

Endurance Owner's Notes

Latest Revision: 9/7/2016, Revised davit circuit breaker description/location, pg 28.

Contents

INTRODUCTION.....	3
PREPARING FOR DEPARTURE.....	4
GETTING UNDERWAY.....	8
CRUISING.....	9
RETURNING TO DOCK	10
CONNECTING TO SHORE POWER.....	10
CLOSING THE BOAT (at end of your trip)	11
ELECTRONICS	11
FUEL	13
WATER.....	16
BOAT ELECTRICAL.....	17
HEAD	20
DECK WASH.....	22
GALLEY	22
Stove (Electric tovetop and Oven)	22
Non-stick cookware	23
Refrigerator	23
Microwave	23
HEATING SYSTEMS	23
OTHER SYSTEMS.....	24
Cell Phones.....	24
Barbeque Grill	24
Anchoring Systems.....	25
Stern Tie	26
Mooring Buoy	26

Tender 27

SALON SETTEE CONVERSION TO A BED 29

KEY ITEMS TO REMEMBER 29

INTRODUCTION

Endurance is a 2013 American Tug 395, powered by a Cummins diesel engine, with a HP rating of 480 @ 2600 RPM. It is a pilothouse coastal cruiser and has capacity for 400 gallons of fuel and 150 gallons of water. According to Cummins Northwest, Inc. data, the American Tug 395 provides hours of cruising fun at reasonable speeds with very limited fuel consumption. Optimum slow cruise is 1600 RPM with fuel use of approximately 2.5 gallons per hour with a cruising speed of approximately 8 knots. Optimum fast cruise is 2800 RPM with fuel use of approximately 16 gallons per hour with a cruising speed of approx.. 15 knots.

NOTE: All system operation instructions assume you have appropriate AC and DC circuit breakers powered.

We hope you enjoy cruising with Endurance. Please let us know if you find anything missing or in need of improvement.

While using or reviewing these notes, please feel free to mark corrections, and make suggestions and improvements. Your constructive criticism will be appreciated.

Thank you, Dan and Kristi Fischer (Owners) info@westernstonemt.com 406-261-3756

PLEASE DO NOT HESITATE TO CALL OR EMAIL US WHILE ON YOUR TRIP IF YOU HAVE ANY QUESTIONS ON ANYTHING. We are happy to help and want to do what we can to make your vacation hassle free.

Note: Throughout this manual, red lettering indicates safety items or key operational notes.

Yellow lettering indicates caution.

These notes are prepared for Quick Reference. American Tug, Inc. has provided an operation manual for the 2013 model. Much of the information is taken from the Tug Operator's Manual but has been condensed for quick reference. For more in depth systems information please consult the owner's manuals and component manufacturers' installation/operation manuals that came with the boat. They are large notebooks found in the document cabinet located under the Generator on/off controls in stairway leading from salon to pilot house on the port side.

The Owner's Notes assume that the charter guest/operator is experienced and competent in the safe operation of a 25,000 pound, 40 foot powerboat, and knowledgeable of boating rules and regulations. These notes do not attempt to anticipate every situation or occasion that may arise, and are not a substitute for reading the Owner's Manuals and other informational materials which are located on the boat, or for exercising reasonable care and good judgment in the handling and operation of the boat.

NO WARRANTY IS EXPRESSED OR IMPLIED.

PREPARING FOR DEPARTURE

1. Power and configuration check

- a. The electrical system is divided into two distribution systems: 110-volt AC and 12-volt DC. The systems are controlled from the AC ELECTRICAL PANEL located in the Pilothouse, the DC AUXILIARY PANEL located in the Pilothouse, and the BATTERY SWITCHES also located in the Electrical Panel. When not connected to shore power or generator, batteries are providing all power. Therefore, monitor the use of onboard electricity carefully with your volt meter located on the DC Panel, and turn off electrical devices that are not needed.
- b. For getting underway the settings below are the recommended configuration in most instances:

DC Panel	
Electronics	On
VHF	On
Head	On
Freshwater	On
Macerator Pump	Off
Wipers	On
Lights	On
12 Volt DC Outlets	On
Spare	Off
Anchor Remote	N/A

AC Panel	
Water Heater	On
Heater	Off
Heater 2	Off
Spare	Off
Spare	Off
Inverter	On
Outlets	On
Outlet 2	On
Stove	On

- c. Check DC Voltages using battery bank switch. There are 3 battery banks: Start, House and Generator. Approximate Voltage Battery State:

Voltage	State
12.8	100%
12.4	75%
12.2	60% (time to recharge)*
11.8	25%
11.6	0%

* Note: Running the voltage below 12.2 volts shortens battery life. Should the house batteries discharge to this level, please start the generator or plug into shore power to recharge the batteries.

2. ENGINE ROOM CHECKS (performed daily, before cruising).

At the helm station switch panel, turn ON the Engine Room Lights. Enter the engine room through the port side hatch in the floor in of the pilot house.

- a. **Check the oil level in the engine.** The dip stick (marked yellow) is on the port side of the engine. The oil level on the dipstick should be between the hash marks. **If the oil level is low (below the bottom mark):**
 - i. Add oil from the Delco 400 15/40 SAE, blue plastic jug using the oil funnel located with the spares kits in the starboard side of the engine room.
 - ii. DO NOT OVERFILL THE OIL CAPACITY of the engine. It only takes 1 quart to fill the oil supply from the lower line to the upper line on the dipstick. Oil level should never go above the top mark on the dip stick.
 - iii. When replacing the dip stick ensure it is properly seated. If not seated, oil will spray out making a mess.
- b. **Check the coolant level** of the white plastic recovery reservoir mounted on the forward bulkhead in front of the engine. The reservoir should be between $\frac{1}{4}$ and $\frac{1}{2}$ full. **If the coolant level is low:**
 - i. Add coolant to the recovery reservoir to the appropriate level, being careful not to overfill—the coolant needs an opportunity to expand.
 - ii. The pre-mixed engine coolant is located with the spares kits in the starboard side of the engine room.
- c. **Check the oil level in the generator.** The generator has a diesel engine requiring the same care as the main engine. Open the rectangular panel on the FRONT SIDE of the generator to access the dipstick. The oil level on the dipstick should be within the hatch-marked area on the stick. **If the oil level in the generator is low:**
 - i. Open the OIL FILL to the side of the dipstick.
 - ii. Add oil from the Delco 400 15/40SAE blue plastic jug using the oil funnel located with the spares kits in the starboard side of the engine room. Be careful not to overfill.
- d. **Check the coolant level in the generator.** The generator's diesel engine uses coolant just like the main engine. A plastic coolant recovery reservoir is mounted on the port side of the generator. Visually check that the coolant level shows approximately 2 inches when the engine is cold and 6 inches if hot. **If the coolant level in the generator is low:**
 - i. Add coolant to the recovery reservoir to the appropriate level, being careful not to overfill—the coolant needs an opportunity to expand.
 - ii. Use the pre-mixed engine coolant located in clear plastic bin in the port side of the engine room.

