CARVER

YACHTS

C34 Coupe

Owner's Manual

Boats manufactured for use in California for model year 2018 and after meet the California EVAP Emissions regulation for spark-ignition marine watercraft. Boats meeting this requirement will have the following label affixed near the helm.

⚠ WARNING

Operating, servicing and maintaining a recreational marine vessel can expose you to chemicals including engine exhaust, carbon monoxide, phthalates, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, service your vessel in a well-ventilated area and wear gloves or wash your hands frequently when servicing this vessel. For more information go to: www.P65warnings.ca.gov/marine

The fuel system in boats marketed in states other than California comply with U.S. EPA mandated evaporative emission standards at time of manufacture using certified components.

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1 GENERAL INFORMATION

Introduction

This manual has been compiled to help you to operate your craft with safety and pleasure. It contains details of the craft, its systems and operation. It also contains information about the equipment supplied or fitted. Read this manual carefully, and familiarize yourself with the craft before using it.

This owner's manual is not a course on boating safety or seamanship. If this is your first craft or if you are unfamiliar with your type of craft, for your own comfort and safety, obtain handling and operating experience before "assuming command" of the craft. Your dealer, national sailing federation, or yacht club will advise you of local sea schools or competent instructors.

Ensure that the anticipated wind and sea conditions will correspond to your craft's design category, and that you and your crew can handle the craft in these conditions.

Even when your yacht is categorized for certain sea and wind conditions, the sea and wind conditions corresponding to the design categories A, B and C range from severe storm conditions to category A, to strong conditions for the top of category C, which is open to the hazards of a freak wave or gust. These are dangerous conditions, and only a competent, fit and trained crew using a well-maintained craft can satisfactorily operate the craft. See **"Design Specifications" on page 6** for category.

This owner's manual is not a detailed maintenance or troubleshooting guide. In case of difficulty, refer to the boat builder or the boatbuilder's authorized representative.

Always use trained and competent people for maintenance, repairs or modifications. Modifications that may affect the safety characteristics of the craft shall be assessed, executed and documented by competent people. The boat builder cannot be held responsible for modifications that he/she has not approved.

Some countries require a driving license or authorization. Some countries enforce specific regulations.

Always maintain your craft properly and make allowances for the deterioration that will occur over time and as a result of heavy use or misuse of the craft.

Any craft, no matter how strong it may be, can become severely damaged if not used properly. Practice safe boating. Always adjust the speed and direction of the craft to sea conditions.

All people should wear a suitable buoyancy aid (life jacket) when on deck. Some countries require all people to wear a buoyancy aid that complies with their national regulations at all times.

Keep this manual in a secure place and hand it to the new owner if you sell the craft.

Using the Owner's Information Kit

Read, understand and follow the instructions provided in the Owner's Manual and all other guides and manuals supplied with the yacht, including all OEM information.

Contact your dealer if any questions arise regarding warranty responsibilities.

The Owner's Information Kit contains:

Qty.	Item
1	Owner's Manual
(varies)	Original Equipment Manufacturer (OEM) information

Read the Owner's Manual and OEM (Original Equipment Manufacturer) information carefully. Become familiar with the yacht, its components and its systems before attempting to operate.

NOTE: The Owner's Information Kit must be onboard when the yacht is in operation. When selling the yacht, hand the new owner the Owner's Information Kit.

OWNER'S MANUAL

The purpose of the Owner's Manual is to explain how to safely operate and maintain the yacht and its various systems. The Owner's Information Kit also contains safety precautions and operation tips.

Obtain handling and operation experience before operating your new yacht. Gaining experience is important if this is your first yacht or if you are unfamiliar with your type of yacht. Gaining experience is for your own comfort and safety. Your dealer, national sailing federation, or yacht club will advise you of local sea schools or competent instructors.

NOTE: Drawings and illustrations contained within this guide are included as graphic aids to assist in the general operation and maintenance of the yacht. The drawings and illustrations are used for graphic purposes only. The drawings do not include all the details of each system, and the drawings are not to scale. Never reference the drawings to order parts or to service the yacht. Contact an authorized dealer for parts or service.

OEM INFORMATION

Components purchased from other companies have been installed in your yacht. The companies supply the Original Equipment Manufacturer (OEM) information. These components include, but are not limited to, standard items such as:

- Engines
- Sanitation system
- Pumps
- Batteries
- Generators
- Electronics
- Battery chargers
- Air conditioners

The OEM information explains how to operate and maintain the components.

Contact your dealer first when information is needed about a system or component on the yacht. If your dealer is unable to provide the information, contact the manufacturer (Original Equipment Manufacturer/OEM) of the system or component. Refer to the OEM information for telephone numbers and addresses.

Be ready to provide the component's serial number when contacting an OEM for information. A Serial Number Record Sheet is provided separately. Use the provided

sheet as a convenient location to record the serial numbers of the yacht's OEM components.

If you install an aftermarket accessory on your yacht, add the OEM information that accompanies the accessory to the Owner's Information Kit.

NOTE: If the OEM information conflicts with this owner's manual, follow the instructions in the OEM information.

Warranty Information

WARRANTY REGISTRATION

Your yacht is covered by a limited warranty. Locate the owner's copy of the warranty, supplied separately. Review the warranty carefully.

The warranty registration is the first step in activating your limited warranty. Complete this document, sign it, and have your dealer sign it before you take delivery of the yacht. Failure to complete and submit the warranty registration could void the limited warranty.

To ensure the warranty remains in effect, all parties must uphold specific responsibilities. Following are some of those responsibilities.

- At the time of delivery, perform a complete inspection of the yacht and its systems. Document any work that the dealer needs to complete to meet the terms of your agreement.
- Locate the two cards at the end of the manual. The cards are the Second and Third Owner Registration Cards. It is strongly recommended that the purchaser of a previously owned yacht register ownership.

PRE-DELIVERY SERVICE RECORD

Your dealer must complete and sign the pre-delivery service record before the yacht gets delivered. Your dealer will prepare the yacht for delivery in accordance with the procedures in this document.

Make sure the pre-delivery service record and all OEM warranty cards have been completed and mailed to the companies listed. Retain a copy of the pre-delivery service record for your own reference.

DEALER'S RESPONSIBILITIES

Warranty Information

Your dealer will review the terms of the warranty and make certain the warranty is registered. Your dealer and will provide instructions on how to obtain warranty service. Your dealer will review and assist in completion of the warranty registration document prior to delivery. Upon completion the dealer will submit the warranty registration and provide a copy to the owner.

Pre-Delivery Service Procedure

Your dealer will prepare the yacht for delivery in accordance with the procedures detailed on the pre-delivery service record. Your dealer will sign the pre-delivery service record and provide you with a copy.

The Federal Boat Safety Act of 1971 requires registration for the yacht and its engines. Your dealer will complete and mail the engine warranty cards as part of the pre-delivery service procedure.

Yacht and Systems Review

A representative from your dealer will review the operation of the yacht and its systems.

OWNER'S RESPONSIBILITIES

Warranty Information

The warranty registration is the first step in activating your limited warranty. Review the warranty registration with the dealer, sign it and have your dealer sign it before you take delivery of the yacht. You should maintain a copy of this document for your records. Failure to submit the

completed warranty registration could void the limited warranty.

NOTE: Complete and forward all warranty cards to the appropriate company within 5 days of the yacht's delivery.

Delivery

Make a complete inspection of the yacht and its systems at the time of delivery. Document work that the dealer needs to complete in order to meet the terms of agreement.

Obtaining Warranty Service

The following requirements must be met before warranty work can be performed on the yacht.

1] Registration of the yacht is required.

2] Your dealer must complete the pre-delivery service and submit the pre-delivery service record.

NOTE: Your dealer is the only entity authorized to approve warranty work. Contact your dealer first for warranty service. There are no exceptions to this policy.

Your dealer has knowledgeable professionals who are familiar with the yachts, and they are capable of providing the highest level of service.

Owner Registration for Pre-Owned Yachts

Second and Third Owner Registration Cards are provided at the end of this manual. The purchaser of a previously owned yacht should complete the appropriate card and mail it once taking title of the yacht.

Registration of a previously owned yacht does not transfer, extend or in any way modify the yacht's original limited warranty. However, purchasers of a previously owned yacht should register the yacht so they can be contacted if necessary.

Certification Standards

Your boat was built to meet Federal USCG requirements and may be certified to more stringent ABYC standards for the fuel, electrical, ventilation, floatation, horn, identification, capacity, placards & labels, powering, start-in-gear protection, navigation lights, backfire flame control, and in most cases, fire extinguishers.

The boat owner is responsible for other USCG required safety items which can vary depending on the size of the boat as follows:

- Fire Extinguishers
- Life Jackets
- Visual Distress Signals
- Navigation Rules on board (Yachts 39' 5" (12 m) in length (LOA) and greater)
- Bell (Yachts greater than 65' (20 m) in length)

Boats in the National Marine Manufacturers Association (NMMA) Certification program up to 26' (7.9 meters), or a Pontoon boat of any length, are certified to ABYC standards, have the USCG maximum rated load capacity on the certification plate and may contain EPA and/or CARB emission information. Do not exceed maximum person or weight capacities.

Yacht Certification

Boats 26' (7.9 meters) and greater certified by the NMMA for compliance with NMMA and USCG safety standards.

Figure 1-1

Hull Identification Number

The U.S. Coast Guard has established an identification system that assigns a unique hull identification number (HIN) to each yacht. The HIN consists of 12 alphanumeric characters that provide coded information about the yacht.

Provide your dealer with the yacht's HIN when contacting them for parts or service.

Design Specifications

The following specifications are based on a standard model with some common options. Some options may change the listed specifications.

ITEM	SPECIFICATION
LOA (with swim platform)	34' 0" (10.36 m)
Beam	11' 6" (3.5 m)
Draft (full load – inboard)	40" (1.02 m)
Draft (full load I/0)	37" (0.9 m)
Deadrise (degrees)	13°15‘
Bridge clearance (without radar & mast)	9' 10" (2.99 m)
Fuel capacity	200 gal (757 L)
Gray water holding tank capacity (option)	39 gal (147 L)
Water system	78 gal (295 L) (39 gal/147 L with gray water option)
Weight (dry with standard engine)	17,300 lb (7,847 kg)
Stateroom headroom	6' 5" (2.0 m)
Salon headroom	6’ 8” (2.03 m)
Sleeps	6 people
Battery chargers	60 amp battery charger (1) – maintains the voltage levels of the engine, accessory and generator batteries. Optional with thruster, 60 amp battery charger (1) – maintains the thrusters.
Batteries	Engine batteries (2) – One 12-volt battery is designated for each engine, Accessory battery (1) – One 12-volt battery designated for the accessory equipment Optional with generator – One 12-volt battery designated for the generator Optional with bow and stern thruster – Two 12-volt batteries designated for the bow and stern thrusters Optional with bow thruster – One 12-volt battery designated for bow thruster
Air conditioner unit cooling capacity (option)	Main Level – 16,000 BTU Lower Level – 10,000 BTU
Bilge system pumping capacity	Pumps (2) – 1,500 gph (5,678 lph)
Water heater capacity	6 gal (22.7 L)

ITEM	SPECIFICATION
Waste tank capacity	30 gal (113.5 L)
GFCI receptacle locations	Galley (2) – one control outlets in the Foward Stateroom, Guest Stateroom and Head. The second controls outlets in the salon and dinette.

Table 1-1 – Design Specifications

DESIGN SPECIFICATIONS – ISO STANDARDS

ITEM	SPECIFICATION
Design category*	B
Length of hull	34' 0" (10.36 m)
Main dimensions: L maximum	34' 0" (10.36 m)
Main dimensions: b maximum	11' 6" (3.50 m)
Maximum height (airdraft) (to top of hardtop at full load)	9' 10" (2.99 m)
Maximum drafts in fully loaded condition	37' (0.9 m)
Mass (light craft condition)	17,600 lb (7,983 kg)
Mass of craft fully loaded	22,034 lb (9,994 kg)
Total weight of liquids, when all permanently installed tanks are full	2,120 lb (961.6 kg)
Maximum number of people	10 people 1,653 lb (749.7 kg)
Maximum recommended load**	4,434 lb (2011.22 kg)

Table 1-2 – Design Specifications – ISO Standards

* This craft is designed to operate in winds up to Beaufort force 8 and the associated wave heights (significant wave height up to 13.1 ft [4 m]; see the following footnote). Such conditions may be encountered on offshore voyages of sufficient length, or on coastal waters when unsheltered from the wind and waves for several dozens of nautical miles. These conditions may also be experienced on inland seas of sufficient size in order to generate wave height. Simply because this vessel is designed for the above described conditions does not mean that all persons are so qualified to operate the vessel under these conditions. The vessel must be well maintained and under the control of a highly experienced captain.

** The maximum recommended load includes the weight of all people onboard, all provisions and personal effects, any equipment not included in the light craft mass, cargo (if any), and all consumable liquids (water, fuel, and other liquids).

Load Capacity

⚠ WARNING

Never exceed the maximum recommended number of persons. Regardless of the number of persons on board, the total weight of persons and equipment must never exceed the maximum recommended load.

- **Reduce the number of people onboard in poor weather or during rough water conditions.**
- **Always load the craft carefully and distribute loads appropriately to maintain design trim (approximately level).**
- **Avoid placing heavy weights high up.**

CE CERTIFIED MODEL

The certification plate indicates the maximum weight and capacity of the yacht under calm sea conditions.

NOTE: Only boats built for / intended for the European Union will be manufactured to EU Standards (CE Certified).

NON-CE CERTIFIED MODEL

The captain holds responsibility for maintaining a safe capacity when operating in non-CE areas of the world.

For the purpose of continuous improvement, product specifications, features, options and prices may be changed at any time, including changes during the model year, without prior notification or obligation to other yachts. No warranty or representation is made to performance or fuel range of an individual yacht due to the many factors that may affect the performance.

California Air Resources Board (CARB)

Outboard, Sterndrive and Inboard powered boats sold in the state of California are equipped with special components and certified to meet stricter environmental standards and exhaust emissions. All boats sold in California since 2009 are required to meet Super-Ultra-Low (four-star) emissions.

Figure 1-2

Sterndrive and Inboard marine engine powered boats meeting CARB's exhaust emission standards are required to display the four-star label on the outside of the hull above the waterline. Outboard and Personal Watercraft marine engines may also comply with these standards.

⚠ DANGER

Carbon monoxide (CO) can cause brain damage or death. Engine and generator exhaust contains odorless and colorless carbon monoxide gas. Carbon monoxide will be around the back of the boat when engines or generators are running. Signs of carbon monoxide poisoning include nausea, headache, dizziness, drowsiness, and lack of consciousness. Get fresh air if anyone shows signs of carbon monoxide poisoning. See Manufacturer's manual for information regarding carbon monoxide poisoning.

⚠ WARNING

Operating, servicing and maintaining a recreational marine vessel can expose you to chemicals including engine exhaust, carbon monoxide, phthalates, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, service your vessel in a well-ventilated area and wear gloves or wash your hands frequently when servicing this vessel. For more information go to: www.P65warnings.ca.gov/marine.

FUEL SYSTEMS

Boats manufactured for use in California for model year 2018 and after meet the California EVAP Emissions regulation for spark-ignition marine watercraft. Boats meeting this requirement will have a label affixed near the helm.

The fuel system in boats marketed in states other than California comply with U.S. EPA mandated evaporative emission standards at time of manufacture using certified components.

Nautical Terminology

It is important that you understand, learn and use appropriate and common nautical terminology while boating to ensure your safety and the safety of others.

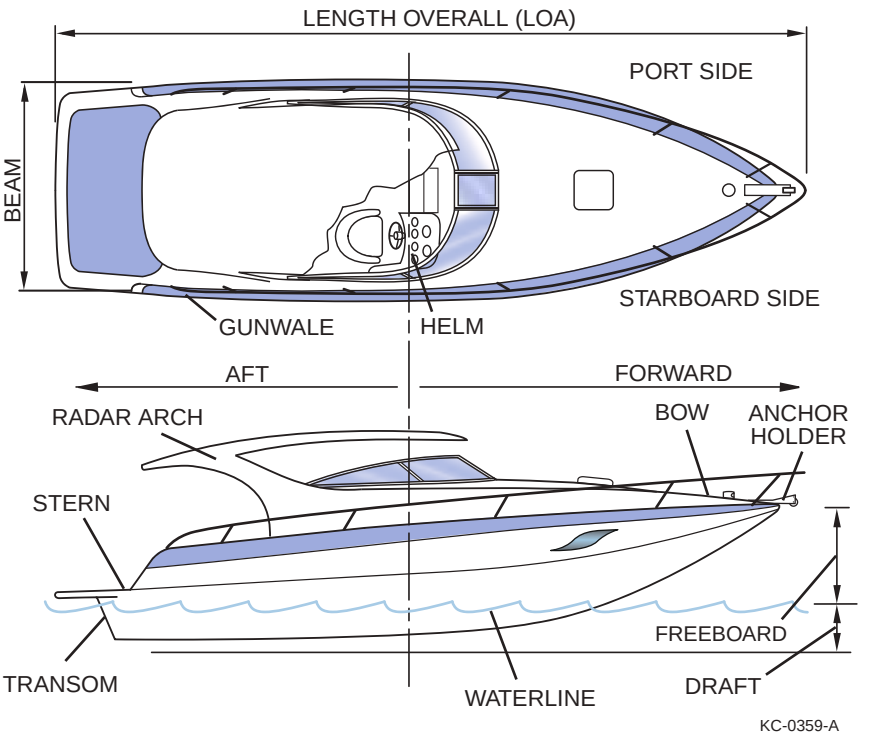

Figure 1-3

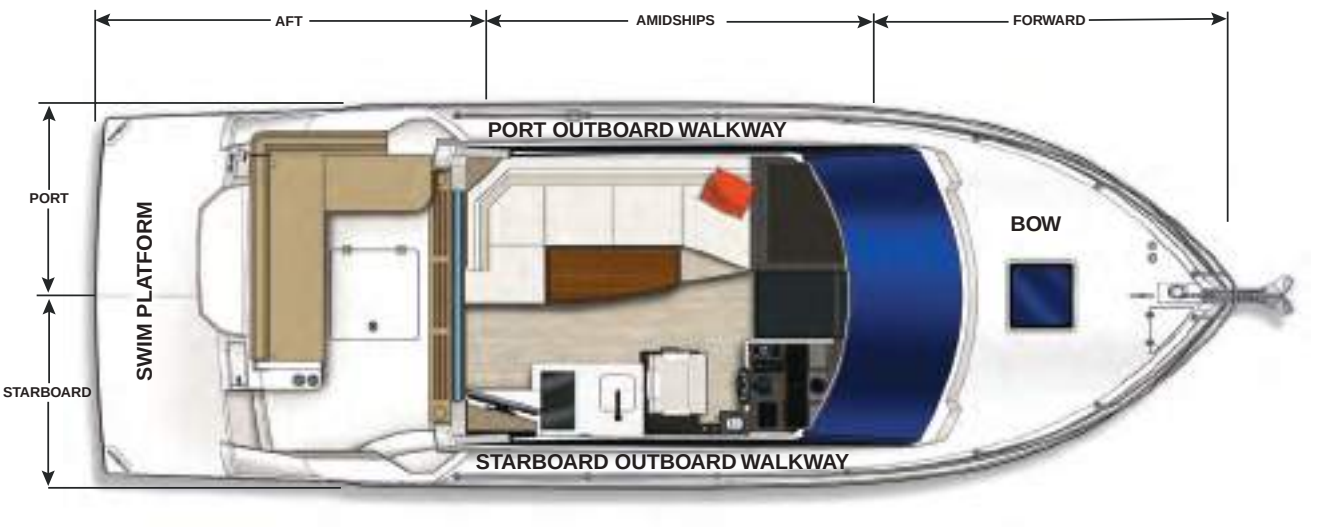

Figure 1-4

EXPLANATION OF NAUTICAL TERMS

TERM	EXPLANATION
ABOARD	On or in the boat
ABYC	American Boat and Yacht Council, Inc.
AC CONTROL CENTER	Alternating circuit breaker panel that controls the alternating current components onboard
AFLOAT	On the water
AFT	The stern or rear of the boat
AGROUND	Touching bottom
AMIDSHIPS	An area midway between the bow (front) and stern (back)
ANCHOR	(1) An iron casting shaped to grip the lake bottom to hold the boat (2) The act of setting the anchor
ASHORE	On the shore
ASTERN	Toward the stern
BAIL	To remove water from the bottom of the boat with a pump, bucket, sponge, etc.
BAITWELL	A miniature livewell used to store and keep live bait alive and healthy
BEAM	The widest point on the boat
BEARING	Relative position or direction of an object from the boat
BERTH	Sleeping quarters of the yacht
BILGE	The lowest interior area of a hull
BILGE PUMP	A pump intended for removal of water that has collected in the hull
BOARDING	To enter the boat
BOUNDARY WATERS	A body of water between two areas of jurisdiction; i.e., a river between two states.
BOW	The front end of the boat
BULKHEADS	The interior walls of a boat
BUNKS	Carpeted trailer hull supports
BURDENED BOAT	Term for the boat that must "give-way" to boats with the right-of-way
CABIN	The enclosed area of the yacht's main level
CABLEMASTER	Powered retractor for shore power cord
CAPSIZE	To turn over

TERM	EXPLANATION
CAST-OFF	To unfasten mooring lines in preparation for departure
CENTER LINE	A lengthwise imaginary line which runs fore and aft with the boat's keel
CHINE	The point on a boat where the side intersects (meets) the bottom
CIRCUIT BREAKER	A device used to interrupt an electrical circuit when the current flow exceeds a predetermined level
CLEAT	A deck fitting with ears to which lines are fastened
COCKPIT	The exposed AFT deck area
COMPANIONWAY	A passageway within the vessel
COMPARTMENTS	Isolated space within the vessel, normally prefaced with its intended use
CONSOLE	Also called helm. The steering wheel area of the boat
CRANKING BATTERY	The main battery used for engine starting and electrical circuits
CURRENT	Water moving in a horizontal direction
DC CONTROL CENTER	Direct current circuit breaker panel that controls the direct current components onboard
DINETTE	The dining area on the yacht
DRAFT	The depth of the boat below the waterline, measured vertically to the lowest part of the hull
ELECTROLYSIS	The breakup of metals due to the effects of galvanic corrosion
ENGINE ROOM	Lower control room of the yacht; housing the engines, control panels, seacocks, and other parts
ENGINE ROOM HATCH	Hatch or cover of the engine room, located in the cockpit
FATHOM	Unit of depth or measure; 1 fathom equals 6 feet
FENDERS	Objects placed alongside the boat for cushioning, sometimes called bumpers
FORE	Toward the front or bow of the boat, opposite the aft
FREEBOARD	The distance from the water to the gunwale
GALLEY	The kitchen area of a boat
GIVE-WAY BOAT	(1) Term for the boat that must take whatever action necessary to keep well clear of the boat with the right-of-way in meeting or crossing situations 2) The burdened boat
GUNWALE	The rail or upper edge of a boat's side
HATCHES	Cover on hatchways or access holes
HATCHWAYS	Access ways through decks

TERM	EXPLANATION
HEAD	A toilet
HELM	Control area to operate and steer the boat
HULL	The main lower body of a boat
HULL BREACH	A hole or puncture in the hull of the boat that can allow water to leak in
HYPOTHERMIA	A physical condition where the body loses heat faster than it can produce it
KEEL	The lowest portion of the boat; extends fore and aft along the boat's bottom
LAZARETTE	Storage compartment at the stern of the vessel
LIFE JACKET	A buoyant, wearable jacket that, when properly used, will support a person in the water; also see PFD
LIST	Leaning or tilt of a boat toward the side
LOCKER	A storage place, or closet
MAIN DECK	The main level of the yacht
MAKING WAY	Making progress through the water
MARINE CHART	Seagoing maps showing depths, buoys, navigation aids, etc.
MASTER DISCONNECT SWITCHES	Switches that turn ON or cut OFF the flow of electricity to various locations on the yacht
MOORING	An anchor, chain or similar device that holds a boat in one location
NAVIGATION AID	Recognizable objects on land or sea such as buoys, towers or lights that are used to fix position to identify safe and unsafe waters
NAVIGATION LIGHTS	A set of red, green and white lights that all vessels must illuminate between dusk and dawn
NMMA	National Marine Manufacturers Association
NO-WAKE SPEED	The speed at which a boat travels to produce an imperceptible wake
PFD	A buoyant personal flotation device used to support a person in the water; also see Life Jacket
PORT	Standing in AFT, facing forward, PORT is the left side of a boat
PORTHOLE	Circular window used on the hull to admit light and air
PRIVILEGED BOAT	Term used for the boat with the right-of-way
RIGHT-OF-WAY	Term for the boat that has priority in meeting or crossing situations. The stand-on or privileged boat.
RODE	Anchor rope or chain.

TERM	EXPLANATION
RULES OF THE ROAD	The nautical traffic rules for preventing collisions on the water
SALON	The main social cabin on a vessel, usually the largest area
SEACOCK	A shut-off valve on a plumbing or drain pipe between the vessel's interior and the sea
SHORE POWER	Alternating electrical current power that is generated from shore
SOLE	Floor within the living area of the vessel
STAND-ON BOAT	Term for the boat that must maintain course and speed in meeting or crossing situations. The privileged boat.
STARBOARD	Standing in AFT, facing forward, the right side of the vessel
STATEROOM	The sleeping quarters onboard
STERN	The back of a boat
STOW	To pack the cargo
TRANSOM	Vertical hull structure at the extreme AFT of the vessel
TRIM	Fore to the aft and side to side balance of the boat when loaded
TRIM FORE and AFT	Angle of the vessel as it relates to the level with the world
UNDERWAY	Movement; usually referring to a vessel proceeding forward
USCG	United States Coast Guard
VISUAL DISTRESS SIGNAL	A device used to signal the need for assistance such as flags, lights and flares
WAKE	The waves that a boat leaves behind when moving through the water
WATERLINE	The line of the water on the hull when the vessel is afloat
WATERWAY	A navigable body of water
WINDLASS	A device used to raise and lower the anchor

Table 1-3 – Explanation of Nautical Terms

Basic Locations

Figure 1-5

Resources

Use these resources for reference and contact information concerning safe boating, navigational rules and other boating topics. Or refer to your local governing body for regulations.

PUBLICATIONS

- Bottomley, Tom. *Boatman's Handbook.* Hearst Marine Book. Morrow
- Brotherton, Miner. *Twelve Volt Bible*. Seven Seas
- Chapman, Charles F. and Maloney, E.S. *Chapman's Piloting, Seamanship and Small Boat Handling*. Hearst Marine Book. Morrow
- Damford, Don. *Anchoring*. Seven Seas
- National Fire Protection Association. *Fire Protection Standard for Pleasure and Commercial Motor Craft*. National Fire Protection Association
- Strahm, Virgil. *Does Your Fiberglass Boat Need Repair?* Strahm
- United States Coast Guard. *Navigational Rules for U.S. Waterways.* United States Coast Guard.
- United States Coast Guard Auxiliary. *Boating Skills and Seamanship, Fourteenth Edition*. United States Coast Guard
- Whiting, John and Bottomley, Tom. *Chapman's Log and Owner's Manual.* Hearst Marine Book

USA ORGANIZATIONS

American Boat & Yacht Council

http://abycinc.org

American Red Cross

http://www.redcross.org

Boat Owners Association of The United States

http://www.boatus.com

BoatU.S. Foundation for Boating Safety

http://www.boatus.org

Phone: 800-336-BOAT (In Virginia, call 800-245-BOAT)

National Association of State Boating Law Administrators

http://www.nasbla.org

National Marine Manufacturers Association

http://www.nmma.org

National Safe Boating Council Inc.

http://www.safeboatingcouncil.org

National Weather Service

http://www.weather.gov

Sea Tow Services International, Inc.

http://www.seatow.com

Phone: 800-4SEATOW (800-473-2869)

U.S. Coast Guard

http://www.uscgboating.org

To contact the U.S. Coast Guard for an emergency while on the water, always use your on-board VHF-FM radio Channel 16. Use cell phones only as a secondary means of communication. Call 911 to reach rescue personnel.

U.S. Coast Guard Auxiliary

http://nws.cgaux.org

Phone: 877-875-6296

U.S. Coast Guard Auxiliary – Float Plan Central

http://floatplancentral.cgaux.org

U.S. Coast Guard Navigation Center

http://www.navcen.uscg.gov

U.S. Coast Guard Office of Boating Safety

http://www.uscgboating.org

U.S. Coast Guard National Response Center

Anyone witnessing an oil spill, chemical release or maritime security incident should call the National Response Center hotline: 1-800-424-8802.

U.S. Coast Guard's America's Waterway Watch

America's Waterway Watch is program for recreational boaters to assist the U.S. Department of Homeland Security in reporting suspicious activity on U.S. waterways.

Phone: 877-24-WATCH (877-249-2824)

U.S. Government Printing Office

The Government Printing Office provides information and documentation on FCC rules and regulations and Skippers Course information, and other government, marine and nautical related documents.

http://www.gpo.gov

U.S. Power Squadrons

http://www.usps.org

Phone: 888-367-8777

NOTES

YACHTING SAFETY

2

⚠ WARNING

Read and understand this Owner's Manual and all OEM information supplied in the Owner's Information Kit. As a yacht owner, you must understand all safety information responsibilities, regulations, controls and operating instructions before attempting to operate your yacht. Improper operation can be extremely dangerous and/or fatal.

The safety content and precautions listed in this Owner's Manual and on the yacht are not all-inclusive. If a procedure, method, tool or part is not specifically recommended, you must feel confident that it is safe for you and others, and that your yacht will not be damaged or become unsafe as a result of your decision. Remember – always use common sense when boating!

Safety Definitions

There is no substitute for common sense and careful practices. Improper practices or carelessness can cause burns, cuts, mutilation, asphyxiation, other bodily injury or death. This information contains general safety precautions and guidelines that must be followed to reduce risk to personal safety. Special safety precautions are listed in specific procedures. Read and understand all of the safety precautions before operation or performing repairs or maintenance.

This safety alert symbol appears with most safety statements. It means attention, become alert, your safety is involved! Please read and abide by the message that follows the safety alert symbol.

⚠ DANGER

Indicates an imminently hazardous situation that if not avoided, *will* result in death or serious injury.

⚠ WARNING

Indicates a potentially hazardous situation that if not avoided, *could* result in death or serious injury.

⚠ CAUTION

Indicates a potentially hazardous situation that if not avoided, *may* result in minor or moderate injury or property damage.

NOTICE

Indicates information considered important, but not hazard-related.

NOTE: Indicates a procedure, practice or condition that should be followed in order for the engine or component to function in the manner intended.

Warning Labels

Your yacht and its equipment are affixed with various warning labels at the time of manufacture. These labels appear in specific locations on the yacht and on equipment where safety is of particular concern. It is important to read, understand and obey all warning labels. Warning labels must remain legible. If you suspect a warning label is missing or one becomes damaged, contact your dealer for immediate replacement.

NOTE: Label placement is accurate at the time of printing.

Label Placement

NOTE: All surfaces must be cleaned with alcohol before applying labels.

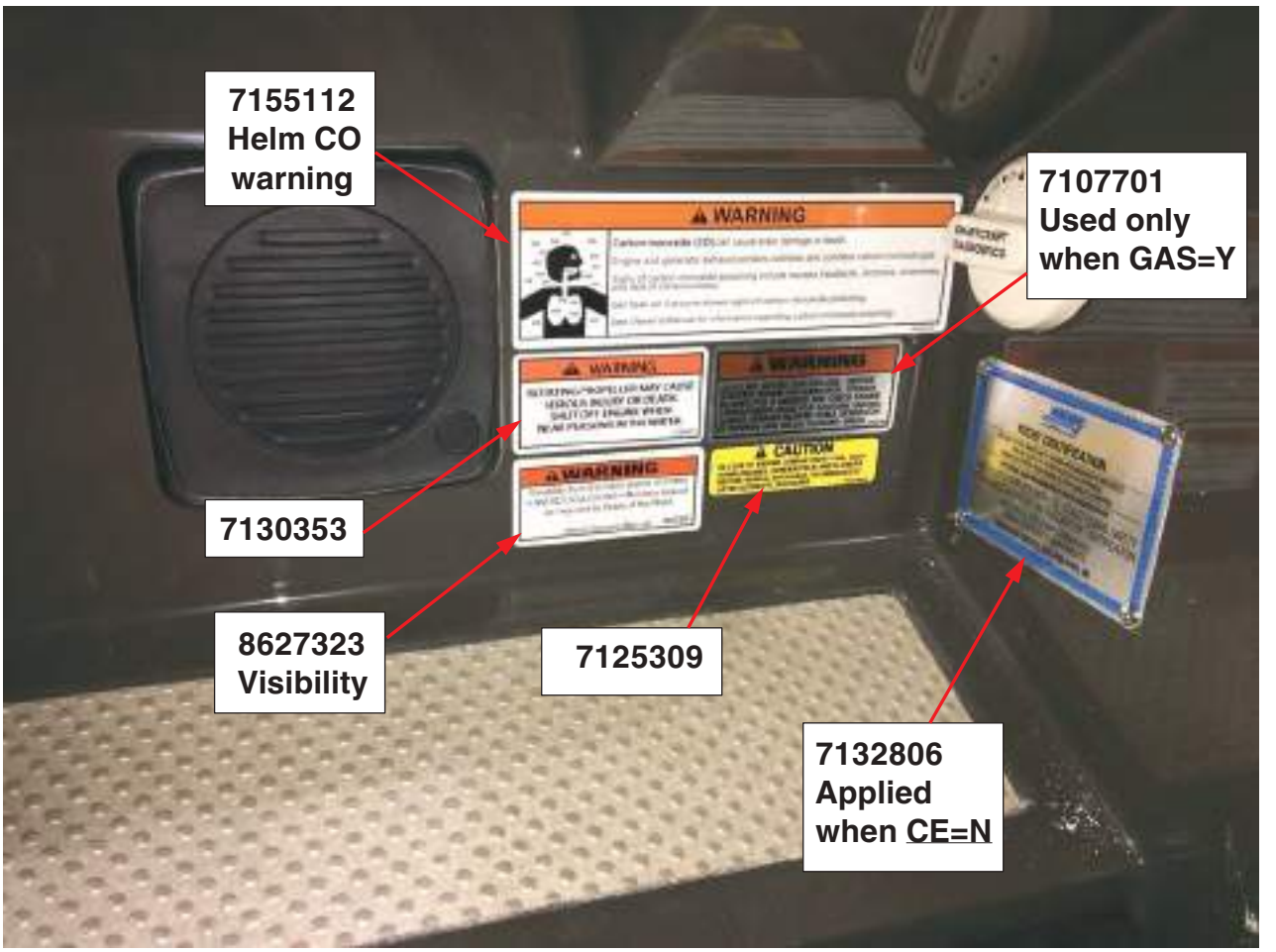

Figure 2-1 – Label Placement at Helm

SAFETY WARNING AND INFORMATIONAL LABELS

Figure 2-2 – Helm

Figure 2-3 – Helm

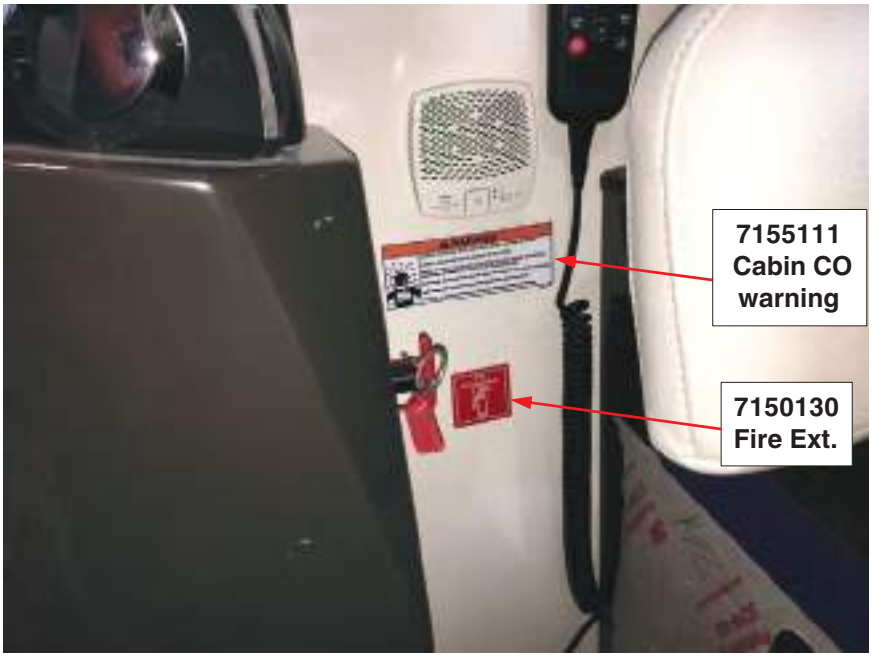

Figure 2-4 – CO and Fire Extinguisher Labels Place din Salon Area

Figure 2-5 – Fire Extinguisher Lable Placed in Cockpit When Transom Grill=Y

Figure 2-6 – Labels Placed at AC Panel

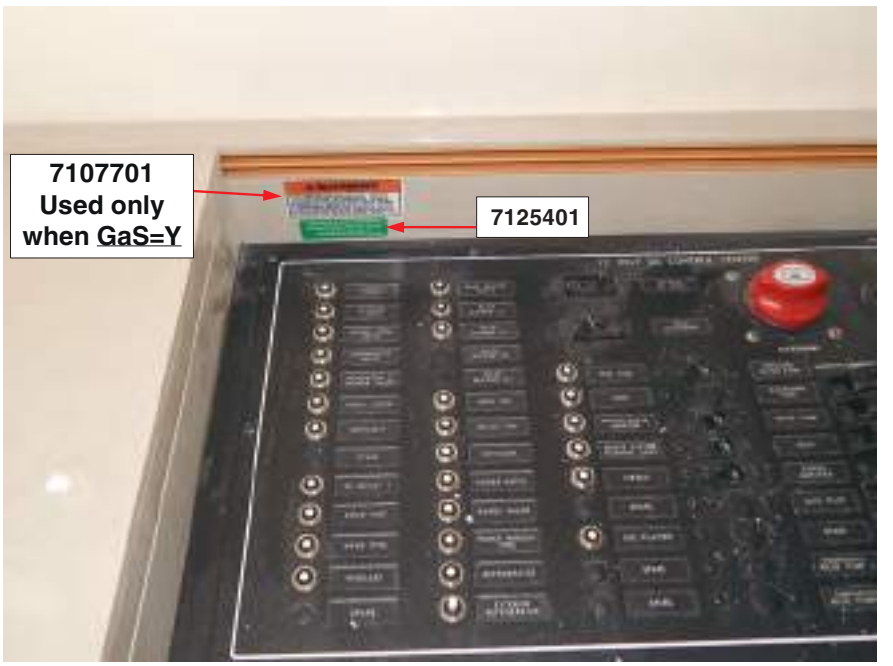

Figure 2-7 – Labels Required at 12V Panel

Figure 2-8 – Labels Placed on Underside of Engine Room Hatch

Figure 2-9 – Labels Placed on Outside of Cabin Door

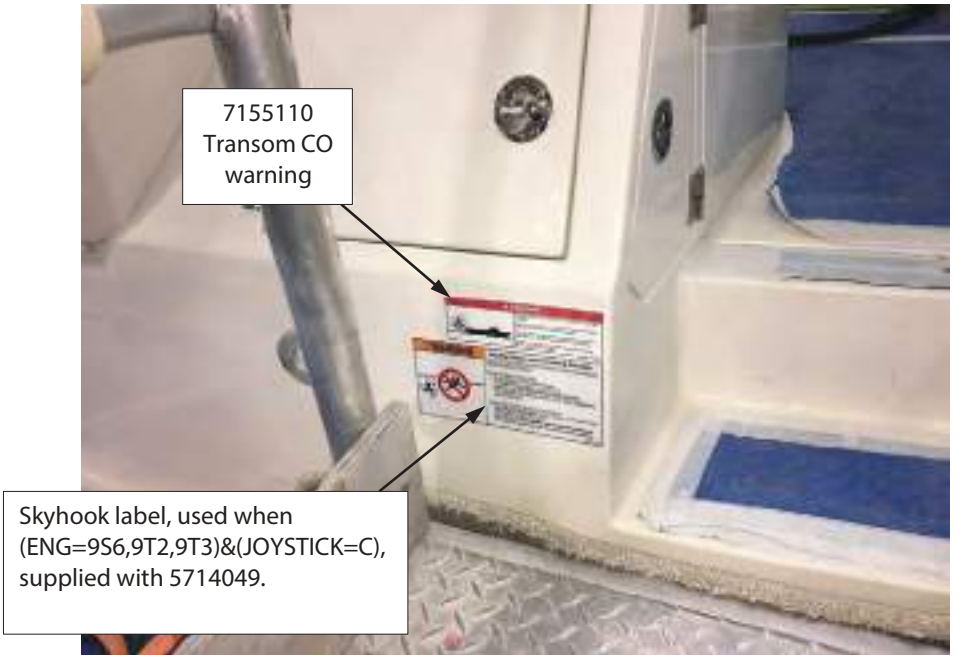

Figure 2-10 – Labels Placed on Transom

Figure 2-11 – Caution Label at Water Fill Deck Plate

Figure 2-12 – Label Applied to Swim Platform, Just Above Swim Ladder

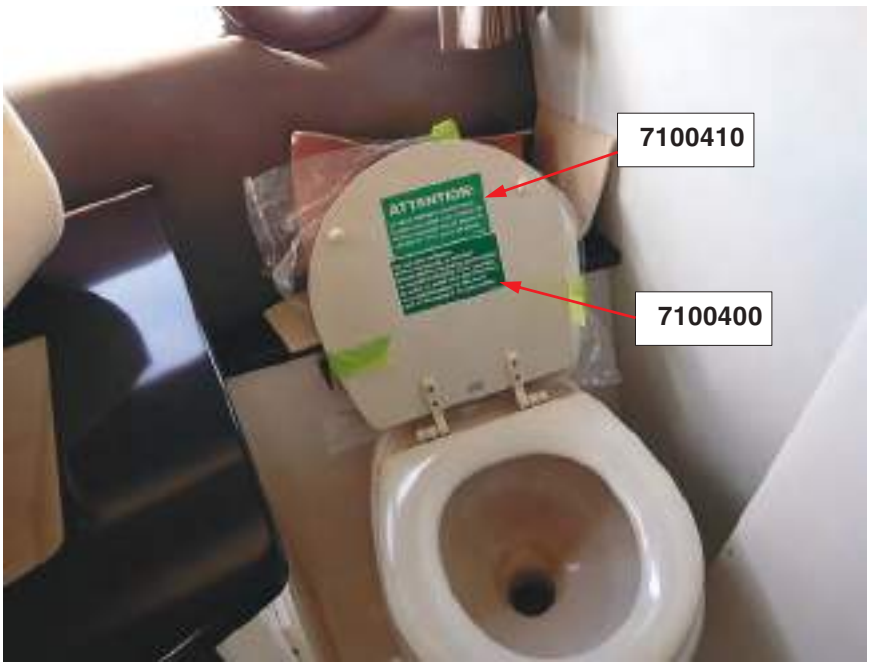

Figure 2-13 – Labels Applied to Underside of Toilet Seat Cover

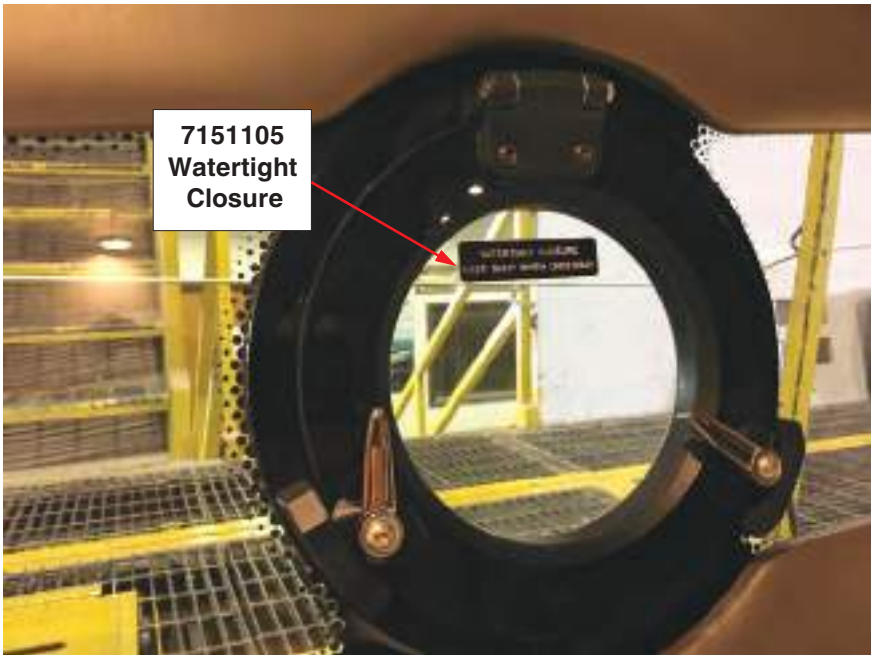

Figure 2-14 – Label Required on all Opening Port Holes

Figure 2-15 – Warning Label

Figure 2-16 – Warning Label Gets Wrapped ARound Dockside Cord

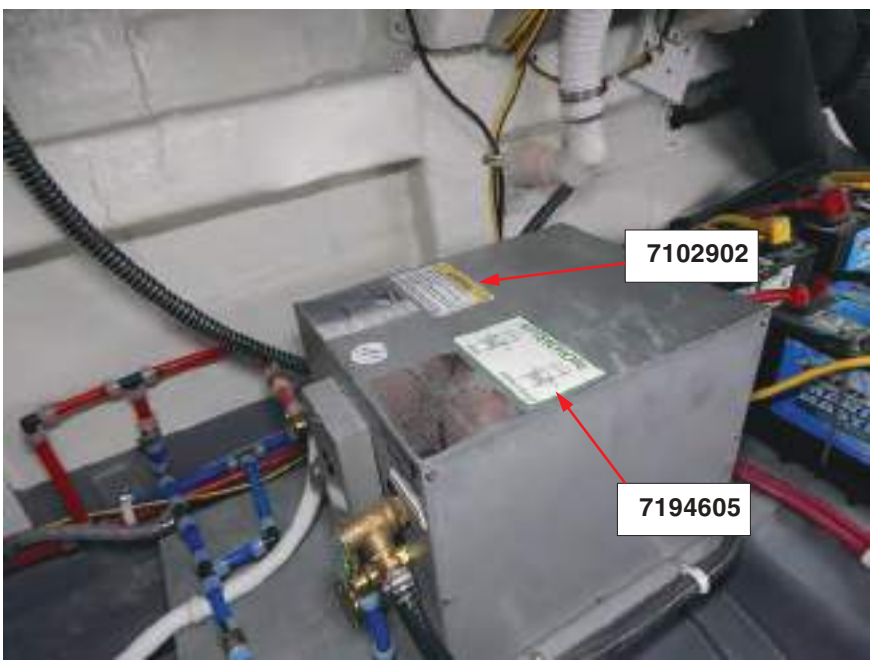

Figure 2-17 – Labels Applied to Top of Water Heater

Yachting Safety

Yachting safety is your responsibility. Fully understand the operating procedures and safety precautions outlined in the Owner's Information Kit and this Owner's Manual before operating the yacht. Safe yachting is no accident.

