ASPEN

POWER CATAMARANS

C 100 Owners Manual

BATTERY SWITCHES

The C100 has five main battery switches:

1) House On/Off
2) Engine On/Off
3) Emergency Parallel
4) Bow Thruster
5) Stern Thruster

Normal operation position is to leave both House and Engine switches in the ON position. Emergency Parallel should be in the OFF position and is rarely used.

The thruster battery switches are located below the main battery switches and are normally ON. ***These must be switched OFF when swimmers are in the water, or for service.*** The thrusters are very powerful and will suck objects in the water toward them.
Do not operate the thruster for more than 30 seconds at a time or the motor may overheat.

The batteries have three charge sources:

1) Two ProMariner chargers (8A for Start battery and 20A for House battery). Shore power is connected and AC breakers at dash are switched on.
2) Two 130W solar chargers (12A) while anchored – automatic.
3) A 125A engine-driven alternator.

The boat has a **Blue Sea Voltage Sensitive Relay** (black box located near switches) that disconnects the House batteries from the Start battery when the voltage on the Start battery drops below 12.3 volts. Once the charging system has brought the Start battery back to 12.3 volts, it reconnects to the house battery bank.

PROMARINER CHARGERS & FULL-TIME POWER BREAKER

The 20amp House **ProMariner automatic chargers** are wired to come on when the boats shore power is connected and the A/C breakers at the dash are in the ON position. The chargers are four stage-smart units that charge aggressively when the battery is low and then ramp down as it charges. They stop completely when the battery is fully charged and do a small topping charge weekly. The design greatly extends battery life and prevents overcharging and subsequent battery damage.

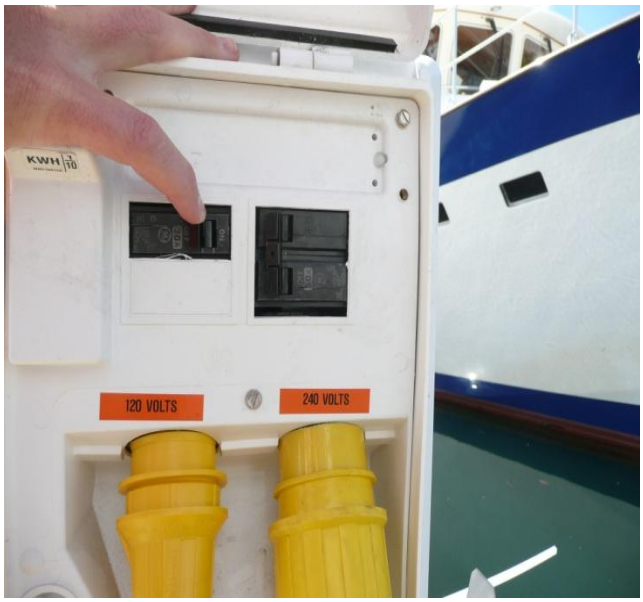
Check battery water levels monthly. Lower water levels and/or exposed plates will damage the batteries lead plates.

NOTE: *Chargers will only charge if they see voltage. If batteries are dead you will need to use the Emergency Parallel Switch and charge for maximum 4-6 minutes.*

The **Full-Time Power Breaker** is **always on**. The 12V power fuse is just inside the battery switch compartment**. It is important to leave this on** as it supplies power to the boats six automatic bilge pumps and other devices that need power to save memory settings. It is not affected by the battery switch position.

NOTE: *If the breaker has popped or fuse is burned out, there is no bilge pump protection from leaks.*

SHORE POWER DISCONNECT



1) SWITCH OFF BREAKER

2) UNPLUG CORD

***NOTE: NEVER LEAVE A HOT OR LOOSE CORD ON DOCK. IT COULD SHOCK SWIMMERS IF IT FELL IN WATER.**

DC / AC PANELS

The AC and DC panels are both Blue Sea Systems premium panels.

DC Panel: The DC panel is fed from the House batteries. It includes both voltage (pressure) and amp (volume) gauges to manage your power during the day. Reducing amps used is important to extend battery life. While boating, turn all of the breakers ON. The small silver toggle switch will show Engine battery voltage (#1 left), House battery voltage (#2 center). (The third is not connected as there are only two battery banks.) These breakers then feed the dash DC switch panels (see next page) and the fuse blocks for electronics and pumps. A DC shunt is standard for the amp meter.
NOTE: *On DC panel with bilge pump switches, the top three switches correspond with pumps on the starboard hull and the bottom three switches correspond to the pumps on the port hull. First pump is forward, second is mid-ship, and third is aft in the port lazarette. On starboard side, the shower pump is mid-ship.*

AC Panel: This panel is fed from the 30-amp shore power connection. Typically all of the breakers, with the exception of the hot water heater, are left **ON** to energize the boats outlets.
If the red reverse polarity light is lit (second bulb down), see your dock master before continuing. It is possible some boat systems could be damaged.

NOTE: *Turn on hot water only when needed.*

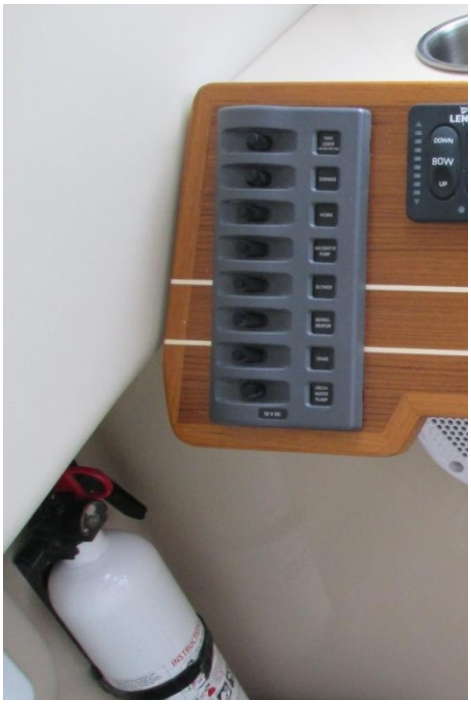
NOTE: *This panel is fed through the whole boat GFI, mounted just behind the deck side shore panel connection. The whole boat GFI does have a reset button on it.*

BOAT GFI: Located on far port side behind the dash above the Master Stateroom bed.

DC PANEL LAYOUT

Pumps Panel: The pumps panel controls the bilge pumps and shower sump pump. Most of these are automatic, but these switches allow you to manually turn on each of the six pumps for each water-tight compartment. With the exception of the fresh water switch, these switches are normally in the off position. This panel is fed from the pumps breaker on the main DC panel. **The automatic portion of the bilge pumps is not affected by this panel.**

NOTE: *The engine room has a seventh pump (1100GPH) which serves as an emergency pump. It is wired to a very loud horn behind the dash. Should you lose an engine hose and the engine room begins to fill, this pump will automatically start and the horn will sound.*



Ship Systems Panel: This panel includes controls for navigation lights, blower, and many other ship systems. Like the Pumps Panel, it is fed from the main DC panel breaker.
These panels have separate automotive blade fuses under the plastic snap cover ranging from 5- to -20 amps. If a fuse has blown, determine and fix the cause and replace the fuse. (Possible causes could be debris in pump, shorted wire.)
To access fuses, carefully pop the grey cover off with a flat-blade screwdriver or tape-wrapped dinner knife. Pull rubber gasket over fuses and replace fuse.

TANK GUAGES & SOLAR PANEL CONTROLS

To Read Tank Level:

Left Gauge = Left Water Tank
Right Gauge = Right Water Tank
Center Gauge = Waste Tank

Solar Panel Charge Controller:

The Solar Boost 2000 is a premium charge controller that helps capture all of the sun's peak mid-day energy. **The unit is automatic and requires no operator input**. As the batteries become fully charged, the system automatically ramps down its charge so batteries are not overcharged. It also automatically shuts down if it senses another charge source (engine or battery chargers). The slide switch is useful to see the current voltage and input of the battery bank. If the batteries are low and the sun is bright, the unit will put out up to 11-amps.

NOTE: *If it seems not to be charging, the batteries may be full, or the Kayaks could be blocking the sun. 1 sq ft. of shade on the solar panel will disable 2 sq ft. of panel.*

FUSE PANELS BEHIND DASH

Blue Seas Panels: Auto Blade Fuse-Type

Each of these four fuse blocks is dedicated to a specific system and is powered by a dedicated breaker.

1) Hot Float – 8 gang, right
2) Electronics – 6 gang, top
3) House equipment – 6 gang, middle
4) House lights – 6 gang, bottom.

The black box to the right of the helm is a Blue Seas dimmer for dash lights.
Fuses are from 3- to -20 amp, most are 5- to -10 amp.