- e. **Check the RACOR fuel filters for water or debris.** Few things you do are as important to your safety on the water as having uncontaminated fuel going to the engine. As you enter the engine room through the port side hatch, look on the aft bulkhead where you will find the RACOR fuel filters. The 2 larger fuel filters on the left are for the main engine. The smaller fuel filter on the right is for the generator. Use a flashlight while performing the following visual checks below.
- i. Make sure both filters are free of debris or water. Look through the glass at the liquid in the bottom of each filter. You don't want to see contaminants or a separation of fluid in the bottom. (Water is heavier than diesel fuel, and will collect at the bottom of the glass bowl if there is water in the fuel.) **IF YOU SEE CONTAMINANTS OR LIQUID SEPARATION**, you want to remove them without removing all the fuel in the glass bowl:
 1. Close the shut-off valve to the specific fuel filter (located under the fuel filter)
 2. Be prepared to catch any fuel from the filter with a small container and some rags.
 3. Remove the plug from the bottom of the drain valve and slowly open the valve to evacuate just the water or contaminants, and then quickly re-tighten the valve and reinstall the safety plug
 4. Open the shut-off valve.
 5. Note: If the engine doesn't start, you may need to prime the fuel system at this time:
 - f. Priming the Fuel System:
 - i. Turn the ignition switch at the helm to the 'ON' position.
 - ii. The fuel priming pump will automatically start and run for approximately 20 seconds
 - iii. Turn off the ignition switch after the pump has stopped.
 - iv. Repeat steps i. through iii. At least one more time.
 - v. **If engine fails to start after repeating 3 times, contact San Juan Charter.**
 - g. Check the fuel filter of the GENERATOR for water or contaminants. **If you see liquid separation or other contaminants**, you need to remove them. Repeat steps 1 through 4 above.
 - h. Ensure the valve on each **RAW WATER THRU-HULL is in the 'open' position** (lever vertical/in-line with the valve).
 - i. Make sure the RAW WATER SEA STRAINERS for the engine and generator are free of debris. If necessary:
 - i. Using a flashlight, visually check to see if that the engine strainer is clear and not plugged with seaweed or debris.
 - ii. To clean the strainer, close the seacock (lever horizontal), unscrew the top with (may require a tool), lift out the basket, swish it back and forth in a bucket filled with clean water, and then reinstall it. There is a red bucket in the lazarette

that can be filled with clean saltwater. Use the bucket to prevent dropping it overboard!

iii. Replace the screen and secure the cap and tighten by hand only.

j. REOPEN THE SEACOCK!!

i. Make sure that the seawater strainer for the generator is free of seaweed or debris. Use the same procedure as above. It is a smaller unit similar to the engine strainer and is located on the left side (facing aft) of the generator.

ii. Remember to REOPEN THE SEACOCK!!

k. Complete a visual check of the engine room for leaking oil, fuel, or coolant, loose items that should be secured, or anything unusual.

l. When you have completed the engine room checks, turn off the engine room lights at the helm station switch panel. Failure to do so may needlessly deplete the batteries.

3. DISCONNECT SHORE POWER

a. At the main breaker panel, turn OFF the main AC gang breaker labeled SHORE POWER.

b. On the dock, first turn OFF the shore power circuit breaker at the pedestal, and then disconnect the white electrical cord from the dock power.

c. On the boat, disconnect the white electrical cord. Coil the cord and store in the cockpit lazarette

Caution: *To avoid handling and moving a LIVE cord, always first DISCONNECT from the SHORE-END first. Conversely when connecting to shore power always CONNECT the BOAT-END first!*

4. **CLOSE ALL PORT HOLES AND HATCHES** that might permit water to enter the interior, especially during rough seas and windy conditions.

5. CHECK AROUND THE BOAT

Review the exterior area around the hull to confirm that there are no obstacles in the water or loose items that should be secured.

6. HELM CHECKLIST

a. Check the fuel level in both the port and starboard fuel tanks using the Tank Monitor Panel located on the port side of the helm station. Note that the tanks should be full on the first day of your charter. See fueling instructions below if fuel is needed.

Note: The Tank Monitor is not 100% accurate; please use the reported fuel levels as approximate. If on an extended trip, the site gages in the Tank Room provide a more accurate measure of fuel level when these can be used. After roughly 90 gallons of fuel has been drawn down, the fuel level will then be below that of the top of the sight gage.

b. Check the water level using the Tank Monitor Panel located on the port side of the helm station. See instructions below for adding water, if necessary.

c. On the 12V DC Breaker Panel, turn on the "Electronics" breaker switch. This switch automatically turns on your Simrad Boat Speed and Depth Finder (this is also the only way to turn off the Simrad Boat Speed and Depth Finder Displays). Start up the two

Simrad Chartplotters by pressing the red power buttons until the display comes on. When the warning screen appears touch "I agree".

- d. To adjust the brightness of the chartplotter screens, press the power button quickly, the brightness control will appear on touch screen. Touch and slide to desired brightness. Then press the "X" to return to the main screen..
- e. Power on the Simrad VHF radio:
 - i. Check the weather channel (Channel 4)
 - ii. Turn to Channel 16 to monitor the hailing channel.

GETTING UNDERWAY

1. Make sure that the **shift lever is in the neutral position.**
2. **Turn the key clockwise to pre-heat the engine.** (about 30 seconds). Until Smartcraft Vessel View Turns On.
3. When preheating is complete, push the "start button" or turn the ignition key to start position to start the engine. Note: "Do not crank engine for more than 10 seconds. Wait 2 minutes to allow the starter motor to cool down before restart attempt. If the engine does not start within 3 attempts, do not continue. Many things could prevent the engine from starting, but over cranking the engine will eventually cause the exhaust system to fill up with sea water and engine damage will result.
4. **Once engine starts check that cooling water is coming out the engine exhaust.** (Starboard aft side). If no water flow is visible, check in the engine room to see that the seawater intake seacock is open!)
5. During warm-up at idle, activate the Throttle Only switch. The Neutral LED will illuminate. You can now increase engine RPM to about 800 which will smooth out the engine vibrations during idle. Once the engine has reach 100 deg, (about 5 min) back down the throttle to 600 RPM and hit the Throttle Only switch again (Neutral only LED extinguishes). Observe the readings of the gauges. The oil pressure will register about 50-60 PSI. The engine temperature should rise slowly.

Note -- If oil pressure is low, shut down engine, and inspect engine compartment and look for possible cause (for example, loss of oil.) Caution -- If the engine is overheating or there is lack of raw water expelled in the engine idle exhaust stop the engine immediately. Recheck the raw water-cooling system to ensure the seacock is 'open' (handle in-line with valve). Next, check the raw water strainer for debris. Remove the strainer, clean, re-assemble, and reopen the raw water intake valve (seacock). Restart the engine and re-check water flow from the exhaust. If water is not flowing properly, the RAW WATER PUMP may need to be serviced. Seek help.

6. **Turn on the bow and stern thrusters** by pushing the 2 ON buttons simultaneously. The light between the buttons will come on. Toggle the joysticks momentarily in both directions to ascertain that the thrusters are functioning properly.
 - a. The thrusters are used primarily in maneuvering at or near the dock. In open water while underway, the thruster is not effective.
 - b. The thrusters will turn off automatically after a period of non-use. Restart in the same manner.
 - c. The thrusters may overheat and stop after 3 minutes of continuous running. After a brief cool-down period, they will reset.
 - d. If the stern thruster is inoperative, check the large red, push button shut off switch located in the aft section of the Tank Room on the starboard side (Tank Room is under the hatch in the main salon).
7. Bring up rudder indicator in the Simrad Autopilot display. Set rudder to neutral position.
8. Check wind and current directions.
9. Use the thrusters to control the movement of the bow and stern while operating the throttle in short applications of forward or reverse, pausing in neutral, as you maneuver in the marina.

