LATIS

GRAND BANKS
OPERATIONS MANUAL

Welcome aboard!

We are happy you have chosen "*Latis*" for your vacation. We are sure you will enjoy cruising the wonderful islands of the Pacific Northwest.

We trust this manual will help you become familiar with the boat. If you have questions about the boat or about places to visit, please do not hesitate to ask any of the AYC staff.

The Grand Banks 46 ranks among the finest cruising yachts ever produced. With her timeless trawler profile, sea-kindly semi-displacement hull and elegant teak interior the 46 Classic has defined cruising luxury since her introduction in 1985.

In the long elegant tradition of Grand Banks, *Latis* epitomizes the classic cruising vessel of the Inside passage. She is comfortable, well laid out, and a great motor yacht for exploring in grace and comfort. *Latis* is 46 foot Sedan Cruiser in a traditional design with a comfortable salon, staterooms, and deck space with easy walk around space on each side of the vessel.

We wish to fair winds and following seas

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SAFETY

Safety is important in your daily cruising and should not be minimized. Review where safety equipment is before cruising. Trying life jackets on is a good idea in case they are needed latter.

Lifejackets are located in the stern lazarette and also on the fly bridge under starboard aft facing seat. A few should always be out and ready, in fact we recommend wearing them whenever working on the decks.

Flares are located in the salon in the upper cabinets on the portside of helm.

Fire extinguishers are located in the forward guest cabin, salon, aft cabin and engine room.

The boat is equipped with a wireless LED searchlight. Rocker switch is marked. Hand held remote located starboard side wheel.

It is a good idea to review what to do in case of an unexpected person in the water... Man Overboard drills take a few minutes!

The throw ring is hanging outside the starboard doorway to the cabin. Again practice is a good idea.

An air horn is located in the small stow away section above the wheel.

QUICK START

Before Starting Engines Checklist

- ☐ Dinghy secured?
- ☐ Grill covered?
- ☐ All breakables stowed away?
- ☐ Disconnect shore power, store cord
- ☐ Power panel: double green dots ALWAYS ON; green dots ON for normal operation; yellow dots ON as needed; red dots ALWAYS OFF
- ☐ Open blinds for visibility
- ☐ Check WOBBS: water (engine coolant), oil, belts, bilges and strainers
- ☐ Check engine pads for signs of leaks
- ☐ Close aft stateroom door to cockpit to keep diesel fumes out of the cabin

Starting Engines:

- Put gear controls in neutral
- On "Engine Panel" of the DC Panel, flip starboard power switch to ON for starboard engine. Buzzer will sound (low oil pressure warning)
- On Engine Panel turn the far left STOP SOL breaker to the ON position
- Push STARTING button for the starboard engine. When engine starts, throttle back to a smooth idle. Buzzer should stop. Do not try to start more than 30 seconds without a 2-minute "rest" period
- Repeat procedure for port engine
- Warm up at idle RPM
- Check oil pressure for both engines: **30-90 PSI**
- Check for water coming out of both engine exhausts at the stern. The exhaust ports are partially submerged so the water flow can be subtle, this is normal.

Before Leaving the Dock:

- Center the rudder
- Untie mooring lines
- Piloting from dock can be done at idle using forward and reverse of the twin props
- Make sure engines are at idle before shifting gears. Make a slight pause at neutral before shifting between forward and reverse

Underway:

- Stow mooring lines and fenders
- Keep watch for logs or debris in water
- Monitor gauges
- Keep engines RPM under 1300 until engines warm to 150 degrees

- Normal RPM is between idle and 2200. 'Latis' cruises a very comfortable 8 knots @ 1600 RPM with fuel consumption about 3 gals per hour. Do not exceed 2300 RPM for more than 30 minutes – check engine temps!
- Normal readings: Engine Temp **175-190** Oil Pressure **30-90 psi**

Approaching Dock:

- Put fenders out. We generally put fenders down on both sides when maneuvering in close quarters. Have extra fenders ready if the vessel will make contact with the dock or another boat
- Attach bowline to cleat and run line out through the hawsehole, OUTSIDE the bow rail and OUTSIDE fender lines toward mid-ship. Same procedure for stern and spring lines. Station a member of the crew at mid-ship to tend the mooring lines
- Engine throttle should be dead slow and rudders centered. Close maneuvering is best done with forward and reverse maneuvers with twin props.
- Mate ready to step off swim step (No leaping across water to dock!) and secure spring line (most circumstances), then bow and stern. Often you will find a friendly person to catch your dock lines and help you secure them.
- Position mate on deck with a spare large fender with line attached.

Upon Arrival at Marina:

- Secure all lines. Stern, bow and two spring lines at a minimum
- If bow-in, be sure anchor is not protruding over dock walkway
- Turn off engines (see "Stopping Engines" below)
- Turn off electronics at both helm stations; replace covers
- Connect shore power. First to the boat, then to the shore receptacle (30 amp power for Latis)
- If at an unfamiliar marina, <u>be sure to check polarity</u> of the shore power connection before turning on the breaker at the dock

Stopping the Engines:

After operating at cruising speed, allow engines to idle a few minutes to cool down before shutting them down (this usually happens naturally while tying dock lines or setting anchor). You can also turn on the engine room VENTS to help cool the engine room.

- Push the port STOPPING button. Low oil pressure buzzer will sound
- Turn off the port engine power breaker. Buzzer will stop
- Push the starboard STOPPING button. Buzzer will sound
- Turn off the starboard engine power breaker. Buzzer will stop
- Turn OFF the STOP SOL breaker

Daily (Overnight) Checklist in Marina:

- AC Input ON for shore power
- Inverter ON – be sure it is charging

- Keep an eye on the holding tank. The meter is located in the master stateroom head on the sink vanity

Daily (Overnight) Checklist at Anchor or Buoy

- Anchor light ON during hours of darkness.
- Turn off unnecessary electrical items. Even unplugging appliances not in use will help reduce the drain on battery power - turn off the power strip for the microwave and coffee maker
- Keep an eye on the holding tank. The meter is located in the master stateroom head on the sink vanity

Mooring at Anchor:

- All anchoring should be done with the engines running as the windlass uses a lot of power
- Turn on WINDLASS POWER on panel to the right of the helm. Anchor is lowered with foot controls on bow deck below the Windlass. Lower the anchor while backing the boat slowly from anchorage

