Lucky Dog- Owner's Notes and Boat Manual

Notes herein are general in nature. Additional and more detailed information can be reviewed in the Catalina 425 Owner's Manual and system reference manuals stowed on board.

(IF you notice any errors or typos requiring revision, or have any comments or questions, please contact the boat owner and author: Christopher Volk at chrisgvolk@outlook.com).

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General Specifications and Dimensions

- Hull Type Fin Keel
- Length overall: 43’ 6”
- Hull Length: 41’ 8”
- Length at Waterline: 39’ 1”
- Beam: 13’ 8”
- Draft: [1] 6’ 8”
- Displacement 18,100 lbs.
- Tonnage 26.5 (approximately)
- Mast head Hight: [2] 62’ 11”
- Engine: Yanmar 56 hp (57mhp), common rail, Electronic Control Diesel
- Propeller Max-Prop automatic feathering
- Capacities
    - Fuel 62 gal.
    - Water
        - FWD 50 gal.
        - AFT 56 gal.
        - Water Heater 11 gal.
        - Total 117 gal.
    - Waste
        - FWD 31 gal.
        - AFT 23 Gal.
        - Total 54 gal.

- **Recommended minimum Bridge Clearance 68 Feet**

- **Recommended minimum depth Clearance[3] 8 Feet.**

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[1] Draft measurement is from boat waterline to bottom of keel. Add safety margin of at least 1 to 2 feet for uneven sea bottom.

[2] Does not include lights and antennas. Add safety margin of 5 feet for bridge clearance.

[3] Be aware that the sea bottom may not be “tabletop” even. Lumps, bumps, or rocks can exist; conservatism is a necessity.

Cabin Equipment and Inventory

Equipment & Location

- Gimbling Marine Propane Stove, galley port side. (See section: Systems – Galley – Stove and Oven Operation).
- Countertop food storage locker, Port side of galley left of stove. **Note: This is not a refrigerator, freezer, or ice chest and has no drain in the bottom.**
- Countertop Refrigerator/Freezer, Port side of galley and right of the stove. **Note: this is a refrigerator OR freezer depending on temperature set point selected.** (See section: Systems – Galley - refrigeration).
- Under Counter refrigerator with top freezer shelf. Located in the galley under the counter on the right side of the galley sink.
- The Wine Cooler is located on the starboard side under the AC/DC distribution panel.
- The microwave is located above the galley stove. (See section: "Systems – Galley - Microwave). **Note: Microwave operatable on AC power only from port outlets. For battery conservation, operate the microwave on shore power only.**
- Stereo and DVD player with remote control located in forward most starboard side locker.
- TV above settee mounted on forward bulkhead.
- The settee table will retract down to allow sleeping accommodation in settee area. To retract, release post clams and evenly push the table down. The table should first be turned and oriented such that the corners contact the settee benches as the table is lowered. Additional cushions are stored in AFT or FWD cabins. **Note: When turning the table for dining, the upper clamp should be released prior to turning the closed when table is in position.**
- Nav table can be moved to a lowered position for a couch or bed. If moved to the lowered position the short support leg must be used. This can be found in the nav table drawer. Additional cushions are stored in AFT or FWD cabins. **Note: The owner's preference is to leave the nav table in the upright "table" position. Frequent and continued movement of the Nav Table between upright and lowered position could result in damage as this installation is not particularly robust.** When moving the table to the elevated nav table position the long support leg must be used. The short dowel at the bottom of that leg must be fitted into the small hole in the sole to stabilize the leg and table.
- 3 staterooms: Starboard AFT, Port AFT and FWD V-berth.
- 2 electric heads: 1 in forward stateroom and 1 in salon, port side. (See section: Systems - Waste for operation.)

Inventory and Location

General Supplies

General and miscellaneous supplies are in the three drawers, starboard side, forward of nav station and by the forward bulkhead. These include non-emergency items including but not limited to extra paper towels, Ziplock plastic bags, plastic storage containers, etc.

Blue Bag Drawer (In lieu of a "Blue Bag")

Starboard side, under seat forward of nav table. This includes the standard "Blue Bag" items:

- Winch Handles
- Deck Keys
- Flashlight
- First Aid Kit
- Wooden Plugs
- Flares
- Air horn
- Etc.

Note: There is no manual bilge pump handle in the drawer as it is integrated into the manual bilge pump in the cockpit, aft port side.

Reference Materials

Located in the drawer, starboard side, under the AC/DC distribution panel. Reference materials include but are not limited to boat and systems manuals, navigation references, and binoculars.

Navigation Supplies

Manual navigation supplies (Plotter, Dividers, bearing compass, charts, Tide, and current reference as well as registration documents and Windworks log are stored at or near the nav station.

Galley

Galley and dining supplies are in the galley drawers and cabinets. Larger items (pots and pans mixing bowls, etc.) are in the drawer, starboard side under the seat aft of the nav table.

Safety Equipment

PFDs, spare parts, toolbox, and emergency bolt cutters are located under the forward settee bench.

Emergency tiller is kept in the closet, aft port stateroom. **(Note: The aft cockpit lazarette is very deep and keeping the emergency tiller there may inhibit quick access if needed.)**

A hand pump is in the closet, aft port stateroom.

Three Fire extinguishers are mounted in the port and forward staterooms and the salon. Two Fire blankets are mounted in the port and Forward staterooms adjacent to the fire extinguishers.

Miscellaneous

An anchor rode snubber pendent assembly is in the Blue Drawer. (See section: "Systems – Anchor and Windlass")

Through-Hulls and location

Grey water

Grey water through-hulls are located for each sink, in the galley, and heads. For the galley sink the seacock is under the grate in the trash locker. For the forward head, the sink through hull is in the center bilge. For the aft head it is under the sink. (See sections: "Systems - Potable Water" & "Systems – Waste"). **These seacocks should remain open**. If while sailing with significant heal, and sea water backflows into sinks is noted, close the sink drain seacocks. Re-open the seacocks when no longer sailing at a heal. **Please do not wash solid particulates (food waste etc.) down any of the sink drains.** This could result in blockage. Food waste should be scraped off and put in a waste basket and garbage bag (or other containers) and disposed of on shore.

Black Water

Black water through-hulls (Waste-Overboard) are located near each head. For the aft head, the seacock can be found under the head sink. For the forward head, the seacock is in the locker behind the head and below the holding tank. **These seacocks should always remain closed** by US Coast Guard regulations. (See section: Systems – Waste).

Engine raw water intake

The raw water intake for the engine cooling system is located aft of the engine in the engine room, port side, and is accessible through the port stateroom access panels. **This seacock should always remain open** to allow cooling seawater to circulate through the cooling system heat exchanger. However, one exception is when opening the raw water strainer to clean the filter basket.

Prior to opening the raw water strainer, the raw water intake seacock should be closed to avoid backflow of cooling seawater and possible introduction of air into the raw water system. (Introduction

of air into the system could cause pump cavitation or “air lock” and cause engine overheating.) **After re-assembly and securely closing the raw water strainer, open the raw water intake seacock prior to starting the engine**. (See section: “Systems – Auxiliary Propulsion”)

Depth & Boat Speed Transducer

Depth and boat speed transducer is located under the sole of the forward stateroom along boat centerline. There is a plastic plug located with the transducer to plug the hole when the transducer is removed for cleaning. The depth sensor readings are calibrated to approximate water line. That is, the water surface level is 0 feet of depth. Bottom of keel is 7 feet deep.

Rigging

General

Lucky dog is a fractional sloop rig featuring a roller furling self-tacking jib and an in-mast roller furling mainsail. Both jib and mainsail halyards are in the mast. **Never release or adjust the halyard tension**. If you feel you need to, contact Windworks dock staff first. Correct halyard tension is critical for smooth operation of the roller furling systems of both mainsail and jib!

NOTE: If you are unfamiliar with the mainsail in-mast furling system, call Windworks dock staff for a briefing prior to departure.

Deploying the Mainsail

Deploy the mainsail using the outhaul. Prior to unfurling the mainsail verify the furling gear at the mast in the **FREE** position. Slowly motor head-to-wind and unfurl the main from the mast by pulling out the outhaul while maintaining some light tension on **BOTH** furling lines as the sail is deployed. (Maintaining some tension on the furling lines, and thus the furling gear, will prevent the sail from deploying uncontrollably with wind load.) After the sail is deployed to the extent desired (full sail or reefed), secure the furling lines to hold the furling gear in position. If the sail is fully deployed the furling gear at the mast may be left in the **FREE** position as the bolt of the sail will prevent further inadvertent deployment. If the sail is partially deployed for a reef in heavy winds, it is recommended to put the furling gear in the **RACHET** position. This will prevent the sail from “self-deploying” under wind load. REMEMBER: selecting **FREE** at the furling gear will allow the sail to be deployed and selecting **RACHET** will prevent the sail from deploying.

The preferred method of deployment is to manually pull the sail out of the mast using the outhaul manually in a hand-over-hand action. **Avoid using the cabin top winch in either manual or electric mode.** Due to the power of this winch, deployment of the mainsail with the winch could result in damage to the sail and rigging. By manually pulling the sail out, any foul can by identified before damage is done.

If mechanical advantage is needed, this can be attained by lightly pulling the "**MAIN OUT**" side of the furling line while pulling the outhaul. Remember: the mainsail should always be deployed using the outhaul. The "**MAIN OUT**" side of the furling line should be used only to assist and overcome friction in the furling system that may be making deployment difficult.

Deploying the Jib

The self-tacking jib is deployed by pulling the jib-sheet (port side) and holding light tension on the foresail furling line (starboard side) to assure the line wraps into the furling drum evenly without overlapping. You may find it easier to deploy the jib at a point slightly off head-to-wind to get assistance of wind load in the sail. After the sail is deployed to the desired position (full or reefed), taught, and secure the foresail furling line.

