

CARVER

YACHTS

C52 COUPE OWNER'S MANUAL



TABLE OF CONTENTS

General Information	1
Introduction	1
Using the Owner's Information Kit	2
Warranty Information	3
Obtaining Warranty Service	4
Owner Registration for Pre-Owned Yachts	4
Design Specifications	5
Nautical Terminology	9
Layout – Basic Locations	14
Resources	15
Yachting Safety	17
Safety Definitions	17
Warning Labels	19
Yachting Safety	41
Carbon Monoxide (CO)	45
Other Health and Safety Information	48
Required Safety Equipment	49
Recommended Safety Equipment	56
State and Local Ordinances	56
Pre-Departure Actions	56
Notes	58
Owner/Operator Responsibilities	59
Registration	59
Insurance	59
Domestic Safe Yachting Courses	59

TABLE OF CONTENTS

CARVER

Yachting Regulations	60
Voluntary Inspections	60
Operation by Minors	60
Drugs and Alcohol	60
Emergency Assistance	60
Yachting Accidents	60
Wake	61
Noise	61
Speed	61
Septic Waste	61
Pollution Regulations	61
Emergencies	63
Escape Ladder	63
Fire	64
Flooding	68
Swamped or Capsized Yacht	68
Collision	68
Towing on the Water	69
Running Aground	69
Man Overboard	69
Medical Emergency	70
Equipment Failure	70
Radio Communication (U.S. Only)	70
Distress Signals	70
Carbon Monoxide Poisoning	71

TABLE OF CONTENTS

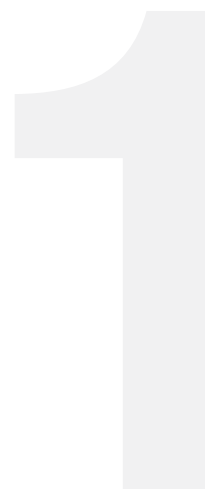
Operating in Hazardous Conditions	72
Severe Weather	72
Water Hazards	75
Restricted Areas	75
Markers	75
Navigation Rules and Aids	76
Right-of-Way	76
Audible Distress Signals	76
Navigation Lights and Night Operation	77
Speed	77
Wake	77
Overtaking/Passing	78
Meeting Head-On	78
Crossing	79
Aids to Navigation	79
System Operating Information	86
DC Electrical System	86
AC Electrical System	98
Air Conditioning System (Optional)	119
Freshwater System	121
Shore Water	126
Bilge Water Pumping System	127
Gray Water System	130
Sanitation System	130
Raw Water Washdowns (Optional)	133
Propulsion System	134

TABLE OF CONTENTS

CARVER

Helm Controls	141
Fire Suppression System	146
Propellers	148
Propeller Shaft Seals	148
Thru-Hull Valves	149
Operating and Maneuvering	154
Launching the Yacht	154
Pre-Start Checklist	154
Preparing for Cruising	155
Navigation	157
Controlling the Yacht	158
Anchoring	164
Getting Underway	167
Maintenance and Care	172
Exterior Care	172
Interior Care	176
Maintenance Schedule	178
To Access the SureShade Mechanism and Actuators	182
To Access the Port and Starboard Wiper Motors	182
To Access the Sun Roof Motors	183
Winterization and Storage	185
Lifting Points	185
Winterization	186
Storage	189
Spring Recommissioning Checklist	191

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 5** 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.

GENERAL INFORMATION

CARVER

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
- Generators
- Sanitation system
- Electronics
- Pumps
- Battery chargers
- Batteries
- 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

GENERAL INFORMATION

CARVER

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.

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.

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.

Design Specifications

The following specifications are based on a standard model with no options installed. Some options may change the listed specifications.

ITEM	SPECIFICATION
LOA (with swim platform)	51.8 ft (15.79 m)
Beam	15.7 ft (4.78 m)
Draft	48 in. (1.22 m)
Bridge clearance (to top of arch)	14.0 ft (4.27 m)
Fuel capacity	550 gal (2,082 L)
Holding tank capacity (option)	80 gal (303 L)
Water system	150 gal (568 L)
Weight (dry with standard engine)	43,000 lb (19,504 kg)
Cabin headroom	6.5 ft (1.98 m)
Sleeps	6 people
Battery chargers	12-volt, 60-amp battery charger: Monitors the voltage levels of the accessory battery bank and generator battery 24-volt, 30-amp battery charger: Monitors both engine battery banks and the thruster battery bank
Batteries	Engine batteries (4) – Two 12-volt series connected batteries (24-volt system) are designated for each engine. Accessory battery (1) – One 12-volt battery is designated for the accessory items onboard. Generator battery (1) – One 12-volt battery is designated for the generator. Stern thrusters (2) (Optional) – Two 12-volt series connected batteries (24-volt system) are designated for each stern thruster. Bow thrusters (2) (Optional) – The bow and stern thrusters share the same battery bank.

GENERAL INFORMATION

ITEM	SPECIFICATION
Air conditioner unit cooling capacity (option)	Master berth – 8,000 BTU V-berth – 10,000 BTU Port galley – 16,000 BTU Starboard galley – 16,000 BTU Crew quarters – 6,000 BTU
Bilge system pumping capacity	Automatic and manual electric submersible bilge pumps – up to 2,000 gph (7,571 lph) Automatic only bilge pump – up to 900 gph (57 lpm)
Water heater capacity	20 gal (76 L)
Waste tank capacity	80 gal (303 L)
GFCI receptacle locations	Galley – controls outlets in the galley and salon VIP stateroom – controls outlets in the VIP stateroom, guest stateroom, and VIP/guest head Master stateroom – controls outlets in the master stateroom and master head Crew quarters – controls outlets in the crew quarters

Table 1-1 – Design Specifications

DESIGN SPECIFICATIONS – ISO STANDARDS

ITEM	SPECIFICATION
Design category*	B
Length of hull	51.5 ft (15.69 m)
Main dimensions: L maximum	47.6 ft (14.51 m)
Main dimensions: b maximum	15.7 ft (4.78 m)
Maximum height (aircraft) (to top of arch at full load)	14.0 ft (4.27 m)
Maximum drafts in the fully loaded condition	4.7 ft (1.42 m)
Mass (light craft condition)	43,000 lb (19,504 kg)
Mass of craft fully loaded	51,554 lb (23,385 kg)
Total weight of liquids, when all permanently installed tanks are full	5,357 lb (2,429.83 kg)
Maximum number of people	15 people
Maximum recommended load**	8,554 lb (3,879.83 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).

GENERAL INFORMATION

CARVER

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.

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.

CE Certified Model

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

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.

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.

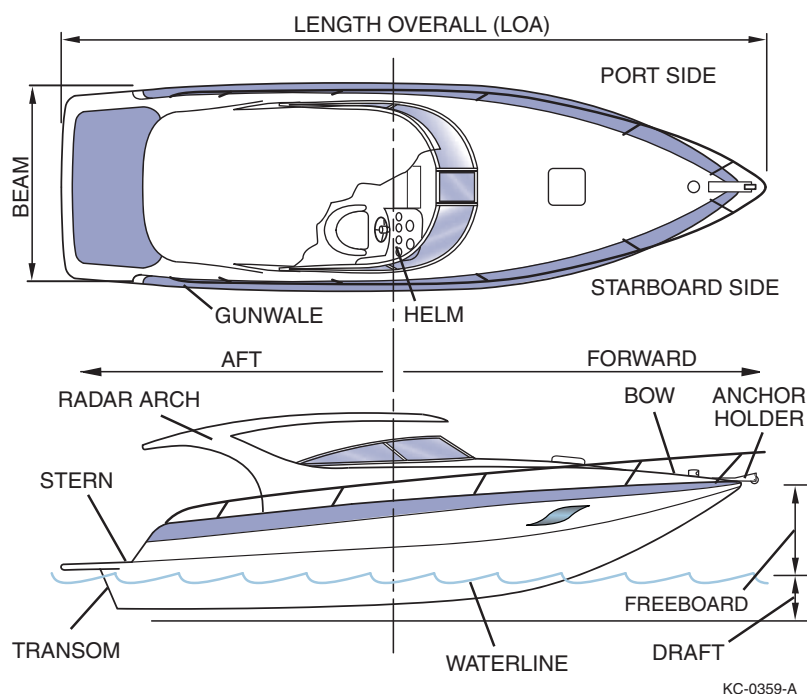


Figure 1-1

GENERAL INFORMATION**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

GENERAL INFORMATION

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

GENERAL INFORMATION

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.
RULES OF THE ROAD	The nautical traffic rules for preventing collisions on the water

GENERAL INFORMATION

TERM	EXPLANATION
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

GENERAL INFORMATION

CARVER

Layout – Basic Locations

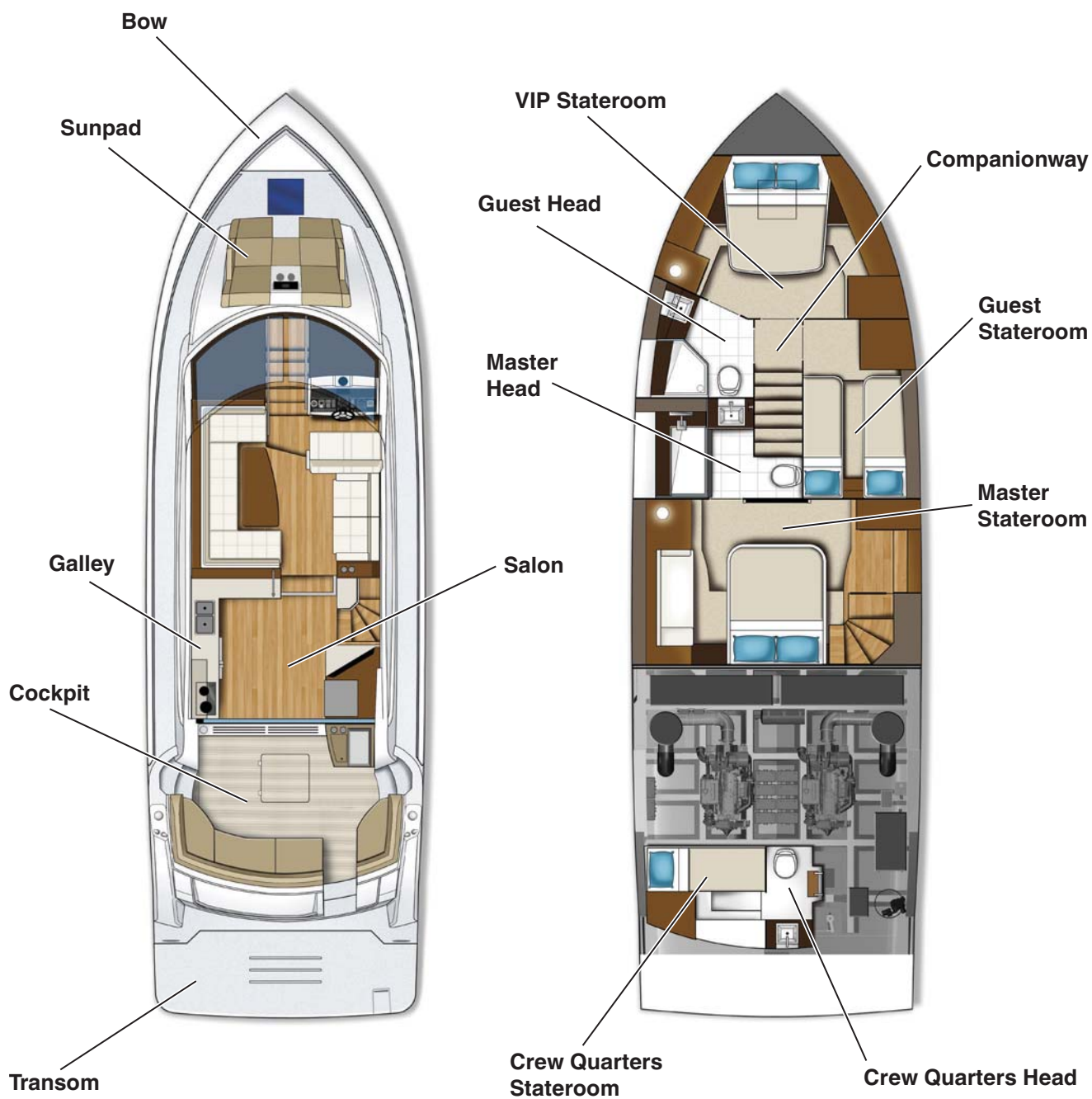


Figure 1-2

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/courses/>

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.uscg.mil>

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

GENERAL INFORMATION

CARVER

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

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 a hazardous situation which, if not avoided, *will* result in death or serious injury.

**WARNING**

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

**CAUTION**

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

Used to address practices not related to personal injury.

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.

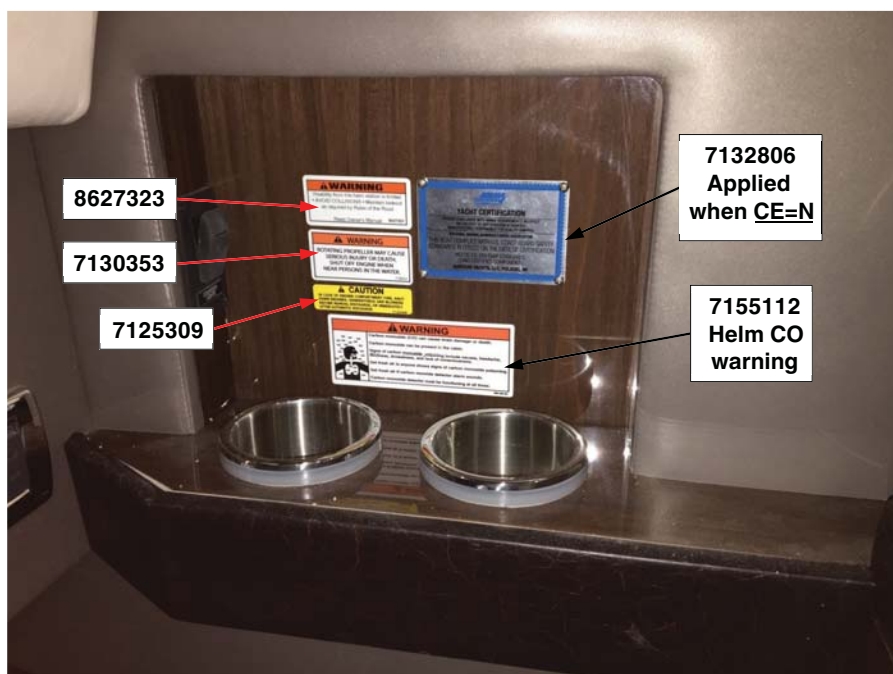


Figure 2-1 – Helm

SAFETY WARNING AND INFORMATIONAL LABELS



Figure 2-2 – Helm



Figure 2-3 – Helm



Figure 2-4 – Salon

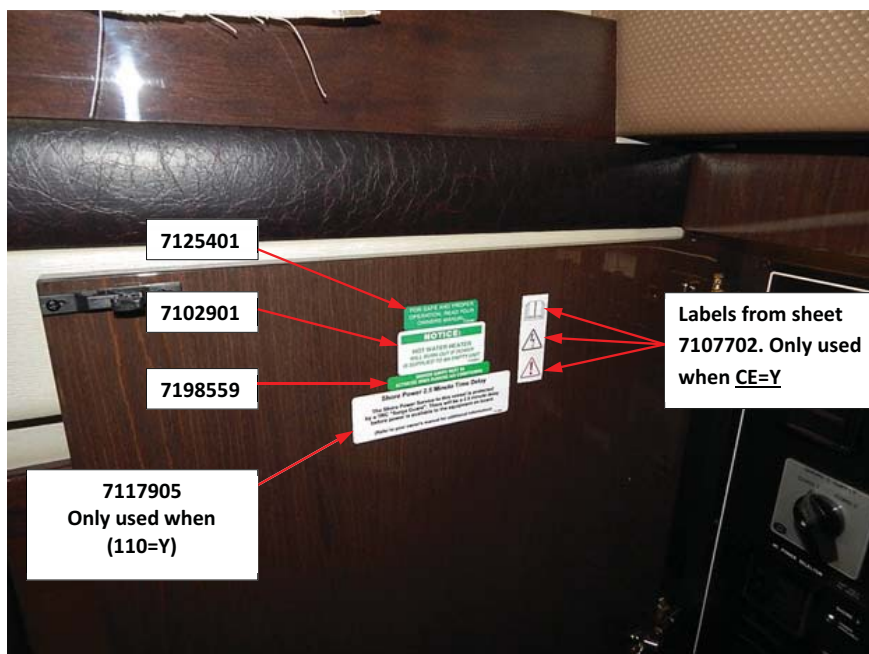


Figure 2-5 – AC Control Center Door



Figure 2-6 – 12v Panel Door



Figure 2-7 – Starboard Storage



Figure 2-8 – Bottom of Galley Storage Below Sink



Figure 2-9 – Bottom of Port Side Storage at Entrance to Master Stateroom



Figure 2-10 – Forward Head



Figure 2-11 – Forward Head



Figure 2-12 – Master Head

NOTE: The sanitation system label and waste system reminder label are applied to every toilet in the yacht.

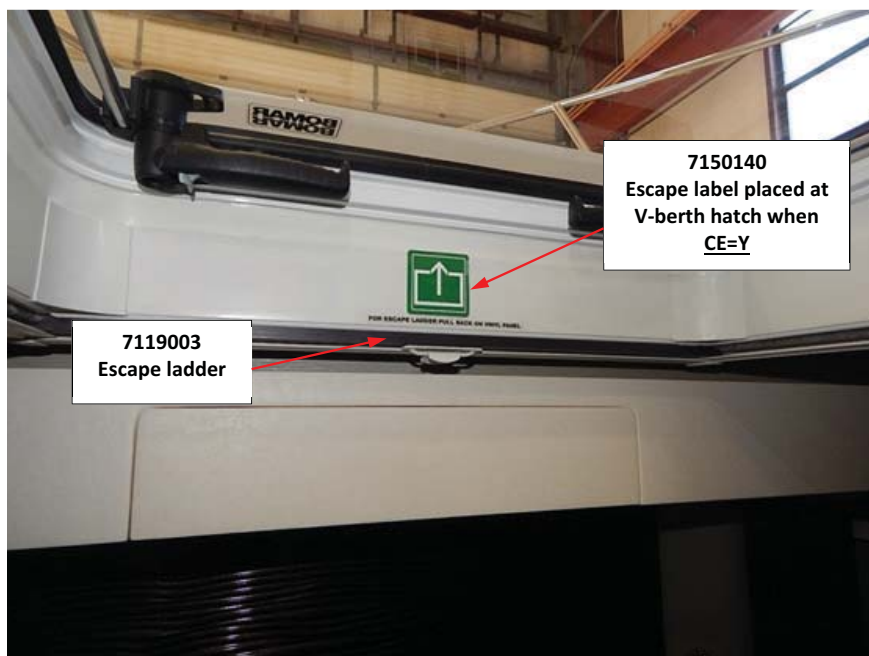


Figure 2-13 – V-berth Hatch

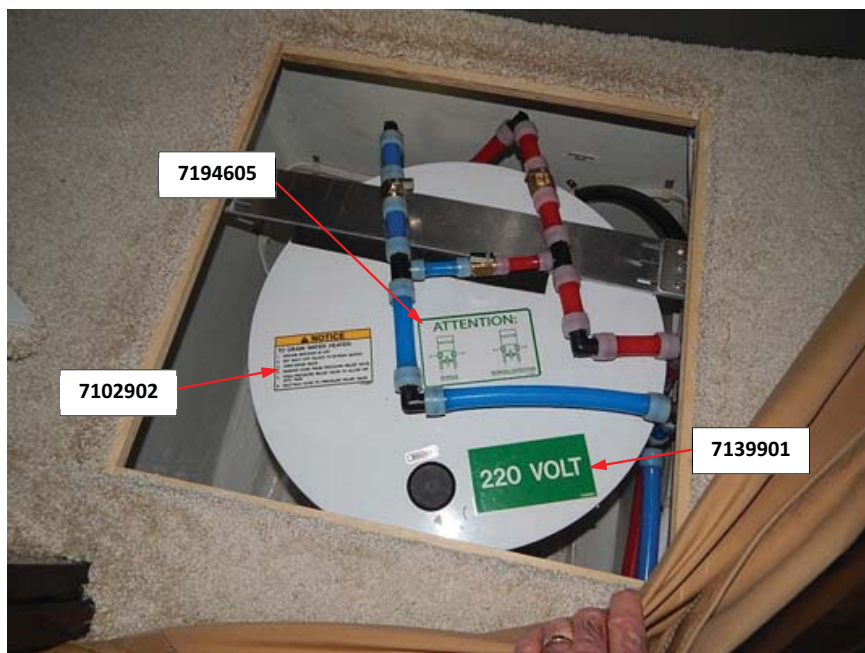


Figure 2-14 – Top of Water Heater

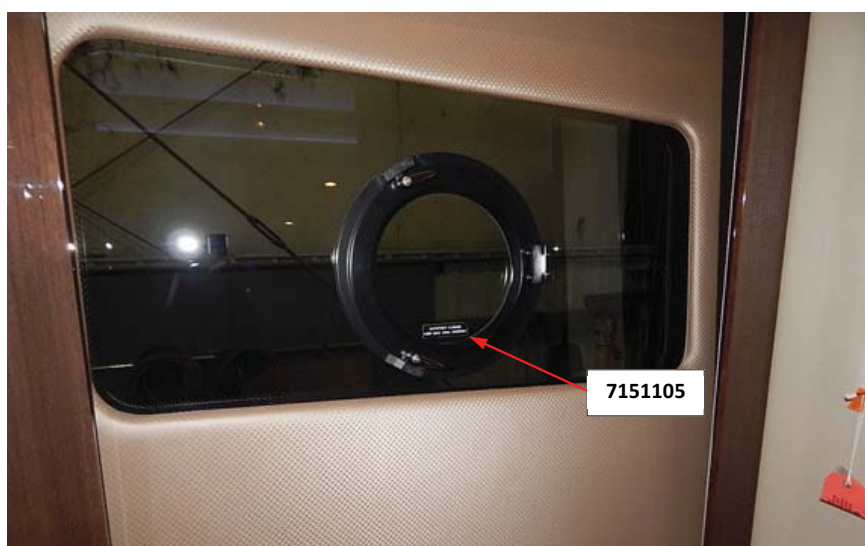


Figure 2-15 – Port Hole

NOTE: The watertight port hole label is applied to every port hole in the yacht.

