CARVER®

YACHTS

2004

356 Motor Yacht

Owner's Guide

HIN - CDR _____

2004 Version 1

CARVER®
YACHTS

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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.

DECLARATION OF CONFORMITY

Model Designation

356 Motor Yacht

Carver Boat Corporation declares that the 356 Motor Yacht complies with EC directive 94/25/EC, and in accordance with the following harmonized standards and the recreational craft sectoral guidelines in effect at the time of construction.

ISO Reference			(Directive) Requirement (RSG) Reference	
8666	12216	8469	Annex I	3.2
12217	8849	8099	Annex V-VIII, XII	3.3
8665	11812	10088	Article 8	2.1
14945	12216	12217	2.2	2.3
15083	10087	9094	3.6	2.4
15084	14945	15085	2.5	3.1
8885	11592	11591	3.4	3.5
10240	11192	7840	3.7	3.8
8846	10133	11105	3.9	4
12215	9093	13592	5.1.1	5.1.3
9097	13297	15584	5.2.1	5.2.2
8847	8848	9775	5.3	5.4.1
10592	13929	15852	5.5	COLREGS
10239		4505		

Type Examination

EC Module B+C

Certification Number

CAR004

Notified Body

IMCI (#0609)
Rond-Point
Schuman 6 Box 6
B-1040 Brussels
Belgium

Robin J. Clonkey
Manager Manufacturing Methods
Carver Boat Corporation
790 Markham Drive
Pulaski, WI 54162
USA

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.

CARVER YACHTS

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.

CARVER YACHTS

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

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Boating Safety

Safe Operation

Boating safety is your responsibility. You must fully understand the operating procedures and safety precautions in the Owner's Information kit and this owner's guide **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, engines, safety equipment, and all boating gear regularly.

  NOTE: *Federal law requires you to provide and maintain safety equipment on your boat. Consult U.S. Coast Guard, state, and local regulations to ensure your boat has all required safety equipment onboard. 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). Refer to the **"Specifications"** portion of **Section 9** for the fuel tank capacity. Refer to 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 proper 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. Back up charts if you use a chart plotter.
- 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 passenger onboard in the basic operation of 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 either or both of the 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 and/or alcohol.
- Do not operate your boat if your visibility is impaired.

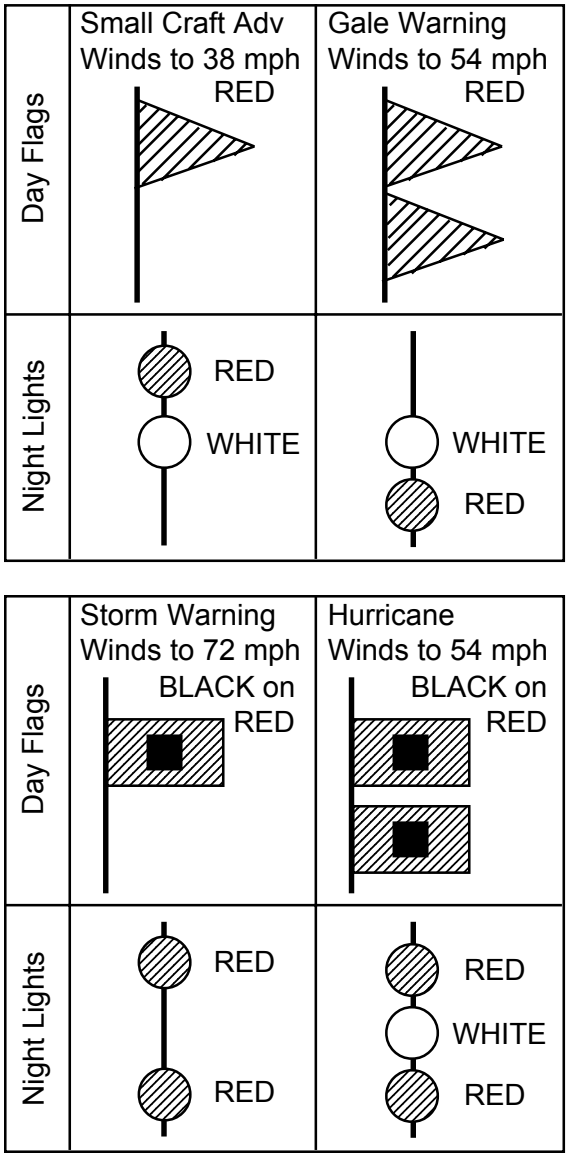
Adverse Conditions

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



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.
- 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 engines 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 portlights, exterior doors 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 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, measured diagonally. They should be placed 12 feet above the 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. You should obtain training to handle any emergencies which may arise.

Fire

⚠ DANGER

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

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 the stove top or other open flame devices. Do not store any materials or equipment of any kind in the engine room.

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.

⚠ WARNING

Never:

- **Obstruct passage ways to exits and hatches.**
- **Obstruct safety controls, such as fuel valves, gas valves and electrical system switches.**
- **Obstruct portable fire extinguishers in lockers.**
- **Leave the boat unattended when cooking or heating appliances are in use.**
- **Use gas lights in the boat.**
- **Modify any of the boat'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.**

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

In case of fire:

- Stop the engines **immediately**.
- If the fire is in the engine room, shut off the bilge blowers **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 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 personal flotation device 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 and adjust the length of the line to hold the bow at the most favorable angle.

Collision

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

- Prepare to help the other craft unless your boat or its passengers are in danger.

- If the bow of the other craft 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 during repairs, if possible.

- If your boat is in danger of sinking, have everyone onboard 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-measuring instrument and allow ample water below the hull while operating.

If your boat runs aground, check everyone onboard for injuries, then inspect the boat for damage. If lightly grounded, shift the weight of the passengers or gear to heel the boat while reversing engines. 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

You should know what to do in case someone falls 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 occurs when a person's body loses heat 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 faster body heat is lost. Personal flotation devices increase survival time because they provide insulation.

WATER SURVIVAL CHART

Water Temp. (°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 boat do fail, radio for help or signal with flags and wait until help arrives.

Radio Communication

You are responsible for obtaining a radio operator's permit and knowing and following proper rules and procedures. Private boats 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 craft in distress as long as your life or boat is not put in harm's way in the process. Good Samaritan laws protect you from any liability incurred while giving aid.

Safety Equipment

NOTE: *Federal law requires you to provide and maintain safety equipment onboard your boat. Consult U.S. Coast Guard, state and local regulations to ensure your boat has all required safety equipment onboard. You must learn about any additional recommended equipment before operating the boat.*

Personal Flotation Devices (PFDs)

There must be one U.S. Coast Guard-approved wearable personal flotation device of Type I, II, or III for each person onboard your boat. 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 people from a facedown position to a vertical or face-up position.

PFD Type II, Wearable: This near-shore buoyant vest is intended for calm inland 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 people 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 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 packaging that children, but not adults, will find difficult to open, especially if young children are onboard.

Sound Signaling Device

Your boat 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 mile away. Refer to the U.S. Coast Guard's publication **"Navigational Rules, International-Inland"** for details on 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 when operating your boat at night.

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 they can extinguish. These classifications include foam, carbon dioxide, chemical, and Halon-type fire extinguishers. Below are the requirements for fire extinguishers at the time this guide was prepared.

Boats longer than 26' and shorter than 40': Two Type B-I or at least one Type B-II portable hand extinguisher. 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 room. 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 its 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(s)
- Tool kit
- Ring buoy
- Navigational charts
- Mooring lines
- 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, at 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 boat responsibly requires you 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 boater, you must comply with the marine traffic rules enforced by the U.S. Coast Guard. There are two sets of rules: the United States Inland Navigational Rules and the International Rules. The United States Inland Rules apply to all vessels inside the demarcation lines separating inland and international waters. The U.S. Coast Guard lists 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 U.S. Coast Guard station, your Carver Dealer, or a local marina about navigational aids unique to your area.

Documentation

The owner of a boat registered with the U.S. 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, an 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 required documents, it is strongly recommended that you maintain the following logs. Log books are available from maritime supply stores.

- A navigation log containing engine speeds, compass courses and time records, which are essential for both cruising and maintenance purposes.

- A radio log, which is mandatory on vessels required to have a radio. A radio log can be useful to record unusual events, especially for future litigation.

- A maintenance log to track the type and frequency of maintenance procedures performed on your boat and its systems. Refer to **Section 7** for more information on maintaining your boat.
- An engine/fuel log, which is essential for calculating range and fuel requirements.
- A GPS/Loran log if your boat contains this equipment.

Drugs and Alcohol

Drugs and alcohol adversely affect a person's ability to make sound judgments, react quickly and, in general, safely operate a boat. As a responsible boater, you must refrain from using drugs or alcohol while operating your boat. Operating a motorized boat while under the influence of drugs or alcohol carries a significant penalty.

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 U.S. 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.**

Voluntary Inspections

The U.S. Coast Guard Auxiliaries or state boating officials in many states offer courtesy inspections to check your boat for compliance with safety standards and required safety equipment. You may voluntarily consent to one of these inspections, after which you are allowed time to make corrections without prosecution. Check with the appropriate state agency or the U.S. 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, 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 your responsibility to make sure that your 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. U.S. Coast Guard regulations prohibit dumping 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 help to clean our waterways by properly disposing of all garbage.

Within three miles of 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 three to twelve miles from shore it is illegal to dump plastic, dunnage, lining and packing materials that float, and any garbage not ground to less than one square inch. From 12 to 25 miles from shore it is illegal to dump plastic, dunnage, lining and packing materials that float. Beyond 25 miles from shore 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 significant fine.

Septic Waste

On U.S. inland and coastal waters, it is illegal to discharge septic waste directly overboard. If your boat is equipped with an overboard discharge option, check

with your local U.S. 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. Check with state and local authorities to make sure that you are in compliance with local regulations regarding marine sanitation, noise, speed and wake.

Pre-Departure Actions

- Check the weather. Make sure conditions and seas will not be hazardous during your voyage.
- Make sure all safety equipment is onboard, accessible and in good working condition.
- Check the bilge for fuel vapor or water. Ventilate or pump out the bilge as necessary.
- Be sure the horn, 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 the engines, check the 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 you. 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 the boat's operation 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 U.S. 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 with the U.S. 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

Your Carver yacht 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. 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, color-coded wire. 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

Gasoline Engines

If your boat is equipped with gasoline engines, power to the propulsion engines and the "house" 12 volt equipment is powered by two 12 volt batteries mounted in the engine room between the two center stringers. Each battery is dedicated to start either the port or starboard engine.

Diesel Engines

If your boat is equipped with diesel propulsion, each diesel engine requires a dedicated double battery bank to start the engine. In this case, each engine will require a master disconnect switch ON/OFF switch located in the engine compartment. These master disconnect switches must be in the ON position for the engines to start.

NOTE: *With diesel engines, the battery selector switch located beneath the salon stairs should only be used to select which battery bank (#1 or #2) that your "house" 12 volt equipment will draw power from. Or, you can use the "BOTH" position to parallel the power from both battery banks should one or the other become unable to start an engine.*

Battery Selector Switch

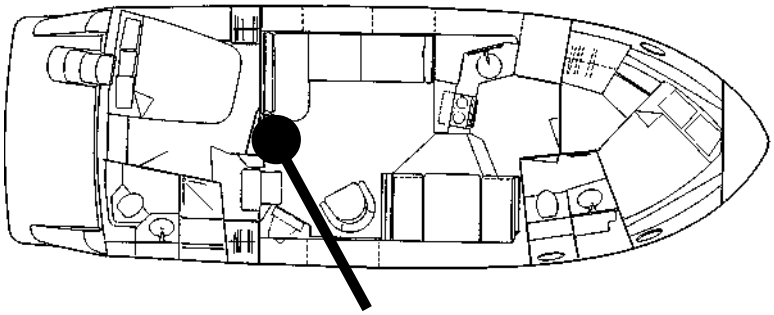
The power from these batteries to the "house" equipment is controlled by the battery selector switch. This switch is located below the lowest step leading from the salon to the aft deck, on the Safety Breaker Panel. The battery selector switch acts as a master disconnect for

the "house" 12 volt systems. The selector switch lets 12 volt equipment draw power from either battery bank #1, battery bank #2, or both battery banks together.

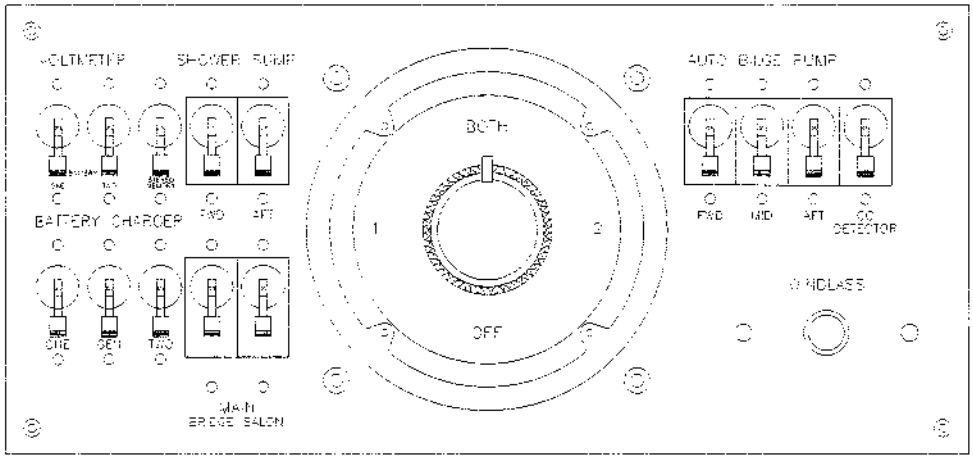
If your boat is equipped with gasoline engines, the selector switch also lets your start your boat's engines by combining the power within both batteries should the charge in an engine's dedicated battery bank become unable to start the boat's engine. This is accomplished by positioning the battery selector switch to the "BOTH" position.

Battery Selector Switch Positions

The following information refers only to boats equipped with gasoline engines. If your boat is equipped with diesel engines, the engines are wired directly to battery ON/OFF switches mounted in the engine room. With diesel propulsion, the battery selector switch should be



BATTERY SELECTOR SWITCH



A TIP FROM CARVER!

Carver recommends using ONE BATTERY AT A TIME. The only time you should use the "BOTH" position is when a single battery is not capable of starting your engines.

After starting the engines in the "BOTH" position, switch the selector to either the "1" or "2" position. Running the boat in the "BOTH" position combines the output of both batteries and does not permit the engine alternator's voltage regulator to sense the charge level of an individual battery.

This could lead to inadequate charging if one battery has been drained more than the other. *Alternating between position "1" and position "2" increases the life of your batteries.*

used only to parallel both batteries together if the charge in either battery is too low to start your engines.

With the battery selector switch in the "OFF" position, all 12 volt DC power to the boat is shut off except for the bilge pumps, voltmeters, battery charger leads, and the CO detectors.

The boat's bilge pumps and CO detectors are "hard-wired" to the selector switch so they operate automatically even when the boat is unattended and the selector switch is in the "OFF" position.

⚠ WARNING

Never turn the battery selector switch or the diesel master disconnect switch to the "OFF" position while the engine or generator is running. Doing so may cause damage to your engine's electrical system.

1: Position "1" uses battery bank #1 to power both engines and all other 12 volt equipment. Battery bank #2 is then isolated and remains in reserve.

2: Position "2" uses battery bank #2 to power both engines and all other 12 volt equipment. Battery bank #1 is then isolated and remains in reserve.

BOTH: With the selector switch in the "BOTH" position, battery bank #1 and battery bank #2 are connected in parallel. Both battery banks are then used by the engines and all other 12 volt equipment.

Battery Master Disconnect Switches (Diesel Engines Only)

Power from the boat's batteries to diesel engines are regulated by master disconnect ON/OFF switches. Each engine and the optional generator have a dedicated master disconnect switch. For the propulsion engines, these master disconnect switches are mounted in the engine compartment.

For the generator, this master disconnect switch is located near the generator. These master disconnect switches must be turned to the "ON" position before starting your engines or the generator.

Voltmeters

Two active voltmeter gauges are installed at the helm console. These gauges become active whenever the ignition has been activated.

A voltmeter gauge reads static voltage when the engines are off. When the engines are running, each battery will indicate a higher reading than when the engine is off. This is because the voltmeter reads alternator charging rate when the engines are running. Each engine's alternator automatically charges the dedicated battery whenever it is running.

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.

A TIP FROM CARVER!

If your boat is equipped with a generator and a battery becomes completely discharged so that you are unable to start an engine, start the onboard generator. Next, switch the Battery Charger circuit breaker on the AC Power Panel "ON". In a short time your battery will be charged enough to start the engine.

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. This is why we recommend using either battery bank #1 OR battery bank #2 . 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 Charger

Your boat is equipped with a 35 amp battery charger. The battery charger uses AC power to recharge the 12 volt batteries. You can find this battery charger mounted in near the center of the engine room’s aft bulkhead. With the boat connected to a dockside power source, you can provide AC power to the battery charger by turning the AC breaker labeled BATTERY CHARGER to the "ON" position. This breaker is located in the salon's AC power panel mounted behind the sliding panel outboard the dinette.

When activated, the battery charger automatically monitors the charge of the propulsion and “house” batteries, regardless of the position of the battery selector switch. When the voltage in a battery drops

below a predetermined level the charger automatically recharges the low battery.

With your boat connected to AC power (either through the shore power cord or by operating the onboard generator) and your battery charger operating, you can use 12 volt equipment (such as cabin lights) with little concern for discharging the boat's batteries.

NOTE: *The battery charger charges the batteries even when the battery selector switch is in the "OFF" position. More information on using the battery charger can be found in the "Shore 1" portion of Section 3.*

DC Circuit Breaker Panels

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

- 12 Volt DC Power Main Breaker Panel
- Bridge Breaker Panel
- 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.

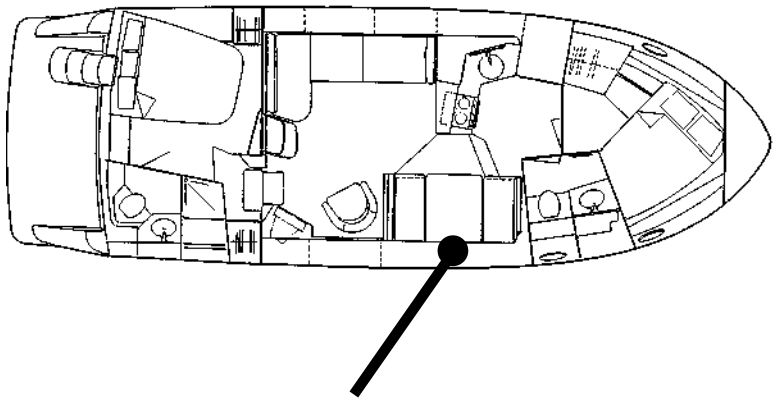
⚠ WARNING

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

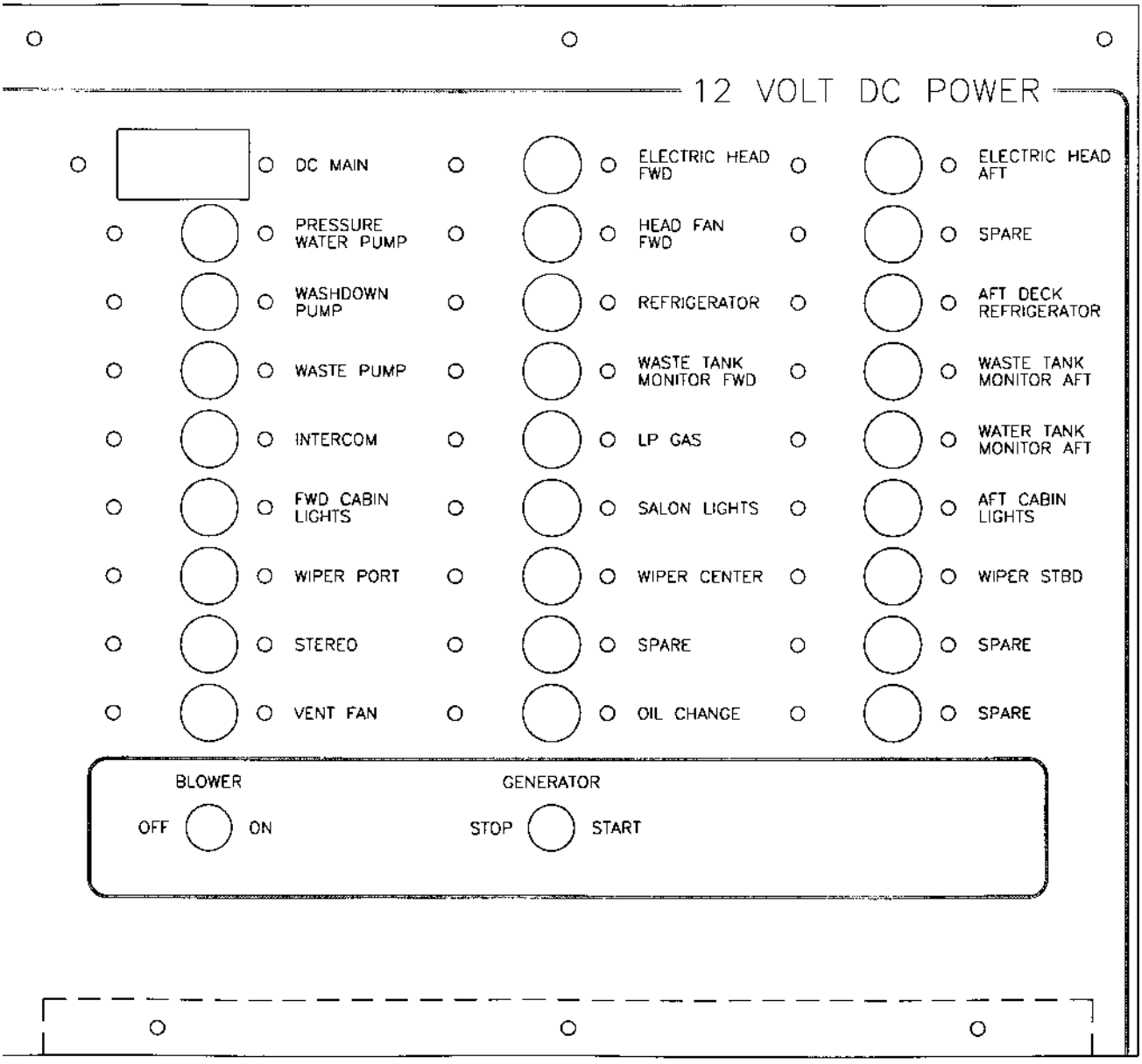
NOTE: *Sometimes a circuit breaker location is labeled but no circuit breaker is present. In this case, the component named on the label is an option that is not installed on your boat.*

12 Volt DC Power Main Breaker Panel

The 12 Volt DC Power Main Breaker Panel is mounted behind a sliding panel located on the starboard wall outboard the dinette. To provide power to this panel, position the battery selector switch to draw from either battery #1 or battery #2. The main breaker panel is



12 VOLT DC POWER MAIN BREAKER PANEL



divided into three rows of circuit breakers which control power to the systems described below.

