FREE SPIRIT

NOTES FROM THE OWNERS OF "FREE SPIRIT"

Welcome aboard FREE SPIRIT!

These notes are prepared for Quick Reference, based on our own experience with Free Spirit in order to bring you up to speed quickly and to make your vacation cruise as trouble-free and enjoyable as possible. The Beneteau factory owner's manuals are in the compartment under the forward port settee in the salon for your further reference.

These "Owner's Notes" assume that you, the charter guest/operator, and any guests you invite on- board, are experienced and competent in the safe operation of a 20,000 pound, 43 foot sail boat 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 exercising reasonable care and good judgment in the handling and operation of the boat. Sailing and boating, by their nature can be hazardous when proper care is not taken in the operation of any equipment aboard. Periodically in the Owners Notes, we have included "Seamen's Notes" about small hints and suggestions to make you a better skipper and crew!

Free Spirit is a great sailing boat, with her deep keel enhancing speed and stability. The furling mainsail makes it easy to adjust to changes in the wind, helping keep everyone onboard comfortable and safe. She's a 2 cabin, 2 head boat with lots of living and storage space, and is also a smoke free vessel.

If you notice things during your charter or have suggestions that would make your charter more enjoyable, please advise the San Juan Sailing staff so that we can continue to improve Free Spirit for everyone's benefit. Please let us know if something failed or got broken. I want to know so I can fix it before the next charter guest.

Thank you for taking good care of Free Spirit, and Happy Sailing!

I. QUICK REFERENCE

The following are highlights of certain key areas, which will be discussed in greater detail in our notes:

A. Holding Tanks

Holding tank gauges show 1/4 when empty.

B. Chart Plotter.

Power up the chart plotter at the nav desk BEFORE you power up the plotter on the binnacle.

C. Dock Lines

Dock lines are stored on hooks in the port side aft lazarette. Also stored in the same area is a block and tackle for the life sling.

D. Mainsail Deployment

The mainsail deploys best when the head sail is deployed first. For the main to deploy, the boom vang and main sheets are slightly loosened. The mainsail must be furled against resistance to make a tight wrap inside the mast.

Otherwise it may jamb when deployed. Also, do not furl beyond the marks near the clew. See additional information later in these notes.

E. Retrieving Anchor

I keep a stick in the anchor locker to knock down the chain pile as I am retrieving the anchor. Letting the chain pile build up while retrieving the anchor will eventually result in it jamming under the chain gypsy.

F. Windlass Operation

The windlass will operate anytime the main breaker/switch in the aft cabin is ON. The engine does not need to be running; however, it is recommended that it is running so the battery does not drain, and you are prepared to move once free of the anchor. A windlass is a dangerous area for kids or those inexperienced.

G. Feathering Maxi-Prop

After killing the engine to sail, pull the transmission lever into reverse for a moment to cause the Maxi-Prop to feather properly. Then return it to neutral. ALWAYS count to 2 before shifting lever and between stages to prevent transmission damage.

H. Keel Depth Draft

The Draft is 7 ft.

I. Hatch Panel Storage

Nice storage exists for the plexi-glass companionway hatch panels in slots just inside the port side cockpit locker. There is a bracket and bungee cords to hold them in place. I generally store the life jackets in there as well.

J. House Battery Capacity

Please don't draw the batteries down below 12 volts. There is 630 amp hours of house battery bank capacity, but these high quality, and expensive, AGM batteries will be damaged if drawn below 12 volts or charged at a rate over 14 volts for an extended period of time. If you DO accidentally draw the volts below 12.3 volts, then the inverter will shut off, causing shut off of various outlets, etc. In that case, you need to switch the "Leave off" battery charger switch on the AC Power Center just forward of the Nav desk, to On, which will charge the battery through the engine. Once it gets above 12.3 volts, you can switch it back off while the engine continues to recharge or you are on shore power. Also, we have installed an ACR switch that allows you to do an emergency engine start from the house batteries. The switch is located just behind the panel in the aft berth that houses the windlass switch and the battery switches. Lift up the wood under the mattress and it is located just to the port of the windlass switch wiring. The normal operation is 'remote'. To do an emergency start from the house batteries, move the switch to 'lock out' to start the engine.

K. Water Pump

The domestic water pump operates very quietly. Make sure all faucets, including the stern shower, are OFF when you turn the breaker/switch ON so you don't pump out all your water. (Voice of experience talking.)

L. Mooring Hook

There is a special bracket attached to the boat hook that is used with the mooring hook. Please see the section on anchoring that describes this very convenient item.

M. Head Thru-Hulls

Do not close the large thru-hull valves in each head. See additional notes.

N. Dinghy Motor Fuel Valve

Turn the fuel valve and fill cap vent off on the outboard before tilting up the motor when beaching the dinghy. Failing to do so can cause flooding and difficult starting.

O. Fresh Water Filling

When filling the fresh water with a hose, please do NOT use a sprayer as it will add too much pressure for the vent line to handle and may cause undue strain on the tanks.

P. Dress On Board

We recommend that you do not wear high heels on the boat both for safety as well as to prevent punching holes in the cabin sole. You should also avoid 'designer' jeans that have rhinestones or other sparklies on them that could snag or tear the salon cushions. The dolphins and whales are not style conscious!

II. FREE SPIRIT KEY NUMBERS AND SPECIFICATION

These are important references for the maintenance professional in the unlikely event you have trouble.

A. Key Numbers

1. Year Built: 2003
2. LOA: 42'3" LWL: 38'7" Beam: 12'11" Draft: 6'11"
3. Fuel: 53 gallons
4. Water: 144 gallons
5. Holding: 22 gallons each, 2 tanks
6. Displacement: 19,799 lbs (dry)
7. Mast Height above Water Line: 60' (with antenna)

B. Key Specifications

1. Engine:

(a) Yanmar Family 4JH3E – 97

(b) Certification No. M140139734

(c) Serial E25858 (on Port side thru access way, lower engine)

2. Starter: Hitachi Model 129698-77010, S114815A 12V 244

3. Raw Water Strainer: Vetus Type 330

4. Transmission: KBW20-1, Tuff Torque, Kanzaki

5. Alternator: Balmar Model 60-100-SR-1G, 100 Volts 12 VDC, Serial 1108B

6. Belt: Carquest #9470XL 13A1195

7. Boat Hull O/N: 1141128 (starboard lazarette cockpit)

8. Boat HIN: BEYN3012B303. Aft transom outboard of toe rail.

9. Oil Filter: Yanmar 129150-35153

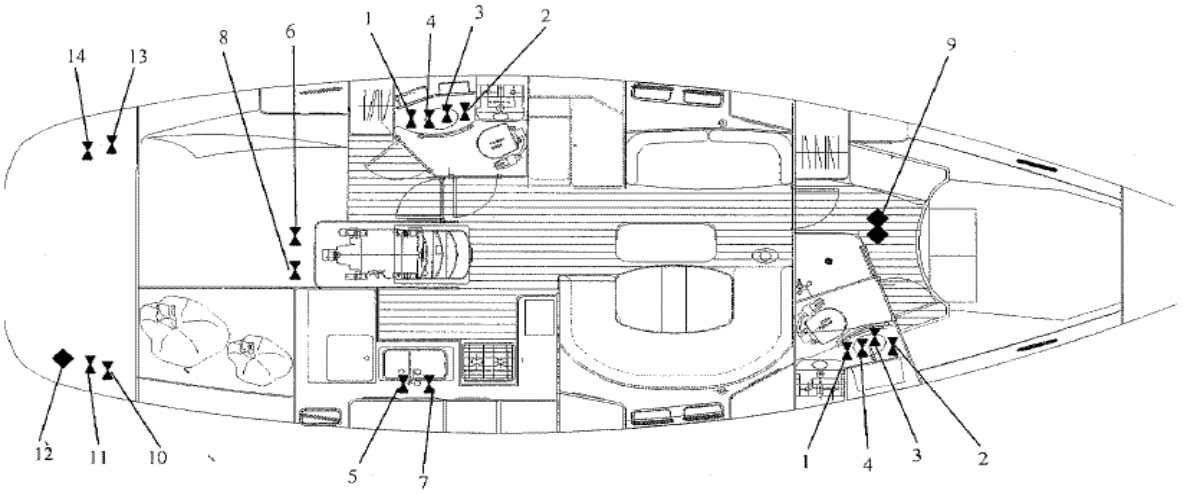
10. Fuel Filter: Yanmar 129470-55703

11. Fuel Filter/Water Separator: R12T Parker/Racor

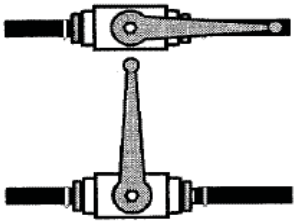
12. Magma Grill: Model A10-918 (Piezo igniter: West Marine #550-1499, MFG #10-960)

13. VHF Radio: ICOM M422 with ICOM HM 157 CommandMicII

III. THRU-HULL SCHEMATIC



Opening and closing of the seacocks



Open

Closed

REF	DESCRIPTION
1	Head Discharge
2	Head Intake
3*	Washbasin / Shower Discharge
4	Optional Waste Tank Discharge
5	Galley Sink Discharge
6	Engine Cooling Water Intake
7	Ice Box Draining
8	Stern Tube Cooling Intake Valve
9	Speed/Log, Depth Sounder Thruhulls
10	Electric Bilge Drain
11	Manual Bilge Drain
12	Exhaust
13	Sail Locker Drain
14	LPG Locker Drain

* The washbasin and shower discharge, connect to the same thru hull through a set of 1/4 turn valves and a tee. The washbasin discharge will be the one with a slightly larger diameter hose.

***Seamen's Note**: There is an additional thru-hull located directly under the settee table that houses the additional sonar/depth sensor. Also note, it is not unusual for it to make a ticking sound at times when the instruments are powered up.*

IV. BOAT EQUIPMENT AND PRIMARY SYSTEMS

A. Anchors

Free Spirit is equipped with two anchors, one forward and one in the port cockpit stern lazarette.