Operation while sailing

The main sheet can be controlled at either the cabin top winch and clutch (starboard side) or the aft port winch and clutch by the port helm.

The jib sheet (for the self-tacking jib) is controlled at the aft port winch and clutch by the port helm.

Note: As the self-tacking jib moves from side to side during a tack or jibe maneuver, the free-traveling jib car will move from side to side. In heavier winds the impact force this free-travelling car imparts on the track end stops may be substantial. This can and has caused damage to the track end caps. To avoid this, it is recommended in high winds to come through your tack slowly at the head to wind point or your jibe slowly at the stern to wind point to prevent the free-traveling car from impacting the track end caps with high velocity.

Furling the Jib

Pull in on the foresail furling line (starboard side) to furl the jib. Maintain slight tension on the jib sheet to ensure the jib wraps tightly around the forestay. Continue furling the jib until the jib sheet wraps about two times around the furled foresail. Clutch and secure the furling line. Clutch and secure the jib sheet.

Furling the Mainsail

To furl the mainsail, verify the furling gear is in **RACHET**. (Furling the mainsail can be done with the furling gear in **FREE**, however, **RACHET** will provide some mechanical advantage and make furling easier as well as make sure the sail does not re-deploy under wind load.) Motor slowly head-to-wind so little to no wind load is in the sail, un-clutch the furling lines and the outhaul. Maintain light tension on the **OUTHAUL** to ensure the sail wraps in the mast tightly. Pull in on the **MAIN-IN** furling line while maintaining light tension on **MAIN -OUT** end to ensure the line is secure around the furling gear. Furl the sail in until the gray sun protecting fabric reaches the mast and no white sail is showing. Taught and

secure both furling lines. Taught and secure the outhaul. The preferred method to furl the mainsail is manually using a hand-over-hand action. **Avoid using the cabin top winch in either manual or electric mode.** Due to the power of this winch, furling the mainsail with the winch could result in damage to the sail and rigging. By manually furling the sail, any foul can be identified before damage is done.

Reefing the Mainsail

To reef when first deploying the sail, the process is like mainsail deployment above. Just do not fully draw the sail out of the mast. I/3rd or 2/3rd of mast height would be sufficient depending on wind strength. Maintain a slow motor head-to-wind and tension on the furling lines to control deployment and avoid self -deployment of the sail due to wind load. Once the sail is drawn out to the desired position, secure the mainsail furling lines and put the furling gear in **RACHET** to avoid the sail being pulled out under wind load. Tighten the outhaul as needed manually. (The winch may be used manually (with care and attention) if needed for purchase.)

To reef the main from fully deployed position, the process will be like furling the sail, only do not pull it all the way into the mast. Again, pulling it in to I/3rd or 2/3rd of mast height would be sufficient depending on wind strength.

Remember, wind load in the sail will make reefing difficult, and possibly cause the sail to self-deploy if the furling gear is in **FREE** and the furling lines are not held under light tension. It is advisable to motor slowly head-to-wind while reefing the main.

Reefing the Jib

Reefing the jib is straight forward. Just do not deploy it all the way, or do not furl it all the way. Being a relatively small sail, the jib may not require as much reefing as the main.

Systems

Auxiliary Propulsion

Engine General

The engine is a Yanmar 56 hp (57 mhp) common Rail Diesel with Electronic Engine Control. Access points are from both port and starboard aft staterooms as well as the companionway. The front is easily viewable for inspection by opening the companionway steps. From the starboard aft stateroom, the raw water strainer, coolant reservoir, fuel filter assembly (with “bulb type” priming pump), and engine oil dipstick can be accessed for inspections. From the port aft stateroom, the raw water intake seacock can be accessed and viewed for visual inspection. The transmission is mechanical.

Engine Operating Limitations

- Normal coolant operation temperature: 169^{o} to 194^{o} F
- Normal Oil Pressure 41 to 78 psi
- Max Engine Operating Speed 2800 RPM
    - **(However, it is preferable to cruise at RPMs no greater than 2500.)**
- When sailing with engine **OFF**, select transmission to **NEUTRAL** (per Yanmar recommendation).
- When shifting from forward gear to reverse and vice versa always briefly pause in neutral during this directional transition. Rapid and sudden gear changes cause transmission damage.
- **Note: At high ambient temperatures and continuous engine operation at high RPM, operation of the blower will provide additional ventilation to the engine room**. Many engine components (turbo charger, exhaust system) operate at very high temperatures. The circulation of outside air in the engine room will assist in venting a hot engine room. The blower is turned on and off at the engine instrument panel.

Cleaning the Raw Water Strainer

Only open and clean the raw water strainer if necessary and initial visual inspection reveals a significant amount of debris in the filter basket. (I.e., A spinach salad!)

Prior to opening the raw water strainer, close the raw water intake seacock to avoid backflow of cooling seawater and possible introduction of air into the raw water system. (Introduction of air into the system could cause pump cavitation or "air lock" and cause engine overheating.) This seacock is located aft of the engine in the engine room, port side, and is accessible through the port stateroom access panels.

Loosen the thumbscrew on top of the strainer, open the strainer, and remove the basket. The lid and basket have self-retaining seals and O-rings. So, loss of an O-ring should not be a problem. However, attention to seals and O-rings should always be exercised when opening any strainer installation. Inspect seals for any damage. Should any seal or O-ring damage or loss be noted notify Windworks Sailing Club dock staff. Be careful not to lose any part of the raw water strainer. Improper re-installation, damage to seals, or loss of any component will result in a compromised seal and engine overheating.

After cleaning debris from the strainer basket, re-install the basket and close and secure the strainer lid with the thumb screw. If, prior to securing the lid, you notice the water level in the strainer has fallen, replenish the water level in the strainer to the top. (Using a bottle or glass of water from the galley.) This will help to ensure that air is not introduced into the system.

Open the raw water intake seacock prior to starting the engine.

Start the engine and verify cooling water discharge, and observe that the strainer is not leaking, and air is not trapped in the strainer. (Small bubbles are OK and will clear itself in time.)

Engine Operation

Starting Procedure

1. Complete all **ENGINE CHECKS** in Skippers log.
2. Turn both main and engine **batteries ON (to 1+2 position)**. Engine and main battery switches are in the starboard locker nearest the AC/DC distribution panel. (Note: Do not turn off the engine battery switch while the engine is operating. This will cause damage to the engine alternator).
3. Shift to **NEUTRAL**.
4. Press and **hold the POWER** button (bottom most button) for two about seconds and then release. Wait for the tachometer to light up and the alarm buzzer to sound. (Do not be concerned when the alarm buzzer sounds. This is normal and verifies all engine alerting functions are operational. (See section: "Checking/Verifying Warning Devices" below.)
5. **Hold the START** button (top) until the engine completely turns over, then release**. (Note: Do not hold the START button for more than 15 seconds. This will overheat the starter motor.)**
6. Check for raw water coming out of the exhaust to verify cooling water circulation.

Should the engine FAIL to start, before attempting another start, make sure the engine has stopped completely. (Attempting to start a running engine will damage the pinion gear on the starter motor.) If the engine does not start after repeated attempts, contact Windworks Sailing Club dock staff.

Note: In cold weather the engine may need a few RPMs higher than idle to effectively start. In this case do the following prior to starting the engine:

- Depress the **BLACK** neutral engage button on the bottom of the shift/throttle lever (this will prevent the transmission from engaging forward gear). Hold the neutral engage button depressed while moving the throttle lever forward to about or just above ¼ throttle.

Checking/Verifying the Warning Devices

When starting the engine, as the power button is depressed (Step 4 above), the LCD and all alarm lamps (i.e., oil pressure, coolant temperature, Battery charge, etc.) on the face of the tachometer will illuminate for approximately 4 seconds. At the same time, the alarm buzzer will sound for approximately 0.5 seconds then silence. After four seconds the LCD on the tachometer will display engine hours. This is

normal operation and indicates engine warning systems are functioning properly. Should alarm lamps remain illuminated and/or the alarm buzzer continue to sound, notify Windworks Sailing Club of the abnormal condition.

Shutdown Procedure

1. Make sure you are in **NEUTRAL.**
2. **Hold the STOP button for a full 1 or 2 seconds** and release only when the engine has been fully shut off. (If the engine is not shut down completely, releasing the **STOP** button may result in accidental restart.)
3. Then turn **POWER OFF by holding the power button for two seconds** and releasing. To verify power is off you can see the fuel gauge decline and the LCD display on the tachometer will extinguish.

Prior to stopping the engine, it is recommended to allow the engine to run at low speed and low load for 5 minutes prior to shut down. This will allow engine components that run at a high temperature (turbocharger, exhaust system, etc.) to cool and stabilize, avoiding thermal shock on shutdown. A slow motor into a marina or anchorage could serve as this cooling period.

Engine Troubleshooting

Engine Overheating

1. Immediately shut down the engine. Make sure you and the vessel are in a safe drift (you may raise sails to keep course and out of danger). The most likely cause is the clogging of the raw water strainer. (See section: “Cleaning the Raw Water Strainer” above.)
2. Check the coolant. Locate the coolant reservoir (viable through the aft starboard stateroom access panel) and make sure the coolant level is between the two fill lines. If the coolant level is low, you may carefully add some (located with spare parts). Note: Coolant needs to be mixed 50/50 with fresh water. Read instructions on the bottle. Contact Windworks Sailing Club dock staff if you have any questions or concerns.
3. If neither of these solutions works, contact Windworks Sailing Club immediately.

Low Oil Pressure

1. Immediately shut down the engine.
2. Check the oil level using the dipstick. Add diesel engine oil if necessary. (Located with the spare parts). Be careful not to overfill. It is best to do small amounts at a time and wait a minute for the level to settle before getting a proper reading on the dipstick.
3. If the engine oil level is **NOT** low, DO NOT RESTART. Contact Windworks Sailing Club dock staff.

