



45 Voyager

Owner's Guide

HIN: CDR_____



Carver Boat Corporation
790 Markham Drive
P.O. Box 1010
Pulaski, WI 54162-1010
USA
Phone (920) 822-3214
Fax (920) 822-3213
www.carveryachts.com

Robert VanGrunsven
President

Congratulations and Welcome Aboard!

This Owner's Guide was designed to acquaint you with the safe, proper operation and maintenance of your new boat and its systems. Your first duty as Captain of your new Carver should be to read your Owner's Guide and all manufacturer-supplied operating and maintenance instructions found within your Owner's Information kit.

Be sure to mail in all manufacturer registrations and warranty cards to validate your Carver and OEM warranties. These warranty cards have been assembled and are contained in the OEM information packets within your Owner's Information kit.

If you're new to boating, learn the proper rules of seamanship to ensure the safety of your passengers. Refer to Chapman's Piloting, Seamanship and Small Boat Handling and attend a safe boating class offered by the U.S. Coast Guard Auxiliary, United States Power Squadron, or any enterprise experienced in conducting safe boating courses.

Thank you for choosing Carver. We're confident your new boat will provide you and your family with years of enjoyable cruising.

Using Your Owner's Information Kit

Your Owner's Information kit contains this Owner's Guide and a set of manuals referred to as "OEM information." Please read the Owner's Guide and OEM information carefully and familiarize yourself with your boat before operating the boat or any of its components or systems.

IMPORTANT: *The Owner's Information kit must be onboard whenever your boat is operated. If you sell your boat, make sure the new owner receives the entire kit.*

Owner's Guide

This guide explains how to safely operate and maintain your boat and its various systems. The guide also contains safety precautions and operational tips, as described below.

A TIP FROM CARVER!

There are many people within the Carver organization who are avid boaters. Some of the experience gained during our years of boating are presented in this Owner's Guide. This information is presented in the left margin and is entitled "A TIP FROM CARVER".



DANGER

Describes a hazard that can cause death or severe injury if the instructions are ignored.



WARNING

Describes a hazard that can cause serious injury and/or property damage if the instructions are ignored.



CAUTION

Describes a hazard that can cause damage to your boat or its components if the instructions are ignored.

NOTE: *Provides important information that can help you avoid problems.*

If this is your first boat, or if you are changing to a type of boat you are not familiar with, for your own comfort and safety, please obtain handling and operation experience before operating the boat. Your dealer or national sailing federation or yacht club can 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 your boat. These drawings and graphics do not include all details of*

each system and are not drawn to scale. Do not reference these drawings to order parts or to service your boat. Contact your authorized Carver Dealer for any parts or service required for your boat.

The information contained in this Owner's Guide was complete and accurate at the time the guide was printed. Carver reserves the right to change materials, part numbers, specifications, or system designs at any time without notice.

OEM Information

The OEM (Original Equipment Manufacturer) information is supplied by companies from whom Carver has purchased components to install in your boat. These components include, but are not limited to, standard items like the engines, sanitation system, various pumps, and 12-volt batteries, as well as optional items like the air conditioning system and navigation systems. The OEM information explains how to operate and maintain the components.

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

NOTE: *If the OEM information conflicts with this Owner's Guide, follow the instructions in the OEM information.*

Pre-Delivery Service Record

The Pre-Delivery Service Record that follows this page must be completed and signed by your Carver Dealer before you take delivery of your new Carver yacht. Your Carver Dealer will prepare your boat for delivery in accordance with the procedures detailed within this document.

Be certain that the boat's Pre-Delivery Service Record and all OEM warranty cards have been completed and mailed to their respective companies. Be sure you retain a copy of the Pre-Delivery Service Record for your own reference.

Warranty Registration

Carver warrants every boat we manufacture as explained in the Carver Limited Warranty. Your copy of the warranty is located in **Section 9**. Please review the warranty carefully.

The Warranty Registration that follows this page is the first step in activating your Carver limited warranty. This document must be completed and signed by you and your Carver Dealer before you take delivery of your new Carver yacht. Failure to complete and register this Warranty Registration could void your Carver limited warranty.

Your Carver Dealer will review the terms of the Carver warranty and make certain the warranty is registered with Carver.

To ensure that the warranty remains in effect during its lifetime, Carver Boat Corporation, your Carver Dealer, and you must each uphold specific responsibilities. These responsibilities are described in **Section 9**.

At time of delivery, make a complete inspection of the boat and its systems. Document any work that needs to be completed by the Dealer in order to meet the terms of your agreement.

There are two cards located at the end of this Preface. These are Second and Third Owner Registration Cards. We strongly recommend that the purchaser of a previously-owned Carver register ownership with Carver.



THIRD OWNER REGISTRATION

Owner's Name: _____

Street Address: _____

City: _____ State: _____ Zip Code: _____

Telephone: (____) _____ Date of Purchase: _____

Purchased From: _____

Boat Hull Identification Number: _____ CDR _____

Third Owner Registration does not extend, alter, or transfer the Carver Limited Warranty. Refer to the Carver Limited Warranty for details.



SECOND OWNER REGISTRATION

Owner's Name: _____

Street Address: _____

City: _____ State: _____ Zip Code: _____

Telephone: (____) _____ Date of Purchase: _____

Purchased From: _____

Boat Hull Identification Number: _____ CDR _____

Second Owner Registration does not extend, alter, or transfer the Carver Limited Warranty. Refer to the Carver Limited Warranty for details.

**CARVER BOAT CORPORATION
P O BOX 1010
PULASKI WI 54162-1010**

**CARVER BOAT CORPORATION
P O BOX 1010
PULASKI WI 54162-1010**

Boating Safety

Safe Operation	2
Safety Recommendations	2
Adverse Conditions	3
Emergency Procedures	6
Safety Equipment	11
Owner's Responsibilities	14
Safe Boating Courses	14
Rules of the Road	14
Documentation	15
Drugs and Alcohol	15
Distress Calls	15
Voluntary Inspections	16
Boating Accidents	16
Boating Regulations	16
Records	17
Pre-Departure Actions	18
Carbon Monoxide (CO) Warnings	19
Preventing CO Exposure	19
Identifying CO Exposure	21
Treating CO Exposure	21
Warning Labels	21

Safe Operation

Boating safety is your responsibility. You must fully understand the operating procedures and safety precautions in this owner's guide and the OEM information **before** you operate your new boat. **Safe boating is no accident.**

Safety Recommendations

Safe operation includes, but is not limited to, the following.

- Keep your boat and equipment in safe operating condition. Inspect the hull, engine(s), safety equipment and all boating gear regularly.

NOTE: *Federal law requires you, the owner, to provide and maintain safety equipment on your boat. Consult your Coast Guard, state, and local regulations to ensure your boat has all required safety equipment on board. Additional equipment may be recommended for your safety and that of your passengers. Make yourself aware of its availability and use.*

- **Be very careful** when fueling your boat. Be sure you know the capacity of your boat's fuel tank and the amount of fuel used when operating at frequently used engine speeds (RPMs). Ask your dealer about the capacity of your boat's fuel tank. See the "**Fueling**" portion of **Section 5** for information on fueling your boat.
- Make sure you have enough fuel onboard for anticipated cruising requirements. In general, use 1/3 of your supply to reach your destination and use 1/3 to return. Keep 1/3 in reserve for changes in your plans due to weather or other circumstances.
- Be sure fire extinguishing and lifesaving equipment is onboard. This equipment must meet regulatory standards, and it should be noticeable, accessible and in safe operating condition. Your passengers should know where this equipment is and how to use it.
- Keep an eye on the weather. Be aware of possible changing conditions by checking local weather reports before your departure. Monitor strong winds and electrical storms.

- Always keep accurate, updated charts of the area you are cruising.
- Before you leave the port or harbor, file a Float Plan with a family member, relative, friend, or other responsible person ashore.
- Always operate your boat with care, courtesy and common sense.
- Instruct at least one other passenger onboard in the basic operating procedures in handling your boat. This person can take over if you unexpectedly become unable to do so.
- Do not allow passengers to ride on parts of your boat other than designated seating areas.
- Ask all passengers to remain seated while the boat is in motion.
- Do not use the boarding platform or boarding ladder while the engine or engines are running.
- Understand and obey the “Rules of the Road.” Always maintain complete control of your boat.
- Do not overload or improperly load your boat.
- Do not travel faster than conditions warrant or beyond your abilities.
- Do not operate your boat in weather or sea conditions beyond your skill and experience.
- Do not operate your boat while under the influence of drugs or alcohol, inclusively.
- Do not operate your boat if the your visibility is impaired or blocked.

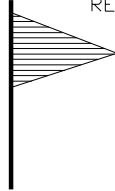
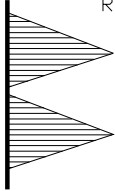
Adverse Conditions

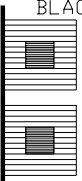
Weather

Storms rarely appear without advance notice. Check the weather forecast before you begin a day of boating. Be aware, however, that weather conditions can change rapidly. If you have a marine radio, listen to the weather reports issued by the U.S. Coast Guard and

others. If you have a portable radio, keep it tuned to a station broadcasting frequent weather reports. Many boating clubs fly weather signals. Learn to recognize these signals, and listen to your local forecasts before leaving port.

WEATHER SIGNALS

	SMALL CRAFT ADV WINDS TO 38 MPH	GALE WARNING WINDS TO 54 MPH
DAY FLAGS	 RED	 RED
NIGHT LIGHTS	 RED WHITE	 WHITE RED

	STORM WARNING WINDS TO 72 MPH	HURRICANE OVER 72 MPH
DAY FLAGS	 BLACK ON RED	 BLACK ON RED
NIGHT LIGHTS	 RED RED	 RED WHITE RED

Your surroundings can also be a good indicator of changing weather conditions. Watch for changes in wind direction or cloud formations. There is no substitute for a good understanding of weather conditions and what to do when the weather takes a turn for the worse.

Fog

Fog is a result of either warm-surface or cold-surface conditions. You can judge the likelihood of fog formation by periodically measuring the air temperature and dew

point temperature. If the difference between these two temperatures is small, fog is likely to develop.

Remember the following guidelines:

- Unless your boat is well equipped with charts and navigational equipment, head for shore at the first sign of fog and wait until conditions improve. If you have charts on board, take bearings as fog sets in, mark your position, and continue to log your course and speed.
- Make sure all persons onboard put on their personal flotation devices (PFDs).
- If your boat has sounding equipment, take soundings regularly and match them with depths shown on your charts.
- Station a person forward in the boat as a lookout.
- Reduce your speed. From time to time, stop engine(s) and listen for other fog signals.
- Sound the horn or fog bell intermittently to warn others.
- If there is any doubt in continuing your excursion, anchor. Listen for other fog signals while continuing to sound your fog horn or bell.

Storms

At all times, the boat operator should be aware of present weather conditions and the weather forecast. If storms are a possibility, keep a watch on the horizon, especially to the West for approaching storms. Monitor the weather forecast on a marine channel or local weather station. It would be best to return to a safe port if time allows.

Other steps to follow to weather the storm include:

- Close portals and hatches and secure them. Stow all loose gear below deck and tie down any gear on deck.

- Reduce speed as the seas build. Make sure all persons onboard have put on their personal flotation devices.
- Drop a sea anchor over the stern to maintain the bow into the seas. If you do not have a sea anchor onboard, use a canvas bucket, tackle box, or other object that will work like an anchor.

Radar reflectors (if installed on your boat) should be 18 inches diagonally. They should be placed 12 feet above waterline. Otherwise, a boat with radar may have trouble “seeing” your boat.

Emergency Procedures

The following is not an exhaustive list of situations which may be encountered while boating. The operator should obtain training to handle any emergencies which may arise.

Fire



DANGER

A fire onboard your boat is serious. Explosion is possible. Respond immediately. Develop a fire response plan.

To help prevent a fire onboard your boat, keep your bilges clean and check for fuel and gas vapors at regular intervals. Also, DO NOT fit free hanging curtains or other fabrics in the vicinity of or above cookers or other open flame devices. Do not store any materials or equipment of any kind in the engine space.

Every boater should develop a fire response plan to determine what kind of fire (fuel, electrical, etc.) might break out, where it might break out, and the best way to react. Have a plan and, if possible, assign responsibilities to others to allow quicker decisions and reactions.



CAUTION

Never:

- Obstruct passage ways to exits and hatches.

- Obstruct safety controls, e.g. fuel valves, gas valves, switches of the electrical system.
- Obstruct portable fire extinguishers in lockers.
- Leave a craft unattended when cooking and/or heating appliances are in use.
- Use gas lights in the craft.
- Modify any of the craft's systems (especially electrical, fuel or gas).
- Fill any fuel tank or replace gas bottles when machinery is running or when cooking or heating appliances are in use.
- Smoke while handling fuel or gas.

In case of fire, perform the following.

NOTE: *Everyone onboard should know where fire extinguishers are and how to operate them.*

- Stop the engine(s) immediately.
- If the fire is in the engine compartment, shut off the bilge blower **immediately. Do not 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. If the fire is aft, head into the wind.
- Have all persons onboard put on their personal flotation devices.
- If you can get at the fire, aim the fire extinguisher at the base of the flames and use a sweeping motion to put out the fire.
- If the fire gets out of control, make a distress signal, and call for help on the radio.

Deciding whether to stay with the boat or abandon ship will be difficult. If the decision is to abandon ship, all persons onboard should jump overboard and swim a safe distance away from the burning boat.



WARNING

Smoking, poor maintenance, or carelessness when refueling can cause hazardous conditions. Always follow proper refueling procedures for your boat.

Flooding

If your boat is taking on water from a leak in the hull, turn on your electric bilge pumps. Assign someone to bail out the bilge and investigate the cause of the flooding. When the source of the leak is found, attempt to repair it.

Almost anything can be stuffed into a hole to stop the leaking temporarily. Material used to stop a leak will work better if it is applied from the outside where water pressure can help hold it in. If necessary, station a crew member to hold the plug in place if the plug is applied from the inside. In all cases, station a crew member or passenger to watch the plugged area and alert others if it fails.

Swamped or Capsized Boat

If your boat becomes swamped or capsizes, put on a PFD immediately and set off a distress signal. Chances are good a capsized boat will stay afloat. For this reason, stay with the boat. Do not leave the boat or try to swim to shore except under extreme conditions. A capsized boat is easier to see than a swimmer, and the shore may be further away than it appears.

If water is coming over the bow, reduce headway and turn the boat slightly so that the bow is slightly off from meeting the waves head on. Drop a sea anchor over the stern of the boat and adjust the length of the line to hold the bow at the most favorable angle.

Collision

If a serious collision occurs, first check the persons onboard for injuries. Then inspect the boat to determine the extent of damage.

- Prepare to help the other craft unless your boat or its passengers are in danger.
- If the bow of the other boat penetrated your boat's hull, prepare to plug the fracture once the boats are separated.
- Shore up the hole inside your boat with a spare life jacket or bunk cushion.

- While plugging the hole, trim weight to get the hole above the water level out of the water during repairs.
- If your boat is in danger of sinking, have all persons put on their personal flotation devices.
- If your boat has a radio, contact the U.S. Coast Guard or other rescue authorities immediately on VHF channel 16 or CB radio channel 22. (You may also be able to use VHF channels 9 or 13 or your cellular phone in some states).

Running Aground

Excessive weight in the fore or aft sections of the boat will cause a trim change and may yield greater draft than expected. Equip your boat with a good quality depth instrument and allow ample water below the hull while operating.

If your boat runs aground, check everyone for injury and inspect the boat and propeller(s) for damage. If lightly grounded, shift the weight of the passengers or gear to heel the boat while reversing engine(s). If towing becomes necessary, use a commercial towing service.



WARNING

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

Man Overboard

The operator should know what to do in case someone goes overboard. Emergency procedures are published in *Chapman's* and instruction is offered by the U.S. Coast Guard.

If a person falls overboard, hypothermia may be an immediate concern. Hypothermia means a person's body loses heat to the water faster than the body can replace it. If not rescued, the person will become exhausted or likely drown. In general, the colder the water, the shorter the time for survival. PFDs will increase survival time because they provide insulation.

WATER SURVIVAL CHART

Water Temperature (°F)	Exhaustion Unconsciousness	Expected Time of Survival
32.5	Under 15 min.	Under 45 min.
32.5-40	15-30 min.	30-90 min.
40-50	30-60 min.	1-3 hr.
50-60	1-2 hr.	1-6 hr.
60-70	2-7 hr.	2-40 hr.
70-80	3-12 hr.	3 hr.- Indefinite
Over 80	Indefinite	Indefinite

Medical Emergency

No one should act as a doctor if they are not properly trained and educated. Someone onboard your boat should know first aid. First aid training is available through your local Red Cross. Keep a fully stocked first aid kit onboard your boat at all times.

Equipment Failure

Steering, propulsion, or control failure can be prevented by having your boat maintained correctly and checked periodically. If systems onboard your yacht do fail, radio for help or signal with flags and wait until help arrives.

Radio Communication

The operator is responsible for obtaining a radio operator's permit and knowing and following proper rules and procedures. Private yachts are not required to have their radio on at all times; however, if your radio is on, it should be tuned to channel 16 unless it is being actively used. Channel 16 is the frequency for emergency calls or initial calls between boats. After establishing contact on channel 16, change your frequency to channel 22.

More information on radio communications can be found in *Chapman's Piloting*.

Distress Signals

The operator is required to lend assistance to a vessel in distress as long as his life or vessel is not put in harm's

way in the process. A Good Samaritan clause protects the operator from liability incurred while giving aid.

Safety Equipment

NOTE: *Federal law requires the owner to provide and maintain safety equipment onboard your boat. Consult your Coast Guard, state, and local regulations to ensure your yacht has all required safety equipment on board. The owner should learn about any additional recommended equipment before operating his boat.*

Personal Flotation Devices (PFDs)

There must be one United States Coast Guard approved wearable personal flotation device of Type I, II, or III for each person onboard your yacht. The PFDs must be readily accessible and in serviceable condition. They must also be of a suitable size for each person onboard. Three PFDs (two wearable and one throwable) are required regardless of the number of persons onboard.

PFD Type I, Wearable: This offshore life jacket is most effective for all waters when rescue may be delayed. In the water, its design turns most unconscious persons from a face down position to a vertical or face-up position.

PFD Type II, Wearable: This near-shore buoyant vest is intended for calm inland water or waters where there is a chance of quick rescue. It turns its wearer to a face-up position, but the turning action is not as pronounced as the Type I, and it will not turn as many persons under the same conditions as a Type I.

PFD Type III, Wearable: Classified as a flotation aid, this PFD will not turn a victim to a face-up position. This type of PFD is frequently used in water sports.

PFD Type IV, Throwable: You must also have onboard at least one throwable PFD Type IV device. The design of the Type IV device does not allow it to be worn. It must be thrown to a person in the water and grasped and held by the user until rescued. The most common Type IV PFDs are buoyant cushions or ring buoys. **This PFD must be in serviceable condition and immediately available for use.**

Visual Distress Signals

The U.S. Coast Guard requires that all boats operating on U.S. coastal waters have visual distress signal equipment. Boats owned in the United States and operating on the high seas must also carry this equipment.

Visual distress equipment must be readily accessible and in serviceable condition. Both pyrotechnic and non-pyrotechnic equipment must be U.S. Coast Guard approved. This equipment can become ineffective with age. If your equipment's usage date has expired, replace the equipment before taking your boat out.

Approved pyrotechnic equipment includes:

- Hand held or aerial red flares
- Hand held 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 one signaling device is ideal under all conditions. Consider carrying various types of equipment. Careful selection and proper stowage of visual distress equipment are very important. Select devices with packages which children, but not adults, will find difficult to open, especially if young children are onboard.

Sound Signaling Device

Your Carver yacht must have an operable device that can produce a sound signal if conditions require. A horn is standard equipment on all Carver models.

For boats over 26 feet and under 39 feet, 4 inches, the device can be hand or power operated and must be able to produce a four-second blast which can be heard one half of a mile away. Refer to the U.S. Coast Guard's publication "Navigational Rules, International-Inland" for details about the appropriate signals.

Boats longer than 39 feet, 4 inches, must have a bell and a whistle. These devices must meet the requirements of the Inland Navigational Rules Act of 1980.

Running and Navigation Lights

Your boat must have running and navigation lights for safe operation after dark. Observe all navigation rules for meeting and passing. Do not run at high speeds during night operation. Always use common sense and good judgment.

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 it can extinguish. Coast guard classifications include foam, carbon dioxide, chemical, and Halon type fire extinguishers. Below are the requirements for fire extinguishers at the time this manual was prepared.

Boats longer than 26' and shorter than 40': Two Type B-I or at least one Type B-II portable hand extinguishers. If your boat has a fixed fire extinguishing system approved by the U.S. Coast Guard, one Type B-1 extinguisher is required.

Boats longer than 40' and shorter than 65': Three Type B-I or one Type B-I and one Type B-II portable hand extinguishers. If your boat has a fixed fire extinguishing system approved by the U.S. Coast Guard, Two Type B-I or one Type B-II extinguisher is required.

All fire extinguishers should be mounted in a readily accessible location away from the engine compartment. Everyone onboard should know where the fire extinguishers are and how to operate them.

If your fire extinguisher has a charge indicator gauge, cold or hot weather may affect the gauge reading. Consult the instruction manual supplied with the fire extinguisher to determine the accuracy of the gauge.

Check and maintain fire extinguishing equipment in accordance with manufacturer's recommendations. Be sure to replace fire fighting equipment, if expired or discharged, by devices of identical or greater fire fighting capacity.

Recommended Equipment

In addition to required equipment, you may want to carry the following:

- Spare anchor
- Heaving line
- Fenders
- Flashlight
- Mirror
- Suntan lotion
- Spare propeller
- Tool kit
- Ring buoy
- Navigational charts
- Mooring line
- Binoculars
- Spare parts
- Spare pump

Owner's Responsibilities

There are several areas you must have knowledge of to operate your boat in a safe, responsible manner.

Safe Boating Courses

Your local U.S. Coast Guard Auxiliary and the U.S. Power Squadrons offer comprehensive safe boating classes several times a year. You may contact the Boat/U.S. Foundation at 1-800-336-BOAT (2628), or in Virginia 1-800-245-BOAT (2628). For a course schedule in your area you may also contact your local U.S. Coast Guard Auxiliary or Power Squadron Flotilla for the time and place of their next scheduled class.

Carver also recommends that you read *Chapman's Piloting, Seamanship and Small Boat Handling* for further information on how to handle your boat in various situations.

Rules of the Road

Navigating a yacht responsibly requires the operator to comply with a set of rules intended to prevent accidents. Just as you assume other car drivers know what they are doing, other boaters assume you know what you are doing.

As a responsible yachtsman, you will comply with the marine traffic rules enforced by the Coast Guard. There are two sets of rules: the United States Inland Naviga-

tional Rules and the International Rules. The United States Inland Rules apply to all vessels inside the demarcation lines separating inland and international waters. The Coast Guard publishes the traffic regulations in its publication “Navigational Rules, International-Inland.” You can get a copy from your local U.S. Coast Guard Unit or the United States Coast Guard Headquarters, 1300 E. Street NW, Washington, D.C. 20226.

Other helpful publications available from the U.S. Coast Guard include “Aids to Navigation” (U.S. Coast Guard pamphlet #123), which explains the significance of various lights and buoys; the “Boating Safety Training Manual”; and “Federal Requirements For Recreational Boats.” Check with your local Coast Guard station, your Carver dealer, or a local marina about navigational aids unique to your area.

Documentation

The owner of a Carver yacht is required to have proof of registration onboard at all times the boat is being operated. In addition, a radio license may be necessary if your boat is equipped with a VHF radio.

In addition to required documents, it is strongly recommended that the operator of a boat keep a log of the boat’s operation. A navigation log containing compass courses and time records is essential for both cruising and maintenance purposes. Radio logs are mandatory on compulsorily equipped vessels, and can be helpful even if one is not required to be kept. In addition, a maintenance log can help keep your boat operating for years.

Drugs and Alcohol

Drugs and alcohol affect a person’s ability to make sound judgments and react quickly. As a responsible boater, you will refrain from using drugs or alcohol (inclusively) while operating your yacht. Operation of motorized vessels while under the influence carries a significant penalty. Drugs or alcohol decrease your reaction time, impair your judgement, and inhibit your ability to safely operate your yacht.

Distress Calls

If you have a ship-to-shore radio telephone, heed storm warnings and answer any distress calls from other boats. The word “MAYDAY” spoken three times is the

international signal of distress. Monitor marine radio channel 16 which is reserved for emergency and safety messages. You can also use this channel to contact the Coast Guard or other boaters if you have trouble. **Never send a “MAYDAY” message unless there is a serious emergency and you are in need of immediate assistance.**

The owner or operator of a vessel is required by law to render assistance to any person or vessel in distress so long as his vessel is not endangered in the process.

Voluntary Inspections

The U.S. Coast Guard Auxiliaries or state boating officials in many states offer courtesy inspections to check out your craft. They will check your yacht for compliance with safety standards and required safety equipment. You may voluntarily consent to one of these inspections, and you are allowed time to make corrections without prosecution. Check with the appropriate state agency or the Coast Guard Auxiliary for details.

Boating Accidents

The operator of a vessel used for recreational purposes is required to file a report whenever an accident results in loss of life or disappearance from a vessel, an injury requiring medical treatment beyond first aid, or property damage in excess of \$200 or complete loss of the vessel.

In cases of death and injury, reports must be submitted within 48 hours. In other cases, reports must be submitted within 10 days. Reports must be submitted in the state where the accident occurred.

Boating Regulations

It is the responsibility of the operator to make sure that his boat is in compliance 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 which deal with relevant state laws.

Garbage

Dumping garbage into the sea is a worldwide problem. Coast Guard regulations prohibit dumping of plastic refuse and garbage mixed with plastic into any waters and restrict the dumping of other forms of garbage. It is

essential that all boaters pitch in to clean up our waterways and properly dispose of all garbage.

Within three miles from the shore of U.S. lakes, rivers and bays it is illegal to dump plastic, dunnage, lining and packing materials that float, and any garbage except dishwater/greywater or fresh fish parts. From a distance of three to twelve miles it is illegal to dump plastic, dunnage, lining and packing materials that float, and any garbage not ground to less than one square inch. Within 12-25 miles from shore, it is illegal to dump plastic, dunnage, lining and packing materials that float. Outside 25 miles, it is illegal to dump plastics.

Oil

The Federal Water Pollution Control Act prohibits the discharge of oil or oily waste into or upon the navigable waters and contiguous zone of the United States 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 \$5,000.

Waste

On U.S. inland and coastal waters, it is illegal to discharge waste directly overboard. If your boat is equipped with an overboard discharge option, check with your local Coast Guard office to be sure that you are in compliance with federal regulations.

State and Local Ordinances

Your State or locality may have laws limiting speed, noise or your boat's wake. Check with your harbor master to find out whether your boat's operation is restricted in any way by local ordinances or state laws. The boat owner should check with state and local authorities to make sure that he is in compliance with local regulations regarding marine sanitation, noise, speed, and wake.

Records

The owner of a boat registered with the Coast Guard is issued a Certificate of Number. This certificate must be onboard whenever the boat is in use. State registration is also required. If your boat has a VHF radio onboard, a FCC license must also be displayed. Check with the

U.S. Coast Guard or your state regulatory agency to determine what other records are required on your boat.

In addition to the required documentation, it is advised that boaters keep a log book which suits the needs of the individual boater. A navigation log with engine speeds, RPM, compass courses and time records can be an invaluable asset on future cruises.

An engine/fuel log is essential to calculate range and fuel requirements. Radio logs, while not required for voluntarily equipped vessels, can be useful to record unusual events, especially for future litigation. A GPS / Loran log can also be useful if so equipped. Log books are available from maritime supply stores.

Pre-Departure Actions

- Check the weather. Make sure conditions and seas will not be hazardous.
- Make sure all safety equipment is onboard, accessible, and in good working condition.
- Check the bilge for fuel fumes or water. Ventilate or pump out as necessary.
- Be sure the horn and navigation equipment and lights are working properly.
- Instruct guests and crew in safety and operational matters.
- Check engine and transmission oil and coolant levels. After starting engines, check overboard flow of cooling water, engine temperatures and oil pressures.
- Fill fuel tanks as full as you need. Know your tank capacity and fuel consumption at various RPMs and the cruising radius this gives. When estimating your range, it is best to count on using 1/3 of your fuel to reach your destination and 1/3 of your fuel to return, with the remaining 1/3 of your fuel in reserve for emergencies.
- Have a second person onboard capable of taking over in case you are disabled.

- Before departing, inform a friend or relative where you intend to cruise and when you will return so they can tell the Coast Guard where to look and the type of boat in case you are delayed. Remember to tell them of your safe return to prevent false alarms. Do not file a float plan form with the Coast Guard. They do not have the manpower to monitor all boats.
- Stow all loose gear securely. Fenders and docklines should be stowed immediately after getting underway.

Carbon Monoxide (CO) Warnings



DANGER

Carbon monoxide (CO) is a colorless, odorless and tasteless gas which is emitted in all engine and generator exhaust. Prolonged exposure to CO can result in unconsciousness, brain damage and death.

Carver has installed CO detectors on your boat. Have these detectors professionally calibrated at regular intervals.

Preventing CO Exposure

To help prevent the accumulation of CO in your boat's cabin and in enclosed exterior areas:

- Pay attention to prevailing conditions and provide ventilation to induce fresh air and minimize exhaust re-entry. Position the boat to maximize the dissipation of CO. Be aware that CO can enter the boat through cockpit and deck drains, especially when the cockpit and deck are enclosed.
- Do not operate the engines or generator for more than a very short period of time while the boat is stationary, especially if the boat is rafted or moored in a confined area.
- Be aware that mooring and anchoring in an area where other boats' engines or generators are running may put your boat in an atmosphere containing CO, even if your boat's engines and generator are not running.

- Keep the engine room hatch(es) closed when operating the engines and generator.
- Be aware that exterior enclosures can create air flows that draw in and trap CO in the enclosed areas. Provide adequate ventilation to these areas.
- Do not occupy aft lounging areas, including the boarding platform, or swim near the engine exhaust outlets while the engines or generator are running.
- Because CO production is greater when the engines are cold, minimize the time spent getting underway.
- Avoid backdrafting. Backdrafting occurs when air moving past the boat creates a low pressure or suction area near the stern. This low pressure area can draw CO into the boat's cabin and enclosed exterior areas.

Under certain speed and operating conditions, the low pressure area may form in other areas of the boat and permit CO to enter through openings that are not near the stern.

To avoid backdrafting:

- Maintain the proper trim angle; avoid a high bow angle.
 - Distribute the boat's load evenly.
 - Do not operate the boat at slow speeds, especially with a following wind.
 - Provide adequate ventilation; make sure the air flow is moving from forward to aft inside the cabin and enclosed exterior areas.
- Have a trained marine technician inspect the boat's exhaust systems whenever the boat is in for service or if you notice a change in the sound of an engine or the generator.
 - Maintain the propulsion and generator engines to optimize their efficiency; this in turn reduces CO emissions.

For additional information on carbon monoxide as it relates to boating, please contact marine organizations that produce safety publications.

Identifying CO Exposure

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

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

Treating CO Exposure

If you suspect that someone is suffering from exposure to CO, 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.

Warning Labels

Warning labels are posted throughout your boat to protect you, your passengers, your boat and its equipment, and any personal property on the boat. It is important to read, understand and obey all warning labels. Failure to obey a warning label may result in serious injury or damage to the boat, its equipment, or any personal property on the boat.

NOTES

NOTES

NOTES

DC Electrical System

Introduction	26
Battery Power	26
Battery Bank #1	26
Battery Bank #2	27
Battery Bank #3	27
Battery Bank #4	28
Voltmeters	29
12 Volt Equipment	30
Battery Chargers	30
Inverter	30
Battery System Monitor	31
12 Volt Circuit Breaker Panels	31
Day Breaker Panel	32
Main DC Subpanel	33
Pilothouse Overhead Panel	42
Engine Room Safety Breaker Panel	44
Davit System	49
Battery Maintenance	49
Troubleshooting the 12 Volt Electrical System	52
Wiring Schematic	54

Introduction

Your boat is equipped with a 12 volt DC (Direct Current) electrical system. This is a comprehensive system that is designed to meet your present and future 12 volt electrical needs. If your boat is equipped with the optional bow thruster, a separate 24 volt battery bank powers the thruster. Wire-runs and connections are placed and positioned to prevent abrasion and exposure to moisture, as well as to remain accessible for inspection, repairs and adding additional electrical components.

Electrical wire used throughout your boat is plastic coated and color-coded. Connections are made using crimped connector points. Your boat's electrical system is virtually maintenance free, with only the batteries requiring periodic inspection and maintenance.

Battery Power

Your boat's 12 volt DC electrical service has been separated into four battery banks:

1. Generator (one battery)
2. House (one battery)
3. Engines (two batteries)
4. Optional Bow Thruster (four batteries)

Power from each of these four battery banks is regulated through a dedicated ON/OFF master disconnect switch located in the boat's engine room. These ON/OFF switches act as master disconnects for each battery bank and must be turned to the "ON" position for the batteries to supply power to the 12 volt equipment.

Battery Bank #1

The generator is started with the aid of a single battery mounted outboard of the generator in the boat's starboard, aft bilge area directly below the cockpit. Power from this battery is supplied to the generator's starter through an ON/OFF switch mounted just below the generator. Turn the switch to the "ON" position to supply power to the generator's starter. The voltage level within this battery is maintained by the generator's alternator and by the engines' battery charger. Refer to the "**Battery Chargers Engine/Gen**" portion of **Section 3** for more information on operating the battery charger. Refer to the "**Engine Room Layout**" portion of **Section 9** for the location of this equipment.

Battery Bank #2

The 12 volt equipment controlled through your boat's four 12 volt circuit breaker panels and the optional davit system are powered by a "house" battery mounted inside the engine compartment. Power from this battery to the boat's 12 volt breaker panels is regulated through an ON/OFF switch. This ON/OFF switch is mounted in the engine room's aft, starboard bulkhead just aft of the starboard engine. Turn this switch to the "ON" position to supply power to the 12 volt breaker panels. Refer to the "**Engine Room Layout**" portion of **Section 9** for the location of this equipment

The "house" battery bank also supplies power to the boat's optional davit system. An davit system ON/OFF switch and isolated circuit breaker control power to the davit system. The ON/OFF switch acts as a master disconnect and must be turned "ON" in conjunction with the breaker to supply power to the davit system.

The charge level in the "house" battery bank is maintained by the engine alternators whenever the engines are running and by the boat's 100 amp battery charger/inverter. With AC power supplied to your boat, the battery charger/inverter automatically monitors the "house" battery and charges it whenever its voltage level drops below a predetermined point. The battery charger/inverter is mounted on the aft, starboard engine room bulkhead just aft of the starboard engine. Power is supplied to the battery charger when AC power is supplied to your boat through shore power or an available generator. Refer to the "**Battery Charger/Inverter**" portion of **Section 3** for more information on operating the battery charger. Refer to the "**Engine Room Layout**" portion of **Section 9** for the location of this equipment.

You can monitor the charge levels within the "house" battery bank by using the optional battery monitoring system mounted on the Day Breaker Panel. This panel is located in the salon above the TV. Refer to the OEM information in your Captain's Kit for details on operating the battery monitoring system.

Battery Bank #3

Each of your boat's propulsion engines is started with the aid of a dedicated battery. The battery is mounted just aft of each engine. Power from each battery to its respective engine starter is regulated through an ON/OFF switch. These ON/OFF switches are mounted on

the engine room's aft bulkhead immediately aft of their respective engine. These ON/OFF switches act as master disconnects and must be turned to the "ON" position before the engines can be started. Refer to the "**Engine Room Layout**" portion of **Section 9** for the location of this equipment.

The voltage level within the two engine batteries is monitored and maintained through a dedicated battery charger. With your boat connected to a source of AC power, this battery charger automatically maintains the voltage levels within the two engine batteries when their voltage drops below a predetermined level. This battery charger is mounted on the engine room's aft, port bulkhead just aft of the port engine. Refer to the "**Battery Chargers Engine/Gen**" portion of **Section 3** for more information on operating the battery charger. Refer to the "**Engine Room Layout**" portion of **Section 9** for the location of this equipment.

NOTE: Each engine's alternator also maintains the charge level within its respective battery whenever the engine is running.

Battery Bank #4

Power to the boat's optional bow thruster is supplied through four batteries. These four batteries are wired in series to create a source of 24 volt power. Power from this four 24 volt battery bank to the bow thruster controls is regulated through a dedicated ON/OFF switch. This ON/OFF switch is mounted on the engine room's aft, port bulkhead. The ON/OFF switch acts as a master disconnect and must be turned to the "ON" position before the bow thruster can operate. An in-line fuse protects the circuitry between this battery bank and the bow thruster motor.

Voltage levels within this battery bank are regulated through a dedicated bow thruster battery charger. This battery charger is mounted on the engine room's aft, port bulkhead just aft the port engine. With the Bow Thruster Battery Charger circuit breaker on the Main AC Subpanel "ON" and power supplied to your boat either through shore power or the onboard generator, the bow thruster battery charger automatically charges the bow thruster battery bank whenever the voltage drops below a predetermined level. Refer to the "**Bow Thruster Battery Charger**" portion of **Section 3** for more information on operating the battery charger.

Refer to the "**Engine Room Layout**" portion of **Section 9** for the location of this equipment.

Voltmeters

Use the house and engine voltmeters to monitor the level of voltage in the battery banks.

"House" Battery Bank

You can determine the charge level within the house battery bank using the optional Link 1000 system monitor mounted on the Day Breaker Panel. This panel is located in the salon above the TV. When the "house" master disconnect switch is "ON" and the Main DC Subpanel circuit breaker and Pilothouse circuit breaker on the Day Breaker Panel are also "ON", this battery monitor system measures and indicates the voltage level within the house battery bank. The battery monitoring system also indicates the current load rate and the estimated life of batteries' charge at the current rate of usage. Refer to the OEM information for details on operating the battery monitoring system.

If the voltage level in the "house" battery bank becomes too low, recharge the battery bank by either running the engines or supplying AC power to the house battery charger/inverter. Refer to the "**Inverter/Charger**" portion of **Section 3** for more information on charging the house battery bank.

Engine Batteries



Read, understand and follow the procedures described in Section 5 before starting your boat's engines. Improper starting procedures may create hazardous situations.

You can determine the voltage level within each engine battery by activating the battery's dedicated voltmeter. These voltmeters are grouped within each engine's combined gauge at both the upper and lower helm stations. For each engine, a single gauge provides information on engine temperature, oil pressure, fuel level, and battery voltage level. To activate each engine's gauge, turn the appropriate ignition key one position to the right.

NOTE: *You do not need to start the engine to activate its gauge. Refer to the OEM information for details on operating the engines.*

12 Volt Equipment

While the engines are running, 12 volt equipment can be used with little concern for excess battery discharge. The power generated by the engine alternators is usually more than adequate to replace any power consumed by 12 volt equipment.

However, without an engine running, a battery will discharge as it powers 12 volt equipment. Operating 12 volt equipment without the engines running or the battery charger functioning will eventually completely discharge the battery. The condition of your batteries can be monitored by referencing the voltmeters.

Fully charged batteries that have not been charged or discharged for at least 2 hours should indicate between 12.3 and 12.6 volts. A reading below this level indicates a partly discharged battery.