400 watt 12V to 120V inverter for laptops and for charging phones.

Note: *There is a Carbon Monoxide detector under the edge of the bed.*

LENCO TRIM TABS

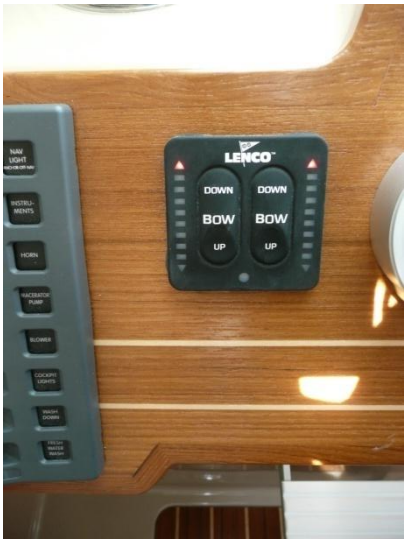
The C100 is equipped with large trim tabs. The tabs are primarily used to trim the boat for maximum efficiency and comfort while cruising. Due to their size and positioning, they can lift a great deal while creating very limited drag.

Typically, after setting for a given throttle RPM, you will level and trim down to find the maximum speed for that RPM. If the seas are choppy you may find that less trim is a softer and drier ride. Use your discretion. I find that in 0 – 12” seas full tabs are most efficient and a good ride. In 12 – 24” seas, you will need to reduce tabs to 2 / 3 or less and let the bow float through the seas. In larger seas you may find no tab is best. Please note your best ride in heavy seas will often be at 14 – 17Kts. If the boat is bouncing or thumping, try something different.

Full Tabs: Used for 0-1’ seas: 14-17Kts

Half Tabs: Used for large seas: 14-20Kts

Zero Tabs: Used for large seas: 14-20Kts



Full Tabs is also used when there is excessive weight in Stern for best efficiency

***Note:** Retract tabs when not in use to protect actuator shaft from marine growth.

GETTING READY TO GO

Fill water tanks as needed (port, starboard, cockpit fwd walls). Be sure water is good – taste it! During long inactive periods, add a little chlorine to keep water fresh.

Stow fenders, dock lines and kicker motor in aft compartment.

Switch on Engine blower.

Switch on refrigerator, lower left DC panel.

Note: *Switch fuses are behind cover plate.*

GETTING STARTED: THRUSTERS, RADIO & WIPERS

Thrusters: These side power units are very handy while docking.
Caution: *Be certain no one is in the water near the boat when the thrusters are on. The thrusters work like a vacuum, sucking from a large area.*
To use, ensure battery switches are on, then press both ON buttons simultaneously. A green light will illuminate signaling the joy sticks are ready. Press bow stick left and boat will got left.
Use in 20 – 30 second bursts and never for more than three minutes of continuous use to make sure motor keeps cool. Unit shuts off automatically after three minutes of inactivity.
A wireless remote is available for solo docking.
NOTE: *When using thrusters make sure inverters are off. Otherwise, the low voltage alarm will ring on the inverter. Thrusters use a lot of voltage and may even cause low voltage on the chart plotter.*

ICOM VHF Radio
Turn on by rotating top right knob. Most conversations with other boaters will be on low power. Channel 16 is used only for hailing. Switch to Channels 72 or 68 for other communication. Weather information is available by pushing the WX button. Use the lower knob to squelch background static.

Wiper Motor
The controls are on the left side of the dash. The wipers have two speeds. Push the control to wash. Wash tank is located in the back corner of the storage bin, behind the refrigerator, under the helm seat. You will have to remove safety gear to gain access. Rain-X works great on front and side windows to aid in visibility.

GETTING STARTED: ENGINE & SAFETY GEAR

Starting Engine: Once batteries and blower are on you can start. Hold Key Fob flat with square edge toward key box and pass down over box. A green light will come on solid, then push start button after fuel pressure pump has stopped humming. ***Important:*** *you must warm the engine up slowly at RPM's under 2000 over a 10-15 minute period. DO NOT go above 2000 RPM until motor has reached* ***176 degrees****. 80% of engine wear is while motor is cold.*

Engine Computer: The engine computer is very useful as it allows you to view engine data. Toggling the propeller button allows you to scan various details. It is fine to push the boat and horizon buttons for additional information. Oil pressure while running will be about 90 PSI and water temperature will be about 176 – 180 degrees.
NOTE: *If you hear a horn or beeping sound while underway you must stop and determine the cause. Engine manuals can be found under the helm seat in a black brief case.*

Safety Gear Storage/Owner Manuals

GARMIN CHART PLOTTER

To start the chart plotter, locate the power button at the top right of the unit. Press and hold the power button for three seconds. The unit will start in approximately ten seconds.

1) Press Charts.

2) Press Navigation Charts.

The screen will display chart and data fields. To zoom in, press the + key; to zoom out, press the – key. To change the page to sounder, press the home button and toggle to the desired page.

NOTE: *To dim the unit at night, tap the power button and use the active button to adjust light level. You must turn the light level back up when done or the screen will be black the next day, making it difficult to see the buttons.*

GARMIN HELP LINE #1-800-800-1020

WALLACE 30D HEATER

The Wallace furnace control is located to the left of the helm. To turn on, push toggle switch to right and rotate fan-heat control knob to desired level. The controller has no thermostat due to size of space heated.

The unit is located under the sink. Note: When first warming up, it may howl for a few moments; adjust speed to stop. During its first operation, it may time out as the fuel pump did not prime, -restart unit.

Note: If a vent is not flowing, pop grill off, twist valve inside open.

The vents are located in the salon, at the dash and in the master stateroom. Do not block the flow as this will shut the unit down from overheating. There is a boost fan for defrosters, switch it on at DC panel to left of helm. We have found at times on the lowest flow setting it may shut off after 4-6 hrs. To reset, trip the constant hot power breaker in the engine room and then reset breaker on.

A/C UNIT

Quick-start Operations Checklist:
1) Ensure seawater-intake ball valve is open.
2) Make sure the control is powered off.
3) Turn on the air conditioner circuit breaker. If the seawater pump has it's own circuit breaker, turn that on also.
4) Turn the control ON.
5) Press the Fan button. Verify that the fan is running and that there is steady airflow out of the supply-air grille.
6) Select a temperature set point lower than the current cabin temperature. This starts the compressor and seawater pump.
7) Check for a steady solid stream of water from the overboard discharge.
8) Verify that there is a steady airflow out of the supply-air grille.

For more specific operation instructions, see your AC Unit owners manual for further detail.

The unit is located under the sink.

The vents are located in the salon, at the dash and in the master stateroom. Do not block the flow as this will overheat the unit and cause it to shut down. There is a boost fan for defrosters. It can be switched on at the DC panel to the left of the helm. We have found that at times it may shut off after 4 – 6 hours on the lowest flow setting. To reset, trip the constant hot power breaker in the engine room and then turn breaker back on.
Note: *If a vent is not flowing, remove the grill and twist the inside valve open.*

PROPANE SNIFFER CONTROL

The propane sniffer control unit is just fwd of the sink. This units power may be switched with the black switch just below it. The sniffer is very sensitive and false alarms can be disconcerting. When its off, the solenoid valve in the tank is closed. When stove is not in use, tap the control button and turn the gas off . It will take about 30 seconds before the sensor can be turned to ON position.

Green light when Power is ON, but unit is OFF.

Gas is ON when the green Light is ON.

LEWMAR WINDLASS

The Lewmar windlass is mounted on the front deck. For ease of use, it has power controls located at both the helm and front deck. The unit uses ¼” chain, typically 40’, and 250’ of ½” line, typically triple-braid, that’s been woven to the chain. The capstan can handle both the chain and line, transitioning automatically as the line moves through. When the line is new, it is a good idea to remove the anchor at its swivel and run the line up and down two-to-three times to clear any kinks in the line.

The windlass has a friction clutch built in to the capstan. Its tension is adjusted by turning the SS knob and tightening clockwise for more friction, counterclockwise for less friction. This is a delicate procedure, as too little tension causes the clutch to slip when lifting under-load. Too much tension while the anchor is lifted can cause damage. When the anchor rode has been purchased from Aspen, it includes depth markers every 30’ to aid in anchoring.

The windlass breaker is located in the master staterooms hanging locker, just forward of the bow thrusters service hatch. **Note:** *The anchor line end must be secured to the bitter end cleat in the anchor locker. Be sure to secure the anchor with a bungee or line while underway.*

ANCHOR DETAILS

ANCHOR WITH SNUBBER BUNGEE

LINE AFTER STACKING - DETANGLE

ANCHOR DEPTH MARKERS

WINDLASS WRENCH

Use wrench to tighten/loosen clutch, capstan.
Note: *The wrench is key to adjusting how much force the windlass pulls in with. Too tight and you will damage the roller assembly.*
Used on 28' and early 32' Aspens

TILT HELM & CURTAINS

The Tilt Helm lever is located under the steering wheel.