Alternator Failure:

You may keep running the engine but be aware that the batteries are not being charged. Conserve usage on engine and house batteries until connected to shore power.

Engine Dies and Won't Restart

Contact Windworks Sailing Club immediately.

Note: Windworks Sailing & Powerboating phone numbers are located at the back of the skipper's log. Windworks Sailing Club can also be reached on VHF channel 68 if you are within sight of Shilshole Marina. (Windworks may not be reachable on VHF 68 unless you are in the marina. At low tides, the breakwater may block line-of-sight radio transmissions)

Propeller

The propeller is a Max-Prop Automatic Feathering 4-blade propeller. When the engine is on, and the transmission is engaged in either forward or reverse the torque created by the shaft rotation on differential gearing in the prop immediately opens the prop blades into the proper position. No lag time is experienced in prop blade opening (Unlike a folding prop). Also, a Max-Prop is more efficient in reverse than a fixed blade prop as the leading edge and blade orientation is the same (but opposite) in reverse as it is in forward.

When sailing (engine off), the blades will feather into a low drag position simply by the flow of water around the blades and the drag of the shaft. This will also prevent the shaft from turning due to the flow of water around the propeller when the transmission is in neutral. Feathering should occur within a second or two.

Note: When in reverse there is port prop-walk. Not a serious amount.

Note: Per Yanmar recommendation, when sailing and engine OFF, the transmission must be in NEUTRAL.

Fuel System

There is one fuel tank, located under the port salon sole. (Optional auxiliary tank under the aft starboard state room berth is **NOT** installed.) Tank capacity is 62 gallons of diesel fuel. The fuel gage for the tanks is located on the engine instrument panel on the aft end of the center cockpit table. To get a reading from the fuel gage the engine instrument panel power must be on.

Fill with diesel fuel only! The fuel fill is located on the port side, at the lifeline gateway entrance. When fueling, please fill slowly and do not top off. You might want to keep a rag or absorbent pad close by in case of overflow or spillage. It is helpful to have the engine instrument panel power **ON** and a crew member watching the fuel gauge to call out a **FULL** reading.

Anchor and Windlass

General

The boat is equipped with one properly sized anchor on the bow. There is not a second or spare anchor onboard. The anchor rode consists of 150 feet of 5/16 inch chain attached to 75 feet of 1/2 inch rope for a total length of 225 feet of rode. Both the chain and rope are marked with red paint at 30-foot intervals.

The anchor and rode are deployed and retrieved using the bow mounted electric windlass with a hand remote control.

Windlass (anchor deployment and retrieval)

The windlass consists of both a drum to feed and retract rope, and gypsy to feed and retract the chain. The gypsy is also capable of feeding and retracting the 1/2" rope portion of the rode if the rope is not under a large load. The chain deployment and retraction must be done by feeding the chain through the gypsy. Always pay close attention to the fairlead of the chain coming up and down as the gear mechanism may jam if chain is not fed properly through the windlass gypsy.

There is a breaker for the windlass located on the starboard side of the forward birth. This breaker is left in the closed position. Should the windlass not operate, check the breaker, and, if it is open, close the breaker. If the windlass still does not operate or the breaker trips open continually, the anchor must be retrieved by hand. Inform Windworks Sailing Club of the failure when able. **Note: The windlass clutch can be loosened with a winch handle to deploy the anchor. However, the anchor cannot be retrieved using a winch handle on this windlass.**

The windlass is operated by a waterproof remote control on the bow plugged into a connector and retained in a mounting bracket in the anchor locker. **Do not remove the remote from this position.** Repeated removal could damage contact pins and render the remote unusable. There is also a connector for the remote in the cockpit. **However, the usage of the windlass from the cockpit is NOT recommended.** Deployment and retrieval of the anchor and rode should always be observed closely for proper and safe control of the anchor, rode, and windlass.

When operating the windlass, the engine must be running. The current draw of the windlass is substantial and will draw down the forward house battery significantly unless supported by the engine alternator.

Always USE EXTREME CAUTION when operating the windlass. Keep fingers, toes, and loose clothing away from the chain and windlass. Watch the chain and rode as it is pulled up by the windlass and **be ready to stop immediately** if there is any problem. **When retrieving the anchor, stop when the anchor reaches the roller and carefully pull the anchor over the roller by hand.**

Anchor Rode Snubber Pendent

When anchoring for extended periods (one or more nights) a snubber should be used to take the load off the windlass and prevent the winless clutch from slipping, possibly damaging the windlass. This can be accomplished using a line with a rolling hitch tied onto the anchor rode (chain or rope). However, Lucky Dog has an anchor rode snubber pendent assembly stowed onboard in the Blue Drawer.

The pendent assembly consists of:

1. A 5mm snubber pendent wrapped in stiff black anti-chafe material with a breaking strength of 12,000 lbs.
2. A 13/32" captive pin bow shackle with a rupture load of 11500 lbs.
3. A lead line, 8' length of ½" 3-strand nylon line with a thimble braided into the working end to avoid chaffing. This line has a breaking strength of 7500 lbs.

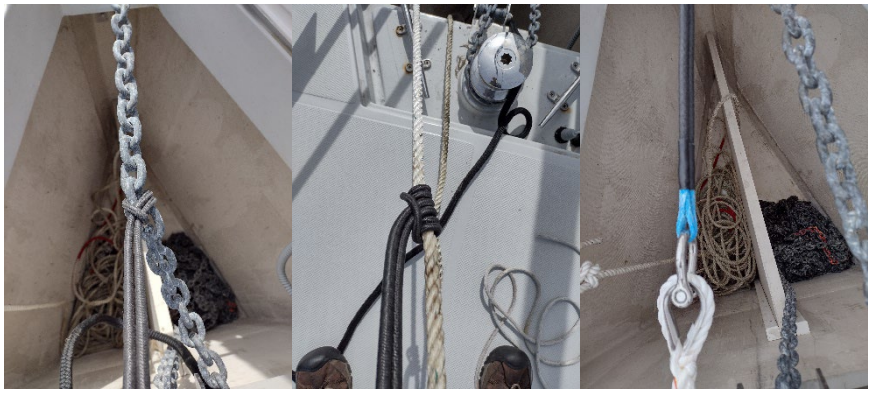
The snubber pendent can be used on both chain and rope. Since Lucky Dog has 150' of chain and 75' of rope rode, this is an advantage depending on the scope deployed. Also, the prusik knot used to tie the pendent to anchor rode is easier to untie after load than a rolling hitch.

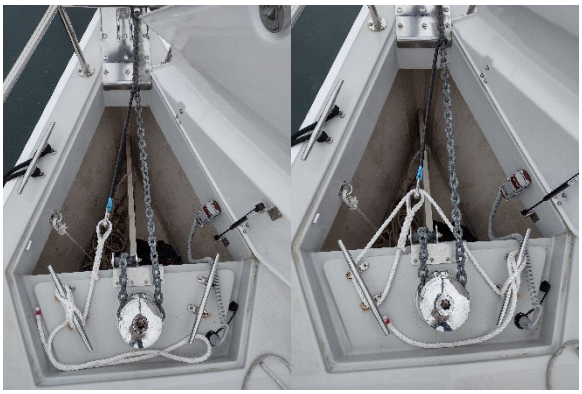
How to use:

Once the anchor has been deployed:

1. Open the bow shackle and remove the bow shackle and the black snubber pendent from the lead line. (Be careful to set the shackle down securely so as not to lose it in the anchor locker or overboard.)
2. Tie the black pendent to the rode using a prusik knot, 1 pass prusik for chain rode and 3 pass prusik for rope rode. (See pictures below). Be sure to keep the blue ends of the pendent even so they secure evenly to the bow shackle.
3. Secure the shackle to the pendent ends and the thimble end of the lead line.
4. Secure the bitter end of the lead line to the port side cleat in the anchor locker using a cleat hitch. Alternatively, the load can be shared by both cleats by passing the lead line around the port cleat, back through the snubber bow shackle and secured to the starboard anchor locker cleat with a cleat hitch. (Pictures below.)

5. Let the anchor rode out until the load around the windlass is relieved and is fully on the snubber pendent assembly.
6. Close the anchor locker.





When you are ready to weigh anchor, remove the pendent assembly simply by reversing the process:

1. Pull in some anchor rode so the load is off the snubber pendent assembly.
2. Remove the bow shackle from the snubber pendent and lead line. (Be careful to set the shackle down securely so as not to lose it in the anchor locker or overboard.)
3. Untie the pendent prusik knot from around the rode.
4. Re-assemble the snubber pendent, bow shackle, and lead line.
5. If the snubber assembly will not be used again on your cruise, please remove it from the anchor locker, place it in the stuff sack and return it to storage in the Blue Drawer. Otherwise, it can be left hanging in the anchor locker for the next use on your cruise.

Bow Thruster

General

Lucky Dog has an Electric Bow Thruster that is controlled from a low-profile joystick assembly and panel adjacent to the starboard side helm. System power is not continually **ON**. To turn the bow thruster **ON**,

depress the **ON** button on the aft side of the thruster control panel and hold for 1 second until the green LED illuminates. Power will automatically turn off after 15 minutes of inactivity. To manually turn the thruster power off, press the **ON** button. Power will immediately shut off and the LED will extinguish. If the system is in **FAULT** mode, the LED will show **RED**. Turn the system **OFF** and allow it to reboot. Normal operation may be restored after a brief shutdown of the system.