Note: when using reverse, the STERN WALKS TO STARBOARD.

CRUISING

1. When clear of the marina, make sure all mooring lines, fenders and anything loose are stowed. Operate the engine at 1000 rpm for warm up. (5min.)
2. After a 5 min. warm up operate the engine no faster than 1400 rpm until the coolant temperature reaches 140 degrees.
3. Ideal slow cruising speed is achieved by operating between 1600 to 1800 RPM viewed on your Smart Craft Display. Long term operating at slower than 1600 RPM is not advisable by the manufacturer and will lead to premature engine component failure. However, short term operation while entering and leaving harbors and anchorages and in No Wake Zones is standard operating procedure and completely fine.
4. Ideal fast cruising speed is achieved by operating between 2400 to 2800 RPM viewed on your Smart Craft Display. Long term operating at higher than 2800 RPM is not advisable by the manufacturer and will lead to premature engine component failure. However, at any time when more speed is needed for short periods of time, it is acceptable to increase RPM as needed.
5. Please make power changes slowly, rapid power changes can put great stress on engine and drive components.
6. Monitor the engine instruments at the helm station while cruising.
 - a. Volts should read between 13 and 14 at normal cruising.
 - b. Water temperature should be between 160 and 180 degrees.

- c. Oil pressure should range between 30 and 100 depending on RPMs.

RETURNING TO DOCK

7. **Insure you have fenders out and mooring lines prepared:**
 - a. On docking side of the boat, (starboard side is most convenient).
 - b. At appropriate level for the dock.
8. **Turn on the bow and stern thrusters** by pushing the 2 ON buttons simultaneously. The light between the buttons will come on. Toggle the joysticks momentarily in both directions to ascertain that the thrusters are functioning properly.
9. The engine cool down period (the last 5 minutes) should be at slow speeds to allow the engine to cool down before shut off.
10. Once docked and the mooring lines are secure, turn off the engine.
11. Shut down all electronics
12. Please re-place the screen covers on all the screens as direct sunlight can damage them.
13. At the DC POWER breaker panel next to the helm station turn OFF breakers on labeled VHF, and Electronics.

CONNECTING TO SHORE POWER

1. At the electrical distribution panel, make sure the AC gang circuit breaker marked SHORE POWER is in the OFF position.
2. Take the white electrical cord located in the propane locker in the cockpit and connect it to the receptacle located in the port side stern area. Line up the prongs, insert the plug, turn, and tighten.
3. Locate the power supply on the dock; making sure that the breaker on the dock is in the OFF position. The white electrical cord is 30 amps. Check the amps for the shore power pedestal on the dock, and use an appropriate adapter, if necessary. Connect the electrical cord to the dock power source, matching prongs, twisting, and tightening. Then turn the dock power source ON.
4. Return to the boat and 1st verify the reverse polarity indicator is not illuminated. Then turn the AC SHORE POWER circuit breaker to the ON position.
5. Verify that you have power to the main electrical distribution panel by looking at the AC voltage gauge on the SHORE POWER distribution panel.
6. Insure that the Inverter circuit breaker is turn on to allow the battery charger to engage if necessary. Other AC breakers may be turned on as desired.

NOTE: 30-amps of power may not be sufficient to run all the ships systems if the batteries have been discharged. The inverter/charger will draw large amperage to charge up the batteries and may cause the dock power to disconnect. If the load exceeds 30 amps, the breaker will activate. If this occurs, turn off any non-essential systems (e.g. water heater, electric heaters, etc) until your use of amps drop. This procedure will be even more important if you are limited to 20 or 15 amp dockside power, which is common at smaller marinas in Canada. Remember to recheck that AC power is still connected after 10 minutes, if not reduce the load more. The most important thing is to keep the batteries charged and not let them fall below 12.2 volts. As the charge level comes up the inverter/charger will draw less power and enable you to turn on other systems like the water heater and / or electric heaters.

NOTE: Any time you are connected to shore power, be sure to turn the inverter **OFF** (green LED light not illuminated) on the Magnum control panel (port side of helm station table). Failure to do so could rapidly discharge the batteries should the dock side power fail. Should this occur, the inverter will attempt to run the entire electrical load.

CLOSING THE BOAT (AT END OF YOUR TRIP)

1. Close windows and hatches. Close the shades on master and guest stateroom deck hatches and on the salon windows (To prevent sun damage to the interior).
2. At the Magnum Control Panel, make sure the Inverter is OFF and the display is showing Batteries are Charging.
3. At the DC POWER distribution panel
 - a. Leave the DC POWER circuit breakers ON.
 - b. Turn off the water heater breaker on the A/C panel.
4. Lock the doors.
5. On the dock, check the position of all fenders and see that mooring lines are secure.

ELECTRONICS

1. Simrad touch screen Chart-plotter, Depth Finder, Radar, and GPS Auto Pilot.

Endurance is equipped with the latest Simrad electronic equipment with built in Insight cartography and installed with highly-detailed Navionics marine cartography of the San Juan's to the Broughton's. Advanced features include:

- a. Navigational support for storing routes, way points, favorite locations and tracks
- b. Built in information on marine services and facilities
- c. Man overboard feature

It is a wonderful tool and confidence builder and should be used in conjunction with paper charts. Routinely, we operate with 2 map displays open. One window will be zoomed

in for in for more detail; the other window will be zoomed out for a bigger picture of the area being navigated. Your check-out skipper will show you the basics on the chart plotter. Use the manual for more detailed functions.

2. Entertainment Package

Endurance is equipped with an entertainment package consisting of:

- A Fusion Marine DVD Stereo system w/ Bluetooth capability
- An LG TV

The Fusion DVD Stereo system is mounted on the port side in the salon above the dinette. It has a very user friendly interface and all functions are easily accessible from the front control panel. There is also a remote control which provides handy access and management of the systems features. The system provides over the air access to AM/FM radio stations, a DVD/CD player for use with music or video content, true integration for iPods.

To use the Fusion system, the “lights” breaker switch on the DC Panel must be turned on.

The manual which describes all operations is found in the documentation cabinet which is in the top of the Galley to Pilot house steps, port side, under the Generator On/Off controls.

- a. Radio:
 - i. To listening to the radio, select the antenna source and tune to your radio station of preference.
- b. iPod/iPhone/any Bluetooth Capable Device
 - i. Uses Bluetooth to “pair” with your device (make sure your devices’ Bluetooth setting is turned on). Only one device can be paired at a time so if a new device tries to pair, the previous devices’ Bluetooth must be turned OFF.
 - ii. Turn the Power button to turn on the Fusion Marine Stereo, the “Bluetooth” is always on automatically when the Fusion stereo system is turned on and will display on your device as “Fusion MS-BT100. Once attached, select the I Pod function on the front panel; iPod control is provided through the front panel of the Fusion console.
- c. CD
 - i. There is a black rubbery button on the top of the Fusion console. Depressing this button firmly while pulling downward and outward will allow the front panel of the console to open and swing down revealing a CD access slot and the eject button.
 - ii. Insert CD into the slot and select the “disk” icon source on the front panel of the console.
 - iii. Hit play.
- d. Watching a DVD
 - i. Carefully pull down the hidden TV entertainment center located immediately above the sink in the salon.