1. Primary Bow Anchor. The primary bow anchor is a 45 lb. CQR with 150 feet of 3/8" chain and 220 feet of nylon line. The chain is marked at 50ft intervals as follows:

(a) At 50ft there is a single red mark on the chain.

(b) At 100ft there is a white mark on the chain.

(c) At 150ft there is a red mark on the chain.

(d) From 200ft on there are black marks on the nylon rode.

2. Secondary Anchor. A second anchor, a 25 lb. Danforth, with 50ft of chain and 200ft of nylon rode, is stored in the port side stern lazarette. Its rode is marked every 30ft with a tag. Be sure and tie off the nylon rode end before deploying it.

3. Scope. The scope to use in the islands is generally 4-to-1 for the highest water depth you'll encounter during the tide cycle in the spot where you choose to drop anchor. Check your tide data -- to know how much water you may lose or gain as the tide floods in and ebbs out during your stay. Since most coves are 15'-30' deep, expect to pay out about 60'-120' of rode. After you have paid out the suitable amount of rode, 2 minutes of reverse (in idle speed reverse) sets the anchor and tests its holding power. (Note other boats and points of reference on land. Are you moving? If not after 2 minutes, you've set your anchor successfully.) After setting anchor as just described, I throttle up to about 1200 RPM in reverse for another 30 seconds to prove to myself that the anchor is set well.

For storm conditions (sustained winds of 25+ knots), extend your scope to 7 or 10-to-1, provided you have room to leeward. Otherwise, set two bow anchors (using the secondary anchor, chain and rode) in a v-type pattern for extra holding power.

Once the anchor is set and secure, attach the snubber line to the chain and tie off to a deck cleat. This is the same line (with chain shackle) used for securing the anchor when underway. I generally shackle it to the chain just past the anchor roller. Then let out enough chain that the shackle ends up just above the water

surface. Secure it to a deck cleat and then release enough chain, via the windlass, so that the load is carried by the snubber line. This provides a level of shock absorption that is easier on the boat and less likely to jerk the anchor loose. Obviously, these instructions apply if you only have chain deployed. If you have also deployed nylon rode, then simply bring the rode back to a deck cleat.

B. Anchor Windlass (Lewmar H3)

Power is received from the engine start battery. The breaker-switch for the windlass circuit is in the aft cabin next to the 3 battery switches. The up-down controller for the windlass is stored hung on a hook above and behind the switch panel at the Navigation Station. It connects to an electrical disconnect on the port side of the windlass area. There is also a simple rocker switch in the windlass area if you don't want to use the cable remote control.

***Seamen's Note**: This windlass has a rotating drum in addition to the chain/rope gypsy. Be sure to keep yourself and the windlass controller cable clear of both.*

This windlass also has a manual recovery system, should it fail electrically someday. Instructions are with the other operation manuals on-board. The handle is in the compartment beside the nav station seat.

C. Deploying the Anchor

Even with an electric windlass, it is important to initially deploy the anchor by hand. Pay out enough slack in the chain (with the windlass) so that you can hand-deploy the anchor to near the water surface. This helps prevent dinging the bow with the anchor. Once the anchor is in the water, use the electric windlass to lower the anchor to the bottom of the bay and deploy the desired amount of scope, generally while moving slowly rearward. I recommend deploying it for about 5 seconds at a time with brief pauses in between to slow it down. Otherwise, if it starts deploying too fast, it sometimes jumps the gypsy, especially if deploying the nylon rode section.

***Seamen's Note**: The point where the chain connects to the nylon rode is sometimes troublesome going through the windlass. Use special care during that step.*

D. Retrieving the Anchor

When retrieving the anchor, don't use the windlass to steadily pull the boat forward to where the anchor is set. (The windlass is not designed for it and it would be a large draw on the batteries). Instead, head the boat up with small moments of idle power toward the anchor while using the windlass to take up the slack in the chain. As the anchor chain tightens directly above the anchor, the windlass may labor as it tries to break the anchor free. STOP at this point. Let the boat's forward momentum break it free from the bottom, and then continue raising it with the windlass.

When retrieving the anchor, do not power retrieve it all the way up. Stop well before it gets to the bow roller. Make sure the chain horseshoe joint and anchor are properly aligned. If not, tap it into alignment with the stick I keep in the anchor locker. Then, by hand, retrieve the anchor the rest of the way up, onto, and over the bow roller, pulling it back snugly into position by hand. The best way to do this is to step on the anchor chain between the roller and the windlass, which will pull up the anchor into the roller. This prevents possible pendulum action, plus, if the anchor were to get hung up on the bow roller and you continue to press the "up" button on the electric windlass, you will probably damage the attachment base or the bow roller. Once the anchor is fully set into the

bow roller, lightly "bump" the windlass up button to remove most of the slack, letting it coast between bumps. DO NOT run the windlass steadily in this situation. You do not want to damage the deck by powering it in all the way.

Take your time during retrieval. The anchor chain dropping off of the gypsy into the locker might try to bunch up under the windlass, so it helps to push it down often (with the stick) to the bottom of the chain locker to prevent the chain from jamming in the windlass.

E. Securing the Anchor

Once the anchor is on the bow roller, secure the anchor with the snubber line. Connect the shackle to a link in the chain nearest the anchor, and then secure the line to a deck cleat. After securing the anchor with a line, switch the windlass breaker "off" to prevent dangerous accidental windlass activation. Note: If you are going to anchor several times during your charter, it generally makes sense to leave the windlass control attached and stowed in the little basket behind the windlass. Just remove it at the end of your charter and hang it back up at the nav station.

Showing snub line while underway only. Not for while anchoring!

F. Stern Tie Line

This is on a 600 foot reel mounted to the port side aft rail, under the BBQ. One very important point: You must secure the line to a cleat. The reel is not strong enough to hold the boat. If you run the line to shore and back to the boat, then both ends must be secured to cleats. My preference is generally to just run the line once to shore and tie it. It means you have to dinghy to shore in the morning to untie, but I find that easier than the hassle of running it there and back. But, remember the tides.

***Seamen's Note**: When securing the stern tie to a cleat, start your first wrap using the line running to shore. That way, when you go to unwrap, the top of the wrap is running to the stern tie line reel, and not to the shore line where the boat is pulling against it.*

G. Special Mooring Hook

Stored in the port side aft cockpit lazarette, with the mooring lines, is a white line with a special mooring hook, designed to work with a special bracket attached to the boat hook (which is stored in the starboard cockpit

lazarette). The photos below show how it attaches to the boat hook. This makes catching a mooring a lot easier. However, I highly recommend a little practice ahead of time. It's a strong hook, but it should not serve as your primary attachment and you will want to use a mooring line with 'lasso' knot as your primary attachment; however, always back it up with a slack second line as per your skippers meeting.

Note: The mooring hook does not work well with the new type of mooring balls that State Parks has been using. You may find backing into the newer mooring ball and having someone on the swim platform then walking the ball to the bow to be the best procedure.

H. Barbecue

The stainless steel propane BBQ is mounted portside on the stern rail. There is a washable drip pan that fits under the grill. If not already installed, you'll likely find it stored with the pots and pans.

A 'T'-fitting on the propane regulator enables propane flow to the BBQ and stove simultaneously, however the tank valve and the electric solenoid valve must be ON. Please remember to turn off the tank valve if neither the stove nor the BBQ are going to be used for several hours.

As a courtesy to the next guest, please use the wire brush attached to the BBQ to clean the BBQ after use.

I. Batteries and Charging

1. For normal operations, leave all battery switches in the aft cabin ON all the time. An isolator assures all batteries are charged, while protecting the engine start battery from draw-down by house usage. One battery is located in front of the engine. The rest are located behind the engine under the boards in the aft berth. If access to the batteries in the aft berth is necessary, the screws that hold down the boards over them are marked for removal. The engine start battery is the most aft under the berth boards.

2. House and Engine Start. The 3 large 210 amp/hr 4D AGM deep cycle batteries are the "house bank", and the 4th smaller, group 27 AGM battery is the engine start battery. Three battery switches are located below and in front of the aft berth. From port to starboard the switches are 1st (port) red is house, 2nd (center) red is engine, 3rd (black) is common ground. The horizontal position is OFF, the vertical position is ON. Again, leave all battery switches on all the time. And, never turn a switch to "off" while the engine is running! This may blow the diodes on the alternator and your batteries will no longer charge. This reminder is especially important if you have kids on-board who might like to turn knobs while you are motoring!

3. Emergency Engine Start. We have installed an ACR switch that allows you to do an emergency engine start from the house batteries. The switch is located just behind the panel in the aft berth that houses the windlass switch and the battery switches. Lift up the wood under the mattress and it is located just to the port of the windlass switch wiring. The normal operation is 'remote'. To do an emergency start from the house batteries, move the switch to 'lock out' to start the engine. Once started, move the switch to 'remote'.

4. Windlass Breaker. *Seamen's Note. The windlass switch/breaker in the same area as the main battery switches. It is best to keep it OFF when the windlass is not being used.*

5. Charging. While motoring, the batteries are charged by a 100 amp Balmar alternator. When attached to dock-side power, they are charged through the inverter.

6. Voltage Caution and Inverter Shutdown Procedure. Please avoid drawing house bank voltage to below 12 volts, which is approximately 50% of capacity. These batteries are very expensive and are damaged by full draw downs. If you inadvertently draw the voltage below 12.3 volts, the inverter may shut down, and in so doing, shut down the cabin outlets. In that case, you will need to recharge the batteries with the engine, by first switching the switch on the AC Power Center forward of the Nav Station, that says, 'Leave Off' to On, then running the engine until the battery charge exceeds 12.3 volts, then switch the switch back to Off mode.

7. Fuel Shutoff Valve. You will likely notice a pull handle with a fuel pump image on it near the main switches in the aft cabin. It controls a fuel shutoff valve at the fuel tank. It is normally left ON (pushed in) all the time.

J. Berths & Table

1. Berths. Being a 2-cabin boat, each cabin has excellent space and storage and you will not feel cramped. The forward cabin mattress is constructed of 4" of memory foam bonded onto a 3" standard foam base, all encased in one mattress cover. If you move the mattress, be sure it gets reinstalled with the memory

foam side upward. Under the forward mattress is a 1" layer of hypervent material which allows better ventilation and moisture removal.