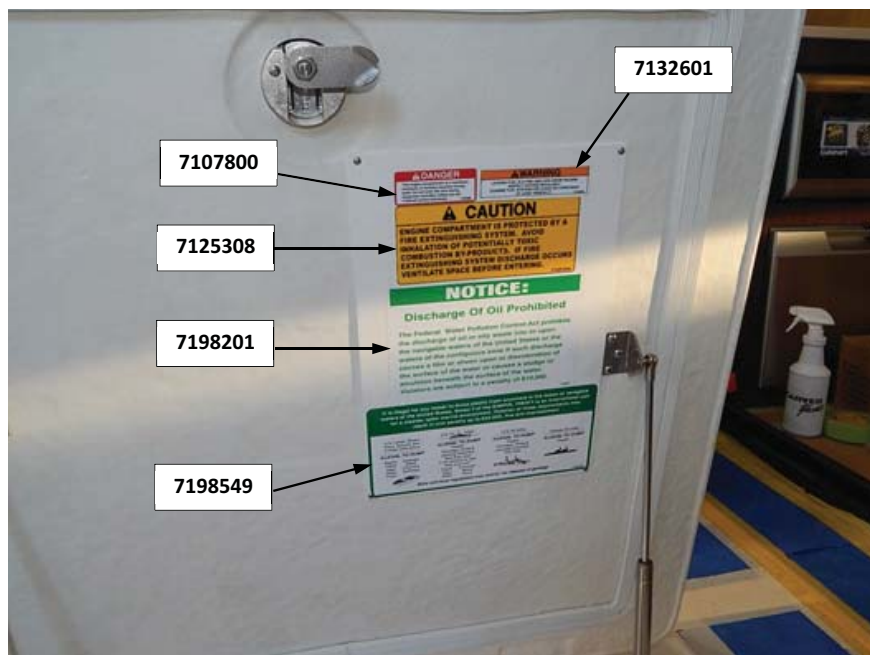


Figure 2-16 – Underside of Engine Room Hatch



Figure 2-17 – Fuel Equalization Labels on Fuel Tanks



Figure 2-18 – Surge Guard in Engine Room



Figure 2-19 – 24-volt Labels on Engine Batteries (1 on Each Battery)

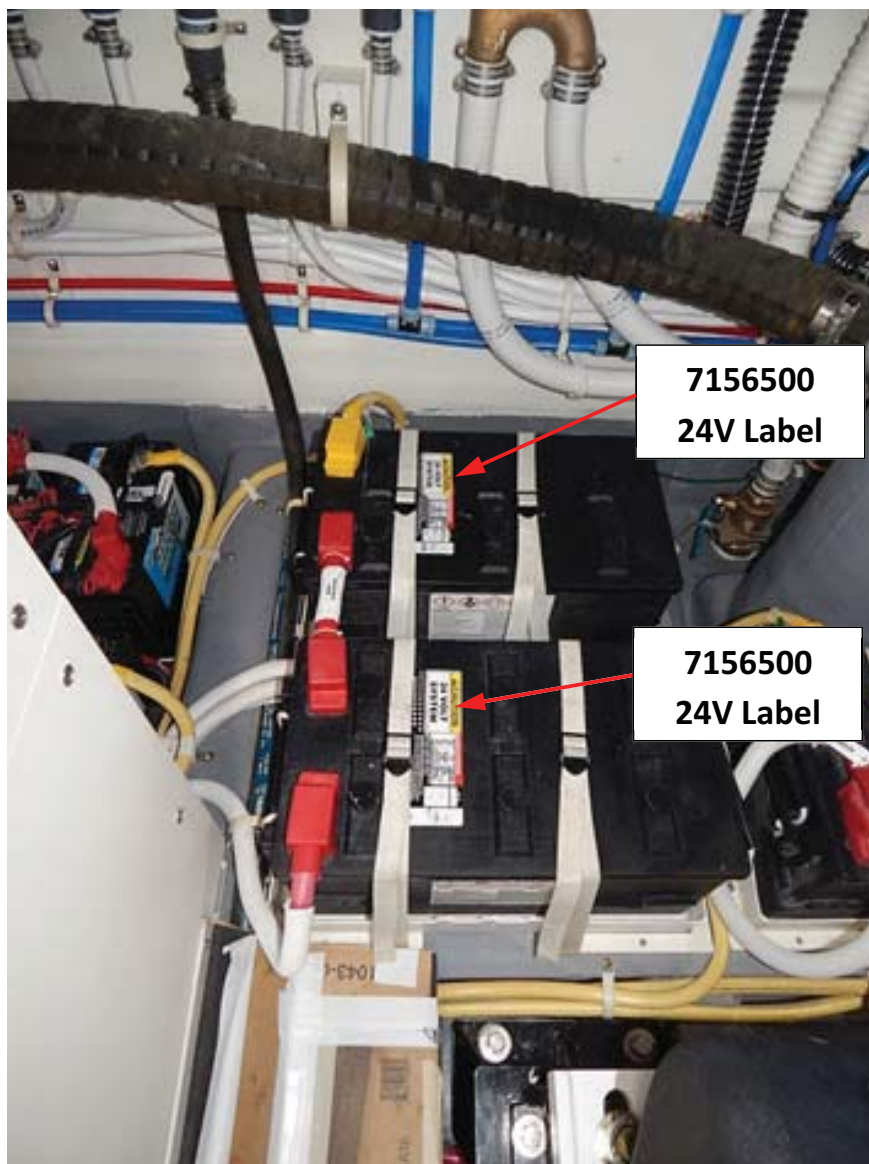


Figure 2-20 – 24-volt Labels on Thruster Batteries (1 on Each Battery)



Figure 2-21 – Outside of Cabin Door

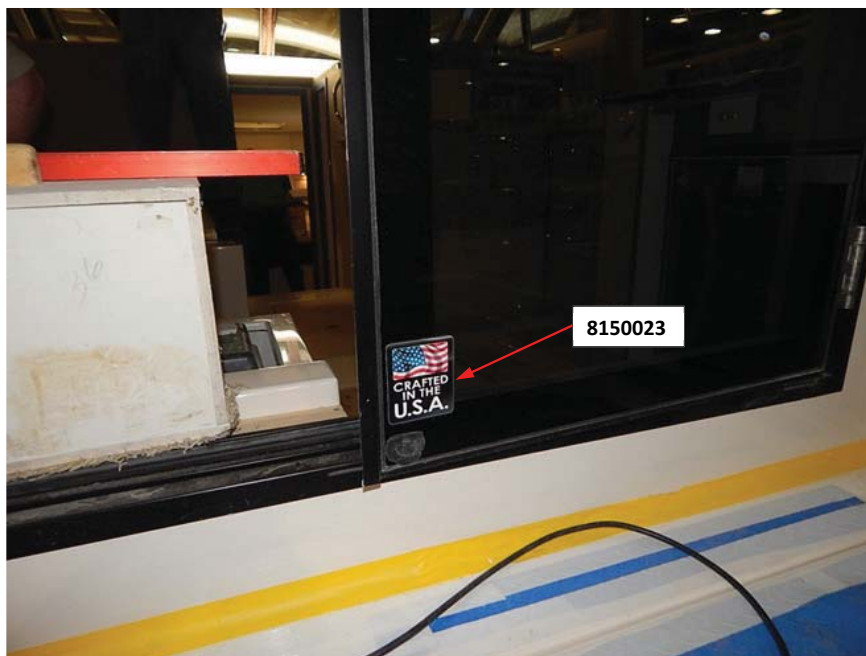


Figure 2-22 – Outside, Bottom of Cabin Door



Figure 2-23 – Starboard Side of Cockpit Entrance



Figure 2-24 – Swim Platform, Just Above Swim Ladder



Figure 2-25 – Dockside Breakers



Figure 2-26 – Inboard Side of Starboard Cabin Top Wing

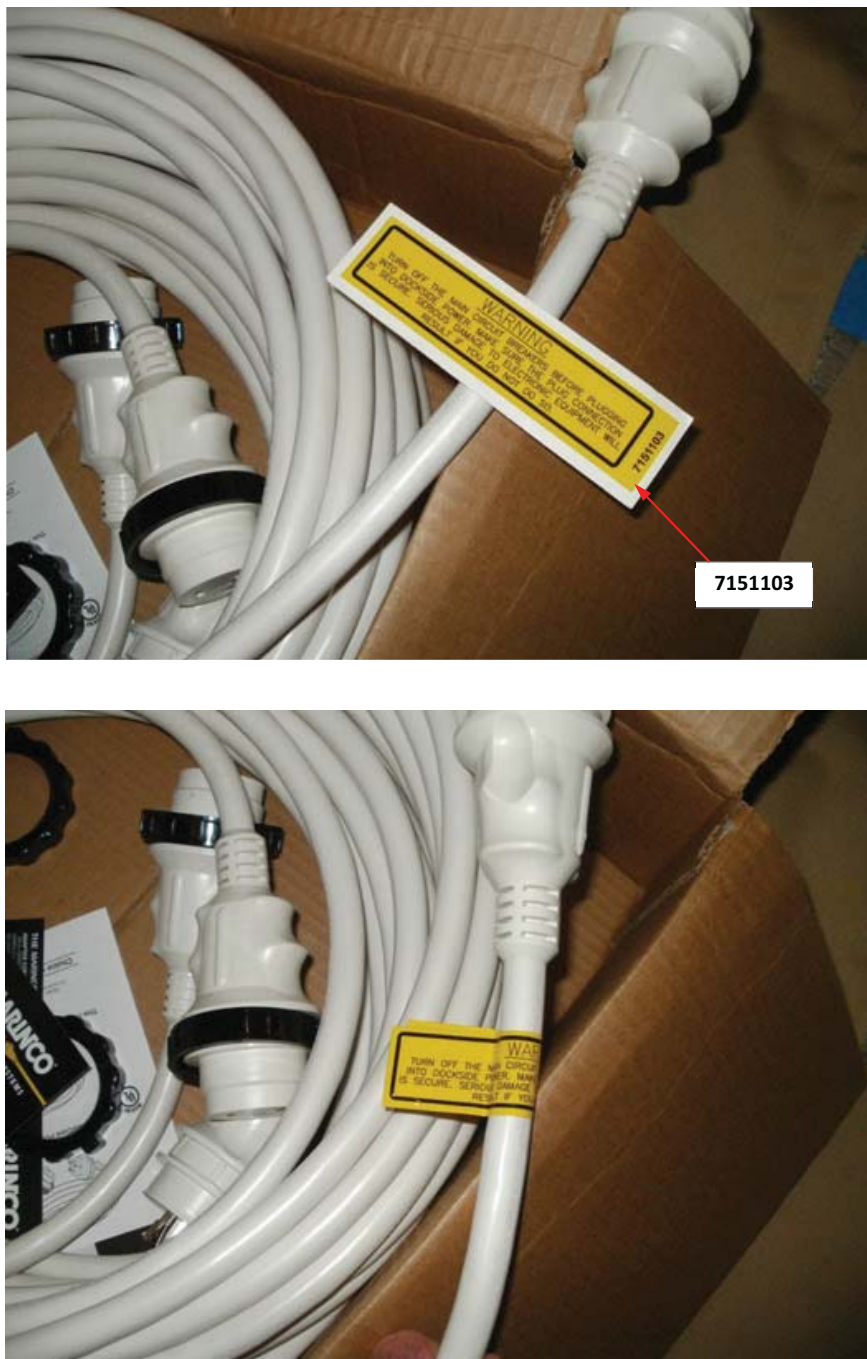


Figure 2-27 – Dockside Cord, Male End

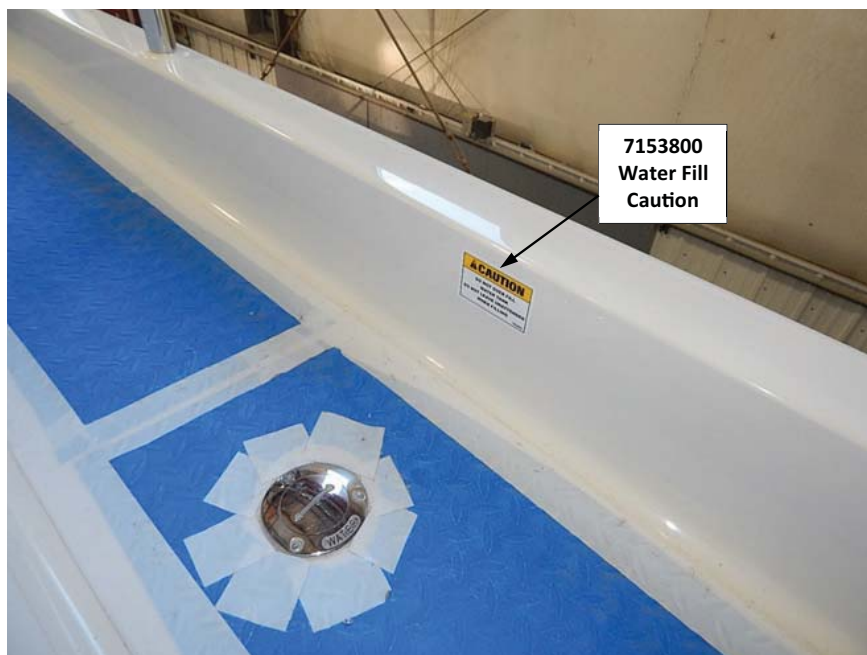


Figure 2-28 – Water Fill on Deck

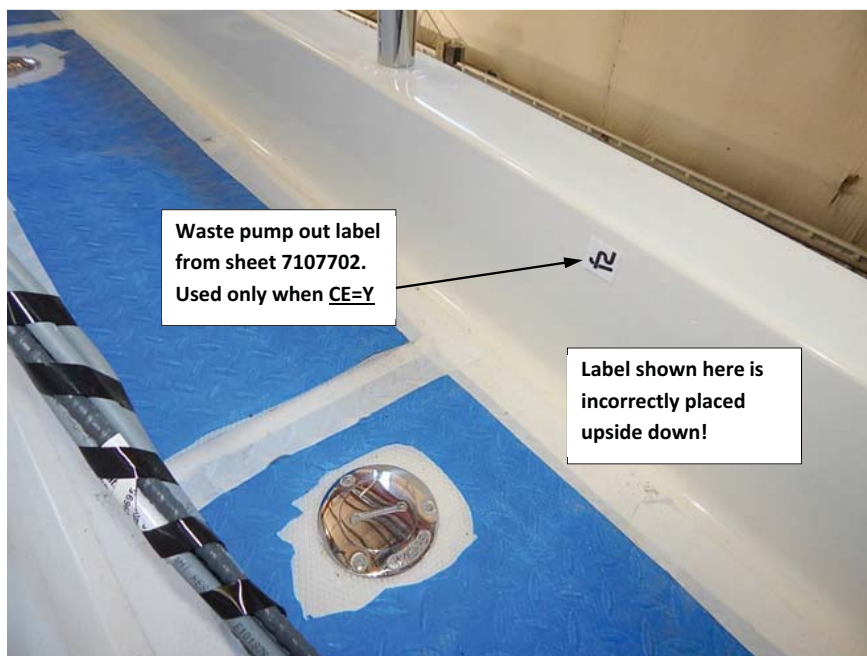


Figure 2-29 – Waste Pump-out Fitting on Deck (CE Only)



Figure 2-30 – Crew Quarters

C8 SAFETY LABEL LOCATIONS

PART NUMBER	DESCRIPTION	OPTION	QTY	LOCATION
7143566	Bilge Pump	Std	4	1 at each discharge thru hull (4)
		CE=Y	3	1 at each discharge thru hull (3)
7160902	Waste Deck Discharge	Std	2	1 on waste hose at tank
				1 on waste hose at deck fitting
		CREW=Y	2	1 on waste hose at tank
				1 on waste hose at deck fitting
7160904	Grey Water Discharge	Std	1	Shower sump dschrg thru hull
7160905	Gray Water Tank	141=Y	1	On tank
		141=Y & OBD=162	1	On 3-way valve
7160906	Grey Water Deck Discharge	141=Y	2	1 on gray water tank,
				1 on hose at deck fitting
7160907	Waste Tank	Std	1	On waste tank
		CREW=A	1	On crew waste tank
		141=Y & OBD=162	1	On 3-way valve
7160910	Engine Port	Std	3	1 at port water pickup strainer
				1 at port battery switch
				1 at engine battery (port)
7160911	Engine Stbd	Std	3	1 at stbd water pickup strainer
				1 at stbd battery switch
				1 at engine battery (stbd)
7160912	Generator	GEN=Y	4	1 at water pickup strainer
				1 at battery
				1 at battery switch
				1 at Racor fuel filter
7160913	Air Conditioner	Std	1	By junction box on equip. board
		A/C=Y	8	1 at water pickup strainer

PART NUMBER	DESCRIPTION	OPTION	QTY	LOCATION
				1 at each discharge thru hull (4)
				1 at each condensate discharge (3)
		(AC=Y)&(CREW=Y)	1	1 at discharge thru hull
7160915	Overboard Discharge	OBD=162	2	1 on waste tank, 1 on ball valve
		141=Y & OBD=162	1	On gray water tank
		OBD=162 & CREW=A	1	On hose at crew waste tank
7160916	Deck Drain	Std	4	1 at each discharge thru hull (4)
7160917	Fwd Head	Std	1	On hose at waste tank
7160918	Aft Head	Std	1	On hose at waste tank
7160921	Head	CREW=Y	1	On hose at crew waste tank
7160922	Fuel Shutoff P Engine	GAS=N	1	By supply valve on port tank
7160923	Fuel Shutoff S Engine	GAS=N	1	By supply valve on stbd tank
7160924	Fuel Shutoff Gen	DSL gen options	1	By supply valve on stbd tank
7160927	Fresh Water	Std	1	On water tank
7160928	Depth Sonar TD	ELECPKG=Y	1	By transducer in hull bottom
7160931	Bow Thruster Charger	Joystick=B	1	At thruster charger breaker
		Thruster=A or B	1	At thruster charger breaker
7160932	Engine Charger	Std	2	1 at each eng. charger breaker
7160933	Accessory Charger	Std	2	1 at accessory charger breaker
				1 below acc/gen charger
7160934	Generator Charger	Gen=Y	1	1 below acc/gen charger
7160939	Engine/Thrstr	Std	1	1 below engine/thruster charger
7160940	Accessory	Std	3	1 at accessory battery
				1 at breaker on equip. board
				1 at battery switch on equip. board
7160941	Bow Thruster	Joystick=B	3	1 at bow thruster battery switch
				1 at thruster battery
				1 at bow thruster breaker
		Thruster=A or B	3	1 at battery switch on equip. board

PART NUMBER	DESCRIPTION	OPTION	QTY	LOCATION
				1 at thruster battery
				1 at breaker on equip. board
7160942	Stern Thruster	Thruster=B	3	1 at battery switch on equip. board
				1 at thruster battery
				1 at breaker on equip. board
7160944	Bilge Water Alarm	Std	2	By float switch
7160951	Windlass	GT=A or B	1	At windlass breaker
7160953	Shore 1	Std	2	1 at dockside inlet
				1 on inlet breaker panel
7160954	Shore 2	AC=Y	2	1 at dockside inlet
				1 on inlet breaker panel
7160955	Fresh Water Washdown	Wshdwn=283orBTH	2	1 at aft spigot, 1 at fwd spigot
7160957	Galley Drain	Std	1	Hose at discharge thru hull
7160958	Water Heater Relief	Std	1	Hose at discharge thru hull
7160959	Sea Water	Wshdwn=284orBTH	3	1 at pickup
				1 at aft spigot, 1 at fwd spigot
7160960	Shore Water	Std	1	At shore water inlet
7160968	Lift Pump	LIFT=Y	2	1 at lift pump
				1 at lift pump breaker
7160975	Power Steering	Std	2	1 at power steering pump
				1 at power steering breaker
TBD	Builders plt. 4857 Carver	CE=Y	1	At helm
5922562	Builders plt. Australia	CNTRY=AUS	1	At helm
7100001	Shaft Align Notice	Std	2	On shaft by coupling
7100400	Sanitation Sys Warn	Std	2	Under each toilet seat cover
		Crew=A	1	Under toilet seat cover
7100410	Waste System Remind	Std	2	Under each toilet seat cover
		Crew=A	1	Under toilet seat cover
7102901	Water Heater Warning	Std	1	110 volt dist. Panel

PART NUMBER	DESCRIPTION	OPTION	QTY	LOCATION
7102902	Water Heater Drain	Std	1	On water heater
7107702	Sht CE Symbols	CE=Y	2	Misc.
7107800	Eng Compartment	Std	1	Engine hatch
		GEN=Y	1	On generator
7117805	Sling	HCOLOR=P,R,S	4	2 on each hull sides
7117806	Sling	HCOLOR=N	4	2 on each hull sides
7117905	2.5 Minute Time Delay	110=Y	3	1 at 110 volt panel
				1 at shore pwr brkr at transom
				1 at Surge Guard in engine room
7119003	Escape Ladder	Std	1	V-berth hatch
7125308	Fire Extinguishing Sys	Std	1	Engine hatch
7125309	Fire Shutdown	Std	1	1 at helm
7125401	Owners Manual	Std	3	Dist. Panels & at helm
7130353	Warning Prop Helm	Std	1	At helm
7130354	Warning Prop Transom	Std	1	Transom at swim ladder
7132601	Leaking Fuel Warning	Std	1	Engine hatch
7132804	Canadian Compliance	CNTRY=CAN	1	At helm
7132806	NMMA Cert Plate	CE=N	1	At helm
7139901	220 volt	Std	1	On water heater
7150130	Fire Ext. location	Std	4	Fire ext. locations
		CREW=Y	1	In crew quarters
7150140	Escape Hatch Loc.	CE=Y	1	V-berth hatch
7150301	Anchor & Chain	GT=N	1	Underside of rope Locker door
7151102	Fuel Equalization	Std	2	1 on each fuel tank by crossover
7151103	Warning Dcksd Cord	Std	1	End of dockside cord
		AC=Y	1	End of dockside cord
7151105	Watertight Closure	Std	5	1 on each opening porthole
7153800	Water Fill Caution	Std	1	By water fill deck fitting
7155003	Emergency Bilge Pump	CE=Y	1	By 12 volt panel

PART NUMBER	DESCRIPTION	OPTION	QTY	LOCATION
7155110	CO Warning Transom	Std	1	On transom
7155111	CO Warning Cabin	Std	1	By salon CO monitor
7155112	CO Danger Helm	Std	1	At helm
7155301	Caution Fumes	Std	1	On patio door
7156500	24V System	Std	4	One on each engine battery
		Thruster=A or B	2	One on each thruster battery
7194605	Water Heater Bypass	Std	1	On water heater
7198201	Oil Discharge	Std	1	Engine hatch
7198549	Marpol Treaty	Std	1	Engine hatch
7198559	Sump for A/C	AC=Y	1	12 volt dist. panel
7198623	Shock & Fire Hazard	Std	1	Shore pwr inlet at transom
8150023	CRAFTED IN USA	Std	1	Bottom outside of patio door
8627320	Tuff-Gel	Std	1	Hardtop wing
7107802	Proposition 65	California	1	Hang on steering wheel

Table 2-4 – Design Specifications – ISO Standards

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.

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.
- Keep the yacht and equipment in safe operating condition. Regularly inspect the hull, engines, safety equipment, and all yachting gear. Show all passengers the location of safety equipment and explain how to use it.
- Take note of periodic service or replacement requirements of safety equipment such as expiration dates on flares, service dates on CO monitors, battery replacement dates on emergency position indicating radiobeacons (EPIRBs), etc.
- As captain of the yacht, you have ultimate responsibility and authority. Instruct passengers to heed your requests and tell them how to respond.
- 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.

NOTICE

Federal law requires the owner to provide and maintain safety equipment onboard. Consult 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. Be aware of the safety equipment's availability and use. Check that all safety equipment such as fire extinguishers, life jackets, flares, distress flags and flashlights is operable and in good condition.

- 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.
- 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.
- 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.
- Be attentive to the weather. Be aware of possible changing conditions by checking local weather

reports before departure. Monitor strong winds and electrical storms. Enable NOAA weather alerts on radios and phones for advance warnings. If weather is approaching, instruct all passengers to wear a life jacket; close all windows, hatches and doors; and seek shelter in a safe harbor.

- Always keep electronic charts of chosen cruising areas up to date. Keep backup paper charts in a safe area.
- 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.
- Never allow passengers to ride anywhere other than designated seating areas.
- Ask all passengers to remain seated while the yacht is in motion and to use the hand-holds provided.
- 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.
- 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.
- 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 or fob 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.

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.

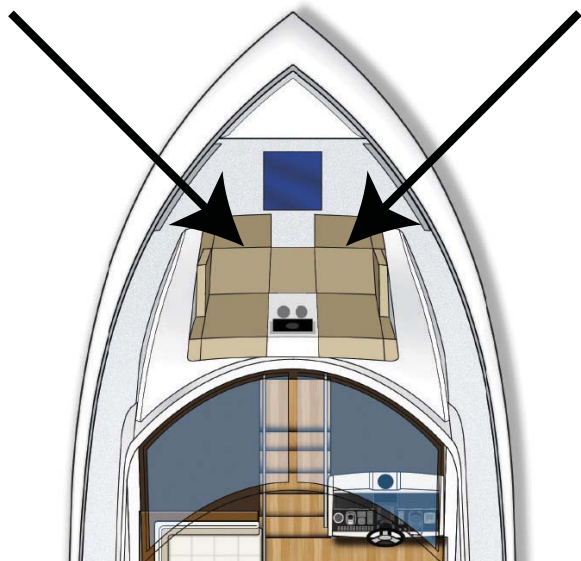


Figure 2-31 – Forward Sunpad

The designated working deck areas contain safety rails and deck surfaces and appear in orange in **Figure 2-32**. Working deck areas help prevent people from falling overboard while underway.



Figure 2-32 – Working Deck

If Someone Falls Overboard

If someone falls into the water unexpectedly, every second counts toward preventing injury or death. Before leaving the dock, instruct passengers on your MOB plan.

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
- Bright cockpit 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.

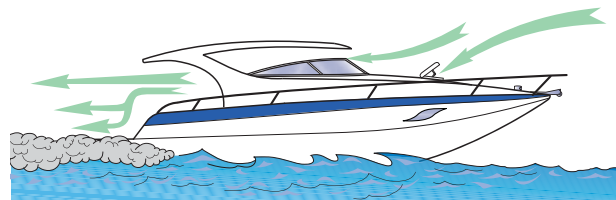


Figure 2-33

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.

Ensure adequate ventilation for correct air movement through boat



KC-0360C-A

Figure 2-34

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 15 for contact information.

Potential Causes of CO Poisoning

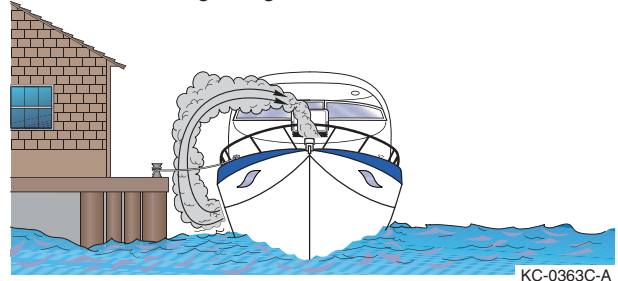
Blockage of exhaust outlets can cause carbon monoxide to accumulate in the cabin and cockpit area – even when the hatches, windows, portholes, and doors are closed. See **Figure 2-35**.