DC Main

The DC Main breaker controls the flow of electricity to all of the other circuit breakers on this panel. To supply power to the other circuit breakers, switch the DC Main breaker "ON". To cut the power supply to the other breakers, switch this breaker "OFF".

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.

Washdown Pump (Raw Water)

This breaker controls the flow of electricity to the boat's optional transom 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.

Waste Pump

On boats equipped with overboard discharge, this breaker controls the flow of electricity to the overboard discharge waste pump ON/OFF switch. This waste pump is used to empty your waste holding tank directly overboard.

You can find this waste pump and its ON/OFF switch below the hatch beneath the dinette's aft seat. Switch this breaker "ON" to supply power to the overboard discharge waste pump controls. Refer to the "**Direct Overboard Discharge**" portion of **Section 4** for the proper use of this pump.

Intercom

This breaker controls the flow of electricity to the boat's optional intercom system. Switch this breaker "ON" to

supply power to the intercom system. Refer to the OEM information for details on operating the intercom.

Fwd Cabin Lights

This breaker controls the flow of electricity to the light controls in the forward stateroom. To supply power to the lights' ON/OFF switches, switch this breaker "ON."

Wiper Port

This breaker controls the flow of electricity to the helm's port windshield wiper controls. Use this wiper to clear water from your boat's port windshield. Switch this breaker "ON" to enable the port windshield wiper.

Stereo

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

Vent Fan

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

Electric Head Fwd

On boats equipped with the electric head, switching this breaker "ON" supplies electricity to the forward head toilet pump. Pressing the button labeled "FLUSH" then flushes the toilet. Refer to the OEM information for details on operating the electric head.

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.*

Head Fan Fwd

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

Refrigerator

This breaker controls the flow of electricity to the dual voltage refrigerator located in the galley. To operate the refrigerator using your boat's 12 volt power, switch this breaker "ON."

Your refrigerator will also operate on AC power when your boat is connected to dockside power or when an onboard generator is running. This breaker does not need to be "ON" when the refrigerator is using AC power. However, when this breaker is "ON", the boat's circuitry automatically switches to DC power when AC power is not available.

NOTE: *Be careful when operating your dual voltage refrigerator using 12 volt power without the engines running. A refrigerator left operating on 12 volt power will eventually discharge the boat's batteries.*

Waste Tank Monitor Forward

This breaker controls the flow of electricity to the boat's forward waste tank monitor, which is located in the forward head. Use this monitor to determine the level of waste in the forward waste tank. To activate this monitor, switch this breaker "ON". Refer to the OEM information for details on operating the forward waste tank monitor.

LP Gas

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**.

Salon Lights

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

Wiper Center

This breaker controls the flow of electricity to the helm's center windshield wiper controls. Use this wiper to clear water from your boat's center windshield. Switch this breaker "ON" to enable the center windshield wiper.

Spare

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

Oil Change

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.

Electric Head Aft

On boats equipped with the electric head, switching this breaker "ON" supplies electricity to the aft head toilet pump. Pressing the button labeled "FLUSH" then flushes the toilet. Refer to the OEM information for details on operating the electric head.

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.*

Spare

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

Aft Deck Refrigerator

This breaker controls the flow of electricity to the dual voltage refrigerator located on the aft deck. To operate the refrigerator using your boat's 12 volt power, switch this breaker "ON."

Your refrigerator will also operate on AC power when your boat is connected to dockside power or when an onboard generator is running. This breaker does not need to be "ON" when the refrigerator is using AC power. However, when this breaker is "ON", the boat's circuitry automatically switches to DC power when AC power is not available.

NOTE: *Be careful when operating your dual voltage refrigerator using 12 volt power without the engines*

running. A refrigerator left operating on 12 volt power will eventually discharge the boat's batteries.

Waste Tank Monitor Aft

This breaker controls the flow of electricity to the boat's aft waste tank monitor, which is located in the aft head. Use this monitor to determine the level of waste in the aft waste tank. To activate this monitor, switch this breaker "ON". Refer to the OEM information for details on operating the aft waste tank monitor.

Water Tank Monitor Aft

This breaker controls the flow of electricity to the boat's water tank monitor. Use this monitor to determine the level of water in the water tank. To activate this monitor, switch this breaker "ON". Refer to the OEM information for details on operating the water tank monitor.

Aft Cabin Lights

This breaker controls the flow of electricity to the light controls in the aft stateroom. To supply power to the lights' ON/OFF switches, switch this breaker "ON."

Wiper Stbd

This breaker controls the flow of electricity to the helm's starboard windshield wiper controls. Use this wiper to clear water from your boat's starboard windshield. Switch this breaker "ON" to enable the starboard windshield wiper.

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.

Blower On/Off Switch

This switch turns on and off the two bilge blowers. To enable this switch, the bilge blower breakers on the Bridge Breaker Panel must be "ON". An additional blower on/off switch is located at each helm station.

Generator Start/Stop Switch

This switch turns on and off the optional generator. Refer to the **"Using the Generator"** portion of **Section 3** for information on operating the generator.

Bridge Breaker Panel

The Bridge Breaker Panel manages power to the bilge pumps, navigation equipment and electronics, and other equipment commonly used while cruising. This breaker panel is located conveniently on the command bridge below the forward bench seat.

Main

The Main breaker controls the flow of electricity to all of the other circuit breakers on this panel. To supply power to the other circuit breakers, switch the Main breaker "ON". To cut the power supply to the other breakers, switch the Main breaker "OFF".

Spotlight

This breaker controls the flow of electricity to the controls for the boat's optional spotlight. Switch this breaker "ON" to activate the spotlight controls. The controls are located at the boat's helm station. Refer to the OEM information for details on operating the spotlight.

Exterior Lights

This breaker controls the flow of electricity to the boat's exterior light controls. To supply power to the lights' ON/OFF switch, switch this breaker "ON."

Panel Lights

This breaker controls the flow of electricity to the helm instrument panel. To supply power to the panel, switch this breaker "ON."

Navigation/Anchor Lights

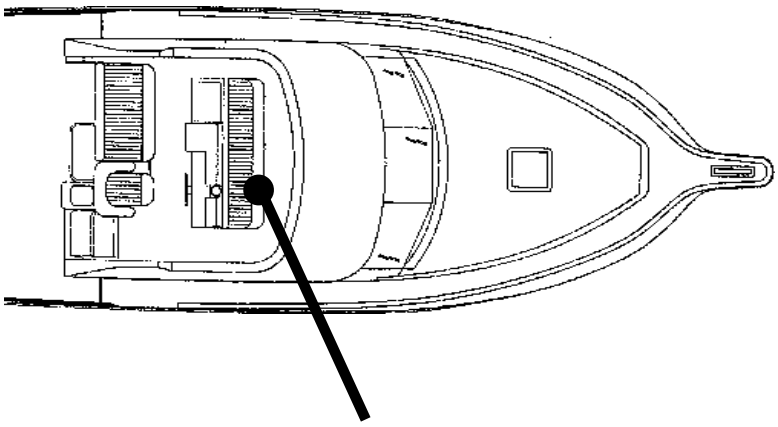
This breaker controls the flow of electricity to the navigation/anchor light controls at the helm station. To supply power to the lights' ON/OFF switches, switch this breaker "ON." Then turn the navigation/anchor light switch to the desired position.

Synchronizer

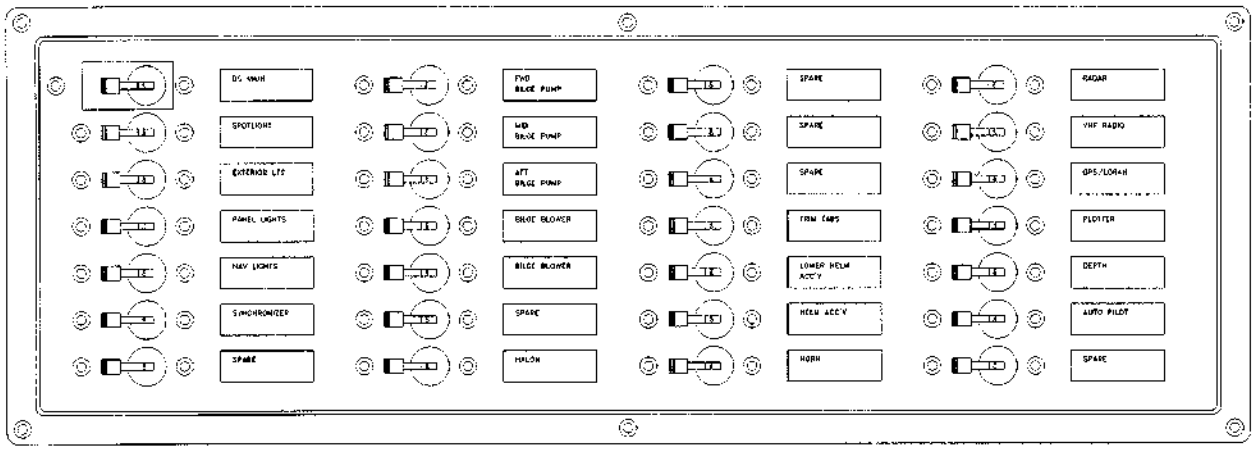
This breaker controls the flow of electricity to the controls for the boat's optional synchronizer. The synchronizer assists in equalizing the RPMs for both engines. Switch this breaker "ON" to activate the synchronizer controls. The controls are located at the boat's helm station. Refer to the OEM information for details on operating the synchronizer.

Fuel Transfer Pump

This breaker controls the flow of electricity to the boat's optional fuel transfer pump control. The pump and its controls are located in the aft, port corner of the engine room.



BRIDGE BREAKER PANEL



Since the generator draws fuel from only one tank, the fuel levels in the tanks may become unequal. If this occurs, use the fuel transfer pump to pump fuel from one tank to the other until the fuel levels are equal.

Switch this breaker "ON" to activate the pump controls. The fuel transfer switch, on the helm instrument panel, toggles between the port and starboard fuel tanks. Placing the switch in the "PORT" position transfers fuel from the starboard tank into the port tank. Placing the switch in the "STBD" position transfers fuel from the port tank into the starboard tank.

Fwd, Mid and Aft Bilge 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.

⚠ 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.

These breakers control the flow of electricity to the forward, mid, and aft bilge pump controls, respectively. These controls are located at the helm station. Switch these breakers "ON" to activate the bilge pump controls.

Bilge Blower

⚠ DANGER

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

These two breakers control the flow of electricity to the bilge blower controls on the helm instrument panel. Switch these breakers "ON" to activate the bilge blower controls.

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

Spare

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

Halon

This breaker controls the flow of electricity to the halon fire suppression system in the engine room. Switch this breaker "ON" to activate the halon system. Refer to the OEM information for details on operating this equipment.

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.

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.

Spare/Lower Helm Accessories

This breaker controls the flow of electricity to the cigar lighter and remote stereo controls at the lower helm station. Switch this breaker "ON" to activate the lighter and stereo controls.

NOTE: *If your boat is not equipped with this option, this breaker is labeled SPARE and reserved for aftermarket accessories you would like to install on your boat.*

Helm Accessories

This breaker controls the flow of electricity to the cigar lighter and remote stereo controls at the upper helm station. Switch this breaker "ON" to activate the lighter and stereo controls.

Horn

This breaker controls the flow of electricity to the boat's horn controls at the helm station. To supply power to the horn's ON/OFF switch, switch this breaker "ON." To operate the horn, rotate the horn switch to the "ON" position.

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.

VHF Radio

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

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.

Depth Sounder

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

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.

Spare

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

Safety Breaker Panel

The Safety Breaker Panel is mounted beneath the lowest step in the stairway leading from the salon to the aft deck. This panel is reserved for safety equipment such as automatic bilge pumps. Some safety equipment listed on the Safety Breaker Panel is directly wired to the batteries and should remain in the "ON" position at all times. This allows various pumps and other safety equipment to remain active regardless of the position of the battery selector switch.

While the safety equipment wired though this Safety Breaker Panel does operate at all times even when the battery selector switch is in the "OFF" position, it will not run if a breaker trips. Therefore, it is important to frequently check that these breakers are "ON" and working properly.

Voltmeter - Battery One

This breaker protects the circuitry between the helm's voltmeter and battery #1. When this breaker is "ON", the voltmeter operates whenever the engine ignition is engaged. The voltmeter indicates the charge level in battery #1.

Voltmeter - Battery Two

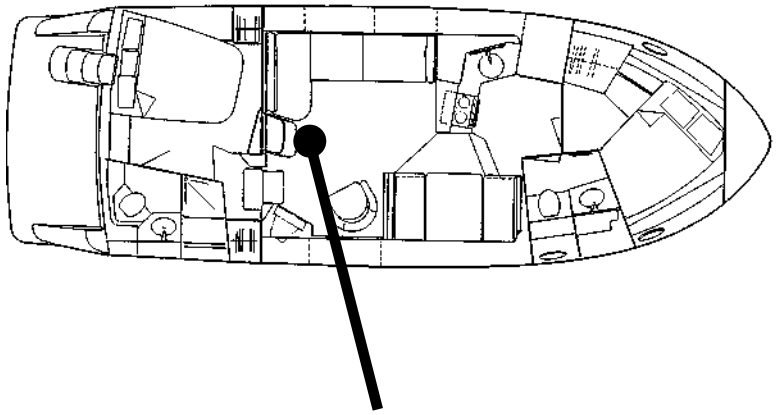
This breaker protects the circuitry between the helm's voltmeter and battery #2. When this breaker is "ON", the voltmeter operates whenever the engine ignition is engaged. The voltmeter indicates the charge level in battery #2.

Stereo Memory

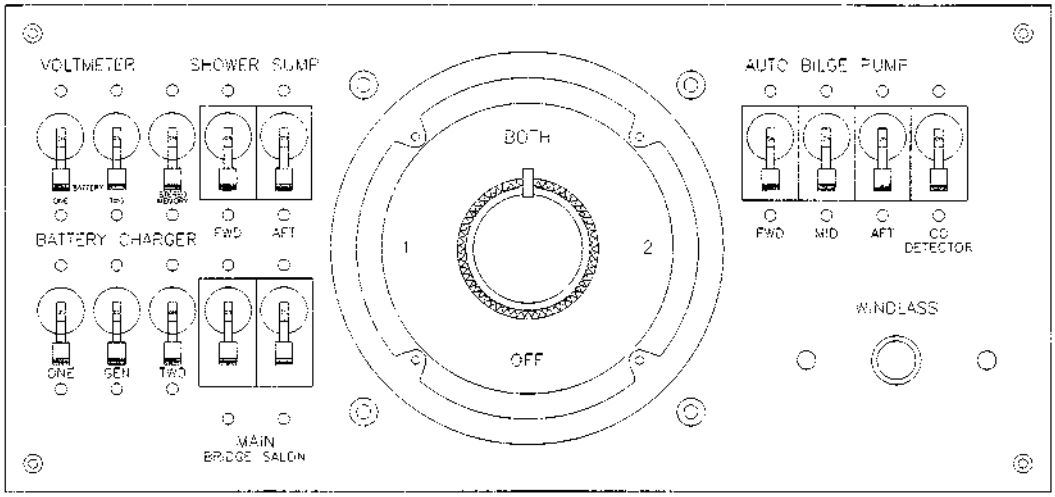
This breaker controls the flow of electricity to the boat's stereo system. This breaker should always be "ON" to maintain the information programmed into the stereo's memory. If this breaker is ever switched "OFF", you will have to reprogram the stereo. Refer to the OEM information for details on programming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

Shower Sump - Fwd and Aft

These breakers control the flow of electricity to the forward and aft shower sump pumps. Since each shower sump is located below the boat's water line, a sump pump is needed to pump shower water overboard or into the optional grey water holding tank. The shower sumps are activated automatically by a float switch whenever water within the sump rises above a predetermined level. Switch the appropriate breaker "ON" before using the forward or aft shower or sink.



SAFETY BREAKER PANEL



NOTE: *Since condensation from the air conditioner drains into the shower sump, the shower sump breakers must remain "ON" whenever the air conditioner is operating.*

Battery Charger - One

This breaker protects the circuitry between the boat's 35 amp battery charger and battery #1. When this breaker is "ON" and the battery charger is operating, the battery charger automatically charges battery #1 whenever the battery's voltage decreases below a predetermined level.

Battery Charger - Gen

This breaker protects the circuitry between the boat's 35 amp battery charger and the generator battery. When this breaker is "ON" and the battery charger is operating, the battery charger automatically charges the generator battery whenever the battery's voltage decreases below a predetermined level.

Battery Charger - Two

This breaker protects the circuitry between the boat's 35 amp battery charger and battery #2. When this breaker is "ON" and the battery charger is operating, the battery charger automatically charges battery #2 whenever the battery's voltage decreases below a predetermined level.

Main - Bridge

This breaker protects the circuitry between the Bridge Breaker Panel and the batteries. This breaker must be "ON" for electricity to reach the Bridge Breaker Panel.

Main - Salon

This breaker protects the circuitry between the 12 Volt DC Power Main Breaker Panel and the batteries. This breaker must be "ON" for electricity to reach the 12 Volt DC Power Main Breaker Panel.

Auto Bilge Pump - Fwd, 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 prede-

termined level. These breakers must be "ON" whenever the boat is in the water.

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

CO Detector

⚠ DANGER

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.

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 will 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.

Windlass

This breaker protects the circuitry between the boat's windlass and the batteries. This breaker must be "ON" to operate the windlass controls at the helm and at the bow of the boat. Refer to the OEM information for details on operating the windlass.

Battery Maintenance

Your boat's 12 volt DC electrical system is powered by 12 volt batteries. These batteries are anchored in the engine room between the propulsion engines. If your boat is equipped with an optional generator, an additional battery supplies power to the generator starter. This generator battery is located near the generator.

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 do 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.

