built into the transom top. The chiller compressor is located under the chiller box.

1 Ensure that the 12 volt “House” battery voltage is adequate (at least 12 volts).



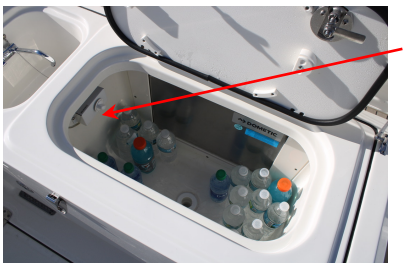
2 Ensure that the “House” battery switch is on at the main D.C. panel to feed power to all of the manual circuit breakers on the D.C. panel.

3 Ensure that the Aft Fuse Panel manual circuit breakers are on at the main D.C. panel. These circuit breakers feed the fuse blocks in the hull aft (mechanical rooms) containing the fuses for the chiller compressors.



4 Ensure that the “Chiller” fuse in the fuse block is intact.

5 Close the drain in the bottom of the chiller box.



6 Rotate the knob on the side of the inside of the chiller box clockwise to turn on the unit. If the red LED on the control flashes or glows, a fault has occurred and the unit cannot be operated. See the *Dometic* manual for the chiller unit for details.

TO USE THE STEREO

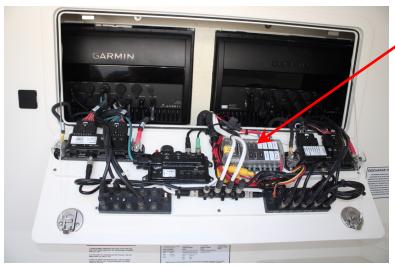
DESCRIPTION: There is a JL Audio MM 100S-BE Sirius XM capable water resistant stereo running off of 12 volts with a JL Audio amplifiers for the speakers. A Fusion-Link control app can be used.

The stereo is tied into the Empirbus system. There are JL Audio marine speakers on deck with lights in them. There is also a USB port for connecting smart phones and other digital music source devices.

LOCATION: The JL Audio main control unit is located in the overhead instrument console.

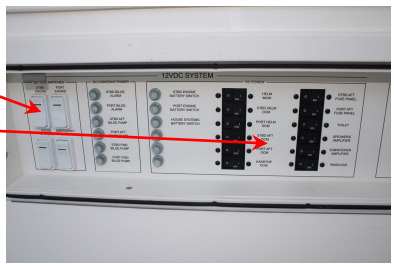
The speakers are mounted strategically on the exterior.

An automotive type blade fuse for the stereo is located in the compartment below the dash.



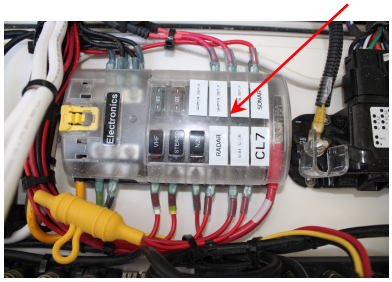
1 Ensure that the 12 volt “House” battery voltage is adequate (at least 12 volts).

2 Ensure that the “House” battery switch in the main D.C. panel is on.



3 Ensure that the Speakers Amplifier and Subwoofer Amplifier circuit breakers on the main D.C. panel are on.

4 Ensure that the Stereo fuse in the fuse block under the dash console accessed from the head is intact.



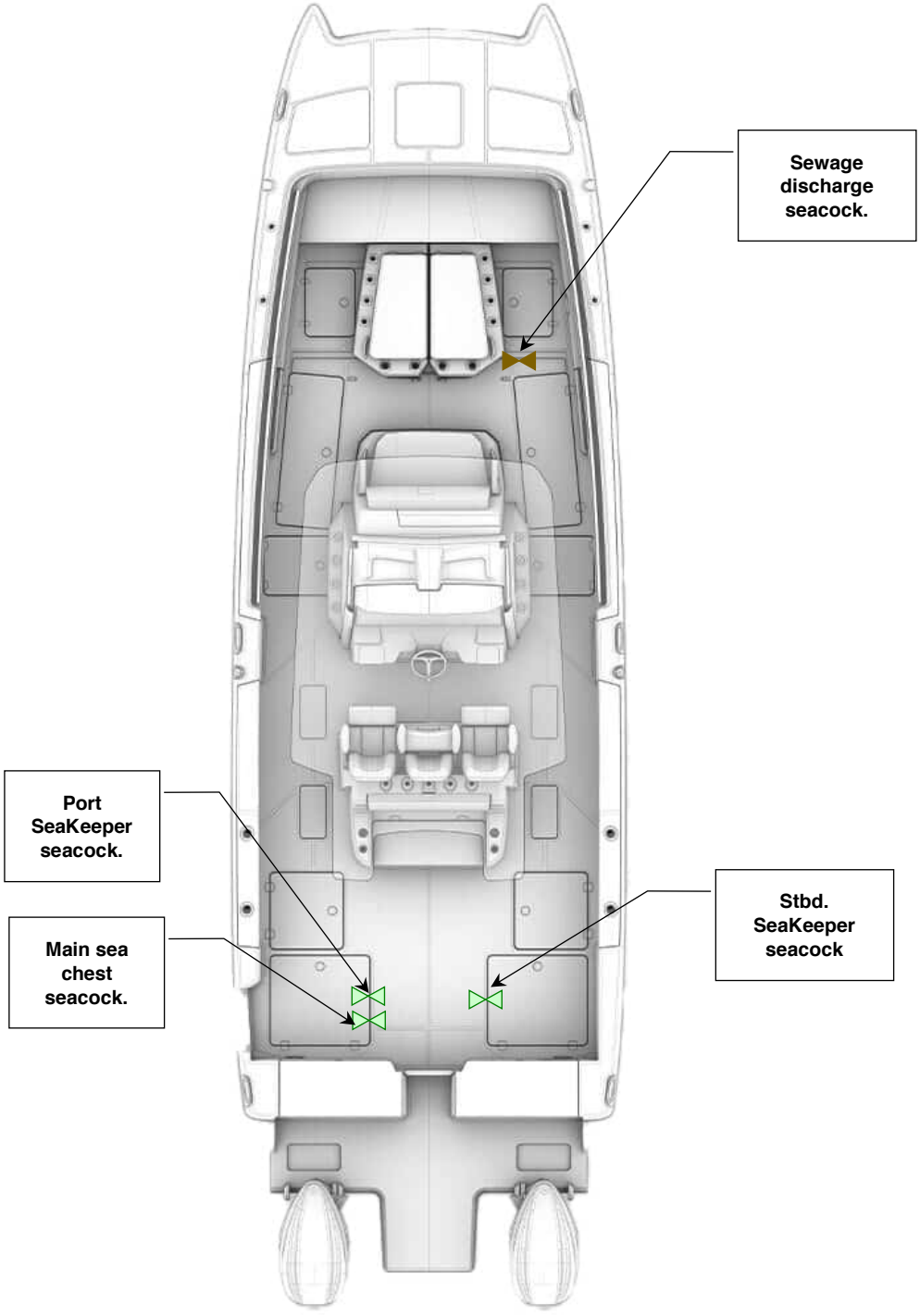
5 Ensure that the Empirbus is up and running.

6 Turn on the stereo on the main control unit.

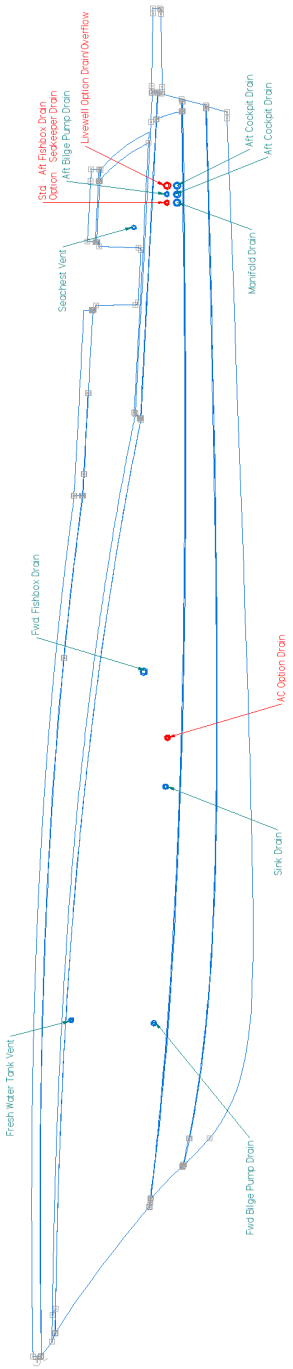
See the *Fusion* product literature.

FIGURES & DRAWINGS
4.0

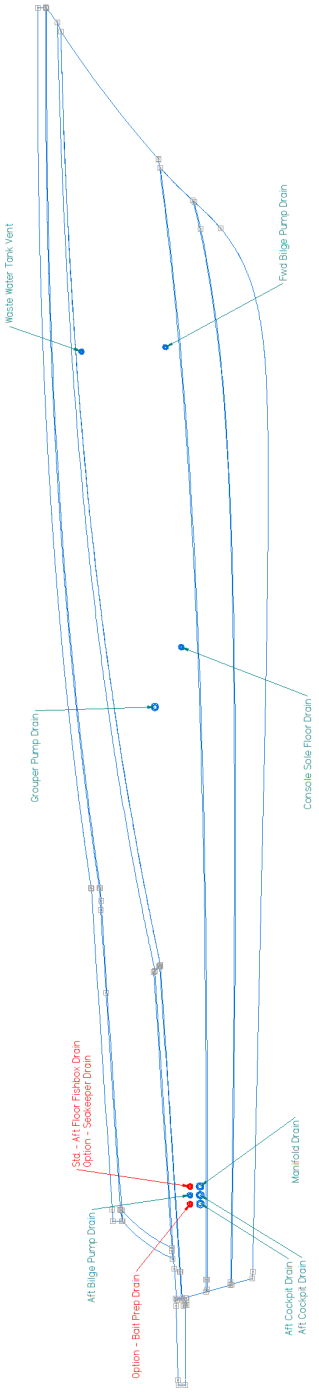
SEACOCKS


Sewage discharge seacock.
Port SeaKeeper seacock.
Main sea chest seacock.
Stbd. SeaKeeper seacock

