



San Juan Yachting

“A Pastoral Call”

A 57' Carver Pilothouse Motoryacht

Operating Manual

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Author's Note

I had the privilege of skippering *A Pastoral Call* for a week in June, 2006 with a couple aboard who wanted to see the San Juan and Gulf Islands. She is a beautiful, luxurious vessel which is kept fit and detailed by her owner!

On the other hand, this 57' Carver is sophisticated! With her extensive equipment list, large powerplants, and comprehensive systems, she requires the skipper's attention when underway or maneuvering, and even at the docks as her operations are managed for safety, efficiency and comfort. She is, after all, over 60' long including her swim platform...

Just as I have done, I urge you to take the time to read this manual carefully, being aware that the boat's other on-board manuals (especially the *Carver Owner's Manual*) and the staff of San Juan Yachting stand ready to answer almost any question you might have. If you are informed about some operation or system before the knowledge is specifically needed, you'll enjoy your trip aboard this gorgeous yacht to the utmost.

Happy cruising!

Joe Coons

Section I: Introduction & General Boat Description

About this Manual

Manual Objective and Limitations

This manual is intended to introduce you to “A Pastoral Call”, its systems and features, allowing you to operate it with the confidence and self-assurance necessary to enjoy your cruising vacation to its fullest. It is not intended to replace a good basic understanding of seamanship, including navigation skills, weather interpretation or boat handling. You are expected to have an understanding of these subjects obtained through other sources, including training, seminars, reading and perhaps most important, experience.

There is no way that a small manual like this one can answer *every* question or give you a solution to *every* circumstance, foreseen or unforeseen. If you have a question which limits your understanding or handling of this vessel, *ask your San Juan Yachting checkout skipper or contact the office for details* (you might make a list of questions as you read the manual, saving them all up to ask efficiently at one time).

How the Manual is Organized

The *tab* for each section defines its general purpose as shown on the front page.

You will use the *Section 3*, containing checklists, most of all. You should have it available so that each checklist can be used on a daily basis, even after you are familiar with the boat.

Section 5, regarding Emergency Procedures, is the most important, and you should read it, but hopefully you will never need it.

Read his section first to learn about this manual and the general details of your boat.

The other sections will tell you most of what you need to know to enjoy your cruise to the fullest with safety and confidence.

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General Description of this Carver 57' Yacht

Exterior

The Carver 57' "570 Voyager" Pilothouse is a modern vessel with many of the amenities of a megayacht. With a fiberglass hull, cabin, deck and flybridge structures, a fiberglass swim step, and stainless steel welded fittings and handrails. The window frames are integral with the vessel's fiberglass with sliding glass panes.

The easy walk-around decks enable safe, secure passage about the boat by passengers and crew in spite of the wide salon dimensions. A roomy cockpit section with a storage *lazarette* beneath and engine room access is especially useful for fishing and for handling the dinghy after it is launched from its deck crane on the boat deck.



A manufacturer's view of a Carver 570 sistership.. A Pastoral Call herself differs in appearance in that she has a sturdy stainless steel structure supporting a Bimini top.



Looking forward along the port side deck. Note the sturdy side rail as well as the rail above the windows. You will be secure as you move about this substantial boat!



A look into the lazarette; the ladder eases engine room access.



Steps from cockpit to the boat deck.

Forward on the bow deck is the anchor windlass, with foot switches, allowing chain movement both “up” and “down” electrically. The anchor is retracted into the bow chain roller strut which hangs out over the bow slightly to give better chain clearance from the hull than otherwise possible; after passing over the winch, the chain goes below decks via a hawse pipe in the foredeck.

There is a fresh water (port) wash-down faucet in the starboard side compartment to rinse the anchor rode with the supplied hose and nozzle for the anchor chain or boat washing.

At the top of the steps from the cockpit is the boat deck area, reserved for the yacht’s dinghy. Since there are no rails here, this area will not be used by crew except for launching the tender. A safety gate in the rail between the boat and flybridge protects the crew. The dinghy is launched with a deck crane the remote control for which is to port alongside the settee in the pilothouse.

The 12' Dinghy is equipped with an electric start/tilt outboard, with nav lights and electric bilge pump.



Looking at the anchor windlass and chain. Just above the windlass with the white cover is one of the footswitches; at the top is seen one of the two deck hatches to hold anchor bridle, dock lines, etc. Washdown faucets are here as well.



A look at the dinghy forward...



...and aft. .

(Right) A Pastoral Call is fitted with the proven Lifesling rescue system mounted on the aft boat deck step that can be used with the dinghy’s davit.

At the top of the stairway from the pilothouse and forward of the boat deck is the extraordinary flybridge, equipped with many amenities to make your stay on *A Pastoral Call* as comfortable as possible.

There is substantial seating on the flybridge: A helm seat for the captain, an easy-chair style seat which rotates to face either forward or aft just behind the skipper’s seat; aft, a circular settee with a table that seats six or seven more; and built in to the port side just aft of the bar/hospitality center yet another easy chair.



The ship’s bell is also on the flybridge to port.



(Above) The incredible flybridge (sistership photo). Door leads to the pilothouse. To right is wet bar with plenty of storage; the lounge seats four plus the skipper. The seat in the foreground behind the helm chair swivels at the touch of an electric button to face the L-settee that is aft on the flybridge. Note: In the lower right corner of the photo is the F/B fire extinguisher.

(Below) Aft on the flybridge, this circular seating area easily accommodates your crew and guests around the table. The seat in the foreground is the same as that in the picture above, but it has been rotated; table has non-skid mat cut to fit.



Of course here is also the upper helm station. Helm's instruments are part of a wrap-around console, which also carries a duplicate complement of critical navigation gear including radar, plotter, sounder, VHF, etc.

Under the aft circular settee is storage for the ship's canvas dinghy winter covers and additional life jackets, while in the aft starboard seat is an emergency liferaft. Attached to the flybridge canvas support rails to port is the ship's bell.

In the cabinet on the starboard side of the flybridge is an refrigerator and a storage locker with life jackets, a crab cooking pot, and other assorted gear. On the top of the cabinet is a Jennair barbecue, while in the cabinet is an additional refrigerator for flybridge service.

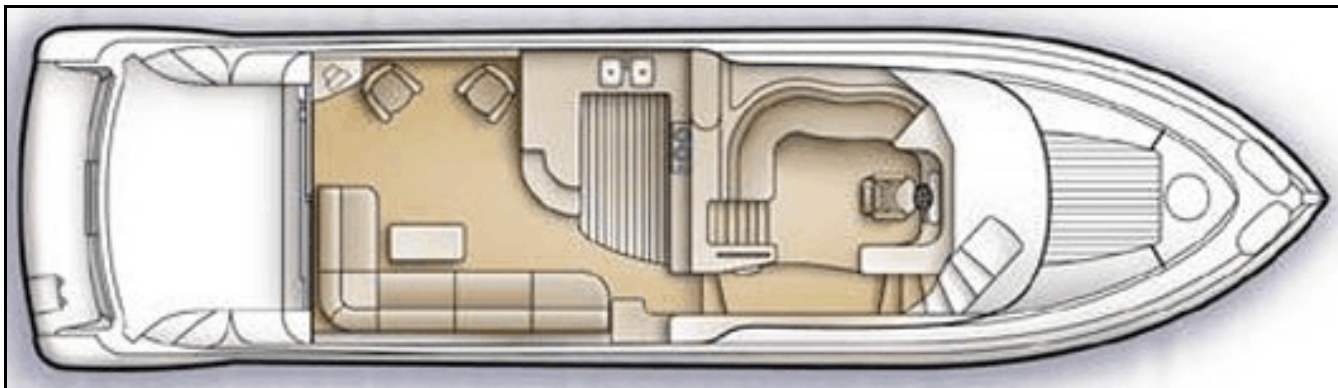
Swim Platform



The huge swim step, with shore power cable in place. Beneath one section of the swim step is a sturdy ladder; storage compartments in the transom hold lines, etc.

At the aft end of the boat is a roomy swim platform. It has access to two cabinets; in the port one are TV cable and phone ports; starboard a hose is stored. On the extreme port corner is the access to the "Cablemaster" shore power cable system with its switch. This connection is selected by the shore power switch in the electric panel; when this cable is to be disconnected, the master breaker in the AC panel should first be turned to the "off" position to avoid arcing which could damage the plug contacts. The boat's 50-amp shore power cable is 50 feet long and stays with the boat when away from its home dock. Additional cables are supplied: (See Section 4).

Interior Accommodations



A Pastoral Call Main Deck Floor Plan

Main Deck

The boat is entered by the main sliding door aft, or by the entry direct to the pilothouse port side door. These doors are fitted with strong locks. Be careful to close the doors when underway in heavier weather to avoid getting spray in the boat.



Salon looking aft to starboard. This settee's sections are each recliners: the padded lower section pops up. Note main door.



Salon looking aft to port. Handy table, with entertainment center with TV, DVD, VCR and storage in the aft corner.



(Left) A sofa section reclined. There are leather straps between the cushions that pull to recline.

(Right) The table swivels and flips open to serve for dining; it also raises/lowers.





Salon port forward is the galley/serving bar. All the amenities are here; note microwave, freezer, stove, sinks.



Across from the galley more cabinetry and the steps to the flybridge with the DC control panel alongside.



Galley storage is copious.

Just forward of the aft sliding door is, to starboard, a huge settee which is sectioned off into semi-individual recliners. Across from this luxurious gathering spot two chairs and a cabinet plus several bar stools provide for a very nice gathering spot after a day's cruising. Across from the settee an entertainment center cabinet houses electronics for video; forward of the chairs is the galley.



In this galley, it's remarkable how much storage has been provided for the ship's cooks. Numerous drawers plus a built in stove, microwave/convention oven, built in freezer and refrigerator, trash compacter, plus lots of drawers and cabinets will keep provisions under control and handy.



...as is a freezer across from it under the higher counter.

Across from the galley a cabinet storing galley and entertainment system manuals flanks the end of the starboard settee, and forward of it is the ship's stereo system cabinet, while forward of that adjacent to the steps to the pilothouse is the DC control panel.



(Left) The Entertainment Center.

(Right) In addition to Satellite receivers, storage for galley items...



Up the steps from the salon is the pilothouse, a comfortable, warm and efficient control center for this yacht. Fitted with a wraparound, aircraft style control panel, the space features a Flexsteel, Ultraleather helm chair that is six-way adjustable for the skipper's comfort (the swivel lock is under the chair skirt starboard side.) The "joystick" on the helm seat controls the autopilot (see section 4).

Electronics in the pilothouse helm include GPS/Plotter, autopilot, VHF radio, radar, depth sounder, electronic engine controls, and controls for the bow thruster. Switches for wipers, bilge pumps, defogger, nav & anchor lights and the windlass are on the overhead panel.

The skipper can easily reach the starboard side deck through a marine grade side door as shown in the photo.

There is a wrap-around settee aft on the pilothouse level, positioned for excellent visibility and comfort while the boat is underway. Above this lounge there is clear visibility aft so that the crew can stay in communication.

To starboard of the pilothouse settee are the stairs to the flybridge with a secure hatch protecting from weather. Adjacent to these stairs a cabinet holds the AC electrical panel and on its forward side, air conditioning controls for the pilothouse area.



The skipper's pilothouse control position is remarkable!

(Below) The starboard door in the pilothouse gives easy access to the side and foredeck for docking and anchoring



(Above) To open the side door, open latch and pull up the locking button, and simultaneously push to door out and aft. To close it, slide it forward and then pull it in with the handle until the aft end latches.



The settee in the pilothouse easily seats four.



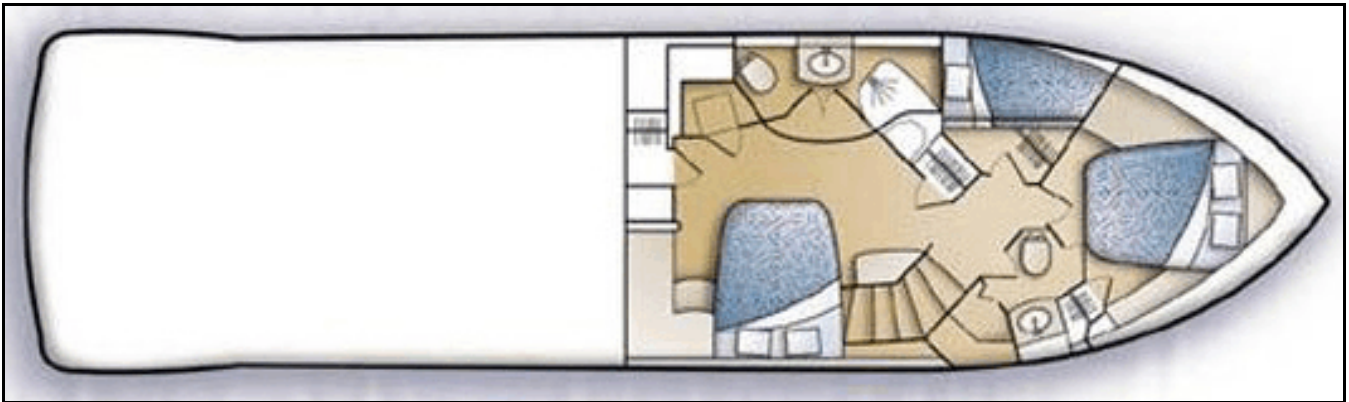
Steps to the flybridge with the AC power panel cabinet at their base...



