Wellcraft®

Go catch yourself some fun™

360 Coastal

OWNER'S MANUAL

Wellcraft Marine Corp.
1651 Whitfield Ave.
Sarasota, FL 34243

THIS PAGE WAS LEFT BLANK
INTENTIONALLY

WELCOME ABOARD

Congratulations on your new boat purchase and welcome to the Wellcraft boating family!

We want your boating experience to be the most enjoyable possible. The more you know about your new boat, the more you'll enjoy the time you spend aboard. That's why we prepared this manual. It's your guide for safe operation as well as understanding your boat's systems and equipment. It has been written for the beginning boater but experienced boaters will find helpful information as well. Be sure to read the contents thoroughly.

The popularity of boating and other water sports has grown tremendously in the past few years. Because of this, safety is an important issue for everyone who shares our waterways. Remember that along with the freedom and exhilaration of boating comes the responsibility that you have for the safety of your passengers and the other boaters who share the water with you. Throughout this manual, specific precautions and symbols identify safety-related information. These symbols and associated instructions are in the form of Danger, Warning and Caution statements. They are described in the Safety Information section of the manual. Be sure to pay close attention to them.

The precautions in this manual can't and don't cover every boating situation. If a specific method or procedure is not recommended, you must make sure that what you do is safe for you and others. Always use common sense when boating! Remember too that every safe boating excursion is a happy experience.

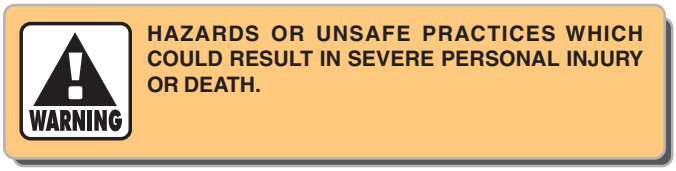
This manual has been compiled to help you operate your craft with safety and pleasure. It contains the details of the craft, the equipment supplied or fitted, its systems, and information on its operation and maintenance. Please read it carefully and familiarize yourself with the craft before using it. If this is your first craft, or if you are changing to a type of craft your are not familiar with, for your own comfort and safety, please ensure that you obtain handling and operating experience before "assuming command" of the craft. Your dealer or national sailing federation or yacht club will be pleased to advise you of local sea schools and competent instructors.

We'd also like to remind you to be kind to our environment while you're boating. Don't throw garbage and other refuse overboard. And do your best to keep harmful compounds like gasoline, diesel fuel and anti-freeze out of the water.

THIS PAGE WAS LEFT BLANK
INTENTIONALLY

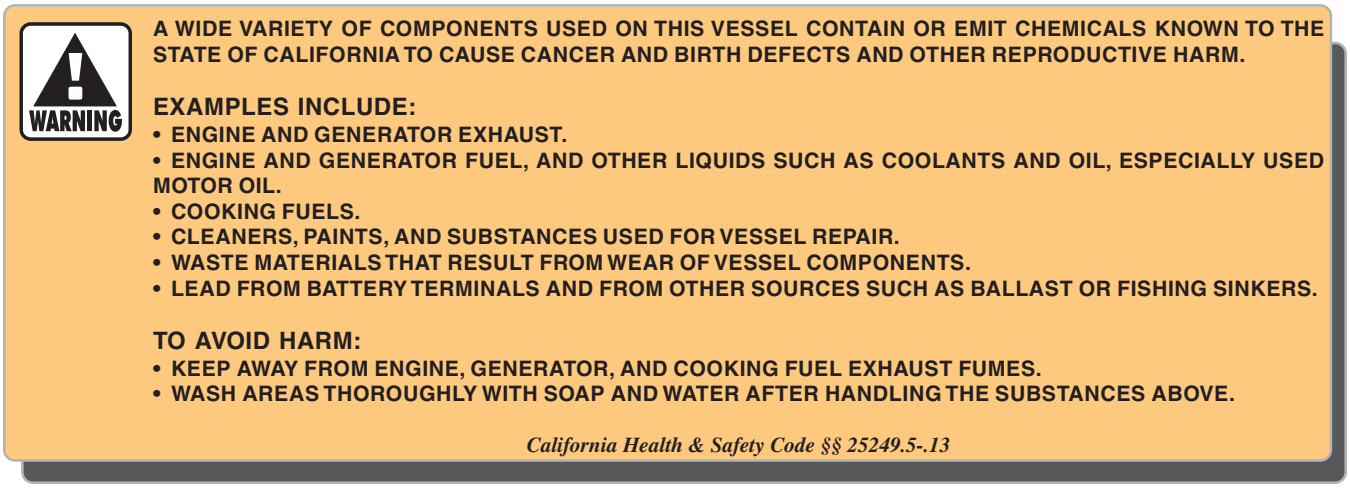
SAFETY INFORMATION

Your Wellcraft manual has been written to include a number of safety instructions to assure the safe operation and maintenance of your boat. These instructions are in the form of **DANGER, WARNING, and CAUTION** statements. The following definitions apply:



All instructions given in this book are as seen from the stern looking toward the bow, with starboard being to your right, and port to your left. A glossary of boating terms is included.