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



KC-0363C-A

Figure 2-35

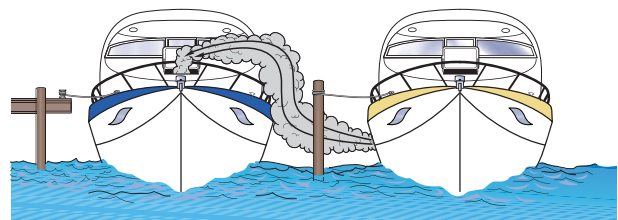
Exhaust from another vessel alongside your yacht, while docked or anchored, can emit poisonous CO gas inside the cabin and cockpit areas of your yacht. See **Figure 2-36**.



WARNING

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

Exhaust from other vessels in confined areas



KC-0364C-A

Figure 2-36

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 2-37**.

⚠ 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

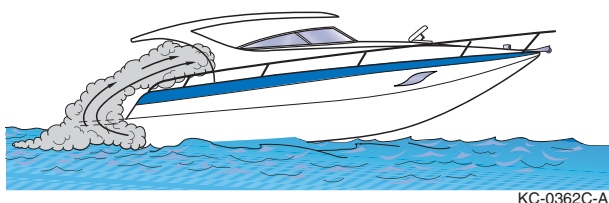


Figure 2-37

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 2-38**.

⚠ WARNING

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

Operating at slow speed or while idling

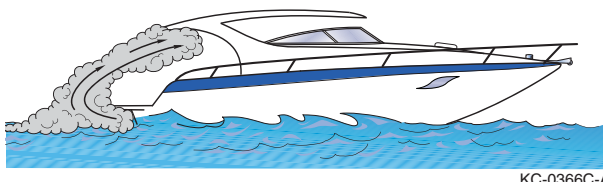


Figure 2-38

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 2-39**.

⚠ 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

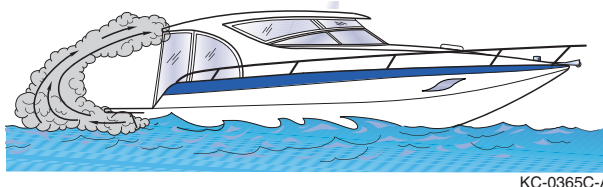


Figure 2-39

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:

- Watery 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.

SEATING AND HAND-HOLDS

Instruct passengers to stay seated in seats and use the hand-holds while the yacht is under way. The bow, gunwale, transom platform, sun lounge and seat backs are not intended to be used as seats while the yacht is under way.

Rails should be used when provided in walkways, but only when the yacht is at rest.

WARNING

Always make sure passengers stay seated and use the hand-holds when the yacht is under way. Failure to stay seated or use the hand-holds could cause personal injury or a man overboard emergency in the event of a sudden turn or wave surge.

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.

The yacht was built to meet federal requirements and certified to more stringent ABYC standards for the fuel, electrical, ventilation, floatation, horn, identification, capacity, placards and labels, powering, start-in-gear protection, navigation lights, backfire flame control, and in most cases, fire extinguishers.

The yacht owner is responsible for other safety items, which can vary depending on the size of the yacht as follows:

- Fire extinguishers
- Life jackets
- Visual distress signals
- Bell (Yachts greater than 65' [20 m] in length)
- Navigation Rules on board (Yachts 39.4' [12 m] in length and greater)

The USCG offers a vast amount of recreational boating regulatory, safety and training information online. This information covers laws, aids to navigation, rules of the road, boating safety courses, vessel safety checks and much more. Go to the following sites for more information:

- United States Coast Guard: www.uscgboating.org
- United States Power Squadron: www.usps.org
- BoatU.S. Foundation: www.boatus.org

LIFE JACKETS

Boaters enjoy the feel of sun and spray – so it's tempting to boat without wearing a life jacket, especially on nice days. But modern life jackets are available in a wide variety of shapes, colors, and sizes. 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 is no excuse not to wear a life jacket on the water.



Figure 40 – Life Jackets

Things to know about life jackets:

- Certain life jackets are designed to keep your head above water and help you remain in a position that permits proper breathing.
- To meet U.S. Coast Guard requirements, a boat must have a U.S. Coast Guard approved life jacket for each person aboard. Boats 16 ft (4.8 m) 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 for children. 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 and personal EPIRBs 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.
- A life jacket, especially a snug-fitting flotation coat or deck-suit style, can help you survive in cold water.

Life jackets must be:

- Coast Guard approved
- In good and serviceable condition
- The appropriate size for the intended user

Select the Right Style

Life jackets are designed for a boater's recreational water activity. A life jacket may be inherently buoyant (using

foam or other buoyant materials to stay afloat) or inflatable (providing buoyancy when inflated by relying on carbon dioxide cylinders).

Be sure each life jacket is U.S. Coast Guard-approved and appropriate for the water activity by checking the label printed on the inside of the life jacket.

Make Sure the Life Jacket Fits

You don't want your life jacket to be too large or too small. A snug fit is a proper fit. Remember that life jackets for adults do not work for children.

- Make sure the life jacket is properly fastened.
- Make sure all straps, buckles and zippers are secure.
- Hold your arms straight up over your head.
- Ask a friend to grasp the tops of the arm openings and gently pull up.



Figure 2-41 – Life Jacket Proper Fit

How to Care for Life Jackets

See the life jacket owner's manual for specific maintenance requirements.

Care for All Types of Life Jackets

- Use properly.
- Make sure there are no rips, waterlogging or mildew.
- Dry after use.
- Hand wash with mild detergent.
- Store in a dry place when not boating.



Figure 2-42 – Discard Damaged Life Jackets

Care for Inflatable Life Jackets

- Test to make sure they orally inflate and hold air for 16 hours.
- Inspect inflation mechanism (not discharged, no corrosion, and properly installed).
- If it holds air, repack and use.

Accessibility

- Wearable life jackets must be readily accessible.
- You must be able to put on the life jacket in a reasonable amount of time in an emergency (vessel sinking, on fire, etc.).
- Do not stow life jackets in plastic bags or in locked or closed compartments. Do not stow other gear on top of them.
- The best life jacket is the one you will wear.
- Though not required, a life jacket should be worn at all times when the vessel is underway. A wearable life jacket can save your life, but only if you wear it.
- Throwable devices must be immediately available for use.

Inflatable Life Jackets

- Inflatable life jackets may be more comfortable to wear.
- The best life jacket is the one you will wear.

- Inflatable life jackets require the user to pay careful attention to the condition of the device.
- Inflatable life jackets must have a full cylinder and all status indicators on the inflator must be green. If the inflatable life jacket does not have a full cylinder or any status indicator on the inflator is not green, the device is NOT serviceable and does NOT satisfy the requirement to carry life jackets.
- Coast Guard-approved inflatable life jackets are authorized for use on recreational boats by person at least 16 years of age.

Child Life Jacket Requirements

Some states require that children wear life jackets:

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

Check with your state boating safety authorities.

Child life jacket approvals are based on the child's weight. Check the "User Weight" on the label, or the approval statement that will read similar to "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".

Life jacket Requirements for Certain Boating Activities Under State Laws

The Coast Guard recommends and many states require wearing life jackets in the following situations:

- For waterskiing and other towed activities (use a life jacket marked for waterskiing)
- While operating personal watercraft (PWC) (use a life jacket marked for waterskiing or PWC use)
- During whitewater boating activities
- While sailboarding (under federal law, sailboards are not "boats")

Check with your state boating safety officials.

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.

Life jacket Flotation

There are three basic kinds of life jacket flotation, with the following characteristics:

Inherently Buoyant (Primarily Foam)

- Adult, youth, child, and infant sizes
- For swimmers and non-swimmers
- Wearable and throwable styles
- Some designed for water sports

Inflatable

- The most compact
- Sizes only for adults
- Recommended only for swimmers
- Wearable styles only
- Some with the best in-water performance

Hybrid (Foam and Inflation)

- Reliable
- Adult, youth, and child sizes
- For swimmers and non-swimmers
- Wearable styles only
- Some designed for water sports

- International Regulations for Preventing Collisions at Sea, 1972 (72 COLREGS);
- Inland Navigation Rules (33 CFR 83) and their respective technical annexes (33 CFR 84-90);
- COLREGS Demarcation Lines (33 CFR 80);
- Vessel Bridge-to-Bridge Radiotelephone Regulations (33 CFR 26);
- Vessel Traffic Management Regulations (33 CFR 161); and,
- Various other pertinent provisions of the U.S. Code and Code of Federal Regulations regarding compliance and penalties associated with the Navigation Rules.

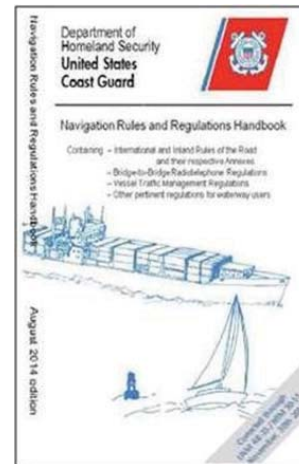


Figure 2-43 – USCG Navigation Handbook

NAVIGATION RULES

USCG Navigation Rules and Regulations Handbook: November 30th, 2015.

This handbook (ISBN: 9780160925665), which supersedes Commandant Instruction 16772.2D, *Navigation Rules: International-Inland**, is a compendium, produced by the U.S. Coast Guard Navigation Standards Branch, U.S. Coast Guard Headquarters, Washington, DC, of the:

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:

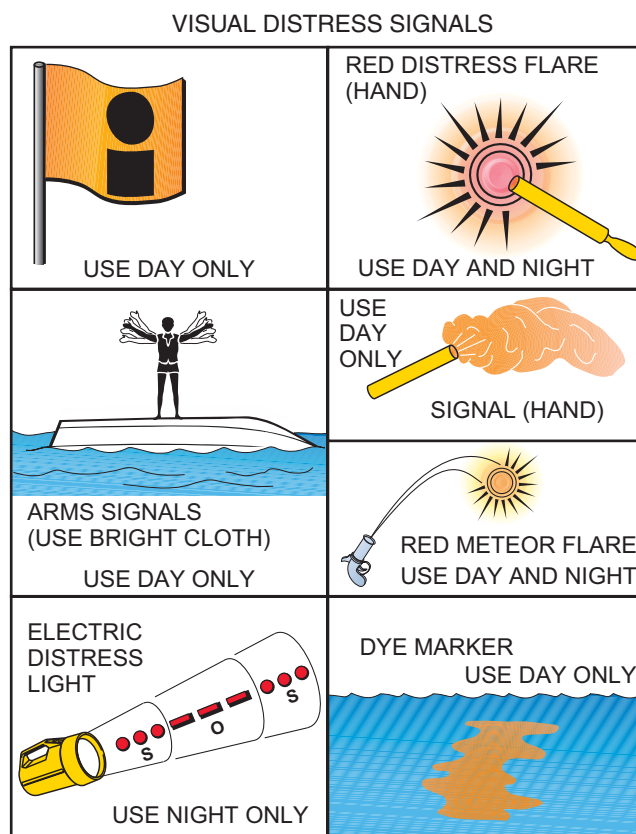
- Orange distress flag
- Dye markers
- Electric distress light

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 15 for contact information.

Pyrotechnic devices expire and must be replaced every few years, as stamped on the unit. Be sure to properly dispose of old pyrotechnics.

Distress lights and strobes are equipped with batteries that must be replaced every few years, as stamped on the unit.



KC-0008C-A

Figure 2-44

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 Signals”** on page 77.

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 78.

RADAR REFLECTORS

If you cruise in open water at night or in inclement weather, Carver recommends installing radar reflectors, especially when in shipping lanes. Radar reflectors increase the signature of the yacht on radar. Carver suggests two reflectors measuring at least 18 in. (46 cm) diagonally. There are several types of reflectors to choose from. Contact a Carver dealer for help choosing. 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 2-45 – Radar Reflectors

EMERGENCY POSITION INDICATING RADIO BEACONS

If you cruise in open water, consider purchasing an Emergency Position Indicating Radio Beacon (EPIRB). In the U.S., you must use a U.S. coded 406 MHz beacon and register it with NOAA by law:

<http://www.sarsat.noaa.gov/beacon.html>.

EPIRBs use GPS technology to identify your exact location, which is sent directly to the NOAA Search and Rescue Satellite (SARSAT) along with your unique identification number. SAR authorities then have all the information on your location and the yacht in minutes and can initiate search and rescue operations far more quickly and efficiently. EPIRBs are equipped with long-lasting batteries that must be replaced every few years, as stamped on the unit.

VHF (SHIP TO SHORE) 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 calling and distress channel and is used to summon rescue services such as the USCG as well as for communicating with the harbor, the

marina, bridges, locks and other boaters in the area. In emergency situations when lives are in danger, use the VHF radio channel 16. Cell phones should be used only as a secondary means of communication.

There are two 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** radio call – A Pan-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. Start the broadcast clearly and calmly with “Pan – Pan – Pan.”

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

- The exact nature of the emergency and an assessment of the severity
- Your location (navigation marker, visual reference or GPS coordinates in open water)
- What your vessel looks like (hull and 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.

Since VHF radios have limited distance line-of-sight (to the horizon) capabilities, it is important for all boaters receiving the distress call to attempt to render assistance until the rescue authorities arrive. The very nature of open water escalates the importance of any distress call. Boaters should always monitor channel 16 but never use it for casual communications.

In other communications, call the other party on channel 16 using your call-sign. Bridges and locks will instruct you on what to do. Harbors, marinas, and other boaters in the area will inform you of what channel to switch to.

Be sure to read the VHF radio manufacturer's information on the features and use of the radio.

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.

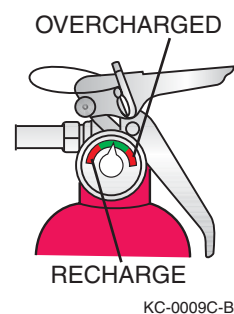


Figure 2-46

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, especially when operating in open water:

- Cell phone with waterproof case
- Mobile device power pack (battery)
- Solar USB charger
- Forward looking infrared (FLIR) night vision
- Handheld waterproof GPS
- Handheld waterproof VHF radio
- Handheld waterproof compass
- Handheld waterproof two-way radios
- Ditch kit
- Dry bag
- Survival suit
- Foul weather gear and thermal clothing
- Throw raft with oars
- Spare keys/fobs
- First aid kit and manual
- Emergency food and water
- Ring buoy
- Spare anchor and 150 ft (46 m) of 5/8" anchor line
- Sea anchor
- Heaving, mooring and towing lines
- Fenders and boat hook
- Waterproof flashlight, radio and spare batteries
- Mirror, whistle and strobe light
- EPIRB (Emergency Position Indicating Radio Beacon)
- Radar reflectors
- Sunscreen, insect repellent and sunglasses
- Navigational charts
- Binoculars
- Tool kit including propeller replacement tools
- Spare propellers and hardware, one each right-hand and left-hand rotation
- Spare parts: pumps, belts, filters
- Bung plug
- Duct tape and electrical tape
- Engine oil
- Selection of fuses

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.

2 | OWNER'S MANUAL

YACHTING SAFETY

CARVER

Notes:

OWNER/ OPERATOR RESPONSIBILITIES

3

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 15** 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 15** 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

OWNER/OPERATOR RESPONSIBILITIES

- 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.

OWNER/OPERATOR RESPONSIBILITIES

CARVER

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.

EMERGENCIES

4

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.

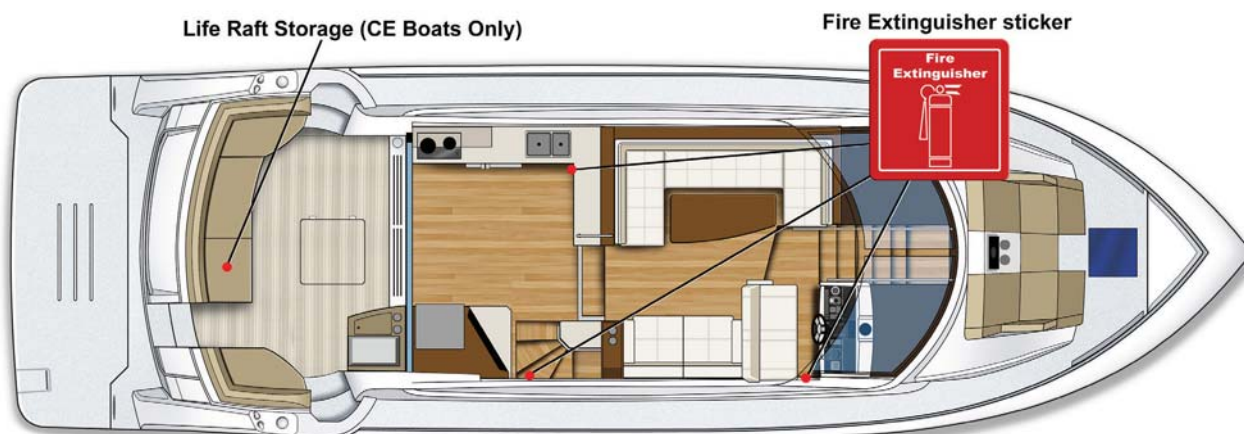


Figure 4-3

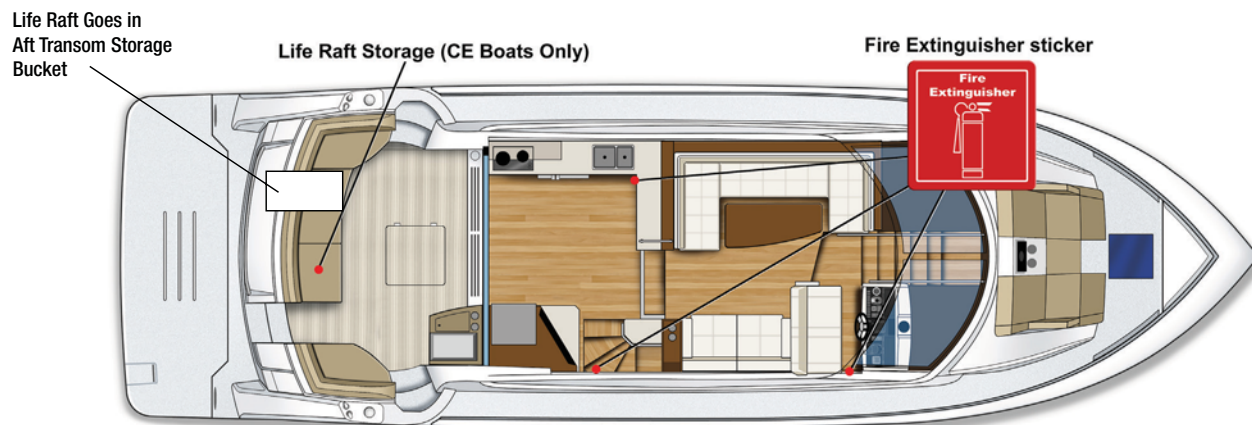


Figure 4-4

4 | OWNER'S MANUAL EMERGENCIES

CARVER

Life Raft is Located
on Port Aft Side of
Lower Crew Liner

Life Raft Storage (CE Boats Only)

Fire Extinguisher sticker

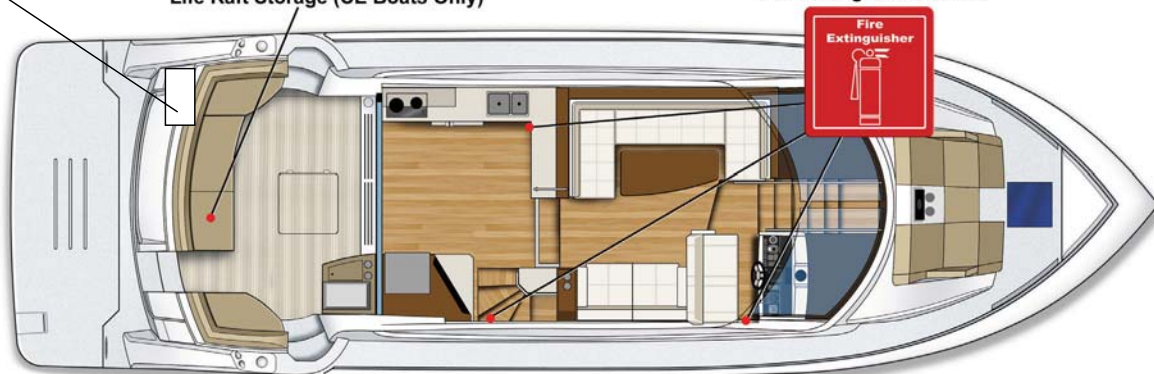


Figure 4-5

Life Raft is Located
on Port Aft Side of Lower
Crew Liner Inside Cabinet

Life Raft Storage (CE Boats Only)

Fire Extinguisher sticker

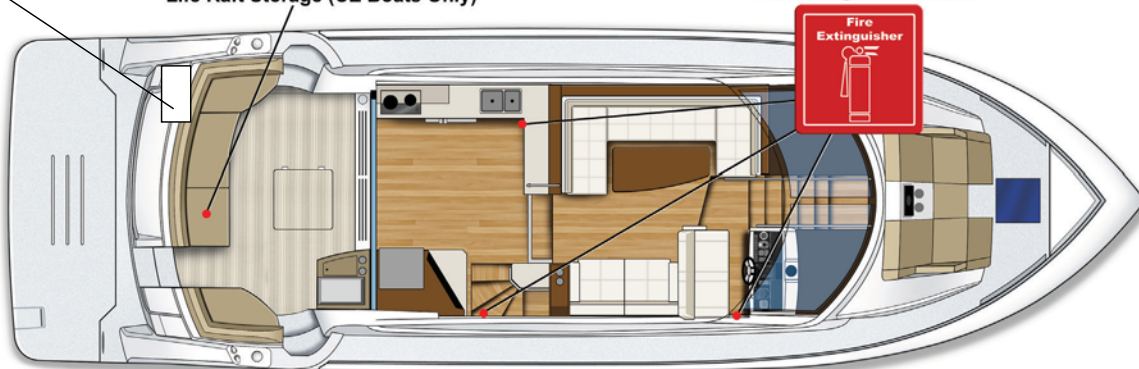


Figure 4-6

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 GROUND

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 42.**

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 4-5.**

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 4-5 – 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 yachtster'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 15 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 45.

Notes:

OPERATING IN HAZARDOUS CONDITIONS

5

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

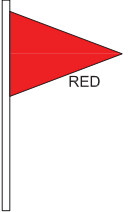
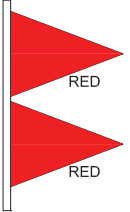
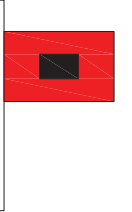
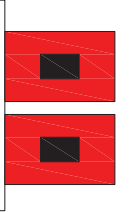
	SMALL CRAFT ADV. WINDS TO 33 KNOTS	GALE WARNING WINDS: 34 - 47 KNOTS		STORM WARNING WINDS: 48 - 63 KNOTS	HURRICAN WINDS: 64+ KNOTS
DAY FLAGS	 RED	 RED RED	DAY FLAGS	 BLACK ON RED	 BLACK ON RED BLACK ON RED
NIGHT FLAGS	 RED  WHITE	 WHITE  RED	NIGHT FLAGS	 RED  RED	 RED  WHITE  RED

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.

OPERATING IN HAZARDOUS CONDITIONS

- 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.
- 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.

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.

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.

OPERATING IN HAZARDOUS CONDITIONS

CARVER

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.

NAVIGATION RULES AND AIDS

6

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.

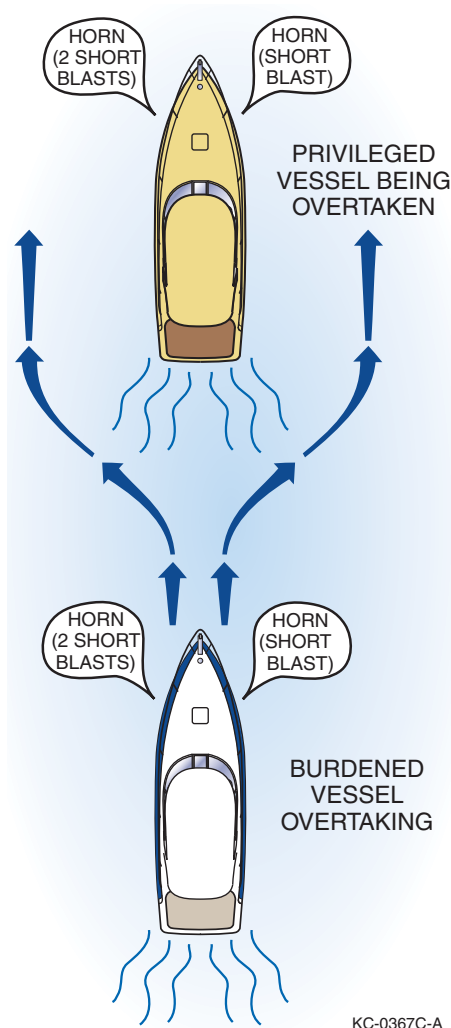


Figure 6-1

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.