AC cabinet with door open. The DC cabinet is down the salon steps.

This AC electrical panel, positioned as it is by the flybridge stair, makes it easily accessible to the salon, the pilothouse, and even the staterooms below. It is also near the DC controls at the bottom of the steps from the salon.

Stateroom Deck



A Pastoral Call's Lower Deck Floor Plan



The stair to the staterooms. At the base of the stairs in this photo the companionway door is open to the guest head: You can see how it is a convenient "day head" for crew.

A circular stair leads from the pilothouse to the staterooms on the lower deck. At the foot of the steps the guest head is to hard right, the VIP stateroom is forward, the #3 stateroom is to port, and the master stateroom is aft.



The forward VIP Guest Stateroom. Notice under-berth drawers & lighting.

The forward VIP Guest stateroom features an island-queen berth with plenty of storage in hanging lockers, drawers and cabinets. It has its own door to the head.

The guest head has vanity, toilet, stall shower and doors both to the companionway and to the VIP Guest Stateroom forward.

Note: Each head compartment has an emergency switch for the Vacu-Flush toilet. Unless a head is inoperative, this switch should always be left on in both compartments! See "Heads and Holding Tanks" in Section 4 of this manual!



A portion of the guest head compartment. Door on left to VIP S/R. Upper switch on forward side wall operates exhaust fan; lower the Vacu-flush toilet.



One of the cedar-lined hanging lockers in the forward VIP Guest Stateroom. TV is above.



Guest Stateroom #2.

The #2 guest stateroom has roomy upper and lower berths, made easier to use by staggering them so occupants can sit up before leaving the berth. It has a hanging locker behind the door at the forward corner, and a “bedtable locker” by the bed. Access to the head is across the companionway.

The master stateroom aboard A *Pastoral Call* is sumptuous! It features an athwartships queen-size island double berth (the best arrangement for quiet nights at anchor) with lots of locker space and lighting.



The Master Stateroom. Note tables each side with stereo speakers; dresser on left; cabinets to right; lighting throughout.



Across from the master berth is this vanity with sink, mirrors, lighting and storage. To its right in the port forward corner is the shower compartment, left is the head compartment..

Across from the berth to port is the built-in vanity, storage, and the shower. The washer and dryer are in this stateroom’s port aft corner.



This dresser is on the aft bulkhead of the Master State Room. Tools and some supplies are in its drawers...

Forward of the berth just to the right of the entry door is this dresser; additional drawers are under the berth. There are hanging lockers on the forward and aft stateroom bulkheads.



The head compartment to left of the vanity.



The ship’s washer and dryer are in the port aft corner of the Master Stateroom.



To left of the Master Stateroom entry door is a hanging locker and this built-in TV.



Engine Room & Lazarette:



Laz starboard: Air conditioning controls with compressors behind and seawater pump below.



The hatch raised; the steps to the boat deck in the corner of the cockpit visible at top. (Another view of the ladder is on page 1.2) In this view you can see the fuel tank & starboard Racor.



Lazarette to port: Steering gear left and fuel tank and Racor Filter right.



Aft center of lazarette: The trim tab pump is lower center, and piping for water and drains is apparent.



Looking forward to port from the lazarette the red engine room fire system is visible and past it the port engine.



Forward to starboard, the other Cummins Diesel is right, the Onan genset is forward, and the bowthruster batteries are in the box aft of genset. The room is neat, brightly lit, clean.



Light switch beside ladder to boat deck.

Access to the engine room is through the hatch in the cockpit that accesses the lazarette as well. DC Engine Room lighting is turned on before entering by a breaker in the ship's DC power panel at the foot of the salon-pilothouse steps, while a light switch is in the cockpit to starboard of the salon sliding door.

The starboard side of the lazarette has four air conditioning refrigeration units and the aft side of the starboard fuel tank and the Racor filter for the starboard engine, while outboard is the generator Racor filter.

Midships aft in the lazarette are the trim tab pump, and steering gear; to port in the lazarette are the port fuel tank, and the port engine's Racor fuel filter. Atop each tank is its shut-off valves. Going forward into the engine room, the twin Cummins 635hp Diesels are on each side.

Engine Room Views & Descriptions



The starboard main engine, looking forward, Onan cabinet on left. The oil filler and dipstick are easily accessible low on the engine beneath to forward blue fuel line under the fuel filter.



E/R aft port corner. 20-amp charger (left) is for the engine and generator batteries. Blue battery isolator. The large white box is the 2600-watt sine-wave inverter. Battery switches control port engine, davit.



Port engine outboard: Water tanks and aft just past stainless support, port engine coolant tank. (Starboard is mirror.)



E/R stbd. aft: Exhaust pipe in foreground, batteries, battery switches for starboard engine & house, E/R DC panel above.



Down low, just port of the generator is its battery and, further to port, the port head's Vacu-Flush pump.



Midships forward is the 17kw Onan Forward midships bilge well with bilge generator; this view with the starboard pump and float switch access door open with the yellow dipstick on left and oil fill pipe center.



Low in forward starboard corner of engine room: Generator sea strainer, fresh water pump, spare oil. The Vacu-Flush pump for the starboard head is in lower right corner of photo.



High in E/R forward starboard corner: Fresh water pump on right, corner of water heater left.

The engine room layout is fairly symmetrical, with water tanks down both sides, engines in the center each side, generator forward, and easy access to nearly everything.



The E/R electric panel has breakers/switches for the bilge pumps, shower sumps, windlass, & battery chargers.

Dinghy:

The boat is equipped with a four-person 12' Zodiac RIB-inflatable dinghy with a 25 horsepower Yamaha four-stroke outboard motor, fuel tank, bilge and air pump, running lights, master DC switch and oars. It is stored on the boat deck (aft end of the flybridge). The dinghy is lowered to the water using the deck crane with its remote control.

Deck Equipment:

The boat has mooring lines; a stern/shore line at least 200' long; an appropriate all-purpose anchor with at least 400' of all-chain anchor rode; washdown hose outlet for fresh water in the cabinet starboard of the anchor windlass; a supply of fenders/bumpers with fender storage; an ice chest for picnics, etc; a crab ring with line, float, and bait rigging; a hose for fresh water tank filling and boat washing; and a boat hook.

Safety Equipment:

This vessel is equipped with five **Fire Extinguishers**, one in the forward guest head compartment; one under the pilothouse console; one in the salon behind the forward port-side easy chair; one mounted below the Jennair on the flybridge; and an automatic, fixed system in the engine room with emergency control at the pilothouse helm; a **Ship's Bell**; **Flares** in the cabinet by the flybridge refrigerator; a "**LifeSling**" attached to the stairway to the boat deck; an **Emergency Life Raft** under the aft flybridge starboard seat; a **First Aid Kit** in the guest head vanity; an appropriate supply of **Life Jackets** on the flybridge under the circular settee; and two **VHF Radios**. *Charter Clients with children under 90 pounds should bring appropriate life jackets for them.*

Hull plans showing thru-hulls, drains and wiring diagrams for the boat are in the white "Carver Owner's Guide" aboard the boat in the bookends on the pilothouse aft shelf!



Engine Room Fire Extinguisher emergency control in the pilothouse: Pull pin and then pull handle to activate. See notes re the fire system in this manual...

Section 2: Specifications, Capacities, & Important Numbers

Important Data For This Boat

Vessel Name: A Pastoral Call
Vessel Official Number: 1121250
Vessel Registration Number: N/A
Hull ID Number: CDRNA056D102

Capacities:

Sleeps six: Two in each stateroom (recommended)
Sleeps eight: Two in each Stateroom plus Two on the Settees
Fuel: 800 Gallons in two 400 gallon tanks
Fresh water: 200 Gallons in two 100 gallon tanks
Holding Tank: 100 Gallons in two 50 gallon tanks

Dimensions:

Length: 59 Feet 2 Inches including swim platform
Beam: 15 Feet 4 Inches
Draft: 4 Feet 9 Inches
Displacement: 52,500 Pounds *with full fuel & water*

Fluids:

Motor Fuel: #2 Diesel
Motor Oil, mains: 15W-40 Chevron Delo Multigrade
Transmission Oil: 30W Chevron Delo Single Grade
Engine Coolant: 50-50 mix, ethylene glycol and water; corrosion inhibitor added

Operating Parameters: 1200 RPM typical speed 11.5 knots, 16.0 gph
1400 RPM typical speed 12.5 knots, 23.0 gph
1600 RPM typical speed 16.0 knots, 31.0 gph*
(1600 RPM is a "sweet spot" for this boat)
1800 RPM typical speed 18.0 knots, 40.0 gph*
2050 RPM typical speed 19.5 knots, 60.0 gph*

All figures are estimated and may vary.

****Higher speeds require using higher RPM first to put boat up onto plane.***

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Section 3: Checklists & Maneuvering Suggestions

Operating Checklists - A Pastoral Call

First Thing Each Day:

- Check engine oil, coolant.
- Check under-engine oil pads. Okay?
- Check fuel tank levels.
- Check holding tanks. Need pumping?
- Turn off anchor light if illuminated.

Starting Engines:

- All lines clear of propellers and on deck.
- Items running on AC evaluated vis-a-vis the Inverter and generator.
- Start Engines:
 1. Turn one engine key "on" (but do not start)
 2. Press Engine Control "Station Select" button until both lights illuminate
 3. Turn engine key past "On" to activate starter. *(3-4 revs before injectors open!)*
 4. If engine does not start, turn to "off" and repeat that engine's procedure.
 5. Repeat steps 1 - 4 for other engine
 6. Lights will be steady (See Section 4.3)
- If engines do not turn over, see "What to Do If".

Leaving Dock: (Only 3-4 minute engine warmup required!)

- Shore power breaker "off", cord removed and reeled on board.
- Lines removed as appropriate.
- Fenders hauled aboard and stowed.
- Lines and other deck gear secure/stowed.
- Doors and hatches closed and secured as appropriate.

Underway:

- Helms person on watch at all times.
- RPM under 1400 until engines warm to 140°; RPM never to exceed 2050 RPM.
- Wake effects always in mind.

Approaching Dock:

- Fenders out on appropriate side. **Trim Tabs "Up" (Bow Up)**
- Bow line *OUTSIDE* stanchions and bloused around to midships.
- Engines dead slow, wheel centered for engine-only maneuvering.
- Mate ready to secure stern first (in most circumstances).

At Dock in Marina:

- Lines secure, including spring lines.
- Trim Tabs “Up” (Bow Up)**
- Water heater breaker off until Inverter current settles (see “Inverters” below).
- Shore power cord connected.
- Shore power switch “On” to appropriate shore power location.
- Shore power confirmed on meters.
- Inverter “On”.
- Electric use monitored for current capacity of shore facilities.

Mooring at Buoy:

- Skipper puts starboard side gate next to buoy with mate standing by it.
- Mate loops 20' or so line, such as bow line, through buoy ring.
- Mate holds two ends together, walks up side of boat to bow of boat.
- With buoy held close to bow, line secured to each bow cleat through hawsepipe.
- Inverter “On”.

Mooring at Anchor:

- Windlass switch at either helm is turned “On” (but windlass is run from foredeck!)
- Anchor is lowered from pulpit while boat is backed up slowly away from anchor.
- When desired chain length out (4:1 or 5:1 scope), windlass is stopped.
- Engines reversed “for count of three” until chain pulls up virtually straight. Note: the boat is *not held in reverse* against a taught anchor chain!
- Windlass switch at helm is turned “Off”.
- Inverter “On”.

Overnight Checklist in Marina:

- Shore power “On”.
- Trim Tabs “Up” (Bow Up)**
- Inverter “On”.

Overnight at Anchor or Buoy:

- Inverter “Off” to conserve batteries.
- Trim Tabs “Up” (Bow Up)**
- Anchor light “On”.
- DC electrical items all “Off” including radios, extra lights, etc.