IMPORTANT NOTE: Your boat uses internal combustion engines and flammable fuel. Every precaution has been taken by Wellcraft to reduce the risks associated with possible injury and damage from fire or explosion, but your own precaution and good maintenance procedures are necessary in order to enjoy safe operation of your boat.



BOAT INFORMATION

Please fill out the following information section and leave it in your Wellcraft owner's manual. This information will be important for you and Wellcraft service personnel to know, if you may need to call them for technical assistance or service.

BOAT			
MODEL:			HULL SERIAL #:
PURCHASE DATE:			DELIVERY DATE:
IGNITION KEYS #:			REGISTRATION #:
WEIGHT:	DRAFT:	BEAM:	VERTICAL CLEARANCE:
DOOR KEYS #:			

ENGINES	
MAKE:	MODEL:
PORT SERIAL #:	STARBOARD SERIAL #:

TRANSMISSIONS	
MAKE:	MODEL:
PORT SERIAL #:	STARBOARD SERIAL #:
RATIO:	

GENERATOR	
MAKE:	MODEL:
SERIAL #:	KILOWATTS:

PROPELLERS	
MAKE:	BLADES:
DIAMETER/PITCH:	SHAFT:

AIR CONDITIONER	
MAKE:	MODEL:
SERIAL #:	BTU OUTPUT:

DEALER	WELLCRAFT
NAME:	PHONE:
DEALER/PHONE:	REPRESENTATIVE:
SALESMAN:	ADDRESS:
SERVICE MANAGER:	
ADDRESS:	
DEALER E-MAIL:	WELLCRAFT E-MAIL:

Wellcraft reserves the right to make changes and improvements in equipment, design and vendored equipment items, at any time without notification.

WELLCRAFT 360 COASTAL SPECIFICATIONS

HULL LENGTH OVERALL W/PULPIT	*39' 6" / 12.04m*
HULL LENGTH OVERALL W/PULPIT & PLATFORM	*40' 9" / 12.30m*
HULL LENGTH	*36' 6" / 11.12m*
*WEIGHT DRY W/ ENGINES (approx)**	*20,000 lbs / 9072kg*
BEAM	*13' 8" / 4.16m*
DEADRISE	*18 degrees*
DRAFT	*40" / 1.02m*
BRIDGE CLEARANCE WITH HARD TOP (approx)	*10'6" / 3.2m*
HEIGHT FROM KEEL TO THE TOP OF THE HARDTOP	*148" / 3.8M*
HEADROOM	*6' 4" / 195cm*
SLEEPING CAPACITY	*5*
FUEL CAPACITY	*400 gal / 1514 litre*
WATER TANK CAPACITY	*108 gal / 408 litre*
WASTE TANK CAPACITY	*18 gal / 68.14*
MAXIMUM HORSEPOWER @ PROPS	*1080 hp / 806kw*

CERTIFICATIONS & SPECIFICATIONS
(For Export Only)

To be in compliance with European directives for recreational boats as published by the International Organization for Standardization (ISO) in effect at the time this boat was manufactured, we are providing the following information.

Manufacturer:

Name _____

Address _____

_____ Zip Code: _____

Identification Numbers:

Hull Identification Number _____

Port Engine Serial Number _____

Starboard Engine Serial Number _____

Intended Design Category:

☐ Ocean ☐ Inshore

☐ Offshore ☐ Sheltered Waters

Weight and Maximum Capacities:

Unladen Weight - Kilograms (Pounds) _____

Maximum Load - Weight- Kilograms (Pounds) _____

Number of People _____

Maximum Rated Engine Horsepower - Kilowatts (Horsepower) _____

Certifications:

Certifications & Components Covered _____

_____

_____

_____

IMPORTANT INFORMATION

Owner's Manual
Spend some time looking through this manual. It contains information concerning the operation and care of your boat. The descriptions contained within the manual will introduce you to the features of the boat and provide you with a general knowledge of how the equipment works. The manual is divided into sections that are listed in the Table of Contents.