- ii. Turn on the LG TV using the remote control and select HDMI 1 as the source video input.
 - iii. Next follow the same procedure as in c) above to insert a DVD disc into the Fusion DVD Stereo unit.
 - iv. Hit play and the DVD will start; audio for the DVD is now available over the speaker system for the Fusion Stereo unit.
- e. Television
- i. First insure the Outlet circuit breakers have been turned out (AC panel). If not plugged into shore power, the Inverter must also be turned on at the Magnum control panel.
 - ii. Carefully pull down the hidden TV entertainment center located immediately above the sink in the salon.
 - iii. Turn on the LG TV using the remote control and select TV as the source video input. You can now tune to off the air channels that may be accessible. Note that unless you are close to a major city/broadcast center, channels may not be available.

3. Simrad VHF Radio and VHF Handheld

The Operations manual can be found the Simrad Black Canvas Envelope in the port side document cabinet at the top of the stairs below the generator controls.

It is recommended that mariners monitor channel 16 while underway. Weather updates are found on channel 4.

The handheld unit is both a backup to the primary Simrad unit, and if needed when operating the dinghy to stay in touch with Endurance. The unit is stored in the pull out drawer on the Starboard side of the steps between the salon and the pilot house.

FUEL

Endurance has two (2) diesel fuel tanks located on the port and starboard sides of the tank room, under the salon. Each fuel tank holds 200 gallons.

1. Managing Fuel Consumption and Monitoring Fuel Levels

Endurance fuel tanks will be full upon your departure. Unless extended cruising is expected, you shouldn't have to worry about how much fuel is onboard. However, it is a good practice to measure fuel usage on a daily basis to track your overall consumption. Following are the procedures for measuring fuel level as well as daily tracking of fuel consumption:

Measuring Fuel Level:

- a. The most accurate means to measure fuel levels is through the sight gages installed on each fuel tank. The fuel tanks are located in the "tank locker" which is accessible under the hatch door in the main salon. Each fuel tank has a sight gauge mounted on the aft

portion of the tank. Turn on the engine room lights when checking these gauge levels. A flashlight may be useful as well. Should the fuel level be below the bottom of the sight gauges, it is time to add fuel!

- b. Fuel level can also be measured at the monitoring panel. This method of monitoring fuel is fine in most situations, but the levels are just approximate and may fluctuate. The Monitor Panel located on the port side of the helm station. Turn the monitoring panel on and push 4=Port Fuel or 5=Starboard Fuel. The LCD display also provides a visual indicator of fuel remaining.

2. FILLING THE FUEL TANKS

Fuel should be added as needed on extended cruise and/or upon return to the fuel dock in Squalicum harbor at the end of your journey.

Note: The “deck key” to open the filler ports is located in the lift-up helm table located port side in pilot station. OPEN FILLER CAP(S) located on the port and starboard side decks just forward of the cockpit (push down on the filler cap, which will pop up, and can be twisted off by hand). On the starboard side the water filler cap is next to the diesel fill cap.

- i. **MAKE SURE YOU HAVE THE RIGHT FUEL! → DIESEL! DIESEL! DIESEL!**
- ii. **MAKE SURE IT IS GOING INTO THE RIGHT DECK FILL! DOUBLE-CHECK!**
- iii. **DO NOT FILL STARBOARD SIDE FUEL AND WATER AT THE SAME TIME!!
CROSS CONTAMINATION IS VERY LIKELY**

- b. Before pumping, have an oil/fuel sorbs handy to soak up spilled fuel. You should have a rough idea of the number of gallons you will need if you have been monitoring engine hours and fuel consumption on a daily basis. It is also a good idea to have someone watch the port and starboard sight glasses on the tanks (located under the hatch in the salon) as each tank is filled (do not rely on the tank monitoring gage in the pilothouse. It may not be accurate).
- c. Before you start to fuel, make sure the engine is shut down, the furnace is off, and all ignition materials have been extinguished. Everyone except the person monitoring the starboard sight should be off the boat.
- d. Place the DIESEL nozzle into the tank opening, pump slowly and evenly, and note the sound of the fuel flow. Pumping too fast may not allow enough time for air to escape, which may result in spouting from the tank opening. As the tank fills, the sound will rise in pitch or gurgle. Pay attention to the TANK OVERFLOW VENT on the outside of the hull near the tank opening. The sound may indicate that the tank is nearly full. Note: Port and Starboard tanks are interconnected, but must be filled independently because the exchange flow between the tanks is too slow. **Top off carefully AND VERY SLOWLY, and be prepared to catch spilled fuel.** Spillage may result in a nasty fine from law enforcement.
- e. When fueling is complete, remove the nozzle from the fill port, **immediately screw the fill cap back in place to ensure no contaminants get into the tank.** Use the same procedure for the opposite fuel tank Wash hands with soap and water thoroughly.

3. SERVICING THE FUEL FILTERS

Few things you do are as important to your safety on the water as having uncontaminated fuel going to the engine! Endurance is equipped with 2 RACOR fuel filters located in the engine room on the port side. Only one RACOR fuel filter is used at a time. The one currently being used has the arrow on the handle in the center of the two filters pointing towards the one in use. A vacuum/pressure gauge is read near the top of the filters. **AT any time, you can switch from the fuel filter currently in use to the backup fuel filter by simply turning the handle 180 degrees so it is pointing towards the new filter.**

The process described below to completely swap out and install a new fuel filter into the canister only needs to be done once you have reached a safe port so that you then have a new backup fuel filter at the ready.

- a. Check the fuel filter which is currently in use (the one which has the arrow on the handle pointing towards it) for contaminants or water as part of the pre-cruising engine room check. If there are contaminants or a separation of fluid in the bottom of the glass collection containers, they should be drained of the contaminants:
 - i. Close the shut-off valve to the specific fuel filter
 - ii. Be prepared to catch any fuel from the filter with a small container (there is a coffee can and some rags located next to the generator).
 - iii. Remove the plug from the bottom of the drain valve and slowly open the valve to evacuate just the water or contaminants, and then quickly re-tighten the valve and reinstall the safety plug.
 - iv. Open the shut-off valve.
 - v. Note: If the engine doesn't start, you may need to prime the fuel system at this time:

TO CHANGE THE FILTER ELEMENT:

1. The replacement RACOR 10-micron filters are located in the clear plastic bins in the starboard side engine room. Labeled SPAREPARTS, AND FILTERS
2. Close the shut-off valve to the specific fuel filter
3. Unscrew and remove the lid to the filter housing
4. Slowly remove the filter element from the top of the housing.
5. Slowly insert the replacement element and replace the lid and tighten the T-handle (hand tight only).
6. Open the shut-off valve.
7. Start the engine and check for leaks. Correct any leaks with the engine off.
8. You may need to prime the fuel system at this time.

WATER

There is a 150 gallon fresh water tank on Endurance. The tank is located in the aft section of the tank room. The tank room is accessed through the hatch door in floor of the salon.