(LED Diagnostics: Green=system ON / Amber=low voltage / Red Flashing=Motor High Temp / Red=fault)

Operation

The thruster is controlled by a low-profile joystick adjacent to the starboard helm. Move the joystick in the direction you want the bow to move. I.e., joystick to port will activate the thruster to give starboard thrust thus moving the bow to port. And vice versa if you move the joystick to starboard, thruster will give port thrust moving the bow to starboard. When changing thruster direction, allow a brief pause at neutral position to allow the thruster propeller to come to rest before accelerating in the opposite direction.

Note: During thruster operation you may notice that the keel will act as a pivot point. Therefore, movement of the bow in one direction will be accompanied by movement of the stern in the opposite direction though less pronounced. This tendency may not necessarily be a bad thing and may, in fact, be helpful depending on the situation.

Never activate the thruster for more than 5 seconds at a time. Continuous activation will cause the thruster motor to overheat and fail. A good rule of thumb is to count to 5 during thruster activation then deactivate the thruster by returning the joystick to neutral to allow the motor a brief pause.

There is a master switch for the thruster located on the starboard side of the forward birth. This switch is left in the **ON** position. If the thruster does not operate, check that the master switch is in **ON**. If not, select the switch **ON.** If the thruster still does not operate, or the LED on the panel continually shows RED (fault Mode) turn the thruster **OFF** and master switch to **OFF** and contact Windworks Sailing Club.

It is recommended to turn **ON** and very briefly activate the thruster in both port and starboard directions (for a brief test) prior to departing or arriving at a dock or prior to any maneuvering where bow thruster use is anticipated.

Galley

Propane Safety

Propane gas (also called LPG) is not only very flammable but heavier than air and can collect in the hull of the boat if it leaks out of the system. The result is a risk of fire or explosion. To minimize risk, the tank, regulator, and solenoid valve are in a locker at the port side aft stern that vents overboard. The solenoid valve switch is located on the starboard sidewall beneath the AC/DC distribution panel under the VHF radio. It is colored RED.

The solenoid switch is to be kept OFF when not using stove. When the solenoid is **OFF**, the solenoid valve is closed preventing propane gas from flowing through the system to the stove. Any flammable gas that leaks from the tank and connecting fittings will be retained in the aft propane locker and vented overboard.

When the solenoid is **ON**, propane gas flows to the stove. Stove and oven controls must be in the **OFF** position when not in use to prevent unburned gas escaping into the cabin.

Oxygen depletion. When the stove is in use, it will consume some of the oxygen in the cabin. Always use the stove and oven with adequate cabin ventilation. The stove should not be left on for more than an hour without ventilating the cabin.

Fire. Keep all flammable items (towels, wood utensils, coat sleeves, etc.) away from the flame.

When underway, be cautious of hot liquids, pans, and surfaces when cooking onboard. The boat can be rocked, even at anchor, by wakes or gusts.

REMEMBER:

- **Turn OFF the solenoid switch when NOT using the stove or oven.**
- **Ventilate the cabin when using the stove or oven.**
- **Close the valve on the top of the propane tank when leaving the boat.**

Stove & Oven Operation

Before lighting the stove

- Make sure the solenoid switch is **OFF**.
- Verify/OPEN the valve on the propane tank. The tank is located behind the port helm in the aft locker.
- Make sure all stove controls are **OFF**.
- Turn solenoid switch **ON** (LPG).

To light the stove top

1. Simultaneously push in and rotate the burner control knob counterclockwise to the flame symbol.
2. Using a lighter or the ignition button (lightning bolt), light the gas while continuing to hold the knob in. (The ignition button is on the right side of the stove/oven control panel.)
3. After it lights, continue holding the knob in for about 10 seconds.
4. Release the knob. If the flame goes out when the knob is released, it needs to be held in a little longer while lit.

Using and lighting the oven

1. There are 2 burners in the oven – the top (broiler) and another burner at the bottom.
2. Open the oven (push the stainless-steel button on the right side and simultaneously pull up and out on the handle.
3. Select a burner. The knob for the burner is on the far right.
4. Position the lighter near the hole where the fuel line is and light the propane while holding the burner knob in and turned to flame indicator. (You may also use the ignitor (Lightning bolt) button located on the right side of the stove/oven control panel.)
5. Keep the knob pushed in for about 10 seconds.
6. Release the knob. If the flame goes out when the knob is released, it needs to be held in a little longer while lit.
7. To avoid accidental extinguishing of the flame, close the oven carefully.

Note: There is a metal plate in the lower support rack of the oven. This is a heat distribution plate to ensure even heating in the oven. **Should not be removed or used as a cooking surface.**

After Stove and/or oven use

1. Verify/Turn **OFF** all stove and oven burners.
2. Turn **OFF** the solenoid switch.
3. **Close** the propane tank valve.

Microwave Oven

The microwave oven is located above the propane stove. It operates **ONLY** on AC current from the port outlets. The DC to AC inverter will operate the microwave when not on shore power. However, microwave ovens use a significant amount of current. **Recommendation: Only operate the microwave oven when on shore power for battery conservation.**

Refrigeration

Lucky Dog has 2 refrigerators/freezers and one wine cooler. All vessel refrigeration works on DC power, but, as current draw is substantial, being on shore power is best while running the refrigerators and

freezers. Watch your battery voltage and use the engine alternator to keep the batteries charged as needed. The general rule is do not operate the refrigerators/Freezers for longer than 6 hours without recharging the batteries.

One refrigerator/freezer is a countertop box located just outboard of the galley sink. On the DC panel this unit is labeled “Refrig-Freezer.” The unit is **either a refrigerator or a freezer, not both** depending on the set point selected. The thermostat is located outboard of the box and on the galley sidewall between the countertop and galley lockers. The manufacturers’ recommended set points are 40^{o} F for a refrigerator and 12^{o} F for a freezer. The compressor for this unit is loud so you may want to turn this unit off during the night. The box is well insulated and will hold refrigeration temperatures.

The thermostat (when powered) will display the box temperature continuously. To adjust the temperature set point:

1. Press the **SET** button. “**SET**” will appear on the display.
2. Press **SET** again; the current set point will flash.
3. Press the **UP** or **DOWN** arrow keys until the desired set point is displayed.
4. Press **SET** to lock in the new set point. “**SET**” will be displayed.
5. Press the **SET** and **DOWN** buttons together to return to the box temperature display. Alternatively, skip step 5 and the display will return to box temperature automatically after 1 minute.

There is a second pull-out refrigerator under the gally counter just to the right of the sink. This is a 2-part unit, refrigerator main selves with a small freezer section above. The temperature set dial is in the unit itself.

The wine cooler is located near the sole below the AC/DC distribution panel.

When leaving the boat after your charter, if you have used the refrigerators, please remove all items, and wipe down both refrigerators and freezers with supplies provided.

Potable Water

General

On board, fresh water is carried in two tanks. Tanks are in the forward cabin under the berth (50 gallons), and starboard midship under the sole (56 gallons). The deck fills are located starboard deck forward of the shrouds.

A pump provides pressure for all faucets and showers. It can be turned on with the water pressure switch on the DC distribution panel. If the pump continues to run and no water comes out of the faucets, one or both tanks may be empty or one or both the supply valves between the tank and the pump may be closed. Check to see if one or both tank valves are closed. The valves are in the bilge aft of the salon table. Normally both valves should remain open. The pump will draw from both tanks in sequence without the need to open and close source selector valves. In the picture the right valve is in the open position and the left valve is closed.

Note: Continuous operation of the pump when the supply valves are closed, or the tanks are empty will burn out the pump. If the pump seems to run continuously for several minutes with little to no water flowing from any of the faucets or showers, turn the pump off at the DC distribution panel and investigate the problem.

Also, if valves are open and tanks are not empty, continuous running of the pump may indicate a leak in the system. Turn the pump **OFF** at the DC distribution panel to avoid damage to the pump and contact Windworks dock staff when able.

The engine, when running, will heat up water in the hot water tank. To heat the tank fully will take approximately 1 hour with the engine ON.

When on Shore power, an AC powered water heater can be turned on at the AC distribution panel. When leaving the boat, always verify this heater is **OFF**.

Water, especially hot water, is a limited resource onboard. In general, it is best to shower at the marina. If you do decide to use the shower, be aware that a small water heater capacity means a brief shower. And be mindful of freshwater usage. Long showers may drain your fresh water supply. Both head showers drain to a contained bilge reservoir separate from the main bilge. To empty, or **while showering, turn on the "shower Sump pump" switch on the DC distribution panel.** Ensure the shower sump outlet (valve) is also open so the pump can empty the reservoir. The valve is under the galley sink in the trash bin locker under the grate. It is recommended to make sure the shower sump pump switch at the DC distribution panel is **ON** and the sump drain **OPEN** when showering. When the power is **ON** the pump runs automatically and will not remain **ON** continuously.

(Trash Bin Locker)

Sinks drain directly into the sea. Please be mindful of what you dump down the drain. Food waste from dirty dishes can clog the drains, so it's good practice to wipe off plates and pans into the garbage before washing them. The drain hoses are connected to seacocks which exit through the hull. It is possible that sea water can backflow up the drains due to pressure created in rough water or when healing. If this is noted, close these seacocks during sailing to prevent water from backing up into the sink. If the sink is not draining, check to make sure the seacock is open. The seacock for the galley sink is located under the sink in the trash bin locker under the grate. The forward head sink drain seacock is in the center bilge. The seacock for the aft head sink is located under the sink.

(Under Aft Head Sink)

(Center Bilge)

Note: Owner has never experienced a back flow issue, so it is unlikely to need to close the through hulls for the sinks. But that doesn't mean a backflow issue cannot occur. So, closing the sink through hulls may be required.

Tank Quantity Display

The tank monitoring display is in a starboard side locker above the NAV station. The monitor must be **ON** to monitor tank quantities. This unit monitors 4 tanks. Forward water, forward waste, starboard water, and aft waste. Tanks can be selected using the UP and DOWN arrow keys.