The hydraulic fluid (Teliflex) fills at the top under rubber cover.

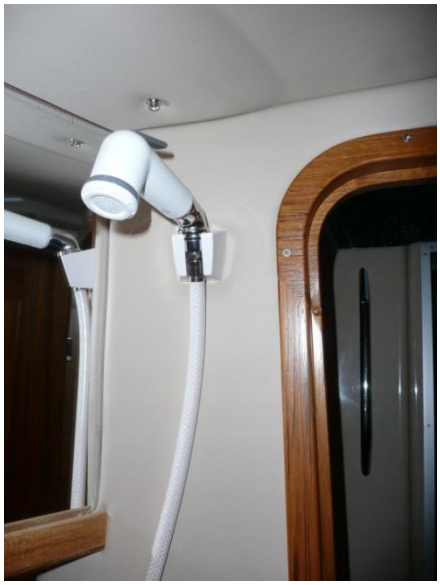
Running attitude, 16 Kts, tabs down.

Master Curtains snap in. Each is Labeled Port/Starboard with arrow showing forward. Fold and store in headboard bookshelf.

SHOWER CURTAIN & SPRAYER

First, set water to preferred temperature. The sink wand lifts to hanger near the door. The curtain from shelf behind door is snapped into the ceiling buttons. Dry door and shower floor when done. Door can be left open or closed while showering. The automatic sump pump under the head evacuates the water.
Note: *To conserve water, "boat" showers are recommended. Get wet, turn off water, soap up, rinse off!*

Before leaving the boat for an extended period of time, sponge out the sump under the toilet to eliminate odors.



Sprayer has three positions:

OFF

ON

ON FULL TIME

ENGINE & TRANSMISSION OIL

The Volvo D3 220 engine uses premium **15W-40 oil**. It's best to check oil levels prior to use. Be carful not to spill or overfill. Change your oil and filter at 50 hrs, then every 100 hrs after.

Note: The engine dip-stick is located on the port side, under the emergency off button. It has a flip top lever to open. **You must re-flip to lock in place or oil will blow out.**

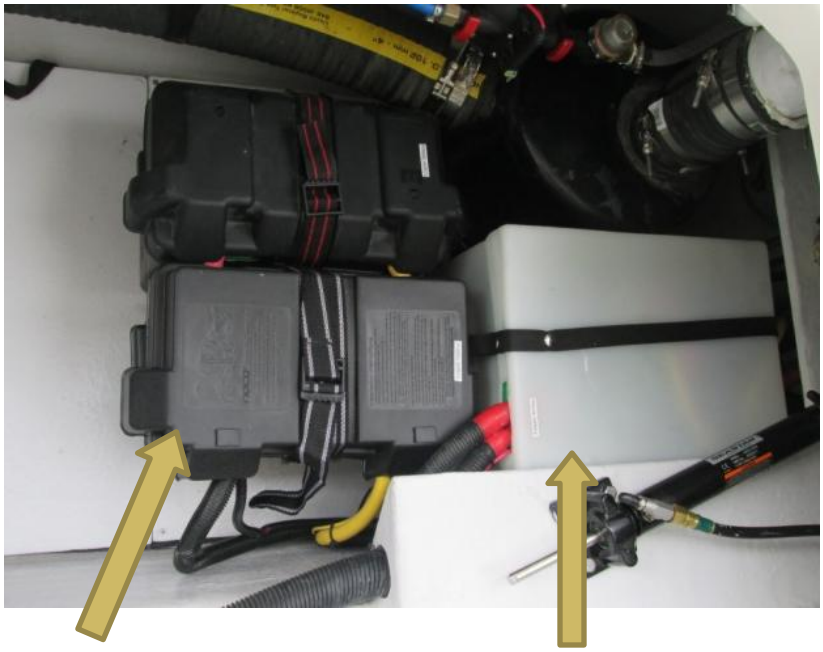
The ZF Transmission uses ATF (automatic tranz fluid) oil for its gear lubrication and to engage its clutch. When you go to check the oil level, make sure the engine is warm (just after its been idling in neutral) but off. Check the oil with the dip stick pushed against the threads but not screwed into the housing. If the oil is low, the clutch will drop out and the boat will stop. Find the leak, repair it and refill the transmission oil. To top it off, it's easiest to fill through the dip stick opening with supplied funnel. Check frequently while filling , as overfilling can damage the transmission. Change after 50 Hrs and then every 200 hrs there after, and clean wire mesh filter with each oil change.

FUEL SYSTEM: FILTERS & PRIMING

The C100 fuel system includes two filters and an electric switching valve at the dash that controls a spool valve **under the dinette**. In normal operation, there is no owner/operator activity needed other than to inspect the Racor Filters clear glass bowl for water (clear liquid). If water is present, you will need to remove the brass plug under the petcock (typically in finger tight) then drain it into a cup through the petcock at the bottom. The engine has its own fuel filter assembly but this is not typically changed as it is protected by the Racor unit. The engine has a manual fuel pump activation button on its port side fwd near the top. The Racor uses a 30 Micron 500 series diesel filter.

The Fuel Tank Switch is located on the left side of the dash. It is labeled Main and Aux. Main is the engine side of the tank, Aux is the port tank. Select the desired tank by pressing the switch of the desired tank. Typically you will run on one tank for 2 hours and then switch so the tanks drop equally while underway. Each tank holds 40 gallons, with approximately 36 being usable. With full fuel and running at 14Kts, you should have approximately 14 hours of running time. This switch also swaps the engines fuel return lines at the same time.

STARBOARD LAZARETTE



House Batteries 2ea Golf Cart 6Volt Deep cycle, wet lead acid, in series for 12V house supply. 4" water lift muffler to left, drain muffler when stored for winter with ball valve at bottom. Be sure to close after.

Engine start battery G27 (Typically next to propane locker) with the Teliflex SeaStar hydraulic steering ram.

Note: *on Generator boats we double up the start batteries and locate in aft starboard hull for weight and balance issues*.

Note: *Rudder packing should be re-tightened/checked with each oil change every spring.*

PYI Shaft Seal

It is maintenance free and water cooled from the raw water off the engine. This should be inspected with each oil change for leaks. If it is ever removed, it's critical to use new, sharp, cup point set screws with lock-tight and to preload spring to correct tension.

RAW WATER BALL VALVES

There are two raw water valves on the boat. Both are located in the Starboard Lazarette. The smaller valve (1/2”) is for the head and the aft deck wash down. The larger one (1.5”) is for the engine.

Both valves should be left on while running the boat, as closing the valves while running the boat will damage the engine and impellers.

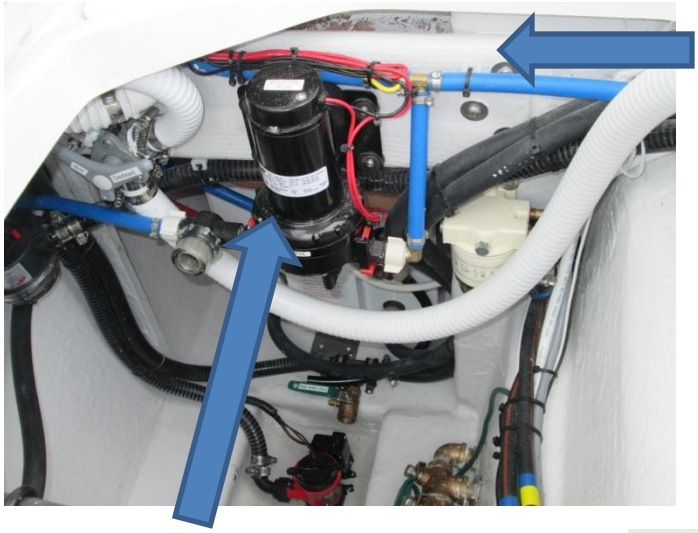
Raw Water Valve OFF

Raw Water Valve On

Engine Cooling Water Ball Valve OFF

Engine Cooling Water ON

PORT LAZARETTE EQUIPMENT



6 Gallon Seaward Hot water heater SS is located in the hull under the port fish well. It runs on 120 V while at dock. Note it draws 1800 watts so you will not be able to run large additional loads while water heater is on. Switch its breaker on only when hot water is needed. While cruising the engines hot water is plumbed through the heater to heat water.