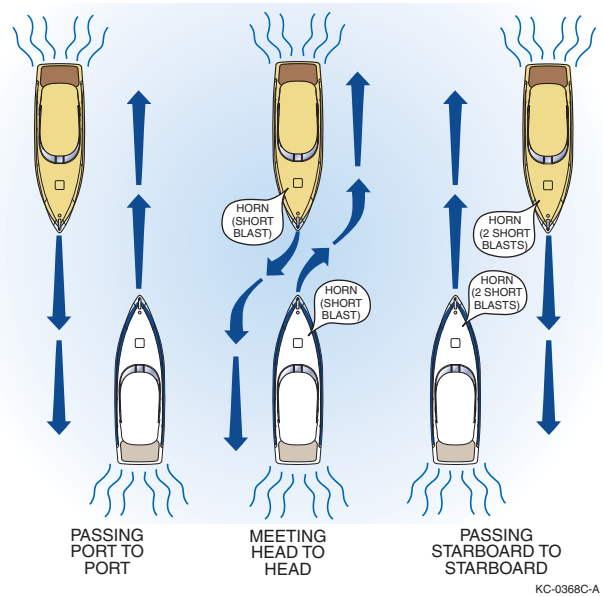


Figure 6-2

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.

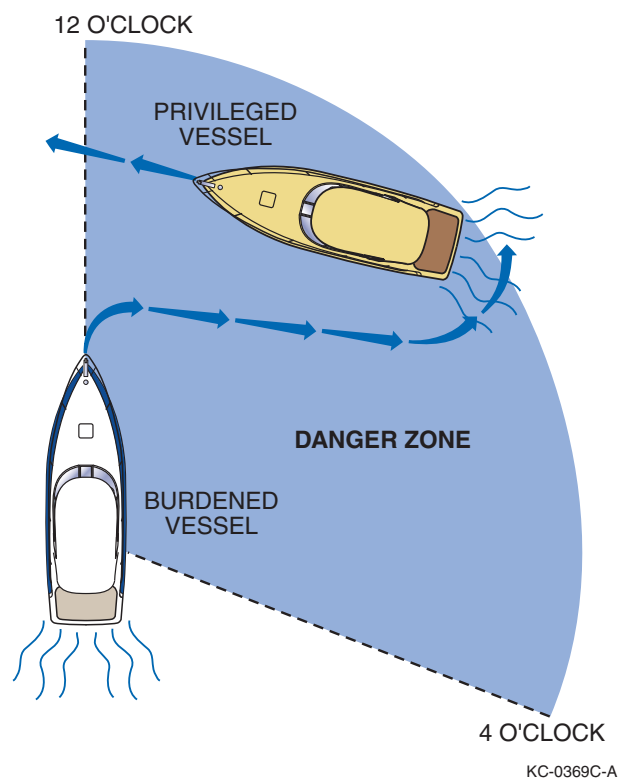


Figure 6-3

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 15 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.

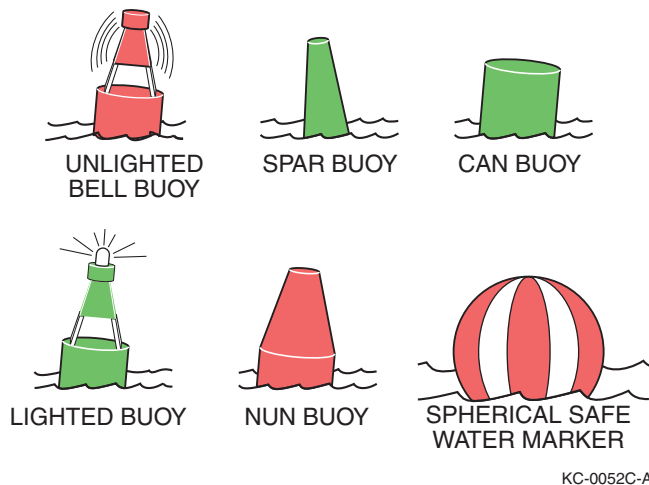


Figure 6-4

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.

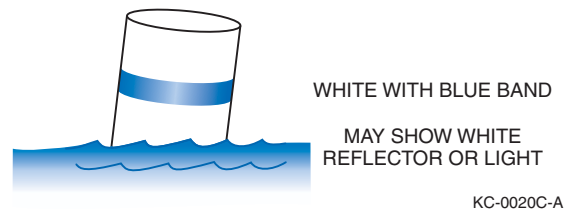


Figure 6-5

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.

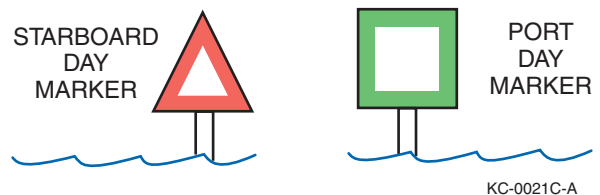


Figure 6-6

LIGHTS AND LIGHTED STRUCTURES

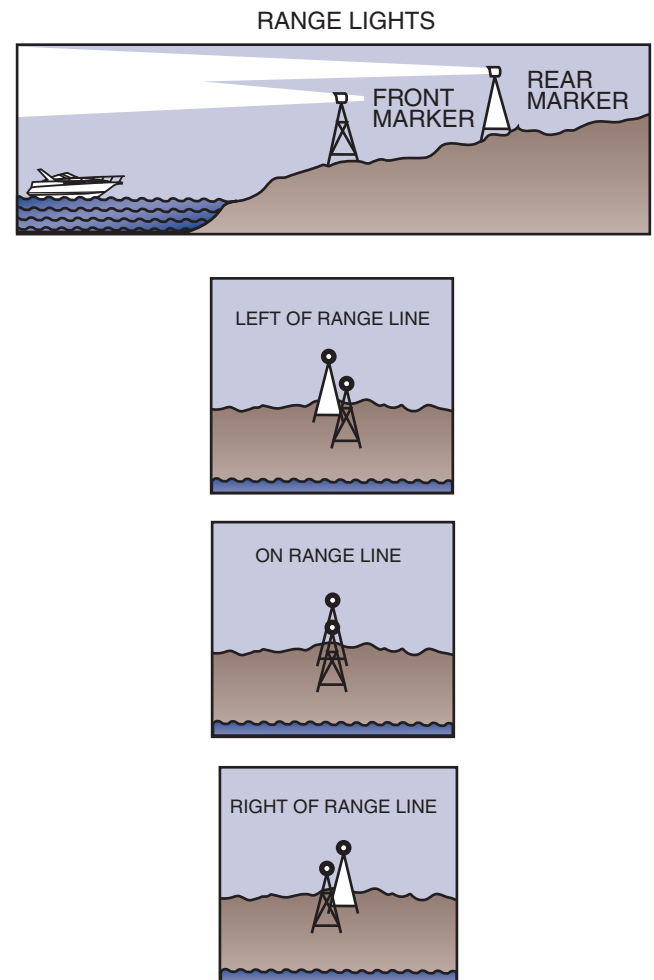
Maneuvering a yacht at night can be dangerous and confusing. To aid boaters with navigation and to warn of hazards, the USCG and state and local authorities maintain a variety of light structures. Some light structures are equipped with radio beacons, radar reflectors and/or fog signals.

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.

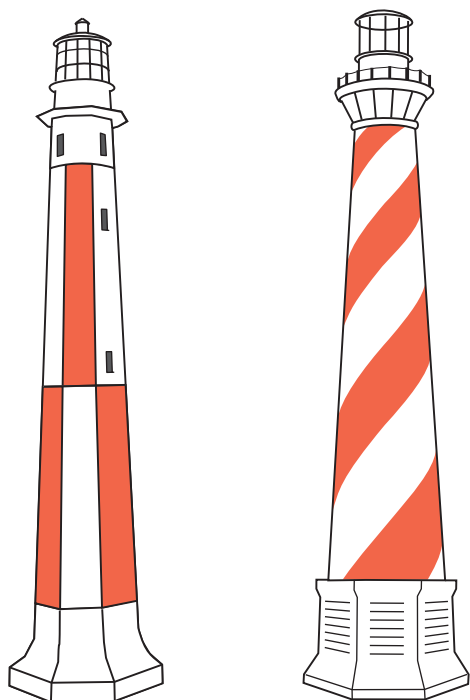


KC-0022C-B

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.



KC-0023C-A

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

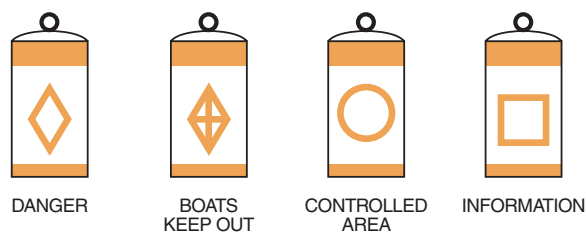
Regulatory Markers

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



KC-0244C-A

Figure 6-9

NAVIGATION RULES AND AIDS

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

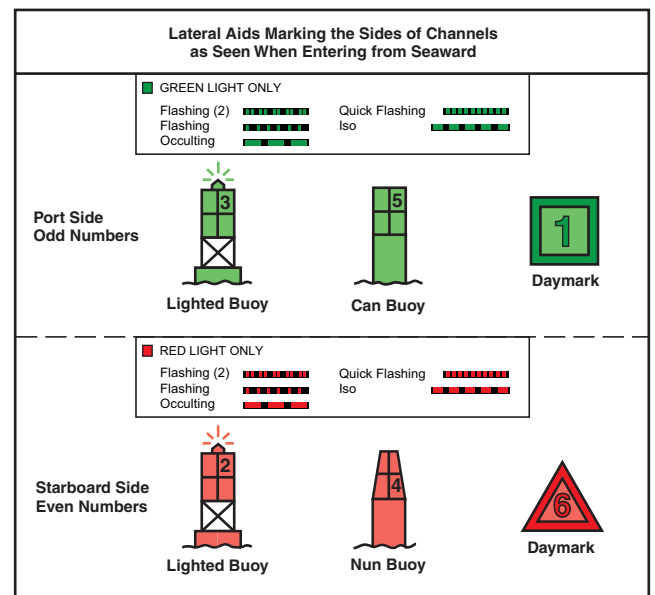
Lateral markers are used to mark the sides of navigable channels. They can be buoys, daymarks or minor lights, and they are red and green in color. They can be lighted or unlighted and may or may not have numbers.

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).

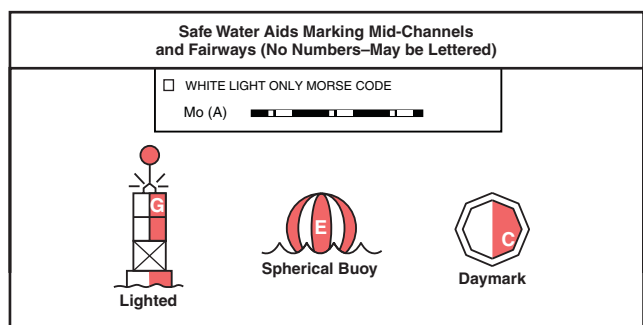


KC-0054C-B

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.

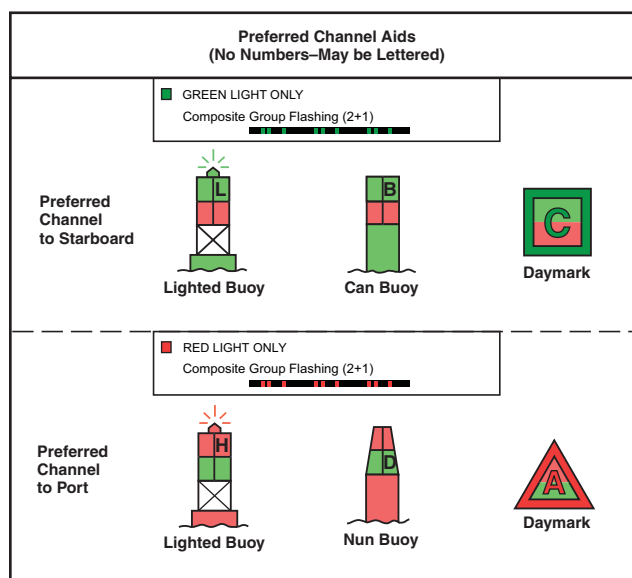


KC-0055C-B

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.



KC-0056C-B

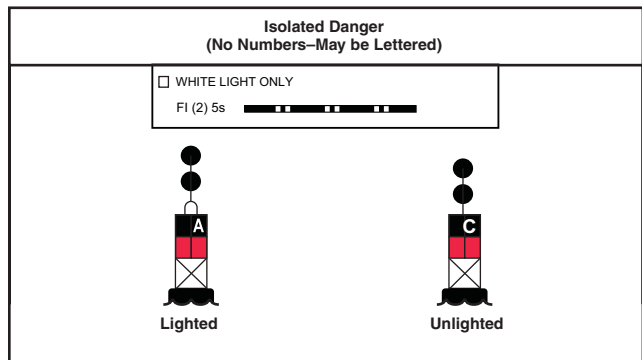
Figure 6-12

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.

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.



KC-0057C-B

Figure 6-13

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.

BATTERIES

The batteries power the DC electrical system. See “**Design Specifications**” on page 5 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 89** 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.

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 the 12-volt accessory battery bank. 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.

Battery Chargers

Two battery chargers are equipped onboard. See **"Design Specifications" on page 5** 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.



Engine Battery Banks and Thruster Battery Charger

Accessory Battery Bank and Generator Battery Charger

Figure 7-1

MASTER DISCONNECT SWITCHES

The master disconnect switches control electricity from the batteries to DC components:

On a fully loaded yacht, six master disconnect switches control the flow of electricity to the DC components:

- Accessory
- Stern thruster
- Bow thruster (also supplies power to windlass and swim lift)
- Generator
- Engine PORT
- Engine STARBOARD

The master disconnect switches are in the engine room. They can be operated manually using the switches shown in **Figure 7-2** or they can be operated remotely with the remote switches at the DC control center.

To manually engage a master disconnect switch, make sure the yellow switch is turned all the way to the left, and then push down on the top of the switch until it engages.

To manually disengage a master disconnect switch, turn the yellow switch all the way to the right. When the yellow switch is in this position, the remote switch at the DC control center will no longer operate. This is the LOCKED OFF position.

For remote operation, turn the yellow switch to the left. When the yellow switch is in this position, the remote switch at the DC control center will operate.

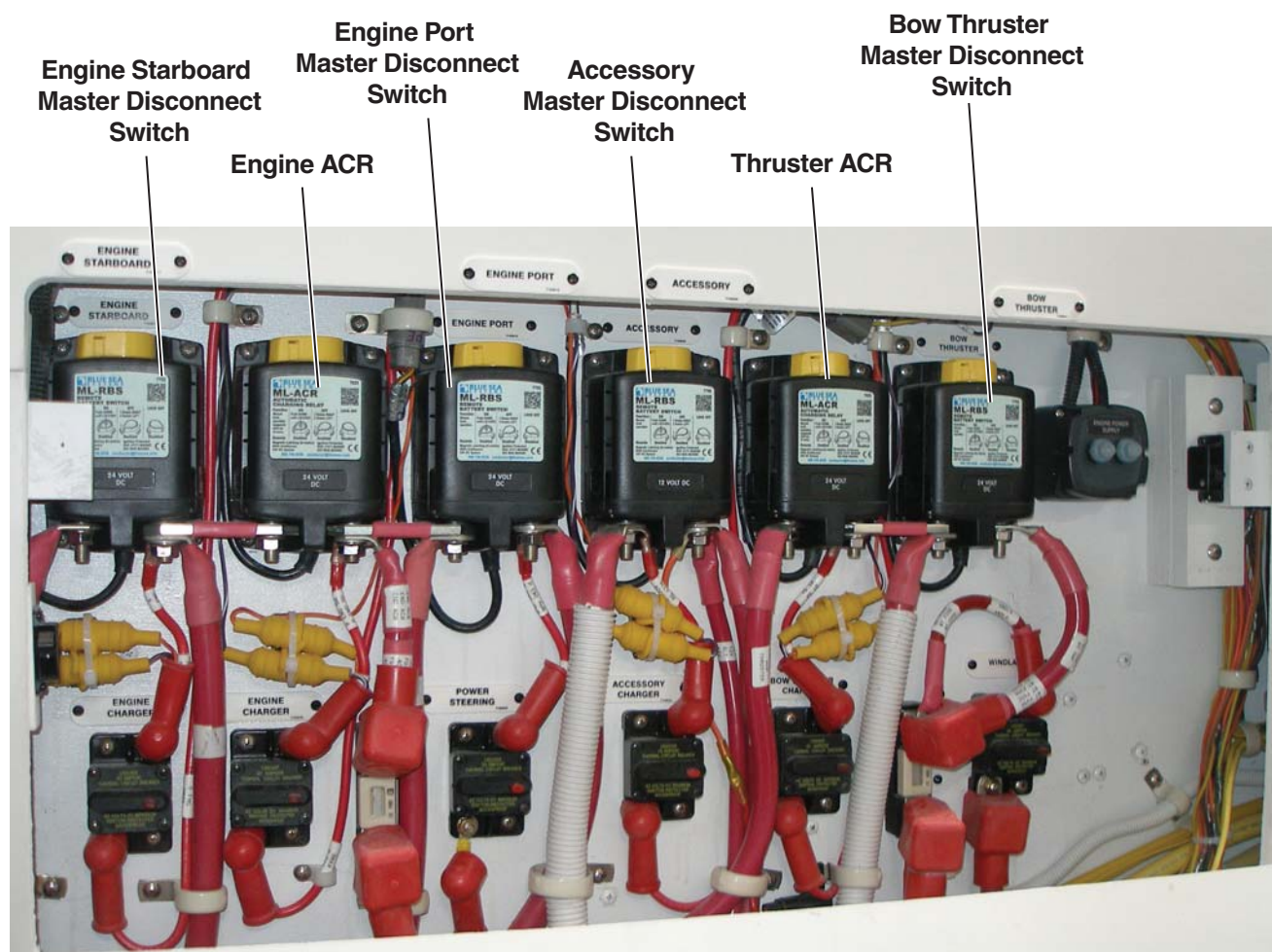


Figure 7-2 – Master Disconnect Switches and Engine Room Thermal Circuit Breakers

NOTE: Options and layout changes are per yacht manufactured.

Automatic Charging Relays

The C52 is equipped with Automatic Charging Relays (ACRs). ACRs allow both 24-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 24-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.

The ACR switches for the engine batteries and the thruster/windlass/swim lift batteries are automatic. They sense battery voltage and automatically engage alternator 24-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.

Fuse Holders

The fuse holders under the master disconnect switches supply operation current to the master disconnect switches.

- Fuse holders with purple and white wires are 10 amp fuses.
- Fuse holders with orange and red wires are 3 amp fuses.

Engine Batteries and Master Disconnect Switches

Each propulsion engine has two designated engine batteries. Each engine battery set is located outboard of the designated engine.

A master disconnect switch controls the electricity from each battery to the battery's designated engine. Turn ON the master disconnect switches to provide electricity to the engines.

Accessory Battery and Master Disconnect Switch

The accessory equipment is controlled by the DC control center. The DC control center is powered by a single 12-volt accessory battery.

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

Generator Battery 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 master disconnect switch for the generator is mounted on the generator. The master disconnect switch can be operated manually at the generator or with the remote switch at the DC control center.

Turn ON the GENERATOR master disconnect switch to provide electricity to the generator starter.

There are two fuse holders at the generator master disconnect switch.

ENGINE ROOM THERMAL CIRCUIT BREAKERS

The thermal circuit breakers in the engine room will trip in the event of overcurrent to the labeled components.

DC CONTROL CENTER

The DC control center manages the power supply to the DC components listed on the panel. The yacht contains a single DC control center. The center contains circuit breakers, additional controls and meters as described in the vendor literature.

Remote Switches

The remote switches allow remote operation of the master disconnect switches in the engine room.

NOTE: The yellow switch on top of the master disconnect switch in the engine room must be turned to the left-hand position (REMOTE) in order for the remote switch on the DC control center to operate.

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

CARVER

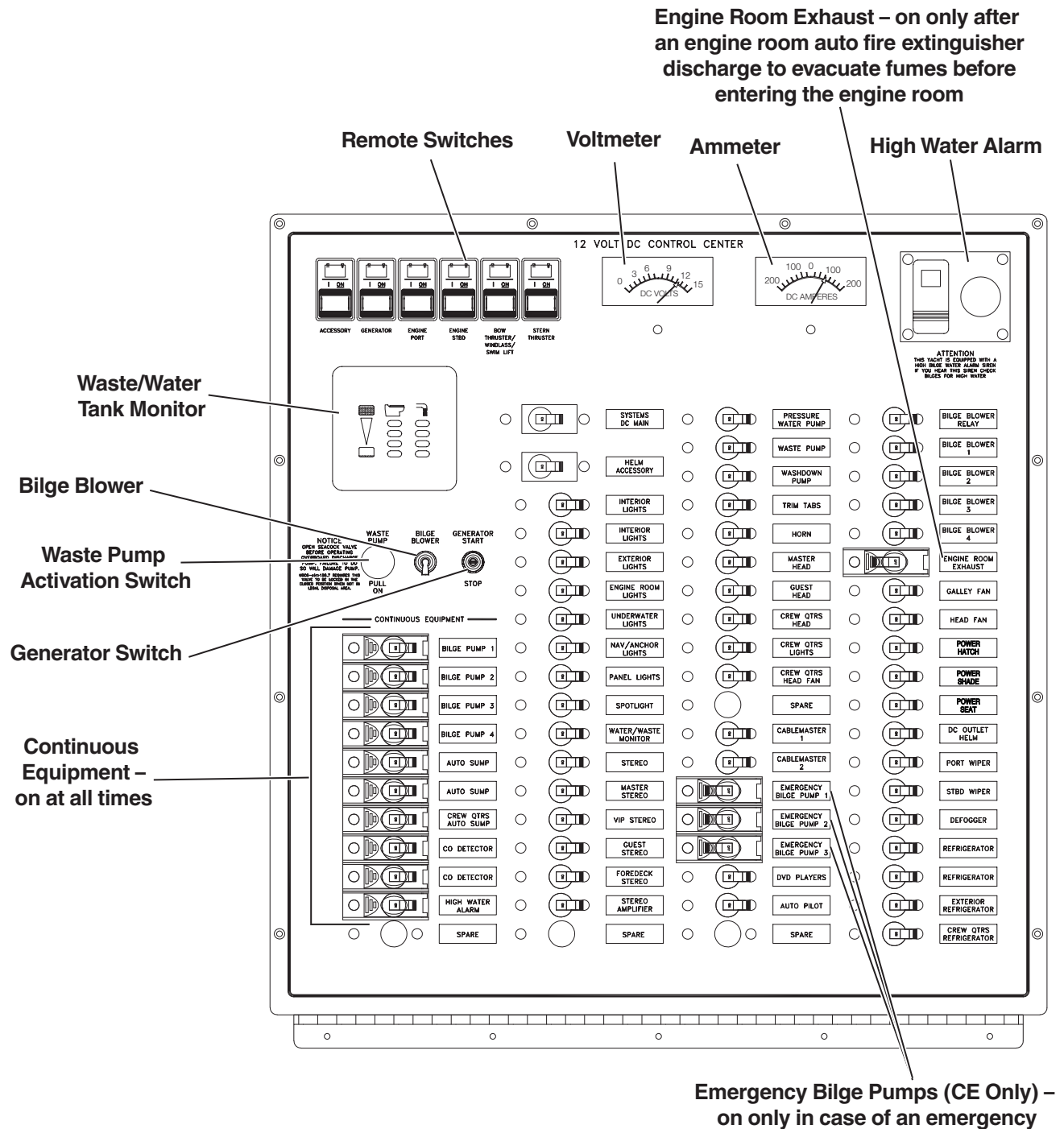


Figure 7-3 – DC Control Center

Auto Pilot (Optional)

The AUTO PILOT breaker controls the auto pilot system.

Auto Sump (3 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 control the electricity to the bilge blowers. Switch the bilge blower circuit breakers ON to supply power to the bilge blowers. Refer to the OEM information for details on operating the bilge blowers.

Bilge Blower Relay

The BILGE BLOWER RELAY breaker controls the relays for the blowers. The blower switch at the helm is connected to relays that operate the engine room blowers.

Bilge Pump 1 – Bilge Pump 4

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

Helm Accessory

The BRIDGE ACCESSORY breaker controls the accessory items at the helm. Switch the breaker ON to enable the helm accessories.

Bridge Refrigerator (Optional)

The BRIDGE REFRIGERATOR breaker controls the refrigerator in the bridge.

Cablemaster 1, Cablemaster 2 (Optional)

The CABLEMASTER breakers control the power dockside electrical cord retractors.