(a) The aft cabin mattress is 4" standard foam sections with a separate 3" memory foam mattress topper, and hypervent material underneath. The topper is a regular queen size with only one corner cut short; so, as you can see, it is quite roomy back there. Most people find it most comfortable to sleep with their heads toward the rear of the boat.

(b) The port side settee forward of the Nav Station in the main salon will also accommodate one short person. There is a 'Lee Cloth' under the cushions that can be attached forward and aft of the berth and one strap to the hand rail above the berth, that makes the settee a good bed for smaller people as well.

***Seamen's Note**: It is amazing how much moisture is released into the mattress as we sleep. To help air this out, I generally lift the aft end of the mattress and place a rolled towel between it and the wood rim during the day to help it air out underneath.*

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2. Table. In the salon, two people can sleep on the bed made from lowering the table and using the settee insert cushions. Short legs for the table are stored under the center salon bench seat locker (next to the table). The salon table has a removable center leaf. If removal of the leaf is desired, lift up firmly on both sides of the marked end of the leaf. It is held down by a small piece of Velcro that you can't see until removed. You will see labels on the edges of the leaf indicating where to lift up. I normally store it in the compartment under the center salon bench seat.

3. Hammock. The hammock is stored in the center salon bench seat locker with the table legs. It is a double hammock capable of holding two people, but one is very comfortable. The hammock should only be used at anchor or at the dock with the sails furled. To use the hammock, with the sails furled, use the white strap to fasten around the mast above the boom. The blue strap should be used on the forestay (roller furling) with a prussic knot to secure the strapping. Then the hammock clips in to the strapping. It is rated for a maximum of 400 pounds. It is very pleasant on nice evenings to set up the hammock and enjoy the sunsets or sleep in the cool air above the deck! Just remember to stow the straps and the hammock in the settee compartment before leaving your anchorage so it doesn't interfere with the sails!

K. Bilge Pumps

Although the engine features a dripless PYI shaft seal which virtually eliminates any water intrusion, it is good practice to check the bilge each day, morning and evening. The easiest place and method is to raise the panel that is in the walk-way between the center and port seating areas in the main salon. Use a flashlight to look underneath toward starboard. You will see the bilge pump float switch, two bilge pump hoses leading to the low spot in the bilge, and also the sonar thru-hull sensor. Note: This sonar sensor sometimes makes a light ticking noise when the instruments are ON. This is normal.

1. There are four bilge pumps, three electric and one manual.

2. Two electric pumps are located under the starboard side settee cushions near the fresh water pump. Both have hoses that lead, through filters, to a common hose and strainer in the bilge sump area. It doesn't hurt to make sure that these filters, near the pumps, are clean and appear unobstructed.

3. One pump always has electric power applied to it, regardless of the position of the switch in the circuit breaker panel, and is controlled by the float switch in the bilge area. You can test it by gently lifting the bilge switch float. You will also notice that it takes quite a bit of water in the bilge to turn it on.

4. The other is controlled by the switch in the circuit breaker panel.

***Seamen's Note**: If I see any water in the bilge, I generally pump it out with one of the two electric pumps, and then mop the bilge dry with a sponge and bucket.*

5. The third electric bilge pump is located under the floor panel aft of the center settee. It has an internal float switch and a manual switch at the bottom of the circuit breaker panel.

6. Monitor bilge water daily and alternate your choice of pumps (lift the float switch with your finger) to ensure that all are functioning properly. As mentioned earlier, no water should be entering, so do some investigating if you regularly have to remove water.

7. Hopefully, you will never hear the bilge pump start automatically. If you do, please investigate immediately. Check the thru-hulls to make sure none are leaking and take appropriate action (shutting off the seacock valve and, perhaps, tighten the hose clamps). Report it to San Juan Sailing either by phone or VHF if a significant problem, or upon your return if a minor problem.

8. The emergency manual bilge pump is located in the cockpit, to starboard of the helm. The handle is a permanent component of the pump, you just pull it upward and then move it slowly back and forth.

L. Dinghy and Outboard

1. Dinghy General. Towing the dinghy works best when the dinghy is brought close to the boat. I generally tie it to the port stern cleat while under way, and when at anchor, temporarily on the lower end of the vertical stern rail post just to port of the rear gate. Towing it close lifts the bow, reduces drag, and lessens the chance of wrapping the painter around the propeller or allowing it to get close to the diesel heater exhaust on the starboard side. Make sure no loose line ends drag to potentially foul the propeller or rudder (again, voice of experience talking). Also, make sure the oars are either well secured in the dinghy floor, or stowed in the starboard cockpit locker. Please take special care when beaching the dinghy (refer to the dinghy beaching procedure in your charter guest book). Most of the beaches you will land at are strewn with barnacle-covered, bottom-slicing rocks. When approaching the shore, weight the dinghy aft by leaning or moving the crew toward the back of the dinghy. Then offload everyone over the bow. Lift the dinghy above barnacle height using the handles on both sides, and set it down gently on the beach. Secure the painter to a rock or large driftwood log above the anticipated high water mark. Remember, we have very large tidal fluctuations, and it will float away if not secured.

2. Outboard. Free Spirit is equipped with a 4-stroke Honda 2 horsepower outboard motor. This brand and size has proven to be a practical and VERY reliable dinghy outboard. DO NOT add any oil to the gasoline mixture – it uses just straight gasoline. The fill cap is located at the top of the engine. As a courtesy we have an additional red spare gasoline container tied into your dinghy.

(a) WARNING – Gasoline fumes are explosive and a very dangerous fire hazard if stored on a boat. Keep the spare gasoline container in the dinghy and tied to the transom so it stays upright. NEVER store the spare gasoline container in a locker, lazarette, or any other storage area on your vessel.

(b) The outboard is light, so it's easy to transfer from the stern rail outboard mount to the dinghy transom (and vice versa). PLEASE do not cruise with the outboard on the dinghy. It will no longer work if saltwater gets into the carburetor. We also recommend taking the outboard off the dinghy at night. We have actually had dinghies deflate in the cool of the night and had wind waves or powerboat wakes flip the dinghy over. We prefer to not have to sell you a $1300 non-working outboard after it has been submerged!

(c) To put the outboard shaft back in the water, release the stainless lever on the starboard side of the shaft. And re-open the vent and fuel valves before starting.

(d) To Start:

(i) Push the fuel valve lever (starboard aft corner of the outboard) aft to open the fuel valve.

(ii) Pull out the choke knob (starboard forward corner of the outboard).

(iii) Open the air vent on the top of the fuel cap (top of outboard) by turning counter- clockwise about 3 full turns.

(iv) Make sure the black U-shaped kill clip (with the red lanyard) is clipped into the red shut-off knob (port forward corner of the outboard).

(v) Turn the handle throttle ¼ turn counter-clockwise.

(vi) Pull the start cord until it starts. (You shouldn't have to pull it more than a few times.)

(vii) If it doesn't start after 2 pulls, it may be flooded. Push the choke knob in to the off position. Increase the throttle to wide open and again attempt to start it, while being prepared to throttle it down as soon as it starts.

(viii) Note: With the throttle at any position above idle, the propeller will engage upon starting. Be careful and prepared.

(e) Troubleshooting. If the engine won't start, review steps (i)-(vi) above to make sure you've done all 6 steps. There is a spare spark plug and spark plug wrench, as well as spare pull cord and engine oil, in the plastic box in front of the diesel engine under the companionway stairs, in case the engine won't start or is running rough. (A new spark plug solves myriad outboard problems. If you use the spare spark plug, notify your check-in skipper upon your return so a new one can be placed aboard for future guests.) If the outboard is running and you're heading toward shore, and the engine suddenly quits, it's usually that someone has forgotten to vent the fuel cap or open the fuel lever. If the engine is running fine but the propeller isn't moving, the shear pin is probably broken – just take the cotter pin out to remove the propeller and replace the broken shear pin (a spare pin is located forward of the shaft under the handle grip) and put the propeller and new pin back into place.

(f) Running.

(i) Push the choke back in after the engine starts.

(ii) There is no transmission--just throttle up to go forward and throttle down to stop. If you want to go in reverse--just swivel the outboard around 180 degrees.

(g) To Shut Off.

(i) Shut the outboard off by pushing in the red shut-off knob (where the kill clip is clipped in). Or pull the red lanyard until the clip pops off.

(ii) To avoid prop damage, shut the outboard off and raise it out of the water before you reach the shore. Pull the outboard forward and out of the water until it clicks and stays in place. Also, close the vent cap valve to prevent it from dripping, and turn the fuel valve to Off.

(h) When Not in Use/Storage.

(i) First: Close the air vent on top of the fuel cap (top of outboard) by turning it clockwise.

(ii) Push the fuel valve lever forward to close (starboard aft corner of the outboard).

(iii) Put the outboard back on the outboard mount on the stern rail and tighten both clamps.

(iv) Secure the outboard further by tying on the safety lanyard.

M. Dodger & Bimini

The center filler panel can be removed when desired. Please don't take off the dodger. (It is difficult to put back on.) The dodger's plastic "glass" (brand new in 2010) is vulnerable to scratching from salt crystals, especially after sailing into a challenging breeze. When salt spray on the glass dries in the wind, tiny salt deposits are left behind and tend to obscure your vision. Please avoid directly touching the glass with a damp rag or sponge. Salt does dissolve in water, but not as fast as you might think. The salt crystals remain un- dissolved for several seconds. It's like rubbing the glass with sand paper! To clean, please use generous amounts of fresh water from a pan from the galley and "flood" the glass to dissolve the salt crystals away. (Better yet, wait until you're at a dock where you can hose off the salt crystals. If the dodger glass is really clear, you can thank previous guests for their diligence. And we thank you too!

CAUTION: We have found that most spray sunscreens and bug spray react chemically with the plexiglass. So please inform your crew to spray sunscreen or bug spray downwind of the dodger glass. And please don't lean against the dodger with sunscreen on your back and shoulders, or even your hands. Once that chemical reaction takes place, the glass is ruined and must be replaced (at a cost of around $400 per panel).