Pressure Water Pump and Strainer: The C100 has two water tanks (24 gallons port side and 26 gallons Starboard side) each has a dedicated pump. The fresh water pump switch is located on the dashes lower DC switch panel. Two tanks are provide so owners can use water to trim the boat port to starboard if needed. Water like fuel is a heavy cargo, top off only if you need it. Water Tanks must be drained and system primed with RV antifreeze during winter storage.

The black water holding tank is a 28-gallon tank. It is equipped with a Wema sensor gauge system located to the right side of the dash. If the tank is full the head will not flush. You must be three miles offshore and in an area with current that will flush to use the macerator switch at the dash. The tank can also be emptied at a pump-out station using the fitting near the transom door. The tank includes two dip tubes so there is no Y-valve to switch.
NOTE: *Shut the boat off to hear the change in tone when the tank is empty. Running the pump dry will damage its rubber impellers.*

PROPANE TANK STORAGE & OPERATION

Propane tank is in the Port Cockpit storage locker. Note: Locker is plumbed with a hose to a through hull overboard so a gas leak would not inter the boat. If you ever smell gas stop-turn off valve and open boat to clear fumes. Find leak.

To use, make sure hose connection is tight, **open valve**, gauge will show approx. 90 Psi. If you hear a hissing or smell gas turn valve off ,check connections w/ soap 50/50 water solution.. 15 pound tank will typically last 2-4 weeks.

Electric shut off valve only comes on if gas controller by sink is on and sniffer smells no gas.

The tank must be centered in compartment to latch lid in place.

TRANSOM

PORT

STARBOARD

THRUSTERS

BOW

STERN

POCKETED PROP, RUDDER & SANDBAR

TRAILER INFO

Aspens Trailer is built by Float On Trailers in Vero Beach Florida. It is a 10,000-12,000 pound capacity aluminum trailer. The minimum tow truck size is ¾ Ton. When the ball weight is set to 6-7% of the towed weight (600-800 pounds) she tows like a dream. Includes a solid winch stand assembly with stair for access while loading. Shown are the optional mag wheels and electric hydraulic breaks (nice for hilly terrain and backing up steep driveways. The design is self centering and loads under power to the winch stand.

Shown is the keel capture and guide pads to center hull as it pulls out of the water. Be sure tires are inflated to within 5 PSI of the recommended capacity. Check bearing and tire temperature with a touch at each fill up. Increased temperature is a sign of bearing problems, low air pressure will heat up the tires.

Shown are the guide bunks. On west coast ramps the tow truck tires will typically be at the waters edge. On east coast ramps which are steeper you will back in less to get the correct depth.

FOLDING THE MAST FOR TRAILERING

While folding, be careful not to lean on the solar panel glass. Rest the support tube carefully on the SS mast, tip in to cockpit, then lift forward to corner for towing.

NOTE: *It is best to close the door before placing support.*

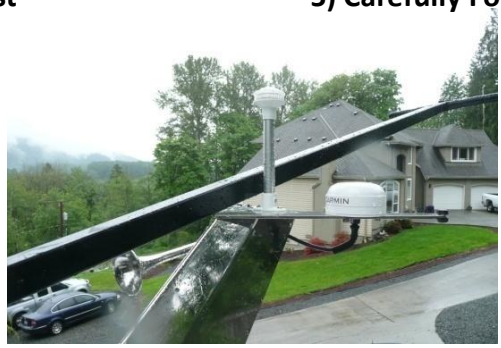
1) Climb onto Hardtop

2) Remove Pin from Mast

3) Get Support Tube Lined Up

4) Insert Pin Back into Mast

5) Carefully Fold Mast Back



6) Done

LIFTING STRAP LOCATION

Note: If the spreader bars are less than 11ft., you will need 24” carpeted 2x6’s just under the gunwales to spread the compression load from the straps and reduce damage to the gunwale rubber.

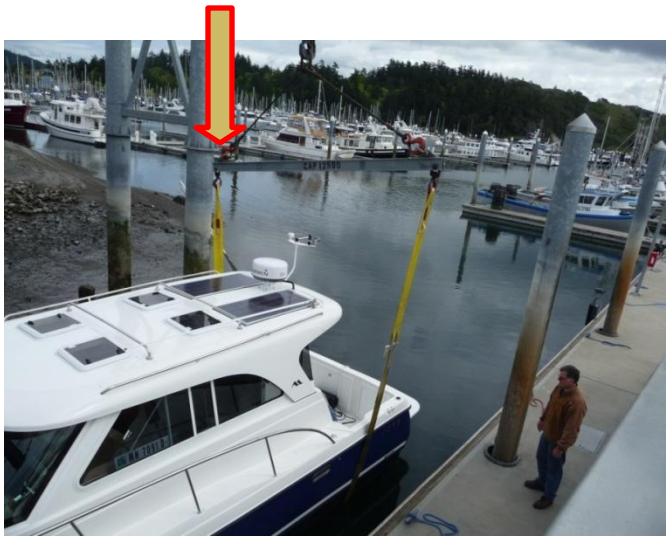
Arrows show location of the lifting straps. On the stern the goal is to lift on the keel (Fiber Glass) about 6” forward of the Stainless Sand Bar. ***Note:*** *Be sure to pre-load the starboard side as tension is brought up by pulling the cross bar down closer to the deck/engine load (approximately 10”.) This will keep the boat level as it lifts*

The forward Sling goes just forward of the port light well clear of the thruster. The cross bar is typically level for the bow. ***Note:*** *If you lift one end at a time to put blocks in to place the straps be sure to block the trailer frame to support it or you will bend the frame. Add pinch pads if necessary.*

BOAT HAULING PROCEDURE

SLINGING THE BOAT

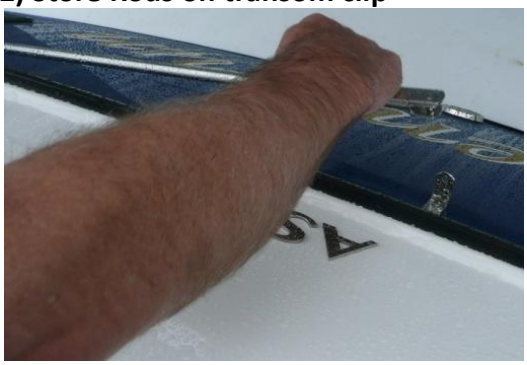
Pre-loading this strap down 12-18”
will lift the boat level.



ZODIAC LAUNCH

1) Un-clip SS support rods

2) Store Rods on transom clip



3) Tip Tender in, leave clipped to boat while mounting motor.

4) Un buckle engine from aft compartment

5) Support Engine on swim step, step into tender and swing engine to tender and secure.

6) When done, rinse engine with hose before storing.

REMOVABLE KICKER BRACKET

Be sure to put the locking pin in the kicker bracket and clamp the motor tight! Find the balance point rudder angle. Once you get it up to speed, lock the tiller clamp and steer the boat from the helm forward.

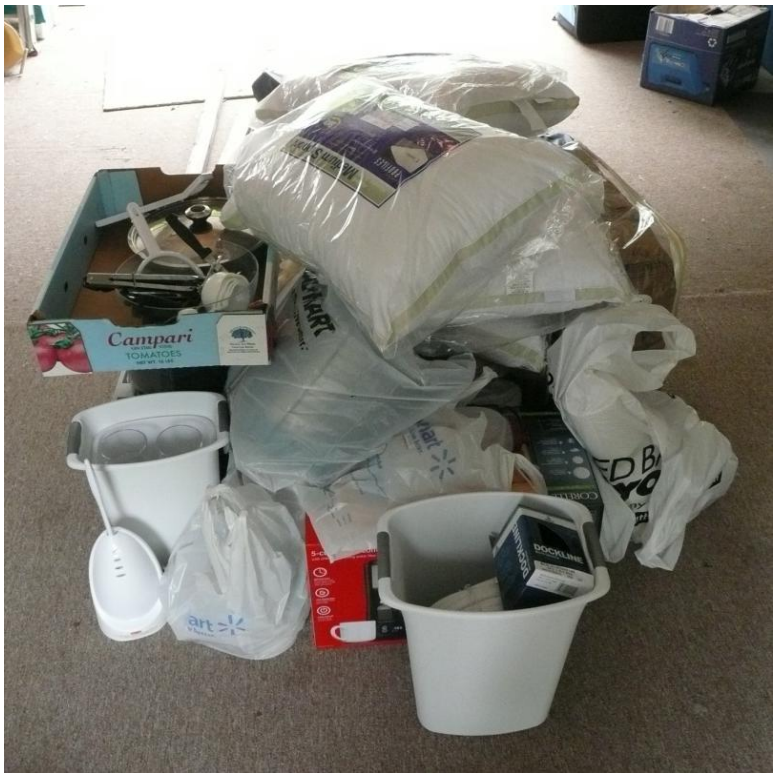
EXTRA DETAILS

Electrical junction box is behind enclosure.