1. CHECKING THE WATER LEVEL/Refilling Water Tank

- a. **Observe the water** level by use of the tank monitoring system on the gauge above the Navigation Table in the Pilothouse (the same gauge used for monitoring fuel, water and waste) and/or by the sight glass on the tank (located under the hatch in the Salon) which is more accurate.
- b. To refill the tank,
 - i. Remove the WATER CAP located on the starboard side deck just forward of the cockpit (push down on the cap, which will pop up, and can be twisted off by hand). Avoid flushing debris from the deck into the tank opening. **DO NOT FILL WATER AND DIESEL AT THE SAME TIME!**
 - ii. Connect the White with Blue stripe, fresh water hose (located in the propane locker in the cockpit) to the domestic water supply at the dock. It is equipped with an attached charcoal filter to insure water is filtered before entering tank. Let the water run through the hose (overboard) for a minute or two to wash any contaminated water from the hose. **DO NOT USE THE HOSE AT THE DOCK TO FILL THE WATER TANK—YOU DON'T KNOW WHERE IT HAS BEEN.**
 - iii. Fill until the filling sound starts to increase or water comes out the Vent/overflow on the hull just below the deck fill.
 - iv. Tighten the deck plate and re-stow the clean water hose in the propane locker screwing the two ends together to keep contaminants out.

2. HOT WATER Tank

The HOT WATER HEATER has an 11 gallon capacity tank and is available when connected to shore power, the generator or via a heat exchanger with the engine when underway. To use on shore power or with the generator in operation, flip on the water heater circuit breaker on the AC electrical panel. **Do not use the water heater if the water tank level is very low.** The water heater tank is located in the port-side engine room.

3. Shower

Before taking a SHOWER, make sure the shower sump breaker is on. The breaker is located in the pilot house, on the starboard side of the overhead plane. All other sump pumps should remain on at all times.

It generally a good idea to take short “boat showers”. To keep shower tidy wipe down the shower stall and floor. Check for accumulation of hair in the shower and sink drains. An optional hand-held FRESH WATER SHOWER is located in the cockpit. Ensure that the faucets and nozzle are completely off after use.

Note: Should the shower begin to drain slowly, it is probably because the filter in shower sump reservoir has become clogged. The shower sump is located beneath the hatch just outside the bathroom. There is a plastic enclosure covering the sump. It can be easily removed (6 snaps) and the sump and filter and cleaned. Please be sure the filter is replaced and secure before reassembly.

BOAT ELECTRICAL

The electrical system is divided into two distribution systems: 110-volt AC and 12-volt DC. The electrical panels controlling each of these systems are located behind the smoked Plexiglas door in the pilot house.

When not connected to shore power or generator, batteries are providing all power. Therefore, monitor the use of onboard electricity carefully with your volt meter located on the DC Panel, and turn off electrical devices that are not needed. Note: switches controlling the batteries are located in the same panel.

1. 110-Volt AC System

SHORE POWER supports all AC equipment and receptacles on board, as well as the inverter/battery charger.

To connect to shore power, plug the 30 amp POWER CORD into the boat and then into the dock receptacle. Check the power rating/plug size of the nearest dock receptacle (that is 30 amp, 20 amp, or 15 amp). If Dock power is 20 or 15 amp, use the appropriate adapter stored in the starboard side drawer under the starboard side helm seat.

Turn the dock power breaker on. Cords coming off the bow can be wrapped loosely around the bow line.

At the ELECTRICAL PANEL in the Pilothouse, flip the SHORE CIRCUIT BREAKER on (note that there is a sliding protector to insure that the panel can be energized by either shore power or generator, but not both). Check for reverse polarity. Then turn on appropriate breakers for battery charger, water heater, outlets. Watch your amp meter for load. If the load exceeds 30 amps, the breaker will pop. If this occurs, turn off any non-essential systems (e.g. water heater or space heaters) until your use of amps drop.

All outlets on board are controlled via the 3 circuit breakers in the Auxiliary AC Panel (Outlets, Outlets 2). Should any outlets fail to work, check your GFIs (one in the kitchen and one in the head) to make sure that they have not been tripped.

2. Generator

Endurance has a 6KW Northern Lights generator. You will likely not need to use it as long as you are connected to shore power. When not connected to shore power, you will need to use the generator for operating the stove and oven. If you haven't ran the engine several hours a day,

you will need to run the generator to Recharge the house batteries. To start your GENERATOR, first check that your generator's fluids are topped off and the raw water intake is open. The generator controls are located on the forward bulkhead in the Salon on the port side of the steps to the helm station.

Before starting the generator, make sure you have performed the pre-start checklist .

At the control panel, push and hold the rocker switch to pre-heat the generator for 15 seconds. While continuing to hold down the pre-heat rocker switch, push the start button. The engine should start.

Let the generator warm up for about two minutes, and then at the AC control panel, move the sliding protector up and energize the generator power breaker. Then turn on AC systems (stove, oven, air conditioning, microwave) as you would on shore power one system at a time. Monitor your current usage.

To turn the generator off, first take off the load by turning off stove/oven, air conditioning, microwave. Let the generator idle for 2 minutes, before killing it by pressing generator switch in the Salon down to "off" until it dies.

3. 12-volt System (DC System and Battery System)

Three battery banks support 12-volt DC power: 1) Main Engine start battery 2) house battery bank 3) generator start battery

The BATTERY SWITCHES are located in the DC/AC control panel behind the charcoal plexiglass door in the helm station. The "DC Main" toggle switch is normally left in the "On" position and supplies power to the DC Panel.

The switch below the DC Main is the "Starting Battery Switch" for the Main Engine. It is normally left in the "On" position unless there should be a fire in the engine room or a battery problem. **Except in an emergency, do not change this switch while the engine is running.** Alternator damage will result.

The "Battery Parallel" switch is normally left in the "Off" position. This switch should only be used to combine the Main Engine Start and House Batteries as a last recourse to provide additional cranking power to start the Main Engine. To the right is the "Constant 12 Volt Breaker". This breaker provides power to the Fuse Block located under the console in the Pilothouse, which supplies power to the Bilge Pumps, Propane Sniffer Systems, Tank Monitor Panel and Defroster. **It should be left in the "On" position at all times.**

House Battery Bank: Two AGM 4D batteries supply House Power. The 12 volt panel shows all the systems supported by the House Battery Bank with the exception of those on the Constant 12 Volt Breaker mentioned above. This includes the Engine Room lights, wash-down pump, and Navigation Lights (all controlled with rocker switches at the console), the Inverter and the Diesel Heater, bilge pumps, CO Detector and Propane Sniffer. Primarily you will be turning on the

panel breakers for your lights, water pressure, electronics, autopilot, refrigerator, toilet, wipers and 12 Volt outlets.

Console rocker switches for the Bilge pumps should always be left on.

Main Engine Start Battery: An AGM 4D battery provides power to start the Main Engine. In addition, it is used to power the Bow Thruster via a 400 Amp Thruster Fuse and the Anchor Windlass via a 125 Amp Fuse. **The Engine should always be running when operating the Bow Thruster or Windlass to avoid depleting the start battery.**

Generator Start Battery: A Group 24 battery supplies power to start the Generator.

4. Inverter/Battery Charger

Endurance is equipped with combined Inverter/Battery Charger unit which is controlled by the Magnum control panel located on the port side of the helm station.