Thank you for your attention to the above items!!

The Bimini is installed high enough that we generally leave it up and deployed all the time. It can be folded up against the backstay cables if desired, which requires removal of a few #3 Phillips screws on the upper cross braces, and then contain it with the canvas cover, which is generally stowed on the little shelf in the port cockpit lazarette. Please don't lose any parts, and reinstall it when done.

The Bimini Filler Panel has two windows and is easily removable and stored if desired. When connecting to the dodger, install it above the dodger hand rail rather than below it. It's a little more difficult that way, but it does a

better job sealing out water. Also, make sure the boom topping lift is keeping the boom high enough that it does not contact the filler panel.

N. Electrical Panel

1. Most switches at the panel board are self-explanatory, but some circuits are unique.

(a) DC Main: This switch must be ON to enable all other switches on the panel. This stays on all the time whether or not underway or at shore. On shore power the batteries charge through the inverter.

(b) Auto Pilot and Instruments: The circuit breakers for the instruments are located on the electrical panel. They are labeled INSTRUMENTS, RADAR, AUTOPILOT, and GPS. I generally turn all 4 of these ON whenever I am using any instruments. The Instruments breaker also supplies power to the Tank Level Monitor display beside the switch panel.

(c) Cabin Lights. Master switch for the Cabin lights

(d) Salon Lights. Master switch for the Salon Lights. Individual switches for the Salon areas are above the electrical panel and just aft of the outlet box. There is a galley switch above the refrigerator. There are also 3 high intensity reading lights, 2 starboard side above the dining table and 1 port side above the port settee.

(e) Steaming Light. If you're underway with the engine running at night. (But please be advised that night passage making is not permitted under terms of your agreement with San Juan Sailing.)

2. Fresh Water Pump. This pump operates "on-demand" as water valves are opened, and stops when the system is closed and at pressure. This breaker should be OFF when underway or when you are away from the boat.

***Seamen's Note**: Make sure the fresh water pump is off when you are underway to avoid inadvertently draining all of your fresh water through the shower.*

3. Shower Pump. This switch must be on in order for the shower drain pumps to operate. The drain pumps are then operated individually by manual switches in the shower areas. Note: This breaker also supplies power to the refrigerator drain pump. The refrigerator drain pump control switch is next to the stove.

4. *Macerator*. Like the shower pump switch, this switch must be ON in order that the individual push button waste discharge pump controls in each head can operate. Turn off when not using.

5. Nav Light. If underway at night, with or without the engine running. (But, again, please be advised that night passage making is not permitted under terms of your agreement with San Juan Sailing.)

6. The Battery Voltage gauge has two readings. #1 is House bank. #2 is Start battery.

7. The Anchor Windlass breaker is located in the Aft Berth next to the battery switches.

8. The main switch for 120 volt shore power is in the 120 volt panel ahead of the nav station. There is also a 120 volt circuit breaker in the port cockpit lazarette. These are normally left ON all the time.

O. Electronics

1. General. The radar/chart plotter/GPS, depth sounder, wind instrument, and autopilot are all RayMarine products. There are laminated RayMarine-prepared quick operating reference guides in the Nav table. If you take them out during your charter, please return them to the Nav station for the next charter guest. Detailed manuals are under the center settee cushion.

2. Depth Sounders: There are two depth indicators on board. The ST60 Tridata readout at the helm and another depth indicator (a sonar) that is read via the 7"color display at the helm. Note: The sonar is not a "forward looking" sonar, but it does show the changes in the sea bottom contour. The depth sounder will not give accurate readings beyond 400'. In deeper water, the sensitivity on the unit increases as the transducer tries to get some reading back. Consequently, you will receive many false readings caused by currents, changes in water temperature, fish, and seaweed. Use the depth sounder only as an aid to navigation in shallow water.

IMPORTANT: The key to avoiding rocks is NOT the depth-sounder – but knowing where you are at all times. (Rocks are the greatest navigational and safety hazard in the islands – but they are all clearly marked on the MAPTECH chart.) The MAPTECH WATERPROOF CHART, not the chart plotter, is your primary navigation aid to avoid rocks. The chart plotter often does not show all of the rocks because of its resolution. The large scale paper chart does. Remember: If you enter into areas marked in RED, you will be responsible for any damage and you will not have insurance to cover it.

We do not recommend using the depth sounder's alarm during night. Besides being a battery drain, it's likely to sound at inappropriate times such as late at night while fish are passing beneath the transducer. (Instead, consult the onboard tide data to determine whether you're anchored in a safe location, considering how shallow your depth will become when the tide ebbs out of your anchorage and your anchor scope lengthens.)

3. Radar & Chart Plotter. Free Spirit is equipped with a RayMarine Radar and two chart plotter multi-displays – a 10" unit at the nav station and a 7" color display at the helm. FIRST: turn on the unit at the nav station, including pushing the "Continue" button when asked, and then turn on the unit at the helm (as the helm unit needs a "feed" from the unit mounted at the nav station). The chart plotters may be used without the radar to minimize battery drain. To start Radar/Chart plotter, turn on the electrical panel switches labeled Radar, GPS, AutoPilot, and Instruments. Then, press and hold the power button at the lower left corner of the unit until it beeps and turns on the display. You then use the display switch to

toggle between Radar, Chart Plotter, Sonar and Logging modes. To shut down the unit, press and hold the power key for 3 seconds.

We recommend using your PRIMARY navigation aids – namely, the Maptech waterproof chart book up in the cockpit while underway, and the roll charts (with the most active "killer rocks" marked in red) unrolled on the salon table. Utilize the chart plotter for added safety to see if you are where you think you are on the chart book or paper charts. If someone asks, "Where are we?" Within 3 seconds, you need to be able to point to the chart and show them the vessel's precise position. If you can't, you're in danger of hitting a rock. Hitting rocks in this area, even at slow speeds, is like slamming your car into a brick wall. It is violent and can cause severe damage and injury. Avoid all areas where there is any risk of hitting a rock. If in any doubt, slow to less than one knot boat speed until you are certain of being clear. And remember, in these waters, there is usually either a north or a south flowing tidal current that can cause you to move sideways in your path more than you think (another voice of painful experience).

***Seamen's Note**: Remember – due to currents and drift, you are generally not on the same line as your bow is pointing.*

The only time when the chart plotter becomes your primary navigation tool is when you're in a "tight spot" like going through a narrow pass or approaching the entrance to a secluded cove. Using the chart plotter in this way, you must "zoom in" as much as possible to make something that's the size of a dime on a paper chart into the size of a book on the screen. You can see more detail and, importantly, any hazards in the area.

***Seamen's Note**: remember that charts are sometimes wrong, and thus so are the chart plotters that read the data. Use good caution and observation skills.*

You should have little need of the radar except for the highly unlikely event that you are suddenly enveloped by fog, which is rare in this area. The fog that we encounter in the islands usually forms in the early hours of the morning and burns off by mid-day. So if it's foggy in the morning, relax and stay put until it lifts. (It's a vacation) Never depart from a safe location into the fog! To do so, even with radar, would be contrary to prudent seamanship. If you can't see 5 football fields ahead, you can't navigate safely. You cannot navigate safely under radar and don't overestimate your ability.

Fog becomes "reduced visibility" when you can see ¼ mile (about 4 football fields) in all directions. It is safe to proceed CAREFULLY in reduced visibility using your radar to "see" beyond the haze, but be sure to look up from the screen about every 10 seconds and use your eyes to scan the horizon forward, behind, and side to side. A motor yacht, tanker, or freighter traveling at 20 knots takes only 39 seconds to travel ¼ mile! You need to see these fast-moving vessels sooner-rather-than-later which may also come up from your stern.

4. Troubleshooting Information: You can use the following procedure to restore all chart plotter and radar settings to their factory default settings, in case someone before you has done a lot of tinkering: Begin by pressing the Menu button. Choose System Setup with the left soft key. Then hold the Menu button down as the unit counts down and restarts. Release and let it start as normal. Also, make sure Radar is set to Auto-Gain, if you are using radar. To align heading with COG in calm (no current) water:

(a) Hold down Standby key on the autopilot control for two seconds to enter Calibration mode.

(b) Press display key until you see the Seatrial Cal screen.

(c) Press the auto key to enter Seatrial Calibration.

(d) Press the display key two more times so the display reads Algn Hdg.

(e) Press the auto key for a moment while on a steady course under way.

(f) Hold the Standby key down for 2 seconds to exit.

5. Knotmeter. If the digital knotmeter shows a reading of "0.00" while underway, the impeller is most likely clogged with a piece of eelgrass. Sometimes it will float off overnight. You can also try removing it by moving in reverse. The impeller is located beneath the floor board in the forward cabin. (We don't recommend that you try to remove the impeller to clear it, unless you are VERY experienced in such things. An open hole in the hull is a scary situation, and if not plugged quickly, it can jeopardize (i.e., 'sink' -- the boat.) If the knotmeter is temporarily "out of service", the GPS input to the chart plotter provides an alternate and more accurate speed indication anyway, displayed as SOG (speed over ground). However, your wind indicator will only display apparent wind in this situation.

6. VHF Radio. The ICOM 422 VHS radio is above the Nav Station chart plotter display. The cockpit remote RAM mike is stored on a clip above and behind the nav station circuit panel. It plugs in to a socket on the port side of the helm. There is also a good portable handheld VHF radio and charging base stored next to the 120 volt panel in front of the nav station. Its charger lies next to the 120 volt outlet above the nav station. Detailed manuals for each are in the nav desk.

(a) Generally operate on the Low power setting.

(b) In case of a distress where you can no longer stand by the radio to pass your mayday, use the red distress button on the Nav Station Radio. First flip up the cover, then press the button. GPS input is automatically coded into your signal. You should monitor channel 16 (the hailing and distress channel) during your cruise. After establishing contact on channel 16, switch to working channels 68, 69, 79, or 80.

(c) Scan the weather channels for the one with the best reception (usually channel 4 or 3) before sailing in the morning and prior to anchoring for the evening. This is generally a light wind region but weather changes can be sudden. Listen for the "Inland waters of Western Washington" or "Camano Island to Point Roberts". Both cover the San Juan Islands. You will also hear "Strait of Juan de Fuca" (south of the San Juans), "Georgia Strait" (north), and "Rosario Strait" (runs through the eastern part of the San Juans).