Battery Chargers

Your boat is equipped with three standard battery chargers mounted in the engine room. These battery chargers require an AC power source, either through a shore power connection or the onboard generator, to recharge the 12 volt battery banks.

When active, each battery charger monitors the voltage level within its respective battery bank. When the voltage level drops below a predetermined point, the charger automatically recharges the battery bank. With your boat connected to an AC power source and your battery charger operating, you can use 12 volt equipment (such as cabin lights) with little concern for discharging the boat's batteries. Refer to the "**Engine Room Layout**" portion of **Section 9** for the location of the battery chargers.

Inverter

Your boat is equipped with an inverter/battery charger. As a battery charger, this unit maintains the voltage level within the house battery bank whenever the boat is connected to an AC power source, either through a shore power source or the onboard generator.

As an inverter, this unit can be used to power some of the boat's equipment that normally operates using AC power. The inverter converts the boat's 12 volt DC power to AC power. Therefore, whenever your boat is away from a source of AC shore power and the generator is not running, the inverter allows you to operate the salon entertainment center, refrigerator/freezer, and the optional bridge ice maker using the 12 volt "house" battery bank.

NOTE: *Using the inverter in this manner will eventually discharge the "house" battery bank. Use the voltmeter to monitor the voltage level within the "house" battery bank whenever you operate equipment using the inverter.*

Refer to the "**Inverter/Charger**" portion of **Section 3** for more information on operating the inverter.

Battery System Monitor

The optional Link 1000 battery monitoring system is designed to help manage your "house" 12 volt power levels. The monitoring system interface is mounted above the Day Breaker Panel in the salon above the TV. Refer to the OEM information for details on operating the battery monitoring system.

12 Volt Circuit Breaker Panels

Twelve volt (direct current) power is managed throughout your boat using four 12 volt circuit breaker panels.

- Day Breaker Panel
- Main DC Subpanel
- Pilothouse Overhead Panel.
- Engine Room Safety Breaker Panel

The circuit breakers on these panels enable you to control the electricity to the boat's various 12 volt systems by switching the breakers ON or OFF. They also protect the electrical system by automatically disconnecting the circuit from the power source in the event of a short or overload. Power is supplied to these four circuit breaker panels by the "house" battery bank.



WARNING

Never reset a breaker that has been automatically tripped without first correcting the problem. Failure to

follow this procedure may create a dangerous situation.

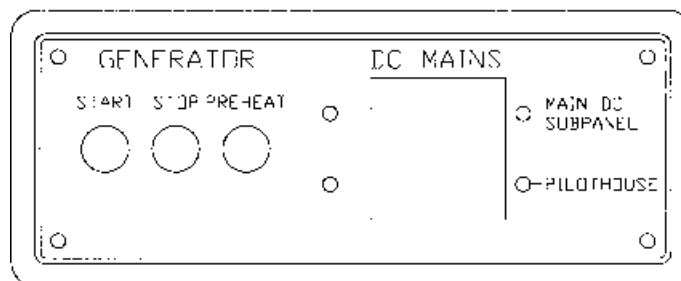
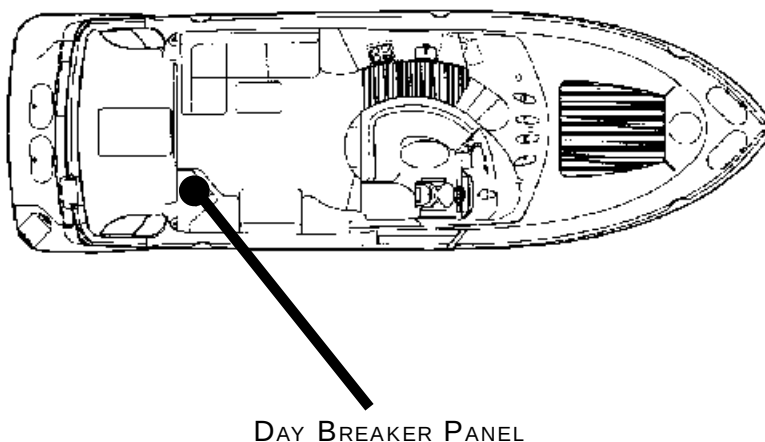
NOTE: Sometimes a circuit breaker location is labeled but no circuit breaker is present. In this case, the component named on the label is an option that is not installed on your boat.

Day Breaker Panel

The Day Breaker Panel, located above the TV in the salon, manages the power supply to the Main DC Subpanel and the Pilothouse Overhead Panel. To provide power to the Day Breaker Panel, turn "ON" the master disconnect "House" switch mounted on the engine room's starboard, aft bulkhead. The Day Breaker Panel contains three sets of controls, described below.

Generator

Use these controls to start, stop, and preheat the on-board generator.



Main DC Subpanel

This breaker protects the circuitry between the Main DC Subpanel and the “house” battery. This breaker must be "ON" for electricity to reach the Main DC Subpanel.

Pilothouse

This breaker protects the circuitry between the Pilot-house Breaker Panel and the “house” battery. This breaker must be "ON" for electricity to reach the Pilot-house Breaker Panel.

Main DC Subpanel

The Main DC Subpanel, located in a locker opposite the galley stove, manages the power supply to the 12 volt “house” equipment and helm controls. To provide power to this breaker panel, first turn "ON" the master disconnect “House” switch mounted on the engine room’s starboard, aft bulkhead, then switch "ON" the Main DC Subpanel circuit breaker on the Day Breaker Panel. The Main DC Subpanel controls power to the systems described below.

Salon Lights

This breaker controls the flow of electricity to the light switches in the salon. To supply power to the switches, switch this breaker "ON."

Galley Lights

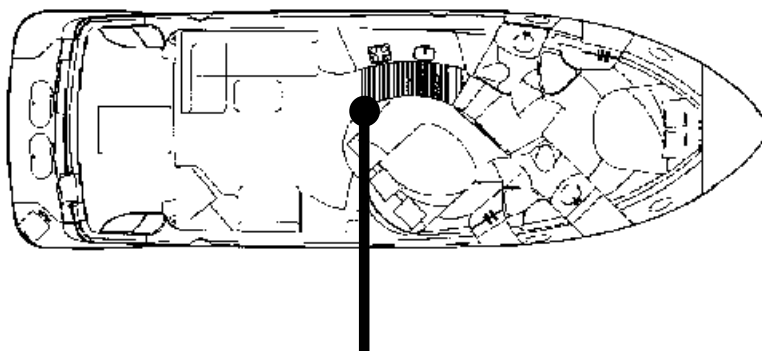
This breaker controls the flow of electricity to the light switch in the galley. To supply power to the switch, switch this breaker "ON."

Pilothouse Lights

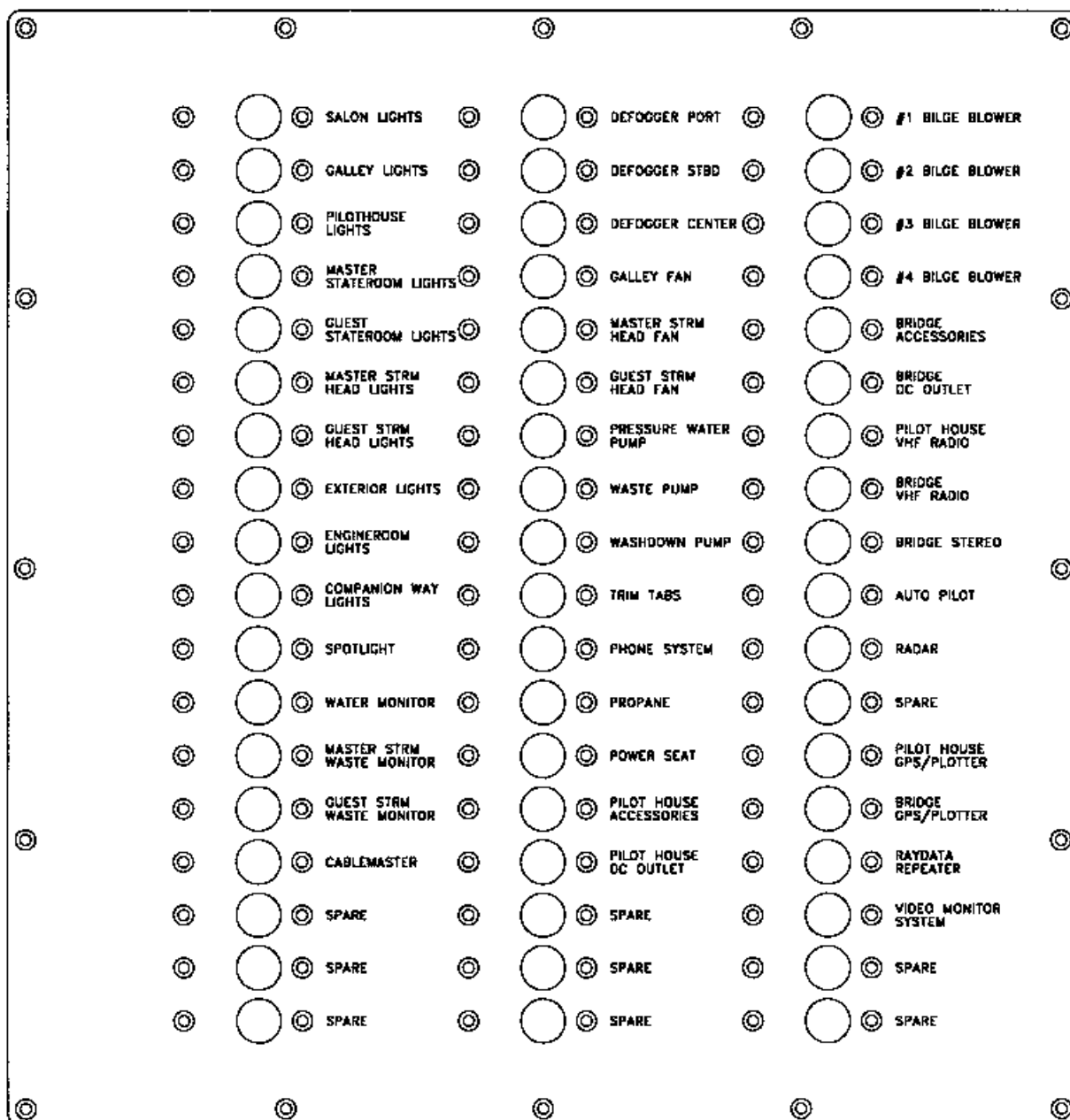
This breaker controls the flow of electricity to the light switch in the pilothouse. To supply power to the switch, switch this breaker "ON."

Master Stateroom Lights

This breaker controls the flow of electricity to the light switches in the master stateroom. To supply power to the switches, switch this breaker "ON".



MAIN DC SUBPANEL



Guest Stateroom Lights

This breaker controls the flow of electricity to the light switch in the guest (forward) stateroom. To supply power to the switch, switch this breaker "ON".

Master Stateroom Head Lights

This breaker controls the flow of electricity to the light switch in the master stateroom's head. To supply power to the switch, switch this breaker "ON".

Guest Stateroom Head Lights

This breaker controls the flow of electricity to the light switch in the guest stateroom's head. To supply power to the switch, switch this breaker "ON".

Exterior Lights

This breaker controls the flow of electricity to the courtesy lights in the cockpit and throughout the boat's exterior. To turn these lights on, switch this breaker "ON".

Engine Room Lights

This breaker controls the flow of electricity to the engine room's light switch. The switch is located in the forward, starboard corner of the cockpit. To supply power to the switch, switch this breaker "ON".

Companionway Lights

This breaker controls the flow of electricity to the companionway's light controls. The controls are located on the wall at the entrance to the companionway. To supply power to the controls, switch this breaker "ON". The companionway lights illuminate the companionway leading from the galley to the lower deck.

Spot Light

This breaker controls the flow of electricity to the controls for the optional spot light. The controls are located on the lower helm instrument panel. To supply power to the controls, switch this breaker "ON". Refer to the OEM information for details on operating the spot light.

Water Monitor

This breaker controls the flow of electricity to the water monitor gauge. The gauge, located next to the AC System Mains Panel, indicates the amount of water in your boat's fresh water tanks. To supply power to the gauge, switch this breaker "ON".

Master Stateroom Waste Monitor

This breaker controls the flow of electricity to the port waste tank's waste monitor. The monitor, located inside the medicine cabinet in the master stateroom head, indicates the amount of waste in the port waste tank. To supply power to the monitor, switch this breaker "ON".

Guest Stateroom Waste Monitor

This breaker controls the flow of electricity to the starboard waste tank's waste monitor. The monitor, located in the guest stateroom head, indicates the amount of waste in the starboard waste tank. To supply power to the monitor, switch this breaker "ON".

Grey Water Tank Monitor

This breaker controls the flow of electricity to the monitor for the optional grey water tank. The monitor, located next to the Day Breaker Panel, indicates the amount of water in the grey water tank. To supply power to the monitor, switch this breaker "ON".

Cablemaster

This breaker controls the flow of electricity to the controls for the optional cablemaster. The cablemaster assists in retracting and storing your boat's built-in shore power cord. The cablemaster controls are located in the transom. To supply power to the controls, switch this breaker "ON". Refer to the OEM information for details on operating the cablemaster.

Spare

This breaker is reserved for aftermarket accessories you would like to install on your boat.

Spare

This breaker is reserved for aftermarket accessories you would like to install on your boat.

Defogger Port

This breaker controls the flow of electricity to the lower helm's port window defogger switch, located on the lower helm's overhead console. To supply power to the switch, switch this breaker "ON". Turn the defogger switch on to help remove any condensation that builds up on the port windshield.

Defogger Starboard

This breaker controls the flow of electricity to the lower helm's starboard window defogger switch, located on the lower helm's overhead console. To supply power to the switch, switch this breaker "ON". Turn the defogger switch on to help remove any condensation that builds up on the starboard windshield.

Defogger Center

This breaker controls the flow of electricity to the lower helm's center window defogger switch, located on the lower helm's overhead console. To supply power to the switch, switch this breaker "ON". Turn the defogger switch on to help remove any condensation that builds up on the center windshield.

Galley Fan

This breaker controls the flow of electricity to the galley fan switch. The fan allows you to vent galley air containing odors, smoke, and moisture to the outside. To supply power to the switch, switch this breaker "ON."

Master Stateroom Head Fan

This breaker controls the flow of electricity to the exhaust fan switch in the master stateroom's head. To supply power to the switch, switch this breaker "ON".

Guest Stateroom Head Fan

This breaker controls the flow of electricity to the exhaust fan switch in the guest stateroom's head. To supply power to the switch, switch this breaker "ON".

Vent Motor

This breaker controls the flow of electricity to the vent fan switch in the salon. The vent fan draws outside air into the salon. To supply power to the switch, switch this breaker "ON".

Pressure Water Pump

This breaker controls the flow of electricity to the water system's pressure water pump. After your water tank is filled, switch this breaker "ON" to activate the pressure water pump. Refer to the "**Priming the Water System**" portion of **Section 4** for information on filling and priming your water system using this pressure pump.

Waste Pump

This breaker controls the flow of electricity to the waste pump switch for the optional overboard discharge system. Use the waste pump to empty your waste tanks directly overboard. The switch is located in the forward, starboard corner of the engine room just inboard of the starboard waste tank. To supply power to the switch, switch this breaker "ON." Refer to the "**Direct Overboard Discharge**" portion of **Section 4** for the proper use of this pump.

Washdown Pump

This breaker controls the flow of electricity to the boat's optional bow and transom raw water washdown pump. To activate the washdown pump, switch this breaker "ON". When you are finished, turn the washdown pump off by switching this breaker "OFF". Refer to the "**Raw Water Washdown**" portion of **Section 4** for information on operating the washdown.

Trim Tabs

This breaker controls the flow of electricity to the trim tab controls at the helm station. Trim tabs are used to improve the running angle of your boat while underway. Switch this breaker "ON" to activate the trim tab controls. Refer to the "**Trim Tabs**" portion of **Section 6** for more information on using the trim tabs.

Phone System

This breaker controls the flow of electricity to the boat's telephone system. To use a telephone on your boat, first connect a shore telephone line to the phone connector located on the transom. Then, connect a telephone to the phone jack in the boat. Finally, switch this breaker "ON". The phone then operates in the same manner as the phone in your home.

Propane

This breaker controls the flow of electricity to the boat's optional propane stove. Before switching this breaker "ON", read both the propane stove OEM information and the "**Propane Stove**" portion of **Section 4**.

Power Seat

This breaker controls the flow of electricity to the controls that adjust the lower helm's captain's seat. The controls are stored in a pouch at the rear base of the seat. Switch this breaker "ON" to activate the controls. Refer to the OEM information for details on using the captain's chair adjustment controls.

Pilothouse Accessories

This breaker controls the flow of electricity to any aftermarket accessories installed at the lower helm. Switch this breaker "ON" to activate these accessories. Refer to the accessories' manuals for information on operating the accessories.

Pilothouse DC Outlet

This breaker controls the flow of electricity to the 12 volt outlet located at the lower helm. You can operate various types of 12 volt equipment from the outlet, such as a cellular phone, spot light, and laptop computer. Switch this breaker "ON" to activate the outlet.

Spare

This breaker is reserved for aftermarket accessories you would like to install on your boat.

Spare

This breaker is reserved for aftermarket accessories you would like to install on your boat.

Bilge Blowers 1 - 4



DANGER

Always run the bilge blowers for at least 4 minutes before starting the boat's engines or the generator.

These four breakers control the flow of electricity to the bilge blower controls at both helms. Switch these breakers "ON" to activate the controls.

Before you turn on the boat's engines or generator, activate the bilge blowers. The blowers remove any flammable vapor that may have accumulated in the engine room, thus preventing the possibility of an explosion when the engines or generator start.

Bridge Accessories

This breaker controls the flow of electricity to any aftermarket accessories installed at the flybridge helm. Switch this breaker "ON" to activate these accessories. Refer to the accessories' manuals for information on operating the accessories.

Bridge DC Outlet

This breaker controls the flow of electricity to the 12 volt outlet located at the flybridge helm. You can operate various types of 12 volt equipment from the outlet, such as a cellular phone, spot light, and laptop computer. Switch this breaker "ON" to activate the outlet.

Pilothouse VHF Radio

This breaker controls the flow of electricity to the lower helm's optional VHF radio. Switch this breaker "ON" to activate the VHF radio. Refer to the OEM information for details on operating the radio.

Bridge VHF Radio

This breaker controls the flow of electricity to the flybridge's optional VHF radio. Switch this breaker

"ON" to activate the VHF radio. Refer to the OEM information for details on operating the radio.

Bridge Stereo

This breaker controls the flow of electricity to the flybridge's optional stereo. To supply power to the stereo, switch this breaker "ON". Refer to the OEM information for details on operating the stereo.

Auto Pilot

This breaker controls the flow of electricity to the optional auto pilot. Switch this breaker "ON" to activate the auto pilot. Refer to the OEM information for details on operating the auto pilot.

Radar

This breaker controls the flow of electricity to the optional radar system. Switch this breaker "ON" to activate the radar system. Refer to the OEM information for details on operating the radar.

Spare

This breaker is reserved for aftermarket accessories you would like to install on your boat.

Loran/GPS

This breaker controls the flow of electricity to the optional Loran and Global Positioning System. Switch this breaker "ON" to activate the Loran and GPS. Refer to the OEM information for details on operating the Loran and GPS.

Chart Plotter

This breaker controls the flow of electricity to the optional plotter. Switch this breaker "ON" to activate the plotter. Refer to the OEM information for details on operating the plotter.

Ray Data Repeater

This breaker controls the flow of electricity to the optional repeater. Switch this breaker "ON" to activate the repeater. Refer to the OEM information for details on operating the repeater.

TV Monitor System

This breaker controls the flow of electricity to the optional TV monitor system. The system includes video cameras in the engine room and at the aft of the boat, and a video monitor at the lower helm. Use these cameras to monitor the engine room and stern when running or docking. Switch this breaker "ON" to activate the TV monitor system. Refer to the OEM information for details on operating the system.

Spare

This breaker is reserved for aftermarket accessories you would like to install on your boat.

Spare

This breaker is reserved for aftermarket accessories you would like to install on your boat.

Pilothouse Overhead Panel

The Pilothouse Overhead Panel, located above the captain's chair at the lower helm, manages the power supply to different equipment used when cruising.

Each control on this panel has its own circuit breaker which is normally "ON". If a circuit breaker trips, identify and correct the cause of the problem, then press the breaker's reset button, which is located below its control on the bottom of the panel.

To provide power to this panel, first turn "ON" the master disconnect "House" switch mounted on the engine room's starboard, aft bulkhead, then switch "ON" the Pilothouse circuit breaker on the Day Breaker Panel. The Pilothouse Overhead Panel controls are described below.

Forward, Mid, and Aft Bilge Pumps



CAUTION

Don't forget to turn the bilge pumps off. Leaving the forward, mid or aft bilge pump on for extended periods of time could cause excessive wear to the pump.

A TIP FROM CARVER!

A certain amount of water will always collect in your boat's bilge, especially in the bilge area where the shaft logs are located. The small amount of water that normally accumulates is usually not enough to activate the bilge pumps' automatic float switch. While underway and on plane, use the helm station switch to turn your bilge pumps on manually and let them run for 30 seconds to a minute.

These switches activate the forward, amidships, and aft bilge pumps, respectively. Turn these switches to their up position to turn on the pumps.

Panel Lights

This switch activates the lower helm's instrument panel backlights. Turn this switch to its up position to illuminate the lights. Turn on these lights when the natural light level is insufficient to clearly view the instrument panel.

Anchor Light

This switch activates the anchor light. Turn this switch to its up position to illuminate the light.

Navigation Lights

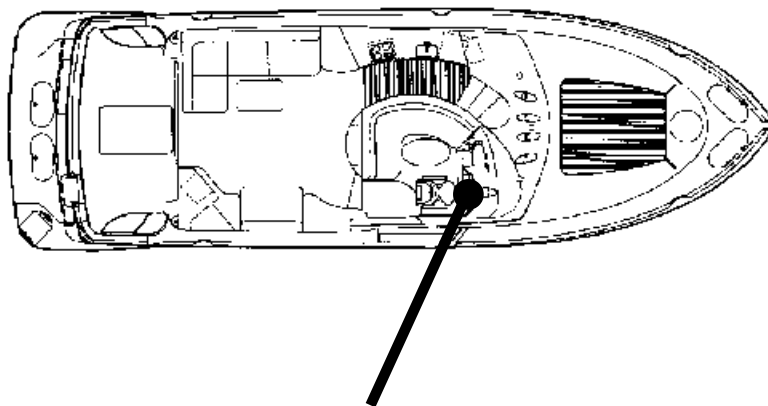
This switch activates the navigation lights. Turn this switch to its up position to illuminate the lights.

Docking Lights

This switch activates the docking lights. Turn this switch to its up position to illuminate the lights.

Wiper Port

This switch activates the port windshield wiper. Turn this switch to its up position to turn on the wiper.



PILOTHOUSE BREAKER PANEL

Wiper Center

This switch activates the center windshield wiper. Turn this switch to its up position to turn on the wiper.

Wiper Starboard

This switch activates the starboard windshield wiper. Turn this switch to its up position to turn on the wiper.

Windshield Washer

This switch activates the windshield washer system. This system works the same as on an automobile. Turn the switch to its up position to spray washer fluid on the windshield.

Defogger

This switch activates the lower helm windshields' defogger fans. To turn on the fans, switch the Defogger Port, Starboard, and/or Center circuit breakers on the Main DC Subpanel "ON", then turn the Defogger switch to its up position.

Horn

This switch activates the horn. Turn the switch to its up position to sound the horn.

Windlass On/Off and Up/Down

The Windlass On/Off switch controls the flow of electricity to the Windlass Up/Down switch. To activate the windlass, turn the On/Off switch "ON", then turn the Up/Down switch to either the "UP" position to raise the anchor or the "DOWN" position to lower the anchor. Refer to the OEM information for details on operating the windlass.

Engine Room Safety Breaker Panel

The Engine Room Safety Breaker Panel, located in the engine room on the bulkhead aft of the starboard engine, manages the power supply to various safety and other equipment.

Because of the importance of the safety equipment, the circuit breakers on this panel should remain "ON" at all times. If a circuit breaker trips, immediately identify

and correct the cause of the problem, then reset the breaker.

Power is always provided to this panel. The Engine Room Safety Breaker Panel circuit breakers are described below.

Auto Bilge Pump - Forward, Mid, and Aft

These breakers control the flow of electricity to the bilge pumps. Each pump is activated automatically by a float switch whenever water within the bilge rises to a predetermined level. These breakers must be "ON" whenever the boat is in the water.

NOTE: *Because the bilge pumps are "hard-wired" to the breaker panel, they operate automatically regardless of the position of the bilge pump breakers. Periodically test each float switch by lifting the float. The pump should turn on when the float is lifted.*

Auto Sump

This breaker controls the flow of electricity to the sump pump. Because the sump is located below the boat's water line, a sump pump is needed to pump shower and sink waste water overboard or into the optional grey water tank. The sump pump is activated automatically by a float switch whenever water within the sump rises above a predetermined level. Switch the Auto Sump circuit breaker "ON" before using the shower or sink in the heads.

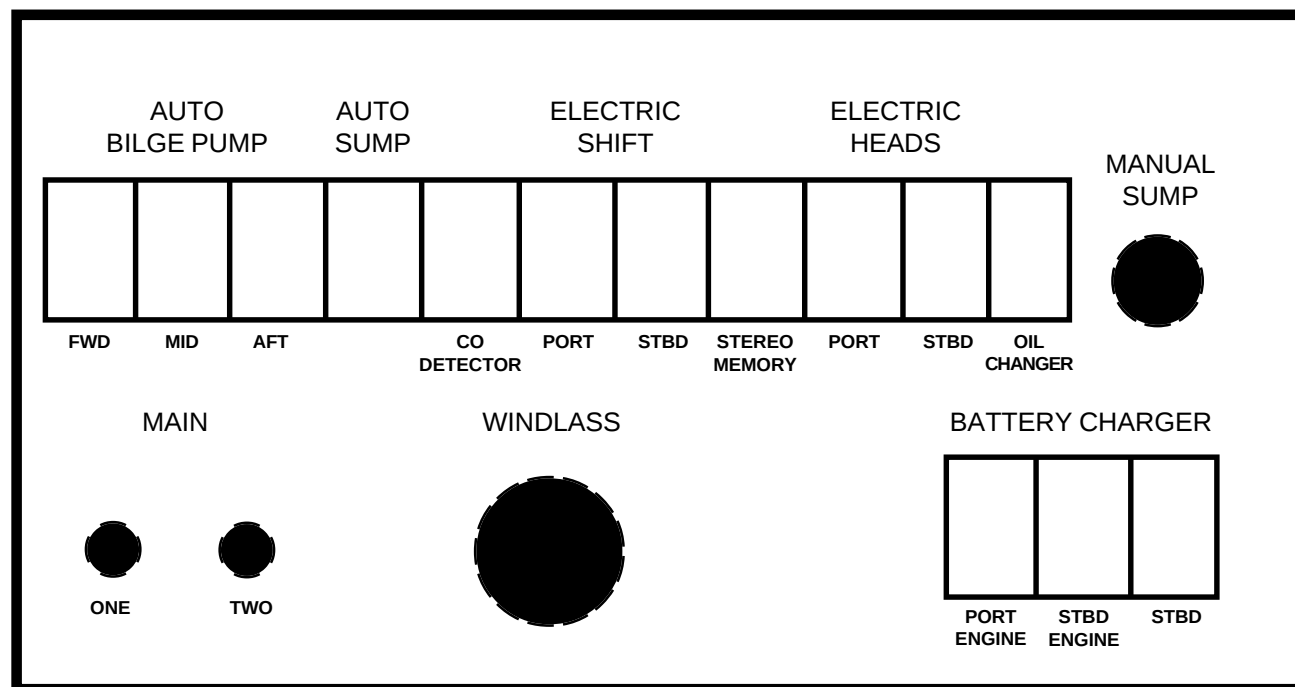
NOTE: *Because the condensation from the two state-room air conditioning units drains into the sump, the Auto Sump circuit breaker must be "ON" whenever these two air conditioning units are on.*

CO Detector



Always activate the CO detectors when the boat's engines or generator are running. Carbon monoxide is dangerous. Refer to Section 1 of this Owner's Guide for information on minimizing, detecting and controlling carbon monoxide accumulation.

ENGINE ROOM SAFETY BREAKER PANEL



ENGINE ROOM AFT, STARBOARD BULKHEAD

Carver has installed several carbon monoxide (CO) detectors on your boat for your safety. This breaker must be "ON" for the CO detectors to operate.

The CO detectors monitor the air throughout the boat's cabin for the presence of carbon monoxide. Carbon monoxide is a colorless and odorless gas that is present in engine and generator exhaust fumes. Carbon monoxide is a very dangerous gas that is potentially lethal when inhaled.

When your CO detectors are activated, they alert you to the presence of carbon monoxide in the cabin by emitting a loud, high pitched sound. When you hear this alarm, determine the cause and correct it immediately.

There is a test button on each CO detector. Test each unit on a weekly basis. If you suspect that a CO detector is faulty, have your dealer repair or replace it immediately. More information concerning carbon monoxide is included in **Section 1** of this Owner's Guide.

Electric Shift - Port and Starboard

These breakers control the flow of electricity to the electronic shift levers at both helms. The shift levers control the direction of the boat: forward, neutral, or reverse. The port shift lever controls the port engine; the starboard shift lever controls the starboard engine. Switch these breakers "ON" to activate the shift levers. Refer to the "**Shift/Throttle**" portion of **Section 5** for more information on operating the shift levers.

Stereo Memory

This breaker controls the flow of electricity to the boat's stereo system. This breaker should always be "ON" to maintain the information programmed into the stereo's memory. If this breaker is ever switched "OFF", you will have to reprogram the stereo. Refer to the OEM information for details on programming the stereo.

Electric Heads - Port and Starboard

These breakers control the flow of electricity to the optional electric toilet pumps. The port head is the guest stateroom head; the starboard head is the master stateroom head. Pressing the button labeled "FLUSH"

then flushes the toilet. Refer to the OEM information for details on operating the electric heads.

NOTE: *If your boat is equipped with a Vacu-Flush head, switch this breaker "ON" to activate the vacuum pump. Pressing the foot lever at the base of the toilet then flushes the toilet.*

Oil Changer

This breaker controls the flow of electricity to the boat's optional oil change pump. The pump is located in the engine room and is designed to assist you in changing the propulsion and generator engine oil. Switch this breaker "ON" to enable the pump. Refer to the OEM information for details on operating the oil change pump.

Manual Sump

Use this control to manually operate the sump pump. Pull the control out to turn on the sump pump. Push the control in to turn off the sump pump. Use this control if you wish to drain the sump when there is not enough water in the sump to automatically activate the sump pump.

Main - One

This breaker protects the circuitry between the Pilot-house Overhead Panel and the "house" battery. This breaker must be "ON" for electricity to reach the Pilot-house Overhead Panel.

Main - Two

This breaker protects the circuitry between the Main DC Subpanel and the "house" battery. This breaker must be "ON" for electricity to reach the Main DC Subpanel.

Windlass

This breaker controls the flow of electricity to the controls that operate the optional windlass. The windlass controls are located at each helm. Switch this breaker "ON" to activate the controls. Refer to the OEM information for details on operating the windlass.

Battery Charger - Port Engine

This breaker protects the circuitry between the battery charger and the port engine battery. When the breaker is "ON" and the battery's voltage decreases below a predetermined level, the battery charger automatically charges the battery.

Battery Charger - Starboard Engine

This breaker protects the circuitry between the battery charger and the starboard engine battery. When the breaker is "ON" and the battery's voltage decreases below a predetermined level, the battery charger automatically charges the battery.

Battery Charger - Generator

This breaker protects the circuitry between the battery charger and the generator battery. When the breaker is "ON" and the battery's voltage decreases below a predetermined level, the battery charger automatically charges the battery.

Davit System

If your boat has the optional davit system, an isolated circuit breaker and master disconnect switch, located in the engine room, provide power to the system. To activate the davit, switch the breaker "ON", then turn the master disconnect switch to the "ON" position. Electricity to the davit system comes from the "house" battery. Refer to the OEM information for details on operating the davit system.

Battery Maintenance

Your boat's DC electrical system is powered by 12 volt batteries located throughout the engine room. If your boat is equipped with the optional bow thruster, an additional bank of four batteries supplies power to the thruster.

While your boat's batteries are relatively maintenance-free, there are a few things you can do to increase their effectiveness and life.

**DANGER**

Your boat's batteries contain electrolyte which is an acid. Wear gloves and protective eye glasses when working on and around the batteries.

When servicing your boat's batteries avoid spilling electrolyte into the engine compartment or bilge. Also, avoid getting any salt water in or on the battery. Either of these conditions could create a poisonous gas that is harmful if inhaled.

If you spill electrolyte, ventilate the area. Neutralize the acid in the electrolyte by pouring baking soda on the spill. Remove the neutralized electrolyte using a disposable rag or paper towel.

Maintaining Your Batteries

1. Keep your batteries fully charged. Batteries that are kept fully 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.
2. Inspect your boat's batteries at least once every 30 days.

**WARNING**

Disconnect the batteries before cleaning them.

3. 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.

4. Check that the battery cables are securely attached to the terminal posts. Tighten the terminal wing nuts 1/4 turn beyond finger tight using a pliers.
5. Check the level of electrolyte in each cell of each battery. The correct level is just above the plates. If

the fluid level is low, top off the cell with DISTILLED water only. DO NOT OVERFILL.

Remove the batteries from the boat during periods of extended storage. Store your batteries in a cool (above freezing temperature), dry area. All batteries lose some charge during storage, but the lower the temperature the less loss of charge. Avoid storing the batteries in a humid place. Humidity causes the terminals to corrode.

Check the battery charge level every three months using a hydrometer or voltmeter. If the specific gravity of the battery is less than 1.225 or the voltage is less than 12.4 volts, charge the battery. Avoid overcharging.

Troubleshooting the 12 Volt Electrical System

Problem	Possible Cause	Possible Solution
12 volt equipment does not function.	Battery bank master disconnect switch is in the "OFF" position.	Turn the switch to the "ON" position.
	Main - One or Main - Two circuit breaker on the Engine Room Safety Breaker Panel is "OFF".	Turn both circuit breakers "ON".
	Main DC Subpanel or Pilot-house circuit breaker on the Day Breaker Panel is "OFF".	Turn both circuit breakers "ON".
	Battery is weak or dead.	Start the engines or activate the battery chargers.
Individual 12 volt component does not function.	Circuit breaker for that component is "OFF".	Switch the circuit breaker for that component "ON".
	Battery is weak or dead.	Start the engines or activate the battery chargers.
	A wire within the 12 volt system is loose or disconnected.	Locate and repair the wire.
Cabin lights do not come on or are dim.	The Salon Lights, Galley Lights, Pilothouse Lights, Master Stateroom Lights, Guest Stateroom Lights, Master Stateroom Head Lights, Guest Stateroom Head Lights, or Companion Way Lights circuit breaker on the Main DC Subpanel is "OFF".	Switch appropriate circuit breaker "ON".
	Battery is weak or dead.	Start the engines or activate the battery chargers.
	One or more light bulbs are burned out.	Replace light bulb(s).

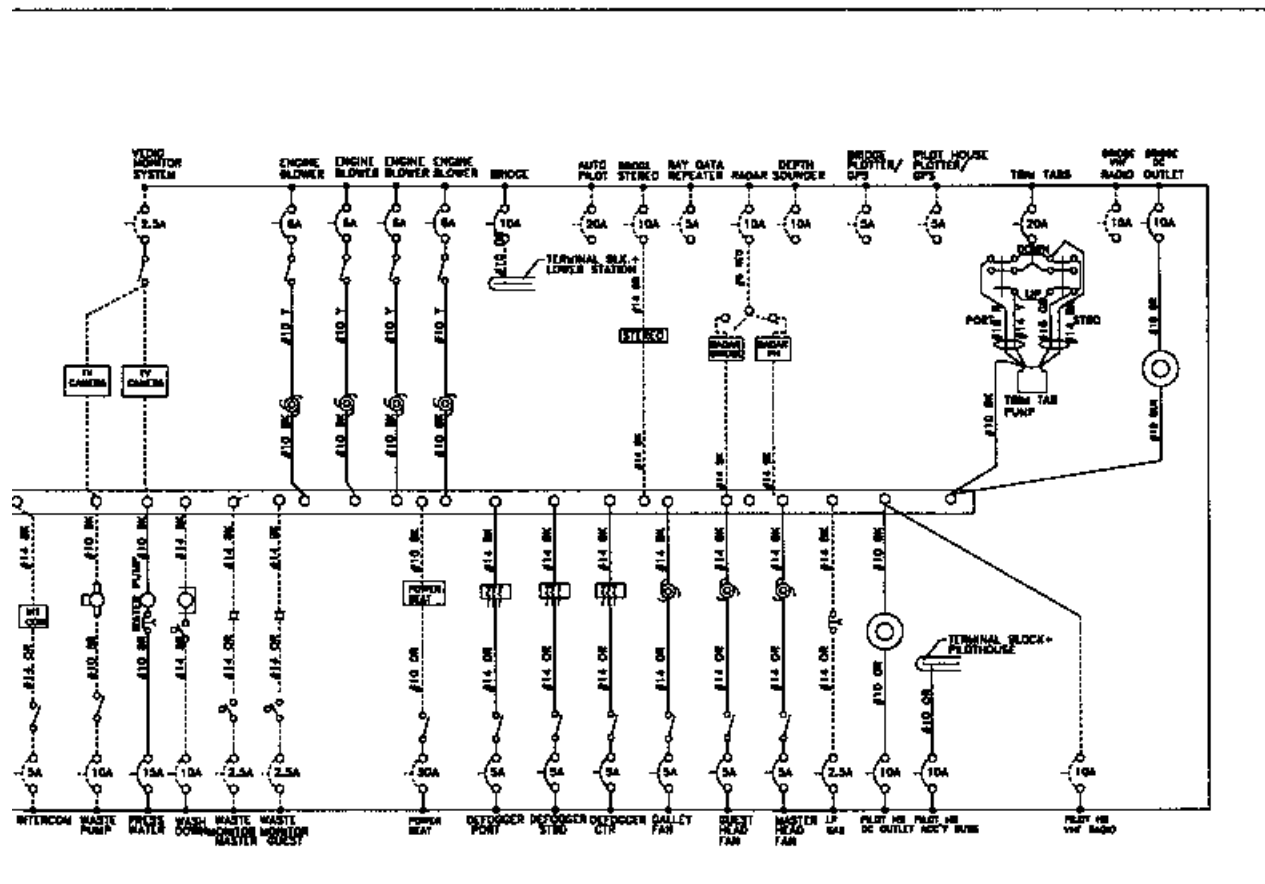
Problem	Possible Cause	Possible Solution
Battery does not hold a charge.	Battery failed.	Replace with a new battery.
Engine is running and voltmeter does not indicate adequate voltage.	Engine alternator belt is loose.	Refer to engine OEM information in your Captain's Kit to tighten the belt.