As a yacht owner, you are responsible for your own safety, as well as that of your passengers and other boaters.

⚠ WARNING

Rotating propeller may cause serious injury or death.

- **Shut off engine when near persons in the water.**
- **Do not approach or use ladder when engine is running.**

⚠ WARNING

Avoid serious injury or death from fire or explosion resulting from leaking fuel. Inspect system for leaks at least once a year.

⚠ WARNING

Avoid personal injury. Stay inside deck rails (and gates) in designated seating areas when boat is underway.

⚠ WARNING

Compartments for fuel, flammable liquids or gases must be properly ventilated to prevent explosive vapors to accumulate. Most vapors are heavier than air and if not in a vapor-tight locker vented overboard, will accumulate in the bilge posing a fire and explosion hazard.

⚠ DANGER

Docks and boats can carry sources of electricity. Faulty wiring or the use of damaged electrical cords, and other devices not approved as "shore or marine rated", can cause the surrounding water source to become energized from electricity leakage. Never enter the water or swim in a marina. Failure to do so may cause severe injury or death.

Safety and Training

There is a vast amount of recreational boating regulatory, safety and training information online; much of it free. This information covers laws, aids to navigation, rules of the road, hands-on boating safety courses, vessel safety checks and much more for both novices and experienced boaters. Go to the following sites for more information:

- United States Coast Guard
  www.uscgboating.org
- United States Power Squadron
  www.usps.org
- Boat U.S. Foundation
  www.boatus.org

Drive Defensively

As the sharing mindset entrenches itself into the culture, boating has seen an influx of new, inexperienced and untrained boaters due to peer-to-peer boat sharing apps. It is increasingly probable that someone on the water "tried" boating because it looked fun to do. Many of the boat owners sharing their boat do little more than cover safety equipment, starting, stopping and docking instruction. With shares of ½ day and less, there is little time for much training let alone covering the rules of the road and navigation.

Boat sharing is in a legal gray area and is not clearly defined in maritime law. Enforcement of existing rules is nearly impossible and almost always after-the-fact. Operators should assume that the other boat operator is untrained and drive defensively. If you choose to share your boat, discuss it with your insurance agent first and consider a mandatory captain requirement.

Seating

Keep your passengers seated in the designated occupant position while underway. The boat's bow, gunwale, transom platform and seat backs are not intended for use as seats while underway.

Figure 2-18 – Designated Occupant Position

Small Vessels and Swimmers

Canoes, kayaks, paddle boards and swimming inflatables have become impulse purchases to many as it looks fun to do and prices have fallen. Most of these operators are new to the sport and have no training on rules of the road or navigation. This is further complicated by the low, thin profile that makes it difficult to see them, especially in the sun, glare and rough water. Operators should keep a close lookout for these vessels, swimmers and other watercraft. Assume that the person is untrained and give them plenty of space.

SAFE OPERATION

Boating-related accidents are generally caused by the operator's failure to follow basic safety rules or written precautions. Most accidents can be avoided if you are completely familiar with your yacht and its operation and can recognize potentially hazardous situations.

In addition to everyday safety, failure to observe safety recommendations may result in severe personal injury or death to you or to others. Use caution and common sense when operating your yacht. Do not take unnecessary chances! Failure to adhere to these warnings may result in severe injury or death to you and/or others.

Safe operation includes but is not limited to the following:

- Keep the yacht and equipment in safe operating condition. Inspect the hull, engines, safety equipment, and all yachting gear regularly. Show all passengers the location of safety equipment and explain how to use it.

NOTICE

Federal law requires the owner to provide and maintain safety equipment onboard. Consult the U.S. Coast Guard, state, and local regulations to make sure all required safety equipment is onboard. Additional equipment may be recommended for your safety and the safety of the passengers. Become aware of the safety equipment's availability and use. Check all safety equipment such as fire extinguishers, life jackets, flares, distress flags and flashlights are operable and in good condition.

- Use caution when fueling the yacht. Understand the fuel tank's capacity and fuel amount used when operating at frequently used engine speeds (RPMs).
- Store enough fuel for cruising requirements. Know the tank's cruising radius and fuel tank range. Typical tank usage is 1/3 of the supply to reach the destination, 1/3 to return, and 1/3 in reserve for changes in plans due to weather or other circumstances.
- Always keep fire-extinguishing and lifesaving equipment onboard. The safety equipment must meet regulatory standards, and should be noticeable, accessible, and in proper operating condition. Passengers onboard should know the location of the equipment and know how to use each piece of equipment.
- Keep sea cocks, cockpit drains, hull drain, and other opening/closing devices in the hull closed or open, as appropriate, to minimize the risk of flooding.
- Keep an eye on the weather. Be aware of possible changing conditions by checking local weather reports before departure. Monitor strong winds and electrical storms.
- Always keep accurate, updated charts of the chosen cruising areas. Keep backup charts if using a chart plotter.
- File a float plan with a family member, relative, friend, or other responsible person ashore before departure from port or harbor.

- Always practice safe yachting, courtesy and common sense.
- Familiarize at least one passenger onboard with the yacht's basic operation. The designated person can take over if the operator unexpectedly cannot maintain control of the yacht.
- Never allow passengers to ride anywhere other than designated seating areas.
- Ask all passengers to remain seated while the yacht is in motion.
- Never use the boarding platform or boarding ladder while either of the engines is operating. Shut off both engines before using the boarding platform or boarding ladder.
- Always maintain complete control of the yacht.
- Never overload or improperly load the yacht. See **"Load Capacity" on page 8** for instructions on maximum capacity.
- Never operate the yacht without being absolutely sure of the depth of the water. Severe injury or death may occur from striking the bottom or submerged objects.
- Always operate slowly in congested areas such as marinas and mooring areas.
- Never travel faster than conditions warrant. Never travel at speeds that you cannot handle.
- Always look before turning the yacht.
- Avoid sudden maneuvers at any speed.
- For comfort and safety, reduce speed in waves.
- Never operate the yacht in weather or sea conditions beyond your skill and experience.
- Seek shelter from open water if lightning is an imminent threat.
- Never operate the yacht while under the influence of drugs and/or alcohol.
- Never operate the yacht if you are visually impaired.
- Never store equipment containing fuel in compartments that have not been designed for this purpose.
- Before starting the engines, make sure that no people are in the engine room and that all people are in the designated working deck.
- Take the ignition keys with you when you leave the yacht to keep untrained and unauthorized persons from operating the yacht.

MAN-OVERBOARD PREVENTION

⚠ WARNING

Never allow passengers to move outside of the designated working areas while the yacht is underway. Serious injury or falling overboard can occur if the passenger is located outside of the designated working deck while underway.

The designated working deck areas contain safety rails and deck surfaces and appear in orange in **Figure 2-18**. Working deck areas help prevent people from falling overboard while underway.

Figure 2-19 – Working Deck

If Someone Falls Overboard

If someone falls into the water unexpectedly, every second counts toward preventing injury or death.

At the first sign that someone has fallen overboard, loudly yell "Man overboard!" and state the position of the person in relation to the yacht. For example, "Man overboard – port!" Assign one person to keep the victim in sight at all times.

Immediately set the engine throttle(s) at idle and place the gear controls in the NEUTRAL position.

Throw a Type IV life jacket to the victim immediately if the life jacket will be within reach of the victim. If the victim is too far away to throw a life jacket to, navigate back and throw the life jacket from a safe distance. If a Type IV life jacket is not readily available, any life jacket or floating device will suffice.

Carefully navigate back to the victim, staying at a safe distance and position to safely retrieve the victim.

Use the boarding ladder located on the transom swim platform to bring the passenger(s) safely back onboard without swamping or capsizing the yacht.

Operating the Boarding Ladder

1] Remove the anchor pin from the bracket by pushing the rungs forward, and then lift the rungs up. Pull the rungs and the entire operable portion of the boarding ladder toward you.

2] Pull the operable portion of the boarding ladder out and away from the yacht until the outer set cylinder relocates from the back to the front of the stationary bracket attached to the swim platform.

3] Pull the rungs outward and away from the yacht to extend the ladder into the water.

4] Fully extend the boarding ladder and place the set cylinder fully forward before safely climbing the ladder.

Visibility from the Helm

High trim angles of the craft and other factors may obstruct operator vision from the helm. The following variable conditions may cause an obstruction in the operator's vision from the helm:

- Propulsion unit trim angles (on craft equipped with a power trim system on the propulsion unit)
- Hull trim plane angles (on craft equipped with power-operated trim planes or trim tabs on the transom)
- Loading and load distribution
- Speed
- Rapid acceleration
- Transition from displacement mode to planing mode
- Sea conditions
- Rain and spray
- Darkness and fog
- Interior lights
- Position of tops and curtains
- People or movable gear in the operator's field of vision

The International Regulations for Preventing Collisions at Sea (COLREGs) and the "rules of the road" require maintenance of a proper lookout at all times and respect for observance of right of way. Observing these rules is essential.

Carbon Monoxide (CO)

Carbon monoxide (CO) detectors are standard equipment on your yacht.

⚠ DANGER

Always avoid exposing your passengers or yourself to carbon monoxide. Carbon monoxide gas is colorless, odorless and extremely dangerous. All engines and fuel-burning appliances produce CO as exhaust. Direct and prolonged exposure to CO will cause brain damage or death.

Never tamper with the operation of the carbon monoxide detector.

Never sleep while the engine or generator are running. People sleeping onboard can easily be overcome by carbon monoxide.

Test the carbon monoxide detector operation before each trip, at least once a week and after the yacht has been in storage. Also have the CO detectors professionally tested at regular intervals. The detectors are required to be replaced every 5 years – see the OEM manual.

Figure 2-20 – Carbon Monoxide Detector

PREVENTING CO EXPOSURE

Open a forward hatch, porthole or window to help prevent the accumulation of CO in the cabin and enclosed exterior areas. Creating air circulation allows air to travel through the interior of the yacht.

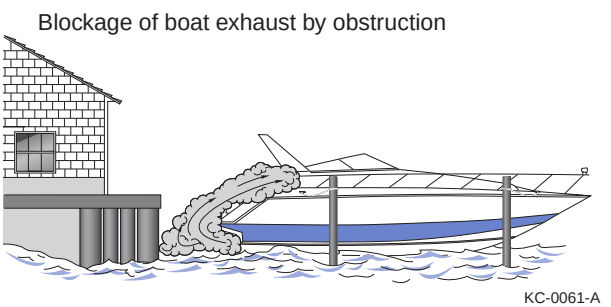

Figure 2-21

Have a trained marine technician inspect the exhaust systems when the yacht is in for service, or if the operator notices a change in the sound of an engine or the generator.

To prevent serious injury or death by asphyxiation:

- Keep the engine room hatch closed when operating the engines and generator.
- Never occupy aft lounging areas, including the boarding platform. Never swim near the engine or generator exhaust outlets while the engines or generator are running.
- Minimize the time spent getting underway. CO production is greater when the engines are cold.
- Maintain the propulsion and generator engines to optimize efficiency, which reduces CO emissions.

For more information on carbon monoxide and yachting, contact marine organizations that produce safety publications.

For information on receiving a free vessel safety check, visit contact the U.S. Coast Guard Auxiliary or United States Power Squadrons®. See **"Resources" on page 17** for contact information.

Potential Causes of CO Poisoning

Blockage of exhaust outlets can cause carbon monoxide to accumulate in the cabin and cockpit area – even when the hatches, windows, portholes, and doors are closed. See **Figure 2-21**.

⚠ WARNING

Never operate the generator while the yacht is moored against another yacht, dock, or wall structure that could block the exhaust outlet.

Exhaust traveling along obstruction

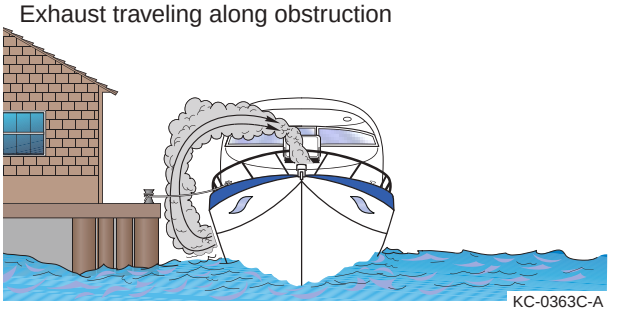

Figure 2-22

Exhaust from another vessel alongside your yacht, while docked or anchored, can emit poisonous CO gas inside the cabin and cockpit areas of your yacht. See **Figure 2-22**.

⚠ WARNING

Be alert for generator and engine exhaust from other vessels alongside your yacht. Provide adequate ventilation.

Exhaust from other vessels in confined areas

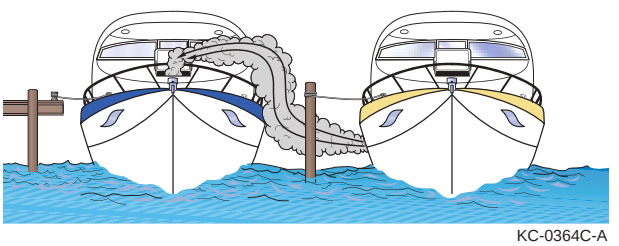

Figure 2-23

The station wagon effect or back drafting can cause CO gas to accumulate inside the cabin and cockpit areas when operating the yacht at a high bow angle or with improper or heavy loading. See **Figure 2-23**.

⚠ WARNING

Provide adequate ventilation, redistribute the load or bring your yacht out of high bow angle. Open forward hatch or window.

Operating with high bow angle

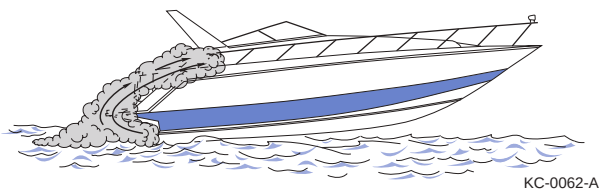

Figure 2-24

CO gas can accumulate in the cabin and cockpit areas when operating your yacht at slow speeds or when the yacht is stopped in the water. A tail wind can also increase accumulation (force of wind entering from aft section of yacht). See **Figure 2-24**.

⚠ WARNING

Provide adequate ventilation or slightly increase speed if possible. Open forward hatch or window.

Operating at slow speed or while idling

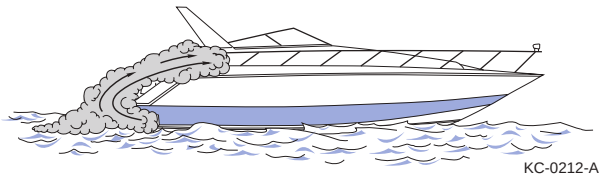

Figure 2-25

The station wagon effect or back drafting can cause CO gas to accumulate inside the cabin, under protective weather coverings or in the cockpit when the yacht is underway. See **Figure 2-25**.

⚠ WARNING

Provide adequate ventilation when the canvas top, side or back curtains are in the closed, protective positions. Open forward hatch or window.

Operating with canvas tops and side curtains in place without ventilation

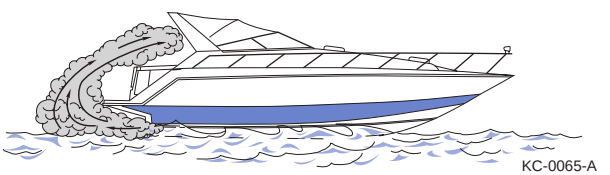

Figure 2-26

IDENTIFYING CO EXPOSURE

In high concentrations, CO can be fatal in minutes. However, the effects of lower concentrations can also be lethal. Symptoms of exposure to CO are:

- Watering and itchy eyes
- Throbbing temples
- Inability to think coherently
- Ringing in the ears
- Headache
- Incoherence/slurred speech
- Flushed appearance
- Inattentiveness
- Loss of physical coordination
- Tightness across the chest
- Drowsiness
- Nausea
- Dizziness
- Vomiting
- Fatigue
- Collapse
- Convulsions

TREATING CO EXPOSURE

If someone is possibly suffering from CO exposure, take the following actions immediately:

- Thoroughly ventilate the area if possible.
- Evacuate the area and move the affected person(s) to a fresh-air environment.
- Administer oxygen, if available.
- Get medical assistance.
- Determine the probable source of the CO and correct the condition.

Other Health and Safety Information

⚠ WARNING

A wide variety of components used on this vessel contain or emit chemicals known to the state of California to cause cancer, birth defects and other reproductive harm. Examples include:

- **Engine and generator exhaust**
- **Engine and generator fuel, and other liquids such as coolants and oil, especially used motor oil**
- **Cooking fuels**
- **Cleaners, paints and substances used for vessel repair**
- **Waste materials that result from wear of vessel components**
- **Lead from battery terminals and from other sources such as ballast or fishing sinkers**

To avoid harm:

- **Keep away from engine, generator and cooking fuel exhaust fumes.**
- **Wash areas thoroughly with soap and water after handling used engine oil.**

STABILITY AND BUOYANCY

To make sure your yacht maintains its stability and buoyancy, take note of the following:

- Any change in disposition of the masses aboard may significantly affect the stability, trim and performance of the craft.
- Keep bilge water to a minimum.
- Remember that any weight added up high reduces stability.
- In rough weather, close hatches, lockers and doorways to minimize the risk of flooding.
- Remember that stability may be reduced when towing or lifting heavy weights using a davit or boom.
- Never use air tanks that have been punctured.
- Remember that breaking waves present a serious stability hazard.

Required Safety Equipment

NOTE: The following information applies to U.S. regulations only. The information applies to the minimum on-board safety equipment requirements of the U.S. Coast Guard.

Federal law requires yacht owners to provide and maintain safety equipment onboard. Consult the U.S. Coast Guard, state, and local regulations to make sure that all the required safety equipment is onboard. It is the owner's responsibility to learn about additional recommended equipment before operating the yacht.

LIFE JACKETS

One Coast Guard–approved Type I, II, III or V wearable life jacket for each person on-board and one throwable Type IV PFD device is required.

Children and nonswimmers must always wear a life jacket when boating. All life jackets and PFDs must be in a readily accessible area and within immediate reach.

All passengers must know the location of the life jackets and how to wear and adjust them. Follow the manufacturer's instructions for proper use, care and operation of the life jacket.

YACHTING SAFETY

Boaters enjoy the feel of sun and spray so it's tempting to boat without wearing a life jacket, especially on nice days. But the failure to wear life jackets is by far the number one cause of boating fatalities!

Modern life jackets are available in a wide variety of shapes, colors, sizes and technologies. Many are thin and flexible. Some are built right into fishing vests or hunter coats. Others are inflatable as compact as a scarf or fanny pack until they hit water, when they automatically fill with air.

There's no excuse not to wear a life jacket on the water! Your boat dealer or marine store is the best source for guidance when selecting this most important piece of safety equipment.

Things to Know About Life Jackets

- Certain life jackets are designed to keep your head above water and help you remain in a position which permits proper breathing.
- To meet USCG requirements, a boat must have a USCG-approved life jacket for each person aboard. Boats 16 feet and over must have at least one Type IV throwable device as well.
- All states have regulations regarding life jacket wear by children.
- Adult-sized life jackets will not work for children. Special life jackets are available. To work correctly, a life jacket must be worn, fit snugly, and not allow the child's chin or ears to slip through.
- Life jackets can be equipped with whistles, strobe lights, handheld VHF Radios and personal locator beacons and are recommended for open water.
- Life jackets should be tested for wear and buoyancy at least once each year. Waterlogged, faded, or leaky jackets should be discarded.
- Life jackets must be properly stowed but easily accessible.
- A life jacket, especially a snug-fitting flotation coat or deck-suit style can help you survive in cold water.

Life Jackets Must Be:

- USCG-approved
- In good and serviceable condition
- Appropriately sized for the intended user
- The best lifejacket is the one you will wear

Accessibility

- Wearable lifejackets must be readily accessible.
- Boaters must be able to locate and put them on in a reasonable amount of time in an emergency.
- They should not be stowed in plastic bags, in locked or closed compartments or have other gear stowed on top of them.
- Throwable devices must be immediately available for use in emergency situations.
- Though not required, a lifejacket should be worn at all times when the vessel is underway. A lifejacket can save your life, but only if you wear it. Set the example and wear it whenever near the water!

Child Life Jacket Requirements

Some states require that children wear lifejackets at all times; check with your state boating safety authorities.

- Applies to children of specific ages
- Applies to certain sizes of boats
- Applies to specific boating operations

Child lifejacket approvals are based on the child's weight. Check the "User Weight" on the label, or the approval statement that will read something like "Approved for use on recreational boats and uninspected commercial vessels not carrying passengers for hire, by persons weighing XX lbs". They can be marked "less than 30", "30 to 50", "less than 50", or "50 to 90".

Since children grow quickly, many boat launches now feature free use of children's life jackets in several different weight categories.

Life Jacket Requirements for Certain Boating Activities Under State Laws

The USCG recommends, and many states require, wearing USCG-approved life jackets:

- For water skiing and other towed/surf activities, use a lifejacket designed for water skiing. **It is illegal in many states to participate in towed water sports without a USCG-approved life jacket. Be aware that some specialized water sports vests are NOT USCG-approved and should be worn in addition to a USCG-approved life jacket.**
- While operating personal watercraft (PWC) (use a life jacket marked for PWC or water skiing use).

Check with your state boating safety authorities. If you are boating in an area under the jurisdiction of the Army Corps of Engineers, or a federal, state, or local park authority, other rules may apply. Special local rules are usually posted at the boat launch.

Selecting the proper life jacket application type and size is important to your safety while boating. There are four application types of wearable PFDs and one type that is used only for throwing in emergency situations. Life jackets may include inherently buoyant designs (do not require inflation) or inflatable (manual and manual with automatic backup). Life jacket sizes generally correspond to chest size and weight.

Type I Life Jacket

This life jacket is designed so that the person wearing it turns to a face-up position when conscious or unconscious. Type I life jackets are the most buoyant and are effective on all waters, especially when rescue is delayed or flotation time is extended.

Figure 2-27

Type II Life Jacket

This life jacket is recommended for use in calm water near shore on most inland waters where quick rescue is likely. A Type II life jacket is similar to a Type I life jacket, but it is not as buoyant or effective in turning the wearer to a face-up position.

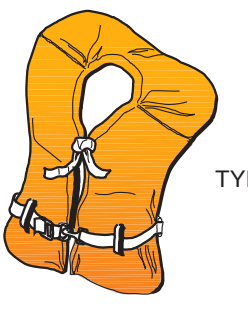

Figure 2-28

Type III Life Jacket

This life jacket is designed for personal buoyancy when the wearer is alert and conscious. Type III life jackets require users to turn themselves to a face-up position. Type III life jackets are recommended in most inland water applications where quick rescue is likely or when used in the presence of other people.

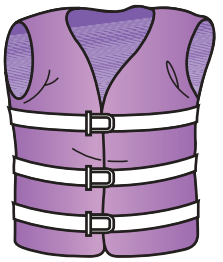

Figure 2-29

Type IV Personal Flotation Device

These PFDs are designed to be thrown to a person in the water who can grab and hold it while being rescued. Never wear a Type IV PFD.

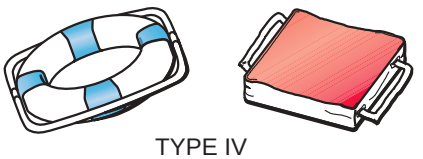

Figure 2-30

Type V Life Jacket

This life jacket is designed for special activities and may be worn instead of a Type I, II or III life jacket if used in accordance with the approval conditions on the label. If a Type V life jacket is part of the minimum on-board life jacket requirements and if it has a label that indicates "required to be worn," it must be worn at all times. Otherwise one additional Type I, II or III life jacket must be on-board to satisfy the minimum life jacket requirements. Some Type V life jackets provide increased protection against hypothermia.

Figure 2-31

VISUAL DISTRESS SIGNAL

Visual distress signal (VDS) equipment is required by the U.S. Coast Guard for all yachts operating on U.S. coastal waters. Yachts owned in the United States and operating on the high seas must also carry VDS equipment. The visual distress equipment signal must be readily accessible and in serviceable condition.

Make sure all passengers on-board understand how to operate all VDS.

VDS must be:

- USCG-approved
- In proper operating condition
- Safety stowed and in a readily accessible area and within immediate reach at all times
- Within the clearly marked expiration date stamp on the device (where applicable)

Types of VDS vary by emergency situations. VDS are classified as either pyrotechnic or non-pyrotechnic.

Approved pyrotechnic equipment includes:

- Handheld or aerial red flares
- Handheld or floating orange smoke
- Launchers for aerial red meteors or parachute flares

Approved non-pyrotechnic equipment includes:

- Orange distress flag
- Dye markers
- Electric distress light

No single signaling device is ideal under all conditions. Carrying a variety of visual distress signal equipment onboard is important. Select devices with packaging that children ONLY will find difficult to open, especially if children are onboard.

NOTE: Some pyrotechnics may be restricted on certain bodies of water. Check with local authorities, or visit the National Association of State Boating Law Administrators (NASBLA) or the U.S. Coast Guard websites for more information. See "Resources" on page 17 for contact information.

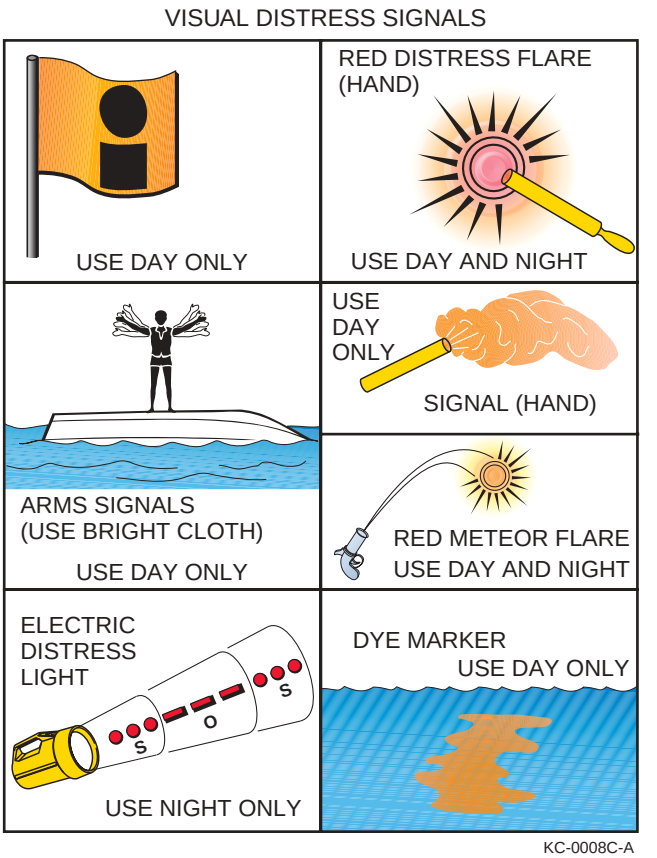

Figure 2-32

AUDIBLE DISTRESS SIGNALING DEVICE

Every yacht must be equipped with an operable device that can produce a sound signal if conditions require. Your yacht has one bell and one whistle. The devices meet the COLREG Rules Act of 1972 requirements.

Make sure all passengers understand how to operate all audible distress signaling devices on-board. Keep these devices in a readily accessible area and within immediate reach at all times when boating.

For usage information, see **"Audible Distress Signaling Device" on page 43**.

RUNNING AND NAVIGATION LIGHTS

- Turn on running and navigation lights for safe operation after dark and in reduced-visibility conditions.
- Observe all navigation rules for meeting and passing.
- Never run at high speeds during night operation.
- Always use common sense and good judgment while cruising at night.

For additional information, see **"Navigation Lights and Night Operation" on page 56**.

FIRE EXTINGUISHERS

Fire extinguishers must be approved by the U.S. Coast Guard. The U.S. Coast Guard classifies fire extinguishers by the type of fire the extinguisher can extinguish, such as foam, carbon dioxide, chemical, and halon.

For yachts not exceeding 65 ft (19.8 m), the yacht has a fixed fire extinguishing system approved by the U.S. Coast Guard. Install either two Type B-I extinguishers or one Type B-II extinguisher onboard.

Mount all handheld fire extinguishers in a readily accessible location away from the engine room and other combustible devices. Make sure all people onboard know where the fire extinguishers are and how to operate them. Follow the fire extinguisher manufacturer's instructions for proper use and operation of the fire extinguisher.

Check and maintain the fire-extinguishing equipment in accordance with the manufacturer's recommendations. Replace fire-fighting equipment if it is expired, damaged, not properly pressurized, or discharged. Be sure to replace fire-fighting equipment with devices of identical or greater capacity.

If the fire extinguisher has a charge indicator gauge, cold or hot weather may affect the gauge reading. Consult the fire extinguisher manufacturer's manual to determine the accuracy of the gauge.

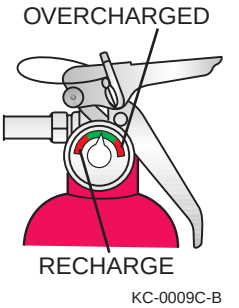

Figure 2-33

RADAR REFLECTORS

If you cruise in open water at night or in inclement weather we recommend installing radar reflectors; especially when in shipping lanes. Radar reflectors increase the signature of the boat on radar. We suggest at least two reflectors measuring 18" (46 cm) or more diagonally. There are several types of reflectors to choose from; your boat dealer can help you. Mount the reflectors as high as possible above the waterline; one forward, one aft for 360° coverage. Mounts are available for both surface and rail mounting.

Having radar reflectors increases your visibility but is not a substitute for an active watch.

Figure 2-34

GLOBAL MARITIME DISTRESS AND SAFETY SYSTEM (GMDSS)

GMDSS, originally developed for international commercial ships, increases safety and reduces Search and Rescue (SAR) efforts by standardizing procedures and integrating several new and old technologies. Although recreational boats do not need to comply with GMDSS, some GMDSS technologies are available to recreational boaters to increase safety, particularly in shipping lanes and offshore in open waters. Components of interest to recreational boaters are as follows:

- Digital Selective Calling (DSC) on select VHF marine radios (VHF-DSC)
- Emergency Position Indicating Radio Beacon (EPIRB) stand-alone units
- Automatic Identification System (AIS) integrated into various electronics
- Global Positioning System (GPS) stand-alone or integrated into various electronics such as a chartplotter utilizing Electronic Nautical Charts (ENCs)

For more information on GMDSS, go to: www.navcen.uscg.gov. Your boat dealer is the best source to use for making an informed decision on adding or integrating safety systems in your boat.

VERY HIGH FREQUENCY (VHF) RADIO

The VHF radio is used to communicate with others, on and off the water. VHF Channel 16 (156.8 MHz) is designated as the International Distress, Safety & Calling channel and is used to summon rescue services such as the USCG, and, initial contact with Ports, Marinas, Bridges, Locks and other boaters in the area.

In emergency situations, when lives are in danger, use the VHF radio Channel 16 (or 2182 kHz SSB); cell phones should only be used as a secondary means of communication. There are three emergency procedure words:

- **MAYDAY radio call** – A Mayday call is reserved for life-threatening situations such as fire, severe weather or sinking where lives are in imminent danger or the vessel is in danger of sinking. Start the broadcast clearly and calmly with ***"Mayday – Mayday – Mayday."***
- **PAN-PAN (pahn-pahn) radio call** – A Pan call is used for urgent but non-life-threatening situations where there is no immediate danger to lives or the vessel such as a loss of steering control or taking-on water of any amount. Start the broadcast clearly and calmly with ***"Pan – Pan – Pan."***
- **Security (se-cure-ih-tay) call** – A Security call is used for non-life-threatening situations to notify authorities and others in the vicinity of important navigation and weather alert calls. Start the broadcast clearly and calmly with ***"Security – Security – Security."***

In an emergency situation there are four important pieces of information that the responder needs to know:

- The exact nature of the emergency and an assessment of the severity
- Number of people onboard
- Your location (navigation marker, visual reference or GPS coordinates in open water)
- What your vessel looks like (hull & top colors, unique features, flags, etc.)

The responder may then ask you for other information to help you. It is important to remain calm, speak slowly and be succinct. Short and concise communications are best – no matter what the situation is.

Recommended Safety Equipment

In addition to the required equipment, it is recommended to carry and know how to use the following equipment as an extra safety precaution:

- Take note of safety equipment that requires periodic service or replacement such as expiration dates on flares, service dates on CO monitors, battery replacement dates on EPIRBs, etc.
- As captain of the boat you have ultimate responsibility and authority. Instruct passengers to heed your requests and tell them how to respond.

	INLAND LAKES & RIVERS	COASTAL & ICW WATERS	GREAT LAKES & OCEAN WATERS
Cell phone with waterproof case & lanyard	•	•	•
Mobile device power pack (battery)		•	•
Solar USB charger & cables	•	•	•
Night vision thermal imaging device such as FLIR		•	•
EPIRB (Emergency Position Indicating Radio Beacon)		•	•
PLB (Personal Locator Beacons)			•
Handheld waterproof GPS			•
Handheld waterproof VHF radio			•
Handheld waterproof compass			•
Handheld waterproof two-way radios			•
SATCOM (Satellite Communications) device for automatic GPS coordinate updates		•	•
Ditch kit		•	•
Dry bag	•	•	•
Survival Suit			•
Mirror, whistle and strobe light	•	•	•
Life ring throwable PFD	•	•	•
Foul weather gear & thermal clothing		•	•
Throw raft with oars		•	•
Spare keys/FOBs	•	•	•
First aid kit and manual/app	•	•	•
Emergency food & water for 3 days minimum in open water			•
Ring buoy			•
Spare anchor and 150 feet (46 m) of 5/8" anchor line		•	•
Sea anchor		•	•
Heaving, mooring and towing lines	•	•	•
Fenders & boat hook	•	•	•
Waterproof flashlight, radio and spare batteries		•	•
Radar reflector			•
Sunscreen, insect repellent & sunglasses	•	•	•
Navigational charts		•	•
Binoculars	•	•	•
Tool kit including propeller replacement tools	•	•	•
Sharp, folding pocket knife	•	•	•
Spare propellers & hardware, one each RH and LH rotation		•	•
Spare parts: pumps, belts, filters		•	•
Bung plugs for each thru-hull port size		•	•

	INLAND LAKES & RIVERS	COASTAL & ICW WATERS	GREAT LAKES & OCEAN WATERS
Crash pump (bilge suction line with valve connected to engine raw water pump intake)			•
Duct & electrical tape	•	•	•
Engine oil	•	•	•
Extra transom plugs	•	•	•
Selection of in-line fuses as required	•	•	•

State and Local Ordinances

States or localities may have laws limiting speed, noise or the yacht's wake. Check with the local harbormaster to determine whether or not local ordinances or state laws restrict yachting operations. Check with state and local authorities to confirm your compliance with local regulations on marine sanitation, noise, speed and wake.

Pre-Departure Actions

The following pre-departure actions are essential to safe boating. Perform these actions before starting the engine or getting under way every time you operate your yacht so they become routine.

Never launch the yacht or leave the safety of the dock if any problem is found during the pre-departure safety check. A problem could lead to an accident during the outing. Have any problems corrected before proceeding.