Kayak with ratchet straps and foam pad. Be sure to remove Kayak while towing.

Tender Snubber Ling - used for medium range towing to take wind buffeting out. For long hauls it is best to deflate the tender. The line is also used to help with lower/raise tender.

OUTFITTING YOUR BOAT



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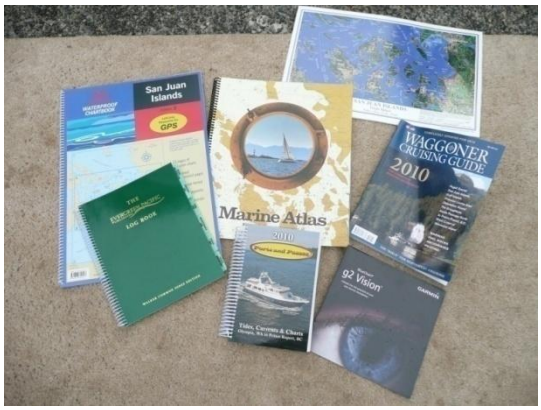

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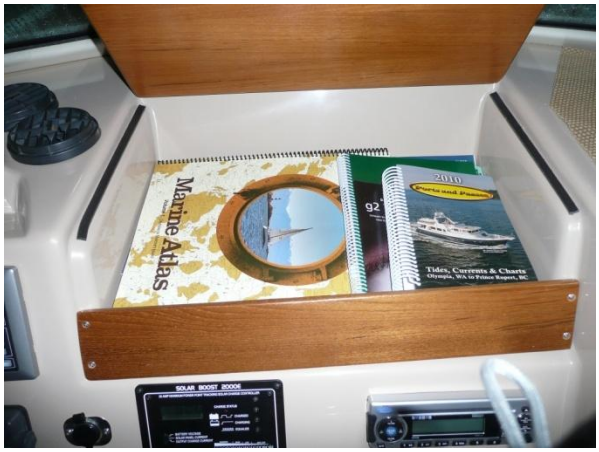

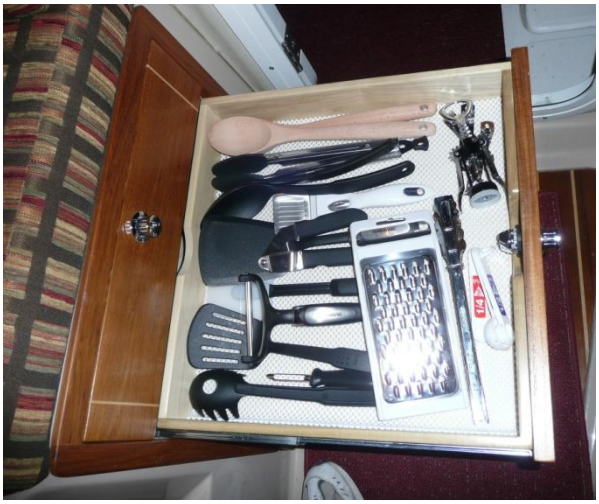

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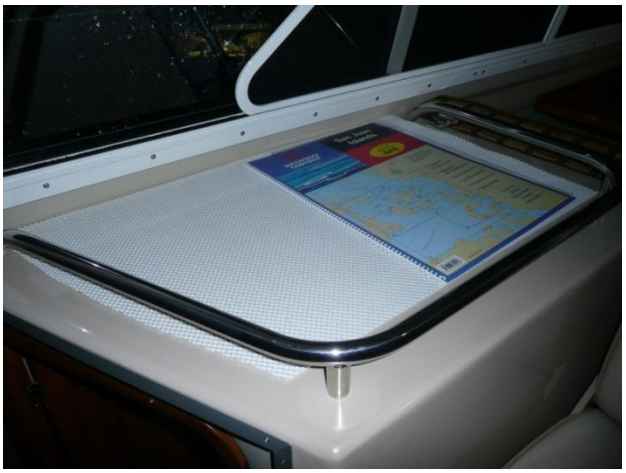


BOAT CLEANING PRODUCTS

Maguire's Marine Boat: Soap with wax keeps boat wax intact, great for gel coat.

BOAT CLEANING PRODUCTS

T-9 Boeshield: This is wonderful for your engine rooms metal parts, all of them, bronze, SS clamps, motor metal parts, battery connections, bonding system connections and kicker motor. Keep away from plastic, and belts. Light re-coat every 6 months. Wipe up any excess while wet.

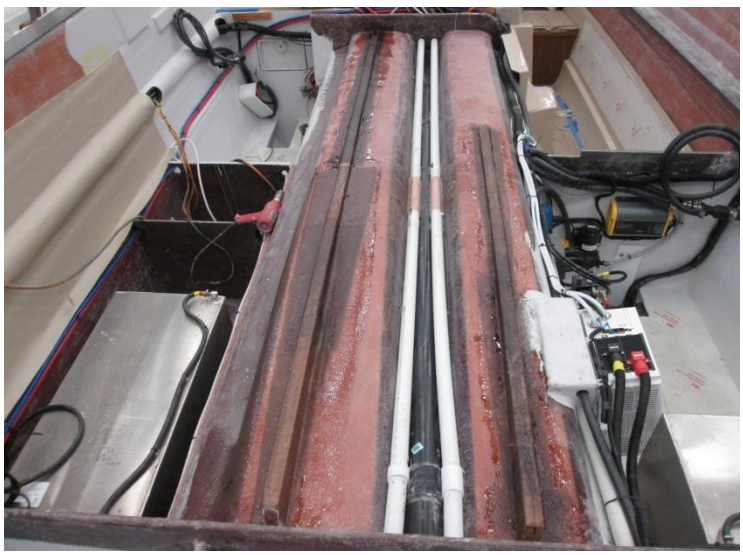
303 Aerospace Protectant: This material is for plastic that's out in the sun, I.E. Vinyl seats, Zodiac boats, recoat every 3 months.

Meguiar's Flagship Wax: This is a premium wax that provides UV protection. Hand wax once per year in Northern climates, twice in southern. Wax both deck and hull. In the south, even the non skid maybe waxed with a brush.