PORT DISCHARGES

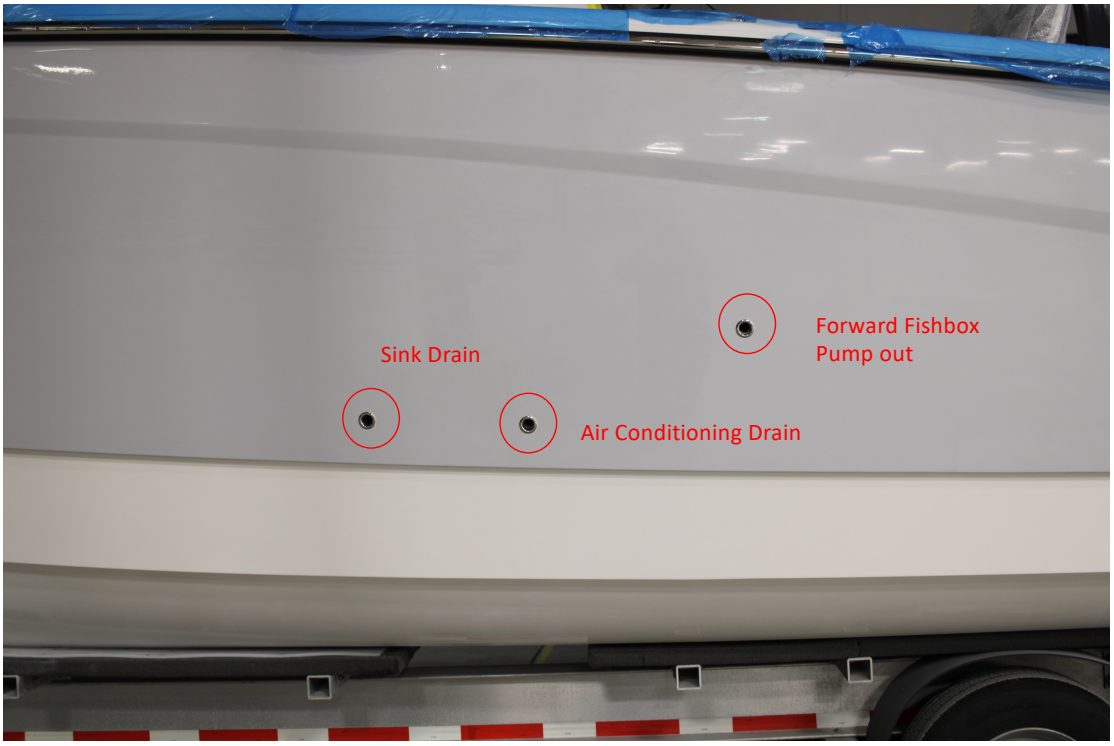


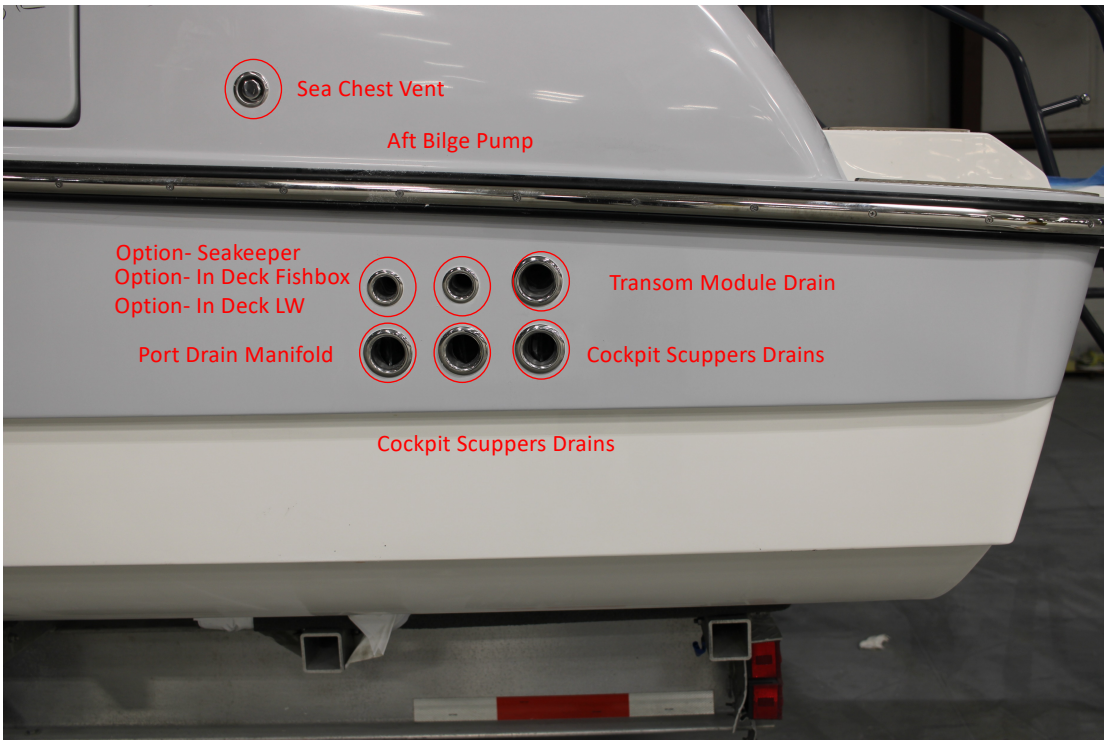
STBD DISCHARGES



DISCHARGE PHOTOS

DISCHARGE PHOTOS

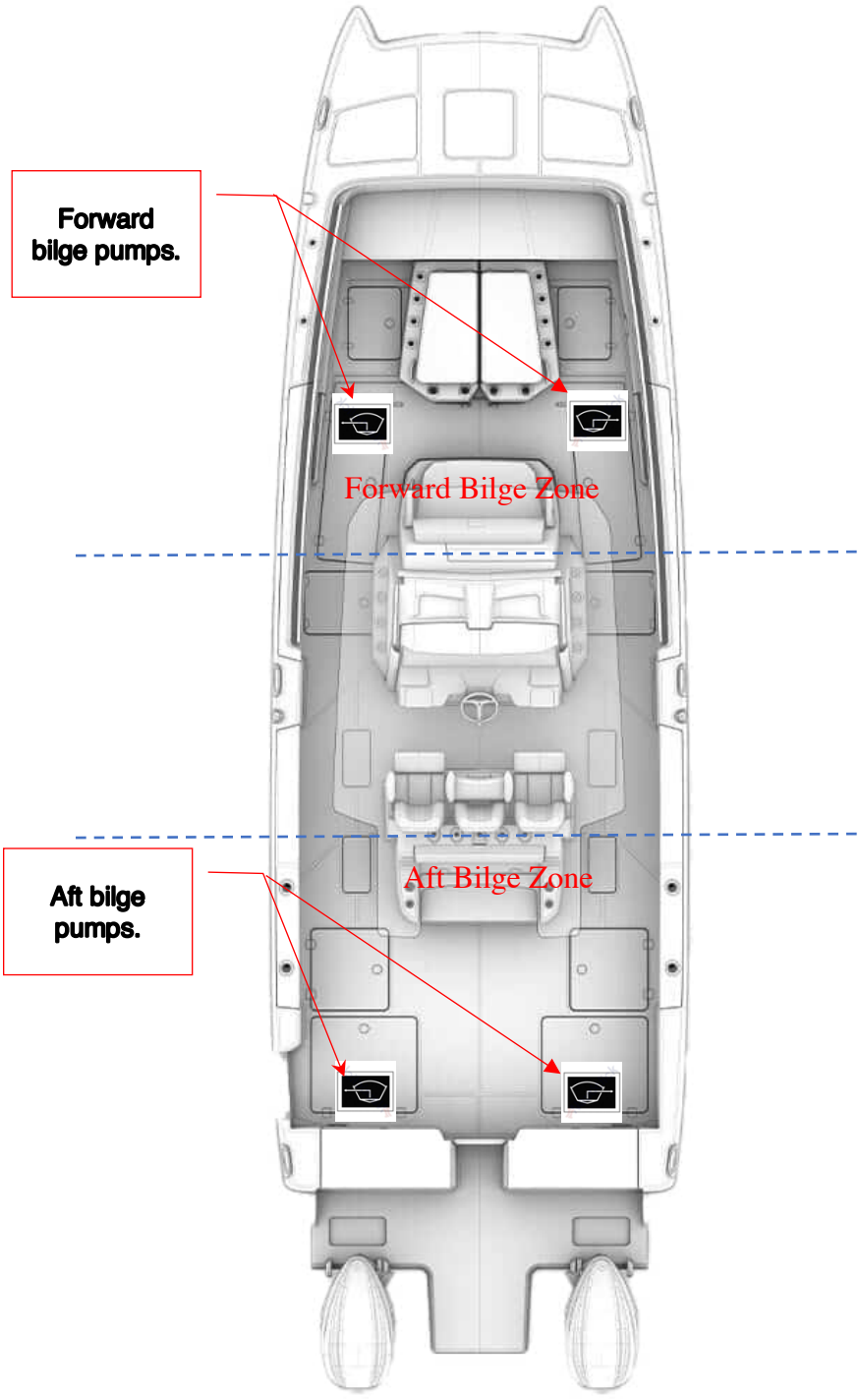




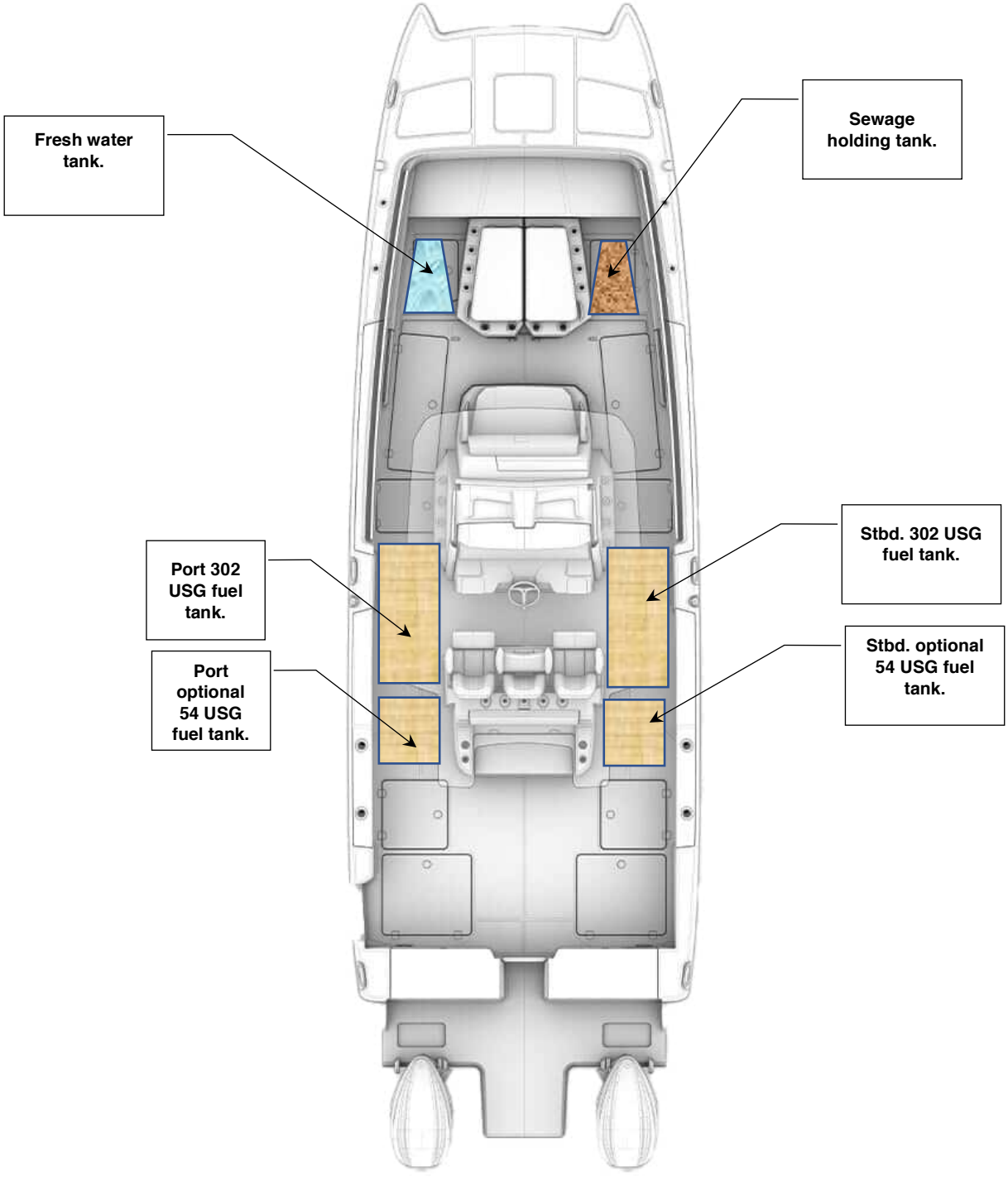
DISCHARGE PHOTOS

DISCHARGE PHOTOS

BILGE PUMPS


Forward bilge pumps.
Forward Bilge Zone
Aft bilge pumps.
Aft Bilge Zone

TANKAGE


Fresh water tank.
Sewage holding tank.
Port 302 USG fuel tank.
Stbd. 302 USG fuel tank.
Port optional 54 USG fuel tank.
Stbd. optional 54 USG fuel tank.

400CC Fuse Layout

WORLDCAT
A BETTER WAY TO BOAT™

400CC Console fuses

VHF Radio- 10 Amp Fuse
Stereo- 15 Amp Fuse
NMEA- 3 Amp Fuse
Radar-
- Garmin 24 Dome- 7.5 Amp
- Fantom 54 or 124- 30 Amp Fuse

Seat- 5 amp (temporary) moving to Empirbus
Engine Screen- 10 Amp Fuse

Blank-
Blank-
Display 1- 15 Amp Fuse
Display 2- 15 Amp Fuse
Display 3- 15 Amp Fuse