(d) San Juan Sailing monitors channel 80 during office hours (closed Sundays). By phone you can reach the San Juan Sailing office at (800) 677-7245 or SJS's owner, Roger Van Dyken, at (360) 224-4300 (cell) or (360) 354-5770 (home). Also, the "Maintenance Pro" for this boat is Craig Cooper, who you can reach at 360 201 0178 ccooper@nwexplorations.com. If you cannot reach Craig, you can reach Parker Armstrong at 360 870 6320 parmstrong@nwexplorations.com; or Matt Robinson at 360 631 3731 mrobinson@nwexplorations.com.

(e) Note: If, all of a sudden, a wailing sound comes from the cabin in the area of the VHF, push any button on the VHF to turn off that alarm. This is a distress alarm, from someone else, and there may be relevant data on the VHF display. Please read the manual for further explanation of this feature.

P. Emergency / Safety Equipment

1. Flares. Visual day/night distress signals are located in the orange plastic boxes behind the port settee back cushion.

2. Horn, and Bell. Stored in same area as flares.

3. Radar Reflector. Installed on the backstay.

4. Thru-hull plugs. Attached to through-hull and some extras in area with flares. There is also a red foam Tru-Plug stored with the safety equipment behind the port settee back cushion.

5. Fire Extinguishers. There are three fire extinguishers. One is located in the port side cockpit locker, one on the side of the nav desk, and one hanging below the port side forward berth locker.

6. Emergency Tiller. It sort of looks like a metal pipe, with an "elbow" bend in it. It's located in the starboard cockpit locker strapped to the bulkhead wall left of the tool box. The rudder post attachment point is under the helmsman seat. (To remove the cover, insert a winch handle in the star-shaped fitting and unscrew).

Q. Handling and Engine

1. Handling.

(a) Reverse. Free Spirit "walks to port" slightly despite the Maxi-Prop. It's easily overcome with the wheel and rudder when you have a little sternway. (Be sure to hang on tightly to the wheel in reverse, as the water over the rudder puts tremendous pressure and can slam the rudder away from you, damaging the rudder assembly and the steering mechanism.)If you are not used to driving in reverse, here are some simple suggestions. First, it is easier to start backing in reverse if the wind is coming across your stern (bow is down wind). Secondly, some folks stand on the cockpit side of the wheel. Steering in reverse is like steering a car – just turn the wheel the way you want the stern to go.

(b) Forward. Free Spirit has a large and deep rudder and turns quickly in a narrow radius. Very small rudder adjustments will easily change course. Take it slow. Periodic power to 2500 RPM will give you quick steerage, but back off after 1-2 seconds to avoid excessive forward speed.

(c) Docking. Remember, "Slow is Pro". Free Spirit, with her 10 tons, carries momentum well, so your final approach and turn in toward your slip can usually be done with the shifter in neutral…you'll certainly need no more than "idle speed forward". Plan at least 5 boat lengths ahead.

***Seamen's Note**: Never turn off the engine until the vessel is securely tied at the dock.*

When coming into the San Juan Sailing docks in high winds or if you'd just like a little assistance upon arrival, simply hail "San Juan Sailing" on VHF channel 80 or call 800-677-7245. We'll be glad to offer some "coaching" and/or catch your lines. In fact, most marinas in the islands will help you if you hail them and ask for assistance. Asking for docking assistance, especially in windy conditions or with an inexperienced crew, is a sign of prudent seamanship.

2. Engine Starting Procedure.

(a) Oil Level. Check oil level before starting, preferably first thing in the morning. To check the oil level, use the following procedure: This is not as easy as it sounds, especially the first time. Although the engine compartment is well organized in general, the dipstick takes a little searching to find. Begin by opening the main compartment by lifting the companionway stairs after unlatching it at the bottom. This will let in some light.

Next, access the starboard side of the engine by unlatching and removing the engine cover on the bulkhead next to the refrigerator in the galley. The dipstick the yellow wire and is just aft of the opening behind the white coolant container above the oil filter. If you don't immediately see it, relax. This is normal. Go back to the front of the engine (under the stairs) and look over the top of the engine in the area of the coolant tank earlier mentioned. You will see the yellow top curl of the dipstick. Now you see what you are reaching for.

The correct level is slightly above the middle mark (there are 3 marks on the dipstick). When looking at the front of the engine from the stairway opening, you will see my reference diagram on the white fiberglass under the starboard motor mount. Any filling, if necessary, is done through either of the orange fill caps, one you see from the starboard side access and the other is on the very top of the engine valve cover. Do not overfill. Use the onboard spare oil, inside the plastic box in front of the engine, to add no more than a cup at a time. Then check the level again. Also, if the dipstick indicates no oil the first time you check it, reinsert and try again - the correct level will show when the air lock bubble is broken. Expect the oil to be blacker than that of a gasoline powered automobile engine…this is normal for a diesel after only a few hours of operation. While the cover is removed, check the coolant level in the reservoir tank. There is a small flashlight forward of the engine in a holder to help you. Please replace it when you are done.

While checking oil level, look for any fresh drips on the absorbent pads under the engine. If you don't see any, generally it is not necessary to check the oil level although prudent sailors will check it every day before getting underway.

(b) Belts. Check for belt tightness (1/2" play is normal). Also, look for any leaking fluids dripping on the absorbent pad under the engine. Check the raw water strainer located high in the compartment near the front of the engine. The cover is clear, so you do not have to remove it but it generally is a good idea to check for any eel grass on a daily basis by removing the lid and emptying the basket.

(c) Battery Switches. After you secure the companionway engine cover, check the battery switches in the front of the Aft Cabin bunk. All three should be in the vertical "on" position.

(d) Visual Stern Check. Look over the stern for things that could foul the propeller.

(e) Starting. I normally start the engine with the speed/shift control in the idle/center position.

(i) Insert the key. During very cold weather (below 40 degrees), turn the key counter- clockwise and hold it to warm the intake air pre-heater for 30 seconds. Otherwise, just turn the key clockwise to start the engine, just like your car. The warning buzzer will sound until the engine starts because there is no initial oil pressure. A second buzzer also sounds for a few seconds, coming from the water-in-fuel sensor gauge in the instrument panel.

(ii) Expect the engine to start right away. If the engine doesn't start after 5 seconds of cranking, turn key to the left and remove it. Make sure the engine STOP pull handle was properly pushed in the last time the engine was shut down. Wait 15 seconds and try again.

(iii) After the engine starts, release the clockwise key pressure.

(iv) Check for water gurgling out the exhaust.

(v) Warming Interval. Avoid placing a heavy load on a cold diesel engine. Unlike a gasoline engine, diesel engines require a short interval – about five minutes is ample -- to warm up. While the engine warms. this is a good time to go on top and check the fittings, lines, and mop the deck and do your other prudent sailor daily checklist.

(vi) Forward. Now you may engage forward gear by pushing ahead on the throttle, or reverse gear by pulling back on the throttle.

Seamen's Note: *Please remember to pause for 1 to 2 seconds in the straight up (neutral) position when changing shifting from forward to reverse and vice versa.*

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3. Engine Operation.

(a) General. These 50hp Yanmar engines are very reliable. Cruising speed is 6.0 knots at 2400 RPM and 7.0 knots at 2800 RPM. In an emergency, it can be pushed to 3500 RPM for a short period; however, it's not good for the engine to do much of this. I generally enjoy cruising at 2400 – 2600 rpm. Above 2800 you really don't gain much additional speed. After you arrive at your destination, please let the engine idle for about 5 minutes to cool down before shutting it off. We have often found that letting the engine run a bit in idle, keeps you ready for any unanticipated issues as you sort out the mooring lines, dock or mooring ball procedures, or checking the anchor.

(b) Fuel Consumption. The fuel gauge is just below the ignition switch. Also check and record your engine hours. Note: Fuel gauges on boats tend to be less than accurate. Instead, I generally keep track of the hours of running time, and generally figure about one gallon burned an hour. The tank holds 54 gallons. Fuel consumption rates (Gallons per hour) @ specific engine speeds are:

0.45 @ 1800 0.73 @ 2200 1.10 @ 2600 1.31 @ 2800

(c) When to Refuel. To avoid the likelihood of sucking air into the fuel system, refuel before the fuel drops below ¼ full.

4. Engine Overheat. If the buzzer sounds while the engine is running, immediately check for oil pressure. Normal oil pressure readings on the gauge are between 30 and 50 psi. If you lost oil pressure, shut down the engine, check the oil level, and contact San Juan Sailing. However, the most likely cause of the alarm buzzer is exhaust temperature or engine overheating. Do check the temperature gauge. Its normal operating range is between 160 and 180 degrees. Check for water gurgling out the exhaust before you shut down the engine. If you have the normal amount of water exiting through the exhaust, check the engine coolant level after the engine cools down. If it is the Water Proof indicator that is lighted or there is no water gurgling out of the exhaust or you see steam instead of water, the seawater strainer is likely plugged with eelgrass.

The best solution to this problem is prevention— watch out for eelgrass masses, especially along those "soapy" tide and eddy lines in the water. When eelgrass gets sucked into the engine cooling water intake, it jams at the raw water strainer. To clear the strainer, shut down the engine and open the engine access door by lifting the stairs. The raw water strainer is above the waterline, so there is no need to shut the seacock valve on the raw water intake. Remove the top of the strainer by turning it counterclockwise. (It will be tight) -- Extract the plastic filter element. Remove the eelgrass and reinsert the plastic filter element into the strainer and slowly rotate it until it seats the basket top level with the sides of the strainer. Replace the lid and tighten by turning it clockwise until the lid is seated on the rubber gasket. (Be careful not to mis-thread or over tighten the plastic top. Hint: Turn counter-clockwise first until you feel the top threads drop down into place in the bottom threads…then tighten clockwise.) If the engine overheats again, check the seal between the strainer and its lid. If the strainer is drawing air, it won't draw water. (If still overheating, contact San Juan Sailing.) There is a small jar of petroleum jelly in the spares plastic case in front of the engine. A light coating applied to the strainer lid threads helps in removal and installation.