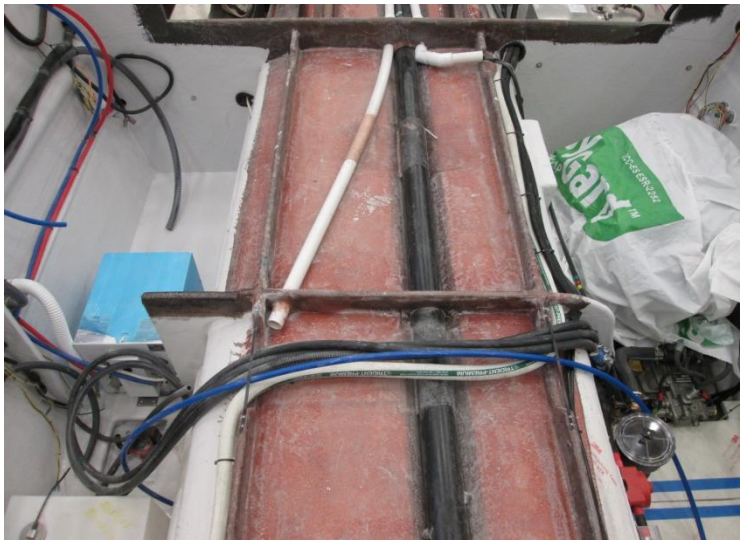
OPEN HULL

BOW

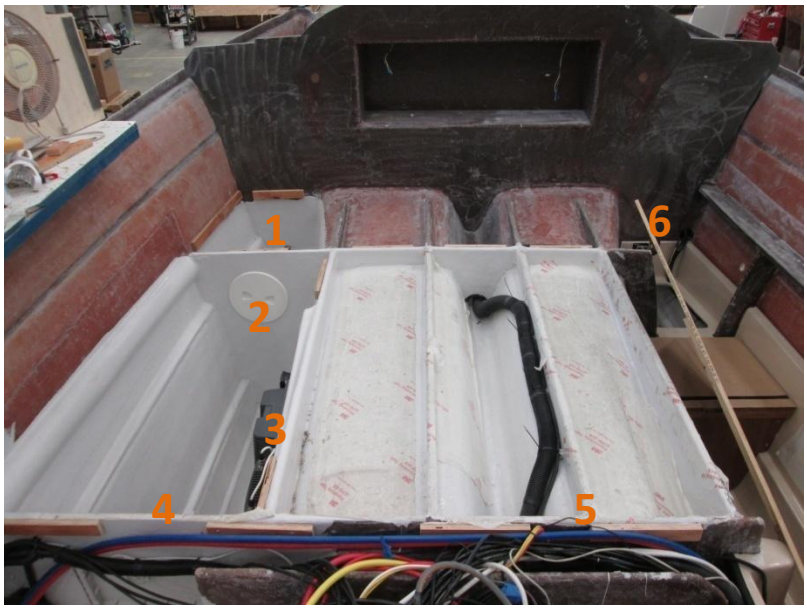
MIDSHIP



STERN



OPEN HULL – PORT BOW



1 **Drain Plug**

2 **Access Hatch**

3 **Optional Garmin Electronics/ Port Compartment Under Bed**

4 **Access Hatch/Bilge Pump**

5 **Optional Garmin Auto Pilot Compass**

6 **Windless Anchor Breaker (Located in Bottom of Hanging Locker)**

OPEN HULL – PORT MIDSHIP

1 **45 gal. Diesel Fuel Tank**

2 **Empty Compartment (Sometimes houses the optional auto pilot pump)**

3 **Compartment contains a Bilge Pump & Transducer**

OPEN HULL – STBRD – MID SHIP

1 **Primary Fuel Filter**

2 **Fuel Tank Selector Valve**

3 **38 gal. Diesel Fuel Tank**

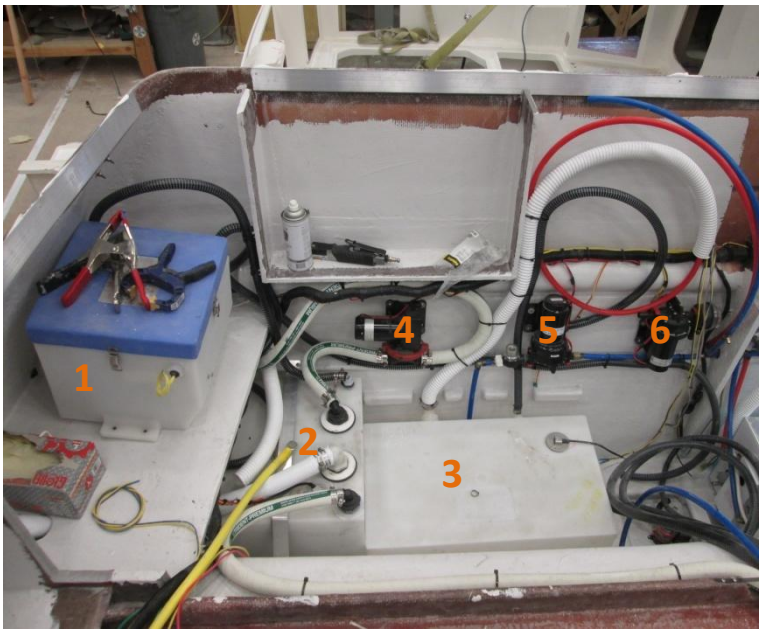
4 **Optional 2000 watt Inverter**

5 **Optional Auto Pilot Pump**

6 **Raw Water Pump for Toilet**

7 **Battery Charger**

OPEN HULL – PORT LAZARETTES



1 **Propane Tank Locker**

2 **28 gal. Waste Tank**

3 **23 gal. Water Tank**

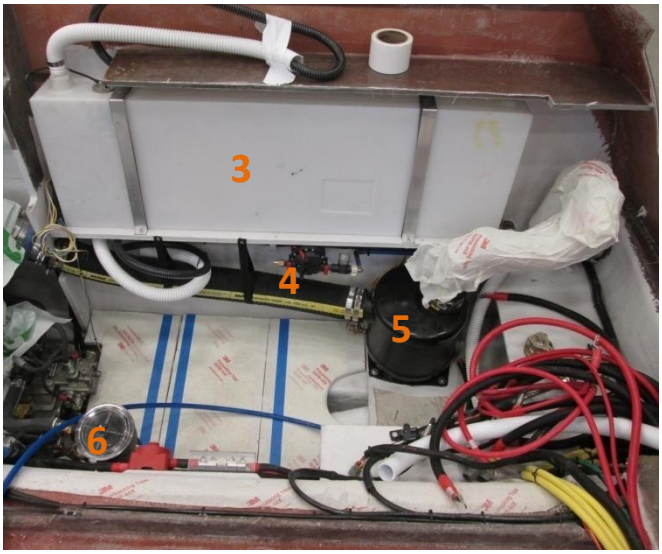
4 **Macerator Pump**

5 **Fresh Water Pump & Strainer**

6 **Raw Water Pump & Strainer**

7 **6 gal. Hot Water Tank**

OPEN HULL – STRBD LAZARETTES



1 **Volvo Penta Engine**

2 **Crash Pump**

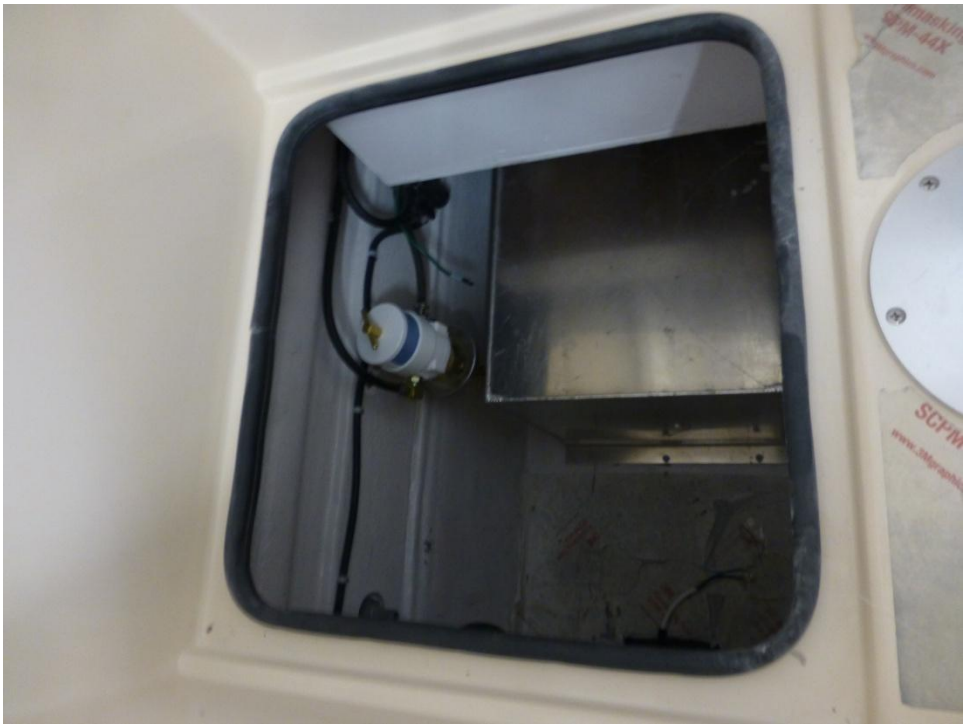
3 **26 gal. Water Tank**

4 **Water Pump**

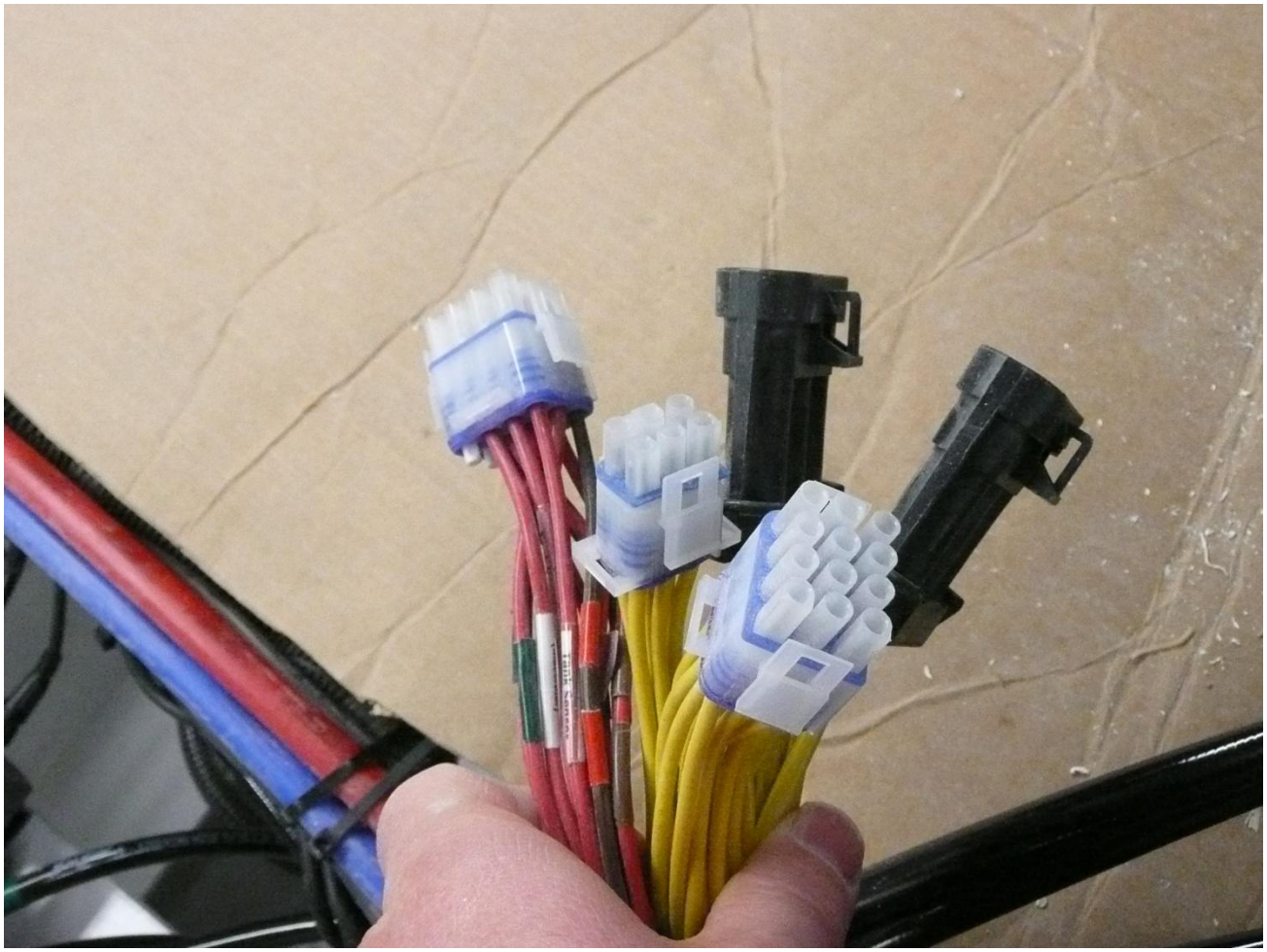
5 **Muffler**

6 **Engine Sea Water Strainer**

ENGINE & STARBOARD FUEL TANK



WATERPROOF PLUGS



TROUBLE SHOOTING

This list is developed from common customer questions.

ELECTRICAL

- **I here beeping but can't figure out from where?** There are about 10 devices on the boat that can beep a warning. Here is a list of the most common and what to do.
  - **Co2 Sensor** under bed overhang– comforter covers it, it's tan colored about 3"x3". Its hard wired to the boats hot float power supply (stays on even when battery switches are off). It will beep if it gets low voltage and keep beeping until power is back up to 12v. To reset it, you have to interrupt its power, either by pulling its fuse behind the dash – wait 10 seconds then reinstall, or pop off the hot float breaker near the battery switches and wait 10 seconds then reset it on. Hot float power is always left on. If you leave it off, the automatic bilge pumps are disabled. This sensor is easily damaged and very sensitive. Acetone fumes – hair spray – some aerosol cleaners will damage the sensitive/rare earth metals inside. If this happens it will need to be replaced. Its sensitivity is amazing. It can go off from a dingy motor or generator 50 ft. away if the port lights are open. If you happen to be having a bad night intestinally, it can also go off. But its job is to keep you safe from invisible carbon monoxide fumes in situations like, if your neighbor runs his generator or furnace all night.
  - **400 watt Inverter** in master is standard, under the dinette as an option. These should normally be turned off when not in use. They beep both with high or low voltage (14.8V+ or 11.0 V low), they also beep if overloaded. It's only 400 watts which is fine for a computer or phone charger, but you will overload and pop its internal fuse if you try a 1800 watt hair dryer.
  - **Electronics** in general and auto pilot, especially, have the same beep horn as the above items. The auto pilot will beep incessantly if you're running a set course and it drops its inbound satellite signal. It wants you to note the loss of signal on the screen. It also beeps if it's lost the heading sensor/gyro compass signal. The gyro compass is mounted under the bed on centerline aft. It's important you do not store electrical things there. Things like vacuum cleaners with DC magnet motors really pull on the heading sensor, destroying its effectiveness.
  - **Stove propane Sensor/Auto shut off Computer.** This device is mounted just under the sink, smells for gas and is also very very sensitive, easily damaged by cleaners. The black unit is in the corner near the floor, under is its sensing unit. To disable, flip the black power switch next to the unit off/down. This will also turn off the computer but also closes the solenoid valve in the propane tank stopping gas flow. It's the most annoying beep.