DC ELECTRICAL SYSTEM



4527 5/04

DC ELECTRICAL SYSTEM (CONTINUED)



NOTES: OPTIONAL EQUIPMENT
RE 254 BREAKERS

Revised 12/19/97

NOTES

NOTES

NOTES

AC Electrical System

Introduction	60
AC Power Sources	61
Shore Power.....	61
Generator Power.....	64
AC Circuit Breaker Panels	68
European AC Electrical System Circuit Breaker	68
AC System Mains Panel	69
Main AC Subpanel.....	72
Ground Fault Circuit Interrupters	80
Electrical Loads	82
Bonding System	84
Troubleshooting the AC Electrical System	86
AC Wiring Schematic (110 Volt)	88
AC Wiring Schematic (220 Volt)	90

Introduction

Your boat is equipped with a 50 amp AC (alternating current) electrical system. The power for this system is supplied by either a shore power source or the onboard generator. All AC power is routed through the AC System Mains Panel, which is located above the TV in the salon. If your boat was built for use in Europe, all AC power runs through an AC Electrical System circuit breaker, located inside the port locker on the aft of the transom, before it runs to the AC System Mains Panel. The indicator lights above the circuit breakers on your AC System Mains Panel indicate which source your AC electrical system is receiving power from. The procedures for connecting to shore power and generator power are explained later in this section.

When power enters the Main AC Subpanel, it splits into a single 50 amp, 220 volt line and either two separate 50 amp, 110 volt lines (for North American and Pacific Rim countries) or two separate 50 amp, 220 volt lines (for European countries). A label on the AC System Mains Panel indicates whether the latter two lines are 110 volt or 220 volt. The single 220 volt line provides power to the optional air conditioning system. The two 110 volt lines provide power to the rest of the AC electrical system.

Wiring System

The AC electrical system on your boat uses four color-coded wires.

The black and red wires carry the current from the power source to the equipment or receptacle. Each black and red wire is connected to and protected by a circuit breaker that is installed in the AC power panel.

The white wire carries the current from the equipment or receptacle back to the power source.

Ground wires are either green or bare copper. During normal operation, current does not flow through the ground wires.

Buss bars are used within the AC electrical system to help route and organize the wires. The system's white or neutral wires are connected together at buss bars. The ground wires are also connected together at a separate buss bar.

**DANGER**

Do not touch the black, red, or white wires while the AC electrical system is connected to a power source. These wires carry enough current to kill or cause serious injury.

AC Power Sources

You can supply power to your boat's AC electrical system by using either a shore power source or your boat's onboard generator.

Shore Power

Depending on the specific shore power connection options on your boat, there may be:

- a single shore power receptacle, located on the boat's transom, for the non-air conditioning systems.
- an additional shore power receptacle, located on the boat's transom, for the optional air conditioning system,
- a single Cablemaster, on the boat's transom, which provides power to both the optional air conditioning system and the rest of the AC electrical system,
- a second shore power receptacle, located forward of the starboard companionway door near amidships, for the non-air conditioning systems.
- an additional shore power receptacle, located forward of the starboard companionway door near amidships, for the optional air conditioning system.

NOTE: *Remove all perishables from your refrigerator if you leave your boat for more than forty-eight hours. The power supply to your refrigerator may be interrupted and your food may spoil.*

To connect to shore power:

**DANGER**

Do not supply power to the water heater when it is empty. Doing so may damage the unit's heating element and cause a fire.

1. Switch "OFF" the Water Heater circuit breaker on the Main AC Subpanel. Do not switch the breaker on again until your boat's fresh water system and water heater have been filled, pressurized and primed.
2. Make sure the Shore One, Generator, and optional Shore Two circuit breaker groups on the AC System Mains Panel are switched "OFF".

**DANGER**

Make sure the shore power cord you use is in excellent condition with no cuts, nicks or abrasions in the exterior plastic cover. Also make sure that the cord is specifically designed to connect your boat to a shore power source. Using a damaged cord or a cord that is not designed for this purpose can cause electrical shock resulting in death or serious injury.

3. Locate your 50' shore power cord(s) or the boat's optional Cablemaster. If you have a Cablemaster, proceed to step 6.
4. Connect the female end of the shore power cord(s) to the boat's shore power receptacle(s).
5. Secure the nonmetallic threaded locking ring that locks the shore power cord(s) to the boat's shore power receptacle(s). This prevents accidental disconnection or arcing due to a gap between the cord plug(s) and the receptacle(s).

**WARNING**

Do not allow the end of the shore power cord(s) to hang in the water. This can cause an electrical field to form which can kill or seriously injure nearby swimmers or passengers.

6. Choose a neat and safe way to route the shore power cord(s) to the shore power source.
7. Switch "OFF" the circuit breaker that is installed in the shore power source box.

8. Plug the male end of the shore power cord(s) into the shore power source box.
9. Secure the nonmetallic threaded locking ring that locks the cord(s) to the shore power source outlet(s). This prevents accidental disconnection or arcing due to a gap between the cord plug(s) and the outlet(s).
10. Switch "ON" the circuit breaker that is installed in the shore power source box.
11. Switch "ON" the AC Main circuit breaker next to the shore power receptacle(s) or optional Cablemaster on your boat.
12. If your boat was built for use in Europe, switch "ON" the AC Electrical System circuit breaker located in the port locker on the aft of the transom.
13. Switch "ON" the Shore One or optional Shore Two (whichever the shore power cable is connected to) circuit breaker group on the AC System Mains Panel. The Shore One breaker controls the transom shore power receptacle(s); the Shore Two breaker controls the amidships shore power receptacle(s).
14. Monitor the voltmeter and ammeters while your boat is connected to the shore power source. The operation of the voltmeter and ammeters is described later in this section.

**DANGER**

Only people who are trained and experienced in working with electricity should service your boat's high voltage AC electrical system. Inexperienced or untrained people may be killed or seriously injured by incorrectly servicing the AC electrical system.

**DANGER**

Always disconnect the boat from the shore power source before attempting to service the AC electrical system.

Generator Power

Use the onboard generator to power the boat's AC electrical system when a shore power source is not available. The generator is installed in the aft of the boat's aft bilge area, directly below the cockpit. Fuel for the generator is drawn from the starboard fuel tank.

To start the generator:

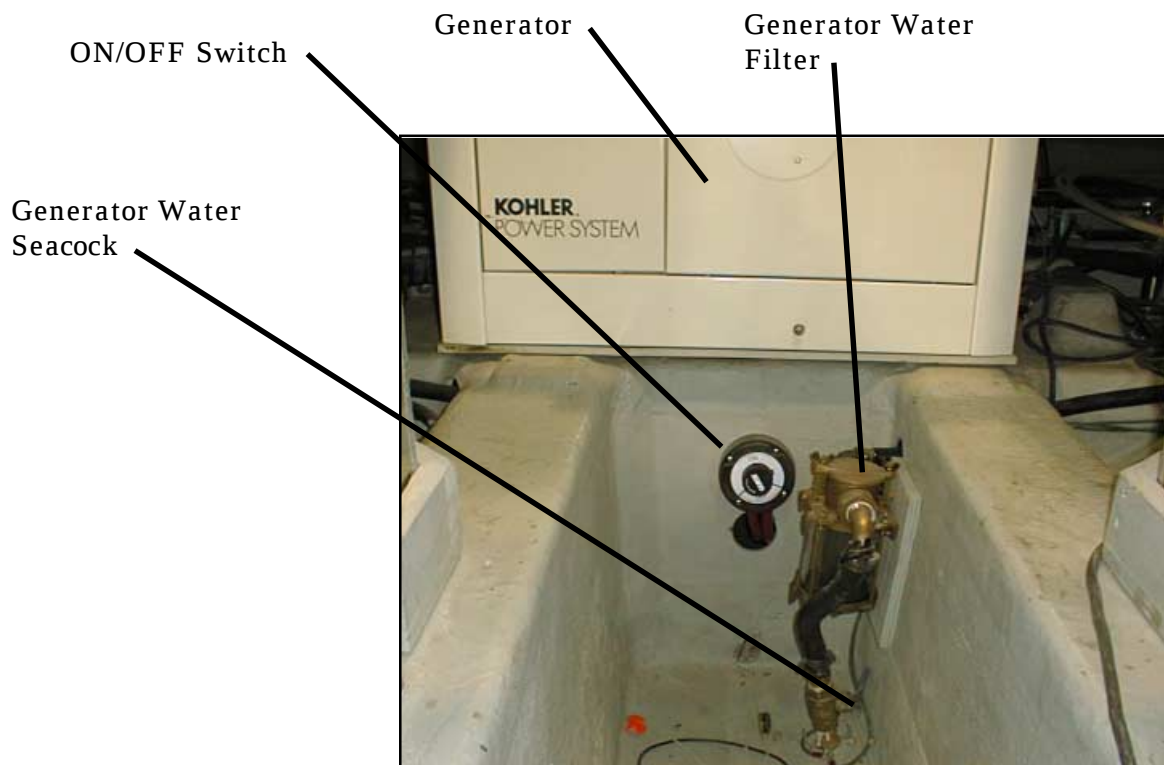
1. Read, understand and follow the OEM information that describes the generator.



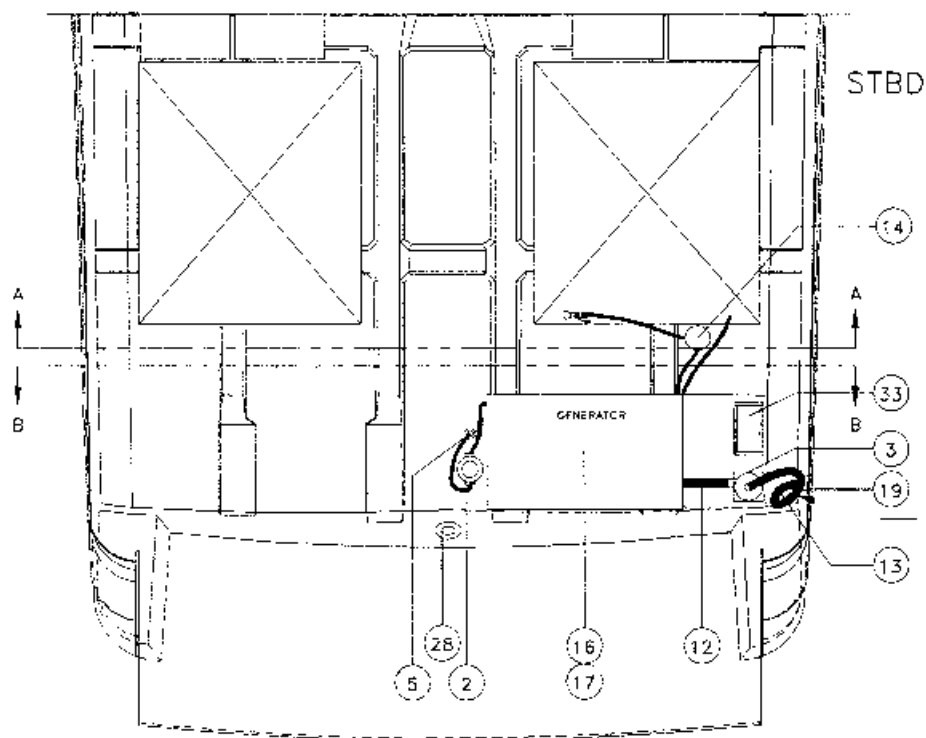
DANGER

Do not supply power to the water heater when it is empty. Doing so may damage the unit's heating element and cause a fire.

2. Switch "OFF" the Water Heater circuit breaker on the Main AC Subpanel. Do not switch the breaker on again until your boat's fresh water system and water heater have been filled, pressurized and primed.



GENERATOR LAYOUT



3. Make sure the Shore One, Generator, and optional Shore Two circuit breaker groups on the AC System Mains Panel are switched "OFF".
4. Inspect and clean the generator water filter. The filter prevents foreign matter from passing into the generator's engine.
5. Open the generator water seacock. The generator's engine uses sea water as a coolant.
6. The generator starter is powered by its own 12 volt deep cycle battery. This battery is installed just outboard and starboard of the generator. Power to the generator from this battery is controlled by a DC circuit breaker to the left of the generator and by an ON/OFF switch mounted below the generator. Switch the circuit breaker "ON", then turn the switch to the "ON" position.

A TIP FROM CARVER!

Dedicating a 12 volt battery to the generator provides an important safety feature. A dedicated battery enables you to start the generator regardless of the voltage levels in the other battery banks. If the propulsion engines battery bank becomes discharged to the point where you can not start an engine, start the generator and turn on the appropriate battery charger on the Main AC Subpanel. Once the propulsion engines battery bank is recharged to an adequate level, you can start the propulsion engines.

NOTE: *The boat's battery charger automatically monitors the voltage level in the generator battery and recharges the battery when necessary as long as the Battery Charger - Gen circuit breaker on the Engine Room Safety Breaker Panel is "ON" and the Engine Battery Charger circuit breaker on the Main AC Subpanel is "ON".*

**DANGER**

Before starting the generator, operate the bilge blowers for at least 4 minutes, then inspect the bilge for fuel vapor. If fuel vapor is present in the bilge, do not start the generator. Identify and correct the source of the vapor, then operate the bilge blowers for at least 4 more minutes before starting the generator. Continue to operate the bilge blowers while the generator is running.

7. Switch "ON" the AC circuit breaker to the left of the generator. This enables the power that the generator creates to flow to the AC System Mains Panel.
8. Switch "ON" the four Bilge Blower circuit breakers on the Main DC Subpanel. The bilge blowers run when the propulsion engine ignition at either helm is turned on.

**CAUTION**

Release the generator START switch from its START position as soon as the generator starts. If you continue to hold the switch in its START position after the generator starts, you may damage the starter.

While you are attempting to start the generator, never hold the START switch in the START position for more than 10 seconds.

9. A spring-loaded generator START switch is located on the Day Breaker Panel above the TV in the salon. An additional START switch is located to the left of the generator. Push either START switch to its START position and hold it until the generator starts. Release the switch when the generator starts.

If the generator does not start within 10 seconds, release the START switch, wait 1 minute, then try to start the generator again.

CAUTION

Never turn the generator battery ON/OFF switch to the "OFF" position while the generator is running. Doing this can damage the generator or alternator wiring.

10. When the generator is running smoothly, switch "ON" the AC Electrical System circuit breaker that is present if your boat was built for use in Europe. This breaker is located in the port locker on the aft of the transom.
11. Switch "ON" the Generator circuit breaker group on the AC System Mains Panel. This connects the generator to the boat's AC electrical system. AC receptacles and accessories can now be used in the same manner as when the boat is connected to shore power.
12. To turn the generator "OFF", push the STOP switch to its STOP position. If you do not intend to use the generator again for at least a few days, turn the generator battery ON/OFF switch to the "OFF" position.
13. To change from generator to shore power, turn the generator "OFF", then follow the steps in the "**Shore Power**" portion of this section.

DANGER

Do not inhale generator exhaust. Generator exhaust contains carbon monoxide, a poisonous gas. Refer to the "Carbon Monoxide Warnings for Gasoline Engines" portion of Section 1 for more information on engine exhaust and carbon monoxide.

14. Monitor the voltmeter and ammeters while the generator is providing power to the AC electrical system. The operation of the voltmeter and ammeters is described later in this section.

**DANGER**

Only people who are trained and experienced in working with electricity should service your boat's high voltage AC electrical system. Inexperienced or untrained people may be killed or seriously injured by incorrectly servicing the AC electrical system.

**DANGER**

Always turn off the generator before attempting to service the AC electrical system.

AC Circuit Breaker Panels

AC power is managed throughout your boat using two or three circuit breaker panels.

- AC Electrical System Circuit Breaker
- AC System Mains Panel
- Main AC Subpanel

The circuit breakers on these panels enable you to control the electricity to the boat's various AC electrical systems by switching the breakers ON or OFF. They also protect the AC electrical system by automatically disconnecting the circuit from the power source in the event of a short or overload.

**WARNING**

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

NOTE: Sometimes a circuit breaker location is labeled but no circuit breaker is present. In this case, the component named on the label is an option that is not installed on your boat.

European AC Electrical System Circuit Breaker

If your boat was built for use in Europe, it has an AC Electrical System circuit breaker located inside the port locker on the aft of the transom. This breaker controls AC power to all of the AC systems in the boat. Switch this breaker "ON" to provide power to the AC System Mains Panel and the Main AC Subpanel.

AC System Mains Panel

The AC System Mains Panel is located above the TV in the salon. All AC power, from either a shore power source or from the onboard generator, is routed through this panel. If your boat was built for use in Europe, you must switch the AC Electrical System Circuit Breaker "ON" to provide power to this panel.

System Voltage (Voltmeter)

The voltmeter indicates the amount of electrical voltage that is entering your boat's AC system.

When your boat is connected to a dockside power source, the voltmeter should read between 110 and 120 volts in a 110 volt system and between 210 and 240 volts in a 220 volt system.



CAUTION

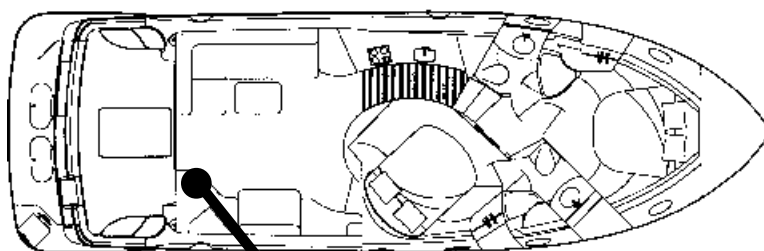
Do not use the boat's AC electrical system if the voltmeter indicates a reading of 105 volts (205 volts in a 220 volt system) or less. If this happens, contact the marina's management to locate the source of the problem.

If the voltmeter is reading zero voltage, it means that no electricity is getting to the AC System Mains Panel. Check your shore power cord(s) to make sure it is properly attached to both the boat and the dockside electrical box. Also, make sure you have turned on the circuit breaker in the shore power source box.

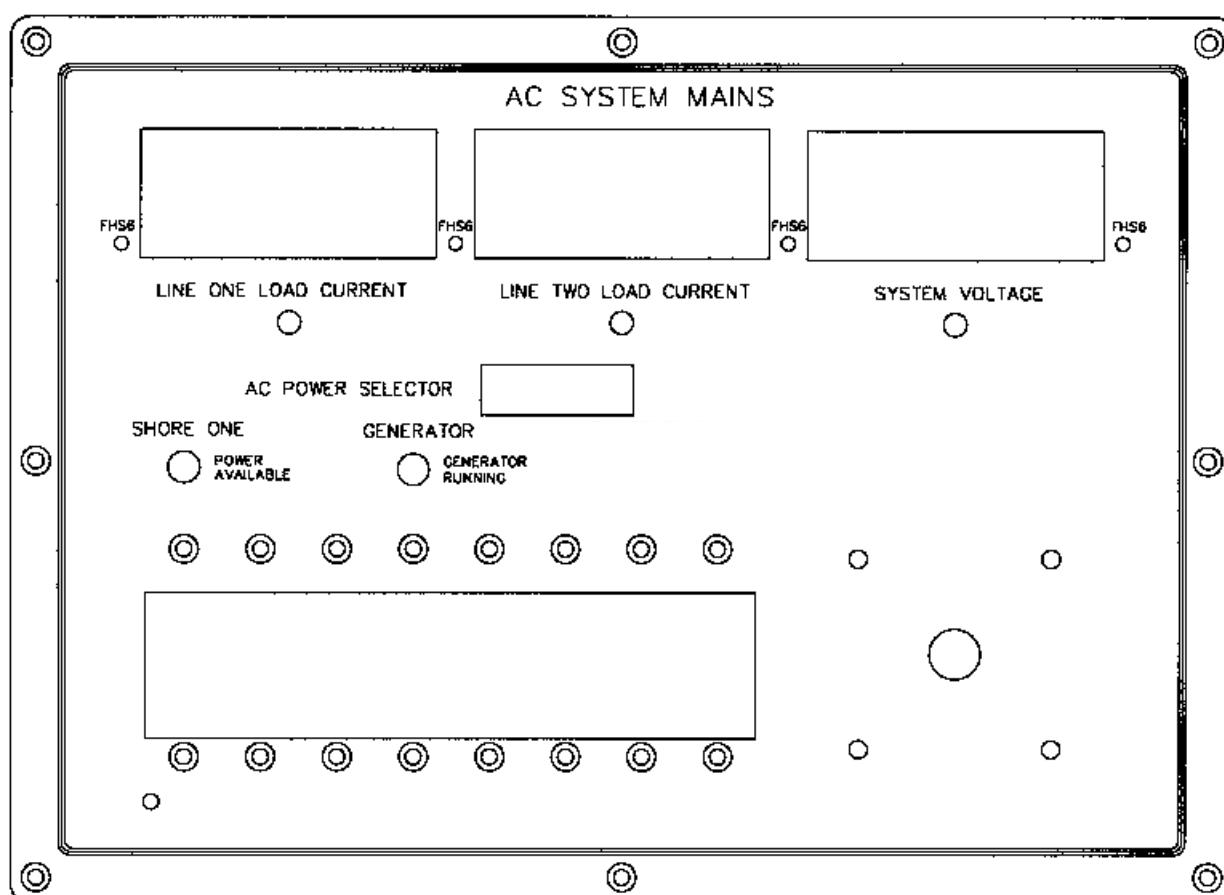
If, after checking these items, the voltmeter still indicates zero voltage, contact marina management to ensure that the shore power source is operating. If indications are that the problem is with the boat's electrical system, have the system inspected by a qualified electrician.

Line One and Line Two Load Current (Ammeters)

The ammeters indicate the load (amount of current) that is being put on the boat's electrical system. There is an ammeter each for Line 1 and Line 2. Line 1 provides power to all of your boat's AC electrical equipment except the air conditioning system. Line 2 provides power to the air conditioning system.



AC SYSTEM MAINS PANEL



When the Shore One, Generator, and optional Shore Two breakers are "ON", all breakers on the Main AC Subpanel are "OFF", and the voltmeter is reading between 110 and 120 volts (210 and 240 volts for a 220 volt system), the ammeters should read 0 amps.

When you switch the Main AC Subpanel breakers "ON" and turn on their associated equipment or turn on equipment plugged into the AC receptacles, the Line 1 ammeter readings increase above 0 amps. When you switch the air conditioning system breakers on the Main AC Subpanel "ON", the Line 2 ammeter readings increase above 0 amps. Refer to "**Electrical Loads**" later in this section for information on the AC electrical system load limits.

Shore Power Available Indicator

When your boat is connected to a shore power source via the transom shore power receptacle, the Shore Power Available indicator should be illuminated. This indicates that the shore power source is ready to provide power to your boat's AC electrical system.

Generator Running Indicator

When your boat's onboard generator is operating, the Generator Running indicator should be illuminated. This indicates that the generator is ready to provide power to your boat's AC electrical system.

Circuit Breakers

When a source of AC power is connected to your boat, either through a shore power source or the onboard generator, use the appropriate group of circuit breakers at the bottom of the AC System Mains Panel to route the power to the Main AC Subpanel. A sliding lockout plate prevents you from switching "ON" more than one group of breakers. Slide the plate to the position necessary to expose the breaker group that you need to use.

If you are using shore power connected to your boat's Shore One power receptacle, switch "ON" the left breaker group. If you are using the onboard generator, switch "ON" the center breaker group. If you are using shore power connected to your boat's optional Shore Two power receptacle, switch "ON" the right breaker group.

Shore Power Receptacle Selector

This selector is installed only if your boat is equipped with two shore power receptacles. In this case, you can connect a different shore power source to each receptacle, then use this selector to select which shore power source will provide AC power to your boat.

NOTE: *Your boat can receive power from only one AC power source at a time, even though you can connect your boat to two different shore power sources.*

Main AC Subpanel

The Main AC Subpanel, located in a locker opposite the galley stove, manages the power supply to your boat's built-in AC-powered equipment and receptacles. To provide power to this breaker panel, first turn "ON" the European AC Electrical System Circuit Breaker, if installed, then turn "ON" the appropriate breaker group on the AC System Mains Panel. The Main AC Subpanel controls power to the systems described below.

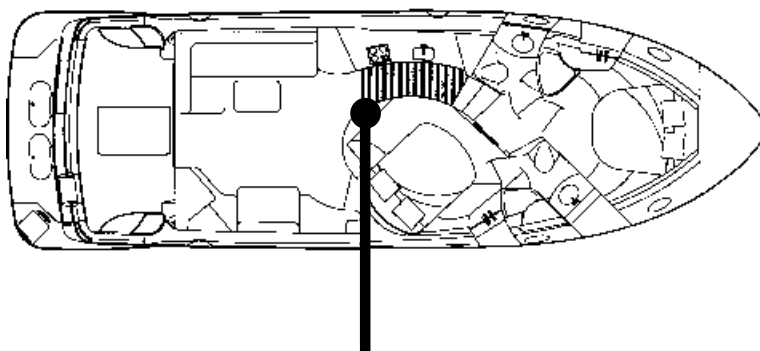
A/C System Water Pump

This breaker controls the flow of electricity to the water pump that supplies the air conditioning system with sea water. Switch this breaker "ON" to supply power to the water pump.

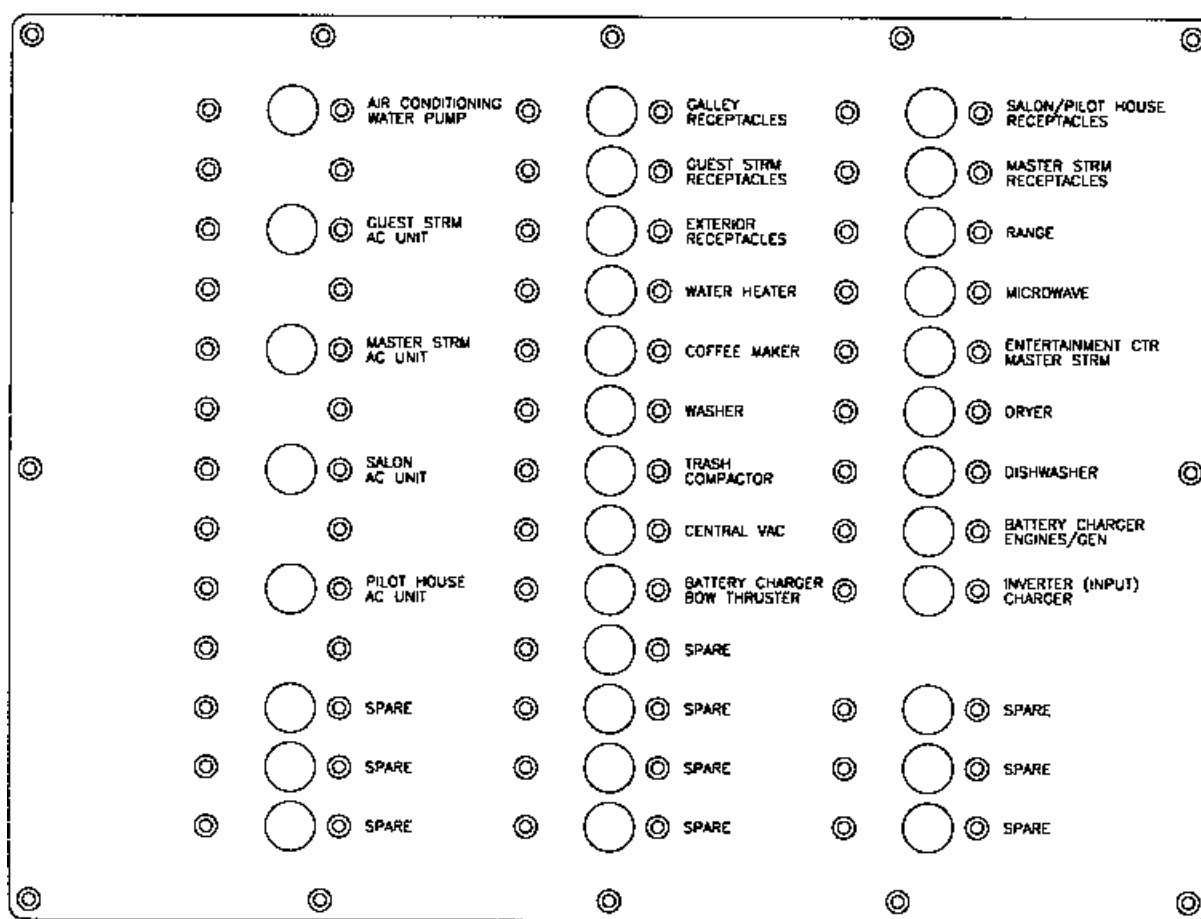
NOTE: *The air conditioning system uses water to operate. Before switching "ON" the A/C Water Pump breaker or any of the A/C Unit breakers, you must supply the air conditioning system with sea water. Refer to the "Air Conditioning System" portion of **Section 4** to prepare the air conditioning system for operation. Refer to the OEM information for details on operating the air conditioning units.*

A/C Unit Guest Stateroom

This breaker controls the flow of electricity to the air conditioning unit beneath the berth in the forward stateroom. Before switching this breaker "ON" to supply power to the unit, switch the A/C System Water Pump breaker "ON".



MAIN AC SUBPANEL



A/C Unit Master Stateroom

This breaker controls the flow of electricity to the air conditioning unit beneath the berth in the master stateroom. Before switching this breaker "ON" to supply power to the unit, switch the A/C System Water Pump breaker "ON".

A/C Unit Salon

This breaker controls the flow of electricity to the air conditioning unit under the galley sink. Before switching this breaker "ON" to supply power to the unit, switch the A/C System Water Pump breaker "ON".

A/C Unit Pilothouse

This breaker controls the flow of electricity to the air conditioning unit under the galley sink. Before switching this breaker "ON" to supply power to the unit, switch the A/C System Water Pump breaker "ON".

Spare

This breaker is reserved for aftermarket accessories you would like to install on your boat.

Spare

This breaker is reserved for aftermarket accessories you would like to install on your boat.

Spare

This breaker is reserved for aftermarket accessories you would like to install on your boat.

Receptacles Galley

This breaker controls the flow of electricity to the receptacles in the galley. Switch this breaker "ON" to supply power to these receptacles. Use the receptacles as you would the outlets in your home.

NOTE: *The Ground Fault Circuit Interrupter (GFCI) receptacle for this group of receptacles is located either next to the refrigerator or next to the microwave. If the appropriate circuit breakers are "ON" but power is still not available at any of the receptacles in this group, the GFCI breaker may have tripped. Refer to "Ground*

Fault Circuit Interrupters later in this section for more information.

Receptacles Guest Stateroom

This breaker controls the flow of electricity to the receptacles in the forward stateroom. Switch this breaker "ON" to supply power to these receptacles. Use the receptacles as you would the outlets in your home.

NOTE: *The GFCI receptacle for this group of receptacles is located in the guest stateroom head next to the sink. If the appropriate circuit breakers are "ON" but power is still not available at any of the receptacles in this group, one or both of the GFCI breakers may have tripped. Refer to "Ground Fault Circuit Interrupters" later in this section for more information.*

Receptacles Exterior

This breaker controls the flow of electricity to the receptacles in the cockpit and on the flybridge. Switch this breaker "ON" to supply power to these receptacles. Use the receptacles as you would the outlets in your home.

NOTE: *The GFCI receptacle for this group of receptacles is located on the transom to the left of the salon's sliding door. If the appropriate circuit breakers are "ON" but power is still not available at any of the receptacles in this group, one or both of the GFCI breakers may have tripped. Refer to "Ground Fault Circuit Interrupters" later in this section for more information.*

Water Heater

A TIP FROM CARVER!

Whenever your water heater has been winterized for storage, or your water tanks are empty, Carver recommends taping the Water Heater breaker in the "OFF" position. This helps prevent the breaker from accidentally being switched "ON" when no water is in the water system.



DANGER

Do not supply power to the water heater when it is empty. Doing so may damage the unit's heating element and cause a fire. Refer to the "Fresh Water System" portion of Section 4 to fill, pressurize and prime the fresh water system before turning on the water heater.

This breaker controls the flow of electricity to the water heater. The water heater supplies hot water to your fresh water system. Switch this breaker "ON" to supply power to the water heater. The water heater is located under a hatch in the engine room between the propul-

sion engines. Refer to the OEM information for details on operating the water heater.

Coffee Maker

This breaker controls the flow of electricity to the optional coffee maker. Switch this breaker "ON" to supply power to the coffee maker. Refer to the OEM information for details on operating the coffee maker.

Washer

This breaker controls the flow of electricity to the optional washing machine located in the master stateroom. Switch this breaker "ON" to supply power to the washer. Refer to the OEM information for details on operating the washer.

Trash Compactor

This breaker controls the flow of electricity to the optional trash compactor located in the galley. Switch this breaker "ON" to supply power to the trash compactor. Refer to the OEM information for details on operating the trash compactor.

Central Vacuum

This breaker controls the flow of electricity to the optional central vacuum system. Switch this breaker "ON" to supply power to the system. Refer to the OEM information for details on operating the central vacuum system.

Bow Thruster Battery Charger

This breaker controls the flow of electricity to the battery charger that maintains the voltage levels in the battery bank for the optional bow thruster. The battery charger, located on the bulkhead aft of the port engine, is present only if the bow thruster is installed. Switch this breaker "ON" to supply power to the battery charger. Refer to the OEM information for details on operating the battery charger.

Spare

These breakers are reserved for aftermarket accessories you would like to install on your boat.

Receptacles Salon

This breaker controls the flow of electricity to the receptacles in the salon and pilothouse. Switch this breaker "ON" to supply power to these receptacles. Use the receptacles as you would the outlets in your home.

NOTE: *The GFCI receptacle for this group of receptacles is located above the built-in end table on the starboard side of the salon. If the appropriate circuit breakers are "ON" but power is still not available at any of the receptacles in this group, the GFCI breaker may have tripped. Refer to "**Ground Fault Circuit Interrupters**" later in this section for more information.*

Receptacles Master Stateroom

This breaker controls the flow of electricity to the receptacles in the master stateroom. Switch this breaker "ON" to supply power to these receptacles. Use the receptacles as you would the outlets in your home.

NOTE: *The GFCI receptacle for this group of receptacles is located in the master stateroom head next to the sink. If the appropriate circuit breakers are "ON" but power is still not available at any of the receptacles in this group, the GFCI breaker may have tripped. Refer to "**Ground Fault Circuit Interrupters**" later in this section for more information.*

Range

This breaker controls the flow of electricity to the galley stove. Switch this breaker "ON" to supply power to the stove. Refer to the OEM information for details on operating the stove.

NOTE: *If your boat contains the optional propane stove, an additional circuit breaker labeled LP Gas on the 12 volt DC power main breaker panel must be switched "ON" to operate the stove. Refer to the OEM information for details on operating the propane stove.*

Microwave

This breaker controls the flow of electricity to the galley microwave. Switch this breaker "ON" to supply power to the microwave. Refer to the OEM information for details on operating the microwave.

Entertainment Center Master Stateroom

This breaker controls the flow of electricity to the optional entertainment center (TV, DVD, and stereo) in the master stateroom. Switch this breaker "ON" to supply power to the entertainment center. Refer to the OEM information for details on operating the TV, DVD, and stereo.

Dryer

This breaker controls the flow of electricity to the optional clothes dryer located in the master stateroom. Switch this breaker "ON" to supply power to the dryer. Refer to the OEM information for details on operating the dryer.

Dishwasher

This breaker controls the flow of electricity to the optional dishwasher located in the galley. Switch this breaker "ON" to supply power to the dishwasher. Refer to the OEM information for details on operating the dishwasher.

Engine Battery Charger

This breaker controls the flow of electricity to the battery charger that maintains the voltage levels in the generator and engine battery banks. The battery charger is located on the bulkhead aft of the starboard engine. Refer to the OEM information for details on operating the battery charger.

Inverter/Charger

This breaker controls the flow of electricity to the battery inverter/charger. In inverter mode, the inverter/charger converts 12 volt DC electricity to 110 volt AC electricity for use by the salon entertainment center, refrigerator/freezer, and exterior icemaker. In battery charging mode, the charger/inverter maintains the voltage levels in the "house" battery bank. Refer to the "**Inverter**" portion of **Section 2** for more information. Refer to the OEM information for details on operating the battery charger.

Spare

This breaker is reserved for aftermarket accessories you would like to install on your boat.

Entertainment Center Salon

This breaker controls the flow of electricity to the optional entertainment center (TV, DVD, and stereo) in the salon. Switch this breaker "ON" to supply power to the entertainment center. Refer to the OEM information for details on operating the TV, DVD, and stereo.

NOTE: The salon entertainment center can be operated from the 12 volt "house" battery bank when an AC power source (shore power or the generator) is not available. To do this, switch the Inverter/Charger breaker on the Main AC Subpanel "ON".

Refrigerator

This breaker controls the flow of electricity to the galley refrigerator/freezer. Switch this breaker "ON" to supply power to the refrigerator/freezer. Refer to the OEM information for details on operating the refrigerator/freezer.

NOTE: The refrigerator/freezer can be operated from the 12 volt "house" battery bank when an AC power source (shore power or the generator) is not available. To do this, switch the Inverter/Charger breaker on the Main AC Subpanel "ON".

Icemaker

This breaker controls the flow of electricity to the optional icemaker located below the optional flybridge wet bar. Switch this breaker "ON" to supply power to the icemaker. Refer to the OEM information for details on operating the icemaker.

NOTE: The icemaker can be operated from the 12 volt "house" battery bank when an AC power source (shore power or the generator) is not available. To do this, switch the Inverter/Charger breaker on the Main AC Subpanel "ON".

Ground Fault Circuit Interrupters

Certain receptacles on your boat contain Ground Fault Circuit Interrupters (GFCI). The GFCI measures both the amount of current flowing to the receptacle and the amount of current returning from the receptacle, then compares the two values. If the values are not the same, the GFCI instantly trips, shutting off power to the receptacle.

When someone receives an electrical shock through a GFCI receptacle, the current flowing to the receptacle continues flowing through the person's body and into any grounded object the person is touching or standing on. Thus, the current does not return from the receptacle through the appropriate wire. The GFCI "sees" this difference in current and shuts off power to the receptacle. This limits the amount of time the person is being shocked to a brief moment, which can reduce the amount of injury to the person.



DANGER

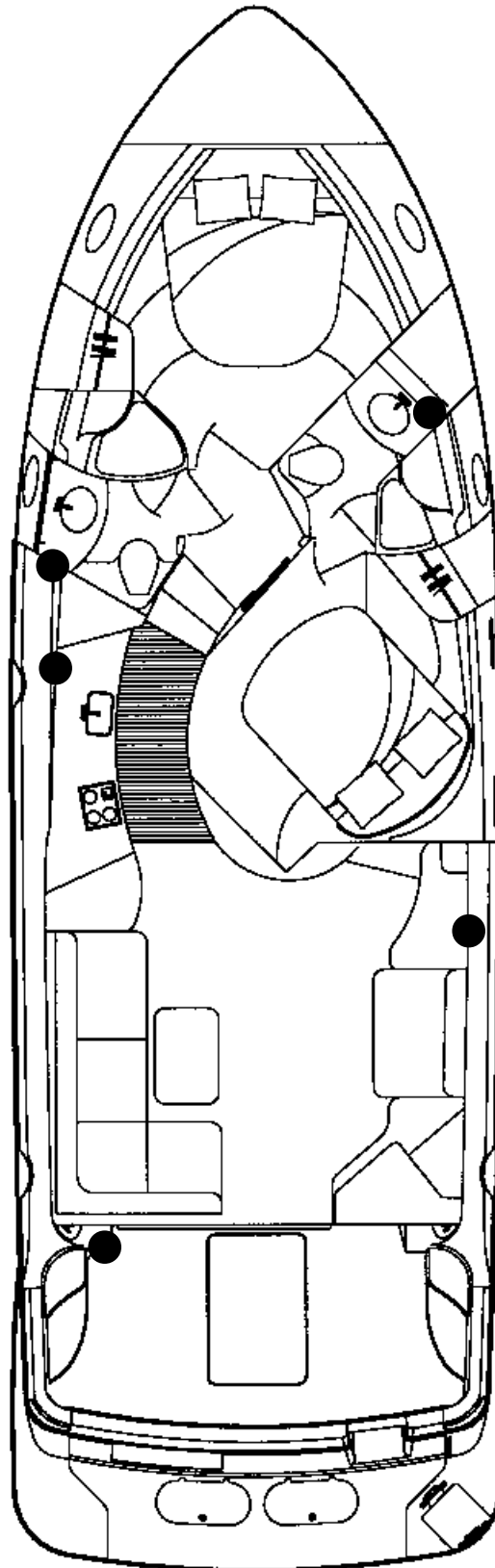
Any electrical shock from the AC electrical system, even through a GFCI receptacle, can cause death or serious injury. Always seek immediate medical attention after receiving such a shock.