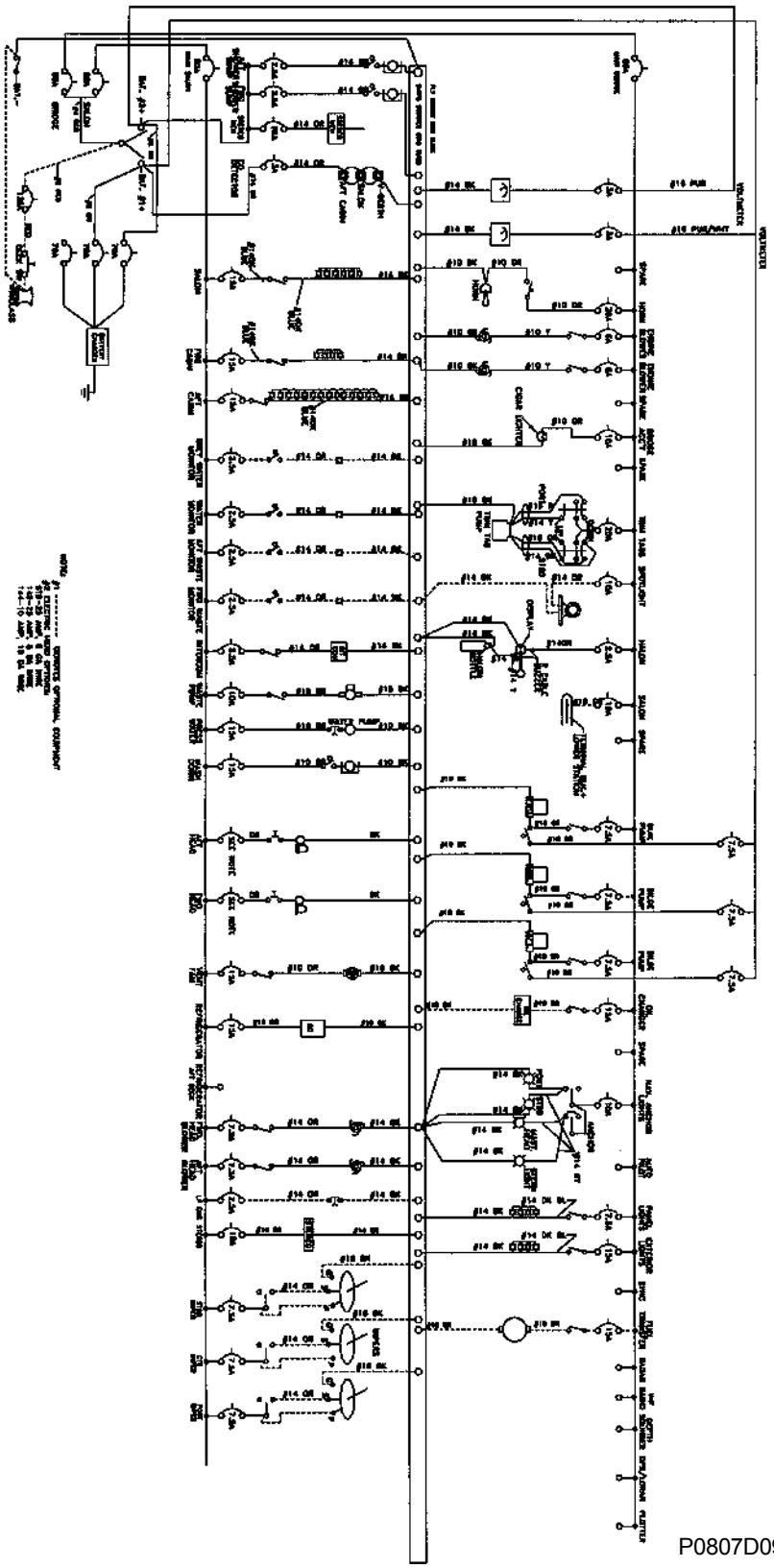
Check the battery charge level every 3 months using a hydrometer or voltmeter. If the specific gravity of the battery is less than 1.225 or the voltage is less than 12.4 volts, charge the battery. Avoid overcharging.

Troubleshooting the DC Electrical System

Problem	Possible Cause	Possible Solution
12 volt equipment does not function.	Battery selector switch is in the "OFF" position.	Turn the battery selector switch to position #1 or position #2.
	Main - Bridge or Main - Salon circuit breaker on the Safety Breaker Panel is "OFF".	Turn both circuit breakers "ON".
	DC Main circuit breaker on the 12 Volt DC Power Main Breaker Panel is "OFF".	Turn the circuit breaker "ON".
	Main circuit breaker on the Bridge Breaker Panel is "OFF".	Turn the circuit breaker "ON".
	Battery is weak or dead.	Reposition the battery selector switch and charge the battery.
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.	Reposition the battery selector switch and charge the battery.
	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.	Fwd Cabin Lights, Salon Lights or Aft Cabin Lights circuit breaker on the 12 Volt DC Power Main Breaker Panel is "OFF".	Switch appropriate circuit breaker "ON".
	Battery is weak or dead.	Reposition the battery selector switch and charge the battery.
	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 new battery.
Engine is running and voltmeter does not indicate adequate voltage.	Engine alternator belt is loose.	Refer to engine manual to tighten belt.

12 Volt Wiring Schematic



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NOTES

NOTES

AC Electrical System

AC Electrical System

Your boat is equipped with a 30 amp AC (alternating current) electrical system. The power for this system is supplied by either a shore power source or the optional onboard generator. All AC power is routed through the AC Power Panel, which is mounted behind a sliding mirror on the salon's starboard bulkhead outboard the dinette. The lights above the main breakers on your AC Power 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.

If your boat does **not** have the optional air conditioning system, all AC power is routed through a single dock-side MAIN breaker service called Line 1. If your boat is equipped with air conditioning, the air conditioning system is powered through an additional 30 amp breaker service called Line 2.

Wiring System

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

The black wire carries the current from the power source to the equipment or receptacle. Each black 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 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.

Reverse Polarity

Reverse polarity can occur only with 110 volt electrical systems. If your boat is equipped with a 220 volt system, disregard this section.

The MAIN circuit within your boat's electrical system is designed to sense the voltage difference between the neutral and ground terminal blocks. If the dockside electrical power source is incorrectly wired and the polarity is reversed, the red reverse polarity light in the dockside electrical box illuminates. If reverse polarity occurs while your boat is connected to shore power, the reverse polarity light on your boat's AC Power Panel illuminates.

⚠ WARNING

If reverse polarity occurs, turn off the 30 amp main breaker(s) on your AC Power Panel and disconnect your power cord(s) from the shore power supply. Notify marina management of the problem. Use a different dockside electrical box.

Shore Power

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 AC Power Panel. 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 AC Main Line 1 and AC Main Line 2 (if present) circuit breakers on the AC Power 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).

4. Connect the female end of the cord to your boat's shore power receptacle located on the transom.

5. Secure the nonmetallic threaded locking ring that locks the cord to the boat's shore power receptacle. This prevents accidental disconnection or arcing due to a gap between the cord plug and the receptacle.

⚠ WARNING

Do not allow the end of the shore power cord 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 into the shore power source box.

9. Secure the nonmetallic threaded locking ring that locks the cord to the shore power source outlet. This prevents accidental disconnection or arcing due to a gap between the cord plug and the outlet.

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 your boat's shore power receptacle.

12. If the red Polarity Reversed light(s) on the AC Power Panel illuminates, disconnect the shore power cord immediately. Notify marina management of the reverse polarity problem and use a different shore power source box.

    If the green Polarity Reversed light(s) illuminates, switch "ON" the AC Main Line 1 and AC Main Line 2 (if present) breakers on the AC Power Panel.

13. Monitor the voltmeter(s) and ammeter(s) while your boat is connected to the shore power source. The operation of the voltmeters 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

You can use the optional onboard generator to power the boat's AC electrical systems when a shore power source is not available. The generator is installed in the engine compartment between the two main stringers. Fuel for the generator is drawn from the port fuel tank.

To start the generator:

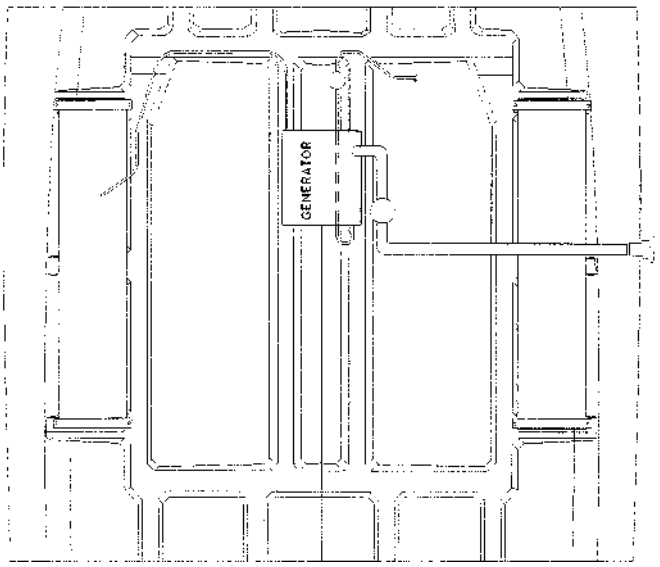
1. Read, understand and follow the OEM information that describes the generator.

2. The generator starter is powered by its own 12 volt deep cycle battery. This battery is installed aft and below the generator. Power to the generator from this battery is controlled by an ON/OFF switch mounted on the aft portion of the generator. Turn this 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 condition of the two 12 volt ship's batteries. If the batteries become discharged to the point where they are not able to start an engine, start the generator and turn on the battery charger. This recharges the boat's batteries and enables you to start the propulsion engines when the batteries have been recharged to an adequate level.

GENERATOR LAYOUT



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 Safety Breaker Panel is "ON".*

⚠ 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.

3. The generator engine uses seawater as a coolant. Open the seawater seacock before you start the generator. This seacock is located beneath the hatch under the dinette's aft cushion.

4. Switch "ON" the two Bilge Blower circuit breakers on the Bridge Breaker Panel.

5. Turn "ON" the bilge blowers using the blower switch on the 12 Volt DC Power Main Breaker Panel or at the helm station(s).

⚠ 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.

⚠ CAUTION

The generator STOP/START switch is spring activated. Release the 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 STOP/START switch in the "START" position for more than 10 seconds.

6. A spring-loaded generator STOP/START switch is located at the bottom of the 12 Volt DC Power Main Breaker Panel. Push the switch to the "START" position and hold it there until the generator starts. Release the switch when the generator starts.

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

7. When the generator is running smoothly, switch "ON" the AC Main Line 1 and AC Main Line 2 (if present) breakers on the AC Power 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.

8. To turn the generator "OFF", push the STOP/START switch to the "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.

9. To change from generator to shore power, switch "OFF" the AC Main Line 1 and AC Main Line 2 (if present) breakers on the AC Power Panel. Then connect to shore power as described earlier in 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.

AC Circuit Breaker Panels

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

- AC Electrical System Circuit Breaker
- AC Power Panel

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 storage area next to the berth's headboard in the aft stateroom. This breaker controls AC power to all of the AC systems in the boat. Switch this breaker "ON" to provide power to the AC Power Panel.

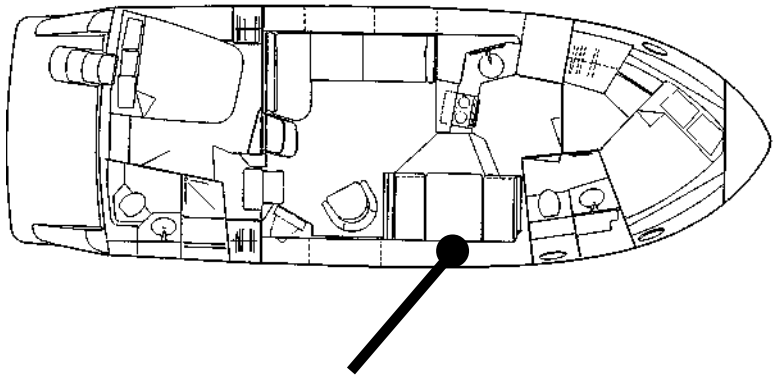
AC Power Panel

The AC Power Panel has a 30 amp MAIN breaker which protects the entire AC electrical system. A second MAIN breaker protects the circuits used by the optional air conditioning system.

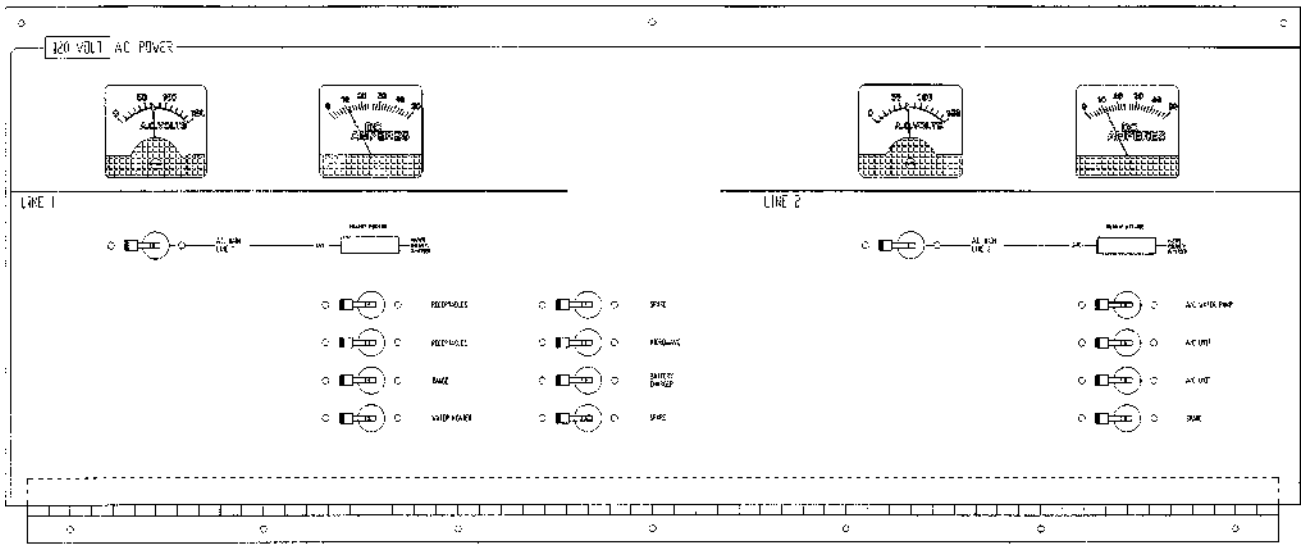
Line 1

The Line 1 30 amp circuit is standard on your boat. This circuit is powered by either a single 30 amp shore power cord or the boat's onboard generator.

The Line 1 circuit is configured as either 110 volts AC or 220 volts AC. 110 volt systems are used throughout North American and Pacific Rim countries. 220 volt systems are primarily used in European countries whose standard electrical system is based on 220 volt power.



SALON AC MAIN DISTRIBUTION PANEL



Line 2

If your boat is equipped with air conditioning, a second 30 amp circuit called Line 2 is installed to handle the extra current flow. The Line 2 circuit is composed of two 30 amp circuits, each powered by its own 30 amp shore power cord or by the boat's onboard generator. The Line 2 circuit is configured as either 110 volt or 220 volt.

Voltmeter

The voltmeter indicates the amount of electrical voltage that is entering your boat's AC system. There is a voltmeter each for Line 1 and Line 2.

When your is boat 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. If the voltage indicates a reading of 105 volts (205 volts in a 220 volt system) or less, DO NOT USE THE SYSTEM. If you experience a low voltage reading as described, contact the marina's management to locate the source of the problem.

If the voltmeter is reading zero voltage, it means that no current is getting to the AC Power Panel. Check your shore power cord to make sure it is properly attached to both the boat and the dockside electrical box. Also, make sure you have turned on the dockside electrical breaker.

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

Ammeter

The ammeter indicates the load (amount of current) that is being put on the boat's 30 amp electrical system. There is an ammeter each for Line 1 and Line 2.

When the MAIN breaker is "ON", all other breakers on the AC Power Panel are "OFF", and the voltmeter is reading between 110 and 120 volts (210 and 240 volts for a 220 volt system), the ammeter should read 0 amps.

As you switch the AC Power Panel breakers "ON" and turn on their associated equipment or turn on equipment plugged into the AC receptacles, the ammeter readings increase above 0 amps. Refer to **"Electrical Loads"** later in this section for information on the AC electrical system load limits.

AC Main Line 1

The AC Main Line 1 breaker controls the flow of electricity to all of the other circuit breakers on AC Line 1. To supply power to the other circuit breakers, switch the AC Main Line 1 breaker "ON". To cut the power supply to the other breakers, switch this breaker "OFF".

Receptacles

This breaker controls the flow of electricity to the receptacles along the port salon, galley and forward cabin. 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 in the forward, port corner 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

This breaker controls the flow of electricity to the receptacles in the forward head, dinette area, starboard salon, aft stateroom, aft head compartment and the exterior icemaker. Switch this breaker "ON" to supply power to these receptacles. Use the receptacles as you would the outlets in your home.

NOTE: *There are two GFCI receptacles for this group of receptacles. One is located in the forward head; the other is located in a locker below the aft stateroom TV. 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.*

Range

This breaker controls the flow of electricity to the galley's 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.*

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 beneath the dinette. Refer to the OEM information for details on operating the water heater.

Spare

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

Microwave

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

Battery Charger

This breaker controls the flow of electricity to the boat's 35 amp battery charger. When AC power is supplied to your boat, the battery charger automatically monitors and charges the boat's 12 volt batteries regardless of the

position of the battery selector switch on the Safety Breaker Panel. The battery charger is mounted between the propulsion engines in the aft, center portion of the engine room. 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.

AC Main Line 2

The AC Main Line 2 breaker controls the flow of electricity to all of the air conditioning circuit breakers on AC Line 2. To supply power to the air conditioning circuit breakers, switch the AC Main Line 2 breaker "ON". To cut the power supply to the air conditioning breakers, switch this breaker "OFF".

NOTE: *The air conditioning system uses water to operate. Before switching "ON" the A/C Water Pump breaker or either 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 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.

A/C Unit

This breaker controls the flow of electricity to the forward air conditioning unit beneath the dinette's forward-most seat. Before switching this breaker "ON" to supply power to the unit, switch the A/C Water Pump breaker "ON".

A/C Unit

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

Spare

This breaker is reserved for expanding the air conditioning system.

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.

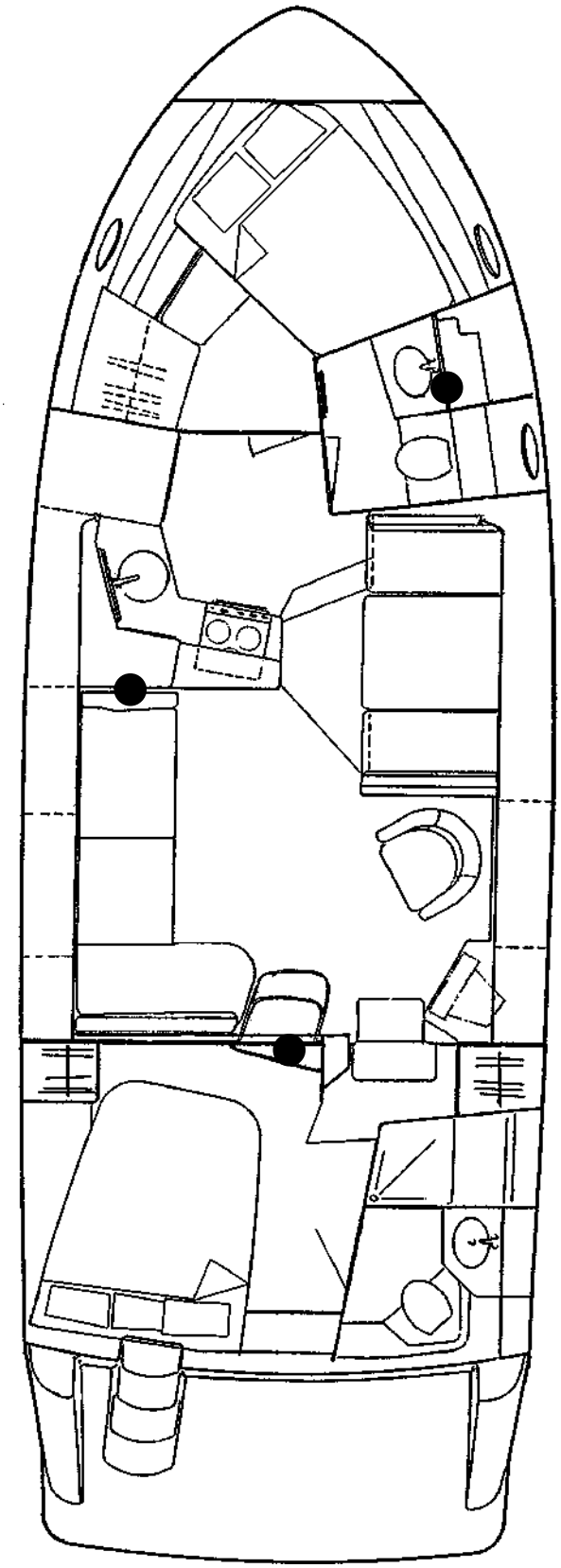
GFCI Receptacle Locations

Three GFCI receptacles are installed on your boat. One is located in the galley above the range and protects the receptacles in the port side salon and forward stateroom. Another GFCI receptacle is located in the forward head and protects the receptacles there, in the starboard salon and dinette, and in the aft head and stateroom. The third GFCI receptacle is located in a locker below the TV in the aft stateroom and protects the TV and aft deck icemaker.

Testing GFCI Receptacles

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

GFCI RECEPTACLE LOCATIONS



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 draws from the AC electrical system. The AC electrical system, like your house's electrical system, has a maximum total load that it can handle. The Line 1 and Line 2 (if installed) circuits each have an electrical load capacity of 30 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 drawing 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 draw 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 draws 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
Fry 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 and aft bilge compartments 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.