Foot controls on bow below the windlass

- Mate on bow to monitor length of chain going out and to troubleshoot if it gets tangled. Anchor line is marked as indicated in the Operations Manual
- When desired chain length is out, stop Windlass
- Attach snubber lines to anchor chain. Use of snubber lines will give a more comfortable anchorage as they act like springs to absorb tension on the line. Attach snubber lines to the anchor chain beyond the anchor roller in order to take the "load" off the Windlass. Secure snubber lines through bow hawseholes and to bow cleats.
- Run out enough chain to take the tension off the Windlass
- Back the boat at idle using just one engine to test the set of the anchor. Use a combination of sighting objects in the harbor and GPS to confirm anchor set
- Turn OFF Windlass power at the panel

- STOP engines

First Thing Each Day:

- If at anchor, turn OFF the anchor light
- Check battery reserve on inverter panel (port side of wheel). If less than 12 volts, consider starting engines to begin recharging house batteries before using any additional electricity
- Check fresh water tank level
- Check holding tank gauge. If near full, it will be necessary to pump out very soon

Before Leaving Vessel:

- DC power panel: turn freshwater (F.W.) Pump OFF
- Cover electronics screens at both helm stations
- Close curtains
- Lock the cabin doors
- If you are docked at an island, make sure no food is left out or accessible as critters will come aboard

BOAT OPERATION

ENGINE INSPECTION

Remember to check **WOBBS** every morning: **W**ater (Coolant), **O**il, **B**elts, **B**ilge and **S**trainer.

Access to the engine compartment is through the hatch near the port door. There are wooden stairs that can be removed when working by raising the silver latch and lifting the ladder up. You do not have to unscrew the bolts at the bottom step.

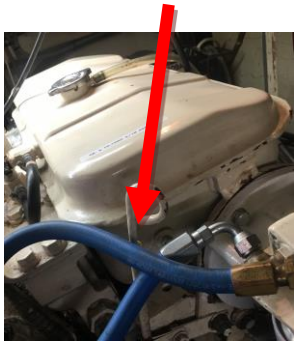
Water (Coolant):

This engine does not lend itself to an easy check of the level of **Coolant** in the coolant reservoir.

The best method to check for coolant is to place one finger inside the reservoir. If your finger touches coolant at any point when inside the reservoir, the coolant level should be adequate.
If you notice overheating please open the coolant cap located towards the front of the engine **once the engine has cooled down.**

Oil:

Port Engine



Starboard Engine

Check the level of **Oil** in each engine by using dipsticks located on the side of each engine, easily accessed from the center of the boat.

Look at the etch marks on each dipstick that indicate the proper oil level.

Only add oil if level is near the lower mark and **DO NOT OVERFILL!** Please use a paper towel or oil rag, not the dish towels, to wipe off the dipstick. Ensure the dipsticks are fully seated back into the tube when done.

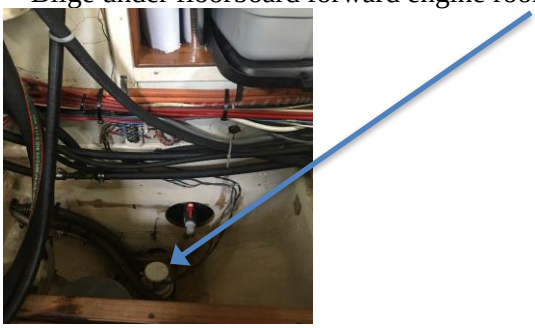
Belts:

Check condition and tightness of the belts. If they feel tight, that's about right.

Bilge:

Check the lower areas of the engine room for excess water. You will note the amount when you first start and after that if it increases, check for causes.

Bilge under floorboard forward engine room



There are sorbs (diapers) under each engine. They will help identify if there are leaks in the engine and to determine where they may be. Under normal operation there are minimal drips, however if an engine is dripping significantly check for the probable cause.

A manual bilge pump is located under the hatch near the entrance to the lower stateroom.

Strainer:

Ensure the valve (**yellow handle**) on each raw water thru-hull is in the "**OPEN"** position (lever in-line with valve).

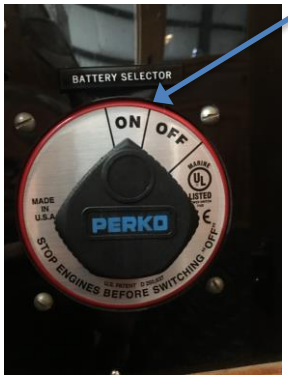
Observe the metal screen through the glass of each strainer for debris. At times it may become necessary to clean the strainer due to a buildup of debris clogging the system. It is important to keep a close eye on sea strainer condition, and if they need a cleaning follow these simple directions:

1. Opposite the yellow handle on the base is a small T-handle. Loosen this about two turns, note that some water may leak through. Close the seacock, (yellow valve).
2. Open the strainer cover using the spanner wrench located under the step inside the starboard door.
3. Clean the strainer thoroughly.
4. Reassemble, remembering to reopen the seacock and tighten the T-handle once the strainer is completely put back together.

START-UP

The engines should be started from the lower helm station.

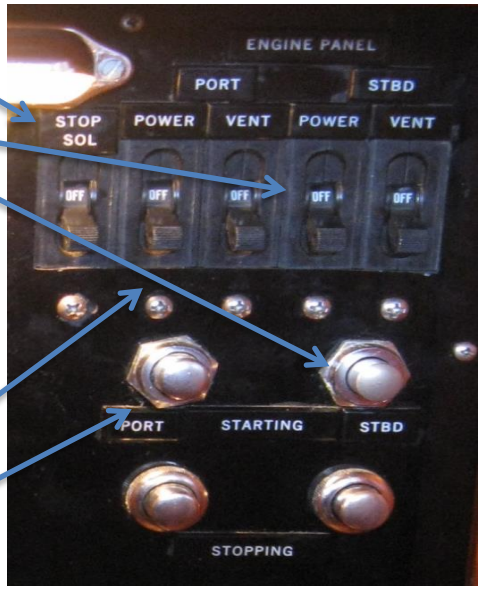
1. Turn battery selector on the DC panel (port side of helm) to "On".



2. GEARSHIFT in neutral.
3. THROTTLE should be just above the idle position.

Normally, plan to start the STARBOARD engine first.

4. Make sure the STOP SOLENOID switch is ON
5. Turn the STARBOARD power switch ON
6. Press the STARBOARD STARTING button. You should hear a loud buzzing noise, this is normal, it's the low oil pressure alarm.
7. After a few seconds the buzzer should stop indicating the oil pressure is normal. If it does NOT stop, turn off the engine by holding the STOPPING button. Determine why the buzzer did not stop. If because of no oil pressure, see Note below.
8. Turn the PORT POWER switch ON
9. Press the PORT STARTING button and again note the buzzer.