Sonar-
- Garmin 25 Sonar Module- 4 Amp
- Garmin 26 Sonar Module- 10 Amp

WORLDCAT
A BETTER WAY TO BOAT™

400CC STBD Transom

Chiller- 15 Amp Fuse
Reverso- 5 Amp Fuse

400CC Port Transom

WORLDCAT
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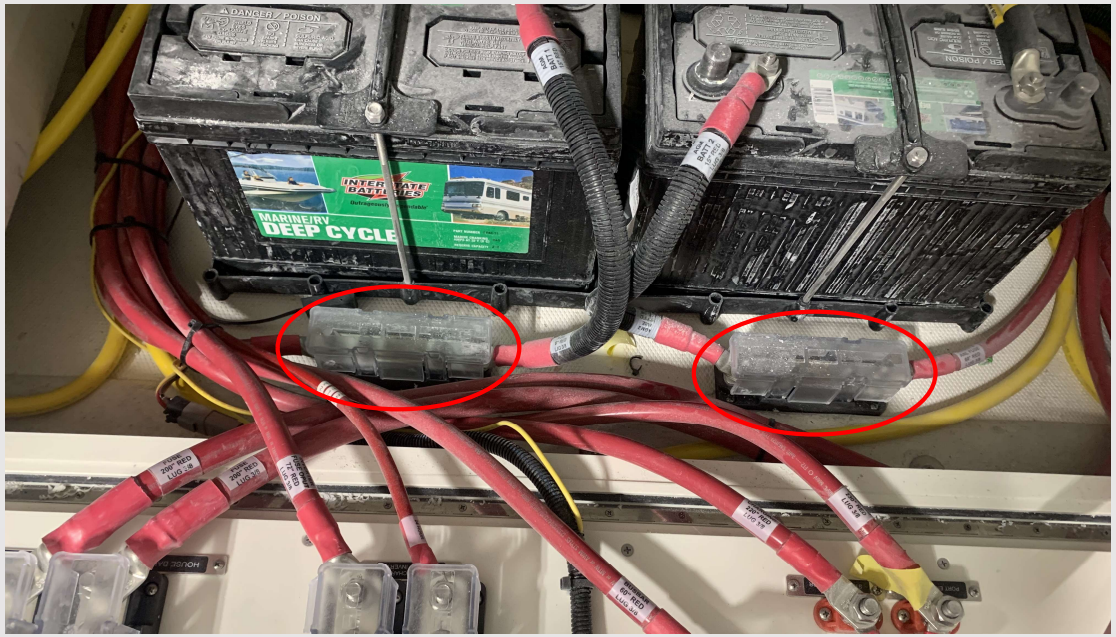
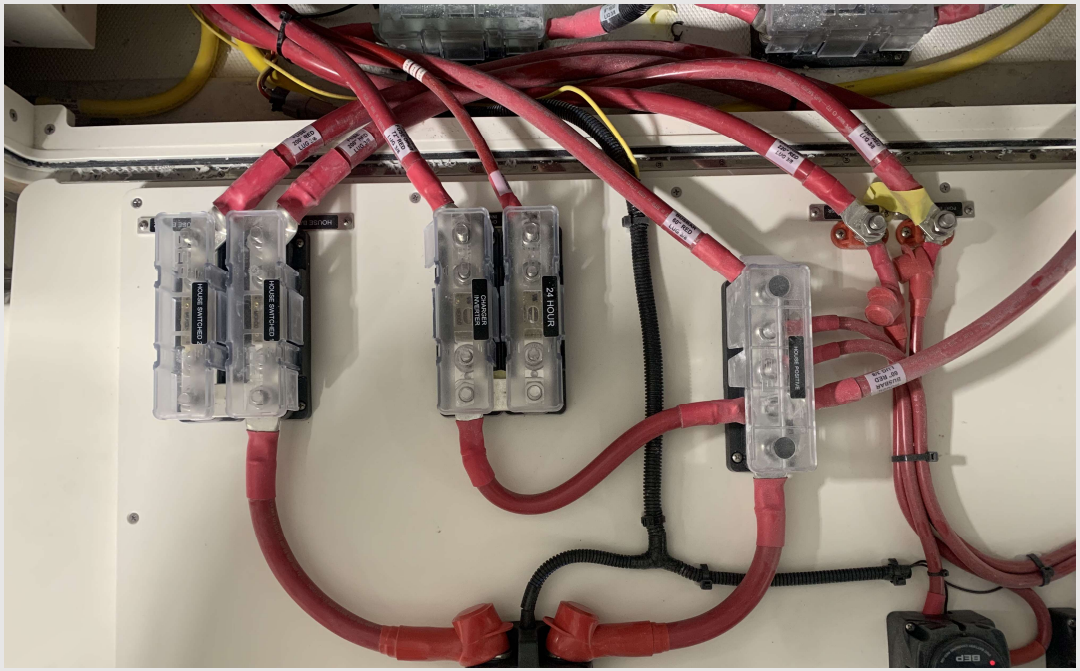
AGM House Batteries



AGM House battery Main fuse-
House Battery 1- 200 amp
House Battery 2- 200 amp

WORLDCAT
A BETTER WAY TO BOAT™

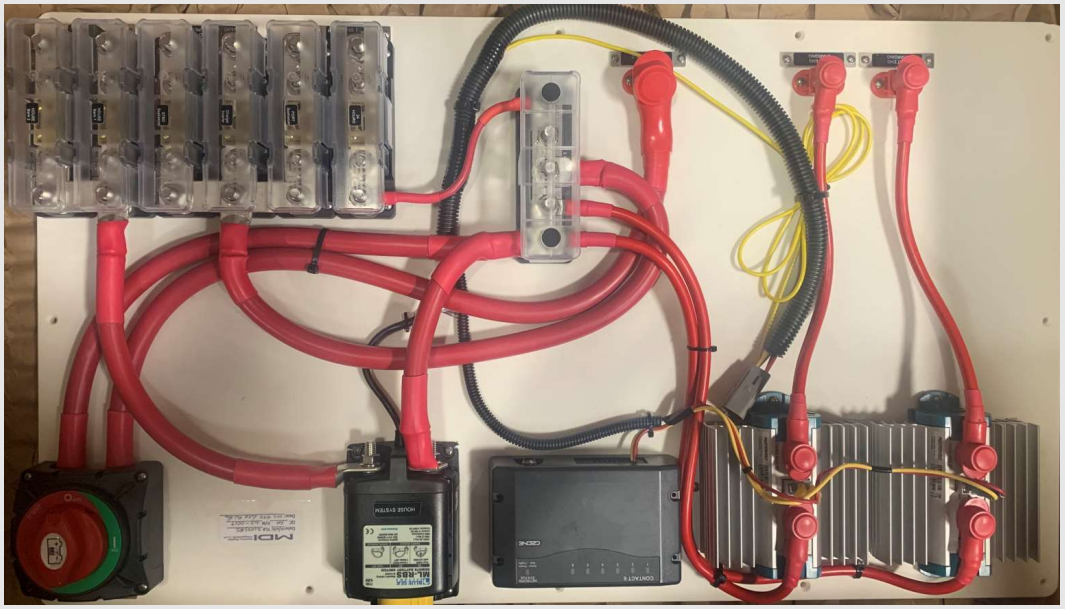
AGM House Batteries



AGM House battery
House Switch- 300 amp
House Switch- 300 amp
Charger Inverter- 200 amp
24 Hour Power- 50 amp

WORLDCAT
A BETTER WAY TO BOAT™

Lithium House Batteries



Lithium House battery
House Switch- 300 amp
House Switch- 300 amp
Charger Inverter- 200 amp
24 Hour Power- 50 amp
Port Seakeeper- 100 amp
STBD Seakeeper- 100 amp