GFCI Receptacle Locations

Five GFCI receptacles are installed on your boat:

- Either next to the refrigerator or next to the microwave; it protects the receptacles on the Receptacles Galley circuit.
- In the guest stateroom head next to the sink; it protects the receptacles on the Receptacles Guest Stateroom circuit.
- On the transom to the left of the salon's sliding door; it protects the receptacles on the Receptacles Exterior circuit.
- Above the built-in end table on the starboard side of the salon; it protects the receptacles on the Receptacles Salon circuit.

GFCI RECEPTACLE LOCATIONS



- In the master stateroom head next to the sink; it protects the receptacles on the Receptacles Master Stateroom circuit.

Testing GFCI Receptacles

The GFCI receptacles are identified by Test and Reset buttons located between the receptacles' two outlets.

Test each GFCI receptacle once every week:

1. Press the Test button. If the GFCI is operating normally, this cuts the power supply to the GFCI receptacle and to all other receptacles on that circuit.



DANGER

If the GFCI receptacle or any other receptacle on that circuit still has power after the Test button is pressed, do not use any of the receptacles on that circuit. Contact a qualified electrician to make the appropriate repairs.

2. Plug a lamp or other AC powered device into the GFCI receptacle and turn on the device. The device should not operate.
3. Repeat Step 2 for each receptacle on the same circuit as the GFCI receptacle.
4. Press the Reset button to restore power to the GFCI receptacle and to all other receptacles on that circuit.

Electrical Loads

When operating AC powered devices through your boat's AC electrical system, be aware that each device exerts a "load" on the system. This load is equal to the amount of current (amps) that the device uses. The AC electrical system, like your house's electrical system, has a maximum total load that it can handle. Line 1, which provides power to all of your boat's AC electrical equipment except the optional air conditioning system, splits into two main circuits, each with a load capacity of 50 amps. Line 2, which provides power to the optional air conditioning system, also has a load capacity of 50 amps.

If the total load on the circuit exceeds the circuit's capacity, the breaker for that circuit trips. This means that the devices operating from the circuit are using too much current.

**WARNING**

Do not overload the electrical circuits. If an excessive load trips a circuit breaker, turn off all devices connected to the circuit, then switch the breaker back "ON".

A list of common AC powered devices and the approximate maximum current that they use when operating is shown below. If you use an AC powered device that has an electric motor, such as a vacuum cleaner or electric drill, the device should have a "motor load plate" mounted on it. This plate lists the current that the device uses while operating.

ELECTRICAL LOADS

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
Electric frying pan	12.3
Space heater	13.7
Refrigerator	1.5

As the chart indicates, appliances that use a motor or a heating element draw relatively large amounts of current. Therefore, be especially careful when using curling irons, toasters, coffee makers, hair dryers, food mixers or similar types of AC powered devices. Do not use too many of these types of devices at the same time.

Bonding System

Your boat is equipped with a comprehensive metallic bonding system that interconnects all underwater equipment and thru-hull fittings. The bonding system ensures that the “cases” of all metallic equipment onboard your boat, including the fittings, are at the same electrical potential. This minimizes corrosion of the underwater fittings caused by stray electrical currents.

Included within this bonding system are sacrificial zinc anodes that have been installed on each of the boat's propeller shafts and onto the underwater portion of the boat's transom. These anodes corrode and deteriorate before the boat's underwater fittings and provide a visual reference to the level of stray current to which your boat is being exposed.

Your boat's 12 volt DC electrical system, AC electrical system, and the batteries' negative leads are all connected to the bonding system through buss bars. The buss bars are located in the engine room and aft bilge area and are connected to the transom-mounted zinc plate.



WARNING

Do not tamper with or modify the boat's bonding system. Doing so could threaten the integrity of the system.



WARNING

Monitor the condition of your boat's zinc anodes. Replace the zinc anodes when they have deteriorated to 50% of their original size. Do not allow the zinc anodes to completely deteriorate. Refer to the "General Maintenance Schedule" portion of Section 7 for recommended inspection intervals.

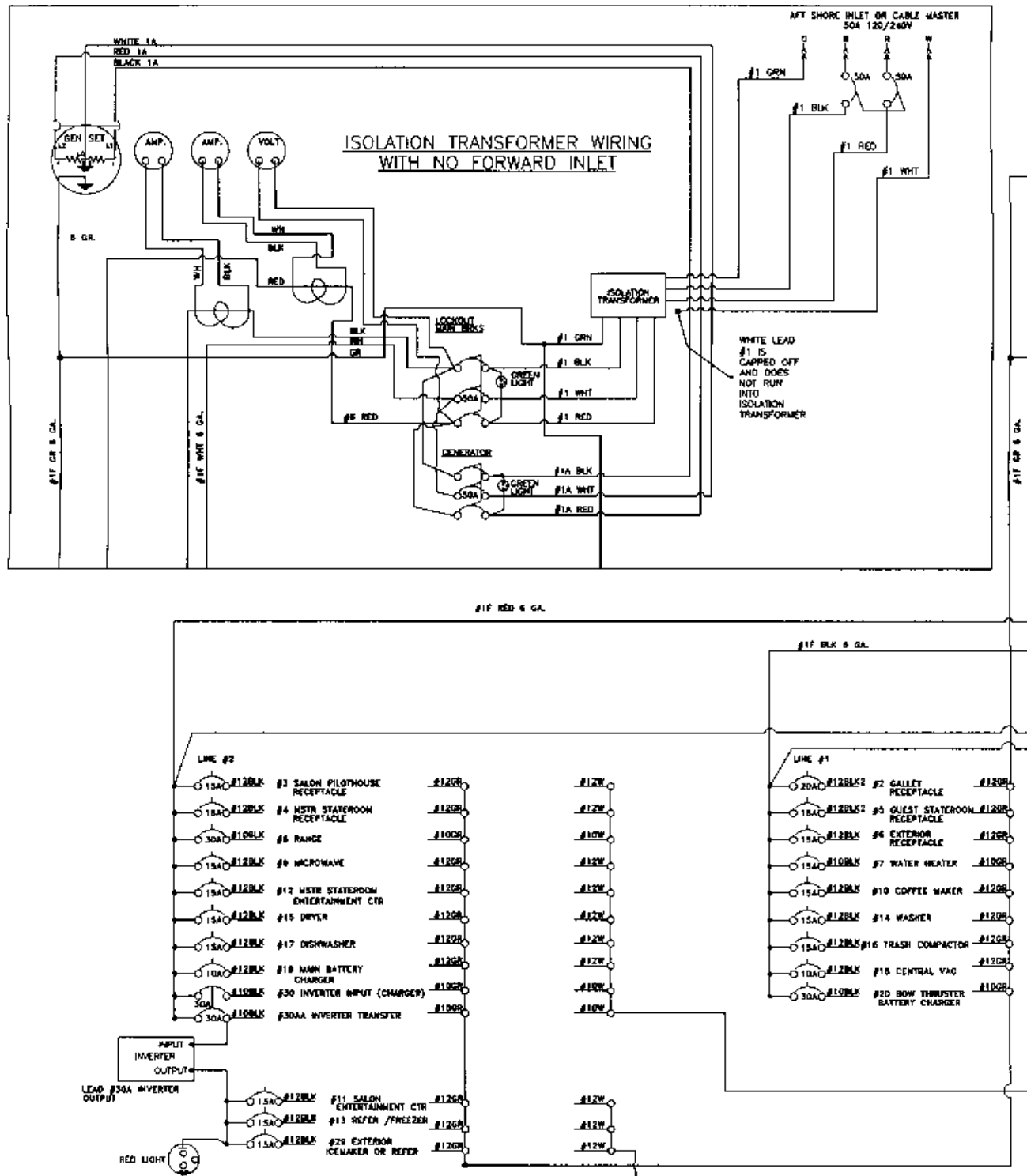
NOTE: *Damage resulting from stray current or galvanic corrosion is NOT covered under the Carver limited warranty.*

Troubleshooting the AC Electrical System

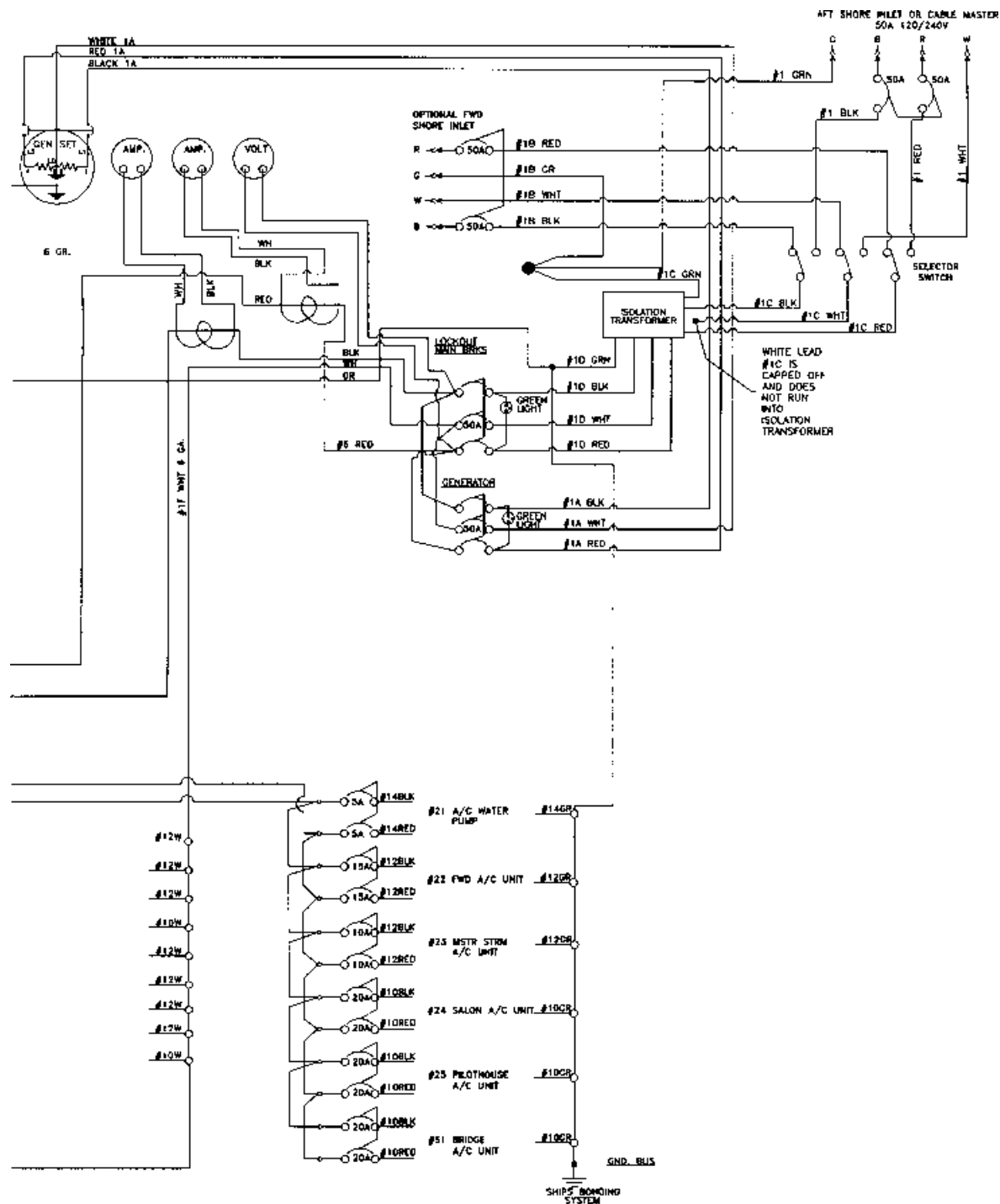
Problem	Possible Cause	Possible Solution
No AC power as indicated by voltmeter.	Shore power cord is not connected.	Connect the shore power cord.
	There is no power at the shore power source box.	Contact marina management.
	The circuit breaker installed in the shore power source box is "OFF".	Switch the breaker "ON".
	The AC Main circuit breaker next to your boat's shore power receptacle is "OFF".	Switch the breaker "ON".
	If your boat was built for use in Europe, the AC Electrical System circuit breaker is "OFF".	Switch the breaker "ON".
	The Shore One, Generator, or optional Shore Two circuit breaker group (whichever power source you are using) on the AC System Mains Panel is "OFF".	Switch the breaker group "ON".
	If you are using the generator, it is not operating.	Switch the DC circuit breaker to the left of the generator "ON". Turn the ON/OFF switch mounted below the generator to the "ON" position.
	If you are using the generator, it is operating but not supplying power to the AC electrical system.	Switch "ON" the AC circuit breaker to the left of the generator.
	A wire within the AC electrical system is loose or disconnected.	Contact a qualified electrician to make the appropriate repairs.

Problem	Possible Cause	Possible Solution
Cabin receptacles have no power.	The Shore One, Generator, or optional Shore Two circuit breaker group (whichever power source you are using) on the AC System Mains Panel is "OFF".	Switch the breaker group "ON".
	The Receptacles breakers on the Main AC Subpanel are "OFF".	Switch the breakers "ON".
	A GFCI tripped.	Locate the tripped GFCI and press the Reset button.
	The shore power cord became disconnected.	Reconnect the shore power cord.
The Shore One, Generator, or optional Shore Two circuit breaker group trips immediately after being reset.	The breaker group failed.	Contact your Carver Dealer to have the breaker group replaced.

AC Wiring Schematic (110 Volt 60 Hz)

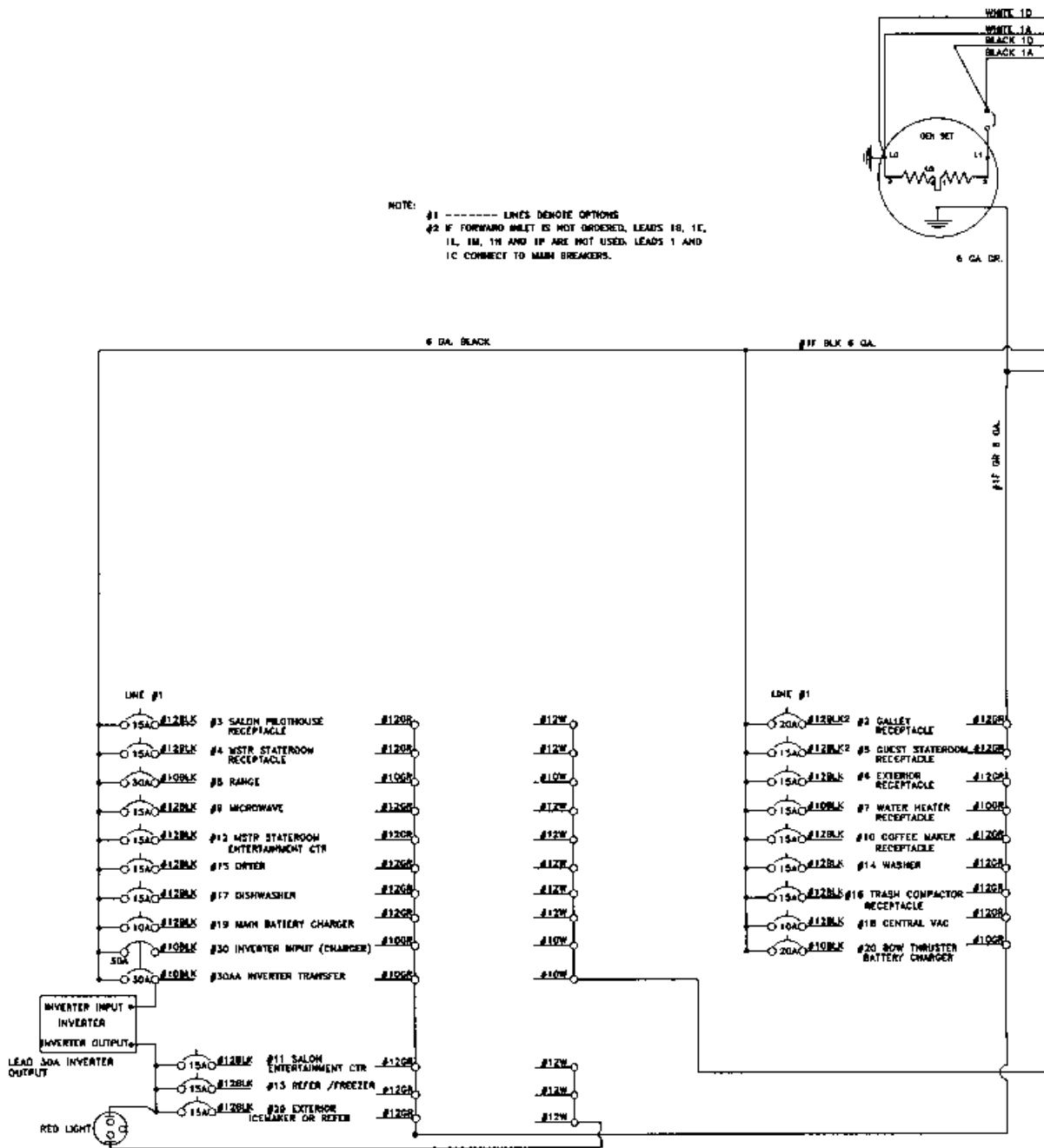


C2057D-1

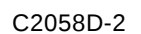


C2057D-2

AC Wiring Schematic (220 Volt 50 Hz)



C2058D-1



NOTES

Internal Systems

Air Conditioning System	94
Producing Heat	94
Powering The Air Conditioning	95
Fresh Water System	96
Filling The Water Tank	96
Pressurizing and Priming the Water System	98
Using the Water System	98
Raw Water Washdown	101
Shore Water Hookup	102
Bilge System	103
Bilge Pump Operation	105
Garboard Drain	106
Sanitation System	106
Heads	106
Emptying the Waste Tanks	107
Grey Water System	113
Propane Stove	115
Checking the System For Leaks	117

Air Conditioning System

This section applies only to the optional air conditioning system installed at the Carver factory. An air conditioning system installed as an aftermarket accessory may not necessarily operate as described in this section.

For the air conditioning system to operate it needs a source of AC power (supplied by either a shore power source or the onboard generator) and a supply of sea water (either salt or fresh).

The factory-installed air conditioning option consists of four air conditioning units:

- A 16,000 BTU unit, located beneath the port salon sofa, to cool the salon and galley. If your boat has the optional third stateroom, this unit is located under the sofa in the salon.
- A 16,000 BTU unit, located beneath the port salon sofa, to cool the pilothouse and guest stateroom head. If your boat has the optional third stateroom, this unit is located under the sofa in the salon.
- A 7,000 BTU unit, located beneath the master stateroom berth, cools the master stateroom.
- A 10,000 BTU unit, located beneath the guest (forward) stateroom berth, cools the guest stateroom and the master stateroom head.

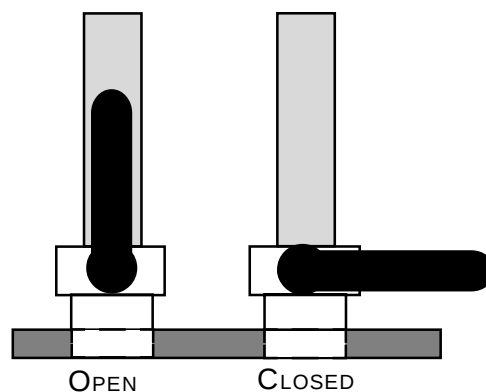
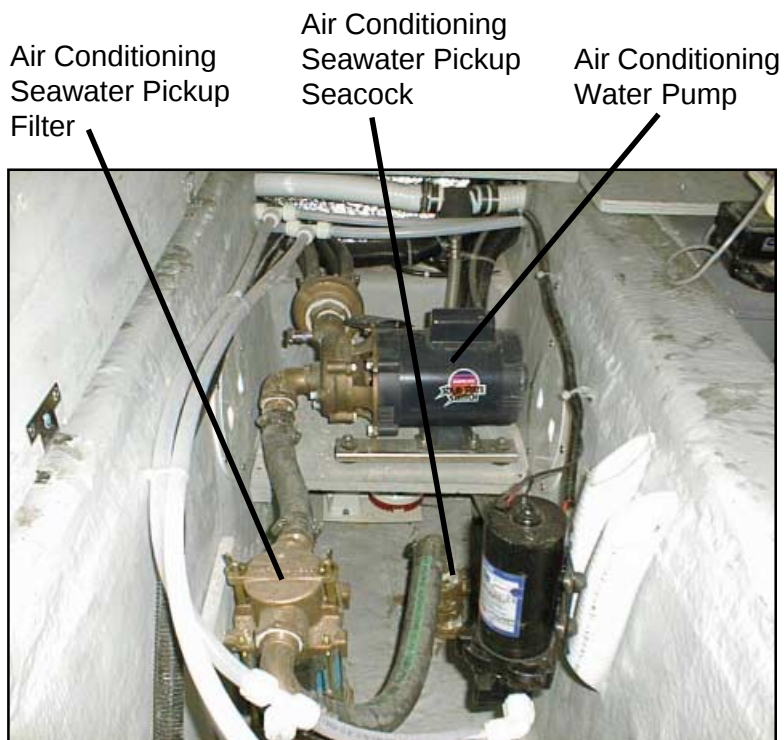
NOTE: *Because the condensation from the two stateroom air conditioning units drains into the sump, the Auto Sump circuit breaker on the Engine Room Safety Breaker Panel must be "ON" whenever these two air conditioning units are on.*

Producing Heat

The air conditioning system can produce heat when it is operated in reverse cycle mode. Reverse cycle operation, however, is affected by the temperature of the sea water. As sea water temperature decreases so does the air conditioning system's ability to produce warm air. Carver recommends that the air conditioning system not be operated in reverse cycle mode when the sea water temperature is below 40 degrees F.

Powering The Air Conditioning

1. Switch the Shore One, Generator, and optional Shore Two circuit breaker groups on the AC System Mains Panel "OFF".
2. A single pump supplies all four air conditioning units with sea water. Open the seacock that supplies sea water to the pump. The seacock is located below the hatch between the center stringers in the forward area of the engine room.



3. A strainer is installed near the seacock to prevent foreign matter from entering the pump and air conditioning units. Inspect and clean the strainer before using the pump.

4. Supply AC power to the boat. Refer to the "**Shore Power**" or "**Generator Power**" portion of **Section 3** to do this.
5. Switch the A/C System Water Pump breaker on the Main AC Subpanel "ON".
6. Switch the A/C Unit breakers on the Main AC Subpanel "ON". If you switch the air conditioning unit in either the guest stateroom or master stateroom "ON", you must switch the Auto Sump breaker on the Engine Room Safety Panel "ON".
7. Verify that sea water is being pumped through the air conditioning units. As the sea water exits the units, it flows into a manifold under the galley, then exits the boat through a single discharge outlet below the port corner of the boarding platform.
8. Use the controls for each air conditioning unit to set the desired temperature. Refer to the OEM information for details on operating the air conditioning controls.

Fresh Water System

The capacity of your boat's standard fresh water system is approximately 150 gallons, divided between two 75 gallon fresh water tanks. When the optional grey water system is installed, the capacity of the fresh water system is approximately 78 gallons, divided between two 39 gallon tanks. The tanks are located in the engine room outboard of each propulsion engine. The water heater is located beneath a hatch in the engine room between the propulsion engines.

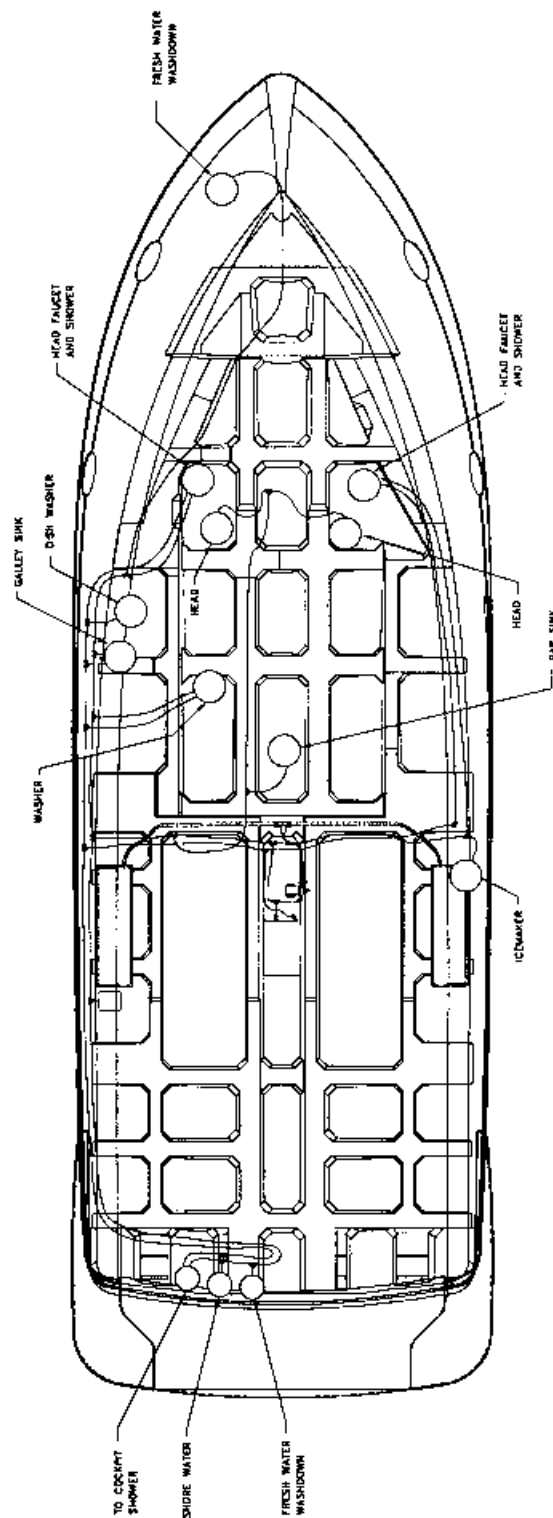
Filling The Water Tank

The fresh water tanks are filled through a single deck fitting with a plate labeled "WATER". The plate is on the starboard sidedeck near amidships. Refer to the "**Fill Plate/Pumpout Locations**" portion of **Section 9** for the exact location of the "WATER" plate.

NOTE: *Thoroughly flush and sanitize the water system before initial use and at least once each season.*

Put only clean, fresh water into your water tanks. The tanks are full when water is discharged from the water tank vent fitting installed through your boat's hull. DO

FRESH WATER SYSTEM



C2069D

NOT overfill your water tanks OR leave a fill hose unattended while the tanks are being filled.

Pressurizing and Priming the Water System

Perform the following **ONLY** after the fresh water tanks are full.

1. Verify that the Auto Sump circuit breaker on the Engine Room Safety Breaker Panel is "ON".
2. Partially open all cold water faucets, including the faucets for the optional transom shower and bow and transom fresh water washdowns.
3. Turn the "house" master disconnect switch to the "ON" position.
4. Switch the Main DC Subpanel circuit breaker on the Day Breaker Panel "ON".
5. Switch the Pressure Water Pump circuit breaker on the Main DC Subpanel "ON". This activates the boat's pressure water pump, which pressurizes the water system. The pump is located below the hatch between the center stringers in the forward area of the engine room.
6. The system is primed when all air is purged from the system's pipes. Monitor each faucet and shower head. When a steady stream of water flows from the COLD side of a faucet or shower head, turn the valve for that faucet or shower head to the HOT side. When a steady stream of water flows from the HOT side of a faucet or shower head, turn that faucet or shower head off. When you have done this for each faucet and shower head, the water system is primed.

When water pressure within the system increases to a predetermined point, the pressure water pump automatically shuts off. Priming the system also fills and maintains the water level within the water heater.

Using the Water System

The fresh water system is designed to operate in the same manner as the water system in your home. After filling, pressurizing and priming the fresh water system, simply turn on a faucet to receive fresh water. As you draw water from the system, the pressure in the system decreases. When the pressure decreases to a predetermined point, the pressure water pump automatically turns on and increases the pressure. This

A TIP FROM CARVER!

If your boat will be left unattended for at least a few days, switch "OFF" the Pressure Water Pump circuit breaker on the 12 volt DC power main breaker panel. If this breaker is left on, pressure within the fresh water system may fall and cause the water pressure pump to engage. If this happens frequently, it could discharge your batteries.

ensures a steady flow of water any time you turn on a faucet.

Sometimes a recently filled system or one that has not been used for some time may need re-priming. This is normal and is caused by an accumulation of air bubbles at the pressure water pump. To re-prime the fresh water system, repeat steps 2 - 6 in "**Pressurizing and Priming the Water System**".

Water Heating System



Do not supply power to the water heater when it is empty. Doing so may damage the unit's heating element and cause a fire. Fill, pressurize and prime the fresh water system as described in "Filling the Water Tank" and "Pressurizing and Priming the Water System" before turning on the water heater.

When you pressurize the fresh water tank, the pressure water pump automatically fills the water heater. To operate the water heater:

1. If your boat was built for use in Europe, switch the AC Electrical System circuit breaker "ON".
2. Switch the Shore One, Generator, or optional Shore Two circuit breaker group (whichever is appropriate) on the AC System Mains Panel "ON".
3. Switch the Water Heater circuit breaker on the Main AC Subpanel "ON".
4. Refer to the OEM information for details on operating the water heater.

A TIP FROM CARVER!

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

Showers

Your boat has a shower in each head. The showers require minimal preparation before use and cleanup after use.

The showers drain into a sump that is positioned lower than the boat's water line. Because of this, a sump pump is needed to discharge the drain water either overboard or into optional grey water tanks. The drain water discharge fitting is located in the aft bilge area

just aft of the port fuel tank. When the Auto Sump circuit breaker on the Engine Room Safety Breaker Panel is "ON", the sump pump operates automatically when water in the sump rises above a predetermined level.

NOTE: *The sump pump can not operate if the Auto Sump circuit breaker is "OFF". Make sure the circuit breaker is "ON" before using the showers.*

Transom Hand Shower

The optional transom or cockpit hand shower is a convenient device that enables you and your guests to rinse off with warm, fresh water after swimming without having to enter the cabin. The hand shower is especially useful if you operate your boat in salt water.

The hand shower is an integral part of your boat's fresh water system. Simply turn on the faucets and adjust them for the desired water temperature. The hand shower and mixing valves are located in the port transom storage locker.

Fresh Water Washdowns

The optional bow and transom fresh water washdowns enable you to use water from the fresh water tanks to washdown and clean your boat. Fresh water washdown is especially useful if you operate your boat in salt water.

To use the fresh water washdowns:

1. Locate the bow- and transom-mounted hose fittings. The bow-mounted fitting is located inside the port bow rope locker. The transom-mounted fitting is located inside the starboard transom locker.
2. Attach one end of an appropriately sized nylon water hose to the hose fitting you wish to use.
3. Attach a nozzle to the other end of the hose. The best type of nozzle to use is the "pistol grip" type that can be opened and closed by squeezing your hand.
4. Open the faucet at the base of the hose fitting to supply water to the hose. Use the washdown as you would a garden hose at your home.

A TIP FROM CARVER!

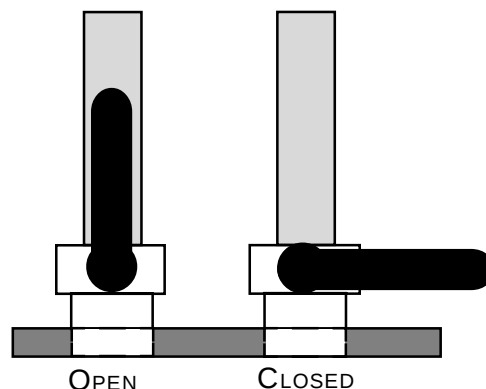
Remember that the fresh water washdown system draws its water from the boat's fresh water tanks. Prolonged use of the washdown system quickly reduces the amount of fresh water in the water tanks.

Raw Water Washdowns

The optional bow and transom raw water washdowns enable you to use seawater to washdown and clean your boat.

To use the raw water washdowns:

1. Locate the bow- and transom-mounted hose fittings. The bow-mounted fitting is located inside the port bow rope locker. The transom-mounted fitting is located inside the starboard transom locker.
2. Attach one end of an appropriately sized nylon water hose to the hose fitting you wish to use.
3. Attach a nozzle to the other end of the hose. The best type of nozzle to use is the "pistol grip" type that can be opened and closed by squeezing your hand.
4. Open the seacock that supplies seawater to the raw water washdown pump. The seacock is located in the aft bilge area.



5. Turn the "house" main disconnect switch to the "ON" position.
6. Switch the Main DC Subpanel circuit breaker on the Day Breaker Panel "ON"
7. Switch the Washdown Pump circuit breaker on the Main DC Subpanel "ON".
8. The raw water washdown system uses a pressure water pump to create pressure in the system. When the hand nozzle is closed, water pressure within the system increases to a predetermined point at which the pump automatically shuts off. When the hand

nozzle is open, releasing water from the system, the pressure in the system decreases. When the pressure decreases to a predetermined point, the pump automatically turns on and increases the pressure. This ensures a steady flow of water any time you use the raw water washdown.



CAUTION

Do not run the pressure water pump when the sea-cock that supplies sea water to the washdown system is closed. Also, frequently clean the raw water filter. Operating the pump with no or a restricted supply of seawater can damage it.

Shore Water Hookup

Your boat has an optional shore water hookup. This enables your fresh water system to draw water from a land water source while your boat is docked. When you use shore water you are not drawing water from your onboard fresh water tanks.

NOTE: *Connecting your boat to shore water bypasses the boat's fresh water tanks and pressure water pump, therefore the water tanks do not get filled. The only way to fill the fresh water tanks is through the deck plate labeled WATER.*

To connect to shore water:

1. Locate the shore water hookup fitting, labeled SHORE WATER, in the starboard transom locker.
2. Attach one end of a water hose to the hose fitting.
3. Attach the other end of the hose to the dockside water tap.
4. Close all sink and shower faucets.
5. Switch the Auto Sump circuit breaker on the Engine Room Safety Breaker Panel "ON".
6. Turn ON the dockside water tap.

**CAUTION**

Do not leave your boat unattended when it is connected to shore water. Should one of the water lines in your boat develop a leak, an unlimited amount of water could enter your boat. Disconnect the shore water hose whenever you leave your boat unattended.

Bilge System

Your boat is equipped with three automatic bilge pumps located beneath the cabin floor. The bilge is the lowest point in the interior of the boat's hull where any liquid that finds its way into the hull will accumulate. Each pump can pump up to 2000 gallons of water per hour. These pumps have been strategically installed to remove water that accumulates in three bilges:

1. The forward bilge starts below the master stateroom and continues to the bow. The forward bilge pump is located below the master stateroom sole.
2. The amidships bilge is located in the engine room. The amidships bilge pump is located in the forward, center sole of the engine room between the center stringers. If your boat was built for use in Europe, there is also a hand bilge pump in the amidships bilge.
3. The aft bilge is located directly below the cockpit. The aft bilge pump is located in the aft, center of the aft bilge area.

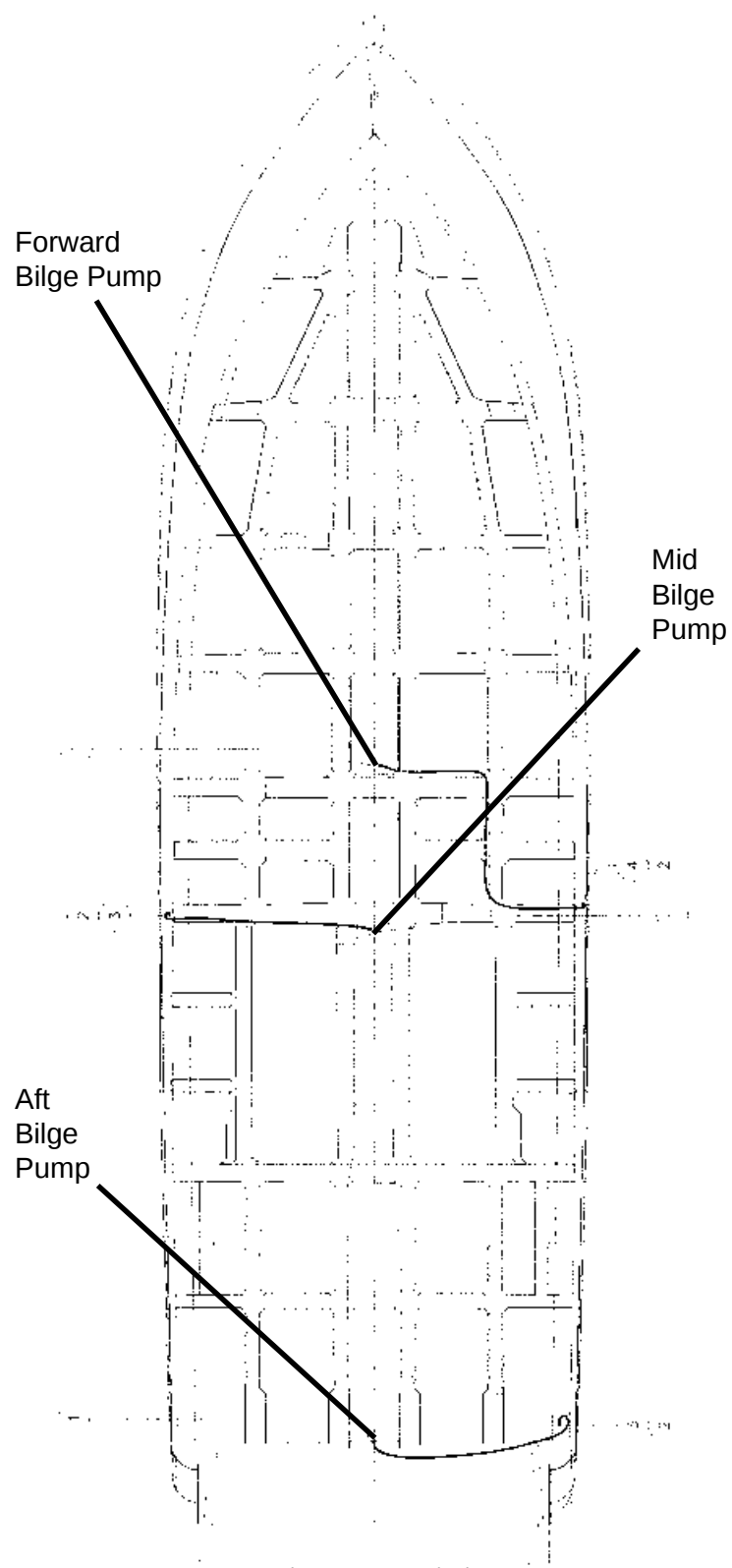
**CAUTION**

Never store anything in the bilges. Storing loose items in the bilges could damage pumps, pipes or other components that are essential for the proper operation of your boat.