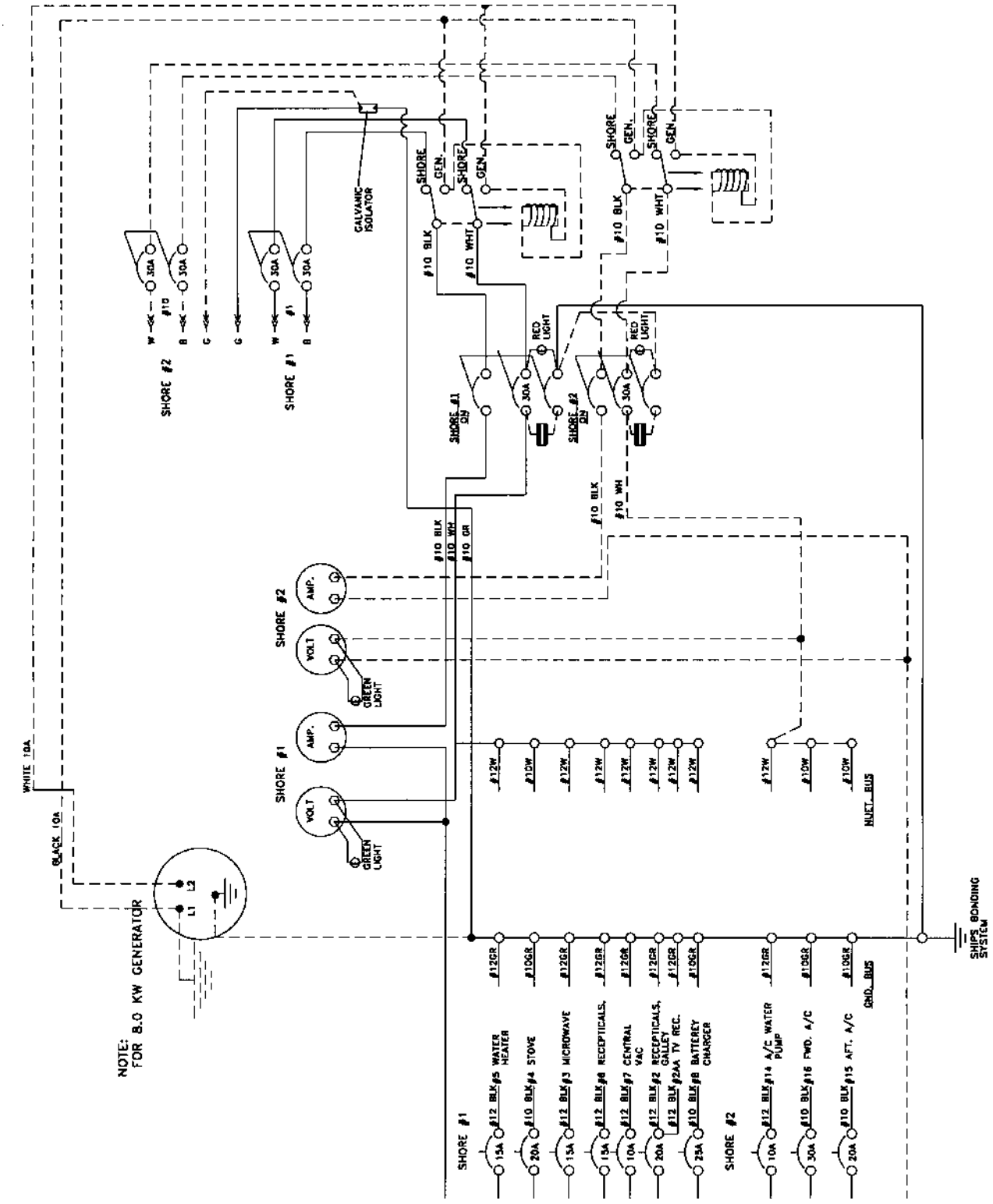
NOTE: *Damage resulting from stray current or galvanic corrosion is NOT covered under the Carver limited warranty.*

Troubleshooting the AC Electrical System

Problem	Possible Cause	Possible Solution
No AC power as indicated by voltmeter(s).	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 AC Main Line 1 and AC Main Line 2 breakers on the AC Power Panel are "OFF".	Switch the breakers "ON".
	A wire within the AC electrical system is loose or disconnected.	Contact a qualified electrician to make the appropriate repairs.
Cabin receptacles have no power.	The AC Main Line 1 and AC Main Line 2 breakers on the AC Power Panel are "OFF".	Switch the breakers "ON".
	The Receptacles breakers on the AC Power Panel 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.

Problem	Possible Cause	Possible Solution
The AC Main Line 1 or AC Main Line 2 breaker trips immediately after being reset.	The breaker failed.	Contact your Carver Dealer to have the breaker replaced.

AC Wiring Schematic



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Internal Systems

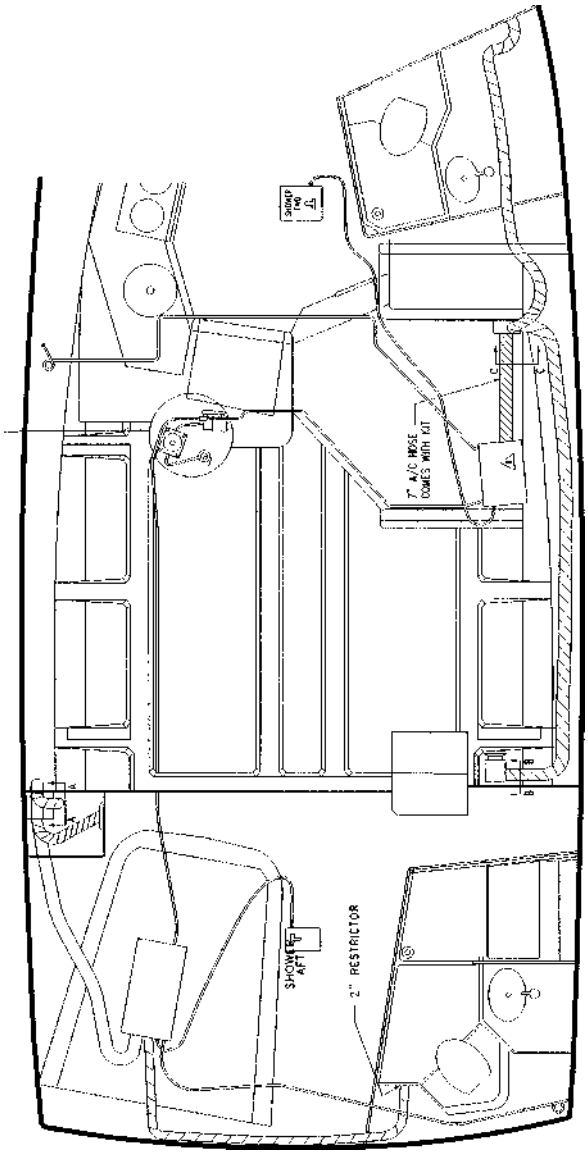
Air Conditioning System

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 optional onboard generator) and a supply of seawater (either salt or fresh).

The factory-installed air conditioning option consists of two air conditioning units. The first, a 16,000 BTU unit, is installed beneath the forward seat in the dinette.

AIR CONDITIONING SYSTEM LAYOUT



Condensation from this unit drains into the forward shower sump. The second, a 12,000 BTU unit, is installed beneath the aft cabin berth. Condensation from this unit drains into the aft shower sump.

NOTE: *Since the air conditioning condensation drains into the shower sump, the forward and aft Shower Sump circuit breakers on the Safety Breaker Panel must be "ON" whenever the air conditioning system is on.*

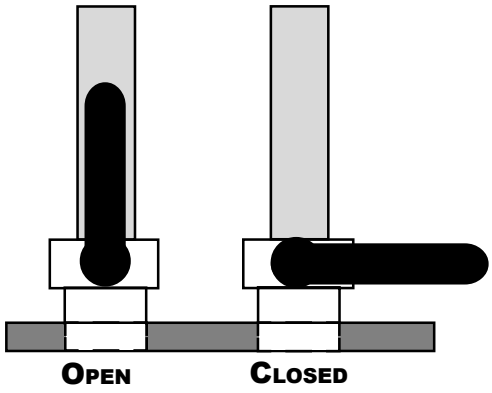
Producing Heat

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 seawater. As seawater 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 seawater temperature is below 40 degrees F.

Powering The Air Conditioning

1. Switch the AC Main Line 1 and AC Main Line 2 breakers on the AC Power Panel "OFF".

2. A single pump supplies both air conditioning units with seawater. Open the seacock that supplies seawater to the pump. The seacock is in the engine room forward the port engine.



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 AC Main Line 2 breaker on the AC Power Panel "ON".

6. Switch the A/C Water Pump breaker on the AC Power Panel "ON".

7. Switch both A/C Unit breakers on the AC Power Panel "ON". These breakers supply power to the controls for each air conditioning unit.

8. Verify that seawater is being pumped through the air conditioning units. As the seawater exits the units, it flows out of the discharge outlets in the boat's hull.

9. 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 fresh water system is approximately 81 gallons. The water is divided between a fresh water tank and an 11 gallon water heater. The water tank is located beneath the aft stateroom berth. The water heater is located beneath a hatch below the boat's dinette.

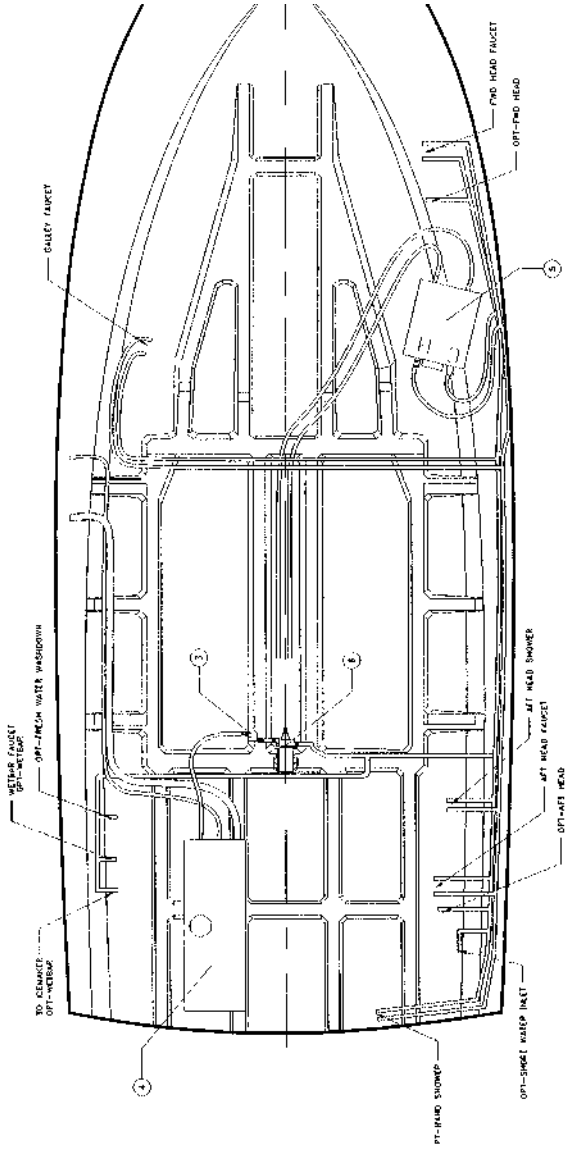
Filling The Water Tank

The fresh water tank is filled through a single deck fitting with a plate labeled "WATER". The plate is on the port 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 tank. Your tank is full when water is discharged from the water tank vent fitting installed through your boat's hull. DO NOT overfill your water tank OR leave a fill hose unattended while the tanks are being filled.

FRESH WATER SYSTEM



Pressurizing and Priming the Water System

Perform the following ONLY after the fresh water tank is full.

1. Verify that the forward and aft Shower Sump circuit breakers on the Safety Breaker Panel are "ON".

2. Partially open all cold water faucets, including the faucets for the optional transom shower and fresh water washdown.

3. Turn the battery selector switch on the Safety Breaker Panel to either the #1 or #2 position.

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.

4. On the 12 Volt DC Power Main Breaker Panel, switch the DC Main circuit breaker "ON", then switch the Pressure Water Pump circuit breaker "ON". This activates the boat's pressure water pump, which pressurizes the water system. The pump is located in the aft, center portion of the engine room between the propulsion engines.

5. The system is primed when all air is purged from the system's pipes. Monitor each faucet and shower head. When a steady steam 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 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 and 5 in **"Pressurizing and Priming the Water System"**.

Water Heating 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. 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, verify that the AC Main Line 1 circuit breaker on the AC Power Panel is "ON", then switch the Water Heater circuit breaker on the same panel "ON". 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.

Each shower's drain basin is positioned lower than the boat's water line. Because of this, a sump pump is needed for each shower to drain the basin and discharge the drain water overboard or into an optional grey water holding tank. When the forward and aft Shower Sump circuit breakers on the Safety Breaker Panel are "ON", each shower sump pump operates automatically when water in the shower's drain basin rises above a predetermined level.

NOTE: *The shower sump pumps can not operate if the forward and aft Shower Sump circuit breakers are "OFF". Make sure both circuit breakers are "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 starboard corner of the transom or cockpit.

A TIP FROM CARVER!

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

Fresh Water Washdown

The optional fresh water washdown enables you to use water from the fresh water tank 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 washdown:

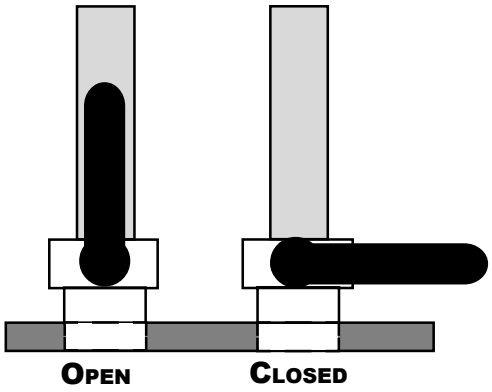
1. Locate the transom-mounted hose fitting and valve.
2. Attach one end of a nylon water hose to the hose fitting.
3. Attach a nozzle to the other end of the hose. The best type of nozzle to use is the “pistol grip” type that can be opened and closed by squeezing your hand.
4. Open the valve at the base of the hose fitting to supply water to the hose. Use the washdown as you would a garden hose at your home.

Raw Water Washdown

The optional raw water washdown enables you to use seawater to washdown and clean your boat.

To use the raw water washdown:

1. Locate the transom-mounted hose fitting in the transom's lower starboard corner.
2. Attach one end of a 3/4" nylon water hose to the hose fitting.
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.



5. Turn the battery selector switch on the Safety Breaker Panel to either the #1 or #2 position.

6. On the 12 Volt DC Power Main Breaker Panel, switch the DC Main circuit breaker "ON", then switch the Washdown Pump circuit breaker "ON".

7. Turn the washdown's ON/OFF switch, located near the washdown hose fitting, to the "ON" position.

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 seacock that supplies seawater 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 a 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

water tank. The shore water hose fitting is located in the starboard corner of the transom.

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

To connect to shore water:

1. Locate the shore water hookup fitting, labeled SHORE WATER, in the transom's lower starboard corner.

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 forward and aft Shower Sump circuit breakers on the Safety Breaker Panel are "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.

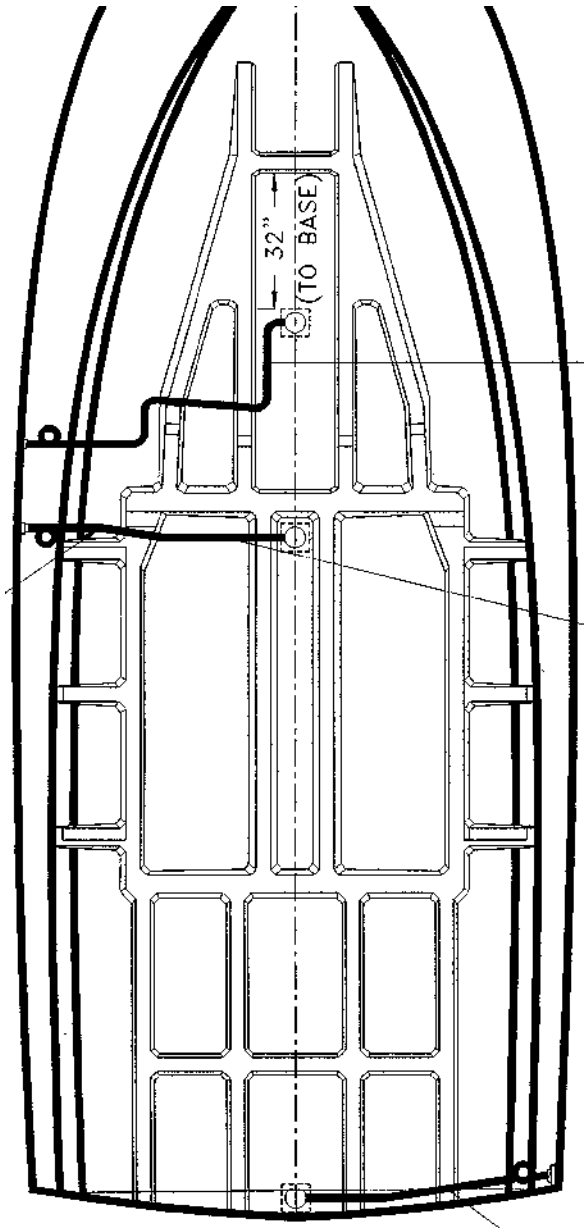
Bilge System

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 1500 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 galley and runs to the bow. Access the forward bilge pump by lifting the hatch beneath the center of the galley floor.

2. The amidships bilge starts at the base of the engine room's forward bulkhead and runs as far as the aft stateroom. The amidships bilge pump is located in the engine room forward the propulsion engines near the centerline. If your boat was built for use in Europe, there is also a hand bilge pump in the amidships bilge.

BILGE SYSTEM



3. The aft bilge starts beneath the aft stateroom floor and runs to the stern. Access the aft bilge pump by lifting the aft-most hatch in the aft stateroom floor. Refer to the **"Interior Hatch Locations"** portion of **Section 9** for more information on bilge pump access.

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

Bilge Pump Operation

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 Bridge 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. The pumps operate in automatic mode regardless of the

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.

position of the battery selector switch. 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. A set of bilge pump control switches have been installed at the bridge helm station to manually control the pumps. For manual operation, first make sure the Forward, Mid, and Aft Bilge Pump circuit breakers on the Bridge Breaker Panel are "ON". Then, at the helm station, turn the switches marked FWD, MID and AFT BILGE PUMP "ON".

⚠ 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.

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

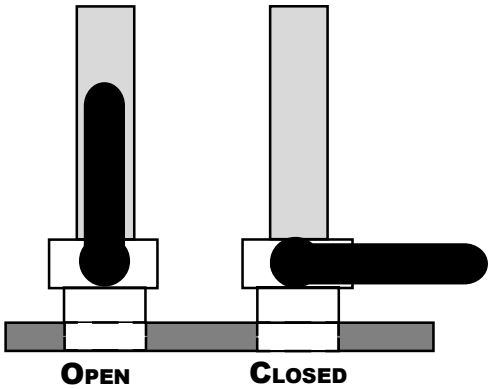
Your boat’s sanitation system includes the forward and aft heads, waste tanks, an optional overboard waste discharge system and an optional grey water system. When properly used, this system conforms to all United States antipollution laws.

Heads

The three types of heads available for your boat are described below. The manual head is standard. The manual and electric heads use either the boat's fresh water or seawater to flush. If you have guests who are unfamiliar with marine sanitation systems, instruct them on how to properly use the head.

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

Seawater heads: To flush a head that uses seawater, you must first open the seacocks for both heads. The forward head's seacock is located beneath a hatch in the galley floor. The aft head's seacock is located beneath the aft-most hatch in the aft stateroom floor.



Refer to the OEM information for details on operating the head.

Manual Head

The manual head is flushed by manually operating a foot pump.

Electric Head

The optional electric head is flushed with the aid of an electric motor. To operate the motor, first switch the Electric Head Forward and Electric Head Aft circuit breakers on the 12 Volt DC Power Main 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.

A TIP FROM CARVER!

If your boat will be left unattended for at least 48 hours, pump the foot lever in each head several times. For electric heads, flush 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.

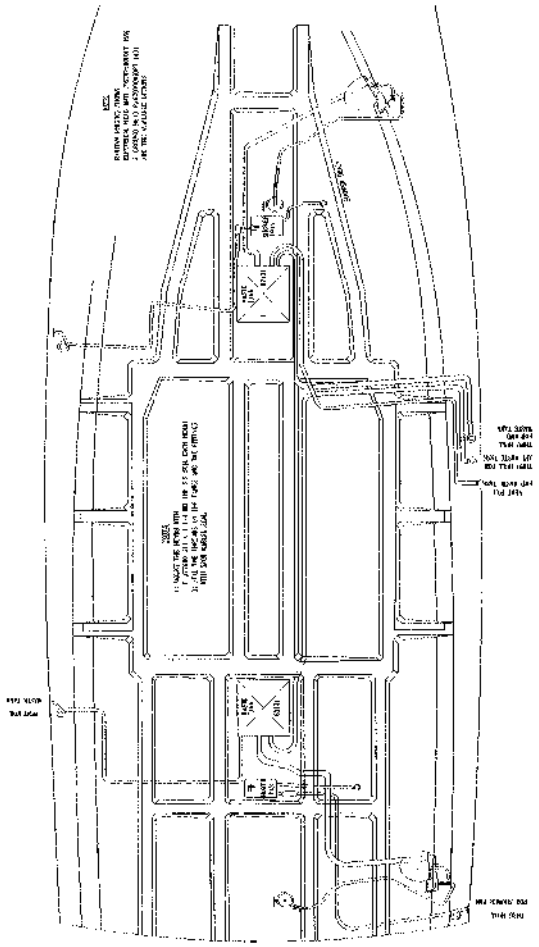
If seawater is used to flush the head, material suspended in the water (seaweed, aquatic organisms, etc.) can become trapped within the passages of the system and lead to bowl staining and odors. Contact your marine supply dealer to obtain an in-line deodorant dispenser that can minimize these problems.

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 Head Forward and Electric Head Aft circuit breakers on the 12 Volt DC Power Main 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.