LOWER SECTION OF ENGINE PANEL

Raise the engine speed to between 700-800 rpm on the TACHOMETER.

Check the engine exhausts at the stern. There should be water burping out of the exhausts. If there is no water coming out, shut down the engines and see NOTE below.

NOTE--If oil pressure is low, shut down the engine, and inspect engine compartment and look for possible cause (for example, loss of oil.)

Caution -- If an engine is overheating or there is lack of raw water expelled in the engine exhaust, stop the engine immediately. Recheck the raw water-cooling system to ensure the seacock on the strainer is open (handle in-line with valve).

Next, check the raw water strainer for debris. If necessary, close the seacock, remove the strainer, clean, re-assemble, and reopen the seacock. Restart the engine and re-check water flow from the exhaust. If water is not flowing properly, the Raw Water Pump may need to be serviced. Call AYC (360-293-4555).

When reaching cruising speed turn on the synchronizers, the port engine is a slave to the starboard engine

Turn off the synchronizers when maneuvering

Check the water level and the oil level daily
Cruising speed

a. 1600 rpm (9.5k..5-6gph)
b. 1800 rpm (10K..8-9 gph)
c. 2100 rpm (11K..12-13gph)

SHUT-DOWN

After operating at cruising speed, allow engines to idle a few minutes to cool down before shutting them down (this usually happens naturally while tying dock lines or setting anchor). You can also turn on the engine room VENT switch to help cool the engine room.

GEARSHIFT in neutral position.

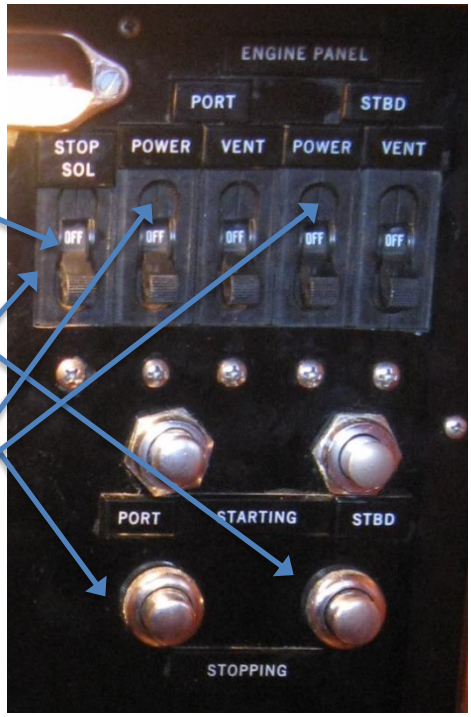
THROTTLE in idle position.

On the engine panel make sure the STOP SOL is UP, or ON.

Turn off engines by pressing the STOPPING button for each engine. Low oil pressure buzzer will sound.

Silence buzzer by turning the POWER switches OFF.

Turn the STOP SOL breaker OFF.



BEFORE LEAVING DOCK

DISCONNECT the shore power cord and stow it aboard. When disconnecting from the dock, make sure to turn the POWER OFF at the dock breaker before you pull out the power cord. This will prevent a 'short' between the power cord legs.

Forward power connection

Aft power connection

Close the portholes, windows, and forward hatch.

Set up VHF radio and electronics (GPS, radar, camera)

Brief crew on what you expect from them to depart, and if you need help with lines, fenders etc. It's not good to have too many people involved as this can cause confusion and accidents. It is up to the captain to double check. Too many accidents have occurred when a boat leaves with a line still tied to the dock.

Make sure all items that can break are stowed away safely

GETTING UNDERWAY

All close quarters maneuvering should take place at the upper (fly bridge) helm for better visibility.

Shift only at idle speed to avoid transmission damage.

Once outside the marina, stow fenders and lines.

CRUISING

Maximum cruising speed is about 1800 RPM. If you run at a slightly slower RPM (1400) you will cruise at about 7 knots and use a little over 2 gallons per hour. Speed will vary depending upon the weight, currents and weather conditions. NOTE: -- Higher engine speed causes higher temperatures (and possible damage) as well as a substantial increase in fuel consumption.

Synchronizers

1. Set the engines to the approximate cruise settings

2. Pull the switch near the engine alarm panel at the lower helm or in the middle of alarm panel at upper helm (the pilot light will go on)
3. Push the "Slave" control all the way forward (This will save stress on the synchronizer as it adjusts the slave engine's speed). You now control the speed of both engines with the "Lead" engine.

Disengage the synchronizer

1. Pull back "slave" lever until you feel resistance
2. Push in the switch. The engine throttles are now once again independent.

Auto Pilot

Autopilot can assist when taking long trips.

Steers best in low range, 3 for smooth water

To transfer the autopilot from the lower station to the fly bridge, turn the fly bridge on and it will turn the lower station off. When you go back to the lower station the autopilot will be off and the mode will be in auto, turn to off and back to auto to operate

The motor and clutch are located below the lower steering console.

Stabilizers

Stabilizers are helpful in rough waters.
When **running** turn rocker switch to "on". When **maneuvering** turn the rocker switch to center or "off"

When running, check the oil level and temperature once a day at the control unit in the engine room .The cooling water takes off the port engines salt water pump and is discharged on the port side ahead of the refrigeration pump discharge.

Trolling Valve for fishing

NEVER RUN THE ENGINE OVER 1000 RPM WITH THE TROLLING VALVE ENGAGED

The trolling valve is located on the port engine transmission.

The trolling valve operates by allowing the oil to bypass in the hydraulic transmission.

The push and pull silver operating lever is on the starboard side of the lower steering station. Out is engaged and all the way in is on. (normal)

For trolling speed;

1. Shut down the starboard engine
2. Reduce the port engine to 500 rpm and leave in gear
3. Pull operating lever all the way out
4. Adjust rpm for the speed (NEVER OVER 1000 RPM)
5. To resume normal speed push operating lever all the way in and run at normal rpm

ANCHORING

Anchoring in the Pacific Northwest can be accomplished with careful planning and patience. The tides, currents, and winds need to be taken into account when choosing the best spot. There are many guidebooks and online recommendations for anchoring in the San Juan's. Taking the extra time saves worry down the road. Use the charts, onboard electronics, and your eyes to find your spot. Gravel, sand and mud are preferable. As you're getting ready to set make sure you have room to swing on your anchor without hitting anything.