When connected to shore power or when the generator is running AND the inverter circuit breaker in ON, the unit acts as a charger for all of Endurance's batteries. When disconnected from these AC power sources, the units' Inverter converts DC battery power to AC power to supply all AC outlets on board with 110V AC. Note: The inverter does not provide AC power to the water heater or the electrical heating units.

The inverter's power source is the DC house batteries located under the hatch in the Salon. The quantity of DC power is limited to the capacity of these batteries. Therefore, running hair dryers, toaster, coffeepots, etc. and will quickly discharge the house/inverter batteries. Use these items VERY SPARINGLY! Monitor your battery usage very carefully! Also, note that the inverter has a 2,000 watt capacity governing maximum connected load.

The Magnum INVERTER control panel has a display which is useful for monitoring the status of the battery charge levels and the operation of the Inverter /Charger. To turn the Inverter on, press Inverter On button two times. Press once to turn off. This Inverter can be used to run the coffee maker, microwave and vacuum cleaner, toaster, etc.

5. Battery State and Charging

The HOUSE BATTERY BANK provides power for all DC systems, except the engines and other systems noted above. When disconnected from shore power, all 12-volt devices drain the house battery. Use devices only as needed. The DC voltmeter on the DC panel can be switched between 1) Main Engine Start, 2) House Battery Bank and 3) Generator Start Battery to measure charging or resting battery voltages.

The Main Engine Start and House Batteries are charged by the engine ALTERNATOR while underway. The Main Engine Start and House Batteries are charged by the BATTERY CHARGER when connected to Shore Power or to the Generator. Ensure the Inverter circuit breaker at the 110 Volt electrical panel is ON.

The Generator Start Battery is charged directly by the Generator when the Generator is in use. On Shore Power the Generator can be charged by the Battery Charger if necessary after a long

period of inactivity. To do so, turn-on the rotary switch found near the Battery Charger below the hatch in the Salon (Normally this switch should be kept in the "Off" position. With the Generator running, the Battery Charger will not provide a charge to any of the batteries if it detects another charging source, namely the direct charge from the Generator to its own battery).

When a battery bank is being charged, the voltage will read from about 13.1 volts to 14.4 volts depending upon state-of-charge of the battery bank. When the battery bank is at rest, (that is, not being charged), the voltmeter can give a rough indication of the state-of-charge of the battery bank.

Approximate Voltage/Battery State

12.8 volts 100%

12.4 volts 75%

12.2 volts 60% → **Recharge at 60% or battery damage could occur.**

11.8 volts 25%

11.6 volts 0%

HEAD

Endurance has one bathroom with a toilet commonly referred to a head in the marine world. The bathroom also has enclosed shower, vanity, and sink. The head uses a VACUFLUSH freshwater system, which helps to eliminate odors often emanating from salt-water toilets. The VACUFLUSH system flushes into a 60 gallon-holding tank. The holding tank can be emptied at a pump-out station, or can be pumped overboard through a macerator pump, and a seacock in the bottom of the hull, (if you are in a legal zone to do so).

1. USING THE HEAD

It is important that every member of the crew be informed on the proper use of the MARINE TOILET. The valves, openings, and pumps are small and may clog easily. If the toilet clogs, it is YOUR RESPONSIBILITY. Always operate the head for children, so you can make sure nothing foreign is being flushed.

Endurance has an electrically operated fresh water VacuFlush toilet. To use the toilet, press the button on the left to add water to the bowl as necessary (sparingly). After using the toilet, to flush, press the right FLUSH button. As desired press the left button to wet the bowl again. Clean the toilet as necessary.

Caution – DO NOT PUT ANYTHING DOWN THE HEAD THAT HAS NOT BEEN EATEN FIRST. Never put paper towels, tampons, Kleenex, sanitary napkins, household toilet paper, or food into the marine toilet. Use only the special dissolving marine toilet tissue. MARINE TOILET PAPER IS THE ONLY EXCEPTION! Endurance is supplied with this type of paper. Should you run out, please get more at the nearest marine or RV store. It is prudent to minimize the amount of marine

toilet paper put in the head. If possible, use the wastebasket. A plugged up waste system can ruin an otherwise great cruise.

2. CLEANING THE HEAD

There is a toilet brush. Use liquid dish washing soap and water for everyday cleaning of the toilet bowl. Never use chlorine based cleaners, caustic cleaners, chemicals, drain openers, alcohol, solvents, etc. in the system.

3. HOLDING TANK

The sanitation HOLDING TANK holds approximately 60 gallons. Be aware of the rate of waste production. (about .5 gallons per flush). With an overfilled tank, it is possible to break a hose, clog a vent, or burst the tank. The result will be indescribable catastrophe and an EXPENSIVE FIX. Empty the tank EVERY OTHER DAY to avoid this problem.

The HOLDING TANK is located under the staircase leading to the bedrooms/bathroom and should be inspected via the hatch in the floor outside the bathroom door, and may be given a visual check with a flashlight.. There is also a tank monitor system with a read-out panel in the Helm station. For the Holding Tank, it is only approximate and should not be relied on as the tank gets full. Obviously empty the waste tank before it reads FULL.

4. Discharging the Holding Tank:

- a. The holding tank is emptied in one of two ways:
 - i. **At the Marine Pump-Out Station**, remove the WASTE CAP located on the port side deck just forward of the Pilothouse door (push down on the cap, which will pop up, and can be twisted off by hand).
 1. Insert the pump-out nozzle into the waste opening. Double-check your deck fitting!
 2. Turn on pump and open valve located on handle.
 3. When pumping is finished (will now be sucking mostly air with a little water), close lever on handle and turn off pump. Remove from deck fitting.
 4. If there is a fresh water hose on the dock, rinse the tank by adding 2 minutes of water into tank. **DO NOT USE Endurance's WHITE FRESH WATER HOSE.**
 5. Then re-pump the tank. This also eliminates head odors.
 6. Replace the WASTE CAP and tighten
 7. Wipe up any spills on the deck and throw away the used disposable gloves and wipe up rags.
 8. Wash down the fill area on the boat with the fresh water hose.
 - ii. Discharging the Holding Tank Overboard using the macerator.

The tank's contents can be discharged with the MACERATOR only in where legal to do so. In the US, this is 3 miles or more from US shores (Canadian rules differ

however). Confirm that through-hull seacock located in the starboard-side engine room is OPEN. Note by Coast Guard regulation this through-hull must remain closed unless a pump-out is taking place where legal to do so.

1. Insure the Holding tank discharge sea cock is open (located in engine compartment starboard side forward)
2. Turn on Macerator breaker on DC Control panel.
3. Then insert the key into the Macerator key switch on the console.
4. Turn the key to begin pumping. The indicator light will illuminate. Use the tank monitoring system and listen for a change in pump motor pitch as the tank empties. It should only take 9 minutes to empty the tank.
5. When finished, turn off the key to stop the macerator pump and close the overboard through-hull seacock (located in starboard side of the engine room).

DECK WASH

There is 1 deck wash access port at the bow on the port side of the windless. To use, there is a green hose with a sprayer (kept in the bow line locker), and should be used to clean the anchor and chain, or wash dirt overboard through the deck drains. To utilize the Salt Water system:

1. Connect the hose to the blue fitting (on the bow port side of anchor windlass).
2. Turn on the SEAWATER WASHDOWN on the helm dash control switch panel. Seawater should pressurize the hose and enable you to stand at the bow and use the spray nozzle to clean the anchor and chain as it comes out of the water. It is best to spray water on the chain before it gets to the roller so that mud and other debris washes back to the sea and not onto the deck or in the chain locker.
3. Note: If there is no water flow, check to see that the seawater seacock, located in the starboard side of the engine room is OPEN and verify that the blue wash down adapter is twisted fully into the access port.