Upon Arising:

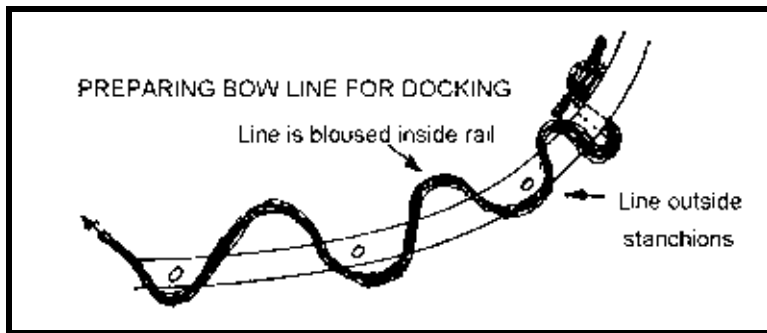
- If at anchor or buoy, Inverter “On” only if necessary.
- If necessary, run generator to charge batteries if at anchor or buoy.
- Turn on heat if necessary.
- Go to top of this *A Pastoral Call* checklist.

Maneuvering Suggestions

Docking & Undocking

Usually it's easier to dock *bow in*. Have your mate at the side rail opening, ready to step off and secure the stern line, against which you can pull to swing the bow in toward the dock. By having your mate ready to disembark when close to the dock, he/she will not have to jump to

the dock, risking a turned ankle or falling overboard. It is the skipper's job to put the boat next to the dock so the mate needn't jump, but merely step off!



reached from the dock. *Never put a line from a cleat over a rail: the boat's weight will bend or break the rail if it pulls against the line!* Then, when the mate is ashore, the line can easily be reached . . .

If dock clearance permits, spring the boat forward so that it pulls forward on the stern line. This will bring the stern close to the dock. Let the bow line out enough so that the boat can rest against the stern and midships fenders.

Maneuvering in a Harbor

With its twin screws, you'll do best if you *center the rudder and steer with the engines only!* The props are so large that the boat will respond well (except in high winds) just with use of the propellers in forward and/or reverse. Take your time, and keep the boat running "dead slow" so that you can plan each approach. You shouldn't need to use the throttles at all.

Filling The Fuel Tanks

With the large fuel tanks, you can fuel the boat pretty fast at the boat's aft-corner fill fittings using a standard hose and nozzle (like the ones on auto gas pumps). You need to fuel each tank separately, *being careful not to let the fuel caps fall overboard!* Fill both the tanks completely but *do not spill fuel!* **Stop fueling immediately as soon as the vents "gurgle": If filled more, fuel will leak from the vents as soon as the fuel warms!**

You can control the flow rate at the nozzle to be sure the fill pipes don't back up, and have a mate listen carefully by the fuel vents. Be careful: The tank vents will gurgle *just as* the tanks are full, so when the vents begin gurgling, **stop fueling!**

Anchoring

Anchoring can be accomplished safely with a minimum of fuss if you are *prepared*. Or, if you are not ready, it can be stressful and dangerous for you or the boat.

Before attempting to anchor, select an anchorage with a soft bottom such as sand, mud, or gravel, if possible. Look at the charts and cruising guides for tips on good locations. Then, choose the spot *in* the anchorage where you have room to “swing” on the anchor without disturbing other boats. Remember, responsibility for leaving room goes to each successive boat to arrive, for the first boat has priority in the anchorage!

Here in the Northwest, because of the deep waters, all-chain rodes and small bays, we anchor a little differently than in the Gulf of Mexico or Carribean, for example. First, except in severe weather we use anchor chain scopes of only 4-to-1 or 5-to-1. For example, in water that is 40 feet at high tide in the typical anchorage, we might use 160 feet of chain unless the weather was to be gale force or greater winds.

Second, because of the small bays and steep bottoms, we often rig a *shore line* from the stern of the boat to shore. The best example of this would be at Todd Inlet at Butchart Gardens. Here is a bay that can accommodate 8 - 10 boats, yet it is only about 150' wide and 200' long! Boats attach their bows to the mooring buoys or, in a few cases, anchor; and then their sterns are secured to rings provided in the steep cliffs overlooking the bay. Boats are thus perhaps only 15-20' apart, side to side.

Third, boats often will “raft” side by side in busy marinas, although this is not too common.

Fourth, courteous boaters will call vessels coming into busy bays and offer to let them raft to the same buoy, if signs on the buoys do not limit usage to only one boat depending upon length.

Anchoring safely requires two persons, one at the helm maneuvering the boat and one on the bow operating the anchor. Putting the bow of the boat over the spot where the anchor is to be placed after checking the depth on the depth sounder, the windlass is turned on at a helm and the windlass foot-switches (*not the helm's up-down switch*) are used to lower the anchor slowly toward (but not onto) the bottom, by watching the chain markings.

When the anchor is about to reach bottom, the boat is backed away by putting the engines into reverse for 3 seconds: Eddies from the chain indicate motion. Resume lowering the anchor while drifting backwards (watch the eddies and add another burst or reverse if necessary!) until the desired amount of chain is out. Stop paying out chain. Engage reverse for five seconds at a time until the chain starts to pull straight off the bow toward the anchor. *A straight chain indicates a “set” anchor!*

NEVER pull on the chain for more than three seconds, and never at any engine RPM other than idle! Putting the boat's weight plus its horsepower on the chain forcefully even at idle will bend the anchor and/or damage the mooring gear!

If while checking the set, the chain rumbles and clunks, and seems to release in bursts, it means you're anchoring on a rocky bottom and the anchor is not holding. Be patient: It may not set on the first try, and you'll have to repeat the process sometimes to get a good “bight” on the bottom.

Shore Lines

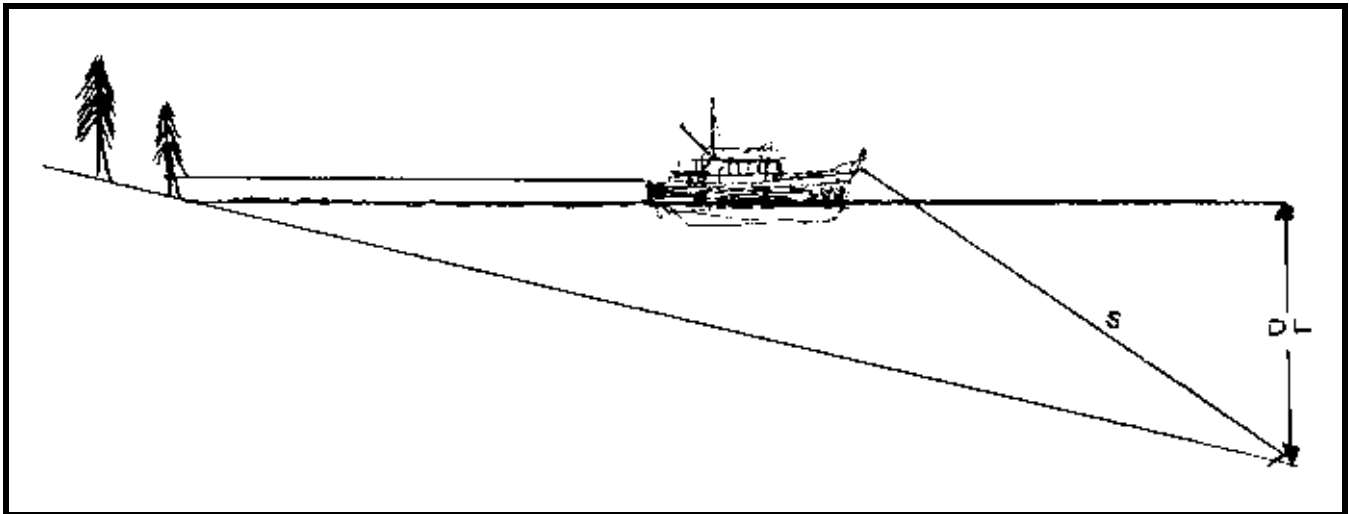
When a shore line is required, anchors are set 75 - 100 feet from shore, with the boat backing toward shore during anchor-setting. The stern line is put around a tree, and brought back to the boat.

During this process, be sure to keep clear of rocks near the shore, and allow for our Northwest tides, occasionally twelve feet, and sometimes 20 feet when further north! Check the present tide, and high and low tides *before* beginning anchoring: *No sense anchoring in 15 feet of water if you're at the "top" of a 15 foot tide!*

To get to the shore, you will need to have a dinghy down, and then have your mate keep the boat's stern toward shore with short bursts of reverse gear. Sometimes a helpful boater already anchored will help you by taking your line to shore for you with his dinghy, a neat "good deed" that you might reciprocate. We've met some nice boaters this way!

The shore line is in the lazarette, and is long enough to usually allow taking it to a tree, around it, and back to the boat so you don't have to go ashore to untie when leaving. With a crew member keeping the boat in position, take the dinghy to shore pulling the end of the shore line with you. Pass it *around* a tree, and pull it back to the boat if you can, since then to get away in the morning all you have to do is release the bitter end from the boat, and pull it aboard. Pull the line *tight*, as long as you've got over 100' total of line out: There is plenty of sag/stretch, and we want to keep the boat in its area! If necessary, put a crab pot float or fender on the line to warn others it's there!

Here is a sketch of a properly anchored boat with a shore line (in this drawing, S=Scope, which should be at least 4 x DL, the Depth at Low Tide):



Trim Tabs

The boat is fitted with a set of *Bennett* Trim Tabs. These are wide “flaps” attached to the aft end of the boat, under the swim step at the trailing edge of the hull, operated hydraulically under the control of the skipper by rocker switches at each helm station.

At low speeds, up to approximately six knots, the tabs do little, and should be left in the “Bow Up” position (see below). But at speeds over this range, the tabs begin to take effect and will help the operator lower the bow for more efficient cruising.

The best way to adjust the tabs is to lower them while watching the “Speed” indicator to get the highest speed at a given throttle setting by adjusting “Bow Down”. If the tabs are “Bow Down” too much, the steering will get mushy and speed may drop off a little, and the tabs should be adjusted “Bow Up” a little. Note that it will take time to make these adjustments; when the buttons are depressed, they need to be held 2-5 seconds each time for change to be felt and observed (the best way to see the effect of the tabs is by the knot meter and by observing the height of the bow relative to the horizon, most easily seen from the lower helm station).

*Because the trim tabs are so large, **THEY MUST BE IN THE FULLY-BOW-UP POSITION WHENEVER THE BOAT IS TO BE OPERATED IN REVERSE**, otherwise the great water forces against the tabs may damage them severely, even tearing them off the hull!*

Bow Thruster

A Pastoral Call has been equipped with a bow thruster with a “joystick” control at each helm. This will assist you in getting extra close to the dock after you have put the stern of the boat against the dock with the engines. The thruster runs from its own bank of batteries which are charged only by AC...unless the generator is operating or you have shore power, those batteries get no charging, so the thruster batteries can easily be run down with excessive use if the generator is not on.

To operate the thrusters::

- Turn on thruster by pressing the button *(the light will go on)*;
- Then operate the “joystick” to run the thruster.
- Turn it “off” when done.

Do not overuse the thruster! Operating it in “jabs” of 10-15 seconds at a time should be enough...it cannot be run for extended times without shutting down when the thermal overload protective relays open!



Section 4: Specific Discussion of Boat Systems

This section of the operating manual will discuss each of the boat's systems in turn. The systems and major components discussed are grouped and in order as follows:

Main Engines & Sea Strainers
Dinghy, Davit & Outboard Motor
Fresh Water System;
Electrical-AC, Electrical-DC, and Inverter;
Heads and Holding Tanks;
Heating System;
Galley Equipment
Navigation Equipment, Radios, and Radar.

Main Engines, Engine Controls & Sea Strainers

The main engines on the boat are two Cummins QSM-11 Diesels, each producing a maximum of 645 horsepower. These extraordinarily-reliable, rugged machines are the top-of-the-line, and can be expected to give you trouble-free, economical cruising.

On engine start, no long warm-up is required! Three or four minutes is sufficient, then load the engines by putting the transmissions in gear. Do not run them over 1400 RPM until the temperature gauges read at least 140° Fahrenheit. Do not run the engines for long periods with the transmissions in neutral, with no load!



Each engine's dipstick and oil fill looks like this (this is port)...use the supplied funnel to add oil if necessary!

The engines require a regular, daily check, since once underway, you will probably not check them while in use, tucked away as they are beneath the cabin floor. *Please perform this check each morning (when the engine room is cool!):*

- **CHECK THE OIL.** *The oil level should be between the two marks on the dipstick. The dipsticks are located on the inboard side of each engine, fairly low on the crankcase. Loosen the T-handle a couple of turns, remove it, use a paper towel, wipe the stick, reinsert, and take reading. **You must remove, wipe, and re-dip the stick to get an accurate reading!** Then reinsert & tighten it.*

The distance between the two marks is about 1.5 quarts. Add only enough oil to bring it up above the “add” mark, say a quart, using the oil provided on the boat. (If you need more oil, buy it! We will reimburse you.) The oil fill on each engine is the “t”-handled cap by each dipstick.