- Check the weather reports for hazardous conditions and seas that could negatively affect your outing.
- Make sure all safety equipment is onboard, accessible, and in good working condition.
- Check the bilge for fuel vapor or water. Ventilate or pump out the bilge as necessary.
- Make sure the horn, navigation equipment, and lights work properly.
- Make sure all passengers are aware of safety and operational matters.
- File a float plan.
- Check engine oil, transmission oil and coolant levels.
- Be sure no people or obstacles are near the propeller.
- After starting the engines, check:
  - The overboard flow of cooling water
  - Engine temperatures
  - Oil pressures
- Fill the fuel tanks as needed. Know the tank capacity and fuel consumption at various RPMs. Know the tank's cruising radius and fuel tank range. Typical tank usage is 1/3 of the supply to reach the destination, 1/3 of the supply to return, and 1/3 in reserve for changes in plans due to weather or other circumstances.
- Designate a secondary person onboard who can operate the yacht in case the primary operator suddenly becomes disabled.

3 OWNER/ OPERATOR RESPONSIBILITIES

Registration

The USCG requires that all yachts operated on the navigable waters of the United States be currently registered in the state in which they are principally used. Many states require current registration in that state whenever operating on waters within their state boundary. Always contact your state boating authorities (and authorities in neighboring states) for registration information on yachts.

Registration numbers must be current and clearly displayed on the yacht according to the defined regulations. Registration certificates must be current and on-board at all times.

State and local authorities may require additional registration for yachting on certain waterways. Check with state and local authorities for additional registration information.

For more information, visit the U.S. Coast Guard Office of Boating Safety and the National Association of State Boating Law websites. See **“Resources” on page 17** for website addresses.

Insurance

As a yacht owner, you are legally responsible for any damage or injury caused when you or someone else is operating your yacht when an accident or collision occurs. Individual states have laws detailing minimum insurance requirements. Contact your insurance agent to verify the type of insurance you need before operating your new yacht.

Domestic Safe Yachting Courses

This manual does not provide complete training on all aspects of yachting safety, operation or regulations. Your local U.S. Coast Guard Auxiliary and the U.S. Power Squadrons offer comprehensive safe yachting classes several times per year. Visit the Boat U.S. Foundation website. For a course schedule in your area, contact your local U.S. Coast Guard Auxiliary or Power Squadron Flotilla for the class schedule and location. See **“Resources” on page 17** for website addresses.

Reading Chapman Piloting's *Seamanship and Small Boat Handling* is recommended for further information on handling the yacht in various situations.

Yachting Regulations

The owner's responsibility includes making sure that the yacht complies with all federal, state and local regulations. Check with your local U.S. Coast Guard office for relevant federal regulations. Your state's Department of Natural Resources may have some publications available that deal with relevant state laws. Be aware of local environmental laws and respect codes of good practice.

Voluntary Inspections

The U.S. Coast Guard Auxiliaries or state yachting officials offer courtesy inspections in many states to make sure that all yachts comply with safety standards and that the required safety equipment is onboard. After a voluntary inspection, the yachter has time to make corrections without prosecution. Check with the appropriate state agency or the U.S. Coast Guard Auxiliary for details.

Operation by Minors

Minors must always be supervised by an adult whenever operating a yacht. Many states have laws regarding the minimum age and licensing requirements of minors. Regulations may vary from state to state. Contact your local and state boating authorities for specific information.

Drugs and Alcohol

⚠ WARNING

Never operate the yacht under the influence of alcohol or other drugs. Federal and state law prohibit operating a yacht under the influence of alcohol or other drugs. Authorities actively enforce these regulations.

Drugs and alcohol adversely affect a person's ability to make sound judgments, react quickly, and operate a yacht safely. Responsible yachters should avoid using drugs or alcohol while operating the yacht. Operating a motorized yacht while under the influence of drugs or alcohol can result in bodily injury and death and carries a significant penalty.

Emergency Assistance

If you see a distress signal or suspect a boat is in trouble, you must assume it is a real emergency and render assistance immediately. By law, the operator in charge of the boat is obligated to provide assistance to any individual in danger if such assistance can be provided safely. Failure to render assistance can result in a fine and/or imprisonment. The 1971 Boating Safety Act grants protection to a "Good Samaritan" boater providing good faith assistance, and it absolves a boater from any civil liability arising from such assistance.

Yachting Accidents

Yachters using a vessel for recreational purposes must file a U.S. Coast Guard Recreational Boating Accident Report when:

- An accident results in death or the disappearance of a person from a vessel

- An injury requires medical treatment beyond first aid
- Property damage exceeds $2,000
- Total loss of the vessel occurs

The form can be downloaded from the U.S. Coast Guard website. In cases of death and injury, yachters must submit reports within 48 hours. In all other cases, yachters must submit reports within 10 days. Yachters must submit reports to officials in the state in which the accident occurred.

Wake

As a yacht owner/operator, you are responsible for the wake your yacht creates. Regulations may vary from state to state. Contact your local and state boating authorities for specific information, as you may be responsible for any damage or injury your wake causes. Always be alert for NO WAKE zones and be courteous of others while boating. Excessive and unexpected wakes can cause dangerous and even life-threatening situations.

Noise

As a yacht owner/operator, you are responsible for the noise your yacht creates. Many state and local boating authorities enforce noise limits that may restrict engine noise, radio volume or even loud talking. Regulations may vary from state to state. Contact your local and state boating authorities for specific information.

Speed

As a yacht owner/operator, you are responsible for maintaining your yacht under control at a safe speed. Many state and local boating authorities enforce speed limits. Regulations may vary from state to state. Contact your local and state boating authorities for specific information.

Septic Waste

It is illegal to discharge septic waste directly overboard on U.S. inland and coastal waters. Never discharge toilets or holding tanks close to the shore or in any prohibited zone. Always use harbor or marina pump-out facilities to empty the holding tank before leaving the harbor. If the yacht has an overboard discharge installed, check with a local U.S. Coast Guard office to make sure the overboard discharge complies with federal regulations.

Pollution Regulations

The discharge of any type of debris or waste into the water, including, but not limited to, food, trash, garbage, oil, fuel, liquids and human waste, is highly restricted and sometimes illegal. Authorities highly recommend that you never discharge anything into the water.

Pollution is a serious matter, and law enforcement authorities highly enforce these regulations. As a yacht owner/operator, you are responsible for your actions affecting the environment. Therefore, you must fully understand and be aware of the following pollution regulations. Contact the USCG, state and local authorities for additional information.

MARPOL TREATY

The USCG enforces the International Convention for the Prevention of Pollution from ships, commonly referred to as the MARPOL Treaty (MARine POLlution). This treaty prohibits the overboard dumping of all ship-generated plastics, chemicals, garbage and oil. Contact the USCG for further information.

REFUSE ACT OF 1899

The Refuse Act of 1899 prohibits throwing, discharging or depositing refuse matter of any kind (including food, trash, garbage, oil and other liquid pollutants) into U.S. waterways.

FEDERAL OIL POLLUTION ACT OF 1990

The Federal Oil Pollution Act of 1990 was passed by Congress to prevent further oil spills from occurring in the U.S. Be aware of your liability under this act, as you may be liable for the cost of actions in the prevention and/or removal of, or damage from, oil spills created by you.

U.S. FEDERAL WATER POLLUTION CONTROL ACT

The Federal Water Pollution Control Act prohibits the discharge of oil or hazardous, potentially harmful substances into U.S. navigable waters. Yachts must display a placard at least 5 x 8 in. (127 x 203 mm), made of durable material, fixed in a conspicuous place in the machinery spaces, or at the bilge pump control station, stating the following:

DISCHARGE OF OIL PROHIBITED
The Federal Water Pollution Control Act prohibits the discharge of oil or oily waste into or upon the navigable waters of the United States or the waters of the contiguous zone if such discharge causes a film or sheen upon or discoloration of the surface of the water or causes a sludge or emulsion beneath the surface of the water. Violators are subject to a penalty of $10,000.

PAINTS

As a yacht owner, you are responsible for the environmental regulations that may govern the use of antifouling paint. If your yacht is kept in water where marine growth is a problem, the use of antifouling paint may reduce the growth rate. Regulations may vary from state to state. Contact your local and state boating authorities for specific information.

CLEANING AGENTS

As a yacht owner, you are responsible for the environmental regulations that may govern the use of cleaning agents. Use household cleaners sparingly and never discharge them into waterways. Do not mix cleaners, and be sure to use plenty of ventilation in enclosed areas. Avoid using chlorine, solvents and products that contain phosphates, as well as non-biodegradable or petroleum-based products. Regulations may vary from state to state. Contact your local and state boating authorities for specific information.

EXHAUST EMISSIONS

As a yacht owner, you are responsible for the exhaust emissions from your yacht. Increased exhaust (hydrocarbon) emissions, which are regulated by the EPA, pollute the water and air. Contact your dealer and the engine manufacturer for more information. Additional restrictions may apply and vary from state to state. Contact your local and state boating authorities for specific information.

PROPOSITION 65

A wide variety of components used on this vessel contain or emit chemicals known to the state of California to cause cancer, birth defects and other reproductive harm.

Examples include:

- Engine and generator exhaust
- Engine and generator fuel and other liquids, such as coolants and oil, especially used motor oil
- Cooking fuels
- Cleaners, paints and substances used for vessel repair
- Waste materials that result from wear of vessel components
- Lead from battery terminals and from other sources, such as ballast or fishing sinkers

To avoid harm:

- Keep away from engine, generator and cooking fuel exhaust fumes.
- Wash areas thoroughly with soap and water after handling the substances above.

4 EMERGENCIES

It is important to obtain training to handle any emergency that may arise. The following is NOT an exhaustive list of situations that operators can encounter while yachting. However, this section serves as a guide to aid in emergencies.

Escape Ladder

An emergency escape ladder is located in the master stateroom.

Figure 4-1 – Emergency Ladder Location

Figure 4-2

Fire

IN CASE OF FIRE

- Stop the engines immediately.
- Have all persons onboard put on their life jacket.
- Shut off the bilge blowers immediately if the fire is in the engine room.
- NEVER open the hatch to the engine room. The fire will flare up if the fresh air supply increases suddenly.
- Keep the fire downwind if possible. Head into the wind if the fire is AFT of the yacht.
- If the fire is accessible, USE THE FIRE EXTINGUISHER.

  1] Aim the fire extinguisher at the base of the flames.

  2] Use a sweeping motion to put out the fire.
- Make a distress signal and call for help if the fire gets out of control.

It is the owner and/or crew's decision to abandon the yacht. If the decision is to abandon ship, ALL people onboard should jump overboard and swim to a safe distance upwind from the burning yacht.

FIRE-FIGHTING EQUIPMENT AND LOCATIONS

Portable Fire Extinguishers

This yacht, when in service, should be equipped with 5A/34B portable fire extinguishers. Stickers placed throughout the yacht designate the location for each fire extinguisher. It is the owner's/operator's responsibility to supply the designated fire extinguishers.

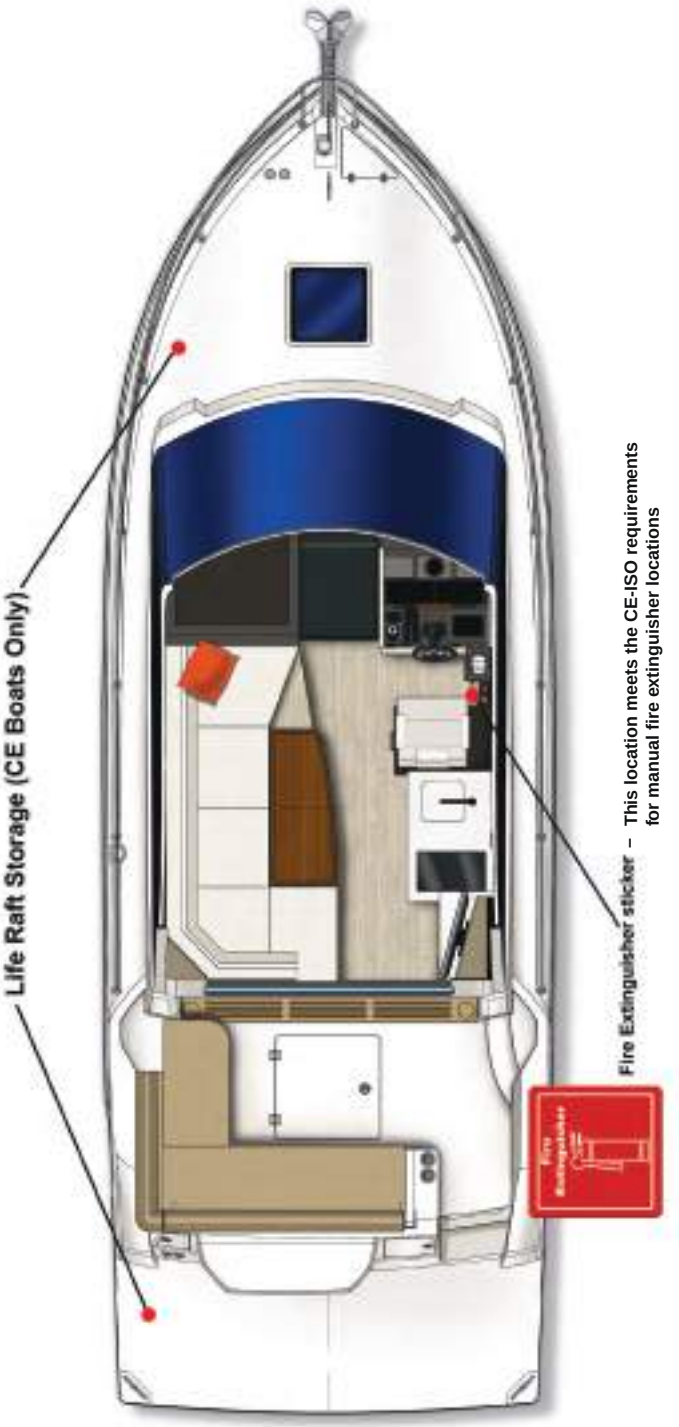
Life Raft Storage (CE Boats Only)
Fire Extinguisher sticker – This location meets the CE-ISO requirements for manual fire extinguisher locations

Figure 4-3

Servicing of Fire-Fighting Equipment

The yacht owner/operator should:

- Have fire-fighting equipment checked at the intervals indicated on the equipment
- Replace portable fire extinguishers, if expired or discharged, by devices of identical fire-fighting capacity
- Have fixed systems refilled or replaced when expired or discharged

RESPONSIBILITY OF YACHT OWNER/OPERATOR

It is the responsibility of the yacht owner/operator to ensure that fire-fighting equipment is readily accessible when the yacht is occupied, and to inform members of the crew about:

- The location and operation of fire-fighting equipment
- The location of discharge openings into the engine space
- The location of routes and exits

CAUTIONARY NOTICES TO THE YACHT OPERATOR

- Keep the bilges clean and check for fuel and gas vapors or fuel leaks frequently and always after refueling.
- Replace old fire-fighting parts with new parts. Use components bearing the same designation or having equivalent technical and fire-resistant capabilities.
- Never fit free-hanging curtains or other fabrics near or above cookers or other open-flame devices.
- Never stow combustible material in the engine space. If stowing non-combustible materials in the engine space, secure them to prevent them from falling into machinery. The stowed material should not obstruct access to the space and should not obstruct access from the space.
- A symbol identifies exits other than the main companionway doors or hatches with permanently fixed ladders.

GENERAL FIRE PREVENTION RESPONSIBILITIES OF THE OWNER

⚠ DANGER

Always respond immediately to an onboard fire. Any fire onboard the yacht is serious, as explosion is possible. Develop a fire response plan.

- Never obstruct passageways to exits and hatches.
- Never obstruct safety controls such as fuel valves, gas valves and switches of the electrical system.
- Never obstruct portable fire extinguishers stowed in lockers.
- Never leave the craft unattended when cooking and/or heating appliances are in use.
- Never modify any of the craft's systems (especially electrical, fuel and gas) or allow unauthorized personnel to modify any of the craft's systems.
- Never fill any fuel tank or replace gas bottles when machinery is running or when cooking or heating appliances are in use.
- Never smoke while handling fuel or gas.

Every yachter should develop a fire response plan. Assign responsibilities to others to allow quick decisions and reactions. The plan should determine:

- The type of fire (fuel, electrical or other type)
- Where the type of fire listed above might break out
- The best way to react

Provide at least one bucket, with a lanyard attached, stowed in a readily accessible position for the protection of the deck.

Everyone onboard should know the locations of the fire extinguishers and how to operate them.

Flooding

⚠ WARNING

Always close thru-hull seacocks not in use to reduce the risk of flooding.

If water is leaking in the hull, and the yacht is taking on water:

1] Turn ON the bilge pumps.

2] Assign someone to bail out the bilge and investigate the cause of the flooding.

3] Attempt to repair the yacht when finding the source of the leak.

4] If the cause is not readily apparent or not easily corrected, head for shore or shallow water as quickly as possible and call for help.

Stuff almost anything into the opening to stop the leaking temporarily. Apply leak-plugging material from the exterior, where water pressure can aid in stopping the leak. Station a crew member to hold the plug in place if applying the plug from the inside. In all cases, assign a crew member or passenger to watch the plugged area and alert others if the plug fails.

Swamped or Capsized Yacht

IMMEDIATELY PUT ON A LIFE JACKET, AND SET OFF A DISTRESS SIGNAL IF THE YACHT BECOMES SWAMPED OR CAPSIZES. Chances are good that a capsized yacht will stay afloat. To ensure the safety of the crew and yacht, it is important to perform the following:

- Stay with the yacht unless an emergency situation occurs.
- Never leave the yacht or try to swim to shore except under extreme conditions.
- Remember that a capsized yacht is easier to see than a swimmer.
- Remember that the shore may be farther away than it appears.

To reduce the occurrence of a swamped or capsized yacht:

1] Reduce headway and turn the yacht slightly if water is coming over the bow.

2] Turn the yacht to prevent the bow from meeting the waves head on.

3] Drop a sea anchor over the stern, and adjust the length of the line to hold the bow at the most favorable angle.

Collision

If a serious collision occurs, check everyone onboard for injuries, and then inspect the entire yacht to determine the extent of the damage.

- Prepare to help the other craft unless your yacht or passengers are in danger.
- If the hull has been penetrated, prepare to plug the fracture once the colliding yachts have been separated.
- Shore up the hole inside the yacht with a spare life jacket or bunk cushion.
- Trim weight, if possible, to get the hole above the water level during repairs.
- If the yacht is in danger of sinking, have everyone onboard put on a life jacket.
- If a radio is installed, immediately contact the U.S. Coast Guard or other rescue authorities on Very High

Frequency (VHF) channel 16 or Citizens Band (CB) radio channel 22. (VHF channels 9 or 13 or a cellular phone in some states may be available.)

The USCG requires the owner/operator of a boat involved in an accident to report the incident immediately to the proper marine law enforcement agency for the state in which the accident occurred. If you witness a collision while yachting, you must report it immediately and provide assistance.

Towing on the Water

Always offer assistance to a vessel in distress. However, towing a capsized yacht or a yacht with a damaged hull is not recommended. Lend aid to the occupants, and call the proper authorities when towing is required. Remember, all yachters are obligated to lend aid to any person in distress, but they should not aim to repair the vessel itself. Never attempt to tow a disabled yacht. One disabled yacht is better than two.

Running Aground

Excessive weight in the FORE or AFT sections of the yacht will cause a trim change and may yield greater draft than expected. Equip the yacht with a quality depth-measuring instrument, and allow ample water below the hull while operating.

IF THE YACHT RUNS AGROUND

1] Check everyone onboard for injuries. Call for emergency assistance as needed.

2] Inspect the yacht for damage and immediate threats such as water leaking into the yacht, or fuel or flammable materials leaking into the water or inside the yacht. Immediately call for assistance if threats exist that could endanger the safety of passengers.

IF THE YACHT IS LIGHTLY GROUNDED

Shift the weight of the passengers or gear to heel the yacht while reversing engines.

IF TOWING BECOMES NECESSARY

Use a commercial towing service.

NOTICE

Never attach a tow line to a single deck cleat or anchor windlass. The cleats and windlass are not designed to take the full load of the yacht and may pull free from the deck, causing serious injury or property damage.

Man Overboard

If someone falls overboard, understanding what to do is important. Chapman Piloting publications publishes emergency procedures, and the U.S. Coast Guard or the local marine authorities offer instruction. See **"Man-Overboard Prevention" on page 23**.

Hypothermia may be an immediate concern if a person falls overboard. Hypothermia occurs when a person's body loses heat faster than the body can replace it. The person will become exhausted or likely drown if not rescued in a timely manner. The colder the water, the faster the body loses heat. Life jackets increase survival time because they provide insulation. To understand the survival time to water temperature ratio, consult **Table 4-1 on page 59**.

WATER TEMPERATURE	EXHAUSTION, UNCONSCIOUSNESS	EXPECTED TIME OF SURVIVAL
32.5°F (0.3°C)	Under 15 min.	Less than 30 min.
32.5-40°F (0.3-4.4°C)	15-30 min.	30-90 min.
40-50°F (4.4-10°C)	30-60 min.	1-3 hr.
50-60°F (10-15.6°C)	1-2 hr.	1-6 hr.
60-70°F (15.6-21.1°C)	2-7 hr.	2-40 hr.
70-80°F (21.1-26.7°C)	3-12 hr.	3 hr.- Indefinite
Over 80°F (26.7°C)	Indefinite	Indefinite

Table 4-1 – Water Survival Chart

Medical Emergency

Every second counts when there is a medical emergency. Boaters must have proper training and take necessary preventive measures to properly assist in times of need.

- Someone onboard should know first aid. First aid training is available through the Red Cross.
- No one should act as a doctor if he/she not properly trained.
- Keep a fully stocked first aid kit onboard at all times.
- Always have dry blankets on hand to protect against hypothermia.

Equipment Failure

- Prevent failure of steering, propulsion and control by having the yacht maintained and checked periodically.
- Radio for help or signal with flags and wait for help if the systems fail.

If a system failure occurs and there is no immediate danger, you can try to troubleshoot or identify the problem first before calling for assistance.

Radio Communication (U.S. Only)

It is the yachter's responsibility to obtain a radio operator's permit and to follow and understand proper rules and procedures. Private yachts are not required to have a radio onboard at all times. However, if a radio is available, tune it to channel 16 unless the channel is actively in use. Channel 16 is the frequency for emergency calls or initial calls between yachts. Once contact is established on channel 16, visit the U.S. Coast Guard Navigation Center website (see **"Resources" on page 17** for website) or go to a different unused channel.

For more information on radio communications, see Chapman Piloting's publications.

Distress Signals

The yacht operator is required, by law, to provide assistance to a craft in distress, as long as your life or yacht is not put in harm's way in the process. In the United States, Good Samaritan laws protect the public from liability incurred while giving aid.

Carbon Monoxide Poisoning

⚠ DANGER

Always avoid exposing your passengers or yourself to carbon monoxide (CO). Carbon monoxide gas is colorless, odorless and extremely dangerous. All engines and fuel-burning appliances produce CO as exhaust. Direct and prolonged exposure to CO will cause brain damage or death.

Do not confuse carbon monoxide poisoning with seasickness, intoxication or heat stress. If someone complains of irritated eyes, headache, nausea, weakness, dizziness or drowsiness, or you suspect carbon monoxide poisoning, immediately move the person to fresh air, investigate the cause, and take corrective action. Seek medical attention if necessary.

For more information, see **"Carbon Monoxide (CO)" on page 35**.

5 OPERATING IN HAZARDOUS CONDITIONS

Severe Weather

All passengers should be aware of present weather conditions and the weather forecast at all times. Getting caught in severe weather can be dangerous. Check the forecast before beginning a day of yachting. However, be aware that weather conditions can change rapidly.

If a marine radio is onboard: Listen to the weather reports issued by the U.S. Coast Guard and other sources.

If a portable radio is onboard: Keep the radio tuned to a station broadcasting frequent weather reports. Many yachting clubs fly weather signals. Learn to recognize the following weather signals.

WEATHER SIGNALS

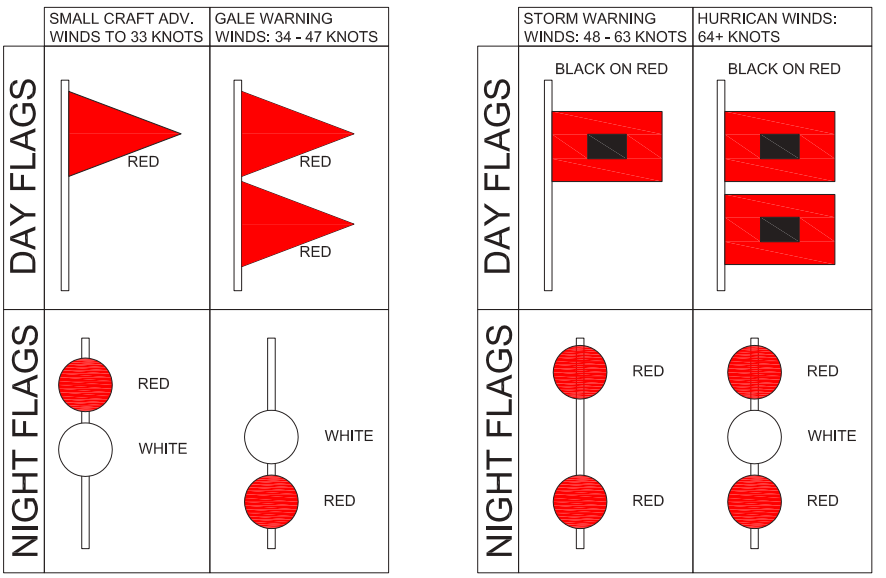

Figure 5-1

STORM CONDITIONS

⚠ WARNING

Always close all portlights, windows, washboards, doors, hatches and ventilation openings when appropriate in rough weather or at planing speeds. Failure to do so may allow seawater to enter the yacht, possibly causing a swamped condition.

Storms rarely appear without advance notice. If a storm is a possibility, keep a watch on the horizon, especially to the west, for the storm's approach. Watch for changes in wind direction or cloud formations. Understanding the weather conditions and what to do when the weather takes a turn for the worse is important. If a storm is approaching, the best course of action is to return to port. If unable to return, prepare to weather the storm. To do so:

- Keep portlights, windows, washboards, doors, hatches, and ventilation openings closed when appropriate in rough weather or at planing speeds. If necessary, provide operating instructions to passengers.

- Locate and have inclement weather gear and safety equipment ready.
- Stow all gear and secure any loose equipment on deck.
- Make sure all people onboard are wearing a life jacket.
- Turn on navigation lights.
- Mark or identify your position.
- Reduce speed as the seas build, and head for port or a safe, easily reachable place.
- Drop a sea anchor over the stern to maintain the bow into the seas. If a sea anchor is unavailable, use a canvas bucket, tackle box or other object that will replace the anchor.
- Keep a lookout for debris and obstructions in the water.
- When possible, head into the waves at a 45 degree angle. Allowing high waves to strike the side of your yacht may cause it to capsize or swamp.

FOG

Fog is a result of either warm-surface or cold-surface conditions. Periodically measure the air temperature and dew point temperature to determine the liability of fog formation. Fog is likely to develop if the difference between the air temperature and dew point temperature is small.

Remember the following guidelines:

- Head for shore at the first sign of fog, unless the yacht is well-equipped with charts and navigational equipment. Wait until conditions improve. If charts are available onboard, take bearings as fog sets in, mark the current position, and continue to log the course and speed.
- All people onboard should wear their life jacket.
- Take bearings and log your course and speed before the fog sets in. Use of a GPS is recommended.
- If sound equipment is installed, check soundings regularly and match the sounds with the depths shown on the charts.
- Station a person forward in the yacht as a lookout.
- Reduce speed to a safe speed or idle. Periodically, stop the engines and listen for surrounding fog signals.
- Sound a 5 second blast from the horn or fog bell once every 2 minutes to warn others of your position.
- If there is doubt about continuing the cruise, quickly find the best position to anchor and then set the anchor. Pay close attention during fog and take time to listen for other fog signals just before sounding your fog horn or bell. You must sound a 5 second blast from your horn or whistle once every 1 minute while anchored.

REDUCED VISIBILITY

Natural environments and inclement weather can cause reduced visibility. Storm condition hazards can be compounded by reduced visibility while on the water. Always use common sense and take safety precautions when operating the yacht in reduced visibility conditions.

COLD WEATHER AND COLD OR FROZEN WATER CONDITIONS

Avoid operating your yacht in cold water or weather conditions, and never operate in frozen or icy waters. Operating in such conditions greatly increases the risk of serious injury or death, including cold-water immersion, shock and hypothermia. Weather conditions may hinder emergency rescue or assistance, and cold weather can pose problems for on-board equipment, as well as the engine. See the engine Operator's Manual and the equipment manufacturer's instructions for cold weather operation.

Water Hazards

Every waterway poses hazards that you must be aware of and avoid, including shallow water, tree stumps and sand bars. Ask local authorities and other boaters for information about known hazards, and consult a marine chart when boating on unfamiliar waters. Try to avoid both known and unknown hazards.

AQUATIC VEGETATION/WEEDS

Avoid operating in or near vegetation. Operating in weeded areas can be extremely hazardous.

NOTICE

Vegetation and weeds in the water intakes can clog the strainers, causing equipment to overheat.

DAMS AND SPILLWAYS

The waterways around dams and spillways are extremely hazardous. Dams and spillways are subject to rapid water flow changes, and there may be floating and sunken debris in the nearby water. These areas are often marked as restricted, and it is best to always stay clear of them.

SHALLOW WATER OPERATION

Operating in shallow water presents a number of hazards. Sandbars in narrow inlets are constantly shifting, making it difficult to mark them with buoys. Sandbars are sometimes indicated by waves as they form into breakers when passing over the sandbar. In coastal areas, tides can affect water level as much as 30 ft (9 m). Check with local marinas or Coast Guard stations for tide tables and current charts.

Restricted Areas

Some waterways and areas are restricted. Always check with local, state and federal authorities to identify restricted areas. Because of the threat of terrorism, the USCG enforces strict limits on watercraft near U.S. Navy and Coast Guard ships and other potential targets. For more information, contact the USCG or local authorities.

Markers

Become familiar with navigation markers, which identify navigable routes and indicate water hazards. Always stay within marked boundaries and steer clear of hazards.

KC-0015C-A

Figure 5-2

Always watch for swimmers and stay clear of all swimming areas, marked or unmarked.

6 NAVIGATION RULES AND AIDS

As a division of the U.S. Department of Homeland Security, the U.S. Coast Guard (USCG) is the ultimate authority on U.S. waters. The USCG has the right to board any boat for any reason at any time. Failure to obey an order from the USCG can result in a fine, confiscation, imprisonment and even being fired-upon in certain areas or conditions.

The following information outlines basic navigational rules. Boating regulations are enforced by USCG, state and local authorities. You are subject to marine navigation regulations for both federal and state waterways. For more information, contact the USCG, state and local marine authorities. The navigational rules for U.S. waterways can be found in the USCG "Navigational Rules" publication.

Right-of-Way

Boats with less maneuverability have right-of-way over more agile boats. Stay clear of a boat with right-of-way. Examples of boats with right-of-way are:

- Boats aground or not under command
- Boats with restricted maneuverability
- Boats engaged in fishing
- Non-motor boats, such as rowboats, paddle boats, canoes and sailboats

Small pleasure craft must yield right-of-way to large commercial boats in narrow channels. A boat with right-of-way is sometimes referred to as the privileged boat.

Audible Distress Signals

It is not necessary to sound a signal every time a boat is nearby. It is typical for boat operators to signal their intention, using a whistle, horn or bell, to avoid potentially confusing or hazardous situations. Privileged boat operators customarily signal first, and then the yielding boat operators return the same signal to acknowledge they understand and will comply. Use the danger signal (five or more short, rapid blasts) if intent is not clear.

Use the following signal blasts early enough so other boaters notice and understand them:

AUDIBLE DISTRESS SIGNAL	DEFINITION
1 long blast	Warning signal (coming out of slip or passing astern)
1 short blast	Pass on port side
2 short blasts	Pass on starboard side
3 short blasts	Engine(s) in reverse
5 or more short blasts	Danger signal

Navigation Lights and Night Operation

Navigational lights alert other boats to your presence and course, especially at night or in restricted visibility conditions.

Regulations require that navigational lights be clearly lit and properly displayed at all times between sunset and sunrise, and always when operating in reduced visibility. Where applicable, lights must appear on the sides, stern, masthead and all-around positions.

All navigational rules apply at night, but speed is restricted on many waterways. At night, always operate at a slow, safe speed and stay clear of all boats, regardless of which boat has right-of-way.

Protect your night vision by avoiding bright lights. If possible, have a passenger help keep watch for other boats, water hazards and aids to navigation.

The size, speed and direction of other vessels are determined at night by white, green and red running lights.

- A green light indicates the starboard side of the boat. Generally, if you see a green light on another boat, you have the right-of-way. Hold your course.
- A red light indicates the port side of the boat. Generally, if you see a red light on another boat, they have right-of-way and you must yield your course.
- A white light indicates the stern side of the boat.

Speed

Always maintain your yacht under control at a safe speed. Many state and local boating authorities enforce speed limits. Regulations may vary from state to state. Contact your local and state boating authorities for specific information.

Wake

You are responsible for the wake your yacht creates. Always be alert for NO WAKE zones and be courteous of others while boating. Excessive and unexpected wakes can cause dangerous and even life-threatening situations. Regulations may vary from state to state. Contact your local and state boating authorities for specific information, as you may be responsible for any damage or injury your wake causes.

Overtaking/Passing

The boat overtaking or passing must yield right-of-way to the boat being passed. The overtaking boat must make any adjustments necessary to keep out of the way of the boat being passed. The boat being passed has the right-of-way and must hold its course and speed.

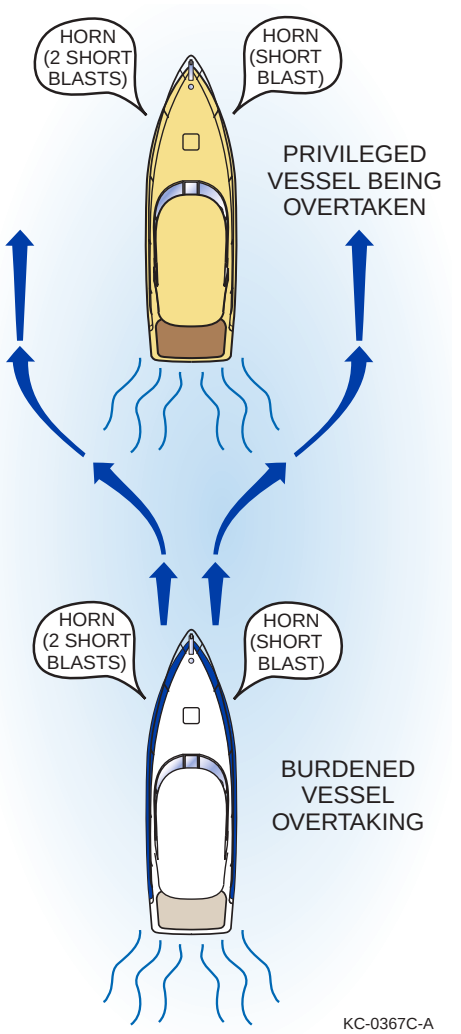

Figure 6-1

Meeting Head-On

When two boats meet head-on, neither boat has the right-of-way. Both boats should decrease speed, turn to the right, and pass port to port. If, however, both boats are on the left side of a channel, each vessel should sound two short horn blasts and pass starboard to starboard.

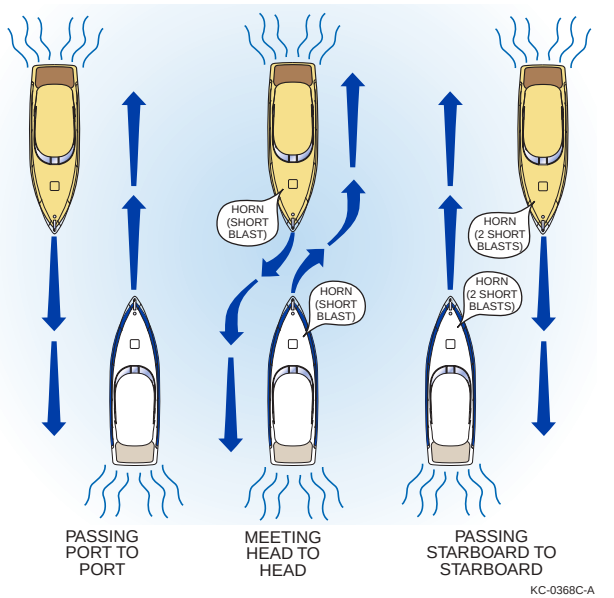

Figure 6-2

Crossing

In crossing situations, the boat to the right from the 12 o'clock to the 4 o'clock position has the right-of-way and must hold course and speed. The boat without right-of-way must yield and pass to the stern of the privileged boat. Boats going up and down a river have the right-of-way over boats crossing the river.

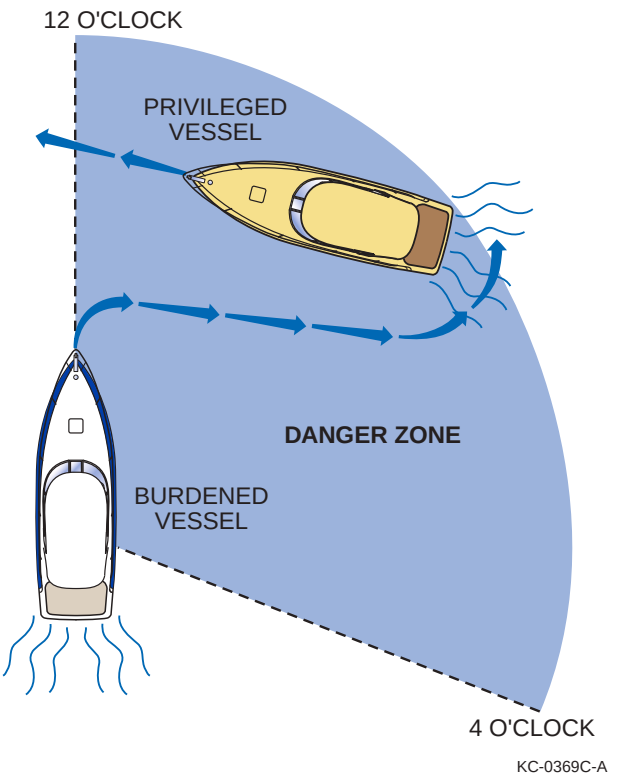

Figure 6-3

Aids to Navigation

Navigational aids are designed and placed accordingly to help you navigate safely on the water. Learn to recognize the different buoys and day markers. They are the signposts of the waterways. The United States Aids to Navigation System (USATONS) is the primary marking system used on inland water, coastal waters and rivers. This system is maintained by the USCG.

The following information is based on the USATONS. For further information, contact the USCG and state and local marine authorities. Also visit the U.S. Coast Guard website for buoyage system information (see **"Resources" on page 17** for website).

The USATONS uses buoys, beacons and minor lights as markers.

NEVER tie or anchor to a navigational aid. This action is unlawful and dangerous to you, your yacht and other boaters.

NEVER move or damage a navigational aid. This action is unlawful and dangerous for other boaters.

BUOYS

Most anchored floating markers are referred to as buoys. Buoys have many uses and color schemes, and they can vary in size and shape.

The most commonly used buoy colors are white, red, green, yellow and black. Buoys may be unlighted or lighted. Some are audible, while others have both audible and visual signals. Lights, bells and horns on buoys aid in night boating or poor visibility conditions. Buoys with unique light-flashing characteristics are identified on nautical charts with the specific flashing pattern.

Become familiar with the specific buoys used in the waters where you are boating. Contact local authorities for specific information and/or navigational aid charts for your waterways.

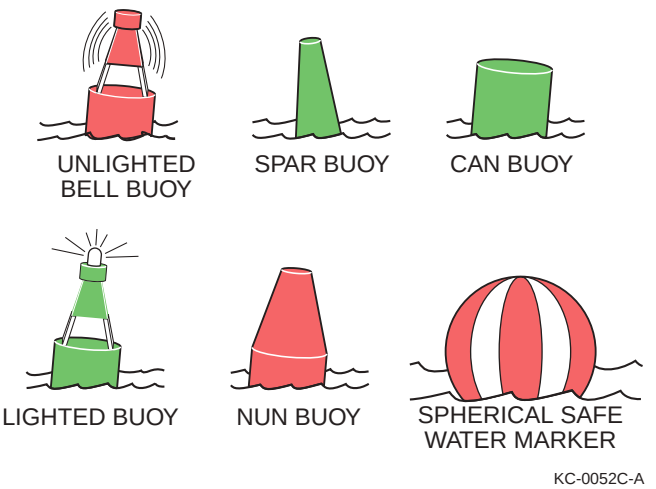

Figure 6-4

Mooring Buoys

The only buoys you are permitted to moor to are mooring buoys. Mooring buoys are white with a blue horizontal stripe. Mooring to a navigation buoy, regulatory markers or lateral markers is illegal.

Figure 6-5

DAYMARKS/DAYBOARDS

Daymarks or dayboards are fixed visual markers in the water. The markers are commonly attached to a post or piling and are sometimes accompanied by a light. Daymarks are either red or green and are usually triangular- or square-shaped, though their shapes can vary. Daymarks often display numbers, which act as navigation guides. Red daymarks are usually triangular and sometimes show an odd number. Green daymarks are usually square and sometimes show an even number. The numbers on the markers are sequential and increase from seaward.