Using the windlass foot controls on the bow lowers the anchor. The windlass power switch is located on the PROTECTION PANEL located to the right of the helm. Turn it ON. It is NOT a good practice to use the windlass controls at the helm as it could be dangerous for the crewmember at the bow.

LOWERING THE ANCHOR

At the bow, tap gently on the down foot control to lower the anchor. If necessary, guide the anchor over the anchor roller to prevent binding on the pulpit.

Let out sufficient ANCHOR RODE before setting the anchor. The chain is marked with strings

5 fathoms=1 string
10 fathoms=2 strings
15 fathoms=3 strings
20 fathoms=4 strings
25 fathoms=5 strings
30 fathoms=6 strings
35 fathoms=7 strings

Use about 5 to 1 scope depending on the weather. When anchor reaches bottom engage reverse for five seconds at a time until the chain starts to pull straight off the bow toward the anchor. When anchor holds set the anchor with gentle tugs, then verify that the anchor has held by having one engine in IDLE reverse and verify the boat is NOT moving backward. If you hear clunks and the chain releases

the anchor may be dragging over rocks. Better to retrieve and try again, sometimes it takes a few tries so be patience. Taking the time saves the worry.

Folks often rig a shoreline from the stern of the boat to shore.

RAISING THE ANCHOR

Before raising the anchor, ALWAYS start the engines as the windlass uses a large amount of power.

Do not overload when pulling the anchor, run up on the anchor so the windless is not overloaded.

NEVER PULL ON THE ANCHOR USING THE ENGINE (RPMS) FOR MORE THAN 5 SECONDS. PULLING WITH THE ENGINE FOR A LONG PERIOD CAN CAUSE DAMAGE . ALWAYS KEEP IN IDLE WHILE RISING ANCHOR WITH THE WINDLASS.

If you are bringing up more than 100’ of chain, it may be necessary to open the chain locker at the head of the v-berth to redistribute the chain as it may “pile-up” in the locker. Please remove the v-berth cushions and place a sorb or towel under the door before opening the chain locker to catch any water or debris.

Turn ON the windlass switch. As you drive the boat toward the anchor, press the UP control to take up slack. Give the windlass short rests as you are pulling the anchor up.

As the anchor rises, be careful not to allow it to swing against the hull. Guide the anchor onto the roller

Wash down the chain if it's muddy before it goes into anchor locker to keep things smelling nice.

Turn OFF the Windlass power switch.

A spare Danforth anchor is stowed in the Lazarette.

Manual Windlass

If the electric windlass is not functioning there is an ‘engaging’ pole in the small lazarette behind the windlass. Take the pole and put it in the slot on the starboard side. You will now manually be able to work the windlass.

Manual for windlass, insert pole into slot located on windlass

DOCKING

During docking, use of the fly bridge provides greater visibility of the stern (most damaged part of a boat).

Have the crew prepare the lines and fenders and give clear instructions on how you expect to dock (bow in, port side tie; etc.). Take into account the wind, you may need to compensate if you are getting blown away from your anchorage. Fenders at the rear of the boat are the most important, however be sure there are several on each side.

Before entering the marina center the wheel (rudders will then be straight) and use only the GEARSHIFTS to maneuver the boat. (Throttles and Steering may be necessary in very windy conditions).

MOORING BUOYS

Because Latis is over 45 ft long at the waterline she cannot hang on a State Parks Mooring Buoy. For this reason, linear mooring only.

FUELING

There are two fuel tanks with a capacity of 300 gallons each.

A spanner wrench is located in the step locker at the starboard side of the helm.

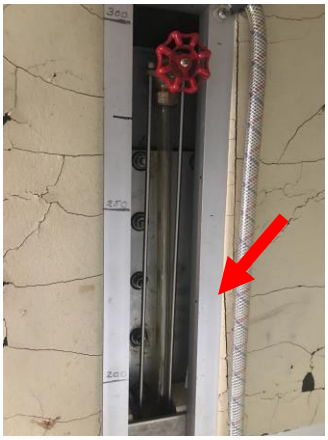
Before pumping, have an oil/fuel sorb handy to soak up spilled fuel. You should have a rough idea of the number of gallons you will need by the engine hour indicator and how hard you have been driving.

Make sure you have the correct fuel, DIESEL!

And, be sure it is going into the correct deck fill. Please double-check as fuel in a holding tank isn't safe!

Open the top and bottom sight gauge shutoffs at the port and starboard fuel tanks by turning them all the way clockwise until snug.

Sight gauge shutoffs (shown in closed position)



Sight gauges are a quick and accurate way of determining how full the diesel tanks are.

Place the DIESEL nozzle into the tank opening, pump slowly and evenly, and note the sound of the fuel flow. Pumping too fast may not allow enough time for air to escape, which may result in a fuel spill from the tank vent. As the tank fills, the sound will rise in pitch (like water filling up a glass).

As it nears full, monitor the sight gauges located in the engine room. Stop filling when the fuel level rises to the top of the sight gauge, this is considered full.

Pay attention to the overflow vent on the outside of the hull near the deck fitting. Fill carefully and be prepared to catch spilled fuel. A fuel spill could result in a fine from law enforcement. By correctly using the sight gauges you should not have any problems.

Replace each deck fitting. It isn't necessary for them to be extremely tight as there are rubber gaskets on the fitting preventing water from entering.

Close the valves at the top and bottom of the sight gauge on each fuel tank when you are finished fueling.

ELECTRICAL

The electrical control panels are located on the port side of the helm. The electrical system is divided into two distribution systems: 12 Volt DC Panel (12 volt batteries) on top and 120 Volt AC (shore power and inverter) on the bottom.

Dot system on the DC panel –
Green dots: Always ON; Green dots: ON during normal operation; Yellow dots: ON as needed; Red dots: normally OFF

12 Volt DC Panel (top section)

120 Volt AC Panel (bottom section)

When not connected to shore power, the batteries are providing all power. Monitor the use of electricity carefully with the voltmeter on the Magnum Energy Charger/Inverter panel located at just above and forward of the electrical panel on the port side of the pilothouse helm.

When any battery is at 12V it is time to re-charge the batteries. If at anchor, you can do this by running the engines at 1200-1400 RPM for an hour or so. Check the voltage on the Magnum Energy panel to verify the increase in battery charge after shutting down the engines.

Turn off electrical devices that are not needed to conserve battery power when not running, or on shore power.

To manage batteries and ensure the boat will start:

- **Shore Power**: All batteries will be charged; 120 Volt outlets and appliances up to 30 amps will work.