CO Detector (2 Breakers)

Several carbon monoxide (CO) detectors have been installed for personal safety. The CO detectors continuously check the air in the cabin for the presence of carbon monoxide. The CO DETECTOR 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.

For information on minimizing, detecting and controlling carbon monoxide accumulation, see “**Carbon Monoxide (CO)**” on page 45.

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. Correct the problem immediately.

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

Crew Qtrs Head

The electric CREW QTRS HEAD breaker controls the electric pump that flushes the toilet in the crew quarters head. Switch the head breaker ON to enable the pump. Pressing the wall-mounted switch, labeled “HEAD,” flushes the toilet. See “**Sanitation System**” on page 131 and the Original Equipment Manufacturer (OEM) information for details on operating the toilet.

Crew Qtrs Head Fan

The CREW QTRS HEAD FAN breaker controls the fan in the crew quarters head.

Crew Qtrs Lights

The CREW QTRS LIGHTS breaker controls the flow of electricity to the crew quarters lights.

Crew Qtrs Refrigerator

The CREW QTRS REFRIGERATOR breaker controls the refrigerator in the crew quarters.

DC Outlet Helm

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.

DC Outlet Lower Helm

The DC OUTLET LOWER HELM breaker controls the flow of electricity to the 12V DC outlet located at the lower helm. Switch the breaker ON to allow use of the DC outlet.

Defogger

The DEFOGGER breaker controls the switch for the helm windshield defogger(s).

DVD Players

The DVD PLAYER breaker controls the flow of electricity to the DVD players. Switch the breaker ON to allow use of the DVD players.

Emergency Bilge Pump 1 – Emergency Bilge Pump 3 (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.

Engine Room Exhaust

The ENGINE ROOM EXHAUST breaker controls the engine room exhaust blower. The breaker should normally be in the OFF position. The exhaust blower is used only to evacuate the engine room of fire extinguisher gas

before anyone enters engine room if the automatic fire extinguisher discharges.

Engine Room Lights

The ENGINE ROOM LIGHTS breaker controls the flow of electricity to the engine room lights.

Exterior Lights

The EXTERIOR LIGHTS breaker controls the flow of electricity to the exterior lights.

Exterior Refrigerator

The EXTERIOR REFRIGERATOR breaker controls the flow of electricity to the exterior refrigerator.

Foredeck Stereo (Optional)

The FOREDECK STEREO breaker controls the auto-switch located on the stereo in the foredeck. Switch the breaker ON to supply power to the system.

Galley Fan

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

Guest Head

The electric GUEST HEAD breaker controls the electric pump that flushes the toilet in the guest head. Switch the head breaker ON to enable the pump. Pressing the wall-mounted switch, labeled "HEAD," flushes the toilet. See **"Sanitation System" on page 131** and the Original Equipment Manufacturer (OEM) information for details on operating the toilet.

Guest Stereo (Optional)

The GUEST STEREO breaker controls the auto-switch located on the stereo in the guest stateroom. Switch the breaker ON to supply power to the system.

Head Fan

The HEAD FAN breaker controls the fans in the heads.

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, see **“BILGE PUMP OPERATION” on page 129**. The high water alarm breaker must be ON when the yacht is in the water.

Horn

The HORN breaker controls the flow of electricity to the switch that operates the horns.

Interior Lights (2 Breakers)

The INTERIOR LIGHTS breakers control the flow of electricity to the interior lights.

Lower Helm Accessory (Optional)

The LOWER HELM ACCESSORY breaker controls the accessory items at the lower helm. Switch the breaker ON to enable the lower helm accessories.

Master Head

The electric MASTER HEAD breaker controls the electric pump that flushes the toilet in the master head. Switch the head breaker ON to enable the pump. Pressing the wall-mounted switch, labeled “HEAD,” flushes the toilet. See **“Sanitation System” on page 131** and the Original Equipment Manufacturer (OEM) information for details on operating the toilet.

Master Stereo (Optional)

The MASTER STEREO breaker controls the auto-switch located on the stereo in the master stateroom. Switch the breaker ON to supply power to the system.

Navigation Lights

The NAVIGATION LIGHT breaker controls the navigation light switches.

Panel Lights

The PANEL LIGHTS breaker controls the flow of electricity to the panel lights.

Port Wiper

The PORT WIPER breaker controls the switches that operate the windshield wiper on the PORT side.

Power Hatch

The POWER HATCH breaker controls the flow of electricity to the power hatch.

Power Shade

The POWER SHADE breaker controls the flow of electricity to the power shade.

Power Seat

The POWER SEAT breaker controls the flow of electricity to the power seat.

Pressure Water Pump

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

Refrigerator

Each REFRIGERATOR breaker controls a refrigerator.

Spotlight

The SPOTLIGHT breaker controls the flow of electricity to the spotlight(s).

Starboard Wiper

The STARBOARD WIPER breaker controls the switches that operate the windshield wiper on the STARBOARD side.

Stereo

The STEREO breaker controls the auto-switch located on the stereo in the salon. Switch the breaker ON to supply power to the system.

Stereo Amplifier

The STEREO amplifier breaker controls the auto-switch located on the stereo amplifier in the salon. Switch the breaker ON to supply power to the system.

Stereo Memory

The STEREO MEMORY breaker controls the stereo systems. The breaker should always be ON to maintain the information programmed into the stereo's memory. The stereos will need to be reprogrammed if the stereo memory breaker is switched OFF.

Refer to the OEM information for details on programming the stereos.

Systems DC Main

The SYSTEMS DC MAIN breaker controls the other circuit breakers on the DC control center, except for those in the Continuous Equipment section of the panel.

Trim Tabs

The TRIM TABS breaker activates the trim tab controls at the helm. Trim tabs are used to improve the running angle of the yacht while underway. See **"Trim Tabs"** on **page 169** for details.

Underwater Lights (Optional)

The UNDERWATER LIGHTS breaker controls the flow of electricity to the underwater lights.

VIP Stereo (Optional)

The VIP STEREO breaker controls the auto-switch located on the stereo in the VIP stateroom. Switch the breaker ON to supply power to the system.

Washdown Pump (Optional)

The WASHDOWN PUMP breaker controls the optional raw water washdown pump. Switch the breaker ON to activate the washdown pump. Turn the washdown pump off by switching the breaker OFF when finished using the washdown. See **"Raw Water Washdowns (Optional)"** on **page 134** for details.

Waste Pump (Optional)

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

Water/Waste Monitor (Optional)

The WATER/WASTE MONITOR breaker controls the waste/water tank monitor.

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 pair is determined by activating the battery's dedicated voltmeter. For both engines, a single LCD display provides information on the engine temperature, oil pressure and battery voltage level. To activate each engine's voltmeter, turn the engine's ignition key one position to the right. See **"ENGINE/MULTI-FUNCTION DISPLAY MONITOR"** on **page 142** for more information.

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 135 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
- 3 or 6 (depending on region the yacht is shipped to) automatic/manual bilge pumps
- 1 automatic bilge pump

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 AC electrical system is supplied by either a shore power source or the onboard generator. See "Shore Power Connection" on page 102 and "Generator Power" on page 104.

- 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-installed or grounded (earthed) electrical appliances.
- On the European CE system, 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.
- Test the AC SHORE 1/SHORE 2 breakers on a monthly basis by pressing the test 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.

AC SYSTEM ORGANIZATION



DANGER

Never touch the AC electrical wires while the AC electrical system is connected to a power source. Each wire carries enough current to kill or cause serious injury.



Figure 7-4

North American Electrical System – Dual 240 Volt, 100 Amp, 60 Hz

This system is designed for use in the U.S. and Canada.

SHORE 1

The SHORE 1 (240 volt, 50 amp, 60 Hz) circuit on the AC electrical panel provides power to all the AC equipment except the air conditioning system.

SHORE 1 is split into LINE 1 and LINE 2:

- LINE 1 is configured as 120 volts.
- LINE 2 is configured as 120 volts.

Turn the SELECT LOAD switch to LINE 1 to see LINE 1 voltage displayed on the voltmeter. Turn the SELECT LOAD switch to LINE 2 to see LINE 2 voltage displayed on the voltmeter.

SYSTEM OPERATING INFORMATION

See the breakers on the AC panel for installed items controlled by the SHORE 1 circuit.

SHORE 2

The SHORE 2 (240 volt, 50 amp, 60 Hz) circuit, located on the AC electrical panel, provides power to all the components listed on the SHORE 2 column of circuit breakers on the AC control center.

See the breakers on the AC panel for installed items controlled by the SHORE 2 circuit.

NOTE: The SHORE 2 SOURCE SELECT switch allows for SHORE 1 and SHORE 2 to be combined at the distribution panel to facilitate connection at the dock of just one cord if there is only one source connection on the dock. The master cord is the SHORE 1 cord. When this cord is connected and the SHORE 2 SOURCE SELECT switch is in the CORD 1 position, the total vessel current supply is 240 volts, 50 amps. The normal position for the SHORE 2 SOURCE SELECT switch is CORD 2 when both cords are plugged into the dock source.

European Electrical System – Dual 230 Volt, 32 Amp, 50 Hz

This system is designed for use in CE countries.

SHORE 1

The SHORE 1 circuit on the AC electrical panel provides power to all the AC equipment except the air conditioning system. SHORE 1 is configured as 230 volts, 50 Hz.

See the breakers on the AC control center for list of installed items controlled by the SHORE 1 circuit.

SHORE 2

The SHORE 2 circuit, located on the AC electrical panel, provides power to all the 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 the breakers on the AC control center for a list of installed items controlled by the SHORE 2 circuit.

NOTE: The SHORE 2 SOURCE SELECT switch allows for SHORE 1 and SHORE 2 to be combined at the distribution panel to facilitate connection at the dock of just one cord if there is only one source connection on the dock. The master cord is the SHORE 1 cord. When this cord is connected and the SHORE 2 SOURCE SELECT switch is in the CORD 1 position, the total vessel current supply is 240 volts, 50 amps. The normal position for the SHORE 2 SOURCE SELECT switch is CORD 2 when both cords are plugged into the dock source.

SHORE 2 Source Select Switch

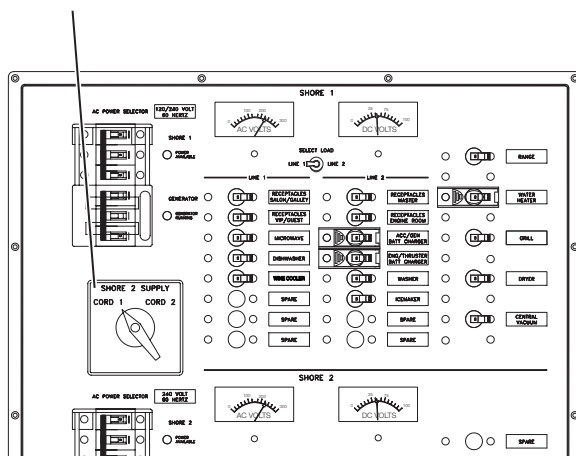


Figure 7-5

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.

SYSTEM OPERATING INFORMATION

NOTICE

Always turn off the SHORE 1 and SHORE 2 circuit breaker groups before connecting to the shore power. This prevents arcing 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.

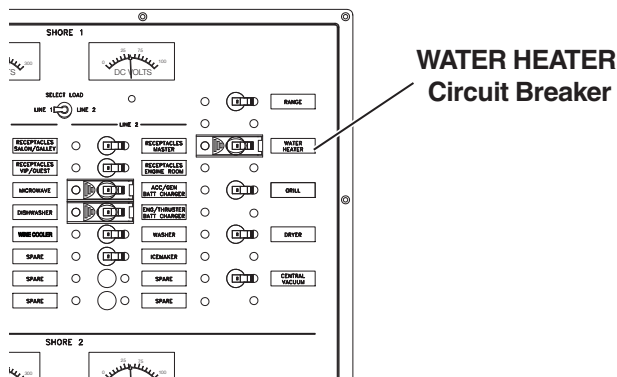


Figure 7-6

- 2] Slide the AC power selector lockout plate(s) to the middle position to switch OFF the SHORE 1 and/or SHORE 2 circuit breaker group(s).

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 7-4.

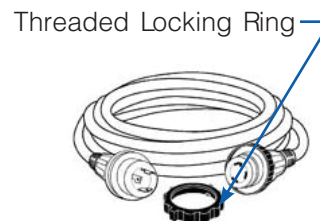


Figure 7-7 – Shore Power Cord

- 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.

SYSTEM OPERATING INFORMATION

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

NOTE: Due to the surge guard protector safety feature, there will be a 2.5 minute delay in power supplied to the yacht after the shore power cord has been connected to active shore service and the yacht.

- 8] Use the AC power selector lockout plate(s) to switch ON the SHORE 1 and/or SHORE 2 circuit breaker groups.
- 9] Make sure the GREEN indicator lights are lit on the AC control center. The green indicator lights indicate that power is available.

- Monitor the voltmeter and ammeter while connected to shore power.

- 10] On the European CE system, check to make sure that the reverse polarity indicator is not lit. If the indicator light illuminates, switch the SHORE 1 and/or SHORE 2 circuit breaker groups OFF.

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. See MASTER DISCONNECT SWITCHES on page 90.

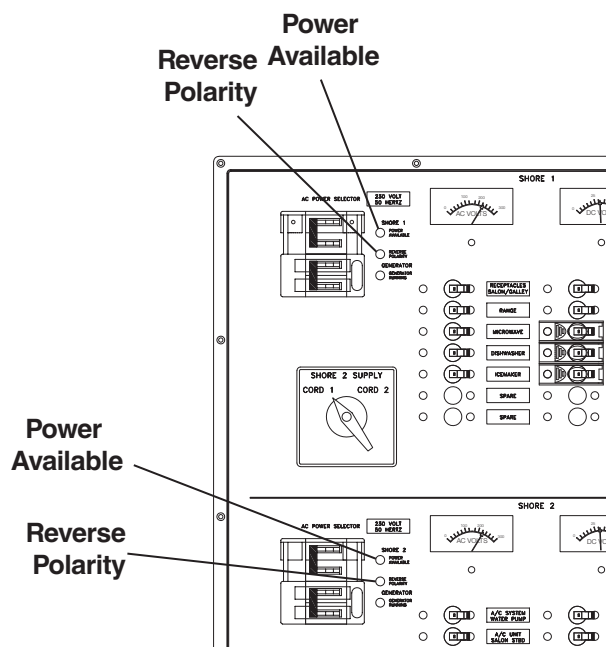


Figure 7-8

If the green indicator light is NOT lit:

- Recheck all connections and check circuit breakers on the AC control center.

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.

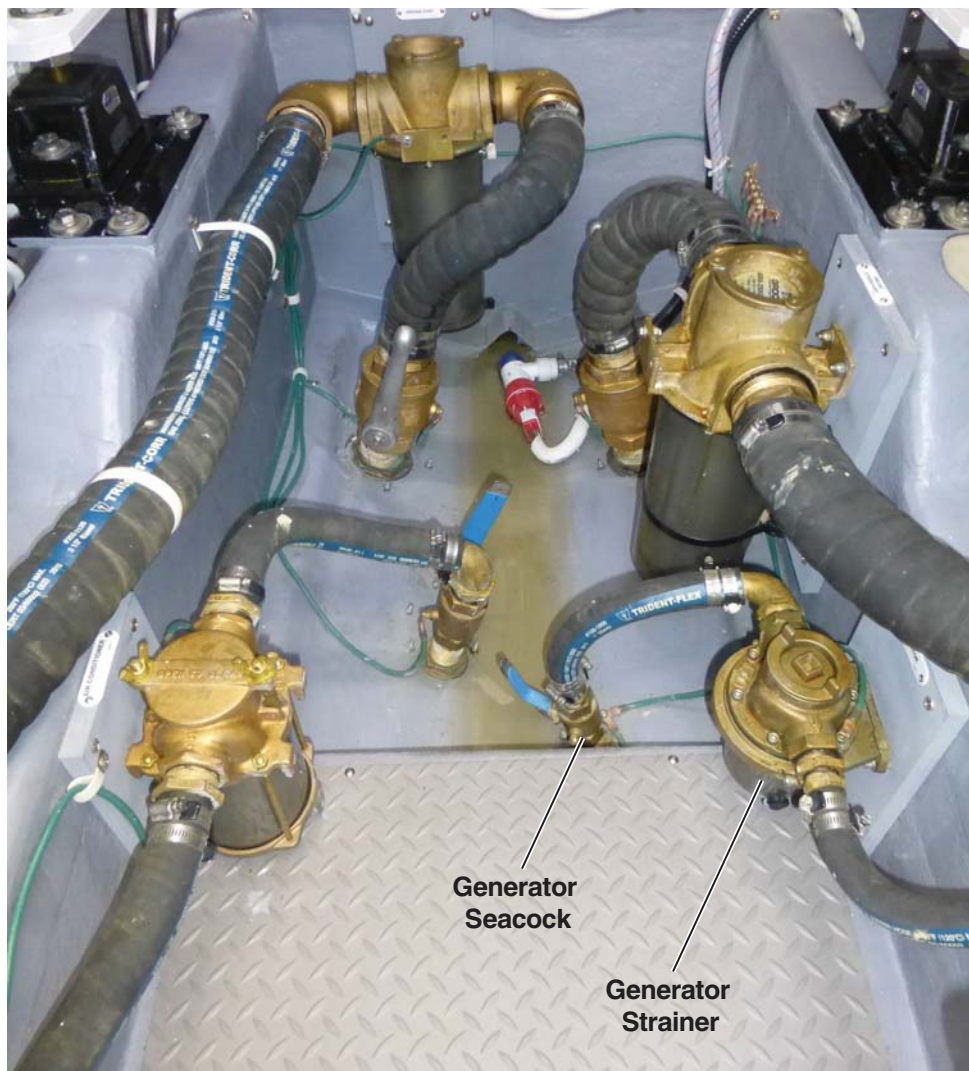


Figure 7-9

- 1] Turn the generator OFF.
- 2] Use the AC power selector to shut off the GENERATOR circuit breaker group located on the AC control center.
- 3] Close the generator cooling system seacock.
- 4] Remove and clean the strainer.

SYSTEM OPERATING INFORMATION

NOTE: The strainer 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, and then check the strainer for correct installation.

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 45 for more information on engine exhaust and carbon monoxide.

- 1] Open the generator cooling system's seacock.
- 2] Switch BILGE BLOWER 1 – BILGE BLOWER 4 circuit breakers and the BILGE BLOWER RELAY breaker to ON, located on the DC control center.



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 ON the BILGE BLOWER switch on the DC control center.

Bilge Blower Switch

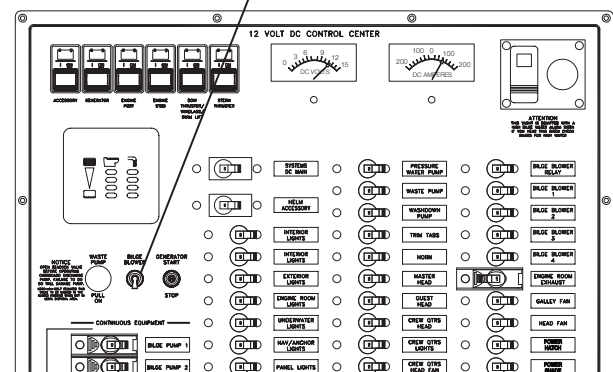


Figure 7-10

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.

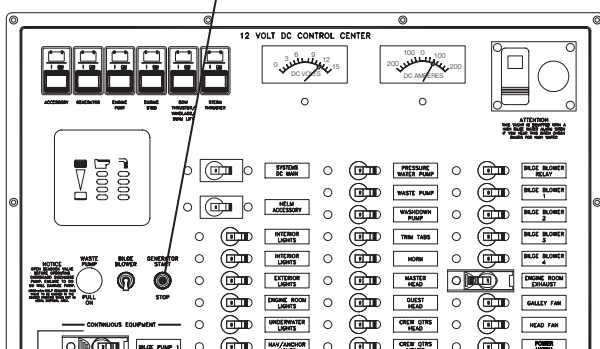
Generator Start/Stop Switch

Figure 7-11

- 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.

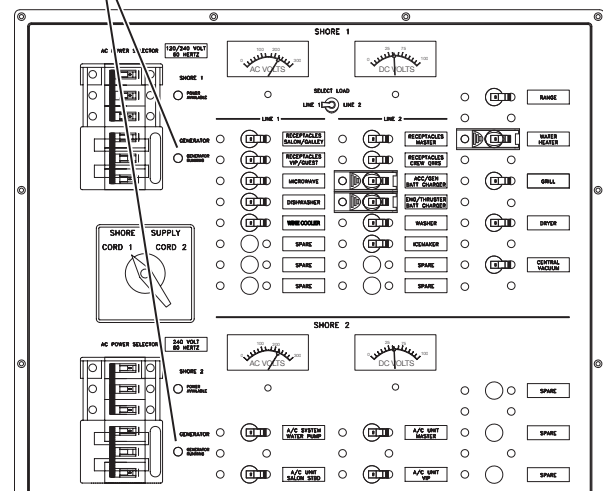
**GENERATOR
Circuit
Breaker**

Figure 7-12

- 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 102.

SYSTEM OPERATING INFORMATION

CARVER

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.