STANDARD SANITATION SYSTEM



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 polyethylene waste tanks. The forward tank is located below the galley floor. The aft tank is located below the aft stateroom floor. The three systems that empty the waste tanks are described below. The dockside discharge system is standard.

Dockside Discharge

With the dockside discharge methods, 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:

1. Locate a dockside pumpout station.

2. Remove the forward 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 aft waste tank deck plate labeled "WASTE" using the cap removal tool supplied with

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.

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.

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.*

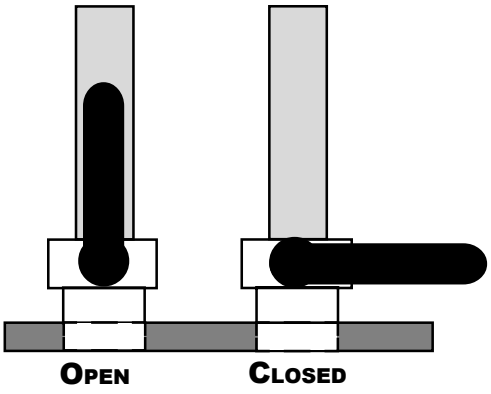
In certain coastal areas of the world it is legal to discharge waste into the sea. To accommodate this procedure Carver offers an optional overboard discharge system for your boat. This system is available only on boats that are exported or used in the coastal areas of the United States.

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.

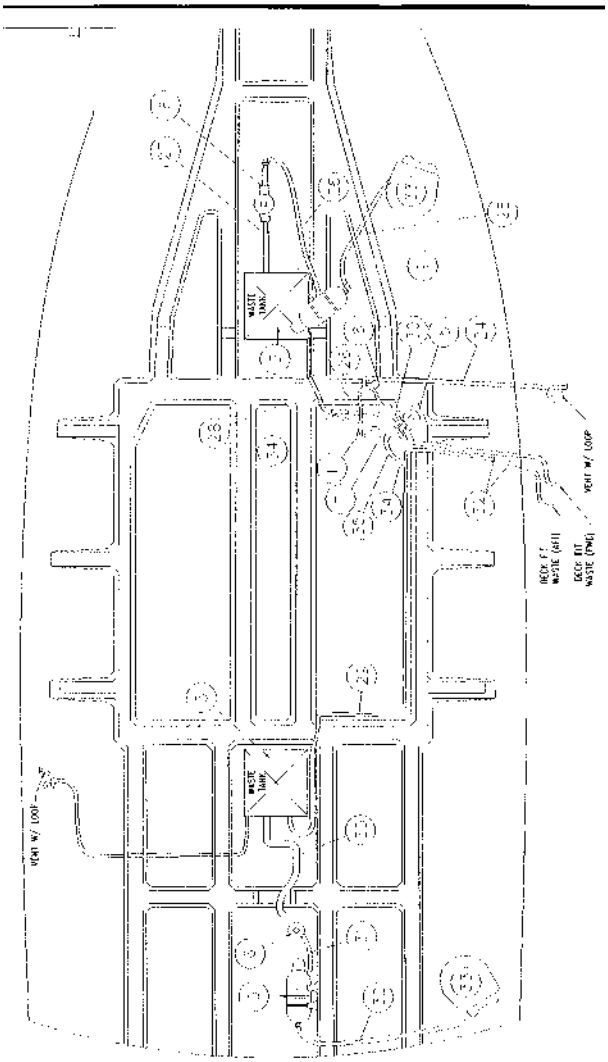
To empty the tanks:

1. Open the overboard discharge seacock located beneath a hatch below the dinette's aft cushion.

2. Locate the waste tank selector valve located beneath a hatch below the dinette's aft cushion. This valve allows you to select the forward or aft waste tank to pump overboard. Position the valve to select the forward waste tank.



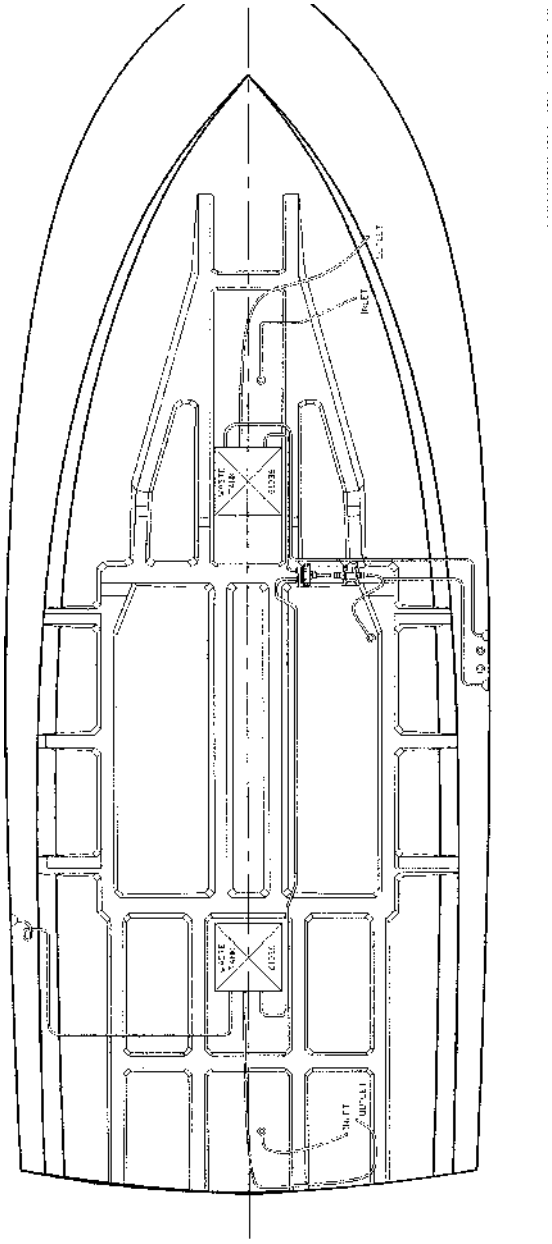
VACUUM HEAD SYSTEM
(OVERBOARD DISCHARGE)



3. On the 12 Volt DC Power Main Breaker Panel, switch the DC Main circuit breaker "ON", then switch the Waste Pump circuit breaker "ON".

4. Turn "ON" the waste pump ON/OFF switch located beneath a hatch below the dinette's aft cushion. This activates the waste pump, which pumps the waste overboard.

ELECTRIC HEAD SYSTEM
(OVERBOARD DISCHARGE)



⚠ WARNING

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

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

6. Remove the forward 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.

7. 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.

8. Replace the "WASTE" deck plate.

9. Position the waste tank selector valve to select the aft waste tank.

10. 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.

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

12. Remove the aft 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.

13. 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.

14. Replace the "WASTE" deck plate.

15. Switch the Waste Pump circuit breaker "OFF".

16. 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.

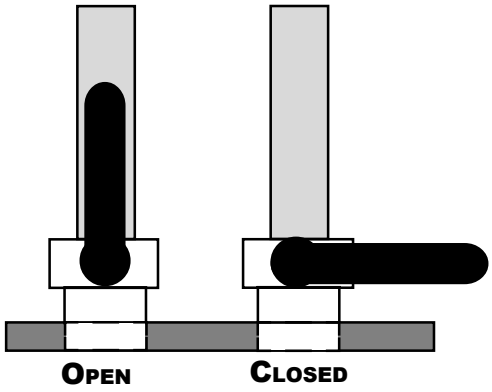
With the direct overboard discharge system, waste is flushed from the heads directly overboard. If overboard discharge is not legal where you are, you can flush the waste to waste tanks where it is stored. You can then either wait until you reach an area where overboard discharge is legal or use a dockside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

To flush waste directly overboard:

1. Open the direct overboard discharge seacock for the forward head. This seacock is located below the hatch in the galley floor.

2. Locate the valve that lets you bypass the forward waste tank and flush waste directly overboard. This valve is located below the hatch in the galley floor. Position the valve to "OVERBOARD".

3. Open the direct overboard discharge seacock for the aft head. This seacock is located below the aft hatch in the aft stateroom floor.



4. Locate the valve that lets you bypass the aft waste tank and flush waste directly overboard. This valve is also located below the aft hatch in the aft stateroom floor. Position the valve to “OVERBOARD”.

5. Flushing the head now transfers waste directly overboard.

To flush waste to the waste tanks:

1. Close the direct overboard discharge seacock for the forward head.

2. Locate the valve that lets you direct waste to the forward waste tank rather than flushing the waste directly overboard. Position the valve to “HOLDING TANK”.

3. Close the direct overboard discharge seacock for the aft head.

4. Locate the valve that lets you direct waste to the aft waste tank rather than flushing the waste directly overboard. Position the valve to “HOLDING TANK”.

5. Flushing the head now transfers waste to the waste tanks.

6. To empty the waste tanks, follow the steps in the **"Overboard Discharge"** portion of this section.

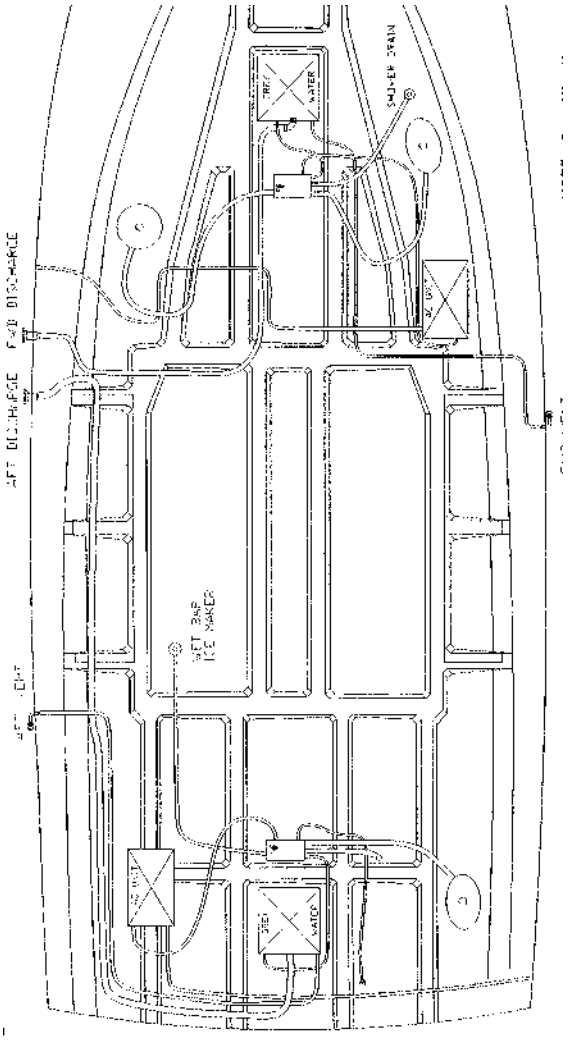
Grey Water System

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 sink and shower drain water, as well as condensation from the optional air conditioning system, drain into grey water waste tanks rather than flow directly overboard. The grey water initially drains into one of two sumps, where a sump pump transfers the water to the waste tank.

Use waste tank deodorizer inside the grey water waste tanks between pumpouts. The grey water waste tanks

GREY WATER SYSTEM



are emptied when you empty the toilet waste tanks. Refer to the **"Emptying the Waste Tanks"** portion of this section for more information.

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 LP Gas circuit breaker on the 12 Volt DC Power Main Breaker Panel "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

Your boat can be equipped with several types of inboard engine packages. The engines may be gas or diesel, fuel injected or carbureted. 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 Systems

Your boat's propulsion engines use either a gasoline or diesel fuel system. The major components used by each system are explained below.

Fuel Tanks

Your boat holds a maximum 316 gallons of fuel in three tanks. The two forward fuel tanks are positioned outboard each engine. The third, auxiliary fuel tank is installed below the cockpit floor and can be accessed by removing the engine room's aft bulkhead. 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.

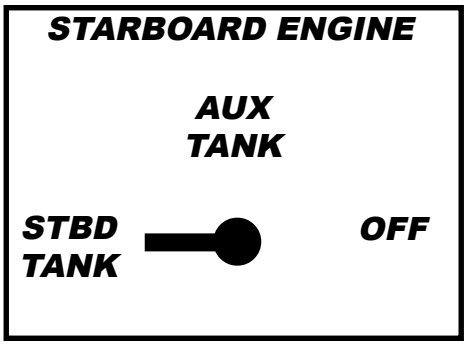
Gasoline Fuel Systems

Each gasoline propulsion engine in your boat is plumbed to the fuel tank located on the same side of the boat as the engine. Each engine can also draw fuel from the 120 gallon auxiliary fuel tank.

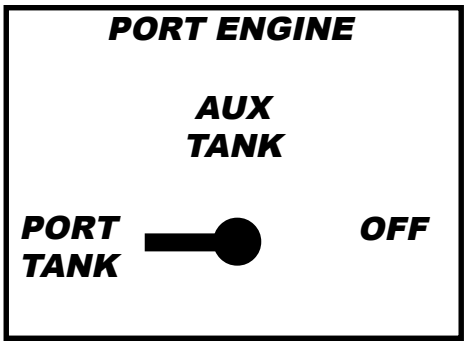
You can choose the fuel tank you wish each engine to draw fuel from using the fuel selector valves mounted forward the port engine. If your boat is equipped with the optional generator, the generator draws fuel only from the port fuel tank.

Anti-siphon check valves are installed in gasoline fuel systems between the fuel hose and the fuel tank withdrawal tube. Anti-siphon check valves are spring-loaded and automatically stop the flow of fuel in the case of a ruptured or disconnected fuel hose.

STARBOARD FUEL SELECTOR VALVE



PORT FUEL SELECTOR VALVE



⚠ DANGER

Never remove an anti-siphon check valve from the fuel system. The valves are important safety components. Clean or replace obstructed or sticking valves.

On electronically fuel-injected systems, fuel return lines have been installed. With electronic fuel-injected engines, the fuel selector valves select both the fuel feed and fuel return lines simultaneously. The fuel return lines return the fuel to the tank the fuel was drawn from, preventing the other tanks from overflowing.

NOTE: *Fuel return lines are not used with carbureted engines.*

Diesel Fuel Systems

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. If your boat is equipped with the optional generator, the generator draws fuel from the port fuel tank.

Fuel Transfer Pump

A fuel transfer pump is included with the diesel fuel system. Because the optional generator draws fuel only from the port fuel tank, the fuel levels in the tanks may become unequal. If this occurs, use the fuel transfer pump to pump fuel from one tank to the other until the fuel levels are equal.

NOTE: *You cannot transfer fuel from the auxiliary tank to the forward tanks, only between the port and starboard tanks.*

To transfer fuel between fuel tanks:

1. On the Bridge Breaker Panel, switch the Main circuit breaker "ON", then switch the Fuel Transfer Pump circuit breaker "ON".

2. Check the fuel gauges at the helm station. Identify the fuel tank that has the highest fuel level.

3. Turn the fuel transfer switch, located on the helm instrument panel, to the fuel tank to which you want the fuel to flow.

4. Monitor the fuel gauges as the fuel transfers. When the fuel levels in the tanks are equal, stop transferring fuel.

Fuel Shut-Off Valves

Fuel shut-off valves are included with the diesel fuel system. The 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 the diesel engine with the 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, for both gasoline and diesel fuel systems, is vented overboard. As the fuel tank is filled, air is displaced from inside the tank and escapes through the vent.

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 any fuel vapors from the engine room before you start the engines or generator.

⚠ DANGER

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

After fueling and before starting the engines or generator:

1. On the Bridge Breaker Panel, switch the Main circuit breaker "ON", then switch the two Bilge Blower circuit breakers "ON".

2. Turn "ON" the bilge blowers using the controls on the helm instrument panel. Allow the blowers to run for at least four minutes. Do not turn "OFF" the blowers yet.

3. Inspect the engine room. If you smell any fuel vapor, wait another four minutes so that the bilge blowers can remove the vapor. Repeat this step as many times as is necessary until the engine room is free of fuel vapor. Do not operate any onboard equipment until you are sure that the boat is free of fuel vapor.

4. Leave the blowers "ON" while operating the boat below cruise speed. The blowers help disperse excess heat in the engine room and also prevent the accumulation of CO which may occur under some operating conditions.

⚠ 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.

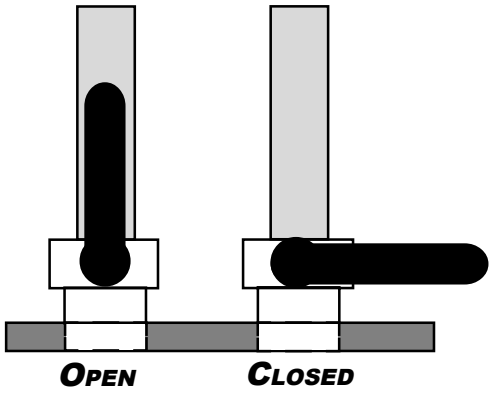
Cooling System

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 raw water 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 seawater 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 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 seawater 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 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 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 station 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.

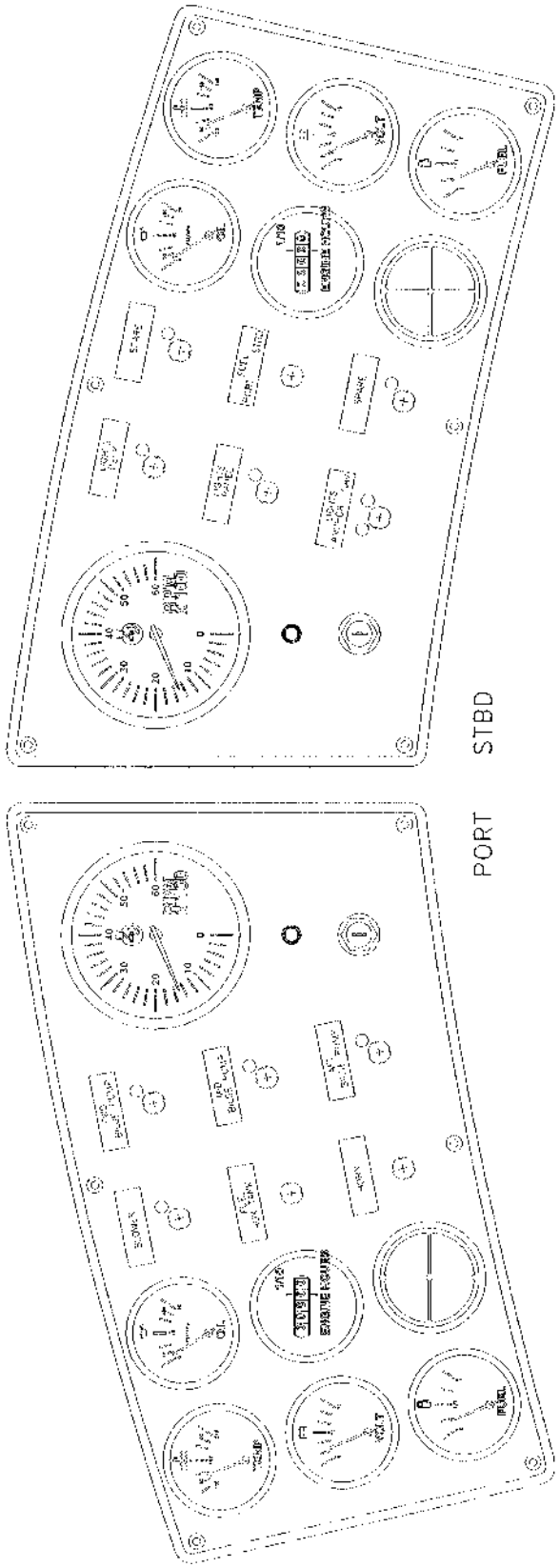
Tachometer

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.

HELM GAUGES



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.

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 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 boat's batteries. 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. The voltmeters are protected by circuit breakers located on the Safety Breaker Panel. Refer to the **"Voltmeters"**, **"Voltmeter - Battery One"** and **"Voltmeter - Battery Two"** portions 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

Shift and Throttle

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 Levers

Two shift levers allow you to shift the engines from neutral to forward or reverse. The shift levers are located on the port side of the steering wheel. The outboard lever controls the port engine and the inboard lever controls the starboard engine. The engines can be shifted independently to improve maneuverability in tight quarters.

⚠ WARNING

Do not shift into or out of gear while the engine speed (as indicated by the tachometers) is above IDLE. Doing so could result in serious damage to the engine's drive train.

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 lever. When properly adjusted, the safety switch does not permit you to start an engine while it is in gear.

Throttle Levers

Two throttles allow you to increase or decrease the speed of the engines. The throttles are located on the starboard side of the steering wheel. The inboard lever controls the port engine and the outboard lever controls the starboard engine. The levers are designed to allow independent control of each engine's speed.

⚠ WARNING

Before shifting an engine into or out of gear, always return its throttle to the extreme low speed position. Failure to follow this procedure could result in serious damage to the engine's drive train.

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 throttles so that the synchronizer gauge needle is centered.

NOTE: *Aligning the throttles 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.*

Throttle Synchronizer

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

Control Cables

Push-pull cables are used to connect the shift and throttle levers to the engines. Refer to the OEM information for details on adjusting and maintaining the shift and 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 the battery selector switch on the Safety Breaker Panel 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 that 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 battery selector switch on the Safety Breaker Panel to either the "1" or "2" position.

5. On the Bridge Breaker Panel, switch the Main circuit breaker "ON", then switch the Bilge Blower circuit breakers "ON".