- **Boat Underway**: All batteries will be charged; 120 Volt outlets and appliances will only work if Inverter is on.

- **Boat at anchor**: It would be prudent to turn off the fridge and other battery draining devices overnight. If in doubt, check the battery voltage on the Magnum Inverter / Charger to make sure voltage is sufficient.

AC SYSTEM

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

Forward power connection **Aft power connection**

To connect to shore power, plug the 30amp power cord into the boat (either shore power connection, forward or aft) and the dock receptacle. If necessary, 50 amp, 30 amp, 20 amp adapters are available.

At the AC POWER PANEL make sure the REVERSE POLARITY light is NOT on. Use the "PUSH TO CHECK" button before turning the master switch ON.

If it is on, do not turn on the SHORE CIRCUIT BREAKER, as there is a problem with the power supply. Almost all marinas in the San Juan Islands will not experience this problem; it is typically the outlying areas that could be a problem.

If the light is not "**ON**" then it is OK to turn on the SHORE POWER BREAKER and you should see approximately 120V on the AC meter. Then, turn on appropriate breakers for the battery charger, refrigeration, water heater, etc. Watch the ammeter to see corresponding load changes.

If the load is greater than the available power (30 amp, 20 amp, etc.), a breaker will likely trip at the dock power connection. If this occurs, reset the dock circuit breaker and turn on the boat systems one at a time while watching the load so as not to exceed the rated maximum 30 amps (3,000 watts), 20 amps (2,000 watts) or even 15 amps (1,500 watts) depending on shore power availability.
Amps = Watts / Volts

Here are some example AC loads:

Microwave	1000 watts	8.3 amps
Hair dryer	1500 watts	12.5 amps
Coffee maker	1000 watts	8.3 amps
Water Heater	1500 watts	12.5 amps

This means you could potentially trip the shore power circuit breaker using any three of these appliances simultaneously.

If a normal AC outlet does not work, check the GFIC on one or more of the available outlets in the fwd head, or above the microwave to make sure it has not tripped. Each GFIC outlet can power several other outlets

INVERTER POWER

The Inverter control is located above and to the port side of the helm on the Magnum Energy panel. This will provide AC power to the 110-volt receptacle plugs (i.e. the microwave oven, coffee maker) when the boat is disconnected from shore power and the inverter button is depressed. The inverter will not provide power to the water heater or battery charger. The inverter has a capacity of 2500 watts. The AC power from the inverter supply the following:

a. Port and starboard base outlets, which will take care of two lamps in the main cabin, radio, TV and other AC appliances.
b. The microwave requires about 900 watts, it should be run up to approximately 10 minutes. For longer periods start the generator.
c. The refrigeration requires about 10 amps to operate. It will quickly deplete the batteries if run on the inverter without the main engine running.

The inverter will act as a battery charger when AC is present
The inverter control panel is on the side of the steering console. To turn on, push the button and steady green light will come on (it is easy to bump this switch and accidently turn the inverter off).

The label is INVERT on the panel. This controller also displays Volts, Amps, Amp hours, etc.

Charge button
On/off inverter button

To use the inverter, push the Inverter button and the INV light should illuminate indicating it is functioning and there is power to outlets. If no electronics are drawing any current from the inverter, the display will read "**Searching**", effectively putting the inverter on standby, saving power while it's not in use.

This same unit is used to determine the voltage of the batteries.

The inverter power source is the DC house batteries located in the engine room. The quantity of DC power is limited to the capacity of these batteries... Running hair dryers, toaster, coffeepots, space heater, etc. and will quickly discharge the batteries.

Use these items very sparingly as they draw a significant amount of power!

When connected to shore power, the inverter automatically becomes a battery charger for the 12-volt HOUSE BATTERIES. If the house batteries fail to charge, check the inverter control panel and make sure the charger button "CHG" is illuminated.

GENERATOR

Latis is equipped with a generator which can provide AC power when shore power is not available.

Before Operating:
Perform checks as you would with the engines:

- Coolant – located on the starboard side of the generator, open the cap on the reservoir, if you can feel the liquid level inside it is full enough (to refill, open the hatch at the aft end of the salon, lift circular opening in generator casing over the radiator cap and fill until you can easily touch the liquid level with a finger)

- Oil – the dipstick is located on the starboard side of the generator.

- Sea strainer – check that the sea cock is open and the strainer is clear – it is located on the port side of the generator. As with the main engine sea cocks, a t-valve must be loosened before operating the valve open or closed, then re-tighten the t-valve once the sea cock is in the desired position (open or closed)

Starting the Generator:

1. Ensure the Generator is not selected at the selector switch on the electrical panel.

2. Turn on the "Generator" switch in the top right of the AC Panel.

3. Hold the "Heater" button in for 15 seconds to pre-heat before starting. After 15 seconds, continue pressing the "Heater" button and press the "Start" button until the generator turns over and starts. Once the generator starts, release the "Start" button but continue holding the "Heater" button for another 5 seconds.
4. Allow the generator to run for about 5 minutes to warm up before putting on load on it by turning the selector switch to "GEN".

Shutting Down the Generator:

1. Turn the selector switch on the AC Panel to “Off” or “Shore”, removing the load from the generator.

2. Allow the generator to run without a load for 5 minutes or so to cool down before shutting it off.
3. To shut the generator down press the “Stop” button until you hear it come to a complete stop. Then turn off the “Generator” switch.

DC SYSTEM 12-VOLT

The 12 Volt DC Panel shows all the systems supported by the batteries. Primarily you will be turning on the breakers for your lights, water pressure, electronics, etc. Bilge pumps should always be left on.

The battery banks supply 12-volt DC power.

The battery switches are normally in the 'ON' position.

BATTERIES

The HOUSE battery bank provides power for all DC systems and automatic bilge pumps. When disconnected from shore power, all 12-volt devices drain the house battery. Use devices as needed.

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

Batteries are charged by the engine alternators while underway. The batteries are charged by the battery charger when connected to shore power. Ensure the Battery Charger circuit breaker at the electrical panel is ON.

Voltage (Wet Cell Battery)	Battery State
12.65 volts	100%
12.47 volts	75%
12.25 volts	50%
11.95 volts	25%
11.70 volts	0%

SANITATION SYSTEM

VACU-FLUSH MARINE TOILET

It is important that every member of the crew be aware of the proper use of the Vacu-Flush TOILET. It is a great system usually without problems. If you only put human waste and a **tiny** amount of MARINE toilet paper into the toilet, you will have NO problems. The valves, openings, and pumps are small and may clog easily. If the toilet clogs, it is YOUR RESONSIBILITY! Always monitor use by children.
The heads are Vacu-flush using fresh water (about one pint per flush) and discharge into their own holding tank (about 30 gallons each)

The holding tanks are empty with electric pumps discharging overboard. In each head there is a red warning light indicating the holding tank is about 2/3 full. The pump is turned on with a timer switch. It takes about 10 minutes to empty the tank.