**CAUTION**

If you keep your boat in a climate where temperatures can drop below freezing, make sure that all water within the bilges is drained before you store the boat for the winter. Water that freezes in the bilge could cause severe damage to your boat and its compo-

BILGE SYSTEM



Bilge Pump Operation

A TIP FROM CARVER!

A certain amount of water always collects in your boat's bilge, especially in the bilge area where the shaft log is located. The small amount of water that normally accumulates is usually not enough to activate an automatic float switch.

While underway and on plane, use the helm station switches to turn your bilge pumps on manually and let them run for 30 seconds to a minute.

When your boat is on plane, water in the forward and aft bilges flows to the aft of these bilge areas, where the bilge pumps are located. The mid bilge pump is near the lowest point in the hull at rest.

nents. Refer to the "Bilges" portion of Section 8 for more information on winterizing the bilges.

For safety and convenience, each bilge pump can be operated either automatically or manually.

The bilge pumps remove almost, but not quite, all of the water that collects within the bilges. If you want your bilges to be completely dry, use a sponge and bucket to remove the small amount of water that remains.

NOTE: *Before operating your boat's bilge pumps, wipe up any oil that may have accumulated in the bilge area. 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.*

Automatic Operation

Each bilge pump is wired to its own circuit breaker on the Engine Room Safety Breaker Panel and then routed to the batteries. Incorporated into each bilge pump is a float switch. If the pump is not already operating, the float switch automatically turns on the appropriate bilge pump when bilge water rises to a predetermined level. Periodically test each switch by lifting the float, which should turn the bilge pump on.

NOTE: *The circuit breakers for the bilge pumps should be "ON" at all times so that the pumps can operate in automatic mode when necessary.*

Manual Operation

The bilge pumps can also be operated manually by using the bilge pump control switches on the Pilothouse Overhead Panel. To manually operate the bilge pumps:



CAUTION

When operating a bilge pump in manual mode, you must turn the pump "OFF" when the bilge water level is so low that the pump can no longer drain it. Allowing the pump to operate when it is not pumping water could seriously damage the pump.

1. Switch the Auto Bilge Pump circuit breakers on the Engine Room Safety Panel "ON".

2. Switch the Pilothouse circuit breaker on the Day Breaker Panel "ON".
3. Turn the Forward, Mid, and Aft Bilge Pump switches on the Pilothouse Breaker Panel "ON".

Garboard Drain

A TIP FROM CARVER!

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

Your boat is equipped with one garboard drain. The drain allows water to drain from the bilges while the boat is in dry storage. The boat and cradle should be positioned to allow water to flow toward the garboard drain. The drain is located in the transom in the deepest portion of the hull's "V."



CAUTION

Make sure the garboard drain plug is securely screwed into the garboard drain before launching the boat.

Sanitation System

Your boat's sanitation system includes the master stateroom (starboard) head, guest stateroom (port) head, waste tanks, an optional overboard waste discharge system and an optional grey water system. When properly used, this system conforms to all United States antipollution laws.

Heads

The two types of heads available for your boat are described below. The electric head is standard. If you have guests who are unfamiliar with marine sanitation systems, instruct them on how to properly use the head. Refer to the OEM information for details on operating the head.

Fresh water heads: To flush a head that uses fresh water, there must be water in the fresh water tanks or the boat must be connected to shore water.

Seawater heads: To flush a head that uses seawater, you must first open the seacock for the heads. The seacock is located beneath a hatch at the entrance to the master stateroom.

Electric Head

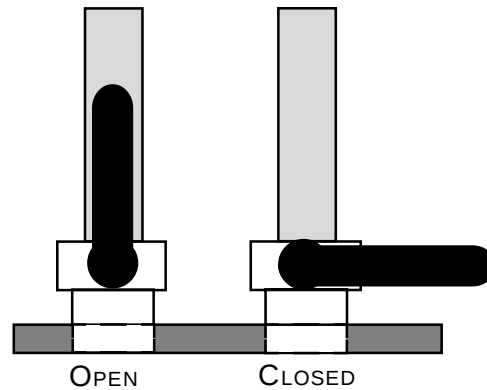
To flush, the electric head uses an electric motor, powered by the "house" battery bank, and either the boat's

A TIP FROM CARVER!

If your boat will be left unattended for at least 48 hours, flush the electric heads for at least 10 seconds. This ensures that waste has cleared the sanitation transfer hose and has entered the waste tank. Waste left in the transfer hose tends to dry and harden. This could become an obstruction which prevents the sanitation system from operating properly.

Make sure that there is always a small amount of water left in the bowl of the head. This acts as a trap and reduces odors.

If seawater is used to flush the head, material suspended in the water (seaweed, aquatic organisms, etc.) can become trapped within the passages of the system and lead to bowl staining and odors. Contact your marine supply dealer to obtain an in-line deodorant dispenser that can minimize these problems.



fresh water or seawater. To operate the motor, first switch the Electric Heads - Port and Starboard circuit breakers on the Engine Room Safety Breaker Panel "ON". Then, press and hold, for several seconds, the "FLUSH" button mounted near the toilet. The toilet continues to flush for as long as the button is pressed.

Vacuum Head

The optional vacuum head uses fresh water and vacuum pressure to remove waste from the head. To operate the Vacu-Flush system, first switch the Electric Heads - Port and Starboard circuit breakers on the Engine Room Safety Breaker Panel "ON". Flush the head by pressing the foot pedal at the base of the toilet.

It is common for vacuum systems to gradually lose vacuum pressure. When pressure in the system drops below a predetermined level, the vacuum pump engages automatically to bring vacuum pressure back to the optimum level.

NOTE: *Whenever you don't want to hear the vacuum pump operating, such as at night, you can temporarily shut it off using a "Sleep" switch installed in the head.*

Emptying the Waste Tanks

The sanitation system contains two 40 gallon, polyethylene waste tanks. The tanks are located in the forward corners of the engine room. The three systems that empty the waste tanks are described below. The dockside discharge system is standard.

Dockside Discharge

With the dockside discharge system, waste is flushed from the heads to the waste tanks where it is stored

until it can be transferred to a dockside pumpout station. To empty the tanks:

A TIP FROM CARVER!

The cap for the WASTE deck plate is not connected to the plate and does not float. Be careful that you don't drop the cap in the water when you remove it.

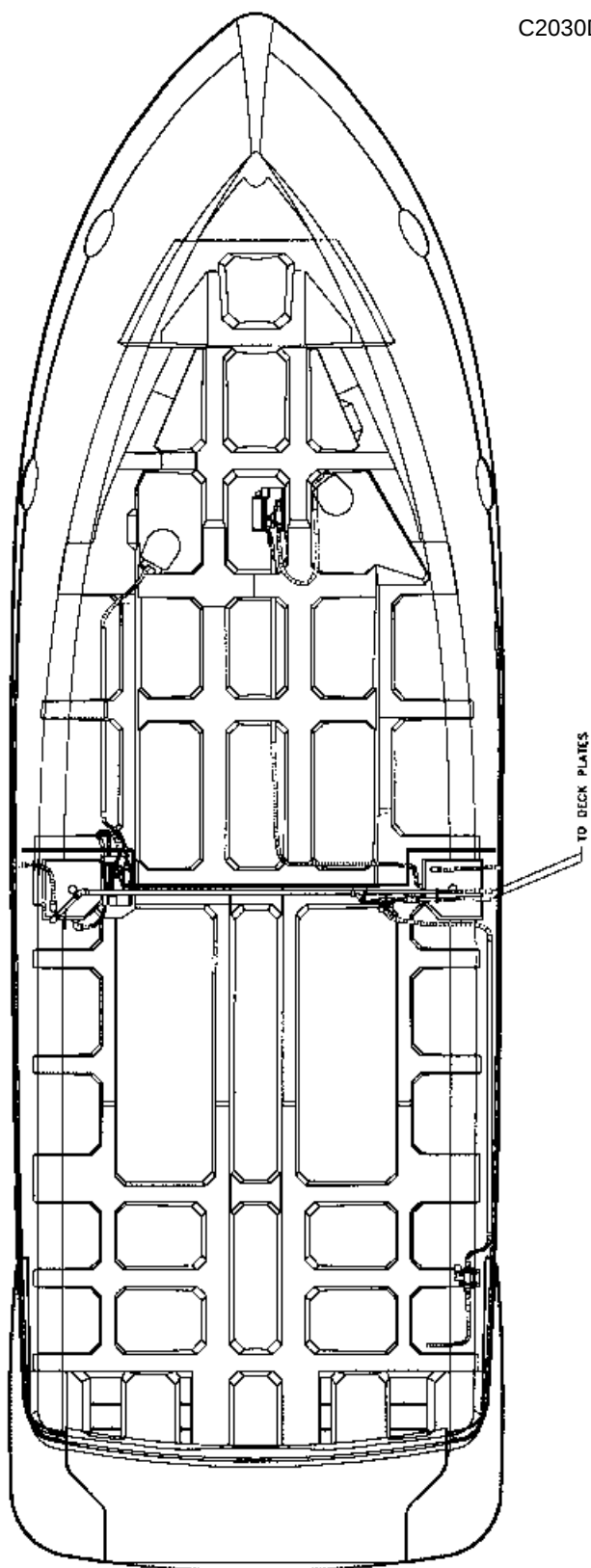
If you do lose the cap, you can order a replacement from your Carver Dealer. WASTE deck plate caps are dropped overboard frequently enough that we suggest you carry an extra in your onboard spare parts kit.

1. Locate a dockside pumpout station.
2. Remove the starboard waste tank deck plate labeled "WASTE" using the cap removal tool supplied with your boat. This plate is located on the starboard sidedeck near amidships. Refer to the **"Fill Plate/Pumpout Locations"** portion of **Section 9** for the exact location of this "WASTE" plate.
3. Attach the pumpout vacuum hose to the "WASTE" deck fitting. Because the transfer process uses a vacuum action, it is essential that there is a secure connection between the transfer hose and the deck fitting.
4. Activate the pumpout vacuum. The pumpout vacuum transfers onboard waste to the dockside holding station.
5. After all waste is removed, flush the waste tank by pouring a few gallons of fresh water through the "WASTE" deck fitting. Reattach the vacuum hose to the deck fitting and activate the pumpout vacuum again to remove the fresh water and any remaining waste.
6. Replace the "WASTE" deck plate.
7. Remove the port waste tank deck plate labeled "WASTE" using the cap removal tool supplied with your boat. This plate is located on the starboard sidedeck near amidships. Refer to the **"Fill Plate/Pumpout Locations"** portion of **Section 9** for the exact location of this "WASTE" plate.
8. Repeat steps 3, 4, 5 and 6 for the aft waste tank.

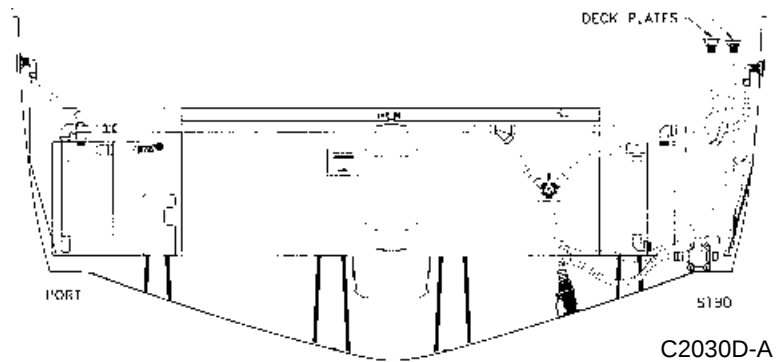
As the waste tanks are filled, air is displaced from inside the tanks and vented through a screen to outside the boat's hull. Clean the screen once a month. This screen is located on the starboard and port hull near amidships. Refer to the **"Above Waterline Thru-Hull Fittings"** portion of **Section 9** for the exact location of the screen.

SANITATION SYSTEM

C2030D-B



SANITATION SYSTEM (CONTINUED)



C2030D-A

Overboard Discharge

A TIP FROM CARVER!

The overboard discharge system contains a significant length of sanitation hose and a number of system components. When using this system in either direct overboard or overboard transfer mode, allow the head to flush or the transfer pump to run for at least 10 seconds. This ensures that waste has cleared the sanitation transfer hose. Waste left in the transfer hose tends to dry and harden. This could become an obstruction which prevents the sanitation system from operating properly.

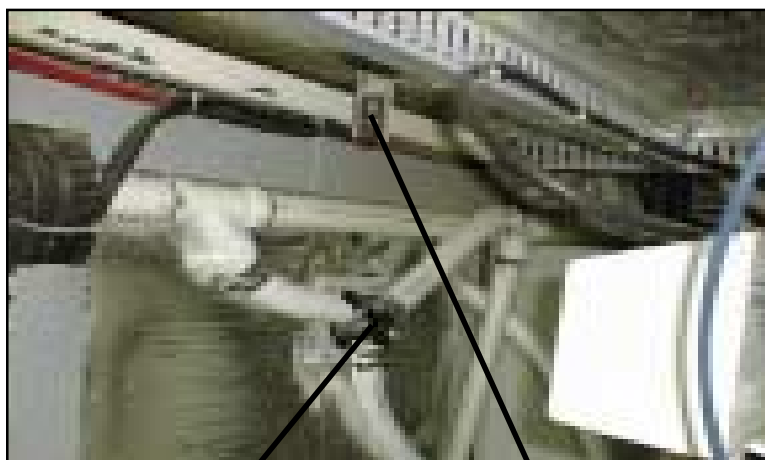
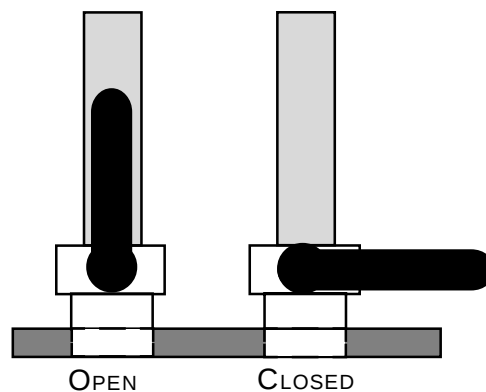
NOTE: *It is against the law to discharge waste overboard in many areas of the United States. It is your responsibility to make sure that you are in compliance with all applicable Federal, state and local laws when using your boat's overboard discharge system. People who discharge waste overboard in restricted areas are subject to significant penalties.*

In certain coastal areas of the world it is legal to discharge waste into the sea. To accommodate this procedure Carver offers an optional overboard discharge system for your boat. This system is available only on boats that are exported or used in the coastal areas of the United States.

With the overboard discharge system, waste is flushed from the heads to the waste tanks where it is stored. Where it is legal, you can then transfer the waste directly overboard. If overboard discharge is not legal where you are, you can either wait until you reach an area where it is legal or use a dockside pumpout station to empty the waste tanks.

To empty the tanks:

1. Open the overboard discharge seacock located in the aft bilge area just aft of the starboard fuel tank.
2. Locate the waste tank selector valve on the engine room's forward bulkhead, forward of the starboard engine. This valve allows you to select the starboard or port waste tank to pump overboard. Position the valve to select the starboard waste tank.



Waste Tank Selector Valve Waste Pump On/Off Switch

3. Switch the Main DC Subpanel circuit breaker on the Day Breaker Panel "ON".
4. Switch the Waste Pump circuit breaker on the Main DC Subpanel "ON".
5. Turn the waste pump ON/OFF switch to the "ON" position. The switch is located near the waste tank selector valve. This activates the waste pump, which pumps the waste overboard.



WARNING

Do not run the waste pump for an extended period after the waste tank is empty. Doing so damages the pump.

6. After all waste is pumped overboard, turn "OFF" the waste pump.

7. Remove the starboard waste tank deck plate labeled "WASTE" using the cap removal tool supplied with your boat. This plate is located on the starboard sidedeck near amidships. Refer to the **"Fill Plate/Pumpout Locations"** portion of **Section 9** for the exact location of this "WASTE" plate.
8. Flush the waste tank by pouring a few gallons of fresh water through the "WASTE" deck fitting. Reactivate the waste pump and remove the fresh water and any remaining waste, then turn "OFF" the waste pump.
9. Replace the "WASTE" deck plate.
10. Position the waste tank selector valve to select the port waste tank.
11. Turn "ON" the waste pump ON/OFF switch.

**WARNING**

Do not run the waste pump for an extended period after the waste tank is empty. Doing so damages the pump.

12. After all waste is pumped overboard, turn "OFF" the waste pump.
13. Remove the port waste tank deck plate labeled "WASTE" using the cap removal tool supplied with your boat. This plate is located on the starboard sidedeck near amidships. Refer to the **"Fill Plate/Pumpout Locations"** portion of **Section 9** for the exact location of this "WASTE" plate.
14. Flush the waste tank by pouring a few gallons of fresh water through the "WASTE" deck fitting. Reactivate the waste pump and remove the fresh water and any remaining waste, then turn "OFF" the waste pump.
15. Replace the "WASTE" deck plate.
16. Switch the Waste Pump circuit breaker "OFF".
17. Close the overboard discharge seacock.

Direct Overboard Discharge

NOTE: *It is against the law to discharge waste overboard in many areas of the United States. It is your responsibility to make sure that you are in compliance with all applicable Federal, state and local laws when using your boat's direct overboard discharge system. People who discharge waste overboard in restricted areas are subject to significant penalties.*

In certain coastal areas of the world it is legal to discharge waste into the sea. To accommodate this procedure Carver offers an optional direct overboard discharge system for your boat. This system is available only on boats that are exported or used in the coastal areas of the United States.

With the direct overboard discharge system, waste is flushed from the heads directly overboard. If overboard discharge is not legal where you are, you can flush the waste to waste tanks where it is stored. You can then either wait until you reach an area where overboard discharge is legal or use a dockside pumpout station to empty the waste tanks.

Grey Water System

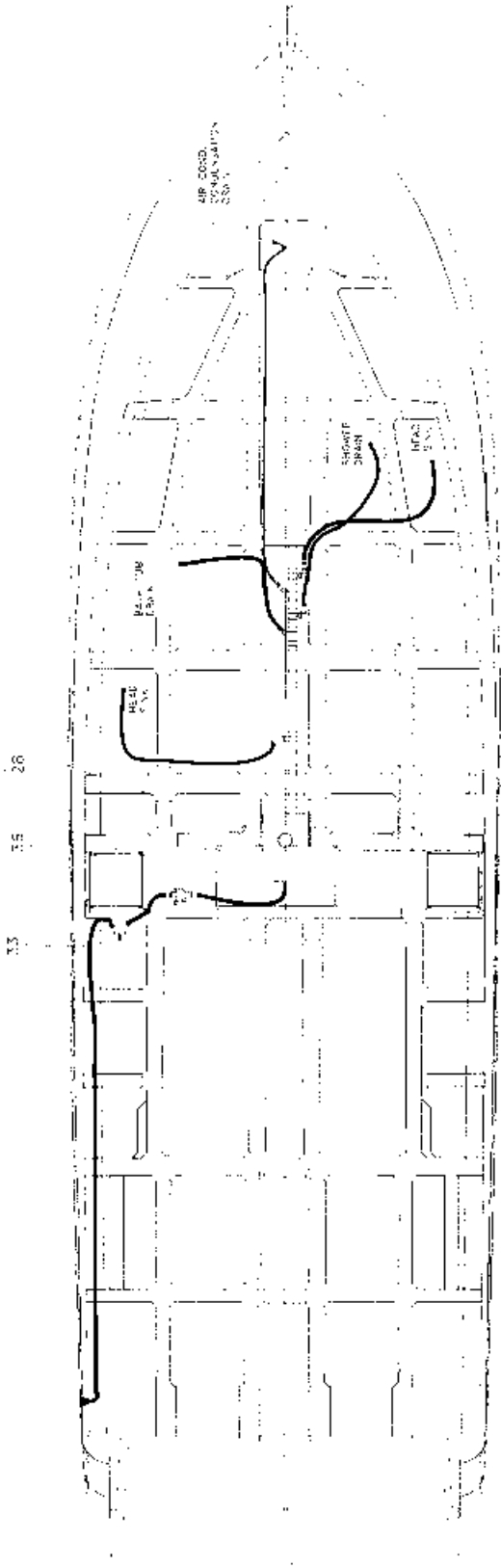
Certain areas of the United States and Europe have initiated antipollution regulations that require the installation of a grey water system on boats.

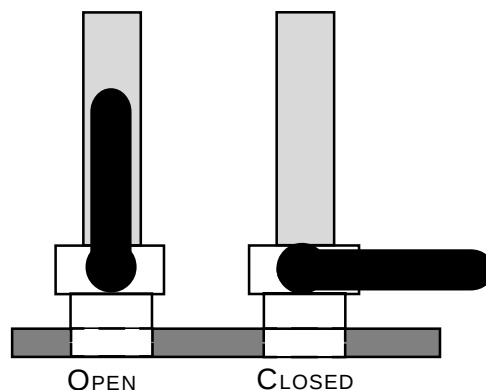
With the optional grey water system, all water in the sump, rather than being pumped overboard by the sump pump, is pumped into the port grey water tank. A hose connects the port and starboard grey water tanks so that the water level is equalized between the two tanks. The grey water tanks are located just aft of the fresh water tanks.

To empty the grey water tanks:

1. Open the overboard discharge seacock located in the aft bilge area just aft of the starboard fuel tank.
2. Locate the grey water tanks selector valve forward and outboard of the starboard engine. This valve allows you to select either the waste tanks or the grey water tanks to pump overboard. Position the valve to select the grey water tanks.

GREY WATER SYSTEM





3. Switch the Main DC Subpanel circuit breaker on the Day Breaker Panel "ON".
4. Switch the Waste Pump circuit breaker on the Main DC Subpanel "ON".
5. Turn the waste pump ON/OFF switch to the "ON" position. The switch is located directly above the waste tank selector valve. This activates the waste pump, which pumps the grey water overboard.



WARNING

Do not run the waste pump for an extended period after the grey water tanks are empty. Doing so damages the pump.

6. After all grey water is pumped overboard, turn "OFF" the waste pump.
7. Use waste tank deodorizer inside the grey water tanks between pumpouts.

Propane Stove

The optional propane stove system includes the stove and a liquid propane gas (LPG) storage tank. Refer to the OEM information for details on operating the propane stove. The propane tank is installed in a fiberglass box on the boat's boarding platform.

Once the propane stove system is properly set-up, switch the Propane circuit breaker on the Main DC Subpanel "ON". The stove is now ready to operate.

**WARNING**

The stove system is designed to use only LPG. Do not use any other fuel.

The propane tank must be firmly secured to the boat with the tank in a horizontal position. The American Boat and Yacht Council (ABYC) has developed specific standards on how propane tanks must be installed. Carver has installed this tank according to the ABYC standards. Do not relocate or reposition the tank.

NOTE: *The propane tank valve outlet fitting and the regulator system nut, by law, have left-hand threads. The nut is so marked with a slot.*

Always close the propane supply line valves and cylinder valve when the stove is not in use. Close valves immediately in an emergency. The appliance valves must be closed before opening the cylinder valve.

**DANGER**

When the propane stove is lit, it burns propane. The burning process uses cabin oxygen and releases combustion by-products. You must ventilate the cabin when using the stove. Failure to do so could result in a lack of oxygen and/or a build-up of combustion by-products, which can cause death or serious injury. Do not operate the stove for space heating. Never obstruct the ventilation openings.

Never obstruct quick access to the propane stove system components and shut-off valves. Keep valves on empty propane tanks closed and disconnected.

Keep protective covers, caps or plugs in place. Store reserve or empty tanks on open decks or in gas-tight lockers that vent overboard and are intended for storing propane tanks. Do not use the propane tank box for storing any other equipment.

Never leave your boat unattended when the propane stove is in use. Do not smoke or use an open flame while replacing propane tanks. Hoses in the propane stove system must be inspected regularly, at least annually, and replaced if any deterioration is found. Inspect the

flue pipes, at least annually, and replace them if any deterioration, cracks or openings are found.

Checking the System For Leaks



WARNING

Never use flame to check your propane stove system for leaks.

The propane stove system is inspected and pressure checked as part of Carver's quality assurance process. We do, however, suggest that you test the system for leaks regularly. Use the following system inspection process every time you remove and reinstall the propane tank. The following information has been taken from the Seaward Products Owner's Manual For Gas-Operated Stoves.

1. After the propane tank has been installed, the regulator system connected, the hose run and connected to both the stove and regulator, slowly open the propane tank valve until the propane is flowing. The pressure gauge on the regulation system should read approximately 110 psi at 70 degrees F. (the pressure is higher if the air around you is warmer; lower if the air is cooler).
2. Close the propane tank valve and observe the pressure gauge. It should hold a constant reading over a 15-minute period. If the gauge reading decreases over that time, there is a leak in the system.

If a leak is present:

1. Make sure the propane tank valve is closed.



CAUTION

Do not use soap that contains ammonia.

2. Use a soap and water solution to check all propane fittings. The solution forms bubbles where propane is leaking from the system.

If you cannot find the leak, contact SeaWard Products or your Carver Dealer.

3. Have a qualified person repair the propane system.

**DANGER**

Propane is heavier than air and if allowed to leak, could settle and accumulate. This accumulation could then ignite and explode.

NOTES

NOTES

Propulsion

Introduction	122
Fuel System	122
Fuel Tanks	122
Fuel Equalization Valves	122
Fuel Shut-Off Valves	123
Fuel Tank Vents	123
Engine Room Ventilation	123
Cooling System	123
Exhaust System	125
Fire Suppression System	125
Engine Gauges	126
Gauge Maintenance	128
Helm Controls	129
Shift/Throttle	129
Steering	130
Preparing for Cruising	130
Fueling	130
Operating the Engines	132

Introduction

This section gives a general overview of your propulsion system and how it works. For a detailed explanation of the engines installed in your boat, including how to operate and maintain them, refer to the OEM information.

Fuel System

Each diesel propulsion engine in your boat is plumbed to the fuel tank located on the same side of the boat as the engine. The diesel propulsion system uses fuel supply and return lines. 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 starboard fuel tank only.

Fuel Tanks

Your boat holds a maximum 500 gallons of fuel in two 280 gallon tanks. The fuel tanks are located on the starboard and port side of the aft bilge area. The fuel system meets or exceeds the standards set by the U.S. Coast Guard, the Boating Industry Association and the American Boat and Yacht Council that were in effect when your boat was constructed. Each fuel tank has passed a rigorous test conducted by the tank manufacturer. Additionally, the entire fuel system passed Carver's own pressure testing and inspection.

Before your boat is delivered, your Carver Dealer also makes a full inspection of the fuel system. An entry on the Carver Pre-Delivery Service Record verifies the dealer's completion of this inspection.

Fuel Equalization Valves

Because the generator draws fuel only from the starboard fuel tank, the fuel levels in the tanks may become unequal. If this occurs, open the fuel equalization valves, located near the center bottom on the aft of each tank. When the fuel levels are equal, close the valves.



WARNING

Always close both fuel equalization valves when you are not equalizing the fuel levels in the fuel tanks. If one of the valves developed a leak while open and unattended, fuel could spill into the aft bilge area undetected, creating a hazardous condition.

Fuel Shut-Off Valves

Fuel shut-off valves are installed between the fuel lines, both supply and return, and the fuel tank that they are connected to. The valves are located on top of the fuel tanks and must be open when operating the engines.



CAUTION

Do not operate a propulsion engine with its return line's fuel shut-off valve closed. Doing so creates excessive pressure within the fuel system that could lead to fuel system failure.

Fuel Tank Vents

Each fuel tank is vented overboard. As the fuel tank is filled, air is displaced from inside the tank and escapes through the vent. Refer to the "**Above Waterline Thru-Hull Fittings**" portion of **Section 9** for the exact location of the vents.

Engine Room Ventilation

Your boat's engine room is equipped with a ventilation system consisting of intake ducts, exhaust ducts and bilge blowers. This system is designed to remove excess heat from the engine room. The bilge blowers operate whenever the engines are running, as long as the three Auto Bilge Pump circuit breakers on the Engine Room Safety Breaker Panel are "ON".



DANGER

Never obstruct or modify the engine room ventilation system in any way.

You are responsible for keeping the engine room ventilation system in proper operating condition. Inspect the intake and exhaust ducts regularly to make sure they are free of obstructions and have not collapsed or torn. Inspect the blowers to make sure they are operating properly. Replace any worn components with new components of the same type.

Cooling System

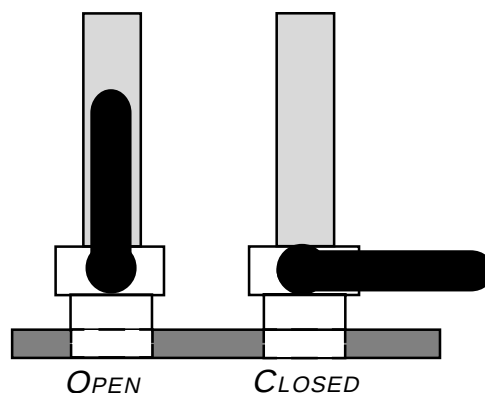
The engine's cooling system removes excess heat from the engines and exhaust system. Closed systems use a freshwater/antifreeze mixture to cool the engine. The coolant runs through a heat exchanger where the excess heat is transferred to seawater taken in through a

seacock for each engine. Open cooling systems use raw water to cool the engines directly. If you are not sure which type of cooling system is installed on your boat, contact your Carver Dealer.

Both open and closed cooling systems require sea water to function. Before each cruise, make sure the strainers located near the seacocks are free of sea weed and other debris. Open the cooling system seacocks before you start your engines. The seacock valve for each engine's cooling system is located in the engine room forward of each engine. If you have a closed system, make sure that you have a sufficient level of coolant in the system.

WARNING

Running an engine with an inadequate supply of antifreeze, or with obstructed or restricted water pickups or water strainers can cause serious damage to the engine and its related systems.



After starting your engines, check the engine exhaust outlet. If water is not being ejected from the outlet, immediately shut down the engines. Determine why sea water is not being pumped through the system. Have the problem corrected before restarting the engines.

If the engine temperature gauges register a higher than normal temperature reading, the cooling system may need to be repaired. If the needles move quickly toward a high temperature reading, immediately shut down the engines and have the cooling system inspected and repaired.

Exhaust System

The exhaust system consists of an exhaust manifold, a muffler, and the exhaust pipes used to remove exhaust from the engine to the atmosphere. Each engine has its own exhaust system. If the exhaust system contains leaks or obstructions, or has any other problem that prevents it from venting exhaust properly, carbon monoxide may escape and endanger you and your passengers. Check the exhaust system regularly for proper operation. Any change in engine noise could indicate an exhaust system problem and should be immediately investigated.

Fire Suppression System

An automatic, Halon fire suppression system is installed in your boat's engine room. This system provides an added measure of safety in the event of an engine room fire. Refer to the OEM information for details on operating the Halon fire suppression system. If your boat was built for use in Europe, the Halon system can also be activated manually using a release control located on the lower helm.



WARNING

If the Halon fire suppression system is activated, anyone in the engine room must immediately evacuate the room. Halon can cause asphyxiation. Once the fire is extinguished and the Halon system is deactivated, ventilate the engine room with fresh air before reentering it.

The Halon tank is installed on the engine room's centerline. A Halon system monitor, installed near the lower helm station, is wired to an ignition switch. The monitor's light should be "ON" when the ignition switch is turned "ON."

The Halon system contains an engine shut-off circuit. When the system is activated, the engines automatically shut down. An override switch, located on the monitor, resets the engine shut-off circuit after the Halon system has been activated, allowing you to restart the engines.

When replacing components while servicing the Halon system, you must use new components that have the same designation or that are equivalent in their technical and fire-resistance capabilities.

Engine Gauges

Each helm is equipped with a complete set of gauges on the instrument panel. The gauges allow you to monitor the operation and condition of your boat's propulsion systems. The side of the instrument panel that the gauges are on (port or starboard) determines which engine (port or starboard) that the gauges are for. Familiarize yourself with the gauges before starting the engines for the first time.



CAUTION

Do not start the engines until you have read and understood the engine OEM information.

Tachometer

The tachometer displays the speed of the engine in revolutions per minute (RPMs). This is not the boat's speed over the water or the speed of propeller rotation. The tachometer may not register zero RPM when its engine's ignition key is turned off; this is normal.



CAUTION

The engine manufacturer has established a maximum RPM rating for your engines, as listed in the engine OEM information. Do not exceed the maximum RPM. Doing so could damage the engines.

Temperature Gauge

The temperature gauge displays the temperature of the coolant in the engine's cooling system. Every engine is designed to operate within a specific temperature range. A sudden increase in the temperature gauge reading could indicate that the cooling water intake system has become blocked; a water intake hose has failed; or the coolant system's water pump has malfunctioned.

Each engine is equipped with a temperature alarm. The alarm sounds when the temperature of the engine's coolant increases to a predetermined point. If the alarm sounds, immediately shut down the affected engine.

Even with high temperature alarms installed, it is important that you visually monitor both temperature gauges while running the engines. If a temperature

A TIP FROM CARVER!

A cold engine has a tendency to stall when first put into gear. Let your engines warm up a few minutes before departing your dock or anchorage.

gauge indicates excessive engine temperature, immediately shut down the affected engine.



CAUTION

The engine manufacturer has established a maximum coolant temperature rating for your engines, as listed in the engine OEM information. Do not exceed the maximum coolant temperature. Doing so could damage the engines.

Oil Pressure Gauge

The oil pressure gauge displays the pressure within the engine's lubrication system. The oil pressure reading changes as engine speed changes. However, a noticeable decrease (either sudden or gradual) in an engine's oil pressure while the boat is maintaining a constant speed may indicate an oil pump failure, a leak in the lubrication system or excessive engine wear.

Each engine is equipped with a pressure alarm. The alarm sounds when the pressure in the lubrication system decreases to a predetermined point. The alarm also sounds when the engine is started or when the ignition switch is "ON" and the engine is not running. In these situations, the engine does not yet have adequate oil pressure; the alarm is silenced as soon as the oil pressure increases to within the normal operating range. Refer to the engine OEM information for the normal operating range.

If the alarm sounds after the engine has been running for a while, or if the alarm is not silenced within 15 seconds after starting the engine, check the oil pressure gauges. If either gauge indicates abnormally low oil pressure, immediately shut down the affected engine.

Even with the low oil pressure alarms installed, it is important that you visually monitor both oil pressure gauges while running the engines. If a pressure gauge indicates low oil pressure, immediately shut down the affected engine.

**CAUTION**

The engine manufacturer has established a minimum oil pressure rating for your engines, as listed in the engine OEM information. To avoid damaging the engines, shut them down if the oil pressure is below the minimum rating.

Voltmeter

The voltmeter displays the amount of charge in the engine's battery. When the battery is fully charged, the voltmeter indicates 12.5 volts. As a battery is used, its indicated voltage decreases. Each engine battery has its own voltmeter. Refer to the "**Voltmeters**" portion of **Section 2** for additional information on the voltmeters.

Fuel Gauges

The fuel gauges display the approximate amount of fuel in the fuel tanks. These gauges are not calibrated and should not be regarded as an accurate method of measuring the amount of fuel in the tanks. Both fuel gauges are "OFF" until the ignition switch for the port engine is turned "ON".

Gauge Maintenance

The gauges on the helm instrument panel should be protected from the sun and weather when not in use. The gauges are not waterproof. Protecting them from the elements prolongs their life.

NOTE: *Small beads of moisture (condensation) can form behind the glass bezel on some gauges. This does not mean the gauge is defective. The Carver Limited Warranty does not cover the replacement of gauges that are cosmetically affected by condensation.*

The gauges can be affected by static electricity that may build up on their glass bezels. To help reduce the static electricity and thus improve the gauges' accuracy, periodically wash the bezels with warm water and a mild liquid detergent.

Helm Controls

The helm controls allow you to engage the boat's engines, control the boat's speed and engine RPMs, and control the direction in which the boat is traveling.

Shift/Throttle

Two shift/throttle levers allow you to both shift the engines from neutral to forward or reverse and control the engine RPMs. With the levers in the center position, the engines remain in neutral at their lowest RPM levels. Lifting the levers above the neutral position shifts the engines to forward and increases the RPM levels. Lowering the levers below the neutral position shifts the engines to reverse and increases the RPM levels.

The shift/throttle levers are located on the starboard side of the steering wheel. The outboard lever controls the starboard engine and the inboard lever controls the port engine. The engines can be shifted/throttled independently to improve maneuverability in tight quarters.

A TIP FROM CARVER!

If you turn the ignition switch key and the engine starter fails to engage, it may be because the neutral safety switch for that engine is slightly out of adjustment. If this happens, wiggle the shift lever for that engine forward and aft until the starter engages.

A neutral safety switch is incorporated into the linkage of each shift/throttle lever. When properly adjusted, the safety switch does not permit you to start an engine while it is in gear.

Because your boat has dual engines, it is recommended that you operate the engines at the same speed while cruising. This reduces engine noise and vibration, and improves engine efficiency.

Use the optional engine synchronizer gauge to monitor the speed of each engine. Adjust the shift/throttle levers so that the synchronizer gauge needle is centered.

NOTE: *Aligning the shift/throttle levers with each other does not necessarily mean the engines are synchronized. To accurately synchronize the engines, rely on the tachometers or the engine synchronizer gauge.*

Engine Synchronizer

The optional engine synchronizer allows you to electronically and mechanically interconnect both engine shift/throttle levers. This allows you to increase and decrease engine speed using one lever. This also keeps the engines precisely synchronized. Refer to the OEM information for details on operating the engine synchronizer.

Control Cables

Push-pull cables are used to connect the shift/throttle levers to the engines. Refer to the OEM information for details on adjusting and maintaining the shift/throttle control systems.

Steering

Your boat uses a hydraulic steering system. This system is preferable over a mechanical steering system because it provides better response for large boats.

The boat's helm is connected to the rudders through a hydraulic pump, a network of hydraulic lines, an oil reservoir, a hydraulic cylinder, and a tiller tie rod. When the helm is turned, oil pumps through the hydraulic line, which activates the hydraulic cylinder. The cylinder is connected to the tiller tie rod. Extending and retracting the cylinder moves the rudders, enabling you to steer the boat. With hydraulic steering, the effort needed to turn the helm remains the same regardless of the boat's speed.

For the hydraulic steering system to operate properly, it must have an adequate source of hydraulic fluid and sufficient pressure within the hydraulic pump and lines. Refer to the OEM information for details on operating and maintaining the steering system.

Preparing for Cruising

Follow the steps provided below to help ensure that your boat is prepared for a safe cruise.

Fueling

Your boat's fuel tanks are designed to take on fuel at a maximum rate of 9 gallons per minute (GPM) when the tank is between 25% and 75% full. During this time the pressure inside the tank must not exceed 4 psi.

When fueling tanks that are either completely empty or nearly full, decrease the fueling rate. This helps prevent the tanks from fuel surge and rupture when they are empty, and from backing up and spilling fuel when they are full. Be aware that many marine fuel pumps can deliver fuel at rates up to 35 GPM. This high fueling rate should never be used with your boat; it could damage your fuel system.

Before Fueling

NOTE: *Refer to the engine OEM information for the type of fuel and octane rating recommended for your boat's engines.*

1. Make sure that the boat is securely moored.
2. Close all ports, windows, hatches and doors.
3. Turn "OFF" all fans, motors and any other devices that could create a spark, including the stove, oven, and generator.
4. Extinguish all open flames and smoking material, such as cigarettes, on the boat and in the area around the fuel dock.
5. Turn all battery master disconnect switches to the "OFF" position.
6. Have all guests and passengers leave the boat. Only the fuel handlers should be in the area.