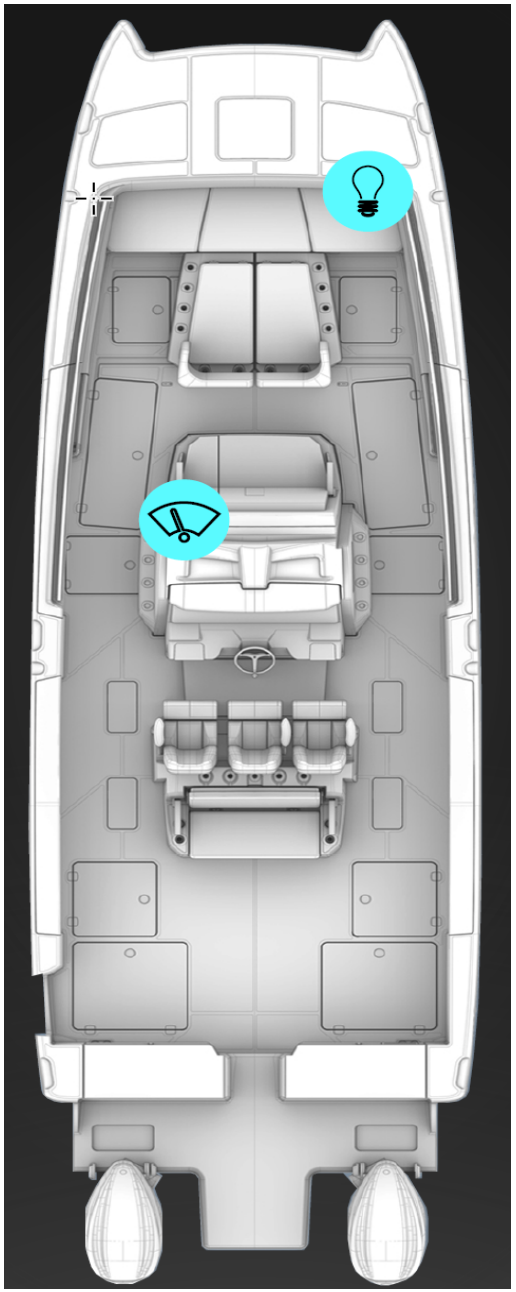
WORLDCAT
A BETTER WAY TO BOAT™

Lithium House Batteries

Lithium House battery- Mounted on top of each battery
House Battery- 300 amp
House Battery- 300 amp

WORLDCAT
A BETTER WAY TO BOAT™

400 CC-X EMPIRBUS COMPONENT LAYOUT



HARDTOP - DCM 03

CONNECT 50 - 11

PORT AFT BILGE - DCM 04

DCM - 03

DCM 1 ***HELM*** ***DCM 2***

CONNECT 50 - 11

WDU

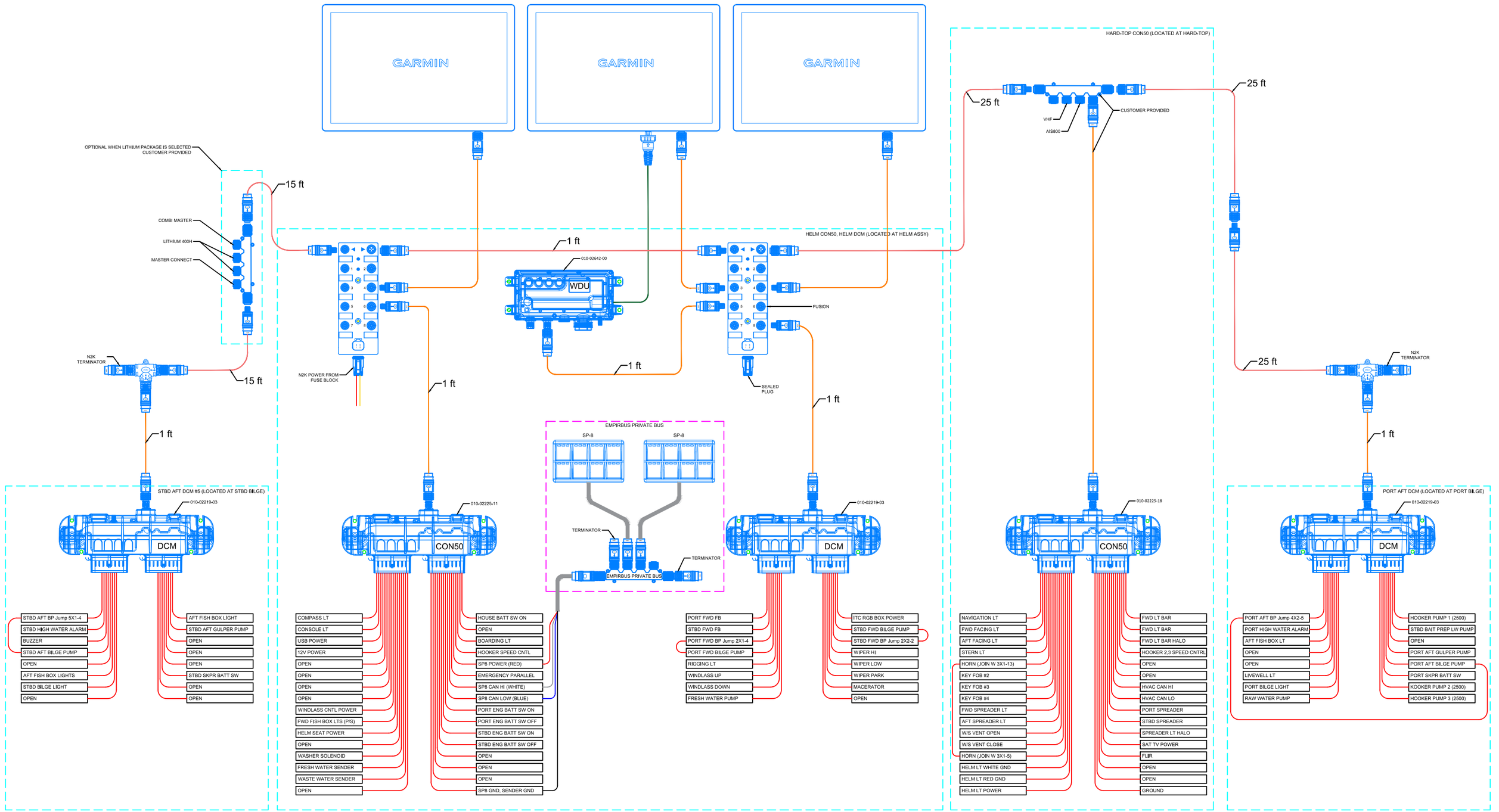
DCM - 03

STARBOARD AFT BILGE - DCM 05

DCM - 03

WORLDCAT 400cc - EMPIRBUS SYSTEM LAYOUT

DOMETIC
Mobile living made easy



Yuri Andrade 11.19.2021
Validated by Tyson Goddard 11.18.2021

WORLDCAT 40CC - DIGITAL CHANNEL REFERENCE CHART

HELM DCM 1

Channel	Description / Function
1	compass light
2	console interior oh lights
3	usb power
4	12v power
5	wdu power
6	livewell light (hull1 only)
7	port fwd fuel tank
8	stbd fwd fuel tank
9	windlass control power supply
10	fwd fb light circuit (port and stbd)
11	helm seat power
12	blank
13	washer solenoid
14	fresh water sending unit
15	waste water sending unit
16	blank
17	house batt sw OFF (brn wire)
18	blank
19	boarding lights
20	hooker speed control (port aquirium)
21	sp8 power - red
22	engine emergency parallel
23	sp8 can hi - white wire
24	sp8 can lo - blue wire
25	port engine batt sw ON (brn wire)
26	port engine batt sw OFF (orange wire)
27	stbd engine batt sw ON (brn wire)
28	stbd engine batt sw OFFf (orange wire)
29	helm accent light
30	blank
31	blank
32	sp8 ground-blk wire, all fwd sender gmds

HELM DCM 2

Channel	Description / Function
1	port fwd fb#1
2	stbd fwd fb#2
3	port fwd float input (jumper to x1-4)
4	port fwd bilge pump
5	rigging lights port and stbd, anchor locke
6	windlass up
7	windlass dn
8	freshwater pump
9	itc rgb box power
10	stbd fwd bilge pump
11	stbd fwd float input (jumper to x2-2)
12	wiper hi
13	wiper lo
14	wiper park
15	macerator
16	blank

HARDTOP DCM 3

Channel	Description / Function
1	nav lights red / green
2	fwd facing light
3	aft facing light
4	stern light
5	horn #2 join with x1-13
6	key fob #2
7	key fob #3
8	key fob #4
9	fwd spreader
10	aft spreader
11	w/s vent open (black wire)
12	w/s vent close (white wire)
13	trumpet horn
14	white helm lts ground
15	red helm lts ground
16	helm light power
17	fwd light bar
18	fwd light bar
19	fwd light bar halo
20	in deck lw speed control
21	blank
22	blank
23	hvac can hi
24	hvac can lo
25	port side spreader
26	stbd side spreader
27	spreader light - halos 5x
28	sat tv power
29	flir option
30	blank
31	blank
32	common ground

PORT AFT DCM 4

Channel	Description / Function
1	port aft float (jumper to x2:5)
2	high water alarm port
3	aft fb or deck livewell light
4	blank
5	port fuel sender
6	port aquarium livewell light
7	bilge light port side
8	raw water pump
9	hooker #1
10	stbd bait prep lw pump
11	port transom FB pumpout
12	gulper pump port aft
13	port aft bilge pump
14	seakeeper bat switches on/off
15	hooker port in deck lw pump
16	hooker stbd in deck lw pump

PORT AFT DCM 5

Channel	Description / Function
1	stbd aft float (jumper x1:4)
2	high water alarm stbd
3	piezo 12v alarm for exit
4	stbd aft bilge pump
5	stbd fuel sender
6	stbd aft fb light
7	bilge light stbd side
8	Stbd Transom FB pumpout
9	stbd bait prep livewell pump light
10	gulper pump stbd aft fishbox
11	blank
12	blank
13	feedback emergency parallel feedback
14	seakeeper bat switches on/off
15	blank
16	blank

MANUAL CIRCUIT/CHANNEL OPERATION AT GARMIN CONTROL BOXES

- WHEN A COMPONENT WILL NOT OPERATE FROM THE GARMIN SCREEN OR SWITCH PANELS

TO MANUALLY TURN OFF A COMPONENT

1 Press the right arrow button. "SEL" will be shown on the display
2 Use the right arrow button to step to the desired channel - SEE REFERENCE CHART ABOVE
3 Press and hold MAN ON/MAN OFF for three seconds.
4 Press the left arrow until the message "SEL" appears in the display
5 The channel switched off will now have a flashing red led indication

TO MANUALLY TURN ON A COMPONENT

1 Press the right arrow button. "SEL" will be shown on the display
2 Use the right arrow button to step to the desired channel - SEE REFERENCE CHART ABOVE
3 Press and hold MAN ON/MAN OFF for three seconds.
note, if LED continues to flash red, repeat press and hold for 3 seconds
4 Press the left arrow until the message "SEL" appears in the display
5 The channel manually switched ON will now have a flashing green led.