Waste

General

Lucky Dog has 2 heads. One in the forward stateroom and one in the Starboard salon just forward of the aft starboard stateroom. The forward head has a dedicated shower stall.

Both toilets are electrically operated to rinse and flush. Flushing the toilet also operates a macerator pump prior to discharge into the holding tank.

Also, both toilets rinse using fresh potable water. This avoids the "marine toilet smell," however, the disadvantage is use of potable water. So, keep in mind that rinsing and flushing the heads depletes the potable water carried in the tanks. Holding tanks for each head are behind the toilets. Tank capacities are: FWD=31 Gal, AFT=23 Gal. Waste outlet through-hull locations are: FWD – in the locker behind the toilet and below the holding tank, AFT– under the head sink. **Seacocks for the Black-Water through hulls are to remain closed per Coast Guard regulations.**

Tank Quantity Display

The tank monitoring display is in a starboard side locker above the NAV station. The monitor must be **ON** to monitor tank quantities. This unit monitors 4 tanks. Forward water, forward waste, starboard water, and aft waste. Tanks can be selected using the UP and DOWN arrow keys.

Head Operation

Please make sure all crew members are aware of precautions and the operation of the marine head.

CAUTION: The marine head and waste system are fragile and have a limited capacity. Absolutely nothing can be flushed down the head except human waste. Windworks has provided Ziplock bags (or dog waste bags) for the disposal of toilet paper and other solids. Anything else can clog the valves, damage the macerator pump, and plumbing of the head. The general rule is **"if it does not go through you first, it does not go down the marine toilet"!**

To operate the head, turn on the head breaker and freshwater pump breaker on the DC distribution panel. (Note: Since the vacuum flush system uses fresh water, there is no raw water intake valve.) Locate the grey rocker switches below the head sink. The top rocker switch floods and flushes the bowl (Wet Flush). The bottom rocker switch when pushed to the left floods the bowl, when pushed to the right flushes without water (Dry Flush).

Note: It is imperative to pump the waste entirely through the pipes and into the holding tank to avoid backflow into the bowl.

If the head(s) are used by **ANYONE** during the charter, the waste tank must be pumped out. The deck fitting for the aft waste pump out is located starboard side on deck, midship. The deck fitting for the forward head is port side, forward of the shrouds.

Pump Out Procedure

The pump-out facilities are located at the end of the fuel dock (H dock) and at the end of "A" dock (south end of marina).

1. Set up for docking just like you are returning to the slip and secure the boat to the dock.
2. Locate the deck fill key and remove the waste cap.
3. Turn on the waste pump on the dock by pushing the green button. Make sure the valves (blue "T" handles are shut on both pump-out hose and behind the porta-potty dump. Otherwise, the vacuum pressure can't build up.
4. Bring the hose on deck and push the black rubber cone into the waste fitting firmly to form a seal. Open the valve "T" handle and keep the end pressed into fitting firmly until the liquid stops flowing consistently.
5. Partially fill the waste tank with non-potable water hose and pump out until clear water is evacuated from tank.
6. Shut the valve and then take the pump out hose back to the dock. Put the end of the hose in the water and open the valve for 10 seconds. This will suck up seawater to rinse out the hose (as a courtesy to the next user). **Discharging waste overboard is illegal in Puget Sound.**

Cabin Heat

Lucky Dog is equipped with a diesel heater for use in cold weather. This is basically a forced air furnace and fan that operates using diesel fuel. The furnace is in the aft port engine room and can be accessed through the aft port stateroom access panels.

Heated air outlets are located, one each, in the 3 staterooms and salon. The thermostat is in the salon mounted on the cabin wall to the starboard of the companionway (inboard external surface of the AD/DC Electrical panel locker). There is an ON/OFF switch on the lower left corner of the thermostat.

To operate the system, simply turn the thermostat switch **ON** and adjust to the desired temperature set point. It will take a few minutes for the furnace to heat and the fan to operate. To turn the heater off, simply select the switch on the thermostat to **OFF**.

RECOMMENDATION: When moored, anchored, or docked and heat in the cabin is desired, turn the heat **ON** to bring the cabin to a comfortable temperature. When the cabin is comfortable, turn the system **OFF** instead of running it continuously. Bear in mind the heater does use a limited amount of diesel fuel and is somewhat noisy. You may want the system **OFF** during the night for quiet. Also, it can heat the cabins uncomfortably hot as the thermostat is in the salon. In the morning, turn it on to heat the cabin to a comfortable temperature.

Electrical

General

Reference system schematics, Catalina 425 Owner's Manual stowed onboard.

DC electrical power on Lucky Dog is provided by 3 batteries. Main house battery (#2), Secondary house battery (#1), and a dedicated engine start battery (Group 27).

Main house Battery (#2): This battery is a double 12 VDC AGM 8D[4] deep cycle lead acid battery (2 in parallel) and powers the house DC electrical system (through the DC distribution panel) and the bilge pump. The battery pair is located just forward of the companionway stairs under the sole. (Note: The connection from this battery to the bilge pump is direct and independent of the battery switch or the DC power distribution panel. So, even with the main battery selection switch selected **OFF**, the bilge pump will operate in manual or automatic mode.)

Secondary House Battery (#1): This battery is a single 12 VDC AGM 8D[5] deep cycle lead acid battery located under the sole of the forward stateroom. Battery #1 powers the house and bilge pump as well as the Bow Thruster and Windlass.

Dedicated Start Battery: This battery is dedicated **ONLY** to start the engine and is a smaller size, like an automobile battery[6]. The engine can be started from the house batteries #1 and #2. However, should these batteries be severely depleted, the Group 27 battery is reserved for engine start only. Location is under the sole just inboard of the nav station.

Battery Switch Panel

The battery switch panel is in the locker, starboard side, just AFT of the nav table. The circuit breaker for the DC distribution panel is in the center between the main and engine battery switches. Just forward of these switches are breakers for the electric winch in the cockpit and the engine Electronic Control Unit (ECU). Both these breakers should remain **ON**. If the winch breaker trips, the winch can be used manually. If the ECU breaker trips continuously, contact Windworks Sailing Club.

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[4] Large commercial size battery yielding approximately 255-amp hours.

[5] Large commercial size battery yielding approximately 255-amp hours.

[6] This battery is a group 27 AGM start battery with output of 745 cooled cranking amps.

Main Battery Select Switch: The main battery select switch is labeled OFF, 1, 2, and 1+2. When **OFF** is selected, no DC power is distributed to the DC distribution panel. Selection **1** selects the secondary house battery #1, Selection **2** selects the main house battery #2, and **1+2** selects both house batteries. (Note: The connection from house battery #2 to the bilge pump is direct and independent of the DC power distribution panel. So, even with the main battery selection switch selected **OFF**, the bilge pump will operate in manual or automatic mode.)

Engine DC Power Switch: This switch is labeled OFF, 1, 2, and 1+2. When **OFF** is selected, no DC power is distributed to the ECU, engine starter, or engine instrument panel. When **1** is selected, the dedicated start battery alone provides DC power to the ECU, engine starter, and instrument panel. When **2** is selected, the house battery(s) (whichever is selected on the Main Battery Select Panel) provides DC power to the ECU, engine starter, and instrument panel. When **1+2** is selected, both the house and dedicated start batteries provide power for the ECU, engine starter, and instrument panel.

Recommended selection: When underway it is recommended to select **1+2** on both the Main Battery Select Switch and the Engine DC Power Switch. In this configuration the most battery power available is being distributed to the house and engine. **Note: When running the engine, ONLY those batteries selected on these switches will be charged by the alternator.** Therefore, when under power or simply running engine to charge the batteries, both Main and Engine battery switches should be selected to **1+2**.

Power Management Recommendation

When underway, sailing or motoring, both the Main and Engine battery switches should be selected to **1+2**. When moored or at anchor, not on shore power, and not using the engine, the Engine DC Power switch should be selected **OFF** and the Main Battery Select switch should be selected to **1+2**. Remember that secondary house battery #1 (forward house) also powers the windlass and bow thruster. If long periods are spent moored or at anchor and not on shore power, it may be desired to preserve secondary house battery #1 by selecting **2** on the main battery select switch. This will draw current only from main house battery #2.

When moored or anchored and not using shore power for long periods of time, running the engine will charge the batteries from the alternator. Batteries should charge in approximately 1 hour of engine run. **Remember**: only the batteries selected on the Main and Engine battery switches are charged during engine operation. So, both main and engine battery switches need to be selected to 1+2. **Note: Never turn the engine DC power switch OFF while the engine is running. This will cause alternator damage since the current produced by the alternator will have nowhere to flow.**

DC Power Distribution Panel

The DC power distribution panel is located on the starboard side aft of the nav station on the bulkhead between the aft head and the nav station. Switches on this panel are well marked and self-explanatory. On the outboard end of the panel, there are switches for the bilge pump (manual and auto) and battery voltage monitor displays. To preserve battery power, select **ONLY** those systems that are required to be **ON** at any one time. For example, refrigerator compressors use a significant amount of current. It may be desired to run the refrigerators/freezers only as needed to maintain refrigeration temperatures. When not on shore power, and anchored or moored, turning them **OFF** at night will avoid drain on the house batteries as well as cut down on compressor noise while sleeping. The refrigerator boxes are well insulated. Likewise, the television will use a significant amount of current. When not on shore power for extended periods, it may be warranted to limit television use.

AC Power System

The AC power system is typically operable only on shore power. However, lucky Dog has an DC to AC inverter (See section: “Digital Multi Control (DC to AC Inverter)” below) supplying AC power to the port and starboard outlets. The port and starboard outlets are protected by GFI outlets in the starboard and forward (port) heads, respectively. Note: The auxiliary water heater is **NOT** powered by the inverter, **ONLY** shore power.