5. Warning Lights. The warning lights on the instrument panel are marked as follows, left to right:

(a) Cooling Water (Water-Proof): This is connected to a temperature sensor on the engine exhaust. If something has caused the raw water flow to stop, such as a plugged strainer, then this senses the rise in exhaust temperature before the engine itself gets too hot. Shut the engine down and investigate the problem.

(b) C.W. Temp: This is a connected to a temperature sensor on the engine that indicates if the engine temperature is too high. Shut the engine down and investigate.

(c) Oil Pressure: This is connected to the engine and indicates if the engine oil pressure is too high. Shut the engine down and investigate.

(d) Charge: This is an indicator that the alternator is not charging the batteries as it should.

6. General Engine Shutdown. Do not shut off the ignition key while the engine is running! First bring the engine to idle and the gearshift to neutral. Allow the engine 5 minutes to cool down if you have been under significant power. Then pull the fuel cutoff handle next to the ignition switch. After the engine stops, the buzzer will sound until you turn off the ignition key switch. Remove the key and make sure you have pushed the engine STOP handle back in. Note: If you have shut down the engine in order to sail, then move the transmission momentarily into reverse and then back to neutral. This will stop the prop rotation and cause the blades to feather properly.

R. Fuel Tank and Filling

The fuel tank holds 54 gallons (200 liters) and is located under the floor in the large starboard cockpit lazarette. Please be very careful when fueling. First, make sure you are filling the inlet marked Fuel. I keep the key for the filler cap hanging from a hook in the nav station side compartment. A spare is kept in the lower part of the same compartment.

Next, fill slowly. Never allow maximum flow from the filler hose. If you do, the fill tube will surge and diesel will spill from the vents onto the side and onto the deck. It takes only a few drops of diesel fuel in the water to create a sheen and subject you to a Coast Guard money fine. Fill slowly and carefully.

Put your ear down to the fill hole and listen to the diesel flow when filling. When the pitch or tone starts rising, the tank is likely full and you're now filling the hose between the tank and the fill hole. STOP! Avoid a fuel spill –Check the fuel gauge (with key on). If the gauge is not on "F", you may continue filling slowly, keeping an eye on the fuel vent.

Another way to verify the tank is full is to calculate ahead of time your fuel consumption, and then see if the amount pumped matches reasonably close.

Check the side vent and, with dish washing soap, wipe up any excess fuel to avoid yellowing the hull and stern and polluting the water. Also be very careful of drips when removing the hose. Diesel and shoe bottoms are a very slippery and dangerous combination. After wiping up any drips and reinstalling the fill cap, please use soapy water to scrub down any drips so it does not stain the fiberglass.

Note: Unlike automobile fuel gauges, fuel gauges on boats are notoriously inaccurate, especially on the low end. Therefore, whenever the fuel level drops below 1/2 full, you should refuel at your next opportunity. NEVER let the fuel level fall below 1/4full or you're in danger of running out of fuel. (Towing and the cost of a mechanic to bleed the air from the fuel lines is an expensive proposition.)

S. Head & Holding Tanks

1. General. Free Spirit has high quality Raritan PHII manual heads, freshly cleaned 22 gallon holding tanks, new hoses and vents, and Sealand bellows type overboard pumps, all designed to reduce potential problems and odors. ALL of the outflow from the heads goes into the holding tanks – another reason NOT to put anything in the toilets that hasn't been eaten.

***Seamen's Note**: Offshore sailors have a rule: "Never put anything down a marine toilet that hasn't been eaten first." And that, of course, includes feminine items and masculine items. In fact, offshore sailors do not even put soiled toilet tissue down a marine head. They simply deposit soiled toilet tissue (and feminine items) in a receptacle such as a waste basket with a liner bag or a zip lock baggie, but not down the toilet. We and San Juan Sailing highly recommend you follow this rule. And since we've been recommending this, we've had almost no incidents of plugged heads! It is far less gross than trying to declog a pressurized toilet system at anchor!*

2. Please monitor your holding tank levels! An electronic monitor panel is at the nav station. On the gauge panel:

(a) #1 tank is rear fresh water tank level.

(b) #2 tank is aft head holding tank level.

(c) #3 tank is forward head holding tank level.

The "Instrument" switch/breaker must be ON for the monitor to work. Also, due to the convoluted shape of these tanks, accuracy is not very good. So, if it says 3/4 full, it's time to empty it. Also, it is not unusual for a tank to indicate 1/4 full even when empty.

***Seamen's Note:** To avoid problems, we prefer to empty our tanks daily. If the toilet pump starts to resist your flushing effort, don't force it! Make sure the flush/dry valve is fully in one position or the other. Also, make sure the head inlet water filter (under the sink) is not clogged. If it still resists, stop, and empty the holding*

tank(s), either with the overboard pumps if in areas permissible to do so, or at a shore facility. Exploding or leaking sewage is terribly unpleasant! Search out the problem and correct it. If you pump out the holding tank at a shore facility, please fill it with fresh water through the deck fitting to rinse, and then pump it out again. That helps keep odors down.

Note: The original macerator pumps were replaced with bellows type pumps that do not have the normal high pitched macerator pump sound. Instead, you will hear a steady stroking/swishing sound that will speed up slightly once the tank is empty. You will also start hearing the glug-glug sound of air bubbles beside the hull when the tank is empty. I generally open the cabinet door below the sink in order to hear it better. Although this type of pump pumps slower than a macerator pump, it is more reliable and not damaged by running dry. It takes about 4 minutes to empty a full tank.

Also, please make sure the tank pump outlet thru-hull valves are open before pumping. Otherwise it won't work and may cause inverting of the pump outlet duckbill valves, after-which it will not work. See markings on hoses.

The head hose plumbing on Free Spirit is very simple. From the toilet it goes to the holding tank. Then it either gets sucked out through the deck fitting at a pump out facility, or it gets pumped out by your overboard pump earlier described. There is no Y-valve to get confused about or to leak. Although I've never had head failure problems, if one did occur there are two heads anyway. Less parts equals less potential problems, and no Y-valves keeps the Coast Guard happier.

3. Toilet Function. General toilet function is as follows:

(a) Pumping with valve in "flush" position will bring seawater into the toilet if desired. Add a little fresh water if needed.

(b) Use toilet.

(c) Pump 3 strokes in the "dry" position to remove excess water.

(d) Pump about 12 strokes in the "flush" position to move waste out of toilet.

(e) Switch valve to the "dry" position.

(f) Pump about 12 strokes to move water and waste fully into holding tank.

(g) Leave valve in the "dry" position.

Note that in the under sink cabinet areas of each head, there are two in-line water filters. The small one catches junk from the shower drain before it gets to the discharge pump. The larger one is on the sea-water intake line for the head. If the head manual pump gets hard to move, and the holding tank is not full, this strainer may be plugged and require cleaning. Neither is below the waterline.

4. Cabin Headroom. Headroom in Free Spirit is over 6 ft in all cabins.

T. Heater

1. Diesel Cabin Heater. The Webasto AT5000 forced air diesel cabin heater is located in the outboard portion of the large starboard cockpit locker, behind the white shielding. It is important to note its location and that of its insulated exhaust pipe. Most areas are well shielded, but beware that some components do get hot during heater operation. The exhaust for the unit can be found outboard the starboard cockpit on the side of the hull. Please be aware of its location as well, especially with dock lines, dinghy, and dingy painters. The hot exhaust air will melt them.

(a) The heater control is located forward of the nav table, by the 110 volt panel, and is turned on by simply turning the switch to the "heat" position. From there, press the up and down keys to the desired temperature on the LCD display. This system works similar to your home in that it is thermostatically controlled at the temperature you set. Be aware that a delay exists when turned ON or OFF. A fuse that protects this circuit is located in the very aft end of the starboard cockpit locker.

(b) There are 4 heat outlets from the furnace unit (aft stateroom, galley, main salon, and forward stateroom). The vent for the main salon is always in the open position while all the others can be controlled by opening and closing the slats with the center knob. The heat is dry, comfortable, and on those rainy days or cool evenings, makes a huge difference in cruising comfort!

(c) Note: The "return air" grill for the heater is in the very aft corner of the aft stateroom. Please keep it uncovered.

(d) When it's cool, we recommend warming the boat before turning in for the night, with the last person to go to bed instructed to turn the diesel heater off or the temperature down before retiring. (Otherwise, the boat may get too hot and the electric fan in the diesel heater may overly drain the house batteries.) Then, the first one up in the morning can simply turn the cabin heater back on, which quickly warms up the cabin.

(e) Caution Note: If "house" battery voltage drops below 11 volts, the diesel cabin heater will not operate.

2. Electric Heater. In addition to the diesel heater, Free Spirit is equipped with an electric cabin heater. However, you should only use the electric heater when on shore power. Otherwise, it will draw a heavy load and WILL drain your batteries.

U. Inverter and 110 Volt Power

1. Inverter. The 2000 watt inverter is located under the nav station seat. It allows you to run 120 volt electronics, microwave, etc. The normally hinged seat is secured down with a Phillips screw at the corner in order to keep curious fingers out of a potentially dangerous electrical area. You should not have to enter this area. The inverter gets its power from the "house" battery bank. On the port side of the engine compartment is its main supply cutoff switch. If you encounter a problem with the inverter requiring a "reboot", do so by cycling this main switch OFF for 10 seconds and then back ON.

(a) Control Panel. The inverter control panel, along with the 120 volt switch panel and heater control, is located just ahead of the nav station. The ProSine panel has three switches. I generally leave all three in the ON/Enabled position all the time. That way inverter operation is automatic, battery charging is automatic when connected to shore power, and the display operates. If you are not connected to shore power, and don't desire any on- board 120volt power, you can choose to turn them off, which does conserve a small amount of battery power. The top switch in the AC Power Center is generally left ON most of the time. The water heater only works when on shore power, however, it also heats from engine temperature when motoring. You can leave the water heater switch in the ON position, unless the water heater is empty of water for some reason.