- *DO NOT OVERFILL the crankcase (above the “full” mark), as these engines will quickly waste excessive lubricant. If oil is required often, check under the engine carefully to be sure there is no oil leak, and if there is, have it corrected promptly.*
- **CHECK THE COOLANT LEVEL.** *There are plastic coolant tanks outboard of each engine on the side of the fresh water tanks. If, when cool, there is coolant in the tanks, there is enough coolant.*

If coolant is needed, determine if there is any sign of a coolant leak under the engine, and if there is, do not run the engine; if no leak, add coolant to the tank from the jug of pre-mixed antifreeze/corrosion inhibitor/water supplied on the boat.

- **VISUALLY INSPECT THE ENGINE ROOM WHENEVER YOU’RE IN IT**, asking yourself, “Does everything look right?” Look at the pads under the engines and transmissions: While some drips are normal, there shouldn’t ever be substantial accumulations of any fluids!
- **CHECK THE SEA STRAINERS ONCE A WEEK, OR IMMEDIATELY IF EITHER ENGINE RUNS “HOT”.** The engine strainers and valves are in the aft end of the engine room on each side of the propellor shafts. The genset sea strainer is just to port of the water heater. *To check a strainer, shine a flashlight through it. While some “fuzziness” from trapped thin growth is normal, you should see the light clearly on the other side; if obscured, you should clean the strainer. See below.*
- **CHECK THE TRANSMISSION OIL LEVEL** with the dipstick on the starboard side of each transmission once every two weeks, more often if a transmission shifts erratically. It is unlikely that any oil will need to be added. Be sure to check under the transmission for leaks! Low transmission oil is a serious matter.

With the engine idling, remove the transmission dipstick. Wipe it with a towel, reinsert it, and take a reading. If the level is below the add mark, stop the engine, add a pint of the same oil used for the engine crankcases through the plug in the top of the transmission case, and then start the engine and measure again. DO NOT OVERFILL, for to do so could cause the seals to “blow out”.

These Cummins engines are red-lined at 2300 RPM. Maximum cruise is 2050 RPM. However, the realities of vessel hull design and powerplant engineering dictate that higher RPM operation is very inefficient on semi-displacement vessels like this one, so you will find these operating specifications to be true (gallons per hour, speeds, and nautical miles/gallon are conservative estimates):

RPM	Gallons/hour, Total both Engines	Speed, Knots	Nautical Miles/ Gallon
1200	16.0	11.5	.72
1400	23.0	12.5	.54
1600	31.0	16.0	.52
1800	40.0	18.0	.45
2050	60.0	19.5	.33

As you can see, each extra knot is very expensive once you have passed “minimum planing speed” on the vessel hull! It is sensible to operate the boat in the 1600-1700 RPM range, and you’ll enjoy quieter, more pleasant cruising and economy, too!

Engine Controls



(Above) A control quadrant at each helm controls the engines and transmissions. The button in the center allows the operator to “Take” command at the quadrant..



Left to right above: Port engine display instrument; rocker switches; status panels (none lit); and display instrument for starboard engine (truncated).

The status of the engines is shown on the display for each and on its Status panel; these units are also at each helm, as is a set of rocker switches to allow additional engine adjustments at the direction of the operator.

The Cummins engine controls provide remarkable capability, **but you should exercise extreme caution when first using them until you are used to their “computer age” operation!**

ENGINE CONTROL QUADRANTS

The control quadrants are at each helm and are easy to use. When an engine “ignition key” is turned on power will flow to its engine control. *Before the key is turned far enough for the starter to engage*, the “station select” button on the quadrant is pressed. This will connect the engine to its control lever, and the red LED by that control will illuminate confirming the condition. In addition, the yellow “Neutral” LED will light indicating the transmission is in neutral. Then the key is turned to engage the starter.

Note: The electronics on the engine itself will cause it to turn several revolutions before injecting fuel! In this way, the cylinder walls are “wiped” with oil prior to combustion. The engines do not start on the first turn!

After the first engine is started, the second engine is started with the same procedure.

The controls control both the throttles and the transmissions; there is a clear “detent” as you move them so you can tell when they are in each “notch”: one in the center of the control’s travel in neutral; and once out of neutral, a long detent on each side forward and aft for “transmission engaged, throttles being adjusted”.

Warning: Be very careful until you are used to the feel of these detents, lest you move the levers unintentionally past a detent, not only reversing your direction, but accelerating! It is best to operate the quadrants with the fingertips of both hands at first!

There is a normal delay when the controls shift gears! This will be as much as a “count of three” between the control’s going into the “forward” or “reverse” detent and the transmission actually going into gear. After the transmissions are shifted a few times, this delay (built in to protect them from being shifted from forward to reverse or vice-versa too quickly) will reduce a little, but plan ahead!

ENGINE CONTROL ROCKER SWITCHES

By each helm’s engine displays are several rocker switches that allow you to put the engines in various modes:

Engine Sync

Used to synchronize the engines to void vibration and “beating” noise underway. When engaged, the starboard throttle is the “Master” throttle, so that once synch is turned on, the boat will be controlled by that throttle.

With both engines set to approximately the same RPM, depress the **top** of the *Engine Sync* rocker. The engines will synchronize.

To disengage the synchronizing feature, **be sure the “Slave” throttle is in the same relative position as the “Master”** (to avoid a sudden swerve) and depress the **bottom** of the rocker.

Cruise 1/Cruise 2 A kind of “marine cruise control”. *Cruise 1* sets the engines to a high speed setting of 2100 RPM. *Cruise 2* sets the engines to 1200 RPM.

To activate, put the cruise switch in the desired position. When the throttles are set to or higher than that preset switch RPM, the preset will activate.

“Cruise” can be used simultaneously with the “sync” feature, therefore it is suggested that you engage “synch” before “cruise”.

To deactivate, return the *Cruise* switch to the middle position. The engines will then ramp up or down to the actual throttle setting(s).

Slow Idle The “*Slow Idle*” rocker allows the boat to operate more slowly in “No Wake” zones by reducing idle speed to 550 RPM.

Because of the risk of engine stalling, “Slow Idle” should NEVER be used when docking or doing other maneuvers lest an engine stall! Use only when idling in one direction to control wakes...

To use the “*Slow Idle*” feature, the engine(s) must be in gear, with the throttle(s) in the “idle” position. Then turn the feature on by depressing the top of the rocker switch. The idle speeds will drop to 550 RPM.

To turn off the *Slow Idle* mode, depress the bottom of the rocker switch. The engine(s) will return to the normal idle speed.

Note: Adjusting the throttle(s) for a higher speed will temporarily turn off the slow idle feature, but it will resume when the throttle is returned to idle.

RPM This rocker switch allows adjustment of the idle speed for engine warmup, for example. With the engine idling, pressing the top of the rocker increases engine idle speed, pressing the bottom decreases it.

The *RPM* rocker does not work with the *Slow Idle* feature described above; use of *Slow Idle* deactivates the *RPM* setting.

ENGINE STATUS PANELS

Each engine has a small black status display panel labeled “PORT” and “STBD”. When the engines are operating normally these panels have no illuminated warnings. Here is what they can display:

Stop Engine ***The engine needs to be shut down at once to avoid engine damage!***

Check Engine This indicates that a non-fatal condition exists, and the engine should be serviced as soon as possible to avoid further maintenance.

Engine Maint This lamp comes on when service is due for the engine.

ENGINE DIGITAL DISPLAYS

There is a electronic digital data display for each engine at each helm. These give you lots of relevant info for the engines. Here are the instructions:

“Power On” A screen appears with the Cummins logo and software information as the system test is run. This screen then disappears.

“Default” The default screen that appears right after “Power On” shows RPM, fuel flow, and other basic data. This is usually the most informative display; we suggest you leave it up.

Buttons and Other Screens See the *Cummins Electronic Display ED-2 User’s Guide* in the pilothouse bookends on the aft shelf above the settee.

“Reset Screen” If you inadvertently change the screen contrast or lighting so that the screen is unreadable, press the left four buttons together: This will reset both the lighting and contrast.

Fuel Filters

At first glance, it’s easy to wonder why the engines need so many filters! There is little likelihood you will ever need to change one. In fact, if a filter does need changing, it is likely to be a primary fuel filter, one of the “Racor” filters located on the aft side of the tanks in the lazarette, rather than an engine filter. But in case you need to service the engine’s secondary fuel filter (rarely needed), see the Cummins Manual Page D-1 to identify the filter, then refer to page 4-1 for filter replacement instructions.

Replacing a primary filter is not hard. (1) Turn off the fuel valve near the filter. (2) Remove the old filter. I like to do this with a large Ziploc bag handy to hold the old filter with the least mess. (3) Fill up the new filter with clean fuel so you will not have an engine shutdown due to fuel starvation, having to then bleed the lines. (4) Tighten up the filter in its housing and restart.

Other Engine Concerns

There is an excellent troubleshooting guide in the Cummins Operations and Maintenance Manual in the troubleshooting (TS) section at the back of the book.

Sea Strainer Cleaning & Seacocks

The sea strainers on this boat are secure and reliable. They protect the engine and refrigeration cooling systems from water-borne debris which might block internal equipment passages. If a sea strainer needs cleaning (see above regarding inspection) here is the procedure:

- 1) Look at the base of the strainer near the hull. On the side is a valve lever, with a relatively long handle.

The main engine sea strainers are aft of each engine. The generator sea strainer is to starboard of the water heater at the forward engine room bulkhead.



Port main engine sea strainer in foreground; its valve is just on the far side of shaft, with blue handle on far side “up”/open.

2) Turn the valve lever so it is perpendicular to the sea strainer (parallel to the hull).

3) Using a spanner from the tool kit, unscrew the top of the sea strainer. Then remove the strainer by pulling it out the top of the assembly. Rinse the strainer thoroughly and, if necessary, remove any debris from the glass housing.

4) Reinsert the strainer, tighten the top cover with the spanner, AND TURN THE VALVE BACK ON — failure to do so will overheat the engine.

This entire operation will take 5-10 minutes at most, and will assure you of cool engines.



The genset sea strainer, with its through-hull right next to it, forward in the engine room.

Fireboy Fire Suppression System

The boat's built-in fire suppression system is controlled by the pilothouse control (see page 1.12) and by the control pane in the illustration to the right.

If a fire occurs, automatic controls will *shut down both engines!* This is so that the engines will not ingest the fire retardant thus letting the fire re-ignite.

After the fire is out, to restart the engines, you will need to operate the switch to "Override" and they can then be restarted.

Unless there has been a fire, the switch should be left in the "Normal" position. The green "charged" light indicates "all is well", while the red "Dischg" light indicates that the system has operated and will need to be refilled.



Dinghy, Davit & Outboard Motor

Dinghy

The dinghy aboard this boat is a hard-bottom inflatable, designed to carry up to four passengers safely, with two sharing the seat behind the console, one alongside the console, and one in the bow. For safety, and compliance with U.S. rules, *there should be a life jacket aboard the dinghy for each passenger aboard whenever the dinghy is at sea.*

Please be careful when pulling the dinghy ashore to minimize damage and scratches to the bottom. It can be lifted by two persons if one is on each side. Don't "Ram" the beach; you can bump up to the beach gently and step ashore over the bow, pulling the dinghy a little more ashore as each person off-loads. And raise the outboard with its electric tilt before it hits bottom when landing on a beach!

The dinghy will seldom require inflation as long as the valve seals are maintained and it is not punctured. Should inflation be required, simply pump up the dinghy until it is pretty hard (thumb can deflect a tube by about ½" maximum) using the pump provided on the boat.

Should the dinghy be punctured and you feel competent to make the repair, follow the instructions in the dinghy manual and use the dinghy repair kit also on the boat; otherwise, have it professionally patched at San Juan Yachting or a dealer's.

When the dinghy is stowed on the boat deck:

- The dinghy Master Battery Switch under the aft seat should be "off" (clockwise);
- The dinghy tiedown cables should be attached and secure;
- The dinghy drain plug should be loosened in the stern drain hole;
- The dinghy seat cushions should be removed and stowed in the lazarette.

The dinghy has a built-in 9.3 gallon/37 liter fuel tank; the fill is under the seat cushion by the console. In addition, the dinghy has mounted in the console a fuel gauge ("on" when the key is on) and three switches:

SWITCH USE	LEFT SIDE PUSHED	CENTER PUSHED	RIGHT SIDE PUSHED
Running Lights (Top)	Off	Anchor Light Lit	Running Lights Lit
Courtesy Light (Mid)	Off		On
Bilge Pump	Off	Automatic	On Manual (Hold Switch)

The stern/anchor light has a post and it is stowed under the aft seat; you need to plug it into its socket if you use the dinghy after dark.