If a channel has been changed via the MANUAL operation, it will not reset to auto operation unless the following steps are performed

TO RESET A CHANNEL TO AUTOMATIC OPERATION

1 Press the right arrow button. "SEL" will be shown on the display
2 Use the right arrow button to step to the desired channel - FLASHING RED OR GREEN
3 Press and hold RESET/AUTO for two seconds.
4 Press the left arrow until the message "SEL" appears in the display
note, LED indication should no longer be flashing

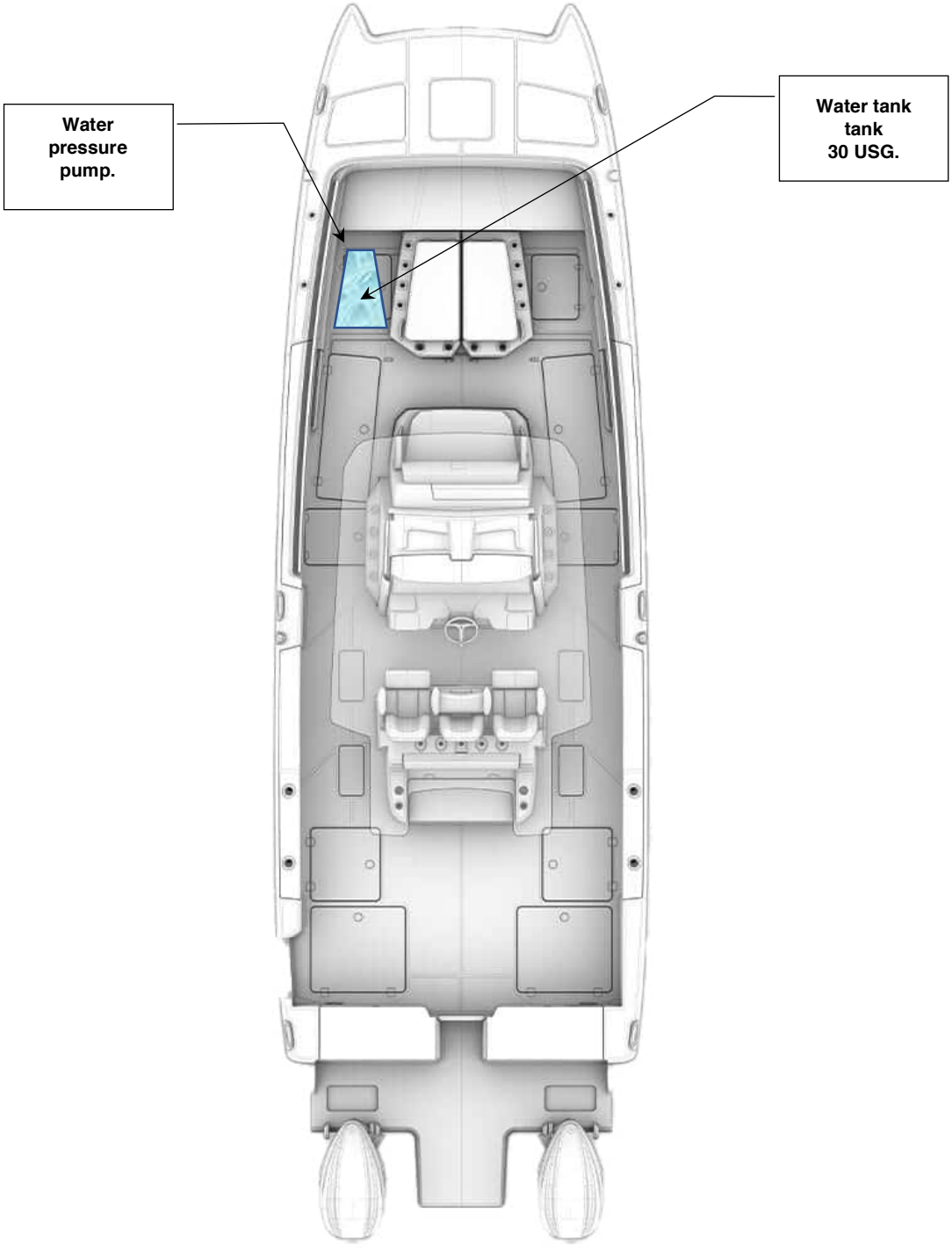
MANUAL CIRCUIT RESET (TRIPPED BREAKER) AT GARMIN CONTROL BOXES

- THE LED CHANNEL WILL BE ILLUMINATED RED

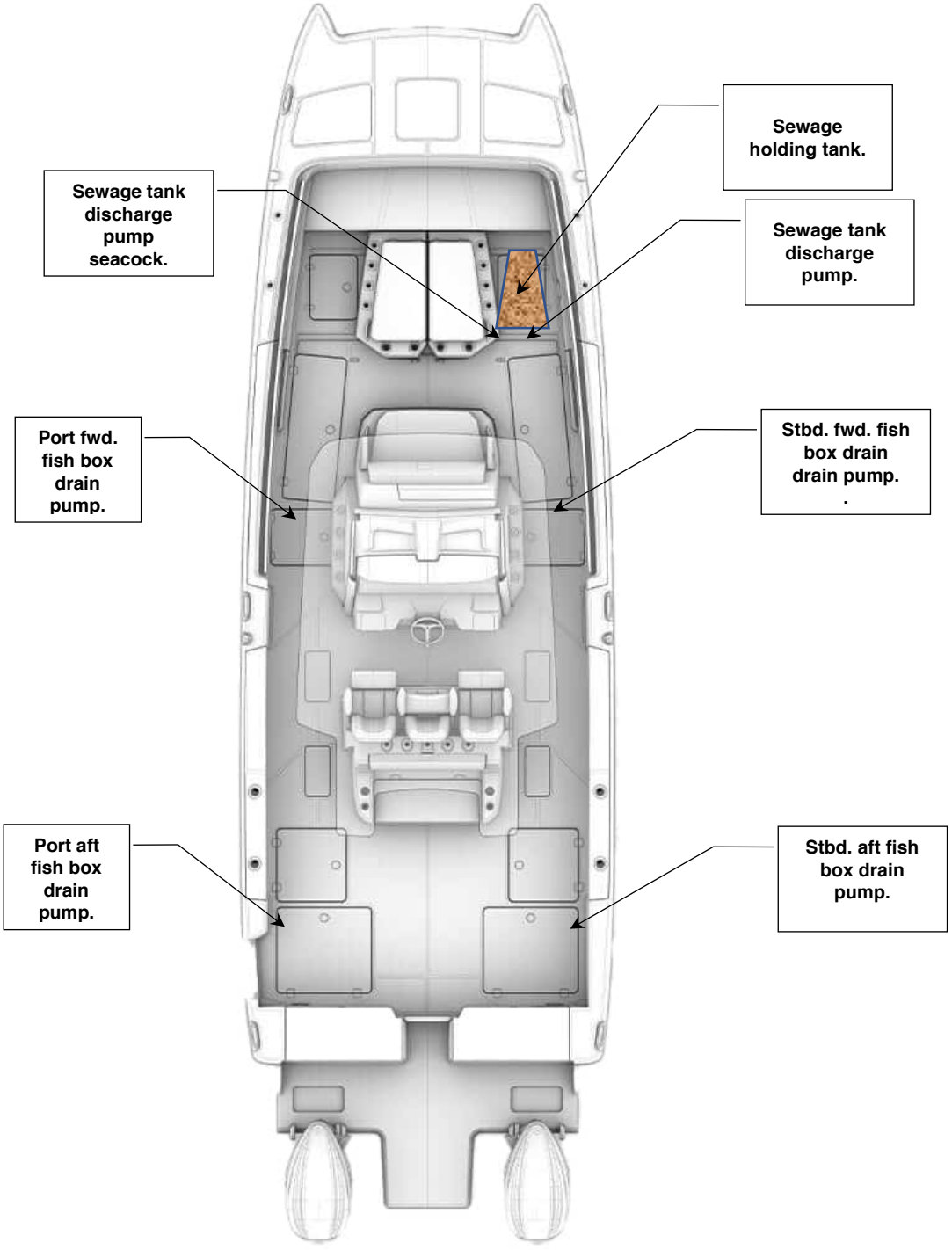
TO RESET CHANNEL

1 Press the right arrow button. "SEL" will be shown on the display
2 Use the right arrow button to step to the desired channel - red led
3 Press and hold RESET/AUTO for two seconds. The circuit will now reset and the led will chg to green or off indication
4 Press the left arrow until the message "SEL" appears in the display

FRESH WATER



SEWAGE & DRAINS



TROUBLESHOOTING
5.0

SAFETY SYSTEMS TROUBLESHOOTING

PROBLEM	CAUSE	ACTION
1. The Empirbus system does not operate.	- The house battery switch is not on. -The NMEA and/or the Engine Screen fuse under the dash is blown. - The Helm Main, Stbd Helm DCM, Port Helm DCM, Stbd Aft DCM, Port Aft DCM, and Hardtop DCM circuit breakers on the main D.C. panel are not on. -The Garmin monitors are not on.	- Turn on the house battery switch and/or check the house battery voltage. -Ensure that the NMEA and Engine Screen fuses under the dash are intact. - Turn on the the Helm Main, Stbd Helm DCM, Port Helm DCM, Stbd Aft DCM, Port Aft DCM, and Hardtop DCM circuit breakers on the main D.C. panel. . -Turn on the Garmin monitors on the dash.
2. The dash monitors do not turn on.	- The house battery switch is not on. - The monitors fuses in the fuse block under the dash are blown.	- Turn on the house battery switch. - Ensure that the monitors fuses in the fuse block under the dash are intact.
3. There is no Empirbus data on any channel.	- The Helm Main, Stbd Helm DCM, Port Helm DCM, Stbd Aft DCM, Port Aft DCM, and Hardtop DCM circuit breakers on the main D.C. panel are not on.	- Turn on the the Helm Main, Stbd Helm DCM, Port Helm DCM, Stbd Aft DCM, Port Aft DCM, and Hardtop DCM circuit breakers on the main D.C. panel.
4. One Empirbus channel is not indicating.	- The circuit breaker for the that DCM is not on. - The sensor for that Empirbus channel is defective.	- Verify that the DCM circuit breakers on the main D.C. panel are on. -Check that all of the chanel LEDs on the Empirbus DCMs are flashing green.