Fueling

1. Remove the starboard and port fuel fill deck plates using the cap removal tool supplied with your boat. Refer to the "**Fill Plate/Pumpout Locations**" portion of **Section 9** for the exact locations of these plates.
2. Make sure that the fuel you are about to pump into your fuel tanks is the type recommended by the boat's engine manufacturer.
3. Estimate the approximate amount of fuel you wish to take on.
4. Begin pumping fuel into the fuel tanks a rate of no more than 9 GPM. When the tank is close to full, slow the fuel flow rate to less than 9 GPM. While fueling, keep the fuel hose nozzle in constant contact with the metal fuel fill deck plate. This is a safeguard against static sparks.

**CAUTION**

Avoid spilling fuel on the gelcoat surface of your boat. Fuel can stain the gelcoat and damage the hull accent stripes.

5. Monitor the fuel tank air vents. When the fuel tank is almost full, air whistles through the vent.

After Fueling

1. Replace the starboard and port fuel fill deck plates.
2. Wash down or wipe up all spilled fuel.
3. Ventilate the cabin by opening ports, windows, doors and hatches.
4. Turn the "house" battery master disconnect switch to the "ON" position.
5. Switch the Main DC Subpanel circuit breaker on the Day Breaker Panel "ON".
6. Switch the Bilge Blower circuit breakers on the Main DC Subpanel "ON".
7. Inspect the engine room. If you smell any fuel vapor, leave the bilge blowers "ON". Do not operate any onboard equipment until you are sure that the boat is free of fuel vapor.
8. When you can no longer detect any fuel vapor in the engine room, turn the bilge blowers "OFF".

Operating the Engines**Pre-Start Checklist**

1. Read and understand this Owner's Guide and all OEM information.
2. Check both fuel gauges to verify that you have sufficient fuel for your trip.
3. Inspect the engine room:
 - a. Sniff for fuel vapor.
 - b. Check the bilge water level.
 - c. Check for oil in the bilge.

- d. Check the crank case oil level in each engine.
 - e. Make an overall inspection of the engine room to look for signs of potential problems.
 - f. Follow all maintenance instructions as detailed in **Section 7**.
4. Turn all battery master disconnect switches to the "ON" position.
 5. On the Day Breaker Panel, switch the Main DC Subpanel and Pilothouse circuit breakers "ON".

Switch "ON" any other circuit breakers for equipment you may need (horn, trim tabs, Halon, etc.).

6. Switch the Bilge Blower circuit breakers on the Main DC Subpanel "ON". Check the output level of the blowers by holding your hand over the bilge vent. You can feel the air blowing from the vent if the blowers are operating properly.
7. Verify that all safety gear is onboard and in proper operating condition. Check items such as the navigation lights, VHF radio, depth sounder, etc. Make sure your boat carries all safety equipment required by Federal, State and local regulations.
8. Verify that you have an adequate supply of fresh water.
9. Check the level of waste in the waste tanks. Empty them if necessary. Refer to the "**Emptying the Waste Tanks**" portion of **Section 4**.
10. Disconnect and store the shore power cord and shore water hose.

Starting the Engines

1. Open the cooling system seacocks for both engines.
2. Move both shift/throttle levers to neutral.
3. A three-position switch located on the helm lets you choose one of three engine idle settings. Select the desired setting.
4. Select the engine you wish to start first. NEVER start both engines at the same time.

**WARNING**

The ignition switch is spring activated. Release the key as soon as the engine starts. Failure to do so may damage the starter.

**WARNING**

If the engine does not start within 10 seconds, release the key, then try starting the engine again. Do not hold the ignition key in the START position for more than 10 seconds.

5. Place one hand on the shift/throttle lever of the engine you are starting. With the other hand, turn the ignition key.

The oil pressure alarm sounds for the first few seconds after the engine has started. This is normal. The alarm is silenced as soon as the oil pressure increases to within the normal operating range.

If the engine is cold when it starts, it may run rough. Advance its shift/throttle lever slightly to keep it running.

6. Start the other engine in the same manner as the first engine.

After the Engines Have Started

**DANGER**

Always run the bilge blowers while the boat's engines are at idle speed.

1. Check the engine gauges. Make sure the oil pressure is within the normal operating range. The voltmeters should read approximately 12.5 to 13.4 volts.
2. Verify that water is being pumped through each engine's exhaust port, located near the transom. If you do not see water being pumped out, turn the affected engine off. Identify and correct the cause of the problem before restarting the engine.

**DANGER**

The engine room contains moving, hot machinery. Keep your hands, feet and body out of the engine room while one or both engines are operating.

3. Look into the engine room and visually inspect the fuel system hoses and exhaust hoses. If you see a leak or suspect that anything is out of order, shut down the engines and investigate. Identify and correct the cause of any problem before restarting the engines.
4. Let the engines warm up until the needles on the temperature gauges begin moving up.
5. Make sure all navigation systems are operating properly.

NOTES

NOTES

NOTES

Operating and Maneuvering

Launching the Boat	140
Navigation	140
Controlling the Boat	141
Loading	141
Casting Off and Docking	141
Maneuvering	145
Anchoring	146
Stern Anchors	147
Mooring Lines	147
Getting Underway	149
Shakedown Cruise	149
Operating at Planing Speed	150
Trim Tabs	150

Launching the Boat

Have a professional launch your boat. Your dealer can either provide experienced people to do this or recommend someone.

Navigation

Understanding navigation is very important when operating your boat on the open seas. Instructions on how to navigate your boat are beyond the scope of this manual. Carver encourages you to read *Chapman's Piloting and Seamanship* and obtain instruction regarding how to navigate your boat.

Charts

You can obtain charts of the waters in which you intend to navigate from the National Ocean Survey, a branch of the National Oceanic and Atmospheric Administration in Washington D.C. The NOS offers a publication listing the charts you will need for your area; however, this listing may not include inland rivers. Charts of inland rivers are also available from the appropriate district office of the U.S. Army Corps of Engineers. Your dealer may also have charts of the waters in which you intend to cruise.

Keeping your charts up-to-date is a very important part of navigation. The Weekly Notice to Mariners available from the Defense Mapping agency or the U.S. Coast Guard is an excellent resource for updating charts.

Compass

The compass is the most important piece of navigation equipment onboard your boat. To operate properly, the compass must be free from interference by local magnetic influences and electrical components. Refer to the OEM information for details on using and maintaining the compass. When it is time to compensate your compass, Carver recommends having it done professionally.

Horn

If you are navigating in fog or at night, use your boat's horn to alert other boaters of your presence. The horn meets U.S. Coast Guard standards.

Depth Sounder

The optional depth sounder can help you avoid entering waters that are too shallow for your boat and can aid in navigation.

Speed Log

Keeping a speed log is essential when trying to determine your position over time. Use the information recorded on the log to plot your approximate position from a known position.

Shallow Water Operation

Always pay attention to the depth of the waters in which you are cruising. Do not venture into waters which are too shallow for your boat's draft. Shallow water navigation can be very hazardous. If you do find yourself in shallow waters, reduce speed immediately. Consult nautical charts to determine your position. Try to plot a course out of the shallows through waters deep enough for your boat's draft. If your boat runs aground, radio for help and wait until it arrives. Do not attempt to relaunch your boat. You may do serious damage to your hull or underwater gear.

Controlling the Boat

Every boat owner should know how to perform the following procedures competently. Do not attempt any of these procedures without first receiving appropriate training.

Loading

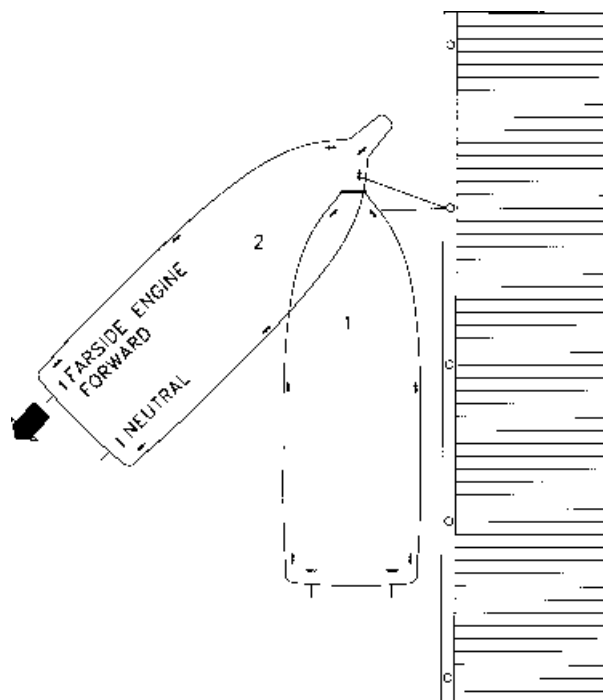
When you load items onto the boat, have someone on the pier hand them to you after you have boarded the boat. Stow all items securely to prevent them from shifting when the boat is in motion. If your boat is loaded near capacity or if seas get rough, distribute the weight evenly and keep the load low. Don't make any abrupt changes in its distribution. Shift the load or move about only after stopping or slowing the boat.

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 his boat against collisions with docks or other boats.

Leaving a Pier or Mooring

Getting underway from a pier is normally accomplished by taking in all lines except the bow spring. With a neutral rudder, power the boat forward using only the engine farthest from the pier. The boat will pivot around the bow spring line, moving the stern out and away from the pier. A fender should be placed between the bow and the pier to prevent scraping as the boat pivots about the bow spring. Once the stern is clear of boats and other obstructions, take the bow spring in and back the boat away.

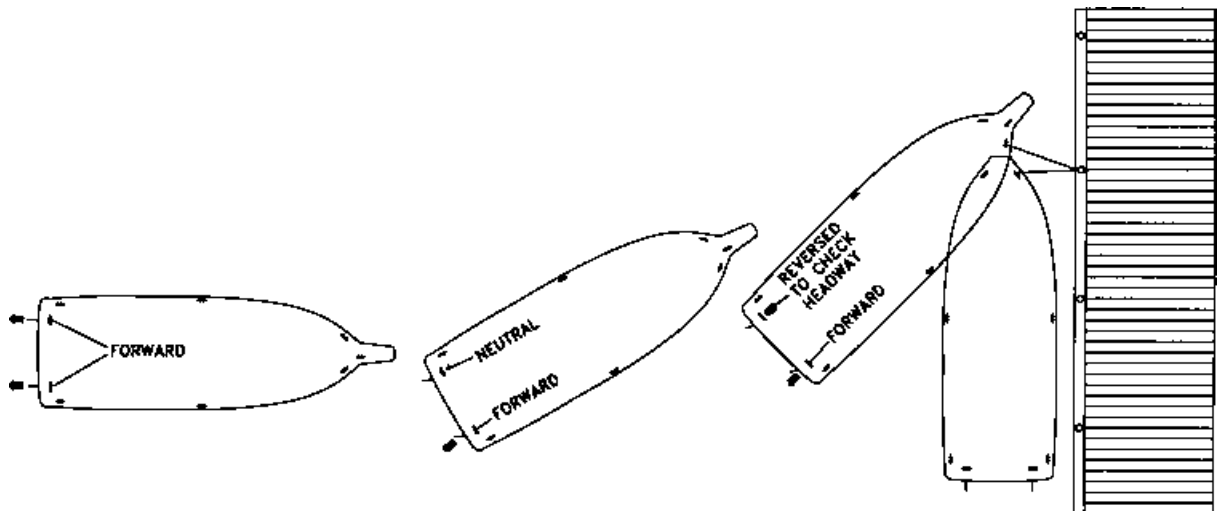


At marina anchorages, boats are often secured to a mooring buoy. Fouling your propeller with a mooring line is the principal hazard when leaving a mooring. If you use a dinghy to reach your boat, make sure the dinghy line does not foul the propeller.

After getting onboard, start the engines and send someone forward to slacken the line. Release the line. In a river with current, the boat will gain headway with the current. After you are clear of the buoy, power the boat forward. In a calm bay, if there is neither wind nor current, back the boat away a few boat lengths. As you power forward, keep the buoy in sight and give it ample room until you are clear. Run slowly until you clear the anchorage to avoid creating a nuisance with your wake.

Landing at a Pier

To land at a pier, approach the pier at a right angle. If you desire a starboard side landing, place the rudders to port and reverse the port engine to check headway. Leave the starboard engine in forward gear to swing the boat parallel to the pier. For landings on the port side, turn the rudders to starboard and put the starboard engine into reverse as the boat comes in. You may have to shift into and out of gear to control the boat's speed.

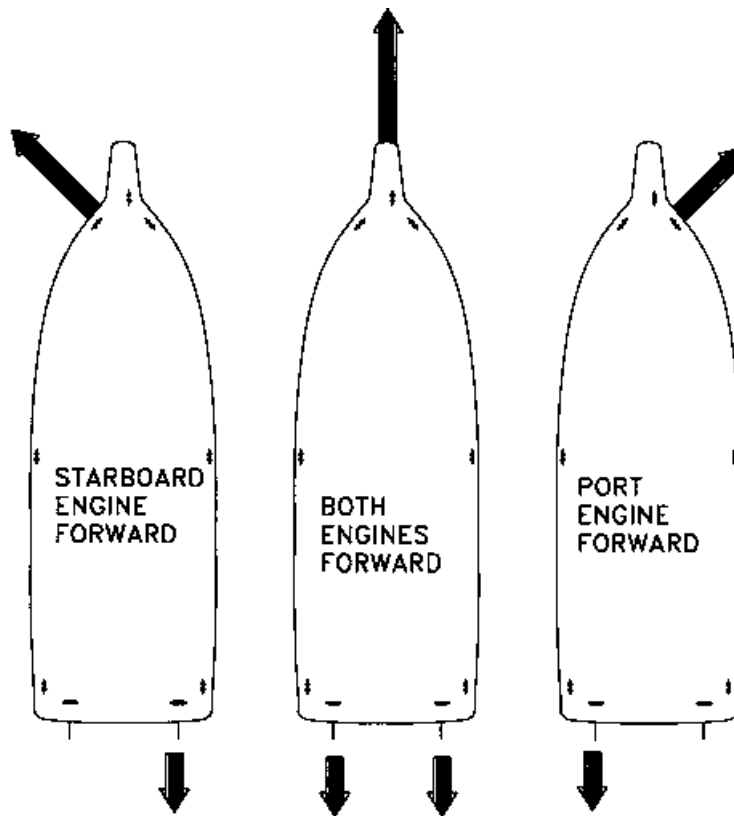


Picking Up a Mooring

As you return to the anchorage, approach your mooring at slow speed. Take note of how other boats are lying at their buoys. They are heading into the wind or current and your approach course should be roughly parallel to their heading. Stay clear of other moorings to avoid fouling them. If you tow your dinghy, station a crew member at the helm to keep the dinghy line from fouling the propeller.

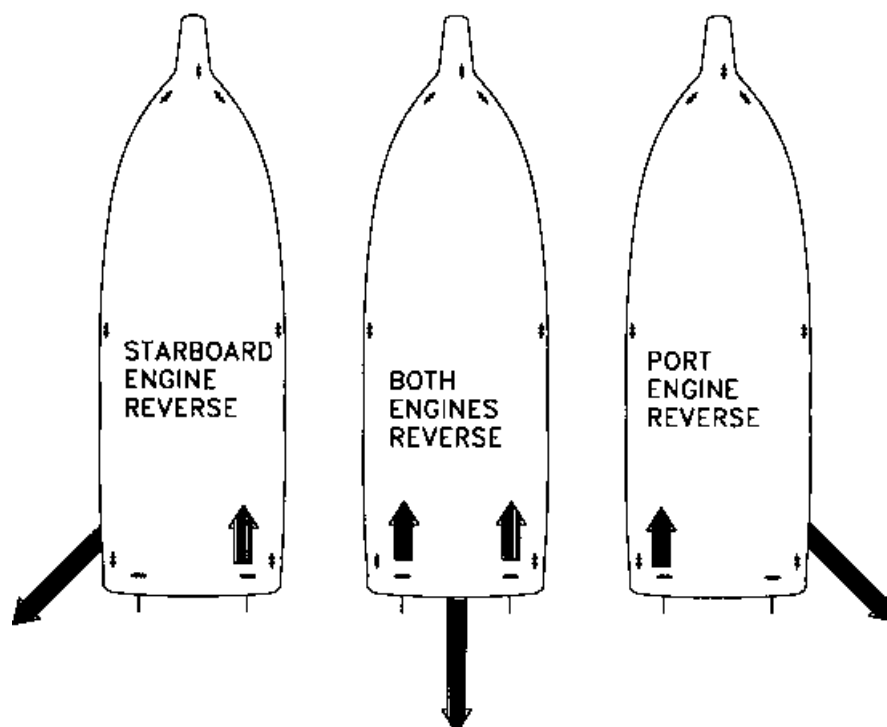
Shift the engines into neutral when you estimate that the boat's forward momentum will carry you to the buoy. Station someone at the bow with a boat hook to pick up the pennant float. If you are about to overshoot your mark, check headway as the bow comes up to the buoy. If you fall short, a few turns of the propeller should get you to the buoy. Keep the engine running until the pennant eye has been secured on the bitt or bow cleat.

If your crewman can not reach the pennant or if you overshoot, get clear and calmly try again.



TRACKING FORWARD (PROPS ONLY)

TRACKING ASTERN (PROPS ONLY)



Maneuvering

The propellers on your boat rotate in opposite directions. With only the port propeller rotating, your boat tracks forward and to starboard in forward gear and backward and to port in reverse gear. With only the starboard propeller rotating, your boat tracks forward and to port in forward gear and backward and to starboard in reverse gear.

With both propellers rotating at the same speed, the rudders amidships and the engines in forward gear, your boat tracks straight forward.

When the boat is moving backward, its rudders are not as effective and the side force from the propellers is used to steer the boat.

Maneuvering Astern

Backing a boat may be necessary in a crowded marina. Your boat's twin engines allow the boat to track straight astern or to either side. When backing, be sure to keep your trim tabs up. To make a turn to port, shift the port engine to neutral. A starboard turn astern is made by shifting the starboard engine to neutral.

Check sternway (stop reverse motion) by shifting your 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.

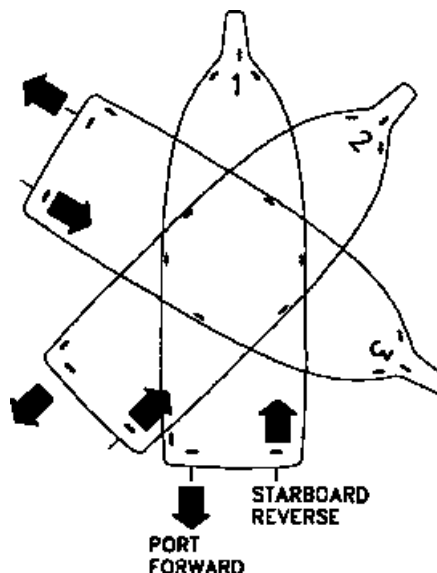
Checking Headway

Stopping the boat's forward motion is referred to as "checking headway". You should learn how to confidently stop your boat within any required distance. You can check headway by shifting engines to neutral and coming to a complete stop over a long distance, or by reversing engines and stopping within a shorter distance.

Close Quarters Turns

To execute a close quarters turn, check your headway, then shift one engine into reverse while shifting the other into forward gear. As you advance the throttles, the opposing forces cause the boat to pivot about a point centered between the propellers. You can assist the rate

of turn by turning the rudders in the direction of the turn.



Towing

Always offer assistance to a vessel in distress. However, towing a capsized boat or a boat with a damaged hull is not recommended. In these situations, lend aid to the occupants and call the proper authorities. Remember, you are obligated to lend aid to any person in distress, but not to the vessel. If you believe your vessel can not tow the vehicle in distress, do not attempt it. One disabled boat is better than two.

Anchoring

An anchor's holding power depends on its weight and the length of the anchor line. The most effective length is six to seven times the depth of the water you intend to anchor in. For example, if the water is 10 feet deep, you should have 60-70 feet of anchor line.

Approach your selected anchor site from downwind. Come to a dead stop over the spot where you want to drop anchor. Have a crew member lower the anchor. When the anchor hits bottom, reverse engines and slowly move the boat backwards to pay out more anchor line as the crew member keeps a slight tension on the line. When the proper length is out, the crew member can snub the line by winding it around the bow cleat. This should cause the anchor flukes to dig in and hold effectively.

Check for anchor drag. Immediately after anchoring, observe shoreline landmarks. After thirty minutes, observe the landmarks again. If the points of reference have changed, reset your anchor.

When weighing (pulling in) your anchor, pull the line in until it is vertical. When the line is taut, a hard tug will pull the anchor's shank up. If the anchor is stuck, wrap some of the line around a bow cleat and keep tension on the line. The boat's momentum may free the anchor. If there is a swell, wind the line around a bow cleat when the bow drops into a wave trough. As the bow lifts, it may free the anchor. If neither of these methods works, pay out a few feet of line, secure it around the bow cleat, and maneuver around the anchor. Keep the line tight until you find the angle that pulls the anchor loose.

An electric windlass simplifies the above procedures. Follow the above procedures and use the windlass control at the helm to drop anchor. To relieve strain on the windlass, hooks called *devil's claws* engage the chain when the anchor is down.

If you intend to stay at anchor overnight or if you anchor your boat close to another structure, consider dropping another anchor from the stern. This prevents your boat from swinging around if the wind or current shifts.

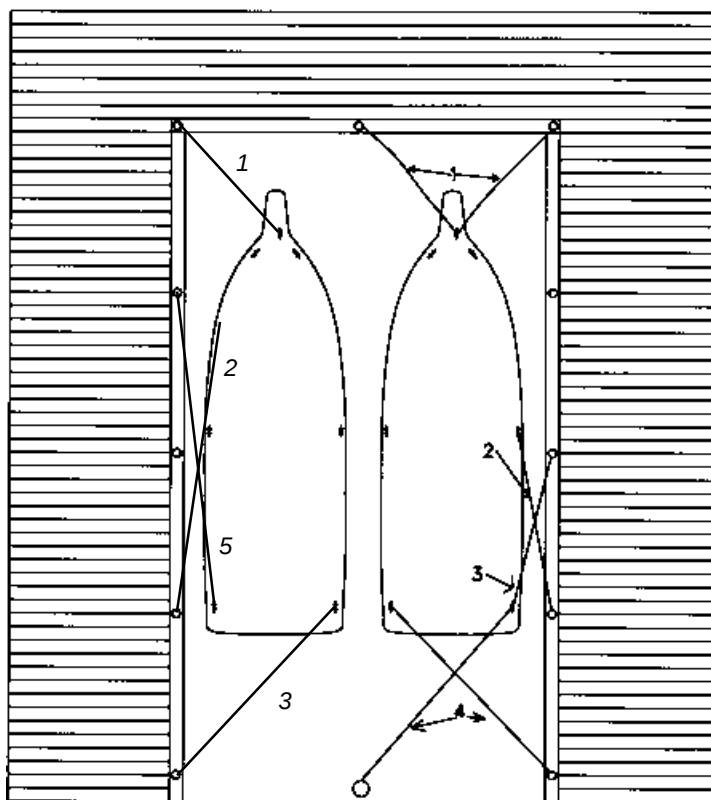
You may also need to anchor in a strong wind. If you drop your spare anchor, make sure the two anchors are laid out at an angle. If both anchors are set in-line and one of them drags, it may cut a trough for the other anchor to follow.

Stern Anchors

In some anchorages, boats lie to anchors bow and stern. To get these anchors down, drop the bow anchor first, then pay out extra anchor line (15-18 times the depth). Drop the stern anchor and adjust the length of line payed out on both anchors as necessary.

Mooring Lines

It's a good idea to familiarize yourself with mooring line terminology and using mooring lines. If necessary, obtain training on mooring your boat. Learn how and when to tie the various knots used in seamanship. Boats which are not moored correctly can suffer and



cause serious damage. The following information serves only as a guide to mooring your boat.

The mooring illustration above demonstrates possible mooring lines for a small vessel. These lines include the (1) bow line, (2) after bow spring, (3) after quarter spring, (4) stern lines and (5) forward quarter spring. Of the two dockings shown, the left one shows how to tie up when docking your boat in an alongside berth. The docking shown on the right is used when tying up at four corners of the boat.

The two spring lines are crossed and running to separate deck cleats. If possible, the stern line should be run 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.

Getting Underway

It takes training and experience to become an "expert yachtsman." Reading and understanding this Owner's Guide gives you only part of the knowledge you'll need to operate a boat safely and skillfully.

Carver 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 with yourself in appraising your level of skill.

Shakedown Cruise

Before taking your boat on its first outing, be sure that the following tasks have been completed.

1. Your Carver Dealer has completed Pre-Delivery commissioning. This inspection is documented on the Pre-Delivery Service Document and is signed by the dealer and the owner.
2. All warranty registration cards have been completed and mailed.
3. You have read and understand this Owner's Guide and all OEM information.
4. The safety equipment onboard your boat is in compliance with Federal, State and local regulations.
5. Your boat has been documented or registered and displays the appropriate identification on the hull.
7. A representative of your Carver Dealer has reviewed the operation of the boat and its systems with you and answered all of your questions to your satisfaction.

If possible, pick a calm day for your first outing. The shakedown cruise with a new boat is not the best time to bring friends or guests along. Entertaining guests can distract you from the real purpose of the cruise, which is to familiarize yourself with your new boat. Bring only those people (spouse and children) who will make up your regular crew. Invite the sales person who sold you the boat or a member of your Carver Dealer's service staff along for the ride.

Carry a pad and pencil with you during this first outing. Write down any questions that come to mind during the cruise so you can discuss them with your dealer.

Follow the procedures outlined at the beginning of this section for fueling and starting the boat's engines.

This may be the first time you have been in total command of your new boat. Proceed slowly. Have fun but remember that the objective of the cruise is to learn more about how your boat operates and handles. Operate at different RPM settings. Try different trim angles. Monitor the gauges. Practice backing down and turning slow speed tight corners that simulate docking maneuvers.

Operating at Planing Speed

Your boat has a "planing" hull. A planing hull skims "over" the water rather than "through" it. To do this, however, your boat first has to reach a certain speed, called "planing speed."

When you first accelerate from a dead stop, the trim angle of the boat increases, causing the bow to rise and the stern to drop. If you continue to accelerate, the boat eventually achieves plane, which means the bow slowly drops to a more level attitude.



CAUTION

It is important to get on plane as soon as possible and avoid speeds that cause the boat to plow through the water with the boat in a bow-high attitude. A bow-high attitude obstructs your vision and limits the boat's handling and performance capabilities.

Once the boat is on plane, you can 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

Your boat is equipped with a set of electric / hydraulic trim tabs. Trim tabs help the boat get on plane by allowing you to adjust the attitude of the boat for variables such as load, passengers, seas or wind. Under normal conditions your boat does not need adjustments to the trim tabs to achieve plane. Use the tabs at plan-

ing speeds to make minor adjustments in the fore and aft and beam-to-beam angle of the boat.

To use the trim tabs:

1. Switch the Trim Tabs circuit breaker on the Main DC Subpanel "ON".
2. The trim tabs controls are located at the helm station. The controls consist of two switches. The port switch controls the port tab; the starboard switch controls the starboard tab. Each switch is labeled "BOW UP" and "BOW DOWN." Before advancing the throttles, press both switches on the "BOW UP" side for 5 seconds. This lifts the trim tabs to the full "up" position.
3. Advance the throttles to bring the boat on plane. Adjust the engine RPMs for cruising speed.



CAUTION

Do not overtrim your boat. When adjusting the trim tabs, press their control switches for only one-half second at a time, then allow the boat to respond. Continue to adjust the trim tabs in this manner until the boat is at the desired trim angle. Over-trimming can cause the bow to veer and may lead to loss of control. Always reset the trim tabs to the BOW UP position before advancing throttles to achieve plane. Accelerating the boat to planing speed while the trim tabs are lowered can cause a loss of control.

4. Use the trim tabs individually to make beam-to-beam adjustments. If the majority of your passengers are sitting on the port side, you may find that the starboard side of your boat is riding higher than the port side. Use the "BOW DOWN" side of the starboard trim tab switch to adjust the trim.

If your passengers decide to shift to the other side of the boat, level the boat 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.

5. The trim tab switches can be used together to bring the bow of the boat to a lower attitude. This adjustment is often used when running into choppy seas. Bringing the bow down uses the sharper part of the boat'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 boat.

NOTES

NOTES

Maintenance

Maintenance Schedule	156
Exterior Maintenance	160
Fiberglass Surfaces	160
Anti-Fouling Bottom Paint	161
Caulking and Sealants	162
Stainless Steel Rails and Hardware	162
Decorative Striping Tape	163
Windows	163
Exterior Vinyl Upholstery	164
Exterior Carpet	164
Canvas	164
Interior Maintenance	167
Woodwork	167
High Pressure Laminate	167
Woven Fabrics	167
Carpet	169
Interior Fiberglass	169
Plexiglass	169
Mechanical Systems	170
Engines / Generator	170
Thru-Hull Valves	170
Propeller Shaft Seals	170
Props	171
Struts	171
DC Electrical System	171
Fresh Water System	173
Bilge System	174
Sanitation System	174

Maintenance Schedule

The maintenance activities and their intervals listed on the following pages are provided as guidelines only. The ideal maintenance activities and maintenance schedule depend on the components installed in your boat and the manner and environment in which you use your boat. The more frequently you use your boat, the more often maintenance needs to be performed. If you use your boat in salt water, it requires more maintenance, especially on its exterior.

For instructions on when and how to maintain many of your boat's components, refer to the OEM information.

Maintenance activities are divided into four types:

Type A Maintenance

Perform Type A maintenance 48 hours after the first launching of your boat, and 48 hours after launching your boat following a period of onshore storage.

Type B Maintenance

Perform Type B maintenance after the engines have operated for 25 hours following launching, whether your boat is new or coming out of onshore storage.

Type C Maintenance

Perform Type C maintenance semiannually 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.

A maintenance log is included at the end of this owner's guide. The log lists the maintenance activities shown on the following pages. Make several copies of the log. Use the log to keep a record of the maintenance activities you perform.

A blank log sheet is also included so that you can develop a maintenance list for OEM components. Make a copy of this log sheet and write in the suggested items from your OEM manuals.

	Type A	Type B	Type C	Type D
Engines and Drive System				
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
Inspect exhaust guard cover.				X
Check props for balance and nicks.				X
Check strut bearings.				X
Check rudder alignment.				X
Check all thru-hull fittings.				X
Inspect shaft seal.	X	X	X	X
Check engine and shaft alignment.	X	X	X	X
Spray ignition switch with contact cleaner.				X
Tighten engine mounts.		X		X
Weigh fire suppression chemical tank.			X	X
Control System				
Make any necessary throttle and shift adjustments.		X		X
Lubricate cables and controls.				X
Steering System				
Inspect linkage and connections.		X		X
Inspect hydraulic fluid level.	X	X	X	X
Inspect rudder seal.	X	X	X	X
Inspect tiller tie bar linkage.		X	X	X
Inspect trim tab reservoir.		X	X	X

	Type A	Type B	Type C	Type D
Electrical System				
Inspect and clean batteries.			X	X
Check battery fluid levels.		X	X	X
Check operation of all DC electrical equipment.	X	X	X	X
Check operation of all AC electrical equipment.		X	X	X
Inspect shore power cords.			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				
Clean engine fuel filters.		X	X	X
Inspect for fuel leaks.	X	X	X	X
Inspect fuel lines for signs of chafe.		X	X	X
Fresh Water System				
Flush water tank(s) and system.			X	X
Clean in-line water filter.			X	X
Fiberglass / Woodwork				
Clean fiberglass.	X	X	X	X
Wax hull and all non-tread areas.		X	X	X
Repair chipped fiberglass.				X
Clean interior woodwork.				X

* Inspect the zinc anodes at least once every two weeks. Check with your marina or consult other local boat owners to determine the average life expectancy of the zinc anodes. If you notice a rapid deterioration of the zinc anodes, have a professional yacht corrosion specialist check your boat, local seawater and dock.

	Type A	Type B	Type C	Type D
Interior				
Perform maintenance on the head(s).	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.			X	X
Clean stove.			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				
Check compass for magnetic deviation.				X
Check trim tab system for leaks.		X		X
Check tightness and caulking of deck hardware.				X
Clean upholstery.			X	X
Clean plexiglass surfaces.				X
Lubricate hinges, latches and locks.			X	X
Wash weather covers.				X
Bilge System				
Check hull drain plug.	X	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 engines.	Each time before starting engines.	Each time before starting engines.	Each time before starting engines.

Exterior Maintenance

The following paragraphs explain how to maintain the various materials present outside your boat's cabin to help keep the boat looking new.

Fiberglass Surfaces

The exterior fiberglass surfaces of your boat are coated with a protective layer of gelcoat. Gelcoat forms a hard, smooth and durable surface. It does, however, contain very small pores that, over time, collect dirt and discolor if the gelcoat is not kept clean.



CAUTION

Do not use abrasive cleaners when washing your boat. Abrasive cleaners scratch and dull the gelcoat.

Wash the boat with fresh water after each outing to help keep the gelcoat clean. If you operate your boat in salt water, wash it at least once every week, even if it hasn't been used since the last washing. Periodically wash the boat with a solution of fresh water 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 them makes them slippery and dangerous to walk on.

Wax all non-tread areas at least once a season. Use a high quality, non-yellowing, marine wax. Waxing your boat provides a shiny surface and seals the pores in the gelcoat, making it easier to keep clean.



CAUTION

The continued and overly frequent use of abrasive polishing compounds eventually erodes the gelcoat.

Gelcoat eventually dulls with age, much like the paint on your car. When it does this, you can restore the gelcoat's luster using an electric buffer and a very fine grade polishing compound. Ask your Carver Dealer what brand and grade of polish to use.

Stress cracks are common on all fiberglass boats. In the majority of instances these cracks are cosmetic and

limited to the gelcoat surface only. Gelcoat stress cracks are rarely an indication of structural problems. If you discover stress cracks in your boat contact your Carver Dealer.

NOTE: *The repair of cosmetic (non-structural) gelcoat stress cracks is not included under the terms of the Carver Limited Warranty.*

Gelcoat Repair

Cosmetic repair of minor gelcoat nicks and scratches is not difficult nor does it require the use of special or unique tools. Any boat owner with a little practice can make visually satisfying repairs. Repairs to fiberglass laminates or structural fiberglass components are best left to the experienced technicians at your Carver Dealer.

A gelcoat repair kit is available from your Carver Dealer (Carver part number 82036-03). This kit includes color matched gel, gel hardener and detailed instructions on making gelcoat repairs.

Gelcoat Blisters

While fiberglass is a durable and economical material, it is not indestructible as is often assumed by many boaters. The most commonly known problem associated with fiberglass is blistering. These blisters generally form in the gelcoat or in the outer most layer of laminate. They can range in size from microscopic to two inches or larger in diameter.

The appearance of fiberglass blisters does not indicate structural problems or faulty hull lamination. Gelcoat blisters form through a natural process and are quite common. If you discover blisters on the underwater portion of your boat's hull, contact your Carver Dealer.

Anti-Fouling Bottom Paint

The underwater surfaces of your boat are coated with a high-quality, factory-applied coat of antifouling bottom paint, applied after the hull has been carefully prepared and primed.

The paint has a high copper content and antifouling elements that retard the growth of marine life on the bottom of your boat's hull. The antifouling elements in

this paint have a limited life span, usually about 12 months. Because of this, Carver suggests you repaint the hull with a fresh coat of bottom paint on an annual basis. Be sure to use a paint that is compatible with the factory-applied paint. Failure to do so can void your bottom paint warranty. Also make sure the paint is best for the type of water you operate the boat in. See your Carver Dealer for assistance in selecting an appropriate bottom paint.

To prepare the hull bottom for painting, lightly sand the existing paint with 80 grit or 100 grit sandpaper. Remove all dirt and sanding residue from the hull. Apply the new paint using a brush, roller or sprayer. If you wish to apply a second coat, allow the first coat to dry before proceeding.

Caulking and Sealants

Deck fittings, rail bases, window frames and all underwater fittings have been sealed with the finest quality sealants. These sealants, however, do not last indefinitely. The working action of the boat and 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 Carver Dealer.

Stainless Steel Rails and Hardware

Stainless steel is not rust-resistant nor is it stain-resistant. When left in contact with the marine environment it does rust and corrode. Proper care helps keep the stainless fittings on your boat looking bright and shiny.

Clean the stainless steel rails and fittings after each outing with either soap and water or glass cleaner. If you operate your boat in salt water, clean the rails and fittings at least once every week, even if the boat hasn't been used since the last cleaning.

If you discover any rust, remove it immediately. Failure to do so 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 them from the elements and keep them looking their best. Use the same wax you use on the fiberglass surfaces of the boat.

**CAUTION**

Never use abrasives like sandpaper or steel wool to clean stainless steel fittings or rails. Never use mineral acids or bleach to clean stainless steel. Never let stainless steel come into prolonged contact with iron, steel or other metals which cause contamination leading to rust or corrosion.

Decorative Striping Tape

A variety of decorative stripes are used on the exterior of your boat. Striping tapes are custom-made to Carver's color and size specifications. Replacement striping tape is only available through Carver Dealers. To remove a damaged section of tape, heat the area with a hair dryer. This softens the adhesive and makes the tape easier to remove. To remove any adhesive residue, use acetone.

**CAUTION**

When fueling your boat, avoid spilling fuel on any of the decorative striping tape. Fuel damages the striping tape.

Windows

The window and hatch frames on your boat are fabricated from aluminum. Some of these frames are painted with enamel. To clean both the painted and unpainted frames, use a sponge dipped in a solution of fresh water and mild soap. Do not use a brush or abrasive cleaner as these can scratch the painted frame surfaces, damaging their appearance.

The cabin windows are made from tempered glass. Clean the windows using a soft rag and glass cleaner. The bridge wind screen is made from formed plexiglass. Do not use glass cleaner to clean plexiglass; instead, use a solution of fresh water and mild soap.

Exterior Vinyl Upholstery



CAUTION

If you have used Dr. Vinyl to repair damaged upholstery, do not use the following cleaners on the repaired area as they will damage it.

- Denatured alcohol
- 3M Citrus Cleaner
- Ammonia and hydrogen peroxide

To care for the exterior vinyl on your boat, refer to the cleaning recommendations in the following "**Vinyl Cleaning and Care**" insert. The insert also contains specific information on removing certain types of stains. The treatment for additional types of stains is described below.

Grease and Pencil Marks: Use a medium-soft brush to apply either a solution of fresh water and Ivory Soap or Fantastik Spray Cleaner.

Tough Stains, Adhesive, Teak Oil and Rust: Use 3M Citrus Cleaner; rinse with soap and water.

Avoid saturating the exterior cushions with water. To enhance the appearance of the exterior cushions and upholstery, occasionally treat them with an approved vinyl protectant.

Exterior Carpet

Rinse the bridge and deck carpet with fresh water when cleaning the other portions of the boat's exterior. When the exterior carpet becomes soiled, remove the carpet from the boat and wash it 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.

Canvas

White Vinyl

White exterior enclosures are made from vinyl coated materials. Clean the enclosures using a sponge dipped in a solution of fresh water and mild soap. To remove heavy dirt, use a vinyl cleaner. Treat the vinyl with a vinyl protectant twice each season.