Dinghy Davit

This boat has a high-quality *MarQuipt* electric davit supporting the dinghy. To use it, you will need to have on hand:

- The dinghy outboard key;
- The safety lanyard/clip from the little drawer in the galley counter;
- The davit control from the shelf along the port side of the pilothouse settee;
- Life jackets for each person to be aboard.

Here is the launching process: (We recommend you wear gloves, stowed under the Jennair, so you don't "stab" yourself with a loose wire end if you handle the cable!)

WARNING: The Boat Deck and Dinghy are high above the water and cockpit. Be especially careful moving around. A fall could seriously injure you! If you are insecure about launching the dinghy, get qualified help or do not use it!

1. Tighten the drain plug in the dinghy's aft end;
2. Turn the Master Battery Switch under the dinghy's rear seat "On" (counter-clockwise);
3. Insert the safety lanyard's clip and the key in the ignition switch.
4. Using the "tilt" lever on the engine control lever, raise the engine a few inches clear of the deck;
5. Plug the davit control box into the davit;
6. Remove the dinghy's tiedown cables;
7. "Lower" the cable enough to unhook it from the storage ring;
8. With the hook free, manually lift the davit boom until it latches in the "up" position;
9. Swing the davit boom and attach the hook to the dinghy sling;
10. Raise the dinghy until the sling almost reaches the boom pulley;
11. Holding the dinghy's bow line, swing the dinghy so that it is on the port side of the boat, with the bow facing aft. Toss the bow line to a mate in the cockpit below.
12. Lower the dinghy. When it reaches the water, have the mate pull it back to the swim platform as you continue lowering it;
13. Unhook *the entire bridle*;
14. Swing the davit hook back to the boat, secure it, and tension it by hooking the bridle cables around a rail to avoid damage to the yacht from a swinging davit if the boat rolls.

To retrieve the dinghy on the boat, reverse the above procedure. *You will need to lift the entire boom to lower it.*

Be sure to reconnect the tie-downs, turn off the master switch, loosen the drain plug, lower the engine until it is resting on the boat deck's surface and stow the cushions!

If davit does not work, check the Davit main switch in the engine room, aft bulkhead port side just outboard of the engine/generator *Charles* battery charger. It should be on!

Outboard Motor

The outboard motor for the boat is an 25hp Yamaha four-stroke, electric start outboard. This outboard is a four-cycle motor, that is, *you need not mix oil with the fuel, it uses regular gas only.* If oil is low (this should seldom happen, if ever!), a warning lamp will light on the front of the engine and an alarm will sound. If this warning occurs, stop the motor at once and add oil.

To check the motor's oil, remove the cover by pulling out the lever just under the aft-side handhold molded into the motor cover. After this lever is released, you can lift the back of the cover and unhook it. You will see the oil fill cap on the aft side of the engine, and the dipstick on its starboard side. (Adding oil is tricky: you may need to use a funnel to avoid spilling it.) Do not overfill! There is outboard oil stored in the lazarette.

Use a good grade of 10W-30 SE, SF, SG, or SH API-rated oil.

Fresh Water System

Tanks

There are two polyethylene water tanks located to port and starboard outside the engines in the engine room of the boat. These are filled at a single cap on the starboard side deck of the boat. The two tanks are interconnected, so they will be emptied together at the same rate. A gauge at the top of the DC electric panel tells you the level in the tanks.

Water Pump

The water line from the tanks leads to the boat's fresh water pump in the engine room, starboard side forward of the engine. Provided its circuit breaker in the DC power panel in the salon is "on", this pump will run whenever its built-in pressure switch detects low water pressure. An "accumulator tank" by the pump provides a "pressure head" for the pump, so the pump doesn't need to run so often. Instead, a pump cycle will provide for several minutes of routine water use before pressure diminishes and the pump starts again.

It is a good idea to *turn off* the fresh water pump breaker in the DC panel (labeled "Pressure Water System") whenever leaving the boat for any extended period, lest a dripping faucet or broken hose cause the pump to run and waste your precious drinking water.



The water pump is in the engine room starboard side forward just to starboard of the hot water heater.

Water Heater



Water heater E/R forward.

After the water pump, water is distributed directly to the cold water faucet lines. In addition, it goes to the boat's water heater. This heater uses either heat from the starboard engine (so you have hot water when underway and after running) or by AC from shore power or the generator if available and the breaker is "on". *It does not run from the inverter power.* The heater is insulated well enough to keep hot water overnight without power, provided you haven't wasted a lot in dishwashing!

Waste Water

Waste water from the sinks and showers (but *not* from the toilets) is dumped overboard in accordance with U.S. and Canadian law. From the various drains, sinks and showers, the water simply flows by gravity down into one of two “sea chests”, located under the floor of the Master Stateroom by the hanging locker door and in the lazarette to starboard. Since these sea chests are *below* the water line, built in sump pumps operate to lift this water back above the waterline and dump it overboard. *It is therefore very important that the “auto sump” breakers in the Engine Room DC panel be left “on”.*

In the unlikely event that a sump pump fails, drain water will back up in the showers or basins. *Try operating the “Manual Sump” switch on the Engine Room DC Panel to see if the failure was simply a float switch. If this doesn’t solve the problem, contact San Juan Yachting.*

DC Electrical System

Concepts

Each year it seems more folks are confused by the operation of electrical systems on yachts than by any other subject! Don't feel discouraged if something isn't clear: You've got company in your confusion. So let's try to cover some theory here first.

Most of the equipment on any boat is run by *12 volt DC* electricity from the boat's batteries. This is true because DC should always be available: We have batteries aboard even when there is no shore power! If the batteries aren't run down, everything should work, just like in the family car.

Since the batteries are used so much, we have to replenish, or *charge* them. The most important way we do this is by *alternators* on the ship's engine(s). In most cases, one engine will provide enough electricity in most every case to run everything, and still have some energy left over to add back to the battery, that is, to *charge it*.

What if the engine(s) isn't running? Then, the batteries are slowly depleted until they have "run down" and there is no more electricity in them . . . a big problem, because then we not only can't run all the stuff on the boat, we can't start an engine to get more electricity.

So a good skipper and crew has "electrical power management" in mind whenever they turn an electrical gadget on or off!

With this in mind then we can state: *If we need more electricity than the batteries alone can provide, and if a propulsion engine isn't running, we will need to get our electrical power from an alternative source!* That's the most reason why we use shore power or use the generator: To keep from running down the batteries. For by using battery chargers getting *their* power from shore power or the genset, we can keep the batteries charged, or, at least, from getting too low.

In modern, luxury cruising boats, however, there is another important factor: Some of the "goodies" we like to have on board such as hair dryers and microwave ovens require ordinary household electricity. This is *110 volts AC*. It is different from DC. So if we want to use these things when we're not at a dock, we must have another way to get 110 volts AC, and for this we use the generator or an *inverter*, an amazing high tech gadget that takes 12 volts DC from the ship's batteries and *makes it into 110 volts DC!*

So here's what we've got: A lot of stuff running on 12 volts DC from the batteries. To keep the batteries from running down, we have *alternators* run by the engines, and *battery chargers* that get their power from shore power or the genset. For the stuff that runs on 110 volts AC, we have *shore power*, the generator, or, for making AC out of the batteries' DC, the *inverter*.

Battery Banks

The batteries on this boat are not just one, big all-purpose battery. To have redundancy, there are actually several “banks” of batteries assigned different tasks.

1. A battery located starboard-most at the aft end of the engine room is used to start the starboard engine, while another battery just to port of the center on the aft bulkhead starts the port engine. Another battery just to port of the generator forward in the engine room starts it. Because these batteries *only start the motors*, we can't run them down playing the stereo for instance, then be unable to start an engine.
2. A group of batteries called “the house battery” are all tied together (paralleled); these are aft in the engine room in two boxes just to starboard of the centerline and at the extreme port side, and more in the center of the room between the engines. These run the inverter, all the pumps, interior and exterior lights, horns, navigation and radio gear, etc. In other words, this bank runs the boat's “house”. They are also charged when there is shore power or the genset is running by the inverter, which serves as a high-capacity charger.
3. Separate batteries (wired in series for 24 volts) for the bow thruster (under the floor just aft of the generator on the engine room centerline) work only this accessory, and are *charged only by the 24-volt charger* dedicated to it; this charger is on the forward engine room bulkhead.
4. The port and starboard engine starting battery, and the house battery, are also charged whenever either or both engines are running: DC Electricity comes from the engine alternators to a *isolator* and from it to all three batteries.
5. The engine and generator batteries are also charged by a *Charles* charger mounted on the aft bulkhead of the engine room just outboard of the engine room doorway.

For instance, if any starting battery is run down and we can't start an engine or the genset, we can still start another and it will begin charging the deficient battery. Then we can start the engine itself that had the once-dead battery. Or we can start the generator, and let it charge all the batteries.

Since a battery works by making electricity through a chemical reaction, one component of which is water, we need to be sure the batteries have water in them; this battery servicing is normally done routinely every few weeks by the boat's owner or charter company.

The DC Electrical Panel

The nerve center of the DC electrical system is the DC circuit breaker panel by the steps to the pilothouse from the salon. On this panel are the switches that control power to the boat's various systems.

Just as in your home, most of these switches are true "circuit breakers": They feed power to somewhere in the boat where there is *another switch* which, in turn, turns the item on and off. An example of this would be the circuit breakers for the spotlight or cabin lights: If the breaker is turned on, the light still won't work unless you turn its switch!

Some of the breakers also serve as the switch for the item. An example of this would be the engine room lights. ("B" means used as circuit breaker, "S" means used as switch AND breaker.)



The DC electrical panel. At top is the fresh water gauge & house battery DC voltmeter.

BREAKER		USE
DC Main	B	DC Main Switch
Cablemaster	B	To Cablemaster control switch
Lights (8 switches)	B	To light switches interior & exterior
Engine Room Lights	S	Turns on E/R lights
Companionway Lights	B	To light switches
Spotlight	B	To spotlight controls
Water Monitor	B	Turns on water meter above in panel
Waste Monitor Master	B	Turns on holding tank monitor
Waste Monitor Guest	B	Turns on holding tank monitor
Grey Water Monitor	B	Turns on grey water monitor
Pilothouse DC Main	B	Pilothouse Main Switch
Defogger Center	B	To defogger switch
Galley Fan	B	To switch in galley
M/S/R Head Fan	B	To Master S/R head fan
Guest S/R Hd Fan	B	To Guest S/R fan
Pressure Water Pump	S	Turns on fresh water system
Waste Pump	S	To switch at Y-valve.

BREAKER		USE
Washdown Pump	S	Turns on washdown system
Trim Tabs	B	To trim tab rocker switches
Phone System	B	To telephones
Propane		(Unused)
Power Seat	B	To Power Seat Pilothouse
Pilothouse Accessories	B	To Misc. Pilothouse Equipment
DC Outlet Pilothouse	B	To Pilothouse DC Outlets
Bilge Blowers (4 switches)	S	Turns on each Bilge Blower
Helm Accessories	B	To Misc F/B Equipment
DC Outlet Bridge	B	To F/B DC Outlets
Bridge Power Seat	B	To F/B Power Seat
Bridge Stereo	B	To F/B stereo system
Autopilot	B	To Autopilot System
"Spare" (with breaker)	S	Power to Satellite antenna
Crew Quarters (3)		(Unused)
Electronics Main	B	Electronics Main

In general, when on the boat, you'll have the exterior lights, engine room lights, waste pump, and washdown pump breakers "OFF", and all others "ON".

Engine Room DC Panel

In addition to the switches on the DC panel, there is a DC power panel in the engine room on the aft bulkhead just to starboard of the entry from the lazarette.

This panel operates the critical bilge pumps for the boat, and also switches the battery chargers, shower sump pumps, CO detector, stereo system memories, oil change pump, electric engine controls, and mounts the windlass and main breakers.

Here are the engine room power panel switches:



Engine Room DC Power Panel.

NAME			DESCRIPTION
Bilge Pump (3 Switches)		S	Fwd, Mid-Aft, Aft: "Up" = Run automatically; "Mid" = Off; "Down" = Run manually
Sump Pump (2 Switches)		S	Fwd, Aft: "Up" = Run automatically; "Mid" = Off; "Down" = Run manually
CO Detector		S	CO Detector "Up" = On "Down" = Off
Stereo Memory		S	Power to stereos to retain button settings, clock "Up" = On "Down" = Off
Electric Heads (Fwd & Aft)		S	"UP" = On "DOWN" = Off
Oil Changer	B		Power to oil change pump "Up" = On "Down" = Off
Electric Shift (2 Switches)	B		Power to engine controls "Up" = On "Down" = Off
Manual Sumps		S	To run sea chest pumps (See Water System) in case float switch fails
Battery Charger (3 Sws)		S	Port Engine/Starboard Engine/Generator "Up" = On "Down" = Off
MAIN (1 & 2)		S	MAIN 1: Feeds DC Breaker panel MAIN 2: Feeds Pilothouse Overhead switches
Windlass	B		Windlass Circuit Breaker

All these switches (except the oil change pump switch) should be left "up" except in an emergency!