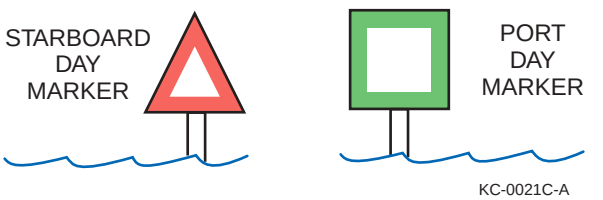

Figure 6-6

LIGHTS AND LIGHTED STRUCTURES

Maneuvering a yacht at night can be dangerous and confusing. To aid boaters with navigation and to warn of hazards, the USCG and state and local authorities maintain a variety of light structures. Some light structures are equipped with radio beacons, radar reflectors and/or fog signals.

Minor Lights

Minor lights are colored according to the buoyage marking system in use. They are similar to lighted buoys, except they are usually higher and on more stable platforms to increase visibility. Most minor lights are part of a series to mark a channel, river, or harbor and fairways.

Range Lights

Range lights are usually visible in one direction and help a boat operator navigate safely. Steering a course to keep range lights arranged in a line (one on top of the other) will help guide a boat through a channel.

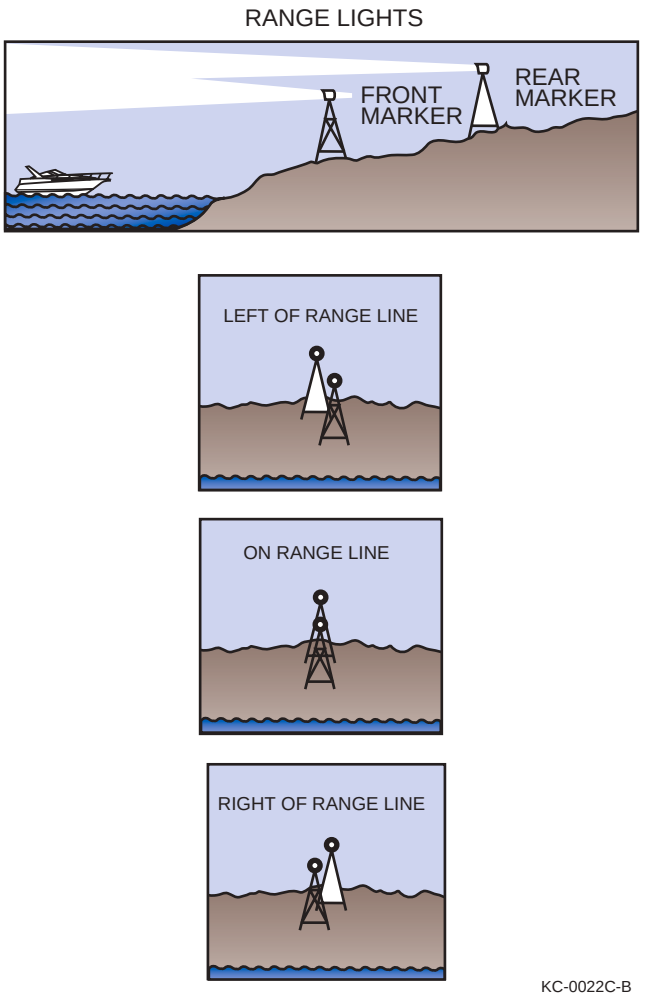

Figure 6-7

Lighthouses

Lighthouses are found at harbor entrances, prominent headlands, isolated danger areas and along the coasts. These striped or patterned structures have unique flashing signals, which help boaters identify them.

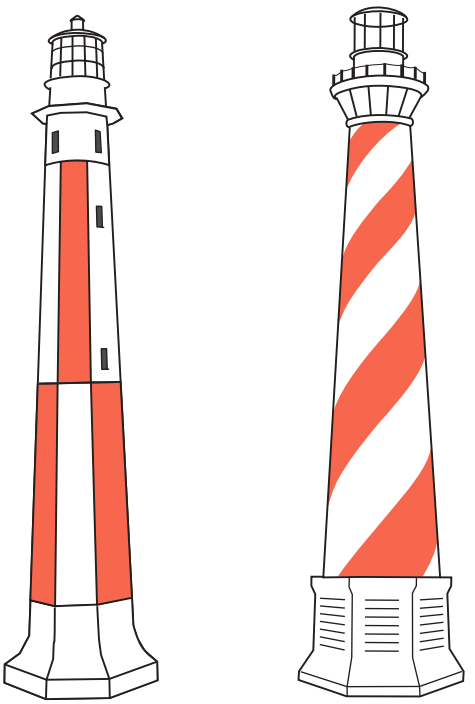

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Figure 6-8

MARKERS

Seven types of markers are used to assist the boat operator:

- Regulatory
- Range
- Special
- Lateral
- Safe Water
- Preferred Channel
- Isolated Danger

Regulatory Markers

Regulatory markers are used to display information or indicate danger. They can be fixed visual markers or anchored floating buoys.

Fixed visual markers are usually white with orange geometric shapes that display information. Anchored floating buoys are white cylinder-shaped buoys with orange bands at the top and orange geometric shapes that may display information.

Following are the various orange geometric shapes used on these markers:

- Diamond – Indicates danger
- Diamond with cross marks inside – Indicates that a boater must keep away
- Circle – Indicates a controlled area or speed limit
- Square – Displays important information

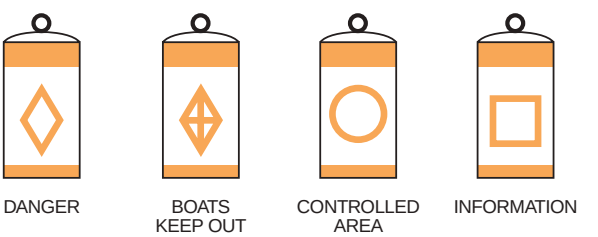

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Figure 6-9

Range Markers

Range markers have many color schemes, may have numbers or letters, and may be lighted or unlighted. They are placed in pairs within close distance of each other. They are commonly used in channels to guide boats safely through the center or safe line of navigation. Keep range markers visually in line with each other while navigating the waterway to avoid obstacles or other invisible dangers.

Special Markers

Special markers are yellow and come in various styles and shapes. Lighted and unlighted daymarks and buoys vary in function. Many are used to display information and navigational direction rules. The most common special markers are those used in intercoastal waterways. Contact your state and local authorities for more information on special markers used in your boating area.

Lateral Markers

Lateral markers are used to mark the sides of navigable channels. They can be buoys, daymarks or minor lights, and they are red and green in color. They can be lighted or unlighted and may or may not have numbers.

The basic nautical rule of lateral markers is the phrase "Red, Right, Returning."

The term "sea" generally refers to the ocean or a large body of water. "Seaward" refers to traveling from the sea or a large body of water inland or to a smaller body of water.

When traveling seaward – keep red markers to your port (left) and green markers to your starboard (right).

When returning from seaward – keep red markers to your starboard (right) and green markers to your port (left).

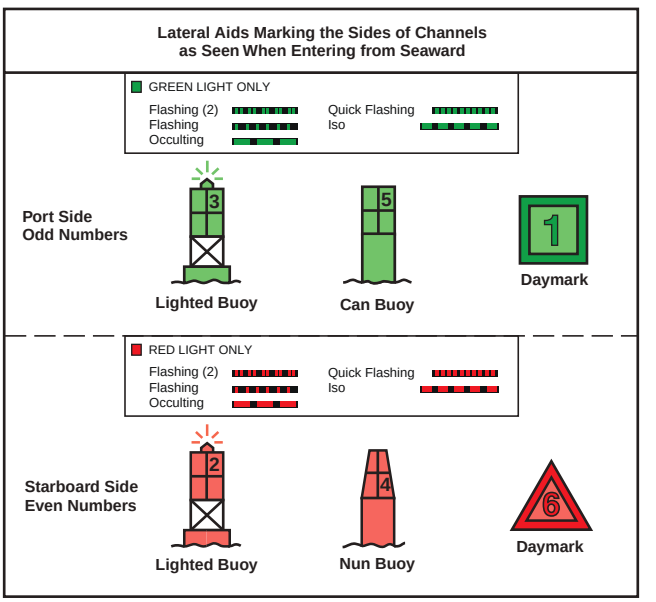

Figure 6-10

Safe Water Markers

Fairways and mid-channels may be marked with safe water markers or buoys. These markers indicate safe water all around. Safe water markers are red and white with vertical stripes, and they are round or have a red spherical top mark.

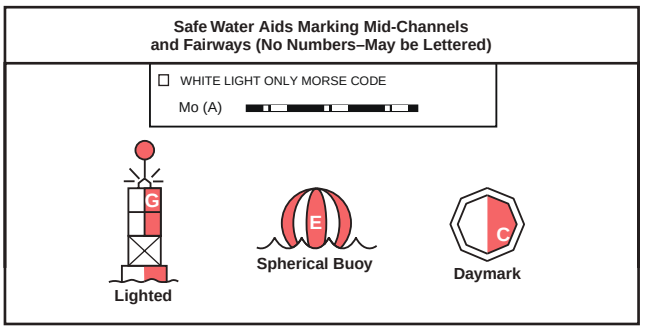

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Figure 6-11

Preferred Channel Markers

Obstructions, channel junctions and preferred channels are marked with red and green horizontally striped can and nun-style buoys. The top band color indicates the preferred path to take. Use these markers in the same manner as lateral markers to follow preferred channels.

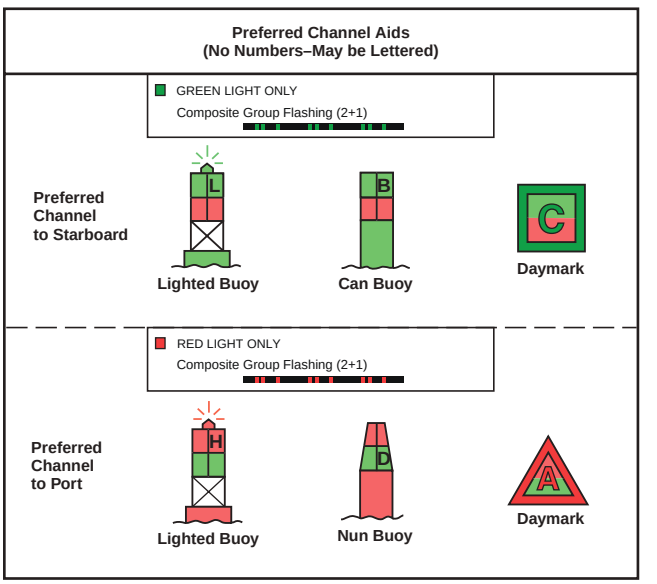

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Figure 6-12

Isolated Danger Markers

Isolated danger markers indicate an isolated danger that may be passed on all sides. These markers are black with one or more broad horizontal red bands and are equipped with a top mark of two black spheres, one above the other. On inland waters, a buoy with alternating vertical black and white stripes may be used to indicate that an obstruction or other danger exists between the buoy and the nearest shore. Do not pass between the buoy and the shore.

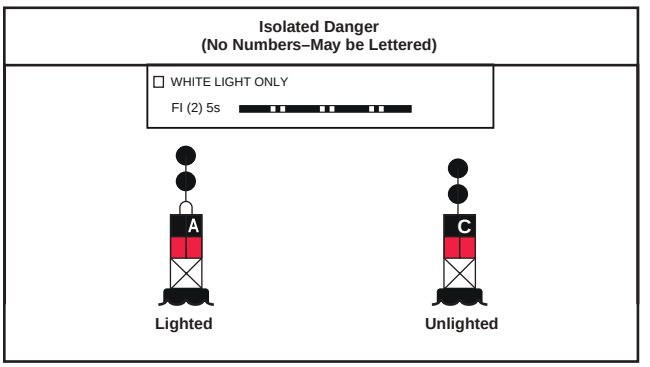


Figure 6-13

Other Special Signs and Markers

Various signs and markers are used throughout U.S. waterways for different purposes. In Florida, special signs are used to warn of "manatee" areas. These signs help to control speed and/or restrict areas from boating to conserve this endangered species. Be aware of special information and markers on the waterways. Contact your state and local authorities for more information on local restricted or controlled areas and their markers.

SYSTEM OPERATING INFORMATION

7

DC Electrical System

⚠ DANGER

Always use caution when operating and maintaining the DC electrical system. Fire or explosion may result from improper use of electrical systems.

A 12-volt DC (Direct Current) electrical system is equipped onboard. The DC electrical system is a comprehensive system designed to meet present and future 12-volt electrical needs. Wire-runs and connections are positioned to prevent abrasion and exposure to moisture, as well as to remain accessible for inspection, repairs and the addition of aftermarket electrical accessories.

Wires used throughout the DC electrical system are plastic coated and color-coded. The electrical system is virtually maintenance-free, with only the batteries requiring periodic inspection and maintenance.

BATTERY CHARGERS

On a fully loaded yacht two battery chargers are equipped onboard.

One 60-amp batter charger for maintaining the engine and accessory batteries.

One 60-amp battery charger for maintaining the thruster batteries. When this option is selected, this charger also maintains the generator battery.

See **“Design Specifications” on page 6** for battery details.

Each battery charger monitors and maintains the voltage levels of one or more battery. When the chargers are ON, they automatically charge the batteries when the voltage drops below the manufacturer’s level.

Figure 7-1 – Battery Charger

MASTER DISCONNECT SWITCHES

Master Disconnect Switches

Master disconnect switches control electricity from the batteries to the DC Control Panel, engines, and accessory items. Multiple master disconnect switches control the flow of electricity to the DC components. The switches are allocated to the following DC electrical component: accessory equipment, bow thruster, generator, port engine, and starboard engine. Turn the master disconnect switch to the ON position to provide electricity to the DC Control Panel and the breakers control the flow of electricity the DC panel's allocated items.

Accessory Battery and Master Disconnect Switch

The accessory equipment is controlled by the DC Control Panel. The DC Control Panel is powered by a single 12-volt accessory battery located in the engine room. See previous page for battery location.

Electricity from the accessory battery is controlled by a master disconnect switch. The switch is located on the DC Control Panel. Circuit breakers on the DC Control Panel control the flow of electricity to the other DC circuit breaker panels.

Figure 7-2

Engine Batteries and Master Disconnect Switches

Each propulsion engine has one or two designated engine batteries depending on the installed engine. Each engine battery set is located outboard of the designated engine.

A master disconnect switch controls the electricity from each battery bank to the battery's designated engine. The engine master disconnect switches are located in the engine room. Turn ON the master disconnect switches to provide electricity to the engines.

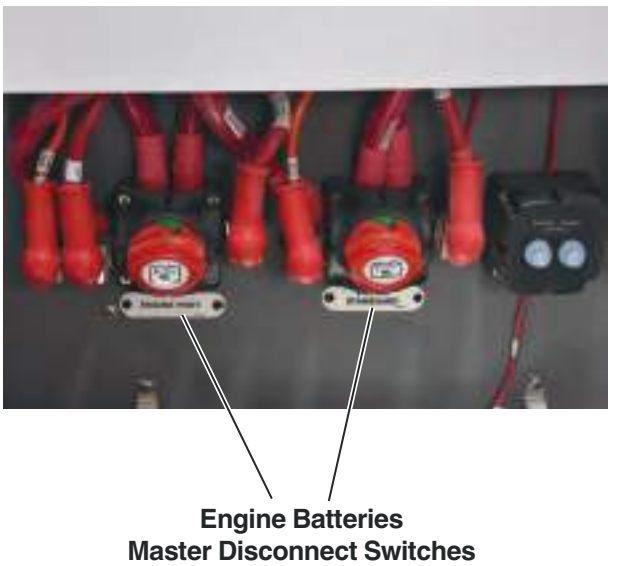


Figure 7-3

Generator Batteries and Master Disconnect Switch

The generator has a single, dedicated battery. Electricity from the battery to the generator starter is controlled by a master disconnect switch. The switch is located in the engine room. Turn ON the master disconnect switch to provide electricity to the generator starter.

Figure 7-4

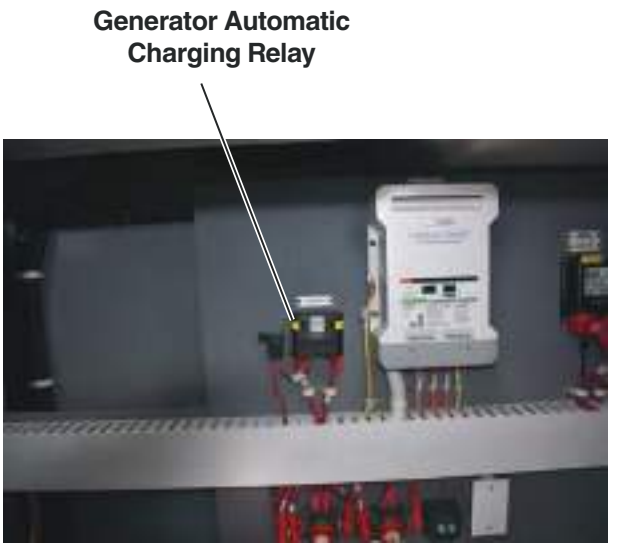


Figure 7-5

Automatic Charging Relays

Automatic Charging Relays (ACRs) allow both 12-volt engine alternators to simultaneously charge both engine battery banks and the thruster/windlass/swim lift battery bank. These battery banks are also charged by their dedicated 12-volt battery charger whenever the charger is turned on and either shore AC power or generator AC power is available. The battery charger charging current is not regulated by the ACRs. The ACRs regulate only the alternator output current. The battery charger has its own voltage regulation and isolation system built into it.

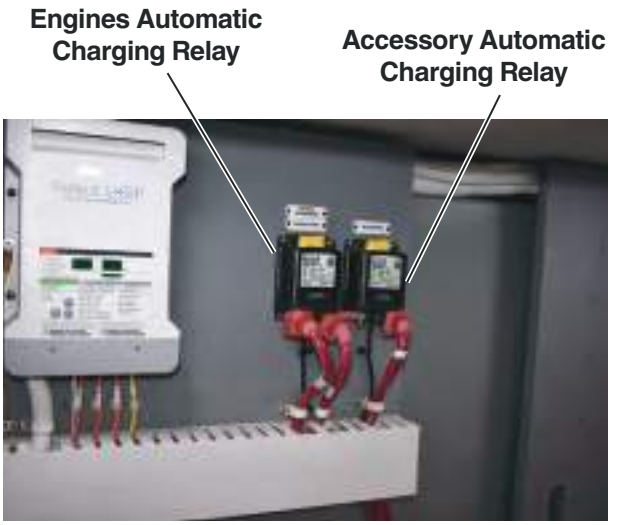


Figure 7-6

The ACR switches for the engine batteries and the thruster/windlass/swim lift batteries are automatic. They sense battery voltage and automatically engage alternator 12-volt output when the battery voltage reaches a predetermined low level. The ACRs can also be operated manually if needed. They can be turned on by first making sure the yellow switch is turned all the way to the left and then pushing down on the top of the yellow switch. The ACR will remain on for 10 minutes after manual engagement and will then turn off automatically if predetermined battery voltage levels have been met. The ACR can be turned off by turning the yellow switch to the right. When in this position, the ACR is in the LOCKED OFF position and its automatic function is inoperative.

NOTE: The engine ACR can also be used as a battery parallel should one of the engine batteries be consumed to an unusable voltage level. Whenever the engine ACRs are engaged, the engine batteries are paralleled.

DC CONTROL CENTER CIRCUIT BREAKERS

⚠ WARNING

Never reset a breaker or replace a fuse that has automatically tripped without first correcting the problem. Failure to make necessary corrections may create a dangerous situation.

The circuit breakers on the DC control center enable the user to control the DC components by switching the breakers ON or OFF. All the circuit breakers protect the electrical system by automatically disconnecting the circuit from the power source in the event of a short or overload. The accessory battery supplies power to the circuit breaker panels.

Thermal circuit breakers are also installed in many circuits to provide added protection.

NOTE: If a circuit breaker location is labeled, but no circuit breaker is present, the component named on the label is an option that is not installed.

SYSTEM OPERATING INFORMATION

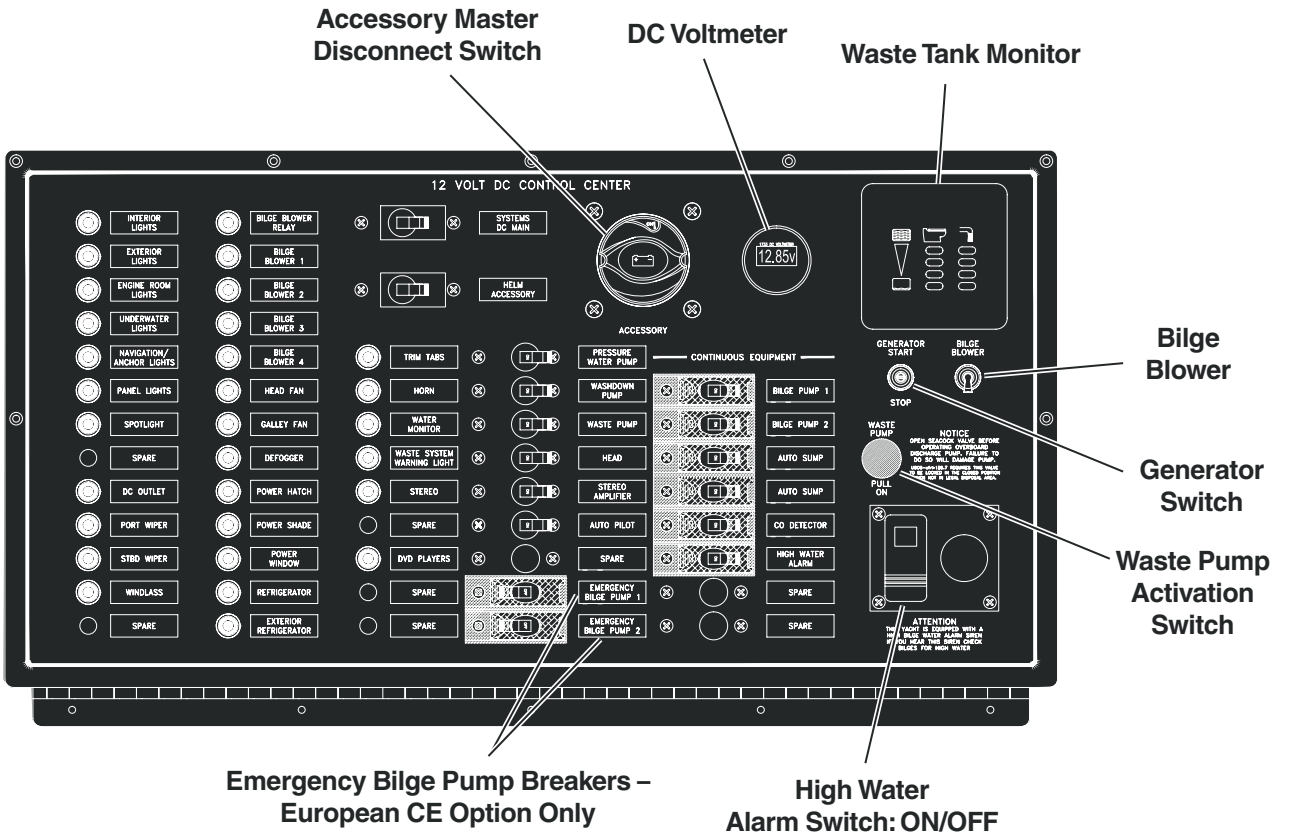


Figure 7-7 – DC Control Center

Auto Pilot

The AUTO PILOT breaker controls the auto pilot system.

Auto Sump (2 Breakers)

Switch the AUTO SUMP breakers ON before using any items on the yacht that drain into the sump. The sump pump is activated automatically by a float switch when water within the sump rises above a point where the water needs to be relocated.

Bilge Blower 1 - Bilge blower 4

The BILGE BLOWER breakers controls the electricity to the bilge blowers. Refer to the OEM information for details on operating the Bilge Blower.

Bilge Pump 1, Bilge Pump 2

Each bilge pump is activated automatically by a float switch when water within the bilge rises to the pump manufacturer's design level. The auto bilge pump breakers must be ON when the boat is in the water.

Bilge Blower Relay

The BILGE BLOWER RELAY breaker controls the relays for the automatic bilge blowers. Each bilge blower switch at the helm is connected to a relay that operates the switch's designated bilge blower.

CO Detector

Carver has installed several carbon monoxide (CO) detectors for personal safety. The CO detectors continuously check the air in the cabin for the presence of carbon monoxide. The breakers must be ON for the CO detectors to operate.

⚠ DANGER

CO detectors should be operational and active at all times. Carbon monoxide is dangerous.

The CO Detectors alert passengers to the presence of carbon monoxide in the cabin. The detectors emit a loud, high-pitched sound when activated. If the alarm sounds, determine the cause of the CO accumulation, and correct the problem immediately.

Test each unit on a weekly basis. Locate the test button on each CO detector. If suspected that the CO detector is faulty, have your dealer repair the detector or replace the detector immediately.

For information on minimizing, detecting and controlling carbon monoxide accumulation, see **"Carbon Monoxide (CO)" on page 35**.

DC Outlet

The DC OUTLET Helm breaker controls the flow of electricity to the 12V DC Outlet located at the helm. Switch the breaker ON to allow use of the DC Outlet.

Defogger

The DEFOGGER breaker controls the switch for the optional windshield defoggers.

DVD Players

The DVD PLAYER breaker controls the flow of electricity to the DVD player located in the Salon.

Emergency Bilge Pump 1, Emergency Bilge Pump 2 (European CE Option Only)

The EMERGENCY BILGE PUMP breakers control the emergency bilge pumps in the hull. The emergency bilge pumps operate continuously when the breakers are switched ON.

Exterior Refrigerator

The EXTERIOR REFRIGERATOR breaker controls the onboard refrigerator located on the cockpit.

Galley Fan

The GALLEY FAN breaker controls the exhaust fan switch in the galley.

Head

The HEAD breaker controls the electric pump that flushes the toilet in the Head. Switch the head breaker ON to enable the pump. Pressing the wall mounted switch on the vanity, labeled, "HEAD" flushes the toilet.

Head Fan

The HEAD FAN breaker controls the fan in the head.

High Water Alarm

The HIGH WATER ALARM breaker controls the flow of electricity to the high bilge water alarm. For a description of the high bilge water alarm. The high water alarm breaker must be ON when the boat is in the water.

Horn

The HORN breaker controls the horn switch.

Lights (all):

ENGINE ROOM LIGHTS, EXTERIOR LIGHTS, INTERIOR LIGHTS, PANEL LIGHTS, NAVIGATION LIGHTS, SPOTLIGHT, UNDER WATER LIGHTS

The lights breakers control the various light switches throughout the yacht.

Helm Accessory

The HELM ACCESSORY breaker controls the accessory items at the helm.

Port Wiper

The PORT WIPER breaker controls the port windshield wiper switch.

Power Hatch

The POWER HATCH breaker controls the power hatch switch.

Power Shade

The POWER SHADE breaker controls the power shade switch.

Power Window

The POWER WINDOW breaker controls the power window.

Pressure Water Pump

The PRESSURE WATER PUMP breaker controls the fresh water system's pressure pump. Switch the water pump breaker ON to activate the pump after the fresh water tank is filled.

Refrigerator

The REFRIGERATOR breaker controls the onboard refrigerator in the galley.

Starboard Wiper

The STBD WIPER breaker controls the starboard windshield wiper switch.

Stereo

The STEREO BREAKER controls the power to the stereo in the Salon.

Stereo Amplifier

The STEREO AMPLIFIER breaker controls the auto-switch located on the stereo amplifier in the salon.

Systems DC Main

The SYSTEMS DC MAIN breaker controls the other circuit breakers on the DC Control panel.

Trim Tabs

The TRIM TABS breaker controls power to the trim tab controls at the helm. Trim tabs are used to improve the running angle of the yacht while underway.

Washdown Pump

The WASHDOWN PUMP breaker controls the optional transom raw water washdown pump. Switch the washdown pump breaker ON to activate the washdown pump. Turn the washdown pump off by switching the washdown pump breaker OFF when finished using the washdown.

Waste Pump

The WASTE PUMP breaker controls the waste pump switch for the optional overboard discharge system. Use the waste pump to empty the waste tank directly overboard.

Water/Waste Monitor

The Water/Waste Monitor breaker controls the fresh water monitoring system, including the water level display.

Windlass

The WINDLASS breaker controls the windlass switch.

MONITORING BATTERY VOLTAGE LEVELS

⚠ CAUTION

Always use caution when recharging, disconnecting or reconnecting the batteries.

A fully charged battery that has not been charged or discharged for at least 2 hours should indicate a reading between 12.3 and 12.7 volts. A reading below this level indicates a partially charged battery.

Engine Battery Voltage Level

The voltage level of each engine battery is determined by activating the battery's dedicate voltmeter. The voltmeter is located at the helm. For both engines, a single LCD display provides information on the engine temperature, oil pressure and battery voltage level.

NOTE: Starting the engines is not necessary to activate the fuel gauge. Refer to the OEM information for details on operating the engines.

VOLTMETER

Voltmeter needs to be cycled to voltmeters, and the engines need to run at idle to indicate correct running voltage.

⚠ DANGER

Always follow the procedures described in *Propulsion System on page 111* before starting the engines. Improperly starting the engines can be dangerous.

Accessory Battery

The voltage level of the accessory battery is determined by using the voltmeter, labeled "DC Volts," located on the DC control center.

Activating the Voltmeter

1] Turn ON the ACCESSORY battery master disconnect switch.

2] Switch ON the SYSTEMS DC MAIN circuit breaker on the DC control center.

DC SAFETY SYSTEM

The safety systems include:

- High water alarm
- CO detectors in the salon and staterooms
- 2 automatic/manual bilge pumps

Keep the safety system circuit breakers within the Continuous Equipment section ON at all times due to the high level of importance the system holds.

If a safety system circuit breaker trips:

1] Immediately identify and correct the cause of the problem.

2] Reset the breaker.

NOTE: Periodically test each bilge pump by operating the manual switch or by placing two moist fingers on the two round raised areas located on the inside of the switch. The switch is located next to the pump. The pump should turn on after a few seconds of finger contact.

AC Electrical System

⚠ DANGER

Always use caution when operating the AC electrical system. Fire or explosion may result from improper use of the AC electrical system. Only trained electricians should service the AC electrical system. Death or serious injury may occur by incorrect servicing of the AC electrical system.

Before attempting to service the AC electrical system, always disconnect the yacht from the shore power source and shut off the generator.

The power for the 30 amp AC electrical system is supplied by either a shore power source or the onboard generator. See **"Shore Power Connection" on page 86** and **"Figure 7-13" on page 88**.

- Never modify the yacht's electrical system or relevant drawings. Installation, alterations and maintenance should be performed by a competent marine electrical technician. Inspect the system at least biennially.
- Disconnect from shore power when the system is not in use.
- Connect metallic housings or enclosures of installed electrical appliances to the protective conductor system in the craft (green or green with a yellow stripe conductor).
- Use double-insulated or grounded (earthed) electrical appliances.
- If the reverse polarity indicator is activated, do not use the electrical system. Correct the polarity fault before activating the electrical system on the craft.
- If reverse polarity indicator is activated, do not use electrical system. Correct polarity fault before activating the electrical system on the craft.
- Test the ELCI on a monthly basis by pressing the "T" on the breaker.
- If tripping occurs:

  1] Unplug all appliances.

  2] Reset the switch.

  3] Individually plug in each appliance until the safety switch trips to determine the faulty appliance.
- If the safety switch does not trip with individual appliances, the circuit may be over-loaded.
- If the safety switch trips with no appliances connected, the installation cabling may be damaged. Consult an electrician.

Figure 7-8 – Shore Power Receptacles

Figure 7-9 – Shore Power Circuit Breakers

North America/Pacific Rim

Standard (North American/Pacific Rim only)

LINE 1

Line 1 (30 amp) circuit on the AC electrical panel provides power to all of the AC equipment except, the air conditioning system. Line1 is configured as 120 volts 60 Hertz. See breakers on AC Panel for list of installed items controlled by the LINE 1 circuit.

LINE 2

Line 2 (30 amp) circuit, located on the AC electrical panel provides power to all of the AC components listed on the Shore 2 column of circuit breakers on the AC Control Panel. Line 2 is configured as 120 volts 60 Hz. See breakers on AC Panel for list of installed items controlled by the LINE 2 circuit.

European Electrical System

SHORE 1

Shore 1 (30 amp) circuit on the AC electrical power provides power to all of the AC equipment except, the air conditioning system. Shore 1 is configured as 230 volts 50 Hertz. See breakers on AC Panel for list of installed items controlled by the Shore 1 circuit.

SHORE 2

Shore 2 (30 amp) circuit, located on the AC electrical panel provides power to all of the AC components listed on the Shore 2 column of circuit breakers on the AC Control Center. Shore 2 is configured as 230 volts 50 Hz. See breakers on AC Panel for list of installed items controlled by the SHORE 2 circuit.

AC POWER SOURCES

Shore Power

⚠ WARNING

When connected to shore power, never swim anywhere near the yacht. Stray voltage may leak from the shore power cord and/or yacht shore power connector. Serious injury or death may occur.

Never supply power to the water heater when it is empty. Fire damage may result if the heating element is damaged.

Never alter shore power cable connectors. Use only compatible cable connectors and shore power receptacles.

NOTE: Remove all perishables from the refrigerator if the yacht is unoccupied for more than 48 hours. The shore power supply to the refrigerator may be interrupted and food may spoil.

Shore Power Connection

⚠ WARNING

To minimize shock and fire hazard:

- Before using the shore power cord, examine the cable for damage. Never use the shore power cord if it appears cut or damaged.
- Turn off the yacht's shore connection switch before connecting or disconnecting the cord.
- Connect the shore power cord to the craft's inlet before connecting to the shore power source.
- If the yacht is equipped with a polarity indicator that activates, disconnect the shore power cord and correct the polarity.
- Disconnect the shore power cord at the shore outlet first.
- Never leave the shore power cord connected to the shore outlet when the cord is not in use.
- Close the shore power inlet cover tightly.
- If the reverse polarity indicator light is activated, do not use the electrical system. Correct the polarity fault before activating the electrical system on the craft.
- Never alter the plug and connector on the shore power cord.

NOTICE

Switching off the ELCI circuit breaker groups before connecting to the shore power prevents arching and burning of the shore power cord receptacles. Disconnecting will protect the electrical equipment on board from rapid ON/OFF current connections, which may occur during the connection process.

1] Switch OFF the WATER HEATER circuit breaker on the AC control center. Never switch the breaker ON again until the freshwater system has been filled, pressurized and primed.

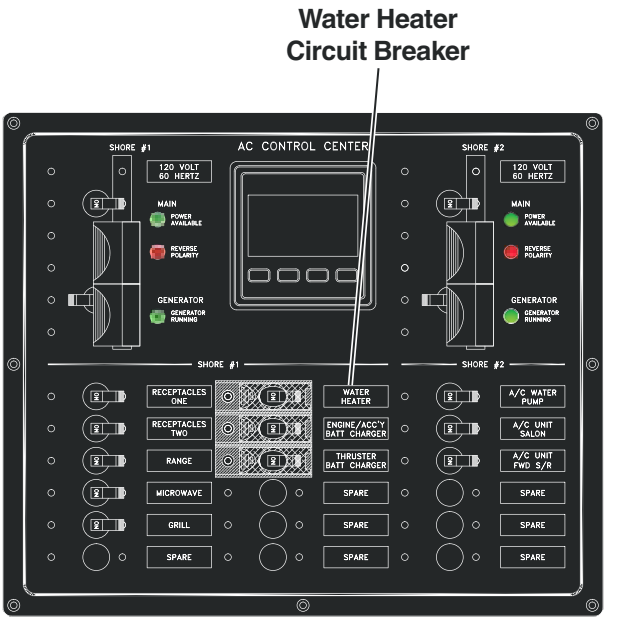


Figure 7-10

2] Switch OFF the ELCI circuit breaker group(s). Depending on region that the yacht is shipped to, the ELCI are labeled either:

- LINE 1/LINE 2
- SHORE 1/SHORE 2

⚠ DANGER

Only use a shore power cord that is in excellent condition with no cuts, nicks or abrasions in the exterior plastic cover. The cord must be specifically designed to connect the yacht to a shore power source. Electrical shock resulting in death or serious injury can occur by using a damaged shore power cord or a cord that is not designed for the intended purpose.

Never allow the end of the shore power cord to hang in the water. An electrical field can result, which can cause injury or death to nearby swimmers.

3] Locate the 50 ft (15 m) shore power cord. Connect the female end of the cord to the yacht's shore power receptacle. See **Figure 7-8**.

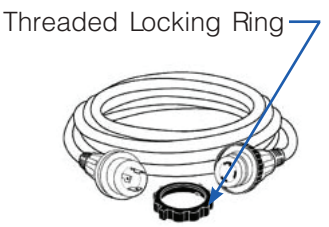


Figure 7-11 – Shore Power Cord

4] Secure the nonmetallic threaded locking ring to the yacht's shore power receptacle. Securing prevents the cord from being accidentally disconnected and prevents arcing due to a gap between the cord plug and the receptacle.

5] Turn OFF the breaker on the shore power source outlet.

6] Secure the nonmetallic threaded locking ring to the shore power source outlet. Securing the locking ring prevents the cord from being accidentally disconnected and from arcing due to a gap between the cord plug and the outlet.

7] Turn ON the breaker on the shore power source outlet.

8] Switch ON the LINE 1 and LINE 2 or SHORE 1 and SHORE 2 ELCI Circuit Breaker Groups. The breakers are labeled either LINE or SHORE depending on the region the yacht is shipped to.

9] Make sure the GREEN indicator lights are lit on the AC control center. The green indicator lights indicate that power is available.

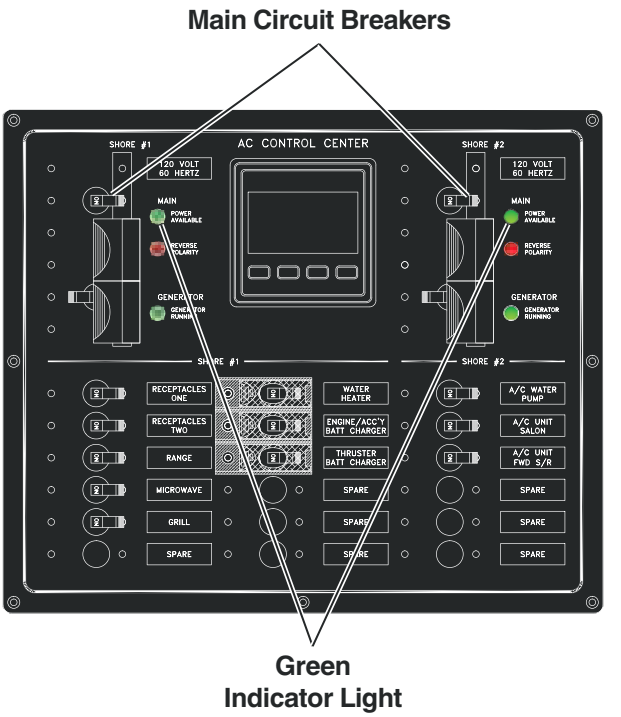


Figure 7-12

If the green indicator light is NOT lit:

- Recheck all connections and check circuit breakers on the AC control center.
- Monitor the voltmeter and ampmeter while connected to shore power.

10] Check to make sure that the Reverse Polarity Indicator is not lit. if the indicator light illuminates, Switch the main circuit breaker groups OFF.

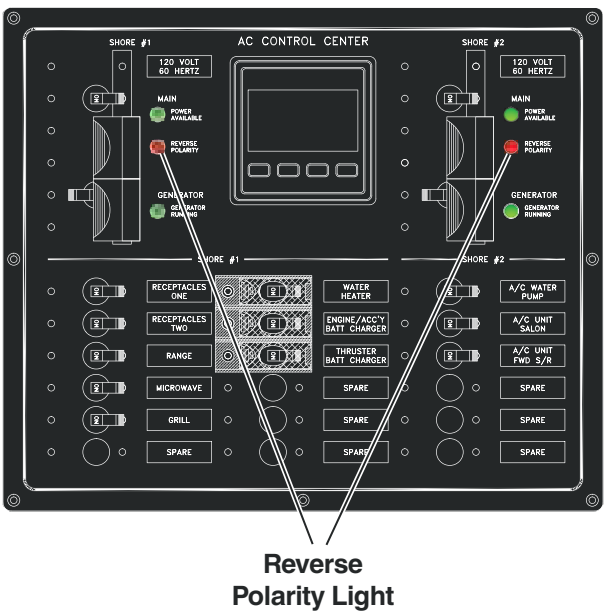


Figure 7-13

Generator Power

NOTICE

Never turn OFF the GENERATOR master disconnect switch while the generator is operating. The generator and/or alternator wiring can be damaged.

The onboard generator can be used to power the AC electrical system when a shore power source is not available.

The generator starter is powered by a designated 12-volt battery. Power to the generator from the battery is controlled by a master disconnect switch.

Prior to Starting the Generator

Read, understand, and follow the Original Equipment Manufacturer (OEM) information that describes the generator.

Figure 7-14

1] Turn OFF the generator by following the OEM instructions.

2] Ensure the seawater strainer is not clogged with debris.

3] Close the generator cooling system seacock. The seacock is located below the engine room access hatch in the cockpit.

4] Remove and clean the seawater strainer. The seawater strainer is located directly forward the generator seacock.

NOTE: The generator engine uses a seawater cooling system. The cooling system includes a strainer that prevents debris in the seawater from entering the cooling system's water pump.

5] Reinstall the strainer. If the strainer leaks when the seacock is opened; close the seacock, then check the strainer for correct installation.