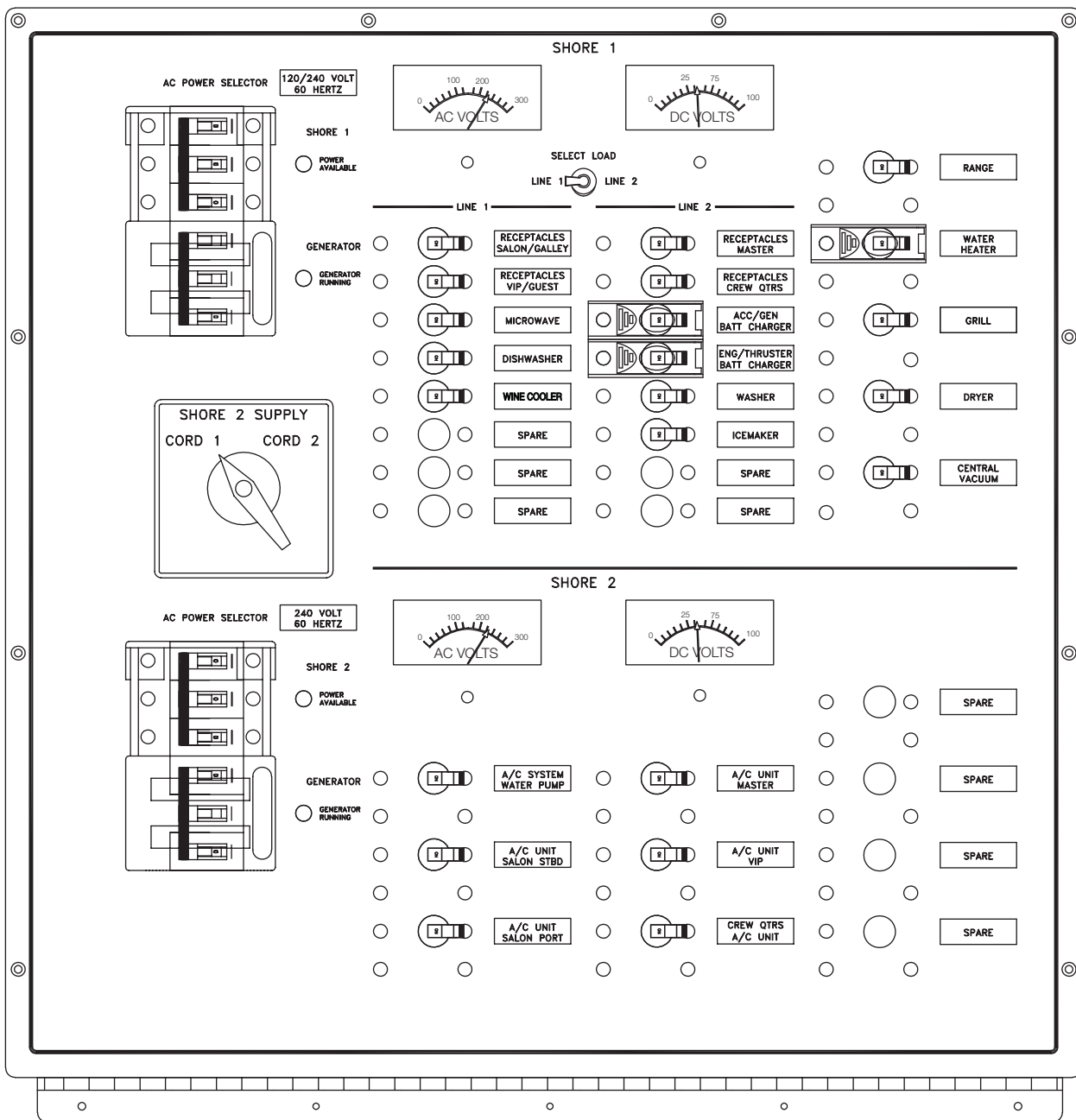


Figure 7-13 – North American AC Control Center

SYSTEM OPERATING INFORMATION

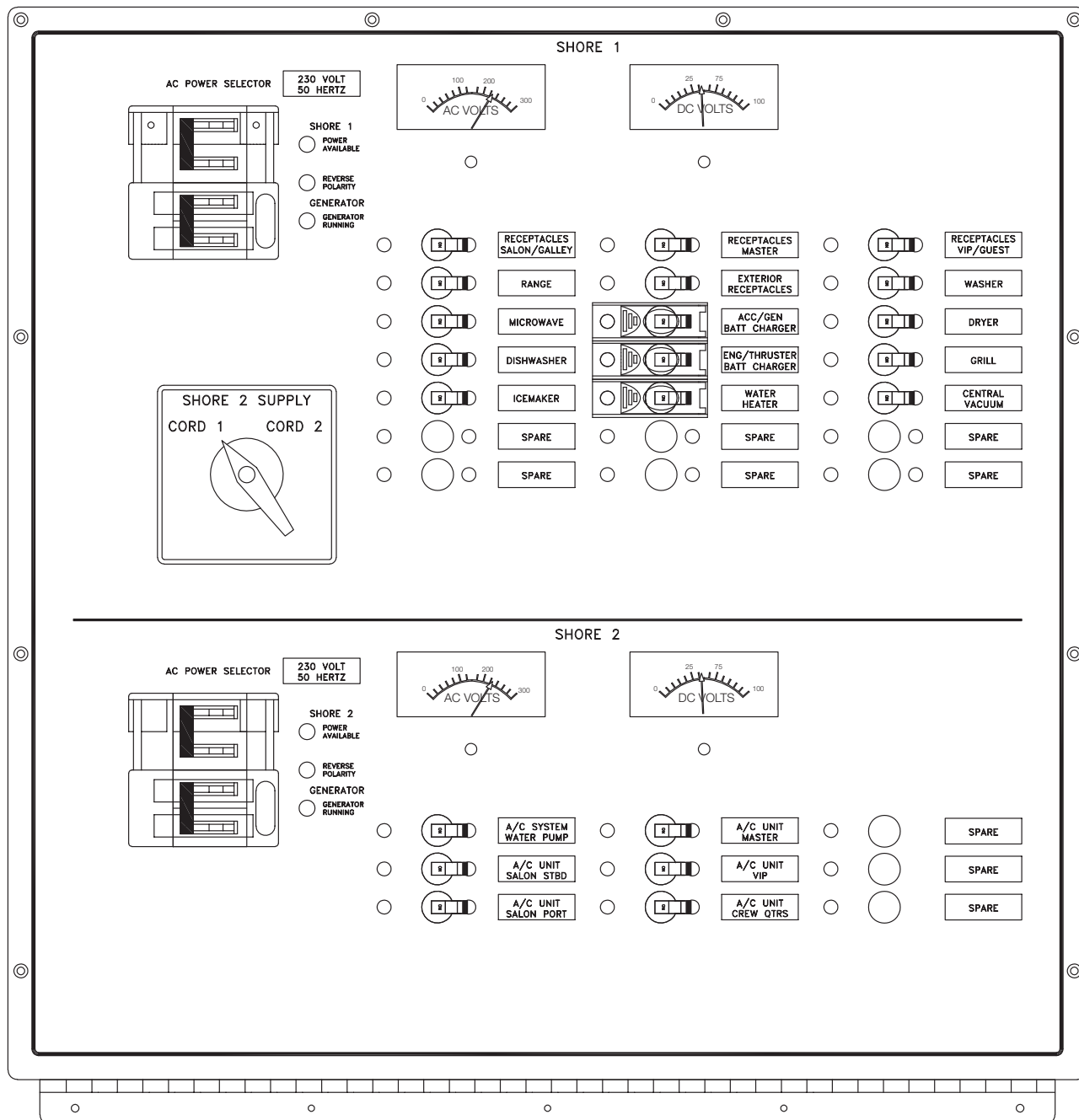


Figure 7-14 – European AC Control Center

AC Power Selector

AC Power Selector

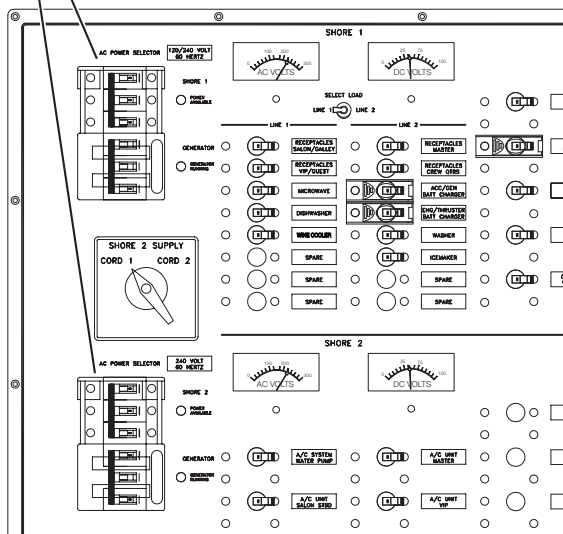


Figure 7-15

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.

North American/Pacific Rim/European AC Control Center

SHORE 1/SHORE 2: Switch the SHORE 1/SHORE 2 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.

Indicator Lights

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.

Reverse Polarity Red Indicator Light (European CE Only)

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.

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 SHORE 1/SHORE 2 breaker groups 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.

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.

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 SHORE 1/SHORE 2 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 SHORE 1/SHORE 2 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 117** 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.

Shore 1 Circuit Breakers

Acc/Gen Battery Charger

The ACC/GEN BATTERY CHARGER breaker controls the flow of electricity to the battery charger that maintains the voltage levels in the accessory batteries and generator battery. Switch the breaker ON to supply power to the battery charger. Refer to the OEM information for details on operating the battery charger.



**Engine Battery
Banks and
Thruster Battery
Charger**

**Accessory Battery
Bank and Generator
Battery Charger**

Figure 7-16

Central Vacuum (Optional)

The CENTRAL VACUUM breaker controls the flow of electricity to the central vacuum system. Switch the breaker ON to supply power to the central vacuum system. Refer to the OEM information for details on operating the central vacuum system.

Dishwasher (Optional)

The DISHWASHER breaker controls the flow of electricity to the dishwasher. Switch the breaker ON to supply power to the dishwasher. Refer to the OEM information for details on operating the dishwasher.

Dryer (Optional)

The DRYER breaker controls the flow of electricity to the dryer. Switch the breaker ON to supply power to the dryer. Refer to the OEM information for details on operating the dryer.

Eng/Thruster Battery Charger

The ENG/THRUSTER BATTERY CHARGER breaker controls the flow of electricity to the battery charger that maintains the voltage levels in the battery supplying power to both engine batteries and the bow thruster battery. Switch the breaker ON to supply power to the battery charger. Refer to the OEM information for details on operating the battery charger. See **Figure 7-16**.

Exterior Receptacles (European 230V Only)

The EXTERIOR RECEPTACLES breaker controls the flow of electricity to the exterior receptacles. Switch the breaker ON to supply power to the receptacles. The receptacles are used the same as in-home outlets.

NOTE: If the EXTERIOR RECEPTACLES circuit breaker is ON but power is not available to the receptacles in this group, the circuit's GFCI breaker may have tripped. See "GROUND FAULT CIRCUIT INTERRUPTERS" on page 116 for more information.

Grill (Optional)

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

Icemaker (Optional)

The ICEMAKER breaker controls the flow of electricity to the optional icemaker. Switch the breaker ON to supply power to the icemaker. Refer to the OEM information for details on operating the icemaker or refrigerator.

SYSTEM OPERATING INFORMATION

Microwave

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

Receptacles Crew Qtrs

The RECEPTACLES CREW QTRS breaker controls the flow of electricity to the receptacles in the crew quarters. Switch the breaker ON to supply power to the receptacles. The receptacles are used the same as in-home outlets.

NOTE: If the RECEPTACLES CREW QTRS circuit breaker is ON but power is not available to the receptacles in this group, the circuit's GFCI breaker may have tripped. See "GROUND FAULT CIRCUIT INTERRUPTERS" on page 116 for more information.

Receptacles Master

The RECEPTACLES MASTER breaker controls the flow of electricity to the receptacles in the master stateroom and master head. Switch the breaker ON to supply power to the receptacles. The receptacles are used the same as in-home outlets.

NOTE: If the RECEPTACLES MASTER circuit breaker is ON but power is not available to the receptacles in this group, the circuit's GFCI breaker may have tripped. See "GROUND FAULT CIRCUIT INTERRUPTERS" on page 116 for more information.

Receptacles Salon/Galley

The RECEPTACLES SALON/GALLEY breaker controls the flow of electricity to the receptacles in the salon and galley. Switch the breaker ON to supply power to the receptacles. The receptacles are used the same as in-home outlets.

NOTE: If the RECEPTACLES SALON/GALLEY circuit breaker is ON but power is not available to the receptacles in this group, the circuit's GFCI breaker may have tripped. See "GROUND FAULT CIRCUIT INTERRUPTERS" on page 116 for more information.

Receptacles VIP/Guest

The RECEPTACLES VIP/GUEST breaker controls the flow of electricity to the receptacles in the VIP stateroom, guest stateroom, and guest head. Switch the breaker ON to supply power to the receptacles. The receptacles are used the same as in-home outlets.

NOTE: If the RECEPTACLES VIP/GUEST circuit breaker is ON but power is not available to the receptacles in this group, the circuit's GFCI breaker may have tripped. See "GROUND FAULT CIRCUIT INTERRUPTERS" on page 116 for more information.

Washer (Optional)

The WASHER breaker controls the flow of electricity to the washer. Switch ON the breaker to supply power to the washer. Refer to the OEM information for details on operating the washer.

Water Heater

The WATER HEATER breaker controls the power to the water heater located in the engine room. Switch the breaker ON to supply power to the water heater. Refer to the OEM information for details on operating the water heater. Never supply power to the water heater when the water heater is empty.

Wine Cooler

The WINE COOLER breaker controls the flow of electricity to the wine cooler. Switch ON the breaker to supply power to the wine cooler. Refer to the OEM information for details on operating the wine cooler.

Shore 2 Circuit Breakers

A/C System Water Pump

NOTICE

Never switch the A/C SYSTEM WATER PUMP breaker ON until after the seacock supplying the air conditioning system with seawater has been opened. See Air Conditioning System (Optional) on page 120 for more information.

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

A/C Unit Master

NOTICE

Never switch the A/C UNIT MASTER breaker ON until after the seacock supplying the air conditioning system with seawater has been opened. See Air Conditioning System (Optional) on page 120 for more information.

The A/C UNIT MASTER breaker controls the flow of electricity to the air conditioning unit that cools the master stateroom. To supply power to the unit, switch the A/C SYSTEM WATER PUMP breaker ON before switching the A/C UNIT MASTER breaker ON.

A/C Unit VIP

NOTICE

Never switch the A/C UNIT VIP breaker ON until after the seacock supplying the air conditioning system with seawater has been opened. See Air Conditioning System (Optional) on page 120 for more information.

The A/C UNIT VIP breaker controls the flow of electricity to the air conditioning unit that cools the VIP stateroom. To supply power to the unit, switch the A/C SYSTEM WATER PUMP breaker ON before switching the A/C UNIT VIP breaker ON.

A/C Unit Crew Qtrs

NOTICE

Never switch the A/C UNIT CREW QTRS breaker ON until after the seacock supplying the air conditioning system with seawater has been opened. See Air Conditioning System (Optional) on page 120 for more information.

The A/C UNIT CREW QTRS breaker controls the flow of electricity to the air conditioning unit that cools the crew quarters. To supply power to the unit, switch the A/C SYSTEM WATER PUMP breaker ON before switching the A/C UNIT CREW QTRS breaker ON.

A/C Unit Bridge

NOTICE

Never switch the A/C UNIT BRIDGE breaker ON until after the seacock supplying the air conditioning system with seawater has been opened. See Air Conditioning System (Optional) on page 120 for more information.

SYSTEM OPERATING INFORMATION

The A/C UNIT BRIDGE breaker controls the flow of electricity to the air conditioning unit that cools the bridge. To supply power to the unit, switch the A/C SYSTEM WATER PUMP breaker ON before switching the A/C UNIT BRIDGE breaker ON.

Bridge A/C Water Pump

NOTICE

*Never switch the BRIDGE A/C WATER PUMP breaker ON until after the seacock supplying the air conditioning system with seawater has been opened. See **Air Conditioning System (Optional)** on page 120 for more information.*

The BRIDGE A/C WATER PUMP breaker controls the flow of electricity to the water pump that supplies the bridge air conditioning system with seawater. Switch the breaker ON to supply power to the water pump.

AC Unit Salon Port

NOTICE

*Never switch the A/C UNIT SALON PORT breaker ON until after the seacock supplying the air conditioning system with seawater has been opened. See **Air Conditioning System (Optional)** on page 120 for more information.*

The AC UNIT SALON PORT breaker controls the flow of electricity to the air conditioning unit that cools the salon, port. To supply power to the unit, switch the A/C SYSTEM WATER PUMP breaker ON before switching the A/C UNIT SALON PORT breaker ON.

AC Unit Salon STBD

NOTICE

*Never switch the A/C UNIT SALON STBD breaker ON until after the seacock supplying the air conditioning system with seawater has been opened. See **Air Conditioning System (Optional)** on page 120 for more information.*

The AC UNIT SALON STBD breaker controls the flow of electricity to the air conditioning unit that cools the salon, starboard. To supply power to the unit, switch the A/C SYSTEM WATER PUMP breaker ON before switching the A/C UNIT SALON STBD breaker ON.

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.

See **Figure 7-17** for the shore power receptacles.



Figure 7-17

GROUND FAULT CIRCUIT INTERRUPTERS

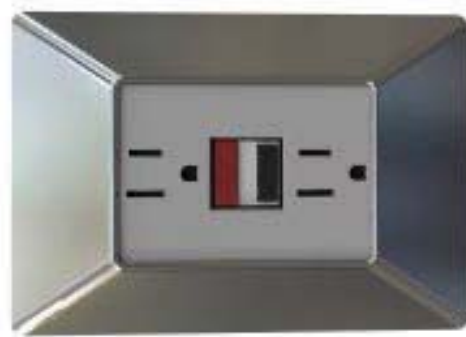


Figure 7-18

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

See **"Design Specifications"** on page 5 for 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.

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.

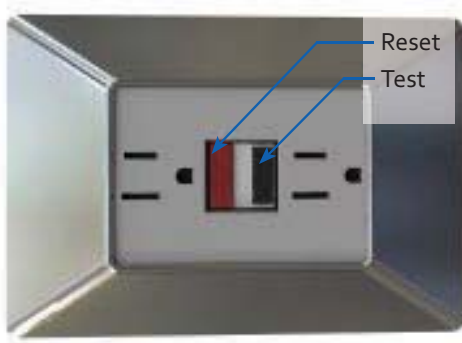


Figure 7-19

- 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 50 amps (North American) or 32 amps (European CE).

The SHORE 1/SHORE 2 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 108 for panel location.

Table 7-6 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 7-6 – Electrical Load per Device

As detailed in **Table 7-6**, 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 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 179 for recommended inspection intervals.

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

SYSTEM OPERATING INFORMATION

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 7-7

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

The air conditioning system consists of several air conditioning units placed throughout the yacht with ventilation supplied to each room. See **“Design Specifications” on page 5** for air conditioner locations and BTU capacities.

**Air
Conditioning
Unit
(8,000 BTU Unit)**



Figure 7-20

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

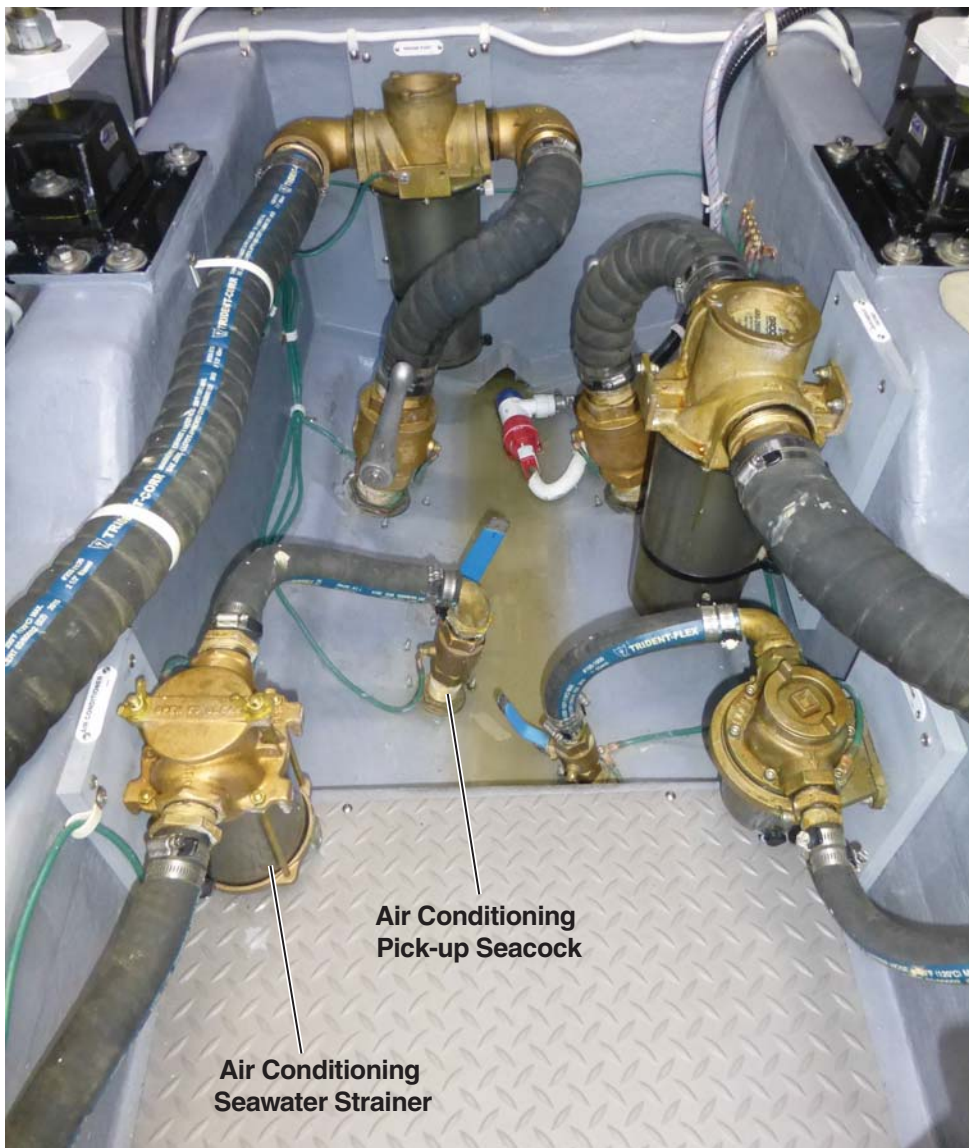


Figure 7-21 – Air Conditioning System

- 1] Close the air conditioning water pick-up seacock.
- 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 102** and/or **“Generator Power” on page 104** 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 air conditioning 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 under the swim platform overhang, port transom.
- 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.

Freshwater System

The freshwater system contains freshwater tanks that supply water to the sinks, showers and heads. See **“Design Specifications” on page 5** 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.

SYSTEM OPERATING INFORMATION

- 3] Locate the hot water tank in the engine room.
- a] Open the hot and cold water shut-off valves on the hot water tank.

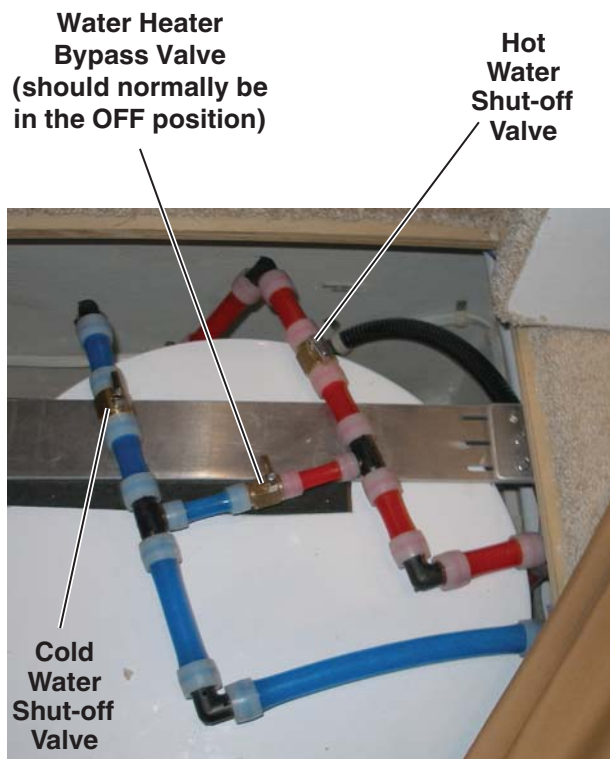


Figure 7-22

- b] Close the pressure relief valve.



Figure 7-23

- 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 122.**

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 122.** This process automatically fills the water heater.
- 2] Supply AC power to the yacht. See **“AC POWER SOURCES” on page 102** 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 122** and **PRESSURIZING AND PRIMING THE WATER SYSTEM on page 122.***

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. See **“Gray Water System” on page 131** for more information on drainage.

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 each head.

Sinks

Sinks are installed in the galley, bridge and each 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

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.

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.

FRESHWATER SYSTEM MAINTENANCE

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 7-8**.
- 4] Drain chlorine solution from entire system.
- 5] Flush the entire system thoroughly with potable water.
- 6] Fill the system with potable water.

Table 7-8 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 7-8 – Chlorine Concentrations

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.



**Pressure Water Pump
and In-Line Filter**

Figure 7-25

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.

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 122.

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:

- 3 automatic and manual electric submersible bilge pumps
- 1 automatic only bilge pump

CE/International:

- 3 automatic and manual electric submersible bilge pumps
- 1 automatic only bilge pump
- 3 manually controlled only, 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 5 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 190 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.

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, BILGE PUMP 2, and BILGE PUMP 3 circuit breakers.
- 2] Press the BILGE PUMP 1, BILGE PUMP 2 and BILGE PUMP 3 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.

SERVICING THE BILGE PUMP

See Original Equipment Manufacturer (OEM) for servicing the bilge pump.

OWNER/OPERATOR RESPONSIBILITIES

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.

BILGE SYSTEM MAINTENANCE

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 128 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.

Gray Water System

The gray water system is designed to have the sinks and shower drain into the gray water sump that 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 5 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 132.

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 5 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 132.



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 132.

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 each 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

- 1] Open the overboard discharge seacock.

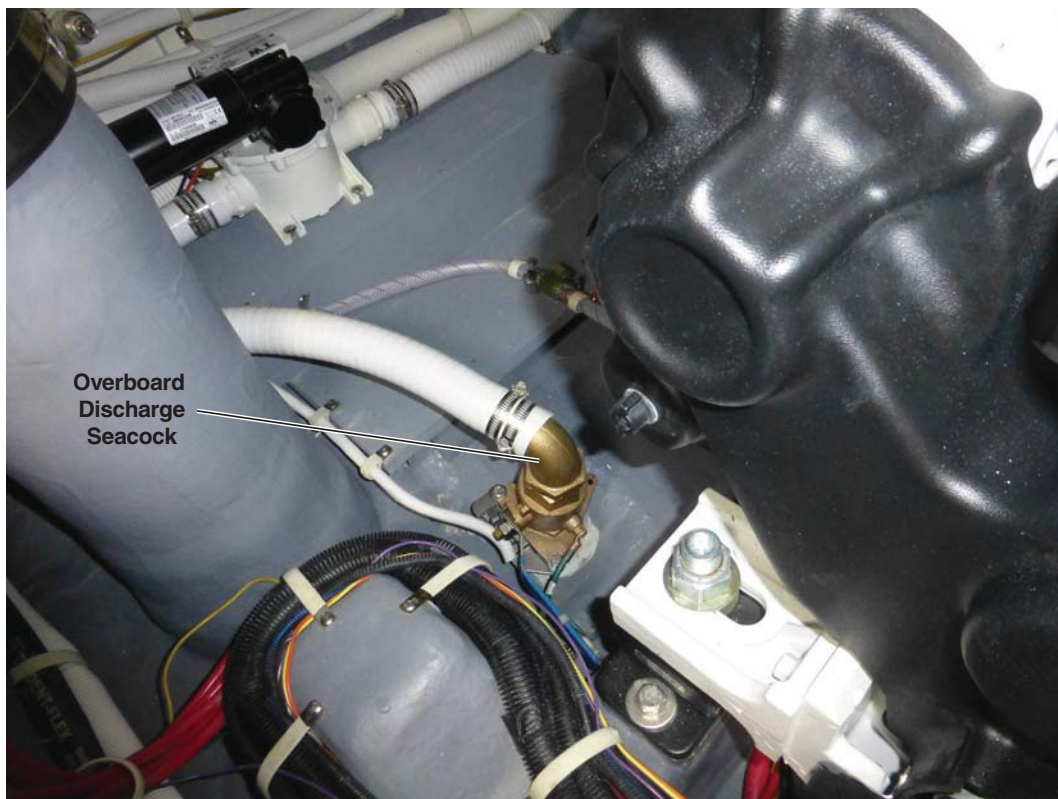


Figure 7-29

- 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.