⚠ DANGER

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

6. Turn "ON" the bilge blowers using the controls on the helm instrument panel. Allow the blowers to run for at least four minutes. Do not turn "OFF" the blowers yet.

7. Inspect the engine room. If you smell any fuel vapor, wait another four minutes so that the bilge blowers can remove the vapor. Repeat this step as many times as is necessary until the engine room is free of fuel vapor. Do not operate any onboard equipment until you are sure that the boat is free of fuel vapor.

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 the battery selector switch on the Safety Breaker Panel to either the "1" or "2" position.

5. On the Safety Breaker Panel, switch the Main Bridge and Salon circuit breakers "ON".

Switch "ON" any other circuit breakers for equipment you may need.

6. On the Bridge Breaker Panel, switch the Main circuit breaker "ON", then switch the Bilge Blower circuit breakers "ON".

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

7. Turn "ON" the bilge blowers using the controls on the helm instrument panel.

8. Check the output level of the bilge ventilator. You can feel air being blown from the output bilge vent if the bilge blower is operating properly.

9. 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.

10. Verify that you have an adequate supply of fresh water.

11. Check the level of waste in the waste tanks. Empty them if necessary. Refer to the **"Emptying the Waste Tanks"** portion of **Section 4**.

12. Disconnect and store the shore power cord and shore water hose.

Starting the Engines

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

1. Open the cooling system seacocks for both engines.

2. Move both shift levers to neutral.

3. 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.

4. Place one hand on the throttle 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 throttle lever slightly to keep it running.

5. 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.

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Operating and Maneuvering

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 guide. 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

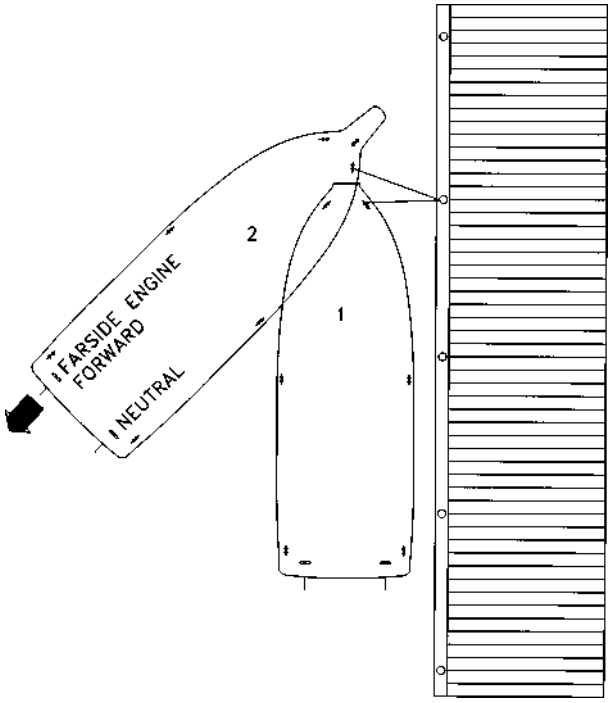
When you load items onto the boat, have someone on the pier hand them to you after you have boarded the boat. Stow all items securely to prevent them from shifting when the boat is in motion. If your boat is loaded near capacity or if seas get rough, distribute the weight evenly and keep the load low. 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.

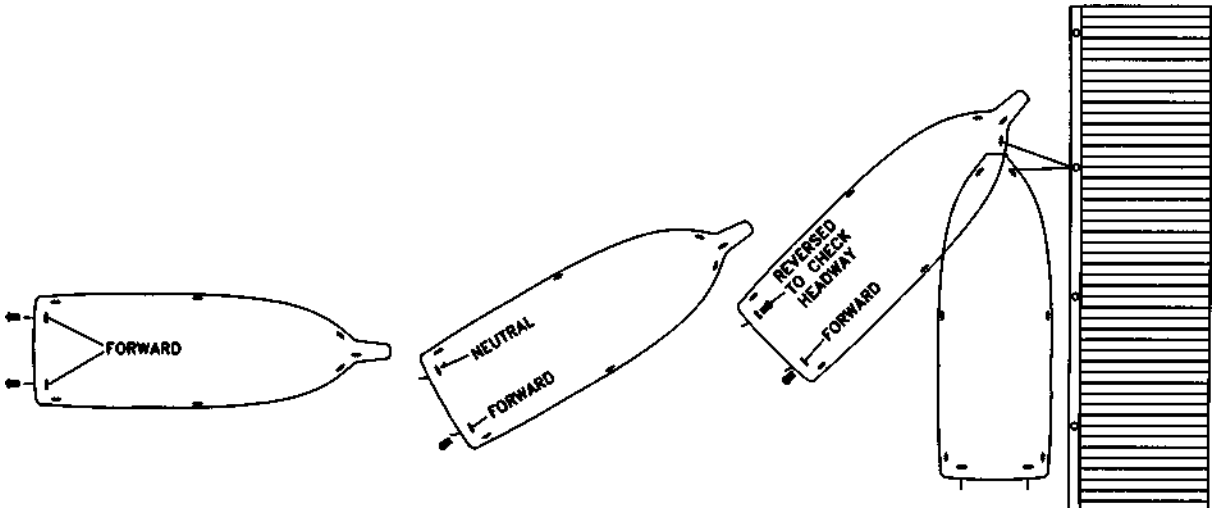


At marina anchorages, boats are often secured to a mooring buoy. Fouling your propeller with a mooring line is the principal hazard when leaving a mooring. If you use a dinghy to reach your boat, make sure the dinghy line does not foul the propeller.

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.

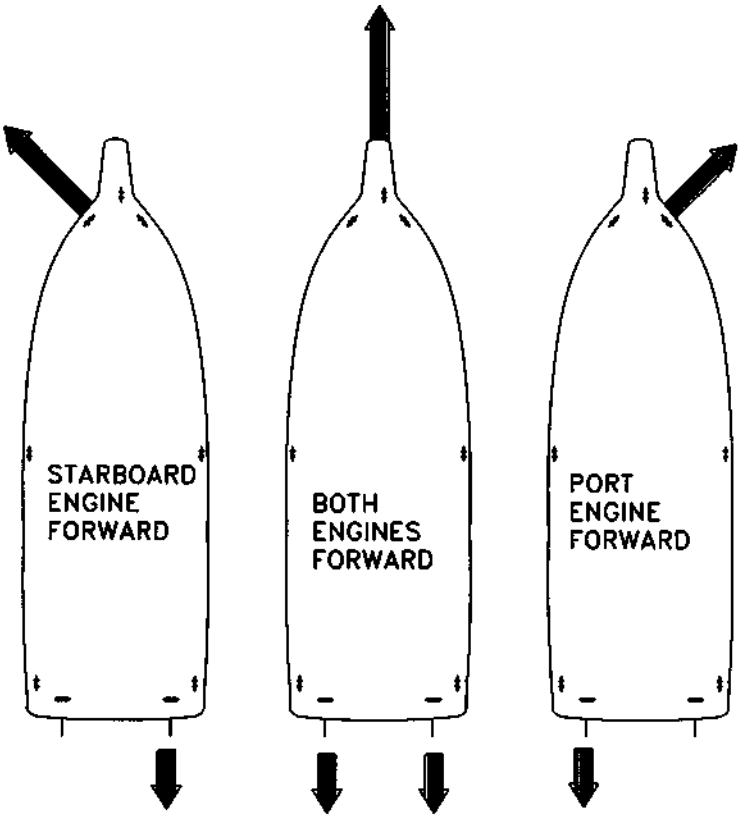


Picking Up a Mooring

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.

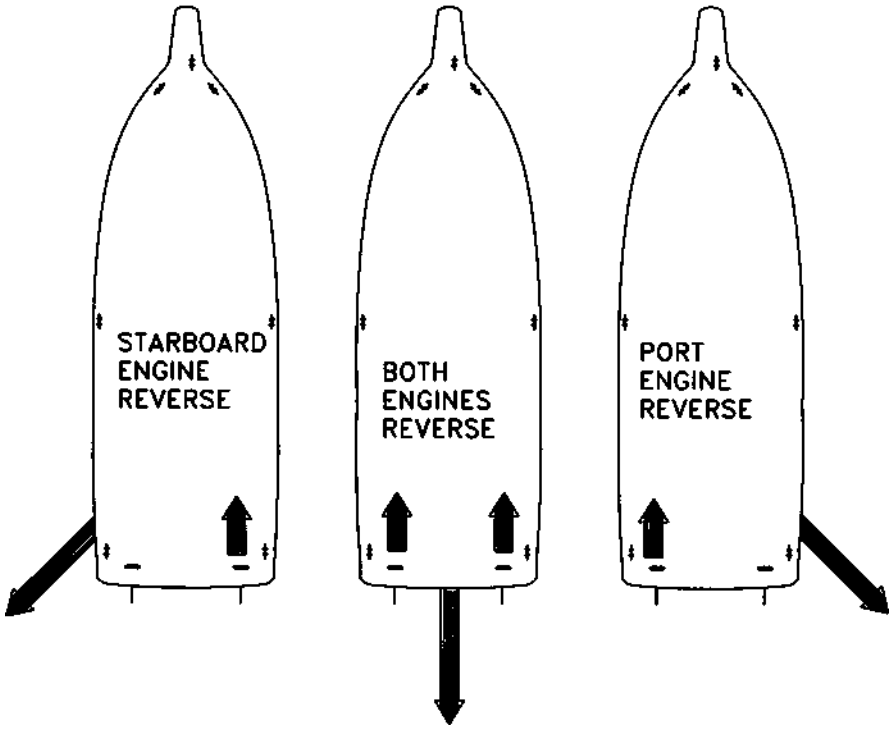
Shift the engines into neutral when you estimate that the boat's forward momentum will carry you to the buoy. Station someone at the bow with a boat hook to pick up the pennant float. If you are about to overshoot your mark, check headway as the bow comes up to the buoy. If you fall short, a few turns 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.

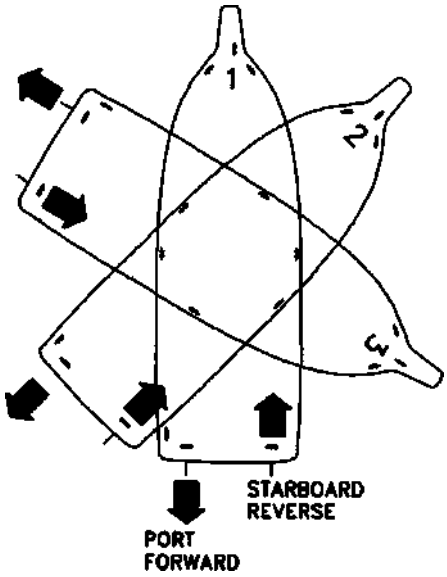
Checking Headway

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.

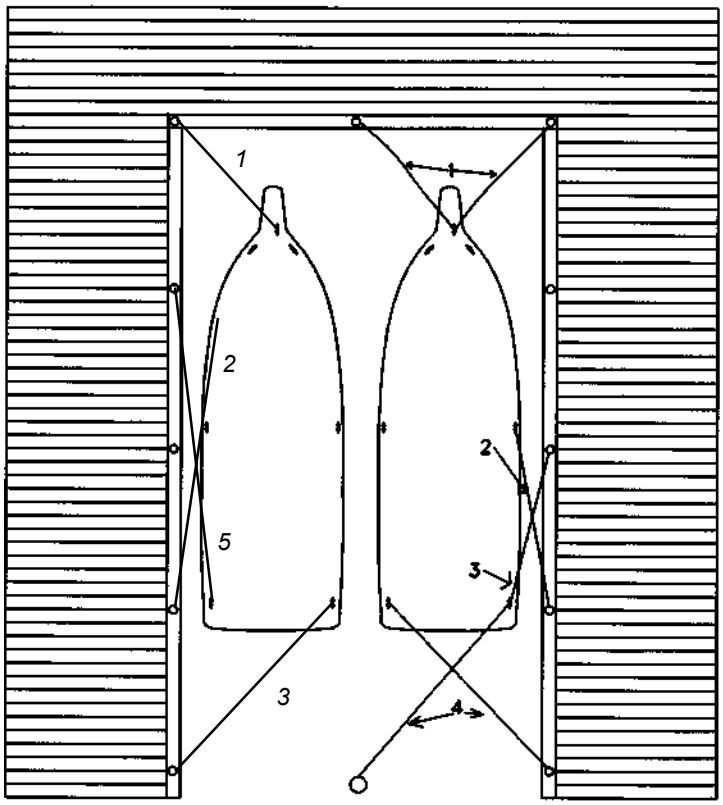
You may also need to anchors in a strong wind. If you drop your spare anchor, make sure the two anchors are laid out at an angle. If both anchors are set in-line and one of them drags, it may cut a trough for the other anchor to follow.

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 Bridge Breaker Panel "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 boats "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.

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Maintenance

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 the OEM information.

	Type A 48 hours after launching	Type B 25 engine hours after launching	Type C 6 months or 100 engine hours	Type D 12 months or 200 engine hours
ENGINES AND DRIVE SYSTEM				
Maintenance as outlined in the engine manual.	As recommended by manufacturer.	As recommended by manufacturer.	As recommended by manufacturer.	As recommended by manufacturer.
Inspect water intake hoses & connections.		X	X	X
Inspect exhaust system hoses & connections.	X	X	X	X
Inspect exhaust guard cover.				X
Check prop for balance & nicks				X
Check strut bearings				X
Check rudder alignment				X
Check all thru-hull fittings				X
Inspect shaft log packing nut	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 halon bottle			X	X
CONTROL SYSTEM				
Throttle and shift adjustments		X		X
Test neutral safety switch				X
Lubricate cables and controls				X
STEERING SYSTEM				
Inspect linkage and connections		X		X
Inspect hydraulic fluid level	X	X	X	X
Inspect rudder packing nut	X	X	X	X
Inspect tiller tie bar linkage		X	X	X
Inspect trim tab reservoir		X	X	X

	Type A 48 hours after launching	Type B 25 engine hours after launching	Type C 6 months or 100 engine hours	Type D 12 months or 200 engine hours
ELECTRICAL SYSTEM				
Inspect and clean batteries			X	X
Check battery fluid levels		X	X	X
Check operation of all 12 volt equipment	X	X	X	X
Check operation of all AC equipment		X	X	X
Inspect shore power cord			X	X
Inspect generator water intake and discharge		X	X	X
Inspect zincs			X	X
Generator maintenance	As recommended by manufacturer.	As recommended by manufacturer.	As recommended by manufacturer.	As recommended by manufacturer.
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
Check propane system for leaks		X	X	X
Inspect propane storage system			X	X
FRESH WATER SYSTEM				
Flush water tank and system			X	X
Clean in-line water filter			X	X
FIBERGLASS / WOODWORK				
Clean fiberglass				X
Wax hull & all non-tread areas				X
Repair chipped fiberglass			X	X
Clean interior woodwork				X

	Type A 48 hours after launching	Type B 25 engine hours after launching	Type C 6 months or 100 engine hours	Type D 12 months or 200 engine hours
INTERIOR				
Head maintenance	As recommended by manufacturer.	As recommended by manufacturer.	As recommended by manufacturer.	As recommended by manufacturer.
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 & wall coverings				X
Spot clean woven fabrics				X
Spot clean carpet				X
EXTERIOR				
Check compass for magnetic diviation				X
Check trim tab system for leaks		X		X
Check deck hardware tightness & caulking				X
Clean vinyl upholstery			X	X
Clean plexiglass surfaces				X
Lubricate hinges, latches & locks			X	X
Wash weather covers				X
BILGE SYSTEM				
Check garboard drain plug	X	X		X
Check and test bilge pumps	X	X	X	X
Inspect shower sump pump			X	X
Check & test bilge blower	Each time before starting engine	Each time before starting engine	Each time before starting engine	Each time before starting engine

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. Alway remove stains immediately.

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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 lemon oil and a soft rag. Avoid using wax-based furniture polish.

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 MOHAWK POUR-N-WIPE FINISH #603-3017. This is an industrial/commercial grade finish that is not commonly found at local paint and hardware stores. You can order MOHAWK POUR-N-WIPE (Carver part number 81069-00) through your Carver Dealer. Follow the manufacturer's instructions on the product package when applying this product to your wood surfaces.

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. Lendow 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.

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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 optional generator. There is an in-line seawater 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 seawater 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 charger (the controls are on the Safety Breaker Panel) 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 charger can overcharge the batteries because, when it determines the batteries are fully charged, it does not shut off but switches 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.

Shower Sump

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

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 **"Fill Plate/ Pumpout Locations"** 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

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.

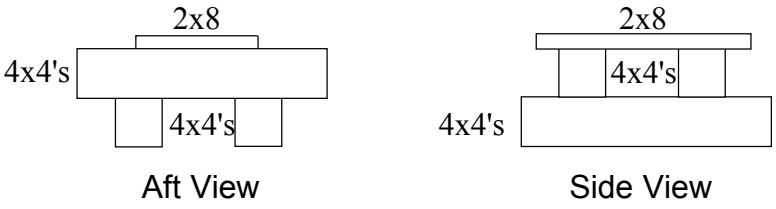
Blocking

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.

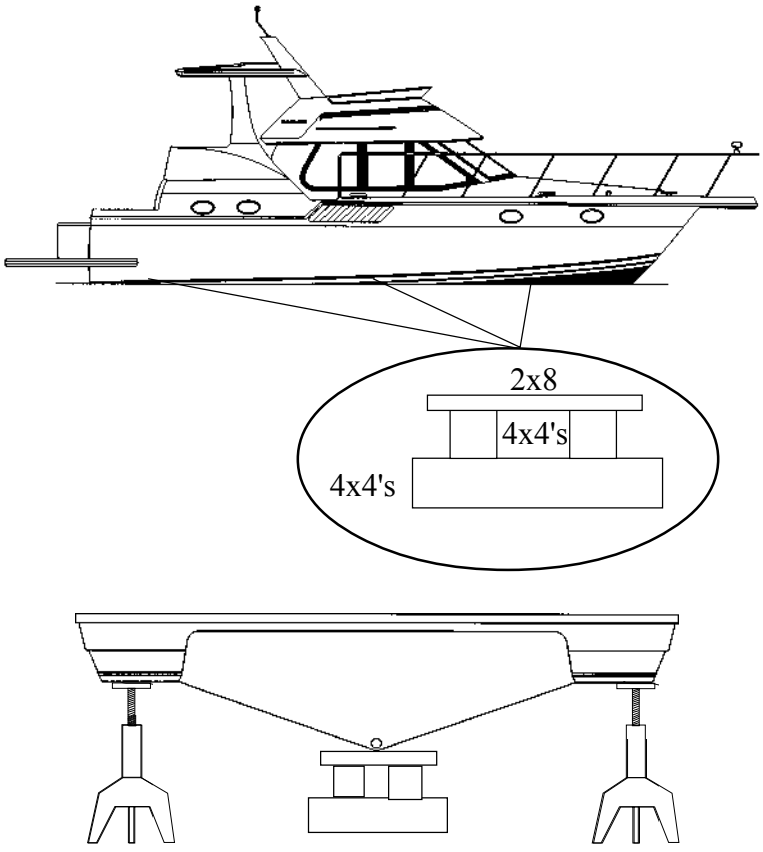
If you wish to build your own blocking supports, you need the following items to make each support.

- 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 AC Power Panel "OFF". Carver recommends taping the breaker in the "OFF" position until the water system is filled and primed after spring recommissioning.

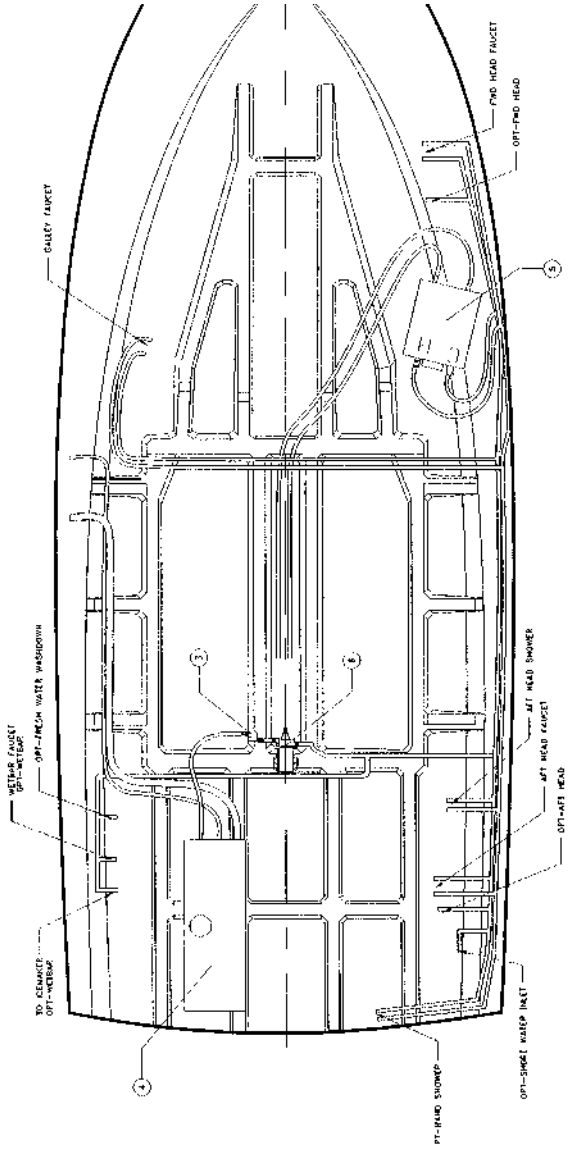
DANGER

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 12 Volt DC Power Main Breaker Panel "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 15 gallons of nontoxic recreational vehicle antifreeze.