BILGE SYSTEMS TROUBLESHOOTING

PROBLEM	CAUSE	ACTION
1. A high water bilge alarm failed to turn on with high bilge levels.	- The “House” 12 volt battery bank has discharged. - The 24 Hour fuse under the helm bench is blown. - The Bilge Alarm circuit breakers in the Constant Power panel in the head are off. - The bilge alarm DCM is offline.	- Check house battery voltage and charge as necessary. - Ensure that he 24 Hour fuse under the helm bench is intact. - Ensure that the Bilge Alarm circuit breakers in the Constant Power panel in the head are on. - Check that the aft bilge DCM chanel LEDs on the Empirbus DCMs are flashing green.
2. A bilge pump failed to turn on with high water.	- The 24 Hour fuse under the helm bench is blown. - The Bilge Pump's circuit breaker in the Constant Power panel in the head is off. - The pump or its internal sensor has failed. - The house batteries are dead.	- Ensure that he 24 Hour fuse under the helm bench is intact. - Turn on the bilge pump's circuit breaker on the Constant Power panel in the head for that bilge pump. - Check that the pump is getting voltage. - Check the house battery voltage.
3. A bilge pump will not operate in manual mode.	- The “House” 12 volt battery switch is not on. - The “House” 12 volt battery bank has discharged. - The Empirbus system is not on.	- Check that the “House” 12 volt battery switch is on. - Check and/or charge the “House” 12 volt battery bank. - Turn on the Empirbus system.

PROBLEM	CAUSE	ACTION
4. Bilge alarm indicators stay on after the high water alarm is silenced.	- Water level is still high in compartment. - The float switch is stuck in the up position.	- Check the level of water in the compartment. - Turn the high water float switch upside down to reset the switch.
5. A bilge pump runs but fails to discharge water.	-The impeller may be plugged with debris.	- Check the bilge pump impeller for free rotation and clean any debris.

FUEL SYSTEM TROUBLESHOOTING

PROBLEM	CAUSE	ACTION
1. Fuel level indicators are inoperative.	- The Empirbus system is down. -The NMEA and/or the Engine Screen fuse under the dash is blown.	- Turn on Empirbus system. -Ensure that the NMEA and Engine Screen fuses under the dash are intact.
2. One engine is running rough, speeding up, and slowing down.	- That engine's fuel/water separtator prefilter may be plugging. - The on engine fuel filter may be plugging or contain water.	- Check Yamaha CL7 or VesselView (Mercury) for water in fuel alarms - Pump the fuel bulb (Yamaha). -Check the on engine fuel filter for water or debris.
3. One engine is starving for fuel.	- The fuel demand valve on the fuel tank top may be stuck shut. - The engine/fuel tank selector valve is set wrong. - The on engine secondary fuel filter may be plugged.	- Press the override on top of the fuel demand valve on the fuel tank top. - Check the position of the engine/fuel tank selector valve for that engine. -Check the on engine fuel filter for water or debris.

ELECTRICAL SYSTEM TROUBLESHOOTING

PROBLEM	CAUSE	ACTION
1. All battery voltages are low while at the dock.	- The battery paralelling switches have been left on with the battery charger off.	- Ensure that the battery charger is on while at the dock. - Leave the battery paralelling switches off.
2. The battery charger is not operating.	-There is no A.C. power on the boat. - Ensure that the battery charger is on at its face. - Ensure that the battery charger is on in the Empirbus system.	-Plug in the shore power cable and connect A.C. power to the boat. - Turn on the battery charger. - Turn on the battery chargers on the Empirbus Power screen.
3. A battery switch will not operate remotely.	- The Empirbus system is not on. - The battery switch remote control pop out circuit breaker is off at the main D.C. panel in the head. - The Helm DCM circuit breakers on the main D.C. panel are not on. - The Helm battery switch DCM/Connect 50 is offline.	- Turn on the Empirbus system. - Ensure that the battery switch remote control pop out circuit breakers are on at the main D.C. panel in the head. - Ensure that the Helm DCM circuit breakers on the main D.C. panel are on. - Check that the Helm battery switch DCM chanel LEDs on the Empirbus DCMs are flashing green.
4. One battery is not charging.	- The fuse on the charging terminal connection to that battery may be blown.	- Check that the fuse on the charging terminal connection to that battery is intact.
5. One battery voltage value is missing on the Empirbus screen.	- The inline fuse on the battery sensing wire connection at the battery top may be blown.	- Check that the inline fuse on the battery sensing wire connection at the battery top is intact.

PROBLEM	CAUSE	ACTION
6. There is no power to any of the “House” 12 volt D.C. loads.	- The house battery switch is off. - The manual "Service Disconnect" switch (Lithium Ion option boat) is off. - The fuse on the Lithium Ion batterry terminal output is blown.	- Make sure the house battery switch is on. - Make sure that the manual "Service Disconnect" switch (Lithium Ion option boat) is on. - Check that the fuse on the Lithium Ion batterry terminal output is intact.
7. The A.C. power shuts off when using the inverter.	- The house batteries have dropped too low.	- Stop using the inverter and recharge the batteries or start an engine.
8. The shore power cable is connected but there is no power to the boat.	- Check that the shore power entrance circuit breaker in the stern is on. -Check that the ELCI in the stern is not tripped out.	-Cycle on/off the entrance circuit breakers on the shore and boat. -Trip and reset the ELCI. -Check that the shore mounted box is live.
9. The shorepower ELCI keeps tripping.	-There is a ground fault on the boat. - The ELCI is defective.	- Turn off all A.C. circuit breakers on the boat, reset the ELCI, and then turn them back on one by one until it trips. Have an electrician diagnose that circuit. -Replace the ELCI.
10. The red reversed polarity light is on at the main A.C. power source selector panel.	- There is a reverse polarity in the dock wiring.	- Try another dock outlet or do not plug in.

PROBLEM	CAUSE	ACTION
11. The exterior lights do not operate properly.	-The house battery switch is not on. -The Empirbus system is not on. -The POCO controller has failed.	-Turn on the house battery switch. - Turn on the Empirbus system. - Check the POCO controller.
12. A circuit will not respond to the Empirbus touch screen controls.	-You may need to manually override that Empirbus system circuit.	- Access the Empirbus DCMs/Connect 50s and check the LEDs. -Review the Empirbus digital channel reference sheet (in the Figures section) and carry out the override proceedure.
13. As long as the Helm Main, Stbd Helm DCM, Port Helm DCM, Stbd Aft DCM, Port Aft DCM, and Hardtop DCM circuit breakers and the battery switch remote control pop out circuit breakers on the main D.C. panel are on, the fuses in the fuse box under the dash are intact, when the house battery switch is turned on the Yamaha CL7 (or Mercury VesselView), Garmin displays, Empirbus system, and starting battery switches will turn on.	This is normal as part of the programing. The Yamaha CL7 (Mercury VesselView) screen is the master and turns on the Garmin equipment and Empirbus.	This is normal behavior.

PROPULSION SYSTEM TROUBLESHOOTING

PROBLEM	CAUSE	ACTION
1. The engines will not start or turn over.	- The engines' emergency shut off clip is not engaged. - The ignitions are not energised on the (Yamaha) EKS panel. - The (Mercury) ignition switches are not on. - The controls are not in neutral position.	- Securely attach the shut off clip. - Use the ignition fob to turn on the ignitions at the EKS panel. - Turn the (Mercury) ignition key switches on. - Place the control levers in the neutral position.
2. The engines will turn over but do not start.	- An engine fuse is blown. - The engine is starved for fuel.	- Check for and replace blown fuse on top of engine. - Pump the fuel line priming bulbs (Yamaha). -Check the fuel water separator and on engine fuel filter for plugging/water. - Press the override on top of the fuel demand valve on the fuel tank top.
3. An engine is overheating.	- The raw water intakes may be blocked. - The raw water pump in the engine my not be functioning properly.	- Check the raw water intakes on the lower unit of the engine and clear away any blocking debris. - If no water is discharging out the pilot hole on the engine while it is running the raw water pump may be malfuctioning and needs repair.
4. No water is coming out of one engine	-See above.	- See above.

PROBLEM	CAUSE	ACTION
5. An engine will not tilt/trim.	- The starting battery voltage may be too low. - The PTT fuse may be blown. -The power tilt/trim control may be defective. - The power tilt/trim motors may be defective.	- Check the starting battery voltage. - Check the PTT fuse on the engine. -The power tilt has a manual override valve (Yamaha) on the side of the bracket that can be released to allow manual tilting of the engine.
6. The engine alert buzzer sounds or the alarm indicator lights come on.	- Engine may be overheating. -Engine may have low oil pressure. -Engine may have water in the fuel filter.	- Check CL7 (Mercury VesselView) for alarm codes to narrow cause. -Check cooling water indicator stream from engine. -Check oil level. -Check the on engine fuel filter bowl.
7. The engine fuel/water separator alert activates.	-Engine may have water in the fuel filter.	-Check the on engine fuel filter bowl. -Check the main fuel/water separators in the stern mechanical rooms.
8. The CL7 Yamaha, VesselView (Mercury) display is dead. This may also take down the Empirbus system.	- The house battery switch is off. -The Engine Screen fuse in the fuse box under the dash is blown.	- Turn on the house battery switch. -Ensure that the Engine Screen fuse in the fuse box under the dash is intact.

STEERING & CONTROLS SYSTEM TROUBLESHOOTING

PROBLEM	CAUSE	ACTION
1. The steering does not work or the steering alarms activate.	- The start battery switch is not on. - The ignition is not energised. - Power steering fuse may be blown (Yamaha and Mercury 600 Hp). - The Mercury (400 Hp) steering pump fuse may be blown. - The Mercury (400 Hp) steering pump may be low on fluid. - Steering may be defetive.	- Check that the start battery switch is on. - Check that the ignition is on. - Check that the power steering fuses on top of the engine (Yamaha and Mercury 600 Hp) is intact. -Check that the Mercury (400 Hp) steering pump fuse is intact. - Check the Mercury (400 Hp) steering fluid level. - Override the steering to center the engine and steer with the throttles and gears to get home (See the Yamaha procedure in the engine manual).
2. The engine controls do not power up.	- The start battery switch is not on. - The ignition is not energised. -Fuse on top of engine is blown.	- Check that the start battery swith is on. - Check that ignition is on. - Check the fuses on top of the engine are intact.
3. The Yamaha controls alert buzzer sounds or the alarm indicator lights come on.	- An engine alarm may have occurred. -A control malfunction may have occurred.	- Check the (Yamaha CL7/Merucry VesselView) for an alarm explanation.

STABILIZER SYSTEM TROUBLESHOOTING

PROBLEM	CAUSE	ACTION
1. The SeaKeeper is overheating.	- The SeaKeeper cooling pump raw water supply seacock may not be all the way open. - The SeaKeeper raw water pump suction strainer may need cleaning. - The SeaKeeper cooling pump may have failed.	- Check that the SeaKeeper cooling pump raw water supply seacock is open. - Check that the SeaKeeper raw water pump suction strainer is clean. - Check that the SeaKeeper cooling pump has power and is pumping.