AC Power Distribution Panel

The AC power distribution panel is located just inboard of the DC distribution panel in the same panel assembly. This panel has switches for:

- Shore power ON/OFF
- Port & Starboard Outlets ON/OFF
- Water Heater ON/OFF – **Only operates on shore power.**
- Battery Charger ON/OFF - **THIS SWITCH TO REMAIN ON AT ALL TIMES!**
  (Note: With this switch OFF, batteries will not charge from shore power or from the engine alternator, and current flow will be inhibited causing alternator damage.)

Shore Power

The AC power system is operational when the boat is connected to shore power (120 VAC, 30 amp, 60 hz) via the orange 50-foot shore power cable. (The exception is that the AC to DC inverter will power the AC outlets in the salon and cabins. Note: The inverter powers the AC outlets ONLY.) The boat side cable receptacle is just outboard and AFT of the starboard helm.

In the lazarette behind the starboard helm is a master switch and GFI to protect against shock hazard and the protect the AC system from ground faults. The master switch should remain **ON** to allow AC power to flow to the boat.

If the master switch has been shut OFF or GFI tripped, the RED stripe on the top of the switch will show. To turn the switch ON, first depress the **RESET** button on the GFI, then select the master switch to the **ON** position. Should the master switch continue to trip contact Windworks Sailing Club.

Disconnecting Shore Power:

1. **Always** turn the Shore Power **OFF** at the AC distribution panel before disconnecting shore power.
2. On the dock, **OPEN** the dockside circuit breaker in the power box, then unplug the dock side shore power connector. (To avoid possible shock never unplug the connector while power is **ON** (i.e., circuit breaker closed).
3. Unplug the boat side connector.
4. Coil the cord and stow. (For convenience during a day sail it is suggested not to stow the shore power cord in the deep cockpit lazarette. It will be difficult to retrieve.)

Connecting Shore Power:

Note: Never connect shore power with the Shore Power switch in the AC distribution panel selected ON.

1. Verify the Shore Power Switch on the AC distribution panel is selected **OFF**.
2. Connect the shore power cable to boat side receptacle.
3. Verify the dock side circuit breaker at the dock power box is **OPEN** to avoid possible shock.
4. Plug in the dock side connector and **CLOSE** the dock power box circuit breaker and lid.
5. To avoid inadvertent disconnection, verify adequate slack in the shore power cord between the boat and dockside power box.
6. On the AC distribution panel, verify the green “power available” light is illuminated.

7. Verify the reverse polarity red warning light is **NOT** illuminated. **IF THIS LIGHT IS ILLUMINATED DISCONNECT SHORE POWER IMMEDIATELY. OPEN THE DOCK SIDE CIRCUIT BREAKER AND DISCONNECT THE CABLE AT DOCK SIDE.**
8. Select the shore power switch at the AC distribution panel **ON**.

Digital Multi Control (DC to AC Inverter)

Lucky Dog is equipped with a DC to AC inverter that will provide AC power to the port and starboard outlets. (Note: The inverter will NOT provide AC power to the Water Heater. The water heater can only be operated on shore power.) The inverter/charger unit is physically located in the aft port engine room. An inverter/charger control panel, or "Digital Multi Control" is in a starboard locker over the nav station.

Note this panel has a 3-position switch. **ON** selects the inverter and provides AC power to the port and starboard outlets, **OFF** selects the inverter off, and **CHARGE ONLY** allows only the charger monitor to operate. The LED display indicates the current limit to be accepted by the inverter/charger unit. This should always be set to 30 since the boat AC system and shore power is 30 amps.

Be aware the inverter itself uses current, and the AC outlets will draw significant current themselves when in use. So, to preserve battery power when not on shore power, only turn the AC inverter **ON** if and as required. When not on shore power, and the inverter is not required, select **OFF** or **CHARGE ONLY**. (**CHARGE ONLY** is preferred to monitor charging when the engine is running.) When on shore power, select **CHARGE ONLY** as AC is provided by shore power and the inverter is not required. **CHARGE ONLY** will allow the batteries to absorption charge if low, and float charge to maintain voltage. The appropriate LED indicator lights will illuminate indicating what mode the Inverter/Charger unit is in. **Note: When on shore power and leaving the boat make sure the Digital Multi Control dip switch is selected to the CHARGE ONLLY POSITION.**

Lighting

The lighting on Lucky Dog is on 3 separate circuits: Salon or Main Cabin lights, FWD and AFT Cabin lights, and Night lights. All 3 circuits are powered by the DC power distribution panel.

The ***Main Cabin Lights or Salon Lights*** are in the ceiling of the salon. These lights are controlled by a dimmer switch on the inboard galley pedestal. So, these lights may be turned **ON** or **OFF** without turning **OFF** power at the DC distribution panel.

The ***Night Lights*** are the outboard salon lights over the starboard and port salon shelves as well as small red floor lighting. The night lights in the salon are controlled by a dimmer switch on the inboard galley

pedestal. So, the lights may be turned **ON** or **OFF** without turning **OFF** power at the DC distribution panel. However, this dimmer will not turn **OFF** the red floor lights.

The ***FWD and AFT Cabin Lights*** circuit controls all stateroom lighting as well as the FWD and AFT lavatory lighting. Note there is a Master Switch for these lights on the inboard gally pedestal. This master must be **ON** to allow these lights to illuminate. Also, each stateroom has switches to control their individual lights.

Electronics Network

The electronics on Lucky Dog (wind sensors, GPS chart plotter, depth sensor, VHF radio, autopilot, etc.) operate on a common data network (Garmin MEMA 2000 and NEMA 0183). Each device sees all data transmitted and selects, by data address, the data required for that instrument. This minimizes any data discrepancy seen between instruments other than rounding errors.

Navigation

Magnetic Compass

A magnetic compass is mounted on the FWD end of the cockpit center table. (Enough said.)

Chart Plotter

The Gamin Chart plotter is located above the engine instrument panel on the AFT end of the cockpit table.

This display is a touch screen (1) to pan, zoom, and select. (2) represents the location of the power button and (3) is the automatic backlight sensor.

Along with GPS data, nautical chart data, and navigation data the chart plotter will also report tide and current data by selecting **INFO**. **AIS** vessel position and data is received from the VHF radio and reported on the display. Touching a vessel icon will select and display vessel data.

It is important to note that on any chart plotter the amount of detail shown on the display is directly proportional to the degree of **ZOOM** selected. For example, the more zoom applied, the more detail regarding depth contours, hazards, shoreline features, and navigational markers is made available on screen. Therefore, when navigating in close quarters (marina, anchorage or moorage, narrow channel, shallow or hazardous waters, etc.) the chart plotter display should always be zoomed in to the level required for complete data display. When navigating in open waters, zooming the display out will provide good overall long-range navigational data.

Radar

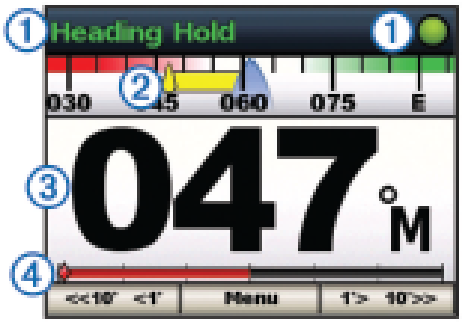
Radar is integrated with the chart plotter and can be displayed in an overlay. The radar range is also controlled from the chart plotter. To activate the radar, it must first be turned on at the DC distribution panel. When turned on it is in standby mode (not radiating high frequency radar waves). The radar will go through a brief warmup period before it can be activated. Activate the radar and the display overlay at the chart plotter by selecting **RADAR** and **TRANSMIT** from the menu, then select the range desired. **Never activate the radar at or near the dock or in a crowded anchorage.** High frequency radiation from the radar antenna can cause harm to those exposed in proximity. Particularly to the eyes.

To deactivate the radar, select **RADAR TO STANDBY** from the chart plotter menu. Turn off the CB on the DC panel when radar is not needed.

Autopilot

The autopilot control is located just outboard of the starboard helm. Autopilot has heading hold and wind angle hold functions. (Note: Rough water will affect the accuracy of Wind Angle hold. The wind vane at the top of the mast and will be affected by pitch and roll giving a wide range of wind angle information to the autopilot.)

On the graphic, (1) the standby key will turn the autopilot **OFF** (On Standby). (2) Represents the multi-function keys and will activate the function listed on the display above the key. (3) Is the power key and will turn the instrument **On** and **OFF** when depressed and held. Depressing this key twice will adjust the backlight. Autopilot can also be **ENGAGED** or selected to **STANDBY** from the chart plotter.



On the display (1) shows device status, (2) indicates heading trend, (3) displays selected heading, and (4) shows rudder position.

Sailing Instrumentation

There are two sailing instrument displays on Lucky Dog. One just outboard of each helm. These instruments will display (on multiple selectable pages) wind data, GPS position, boat speed (GPS and water), depth and even set and drift. To select and scroll through data pages use the **UP** and **DOWN** arrow keys.

Wind

Wind Speed and direction transducers are located at the top of the mast. Wind data is transmitted to each sailing instrument at the port and starboard helms and accessible on selected pages. Data reported includes wind angle, direction, and speed. Both apparent and true wind data are calculated and are displayed on appropriate pages of each sailing instrument.

Depth

Depth transducer is located under the sole of the forward cabin along the centerline. Calibration is approximately to boat waterline. (Water surface = depth of 0 feet.) Depth data is transmitted to each sailing instrument display at the port and starboard helms and accessible on selected pages. Depth data is also transmitted to the chart plotter and can be viewed in the depth window of the chart plotter display.

Communication

VHF Radio/AIS

General

Lucky Dog is equipped with a Garmin VHS radio. The radio is equipped to receive AIS signals from other vessels. Since the radio is active on the NEMA 2000 network, AIS information is transmitted to other instruments such as the chart plotter.