VINYL CLEANING & CARE

Important information concerning your G&T vinyls. G&T vinyls are made to withstand the effects of sun, heat, acid rain, and soiling under normal conditions. Please consult these cleaning recommendations.

Steps	1	2	3
Betadine	B	A	
Chewing Gum	D	A	B
Eyeshadow	B		
Motor Oil	B		
Spray Paint	B	E	
Mildew or Wet Leaves*	C	A	B
Shoe Polish*	D	B	E
Yellow Mustard	A	B	C
Oil Base Paint (fresh)	D	B	E
Oil Base Paint (dried)	D	A	B
Suntan Lotion*	A	B	E

Steps	1	2	3
Tar/Asphalt	D	A	B
Lipstick	A	B	
Latex Paint	A	B	E
Crayon	D	B	
Ketchup	A	B	
Grease	D	B	E
Ballpoint Ink*	A	B	E
Household Soil	A	B	
Permanent Marker*	B	C	E
Coffee, Tea, Chocolate	B		

- A. Medium-soft brush, warm soapy water/Rinse/Dry
- B. Fantastik Spray Cleaner/Rinse/Dry
- C. One (1) tablespoon ammonia, one-fourth (1/4) cup of hydrogen peroxide, three-fourth (3/4) cup of water/Rinse/Dry
- D. Wipe or scrape off excess (Chill gum with ice)
- E. 3M Citrus Base Cleaner Rinse/Dry (617-733-1110 #55)
- F. Denatured Alcohol/Rinse/Dry

Note: All cleaning methods must be followed by a thorough rinse with water.

*Suntan lotion, shoe polish, wet leaves, and some other products contain dyes that stain permanently.

Certain household cleaners, powdered abrasives, steel wool and industrial cleaners can cause damage and discoloration and are not recommended. Dry cleaning fluids and lacquer solvents should not be used as they will remove the printed pattern and gloss. Waxes should be used with caution. Many contain dyes or solvents that can permanently damage the protective coating. Always remove stains immediately.

96 Willard Street, Suite 201, 1726 Mariners Square, Cocoa, FL 32922, (800) 628-3775 — 700 Collins Road, Elkhart, IN 46516, (800) 343-1565
1726 Henry G Lane, Maryville, TN 37801, (800) 247-9901 — 475 36th Street, S.E., Grand Rapids, MI 49548, (800) 967-7753

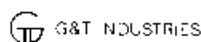
For More Personalized Information About Our Products and Services:

1-800-247-9901

DO NOT USE
409 CLEANER
OR
SILICONE BASE PRODUCTS!!!



MARINE SPECIALTIES GROUP



G&T INDUSTRIES

IMPORTANT INFORMATION REGARDING YOUR VINYL

WHILE YOUR VINYL IS MADE TO WITHSTAND THE ELEMENTS, IT IS IMPORTANT TO CARE FOR IT BY KEEPING IT CLEAN AT ALL TIMES. MANY SUBSTANCES MAY STAIN YOUR VINYL IF LEFT ON OVER A PERIOD OF TIME. REMEMBER TO REMOVE ANY CONTAMINANT AND CLEAN VINYL IMMEDIATELY.

Sunbrella

Colored canvas enclosures are made from Sunbrella fabric. This fabric should be cleaned regularly before dirt accumulates and becomes embedded in it. The fabric can be cleaned without removing it from the stainless steel bow supports. Brush all loose dirt off the Sunbrella, then hose down the fabric with a solution of natural soap and lukewarm fresh water (no more than 100 degrees F.). Rinse with fresh water until the soap is removed. Do not use detergents.



WARNING

Do not soak the Sunbrella in Clorox for an excessive amount of time as this can damage the stitching. Cleaning the Sunbrella using bleach may reduce the fabric's water repellency. To restore its water repellency, apply an air-curing fluorocarbon water repellent treatment.

For stubborn stains: Remove the fabric from the bow supports. Soak the fabric for 20 minutes in a solution of no more than 1/2 cup (4 oz.) Clorox and 1/4 cup (2 oz.) natural soap per gallon of lukewarm fresh water (no more than 100 degrees F.). Rinse with fresh water until the soap is removed, then allow the fabric to air dry.

Do not subject canvas fabric to excessive heat. Before storing the fabric, thoroughly air dry it. Store it in a dry, ventilated area.

Enclosure Curtains

The enclosure curtain's clear vinyl windows are easily scratched if cleaned incorrectly. Because of this, use only nonabrasive cleaners and a soft cloth to clean the vinyl windows. To remove water spots, use glass cleaner and a clean, soft cloth. To remove dirt and dust, use a clean, soft cloth dipped in a solution of fresh water and very mild soap. Do not use paper towel to clean the clear vinyl windows as it will scratch them.

There are several cleaners made specifically for vinyl windows. If you decide to use one of these cleaners, first try the product on a small, inconspicuous area to make sure that it does not damage or scratch the vinyl surface.

Interior Maintenance

One of the best things you can do to maintain the interior of your boat is to ventilate the cabin as often as possible. Do not allow moisture to accumulate in the boat's interior. Moisture leads to a damp, musty environment, which encourages the growth of mildew.

Woodwork

Solid hardwood and hardwood veneer are used throughout the interior of your boat. Treat this woodwork like you treat your finest furniture. Dust it on a regular basis using 3M Clean and Shine and a soft rag. Do not use wax-based furniture polish or cleaner containing abrasives.

Do not lay wet or damp towels or clothing on or against the finished hardwood surfaces.

The interior woodwork was finished at the factory with a special industrial/commercial grade finish. If you need to refinish any woodwork, contact your Marquis Dealer to order the appropriate product. Follow the manufacturer's instructions on the product package when applying the finish.

High Pressure Laminate

High Pressure Laminate (HPL) is used on many of the cabinet faces and counter tops inside your boat. HPL is extremely durable and easy to clean. Clean the laminated surfaces with a cleaner made for use on household counter tops. Avoid using the counter tops as cutting surfaces. Cutting or slicing on the HPL surfaces can permanently scratch them.

Woven Fabrics

The woven fabrics used in your boat's interior include drapes, pillow shams, bed spreads, woven (fuzzy) headliners and sofa and barrel chair coverings. These fabrics have been treated with a popular stain retardant product. Even so, the fabrics still need periodic cleaning. To care for the fabrics, refer to the cleaning recommendations in the following "**Fabric Cleaning and Care**" insert. The insert also contains specific information on removing certain types of stains. The treatment for additional types of stains is described below.

Pencil Marks: Use a clean, white cloth and Westley's Clear Magic.



FABRIC CLEANING & CARE

Important information concerning your G&T Marine Headliner and Fabrics

Steps	1	2	3
Water Stain	B	C	E
Motor Oil	A		
Spray Paint	A	D	F
Mildew	A	E	
Yellow Mustard	A	D	
Wet Leaves*	A		
Oil Base Paint	A	D	F
Suntan Lotion*	A	F	
Chewing Gum	D		
Tar	D	A	
Lipstick	A		

Steps	1	2	3
Ketchup	A		
Grease	A	D	
Ball Point Ink	A		
Household Soil	A		
Permanent Marker*	A	F	
Coffee, Tea	A		
Chocolate	A		
Adhesive	D		
Teak Oil	D		
Latex Paint	A	D	F
Crayon	A	D	

- A. White cloth - Westley's Clear Magic.
1-800-545-0982
- B. White cloth - Westley's Clear Magic - air hose.
- C. Jendow Glass Cleaner. 313-777-2236
- D. Lift Off Spot Remover. 216-881-4070
- E. Clothes shaver to remove lint.
- F. Follow instructions of staining agent manufacturer.

*Suntan lotions, wet leaves, permanent markers and some other products contain dyes that permanently stain.

Always clean immediately. Test an unseen area of fabric before cleaning stain.

96 Willard Street, Suite 201, 1726 Mariners Square, Cocoa, FL 32922, (800) 628-3775 — 700 Collins Road, Elkhart, IN 46516, (800) 343-1565

1726 Henry G Lane, Maryville, TN 37801, (800) 247-9901 — 475 36th Street, S.E., Grand Rapids, MI 49548, (800) 967-7753

For More Personalized Information About Our Products and Services:

1-800-247-9901



MARINE SPECIALTIES GROUP

Tough Stains and Set Water Stains: Always try the technique outlined in the insert first. If that doesn't remove the stain, spray Westley's Clear Magic on the area, going two inches around the stain or, if possible, bring the wetness to a break point, such as a bulkhead. Spray water on the area as directed on the product bottle. Let set about 5 minutes. Rub the area with a clean towel, rotating the towel as the stain is removed. As you rub, go a little beyond the wetness with the towel, flaring the edges.

Allow the area to dry or blow the entire cleaned area with compressed air. Repeat if necessary or use Lendow glass cleaner. After the stain is removed, use the clothes shaver to remove "fuzzies".

Carpet

The carpet used on the interior of the boat has been treated with a popular stain retardant product. Even so, the carpet still needs periodic cleaning. Care for the carpet as you would care for the carpet in your home. Vacuum it often and shampoo it as needed.

When your boat is new, the carpet sheds and needs to be vacuumed frequently. This is normal. The shedding stops after a few weeks.

Interior Fiberglass

Some of your boat's interior components, such as the shower stalls, lower helm module and master stateroom bed platform, are made of gelcoated fiberglass. Interior fiberglass can be cleaned with any household cleaner that has been made for cleaning fiberglass. Many of these 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.

Plexiglass



CAUTION

Do not use glass cleaner, abrasive cleaners or aromatic solvents on plexiglass. Doing so etches the plexiglass.

The shower door, mirrored face of the head medicine cabinets, and other areas of your boat are made of plexiglass. Clean plexiglass with a solution of fresh

water and mild liquid detergent. Remove any fine scratches with a fine automotive acrylic rubbing and polishing compound.

Mechanical Systems

The following paragraphs explain how to maintain your boat's propulsion, electrical, fresh water, bilge and sanitation systems.

Engines / Generator

Refer to the engine and generator OEM information for instructions on maintaining your boat's engines and generator. There is an in-line sea water strainer installed in the water intake lines for each engine and the generator. Open and clean the strainers at least once every 30 days. If you are operating the boat in dirty waters or areas with a high degree of aquatic vegetation, inspect the strainers more frequently. A clogged strainer restricts the intake of sea water which can cause the affected engine or the generator to overheat.

Thru-Hull Valves

Inspect the thru-hull valves on a monthly basis. 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. This guards against the valve seizing in the open or closed position. While doing this make sure the valve handle is securely fastened. Tighten any loose handles.

Propeller Shaft Seals



DANGER

Make sure the engines are OFF before inspecting the propeller shaft seals. The engine room contains moving, hot machinery. Keep your hands, feet and body out of the engine room while one or both engines are operating.

The propeller shaft extends through a watertight fitting called a shaft seal. Check the shaft seal every month; if you notice the seal is leaking, contact your Carver Dealer.

Props

A TIP FROM CARVER!

Consider purchasing and carrying a spare set of props onboard your boat. 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 your boat's primary set of props is damaged.



WARNING

Wear gloves when handling a propeller. Its blades are sharp.

Inspect your props often. Carry a swim mask in your boat so you can inspect the props while swimming. Props that are out-of-balance or damaged can diminish the boat's performance by reducing the boat's speed, causing steering problems, and creating vibrations. Vibrations can lead to drive train damage.

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

Struts

Propeller shaft struts require very little maintenance. Within each strut is a strut or cutlass bearing that provides a smooth surface for the shaft to rotate. These bearings occasionally need to be replaced. They need replacement more often if you use your boat in water that has a lot of sand or abrasive material suspended in it. Have your marine technician inspect the strut bearings whenever the boat is pulled. Replace the bearings when the technician recommends it.

DC Electrical System

The majority of difficulties that occur with the 12 volt DC electrical system are caused by poor battery maintenance. The factory-installed batteries on your boat should function normally for several years if properly maintained. These heavy-duty batteries can be discharged and recharged repeatedly without damaging them; however, completely discharging and overcharging a battery can shorten its life span.

To maximize the useful life of the batteries:

1. Do not store batteries that are only partially charged. Recharge the batteries to a voltage reading between 12.3 and 12.6 volts before storing. Monitor the voltage reading every 30 days while the batteries are in storage and recharge them if the voltage drops below 12.3 volts.
2. Do not overcharge the batteries. Stop charging the batteries when the voltage is between 12.3 and 12.6

volts. Do not continuously (trickle) charge the batteries. Trickle charging a fully charged battery reduces its useful life.

While using the boat, use the voltmeters to frequently monitor the charge level of each battery bank. Monitor the charge level with the engines turned off (static condition). Use the onboard battery chargers (the controls are on the Main AC Subpanel) or the engine alternators (which work automatically while the engines are running) to recharge the batteries when they are not fully charged. When the battery bank is fully charged the voltmeter reads between 12.3 and 12.6 volts.

Do not charge the batteries if they are already fully charged. The engine alternators can not overcharge the batteries. The onboard battery chargers can overcharge the batteries because, when they determine the batteries are fully charged, they do not shut off but switch to trickle charge mode.



WARNING

Disconnect the batteries when performing maintenance tasks on the DC electrical system. Failure to do so can lead to electrical shock.

Inspect the batteries once every month. Clean any corrosion that has developed on the battery terminals. Spray a terminal protector on the terminals and battery cable eye connectors. Make sure the battery cables are securely fastened to the terminals. Tighten the wing nuts only slightly beyond finger tight with a pliers.

Check the level of fluid in each battery cell. Fill any low cells with distilled water only. The fill level is marked on the side of the battery case.

Spray the connections for the bridge instruments and switches with an electrical connection protector every six months.

Fresh Water System

Flush and sanitize the fresh water system at least once every season. Flushing involves draining all water from the system. Sanitizing involves using a commercially-made fresh water tank sanitizing liquid that is available at many marine supply stores.

NOTE: *The fresh water system, including the water heater, must be drained as part of the winterization process. Failure to winterize the water system could lead to damaged pipes, valves, faucets, tanks, or a ruptured water heater. Refer to the "**Fresh Water System**" portion of **Section 8**.*

Shower

If the water flow from the shower becomes restricted, it may be due to the accumulation of sediment in the shower head. If this happens, remove the head and rinse it with clean water. If necessary, clean the discharge holes with a narrow wire.

Sump

Clean the sump frequently. Hair, dirt and soap scum collect in the sump and, if not removed, eventually clog the sump pump.

Faucet Discharge Spouts

Periodically remove and clean the filter screens from the faucet discharge spouts. 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.

Pressure Water Pump

There is an in-line filter installed near the pressure water pump. Clean the filter once a month.

Water Tank Vent Screen

A vent for each fresh water tank is installed through the boat's hull. Each vent has a screen over its opening to prevent dirt and insects from entering the fresh water tank. Clean the vent screens once every six months or twice a season. Refer to the "**Above Water-line Thru-Hull Fittings**" portion of **Section 9** for the exact location of the vents.

Bilge System

Keeping the bilges clean is important. A dirty bilge leads to clogged bilge pumps and unpleasant odors in the cabin. Keeping the bilges dry helps reduce moisture in the cabin.

1. Periodically inspect and clean each bilge pump's strainer. The strainers prevent dirt and debris from clogging the bilge pump intakes.
2. Frequently check the operation of each bilge pump float switch to ensure that it is operating properly. Clean the float switch so that it can move freely.
3. Clean the bilge pumps twice a season by wiping any dirt or oil from their exterior surfaces.
4. Remove any oil, dirt or debris from the bilges. Treat the bilges with a commercial bilge cleaner twice a season. Bilge cleaners are available from your Carver Dealer.

Sanitation System

Unlike the other systems in your boat, the sanitation system requires ongoing maintenance to avoid problems.

Always use sanitation system deodorizer. Use the brand recommended by your Carver Dealer. Your boat's head and sanitation system is not like the toilet and sewer in a home. Do not flush any items down the head that the head was not designed to accommodate. Refer to the OEM information for details on maintaining the heads.

Empty the waste tanks often and when you know the boat will not be used for an extended period. Each time you empty the waste tanks, flush them with fresh water. This helps remove any remaining waste from the tanks.

NOTES

NOTES

Winterization and Storage

Introduction	178
Lifting	178
Blocking	178
Winterization	180
Engines	180
Air Conditioning System	180
Fresh Water System	180
Raw Water Washdowns	183
Bilge	185
Sanitation System	185
Grey Water System	192
Exterior	193
Interior	194
Storage	194
Dry Storage	194
Wet Storage	194
Spring Recommissioning Checklist	197

Introduction

Before you store your boat for an extended period of time during which temperatures could fall below freezing (such as during winter), you must properly winterize it. Winterizing your boat removes all water from its various systems. If this water froze, it could cause extensive damage to the boat and its systems.

Carver recommends that you hire a professional to winterize your boat and its systems. Carver also recommends that you place your boat in dry, as opposed to wet, storage. Some of the winterizing procedures can only be completed when the boat is out of the water. Dry storage also gives you the opportunity to thoroughly inspect your boat's hull and underwater components for any maintenance needs.

Lifting

To lift your boat from the water, hire a professional experienced and trained in lifting yachts. The boat's hull must be properly supported during the lifting operation to avoid serious and permanent hull deformation.



CAUTION

Do not place a lifting strap around the boat's shaft or any other underwater component.

Use approved lifting straps. "SLING" tags are located on the sidedeck of the boat. These are the only places where lifting straps should be positioned for lifting.



WARNING

Never go under the boat when it is suspended in a lift.

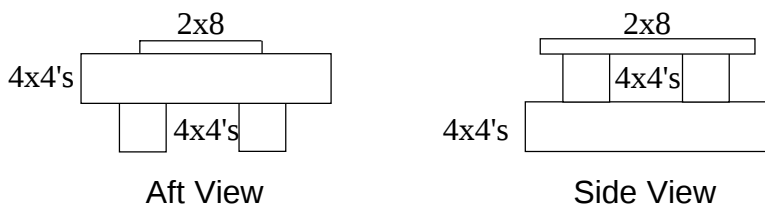
Blocking

When your boat is placed in dry storage its hull must be properly blocked to avoid damaging it. You can either use a cradle designed specifically by Carver to support your model of boat or build your own blocking supports.

If using the Carver-designed cradle, the forward end of the cradle should be slightly elevated to position the boat in a bow-high attitude. This allows any water in the bilges to flow to the back of the aft bilge compartment and drain through the garboard drain.

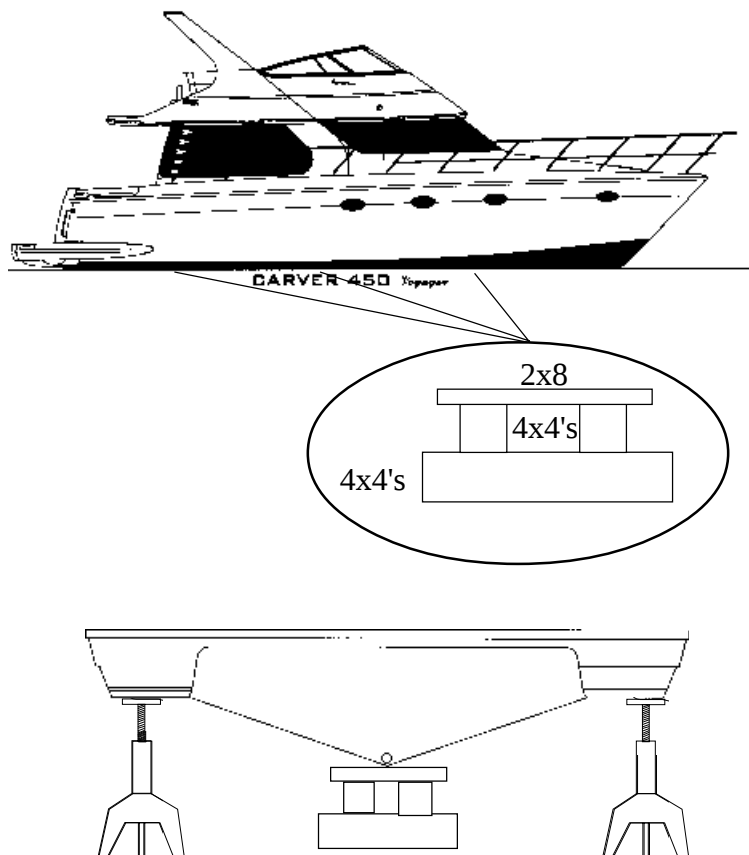
If you wish to build your own blocking supports, you need the following items to make each support.

- Four 4"x4"s, each three feet long
- One 2"x8", two feet long
- The appropriate fasteners (nails, bolts or screws)
- The appropriate tools.



Position one blocking support under the boat's keel beneath a transverse stringer in each of three locations: forward, amidships and aft. Position additional side supports on each side of the boat adjacent to the keel blocking.

All of these supports should be setup to prevent the boat from shifting while it is in storage.



Winterization



CAUTION

Your boat must be properly winterized before storage. Failure to winterize the boat could result in damaged pipes, valves, faucets, tanks, hot water heater and other components.

The following paragraphs explain how to winterize the systems that require it.

Engines

Refer to the OEM information for details on winterizing the engines.

Air Conditioning System

Refer to the OEM information for details on winterizing the air conditioning system. Carver recommends that you have a qualified marina winterize your air conditioning system for you.

Fresh Water System



CAUTION

When winterizing your boat's fresh water system, drain the entire system including the water heater and optional engine heat exchanger.

Draining the System

1. Switch the Water Heater circuit breaker on the Main AC Subpanel "OFF". Carver recommends taping the breaker in the "OFF" position until the water system is filled and primed after spring recommissioning.

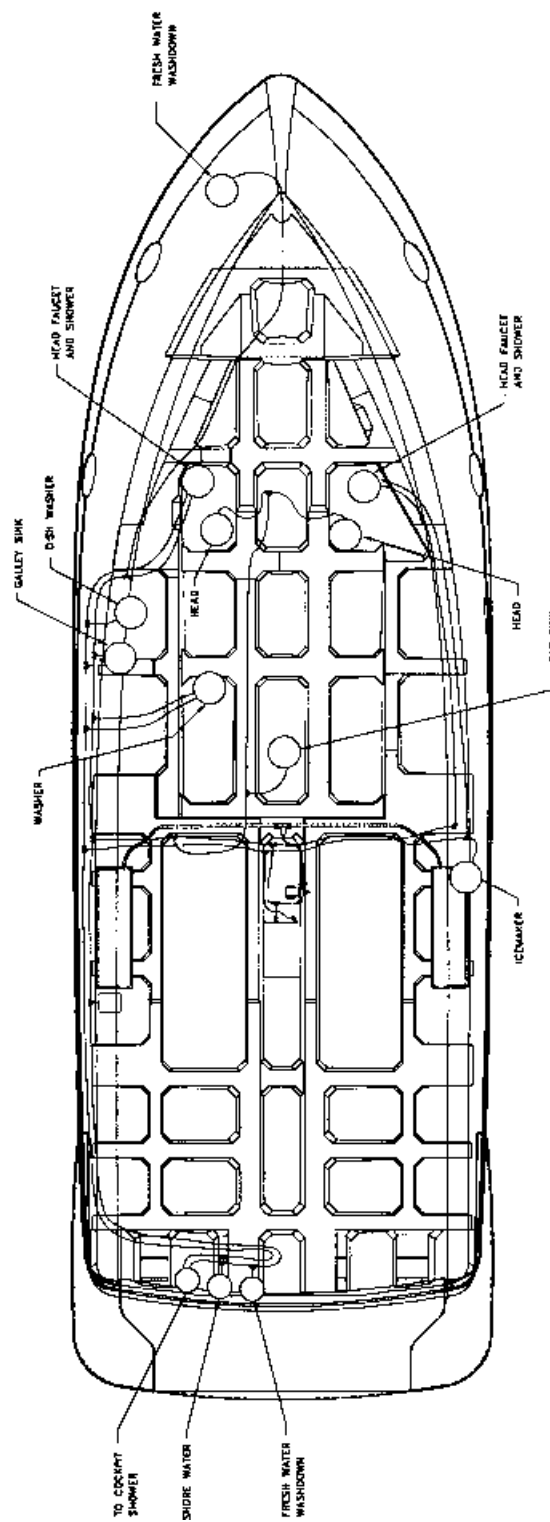


DANGER

Do not supply power to the water heater when it is empty. Doing so may damage the unit's heating element and cause a fire.

2. Switch the Pressure Water Pump circuit breaker on the Main DC Subpanel "ON".
3. Open all faucets and shower valves on the boat, including the faucets for the optional transom shower and fresh water washdown.

FRESH WATER SYSTEM



4. When there is no more water coming from any of the faucets, switch the Pressure Water Pump circuit breaker "OFF".
5. Drain the water heater. It is located beneath a hatch below the dinette. Refer to the OEM information for details on draining the water heater.

Winterizing the System



DANGER

You must use an approved, nontoxic antifreeze in your boat's fresh water system. Refer to the SeaLand Technical Bulletin at the end of this section for information on the proper type of antifreeze to use. Using the wrong type of antifreeze can damage the fresh water system. The repair of such damage is not included under the terms of either the Carver Limited Warranty or the fresh water system OEM's warranty.

1. Purchase 30 gallons of nontoxic recreational vehicle antifreeze. If the fresh water system loses pressure during this procedure, you will need to add more antifreeze to the fresh water tanks.
2. Pour the nontoxic antifreeze into your boat's fresh water tanks. The fresh water tanks are filled through a single deck fitting with a plate labeled "WATER". The plate is on the starboard sidedeck near amidships. Refer to the **"Fill Plate/Pumpout Locations"** portion of **Section 9** for the exact location of the "WATER" plate.
3. Close all faucets.
4. Switch the Pressure Water Pump circuit breaker on the Main DC Subpanel "ON".
5. Switch the Auto Sump circuit breaker on the Engine Room Safety Breaker Panel "ON".
6. Open the galley sink cold water faucet. When a steady stream of antifreeze flows from it, close the faucet. Repeat this step for the galley hot water faucet, then for each cold and hot water faucet on the boat, except for the optional transom shower and bow and transom fresh water washdowns.

For the transom shower, place the shower head in a bucket before turning on the shower faucet. This catches the antifreeze, which can be reused. Proceed as described earlier in this step.

For the bow and transom fresh water washdowns:

- a. Remove the hose(s) from the fresh water washdown fittings.
 - b. Place a bucket under the washdown fittings to catch the antifreeze, which can be reused.
 - c. Open the washdown faucets. When a steady stream of antifreeze flows from the fittings, close the faucets.
7. Turn on the optional windshield washers. When a steady stream of antifreeze flows from them, turn them off.
 8. Pour one gallon of nontoxic antifreeze into each shower drain.
 9. Pour a gallon of nontoxic antifreeze into each sink drain.

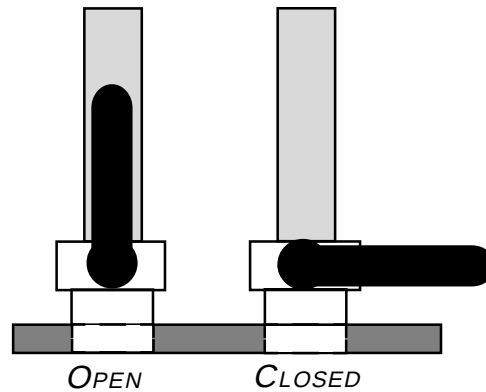
Preparing the System for Use Again

When you remove your boat from storage and prepare to use it again, flush the entire fresh water system with fresh water. Nontoxic antifreeze is colored, so the water system is adequately flushed when uncolored water flows from all of the faucets and shower heads.

Raw Water Washdowns

Before performing this procedure on the optional raw water washdowns, your boat should be pulled from the water.

1. Locate and close the thru-hull valve that supplies the raw water washdown pump with sea water.
2. Disconnect the end of the hose that is attached to the thru-hull valve.

**WARNING**

You must use an approved antifreeze in your boat's raw water washdown system. Refer to the SeaLand Technical Bulletin at the end of this section for information on the proper type of antifreeze to use. Using the wrong type of antifreeze can damage the raw water washdown system. The repair of such damage is not included under the terms of either the Carver Limited Warranty or the raw water washdown system OEM's warranty.

3. Place the disconnected hose end into a bucket that contains about a gallon of antifreeze.
4. Remove the raw water washdown hose(s) from the bow- and transom-mounted washdown fittings.
5. Place a bucket under the washdown fittings.
6. Switch the Washdown Pump circuit breaker on the Main DC Subpanel "ON".
7. When a steady stream of antifreeze flows from the washdown fittings, switch the Washdown Pump circuit breaker "OFF".
8. Reconnect the hose(s) to the washdown fitting(s).
9. Reconnect the hose that was disconnected in Step 2.

Bilge

1. Open the garboard drain. Leave the drain open while your boat is in storage.
2. Remove all water from the bilge.
3. Clean the bilge as described in the "**Bilge**" portion of **Section 7**.

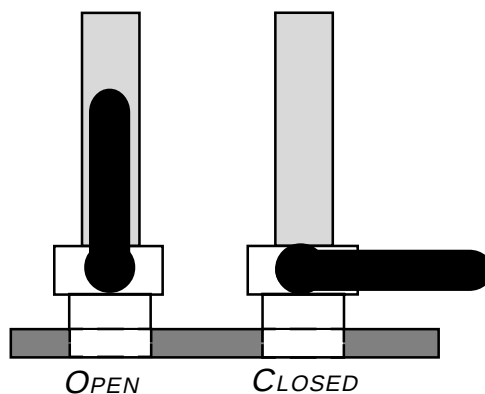
Sanitation System

Before performing this procedure on the sanitation system, your boat should be pulled from the water. Refer to the OEM information for more information on winterizing the sanitation system.

There are three types of sanitation systems: the standard system, the overboard discharge system and the direct overboard discharge system.

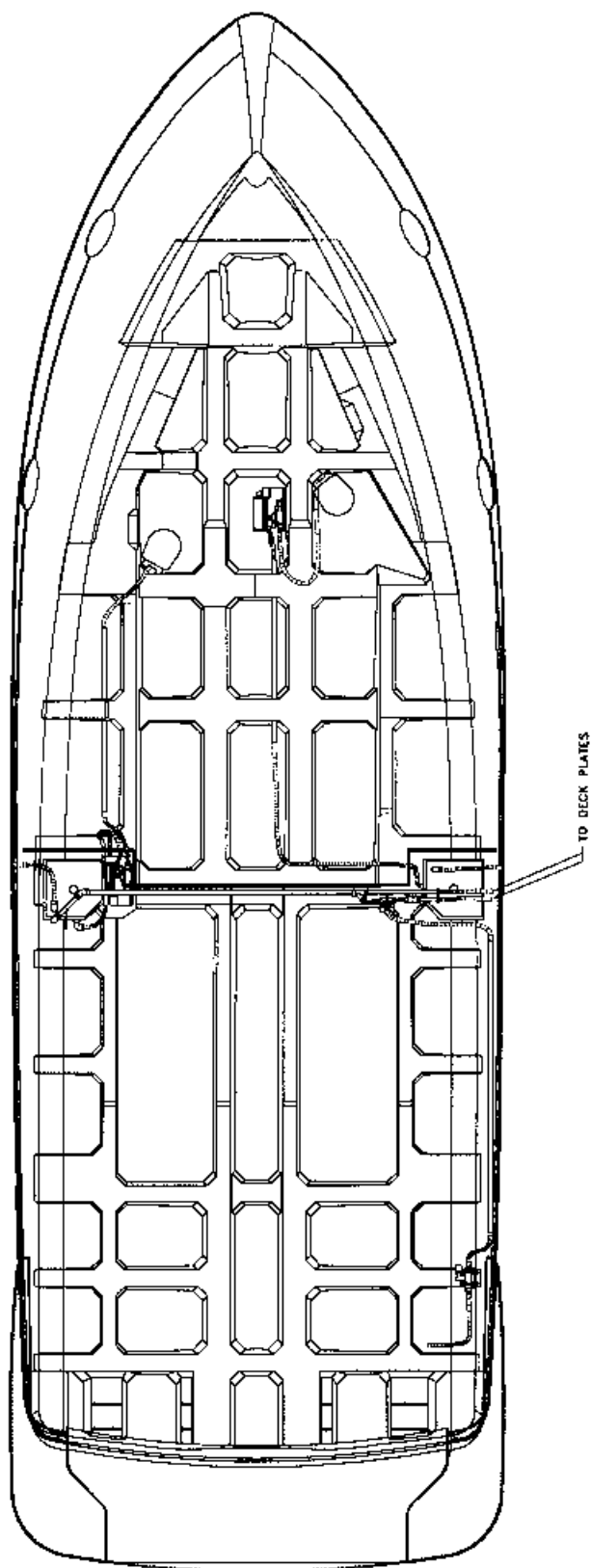
Standard Sanitation System

1. Empty the waste tanks as described in the "**Emptying the Waste Tanks**" portion of **Section 4**. Remove as much of the fresh water used in flushing the tanks as possible.
2. If your boat has the optional seawater head system:
 - a. Close the seacock for each head.



- b. Disconnect the seawater pickup hoses from the seacocks.
- c. Flush the heads until all water is drained from the seawater pickup hoses.
- d. Reconnect the seawater pickup hoses to the seacocks. Leave the seacocks closed.

SANITATION SYSTEM



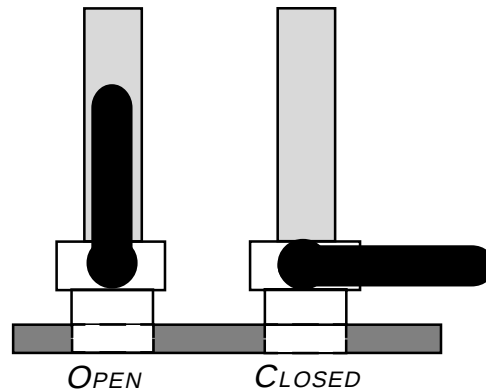
**WARNING**

You must use an approved antifreeze in your boat's sanitation system. Refer to the SeaLand Technical Bulletin at the end of this section for information on the proper type of antifreeze to use. Using the wrong type of antifreeze can damage the sanitation system. The repair of such damage is not included under the terms of either the Carver Limited Warranty or the sanitation system OEM's warranty.

3. Purchase at least 8 gallons of nontoxic recreational vehicle antifreeze.
4. Flush 4 gallons of antifreeze through each head and allow it to remain in the waste tanks while the boat is in storage.
5. When you remove your boat from storage and prepare to use it again:
 - a. Pour 5 gallons of fresh water through each head.
 - b. Empty the waste tanks as described in the **"Emptying the Waste Tanks"** portion of **Section 4**.
 - c. Open the seawater pickup seacocks. Flush the head a few times to prime the sanitation system.
 - d. Charge the waste tanks by adding deodorizer. Use the brand of deodorizer recommended by your Carver Dealer.

Overboard Discharge System

1. Empty the waste tanks as described in the **"Emptying the Waste Tanks"** portion of **Section 4**. Remove as much of the fresh water used in flushing the tanks as possible.
2. If your boat has the optional seawater heads:
 - a. Close the seawater seacocks.
 - b. Disconnect the seawater pickup hoses from the seacocks.



- c. Flush the heads until all water is drained from the seawater pickup hoses.
 - d. Reconnect the seawater pickup hoses to the seacocks. Leave the seacocks closed.
3. Below the boat, place a large bucket beneath the overboard discharge fitting to collect antifreeze pumped out later in this procedure. This fitting is located in the aft bilge area just aft of the starboard fuel tank.

**WARNING**

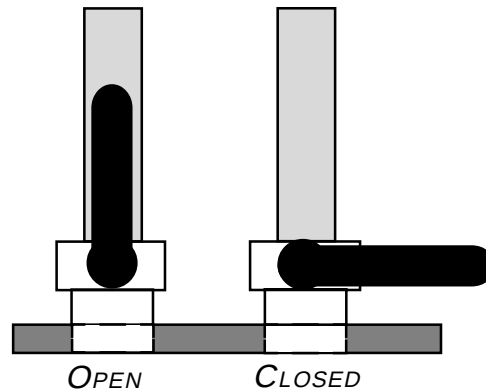
You must use an approved antifreeze in your boat's sanitation system. Refer to the SeaLand Technical Bulletin at the end of this section for information on the proper type of antifreeze to use. Using the wrong type of antifreeze can damage the sanitation system. The repair of such damage is not included under the terms of either the Carver Limited Warranty or the sanitation system OEM's warranty.

4. Purchase 20 gallons of nontoxic recreational vehicle antifreeze.
5. Locate the waste tank selector valve on the engine room's forward bulkhead, forward of the starboard engine. Position the valve to select the starboard waste tank.
6. Flush 10 gallons of antifreeze through the master stateroom (starboard) head.
7. Open the overboard discharge seacock located in the aft bilge area just aft of the starboard fuel tank.

8. On the Main DC Subpanel, switch the Waste Pump circuit breaker "ON".
9. Turn "ON" the waste pump ON/OFF switch located near the waste tank selector valve. This activates the waste pump.
10. When a steady stream of antifreeze flows from the overboard discharge fitting, turn "OFF" the waste pump.
11. Position the waste tank selector valve to select the port waste tank.
12. Flush 10 gallons of antifreeze through the guest stateroom (port) head.
13. Turn "ON" the waste pump ON/OFF switch.
14. When a steady stream of antifreeze flows from the overboard discharge fitting, turn "OFF" the waste pump.
15. Switch the Waste Pump circuit breaker "OFF".
16. Close the overboard discharge seacock.
17. When you remove your boat from storage and prepare to use it again, flush and pump the waste tanks to remove the antifreeze.

Direct Overboard Discharge System

1. Empty the waste tanks as described in the "**Emptying the Waste Tanks**" portion of **Section 4**. Remove as much of the fresh water used in flushing the tanks as possible.
2. If your boat has the optional seawater head system:
 - a. Close the seacock for each head.
 - b. Disconnect the seawater pickup hoses from the seacocks.
 - c. Flush the heads until all water is drained from the seawater pickup hoses.



- d. Reconnect the seawater pickup hoses to the seacocks. Leave the seacocks closed.
3. Below the boat, place a large bucket beneath the overboard discharge fitting to collect antifreeze pumped out later in this procedure.



WARNING

You must use an approved antifreeze in your boat's sanitation system. Refer to the SeaLand Technical Bulletin at the end of this section for information on the proper type of antifreeze to use. Using the wrong type of antifreeze can damage the sanitation system. The repair of such damage is not included under the terms of either the Carver Limited Warranty or the sanitation system OEM's warranty.

4. Purchase 30 gallons of nontoxic recreational vehicle antifreeze.
5. Locate the waste tank selector valve on the engine room's forward bulkhead, forward of the starboard engine. Position the valve to select the starboard waste tank.
6. Locate the starboard head overboard discharge selector valve. This valve allows you to bypass the forward waste tank and flush waste directly overboard. Position the valve to "HOLDING TANK".
7. Flush 10 gallons of antifreeze through the master stateroom (starboard) head.
8. Open the overboard discharge seacock located in the aft bilge area just aft of the starboard fuel tank.