GROUND TACKLE TROUBLESHOOTING

PROBLEM	CAUSE	ACTION
1. The windlass will not power the rode in or out.	- Check that the windlass is not in manual mode. - The Empirbus Windlass circuit breaker may not be on. - The House battery switch may be off. -The Windlass circuit breaker in The D.C. panel may be tripped. - The foot switch on deck or rocker switch on the console may have failed. - The windlass directional solenoid may have failed.	- Ensure that the button on the face of the free fall cap is released and the plunger on the rim is extended. - Ensure that the Empirbus Windlass circuit breaker is on. - Turn on the House battery switch. -Check that the Windlass circuit breaker on the D.C. panel is on. - Check the switches. - Check the directional solenoid in the rode locker.
2. The line is jamming while running out.	- The line is tangled in the locker.	- Align the line stack in the locker.
3. The chain/line is pilling up on deck while retrieving it with the windlass.	- The rode may be piled up below in the locker.	- Align the rode stack in the locker.

FRESH WATER SYSTEM TROUBLESHOOTING

PROBLEM	CAUSE	ACTION
1. The water tank level gauge is not indicating.	- The house battery switch is off. -The Helm DCM circuit breaker on the main D.C. panel is not on. - The Empirbus sensor for the water tank level channel is defective. - Check the water tank sender function.	- Turn on house battery switch. -Turn on the Helm DCM circuit breakers on the main D.C. panel. - Check the Empirbus sensor for the water tank level channel. - Check that the water tank sender is functioning.
2. There is no water pressure.	-The water tank is empty. - The house battery switch is off. - The Empirbus system is not on. -The circuit for the fresh water pump in the Empirbus system is not on. -The fresh water pump strainer may be plugged. -The fresh water pump may have failed.	-Fill the water tank. - Check that the house battery switch is on. -Check that the Empirbus system is up and running. -Check that the circuit for the fresh water pump in the Empirbus system is on. - Clean the pump strainer. - Check that the pump is receiving power if not responding.
3. The water pressure is weak.	-The house battery voltage may be low. -The fresh water pump suction strainer may be plugged.	- Check the house battery bank voltage. - Clean the pump suction strainer.

SEWAGE & DRAINS SYSTEM TROUBLESHOOTING

PROBLEM	CAUSE	ACTION
1. The holding tank level is not indicating.	- The house battery switch is off. - The Empirbus system is not up and running. - The Helm DCM circuit breakers on the main D.C. panel are not on. - The Toilet circuit breaker on main D.C. electric panel is off. - The sensor for the holding tank level Empirbus channel is defective.	-Turn on the house battery switch. - Ensure that the Empirbus system is up and running. - Turn on the Helm DCM circuit breakers on the main D.C. panel. -Turn on the Toilet circuit breaker on main D.C. electric panel. - Check the level sensor for the holding tank level Empirbus channel.
2. Toilet will not operate.	- The head is in lockout mode because the holding tank is full. - The house battery switch is off. - The Toilet circuit breaker on the main D.C. electric panel is off. -The toilet flush panel in the head has failed. - The toilet pump motor has failed.	-Empty the holding tank or turn off the lockout mode on the toilet (see the toilet manual). - Turn on the house battery switch. - Turn on the Toilet circuit breaker. - Check if the motor is receiving power but not responding. - Check/replace the toilet pump.
3. Toilet runs but there is no rinse water.	- The boat's water pressure pump is off. -The toilet panel in the head has failed. - The toilet rinse valve has failed.	- Restore water pressure on boat. - Check that the panel is commanding the toilet rinse valve to open. -Check that the toilet rinse solenoid valve (inside the toilet) is operable.

PROBLEM	CAUSE	ACTION
4. Toilet runs but does not drain the bowl fully.	- The holding tank is full. - The toilet's macerator/evacuation pump has failed.	- Empty the holding tank as necessary. - Check the toilet's evacuation/macerator function.
5. The holding tank discharge pump does not operate.	- The Empirbus system is not on. - The Helm DCM circuit breakers on the main D.C. panel are not on. -The circuit for the discharge pump in the Empirbus system is not on. -The Empirbus Helm DCM discharge pump chanel may have failed. -The holding tank discharge pump may have failed.	- Turn on Empirbus system. - Ensure that the Helm DCM circuit breakers on the main D.C. panel are on. -Check that the circuit for the discharge pump in the Empirbus system is on. - Check that the discharge pump chanel LED on the Empirbus Helm DCM is flashing green. -Check for power to pump.
6. The holding tank pump operates but does not empty the tank.	- The pump discharge seacock may be shut. - The pump suction is plugged. - The pump macerator has failed.	- Open the seacock if in legal discharge waters. - Remove the pump and check the suction hose. - Check the macerator impeller.

VENTILATION & AIR CONDITIONING SYSTEM TROUBLESHOOTING

PROBLEM	CAUSE	ACTION
1. The air conditioning does not run.	- There is no A.C. power. - The Air Conditioning circuit breaker on the main electric panel may be tripped. - The Empirbus system is not on. -The Empirbus Console Air ciruit breaker is not on. -The thermostat control has failed.	- Connect A.C. power to main electric panel from the (optional) inverter or shore power. - Turn on the Air Conditioning circuit breaker on the main electric panel. - Turn on the Empirbus system. -Turn on the Console Air ciruit breaker on the Empirbus screen. -Check the thermostat control.
2. The air conditioning runs but doesn't cool.	- There is inadequate sea water flow through the unit. The control may display "HPF". - The unit's seawater coils are scaled internally. - Low refrigerant gas level.	- Check that the air conditioning raw water pump supply seacock is open. - Check that the pump suction sea strainer is clean. -Check for adequate water discharge thru the pump from the hull side. - Check that sea chest exterior sea strainer is clean. -Check that sea chest is clear of debris. - Check the temp. of compressor coils to see if they are hot to touch. If so descale. - Check refrigerant gas pressure.

PROBLEM	CAUSE	ACTION
3. Coils on the units ice up.	- The unit fan speed may be set too low. - Return air filter may need cleaning to increase flow.	- Increase fan speed or set to automatic. - Clean return air filter on unit.
4. Low air flow with high fan speeds.	- Return air filter is dirty. - Fan motor is failing.	- Clean return air filter. - Check fan operation.
5. Condensate pan overflows.	- Condensate pan drain is plugged.	- Clear the drain pan ports and pour Hydrogen Peroxide into the open edge of the drain pan.

RAW WATER SYSTEM TROUBLESHOOTING

PROBLEM	CAUSE	ACTION
1. The raw water wash down pump does not turn on.	- The house battery switch is off. - The Empirbus system is not on. -The Empirbus ciruit breaker for the raw water pump is not on. -The raw water pump may have failed.	- Turn on house battery switch. - Turn on the Empirbus system. -Ensure that the the Empirbus ciruit breaker for the raw water pump is on. -Check the raw water pump ops..
2. The raw water pump runs but pressure is weak.	-The raw water seachest strainer may be plugged. -The inline suction strainer for the raw water pressure pump may be dirty. - House battery voltage may be low.	- Check that sea chest exterior sea strainer is clean. -Check that sea chest is clear of debris. -Check that the inline suction strainer for the raw water pressure pump is clean. - Check house battery bank voltage.
3. The raw water pump runs but does not deliver any water.	- The raw water sea chest suction seacock may be shut. -The raw water pump suction seacock may be shut. -The raw water sea chest external strainer may be plugged. - Pump may have failed internally.	- Open the raw water sea chest suction seacock. -Open the raw water pump suction seacock on the sea chest. - Check that the exterior sea strainer on the sea chest is clean. -Check that the sea chest is clear of debris. - Check pump ops..

PROBLEM	CAUSE	ACTION
4. The baitwell does not circulate.	-The raw water sea chest suction seacock may be shut. -The raw water sea chest external strainer may be plugged. -The discharge valves in/for the baitwell or standpipe may be set wrong.	-Open the raw water sea chest suction seacock. -Ensure that the raw water sea chest external strainer is clear. -Adjust the discharge valves in/for the baitwell or the standpipe for proper flow through.

DECK APPLIANCES TROUBLESHOOTING

PROBLEM	CAUSE	ACTION
1. The windsheild vent window does not operate.	- The house battery switch is off. - The Empirbus system is not on. -The Empirbus ciruit breaker for the Windsheild Vent on the System screen is not on. -The windsheild vent window linear actuator may have failed.	- Ensure that the house battery switch is on. - Ensure that the Empirbus system is on. -Ensure that the Empirbus ciruit breaker for the Windsheild Vent on the Empirbus System screen is on. -Verify power to the vent window linear actuator.
2. The electric helm seat does not operate.	- The house battery switch is off. - The Empirbus system is not on. -The Empirbus ciruit breaker for the Helm Seat power is not on. -The helm seat rocker switch is inoperative. -The helm seat drive mechanism is inoperative.	- Turn on the house battery switch. - Ensure that the Empirbus system is on. -Ensure that the Empirbus ciruit breaker for the Helm Seat power is on. -Check power to the helm seat rocker switch and operation. -Check power to the helm seat drive mechanism from the switch.

APPLIANCES AND ENTERTAINMENT TROUBLESHOOTING

PROBLEM	CAUSE	ACTION
1. The aft deck chiller box does not cool.	- The house battery switch is off. - The Aft Fuse Panel circuit breakers on the main D.C. panel are not on. -The Aft deck “Chiller” fuse may be blown. -The thermostatic control inside the box may have failed.	- Turn on the house battery switch. - Turn on the Aft Fuse Panel circuit breakers on the main D.C. panel. -Ensure that the Aft deck “Chiller” fuses in the fuse blocks in the mechanical rooms are intact. -Check the thermostatic control inside the box.
2. The stereo is not working.	-The house battery switch is off. -The Stereo fuse in the fuse block under the dash is blown. -The main deck stereo may be defective.	-Turn on the house battery switch. -Check that the Stereo fuse in the fuse block under the dash is intact. -Check that there is power to the main deck stereo.
3. The stereo amplifiers are not working.	-The house battery switch is off. -The Amplifier circuit breakers on the main D.C. panel are not on. -The Stereo fuse in the fuse block under the dash is blown. -The stereo may be defective. - The turn on mode switch on the amplifier is not set to “Rem.” or remote so that it will turn on when the stereo turns on.	-Turn on the house battery switch. -Check that the Amplifier circuit breakers on the main D.C. panel are on. -Check that the Stereo fuse in the fuse block under the dash is intact. -Check that there is power to the stereo. - Set the turn on mode switch on the amplifier to “Rem.” or remote so that it will turn on when the stereo turns on.

MAINTENANCE
6.0

MAINTENANCE

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.

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.

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.

Waxing

Similar to automotive finishes, gelcoat will begin to fade over an extended period of time. Constant exposure to environmental pollutants 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. You should select which compound 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 an 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.

NOTICE **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.**

NOTICE **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.**

NOTICE **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.

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 qualified fiberglass repair shop.

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 will not eliminate, gelcoat blistering on the hull, which is not covered by the warranty. 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.

⚠CAUTION 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 submerse catalyzed materials.

Upholstery

Basic Stains - Clean with a mild detergent and a soft to medium brush, or an all-purpose cleaner and rinse well with fresh water after cleaning.