An AIS transceiver (Garmin 800) programmed with Lucky Dog's MMSI number is installed behind the VHF mounting panel. DC power to the transceiver is provided by the "NAV INSTRUMENTS" switch on the DC Distribution panel. So, anytime the nav Instruments and the VHF radio are ON, AIS transmissions will be sent re: Lucky Dog's position and vessel information.

The VHF is registered as a Marine Radio Station with the FCC and is programmed with a MMSI number to support DSC (Digital Selective Calling) distress calls. (See Emergency Operations section below). The keys are as follows:

(1) **Distress**. Sends a DSC distress call. (See Emergency Operations section below).
(Take care to never push the distress button inadvertently. This will transmit a DSC distress call to the Coast Guard and will result in significant fines if not an actual distress.)
(2) Adjust volume/Squelch. Press to select squelch or volume.
(3) Softkeys. Menu selection as illuminated on LCD screen.
(4) Channel or menu item select. Press to toggle for weather channels.

Microphone/Handset:

(1) Push to Talk (PTT)
(2) Channel Select UP/DOWN
(3) Toggle between preset channels

To turn on select VHF on the DC distribution panel. If the radio does not come on, press the power button in the top right corner of the radio. If an alarm sounds, this is normal when the radio is powered on. This is a DSC alarm self-test. Simply press the CLEAR button on the bottom of the radio to silence the alarm.

Note: Lucky Dog is equipped with a VHF remote handset connector at the Starboard helm station (outboard near throttle). No remote handset is provided. The connector is capped to prevent corrosion. **Please leave the protective cap on the connector.** Please re: install the cap should it become dislodged.

Operations

Normal

After turning the radio on, check your squelch and volume and adjust to the desired level. Then select your desired channel. In most cases that will be 16 or, for Windworks, 68.

When making a radio check **NEVER** use channel 16. Use channel 9, a listed marina channel at your location, or for Windworks, use channel 68. Procedure:

- Windworks, Windworks, Windworks, this is Lucky Dog requesting radio check.
- Lucky dog this is Windworks read you loud and clear.
- Windworks, Lucky Dog has you loud and clear, Lucky Dog out, switching and standing by 16.

Under typical conditions underway **always select and monitor channel 16**. This channel is used for distress and safety calls as well as hailing to initialize contact with another vessel.

When hailing another vessel, initial contact should be made on channel 16 with the subsequent conversation being broadcast on another non-commercial channel (i.e., 9, 67, 68, 69, or 71). For example:

- **Blue Duck**: "Mary Jane, this is Blue Duck" (the name of the vessel or MMSI being called may be said 2 or 3 times if conditions warrant)
- **Mary Jane**: "Blue Duck, this is Mary Jane. Reply 68" (or some other proper working channel)
- **Blue Duck**: "68" or "Roger"

If you hear a distress message from a vessel and it is not answered, then **you must answer**. If you are reasonably sure that the distressed vessel is not in your vicinity, you should wait a short time for others to acknowledge.

Emergency

Should it be necessary, distress calls are **always transmitted on channel 16**. Any distress transmission needs to be started by broadcasting the emergency signal commensurate with the urgency of the situation:

- **MAYDAY**: Vessel and occupants in grave and imminent danger, immediate assistance required.
- **PANPAN**: Urgent message concerning safety of vessel and/or occupants.
- **SECURITÉ**: Message concerning safety of navigation or weather conditions.

Distress call procedure:

(1) Tune to channel 16.
(2) Distress signal "MAYDAY", spoken three times. (Or PANPAN or SECUITÉ as the situation demands)
(3) The words "THIS IS", spoken once.
(4) Name of vessel in distress (spoken three times) and call sign or boat registration number, spoken once.
(5) Repeat "MAYDAY" and name of vessel, spoken once.
(6) Give position of vessel by latitude or longitude or by bearing (true or magnetic, state which) and distance to a well-known landmark such as a navigational aid or small island, or in any terms which will assist a responding station in locating the vessel in distress. Include any information on vessel movement such as course, speed, and destination.
(7) Nature of distress (sinking, fire etc.).
(8) Kind of assistance desired.
(9) Number of persons onboard.
(10) Any other information which might facilitate rescue, such as length or tonnage of vessel, number of persons needing medical attention, color hull, cabin, masks, etc.

(11)The word "OVER"

Example:

- MAYDAY-MAYDAY-MAYDAY
- This is Blue Duck, Blue Duck, Blue Duck WA1234 MAYDAY this is blue duck
- Cape henry light bears 185 degrees magnetic-distance 2 miles
- Struck submerged object
- Need pumps-medical assistance and tow
- Three adults, two children onboard
- One person compound fracture of arm
- Estimate can remain afloat two hours
- Blue duck is thirty-two-foot cabin cruiser-white hull-blue deck house

Repeat at intervals until an answer is received.

As previously mentioned, this radio is programmed with an MMSI number and can send a DSC distress call. When used the vessel information is transmitted digitally, however the nature of the emergency is not. Therefore, the distress signal must be followed by a call on channel 16. Procedure:

- Lift the spring-loaded door and hold **DISTRESS** for at least 3 seconds.
- The radio beeps and counts down the seconds. DISTRESS CALL COUNTING DOWN appears on the screen.
- The radio sounds an alarm, switches to channel 70, and transmits your call on high (25 W) power.
- Press the **CLEAR** key to silence the alarm sound.
- The radio tunes to channel 16 on high (25 W) power.
- Select **PTT** on the handset or radio to relay your distress message.
- The radio waits for an acknowledgment (ACK) on channel 70 from a listening station.

If you inadvertently make a distress call, or are no longer in distress, you should cancel the call immediately by transmitting a voice message to all stations on channel 16. Procedure:

- Select **CANCEL > YES** and wait until DISTRESS CANCEL HAS BEEN SENT appears on the screen.
- Select **OK**.
- Hold **PTT** on the handset and transmit an appropriate voice message to cancel the distress call (Distress Call Cancellation Script below).
- Select an option:
    - Select **END** to complete the distress-call cancellation and return to normal radio operation.
    - Select **RESEND** to resend the distress-call cancellation and start the process again.

Example revocation message:

"All stations, all stations, all stations, this is _____ (vessel name), MMSI number ____, position ____ (North or South), ____ (West or East). Cancel my distress alert of ____ (date and time). This is ____ (vessel name), MMSI number ____. Out."

Entertainment

Stereo

The stereo control panel is in a starboard locker forward of the nav table. The remote control for the stereo is in the same locker. The “Stereo” switch must be turned on the DC distribution panel to operate. The stereo will support Bluetooth wireless connection with a range of 33 feet. (For best connection keep the devices in “line-of-sight” proximity.) AM and FM bands are also supported. Note: Sirius XM is supported but no account is active.

Speakers are in the salon and cockpit. Volume levels can be controlled for each area independently using the dial and on-screen menu.

(1) Press to open the menu or return to the previous screen.
(2) Press to select input source.
(3) Pause or resume.
(4) Tune AM or FM stations or skip to previous track.
(5) Tune AM or FM stations or skip to next track.
(6) Mute &unmute.
(7) LED brightness
(8) Volume adjust / Press to switch between zones.
(9) On/Off

Cell Phone Dock

There is also a media player dock that, when opened, has a tray that pulls out the accommodate a cell phone or media player no bigger than 5.67”x 2.8”x 0.52” and with a USB connection on the bottom. The

dock will also support a correctly formatted (FAT32 or NTFS) USB flash drive connected directly to the USB port in the dock.

DVD and CD

By opening the face of the stereo control panel (top slide button) a DVD or CD can be inserted and played. Before a DVD can be played **DVD** must be selected on the source menu to send video to the television. (The Fusion stereo will also play a DVD if AUX 1, AUX 2, or ARC is selected. However, with these selections you must manually select the TV input source to **Receiver**. The DVD setting will make the selection of TV input source input automatically.)

Television

The television is mounted on the bulkhead forward of the settee area. To operate the "TV" switch on the DC distribution panel must be turned on. The remote control for the TV is in the starboard locker forward of the nav table with the stereo control panel. The TV reception is provided by an antenna for local stations or streaming from a Wi-Fi source. The TV is Bluetooth enabled, so screen casting from a smart device is available if the smart device has a screen casting app downloaded that is compatible with newer Samsung TVs. (There is a switch under the FWD INBD settee to select reception from "antenna" or "dock side cable". For use with Wi-Fi, Bluetooth, or DVD this switch has no effect.)

Note: The TV does draw a significant amount of current. Therefore, the use of the TV when not on shore power should be limited to preserve battery power.

DVD

To play a DVD, open the face of the stereo control panel (top slide button) insert the DVD and select "DVD" on the stereo source menu. The TV will automatically re-select its input source to **Receiver**. Once your DVD is over, if you want to switch back to broadcast TV select the TV input source to **TV**. (The Fusion stereo will also play a DVD if source AUX 1, AUX 2, or ARC is selected on the stereo menu. However, with these selections you must manually select the TV input source to **Receiver**.)

Things to Remember

- Pump out heads frequently to avoid over filling and pressurizing the tanks.
- Never turn off the battery switch while the engine is running.
- If seawater backflow into sinks is noted, close sink seacocks when sailing. Healing may cause seawater to backflow into the sinks and possibly overflow the sink.
- If the sink is not draining, check to ensure the seacock is open.
- Turn solenoid off when not cooking.
- Engine – max RPM 2800 (Recommend cruising less than 2500 RPM)
- Do not overtighten or force any lines when using the electric winch. Always complete tightening lines manually with the winch and handle.

Appendix

Marine Radio Channels and Frequencies

Note: Specific channels and frequencies for vessel traffic and marinas in the Puget Sound can be found in the Waggoner's Cruising Guide stowed onboard.