Power for Aft head is at bottom of main DC panel. Power for Fwd head is at top of sub DC panel (panel starboard of steering wheel) PICTURE

To add water to bowl lift foot pedal.

Caution – Never put paper towels, tampons, Kleenex, sanitary napkins, household toilet paper or food into the marine toilet. Use only the special dissolving marine toilet tissue provided by AYC.

HOLDING TANK

The holding tank holds approximately 80 gallons in 2 tanks. Be aware of the rate of waste production, (about 1 gallon per flush). With an overfilled tank, it is possible to break a hose, clog a vent, or burst the tank. The result will be indescribable catastrophe and an EXPENSIVE FIX for you. Empty the tank at least EVERY OTHER DAY to avoid this problem.

The holding tank is located aft of the fuel panel in the engine room. There is a **tank watch warning light located in the aft head** but do not rely too greatly upon this as they are unreliable... dump often is the best strategy!

The holding tank is emptied in one of two ways, pump out or dump overboard.

Pump Out:

At a Marine Pump-Out Station (all around the San Juan's), remove the HOLDING TANK deck fitting located on the starboard side deck. Correct picture

Holding tank pump out

Insert the pump-out nozzle into the WASTE opening. Double-check the correct deck fitting (sucking DIESEL into their sewer system is frowned upon)! Turn on pump and then open valve located on handle. When pumping finished, close lever on handle before removing from deck fitting. Turn pump off.

If there is a fresh water hose on the dock, rinse the tank by adding about 2 minutes worth of water into tank. Then pump out again to leave the tank rinsed for the next charterer. This also helps eliminate head odors.

In Canadian waters the tank contents can be discharged overboard with the MACERATOR. If you choose to do this, instructions for opening the Y-VAVLE and operating MACERATOR follow.

Y-VALVE

The Y-VALVE directs waste effluent into the sanitation-holding tank or flushes the effluent directly overboard.

There are Y-VALVES under the v-berth floor and under the aft head sink. A plastic tie keeps the handle pointed "TO HOLDING TANK" – the normal position.

The Y-VALVE is wire-tied to the holding tank position by Coast Guard regulations. Please leave it "as is" unless there is an emergency. Be familiar with the applicable laws concerning dumping overboard.

Dump Overboard:

To discharge the contents of the holding tank overboard:

1. Turn the Y-VALVE so it is pointing towards the "Waste Overboard" discharge line under the v-berth floor/aft stateroom center hatch.
3. Turn ON the MACERATOR PUMP and timer switch located on the DC power panel. Listen for the macerator's sound. When the pitch becomes higher, the tank is empty. Watch for bubbles coming out from under the boat on the starboard side. It should only take a few minutes (4 max) to empty the tank. Do not run it too long as it will burn out! Usually, it will be necessary to stop the engines to hear the sounds.

WATER SYSTEM

Water system consists of the following:

FRESH WATER TANK

The water pump is located above the refrigeration in the engine room. The two fresh water tanks hold 300 gallons total. One is located below the generator with a sight glass and the other is under the forward stairs. When using the water maker, the aft tank is used. Observe the water level visually. To refill the water tanks, open the aft hatch, remove a cap and fill.

FRESH WATER PRESSURE PUMP

Activate the pump by turning on the F.W. PUMP breaker on the DC electrical panel. If the water pump runs continuously, you are either out of water or might have an air lock and need to bleed the system by opening up a faucet.
If you run out of water, shut off the hot water heater on the AC Power Panel or serious damage can occur!

HOT WATER

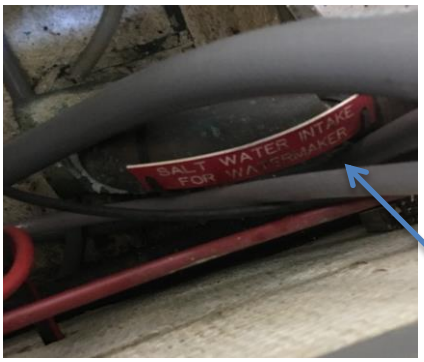
The hot water heater is a 20-gallon tank, heated when connected to shore power from the AC Power Panel or from engine heat through a heat exchanger when underway.

To use while on shore power, turn on the WATER HEATER circuit breaker on the AC Power Panel. Do not use the water heater if the water tank level is very low

WATER MAKER

1. To start you need AC power, generator or shore power

    a. Open the ball valve on the salt water supply (forward of the starboard engine)



Red tag marks salt water supply for water maker

    b. Turn on "water maker " in the AC panel.
    c. Water maker panel located under the helm seat. Make sure the control valve is all the way open (cc) and the 'tank test' is on 'test'.
    d. Hold red start button in and throw the red power switch at the same time, hold until the green light stays on
    e. Gradually close the control valve until pressure is about 500 psi. The flow gage will show water flow and water should flow at the spout in the galley sink.
    f. When the flowing water tastes and smell good turn the test valve to "tank"and increase the pressure to 700 psi. This produces about 20 gpm.

2. If the water maker shuts down while operating it will be because the two filters for the sa1t water supply arc plugged up. They are located under the grate at the forward end of the engine room.

3. To replace the **salt** water filters;

    a. Shut off the ball valve supply to the filters (located under the forward end of starboard engine)

    b. Replace the first filter with 20 micron and the second with 5 micron. Be sure to allow the filters housing to fill with water before making tight.

4. Shut down the water maker,
    a. Open control valve all the way (cc) so there is no pressure or flow
    b. Turn the test valve to 'test'.
    c. Turn off red power switch.
5. Back flush the system

a. Turn the three way ball valve, just ahead of the salt water feed pump to the fresh water position and leave it on for approximately 3 minutes. Then return to the salt-water position.

6. The system should be backed flush each time after making water.

SHOWER

Water from the sinks and showers drains overboard through various thru-hulls usually located under the sinks.

Before taking a shower, turn on the DRAIN PUMP switch on the DC Power Panel. When taking a shower, pull out the drain pump switch in the shower stall to activate the shower sump pump. The drain is below the waterline so a pump is required

To conserve water, take only very short "boat" showers (turning off water between soaping up and rinsing). To keep shower tidy wipe down the shower stall. Check for accumulation of hair in the drains and remove.