In addition to the power panel, there are two battery switches on each side of the engine room aft bulkhead (pictures on pages 1.10 & 1.11). The starboard side has switches for the starboard engine starting battery and the house battery, while the port side's switches are for the port engine starting battery and davit.

If you are moored and running from the batteries alone, plan your battery usage carefully. Allow for those 5-10 amp loads which are on much of the time such as the fridges, entertainment electronics, and lighting. Any one of these can run down the batteries if ignored for a significant time, so plan at the start to replenish batteries daily by running the Generator if moored, or the engines underway for at least two or more hours.

Link 10 DC Power Monitor

To the left of the DC power panel is a Link 10 DC Energy Monitor. This nifty unit allows you to check DC house battery voltage, charging/use rates in amps, and approximate cumulative battery energy used.

Across the top are the green LED's that indicate the state of the batteries' charge, from "empty" (on the left) to "full" (on the right).

There are two buttons on this unit's panel, "SEL" and "SET". You will use only the "SEL" button! When pressed, it cycles the monitor through the "V", "A", "Ah" and "t" steps, illuminating the small LED's, representing "Volts", "Amps", "Amp-Hours", and "Temperature".



In the "V", "Volts" mode, the unit displays the present house battery voltage.

The "volts" mode will display between 10 and 15 volts, with 12.8 fully charged, nothing running; 14.2 or more bulk charging; 13.2 - 13.8 float charging, less than 10.0 volts, discharged.

In the "A", "Amps" mode, the unit displays the rate of charge or discharge of the house batteries; a "-" sign appears when the battery is discharging, no sign when charging.

In the "Ah", "Amp-Hours" mode, the unit is like a "fuel gauge in reverse". When the batteries are fully charged, the unit should show approximately "0". Then, as ampere-hours are used, the unit counts them, i.e., after you've used 50 amp-hours, the unit will display "-50" or so.

The amp-hours readings are approximate, and relative. When you run the boat, the number should decrease again to zero. In fact, the most useful setting for the energy monitor is the amps mode, which answers the question "Am I using up (-) or adding power to the batteries right now?"

We suggest you look at the monitor especially just before bed when at anchor, to warn you if you've left something on. You will normally see only a modest "-" current for your anchor light and perhaps the fridge. If nothing is running, voltage should be about 12.6 - 12.8, fully charged.

After you wake up, check the voltages before you start using more DC energy: You may want to charge your batteries by "going for a boat ride" or using the generator if you were at anchor.

If you take readings frequently for the first day or two of your cruise, you'll get an idea of normal system operation and power consumption rates.

Other DC Switches at the Helms



Some of the switches at the flybridge helm...



...and at the main helm overhead.

There are switches above the lower helm in the pilothouse and alongside the flybridge helm that control various items:

- Windlass Power On/Off
- Windlass Up/Down
- Running Lights
- Anchor Light
- Panel Lights
- Bilge Pump Manual "On"/Override
- Horn

and at the lower helm only:

- Windshield Wipers/Washers

For all of these, operation is self-explanatory. Pressing the top of the switches turns them "On" unless otherwise marked.

The AC Electrical System



AC Panel, Metering & Power Selection section.



AC Power Panel, Switch section.

The AC Electrical System is controlled at two sites, the AC circuit breaker panel and the Inverter control panel. These panels have the switches that control the boat's AC electric systems. In addition, there is an AC voltmeter and AC ammeter in the AC panel. This allows the skipper to monitor power usage to determine whether the generator or shore power is needed. Just as in the case of the DC panel, the AC panel has some circuit breakers which are also switches:

BREAKER			USE	BREAKER			USE
SHORE		S	<i>These two breakers select the boat's power source. Pilot lights confirm that power is on.</i>	Engine Battery Charger		S	Turns on Batt Charger
GENERATOR		S		Water Heater		S	To Water Heater Thermostat
A/C System Water Pump	B		To Air Conditioning Pump	Jenn-Aire Range	B		To F/B Jennair controls
A/C Guest Stateroom	B		Air Conditioning Breaker	Receptacles Salon/Master (2)	B		To Outlets*
A/C Master Stateroom	B		Air Conditioning Breaker	Microwave	B		To Microwave Outlet*
A/C Salon	B		Air Conditioning Breaker	Ent. Center Mast. S/R	B		To M/S/R Entertainment Ctr.*
A/C Pilothouse	B		Air Conditioning Breaker	Range	B		To Electric Range
<i>Pilot Lt: Power Available</i>			Shows power is "on" to Panel	Dryer	B		To Dryer in Master S/R
<i>Pilot Lt: Generator Runn'g</i>			Shows Genset is Running	Bow Thruster Battery Charger		S	Turns on Thruster Charger
Receptacles Galley	B		To Outlets*	Central Vacuum	B		To vacuum system
Receptacles Guest S/R	B		To Outlets*	Inverter Charger		S	To Inverter: See below!
Receptacles Exterior	B		To Outlets*	Icemaker	B		(Unused)
Coffee Maker	B		To Coffee Maker*	Ext. Refrigerator	B		Flybridge Fridge*
Trash Compactor	B		To Trash Compactor	Refrigerator Freezer	B		To Refrigerator and Freezer*
Washer	B		To Clothes Washer in S/R	Entertainment Center Salon	B		To Salon Entertainment Ctr*

* Receptacles, Coffee Maker, Entertainment Centers, Microwave & Refrigerators run off both the AC Shore Power and Generator, and also the Inverter.

Connecting/Disconnecting Shore Power

The two breakers at the top left of the panel select between the shore power connector at the transom and the generator's power. You will see that only one can be "on" at one time! But, of course, both can be "Off".

You will want to turn "Off" the shore power breaker *before you connect or disconnect the boat to shore*. This is true so that you do not draw an arc from the plug due to the load of the boat on the connector's pins: Such an arc will burn the contacts and eventually cause them to overheat when in use, creating a fire hazard.

Once connected to shore power, monitor the AC "line voltage" voltmeter and "line current" ammeter to be sure you have not overloaded the circuit.

Important Note: If the house batteries are low when you first hook up to shore power, and the inverter is turned on (as it should be), the inverter will begin charging its batteries at a very high charging rate, drawing a lot of shore power current. Until this demand reduces (see "The Inverter System" below), you should turn "OFF" other high-current AC appliances such as the water heater.

You can then turn on AC appliances as needed. Watch the ammeter to be sure you don't exceed the dock's available supply, typically 30 amps.

Here are some estimates of AC power consumption for typical appliances:

Water Heater	15 amps	Inverter	up to 22 amps
Hair Dryer	12 amps	TV	1.5 amps
Coffee maker	10 amps	Cell phone	.3 amps
Microwave	10 amps	Refrigerator & Freezer	7 amps each

The Inverter System

As we said, the Inverter system is used to provide AC to the boat when there is no shore power. It is wonderful, for example, to use the inverter to run the refrigerator and freezer, to make a pot of coffee when the engines are running and you are underway, or to watch TV in a quiet anchorage, or use a hair dryer for a few minutes in the morning. But for long-period use of AC by large appliances, the engines must be running or you must have shore power available. That's because the boat's house batteries store about 300-400 amp-hours of electricity, that is, they can produce 100 amps for four hours, more or less.

Now the microwave, for example, will draw about 100 amps of DC when using the inverter to run it, so in 15 minutes you use one-quarter of an hour at 100 amps, or 25 ampere-hours. In fifteen minutes, you've consumed almost 10% of the house batteries' stored power. OK. But what if you cook a roast for 60 minutes? You use up one-quarter of your energy on that one job alone! That's too much use for the inverter, and the generator should be used.

For a short task, the inverter is great: No need for a generator, no noise, no fuss, the power is there. If the engines are running, use it all you wish, as long as you don't try to do two big jobs at once: The inverter can only produce 2,600 watts of energy at a time. So the inverter is only wired to certain outlets, the microwave, and the refrigerators. It will not run the water heater, boat heaters, air conditioning or battery charger. *Electrical portable heaters, particularly, should never be run by the inverter!*



Inverter control panel by DC panel.

But in addition to making AC out of DC, the inverter can do the reverse! If there is AC available from shore power, it will charge batteries! You tell what the inverter is doing by its control panel. The little lights indicate its status:

STATUS LIGHTS LIT	MEANING OF STATUS LIGHTS
"Inverter"	If lit, Inverter is On
"Battery Low"	If lit, inverter supply is low, batteries need charging.
"Over Temp / Overload"	Inverter has shut off do to error condition. Operate ON/OFF-RESET Switch
"Charger Bulk"	Inverter is charging batteries at "bulk" or fast rate (+/- 14.2 volts)
"Charger Float"	Inverter is charging batteries at "float" or idle rate (+/- 13.2 volts)

Remember the important note above under "Connecting/Disconnecting Shore Power": The inverter, if on, will draw a lot of current when bulk charging, so be careful not to overload a shore power circuit. If "Inverter" and "Charger Bulk" are both lit, and the AC ammeter in the AC power panel shows more than 30 amps (with other loads such as the Water Heater off), this higher load is being drawn from the AC supply by the Inverter!.

In summary, the inverter should be on whenever shore or generator power is present, and it may also be left on when underway.

The Generator System

The ship's Onan Generator provides 17,000 watts of AC power to the vessel and is mainly used for battery charging, refrigeration, cooking on the range and microwave, heating hot water, and air conditioning. Generally 1 to 3 hours of operation daily will recharge the boat's batteries.

Given that distances are short in the Pacific NW – one of its appeals – you may only run the main engines a couple of hours on a run day. This may not be enough to recharge the batteries fully since the engine alternators are not as effective a charging source as the generator combined with the inverter. Take this into account in your power budgeting.

The generator is in the engine room at the forward center, and its oil and coolant levels are checked before each charter by the San Juan Yachting staff. More important when traveling is checking the sea strainer (see previous section) to be sure it has not accumulated substantial debris while the generator was run for extended periods, particularly at anchor.

The generator stop/start controls are at the top of the DC power panel (that this is in the DC power panel is an anomaly!

Starting the Generator:

- 1) Hold down the switch in the top left of the power panel *down* in the "Stop/Preheat" position for 15 seconds (this energizes "glow plugs" to warm the engine's cylinders).
- 2) Then press and hold the switch *up* in the "start" position until the engine starts. If the engine does not start in 15 seconds, repeat step one and try again.

IMPORTANT! Do not repeat start procedure more than twice lest the exhaust system becomes water-locked, possibly damaging the genset! Shut off the genset's water supply if you need to repeatedly try to crank it. Then, as soon as it starts, re-open the supply.

- 3) Check the generator exhaust (aft of the port engine exhaust pipe at the port side stern of the boat), or listen for it to confirm that cooling water is being pumped from it.
- 4) After a brief warmup of a minute or so, switch the circuit breakers in the AC power panel from "Shore" to "Generator". You should see the "AC Present" pilot light go on!

Stopping the Generator

- 1) Switch the "Generator" circuit breaker in the AC panel off. This removes the load for the generator and allows it to cool down.
- 2) *After at least a minute to allow the generator to cool down*, press and hold the generator stop switch in the DC panel until the generator completely stops.

Generator Problems

The generator monitors its own operation! It has two fault-detection systems: one of these will detect any loss in oil pressure, the other detects overheating. If either condition occurs, the generator will shut itself off, and it then will not keep running when you try to restart it. The start switch overrides the low-oil shutdown while the oil pressure builds.

Do not remove the water fill cap from an overheated engine. Let it cool, then remove the cap slowly with protective clothing on in case high temperature steam escapes. If oil pressure is the problem, check the oil level and top up. However do not attempt to re-start if the oil level is normal and you have checked the cooling system including the raw water strainer – if one of these is not the problem then the shutdown is protecting the engine from damage due to an internal failure.

If the generator will not keep running, call San Juan Yachting for assistance.

Heads & Holding Tanks

Head System Overview

The head system on this boat is reliable, straightforward, and easy-to-use.