Wireless Telecommunications Bureau

MARINE VHF RADIO CHANNELS

The chart below summarizes a portion of the FCC rules -- 47 CFR 80.371(c) and 80.373(f)

Type of Message	Appropriate channel(s)
DISTRESS SAFETY AND CALLING - Use this channel to get the attention of another station (calling) or in emergencies (distress and safety).	16
INTERSHIP SAFETY - Use this channel for ship-to-ship safety messages and for search and rescue messages and ships and aircraft of the Coast Guard.	6
COAST GUARD LIAISON - Use this channel to talk to the Coast Guard (but first make contact on Channel 16).	22
NONCOMMERCIAL - Working channels for voluntary boats. Messages must be about the needs of the ship. Typical uses include fishing reports, rendezvous,scheduling repairs and berthing information. Use Channels 67 and 72 only for ship-to-ship messages.	9(fn6), 68, 69, 71, 72, 78, 79(fn4), 80(fn4)
COMMERCIAL - Working channels for working ships only. Messages must be about business or the needs of the ship. Use channels 8, 67, 72 and 88 only for ship-to-ship messages.	1(fn5), 7, 8, 9, 10, 11, 18, 19, 63(fn5), 67, 72(fn7), 79, 80, 88(fn1)
PUBLIC CORRESPONDENCE (MARINE OPERATOR) - Use these channels to call the marine operator at a public coast station. By contacting a public coast station, you can make and receive calls from telephones on shore. Except for distress calls, public coast stations usually charge for this service.	24, 25, 26, 27, 28, 84, 85, 86, 87, 88(fn2)
PORT OPERATIONS - These channels are used in directing the movement of ships in or near ports, locks or waterways. Messages must be about the operational handling movement and safety of ships. In certain major ports, Channels 11,12 and are not available for general port operations messages. Use channel 20 only for ship-to-coast messages. Channel 77 is limited to intership communications to and from pilots	1(fn5), 5(fn3), 12, 14, 20, 63(fn5), 65, 66, 73, 74, 77
NAVIGATIONAL - (Also known as the bridge-to-bridge channel.) This channel is available to all ships. Messages must be about ship navigation, for example, passing or meeting other ships. You must keep your messages short. Your power output must not be more than one watt. This is also the main working channel at most locks and drawbridges.	13, 67
MARITIME CONTROL - This channel may be used to talk to ships and coast stations operated by state or local governments. Messages must pertain to regulation and control, booting activities, or assistance to ships.	17
DIGITAL SELECTIVE CALLING - Use this channel for distress and safety calling and for general purpose calling using only digital selective calling techniques.	70
WEATHER - On these channels you may receive weather broadcasts of the National Oceanic and Atmospheric Administration. These channels are only for receiving. You cannot transmit on them.	Wx-1 162.55 Wx-2 162.4 Wx-3 162.475

Footnotes to table

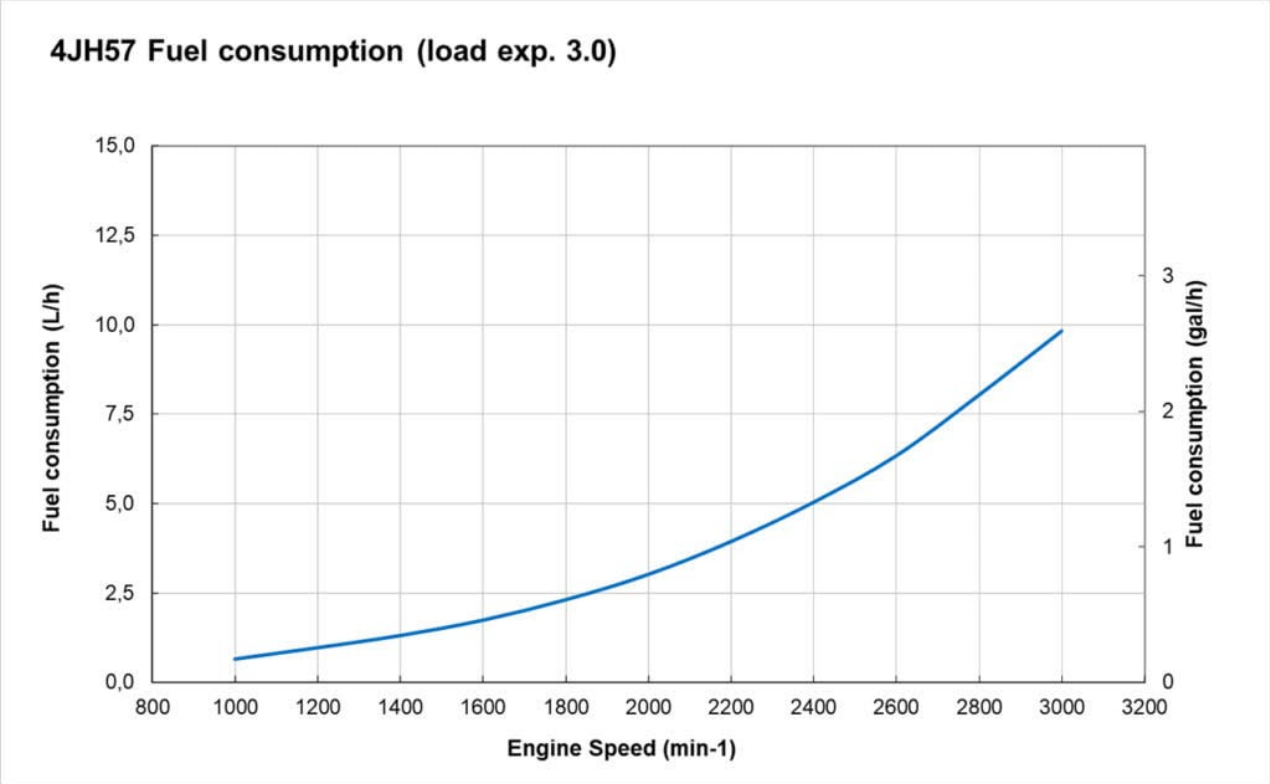
1. Not available in the Great Lakes, St. Lawrence Seaway, or the Puget Sound and the Strait of Juan de Fuca and its approaches.
2. Only for use In the Great Lakes, St Lawrence Seaway, and Puget Sound and the Strait of Juan de fuca and its approaches.
3. Available only In the Houston and New Orleans areas.
4. Available only in the Great Lakes.
5. Available only In the New Orleans area.
6. Available for Intership, ship, and coast general purpose calling by noncommercial ships.
7. Available only In the Puget Sound and the Strait of Juan de Fuca.

Manufacturers Estimated Fuell Consumption

Manufacturers estimated fuel consumption at max cruise is 0.8 to 1.1 gal/hr.

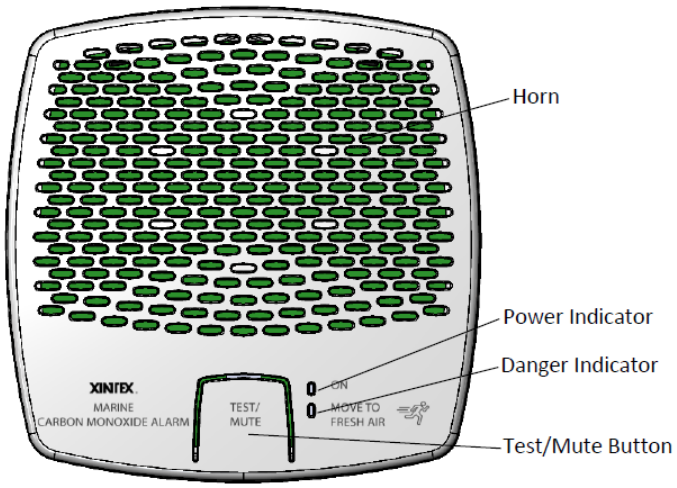
(Note: Owner's personal experience is about 0.7 gal/hr. at an average speed of 2300 RPM.)

Fuel consumption varies based on factors such as hull condition, bottom cleanliness, and propeller type. Manufacturer's chart estimates below are general and may not precisely reflect Lucky Dog's actual fuel consumption. This data is for reference only.



Marine Carbon Monoxide Alarms

There are CO alarms mounted in each cabin and the salon. These alarms are battery powered by a permanent non-replaceable battery. If you notice a green flash about every 3 minutes do not be alarmed. This is a normal self-diagnosis of the unit.



Should a very high level of carbon monoxide exist, the CO Alarm will alarm in a few minutes. However, if small quantities of CO are present or high levels are short-lived, the micro controller will accumulate the information and determine when an alarm level has been reached. This feature eliminates nuisance alarms.

Status Indicators and Explanations

SYSTEM STATUS	Green LED INDICATOR	Red LED INDICATOR	AUDIBLE HORN
Normal:	1 Flash/180 sec.	Off	Off
Alarm:	Off	1 Flash/5 sec.	4 Beeps, 5 sec. Silence
End of Life	Off	Off	1 Beep/60 sec.

Testing the Unit

The audible alarm cannot be checked by the internal circuitry and therefore the co alarm should be tested frequently using the test button and verifying proper alarm sequences and operation. It is recommended to test the CO Alarms no less than once per week.

If you are going on a multi-day sail and wish to test the CO alarm units simply: Press “Test/Mute” button until Green LED turns on and release. The alarm will simulate 2 alarm cycles (2 sets of 4 Beeps, 5 sec. Silence between). The Red LED will flash once every 5 seconds.

Silencing an alarm

Simply **depress the Test/Mute Button.** Move to fresh air and ventilate the cabins if and as possible.

NOTE: Nuisance alarms are possible due to high concentrations of other vapors or gasses from chemicals and out-gassing of materials (i.e. batteries or cleaning fluids). Although not CO, these gasses can be hazardous. Therefore, any alarm should be treated with caution and evacuate and ventilate the boat.