  - **Engine warnings**. These flash on the engine monitor and also beep on the chart plotter. You will see things like "low coolant level" or "over temp" on the engine in both units. These two are tied together through the NMMA backbone that shares information. Normally, resetting the error/acknowledging it on the Volvo/engine display will reset the chart plotter. If the chart plotter continues with its warning, stop and shut the engine and the chart plotter off. Then restart and turn plotter back on. If the engine is warning you they are not normally false, it's doing what it says and you need to address the issue. If you

are getting warnings, for instance, “water in the fuel” erroneously, this sensor may need to be changed. Once they see water they often do not work well in the future. To reset the whole engine to factory, you can pull the main ECU fuse at the motor near the emergency off button (port side mid motor) But you will have to re-teach the throttles to the engine (single station) and so on, so not my favorite solution. You’ll need the owner’s manual to do this.

– **High water Alarm/Pump**. This alarm is behind the dash, it’s tied to a second high capacity bilge pump (2200Gph most models). This pump is mounted 2” above the first pump in the engine room. If you hear a very loud alarm from behind the dash this is probably it. Do not ignore, go look in the engine room, you have big problems. It’s designed so, should you melt a large pressurized hose or blow one off the engine, it will pump big volumes of water. But you need to fix the problem – shut the engine off, this stops the raw water pump.

- **Battery Chargers**. Your Aspen has two chargers, one 12amp dedicated to the engine start battery and a second 20 amp dedicated to the house battery. On boats with 1,000 or 2,000 watt inverters, they have built-in 80-100 amp chargers for the house battery charging. The most common issue with the battery chargers is the owners plugging in to shore power but forgetting to turn on the boats house breaker, dock breaker or charger outlet breaker. Then they leave the boats systems on, like refrigerator and depart for 1-2 weeks. When they come back they have flattened the house batteries dead. Once they do turn on the chargers nothing happens, it’s still dead. The issue is new computerized chargers need even to sense voltage so the computer can calibrate the charge. No voltage no go, even the engine alternator. So if this happens, you will need to switch on the emergency parallel battery switch for 5-10 minutes. Don’t leave on too long, as it’s very hard on the batteries. One is up at, for example, 10,000 ft. (12.7 volts) and the other is flat at sea level. This big difference puts big stress on the batteries, they try to equalize at warp speed. After 5 minutes the house will typically have enough voltage to be seen by the chargers and they will fill smartly. Note: if you leave the emergency parallel on all the time, you run the risk of having both battery banks dead and no way to start the engine.

- **Inverters 1000** – **2000 watt**. These devices take 12 volt power and step it up to 120Volts and also turn it into a sign wave (AC power). What most people don’t understand is how much energy is in a typical 120 volt outlet and how that compares to 12V power. The formula is: Volts x Amps = Watts. A typical 120V outlet can pull 15 amps or 1,800 watts. 12V outlet at the same 15 amps (max typical) only produces 180 watts. So it would take TEN 12V outlets to run one 1800 watt hair dryer. The second factor in inverters is the size/capacity of the house battery bank where they pull the power. Ours typically run from 2ea 70 amp hour (140amp hr. C90) to 2ea 6V 120amp hour (240 amp Hr C100). So if you’re running a 800 watt micro wave at 120 volts, your burning 66 amps at 12Volts (a lot). In a C100 you could do this for about 2 hrs. before your house bank got down to ½ charge. However, if you start the engine, warm it up and then run it <u>at fast</u> <u>idle while you’re running the inverter,</u> the engines 125 amp alternator will put out approximately 70-80 amps working very much like a generator. Then after you’re done with appliances, the house batteries are at, or still near full charge. These inverters are a “pass through type”, so when you’re hooked to shore power and are switched ON, they feed the shore power automatically through and to the outlets without using 12V battery power.