First, a note about discharge of sewage:

*It is forbidden to discharge untreated sewage in inland US. waters, an area that includes all US. waters in which this boat operates. The boat holding tank must only be emptied at proper pump-out stations if it is in US. waters. (With the exception of certain Canadian Harbors which are no-discharge zones, This rule does not apply in Canadian waters. However, in Canada, courteous practice dictates that the holding tank be dumped only when outside **all** confined marinas or bays, as we are sure the reader agrees!)*

The boat is equipped with electric Vacu-Flush heads. These heads each have a separate pump which macerates waste and puts it either into a holding tank. The holding tank is emptied either of two ways: By operating an overboard macerator pump controlled at the DC power panel **and** by a switch and Y-valve in the engine room, or by pumping it using a shore side pump out station through the boat's side-deck pump out fitting.

The Vacu-Flush Heads

These premium heads are easy to use, odor free, and very reliable. They work with two separate vacuum pumps and vacuum accumulator tanks. A vacuum is maintained in the tank until the head is used, when the waste matter in the bowl is sucked out of the head by the vacuum, then it is pumped through the system by the head pump, which then also pumps up a vacuum again. Note that *it is this rush of the head's contents caused by the accumulated vacuum that is important to the head's operation!* This sudden rush causes any solid material in the waste stream to be shattered as it passes through the specially-shaped orifice in the bottom of the head. *For this reason, proper head operation requires that the head pedal not be held down for long periods if time.*

The head uses about a half pint of *fresh* water from the ship's supply with each flush.

The head is operated by a the pedal to the left of the head base (as you face the head), and operation is as follows:

1) Be sure the switch for the head in the toilet compartment is "On". **The switch in each head compartment should be left on unless you have trouble with the head (see below), in which case you will turn the switch "Off".** They carry this legend:

The top of this toilet switch must be pushed in the "up"/"on" position for the toilet system to work properly. If toilet pump keeps running, consult the captain and vessel manual!



One of the head power switches. It carries the word "toilet". The top must be pushed in unless the head has failed!

- 2) Before using the head if the waste will be solid, lift the pedal to add water to the bowl;
- 3) Use the head;
- 4) Step on the pedal just long enough to hear the “whoosh” as the head is evacuated and a small amount of water rinses the bowl - - - about five seconds!
- 5) Releasing the pedal, if you wish to flush again, wait at least twenty seconds or so (until you hear the head pump stop) before flushing again.

As the pedal is released, the ball-valve at the bottom of the head seals it so that the vacuum can be pumped up, the pump will then stop, and the head is again ready for use.

If the head pump runs often or steadily between flushes, it is likely that the seal at the bottom of the bowl did not seal completely: you can tell if there is no water in the bowl. The solution is usually simple: Flush the head again and make sure the pedal comes all the way up when you remove your foot from it; then make sure the water doesn't leak out.

Only things which were eaten or drunk, or the toilet paper supplied with the boat, should be put in the heads! Facial tissues, tampons, and other foreign matter will clog the system. If these heads are used properly, they are quite reliable. Failures are virtually always due to mis-use! When it comes to tissue, usually “four squares is enough!”

In US. Waters, the Coast Guard Rules require that the valves be “secured” in the holding tank position to assure that all effluent will be kept aboard in the tank. If you turn the valves to overboard while in Canadian waters, re-secure them with the wire ties supplied and stored near the valves when you return to the U.S.! See below.

Holding Tank Pumpout, Y-Valve

There are holding tanks in the boat located in the engine room forward on each side; the port head always fills the port tank, starboard head always goes to the starboard tank. A *Pastoral Call* is equipped with holding tank indicators in each head compartment so it is easy to tell if the tank is full. Two deck plates on the starboard side deck allow pumping both the port and starboard tanks at a shore-side waste pumpout station.

To pump the tanks overboard, you must be in the engine room:

1. Turn “on” the “Waste Pump” breaker in the DC panel by the salon-pilothouse steps.
2. Be sure the “Waste” seacock in the starboard side of the lazarette is “open” (in line with the hose as it enters the valve).
3. In the engine room forward on the ceiling above the starboard tank is a “Y Valve”. Point the handle of this valve at the tank you wish to empty: If the end is alongside the hose to the port tank, you are emptying the port tank; if it point forward an to starboard, you are emptying the starboard tank.



Y-Valve on ceiling of Engine Room port forward. Switch for overboard pump (red).

4. Operate the switch by the valve to run the pump until the tank is empty. *Do not let the pump run dry: It will be damaged!* The effluent passes through a the hose and pipe aft to the pump and thru-hull valve.
5. When you are done, re-secure the thru-hull valve and turn off the pilothouse DC panel “Waste Pump” breaker.

Heating/Air Conditioning Systems

Air Conditioners

Heating and air conditioning on *A Pastoral Call* is provided by four air conditioning systems serving the salon, pilothouse, Master and Guest Stateroom areas. The air conditioning compressors are located in the lazarette, starboard side aft.

To operate the units:

- 1) Be sure all *five* breakers in the AC breaker panel in the pilothouse are “on” for the air conditioning pump and the four units.
- 2) To run more than two units, you will need to have 50-amp shore power, or you will need to have the generator running.
- 3) Set the controls in each area for operation as desired. You can set the controls to automatically switch from heating and cooling, or select heating or cooling manually. You can also set the temperature for the area, and control that area’s fan speed.

Hint: In cold weather, because the air conditioners in the “heat” (heat pump) mode are not very efficient, to heat the salon you will need to have the pilothouse air conditioning on, and in the “heat” mode, and have the pilothouse control set about 10 degrees higher than the salon’s control.

Control Operation:

- “Mode”** Controls whether the system is heating or cooling. In “Auto”, it will operate as called for by the thermostat.
- “Fan Speed”** In “Auto”, the fans will speed up or slow down as necessary; at night, this can be annoying. In the “Manual” mode, pressing the button repeatedly varies the speed as shown by the row of LED’s under the temperature display.



- “Power”** Turns unit on and off.
- “Temp Select”** “Inside” shows present temperature. Set to “Set Point” for setting system temperature for this area.
- “Up”, “Down”** Use these arrows to adjust fan or temperature.
- “Dot”** This illuminated dot (in the photo you will see it to the right of “71” in the temperature window) tells you that the system is on.

Galley & Laundry Equipment

The galley is fitted with a number of appliances for your convenience. Most of these (like the microwave) are easy to operate, “just like a home appliance”.

Electric Counter-top Range

This unit operates conventionally. Keep the glass clean to avoid burned-on food. If operating with shore power, watch your AC loads, especially if air conditioning is in operation.

Microwave

Operates conventionally. You will need to reset the clock whenever power is interrupted. The microwave will operate on shore, generator or inverter power. If operating it without shore power or the generator (thus on the inverter) be sure that either the engine(s) are running or you don't use it excessively. See “Inverter” page 4.20.



The coffee maker, microwave and range top.

Refrigerating Systems

The boat is equipped with:

- An efficient under-counter refrigerator on the forward side of the galley;
- A freezer, also under-counter, also in the galley in the “L”;
- A small refrigerator on the flybridge under the Jenn-Aire barbecue.

All run on AC only, and all are wired so they can run off shore power, the generator *or the inverter!* Because the inverter uses the ship's batteries particularly when at anchor, you will want to be sure that you (a) keep the batteries charged and (b) don't open the unit's doors excessively! There are breakers in the AC panel providing each with power.

Temperature is controlled by the thermostat in the back of each unit; set as required *after allowing the unit to stabilize for a few hours after loading.* Remember, these machines will use less power if they are full! Many boaters keep extra water bottles/jugs filled and in the units as space permits to conserve the ship's power. We recommend this.

Because of their excellent insulation, they will stay cold a long time! If you wish, and you have kept the doors closed for the preceding hour or so, you can shut them off at night when at anchor to save batteries; but be sure to turn them on again in the morning!



(Top) The freezer in the galley; fridge on opposite wall is identical.



Jennair Barbecue

Located on the flybridge, this is a conventional unit. Be sure the cover is completely up before use.

Washer and Dryer

Located in the Master Stateroom, these operate conventionally. They require shore power or the generator to operate!



Electronics Systems

Overview

The boat is equipped with extensive electronic equipment, including VHF radios, two radars, two plotters with GPS receivers, two depth sounders, and an autopilot.

The DC power supply for this equipment is controlled by a single electronics master circuit breaker in the bottom right corner of the DC power panel. Each unit then has its own power switch.

This manual does not attempt to provide operating instructions for any of the electronic equipment. Instead, you are referred to the equipments' own manuals kept in the pilothouse black cases on the shelf.

VHF Radios

The VHF radios' controls are at both helm stations, in the salon and on the flying bridge. The radios are designed for easy access to Channel 16, which is the hailing and emergency channel in the Northwest. Other buttons allow you to select different channels, weather channels, high and low power, and US/International operation. Your checkout skipper and/or the radio's own instructions will quickly familiarize you with basic operation.

Be sure to re-check the squelch each time you turn it on.

Radar

The boat is equipped with two radar sets. These can be used, combined with the electronic chart units, for operation in restricted visibility, with the radar primarily serving as a device for *collision avoidance* while the chart unit provides *position*.

Proper and safe use of a ship's radar requires lots of practice and careful study. While you are using the boat, you can have the radar on as much as you like to get used to the way it displays images, but for detailed operating instructions we refer you to the radar's own complete manual and details bottom of next page.

Note that charterer's insurance DOES NOT PERMIT OPERATION OF THE VESSEL IN RESTRICTED VISIBILITY. You should confine your use of the radar to familiarization and training only in weather with good visibility.



The VHF radios are to the right of each helm station. This is the pilothouse unit.



One of the two identical Radar units.

GPS and Electronic Charting System

The boat is equipped with two Raytheon GPS and Electronic Charting Systems to make your location easily identifiable. One unit is at the lower helm and another is at the upper helm. Operation is described fully in its manual on the boat and below.

REMEMBER: THE ELECTRONIC CHARTING SYSTEM IS NOT A SUBSTITUTE FOR CAREFUL STUDY OF TRADITIONAL PAPER CHARTS. You are required by maritime law to use your paper charts for navigation information, especially since electronic chart technology does not always permit full cartographic details to show, especially underwater hazards. The electronic charts are for convenience only!

There is a GPS serial data output receptacle on the port edge of the console to use with a laptop with navigation software if you have one.



TriData Digital Sounder:

Note: Northwest waters are rocky and depths change rapidly. You should be especially careful to study your charts, and then check them often whenever running in lesser depths, so that you don't hit a rock! Just as our islands "pop up" to heights of 50, 100, or even thousands of feet in a very small distance, so do rocky obstacles underwater!

This comes on with the DC breaker to provide a digital readout of depth and speed at both helms. The speed readout is measured with a 'paddlewheel'. It is an approximate speed in water versus the GPS speed over ground (SOG). Remember when going astern, or when crossing a tide line, turbulent water from the tides or the boat's screws (or the propellers of another boat) can interrupt the sounding information received by the unit. Be careful!



The depth display will flash when unable to get a reading, usually due to excess depth. When *flashing*, the numbers are *totally meaningless and do not represent the last reliable reading!*

Raytheon Autopilot:

The boat is equipped with a Raytheon "Raypilot" Autopilot. The primary control is at the lower helm. A second smaller remote control is at the upper helm on the port side of the console. Although rudder indicators are at both helms in the instrument panels turned on by a switch on the electronics panel, the autopilot also has a rudder display at each location, but for it to work, the autopilot must be on.

Here is the function of each button:

- Lights** Turns the dial lights on/off
- Resp** Allows the operator to adjust autopilot response. *Please do not use, as the pilot is already set correctly for most conditions!*
- Nav** Links the autopilot to the navigation course plotters. **Please do not use this function!**
- Auto** Engages the autopilot to steer your boat.
- Resume** Press once to see the last "Auto" heading; Press again within 10 seconds to go to that last heading.
- Stby** Disengage the autopilot back to "standby" mode.
- Knob** Allows you to correct your heading under autopilot control.



(Above) Autopilot control at lower helm. (Below) Flubridge unit



The autopilot is also controlled by the "Joystick" on the pilothouse helm seat:

- Red Button** Disengages the autopilot as long *only as long as pressed*.
- Joystick** If tipped left, boat steers left, if tipped right, boat steers right. *Releasing the red button will then hold the new course.*

Basic operation is simple:

- 1) To turn on the unit, push the "Stby" button to be in the "standby" mode. The unit will do a quick self-test, then display its present heading. **The autopilot should be in standby mode when underway, as some electronic equipment gets data from it.**
- 2) To engage the autopilot, push the turn the switch to "Pilot". It will hold the present heading.
- 3) To disengage the pilot, push "Stby", the unit returns to "Standby".
- 4) Pressing the standby button on either control takes control at that location. Once in control, that station stays there until the other station takes control by pressing standby.

ALWAYS MAINTAIN A CAREFUL LOOKOUT WHEN USING THE AUTOPILOT! It is an aid to comfortable cruising, not a replacement for an aware, diligent helmsperson! Remember, you can disengage it quickly at any time simply by pushing "Standby"!