Figure 7-15 – Generator Seawater Strainer and Seacock

6] Before attempting to start the generator, make sure the generator seacock is OPEN.

TIP

Dedicating a battery to the generator provides an important safety feature. A dedicated battery enables you to start the generator regardless of the condition of the propulsion engine batteries. If the engine batteries become discharged to the point where they are unable to start an engine, start the generator and then turn on the engine battery chargers. When the engine batteries are recharged to an adequate level, you can start the propulsion engines.

NOTICE

Do not operate the generator while the generator's cooling system seacock is closed. Operating the generator with the seacocks closed can damage the system.

Starting the Generator

⚠ DANGER

Never inhale generator exhaust. Generator exhaust contains carbon monoxide, a poisonous gas. See *Carbon Monoxide (CO) on page 35* for more information on engine exhaust and carbon monoxide.

1] Open the generator cooling system's seacock.

2] Switch Bilge Blower 1, bilge blower 2, bilge blower 3, and bilge blower 4 circuit breakers ON, located on the DC Control Panel.

⚠ WARNING

Always operate the bilge blower for a minimum of 4 minutes prior to starting the engines. Gasoline vapors can explode, resulting in injury or death. Before starting the engines or generator, perform the following:

- **Check the engine room for gasoline/fuel vapors.**
- **Operate the bilge blower for 4 minutes.**
- **Verify that blowers are operating properly. Run the blower when the vessel is operating below cruising speed.**

3] Turn the bilge blower switch ON. The bilge blower switch is located on the upper right corner the DC Control Panel.

NOTE: The Westerbeke gasoline generator has a safety feature that prevents you from starting it if the bilge blower is not turned on prior to start attempt. If you make the mistake you must first cycle the ON/OFF switch on the generator. Then turn on the bilge blower before you make your second attempt of starting the generator.

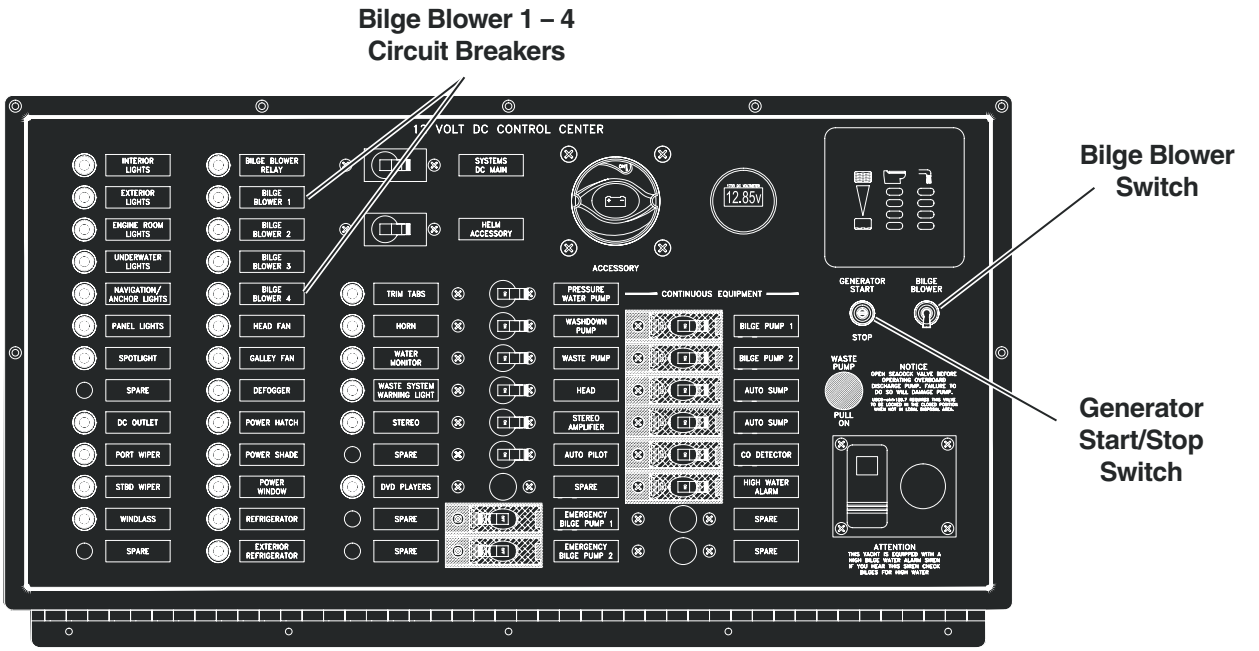


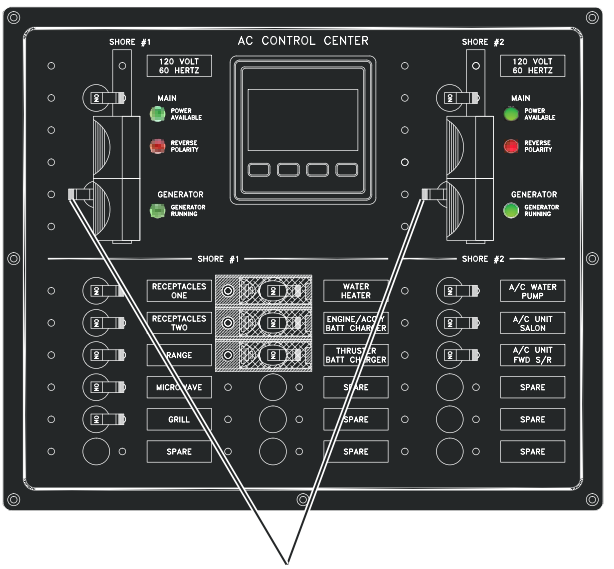
Figure 7-16

NOTICE

The starter can be damaged by holding down the generator switch in the START position after the generator is started. The generator START/STOP switch is spring-activated. Release the switch from the START position once the generator begins to crank. Never hold the STOP/START switch in the START position for more than 2 seconds.

4] On the DC control center, press and hold the GENERATOR START/STOP switch until the generator begins to crank. The generator cranking/starting cycle is automatic after the initial press/hold and release of the GENERATOR START/STOP switch. The generator will crank for 10 seconds and automatically stop cranking if the generator does not start. A second start cycle can be attempted after the first stop. If the generator does not start after two attempts, consult the generator owner's manual troubleshooting guide. Stopping the generator also only requires a momentary press and hold of the GENERATOR START/STOP switch.

5] Once the generator is running smoothly, switch the GENERATOR circuit breaker group ON, located on the AC control center. The breaker group connects the AC electrical system to the generator output. Once the GENERATOR RUNNING indicator light illuminates, power is available to the other circuit breakers on the AC control center.



Generator Circuit Breakers

Figure 7-17

6] To turn the generator OFF, turn the GENERATOR START/STOP switch to the STOP position, located on the DC control center.

7] Turn the generator battery master disconnect switch to the OFF position if the generator is not going to be used for a few days.

8] To change the AC power source from the generator to shore power, switch the GENERATOR circuit breaker group OFF, located on the AC control center.

9] Once the GENERATOR circuit breaker group has been turned OFF, connect to a shore power source as described in **"Shore Power Connection" on page 86**.

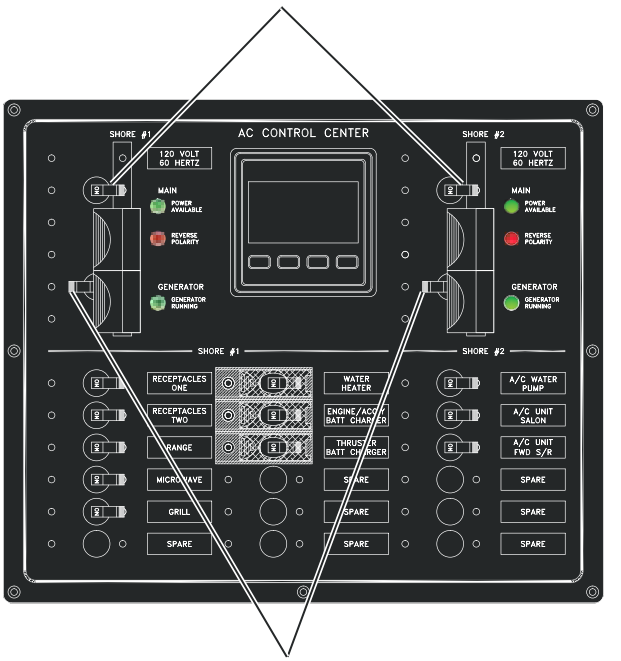
AC CONTROL CENTER

The AC control center manages the power supply to all AC equipment installed onboard.

Power to the panel is supplied by either a shore power connection or the generator.

AC Power Selector

Main Circuit Breakers



Generator Circuit Breakers

Figure 7-18

A sliding lockout plate prevents the SHORE breaker group and GENERATOR breaker group from switching ON at the same time. Slide the lockout plate to the position necessary to expose the chosen breaker group.

MAIN: Switch the MAIN breaker group ON if a shore power source is used to provide electricity to the AC electrical system.

GENERATOR: Switch the Generator breaker group ON if the generator is used to provide electricity to the AC electrical system.

Power Available Green Indicator Light

The power available indicator light illuminates when the yacht is connected to a working shore power source. Switch the SHORE circuit breaker group ON to provide power to the AC electrical system.

Indicator Lights

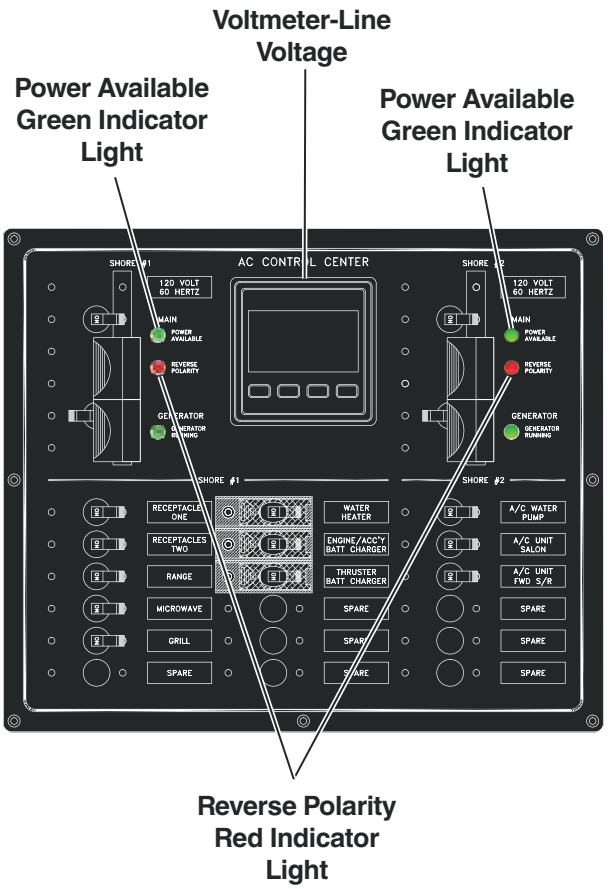


Figure 7-19

Reverse Polarity Red Indicator Light

The reverse polarity indicator light is illuminated when the shore power source electrical system is wired incorrectly and the hot and neutral wires have been reversed.

NOTICE

If the reverse polarity light is illuminated, turn off the craft's shore power connection switch immediately, and then contact the dock master to have it corrected.

Voltmeter – Line Voltage

The voltmeter indicates the amount of voltage that is entering the AC electrical system.

The voltmeter should read between 110 and 120 volts (220 and 230 volts European) when the yacht's AC electrical system is connected to either a shore power source or to the generator (while the generator is running) with the MAIN breaker ON.

If the voltmeter reads 95 volts (220 volts European) or less, DO NOT USE THE AC SYSTEM. Do one of the following:

- Contact the marina's management to identify and correct a shore power problem.
- Have a qualified technician service your generator.

NOTE: For yachts that operate on 110 volts (230 volts European), the limits are 110-120 volts (220 and 230 volts European) AC and no less than 100 volts (220 volts European).

If the voltmeter reads zero voltage and indicator lights are not illuminated, no electricity is reaching the AC control center.

If a generator is being used, make sure:

- The generator is operating properly.
- The safety circuit breaker is ON, located on the generator control center.

If shore power is used, make sure:

- The shore power cord is properly attached to both the yacht and the shore power source.
- The circuit breaker at the shore power source box is ON.
- The ELC1 circuit breaker group is ON.

If the voltmeter continues to read zero voltage, do one of the following:

- Have a qualified technician service your generator.
- Contact the marina's management to identify and correct a shore power problem.
- If the problem appears to be with your yacht's AC electrical system, have the system inspected by a qualified electrician.

AMPMETER – LOAD CURRENT

The ampmeter indicates the amount of current being drawn by the AC electrical equipment.

The ampmeter should read zero amps when the following items occur:

- Either the MAIN or GENERATOR circuit breaker group is ON and all other breakers on the AC control center are OFF.
- There is no power being consumed onboard the vessel.

The ampmeter readings increase above zero amps:

- As the circuit breakers located on the AC control center are switched ON and the associated equipment is turned ON.
- As the equipment plugged into the AC receptacles is turned ON. See **"Electrical Loads" on page 98** for information on the AC electrical system load limits.

AC CONTROL CENTER CIRCUIT BREAKERS

NOTE: A circuit breaker location may be labeled, but no circuit breaker is present. In this situation, the component named on the label is an option that is not installed on the purchased model.

Line 1/Shore 1 Circuit Breakers

Engine/Acc'y Battery Charger

The ENGINE/ACC'Y BATT CHARGER breaker controls the flow of electricity to the battery charger that maintains the voltage levels in the engine batteries and the accessory batteries. The engine battery chargers are located on the engine room breaker/master disconnect panels forward the engines. Refer to the OEM information for details on operating the battery charger.

Grill

The GRILL breaker controls the flow of electricity to the grill. Refer to the OEM information for details on operating the grill.

Microwave

The MICROWAVE breaker controls the flow of electricity to the microwave located in the galley. Refer to the OEM information for details on operating the microwave.

Range

The RANGE breaker controls the flow of electricity to the range located in the galley. Refer to the OEM information for details on operating the range.

Receptacles One

The RECEPTACLES ONE breaker controls the flow of electricity to the receptacles in the Forward Stateroom, Guess Stateroom and Head. The receptacles are used the same as in-home outlets.

NOTE: If the Receptacles ONE circuit breaker is ON, but power is not available to the receptacles in this group, the circuit's GFCI breaker may have tripped. Refer to Ground Fault Circuit Interrupters later in this section for more information.

Receptacles Two

The RECEPTACLES TWO breaker controls the flow of electricity to the receptacles in the salon and dinette. The receptacles are used the same as in-home outlets.

NOTE: If the Receptacles TWO circuit breaker is ON, but power is not available to the receptacles in this group, the circuit's GFCI breaker may have tripped. Refer to Ground Fault Circuit Interrupters later in this section for more information.

Thruster Battery Charger (Option)

The THRUSTER BATT CHARGER breaker controls the flow of electricity to the bow/stern thruster and generator battery charger that maintains the voltage levels in the battery supplying power to the bow and/or stern thruster. Refer to the OEM information for details on operating the battery charger.

Water Heater

The WATER HEATER breaker controls the power to the water heater located in the engine room. Refer to the OEM information for details on operating the water heater.

NOTICE

DO NOT supply power to the water heater when the water heater is empty.

Line 2/Shore 2 Circuit Breakers

A/C Water Pump

The A/C WATER PUMP breaker controls the flow of electricity to the water pump that supplies the air conditioning system with seawater.

NOTICE

Do not switch the Air Conditioning System Water Pump breaker ON until after the seacock supplying the air conditioning system with seawater has been opened. Refer to Air Conditioning System for more information.

A/C Unit Fwd S/R

The A/C UNIT FWD S/R breaker controls the flow of electricity to the air conditioning unit that cools the Master Stateroom, Guess Stateroom, and Head. To supply power to the unit, switch the A/C System Water Pump breaker ON, before switching the Air Conditioning Unit Master Stateroom breaker ON.

NOTICE

Do not switch the Air Conditioning unit master stateroom breaker ON until after the seacock supplying the air conditioning system with seawater has been opened.

AC Unit Salon (2 Breakers)

The AC UNIT SALON breaker controls the flow of electricity to the air conditioning unit that cools the Salon and Galley. To supply power to the unit, switch the A/C System Water Pump breaker ON, before switching the Air Conditioning Unit Salon breaker ON.

NOTICE

Do not switch the Air Conditioning unit salon breaker ON until after the seacock supplying the air conditioning system with seawater has been opened. Refer to Air Conditioning System for more information.

OPERATING AC EQUIPMENT

⚠ WARNING

Never reset a breaker that has automatically tripped without first correcting the problem. Failure to correct the problem may create a dangerous situation.

Power to the AC components is controlled by circuit breakers and individual controls for each component.

Electricity to the AC components can be controlled by switching the breakers from the AC control center ON or OFF. The breakers also protect the electrical system by automatically disconnecting the circuit from the power source in the event of a short or overload.

GROUND FAULT CIRCUIT INTERRUPTERS

Figure 7-20

Each AC receptacle is protected by a Ground Fault Circuit Interrupter (GFCI). The GFCI measures both the amount of current flowing to the circuit's receptacles and the amount of current returning from the receptacles. The GFCI compares the two values once measured. If the values are not the same, the GFCI instantly trips, and power is shut off to the receptacles.

An electrical shock received through a standard receptacle will continue through a person's body and flow into any grounded object that the person is touching or standing on. The GFCI, however, will immediately shut off power to the receptacle. Shutting off the power limits the time the person is being shocked to a brief moment, significantly reducing injury to the person.

GFCI Receptacle Locations

The receptacles protect a group of receptacles that can include both open outlets and outlets already in use for built-in equipment. All outlets onboard are connected to a GFCI.

Testing GFCI Receptacles

GFCIs have TEST and RESET buttons located on the receptacles.

Switch the TEST button ON/OFF switch to ON to reset a GFCI that has tripped.

Press the RESET button to reset the GFCI after it has tripped. Resetting a GFCI allows electricity to flow again to the receptacle.

Test each GFCI circuit once per week.

GFCI Receptacle Locations:

- Receptacle Circuit 1-Port Aft Salon
- Receptacle Circuite 2-Galley

⚠ DANGER

Never use a GFCI or any receptacle on a GFCI circuit if power is still available on that circuit after the test button has been pressed. Death or serious injury can occur by receiving an electrical shock from the AC electrical system including the Ground Fault Circuit Interrupter (GFCI) receptacle. Seek immediate medical attention after receiving an electrical shock. Contact a qualified electrician to make appropriate repairs.

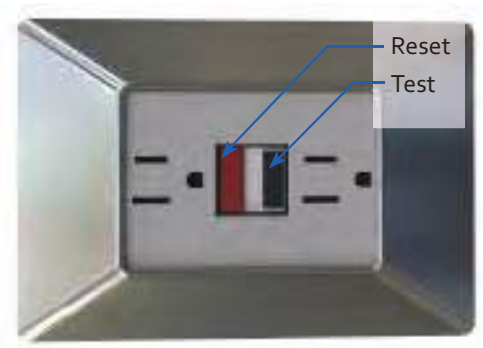


Figure 7-21

1] Press the TEST button. If operating normally, it cuts the electricity to the receptacle on the GFCI.

2] Plug a lamp or other AC-powered device into the receptacle, and turn ON the device. The device should NOT operate.

3] Press the TEST button. Never use the receptacle if the receptacle still has power. Contact a qualified electrician to make the appropriate repairs.

4] Reset the GFCI to restore power to the receptacle.

ELECTRICAL LOADS

⚠ WARNING

Never overload the electrical circuits. Turn off all devices connected to the circuit, and then switch the breaker back on if an excessive load trips a circuit breaker.

Be aware that each device exerts a "load" on the system when operating AC-powered devices through the AC electrical system. The electrical load is equal to the amount of current (amps) that the device draws from the AC electrical system. The AC electrical system is designed with a maximum total load that the device can handle. Each LINE circuit has an electrical load capacity of 30 amps.

The MAIN circuit breaker groups on the AC control center will trip if the total load on the circuit exceeds the circuit's capacity; it will trip if the devices operating from the circuit are drawing too much current. See **"AC Control Center" on page 93** for panel location.

Table 7-2 shows common AC-powered devices and the approximate maximum current that the devices draw while operating. If an AC-powered device is used that has an electric motor, such as a vacuum cleaner or electric drill, the device should have a "motor load plate" mounted on it. The motor load plate lists the current that the device draws while operating.

AC DEVICE	APPROXIMATE MAXIMUM CURRENT USED (AMPS)
Fan	0.7
Electric blanket	2.0
Television	2.7
Coffee maker	6.3
Battery charger	7.3
Toaster	10.5
Frying pan	12.3
Space heater	13.7
Refrigerator	1.5

Table 7-2 – Electrical Load per Device

As detailed in **Table 7-2**, appliances using a motor or a heating element will draw a relatively large amount of current. Exercise caution when using appliances such as curling irons, toasters, coffee makers, hair dryers, food mixers, or similar types of AC-powered devices.

Never use too many motor-operated appliances at the same time.

BONDING SYSTEM

⚠ DANGER

Never modify the yacht's bonding system. The system's integrity is weakened by making modifications.

A comprehensive metallic bonding system that interconnects all metallic underwater equipment and thru-hull fittings is equipped on each model. The bonding system ensures that all metallic equipment onboard, including the fittings, have the same electrical potential. The bonding system minimizes corrosion of the underwater fittings caused by stray electrical currents.

Sacrificial zinc anodes are components on the propeller shafts and on the trim tabs. The anodes corrode and deteriorate before the yacht's underwater fittings. The sacrificial zinc anodes protect the underwater metal components from galvanic corrosion, as well as stray current corrosion.

The yacht's 12-volt DC ground electrical system is connected to the bonding system through bus bars.

Monitor the condition of the yacht's zinc anodes. Replace the zinc anodes when they have deteriorated to 30% of the original size. Never allow the zinc anodes to completely deteriorate. See **"Maintenance Schedule" on page 151** for recommended inspection intervals.

NOTE: Damage resulting from stray current or galvanic corrosion is NOT covered under the limited warranty.

TROUBLESHOOTING THE AC ELECTRICAL SYSTEM

PROBLEM	PROBLEM CAUSE	POSSIBLE SOLUTION
Voltmeter on AC control center reads zero	Shore power cord is not connected	Connect the shore power cord
	No power is at the shore power source box	Contact marina management
	The breaker installed in the shore power source box is OFF	Switch ON the circuit breaker
	The appropriate SHORE or GENERATOR circuit breaker group on the AC control center is OFF	Switch ON the circuit breaker group
	The shore power cord failed	Replace the cord
	The generator ran out of fuel	Check the fuel level in the PORT fuel tank; refuel if necessary
	The SAFETY circuit breaker on the generator control center is OFF	Switch ON the circuit breaker
	The generator failed	Contact a qualified electrician to make the appropriate repairs
	The voltmeter failed	Contact a qualified electrician to make the appropriate repairs
	The wire within the AC electrical system is loose or disconnected	Contact a qualified electrician to make the appropriate repairs
No power at the receptacles, but the voltmeter on the AC control center indicates an adequate voltage level	The RECEPTACLES breakers on the AC control center are OFF	Switch ON the circuit breakers
	GFCI has tripped	Locate the tripped GFCI and press the RESET button
The SHORE 1 or SHORE 2 circuit breaker on the AC control center trips immediately after being reset	The circuit breaker has failed	Contact your dealer to have the circuit breaker replaced

Table 7-3

Air Conditioning System (Optional)

This section applies only to the interior air conditioning system installed at the factory. An aftermarket air conditioning system may not operate the same as the system outlined in this section.

The air conditioning system needs an AC power source to operate, supplied either by shore power or onboard generator.

AIR CONDITIONING SYSTEM LAYOUT

- Salon Level – 16,000 BTU
- Stateroom Level – 10,000 BTU

PRODUCING HEAT

The air conditioning system produces heat when operated in reverse cycle mode. Reverse cycle operation is affected by the temperature of the seawater. The air conditioning system's ability to produce warm air decreases as seawater temperature decreases. It is recommended not to operate the air conditioning system in reverse cycle mode when the seawater temperature is below 40°F (4°C).

POWERING THE AIR CONDITIONING

1] Close the air conditioning water pick-up seacock.

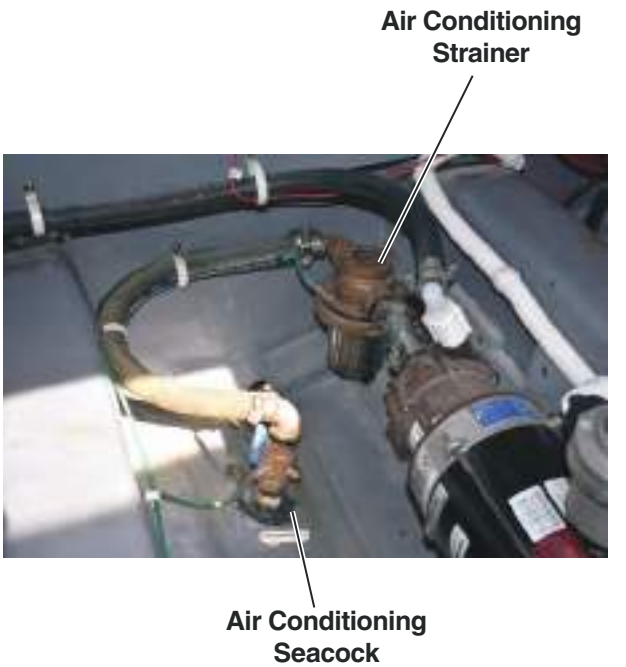


Figure 7-22

2] Remove and clean the air conditioning system's seawater strainer. The strainer prevents debris in the seawater from entering the air conditioning system.

NOTICE

Never switch the air conditioning system water pump breaker ON until after the seacock supplying the air conditioning system with seawater has been opened.

3] Reinstall the seawater strainer. If the strainer leaks when the air conditioning seacock is opened, close the seacock, and then check the strainer for correct installation.

4] Open the air conditioning water pick-up seacock. A single pump supplies the air conditioning units with seawater.

5] Supply AC power to the yacht. See **"Shore Power Connection" on page 86** and/or **"Figure 7-13" on page 88** for instructions.

6] Switch the correct circuit breakers group to ON (SHORE POWER or GENERATOR) located on the AC control center.

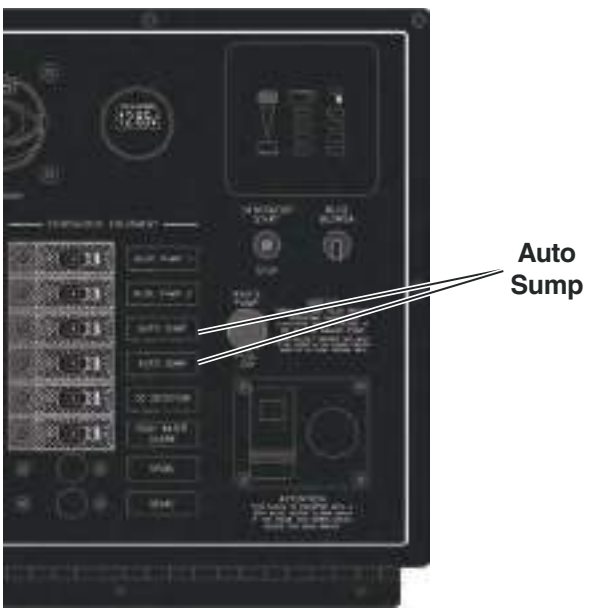
7] Switch the AUTO SUMP circuit breakers to ON. They are located on the DC control center. Condensation from the air conditioning system drains into the sump. The circuit breaker must be ON while the air conditioning system is operating.

8] Switch the A/C WATER PUMP circuit breaker, located on the AC control center, to ON.

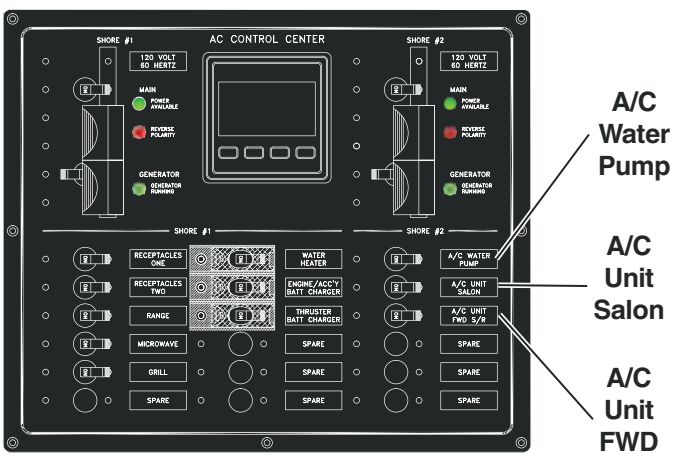
9] Switch ON the desired air conditioning unit circuit breakers, located on the AC control center.

10] Verify that seawater is pumping through the air conditioning units. The seawater exits through the discharge thru-hull fittings on the transom of the yacht.

11] Use the controls for each air conditioning unit to set the desired temperature. Refer to the Original Equipment Manufacturer (OEM) information for details on operating the air conditioning controls.



DC CONTROL PANEL



AC CONTROL PANEL

Figure 7-23

Freshwater System

The freshwater system contains freshwater tanks that supply water to the sinks, showers and heads. See **"Design Specifications" on page 6** for system capacity.

It is important to flush the freshwater tanks periodically. Thoroughly flush the water system at the following intervals:

- Before initial use
- Flush and sanitize at least once each season

FILLING THE FRESHWATER TANK

The freshwater tank is filled through a deck fitting with a plate labeled WATER.

NOTE: Tank capacity may not be usable according to trim and loading. It is important to keep a 20% reserve in the tanks at all times.

NOTICE

Never overfill the water tank. Never leave the fill hose unattended while the tank is being filled. Overfilling could rupture the tank.

PRESSURIZING AND PRIMING THE WATER SYSTEM

NOTE: Pressurize and prime the water system only after the freshwater tanks are full.

1] Verify that the DC control center has power.

2] Switch ON the AUTO SUMP circuit breakers, located on the DC control center.

3] Locate the water heater tank in the engine room.

a] Open the hot and cold water shut-off valves on the water heater.

b] Close the pressure relief valve.

4] Partially open all cold water faucets including sinks, showers, and transom hand shower.

5] Switch ON the PRESSURE WATER PUMP circuit breaker, located on the DC control center. Turning the breaker on activates the pressure water pump and pressurizes the water system. The freshwater system is fully primed when all the air is purged from the system's pipes and hoses.

6] Monitor each sink tap and shower head starting from the transom.

7] Once a steady stream of water flows from the tap or shower head, close the cold water faucet for the tap or shower head.

8] Open all hot water faucets.

9] The water system is fully primed when all hot and cold water faucets have a steady flow of water.

10] Add water to the freshwater tank to replace the water used in previous steps.

11] The pressure water pump automatically shuts off when water pressure within the system increases to the manufacturer's design level.

USING THE WATER SYSTEM

The freshwater system is designed to operate the same as an in-home water system. Open any faucet to receive fresh water after filling, pressurizing and priming the freshwater system. The pressure in the system decreases as water draws from the system. The pressure water pump automatically turns on and increases the pressure when pressure within the system decreases. The automated system ensures a steady flow of water any time a faucet is opened.

Occasionally, re-priming may be necessary for a recently filled system or a system that has not been used for a while. Re-priming is normal and is caused by an accumulation of air bubbles at the pressure water pump. To re-prime the freshwater system, repeat the procedure in **"Pressurizing and Priming the Water System" on page 103**.

TIP

To obtain a consistent shower temperature, turn on the cold water faucet fully, and then slowly turn on the hot water faucet until the water flowing from the shower head is at the desired temperature. This method keeps the pressure water pump running and eliminates widely fluctuating temperatures.

WATER HEATER OPERATION

1] Fill, pressurize and prime the freshwater system as explained in **"Pressurizing and Priming the Water System" on page 103**. This process automatically fills the water heater.

2] Supply AC power to the yacht. See **"AC Power Sources" on page 85** for instruction.

3] On the AC control center:

a] Switch ON the SHORE circuit breakers.

b] Switch ON the WATER HEATER circuit breaker.

4] For more information, refer to the Original Equipment Manufacturer (OEM) information for details on operating the water heater.

NOTICE

Never supply power to the water heater while empty; damage may occur to the heating element. Fill, pressurize and prime the freshwater system before turning on the water heater, as described in ***Filling the Freshwater Tank on page 103*** *and* ***Pressurizing and Priming the Water System on page 103****.*

SHOWERS AND SINKS

If supplied, used (gray) water from the sinks and showers drains into the sump. The sump is located below the yacht's waterline. A pump is needed to drain the sump and discharge its water overboard.

The sump pump operates automatically when water in the sump rises above the pump's manufactured level. The automatic operation occurs only when the AUTO SUMP circuit breakers are ON. The breakers are located on the DC control center.

Shower

A shower is installed in the head.

Sinks

Sinks are installed in the galley, and in the head.

Transom Hand Shower (Optional)

The optional transom hand shower supplies warm, fresh water after swimming. The hand shower is especially useful when the yacht is run in saltwater. The hand shower is an integral part of the yacht's freshwater system. Simply turn on the faucet and adjust for the desired water temperature.

Figure 7-24 – Transom Shower Components

FRESHWATER WASHDOWNS (OPTIONAL)

The optional transom freshwater washdowns supply water from the freshwater tank to wash down and clean the yacht. The freshwater washdown is especially useful if the yacht is operated in saltwater.

Figure 7-25

TIP

The freshwater washdown system draws water from the yacht's freshwater tanks. If you are not connected to shore water, the amount of freshwater in the water tanks is quickly reduced by prolonged use of the washdown system.

1] Attach one end of an appropriately sized nylon water hose to the fitting of choice.

2] Attach a nozzle to the other end of the hose.

3] Open the faucet at the base of the hose fitting to supply water to the hose.

Shore Water

The shore water fitting enables the freshwater system to draw water from a land water source while the yacht is docked. Shore water is not drawn from the onboard tank.

The deck plate labeled WATER is the only way to fill the freshwater tank. Connecting to shore water bypasses the onboard freshwater tank and pressure water pump; water does not fill into the tank.

When connecting to shore water, switch OFF the PRESSURE WATER PUMP circuit breaker, located on the DC control center.

NOTICE

Never leave the yacht unattended while connected to shore water. Water may develop onboard if a water line leaks.

CONNECTING TO SHORE WATER

1] Locate the shore water fitting, labeled SHORE WATER.

Figure 7-26

2] Attach one end of a water hose to the shore water fitting.

3] Attach the opposite end of the hose to the dockside water tap.

4] Close all sink and shower faucets.

5] Turn on the AUTO SUMP circuit breakers, located on the DC control center.

6] Partially open all cold water faucets including sinks, showers and transom hand shower.

7] Turn the dockside water tap ON.

8] Follow steps 6-10 from **"Pressurizing and Priming the Water System" on page 103**.

Raw Water Washdowns (Optional)

The bow and transom raw water washdowns can be used to wash down and clean the yacht with seawater.

NOTICE

Never operate the washdown pump when the seacock supplying seawater to the washdown system is closed. The pump can be damaged by continuing operation without seawater.

1] Locate the bow- and transom-mounted hose fittings.

2] Attach one end of an appropriately sized nylon water hose (with nozzle) to the hose fitting of choice.

3] Make sure the raw water seacock is closed. Remove and clean the raw water filter.

4] Reinstall the seawater filter and open the seacock. If the filter leaks when the seacock is opened, close the seacock and check the filter for the correct installation.

5] Open the seacock to supply the seawater to the washdown pump.

6] Switch ON the WASHDOWN PUMP circuit breaker located on the DC control center.

NOTICE

DO NOT operate the washdown pump when the seacock supplying seawater to the washdown system is closed. The pump can be damaged by continuing operation without seawater.

The raw water washdown pump, when activated, creates pressure in the raw water washdown system. When the hose nozzle is closed, water pressure within the system increases to the design specifications. Once the pressure is reached, the pump automatically shuts off. When the hose nozzle is open and water is released from the system, the pressure in the system decreases. When the pressure decreases to the manufacturer's design level, the pump automatically turns ON and increases the pressure. The system settings ensure a steady flow of water every time the raw water washdown is used.

Bilge Water Pumping System

Check the function of all bilge pumps at regular intervals. Clear pump inlets from debris.

The bilge system contains the following bilge pump quantities based upon region:

North American:

- 2 automatic and manual electric submersible bilge pumps

CE/International:

- 2 automatic/manual electric submersible bilge pumps
- 2 manual emergency electric submersible bilge pumps

The bilge is the lowest interior point of the hull. Any accumulation of water in the hull will flow to the bilge.

See **"Design Specifications" on page 6** for pumping capacity. The combined capacity of the system is not intended to drain the craft in the case of damage.

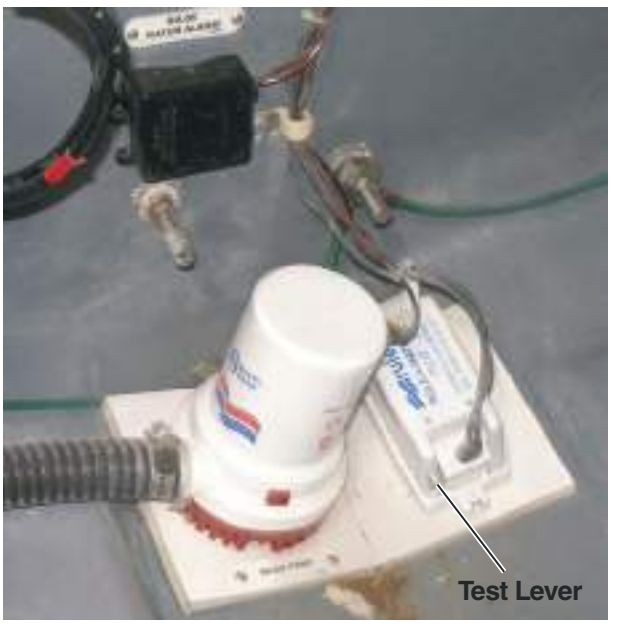


Figure 7-27

NOTE: Wipe up any oil that may have accumulated in the bilges before operating the bilge pumps. Pumping oil overboard contributes to water pollution and is in violation of the Federal Water Pollution Control Act. Violators are subject to a substantial penalty.

NOTICE

Never store items in the bilges. Damage may occur to the pumps, pipes or other components essential for proper operation by storing loose items in the bilges.

NOTICE

The water in the bilges must be drained before storing for the winter if the yacht is kept in a climate with below-freezing temperatures.

*Frozen water in the bilges may cause severe damage to the yacht and its components. See **Bilge Drainage Procedure on page 168** for more information on winterizing the bilges.*

BILGE PUMP OPERATION

Each automatic bilge pump can be operated either automatically or manually. The bilge pumps remove nearly all the water that collects in the bilges.

The high-water sensors detect high bilge water, and an alarm will sound if detected. The most likely causes of high bilge water are:

- A hull breach
- Faulty bilge pump
- Faulty seacock/hose

NOTE: The HIGH WATER ALARM switch and HIGH WATER ALARM circuit breaker, located on the DC control center, must be ON at all times. The alarm will sound if high water is detected in the bilge. Periodically test each switch to ensure that the switch and pump are in proper working condition. Test by depressing small lever on back of switch housing.

Automatic Operation

The automatic bilge pump is activated by a float switch, located on or near the bilge pump. The switch automatically turns the pump ON when bilge water rises to the product's design level.

The automatic float switch operation can be tested by pushing down on the test lever located on the wire connection end of the float switch.

Manual Operation

1] Provide power to the circuit breakers on the DC control center:

a] Switch ON the SYSTEMS DC MAIN circuit breaker.

b] Switch ON the BILGE PUMP 1, and BILGE PUMP 2 circuit breakers.

c] CE/International - Switch ON the EMERGENCY BILGE PUMP 1 and EMERGENCY BILGE PUMP 2 circuit breakers.

2] Press the BILGE PUMP 1, and BILGE PUMP 2 switches located at the helm to activate the bilge pumps.

3] Turn the bilge pumps OFF when the bilge water level is low enough that the pump no longer pumps bilge water.

NOTE: A light will illuminate on the manual switch at the helm when the bilge pumps are operating in either manual or automatic mode. The light indicates that the pumps are operating.

It is the owner/operator's responsibility to supply at least one bailer/draw bucket on board, secured against accidental loss.

TIP

A small amount of water collects in the yacht's bilge. The water is usually not enough to activate the automatic switch on the bilge pump. While underway, use the helm switches to manually turn the bilge pumps on, and let the pumps run for 30 seconds to 1 minute. When your yacht is on plane, water in the bilge flows to the stern, where the AFT bilge pump is located. The amidships bilge pumps are near the lowest point in the hull.

HULL DRAIN

⚠ CAUTION

Securely tighten the drain plug into the hull before launching.

The hull drain allows water to drain from the bilges while the yacht is in dry storage. Make sure the yacht and cradle are positioned to allow water to flow toward the hull drain.

The hull drain will drain water only from the bilge area AFT of the forward engine bulkhead. If water collects forward of the engine room bulkhead, the water must be pumped out.

TIP

Coat the threads of the hull drain plug with waterproof grease before you install the plug into the hull drain fitting. This makes it easier to remove the plug at a later date.

Gray Water System

The gray water system is designed to have the shower drain and stateroom AC unit condensate drain flow into the gray water sump. The sump discharges the water either overboard or into an onboard optional gray water tank.