SANITATION SYSTEM MAINTENANCE

The sanitation system requires ongoing maintenance to avoid problems.

- Always use sanitation system deodorizer. Any RV deodorizer is acceptable.
- The sanitation system on the yacht is not like the toilet and sewer in a home. Never flush items down the toilet that the toilet was not designed to accommodate. Refer to the Original Equipment Manufacturer information for details on maintaining the toilet.
- Empty the waste tank often. Make sure the tank is empty during periods of time when the yacht is not in use.
- Flush the waste tank with freshwater each time the tank is emptied. Flushing with freshwater helps remove remaining waste from the tank.

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.



Figure 7-30



Figure 7-31

- 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.

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.

Propulsion System

WARNING

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

This section covers the standard factory-installed diesel engines and the optional factory-installed diesel engines. It covers the engines and the engines' attributing components in the engine room and the components at the helm.

DIESEL EXHAUST SYSTEM

The exhaust system for each engine consists of various exhaust system components used to vent the exhaust overboard. Carbon monoxide may escape and endanger everyone onboard if the exhaust system contains leaks or obstructions, or if any other problem that exists prevents the system from venting exhaust properly. See **"Carbon Monoxide (CO)"** on page 45 for more information.

Check the exhaust system regularly for proper operation. Change in engine noise could indicate an exhaust system problem and should immediately be investigated.

DIESEL 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.

NOTICE

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

Both propulsion engines are plumbed to the allocated fuel tank located on the same side as the engine. The diesel propulsion system uses fuel supply lines and fuel return lines to fuel the engines. The supply lines feed fuel to the engine. The return lines transfer fuel not burned by the engine back to the fuel tank. The generator draws fuel from the port fuel tank only.

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.

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 7-32

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.

Engine Fuel Filter/Separator



Figure 7-33



Figure 7-34

Fuel Tank Equalization Valves

The yacht is equipped with two fuel tank equalization valves, one in each tank, located at the bottom of the tank. When the valves are open, fuel is allowed to flow between the tanks, equalizing the amount of fuel in each tank.

The only time the fuel tank equalization valves are in the OPEN position is when transferring fuel. Otherwise, the valves must be in the CLOSED position.

**Fuel Tank
Equalization Valves**



Figure 7-35

DIESEL 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.

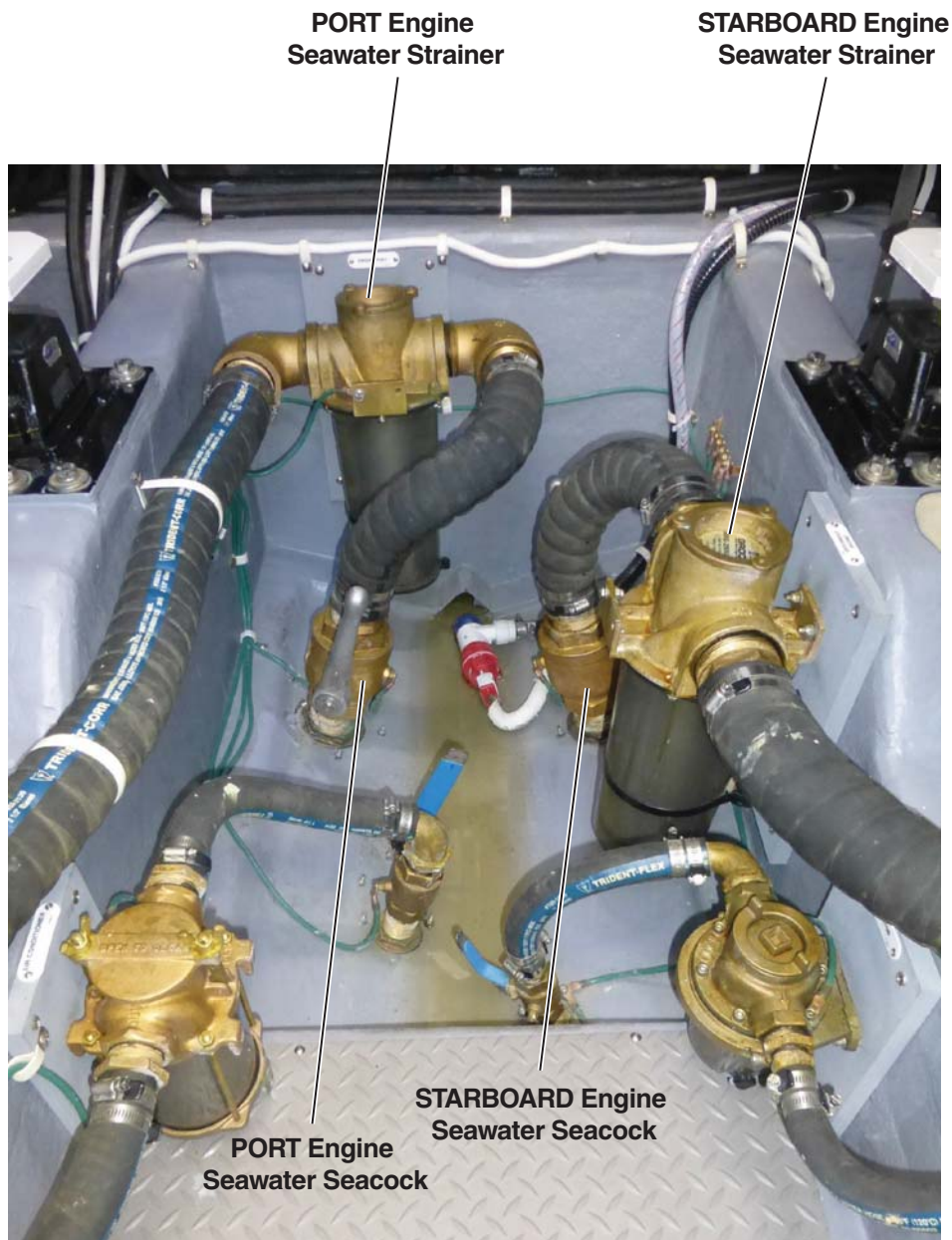


Figure 7-36

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.

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.

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, and then open and clean the strainers. See **“DIESEL COOLING SYSTEM”** on page 140 for the exact location of 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 operator to be engaged with the engine activity and to control the yacht's speed, engine RPMs, and direction.

ENGINE/MULTI-FUNCTION DISPLAY MONITOR



Figure 7-37

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

A remote keypad provides full control of the engine/multi-function display monitor. Refer to the OEM manuals for features and operation.

SWITCHES

TYPE	LOCATION	TYPE	LOCATION	TYPE	LOCATION
 Overhead Light	Helm and Patio	 Bilge Pump 1	Helm	 Horn	Helm
 Close/Open	Helm	 Bilge Pump 2	Helm	 Courtesy Light	Helm
 Anchor Up/Down	Helm	 Bilge Pump 3	Helm	 Engine Room Lights	Patio
 Winds On/Off	Helm	 Navigation Lights	Helm	 Sun Shade In/Out	Patio
 Panel Lights	Helm	 Blower	Helm	 Under Water	Patio

SPOTLIGHT CONTROL



Figure 7-38

The spotlight control function controls the direction of the spotlight movement. The spotlight 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

Full Joystick Control is a docking control system that incorporates full directional control of the vessel to include FORE, AFT, PORT, STARBOARD, rotational, sideways and angular. See the controls section of the engine manual for instructions on the use of the Joystick Control, as this system is a component of the Cummins Engine control system.



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

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.

Fire Suppression System Monitor



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.

Propeller Shaft Seals

WARNING

Do not enter 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.

The propeller shaft extends through a shaft seal, which is a watertight fitting. Check the shaft seal every month for leakage. Contact your dealer if signs of leakage are found.

PROPELLER SHAFT STRUTS

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 removed from the water. Replace the bearings as recommended.

INBOARD PROPELLER INSTALLATION

- 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 burrs) 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.

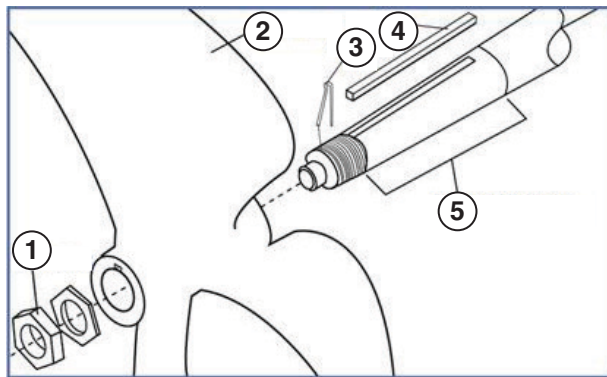


Figure 7-47

- | | |
|----------------|------------------------------|
| 1 – Wide Nut | 4 – Key |
| 2 – Propeller | 5 – Tapered Section of Shaft |
| 3 – Cotter Pin | |

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.

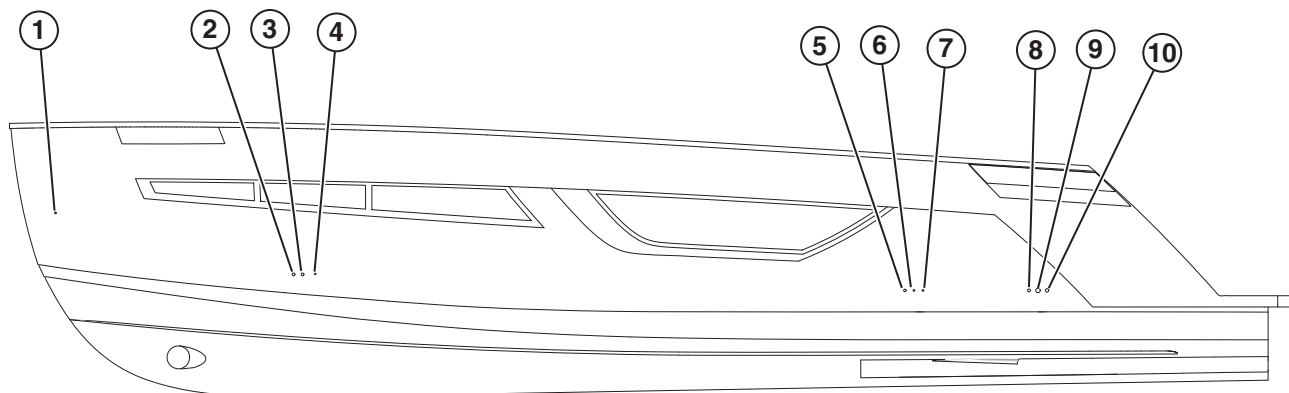


Figure 7-48 – Port Thru-hull Valves

- | | |
|---------------------------------------|--|
| 1 – Rope Locker Drain | 6 – Master Air Conditioning (On Models with Air Conditioning Option) |
| 2 – Forward Bilge Pump (On CE Models) | 7 – Galley Air Conditioning (On Models with Air Conditioning Option) |
| 3 – VIP Head Sink | 8 – Galley Sink (On Models Without Gray Water Tank Option) |
| 4 – Water Heater Relief Valve | 9 – Threshold Drain |
| 5 – Mid Bilge Pump | 10 – Bridge, Cockpit and Hatch |

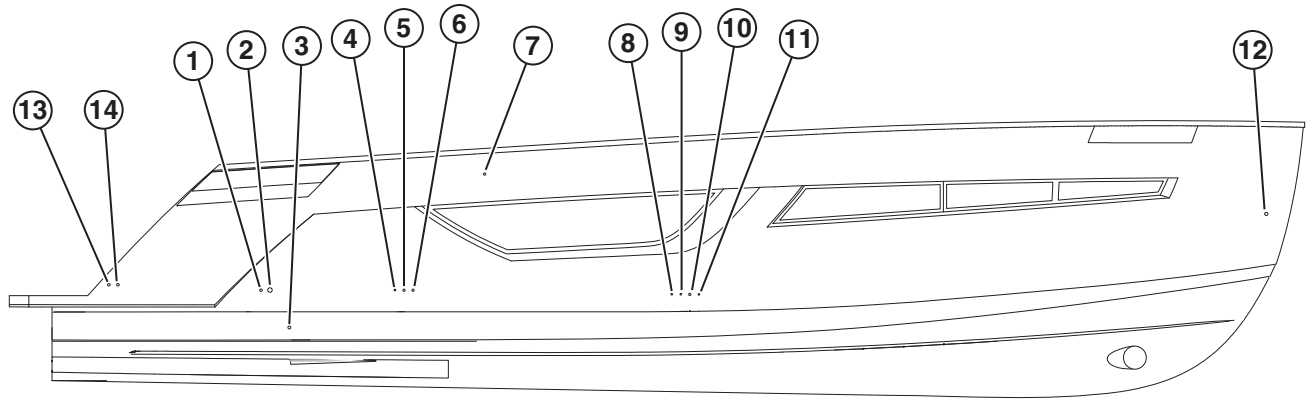


Figure 7-49 – Starboard Thru-hull Valves

- | | |
|---|---|
| 1 – Bridge, Cockpit and Hatch | 8 – Clothes Washer (On Models with Washer Option) |
| 2 – Threshold Drain | 9 – Waste Tank Vent |
| 3 – Generator Bypass | 10 – Forward Bilge Pump |
| 4 – Salon Air Conditioning (On Models with Air Conditioning Option) | 11 – Shower Sump Discharge |
| 5 – Forward Engine Room Bilge | 12 – Rope Locker Drain |
| 6 – Mid Bilge Pump (CE Models Only) | 13 – Aft Bilge Pump |
| 7 – Water Tank Vent | 14 – Starboard Storage Drain |

SYSTEM OPERATING INFORMATION

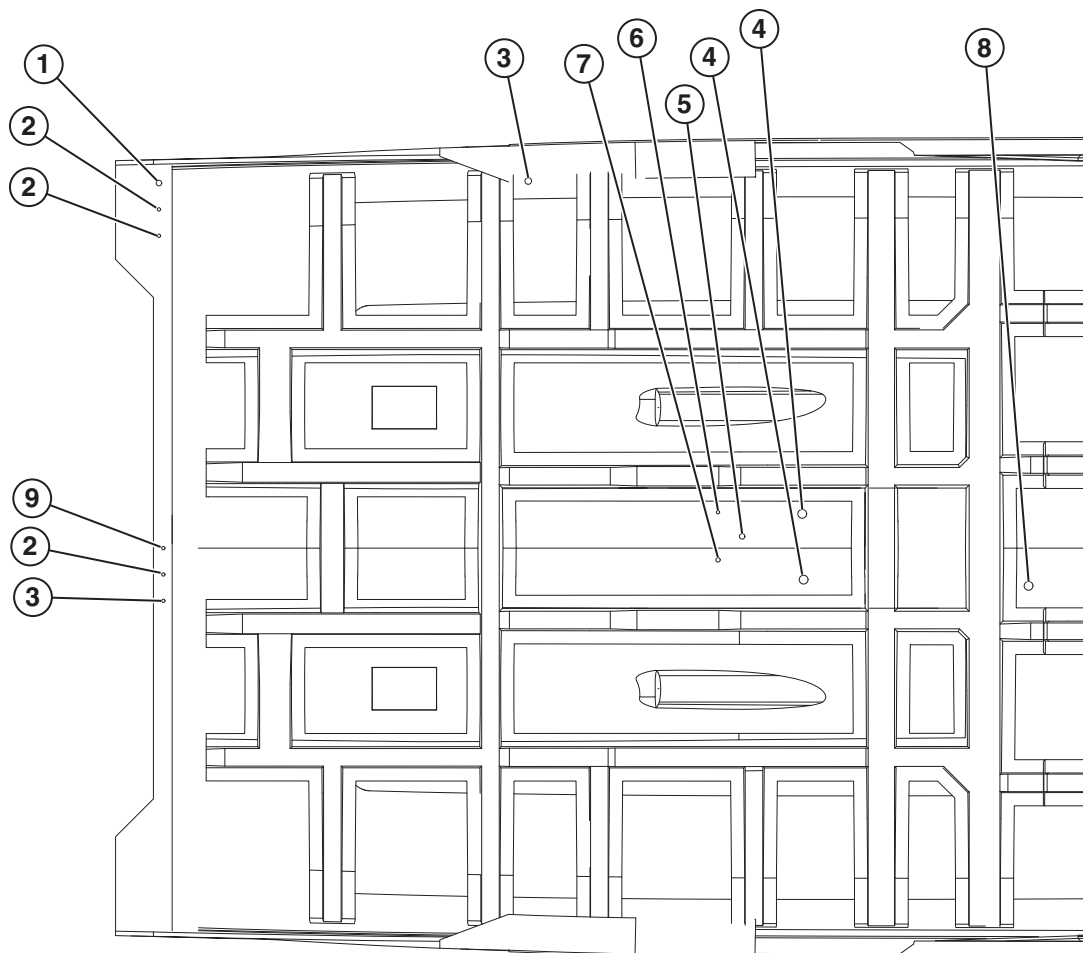


Figure 7-50 – Aft Thru-hull Valves

- | | |
|---|---|
| 1 – Aft Bilge Pump (On CE Models) | 6 – Raw Water Washdown (On Models with Raw Washdown Option) |
| 2 – Air Conditioning Discharge | 7 – Generator Pick-up |
| 3 – Overboard Discharge (On Models with Overboard Discharge Option) | 8 – Transducer (On Models with Sonar Options) |
| 4 – Engine Pick-up | 9 – Transom Storage/Crew Sump |
| 5 – Air Conditioning Pick-up (On Models with Air Conditioning Option) | |

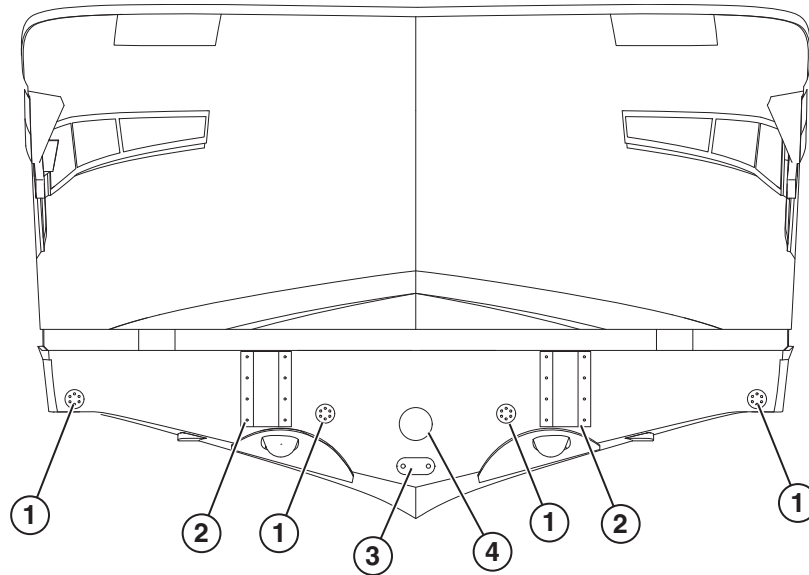


Figure 7-51 – Stern Thru-hull Valves

- 1 – Underwater Lights (On Models with Underwater Lights Option)
- 2 – Lift Adapter Bracket (On Models with Swim Platform Option)

- 3 – Transom Zinc
- 4 – Stern Thruster (On Models with Stern Thruster Option)

IMPORTANT NOTICE

The latest generation of Carver hulls is of the vacuum-molded, resin-infused and balsa-cored design for superior strength, rigidity, reduced weight and increased laminate quality. It is imperative that certain procedures are followed when installing any fittings that require penetrating the hull laminate for installation. If a hole in the hull lamination is required and it includes an area where balsa core exists, the balsa core must be removed over an area sufficient around the perimeter of the hole to replace the core material with fiberglass and also to completely seal the exposed edge of the balsa core. You need to protect the balsa core from water intrusion. It is always best to provide yourself an area of at least 2 in. (5 cm) of core material removal around the hole and to bevel the core edge back so a hand layup of fiberglass can be easily done. The fiberglass core replacement layup should be at least half the thickness of the core material that is removed. The core replacement laminate

material must consist of at least biaxial knit-strand fiberglass, not fiberglass chop strand matt. The factory material specification is V2 Composites, VTX 4810 Quad Axial.

There are areas in the hull that are designated for thru-hull fitting installation. In these designated areas, the balsa core has already been removed and replaced with fiberglass laminate. These areas can be located by referencing the thru-hull installation print for the yacht. By referencing the thru-hull installation print, you will be able to locate the thru-hulls that are factory-installed and you will notice on the inside of the hull in these areas that the elevation of the lamination is lower in the areas where the core material has been removed. It is safe to install thru-hull holes in these areas. If none of these areas are suitable for the thru-hull fittings that you are proposing to install, you must revert back to the procedure described in the first paragraph of this notice.

OPERATING AND MANEUVERING

8

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 179.**
- 4] Turn ON the master disconnect switches for both engine battery pairs and the accessory battery. See **"MASTER DISCONNECT SWITCHES" on page 90.**

- 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 BRIDGE ACCESSORY (for a single-station yacht) or HELM ACCESSORY (for a dual-station yacht) circuit breaker if navigation equipment is installed at the helm.
 - e] If needed, switch ON the AUTO SUMP (3 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 132.
- 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 166 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 90.
- 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.

OPERATING AND MANEUVERING

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-powered vessels only)
- 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 **"DIESEL COOLING SYSTEM"** on page 140 for seacock locations.
- 2] Move the shift/throttle lever to the NEUTRAL position.
- 3] On the throttle/shift control, select the control station position by pressing the STATION SELECT button per the engine manufacturer's instructions.
- 4] Select the desired engine to start first by turning the engine key switch to the START position. Never start both engines simultaneously.

OPERATING AND MANEUVERING

CARVER

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.

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.

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.

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

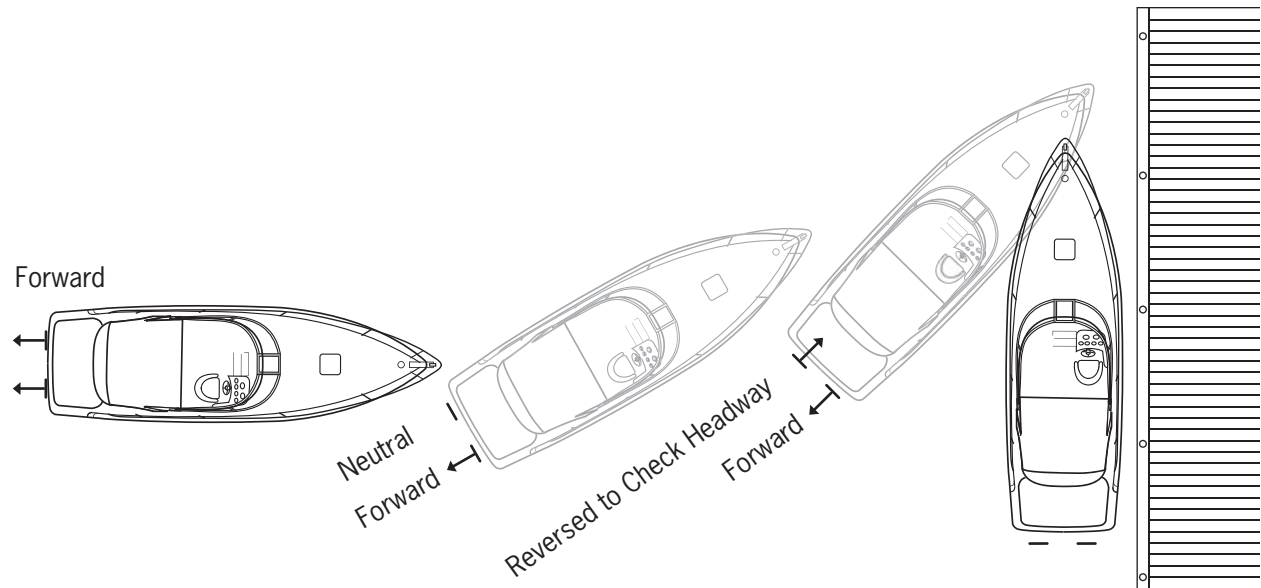


Figure 8-1

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.

OPERATING AND MANEUVERING

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.