2. Pour the nontoxic antifreeze into your boat's fresh water tank. The fresh water tank is filled through a single deck fitting with a plate labeled "WATER". The plate is on the port 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 12 Volt DC Power Main Breaker Panel "ON".

5. Switch the Forward and Aft Shower Sump circuit breakers on the 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 fresh water washdown faucets.

   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 fresh water washdown:

   a. Remove the hose and nozzle from the fresh water washdown fitting.

b. Place a bucket under the washdown fitting to catch the antifreeze, which can be reused.

c. Open the washdown faucet. When a steady stream of antifreeze flows from it, close the faucet.

7. Pour one or two quarts of nontoxic antifreeze into each shower drain until the shower sump pumps turn ON.

8. Pour a quart of nontoxic antifreeze into each sink drain.

9. Winterize the engine heat exchanger system. When the boat's engines are running, this system, rather than the electric water heater, heats fresh water to provide hot water.

   a. Locate the 5/8" heater hose that runs from the port engine to the water heater and back to the engine.

   b. Disconnect the heater hose in both places where it connects to the engine.

   c. Drain all water from the hose.

   d. Pour antifreeze into the hose.

Preparing the System for Use Again

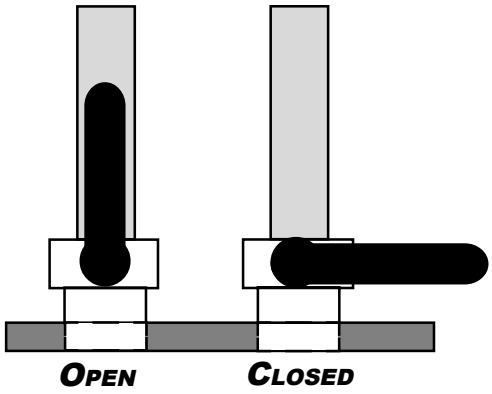
When you remove your boat from storage and prepare to use it again, flush the entire fresh water system with fresh water. Nontoxic antifreeze is colored, so the water system is adequately flushed when uncolored water flows from all of the faucets and shower heads.

Raw Water Washdown

Before performing this procedure on the optional raw water washdown, your boat should be pulled from the water.

1. Locate and close the thru-hull valve that supplies the raw water washdown pump with seawater.

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 from the transom-mounted washdown fitting.

5. Place a bucket under the washdown fitting.

6. Switch the Washdown Pump circuit breaker on the 12 Volt DC Power Main Breaker Panel "ON".

7. When a steady stream of antifreeze flows from the washdown fitting, switch the Washdown Pump circuit breaker "OFF".

8. Reconnect the hose to the washdown fitting.

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.

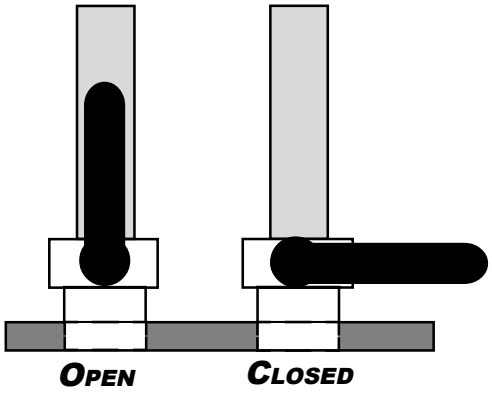
There are three types of sanitation systems: the standard system, the overboard discharge system and the direct overboard discharge system.

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.

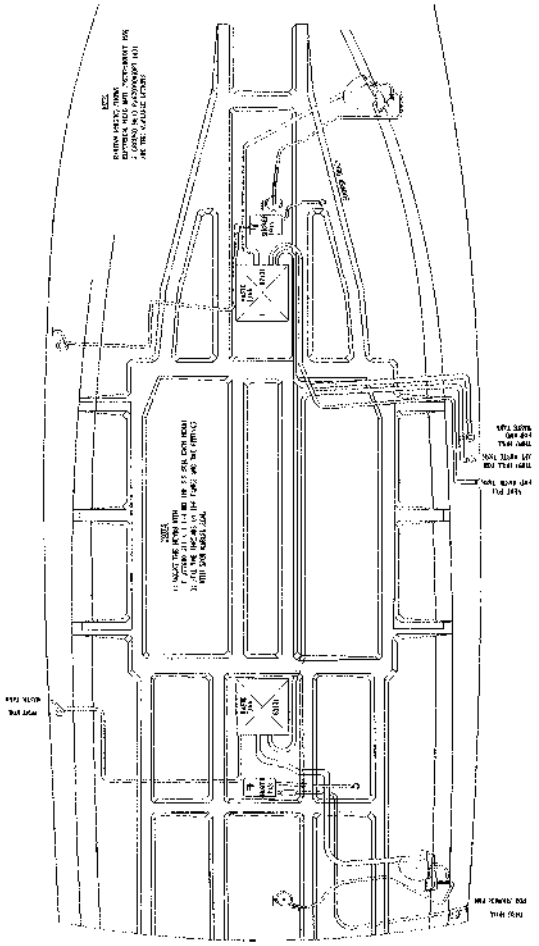


   b. Disconnect the seawater pickup hoses from the seacocks.

   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.

STANDARD 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.

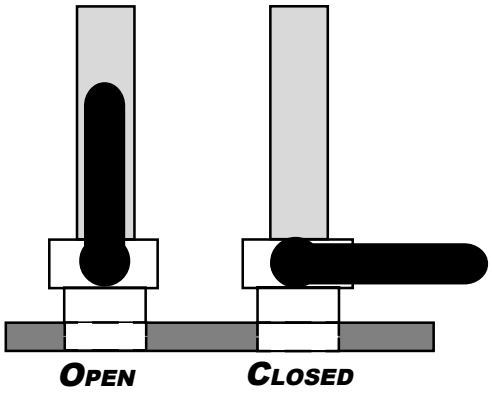
   d. Charge the waste tanks by adding deodorizer. Use the brand of deodorizer recommended by your Carver Dealer.

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:

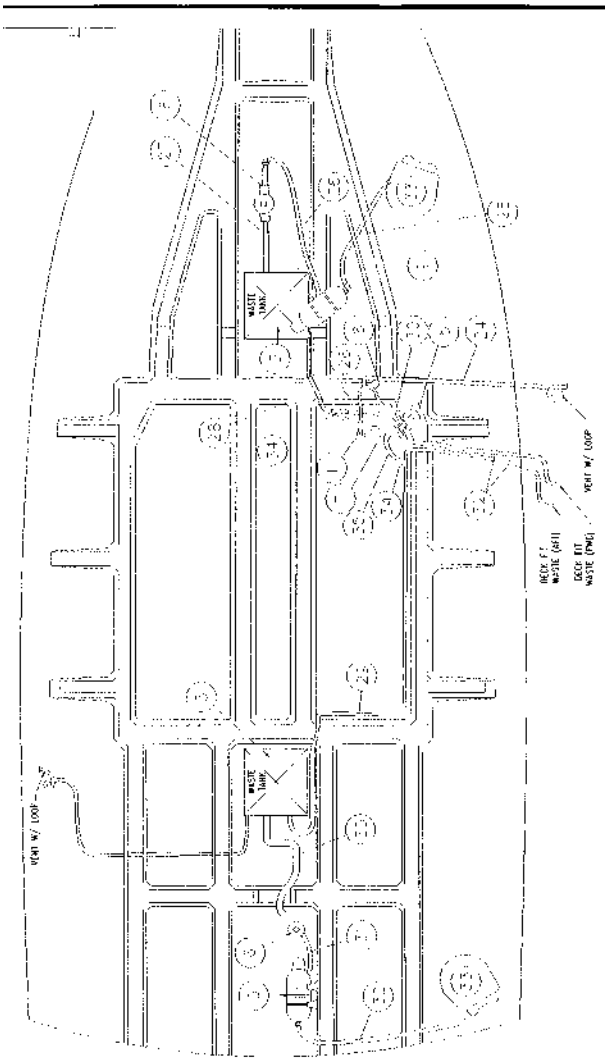
   a. Close the seawater seacocks.



   b. Disconnect the seawater pickup hoses from the seacocks.

   c. Flush the heads until all water is drained from the seawater pickup hoses.

VACUUM HEAD SYSTEM
(OVERBOARD DISCHARGE)



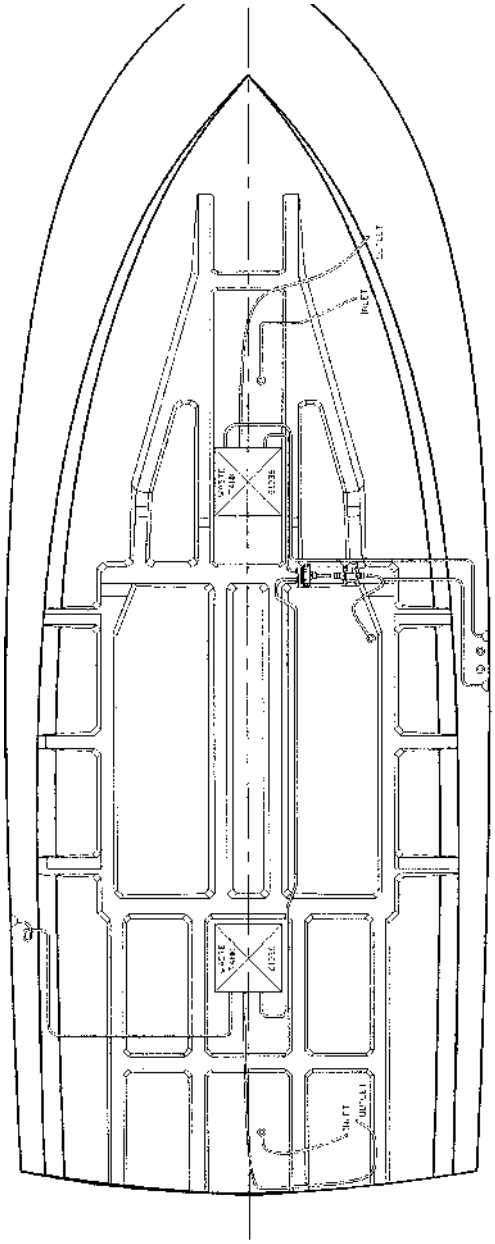
d. Reconnect the seawater pickup hoses to the seacocks. Leave the seacocks closed.

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 beneath a hatch below the dinette's aft cushion.

⚠ WARNING

You must use an approved antifreeze in your boat's sanitation system. Refer to the SeaLand Technical

ELECTRIC HEAD SYSTEM
(OVERBOARD DISCHARGE)



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 located beneath a hatch below the dinette's aft cushion. This valve allows you to select the forward or aft waste tank to pump overboard. Position the valve to select the forward waste tank.

6. Flush 10 gallons of antifreeze through the forward head.

7. Open the overboard discharge seacock located beneath a hatch below the dinette's aft cushion.

8. On the 12 Volt DC Power Main Breaker Panel, switch the DC Main circuit breaker "ON", then switch the Waste Pump circuit breaker "ON".

9. Turn "ON" the waste pump ON/OFF switch located beneath a hatch below the dinette's aft cushion. 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 aft waste tank.

12. Flush 10 gallons of antifreeze through the aft 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.

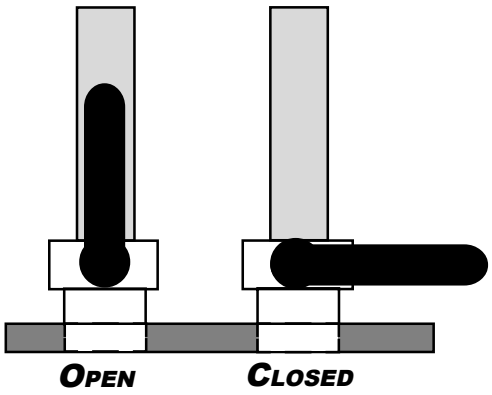
17. When you remove your boat from storage and prepare to use it again, flush and pump the waste tanks to remove the antifreeze.

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. This fitting is located beneath a hatch below the dinette's aft cushion.

⚠ 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 located beneath a hatch below the dinette's aft cushion. This valve allows you to select the forward or aft waste

tank to pump overboard. Position the valve to select the forward waste tank.

6. Locate the forward head overboard discharge selector valve located below the hatch in the galley floor. 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 forward head.

8. Open the overboard discharge seacock located beneath a hatch below the dinette's aft cushion.

9. On the 12 Volt DC Power Main Breaker Panel, switch the DC Main circuit breaker "ON", then switch the Waste Pump circuit breaker "ON".

10. Turn "ON" the waste pump ON/OFF switch located beneath a hatch below the dinette's aft cushion. 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 aft waste tank.

13. Locate the aft head overboard discharge selector valve located below the aft hatch in the aft state-room floor. 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 aft 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 aft head overboard discharge selector valve to "OVERBOARD".

20. Below the boat, place a large bucket beneath the aft overboard discharge fitting to collect antifreeze pumped out later in this procedure. This fitting is located beneath the aft hatch in the aft stateroom floor.

21. Flush 5 gallons of antifreeze through the aft head. Continue flushing the head until a steady stream of antifreeze flows from the overboard discharge fitting.

22. Close the aft overboard discharge fitting.

23. Position the forward 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. This fitting is located below the galley floor hatch.

25. Flush 5 gallons of antifreeze through the forward head. Continue flushing the head until a steady stream of antifreeze flows from the overboard discharge fitting.

26. Close the forward 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.

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 shows 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 TECHNOLOGY, INC. Technical Bulletin

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

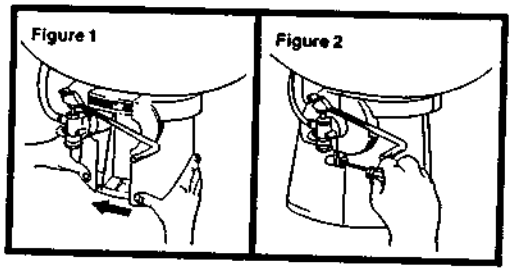
SeaLand Technology has endeavored to provide the boatowner with a toilet system which provides "at home" convenience and reliability. As with any quality product, satisfactory use depends on proper maintenance.

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

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 United States Coast Guard has established a universal system of numerically identifying vessels by using a hull identification number (HIN). This number consists of 12 alphanumeric characters and identifies the boat's make, model, hull number, and month and year of manufacture.

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 OEM of the system or component.

The OEMs used by Carver are listed below. When contacting an OEM for information, be ready to provide the component's serial number. A Serial Number Record Sheet is provided after the OEM list. Use this sheet as a convenient location to record the serial numbers for your boat's OEM components.

Engines

Mercury Marine
3003 N. Perkins Road
Stillwater, OK 74074
(405) 743-6566

Thermo-Electron/Crusader Corporation
7100 E. 15 Mile Road
Sterling Heights, MI 48312
(810) 264-1200

Volvo Penta of North America
1300 Volvo Penta Drive
Chesapeake, VA 23320
(804) 436-5100
Fax (804) 436-5313

Cummins Engine Company
875 Lawrence Drive
DePere, WI 54115
(414) 337-1991

Caterpillar Tractor Company
Attn: Marine Customer Service
Engine Division
P.O. Box 610
Mossville, IL 61552-0610
1-800-447-4986

Fuel Filters

Racor Industries, Inc.
P.O. Box 3208
Modesto, CA 95353
(209) 521-7860

Drive Systems

Walters Machine Company
84-98 Cambridge Avenue
Jersey City, NJ 07307
(201) 656-5654

Velvet Drive Transmissions
200 Theadore Rice Blvd.
New Bedford, MA 02745
(508) 979-4800

ZF Industries
Attn: Marine Dept.
777 Hickory Hills Drive
Vernon Hills, IL 60061
(847) 634-3500

Generators

Kohler Generators / Kohler Company
444 Highland Drive
Kohler, WI 53044
(414) 565-3381

Onan Corporation
1350 73rd Avenue N.E.
Minneapolis, MN 55432
(612) 574-5000

Westerbeke Corporation
41 Ledin
Avon, MA 02322
(508) 588- 7700

Steering Systems

Hynautic Marine Systems
1579 Barber Rd.
Sarasota, FL 34240
(941) 379-0500

Teleflex Steering Systems
640 N. Lewis Road
Limerick, PA 19468
(610) 948-5100

Heads

SeaLand Technology, Inc.
P.O. Box 38
4th Street
Big Prairie, OH 44611
(216) 496-3211

Raritan Engineering Corporation
P.O. Box 1157
530 Orange Street
Millville, NJ 08332
(609) 825-4900

Water Heaters

SeaWard Products
3721 Capitol Drive
Whittier, CA 90601
(310) 699-7997

Air Conditioners

Marine Air Systems
2000 N. Andrews Avenue Extension
Pompano Beach, FL 33069
(954) 973-2477

Trim Tabs

Bennett Marine Inc.
550 N.W. 12th Avenue
Deerfield Beach, FL 33442
(305) 427-1350

Boat Leveler Company
7305 Natural Bridge
St. Louis, MO 63121
(314) 385-7470

Entertainment Equipment

JVC Service & Engineering Company of America - Div. of JCV Corporation
107 Little Falls Rd.
Fairfield, NJ 07004
1-800-537-5722
(110 volt stereo system)

Capitol Sales Co.
3110 Neil Armstrong Blvd.
Eagan, MN 55121
1-800-545-2672
(Quasar TV)

Marine Audio Sales
16137 Westwoods Business Park
Ellisville, MO 63021
(314) 394-2631
(12 volt Clarion AM/FM/CD stereo system)

Battery Chargers

Professional Mariner
2970 Seaborg Ave.
Ventura, CA 93003
(805) 644-1886

Guest Corporation
95 Research Parkway
Meridin, CT 06450
(203) 235-4421

Charles Marine Products
5600 Apollo Drive
Rolling Meadows, IL 60008
(708) 806-6300

Refrigerators and Ice Makers

Norcold Inc. (Division of Stolle Co.)
P.O. Box 4248
2655 Cambell Rd.
Sidney, OH 45365
1-800-543-1219

Nova Kool Mfg., Inc.
1457 Barrow St.
North Vancouver, B.C.
Canada V7JIB6
(604) 984-7794

Raritan Engineering Corporation
P.O. Box 1157
530 Orange Street
Millville, NJ 08332
(609) 825-4900

General Electric Company
Consumer Affairs Dept.
Appliance Park
Louisville, KY 40225
1-800-626-2000

Ranges and Microwaves

SeaWard Products
3721 Capitol Drive
Whittier, CA 90601
(310) 699-7997

Kenyon Marine
351 New Whitfield St.
Guilford, CT 06437
(203) 453-4374

Origo USA, Inc.
1121 Lewis Avenue
Sarasota, FL 34237
(941) 365-3660

Miscellaneous Accessories

Teleflex Marine, Inc.
1816 57th Street
Sarasota, FL 34243
(941) 355-7721
(Instruments)

Teleflex Marine
Mechanical Products
640 North Lewis Rd.
Limerick, PA 19468
(610) 948-5100
(Controls)

Teleflex of Canada LTD
3831 No. 6 Road
Richmond, British Columbia
Canada V6V 1P6
(604) 270-6899
(Steering)

VDO Yazaki Corporation
188 Brooke Road
Winchester, VA 22603
(540) 665-0100
(Gauges)

Guest Company, Inc.
95 Research Parkway
Meriden, CT 06450
(203) 235-4421
(Spot Lights)

Morse Controls - IMO
21 Clinton Street
Hudson, OH 44236
(216) 653-7701
(Controls, Throttle & Shift Cables)

ITT Jabsco
152 South West 8th St.
Miami, FL 33130
(7" and 8" Spotlights)

E.S. Ritchie & Sons Inc.
P.O. Box 548
243 Oak Street
Pembroke, MA 02359
(617) 826-5131
(Compass)

Alson Corporation
42 Union Street
Hillsdale, MI 49242
(517) 439-1411
(Shower Controls)

Maxwell Winches, Inc.
1610 Babcock St.
Costa Mesa, CA 92627
(714) 631-2634
(winches)

Sea-Fire
Division of Metalcraft, Inc.
9331-A Philadelphia Road
Baltimore, MD 21237
(410) 687-5500
(Halon System)

MTI Industries
Division of Marine Technologies, Inc.
1000 Brown Street
Suite 107
Wauconda, IL 60084
1-800-383-0269
(CO Detector)

Bomar, Inc.
South West Street
P.O. Box W
Charlestown, NH 03603
(603) 826-5791
(Hatches)

Aluminum 2000, Inc.
595 East Oregon Road
Lititz, PA 17543
(717) 569-2300
(Doors)