Closed-Circuit TV Monitoring System

A *Pastoral Call* is equipped with a closed circuit TV system with cameras over the cockpit looking aft and in the engine room. This unit facilitates docking the boat and allows you to easily check the engine room (provided its lights are on).

To operate it, all you need to do is turn the monitor (at the left side of the pilothouse console) "On". The buttons under the power switch let you select which of the two cameras you wish to use.



The closed circuit TV. The photograph of the image was blurred due to the TV's "scan" rate: the image is actually quite good!

Entertainment Systems

The boat has a stereo system serving the salon and pilothouse; a DVD/CD player for the salon TV and the stereo system; two satellite receivers for Dish TV feeding the Salon TV and Master Stateroom; a TV in the VIP guest stateroom; a radio and CD player in the Master Stateroom that can also feed the VIP guest stateroom; and a radio/CD player serving the flybridge. Wow!



The tuner (top) and DVD/CD player (bottom). An A/B switch is in the cabinet beneath this on the left side of the opening.



The satellite receivers, A/B box on top.



The salon TV & VCR

The units each have remote controls, so operation can be confusing; see the next page for checklists for each operation.

This table tells you “what can be done where” with each of the units in the boat’s elaborate entertainment system:

DEVICE	ROOMS WHICH EACH UNIT SERVES				
	SALON	MASTER S/R	PILOTHOUSE	FORWARD S/R	FLYBRIDGE
Satell. TV (2 Units)	Yes (#1)	Yes (#2)	No	No	No
DVD & CD	Yes	No	Audio only	No	No
Local TV (Limited)	Yes	Yes	No	Yes	No
Salon AM/FM	Yes	No	Yes	No	No
Video Cassettes	VCR	VCR	No	Yes By TV	No
Master S/R Stereo	No	Yes	No	Yes (Switch)	No
Flybridge Stereo	No	No	No	No	Yes

Specific Procedures for Entertainment System Units

To play the satellite TV in the Salon:

In this mode, the satellite receiver #1 receives the TV signal and it is played through the salon TV:

1. Be sure the outlet just to the right of the salon entertainment center is switched “ON” (this provides power the all AC entertainment components in the salon!).
2. Be sure the DC switch, right column DC panel, marked “Spare”, is “ON” (this provides power to the satellite positioning unit on the radar arch).
3. Set the “A/B” switch in the cabinet under the tuner and DVD player to “A”.
4. Use the RCA “Guide Plus” remote control to set the salon TV:
 - a. Turn on TV
 - b. Press “Sat + Cable” button;
 - c. Control volume with green left/right arrows.
5. Use the salon Sony “Satellite Receiver” remote control to turn on receiver and to select channels and/or menu.

Note: Seattle channels are 4, 5, 6, 7, 9, 11, 13. For other channel information, press “Guide” on the Sony control, then using “page” to scan the information, select a channel per the on-screen guide .

To play a DVD or CD in the Salon (with audio in the Pilothouse):

In this mode, the audio plays through the entertainment system(available to the salon and pilothouse), while if a DVD is being played, the video image will appear on the salon TV:

1. Be sure the outlet just to the right of the salon entertainment center is switched "ON" (this provides power the all AC entertainment components in the salon!).
2. Turn the Harmon-Kardon Stereo Receiver "ON";
 - a. Press the "AUX" Button (*you will control volume with the big knob*).

If playing a CD, skip now to step 6. Steps 3-5 are for DVD's only!

3. Set the "A/B" switch in the cabinet under the tuner and DVD player to "A".
4. Set the "A/B" switch by the satellite receivers to "A".
5. Use the RCA "Guide Plus" remote control to set the salon TV:
 - a. Turn on TV
 - b. Press "TV" button;
 - c. Press "Who-Input", "VID" will appear on TV screen.
6. Turn the Harmon-Kardon DVD-50 DVD/CD Player "ON"
 - a. Insert the CD or DVD (the little gold button to the right of the disk drawer opens it)
 - b. Press "1" or other number to load that disk;
 - c. When display id ready and/or you have completed step 4 as applicable, press "Play";
 - d. [If a CD, it will now be playing through the audio system.]

To play the satellite TV in the Master Stateroom:

In this mode, the satellite receiver #2 receives the TV signal and it is played through the Master Stateroom (M/S/R) TV:

1. Be sure the outlet just to the right of the salon entertainment center is switched "ON" (this provides power the all AC entertainment components in the salon!).
2. Be sure the DC switch, right column DC panel, marked "Spare", is "ON" (this provides power to the satellite positioning unit on the radar arch).
3. Set the "A/B" switch in the cabinet under the tuner and DVD player to "A".
4. Use the JVC "TV" control from the drawer under the M/S/R TV to set the M/S/R TV:
 - a. Turn on TV;
 - b. If TV does not come on with "Chan 3" displayed, use the "Input" button until it is;
 - c. Control volume with this remote.
5. Use the M/S/R Sony "Satellite Receiver" remote control to turn on receiver and to select channels and/or menu.

Note: Seattle channels are 4, 5, 6, 7, 9, 11, 13. For other channel information, press "Guide" on the Sony control, then using "page" to scan the information, select a channel per the on-screen guide .

Using the M/S/R Aiwa Audio AM/FM/CD player in the Master Stateroom and/or VIP Guest (forward) stateroom:

In the M/S/R, play it as you would normally, then select the desired loudspeakers using the speaker switch in the cabinet just to left of the unit in the Master Stateroom so that the sound is “on” where desired. *Note: The volume control for the VIP Guest S/R speakers is on the aft wall to starboard.*

Using the TV in the VIP Guest (forward) Stateroom:

This TV plays regular TV only or a tape on its adjacent VCR. TV reception is limited to regular TV signals.

Using the Flybridge AM/FM/CD Stereo:

This operates just like a car stereo.

Section 5: “What to Do If”

ANCHOR CHAIN WON'T COME OUT OF CHAIN LOCKER

The anchor chain is continuous, secured at both ends, and cannot tangle. But sometimes a pile of chain will fall over, and one loop of chain will fall through another loop. Usually you can clear this by grasping the chain where it exits the hawse pipe from the chain locker with your hands, and pulling it up or down to “jiggle” the loop out of the chain; you may have to retrieve some chain to do this, in order to have enough slack to jiggle it! It is rare when this will not clear the jam. The other solution: go below and clear the tangle in the chain locker. *Caution: Turn off the windlass breaker to protect your hands when manhandling chain!*

ANCHOR FOULED, CAN'T RAISE IT

This can happen if you “pull the boat to the anchor” with the windlass. You should move the boat under power until it is over the anchor, or, even better, slightly ahead of it before hauling. Usually this will clear it. Otherwise, take a line and form a fixed, loose loop around the chain. Weight the loop, and lower it down the line until it reaches the bottom, sliding down the chain. Then, using the dinghy, take the line forward past the anchor so that you can pull the anchor out, opposite the direction its flukes are pointing. This should help you to pull the anchor free.

ANCHOR WINDLASS WON'T TURN

If the motor isn't running, is the circuit breaker by the lower helm on? If the motor is running, is the clutch tight? Use the anchor windlass handle in the salon first aid cabinet. Windlasses are equipped with a shear pin to protect them: if you sheared the pin, you will have to haul the anchor by hand using the emergency handle.

BATTERIES (HOUSE) KEEP RUNNING DOWN

Have you run the engines enough? Is something left on (like the engine room or mast lights, too many electronics, etc.) that is too great a load for the time you were not charging? Are you using the inverter for big jobs? Use the stove or shore power. Have you had the inverter on whenever plugged in to shore power? You must, for the house batteries to charge!

ENGINE OVERHEATS

Is the drive belt for the water pump intact? Spare belts are in the engine room spares kit. Is the sea strainer clogged? See that section in this manual. Is the impeller shot? If sea strainer is clear and belt is good, this is likely. Change (spare in spares kit) or call a mechanic. *Do not run engine if it overheats!*

ENGINE WON'T START

If starter does not turn, is transmission in neutral? Are engine controls selected with E/R breakers on? Check battery, battery switches. Try starting with battery switch set to “both”. If starter turns, assume fuel problem: did you bump a fuel valve on the tanks? Make sure all open, if one was closed, re-prime engine or call a mechanic if you can't do this (see Cummins engine manual). Remember, the starboard engine has its *own* battery!

FOG DELAYS RETURN

Call San Juan Yachting by telephone or VHF marine operator and advise for instructions.

HEAD WON'T FLUSH

Is breaker on? Turn it on. Have you over-filled the holding tank? Pump it to allow more effluent to enter it. See the "Heads" section of this manual. If all else fails, just use only the other head.

HIT A FISH NET

Engines in Neutral: don't try to back off, you may foul the net more. Try pulling the boat back with the dinghy & outboard. Get assistance from the fisherman. *You are responsible for damage you cause to a net!*

HIT A LOG OR ROCK

See **EMERGENCY PROCEDURES**, next chapter.

PROPELLER FOULED OR DAMAGED

Best thing: Have the prop checked by a diver or dive it yourself if able. Check for vibration. Try turning shaft by hand in engine room, both should be turn-able with engine in neutral. Is shaft noisy, or does it load engine? Do not use that side or call Vessel Assist. See emergency procedures, next chapter.

WATER (FRESH) WON'T FLOW

Is there water in the tank? Is F.W. Pump breaker on? If capable, check pressure switch on pump, run manually if necessary.

Section 6: Emergency Procedures

Protect your lives first!

Put on life jackets

Contact the Coast Guard with an emergency "MAYDAY" call.

If adrift, prepare to anchor to keep the boat from drifting into danger.

If the boat is really sinking, consider "beaching it" if necessary.

Launch the dinghy and prepare to board if necessary. If an engine is available and you have time, mount the outboard engine and load its fuel tanks. Take a handheld VHF radio, if available. Be sure to wear life jackets!

Then, worry about the boat!

In a true emergency, you certainly are authorized to call for immediate commercial assistance as minimally required to assure the safety of you and the boat.

It is not an emergency, however, if neither you nor the boat are at risk. For all non-emergency assistance or mechanical repairs done by others, San Juan Yachting MUST give prior approval for you to be reimbursed!

If you think it may not be an emergency:

If you have any concern about your long-term safety, contact the Coast Guard, either normally or using an urgent "PAN" call. Tell them that you are calling to advise them about your situation, so they can keep in touch.

Be sure that the status and safety of the boat and crew is someone's responsibility while you sort out the boat's problem. For example, delegate your mate to keep a watch for hazards, or to operate the boat on course slowly while you deal with the difficulty.

Here is a checklist for solving the problem:

- (A) Isolate it;
- (B) Get the manuals;
- © Get parts;
- (D) If necessary, call San Juan Yachting for help.

Over the years, most problems with charter boats are caused by misuse! Holding tanks overflow because they aren't checked; heads clog because foreign matter (especially facial tissues and tampons) are put in them; engines fail because they run out of fuel,

then must be "purged" to re-start. Use the boat carefully, and you'll avoid these problems.

Almost all problems that are not operator-caused, i.e., that are boat deficiencies, are caused by pumps that fail, hoses and belts that break, and seawater strainers that get clogged. Generally, these problems are annoyances, and usually they are inconvenient, but they still *can* happen. Try to stay calm, collected, and be a professional by dealing with the problem in a businesslike, calm way. It will make everyone's day a better one!

Hitting a Log, Rock, or Debris ----- Please Don't!

Hitting a log is a real risk in our Northern waters because logging, and "log rafts," are such a big part of our commerce.

If you hit a log:

- Did you put a hole in the boat? Idle the engines, then think: usually, you can tell just by where the noise of the hit came from. Check the bilges (don't forget the lazarette area, where the rudder posts are) after putting the engines into idle and/or neutral, if necessary.

If you did "hole" the boat, go immediately to the "If an Emergency" on the preceding pages.

- If no hole, and still idling, is the boat vibrating?

If "yes," put each engine into neutral in turn, identify and shut down the offender. Then continue on one engine. Call San Juan Yachting after you reach the closest safe harbor. If no vibration at idle, slowly accelerate one engine at a time. Is there vibration on either?

If "yes," run at idle or on only the good engine, to reach a close, safe harbor. Then contact San Juan Yachting.

With a twin-screw boat, the damaged running gear can't be used after hitting an object. However, if while under way on one engine the other engine's propeller shaft rotates by itself because of water passing over it's propellor, then you must let the unused engine idle in neutral so that its transmission has lubrication, and the cutless bearings on the damaged shaft are lubricated. This is still true whether the boat has dripless shaft seals or a standard shaft "log".

When running on one engine with the other idling as required, be sure that the idling engine is pumping water through its exhaust pipe.

- If there is no vibration on either engine, you probably did no running gear damage. Congratulations! Our diver will check your vessel's bottom upon your return, just as after every charter.

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