Mildew - Use a 4 to 1 mixture of water and ammonia, brushing the stain vigorously to remove the bacteria responsible for the mildew. If the stain remains, briefly apply bleach to the area and rinse with fresh water.

Tough Stains or Mildew - Use a mixture of 1 tablespoon of ammonia, 1/4 cup of hydrogen peroxide, and 3/4 cup distilled water. Briefly, apply to the surface, allowing the peroxide to bubble. Rinse with fresh water.

Trim / Plexiglass / Polyethylene

World Cat uses vinyl, plexiglass, and polyethylene material (StarboardTM) 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.
StarboardTM can be cleaned using surface cleaners such as 409TM.

Stainless Steel / Aluminum

Stainless steel and aluminum are used throughout your vessel. World Cat uses only 316 marine grade stainless hardware and anodized aluminum 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 contaminates, and shield the metal. World Cat recommends high quality sealants such as Boeshield T-9TM developed by BoeingTM Aviation. If you cannot find it locally call PMS Products Inc. at 800-962-1732.

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.

Cockpit Drains

All World Cats have four drains located in the cockpit, two on both the starboard and port sides. 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 hull side. Each scupper has a rubber flap to prevent water from entering the boat. Check this material occasionally to keep the scuppers free of debris and in good working condition.

⚠CAUTION **Do not mix ammonia and household bleach. Doing so will result in the formation of deadly chlorine gas. If it is necessary to use bleach, clean up any traces of ammonia and ventilate the work space for a minimum of 15 minutes prior to applying bleach.**

Winterization

Routine maintenance checks should be performed prior to each trip, 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, fish boxes, 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 manufacturer's recommendations for portable and marine heads.

- Inspect fuel system components and replace fuel / water separators. You can keep the system fueled but do not overfill, and use a fuel additive to prevent condensation.

- Lubricate hinges and coat all metal surfaces with a metal protecting compound. Tighten down any 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.

400 CC-X MAINTENANCE SCHEDULE

System/ Category	Item	Interval	Alt. Interval	Action
Propulsion	Yamaha Engines.	20 Hours.	3 Months.	Dealer check/service.
Propulsion	Yamaha Engines.	100 Hours.	1 Year.	Dealer check/service.
Propulsion	Yamaha Engines.	300 Hours.	3 Years.	Dealer check/service.
Propulsion	Yamaha Engines.	500 Hours.	5 Years.	Dealer check/service.
Propulsion	Mercury 400 Hp Engines.	100 Hours.	1 Year.	Dealer check/service.
Propulsion	Mercury 400 Hp Engines.	300 Hours.	3 Years.	Dealer check/service.
Propulsion	Mercury 600 Hp Engines.	200 Hours.	Before long term storage.	Dealer check/service.
Propulsion	Mercury 600 Hp Engines.	1000 hours.		Dealer check/service.
Safety	Survival raft	1 year.		Inspect and recertify.
Safety	Epirb	90 Days.		Inspect bracket and clean. Check battery and hydrostatic release dates.
Safety	Portable fire extinguishers	1 year.		Recertify.
Safety	Flares	1 year.		Inspect and replace out dated.
Safety	PFDs	6 months.		Inspect condition.
Bilge pumps	Submersible bilge pumps	Monthly.		Prove float and manual switches.
Bilge pumps	Submersible bilge pumps	2 months.		Lift pumps, inspect impellers, and clean strainers.
Bilge pumps	Bilge alarms	Weekly.		Prove bilge alarms.
Steering	Steering tilt/trim system.	100 hours.	6 months.	Check for mechanical play or slop.
Steering	Steering system.	100 hours.	6 months.	Check for corrosion.
Steering	Electrical cables.	100 hours.	6 months.	Check for chafting and wear.
Steering	Greasing points	100 hours.	1 year.	Apply marine grease.
Controls	Control system.	100 hours.	6 months.	Check for corrosion.
Electrical	Shore power cable end	Monthly.		Inspect plugs.
Electrical	Interior lighting	Weekly.		Prove all interior lighting, replace bulbs as necessary.
Electrical	Exterior lighting	Weekly.		Prove all exterior lighting, replace bulbs as necessary.
Electrical	Underwater zincs	6 months.	Haul out.	Check and replace transom zincs as necessary.
Electrical	Batteries	Monthly.		Check terminals for corrosion. Clean as necessary.
Electrical	Battery charger	Weekly.		Check output.
Electrical	Electrical panels	1 year.		Open and inspect connections.
Electrical	Electrical panels	6 months.		Check indicator light op.s.
Electrical	Shore power ELCI	When connecting.		Test ELCI with test button each time shore power cable is connected.

400 CC-X MAINTENANCE SCHEDULE

System/ Category	Item	Interval	Alt. Interval	Action
Electrical	A.C. outlet GFCIs.	Monthly.		Test all GFCI outlets.
Fuel	Fuel fill deck fittings	6 months.		Lube cap threads, inspect keeper chains and "O" rings.
Fuel	Fuel vent screens	6 months.		Inspect vent flame screen.
Fuel	Fuel hoses and tubing	Weekly.		Visually inspect for leaks and corrosion.
Fuel	Fuel tanks.	1 year.		Clean/drain sediment.
Ground Tackle	Windlass	3 months.		Clean windlass with cloth damp with Kerosene. Spray with CRC3097.
Ground Tackle	Windlass	3 months.		Spray under deck components with CRC3097.
Ground Tackle	Windlass	2 months.		Grease windlass main bearing.
Ground Tackle	Windlass	3 months.		Clean and spray electrical terminals with corrosion block.
Ground Tackle	Windlass	3 months.		Check tightness of all fasteners.
Ground Tackle	Windlass	1 year.		Derust and paint motor.
Ground Tackle	Chain locker	1 year.	Haul out.	Clean chain locker.
Ground Tackle	Rodes	Haul out.	1 year.	Range rodes, inspect, and renew markings.
Fresh Water	Water fill deck fittings	6 months.		Lube cap threads, inspect keeper chain and "O" ring.
Fresh Water	Water tank vent	6 months.		Inspect and prove clear.
Fresh Water	Faucets and mixing valves	Monthly.		Prove free of leaks and for normal operation.
Fresh Water	Pump suction strainer.	Weekly.		Inspect and clean fresh water pump suction strainer.
Fresh Water	12 volt pressure pump	Monthly.		Prove leak free and check system pressure.
Fresh Water	Water heater	Monthly.		Inspect for leaks and prove element operational.
Raw Water	Sea chest suction strainer.	Monthly.		Check/clean external suction strainer.
Raw Water	Wash down pump.	Monthly.		Operate raw water pressure pump.
Raw Water	Sea chest seacocks.	Monthly.		Exercise seacocks on seachest.
Raw Water	Seachest.	Monthly.		Open and clean seachest.
Sewage & drains	Toilet	3 Days.		Flush toilet and inspect.
Sewage & drains	Toilet	Daily.	As req.'d	Clean toilet.
Sewage & drains	All toilet hoses	1 year.		Inspect hoses and clamps.
Sewage & drains	Sewage discharge seacock	Monthly.		Operate and inspect sewage discharge seacock.
Sewage & drains	Holding tank	2 months.		Visually inspect holding tank.
Sewage & drains	Holding tank	Weekly.	As req.'d	Pump holding tank, flush with clean water, and add Raritan KO.
Sewage & drains	Holding tank vent openings	6 Months.		Inspect to prove clear.

400 CC-X MAINTENANCE SCHEDULE

System/ Category	Item	Interval	Alt. Interval	Action
Sewage & drains	Holding tank pump out fitting	6 months.		Lube cap threads, inspect keeper chain and "O" ring.
Sewage & drains	Holding tank pump.	Weekly.		Observe holding tank pump in operation.
Ventilation	Head compartment vent fan	Weekly.		Prove operational.
Ventilation	Return air conditioning grills	Weekly.		Clean return air grills.
Ventilation	Air conditioning condensate drains	6 months.		Flush condensate pans and drain with hydrogen peroxide.
Ventilation	Air conditioning Freon charge	1 year.		Check all air conditioning compressors Freon charge.
Ventilation	Air conditioning compressor coil temp.	Weekly.		Measure and log airco coil temps..
Ventilation	Air conditioning compressor coils	2 years.		Descale coils.
Ventilation	Air conditioning raw water seacocks	Monthly.		Operate and inspect airco raw water seacocks.
Ventilation	Air conditioning raw water hoses	Monthly.		Inspect for cracks, leaks, and clamps condition.
Ventilation	Air conditioning raw water pumps	Weekly.		Visually inspect.
Ventilation	Air conditioning controls	6 months.		Perform factory reset of controls.
Appliances	Refrigerators	Weekly.		Clean lint from air grills.
Appliances	Refrigerators	Weekly.		Clean interior and check door gasket.
Appliances	Grill	2 months.	As req.'d	Clean grill.
Exterior	Lock Tumblers	Monthly.		Lubricate lock tumblers.
Exterior	Hand rails	Weekly.		Polish hand rails.
Exterior	Stainless steel fittings	Weekly.		Polish stainless steel.
Exterior	General exterior surfaces	Weekly.	As req.'d	Wash down and dry.
Exterior	Mooring lines	6 months.		Inspect and replace/repair as necessary.
Exterior	Fenders	2 months.	As req.'d	Clean and inspect, top air pressure.
Exterior	Gel coat surfaces	6 months.	As req.'d	Clean and reseal.
Exterior	Windows	2 months.		Reapply Rainex.
Exterior	Canvas	2 months.	As req.'d	Remove and scrub.
Exterior	Canvas snaps and zippers.	2 months.	As req.'d	Lubricate snaps and zippers.
Exterior	Boot line	Monthly.	As req.'d	Scrub.
Exterior	Boot line	1 year.	Haul out.	Clean and apply wax.
Interior	Bilges	Monthly.	As req.'d	Clean and inspect.
Interior	Latches	2 months.		Check fit and lubricate.
Interior	Drawers	6 months.		Wax sliding surfaces.
Interior	Cabinetry general	Monthly.		Check fit/op.s of doors, drawers, etc..

400 CC-X MAINTENANCE SCHEDULE

System/ Category	Item	Interval	Alt. Interval	Action
Interior	Hard decks	Weekly.	As req.'d	Wet mop and dry.
Interior	Wood surfaces	6 months.		Clean to remove salt film and dry.
Interior	Plumbing fixtures	Weekly.		Polish.

SPARE PARTS
7.0

SPARE PARTS

SYSTEM	PART
Fuel	Main engine fuel/water separator elements
Electrical	Generator Lube Oil
Electrical	Generator Coolant
Electrical	Replacement Fuses
Propulsion	Engine Lube Oil
Propulsion	Spare Propellers/Nuts
Propulsion	Yamaha Propeller Wrench
Steering & Control	Mercury (400 Hp) Steering Fluid
Sewage & Drains	Raritan K.O. Holding Tank Treatment
Sewage & Drains	Raritan C.P. Toilet Cleaner

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