Serial Number Record Sheet

Specifications

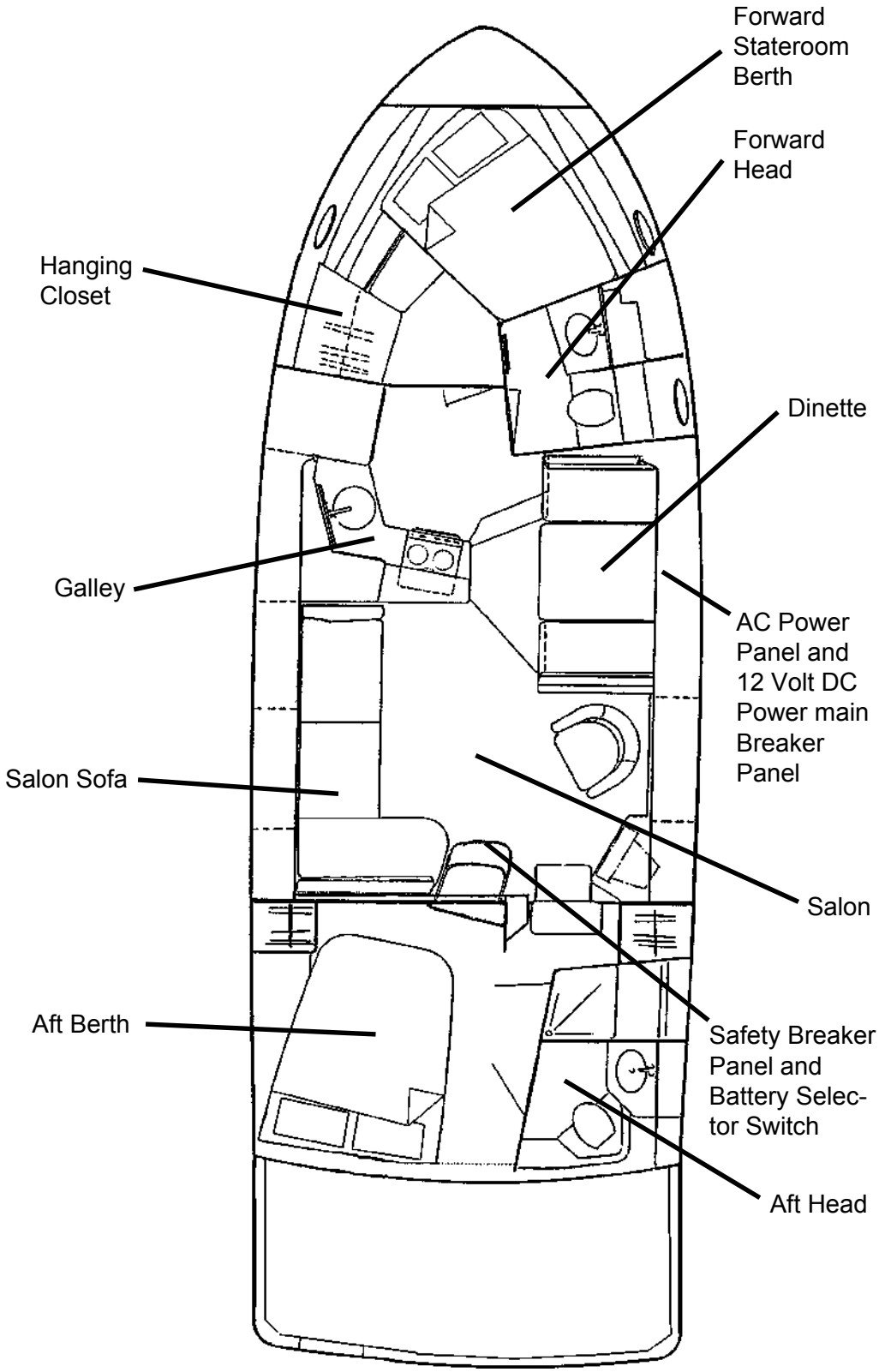
The specifications listed here are based on a standard model with no options installed. Certain options may change some of these specifications.

Length Overall (LOA) with boarding platform	43’5" / 13,23 m
Beam	13’3" / 4,04 m
Bridge Clearance (waterline to arch)	17’6" / 5,33 m
Draft	39" / 0,99 m
Weight (estimated, with fuel and water):	21,000 lbs / 9525,60 kg
Water	81 U.S. gal / 306,61 l
Hot Water	11 gal. / 41,64 liters
Waste	36 U.S. gal / 136,27 l
Fuel	318 gal. / 1203,76 liters

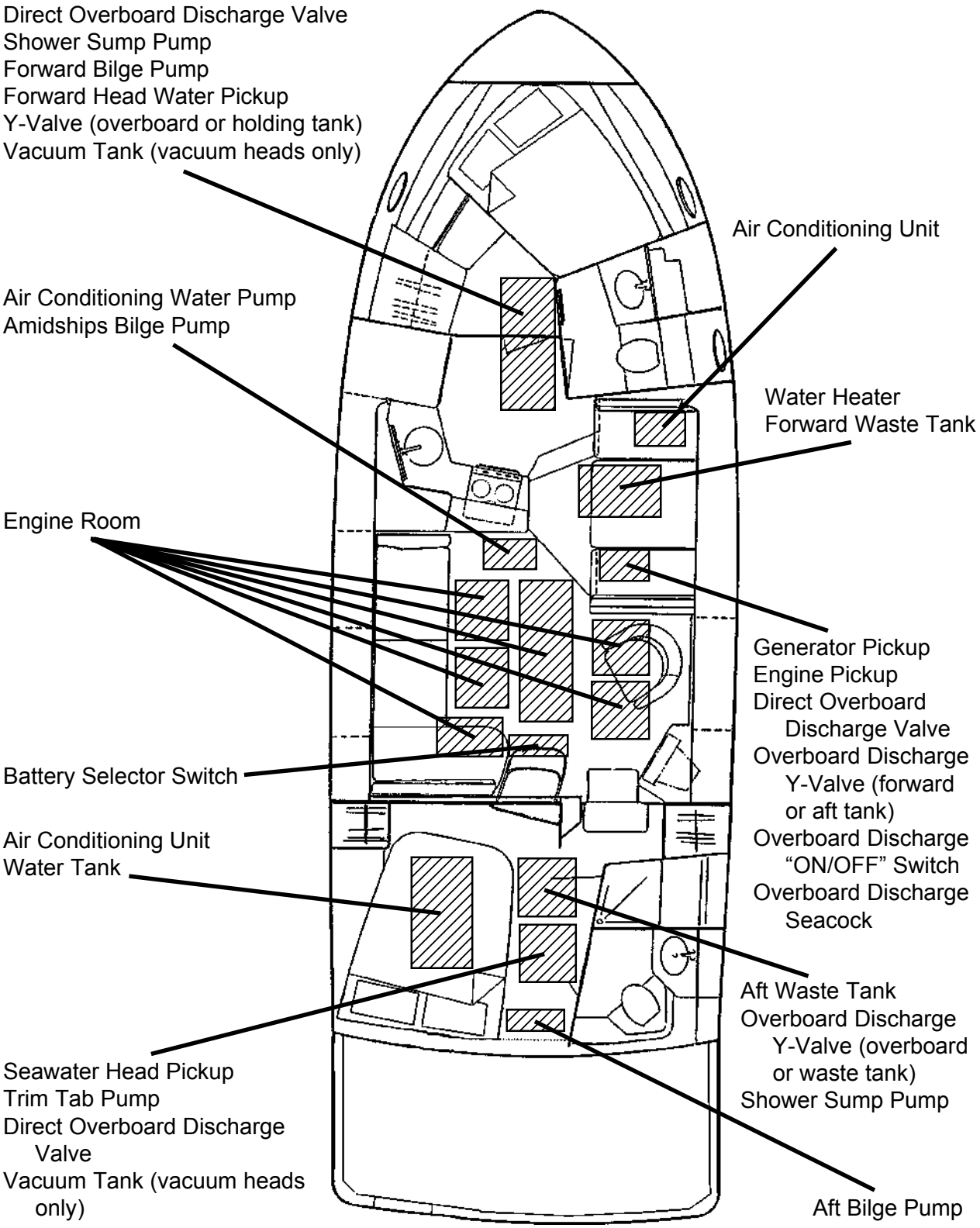
Component Locations

The illustrations on the following pages show the locations of various components, deck plates, and thru-hull fittings discussed throughout this guide.

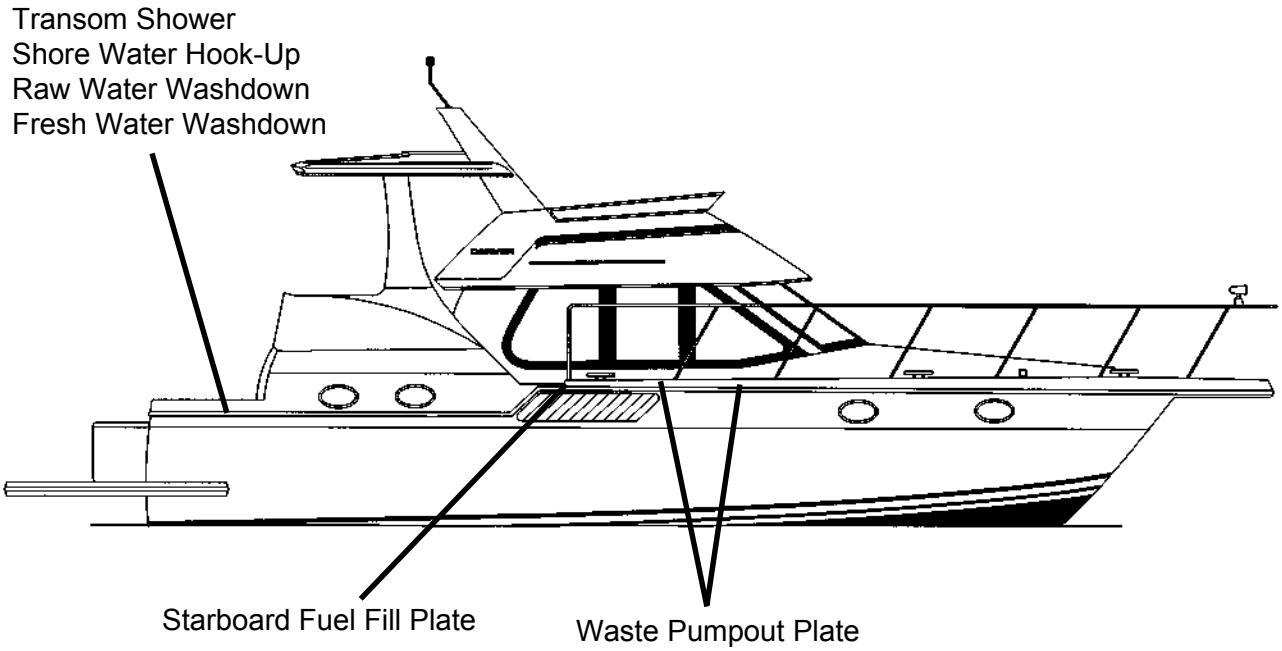
Interior/Cabin Layout

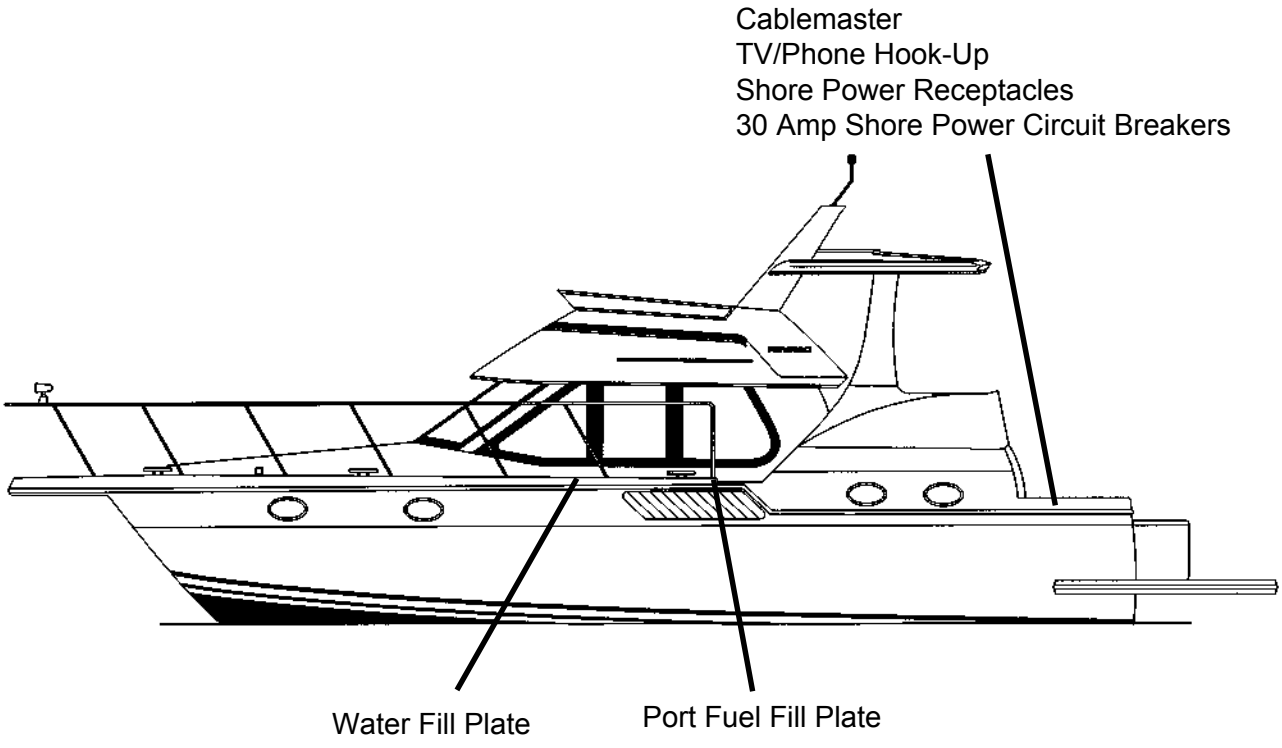


Interior Hatch Locations

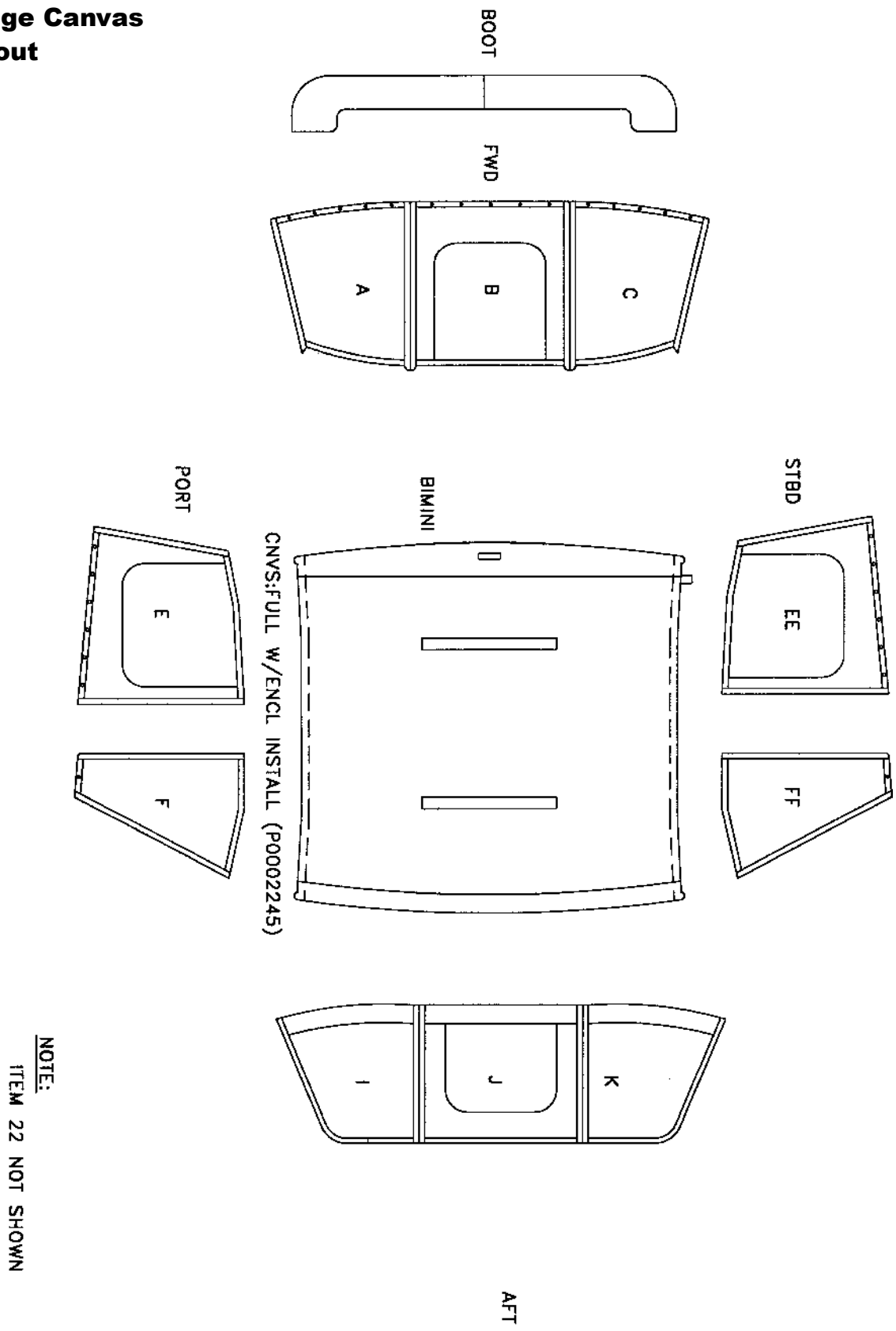


Fill Plate/Pumpout Locations

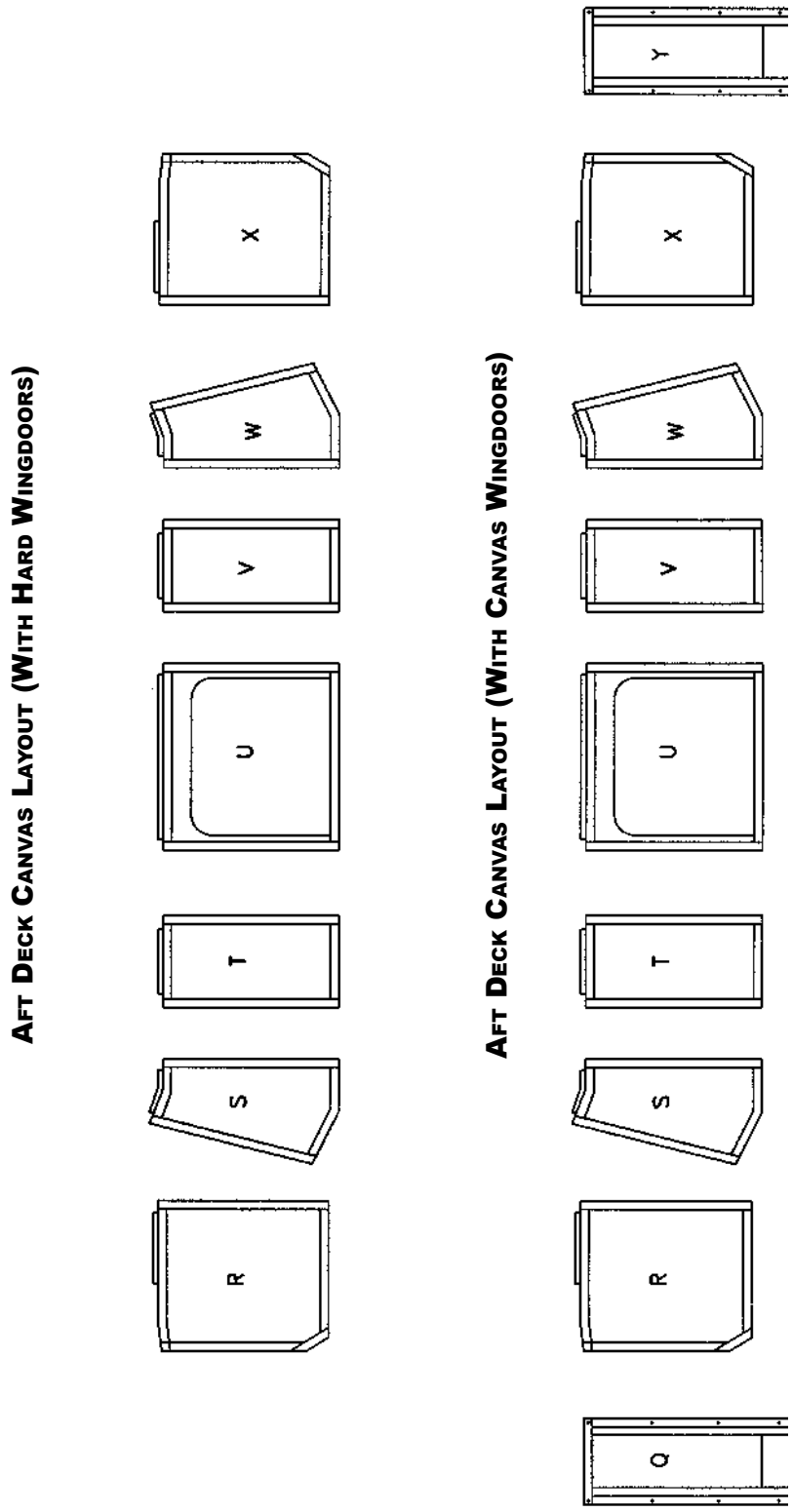




Bridge Canvas Layout



Aft Deck Canvas Layout



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

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