TROUBLE SHOOTING

- **12Volt central breaker panel**. This panel is the central distribution point for 12 volt ships power. It comes from the house batteries, forward in a finger thick cable through the breakers and then out to the ships switch panels, thrusters and also behind the dash to the four fuse panels, ships systems, electronics, lighting and options. The panel includes an LED display that shows both volts and amps being burned. This panel also lets you toggle from house battery to start battery, to read each voltage. Typically, these will be almost the same voltage as the Blue Seas voltage sensitive relay will be engaged and tying the house and start batteries together. But it's important to understand these breakers must be on to get any of the downstream equipment to work.

- **Voltage Sensitive Relay**. This devise is mounted in the transom (3"x4" black box) opposite the battery switches. Its job it to automatically pair both your house and start batteries together so they can share the work load. It does this up to the point that the engine start battery drops below 12.3 volts (the point where you're sure to have power to start) after this voltage, the (VSR) voltage sensitive relay says nope, house you can't have any more power from us, we're protecting the start battery. This protection only works if the parallel switch is off.

- **Dash DC, left of helm switch panels**. The upper one controls the ships pumps manually, the lower one controls ship equipment like Nav lights, horn, macerator pump, refrigerator and fresh water pump. The fresh water pump toggles left for port pump, center for off, and right for starboard water tank. It's important to know that the panel's plastic cover pops off the panels and reveals a rubber boot that covers individual 12V GM type blade fuses for each device. If the fuse has blown it typically is "not the problem", it's the symptom of a problem at the device. Inspect and identify the device before you put in a new fuse. Going larger is almost always the wrong solution.

MECHANICAL SYSTEMS

- **Ships Hydraulic Steering**. Aspen uses a Teleflex Sea Star steering system made in Richmond, BC. The unit's hydraulic reservoir is filled by removing the rubber cover on top, then the black screw cap on top of helm. The boat ships with a clear hose with the fitting to attach to the bottle and the helm (in owner's manual bag). Once hoses are attached, you tip the bottle up and slowly turn the wheel port, then starboard while burping air out. Be careful not to over fill and have lots of rags nearby; this is a messy process. Also, it typically is low only if there is a leak in the system. It is a clear oil that's hard to see and better to touch. Look for loose fittings. Don't fill to the top it, should be down from the threads about 3/8th inch. The oil expands on warm days and will burp out the breather hole in the cap and make a mess.

- **Macerator Pump**. The macerator is a diaphragm type pump located in the port aft lazarette (black pump with red ring around bellows section). To activate, hold on the spring loaded switch at the dash. The design does not use a lock out key switch as the driver must hold the button to engage and there is no Y valve in the system. We use two dip tubes in the holding tank, one plumbed directly to the suck out fitting and one directly to the macerator. The rules about lockout don't apply as there is no Y valve in the system to position incorrectly. The pump is very robust and can pump amazing things but it does have valves inside that do not like string, diaper wipes, nuts and non RV/Marine toilet paper. Nine out of ten times when they stop, it's due to these things. The pump will have to be disassembled, cleaned out and reassembled.

TROUBLE SHOOTING

- **Windless.** The windless is a Lewmar unit. Use is pretty obvious but few owners give it the respect it deserves. These are very strong geared down motors. Never try to have two people work the anchor at the same time. Keep your fingers and toes well clear of the chain and line, go slow, think. Tap on the control is good, especially when the anchor is nearing the bow roller. Many owners do not realize the motors design includes a cone clutch under the tension cap (wheel that moves) this cap (or knob on some models) can be tightened or loosened, allowing the gear motor to slip a bit, rather than pull with full force. This is especially important as the anchor jams into the bow roller in the up position. It can, when locked tight, pull with 700 to 1,000 pounds of force. This can damage the roller and fiberglass. Spray the motor and anchor chain off with fresh water after long trips. Be sure to hook a bungee cord or safety line to the anchor when not in use. We had one owner who had his anchor deploy at cruising speed (loose clutch).

- **Hatches**. Easy to use but many owners miss the "open just a crack" option. If you look at the area where the handle latches, there are two tabs that protrude. If you open the hatch ¼ Inch and twist the latch, it locks in that position. This is handy, allowing some ventilation while keeping 90% of the water out except in big down pours. If you're latched tight and still getting slight leaking at the gasket, often you can tighten the Philips screw in the handle for extra tension. In some cases, we have also fixed leaks by thinning the handles plastic slightly. If the hatch seems tight yet you're still getting a drip, check the seal around the outside next to the fiberglass. We have, at times, seen the hatch plastic move just a bit with temperature, heating and breaking the seal.

- **Windows and Screens**. Issues here normally have to do with the screens being stiff to move/slide. The core issue is they ride in a vinyl track that has a center open section in the top so they can slide to this area and be lifted out for window cleaning. Owners will get off track a bit while sliding through this area and if they push really hard they bend the plastic and derail the screen. The trick is to go easy and push out a bit while sliding. This plastic can be removed but at times the screen will vibrate annoyingly. The second window issue has to do with overloading the gutter tracks weep holes with heavy seas or boat wash hose. This will cause some dripping inside, typically aft. There is no great fix for this. If we increase the height of the inside track, then the screens can't be removed for cleaning.

- **Engine Raw water Strainer**. This devise protects the engine from sea weed and such getting into the engines cooling system. It's accessed from the Starboard aft engine hatch. Common problems are; A. Owners pull the top off before they turn off the ball valve = wet bilge and lots of excitement. They reinstall the strainer upside down (cone Up) letting debris flow past the mesh without cleaning. The Strainer goes cone down, fitting over the cone at the bottom of the strainer, snug with no slip from side to side. The last area to be careful is with the square O-ring gasket at the top. It is greased with silicone to make assembly easy but it must be pressed in to the gutter all the way around before you push the clear cap back in place and snug the wing nut back on. Note: the wing nut does not have a gasket or O-ring, it fits tight against a machine surface. The VERY IMPORTANT to RE – Open the Ball Valve. Running the engine for even 2 minutes with the valve closed damages the raw water pump (I did this one day).

- **Garmin Electronics.** For set-up instructions, see your Garmin Manual. If you electronics aren't working, it could be a loose plug, the fuse or breaker is off, it's a faulty unit, or it may need an update. You can find updates on the Garmin website, or call their service # for further assistance: **1-800-800-1020**

WINTERIZING YOUR BOAT

1) Drain water tanks, Port & Starboard: Flip on DC breakers, located left side center under glove box. Then push toggle switch for water pump switch (**Left** = port tank, **Right** = starboard tank) and open faucets.

2) Hot Water Heater Drain: Flip open the hot water tank drain (Note: on older boats, open Port Lazarette to access hot water heater) and drain to bilge, then turn on bilge pump to empty over.

3) Put 2-3 gallons of RV antifreeze in each water tank. You will need a funnel with hose attached to get this into the water tank fill as they are horizontal. Then run each pump till red comes out at all faucets.

4) Drain Muffler (it will hold about 2 gallons of salt water): Drain plug is a ¼" black hex bolt on bottom of muffler or ball valve. Once empty, re-silicone plug and reinstall.

5) Engine; Remove raw water feed hose from the strainer, drop it into the bilge and drain. Re-attach/re-seal for the spring. (**Only done on boats being stored out of water**)

6) Pump bilges dry and then vacuum the remaining.

7) Pump head out then pour in 1 gallon RV antifreeze until it touch's pump motor. The Head salt water in-feed line will drain when the boat comes out of the water. Run most of it into the waist tank leaving 2" in the bowl and hose. Open the ball valve on the raw water washdown pump so it can also drain out; freezing water in any of the pumps will damage them**.** Check/drain macerator pump. **(If boat is kept in the water, you need to drain the raw water pick-up manually)**

8) Crank up winch stand so the bow is up. The center hull wave breaker also has a drain plug. With the bow up, this is a good time to check and drain this area, then re-silicone and reinstall the plug now so you don't forget in spring. (**Only done on boats being stored out of water**)

9) Turn off batteries. Coat the battery terminals with boeshield. (**Only done on boats being stored out of water**)

10) Wash Motor with fresh water to spray off any salt. Once dry, coat any metal parts with boeshield, NOT the belts or rubber/plastic parts.

11) Add Fleetgaurd Microbiocide to both Fuel Tanks; an anti-fungal stabilizer per Volvo recommendation.

12) On Cummins motors, pull heat exchanger Zinc (brass hex plug on back side) and check/replace if it's melted. Reinstall snug.

13) Put in some type of heat or dehumidifier. We like a 1500 water boat heater (West Marine $69), set to 400 watts or 600 watts on a thermostat so it keeps the boat about 50 degrees. This will keep the boat dry and not smelling old. Open all doors and compartments for air flow, even under the bed - both compartments.