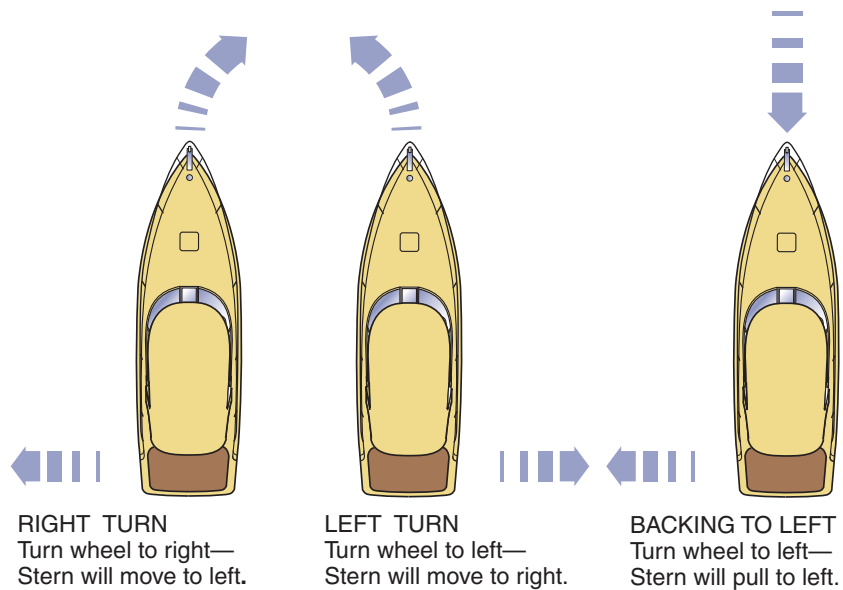
MANEUVERING ASTERN

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.

OPERATING AND MANEUVERING

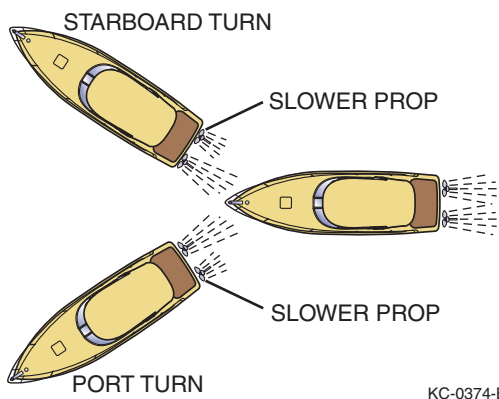
CARVER

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.



KC-0373-C

Figure 8-2



KC-0374-B

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.

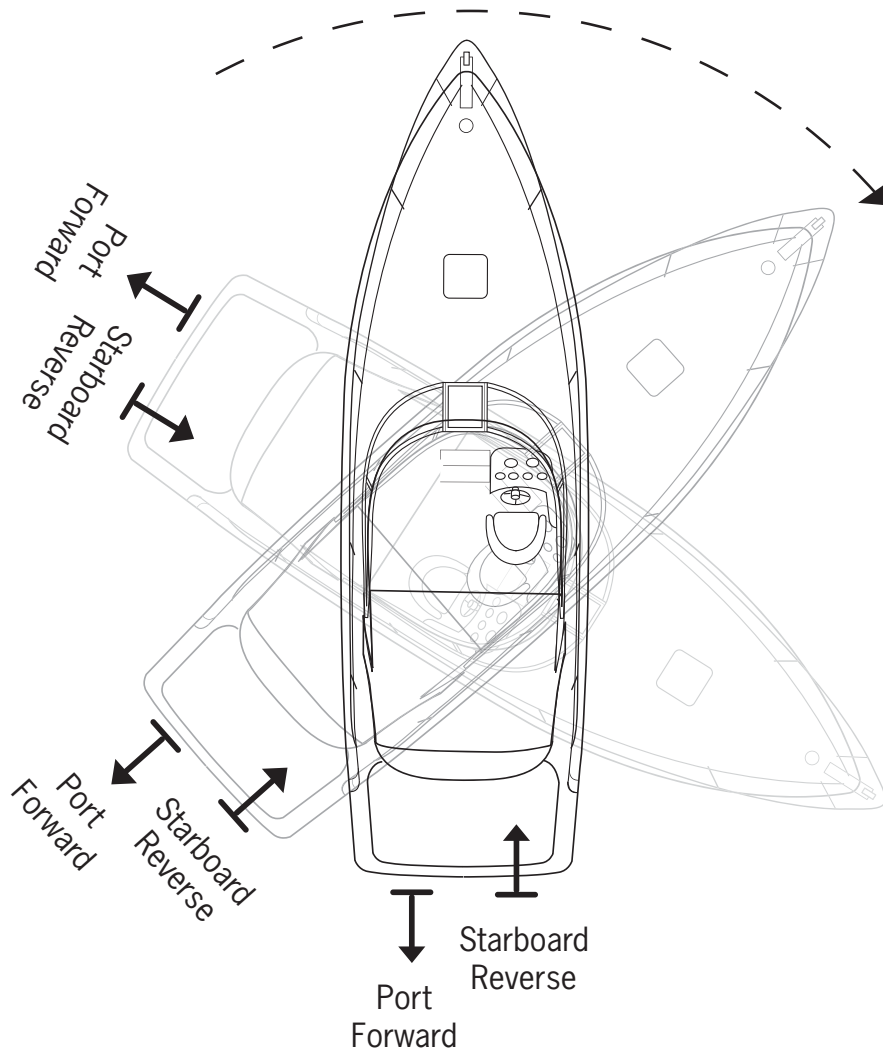


Figure 8-4

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.

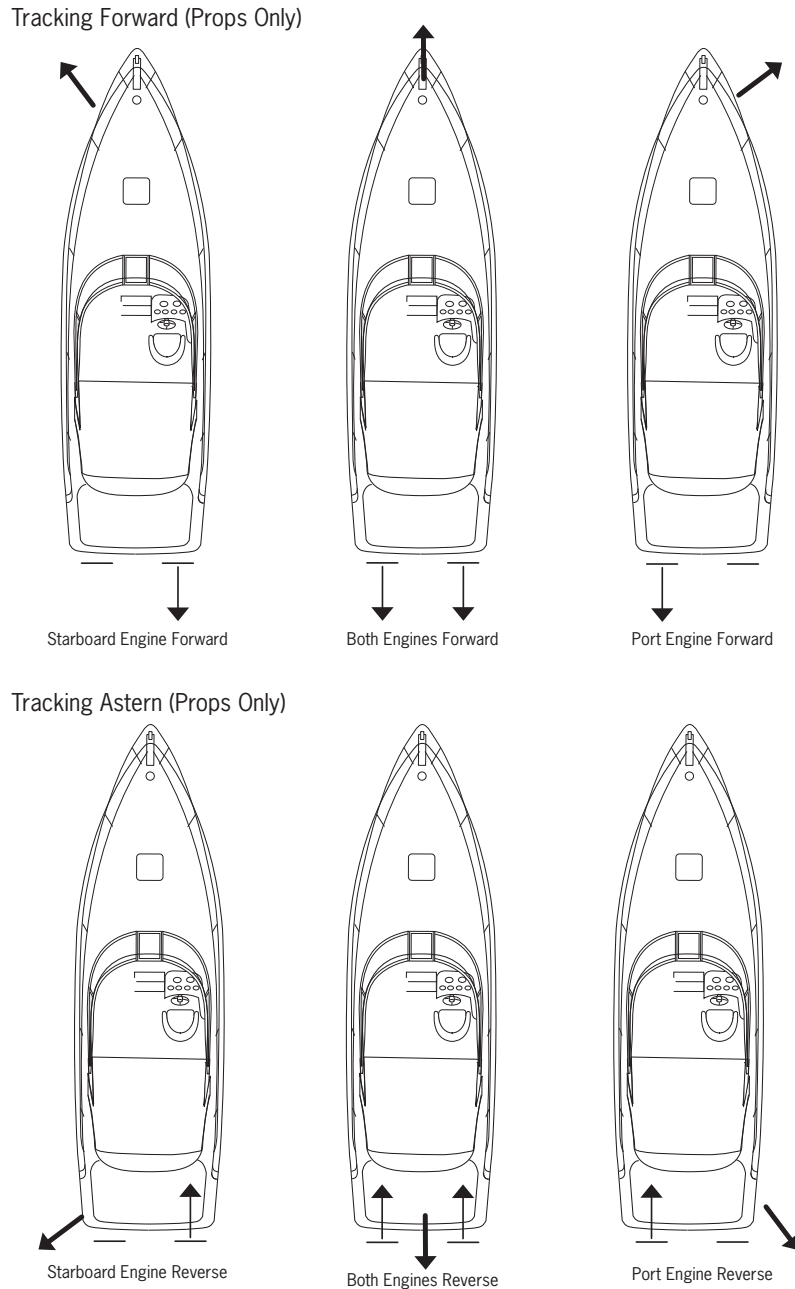


Figure 8-5

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).

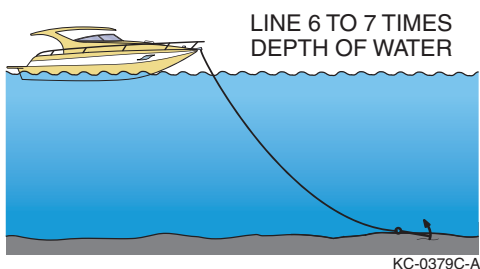


Figure 8-6

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.

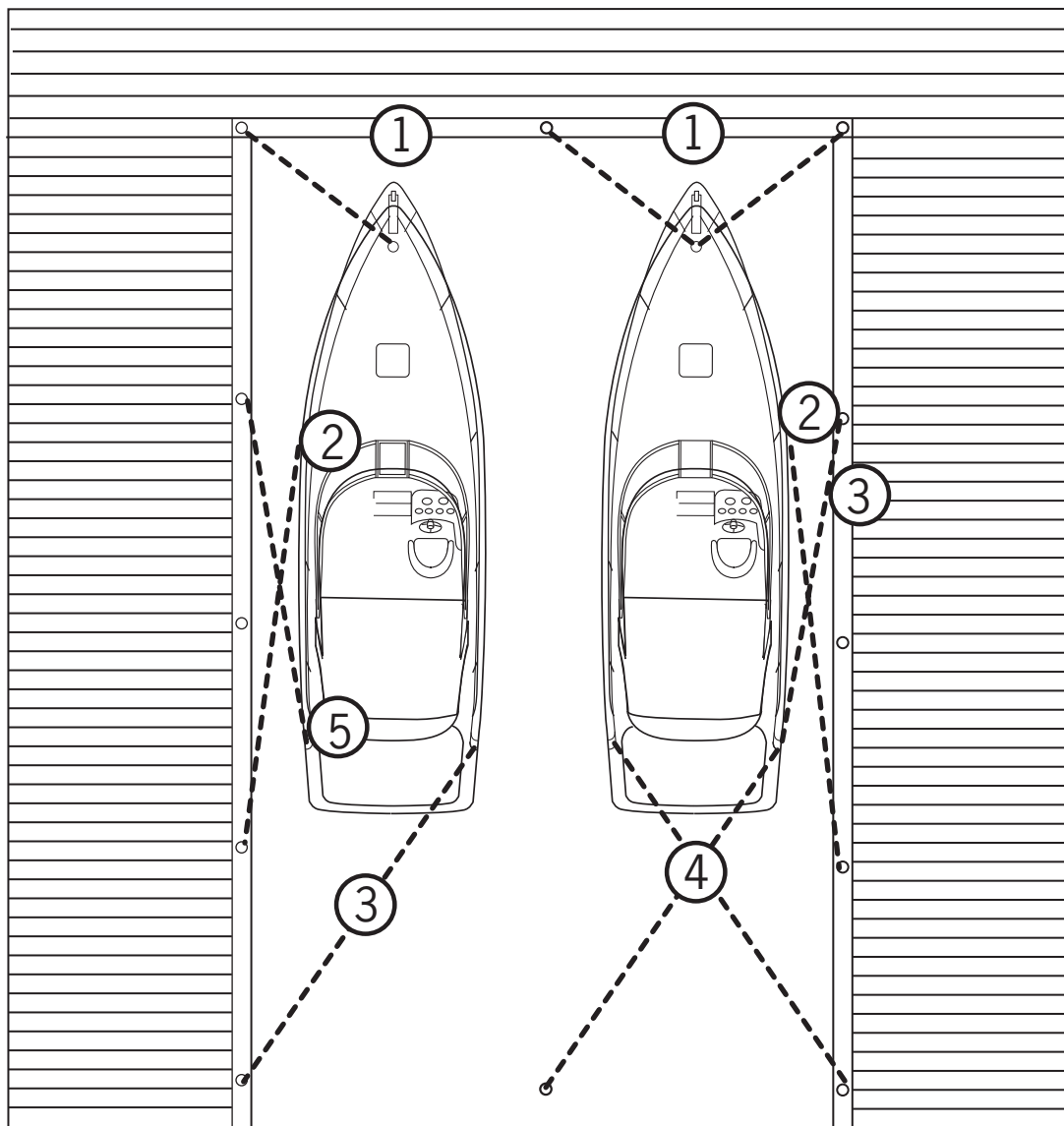
Figure 8-7 demonstrates possible mooring lines. The lines include:

- 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.

OPERATING AND MANEUVERING

*Figure 8-7*

The lines illustrated are as follows:

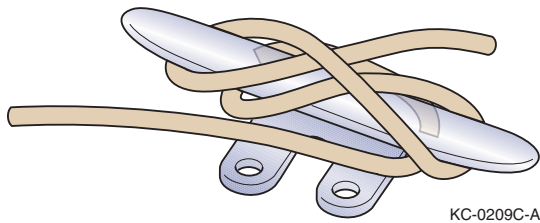
NUMBER	DESCRIPTION
1	Bow Line
2	Aft Bow Spring Line
3	Aft Quarter Spring Line
4	Stem Lines
5	Forward Quarter Spring Line

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.

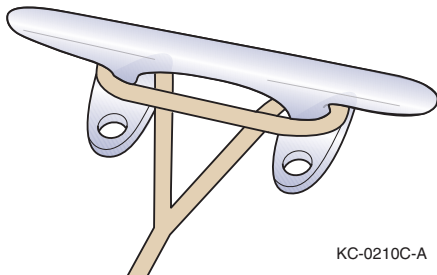
Learn and become familiar with tying and using knots. Knowing how to use knots and lines properly can prevent personal injury and property damage.

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.



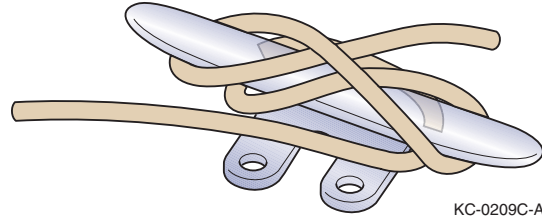
KC-0209C-A

Figure 8-8 – Cleating an Open Line



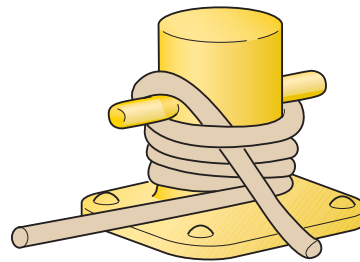
KC-0210C-A

Figure 8-9 – Cleating an Eye Spliced Line



KC-0209C-A

Figure 8-10 – Securing to Piling (Clove Hitch)



KC-0208C-A

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.

OPERATING AND MANEUVERING

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 156** 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.

OPERATING AND MANEUVERING

- 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

- 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.

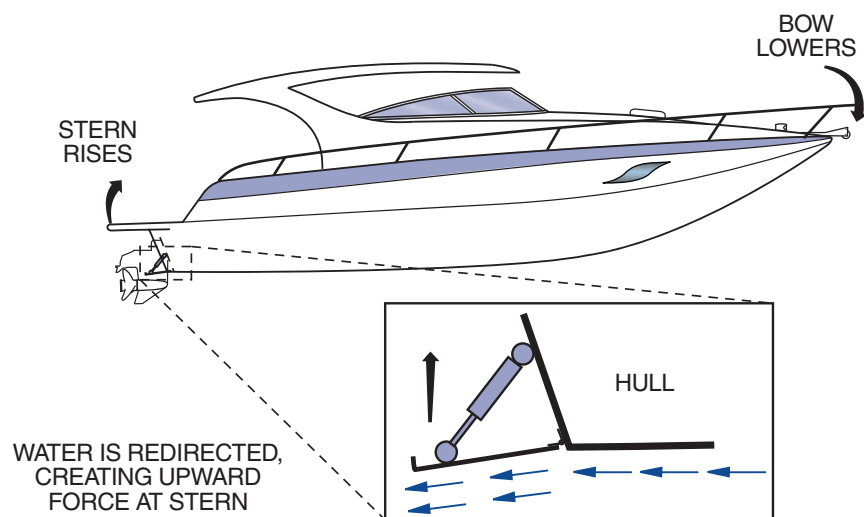
Put the trim tabs in the full BOW UP position when the seas are at any angle to the yacht's stern. Do not change the trim tabs' position until the seas are no longer at the stern.

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

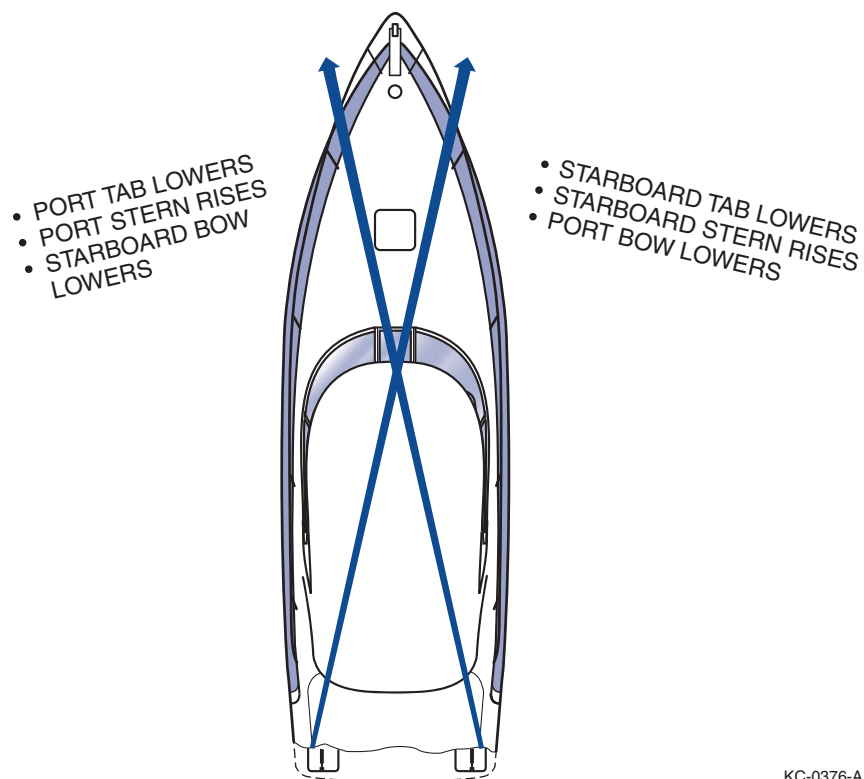
Use the trim tabs individually to make beam-to-beam adjustments. If the majority of the onboard passengers are sitting on the PORT side, the STARBOARD side of the yacht should be riding higher than the PORT side. Use the BOW DOWN side of the STARBOARD trim tab switch to adjust the trim.

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.



KC-0375-A

Figure 8-13



KC-0376-A

Figure 8-14

OPERATING AND MANEUVERING

CARVER

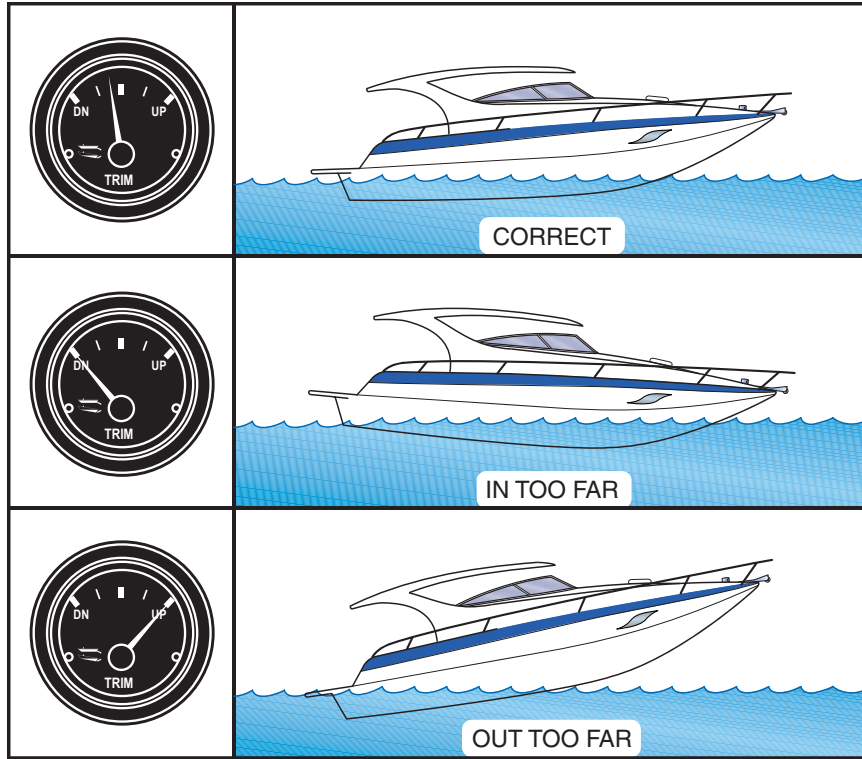


Figure 8-15

MAINTENANCE AND CARE

9

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.

MAINTENANCE AND CARE

CARVER

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.

MAINTENANCE AND CARE

CARVER

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.

NOTE: For interior and exterior maintenance, “Interior Care” on page 177 and “Exterior Care” on page 173.

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 AND CARE

CARVER

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 strut bearings			X	X
Check rudder alignment			X	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

MAINTENANCE AND CARE

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

MAINTENANCE AND CARE

CARVER

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.

To Access the SureShade Mechanism and Actuators

1. Locate the four latches on the exterior fiberglass cover.



Figure 9-1

2. Unlatch the four latches and lift the cover to remove.



Figure 9-2

3. Remove the access panel in the ceiling of the cockpit to access the SureShade control box.

To Access the Port and Starboard Wiper Motors

Remove the forward headliner in the Guest Head and Guest Stateroom.



Figure 9-3

*Figure 9-4**Figure 9-5**Figure 9-6*

To Access the Sun Roof Motors

When necessary, the sliding sun roof can be operated manually. To access the sun roof motor:

1. Locate the interior closeout which covers the aft transverse edge of the sun roof. Pull down on the closeout to remove. The close out is attached with push-fit connectors.

2. The driving motors can be turned using a hex wrench to open or close the roof.

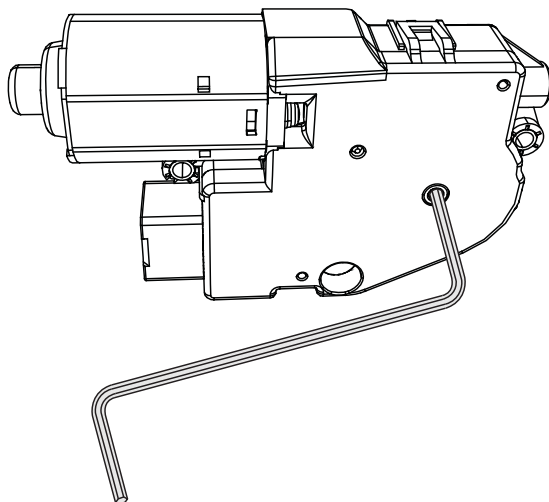


Figure 9-7

3. If the roof is operated manually, the control system has to be reset.

NOTE: There should be an amperage of at least 40 A available.

- Press and hold button  (close) to close the roof as far as possible.
- Release button  (close)
- Press and hold button  (close). After approximately 10 seconds the roof moves with small steps until it's completely closed and the motors produce a loud "click" sound.
- Now, release button  (close).

The system has been reset.

From now on, the roof will function normally.

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 192.

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 122** 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 **FILLING THE FRESHWATER TANK** on page 122 and **PRESSURIZING AND PRIMING THE WATER SYSTEM** on page 122.*

- 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 122** 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.

WINTERIZATION AND STORAGE

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. See **"Gray Water System" on page 131** for the exact location of the fitting.

- 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. See

"Gray Water System" on page 131 for the exact location of the fitting.

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 134** 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 128 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 MAINTENANCE"** on page 130.

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 131 for a description of the sanitation system.

If your sanitation system has the optional overboard discharge system, see **"OVERBOARD DISCHARGE SYSTEM"** on page 191.

- 1] Empty the waste tanks as described in **"EMPTYING THE WASTE TANK AND/OR OPTIONAL GRAY"**

WATER TANK" on page 132. 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 132.
 - 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.

WINTERIZATION AND STORAGE

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 191**.

- 1] Empty the gray water tank as described in **“EMPTYING THE WASTE TANK AND/OR OPTIONAL GRAY WATER TANK” on page 132**. 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 132**.
- 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.

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

CARVER YACHTS
PO BOX 1010
PULASKI WI 54162-1010

CARVER YACHTS
PO BOX 1010
PULASKI WI 54162-1010



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.



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.