WASHDOWN

A pressured fresh water wash down is available from a hose spigot in the stern on the deck. The fresh water pump must be on at the circuit breaker for it to function.

There is also a saltwater wash down located in the bow on deck. This is primarily used for cleaning off the anchor as you are lifting it back up. This pump is operated by the wash down circuit breaker, located on the DC electrical panel. Please turn off the switch after use.

GALLEY

STOVE & OVEN

The stove and oven are propane. To use them, turn on the GAS STOVE circuit breaker on the DC power panel.

The propane stove is activated by the following steps:

1. Turn on the propane tank located in the port side, forward, fly bridge seat. Open the valve slowly so as not to trip the regulator. If you hear a "click" while opening the valve you will need to close the valve, and loosen the regulator fitting from the tank a bit to bleed the system and reset the regulator.

2. Turn on the LP GAS solenoid switch located in the salon port side front

3. Open the manual cylinder and solenoid valves. Turn the manual cylinder valve in the counterclockwise direction and switch the solenoid to the open position.
4. Push in the control knob as far as it will go and turn it counterclockwise to HIGH. At the same time push the spark ignition button until the burner is lit.
5. Continue holding the burner control knob all the way for about twenty (20) seconds after ignition. This will heat the thermocouple is designed to cut off the gas supply to the burner if the flame should accidently be extinguished.
6. If the electromagnetic ignition fails turn the burner OFF and apply a lit match before turning it back to the HIGH position.
7. You should now be able to set the flame by turning the control knob (low=1, high=6).

8. To turn off the burner turn the control knob to OFF.
9. You must shut off both the solenoid and the manual gas cylinder valves whenever the vessel is unattended or if there is an emergency.

Lighting the Oven

1. Light the oven burner using the procedure described in instructions above.
2. Close the oven door carefully to ensure that the oven burner will not be extinguished. You can also use a lighter or match. It may take a few seconds the first time to light due to the air in the line between the propane tank and the appliance. You might need to hold knob in for a few seconds while the thermocouple warms up.

When finished turn the LP GAS switch off and turn the GAS STOVE circuit breaker on the DC Power Panel to OFF.

If leaving the boat, it is a good idea to turn off the gas at the tank.

REFRIGERATION

There are four refrigeration areas; one in the galley, one in the salon under the settee, one in the master stateroom, and one topside near the barbeque.

1. Refrigeration will run from any of two sources of power; shore or generator.
2. To start with shore power turn on switch (fridge) on the main AC panel. Check the cooling water discharge on the port side aft of stabilizer discharge
3. To start with generator, turn on;use the same procedure as above
4. Without the engines running and the alternator charging, the refrigeration will rapidly discharge the batteries. Only use the inverter for source power when underway. Check that inverter is on (steady green light on inverter panel) Turn circuit breaker "fridge" on the AC panel, check cooling water discharge.
5. Under normal conditions it will require approximately l hour of running in the morning and evening. Refrigerator box should be kept between 40 and 48 degrees. The freezer box should be kept between 10 to 20 degrees.

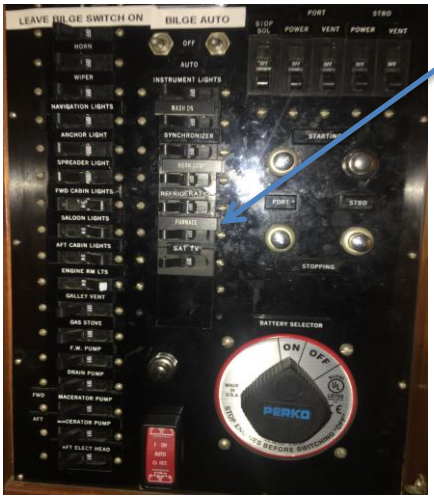
NOTE: Both "fridge" breaker and "refrigeration" breaker on DC PANEL must be ON for fridge to cool!

HEATING SYSTEM

1. Hot water heat is from the diesel furnace or the heat exchanger on the engine. The circulating pump is located by the furnace in the engine room. The expansion tank is under the aft corner of the settee. Check this regularly

2. To operate the diesel furnace;

a. Turn on the furnace switch on the main panel. This will turn on the fans if the thermostats are set high enough.



b. Turn rocker switch to on (located on the bulkhead by the liquor cabinet).

A green light will come on and you should hear the furnace ignite in about 30 sec.

c. It takes about 15 min for the water to heat; adjust the thermostats.

Operate from the engine

a. Run engine up to temperature (heat exchanger is on the starboard engine)
b. Pull switch to 'on' located below the Hurricane rocker switch (leave rocker switch off)
c. Set thermostats

4. Shut down diesel furnace
   a. Turn off Hurricane rocker switch
   b. When the green light goes out (the boiler has cooled down)turn off the switch on the main panel (NEVER TURN OFF THE SWITCH ON THE MAIN PANEL UNTIL THE GREEN LIGHT IS OUT)

5. **Shut down from the engine**, push off switch under hurricane panel, and turn off thermostats.

BILGE PUMPS

Latis has two automatic bilge pumps located in the engine room.

The master switch is located on the DC power panel. Normally, the switch will be left in the AUTO position. You may occasionally hear the pump operate due to condensation and water drips from the shaft log accumulating in the bilge.

An auxiliary hand operated bilge pump is accessed through the aft hatch in the floor of the salon. This is used only in emergency situations.

ELECTRONICS

VHF RADIO

There are two VHF radios. The first is located above the helm. Make sure the VHF breaker on the DC power panel is ON. To be able to hear the VHF, the Shipmate speaker device located to the left of the VHF must also be turned on.

There is a second VHF radio located at the flybridge.

DEPTH SOUNDER

The DEPTH circuit breaker must be ON. The sounder should provide reliable readings in shallow waters. If in doubt, switch it off, then turn it back on to reset sounder. If your reading is blinking, it is a FALSE reading. False readings can occur at depths of more than 200 feet.

WIPERS

Wiper controls are above the wheel on the starboard side next to the radar.

RADAR

To turn the radar on, please read the extensive instructions available in the Radar manual.

We do not recommend operating the vessel in reduced visibility

GPS / PLOTTER

The GPS is at the helm and on the fly bridge. Turn on the rocker switch starboard side of wheel.

HORN

The horn is located on the starboard side of the vessel above the salon door.

Two breakers - “Horn” and “Horn Comp” – must both be on in order to operate the horn. When the “Horn Comp” is turned on the compressor can be heard charging up and this may continue for many seconds before the horn is ready for use.