(b) The Battery Charger switch is marked "Leave Off" because the inverter's charger generally does a better job of charging batteries. However, this other battery charger is functional if needed. If you draw the voltage below 12.3 and the inverter shuts off, turn this on and charge the batteries with the engine until it exceeds 12.3 volts. You can then shut this off.

(c) Important Note: Heat producing devices, such as microwaves and blow dryers, generally consume about 1300 watts each. So, using only one such device at a time will save you from the aggravation of blowing a circuit breaker. Also, keep in mind that they rapidly drain the inverter's supply batteries, so avoid prolonged use of any high wattage devices.

(d) Beeping Noise. If a beeping alarm comes from the inverter control panel, it is probably indicating a low battery voltage situation. This alarm will sound when loaded house battery voltage drops to 11.7 volts. This corresponds to an open circuit voltage of 12.2 volts, which is 50% battery capacity. If this is the case, you may as well turn OFF all 110 volt devices and turn the inverter switch to the disabled position until the batteries are recharged. If the house battery voltage drops to 11.5 volts, the inverter will shut off in order to protect the batteries, and will not come back ON until house voltage is at

least 12.5 volts. At that point it may also require a "re-boot" as earlier described, once the battery is back up to power.

(e) Alternator Recharging. Keep in mind that it takes a lot of alternator charging time to fully recharge the sizable "house" battery bank, especially if you are drawing it down by using the inverter a lot. I generally recommend taking advantage of power on the docks when available to get a nice full charge on the batteries.

2. 110 Circuits. The 110 outlet circuits are protected by a GFI outlet above the circuit panel in the nav station, and a second one in the under sink cabinet area of the forward head. If you mysteriously don't have power on some outlets, see if the indicator light is ON at the GFI outlet. If so, push the reset button on the outlet. When the light is on, it indicates it is tripped and needs to be reset. Normal operation is when the GFI light is off.

V. Keel Depth and Prop-Walk

1. Keel. Free Spirit's sailing characteristics are greatly enhanced by her 7ft deep keel. It is recommended that you always maintain a minimum of 10'-12' under the keel at all times, both underway and at low tide on anchor.

2. MAXI-PROP. Free Spirit has a MAXI-PROP to lessen prop-drag under sail and it also somewhat reduces prop walk when backing under power. However, prop-walk still occurs, so please take care and use it to your advantage. She walks to port in reverse.

W. Refrigerator & Freezer

1. General. The well-insulated refrigerator and freezer must be turned on at the electrical panel. There is a thermostat for both units. We recommend running the refrigerator during the day only, generally with the thermostat in the freezer compartment set to a setting of between 4 and 5, but not at night. This will help conserve house battery power and also keeps an excessive amount of ice from accumulating on the cooling coil in the freezer.

2. Refrigerator Cooling. The refrigerator is cooled by two large holes that allow cold air to flow from the freezer to the refrigerator. When loading the refrigerator, keep items clear of the two air passage holes that allow cold air from the freezer to enter the refrigerator and watch for excessive ice buildup in the freezer that limits the circulation of these holes.

3. Drain Pump Switch. There is an "icebox drain" pump with switch located next to the stove. The shower drain switch/breaker must be ON for it to operate.

4. Note: If the icebox lid support starts getting stiff and hard to raise, it is usually because the thermostat is set too cold (high number).

X. Sails

1. Headsail. The 140% genoa/jib has roller furling and foam luff. Whether fully or partially deployed, you'll have good sail shape. Slight hand-over-hand tension on opposing lines – furling line and sheets – prevents problems such as a rat's nest on the drum (should the wind catch the sail and unwrap it violently) or a baggy furled sail. Reefing the Headsail – Simply ease the jib sheets (keeping control of them) while pulling in the jib reefing line until only the amount of sail you desire is deployed.

Seamen's Note: *When at anchor or tied up for the night or at the end of your charter, I like to put knots in the furling line and jib sheets, behind the clutches, to prevent the jib from unfurling in an unexpected high wind situation if one of the clutches should not hold.*

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2. Mainsail.

(a) General. The main has an in-mast furling system. With an in-mast rig, in normal conditions, it's recommended that the head sail be deployed first (while underway). The mast bows slightly aft at the top. By deploying the head sail first, the pressure of the wind in that sail tends to straighten up the mast. This makes it easier for the main to deploy from within a plumb mast. So provided that the wind is less than 20 knots, steer to a course of approx. 60 degrees to the wind (close reach). Deploy the head sail. Now you may throttle down and place the engine in neutral, sailing on the head sail alone. Now you're ready to deploy the main.

(b) High Wind. If you're in high wind (20+ knots) conditions, you may prefer to deploy the mainsail head-to-wind instead. That's okay, but in this situation, deploy the main first. (Since you're in high winds, only partially deploy the main so it's in effect "reefed".) Once deployed, fall off and begin sailing…just like you would on a vessel with a conventional main. Then partially deploy the head sail. Be conservative with the amount of sail you deploy in high winds. If you've been too conservative, you can easily deploy more sail area while sailing.

Seamen's Note: *In high winds, it is far better to deploy less sail than more sail. It is easier to add sail than to shorten sail.*

(c) Deploying the Main Sail:

(i) The mainsail does not cooperate when the boom is pulled down too tight, so give it a little 'play'. Loosen the boom vang by pulling out about a foot of line (then close the line clutch) and loosen the main sheet by pulling out about 3 feet of line (then close the clutch). The "outhaul" line is what pulls out the main. Pull the outhaul by hand or by careful use of the winch. (The rope clutches provide one-way stops, so you don't need to fully open them when winching in.) Be careful not to force the outhaul or you will do damage to the rigging and the sail. If it does not respond to moderate force, check for the hang-up. For control, keep slight hand tension on the "main furler" line while pulling out the outhaul until the main is partially or fully deployed (depending on the wind and your preference). The wind pressure on the main will actually help the main to deploy.

(ii) Important: If you encounter resistance when unfurling the mainsail, STOP and investigate. It should unfurl with very little resistance. In fact, the resistance should be light enough that you could unfurl it by hand without a winch. Make sure the furling line clutch is fully released. Binding during the last half of deployment can also occur if you are fully deploying the main without the boom pulled down as earlier mentioned.

(d) Reefing the Main Sail: You have infinite reef points with an in-mast furling main. You can deploy as little or as much sail area as you determine is appropriate for wind conditions you encounter. And you can reef an in-mast mail while sailing and from the safety of the cockpit. To Reef, simply wrap the "main furler" line on a winch. Then grasp and control the "outhaul" line (with a minimum of two wraps of line around the winch since the sail is under load and you'll need to maintain control, but do not lock the line in the winch since it needs to be free to pay out slowly). Then, when you're ready, fully open the outhaul rope clutch. Winch in the main furling line, while you slowly pay out the opposing outhaul line, until you've shortened the mainsail to a position appropriate for the current wind conditions. Close the rope clutch on the outhaul. Again: The mainsail should furl with little resistance. If you encounter resistance, investigate. The outhaul line clutch may not have been fully released.

Seamen's Notes: *The old adage is true. Watch the weather -- reef before you need to!*

(e) Shortening the Head Sail. After you've furled the main, you are ready to shorten the head sail. (If you shorten the head sail first, you'll increase "weather helm" and likely round up. So always reef the main first.)

(f) Furling the Sails. When you're ready to bring in the sails, start by furling in the main. Think of furling the main as reefing 'all the way'.

(i) Furling the Main. 1. While still sailing, steer the vessel into a close reach (about 60 degrees off the wind). 2. Winch in the boom vang to pull the boom down. (This will help the mainsail enter the mast without wrinkles that may hinder a future deployment. 3. Wrap the 'main furler' line on a winch. 4. Grasp and control the 'outhaul' line by maintaining adequate tension (with a minimum of two wraps around the winch, not locking the line as it needs to pay out slowly), and then open the outhaul line clutch. 5. Winch in the main furling line, while you slowly pay out the opposing outhaul line (maintaining a fair amount of

tension to ensure a tight wrap inside the mast), until the main is completely furled, to the mark near the clew. don't force it if you encounter a lot of resistance. It should furl rather easily.

(ii) IMPORTANT: Be sure to keep firm hand and plenty of tension on the outhaul while reefing/furling the main in order to get a nice tight wrap of the mainsail inside the mast. The wind will help you get a nice tight wrap. Remember, if you furl the main without any wind pressure on it (if you're head- to-wind in high winds or if you're simply becalmed), tension on the outhaul line is the ONLY force that will get you a nice tight wrap inside the mast. A loosely furled main inside the mast could mean a tough next deployment or, in the worst case, a jammed main.

My method of applying correct tension on the outhaul when furling the main in light wind conditions is shown in the photos below. Note how I make one –two wraps around the winch with the outhaul line and tail it with a good squeeze between thumb and forefinger. For me this always results in the correct amount of tightness of mainsail furling wrap, thus making future deployment easy.

(g) Furling the Head Sail. Now that you're sailing on a close reach on the head sail only, it's time to start the engine and shift into forward in order to maintain your course of 60 degree off the wind. While holding course, furl in the head sail and secure its clutch. And motor in to your anchorage or marina!

3. Cruising Spinnaker. If you are experienced with a cruising spinnaker, you are welcome to use this sail in light wind conditions; PROVIDED IT IS PRE-CLEARED WITH SAN JUAN SAILING BY DEMONSTRATING YOUR COMPETENCE. You will need to request it be put on-board before your departure from the docks.

If you do not have significant previous experience, then we respectfully ask that you do not attempt this, as you can get in trouble very quickly. All of the spinnaker gear, except the spinnaker and spinnaker sock itself, is stored in the yellow ditch bag in the starboard cockpit locker. The photos below will guide you as to how I generally rig it:

Y. Shower, Hot Water & Shower Sump Pump

There is a roomy shower in the forward head and another shower in the aft head. After turning the shower sump pump switch ON at the panel board, it is controlled by a toggle switch located below the shower faucet in the forward head and above the sink basin in the aft head. It takes about 30 minutes of running the engine under load to get hot water. It will not get hot idling in an anchorage, so don't waste your time or relations with your

neighbors trying. However, if the water was hot the evening before and you don't waste it with a lot of dish washing, it's usually still a bit warm in the morning. Experienced cruisers know the sailor's shower: get wet, turn it off, soap up, rinse off.