NOTE: The sump pump operates only when the AUTO SUMP circuit breakers on the DC control center are switched on.

GRAY WATER TANK (OPTIONAL)

When the gray water tank option exists, all sink and shower water discharges into the gray water tank. See **"Design Specifications" on page 6** for tank capacity.

Once the gray water tank is full, it can be emptied according to the procedures in **"Emptying the Waste Tank and/or Optional Gray Water Tank" on page 110**.

Sanitation System

TOILETS

The toilet system uses a motor to flush the head. Instruct guests on how to properly use the system.

See **"Design Specifications" on page 6** for waste tank capacity.

Once the waste tank is full, it can be emptied according to the procedures in **"Emptying the Waste Tank and/or Optional Gray Water Tank" on page 110**.

Figure 7-28

1] Confirm DC power is available at DC control center.

2] Make sure the HEAD circuit breaker is ON, located on the DC control center.

3] Check the level indicated on the tank monitor located on the DC control center.

4] Check the waste system warning light. Empty the waste tank if the indicator shows a reading of at least 3/4 full. See **"Emptying the Waste Tank and/or Optional Gray Water Tank" on page 110**.

NOTE: A warning light in the master head will illuminate when the waste tank is 3/4 full. If the red indicator is not lit, proceed to the next step.

5] Press the FLUSH button located on the wall-mounted FLUSH/ADD WATER control mechanism.

6] If the toilet bowl is dry, press the ADD WATER switch, which is located on the FLUSH/ADD WATER control mechanism.

NOTICE

If the waste system is not going to be used for two or more weeks, flush 2-3 gal (8-11 L) of freshwater through the head. Flushing water will flush the waste in the hoses to the tanks. Removing the waste from the hoses will decrease odors onboard.

EMPTYING THE WASTE TANK AND/OR OPTIONAL GRAY WATER TANK

The sanitation system contains a single centrally located polyethylene waste tank. It is important to observe local regulations on discharge.

Dockside Discharge

Using the dockside discharge method, waste is stored in the waste tank until it is transferred to a dockside pumpout station. If a gray water tank is installed, water drained from the showers and sinks is stored in the gray water tank until it is discharged at a dockside pumpout station.

NOTICE

Discharging waste overboard is illegal in many areas of the United States.

It is everyone's responsibility to comply with all applicable federal, state, and local laws when using the overboard discharge system. Discharging waste overboard in restricted areas will result in significant penalties. It is important to follow international regulations against marine pollution (MARPOL) and respect it as much as possible.

Use a harbor or marina pumpout facility to empty the holding tank before leaving harbor.

1] Locate a dockside pumpout station.

2] If a gray water tank is installed, make sure the Y-valve, which is located in the engine room, is set to the correct position. The Y-valve allocates the WASTE tank or GRAY WATER tank to be emptied.

3] Remove the waste deck plate, labeled WASTE, using the waste tank deck key supplied with the yacht.

4] Attach the pumpout vacuum hose to the WASTE deck fitting. Make sure to have a secure connection between the transfer hose and the deck fitting.

5] Activate the pumpout vacuum. The pumpout vacuum transfers onboard waste to the dockside holding station.

6] Flush the waste tank, after all waste is removed:

a] Pour at least 3 gal (11 L) of freshwater through the WASTE deck fitting.

b] Reattach the vacuum hose to the deck fitting, and activate the pumpout vacuum to remove the freshwater and any remaining waste.

7] Replace the deck plate.

TIP

The waste deck plate is not connected to the fitting and does not float. Be careful not to drop the deck plate when removing. You can order a replacement from your dealer if you do lose the plate. Waste deck plates are dropped overboard frequently enough that we suggest you carry an extra plate in your onboard spare parts kit.

NOTICE

The waste system must be empty during storage at freezing temperatures.

Waste Tank/Gray Water Tank Deodorizers and Acceptable Cleaning Chemicals

Any RV tank cleaner, RV anti-freeze, or RV deodorizer is acceptable for use with the waste tank or gray water tank.

Overboard Discharge (Optional)

1] Open the overboard discharge seacock.

2] If a gray water tank is installed, make sure the Y-valve is set to the correct position. The Y-valve allocates the WASTE tank or GRAY WATER tank to be emptied.

3] Turn the ACCESSORY battery master disconnect switch to the ON position. The ACCESSORY master disconnect switch is located on the DC control center.

4] On the DC control center, switch the SYSTEMS DC MAIN circuit breaker ON, and then switch the WASTE PUMP circuit breaker ON.

5] Turn the WASTE PUMP switch ON located on the DC control center. This activates the overboard discharge pump, which pumps the waste overboard.

NOTICE

When the waste tank is empty, turn the WASTE PUMP switch OFF. Operating the pump when the waste tank is empty can damage the pump.

6] After all waste is pumped overboard, turn the WASTE PUMP switch OFF.

7] Remove the waste tank deck plate labeled "WASTE" using the waste tank deck key supplied with the yacht.

8] Flush the waste tank by pouring at least 3 gal (11 L) of freshwater through the "WASTE" deck fitting.

9] Reactivate the overboard discharge pump and remove the freshwater and any remaining waste, and then turn the pump switch OFF.

10] Close the overboard discharge seacock.

11] Replace the "WASTE" deck plate.

12] On the DC control center, switch the WASTE PUMP circuit breaker OFF.

Propulsion System

⚠ WARNING

Never allow flammable materials to contact hot propulsion parts. Fire and explosion may occur.

The Propulsion System covers the standard factory installed gas engines and any options within the propulsion system.

EXHAUST SYSTEM

The exhaust system for each engine consists of an exhaust manifold, exhaust piping, and the exhaust hoses used to vent the exhaust to the atmosphere. Carbon monoxide may escape and endanger everyone on board if the exhaust system contains leaks or obstructions, or has any other problem that prevents it from venting exhaust properly. Check the exhaust system regularly for proper operation. Change in engine noise could indicate an exhaust system problem, and should immediately be investigated.

ENGINE AND GENERATOR FUEL SYSTEM

Fuel Lines

To avoid damage to the fuel lines, make sure that the fuel lines are sealed, clamped and intact.

Fuel Tanks

The fuel system meets or exceeds the standards set by the U.S. Coast Guard, National Marine Manufacturers Association (NMMA), and the American Boat and Yacht Council at the time when the yacht was built. Each fuel tank has passed rigorous tests performed by the tank manufacturer. The entire fuel system has passed factory pressure testing and inspection. Your dealer also makes a full inspection of the fuel system before the yacht is delivered to the owner. An entry on the pre-delivery service record verifies the dealer's completion of the inspection.

NOTICE

Over time, water can condense inside the fuel tanks, especially in areas with high humidity. The condensation can react with the fuel in the tanks to create a mixture that can corrode the tanks from the inside.

Avoiding Tank Corrosion

- Use the fuel in the fuel tanks as often and as completely as possible.
- Keep the tanks full of fuel when the yacht is stored and when it is used infrequently.
- Do not put alcohol-based fuels in the tanks.
- Check the Racor fuel filter bowls for water accumulation on a regular basis.

NOTICE

Tank capacity may not be usable according to trim and loading. Keep a 20% reserve in the tank at all times.

Fuel Shut-off Valves

Diesel engine options require fuel shut-off valves. Fuel supply shut-off valves are located in the engine room on top of each fuel tank. Each valve opens or closes to supply fuel to the allocated system component.

Figure 7-29 – Typical Fuel Shut-Off Valves Installation

Fuel Tank Vents

Each fuel tank is vented overboard. As the fuel tanks get filled, air is displaced from inside the tanks and escapes through the vents. However, when the engines are running, air enters the fuel tanks through the vents to displace the fuel being used.

Diesel Engine and Generator Fuel Filter/Water Separator

Each engine and the generator have a fuel filter/water separator to remove contaminants and any water from the fuel.

Gasoline Propulsion Fuel Filter

Gasoline propulsion fuel filters are of the cartridge replaceable type mounted on the engine. Refer to the Engine Operator's Manual for additional information.

Diesel Engine Fuel Filter/Separator

Figure 7-30

Figure 7-31

COOLING SYSTEM

Each propulsion engine has a closed cooling system that removes heat from the engine and the exhaust system. Closed systems use a freshwater/anti-freeze mixture to cool the engine. The coolant mixture runs through a heat exchanger that transfers the heat to seawater taken in through a seacock for each engine.

Some engine options require sea water to cool the heat exchangers or engines. These options have a seawater seacock and strainer for each engine.

Figure 7-32 – Typical Installation

Make sure that a sufficient level of coolant mixture is kept in each system. Open the cooling system seacocks before starting the engines. The inlet seacocks for each engine are labeled ENGINE WATER SUPPLY.

Clean the seawater strainer every 14 days or sooner as necessary.

NOTICE

Serious damage to the engine and related systems can occur by running an engine with an inadequate supply of anti-freeze or obstructed seawater pickups or strainers.

The cooling system may need to be repaired if an above-normal temperature registers on the engine temperature gauge. If the engine temperature rises quickly, immediately shut off the affected engine, and have the cooling system inspected and repaired.

ENGINE ROOM VENTILATION

The engine room is equipped with a ventilation system that consists of intake ducts, exhaust ducts and bilge blowers. The ventilation system is designed to remove fuel vapor and excess heat from the engine room. The bilge blowers operate when the engines are running, as long as BILGE BLOWER 1 through BILGE BLOWER 4 and BILGE BLOWER RELAY circuit breakers are ON, which are located on the DC control center.

The engine room ventilation system must be kept in proper operating condition. Perform the following actions to ensure proper condition:

- Inspect the intake and exhaust ducts regularly to keep free of obstructions. Make sure the ducts have not collapsed or torn.
- Inspect the blowers to ensure they are operating properly.
- Replace worn components with new components of the same type.

⚠ WARNING

Always operate the bilge blower for a minimum of 4 minutes prior to starting the engines. Gasoline vapors can explode, resulting in injury or death. Before starting the engines or generator, perform the following:

- **Check the engine room for fuel vapors.**
- **Operate bilge blower for 4 minutes – gasoline engines.**
- **Verify that blowers are operating properly. Always run the blower when the vessel is operating below cruising speed.**

PROPULSION/GENERATOR MAINTENANCE

Refer to the propulsion and generator Original Equipment Manufacturer (OEM) information for instructions on maintaining the yacht's propulsion units and generator.

A seawater strainer may be installed in the water intake lines for each engine and the generator. At least once every 30 days, close the seawater seacocks, and then open and clean the strainers.

Inspect the strainers more frequently if the yacht is operated in dirty waters or areas with a high degree of aquatic vegetation. A clogged strainer restricts the intake of seawater, which can cause the affected engine or the generator to overheat.

Helm Controls

The helm controls allow the operative to be engaged with the engine activity, control the boat's speed, engine RPMs, and control the boats direction.

Figure 7-33 – Helm Controls


Navigation/
Multi-Function
Diplay Monitor –
Optional
Engine/
Multi-Function
Display Monitor

Figure 7-34

ENGINE/MULTI-FUNCTION DISPLAY MONITOR

The engine/multi-function display monitor displays various engine functions and other necessary functions to keep the yacht running efficiently. Items monitored by the display include:

- RPM
- Engine Hours
- Coolant Temperature
- Voltage
- Turbo Pressure
- Oil Pressure
- Warnings and Alarms
- Trim Position
- Surface Water Temperature
- Speed through Water
- Water Tank Level
- Fuel Tank Level

DISPLAY PANELS (OPTIONAL)

The navigation/multi-function display monitor is a wireless integrated touchscreen display unit that provides charts for navigation.

Your boat may be equipped with one or more display panels sometimes referred to as a multi-function display (MFD) or cockpit display. Panels are available in different sizes and can be dedicated to a single function such as switching, or multi-functional for engines, navigation, systems, etc. Some displays allow side-by-side or 4-quadrant display of information at the same time. Panels can also be dedicated to the propulsion system and can duplicate other helm controls.

Operation of the displays can vary by type, brand, and installed options; be sure to read the display operation information and control specific user manuals for proper use. Your boat dealer is the best source to use for making an informed decision on adding or integrating display panels.

Display panels and some electronic controls can also integrate one or more optional capabilities such as:

- Engine/Systems Information Display
- Embedded WiFi/Bluetooth/Remote Control Operation
- Radar/Sonar/Fishfinder
- GPS/Auto Pilot/Navigation/Chartplotter
- Station Keeping
- Cruise/Tow/Trim Control
- Second Station/Joystick Operation
- VHF/AIS/DSC
- Video/Camera/Thermal image display
- Digital Switching/Stereo

Some options can be retro-fitted if the NMEA 2K network is in place but it is dependent on the propulsion/display manufacturer.

⚠ WARNING

Multi-function display panel features and options are only tools to assist skippers with operation. Use of these tools does not relieve the skipper of the responsibility to safely operate the boat.

- **Never leave the helm unattended and be prepared to quickly regain helm control should a situation arise.**
- **Never operate the boat while watching video. Distracted driving while the boat is moving is extremely dangerous.**
- **Units with GPS are a navigational aid only and cannot be used for precise measurement of direction, distance, location or topography.**

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NAVIGATION SWITCH PANELS

Switch panels contain switches that activate the yacht's common circuits.

Figure 7-35

1 – Sunroof Open/Close
2 – Windlass Up/Down
3 – Windlass On/Off
4 – Bilge Pump 1 On/Off
5 – Bilge Pump 2 On/Off
6 – Port Windshield Wiper On/Off
7 – Starboard Windshield Wiper On/Off

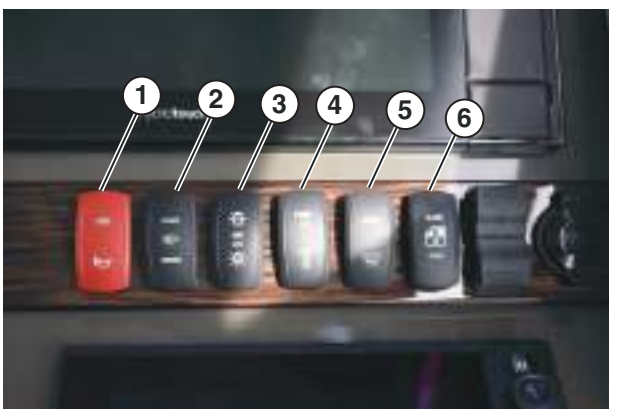


Figure 7-36

1 – Horn On/Off
2 – Blower On/Off
3 – Navigation Lights On/Off
4 – Panel Lights On/Off
5 – Defogger On/Off
6 – Sunroof Open/Close

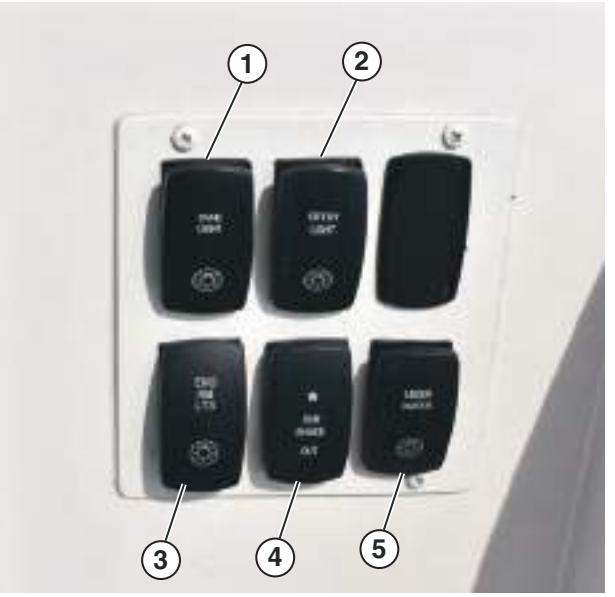


Figure 7-37 – Aft Switch Panel

1 – Overhead Lights On/Off
2 – Courtesy Lights On/Off
3 – Engine Room Lights On/Off
4 – Sunshade In/Out
5 – Underwater Lights On/Off

SEARCH LIGHT CONTROL

Figure 7-38

The searchlight control function controls the direction of the searchlight movement. The searchlight can be moved either side to side or up and down.

THRUSTERS AND JOYSTICKS (OPTIONAL)

The yacht can be equipped with one of three different docking assist systems:

- Bow Thruster
- Bow and Stern Thruster
- Full Joystick Control

Bow Thruster

The Bow Thruster system provides thrust to PORT or STARBOARD of the bow. It is controlled by a single joystick at the helm. FORE and AFT movement of the vessel, as well as PORT and STARBOARD movement of the vessel's stern, are accomplished by use of the engine controls. Press the two ON/ON buttons simultaneously to activate the system. A "system active" light on the control will illuminate. The system is equipped with an automatic timeout shut-off, so after a period of nonuse it will shut off by itself. There is also an anytime shutoff button on the control.

Figure 7-39

Bow and Stern Thruster

The Bow and Stern Thruster provides thrust to PORT or STARBOARD of the bow as well as PORT or STARBOARD thrust of the stern. They are controlled by a dual joystick at the helm. FORE and AFT movement of the vessel is accomplished by use of the engine controls. Press the two ON/ON buttons simultaneously to activate the system. A "system active" light will illuminate. The system is equipped with an automatic timeout shut-off, so after a period of nonuse it will shut off by itself. There is also an anytime shutoff button on the control.

Figure 7-40

Full Joystick Control

Your boat may be equipped with an optional joystick control which works in conjunction with electronic steering and propulsion controls. Joystick controls provide precision maneuverability for docking and slow speed navigation such as in a marina and may offer other optional functions. Practice using the joystick in open water away from traffic to get the feel of the control. Refer to the joystick/propulsion manufacturer owner's manual for more information.

Figure 7-41

ENGINE IGNITION

Figure 7-42

You can start or stop both engines with the key switches. The engines are equipped with the "easy start" system. Rotate the key switch momentarily to the START position and then release it. The engine will continue to crank until it starts.

SHIFT/THROTTLE LEVER

Figure 7-43

The shift/throttle levers are connected to the engines by an electronic control system (engine interface). The function of the shift/throttle levers is to control the engine speed and vessel direction of travel.

The levers allow the captain to shift the engines from neutral to forward or from neutral to reverse to control the engines' RPMs. See the following lever position guide:

- FORWARD – Above Neutral Position: Shifts the engines to forward and increases the RPM levels
- NEUTRAL – Center Position: The engines remain in neutral at their lowest RPM levels.
- REVERSE – Below Neutral Position: Shifts the engines to reverse and increases the RPM level.

NOTE: It is recommended to operate the engines at the same speed while cruising. Doing so reduces engine noise, reduces engine vibration, and improves engine efficiency.

See the engine control manuals for more in-depth information on the operation of the engine's control system.

Fire Suppression System

⚠ WARNING

Immediately evacuate the engine room and the AFT bilge area if the fire suppression system is activated. Asphyxiation can result if the fire suppression system chemicals are inhaled.

Immediately ventilate the engine room with fresh air once the fire is extinguished and the system is deactivated.

Do not attempt to restart the engines until the fire is out and any damage to the engines and fuel system has been repaired.

Automatic Fire Suppression System

Figure 7-44

SYSTEM OPERATING INFORMATION

An automatic fire suppression system is installed in the engine room. This system provides extra security in the event of an engine room fire. Refer to the Original Equipment Manufacturer (OEM) information for details on operating the fire suppression system. The system can also be activated manually by a handle mounted at the helm.

The fire suppression system monitor is wired to an ignition switch. The monitor light should be ON when the ignition switch is turned ON. The monitor is installed below the lower helm controls. The suppression system contains an engine shut-off circuit. The engine, generator and engine compartment blowers automatically shut off when the system is activated for safety reasons.

This system function can be reversed after a fire has been extinguished by moving the switch on the fire suppression monitor to the OVERRIDE position. This switch should always be in the NORMAL position during all normal operating periods.

Figure 7-45

The override switch, which is located on the system monitor, resets the engine shut-off circuit after the system has been activated, allowing the engines to be restarted.

New components that have the same designation or equivalent technical and fire-resistance capabilities must be used when performing maintenance on the fire suppression system.

Fire Suppression System Manual Release Handle

Figure 7-46

The fire suppression system manual release handle, when pulled, will activate the fire suppression tank in the engine room. Use it in the event of a fire in the engine room.

Do not enter an engine room after a discharge of the fire suppression system until all fumes within the compartment have been discharged.

There is a circuit breaker in the DC control center labeled "Engine Room Exhaust." This breaker switch controls a dedicated engine room exhaust fan that is intended to be used solely for the discharge of engine room exhaust fumes after a fire suppression system discharge. Make sure the fire is out before you turn on the fan.

Propellers

⚠ WARNING

Always wear gloves when handling the propeller. The propeller blades are sharp.

Inspect the propellers often. Keep a swim mask in the yacht to inspect the propellers while swimming. Out-of-balance or damaged propellers can diminish the yacht's performance by reducing speed, causing steering problems and creating vibrations. Vibrations can lead to drivetrain damage.

Have the propellers balanced by an established propeller repair shop at least once a year. Repair or replace damaged propellers.

TIP

Consider purchasing and carrying a spare set of propellers onboard. Many marine dealers do not carry a full inventory of replacement propellers. A spare set allows your vacation or cruise to continue in the event that the primary set of propellers gets damaged.

8 OPERATING AND MANEUVERING

Launching the Yacht

⚠ WARNING

Verify the porthole windows located on the hull sides are closed and secured whenever the vessel is underway.

Always close all portlights, windows, washboards, doors, hatches and ventilation openings when appropriate in rough weather or at planing speeds. Failure to do so may allow seawater to enter the yacht, possibly causing a swamped condition.

Have a professional launch the yacht. Your dealer can either provide experienced people or recommend someone to launch.

Pre-Start Checklist

1] Read and understand the Owner's Manual and all OEM information.

2] Check both fuel gauges to verify that the yacht is sufficiently fueled for the trip.

3] Inspect the engine room:

- a] Check the fuel system for any signs of leakage.
- b] Check the bilge water level.
- c] Check for oil in the bilge.
- d] Check the crankcase oil level in each engine.
- e] Make an overall inspection of the engine room for signs of potential problems.
- f] Follow all maintenance instructions as detailed in **"Maintenance Schedule" on page 151**.

4] Turn ON the master disconnect switches for the engine batteries pairs and the accessory battery. See **"Master Disconnect Switches" on page 76**.

5] On the DC control center:

a] Switch on the SYSTEMS DC MAIN circuit breakers

b] Verify that all the safety circuit breakers are ON.

c] Switch ON the BILGE BLOWER 1 through 4 and BILGE BLOWER RELAY circuit breakers.

d] Switch ON the ELECTRONICS MAIN circuit breaker if navigation equipment is installed at the helm.

e] If needed, switch ON the AUTO SUMP (2 breakers) circuit breakers.

f] Switch ON any other circuit breakers for equipment that may be needed.

6] Verify that all safety gear is onboard and is in proper operating condition. Make sure all safety equipment is carried onboard as required by federal, state, and local regulations.

7] Verify that an adequate supply of fresh water is onboard.

8] Check the level of waste in the waste tanks. Empty the waste if necessary. See **"Emptying the Waste Tank and/or Optional Gray Water Tank" on page 110**.

9] Disconnect and store the shore power cord and shore water hose.

Preparing for Cruising

Adhere to the following steps to safely fuel the yacht and operate the engines.

FUELING

⚠ DANGER

Fuels are extremely flammable and highly explosive under certain conditions. Take all precautions every time you fuel the yacht.

- **Stop the engines, generator and any fuel-operated machinery.**
- **Do not smoke or allow open flames or sparks within 50 ft (15 m) of the fueling area.**
- **Clean up any spilled fuel immediately and dispose of rags properly ashore. Do not store rags used to wipe up fuel in the yacht.**

1] Securely moor the yacht. See **"Mooring Lines" on page 138** for information on mooring the yacht.

2] Close all portholes, windows, hatches and doors.

3] Turn OFF all electrical devices required to operate the yacht.

4] Extinguish all open flames and smoking material on the yacht and in the area around the fuel dock.

5] Turn OFF all battery master disconnect switches. See **"Master Disconnect Switches" on page 76**.

6] Have all passengers evacuate the yacht.

7] Estimate the amount of stored fuel that is necessary for the cruise.

8] Select the fuel tank to be fueled first.

9] Remove the appropriate fuel fill deck plate using the deck plate key supplied with the yacht.

NOTICE

Avoid spilling fuel on the gel coat and painted surfaces of the yacht. Fuel can stain the gel coat, paint, and hull accent stripes (if applied).

NOTICE

The fuel tanks are designed to accept fuel at a maximum rate of 9 gallons per minute (gpm) (34 liters per minute [lpm]) when the tank is between 25% and 75% full. The pressure inside the tank must not exceed 4 psi (124 kPa) during fueling. Many marine fuel pumps can deliver fuel at rates up to 35 gpm (132 lpm). A high fueling rate should never be used. A high fueling rate could damage the fuel system.

10] Decrease the fueling rate when fueling a tank that is either nearly empty or nearly full. Decreasing the rate helps prevent a fuel surge when the tank is empty and prevents back-up and spillage when the tank is full.

11] Begin pumping fuel at a rate of no more than 9 gpm (34 lpm) into the fuel tank. When the tank is close to full, slow the fuel rate to less than 9 gpm (34 lpm).

12] Monitor the fuel tank air vents. Stop filling when the sound of the air exiting the fuel tank vents changes during the filling process. The sound will change significantly once the tank is full.

13] Replace the fuel fill deck plate.

14] To fuel the next fuel tank, repeat steps 9-12.

15] Wipe up any spilled fuel after each tank is filled.

STARTING THE ENGINES

⚠ WARNING

Always operate the bilge blower for a minimum of 4 minutes prior to starting the engines. Gasoline vapors can explode, resulting in injury or death. Before starting the engines or generator, perform the following:

- **Check the engine room for fuel vapors.**
- **Operate bilge blower for 4 minutes – gasoline engines.**
- **Verify that blowers are operating properly. Always run the blower when the vessel is operating below cruising speed.**

NOTE: On diesel-powered vessels, the blower activation is automatic when the key switches are in the ON position. The blowers will also automatically activate when the generator is started.

Refer to the Original Equipment Manufacturer (OEM) information for details on using the engine controls.

1] Open the cooling system seacocks for both engines. See **"Cooling System" on page 115** for seacock locations.

2] Move the shift/throttle lever to the NEUTRAL position.

3] Select the desired engine to start first by turning the engine key switch to the START position. Never start both engines simultaneously.

NOTICE

Do not hold the ignition key in the START position for more than 10 seconds. The ignition switch is spring activated. Release the ignition key as soon as the engine starts. Failure to release the key may damage the starter. If the engine does not start within 10 seconds, release the ignition key, and start the engine again.

ONCE THE ENGINES HAVE STARTED

1] Check the engine gauges. Verify that all readings on the helm are within the normal range.

⚠ WARNING

Do not enter the engine room while one or both engines are operating. The engine room contains moving, hot machinery.

Look into the engine room. Visually inspect the fuel system hoses and exhaust hoses. Shut off the engines, and investigate if a leak is suspected or if anything else is out of order. Identify and correct the cause of the problem before restarting the engines.

2] Allow the engines to warm up until the temperature gauges begin moving up before engaging drives.

3] Make sure all navigation systems are operating properly.

4] Periodically perform a visual inspection of the engine room while underway.

FUEL MONITORING

It is recommended to monitor and log the amount of fuel added to each tank at fill-up during the initial usage of the yacht. Compare the fuel usage to the fuel gauge indication at the time of fill-up. Make the comparison at least three times:

- 1/4 to full
- 1/2 to full
- 3/4 to full

Perform a fourth check if a safe condition is available that will allow the engines to run to near empty.

The readings will provide a better indication of the amount of fuel in the tanks in comparison to the fuel gauges. The readings provide security and keep the fuel tanks from being depleted. It is recommended start all cruises with full tanks, especially cruises that take up at least half of the total tank capacity before coming to the next fuel station.

Navigation

Understanding navigation is very important when out on the open seas. Instructions on navigation are beyond the scope of this guide. To obtain instruction regarding navigation, read *Chapman Piloting & Seamanship*.

CHARTS

Water charts are available from the National Ocean Survey (NOS), a branch of the National Oceanic and Atmospheric Administration in Washington, D.C. The NOS offers publications listing the charts needed for local areas. However, inland rivers may not be included on the listing. Inland river charts are available from the U.S. Army Corps of Engineers district office. Your dealer may also have local water charts.

Keeping charts up to date is an important part of navigation. The Weekly Notice to Mariners is available from the Defense Mapping Agency or the U.S. Coast Guard is an excellent resource for updating charts.

HORN

Use the horn to alert other yachters of your presence when operating at night or in fog. The horn meets U.S. Coast Guard standards. Refer to the U.S. Department of Homeland Security Navigation Rule Book for various horn signals.

SHALLOW WATER OPERATION

Always pay attention to water depth while cruising. Shallow water navigation can be very hazardous. Avoid waters that are too shallow for the yacht's draft.

Navigating Out of Shallow Waters

1] Reduce speed immediately if crossing into shallow waters.

2] Consult nautical charts to determine the yacht's position.

3] Try to plot a course out of the shallows through waters deep enough for the yacht's draft.

4] Radio for help and wait until help arrives if the yacht runs aground. Do not attempt to relaunch the yacht. Serious damage may occur to the hull or underwater gear.

Controlling the Yacht

⚠ WARNING

Avoid sudden maneuvers when the yacht is underway. Never allow passengers to ride on the forward sunpad while the yacht is underway. Sudden turning of the yacht or unseen wave surge can cause loss of balance resulting in injury or falling overboard. Always use the seats/seating spaces provided when the yacht is underway.

Every yacht owner should know how to perform the following procedures competently. Do not attempt the following procedures without first receiving appropriate training.

LOADING

When loading items onto the yacht, have someone on the pier hand the items on deck once boarded. Stow all items securely to prevent them from shifting once in motion. Distribute the weight evenly and keep the load low if the yacht is loaded near capacity or if seas get rough. Do not make abrupt changes in load distribution. Shift the load or move about only after stopping or slowing the yacht.

CASTING OFF AND DOCKING

Docking and casting off can be hampered by wind and current. It is important to use the current by approaching or leaving with the current instead of fighting against it. Also, the operator should adequately fender the yacht against collisions with docks or other yachts.

If a dinghy is used to reach the yacht, make sure the dinghy line does not foul the propeller. Start the engines after getting onboard, and send someone forward to slacken the line. Finally, release the line.

In a river with current, the yacht will gain headway with the current. Power the yacht forward after clearing the buoy.

In a calm bay with neither wind nor current, back the yacht away a few yacht lengths. Powering forward, keep the buoy in sight, and give it ample room until clear. Run slowly until the anchorage has been cleared to avoid creating a nuisance with the yacht's wake.

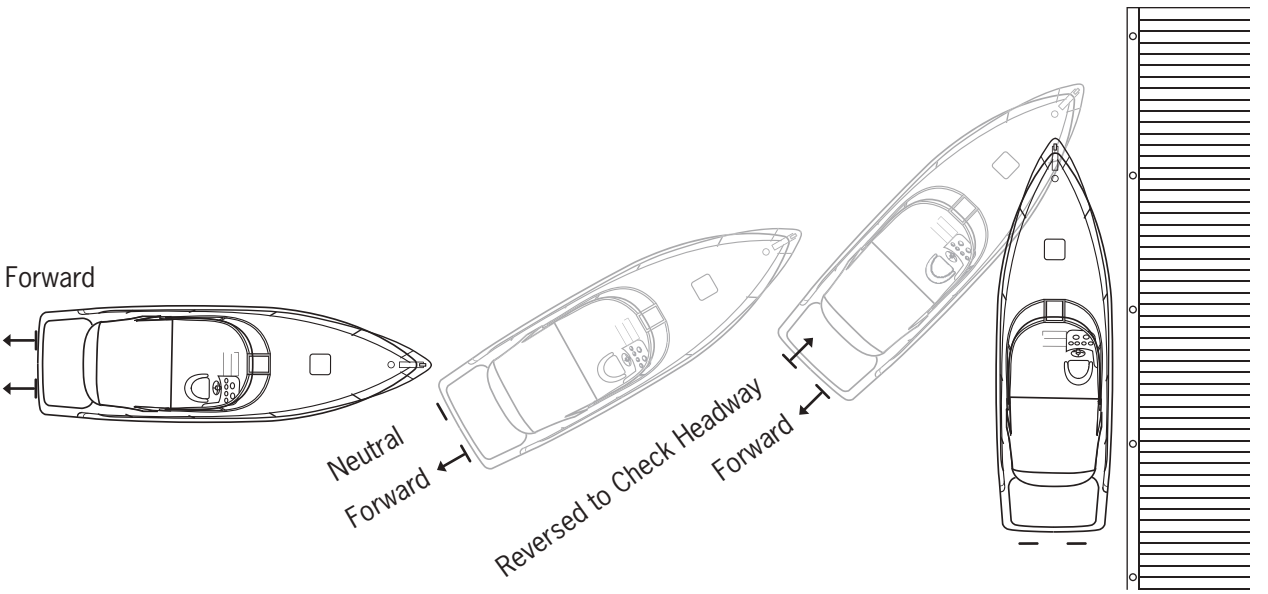


Figure 8-1

LEAVING A PIER OR MOORING

Getting underway from a pier is accomplished by performing the following:

1] Take in all lines EXCEPT the bow spring.

2] Power the yacht forward, with a neutral rudder, using only the engine farthest from the pier. The yacht will pivot around the bow spring line, moving the stern out and away from the pier.

3] Place a fender between the bow and the pier to prevent scraping as the yacht pivots about the bow spring.

4] Take the bow spring in and back the yacht away, once the stern is clear of yachts and other obstructions.

Yachts are often secured to a mooring buoy at marina anchorages. Fouling the propeller with a mooring line is the principal hazard when leaving a mooring.

If a dinghy is used to reach the yacht, follow this procedure to get underway:

1] Make sure the dinghy line does not foul the propeller.

2] Start the engines after getting onboard.

3] Send someone forward to slacken the line.

4] Release the line.

IF YOU ARE IN A RIVER WITH CURRENT, PERFORM STEP 5.

5] Power the yacht forward after the buoy has been cleared.

IF YOU ARE IN A CALM BAY (WHERE THERE IS NEITHER WIND NOR CURRENT), SKIP STEP 5 AND PERFORM STEPS 6-8.

6] Back the yacht away a few yacht lengths.

7] Keep the buoy in sight, as the yacht is powered forward, and give the buoy ample room until clear.

8] Run slowly until the anchorage has been cleared to avoid creating a nuisance with your wake.

LANDING AT A PIER

Approach the pier at a right angle to land at a pier.

Starboard Landing

1] Place the rudders to PORT and reverse the PORT engine to check headway.

2] Leave the STARBOARD engine in forward gear to swing the yacht parallel to the pier.

Port Landing

Turn the rudders to STARBOARD, and put the STARBOARD engine into reverse as the yacht comes in. If necessary, shift in and out of gear to control the yacht's speed.

PICKING UP OR MOORING

1] Approach the mooring at slow speed.

2] Take note of how other yachts are moored. The approaching course should be roughly parallel to the others' heading if they are heading into the wind or water current.

3] Stay clear of other moorings to avoid fouling them.

4] If a dinghy is being towed, station a crew member at the helm to keep the dinghy line from fouling the propeller.

5] Shift the engines into neutral when estimating that the yacht's forward momentum will carry the yacht to the buoy.

6] Station someone at the bow with a yacht hook to pick up the pennant float.

IF YOUR MARK IS ABOUT TO BE OVERSHOT, PERFORM STEP 7:

7] Check headway as the bow comes up to the buoy.

IF YOU FALL SHORT OF YOUR MARK, SKIP STEP 7 AND PERFORM STEPS 8-9:

8] A few turns of the propeller should get the yacht to the buoy. Keep the engine running until the pennant eye has been secured on the bitt or bow cleat.

9] Get clear and calmly try again if passengers cannot reach the pennant or if you overshoot.

MANEUVERING

The yacht's propellers rotate in opposite directions. Depending on which propeller is rotating, the yacht will track in different directions.

Port Propeller Rotating Only

The yacht tracks forward and to STARBOARD in forward gear and to PORT in reverse gear.

Starboard Propeller Rotating Only

The yacht tracks forward and to PORT in forward gear and to STARBOARD in reverse gear.

Both Propellers Rotating At the Same Speed

With the rudders amidships and the engines in forward gear, the yacht will track straight forward.

Moving Backward

The yacht's rudders are not as effective; the side force from the propellers is used to steer the yacht.

MANEUVERING ASTERN

Backing a yacht may be necessary in a crowded marina. The yacht's twin engines allow the yacht to track straight astern or to either side. When backing, keep the trim tabs up. To make a turn to PORT, shift the PORT engine to NEUTRAL. A STARBOARD turn astern is made by shifting the STARBOARD engine to NEUTRAL.

Check sternway (stop reverse motion) by shifting the engines to forward gear and throttling forward. Full stern turns can be executed, but watch the bow. The bow cuts a much wider arc than the stern, and collisions could occur in crowded areas.

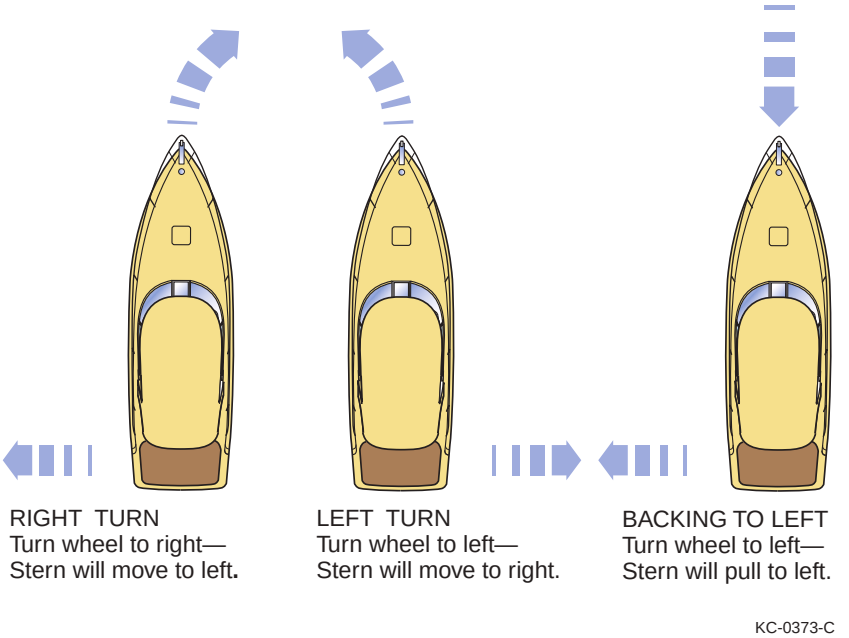


Figure 8-2

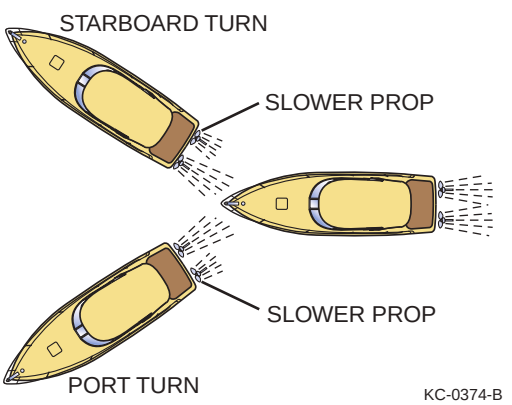


Figure 8-3

CLOSE-QUARTER TURNS

Executing a close-quarter turn:

1] Check your headway.

2] Shift one engine into reverse while shifting the other into forward gear. As you advance the throttles, the opposing forces cause the yacht to pivot about a point centered between the propellers.

3] Turn the rudders in the direction of the turn to assist the rate of turn.

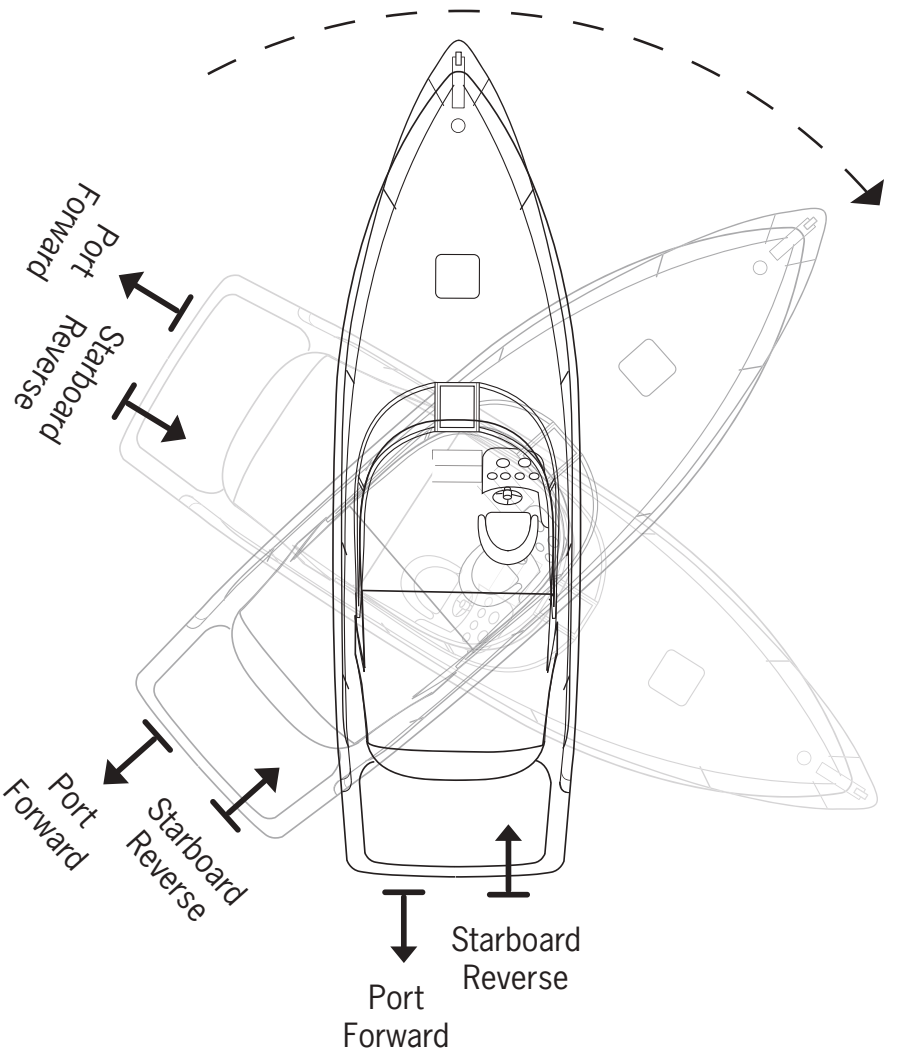


Figure 8-4

CHECKING HEADWAY

Stopping the yacht's forward motion is referred to as "checking headway." It is important learn how to confidently stop the yacht within any required distance.