There is a button located at the starboard side of each helm to operate the horn and an air horn located in the storage forward of the lower helm can be used as a back- up.

INTERCOM

Newmar Phone Company Intercom operates by simply picking up the phone and dialing the station number for the station you want to pick up.

Ensure the “Intercom” breaker located on the electrical panel on the starboard side of the helm is “On”.

SEARCH LIGHT

To operate, ensure the "VHF 2 & Spotlite" breaker located on the starboard side of the helm is on. The light is turned on/off using the power button on either the remote control at the lower helm or the mounted control at the upper helm (both on the starboard side). Arrow buttons control direction and tortoise/hare controls high or low speed of movement. Be sure to turn off light and breaker when not in use.

ENTERTAINMENT SYSTEMS

SAT TV

Quick Guide:

1. Both breakers on (see below)
2. Turn on TV (see below)
3. Wait for SAT TV to power up and connect.
4. Select channels/guide/volume as needed.
5. When finished, turn off TV and then breakers

Ensure both the "TV" breaker on the starboard side of the helm and the "SAT TV" on the port side of the helm are turned on. When the "SAT TV" switch is flipped two beeps will indicate powering up and one beep will indicate powering down.

The remote shown is the only one needed to operate the salon TV.

Use only the "On" and "Off" buttons on the top right of the remote (with red and green dots next to them) to power the TV on/off. Most issues in operating this system come from trying to complicate the operation, as long as simple commands are used and formatting is not altered it should be pretty straightforward.

AM/FM/CD/MP3/WMA STEREO PLAYER

There are two sets of stereo speakers; one set in the salon and one set on the fly bridge. The salon speakers are the "front" speakers and the fly bridge speakers are the "rear" speakers. To increase the volume on the fly bridge, press in on the knob and select the audio function. Press the knob again and turn to select "Bal" or "Fad". To increase the volume to the fly bridge "rear" speakers, push the knob down. To increase the volume to the salon "front" speakers, push the knob up. Push the knob left or right to change the balance.

COMMUNICATION

Newmar Phone Company Intercom operates by simply picking up the phone and dialing the station number for the station you want to pick up.

BARBECUE

Latis is equipped with a Magma BBQ grill that has a dedicated propane tank stored under the port aft-facing flybridge seat and connected via hose. Ensure the valve at the top of the propane tank is open before attempting to use. It is good practice to close this valve when not in use.

To light the BBQ:

- Open lid by turning lock lever counter-clockwise to loosen catch.
- Stick lighter through hole on the left side and light lighter
- Depress valve and turn counter-clockwise to "High"
- Visually confirm ignition

To reduce flare-up:

- Empty and clean grease tray prior to each use
- Trim excess fats from meat
- Use non-oil based marinades
- Reduce heat

Warning: Do not overheat grill. Grills do not require pre-heating. When grilling on medium or high heat, grill with the lid open.

After use, please close the valve at the top of the propane tank. Please wipe the BBQ down and clean grease tray with a paper towel to prevent grease from soiling the boat. Please replace canvas cover once BBQ is cool to help prevent corrosion.

Caution -- For safety reasons, do not store a propane bottle within the salon or engine compartment. Leave propane tanks in their designated positions under the port flybridge seatin

DINGHY & OUTBOARD MOTOR

The Avon Dinghy is outfitted with a Yamaha 15hp, 2-Cylinder outboard and is located on upper level. It has a capacity of approximately 1,200 total pounds (which includes, motor, equipment and up to 4 people). The dingy is lowered with the davit controls. The control is stored in pilothouse forward in the port side cabinets. This is screwed into the davit controls that are on the starboard side forward of dingy. NOTE: Use 50:1 premixed z stroke fuel only

Oars are stored in the dinghy. Life jackets are located in the lazarette. The gas tank for the outboard is typically kept in the dinghy.

Deploy the Dinghy:

1. Engines (in idle) or generator must be running in order to operate the davit as it draws a substantial amount of power.
2. Attach davit control and ensure the switch below the plug is set to "Davit" (see photo above)
3. Stow the outboard engine in the "up" position, remove the securing line from the bow and any straps holding the dinghy down. Ensure that boat plugs (one interior one exterior) are both plugged in and secure.
4. Attach davit hook to the bridle loop in the dinghy. Before taking tension on the bridle, ensure the midship dinghy bench has been taken down so the bridle does not put pressure on it.
5. Ensure a bow and stern line are attached to the dinghy and have a crew member attend each to control any swinging of the boat when it is aloft.
6. Lift the boat using the davit until it will clear its cradle and the outer rail.
7. Swing the dinghy over the side by pushing gently against it.
8. Once the dinghy is swung out as far as possible lower it using the davit, ensuring it does not scrape anything or get caught as it goes down.
9. Once the dinghy is in the water be sure to tie off the bow or stern line before detaching the davit hook from the bridle.
10. To detach the davit hook, a crew member will need to board the dinghy either via the starboard side railing gate or the swim platform. To maneuver the dinghy to either of these positions, extra slack will need to be fed out by the davit. Once the davit hook is detached, carefully guide the hook and weight as it is retracted to prevent damage to the boat. Stow the davit as it was before the dinghy was launched between uses.

Outboard Engine:

To start outboard motor, connect the key connect the gas tank hose to the gas connection on the motor and pump the priming bulb until it is firm. It is a good practice to not disconnect the dinghy from the boat or dock until the outboard is running.

Open the choke and set the throttle up slightly. Pull the starter cord until the motor starts. If the motor has not been run in a while, it may need to warm up for a minute or so before the choke can be set back.

Note: By law, when operating a dinghy the cutoff switch lanyard must be physically attached to the operator to avoid a fine.

CRABBING & FISHING

Always check the fishing and crabbing requirements before you leave on your cruise.

You will need a valid Washington fishing license to participate.

Many areas are CLOSED to crabbing and fishing on certain months, read the pamphlet carefully.

CRAB AWAY FROM THE BOAT! Lines can get easily wrapped around props.

Fish-flavored cat food with the pop-up ringed lids work well for a neat and lost cost way to bait the ring. After 20-30 minutes, retrieve the crab line and ring quickly.

Measure the crab carapace using a CRAB MEASURING GAUGE.

Boil crabs in seawater, about 12 minutes should do it.

After using, please wash the equipment thoroughly with fresh water (available from the cockpit shower faucet).

Note -- Please do not store wet rings and gear inside the boat. Let it dry out a bit on deck to help keep things smelling nice.