9. On the Main DC Subpanel, switch the Waste Pump circuit breaker "ON".
10. Turn "ON" the waste pump ON/OFF switch located near the waste tank selector valve. This activates the waste pump.
11. When a steady stream of antifreeze flows from the overboard discharge fitting, turn "OFF" the waste pump.
12. Position the waste tank selector valve to select the port waste tank.
13. Locate the port head overboard discharge selector valve. This valve allows you to bypass the aft waste tank and flush waste directly overboard. Position the valve to "HOLDING TANK".
14. Flush 10 gallons of antifreeze through the guest stateroom (port) head.
15. Turn "ON" the waste pump ON/OFF switch.
16. When a steady stream of antifreeze flows from the overboard discharge fitting, turn "OFF" the waste pump.
17. Switch the Waste Pump circuit breaker "OFF".
18. Close the overboard discharge seacock.
19. Position the port head overboard discharge selector valve to "OVERBOARD".
20. Below the boat, place a large bucket beneath the port overboard discharge fitting to collect antifreeze pumped out later in this procedure.
21. Flush 5 gallons of antifreeze through the port head. Continue flushing the head until a steady stream of antifreeze flows from the overboard discharge fitting.
22. Close the port overboard discharge fitting.
23. Position the starboard head overboard discharge selector valve to "OVERBOARD".

24. Below the boat, place a large bucket beneath the forward overboard discharge fitting to collect antifreeze pumped out later in this procedure.
25. Flush 5 gallons of antifreeze through the starboard head. Continue flushing the head until a steady stream of antifreeze flows from the overboard discharge fitting.
26. Close the starboard overboard discharge valve.
27. When you remove your boat from storage and prepare to use it again, flush and pump the waste tanks to remove the antifreeze.

Grey Water System

Winterize the grey water system after you have winterized the fresh water and sanitation systems. Before performing this procedure on the grey water system, your boat should be pulled from the water.

1. Empty the grey water tanks as described in the "**Grey Water System**" portion of **Section 4**.
2. Below the boat, place a large bucket beneath the overboard discharge fitting to collect antifreeze pumped out later in this procedure. This fitting is located in the aft bilge area just aft of the starboard fuel tank.



WARNING

You must use an approved antifreeze in your boat's grey water system. Refer to the SeaLand Technical Bulletin at the end of this section for information on the proper type of antifreeze to use. Using the wrong type of antifreeze can damage the grey water system. The repair of such damage is not included under the terms of either the Carver Limited Warranty or the grey water system OEM's warranty.

3. Purchase 2 gallons of nontoxic recreational vehicle antifreeze.
4. Pour the antifreeze into the starboard head shower drain.

5. Activate the Manual Sump control on the Engine Room Safety Breaker Panel
6. When the sump is empty, turn off the Manual Sump control.
7. Open the overboard discharge seacock located in the aft bilge area just aft of the starboard fuel tank.
8. Position the grey water tanks selector valve to select the grey water tanks. This valve is located forward and outboard of the starboard engine.
9. Switch the Waste Pump circuit breaker on the Main DC Subpanel "ON".
10. Turn "ON" the waste pump ON/OFF switch located near the waste tank selector valve. This activates the waste pump.
11. When a steady stream of antifreeze flows from the overboard discharge fitting, turn "OFF" the waste pump.
12. Switch the Waste Pump circuit breaker "OFF".
13. Close the overboard discharge seacock.
14. When you remove your boat from storage and prepare to use it again, flush and pump the grey water tanks to remove the antifreeze.

Exterior

Wash the exterior of the boat, particularly the underwater portions. Remove as much aquatic growth as possible while it is still wet. Once the growth has dried it is more difficult to remove.

Check the zinc sacrificial anodes for deterioration. If the zincs show signs of deterioration have them replaced before spring launch. 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 Carver Dealer.

Interior

Air out the cushions and make sure they are dry. Storing damp cushions leads to mildew. Position the cushions so air can circulate around them. Purchase and position moisture accumulators throughout the boat. These help reduce the amount of moisture that accumulates during storage. Remove everything from the boat that could spoil or freeze while the boat is stored. Also remove all dried food. Food attracts mice and insects.

Storage

To give your boat the maximum protection while it is in storage, Carver recommends that you place your boat in dry, as opposed to wet, storage.

Dry Storage

Protecting the boat from the elements during winter storage is advised. Have your marina shrink wrap the boat or have a winter storage cover made. Occasionally check on the boat while it is in storage to make sure that it is in good condition.

If your boat will be in outside storage, properly support a storage cover and secure it over the boat. Do not secure the cover to the boat too tightly. Allow adequate ventilation to protect against dry rot. Do not store the boat in a damp storage enclosure. Purchase and position moisture accumulator packets between the shrink-wrap and your boat's enclosures to help prevent moisture from accumulating. Excessive dampness can lead to mildew, electrical problems, corrosion and dry rot.

NOTE: *Do not use the bridge enclosure, aft deck enclosure, bimini top or convertible top canvas in place of a winter storage cover. These are not designed for long-term storage purposes. The life of these enclosures may be significantly shortened if they are exposed to harsh weather elements for prolonged periods.*

Wet Storage

Wet storage procedures vary from region to region. Consult your dealer before preparing to leave your boat in the water over the winter.

IMPORTANT ANTIFREEZE BULLETIN

SeaLand *Technical Bulletin*

TECHNOLOGY, INC.

P.O. Box 38, Fourth Street, Big Prairie, Ohio 44611 • Telephone: 216/496-3211 In Ohio • 800/321-9889 • Fax: 216/262-1727

Bulletin Number: VF-005
Effective: February 15, 1990

SANITATION HOSE MALODOR: ALCOHOL ANTIFREEZE

Affected Installations: Any pleasure craft sanitation systems utilizing SeaLand heavy duty, smooth wall hose (identified with "SeaLand" marked in blue on outer surface).

Symptoms: A strong malodor is evident from a non-specific source. No indication of leakage or a loose fitting is present.

Cause: SeaLand heavy duty, smooth wall sanitation hose is especially formulated with a malodor resistant ingredient. This ingredient is designed to prevent malodor molecules from permeating the hose wall. If an alcohol based antifreeze is used, the malodor resistant ingredient in the hose is removed and failure will result sometime later.

One brand which has been found to definitely cause this type of failure is **ARTIC BAN** from Camco Manufacturing Company. This statement is supported by gas chromatography and scanning electron microscopy studies at the Institute of Polymer Science, University of Akron.

Note: Other liquids such as petroleum solvents, fuels and pine oil cleaners will also produce similar results.

Troubleshooting: 1.) Carefully inspect all fittings and joints to assure malodor is not coming from a loose fitting or hose joint. 2.) With a clean paper towel or cloth, rub the outside of the hose. At regular intervals check the cloth to determine if malodor has been transferred to cloth or paper. 3.) Determine if boat has been winterized using antifreeze, and if so, determine the type. SeaLand can verify if the hose has failed due to chemical attack by examination of a small sample.

Corrective Action: Once a hose has been degraded by exposure to an alcohol based antifreeze, it cannot be repaired. The only remedy is to replace the contaminated hose. It is clearly stated in the SeaLand Owner's Manuals that alcohol based products should never be used (see exhibit on reverse side). Hose failure for this reason is considered misuse and is not covered by SeaLand's warranty policy.

The recommended antifreeze is propylene glycol base without alcohol. Brands recommended by SeaLand are listed on the reverse side.

Information concerning proper hose care should be given to all boat owners. An information card with this information is enclosed. Instructions for ordering copies are on the card.

Winterizing

At the end of each boating season, the VacuFlush® system must be winterized for storage. The following procedure should be used:

CAUTION: DO NOT use chlorine, alcohol or alcohol based products in the system.

1. Thoroughly flush system with fresh water.
2. Pump out holding tank.
3. Shut off water supply to toilet(s), remove water line.
4. Press flush lever until all water is drained from toilet.
5. For each toilet, flush 4 gallons of permanent type anti-freeze and water in a 50:50 mixture through toilet. Each installation is different so amounts may vary. User discretion is required to assure adequate protection.
6. Turn off electrical power.

Maintenance

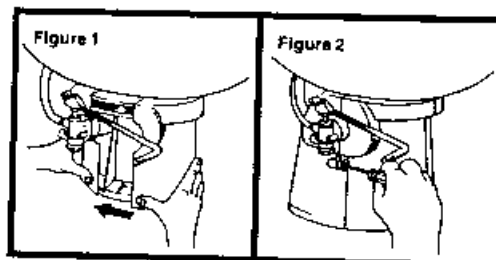
SeaLand Technology has endeavored to provide the boatowner with a toilet system which provides "at home" convenience and reliability. As with any quality product, satisfactory use depends on proper maintenance.

Maintenance intervals and normal parts replacement vary widely depending on numerous factors such as; type of vessel, frequency of system use, quality of flushing water, etc. The chart below is intended strictly as a general guideline. Owner discretion and consideration of actual usage must be the first basis for determining proper maintenance levels.

Pedestal Cover Installation

Before installing pedestal and pedal covers, unit must be mounted to floor flange and water supply line connected.

1. Install pedestal cover around base and snap bottom into place (see Figure 1).
2. **Tall base unit only.** Install (2) mounting screws (see Figure 2).
3. Slide pedal cover onto foot pedal rod (see Figure 3).
4. Attach pedal cover side plate and secure with (2) mounting screws (see Figure 4). For short base units, secure front screw, then press foot pedal down completely to secure second screw.
5. To remove, reverse above procedure.



RECOMMENDED ANTIFREEZE PRODUCTS

"WINTER-PRUF"

CENTURY CHEMICAL PRODUCTS
28790 C.R. 20 W.
P.O. Box 1442
Elkhart, IN 46515

219/293-9521
800/348-3505 (Outside Indiana)

Fax: 219/522-5723

"FREEZE BAN"

CAMCO MANUFACTURING, INC.
121 Landmark Dr.
Greensboro, NC 27409-9626

919/668-7661
800/334-2004

Fax: 919/668-2049

Spring Recommissioning Checklist

Before launching your boat, complete the following.

Hull

- ☐ Remove old antifouling bottom paint
- ☐ Fill nicks and gouges
- ☐ Inspect props, struts, rudders
- ☐ Inspect through hull fittings
- ☐ Apply new antifouling bottom paint
- ☐ Buff out minor hull scratches
- ☐ Remove dirt, stains
- ☐ Apply wax

Deck and Cabin

- ☐ Inspect hatches and windows for leaks
- ☐ Wax non-walking surfaces

Engines

- ☐ Follow manufacturer's recommissioning guidelines
- ☐ Check crankcase, transmission oil levels
- ☐ Inspect belts, hoses
- ☐ Tune-up engine
- ☐ Replace fuel filters

Electrical System

- ☐ Check battery water level
- ☐ Charge batteries
- ☐ Inspect connections for corrosion

Plumbing

- ☐ Purge antifreeze
- ☐ Replace taste/odor filters
- ☐ Inspect, lubricate sea valves
- ☐ Inspect, repair heads
- ☐ Chemically charge waste and grey water tanks
- ☐ Fill fresh water tanks

Safety Equipment

- ☐ Inspect PFDs
- ☐ Replace old distress signals
- ☐ Inspect fire extinguishers
- ☐ Inspect, test bilge pumps
- ☐ Inspect mooring lines, fenders

After launching your boat, complete the following.

- ☐ Check for engine cooling water flow
- ☐ Check propshaft alignment
- ☐ Check propeller shaft seals
- ☐ Have compass professionally readjusted

NOTES

NOTES

Warranty and Parts

Warranty Information	202
Carver Dealer's Responsibilities	202
Owner's Responsibilities	202
Obtaining Warranty Service	203
Second Owner Registration	204
Hull Identification Number	204
OEMs	205
Serial Number Record Sheet	206
Specifications	207
Component Locations	207
Interior Hatch Locations	208
Engine Room Layout	209
Fill Plate/Pumpout Locations	212
Above Waterline Thru-Hull Fittings	213
Bill of Material	215
Carver Limited Warranty	217

Warranty Information

Carver warrants every boat we manufacture as explained in the Carver Limited Warranty. Your copy of the warranty is located at the end of this section. Please review the warranty carefully.

To ensure that the warranty remains in effect during its lifetime, Carver Boat Corporation, your Carver Dealer, and you must each uphold specific responsibilities. Carver's responsibilities are described in the Carver Limited Warranty.

Carver Dealer's Responsibilities

Warranty Information

Your Carver Dealer will review the terms of the warranty and make certain the warranty is registered with Carver. Your Dealer will also instruct you on how to obtain warranty service.

Pre-Delivery Service Procedure

Your Carver Dealer will prepare your boat 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.

Registration of your boat and its engines is required by the Federal Safe Boating Act of 1971. Your Carver Dealer will complete and mail your engine warranty cards as part of the Pre-Delivery Service procedure.

Boat and Systems Review

A representative from your Carver Dealership will review the operation of your boat and its systems with you.

Owner's Responsibilities

Pre-Delivery Service Record

Verify that the boat's pre-delivery service record has been completed and mailed to Carver. The pre-delivery service record is located in the **Preface** of this guide. Review the Pre-Delivery Service procedure with your dealer. Read the Pre-Delivery Service Record. Be certain you sign a copy of the Pre-Delivery Service Record and retain a copy for your records.

OEM Components

Many of the OEM components installed in your boat are warranted by their respective manufacturers. To activate these warranties, complete and mail all OEM warranty cards. The warranty card for each component that is warranted is located with its respective OEM information. Many of these OEMs also have programs designed to resolve any problems you may experience with their products. Your Carver Dealer can assist you when necessary in gaining access to these programs.

NOTE: *All warranty cards must be completed and forwarded to the appropriate company within 5 days of taking delivery of your boat.*

Delivery

At the time of delivery, make a complete inspection of the boat and its systems. Document any work that needs to be completed by the dealer in order to meet the terms of your agreement.

Owner's Information Kit

Read, understand, and follow the instructions in this Owner's Guide and all OEM information.

Contact your Carver Dealer if you have any questions regarding warranty responsibilities.

Obtaining Warranty Service

The following requirements must be met before warranty work can be performed on your boat.

1. Your boat must be registered with the Carver Boat Corporation. Registration is accomplished by completing, then submitting the Pre-Delivery Service Record to the Carver Boat Corporation, P.O. Box 1010, Pulaski, WI 54162-1010.
2. Pre-Delivery Service must be completed by your Carver Dealer. Information concerning Pre-Delivery Service can be found in the preface of this manual. The Pre-Delivery Service Record must be signed by both the dealer and the owner.

NOTE: *Your Carver Dealer is the ONLY person authorized to approve warranty work. If warranty*

service is needed you MUST contact your Carver Dealer first. There are no exceptions to this policy.

Your Carver Dealership is staffed with knowledgeable professionals who are familiar with your boat and are capable of providing the highest level of service. The Carver Dealership service personnel will communicate with the Carver Boat Corporation to ensure that you receive fast and satisfactory solutions to any problem that may arise.

Second Owner Registration

A "Second Owner Registration" card is located in the **Preface** of this guide. The purchaser of a previously-owned Carver boat should complete this card and mail it as soon as taking title to the boat.

Registration of a previously-owned Carver boat does not extend or in any way modify the boat's original limited warranty. However, purchasers of a previously-owned Carver boat should register the boat so that, if it is ever necessary, Carver can contact you.

Hull Identification Number

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

When contacting your Carver Dealer for parts or service, provide them with your boat's HIN.

OEMs

Whenever you need information about a system or component on your boat, contact your Carver Dealer first. If your Dealer is unable to provide the information, contact the manufacturer (OEM) of the system or component. Refer to the OEM information for telephone numbers and addresses.

When contacting an OEM for information, be ready to provide the component's serial number. A Serial Number Record Sheet is provided on the following pages. Use this sheet as a convenient location to record the serial numbers of your boat's OEM components.

Serial Number
Record Sheet

Specifications

The specifications listed here are based on a standard model with no options installed. Certain options, such as the grey water system, will change some of these specifications.

Length Overall (LOA) with boarding platform	46'11" / 14,30 m
Beam	14'11" / 4,55 m
Bridge Clearance (waterline to arch)	16'8" / 5,08 m
Draft	43" / 1,09 m
Weight (estimated, dry)	26,500 lbs / 12020,00 kg
Water	150 U.S. gal / 567,8 l
Hot Water	11 gal. / 41,64 liters
Waste	80 U.S. gal / 302,83 l
Fuel	560 gal. / 2119,82 liters

Component Locations

The illustrations on the following pages show the locations of various components, deck plates, and thru-hull fittings discussed throughout this guide.

Interior Hatch Locations

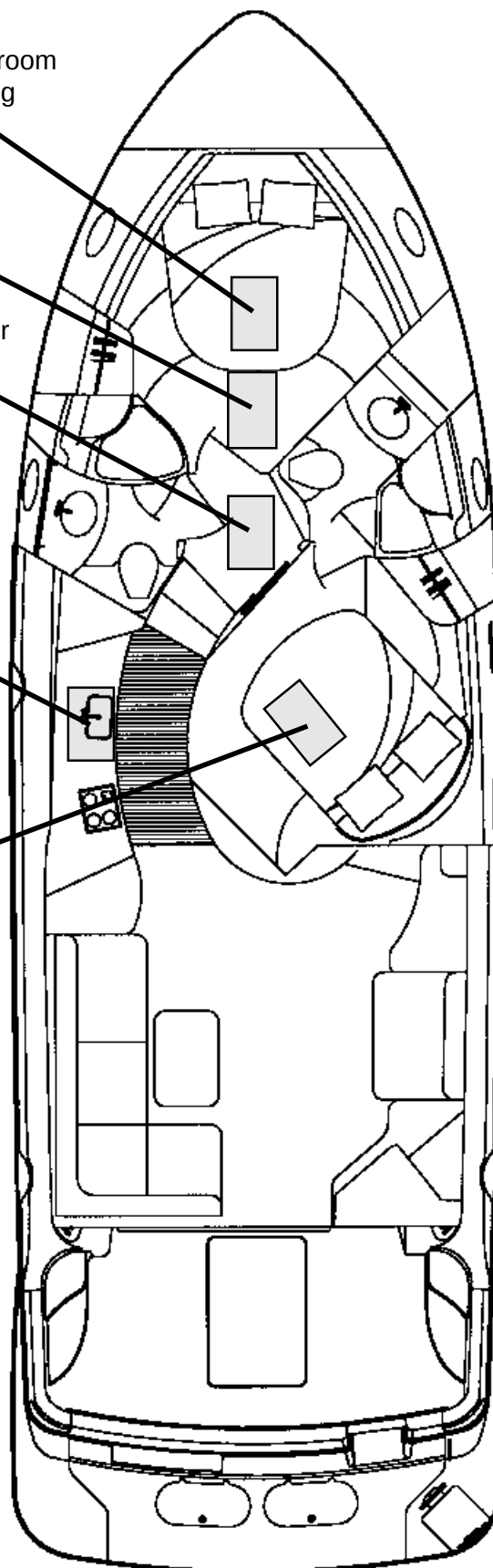
Forward Stateroom
Air Conditioning
Unit/Storage

Bow Thruster
Access

Head Seawater
Seacock

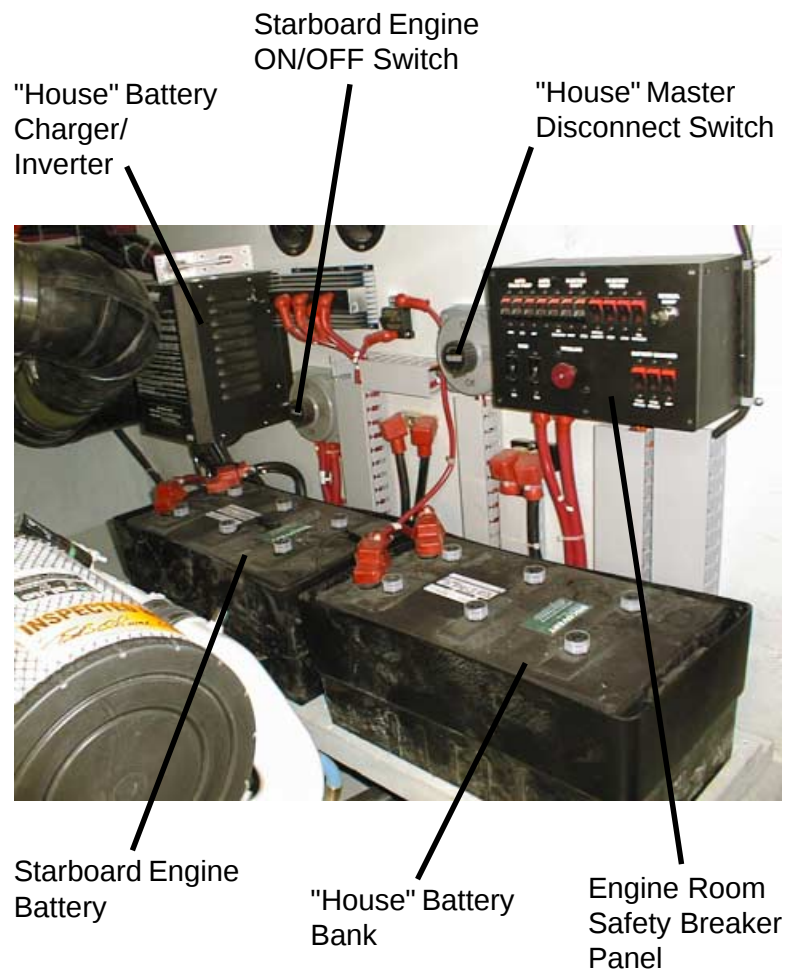
Salon/Galley
Air Condition-
ing Unit and
Pilothouse Air
Conditioning
Unit

Master
Stateroom Air
Conditioning
Unit/Storage

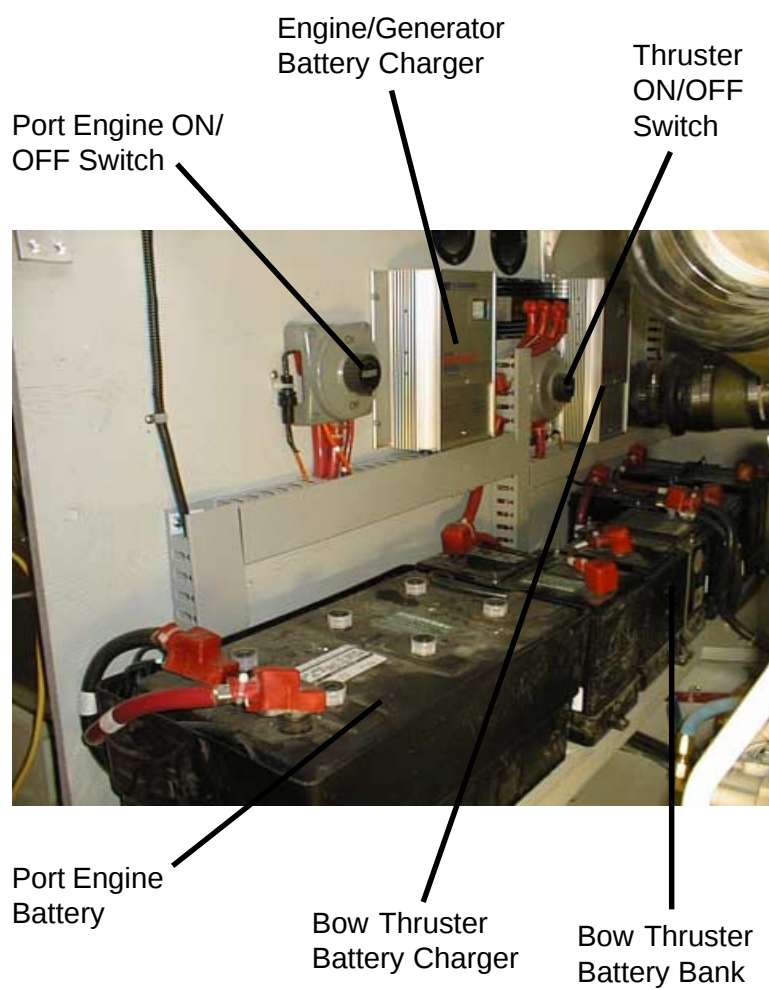


Engine Room Layout

ENGINE ROOM AFT STARBOARD BULKHEAD



ENGINE ROOM AFT PORT BULKHEAD



FORWARD ENGINE ROOM

Air Conditioning
Seawater Pickup
Seacock

Air Conditioning
Water Pump



Air Conditioning
Seawater Pickup
Filter

Pressure Water
Pump

Fill Plate/Pumpout
Locations

Fresh Water
Washdown

Starboard
Shore Power
Receptacle

Waste Tank
Pumpout Plate
(starboard tank)

Waste Tank
Pumpout
Plate
(port tank)

Water Fill
Plate

TV/Phone Hookup
Shore Cable Inlets
50 amp Breakers

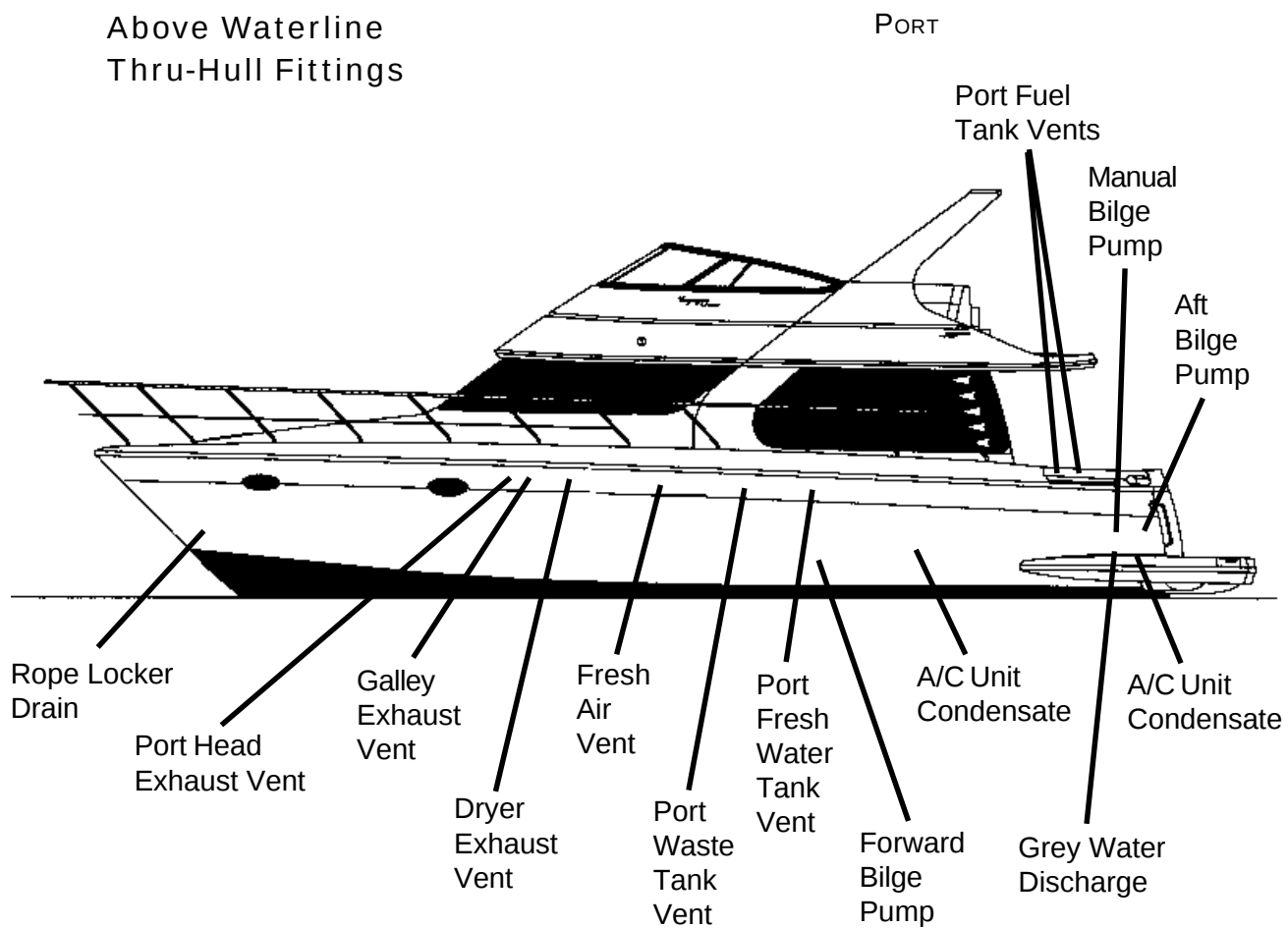
Cable Master Inlet

Port Fuel Tank
Fill Plate

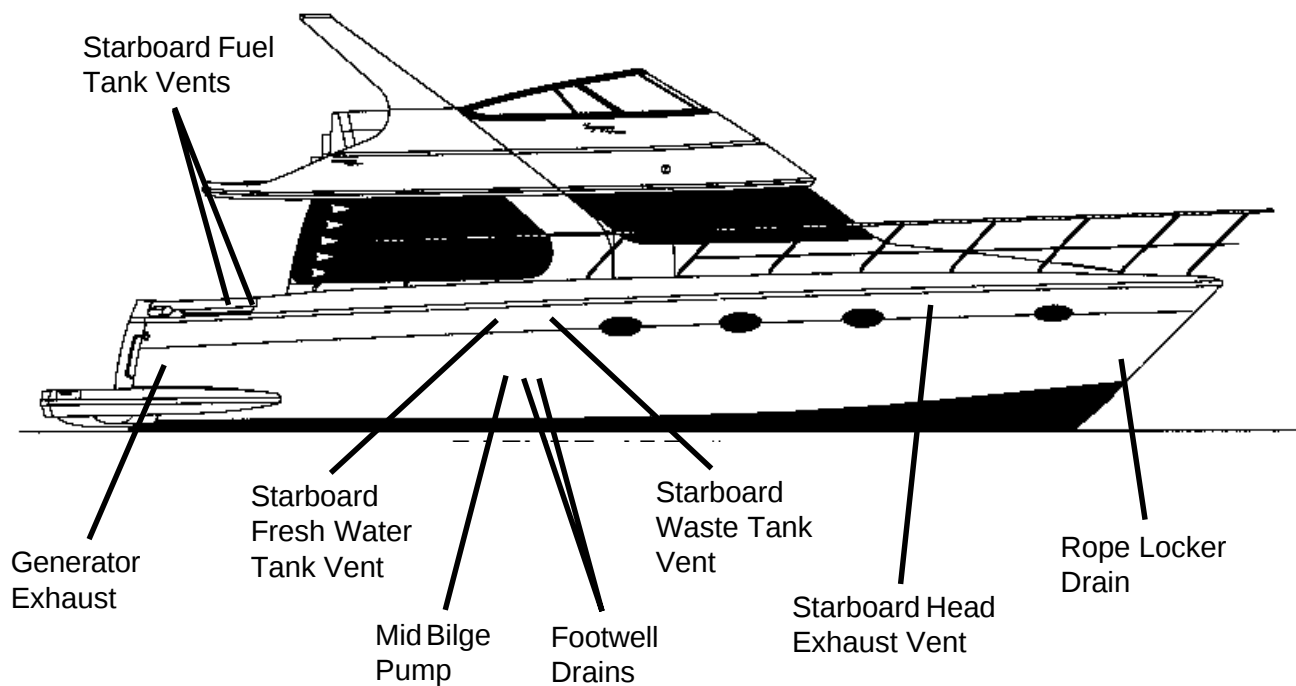
Starboard
Fuel Tank
Fill Plate

Transom Hand Shower
Shore Water Hookup
Raw Water Washdown
Fresh Water Washdown





STARBOARD



Bill of Material

Any component that begin with a letter or have a category number lower than 50 is a manufactured component and therefore may not have all of its subcomponents listed.

Category Number	Part Description
50	Engines and V-Drives
51	Inboard Engine Equipment
52	Propellers
53	Steering Cables
54	Steering Helms and Kits
55	Control Cables
56	Controls and Kits
57	Instruments and Instrument Accessories
58	Fresh Water Cooling
59	Engine Equipment; Batteries
60	Fuel System and Tanks
61, 62	Galley, Head and Shower Equipment, and Tanks
63	Pressure Water System
64	Navigation and Interior Lighting
65	Bilge Pumps, Blowers, and Ventilators
66	Deck Hardware; Arch
67	Rails, Taffrail Kits, and Ladders
68	Wire Harnesses, Dockside Kits, and Panels
69	Electrical Equipment, Generator, Windlass
70	Windows, Doors, Windshield Sets, Hatches, and Screens
71	Hardware, Logo
72	Pilot Seat Hardware, Table Legs and Footrests
73	Accessories; Hatch, Horn, Screens, Stereo, TV, Vacuum
74	Fittings, Pipe and Tube
75	Clamps, Hoses, and Tubing
77	Wood Screws and Sheet Metal Screws
78	Lag and Machine Screws, Bolts, Nuts, and Washers
79	Nails, Staples, and Rivets
80	Blinds, Canvas, Carpet, Curtains, and Upholstery Material
81	Finishing Material and Adhesives; Logos, Paint, Plaques, Stripe
82	Fiberglass Materials, Gel and Putty
83	Extrusions

Category Number	Part Description
84	Lumber, Plywood, Hardboard, and Balsa
85	Plastics, Plastic Laminates, Doors, Lids, and Covers
89	Electrical
90	Air Conditioning and Accessories
91	Foam
94	Woodset

Carver Limited Warranty

A

A/C system water pump 72
A/C unit guest stateroom 74
A/C unit master stateroom 74
A/C unit pilothouse 74
A/C unit salon 74
Abandon ship 7
AC voltmeter 69
AC wiring 60
AC wiring schematic 88
After bow spring 148
After fueling 132
After quarter spring 148
After the engines have started 134
Air conditioning seawater pickup filter 95
Air conditioning seawater pickup seacock 95
Air conditioning water pump 95
Ammeters 69
Anchor light 43
Auto pilot 41
Automatic bilge pump operation 105

B

Back drafting 21
Battery cables 50
Battery charger/inverter 27
Battery electrolyte 50
Battery inspection 50
Battery management 50
Before fueling 131
Bilge blowers 40, 66, 123
Bilge pumps 42, 45, 103, 174
Boarding ladder use 3
Boarding platform use 3
Boat and systems review 202
Boat cradle 178
Bow line 148
Bow thruster 26, 28
Bow thruster battery charger 28, 77
Bridge accessories 40
Bridge DC outlet 40
Bridge stereo 41
Bridge VHF radio 40
Buss bars 60, 84

C

Cablemaster 36, 61
Calling for help 9
Capsized boat 8

Carver Limited Warranty 225
Central vacuum 76
Certificate of number 17
Chart plotter 41
Charts 3, 140
Checking headway 145
Close quarters turns 145
CO detector 45
Coffee maker 76
Collision 8
Companionway lights 35
Compass 140

D

Davit system 27
DC wiring schematic 54
DC voltmeter 128
Defoggers 37
Delivery 203
Depth sounder 141
Desired airflow through boat 20
Direct overboard waste discharge 113
Direct overboard waste discharge system 189
Dishwasher 79
Distress signals 10
Docking lights 43
Dockside waste discharge 107
Dryer 78

E

Electric head 106
Electrical wire 26
Enclosure curtains 166
Engine batteries 29
Engine battery charger 28, 49, 79
Engine pre-start checklist 132
Engine room aft port bulkhead 217
Engine room aft starboard bulkhead 216
Engine room lights 35
Engine synchronizer 129
Engine synchronizer gauge 129
Engine temperature gauges 124, 126
Engine/fuel log 18
Entertainment center 78, 79
Equipment failure 10
Exhaust systems 20
Exterior lights 35

F

Faucet discharge spouts 173
FCC radio license 17
Fire 6
Fire extinguishers 13
Float plan 3
Flooding 8
Fog 4
Forward engine room 218
Forward quarter spring 148
Fresh water heads 106
Fresh water washdown 100
Fuel gauges 128
fuel requirements 2
Fueling 2, 131
Fueling flow rate 131

G

Galley fan 37
Galley lights 33
Garbage 16
Garboard drain 178
Gelcoat 160
Gelcoat blisters 161
Gelcoat repair 161
Gelcoat stress cracks 160
Generator 30, 32
Generator battery charger 49
Generator indicator 71
Generator layout 65
GFCI receptacle locations 81
GPS / Loran log 18
Grey water system 96, 114
Grey water tank monitor 36
Guest stateroom head fan 37
Guest stateroom head lights 35
Guest stateroom lights 35
Guest stateroom waste monitor 36

H

Halon 125
Hand bilge pump 103
Hardwood 167
Hardwood veneer 167
Head overboard discharge selector valves 190
Heads 47
Horn 12, 44, 140
"House" battery 27, 29, 31
"House" battery inverter/charger 79
Hypothermia 9

I

Icemaker 80
Inspections 16

L

Landing at a pier 143
Leaving a mooring 142
Leaving a pier 142
Line 1 69, 71
Line 2 69, 71
Link 1000 system monitor 29
Local ordinances 17
Loran/GPS 41

M

Main DC subpanel 32
Maintenance log 15, 156
Maintenance types 156
Man overboard 9
Manual bilge pump operation 105
Marine traffic rules 14
Master stateroom head fan 37
Master stateroom head lights 35
Master stateroom lights 33
Master stateroom waste monitor 36
Medical emergency 10
Microwave 78

N

Navigation lights 13, 43
Navigation log 15
Neutral safety switch 129
Nontoxic antifreeze 182

O

OEM components 203
OEM warranty cards 203
Oil 17
Oil changer 48
Oil pressure gauge 127
ON/OFF master disconnect switches 26
Overboard waste discharge 110
overboard waste discharge seacock 190
Overboard waste discharge system 187
Owner's information kit 203

P

Panel lights 43
Personal flotation devices 5, 11
Phone system 39
Picking up a mooring 143
Pilothouse accessories 39
Pilothouse DC outlet 39
Pilothouse lights 33
Pilothouse overhead panel 32
Pilothouse VHF radio 40
Planing hull 150
Power seat 39
Pre-delivery service procedure 202
Pre-delivery service record 202
Pressure water pump 38, 173
Propane 39

R

Radar 41
Radar reflectors 6
Radio communication 10
Radio log 15
Range 78
Ray data repeater 41
Receptacles exterior 75
Receptacles galley 75
Receptacles guest stateroom 75
Receptacles master stateroom 77
Receptacles salon 77
Recommended antifreeze products 197
Refrigerator 80
Registration 202
Registration 15
Running aground 9
Running lights 13

S

Safety equipment 2
Salon lights 33
Sanitation system 109, 110, 186
Sea anchor 6
Seawater heads 106
Shallow water operation 141
Shift/throttle 47
Shift/throttle control cables 130
Shore One 72
Shore One indicator 71
Shore power 30
Shore power receptacles 61
Shore Two 72
Shore Two indicator 71

Shower 99, 173
"SLING" tags 178
Sound signaling device 12
Spare set of props 170
Speed log 141
Spot light 35
Standard sanitation system 185
Starting the engines 133
State ordinances 17
Station wagon effect 21
Stereo memory 47
Stern anchor 147
Stern lines 148
Storms 5
Sump 173
Sump pump 45, 94, 99
Sump pump (manual) 48
Sunbrella 166
Swamped boat 8

T

Tachometer 126
Tail wind 21
Testing GFCI receptacles 81
Towing 146
Tracking astern 144
Tracking forward 144
Transom hand shower 100
Trash compactor 76
Trim tabs 38
TV monitor system 42

V

Vacuum head 107
Vent motor 38
Visual distress signals 12

W

Warranty information 202
Washdown pump 38
Washer 76
Waste 17
Waste pump 38
Waste tank selector valve 111
Water heater 76, 99, 180
Water monitor 36
Water survival chart 10
Water tank vent screen 173
Weather 2, 3
Weather signals 4
White vinyl 164
Windlass 44, 48, 147
Windshield defogger 44

Windshield washer 44
Windshield wipers 43, 44

Z

Zinc anodes 84, 193