CAUTION: The engine can heat the water to scalding temperatures! On warm days, an alternative to the below decks shower is the swim platform shower. This is also a good way to rinse off salt after swimming or dirty shoes after hiking. Move the control up or down for on/off, and rotate it for temperature control. There is also a push-button control on the shower head itself. Be sure and turn the control off when done.

Z. Stove/Oven

The gimbaled propane stove has two standard sized burners, one oversized burner and an oven.

1. Caution Warning and Lighting Procedures. Propane is heavier than air and requires caution. For your safety, please follow these procedures:

(a) Make sure all stove control knobs and the electric solenoid switch (Marked "Gas Valve") are in the 'off' position.

(b) Open the hand valve at the propane tank in the stern propane locker all the way open and slightly snug.

(c) Turn the electric solenoid switch (marked Gas Valve) located in the electrical panel to "on".

(d) Then push the stove control knob in and turn to the left to high. Although the stove is equipped with a piezo lighter, these are notoriously prone to failure. We recommend you use the hand held lighter. Using the handheld lighter and the stove knob in and turned, the burner should light immediately. Continue to push the knob in for a few moments for the thermocouple to sense the flame and keep the flame on. Note: If it's been a while since its last use, it might take a little while for propane to make it from the tank to the stove.

2. Shutdown. When finished with the stove, shut off the burner(s), then shut off the solenoid switch. (What little propane remains in the line from the tank to the galley is insignificant, and even if this tiny amount of propane were to leak into the cabin, it would not cause a problem.) If you do not intend to use the stove again in the next several hours, it's also a good idea to shut off the hand valve at the propane tank. Then you'll have both the solenoid valve and the hand valve protecting against a potential propane leak into the main cabin. Please note that both propane valves – the hand valve and the solenoid valve – are located in the propane locker in the aft of the cockpit, which is vented and isolated from the rest of the boat. Any leaks there will move down, out, and away from the boat.

3. Filling Tank. While the propane tanks normally last for six weeks or more, San Juan Sailing's staff fills the propane tanks every 3 weeks. You should not need to fill the tank.

4. Cooking Underway. If cooking underway, gimbal the stove by pushing the rod above the oven door to the right, so it is not inserted in the hole in the cabinet (forward). Then if the boat heels, hot liquids and foods will not readily slide off of the stove. Also, for added security, use the fiddles that hold the pots/pans on the burners. If you have something in the oven, please lock the oven door so the contents cannot slide out onto the galley sole (or someone's feet). A latching mechanism is incorporated into the oven door handle. WARNING: Never cook in high wave conditions or in strong, gusty winds.

5. Cooking at Anchor. When cooking at a dock or in a quiet anchorage, lock the stove in position by pushing the rod under the stove to the left and into the hole in the cabinet (forward). That way, if someone leans on the stove or grabs the oven handle, it won't tip and spill pot/pans.

6. Oven. The oven should be lighted with a hand lighter as well in the same fashion as the burners. Note: There is a heat diffuser plate inside the oven. This is not a broiler pan, and needs to stay in its intended position for good oven heat distribution.

AA. Water Pressure & Tanks

1. Water Pressure: The fresh water pump switch is located on the electrical panel. Please switch this off when motoring or sailing. The fresh water pump is very quiet and you could burn out the water pump should one of the tanks run dry (and you would not hear the pump running over the sound of motoring or sailing). Also a leak would cause you to loose most of your on-board water supply.

2. Water Tanks: We have two water tanks, one located under the aft bunk (54 gallons / 200 liters) and another located under the forward V-berth (90 gallons / 340 liters), with a total capacity of 144 gallons. Selection valves are under the starboard settee. Use only one tank at a time – do not leave both valves open.

(a) The water level in the aft tank is displayed on the same monitor panel as the holding tank gauges. It is Tank #1 on the display. Again, accuracy is not a strong feature of these gauges due to the tank's convoluted shape.

(b) There is no level gauge for the forward water tank. Generally, make sure you are full before departing, and then judge your needs for the expected duration of the rest of your trip once one of the tanks goes empty. If your crew does not let the water run continuously while they brush their teeth, shave, or wash dishes, you shouldn't have a problem.

3. Water Filter: A two stage water filter system is mounted next to the freshwater pressure pump. The first filter (left) is an inexpensive carbon block 5 micron filter that removes most trash as well as taste problems.

The second filter has an expensive 0.2 micron absolute filter element that removes most remaining impurities.

I generally keep a spare carbon block filter element sitting to the left of the first filter housing. If a water flow problem develops, you may replace this filter element and discard the old one. Removal is accomplished by unscrewing the large bowl, letting it drop several inches, pulling the element down to release it, and then removing both. A wrench for this purpose sits above the filter assembly. Do

the reverse to install the replacement. Hand tight without the wrench is generally tight enough during reinstallation. Please be aware that there is a small coarse screen filter unit ahead of the water pump. It could also be the source of a water flow problem, and is easily cleaned. If a severe problem occurs, the complete filter assembly can be bypassed by removing the hose from the filter outlet and connecting it directly to the water pump outlet. Or the filter elements could simply be removed and the bowls reinstalled without their elements. Note: State parks have no pressurized water to refill tanks, but most points of civilization do.

BB. Entertainment Systems

1. Radio, CD, and iPod Player. The control head is located right below the switch panel at the nav station. The operation manual is in the nav desk. The iPod cable connection hangs out of the nav station panel just above the desk. You can control the iPod from the radio head unit.

2. TV / DVD Player. The self-contained TV/DVD with remote control is mounted to the port side forward bulkhead with a pivot arm mount. There are tightening knobs on the back side for swinging the arm, angling the screen, and tilting the screen. Please make sure all are snug and secure before each day's sail. The TV/DVD uses 110 volt power, so the inverter must be ON or you must be connected to shore power. The DVD loads from the right side. Use the Remote to toggle the TV to DVD mode, which will then self-load. The remote will also be used to cause the DVD to Eject, using the lower set of buttons on the remote, top left button.

V. MISCELLANEOUS

A. Hidden (Almost) Storage Areas

Some of the storage areas that people tend to not be aware of are:

1. Under the starboard settee forward cushion.

2. Under the forward cabin port side seat.

3. Under the port side settee cushions.

4. Drawers under the forward bunk.

5. Under the center settee cushion.

6. Under the floor of the compartment ahead of the forward bunk.

7. Although space exists under the forward bunk, it is difficult to get to. So, I generally keep my own property under there and leave the other areas open for guest storage since they are more easily accessed.

B. Spares Inventory

Free Spirit is equipped with Engine and General Spares. Please reference the inventory list. However, in general:

1. A few engine items (oil, Racor filter, fuel filter, absorbent pad, antifreeze, and outboard motor parts) are located in front of the engine under the stairs.

2. The rest of the Engine Spares are located in compartments under and behind the starboard settee ahead of the fresh water pump compartment.

3. General spares, including those for the toilet systems, are located in the same area.

4. Other General Spares (mostly small parts) are located in plastic containers in a white box beside the toolbox in the large starboard cockpit locker.

C. Some Additional Technical Notes

For those who like navigation, the Ship Compass Deviation Table is below:

Heading	Deviation	Heading	Deviation	Heading	Deviation
0	5.0 E	150	3.0 W	270	1.0 W
30	2.0 E	180	4.0 W	300	2.0 E
60	4.0 E	210	2.0 W	330	2.0 E
90	4.0 E	240	3.0 W	360	5.0 E
120	2.0 E				

D. Racor Fuel Filter Replacement

It would be highly unusual to have to replace the Racor Fuel Filter. However, for those cruising in the Gulf Islands, this procedure is included in the very unlikely event there is a maintenance issue. A Racor filter problem would be indicated if you are encountering low engine power and the fuel vacuum gauge, located in the ignition panel, is showing vacuum of over 6". Another indicator would be the water-in-fuel alarm, also located in the ignition panel.

1. The Racor fuel filter/water separator is located under the aft bunk panel directly behind the engine. There are marked screws that have to be removed, after removing the mattress panel from this area. The easiest way to replace the filter element and empty the sediment bowl, once you have access, is as follows:

(a) Pull out the engine fuel shutoff cable located beside the main battery switches in the aft cabin.

(b) Disconnect the two small electrical connectors for the water-in-bowl sensor near the sediment bowl.

(c) Place a cup and an absorbent pad under the sediment bowl.

(d) Open the drain valve in the bottom of the sediment bowl by turning with your fingers.

(e) Make sure the cup is under the bowl, and then remove the silver colored air bleed plug from the top side of the assembly. The fuel will now drain out.

(f) Now you can unscrew the bowl and filter element.

(g) Clean out the sediment bowl and install the new element. Reinstall assembly and do not overtighten.

(h) Make sure the bowl drain is closed and reconnect the electrical connectors.

(i) Again, place an empty cup and absorbent pad under the assembly.

(j) For the moment, reinstall the air bleed plug, partially.

(k) Open the fuel shutoff valve, previously closed, by pushing the cable back in.

(l) Fuel will flow into the filter assembly, if the fuel tank is over half full. You will need to open the bleed valve for it to fill, and some fuel will leak out the bleed hole while it is filling. However, this will generally accomplish filling the filter and eliminating most air.

(m) Once it appears full, install and lightly tighten the air bleed plug.

(n) Dry off everything and inspect for leaks. Reinstall the access panel and start the engine. The design of the engine's fuel system is such that it will self-bleed out most air.

If you encounter a low engine power condition after all this, it is probable that the cable controlled fuel shutoff earlier closed has not fully reopened when the cable was pushed back in. If you suspect this problem, the valve is accessible through the same hole in the starboard cockpit locker as you would access the red heater fuel shutoff valve. The photo below shows both valves with the floor panel removed. The engine fuel shutoff is the silver one on the left (NOT the one with the RED handle. It controls fuel to the heater).

We wish you fair winds and following seas! Have a great trip!

Piscataqua Investments, LLC
Nancy & Craig Johnson

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