GALLEY

Stove (Electric tovetop and Oven)

To operate the stove:

1. Make sure Breaker on the AC Electrical panel is on.
2. Start the generator.

3. Use the stove and oven controls as you would on your range at home. For best oven operation, let fully preheat prior to using. The oven light will go off when it has reached the temperature you set it to.
4. Make sure to turn all knobs to OFF when finished. Then turn generator off.

Non-stick cookware

1. *Do not use nonstick cooking sprays* on the nonstick cookware- an invisible buildup will impair the nonstick release system and food will stick in the pan. The nonstick cookware *does not need oil*. If you prefer oil for flavor, olive oil or peanut oil is recommended.
2. Use *low to medium heat* only. Excessive use of heat will cause pan warping and permanent nonstick coating damage. The non-stick cookware is *oven safe to 350 degrees F*, but never in the broiler.
3. Do not use metal or sharp-edged utensils.
4. Clean using mild dishwashing detergent and warm water. Use only nonabrasive plastic mesh pads to dislodge food particles.

Refrigerator

Make sure the refrigerator breaker is ON at the DC Control panel in the HELM station. It may ice up occasionally. **However, if excess icing occurs, refrigerator may shut down on its own and defrost. For restart, turn temperature control knob all the way past off until you feel a click, then turn back to desired temperature.**

Microwave

Make sure the Microwave is on at the AC Control panel in the HELM station. The microwave can be used with the Inverter On or with the Generator On.

HEATING SYSTEMS

There are three sources of heat on Endurance:

1. Forced Air Diesel furnace:

With control panel located on the front of the port side of the helm – Slide Control Switch to ON and adjust thermostat using up and down arrows.

- a. You may now set either thermostat to your desired temperature.
2. Auxiliary heat when the engine is running.
3. 2 electric heaters; one in the aft part of the salon, on the port side and one in the stateroom.
 - a. These heaters should be used only when plugged into shore power and typically when you have left the boat for an extended period of time.

- b. To use the saloon heater, turn on the AC panel breaker labeled “Heater”.
- c. To use the state room heater, turn on the AC panel breaker labeled “Heater 2”
- d. Each heater has a small thermostat control knob located on the front panel.

Caution: Do not leave anything in front of these heaters which would impede airflow while they are operating, especially something combustible.

OTHER SYSTEMS

Cell Phones

You can re-charge your cell phones at the 12-volt receptacles located at either side of the helm station.

Barbeque Grill

The stainless steel propane barbeque grill is mounted on the port aft railing. It is for *outdoor use only*.

To use the grill:

1. First remove the cover.
2. Open the valve of the propane tank as well as the BBQ shutoff valve.
3. Make sure the regulator knob on the grill is in the OFF position.
4. Open the lid to the grill. Remove any accessories stored inside.
5. Push and turn the regulator knob counter-clockwise to the high setting.
6. Push the red igniter button, several times if necessary
7. Confirm that the burner is lit, by looking through the front vents of the BBQ.
8. Adjust the regulator knob on the grill to the desired heat setting.
9. The BBQ does not require pre-heating. Do not overheat.
10. Do not cook on the high setting with the lid closed.
11. Unless you are searing a steak the low setting works best for general use.
12. To shut off the grill, turn the regulator knob on the grill clockwise to the LOCK-OFF position.

Cleaning the Grill:

The grill should be cleaned on a regular basis. Stainless steel exposed to high heat will change color over time. Discoloration of components does not affect the operation or performance of the BBQ.

1. On the front lower outside of the BBQ slide out the grease tray for cleaning.
2. Lift out the cooking grill and the heat plate for cleaning.
3. The exterior of the BBQ can be cleaned with soapy water.

4. Lock the lid of the grill securely with the latches.
5. Cover the grill with the canvas cover between use.

Anchoring Systems

1. CHAIN MARKINGS

The anchor chain is 275' in length. The chain is marked with 10' of yellow paint at 100' and with 5' of yellow paint at 150', 200' and 250'. The last 20' of chain is painted red so you know when you are at the end.

2. WINDLASS

The anchor windlass has foot controls (Up/down) at the forward end of the deck.

If there is no power to the Windlass, check the two circuit breakers for the windlass. One is located in the master stateroom on the starboard side of the berth. The other is in the helm station electrical panel near the bottom of the panel.

Note: It is strongly recommended that you use this second breaker as a safety switch and turn it on only when deploying or retrieving the anchor and then turn it off. This will prevent an unintentional deployment of the anchor that could also cause injury.

3. SCOPE AND TIDE SWING

Scope is the relationship of length of rode (chain, line, cable) to the depth of the water. San Juan Sailing recommends a 4:1 scope.

- a. Check the tide tables to know at what point in the range you are anchoring, and measure the scope for the high tide.
- b. Check for depth and rocks within the proposed "swing" area.

4. SETTING THE ANCHOR

- a. The boat should be stopped facing into the wind. At the bow, unclip the safety line and hook from anchor chain.
- b. Ensure that the "Windlass" breaker on the DC panel is ON. Depress the down arrow foot switch momentarily to let out about 2' of chain.
- c. Gently ease the anchor out on the roller so that gravity can take over.
- d. Let out the proper amount of rode based on scope desired.
- e. Put the engine astern momentarily to put a strain on the anchor.
- f. Verify the anchor is set by feeling the anchor catch and boat move forward. The angle of chain dropping down should be near straight.
- g. Using the anchor holding line with the stainless chain hook (stowed in the bow line locker), secure the chain in front of the anchor roller with the stainless hook and tie off each end of the line to the port and starboard bow cleats. Let out more chain so that a slack loop is created in the chain between the anchor roller and the place where the

hook grabs the anchor chain. This will relieve stress on the windless and ensure additional chain is not pulled from the windlass.

- h. Do an “anchor watch” for the first 30 minutes, observing how the boat swings and how close it gets to other boats and objects.

5. RETRIEVING THE ANCHOR

- a. Raise the chain so you can easily unhook the anchor harness. Release the line from one of the cleats and bring it over to the other cleat and remove the harness and stow. Wash the chain and anchor with plenty of sea water as it is retrieved:
 - i. Turn ON the SEAWATER WASH DOWN on the dash control panel at the Helm Station.
 - ii. Retrieve the green hose and spray nozzle from the bow line locker.
 - iii. Connect the hose with the nozzle attached to the seawater receptacle at the bow near the anchor.
 - iv. Start the engine and move slowly toward the anchor.
- b. At the bow, have a crewmember depress the up arrow switch to retrieve the anchor.
- c. Use the seawater nozzle to continuously wash the chain and anchor before they reach the deck.
- d. If the chain tightens and starts to bog down the Windlass, wait until the boat “catches up” before continuing. **Don't drag the boat by the anchor chain through the water.**
- e. When the anchor is clear of the water make sure it is clean of mud and seaweed. A boat brush and spray nozzle may be necessary to make this easier.
- f. Be careful for the last couple feet to make sure the anchor is facing the proper direction. Use short bursts on the windless as the anchor comes aboard.
- g. Reinsert the safety line and hook to secure the anchor in the bow roller.
- h. Release the tension on the chain slightly to take the strain off the Windlass.
- i. Re-stow the hose and nozzle in the bow line locker.