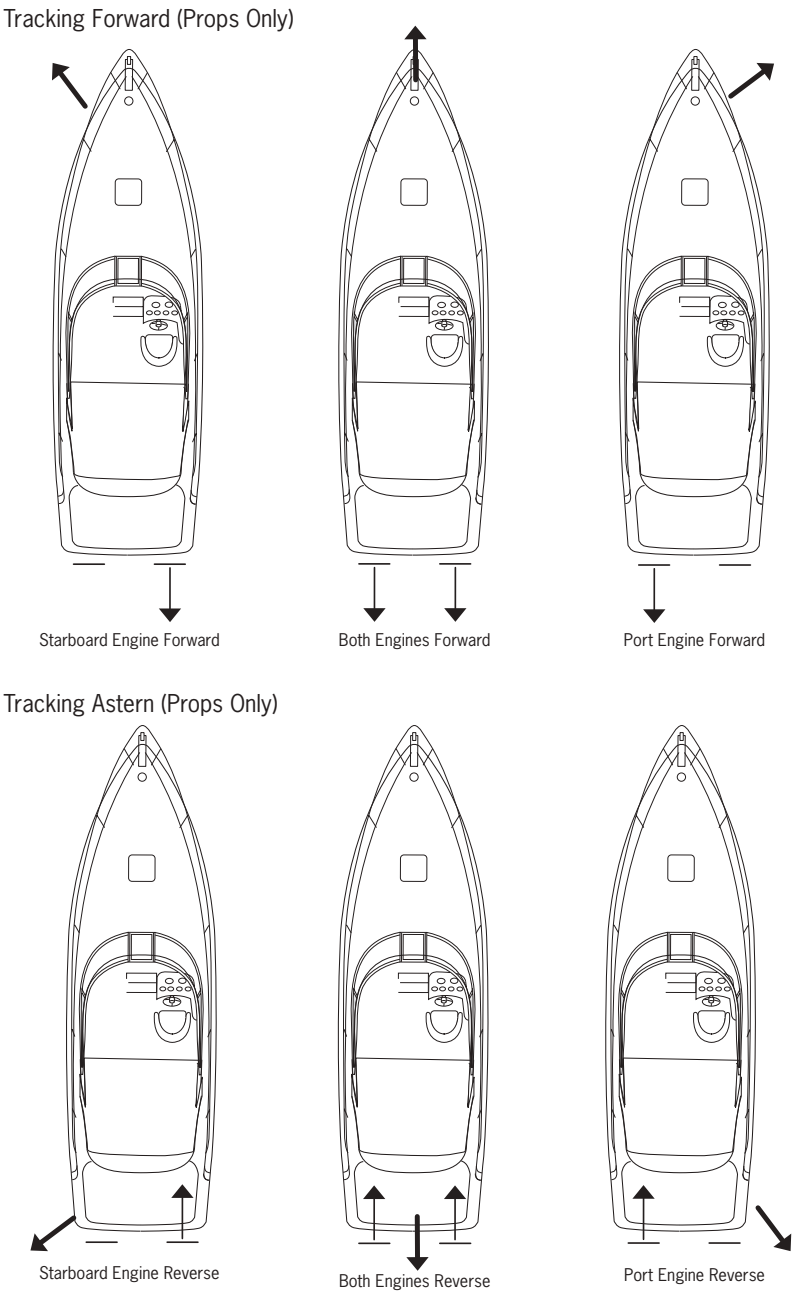


Figure 8-5

Check headway by shifting the engines to neutral and coming to a complete stop over a long distance, or by reversing the engines and stopping within a shorter distance.

Anchoring

The anchor's holding power depends on the anchor's weight and the anchor line length. The most effective anchor line length is six to seven times the depth of the water. For example, if the water is 10 ft (3 m) deep, the anchor line length should be 60-70 ft (18-21 m).

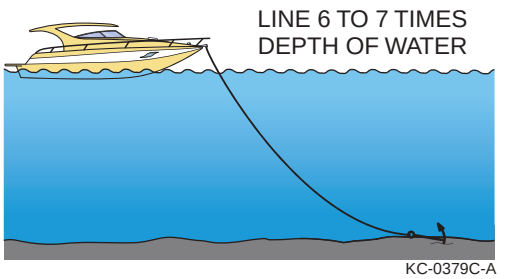


Figure 8-6

DROPPING THE ANCHOR

1] Approach the selected anchor site from downwind.

2] Come to a complete stop over the desired anchor drop spot. The anchor can be lowered from either the helm or from the bow with foot switches. To activate the foot switch at the bow, simply lift the cover.

3] Reverse the engines and slowly move the yacht backward to pay out more anchor line when the anchor hits bottom. The anchor flukes will dig in when the anchor is appropriately set.

4] Check for anchor drag immediately after anchoring. Observe the shoreline landmarks.

5] Observe the landmarks again after 30 minutes.

6] Reset the anchor if the points of reference have changed.

WEIGHING IN

When weighing (pulling in) the anchor:

1] Weigh in the rope until vertical.

2] When the rope is taut, give a hard tug to pull the anchor's shank up.

a] If the anchor is stuck, wrap some of the rope around a bow cleat and keep tension on the rode. The yacht's momentum may free the anchor.

b] If there is a swell, wind the rope around a bow cleat when the bow drops into a wave trough. As the bow lifts, it may free the anchor.

c] If neither 2a nor 2b methods works:

i. Pay out about 3 ft (1 m) of rope.

ii. Secure the rope around the bow cleat, and maneuver around the anchor.

iii. Keep the rope tight until the proper angle is found to pull the anchor loose.

3] Stow and secure the anchor and line before departing.

ELECTRIC WINDLASS

An optional electric windlass simplifies the previously mentioned procedures. Follow the previously mentioned procedures, and use the windlass control at the helm to drop anchor. To relieve strain on the windlass, a hook called the devil's claws engages the chain when the anchor is down.

TIP

Always tie off the anchor rope to the anchoring cleat to avoid potentially damaging stress on the windlass.

ADDITIONAL ANCHORAGE INFORMATION

If intending to stay at anchor overnight or if anchored close to another structure, consider dropping another anchor from the stern. Additional anchorage prevents the yacht from swinging around if the wind or current shifts.

Paying out about 3 ft (1 m) of line and maneuvering around the anchor may be necessary if the anchor is stuck when weighing in. Keep the line tight until the correct angle is found in order to pull the anchor loose.

If a swell occurs, hold the anchor chain in a vertical position and let a wave trough lift the bow.

Consider dropping another anchor from the stern if planning to stay at anchor overnight or if anchored close to another structure. Dropping a second anchor prevents the yacht from swinging around if the wind or current shifts.

Anchoring may be required in strong wind. If the spare anchor is dropped, make sure the two anchors are laid out at an angle. A trough may set for the second anchor if both anchors are set in-line and one of them drags.

STERN ANCHORS

It may be necessary to use both bow and stern anchors at the same time during anchorages. To drop both anchors:

1] Drop the bow anchor.

2] Pay out extra anchor line (15-18 times the depth).

3] Drop the stern anchor and adjust the length of line paid out on both anchors as necessary.

MOORING LINES

Become familiarized with mooring line terminology and mooring line use. Obtain training on mooring if necessary. Learn how and when to tie the various knots used in seamanship. Yachts that are not moored correctly can suffer and cause serious damage. The following information serves only as a guide to mooring the yacht.

Figure 8-7 demonstrates possible mooring lines. The lines include:

- LEFT (Example 1) docking illustration shows how to tie up when docking in an alongside berth.
- RIGHT (Example 2) docking illustration is used when tying up at four corners of the yacht.

The two spring lines are crossed and running to separate deck cleats. If possible, run the stern line to the offshore quarter cleat. Spring lines are useful in preventing undesired movement ahead or astern in a berth; they also keep a moored vessel in position when there is a significant rise or fall in tide.

When possible, tie up with the bow facing into the wind or current.

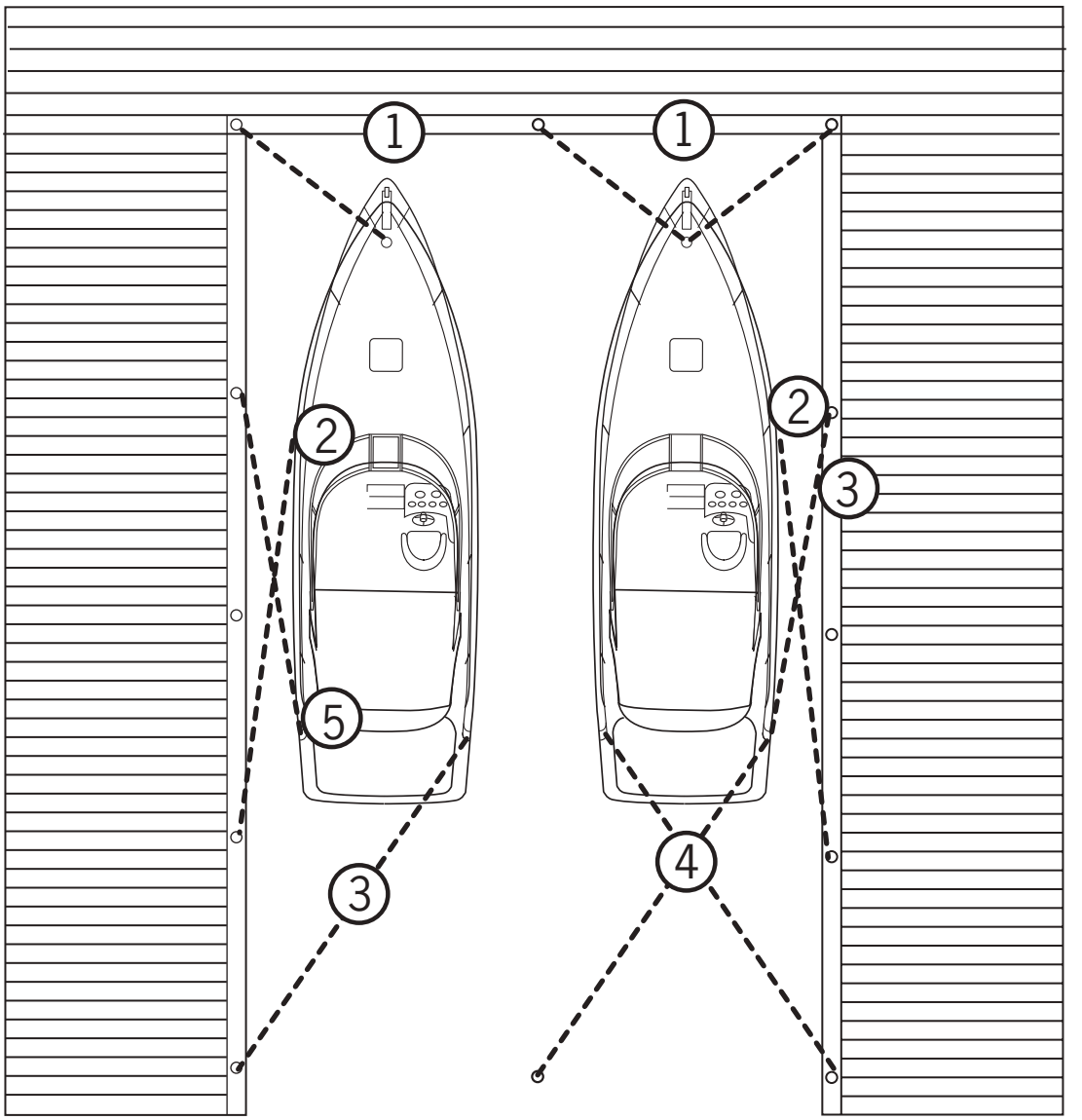


Figure 8-7

The lines illustrated are as follows:

NUMBER	DESCRIPTION
1	Bow Line
2	Aft Bow Spring Line
3	Aft Quarter Spring Line
4	Stern Lines
5	Forward Quarter Spring Line

LINES AND KNOTS

Mooring, anchor and other nautical lines are constructed from many different types of materials, and they are available in many diameters and styles. Consult your local marine supply store for a recommendation of appropriate lines for your yacht and application. Commonly used mooring lines are constructed of a high-quality synthetic material in a double-braided configuration and usually have eye splices on at least one end.

Learn and become familiar with tying and using knots. Knowing how to use knots and lines properly can prevent personal injury and property damage.

Practice tying lines to docks, cleats and anchors, and connecting two lines together. Consult other qualified boaters, local marine authorities, or other resources for information on the proper use of nautical lines and knots. The following illustrations represent a few examples of securing mooring lines.

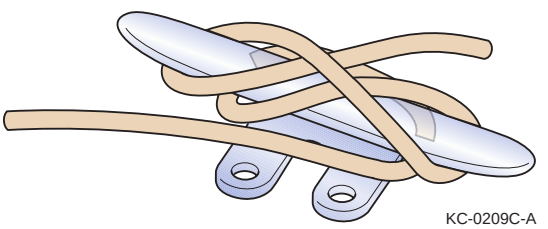


Figure 8-8 – Cleating an Open Line

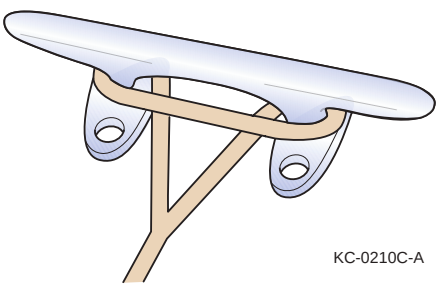


Figure 8-9 – Cleating an Eye Spliced Line

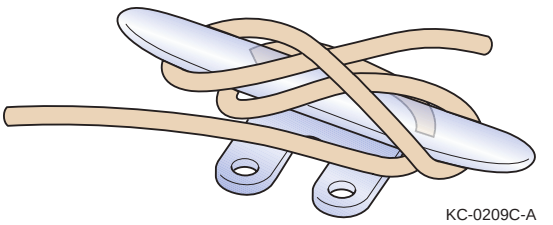


Figure 8-10 – Securing to Piling (Clove Hitch)

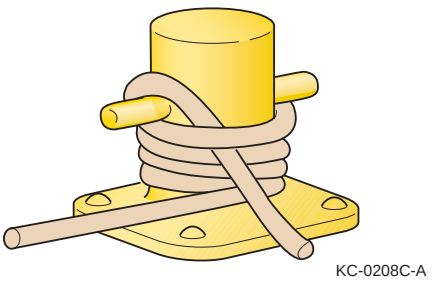


Figure 8-11 – Securing to Dock Bit

Getting Underway

Becoming a yachting expert requires training and experience. Reading and understanding the provided information in this Owner's Manual provides only part of the knowledge needed to operate a yacht safely and skillfully.

Yacht owners have a wide range of abilities, from seasoned yachtsmen with years of experience to absolute beginners with a new-found love for the water. Be honest in appraising your level of skill.

SHAKEDOWN CRUISE

Make sure that the following tasks have been completed before taking your first cruise:

1] Your dealer has completed pre-delivery commissioning. The inspection is documented on the pre-delivery service document and is signed by the dealer.

2] All warranty registration cards have been completed and mailed.

3] The Owner's Manual and all OEM information has been read and understood.

4] The safety equipment onboard is in compliance with federal, state and local regulations.

5] The yacht has been documented or registered, and displays the appropriate identification on the hull.

6] A representative from your dealer has reviewed the operation of the yacht and its systems and answered all your questions to your satisfaction.

Pick a calm day for the first outing if possible. The shakedown cruise with a new yacht is not the best time to bring friends or guests along. Entertaining guests can be a distraction from the real purpose of the cruise, which is to become familiar with the yacht. Bring only people who will be part of the regular crew, such as family members. Invite the salesperson who sold the yacht or a member of your dealer's service staff along for the ride.

Carry a pad and pencil during the first outing. Write down any questions that come to mind during the cruise. Discuss the issues with your dealer. Follow the procedures in **"Preparing for Cruising" on page 128** for fueling and starting the yacht's engines.

Tasks to Perform on the First Outing

- Proceed slowly.
- Have fun, but remember that the objective of the cruise is to learn how the yacht operates and handles.
- Operate the engines at different RPMs.
- Try different trim angles.
- Monitor the gauges.
- Practice backing down and turning at slow speed around tight corners.
- Above all, become familiar with the propulsion system.

OPERATING AT PLANING SPEED

The yacht is equipped with a "planing" hull. A planing hull skims over the water rather than through it. Planing is performed by first reaching a certain speed, called planing speed.

The trim angle of the yacht increases, when accelerating from a dead stop, causing the bow to rise and the stern to drop. The yacht eventually achieves plane, if acceleration continues, which means the bow slowly drops to a more level altitude.

⚠ CAUTION

Always get on plane as soon as possible. Avoid speeds that cause the yacht to plow through the water while in a bow-high altitude. A bow-high altitude obstructs vision and limits the yacht's handling and performance capabilities.

Once on plane, back the throttles off to a point where the hull is still planing but the engines are operating at a fuel-efficient speed.

Trim Tabs

A trim system is designed into the operational controls. Trim tabs help the yacht get on plane by allowing the operator to adjust the altitude of the yacht for variables such as load, passengers, seas or wind. Use the tabs at planing speeds to make minor adjustments in the fore-to-aft and beam-to-beam angle of the yacht.

Using the Trim Tabs

1] Provide power to the DC DISTRIBUTION PANEL circuit breakers.

2] Switch ON the SYSTEMS DC MAIN circuit breaker on the DC control center.

3] Switch ON the TRIM TABS circuit breaker, located on the DC control center. The trim tab control switches are located at the helm. The controls consist of two switches. The PORT switch controls the STARBOARD tab; the STARBOARD switch controls the PORT tab. Each switch is labeled BOW UP and BOW DOWN.

Figure 8-12 – Trim Tab Switches

4] Press both switches on the BOW UP side for 5 seconds before advancing the throttles. Pressing both switches lifts the trim tabs to the full UP position and assures that when the vessel gets on plane that the bow will not be lowered to a point that is unsafe to operate.

5] Advance the throttles to bring the yacht on plane.

6] Adjust the engine RPMs for cruising speed.

⚠ WARNING

Never over-trim the yacht. Over-trimming can cause the bow to veer and may lead to loss of control. Press the control switches for 1/2 second at a time, and then allow the yacht to respond when adjusting the trim tabs. Continue to adjust the trim tabs until the yacht is at the desired trim angle.

Put the trim tabs in the full BOW UP position when the seas are at any angle to the yacht's stern. Do not change the trim tabs' position until the seas are no longer at the stern.

The trim tab switches can be used together to bring the bow of the yacht to a lower altitude. This adjustment is often used when running into choppy seas. Bringing the bow down uses the sharper part of the yacht's V-hull to break through waves. Use the BOW DOWN side of both trim tab switches simultaneously to adjust the trim. Be careful when making bow down adjustments. Excessive bow down trim can cause considerable bow spray, which hampers visibility and reduces control of your yacht.

Leveling the Yacht with the Trim Tabs

Use the trim tabs individually to make beam-to-beam adjustments. If the majority of the onboard passengers are sitting on the PORT side, the STARBOARD side of the yacht should be riding higher than the PORT side. Use the BOW DOWN side of the STARBOARD trim tab switch to adjust the trim.

If the passengers decide to shift to the other side of the yacht, level the yacht by pressing the BOW UP side of the STARBOARD trim tab switch for a few seconds. This undoes your previous adjustment. Then, use the BOW DOWN side of the PORT trim tab switch to adjust the trim.

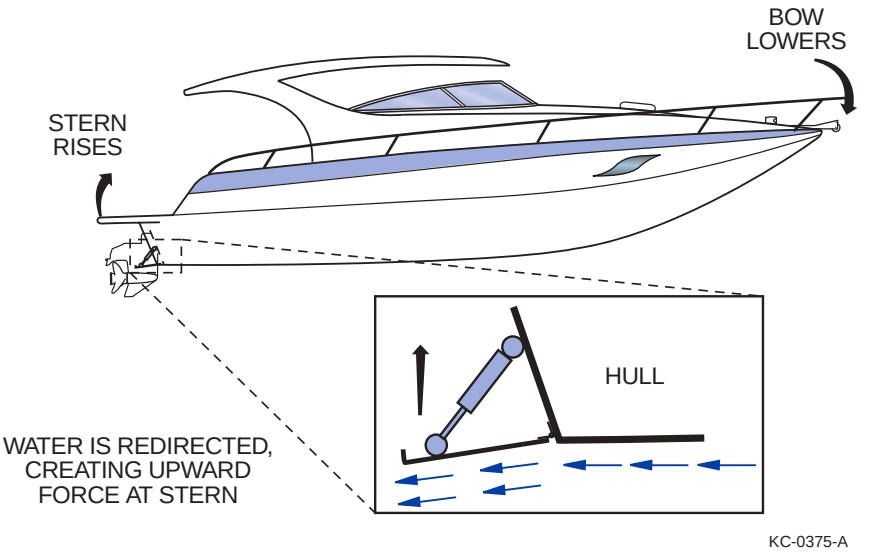


Figure 8-13

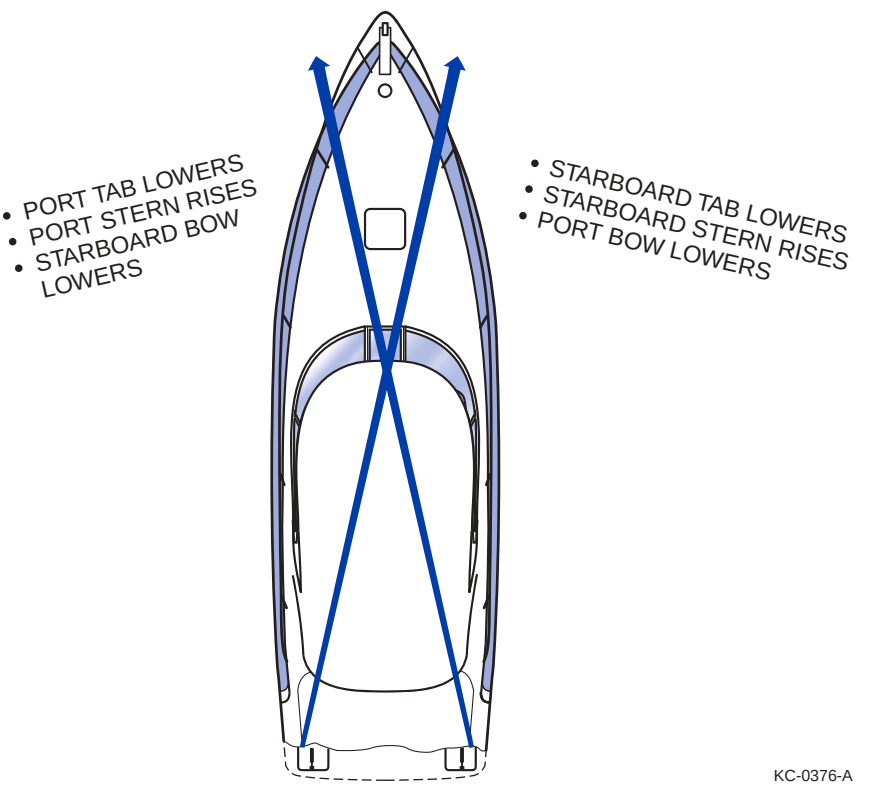
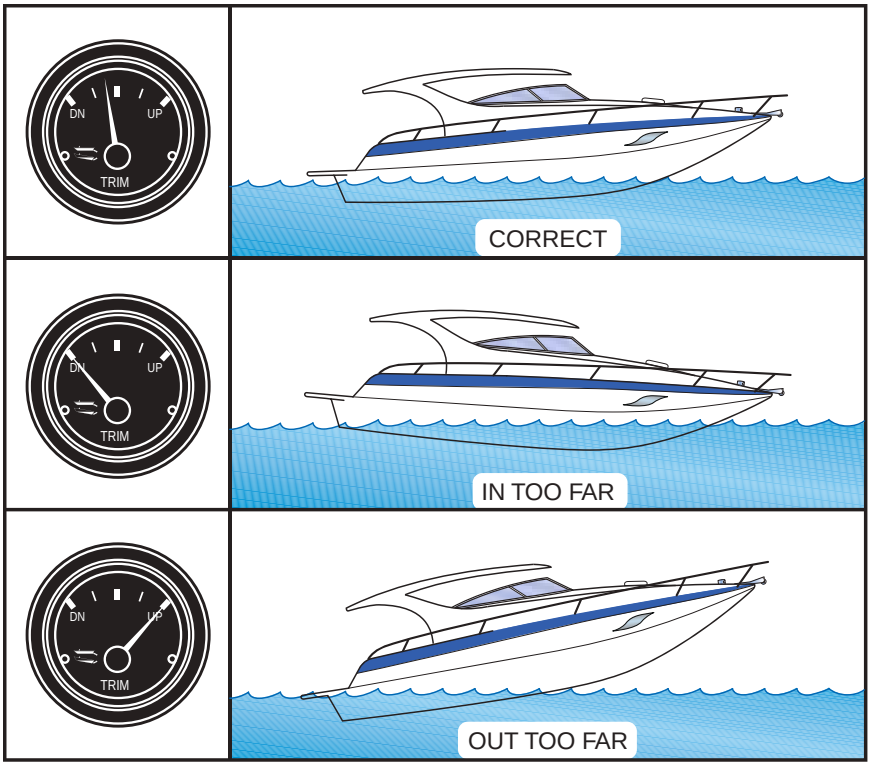


Figure 8-14


DN
UP
TRIM
CORRECT
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UP
TRIM
IN TOO FAR
DN
UP
TRIM
OUT TOO FAR
KC-0377C-A

Figure 8-15

9 MAINTENANCE AND CARE

Exterior Care

This section explains how to maintain various materials on the cabin exterior and how to help keep the yacht looking new.

FIBERGLASS SURFACES

The exterior fiberglass surfaces are coated with a protective layer of gelcoat. Gelcoat forms a hard, smooth and durable surface. Gelcoat contains microscopic pores that can, over time, collect dirt and discolor if the gelcoat is not kept clean.

NOTICE

Do not use abrasive cleaners when washing the yacht. Abrasive cleaners scratch and dull the gelcoat.

Wash the yacht with freshwater after each outing to help keep the gelcoat clean. If the yacht is operated in saltwater, do the following:

- Wash the yacht at least once every week, even if it has not been used since the last washing.
- Periodically wash with a solution of freshwater and mild soap.
- Use a sponge to wash smooth surfaces and a stiff nylon or natural-bristle brush to wash nonskid surfaces.

⚠ WARNING

Do not wax the nonskid surfaces. Waxing makes the nonskid surfaces slippery and dangerous to walk on.

NOTE: Wax all non-tread areas at least once per season. Use a high-quality, non-yellowing marine wax. Waxing provides a shiny surface and seals the pores in the gelcoat, making it easier to keep clean.

NOTICE

Frequent and continued use of abrasive polishing compounds eventually erodes the gelcoat.

Gelcoat eventually dulls with age, much like the paint on a car. Restore the gelcoat's luster using an electric buffer and a very fine–grade polishing compound. Ask your dealer what brand and grade of polish to use.

Gelcoat stress cracks are common on all fiberglass yachts. The majority of stress cracks are cosmetic and limited to the gelcoat surface only. Gelcoat stress cracks are rarely an indication of structural problems. Contact your dealer if stress cracks are found.

NOTE: The repair of cosmetic (non-structural) gelcoat stress cracks is not included under the warranty.

GELCOAT REPAIR

Minor gelcoat nicks and cosmetic scratches are not difficult to repair and they do not require the use of special or unique tools. Visually satisfying repairs take little effort. Repairs to fiberglass laminates or structural fiberglass components are best left to the experienced technicians at your dealer.

A gelcoat repair kit is available from your dealer. The kit includes color-matched gel, gel hardener and detailed instructions on making gelcoat repairs.

GELCOAT BLISTERS

Fiberglass is a durable and economical material. However, it is not indestructible. Blistering is the most problem associated with fiberglass.

The blisters generally form in the gelcoat or in the outermost layer of laminate. The blisters can range in size from microscopic to 2 in. (5 cm) or larger in diameter.

The appearance of the fiberglass blister appearance does not indicate structural problems or faulty hull lamination.

Gelcoat blisters form resulting from a natural process and are quite common. Contact your dealer if blisters are discovered on the underwater portion of the hull.

HULL BOTTOM

The underwater portion of the hull is coated with a high-quality, factory-applied coat of anti-fouling bottom paint. The paint is applied after the hull has been carefully prepared. The paint has a high copper content and is high in anti-fouling elements that retard the growth of marine life on the bottom of the hull. The anti-fouling elements in the paint have a limited life span, usually from one to three years, depending on how and where the yacht is used.

Inspect the hull bottom once a year. Repaint the hull if gelcoat is showing through the bottom paint. Use a paint that is compatible with the factory-applied paint. Failure to do so can void the bottom paint warranty. Also make sure the paint is formulated for the type of water the yacht is operated in. See your dealer for assistance in selecting an appropriate bottom paint.

To prepare the hull bottom for painting:

1] Lightly sand the existing paint with 80- to 100-grit sandpaper.

2] Remove all dirt and sanding residue from the hull.

3] Apply the new paint using a sprayer. Using a sprayer applies the smoothest coating and the best hull efficiency.

4] Allow the first coat to dry before proceeding if a second coat will be applied.

UNDERWATER METAL COMPONENTS

The hull's underwater portion has been carefully prepared, primed and coated with a high-quality, anti-fouling bottom paint at the factory. However, the underwater metal components, including the shafts, struts, propellers, trim tabs and thru-hull fittings, were not primed or painted at the factory.

The owner is responsible for priming and painting all underwater metal components. Use a high-quality primer and antifouling paint.

Reprime and repaint the components when bare metal is visible.

NOTE: Painting the propellers requires special care to attain a smooth surface. A rough surface on the propellers will seriously affect the performance of the yacht.

Contact your dealer's service department if more information is needed on priming and painting the underwater metal components.

CAULKING AND SEALANTS

Deck fittings, rail bases, windows and all underwater fittings have been sealed with the finest quality sealants. The sealants, however, do not last indefinitely. The working action of the yacht as well as the expansion and contraction caused by variations in outside temperature eventually break down the sealant.

Fittings that have begun to leak must be resealed. Remove the fitting and clean the old sealant from both mating surfaces.

Reseal the fitting using the sealant recommended by your dealer.

STAINLESS STEEL RAILS AND HARDWARE

Stainless steel is not rust-free. When left in contact with the marine environment, stainless steel does rust. Proper care helps keep the stainless fittings on the yacht looking bright and shiny.

Clean the stainless steel rails and fittings after each outing with soap and water or with glass cleaner.

If the yacht is used in saltwater, clean the rails and fittings at least once every week, even if the yacht has not been used since the last cleaning.

If rust appears on the metal:

- Remove the rust immediately with 3M Metal Restorer. Failure to remove rust leads to irreversible pitting.
- Use brass, silver or chrome polish to remove rust on stainless steel.
- Wax the stainless fittings and rails to help protect the surfaces from the elements and keep them looking their best.

Use the same wax on the fiberglass surfaces of the yacht.

NOTICE

Never use sandpaper, steel wool, or other abrasives to clean stainless steel fittings or rails. Never use mineral acids or bleach to clean stainless steel. Never allow stainless steel to come into prolonged contact with iron, steel or other metals. Prolonged contact could cause contamination, leading to rust or corrosion.

DECORATIVE STRIPING TAPE

A variety of decorative stripes are applied to the exterior of the yacht. Striping tapes are custom-made and replacement striping tape is available only through dealers. To remove a damaged section of tape, heat the area with a hair dryer. Heating with a hair dryer softens the adhesive and makes the tape easier to remove. Use acetone to remove the adhesive residue.

NOTICE

Avoid spilling fuel on the striping tape while fueling. Fuel damages the striping tape.

HATCHES AND WINDOWS

The hatch frames are fabricated from aluminum or stainless steel. Some frames are painted with enamel. To clean both the painted and unpainted frames, use a sponge dipped in a solution of freshwater and mild soap. Do not use a brush or abrasive cleaner, as they can scratch the painted frame surfaces, damaging the appearance.

The cabin windows are made from tempered glass. Clean the windows with a soft cloth and glass cleaner.

EXTERIOR VINYL UPHOLSTERY

Refer to the OEM information for details on cleaning the exterior vinyl upholstery.

Avoid saturating the exterior cushions with water. To enhance the appearance of the exterior cushions and upholstery, occasionally treat each item with an approved vinyl protectant.

NOTICE

If Dr. Vinyl has been used to repair damaged upholstery, do not use denatured alcohol, 3M Citrus Cleaner, ammonia or hydrogen peroxide on the repaired area. Further damage will occur.

EXTERIOR CARPET

Rinse the deck carpet with freshwater when cleaning the other portions of the exterior of the yacht. If the exterior carpet becomes soiled, remove the carpet from the yacht and wash the carpet with hot water and any brand of carpet detergent suitable for hot water extraction.

To remove stains from the carpet, refer to the carpet OEM information.

EXTERIOR ENCLOSURES

Exterior enclosures are made from a high-quality, marine-grade, vinyl-coated fabric. Clean this fabric at regular intervals (at least twice per year).

White Vinyl

White exterior enclosures are made from vinyl-coated materials. Clean the enclosures with a sponge dipped in a solution of freshwater and mild soap. To remove heavy dirt, use a vinyl cleaner. Treat the vinyl with a vinyl protectant twice each season.

Sunbrella

Colored canvas enclosures are made from Sunbrella fabric. Clean the fabric regularly before dirt accumulates and becomes embedded. The fabric can be cleaned without removing it from the stainless steel bow supports. Refer to the OEM information for details on cleaning the Sunbrella fabric.

NOTICE

Do not clean the exterior enclosure fabric using abrasive detergents or substrates containing solvents or gasoline. These products will damage the vinyl coating and/or the fabric. Be careful if using high-pressure or steam-cleaning devices, as improper use could damage the vinyl coating and/or fabric.

Cleaning the Exterior Enclosures

1] Apply a mild, lukewarm soap solution, such as liquid dishwashing soap, to the fabric using a soft brush or sponge.

2] Let the soap stand for a short period, but do not allow the soap to dry.

3] Carefully rinse the fabric with fresh, clear water until all the soap is removed.

NOTICE

To prevent mildew build-up, do not fold the fabric while it is wet or damp.

NOTICE

The exterior enclosure fabric was treated by the manufacturer with anti-mildew agents. However, this protection does not offer absolute safety against fungal attack.

4] Allow the fabric to dry thoroughly, and then reuse it or fold and store it.

NOTICE

The exterior enclosure fabric is sensitive to excessive mechanical strain. Avoid pulling the fabric over sharp edges or rough surfaces. Do not walk on the fabric. Folded corners are overstretched and therefore particularly sensitive to friction and abrasion.

NOTICE

Fabric must be completely dry before storage. Moisture on stored fabric can cause the glass to cloud and can cause the fabric and thread to break down.

STORAGE

Preparing the fabric for storage:

1] Thoroughly air-dry the fabric.

2] If possible, store the fabric in a flat position (avoid rolling the fabric).

3] Avoid storing the fabric with the zipper(s) exposed to eliminate imprints into the next curtain.

4] Place the fabric in a dry, ventilated area.

When removing the fabric from storage, check for cloudy glass and zipper imprints. In most cases, both can be removed by hanging the fabric in the sun.

EXTERIOR WOOD TABLE

Exterior wood tables need regular care and maintenance. There is no warranty coverage once the table is exposed to daily temperature changes. Daily temperature changes affect wood when it naturally expands and contracts.

Teak Table

A teak table should be oiled monthly to keep the wood from drying out. When the table is not in use, keep it covered with a water-resistant breathable cover to protect it from the elements.

The exterior teak table is an optional item; the warranty period for the table is the same as the yacht's limited warranty period. The warranty period for both items starts from the date of delivery to the original owner.

Interior Care

Ventilating the cabin as often as possible is one of the best ways to maintain the yacht's interior. Do not allow moisture to accumulate in the yacht's interior. Moisture leads to a damp, musty environment, which encourages mildew growth.

WOODWORK

Solid hardwood and hardwood veneer is used throughout the interior of the yacht. Treat the woodwork with special care. Dust it on a regular basis using 3M Clean and Shine and a soft rag.

NOTICE

Never use a wax-based furniture polish or a cleaner containing abrasives.

NOTICE

Never lay wet or damp towels or clothing on or against the finished hardwood surfaces.

The interior woodwork has been finished at the factory with a special industrial/commercial-grade finish. If any of the woodwork needs to be refinished, contact your dealer to order the appropriate product. Follow the manufacturer's instructions on the product package when applying the finish.

FABRICS

The yacht interior fabrics include drapes, pillow shams, bedspreads, woven headliners, and sofa and chair coverings.

Some fabrics have been treated with a stain protector. All fabrics require periodic cleaning. For best results, dry clean the fabrics.

For furniture upholstered in Ultraleather, refer to the OEM information for details on cleaning the material.

LEATHER

For furniture upholstered in Ultraleather, refer to the OEM information for details on cleaning this material.

CARPET

The interior carpet has been treated with a stain protector. However, the carpet still needs periodic cleaning. Care for the carpet in the yacht is the same as carpeting in the home. Vacuum often, and shampoo as needed using carpet shampoo.

New carpet sheds and needs to be vacuumed frequently. Shedding is normal and will stop after a few weeks.

INTERIOR FIBERGLASS

Some interior components are made of gelcoated fiberglass, such as the shower stalls and stateroom berth platforms.

Interior fiberglass can be cleaned with standard household cleaners intended for cleaning fiberglass. Many types of cleaners are marketed as "tub and tile" cleaners. Do not use abrasive cleaners on the interior fiberglass surfaces. Abrasive cleaners scratch and dull the shiny gelcoat surface.

PLEXIGLAS

The shower door, mirrored face of the head medicine cabinets, and other areas of the yacht are made of Plexiglas. Clean Plexiglas surfaces with a solution of fresh water and mild liquid detergent. Remove fine scratches with a fine automotive acrylic rubbing and polishing compound.

NOTICE

Do not use glass cleaners, abrasive cleaners, or aromatic solvents on Plexiglas. Abrasive cleaners etch the Plexiglas.

Maintenance Schedule

The maintenance activities and the intervals listed on the following pages are provided as guidelines only. The ideal maintenance activities and maintenance schedule depend on the components installed on the yacht and the manner and environment in which the yacht is used. The more frequently the yacht is used, the more maintenance that needs to be performed. If the yacht is used in saltwater, more maintenance is required, especially on the exterior.

For maintenance instructions on many of the yacht's components, refer to the Original Equipment Manufacturer (OEM) information. Maintenance activities are divided into four types:

TYPE A MAINTENANCE – Perform Type A maintenance:

- 48 hours after first launching the yacht
- 48 hours after launching, following a period of on-shore storage

TYPE B MAINTENANCE – Perform Type B maintenance after the engines have operated for 25 hours following launching, whether the yacht is new or coming out of on-shore storage.

TYPE C MAINTENANCE – Perform Type C maintenance semi-annually, or after the engines have operated for 100 hours, whichever comes first.

TYPE D MAINTENANCE – Perform Type D maintenance annually, or after the engines have operated for 200 hours, whichever comes first.

MAINTENANCE LOG

Use a maintenance log to keep a record of the maintenance activities performed on the yacht. The log should list both the activities described in the following chart and the maintenance activities for the Original Equipment Manufacturer (OEM) equipment as recommended in the OEM information. Make copies of the log and keep the copy in a safe place.