Stern Tie

There is 600' of line in the cockpit that can be used for a stern tie off to an object on shore. Use the tender to take the line ashore and loop around your tie off ring or tree, etc. Bring the end of the line back to Endurance and tie it to a cleat.

Mooring Buoy

You may use one of the bow dock lines to tie to a mooring buoy by using the boat hook to catch the ring on top of the buoy. Carefully maneuver the boat to approach and come along side of a buoy. Then move the boat forward while walking the buoy toward the stern were it will be easier to attach the dock line. Pull the ring up enough to pass the dock line through the ring twice, back the boat until you can easily tie off to the port and starboard bow cleats. A second bowline looped through the buoy ring is advisable as a safety backup.

Tender

1. LAUNCHING THE TENDER

- a. The Tanner Stern Davit system is used to launch the tender.
- b. The tender is an AB Lammina 10 foot hard bottom inflatable style boat. It can handle a maximum of 4 people. A 20 HP Tohatsu, four stroke motor with electric start and trim, power the tender. There is a storage compartments under the front seat, built in fuel tank, and a helm station.
- c. The Tohatsu outboard uses straight gas from the fuel tank, (NO OIL PRE-MIX). Oil is automatically injected into the fuel for the proper mix ratio.
- d. To launch the tender:
 - i. Insert the drain plug into the stern and secure.
 - ii. Davit winch system is operated by two buttons in rear of dockpit, port side. Red button shows Down Arrow and Gray button shows Up Arrow.
 - iii. Run davit winch up slightly to take tension off davit side turnbuckles. Loosen the turnbuckles that attached the davit to the stern rail by twisting until the latch can be released. This detaches the davit. Hook the port side turn buckle to red nylon line so it is ready to re-hook when putting back on.
 - iv. Also loosen the tender's bow "tie off" line enough that the boat may be lowered into the water. Then retie to the aft starboard cleat. Also, loosen and remove the black stern tie off strap.
 - v. Using the winch controller feed out enough line to determine that there are no encumbrances to full deployment (ie, no lines or cables are attached and there nothing restraining the tender from being deployed.) Once satisfied, proceed to lower the tender into the water.
 - vi. Deploy the davit until the securing lines are slack. Check to see that there is no water entering through the drain plug.
 - vii. It is now safe to step into the tender and release the four securing hooks. The tender should now be floating freely, secured to the boat by its tie off line.
 - viii. Now press Up Button to get the davit arms up and out of the way of dinghy.
 - ix. Position the tender close to the swim platform, so any passengers boarding (only up to 3) can step off the platform and comfortably on board.
 1. All parties boarding the tender should be wearing life vests provided on Endurance.
 2. The ignition key is kept on a float key located in the lift up storage area on port side of pilot house.
 3. The driver should board first followed by up to three additional passengers.
- e. Starting the tender
 - i. Ensure the gas line is connected, and pump the primer bulb until it is firm.

- ii. Make sure the outboard is in neutral, (throttle lever vertical), and the motor is lowered to the stop. For cold starting, raise the cold start lever halfway. Turn the key to start. To choke, press the key in several times while cranking the key.
 - iii. Let engine warm up a few minutes before operating.
- f. Retrieving the tender
- i. Shut down the engine.
 - ii. Reverse launch procedure the tender by offloading passengers and positioning the tender so that it is ready to be lifted by the davit system.
 - iii. Lower davit arms to rehook lift cables and using the winch controls, raise the davit a few inches to insure cables are secure.
 - iv. The driver should now step off onto the swim platform, enter the cockpit and continue to raise the tender until it is secure against the protecting pads on the aft rail.
 - v. The turnbuckles which secure the davit to the stern rail may now be reconnected and tightened to secure the tender and davit. Press down button slightly to take line tension off davit winch.
 - vi. *Note: If the davit is raised too quickly and strikes the railing, this may cause the circuit breaker to trip. Should you suddenly find the red/grey control buttons are not working, it is a good possibility this has occurred and you need to reset the breaker. The breaker is located in the tank room below the salon floor (access hatch is below the dinette table). Look for the battery switches on the starboard side aft end at floor level. The davit breaker is labeled and is located just above the davit battery switch. The breaker is reset when the yellow tab is pushed up to horizontal and clicks in place.*
 - vii. Remove the drain plug in the aft section of the tender and restow.
 - viii. Put the ignition key back in the lift up storage area at port side pilot house map table.

2. OPERATING THE TENDER

- a. Make sure all occupants are wearing appropriate life jackets. (This is a coast guard requirement. All occupants must have life jackets be immediately available). There are 2 inflatable life jackets kept in lift up step next to starboard side pilot house door. Additionally there are 4 standard US Life Guard approved orange life jackets and 3 US Life Guard approved blue life jackets in the tank.
- b. Never let minors start or operate the tender.
- c. Check the gas level by observing the gauge on top of the fuel tank. *Always stop the motor before refilling.*
- d. Start the motor:
 - i. Check for a steady, stream of water flowing out of the back of the motor. If little or no water is coming out, *stop the engine* and check the cooling water intake or the outlet hole for obstruction. If there is no obstruction, there may

be a water pump failure or blockage in the cooling system, which will cause the engine to overheat--*do not operate the engine.*

- e. The red lanyard is connected to the safety switch or (kill switch). The driver should attach one end the event he/she falls out of the tender the motor will stop.
- f. Operate the motor with the shift/throttle lever by smoothly advance the throttle until it shifts from neutral to forward and then advance the lever for desired speed. Use the same procedure for reverse. Steer with the wheel. Use the power trim as required for optimum performance based on the weight distribution in the tender.
- g. To stop the engine, close down the throttle, put the motor in neutral and turn the key to off.

SALON SETTEE CONVERSION TO A BED

To convert the salon settee to a queen bed, release the locking lever under the settee table and lower the table to its lowest position. Lift the front side of the settee about 6" and smoothly pull it toward the center of the salon. The backrest come down and fill out the bed to its full width.

Note: Please insure the table is at its lowest position to avoid scratching its surface as the settee is pulled out.

Reverse this procedure to return the backrest to the settee configuration.

In the pockets behind the settee cushions you will find additional bed sheets, comforters and pillows.

Advise San Juan Yachting staff if you plan on using the salon settee as a bed and they will provide additional linens.

KEY ITEMS TO REMEMBER

1. Remember to properly seat all dipsticks after checking oil levels. If not seated, oil will spray out and make a mess.
2. Turn the Inverter OFF on the Magnum inverter panel (helm station) when shore power is connected. (Prevents battery depletion if shore power fails).
3. Turn the Windlass breaker located in the DC breaker panel off when anchor is not is use. (Prevents accidental deployment of the anchor).
4. When raising and lowering the shades, use two hands. Note also that there is both a courtesy shade and a privacy shade associated with each salon window

Again, please call 24/7 if we can help in any way. Peace of Mind regardless of your questions helps your trip run smoothly. Your successful vacation is our goal.

Dan Fischer (406)261-3756

Kristi Fischer (406)261-5103