ENGINES AND DRIVE SYSTEM	TYPE A	TYPE B	TYPE C	TYPE D
Perform maintenance as outlined in the engine OEM information	REFER TO OEM INFORMATION	REFER TO OEM INFORMATION	REFER TO OEM INFORMATION	REFER TO OEM INFORMATION
Inspect water intake hoses and connections		X	X	X
Inspect exhaust system hoses and connections	X	X	X	X
Check propellers for balance and nicks				X
Check all thru-hull fittings			X	X
Inspect engine seals	X	X	X	X
Check engine alignment	X	X	X	X
Spray ignition switch with contact cleaner			X	X
Tighten engine mounts		X		X
Check fire suppression chemical tank			X	X
CONTROL SYSTEM	**TYPE A**	**TYPE B**	**TYPE C**	**TYPE D**
Make any necessary throttle and shift adjustments		X	X	X
Inspect linkage and connections		X		X
Inspect hydraulic fluid levels	X	X	X	X
Inspect rudder seals	X	X	X	X
Inspect tiller tie bar linkage		X	X	X
Inspect trim tab reservoir		X	X	X
ELECTRICAL SYSTEM	**TYPE A**	**TYPE B**	**TYPE C**	**TYPE D**
Inspect and clean batteries		X	X	X
Check battery fluid levels		X	X	X
Check operation of all 12-volt equipment	X	X	X	X
Check operation of all AC equipment		X	X	X
Inspect shore power cords		X	X	X

Inspect generator water intake and discharge		X	X	X
Inspect zinc anodes	*	*	*	*
Perform generator maintenance	REFER TO OEM INFORMATION	REFER TO OEM INFORMATION	REFER TO OEM INFORMATION	REFER TO OEM INFORMATION
FUEL SYSTEM	**TYPE A**	**TYPE B**	**TYPE C**	**TYPE D**
Replace engine fuel filters	REFER TO OEM INFORMATION	REFER TO OEM INFORMATION	REFER TO OEM INFORMATION	REFER TO OEM INFORMATION
Inspect for fuel leaks	X	X	X	X
Inspect fuel lines for signs of chafe		X	X	X
FRESHWATER SYSTEM	**TYPE A**	**TYPE B**	**TYPE C**	**TYPE D**
Flush water tank and system			X	X
Clean in-line water filter			X	X
FIBERGLASS/WOODWORK	**TYPE A**	**TYPE B**	**TYPE C**	**TYPE D**
Clean fiberglass		**	X	X
Wax hull and all non-tread areas		**	X	X
Repair chipped fiberglass				X
Clean interior woodwork				X
INTERIOR	**TYPE A**	**TYPE B**	**TYPE C**	**TYPE D**
Perform maintenance on the head	REFER TO OEM INFORMATION	REFER TO OEM INFORMATION	REFER TO OEM INFORMATION	REFER TO OEM INFORMATION
Inspect thru-hull fittings	X	X	X	X
Clean refrigerator/freezer			X	X
Clean range and microwave oven			X	X
Lubricate door hinges and locks			X	X
Clean vinyl fabrics and wall coverings			X	X
Spot-clean woven fabrics				X
Spot-clean carpet				X

EXTERIOR	TYPE A	TYPE B	TYPE C	TYPE D
Check compass for magnetic deviation			X	X
Check trim tab system for leaks		X	X	X
Check tightness and caulking of deck hardware				X
Clean upholstery			X	X
Inspect tiller tie bar linkage		X	X	X
Clean Plexiglas surfaces				X
Lubricate hinges, latches and locks			X	X
Wash weather covers				X
BILGE SYSTEM	**TYPE A**	**TYPE B**	**TYPE C**	**TYPE D**
Check hull drain plug	X	X		
Check and test bilge pumps	X	X	X	X
Inspect sump pump(s)			X	X
Check and test bilge blowers	EACH TIME BEFORE STARTING THE ENGINE	EACH TIME BEFORE STARTING THE ENGINE	EACH TIME BEFORE STARTING THE ENGINE	EACH TIME BEFORE STARTING THE ENGINE

* Inspect the zinc anodes at least once every two weeks. Check with local marina or consult other local yacht owners to determine the average life expectancy of the yacht's zinc anodes. If a rapid deterioration of the zinc anodes is noticed, have a professional yacht corrosion specialist check the yacht, local seawater, and dock.

** The owner is recommended to clean and wax the fiberglass on a regular basis (monthly), but not as part of a 25-hour check by the dealer.

Mechanical Systems

ENGINES/GENERATOR

Refer to the engine and generator OEM information for instructions on maintaining the yacht's engines and generator.

As an option, a seawater strainer may be installed in the water intake lines for each engine and the generator. At least once every 30 days, close the seawater seacocks, then open and clean the strainers.

Inspect the strainers more frequently if the yacht is operated in dirty waters or areas with a high degree of aquatic vegetation. A clogged strainer restricts the intake of seawater which can cause the affected engine or the generator to overheat.

THRU-HULL VALVES

Inspect the thru-hull valves on a monthly basis. Items to inspect are as follows:

- Make sure the connections between the hose and the valve are tight.
- Look for water leaks around the area where the valve and hull meet.
- Every 30 days, open and close each valve two or three times. Turning them guards against marine growth that causes the valve to seize in the open or closed position.
- Make sure the valve handle is securely fastened. Tighten any loose handles.

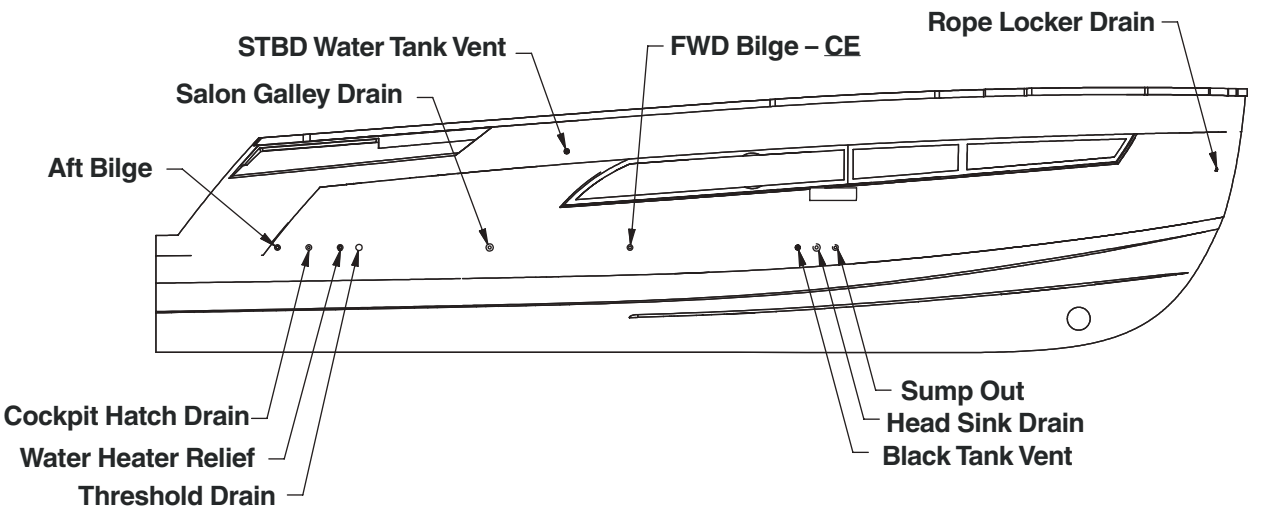

Figure 9-1 – Starboard Thru-Hull

NOTE: Only thru-hulls required by ABYC Regulation H-27 will have valves.

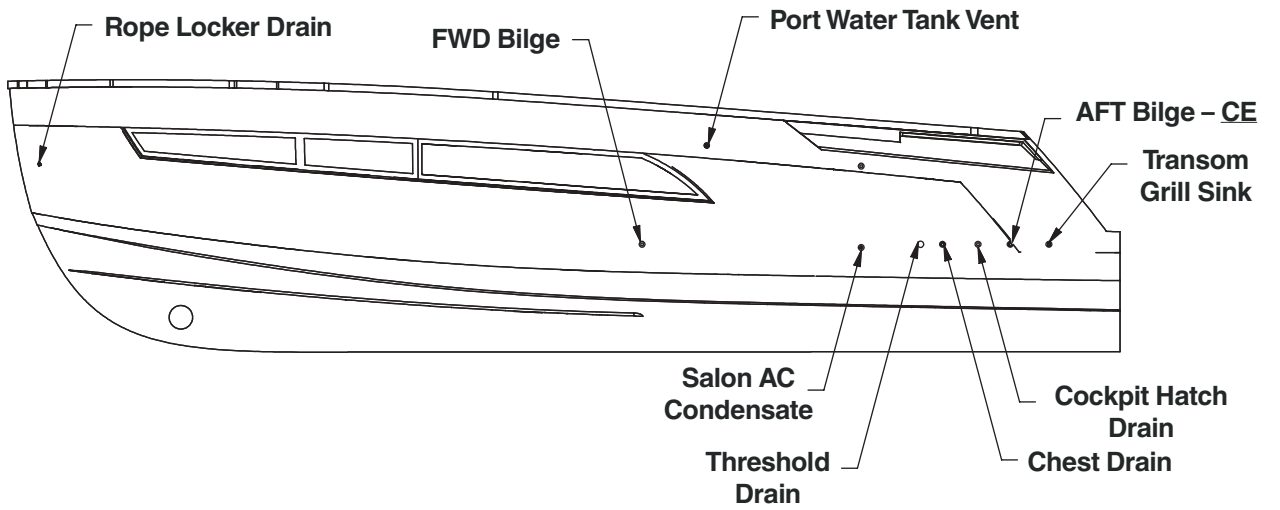

Figure 9-2 – Port Thru-Hull

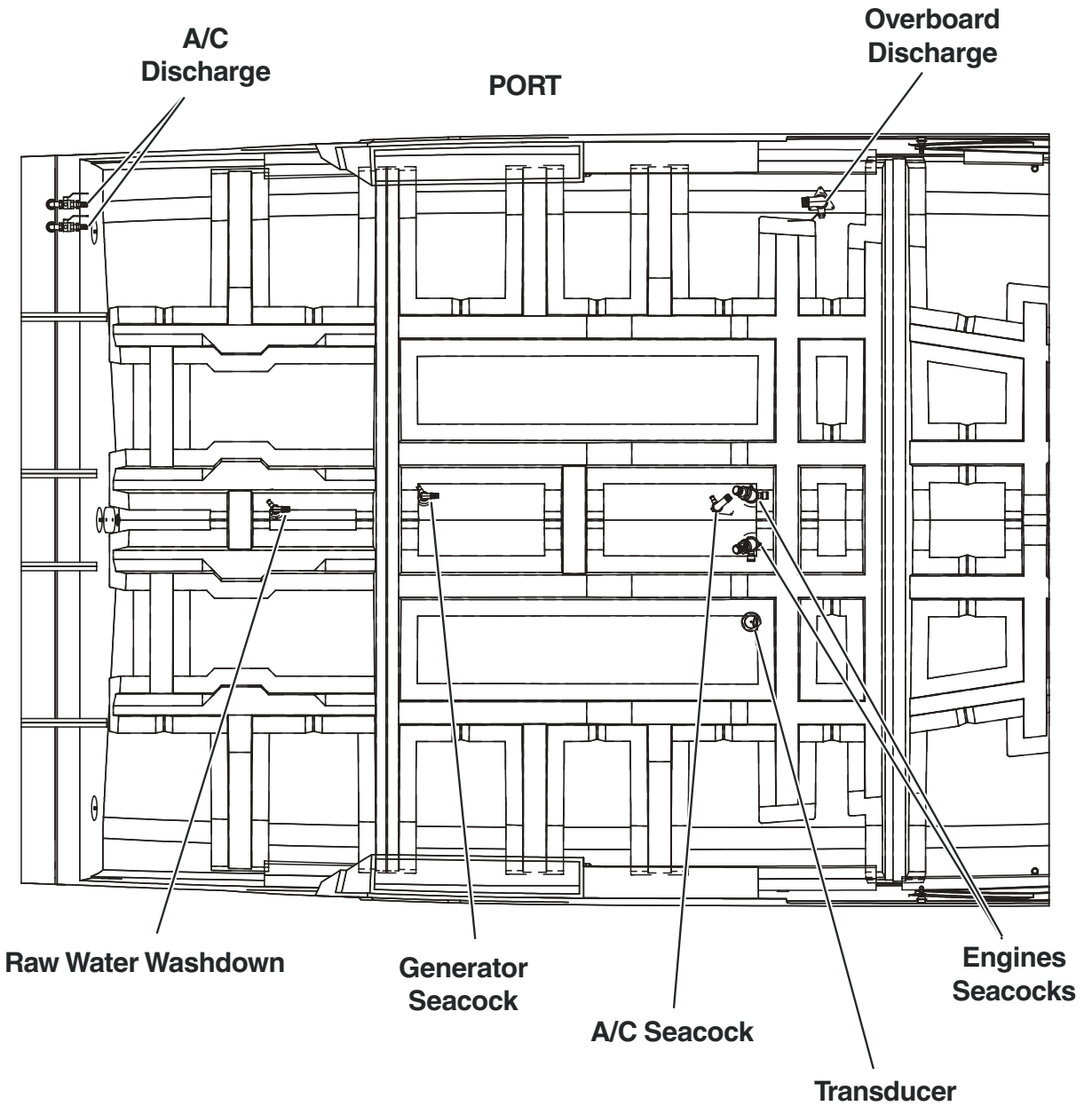

Figure 9-3 – Aft Thru-hull Valves

PROPELLER SHAFT SEALS – INBOARD MODELS

The propeller shaft extends through a shaft seal which is a watertight fitting. Check the shaft seal every month for leakage; contact your Carver Dealer if signs of leakage are found.

⚠ WARNING

Keep out of the engine room while one or both engines are operating. The engine room contains moving, hot machinery. Check that the engines are OFF before inspecting the propeller shaft seals.

PROPELLERS

Inspect the props often. Keep a swim mask in the yacht to inspect the props while swimming. Out-of-balance or damaged props can diminish the yacht's performance by reducing speed, causing steering problems, and creating vibrations. Vibrations can lead to drive train damage.

Have the propellers balanced by an established propeller repair shop at least once a year. Repair or replace damaged props.

⚠ WARNING

Always wear gloves when handling the propeller. The propeller blades are sharp.

TIP

Consider purchasing and carrying a spare set of props onboard. Many marine dealers do not carry a full inventory of replacement propellers . A spare set allows your vacation or cruise to continue in the event that the primary set of props are damaged.

PROPELLER INSTALLATION – INBOARD MODELS

1] Push the propeller snugly onto the shaft taper without the key in either keyway (propeller or shaft).

2] Make sure the propeller is snug and there is no side-to-side movement by gently moving the propeller back and forth.

3] Make a line on the shaft with a non-graphite marker at the forward end of the propeller where it stops up against the shaft taper.

4] Remove the propeller.

5] Put the key into the keyway on the shaft taper with radiused or chamfered corners (down) in the shaft keyway (if the propeller shaft keyway has radiused corners).

6] Put the propeller onto the shaft taper.

7] Check to see that the propeller moves back to the forward line made in Step 3. If it does, skip down to Step 8. If it does not, perform the following:

a] Remove the propeller from the shaft.

b] Place a file on a flat surface area or work bench.

c] Run the opposite end of the chamfered key back and forth over the file (to remove any burs) with a downward pressure on the key until the side being filed is clean.

d] Install the cleaned key in the shaft keyway with the chamfered corner side down in the shaft (the cleaned, filed side up in the keyway).

e] Replace the propeller on the shaft and fit snugly on the taper. Check to see if it reaches the line made in Step 3. If it does not, line up and then repeat Steps 7a through 7e.

NOTE: A vice can be used to hold the key for filing, but take care not to tighten too much. Overtightening will cause burrs and irregularities on the key.

8] When propeller hub moves to correct position, install propeller nut on shaft and torque to seat the propeller. Install the torque jam nut, if the shaft is equipped. Install cotter pin at end of the shaft.

Correct Nut Installation

Install the jam nut (thin) first. Install the full nut (thick) second.

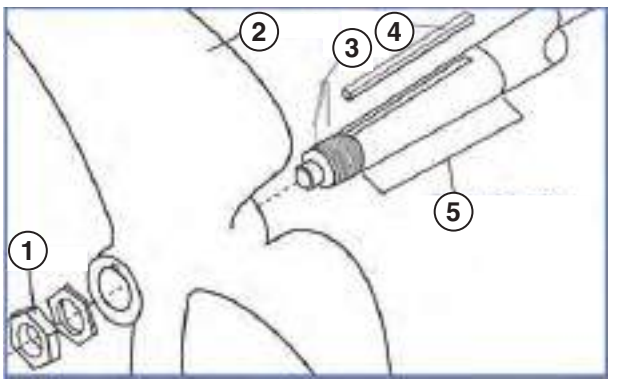

Figure 9-4

1 – Wide Nut
2 – Propeller
3 – Cotter Pin
4 – Key
5 – Tapered Section of Shaft

STRUTS – INBOARD MODELS

Propeller shaft struts require very little maintenance. Within each strut is a cutlass bearing that provides a smooth surface for the shaft to rotate. The cutlass bearings occasionally need to be replaced. However, bearing replacement is required more often if the yacht is used in sand or within other abrasive materials. Have a marine technician inspect the strut bearings when the yacht is pulled. Replace the bearings as recommended.

BATTERIES

The batteries power the DC electrical system. See **"Design Specifications" on page 6** for battery details.

⚠ WARNING

Always disconnect the batteries before performing maintenance on the DC electrical system. Electrical shock may occur if the batteries are not disconnected during maintenance of the DC electrical system.

Poor battery maintenance causes the majority of difficulties with the DC electrical system. The factory-installed batteries should function normally for several years if properly maintained. The heavy-duty batteries can be discharged and recharged repeatedly without damaging them. However, completely discharging or overcharging a battery can shorten its lifespan.

TO MAXIMIZE THE USEFUL LIFE OF THE BATTERIES:

- Use the voltmeters to frequently monitor the voltage level of each battery or battery bank while the engines are running and the yacht is used.
- Monitor the charge level with the engines turned off (static condition).
- Recharge the batteries (when not fully charged), using the onboard battery charger or the engine alternators. See **"Charging the Batteries" on page 161** for more information. When the battery bank is fully charged, the voltmeter reads between 12.3 and 12.6 volts.
- Never store partially charged batteries. Recharge each battery, if necessary. Check the voltage level every 30 days while the battery is in storage. Recharge if the voltage reads 12.3 or less.
- Maintain electrolyte levels in deep-cycle accessory batteries with distilled water.

NOTE: Do not allow batteries to drop below 10.5 volts. A 12-volt battery is considered "dead" at 10.5 volts.

Battery Inspection

Inspect the batteries every month:

- Clean corrosion that has developed on the battery terminals.
- Spray terminal protector on the terminals and battery cable eye-connectors.
- Make sure the battery cables are securely fastened to the terminals.
- Tighten the nuts only slightly beyond finger-tight with a wrench.

Spray the connections for the instruments and switches with an electrical connection protector every six months.

Battery Maintenance

⚠ WARNING

Always wear gloves and protective eyewear when working on and around the batteries. The batteries contain an acid called electrolyte. Avoid causing damage that could spill electrolyte into the engine room or bilge when servicing the batteries. Avoid getting saltwater in or on the battery. Either condition can create a poisonous gas that is harmful if inhaled. Always disconnect the batteries before cleaning.

If the battery is damaged and electrolyte gets spilled:

1] Ventilate the area of the spill.

2] Neutralize the acid in the electrolyte by pouring baking soda on the spill.

3] Remove the neutralized electrolyte using a disposable rag or paper towel.

4] Replace damaged/leaking battery.

Batteries are relatively maintenance-free. However, to increase the batteries' effectiveness and life, perform the following:

- Keep the batteries fully charged at all times. Batteries that are kept full or near fully charged last longer than batteries stored with a partial charge. The charge level of the batteries can be monitored using the voltmeters on the helm instrument panel (engine batteries) or tribulation panel (accessory batteries).
- Inspect the batteries at least once every 30 days for corrosion, loose wiring, dirt and other issues.
- Periodically clean the battery terminals and cable connections. Remove any accumulation of dirt on the top of the battery case. Use a wire brush to clean the terminals. Coating the terminals with a terminal-protecting product will help reduce corrosion that can form in these areas.
- Make sure the battery cables are securely attached to the terminal posts. Tighten the terminal nuts snugly using a torque wrench to 20 ft-lb (27 Nm).
- Remove the batteries from the yacht during periods of extended storage in freezing climate areas. Store the batteries in a cool (above freezing temperature), dry area. All batteries lose some charge during storage, but the lower the temperature, the less charge is lost. Avoid storing the batteries in a humid area.
- Check the battery charge level once every three months using a hydrometer or installed voltmeter. Charge the battery if the specific gravity of the battery is less than 1.225 or the voltage is less than 12 volts. Avoid overcharging the batteries.
- Engine start batteries are maintenance-free. Electrolyte cannot be checked.
- Deep-cycle accessory batteries require that you monitor the electrolyte levels in the cells and keep them topped off to at least the top of the plates with distilled water.

Charging the Batteries

NOTICE

Never allow the yacht's batteries to become completely discharged. Completely discharging a battery can damage it so that the battery can no longer be recharged.

While the engines are running, the designated alternators generally supply enough power to replace the power used by the yacht's DC equipment.

The PORT and STARBOARD engines are equipped with an alternator that charges each 12-volt battery installed, except the generator battery. The DC equipment will eventually drain the batteries being used without the engines running.

IF THE BATTERIES GET DRAINED, EITHER:

- Start the PORT or STARBOARD engine or use the onboard battery chargers to recharge the batteries.
- If not connected to shore power, run the generator to activate the battery chargers.

The battery charger should always be operating when the yacht is connected to shore power. Turn all battery master disconnect switches to the OFF position if the yacht is unoccupied for an extended period of time and if the yacht is not connected to shore power.

FRESH WATER SYSTEM

Flush and sanitize the fresh water system at least once every season.

- Flushing involves draining all water from the system.
- Sanitizing involves using a commercially-made fresh water tank sanitizing liquid that is available at many marine supply stores.

Shower

The water flow from a shower head may become restricted due to the accumulation of sediment in the shower head.

Remove the head and rinse with clean water if water flow is restricted. If necessary, clean the discharge holes with a narrow wire.

Water Taps

Periodically remove and clean the filter screens from the sinks' water taps. Rinse the screens with clean water. If necessary, clean the screens with a narrow wire. A buildup of debris in the filter screens can block the water flow enough to cause the pressure water pump to repeatedly cycle on and off.

Shower Sump

Clean the sump and sump filter frequently. Hair, dirt and soap scum collects in the sump. If not removed, it eventually can clog the sump pump or sump hoses. An infrequently used sump will promote bacteria growth in the sump. Bacteria growth will promote odors. In addition to keeping the sumps flushed clean, it is a good idea to add waste tank deodorant to the sump when used infrequently. The deodorant can easily be flushed down any of the drains that empty into the sump.

Pressure Water Pump

An in-line filter is installed near the pressure water pump. Clean the filter once a month.

Water Tank Vent Screen

A freshwater tank vent is installed through the hull, above the freshwater tank fill plate. A screen is applied over the vent's opening to prevent dirt and insects from entering the freshwater tank. Clean the vent screen once every six months or twice a season.

SUGGESTED METHOD OF DISINFECTION

1] Flush the entire system thoroughly by allowing potable water to flow through it.

2] Drain the system completely.

3] Fill the entire system with a chlorine solution having a strength of at least 100 parts per million, and allow to stand for 1 hour. Shorter periods will require greater concentrations of chlorine solution. See **Table 9-4**.

4] Drain chlorine solution from entire system.

5] Flush the entire system thoroughly with potable water.

6] Fill the system with potable water.

Table 9-4 shows how much disinfecting agent is required to make up various quantities of 100 parts per million chlorine solution.

AMOUNT OF CHLORINE COMPOUND REQUIRED FOR 100 PPM SOLUTION	CHLORINATED LIME 25%	HIGH TEST CALCIUM HYPOCHLORITE 70%	LIQUID SODIUM HYPOCHLORITE 1%
5 gal (19 L)	0.3 oz (8.9 mL)	0.1 oz (3.0 mL)	0.2 qt (189.3 mL)
10 gal (38 L)	0.6 oz (17.7 mL)	0.2 oz (5.9 mL)	0.4 qt (378.5 mL)
15 gal (57 L)	0.9 oz (26.6 mL)	0.3 oz (8.9 mL)	0.6 qt (567.8 mL)
20 gal (76 L)	1.2 oz (35.5 mL)	0.4 oz (11.8 mL)	0.8 qt (757.1 mL)
30 gal (114 L)	1.8 oz (53.2 mL)	0.6 oz (17.7 mL)	1.2 qt (1,135 mL)
50 gal (189 L)	3.0 oz (88.7 mL)	1.0 oz (30.0 mL)	2.0 qt (1,892.7 mL)
100 gal (379)	6.0 oz (177.4 mL)	2.0 oz (59.1 mL)	4.0 qt (3,785.4 mL)

Table 9-4 – Chlorine Concentrations

BILGE SYSTEM

Keeping the bilges clean is important. A dirty bilge leads to clogged bilge pumps and unpleasant odors in the cabin.

Keeping the bilges dry helps reduce moisture in the cabin. Tips to keep the bilge system clean:

- Periodically inspect and clean each bilge pump's strainer. The strainers prevent dirt and debris from clogging the bilge pump intakes. See **"Bilge Water Pumping System" on page 106** for the exact location of the bilge pumps.
- Frequently check the operation of each bilge pump float switch to ensure that it is operating properly.
- Clean the bilge pumps twice a season by wiping dirt or oil from their exterior surfaces.
- Remove any oil, dirt or debris from the bilges. Treat the bilges with a commercial bilge cleaner twice a season. Bilge cleaner is available from your dealer.

SANITATION SYSTEM

The sanitation system requires ongoing maintenance to avoid problems.

- Always use sanitation system deodorizer. Use the brand recommended by your Carver Dealer.
- The sanitation system on the yacht is not like the toilet and sewer in a home. Do not flush items down the toilet that the toilet was not designed to accommodate. Refer to the OEM information for details on maintaining the toilet.

Manufacturer information for details on maintaining the toilet.

- Empty the waste tank often. Make sure the tank is empty prior extended periods of time that the yacht is not in use.
- Flush the waste tank with fresh water each time the tank is emptied. Flushing with fresh water helps remove remaining waste from the tank.

CARVER

NOTES

WINTERIZATION AND STORAGE

10

Lifting Points

⚠ WARNING

Never go under the yacht while it is suspended in a lift. Always keep a safe distance from a suspended yacht.

Hire an experienced professional to lift the yacht from the water. The individual should have the proper equipment and training in lifting yachts. The yacht's hull must be properly supported during the lifting operation to avoid serious and permanent hull deformation.

NOTICE

Do not place a lifting strap around the yacht's integrated propulsion system (IPS) drives or other underwater components.

Use approved lifting straps. "Sling" tags are located on the side deck of the yacht. Place lifting straps on the side deck only for lifting.

BLOCKING LOCATION

The hull must be properly blocked to avoid damage when storing the yacht in dry storage. To block, either use a cradle or blocking supports.

If using a cradle, the forward end of the cradle should be slightly elevated to position the yacht in a bow-high altitude. The elevated position allows water in the bilges to flow to the back of the AFT bilge and drain through the hull drain.

Set up all the blocking supports to prevent the yacht from shifting while in storage. The major portion of the yacht's weight should rest on keel blocks. Use side supports to stabilize the yacht ONLY. Use a minimum of four keel blocks.

It is recommended to store the yacht in dry storage to maximize protection. See **"Dry Storage" on page 170**.

Winterization

NOTICE

Always properly winterize the yacht before storing it. Failure to winterize the yacht could damage the pipes, valves, faucets, tanks, hot water heater and other components.

ENGINES

Refer to the Original Equipment Manufacturer (OEM) information for details on winterizing the engines.

GENERATOR

Refer to the OEM information for details on winterizing the generator.

AIR CONDITIONING SYSTEM

Refer to the OEM information for details on winterizing the air conditioning system. The air conditioning system is winterized in house. It is recommended to have a qualified marina winterize the air conditioning system.

FRESHWATER SYSTEM

See **"Freshwater System" on page 103** for a description of the yacht's freshwater system.

NOTICE

Always drain the entire system, including the water heater, when winterizing the freshwater system.

Draining the Freshwater System

1] Switch OFF the WATER HEATER circuit breaker, which is located on the AC control center.

NOTICE

Never supply power to the water heater while empty, as damage may occur to the heating element. Fill, pressurize and prime the freshwater system before turning on the water heater, as described in ***Freshwater System on page 103*** *and* ***Pressurizing and Priming the Water System on page 103****.*

2] On the DC control center:

- **a]** Switch ON the SYSTEMS DC MAIN circuit breaker.
- **b]** Switch ON the AUTO SUMP circuit breakers (3 breakers total).
- **c]** Switch ON the PRESSURE WATER PUMP circuit breaker.
- **d]** Switch ON the ACCESSORY battery master disconnect switch.

3] Open all sink and shower faucets, including the faucets for the transom hand shower and bow and transom freshwater washdowns. See **"Freshwater System" on page 103** for faucet locations.

4] Switch OFF the PRESSURE WATER PUMP circuit breakers, from Step 2, when water is no longer draining from the sink taps, shower heads or freshwater washdowns.

5] Drain the water heater. Refer to the Original Equipment Manufacturer (OEM) information for details on draining the water heater.

Winterizing the Freshwater System

1] Pour 20 gal (76 L) of non-toxic recreational vehicle antifreeze into the freshwater tank.

NOTE: Additional antifreeze may need to be added to the freshwater tank if the freshwater system loses pressure during the winterization procedure.

NOTICE

Damage can occur to the freshwater system by using the wrong type of antifreeze. Use a non-toxic, nonalcohol, RV-type (pink) antifreeze. Damage resulting from using the incorrect antifreeze is not included under the warranty.

2] Close all faucets.

3] Switch ON the PRESSURE WATER PUMP on the DC control center.

4] If the optional gray water holding system is not supplied on the yacht, place a large bucket under the gray water and sump discharge fittings. The bucket catches the antifreeze pumped out described in step 5.

5] Open the galley sink cold water faucet. Once a steady stream of antifreeze is flowing from the tap, close the faucet.

TRANSOM HAND SHOWER, BOW AND TRANSOM FRESHWATER WASHDOWNS ONLY:

a] Place the shower head in a bucket before turning on the shower faucet. The bucket catches the antifreeze, so the antifreeze can be reused.

b] Remove the hose(s) from the freshwater washdown fittings.

c] Place a bucket under the washdown fittings to catch the antifreeze, so the antifreeze can be reused.

d] Open the washdown faucets. Once a steady stream of antifreeze is flowing from the fittings, close the faucets.

6] Open the galley sink hot water faucet. Once a steady stream of antifreeze is flowing from the tap, close the faucet. Repeat this procedure for each cold and hot water faucet on the yacht as well as the windshield washer.

7] If the optional gray water holding system is not supplied on the yacht, pour 1 quart (1.0 L) of antifreeze into the shower and each sink drain.

Once the yacht is removed from storage and prepared to be used again:

8] Flush the entire freshwater system with freshwater when the yacht is removed from storage and prepared to be used again. Non-toxic antifreeze is colored, so the water system is adequately flushed when uncolored water flows from all the faucets and shower heads. The water tank may need to be filled more than once to flush the system.

BOW AND TRANSOM RAW WATER WASHDOWNS (OPTIONAL)

Remove the yacht from the water before performing the raw water washdown procedure on the optional bow and transom raw water washdowns.

See **"Raw Water Washdowns (Optional)" on page 106** for a description of the raw water washdown system.

Raw Water Washdown Procedure

1] Close the seacock supplying the raw water washdown pump with seawater.

2] Disconnect the end of the hose attached to the washdown side of the seacock.

NOTICE

Damage can occur to the freshwater system by using the wrong type of antifreeze. Use a non-toxic, nonalcohol, RV-type (pink) antifreeze. Damage resulting from using the incorrect antifreeze is not included under the warranty.

3] Place the disconnected hose end into a bucket containing about 1 gal (3.8 L) of non-toxic recreational vehicle antifreeze.

4] Connect short hoses to the bow and transom raw water washdown fittings and open valves.

5] Place a bucket under the hoses to catch the antifreeze, so the antifreeze can be reused.

6] On the DC control center:

a] Switch ON the SYSTEMS DC MAIN circuit breaker.

b] Switch ON the WASHDOWN PUMP circuit breaker.

7] Once a steady stream of antifreeze flows from the washdown fittings, switch OFF the WASHDOWN PUMP circuit breaker.

8] Disconnect the hoses to the washdown fittings and close valves.

9] Reconnect the hose that was disconnected in step 2.

BILGE

See **"Bilge Water Pumping System" on page 106** for a description of the bilge system.

Bilge Drainage Procedure

1] Open the hull drain. Leave the drain open while the yacht is in storage.

2] Remove all water from the bilge.

3] Clean the bilge as described in **"Bilge System" on page 163**.

SANITATION SYSTEM

Remove the yacht from the water before performing the sanitation system procedure. Refer to the Original Equipment Manufacturer (OEM) information for more information on winterizing the sanitation system.

See **"Sanitation System" on page 168** for a description of the sanitation system.

If your sanitation system has the optional overboard discharge system, see **"Overboard Discharge System" on page 169**.

1] Empty the waste tanks as described in **"Emptying the Waste Tank and/or Optional Gray Water Tank" on page 110**. Remove as much of the freshwater used in flushing the tanks as possible.

2] If the toilet uses seawater to flush, follow steps 2a - 2d. Otherwise, proceed to step 3.

a] Close the seacock that supplies seawater to the toilet.

b] Disconnect the toilet seawater hose from the seacock.

c] Flush the toilet until all water is drained from the seawater hose.

d] Reconnect the seawater hose to the seacock. Leave the seacock closed.

NOTICE

Damage can occur to the freshwater system by using the wrong type of antifreeze. Use a non-toxic, nonalcohol, RV-type (pink) antifreeze. Damage resulting from using the incorrect antifreeze is not included under the warranty.

3] Flush 4 gal (15.1 L) of non-toxic recreational vehicle antifreeze through the toilet. Keep the antifreeze in the waste tanks while the yacht is in storage.

4] When removing the yacht from storage and preparing to use the yacht again:

a] Flush 5 gal (18.9 L) of freshwater through each toilet.

b] Empty the waste tanks as described in **"Emptying the Waste Tank and/or Optional Gray Water Tank" on page 110**.

c] If the toilet uses seawater to flush, open the seacock supplying seawater to the toilet.

d] Flush the toilet a few times to prime the sanitation system.

e] Charge the waste tanks by adding deodorizer. Any RV deodorizer is acceptable.

GRAY WATER HOLDING SYSTEM (OPTIONAL)

Before performing the optional gray water holding system procedure, remove the yacht from the water. Winterize the gray water holding system only after the freshwater system has been winterized.

If your gray water system has the optional overboard discharge system, see **"Overboard Discharge System" on page 169**.

1] Empty the gray water tank as described in **"Emptying the Waste Tank and/or Optional Gray Water Tank" on page 110**. Remove as much of the freshwater used in flushing the tank as possible.

2] Verify that the AUTO SUMP circuit breakers are ON, which are located on the DC control center.

NOTICE

Damage can occur to the gray water system by using the wrong type of antifreeze. Use a non-toxic, nonalcohol, RV-type (pink) antifreeze. Damage resulting from using the incorrect antifreeze is not included under the warranty.

3] Pour 3 gal (11.4 L) of non-toxic recreational vehicle antifreeze through each shower and sink drain.

Once the yacht is removed from storage and prepared for use again:

4] Pour 5 gal (18.9 L) of freshwater through each shower and sink drain.

5] Empty the gray water tank as described in **"Emptying the Waste Tank and/or Optional Gray Water Tank" on page 110**.

6] Charge the gray water tank by adding deodorizer. Any RV deodorizer is acceptable.

OVERBOARD DISCHARGE SYSTEM

NOTE: Perform this procedure with the yacht out of the water.

If the yacht has the overboard discharge option for waste water and/or gray water, follow this procedure after the waste water and/or gray waste water winterization procedure has been completed.

1] Increase the amount of nontoxic antifreeze in the tank to a total of 5 gal (19 L).

2] Open the overboard discharge seacock.

3] Place a 5 gal (19 L) bucket under the overboard discharge thru-hull on the outside bottom of the vessel to catch the discharge effluent.

4] On the DC control panel, turn on the overboard discharge pump.

5] With a second person watching the discharge on the outside of the vessel, run the pump until you see the color of the effluent match the original color of the nontoxic antifreeze or until all effluent from the tank has been discharged. The overboard discharge system is now winterized.

NOTE: The overboard discharge pump will not be damaged if it is run dry.

Storage

The yacht must be properly "winterized" before storing for an extended period of time, while temperatures could fall below freezing. Winterizing the yacht consists of removing all water from its various systems. Water left onboard could cause extensive damage to the yacht and internal systems.

WINTERIZATION AND STORAGE

Hiring a professional to perform the winterization of the yacht is recommended. Storing the yacht in dry, out-of-water storage is also recommended. Some winterizing procedures can be performed only when the yacht is out of the water. Dry storage also provides the opportunity to thoroughly inspect the hull and underwater components for maintenance needs.

DRY STORAGE

Protect the yacht from the elements during winter storage. Have a local marina shrink-wrap the yacht, or have a winter storage cover made. Occasionally check on the yacht while in storage to make sure that it is in good condition.

OUTSIDE STORAGE

NOTE: If the hull drain plug is removed for storage, make sure to install the plug prior to launch.

Properly support a storage cover and secure the cover over the yacht. Never secure the cover too tightly. Allow adequate ventilation to protect against dry rot. Never store the yacht in a damp storage enclosure. Purchase and position moisture accumulators between the shrink-wrap and the yacht's enclosures to help prevent moisture from accumulating. Excessive dampness can lead to mildew, electrical problems, corrosion and dry rot.

WET STORAGE

Wet storage procedures vary from region to region. Consult your dealer before preparing to leave the yacht in the water over the winter.

INTERIOR CARE

As part of the winterization of the yacht, check and complete these items in the interior of the yacht prior to storage.

- Air out the cushions until they are completely dry. Storing damp cushions leads to mildew.
- Position the cushions to allow air to circulate around them.
- Purchase and position moisture accumulators throughout the yacht. The moisture accumulators help reduce the amount of moisture that accumulates during storage.
- Remove items that could spoil or freeze while the yacht is stored.
- Remove all dried food. Food attracts mice and insects.

EXTERIOR CARE

As part of the winterization of the yacht, check and complete these items on the exterior of the yacht prior to storage.

- Wash the exterior of the yacht, particularly the underwater portions.
- Remove as much aquatic growth as possible while wet. Dried growth is more difficult to remove.
- Check the zinc sacrificial anodes for deterioration.
- Have the zinc sacrificial anodes replaced before spring launch if signs of deterioration appear.
- Check stainless steel rails and fittings for signs of rust.
- Remove rust prior to winter lay-up. Inspect the underwater portions of the hull.
- Review anything that looks out of the ordinary with your dealer.

Spring Recommissioning Checklist

Before launching for the first time of the season, complete the following checklist.

HULL

- ❑ Fill gelcoat nicks and gouges
- ❑ Inspect propellers, struts, rudders
- ❑ Inspect thru-hull fittings
- ❑ Apply new anti-fouling bottom paint or touch up failing areas
- ❑ Buff out minor hull scratches
- ❑ Remove dirt, stains
- ❑ Apply wax

DECK AND CABIN

- ❑ Inspect hatches and windows for leaks
- ❑ Wax non-walk surfaces

ENGINES

- ❑ Follow manufacturer's recommissioning guidelines
- ❑ Inspect belts, hoses
- ❑ Tune-up engines
- ❑ Replace fuel filters

ELECTRICAL SYSTEM

- ❑ Check battery water level
- ❑ Charge batteries
- ❑ Inspect connections for corrosion

PLUMBING

- ❑ Purge freshwater system of antifreeze
- ❑ Replace Sealand vent filters
- ❑ Inspect seacocks
- ❑ Inspect heads
- ❑ Chemically charge waste and gray water tanks
- ❑ Fill freshwater tank

SAFETY EQUIPMENT

- ❑ Inspect life jackets
- ❑ Replace old distress signals
- ❑ Inspect fire extinguishers
- ❑ Inspect, test bilge pumps
- ❑ Inspect mooring lines, fenders
- ❑ Test, recalibrate and/or replace CO detectors

AFTER LAUNCH

- ❑ Check for engine cooling water flow
- ❑ Check propeller shaft alignment
- ❑ Check propeller shaft seals
- ❑ Check crankcase (yacht must be in water)
- ❑ Check transmission oil levels
- ❑ Have compass professionally calibrated
- ❑ Inspect thru-hulls, exhaust, etc.

WINTERIZATION AND STORAGE

CARVER YACHTS
PO BOX 1010
PULASKI WI 54162-1010

CARVER YACHTS
PO BOX 1010
PULASKI WI 54162-1010

CARVER

SECOND OWNER REGISTRATION

Owner's Name: _____

Street Address: _____

City: _____ State: _____ Zip Code: _____

Country: _____

Telephone: (_____) _____ Date of Purchase: _____

Email: _____

Purchased From: _____

Yacht Hull Identification Number: CVR _____

Owner Registration does not extend, alter, or transfer the Carver Limited Warranty. Refer to the Carver Limited Warranty for details.

CARVER

THIRD OWNER REGISTRATION

Owner's Name: _____

Street Address: _____

City: _____ State: _____ Zip Code: _____

Country: _____

Telephone: (_____) _____ Date of Purchase: _____

Email: _____

Purchased From: _____

Yacht Hull Identification Number: CVR _____

Owner Registration does not extend, alter, or transfer the Carver Limited Warranty. Refer to the Carver Limited Warranty for details.

CARVER

YACHTS