All instructions given in this book are as seen from the stern looking toward the bow with starboard being to your right, and port to your left. The information and precautions listed in this manual are not all inclusive. It may be general in nature in some cases and detailed in others. The suppliers of some of the major components such as engines, pumps, and appliances, provide their own owner's manuals which have been included with your boat. You should read the information in this manual and the manuals of other suppliers completely and have a thorough understanding of all component systems and their proper operation before operating your boat.

REMEMBER - IT IS YOUR RESPONSIBILITY TO ENSURE THAT YOUR BOAT IS SAFE FOR YOU AND YOUR PASSENGERS. ALWAYS EXERCISE GOOD COMMON SENSE WHEN INSTALLING EQUIPMENT AND OPERATING THE BOAT.

Warranty and Warranty Registration Cards
The Wellcraft Limited Warranty Statement is printed in this manual and on the warranty registration card. It has been written to be clearly stated and easily understood. If you have any questions after reading the warranty, please contact your dealer or the Wellcraft Customer Service Department.

Wellcraft Marine Corp.
Attn: Customer Service
1651 Whitfield Avenue
Sarasota, FL 34243
Phone: (941) 753-7811

Wellcraft, engine manufacturers, and the suppliers of major components maintain their own manufacturer's warranty and service facilities. ***It is important that you properly complete the warranty registration cards included with your boat and engine(s) and mail them back to the manufacturer to register your ownership.*** This should be done within 15 days of the date of purchase and before the boat is put into service. A form for recording this information for your records is provided at the beginning of this manual. This information will be important for you and service personnel to know, if and when you may need service or technical information.

Hull Identification Number Location

The boat warranty registration requires the **H**ull **I**dentification **N**umber **"HIN"** which is located on the starboard side of the transom, just below the rubrail. The engine warranty registration requires the engine serial numbers. Please refer to the engine owner's manual for the location of the serial numbers.

Note: There are items which are <u>not covered</u> by this warranty. These items are outlined in the warranty statement.

By signing the warranty registration card you, the new owner, indicate an understanding of the terms and conditions of the limited warranty. The warranty registration card should be properly completed by the dealer, signed by the new owner, and returned to us within fifteen (15) days after the original purchase in order to validate the warranty. Be sure to keep the Owner's Registration Card for your records.

IMPORTANT:
All boat manufacturers are required by the Federal Boat Safety Act of 1971 to notify first time owners in the event any defect is discovered "which creates a substantial risk of personal injury to the public." ***It is essential that we have your warranty registration card complete with your name and mailing address in our files so that we can comply with the law if it should become necessary.***

Transferring the Warranty
All rights and terms of the Limited Warranty can be transferred to subsequent owners of Wellcraft models for the duration of the original warranty period. To take advantage of this program, you must complete a **Warranty Registration Transfer Form** found in this chapter and send it to Wellcraft Marine Corp., Attention Customer Service Department, 1651 Whitfield Ave., Sarasota, FL 34243, within 15 days of the date of resale. The transfer request must be accompanied by a copy of the title/registration and the transfer fee as determined by the boat length overall:

Boat Length Overall	**Transfer Fee**
Up to 21'	$200.00
Over 21'	$300.00
Over 26'	$500.00

Wellcraft will confirm, in writing, that the transfer of the warranty has taken place. After which, the transferee will be treated as the original purchaser as outlined in the Wellcraft Limited Warranty Statement.

Warranty Service
As the owner, you are responsible for the proper registration of your boat at the time of purchase. You must also follow proper operation procedures and adhere to the care and maintenance procedures set forth in this manual. Be sure to read your boat's warranty, as well as the information and warranties (provided in your owner's portfolio) for major components. You are responsible for notifying your dealer in writing of any claimed defect within a reasonable period of time and returning your boat to your dealer for service.

All warranty repairs must be performed by an authorized Wellcraft dealer. Your dealer has been carefully selected to assist you with your sales and service needs. Your dealer will be glad to answer any of your questions about your new boat. The dealer has a direct interest in you as a customer and wants to see that your are completely satisfied with your purchase. The dealer is in the best position to help you and has full support and assistance from Wellcraft Marine.

Should a problem develop that is related to faulty workmanship or materials, as stated in the Limited Warranty, you should contact your Wellcraft dealer to arrange for the necessary repair. If you are not near your dealer or another authorized Wellcraft dealer or the dealer fails to remedy the cause of the problem, then contact Wellcraft Customer Service by calling (941) 753-7811 or by writing.

Wellcraft Marine Corp.
Customer Service Department
1651 Whitfield Avenue
Sarasota, FL 34243

Have the following information available:
- HIN (hull identification number)
- Selling dealer's name and location
- Date of purchase
- Servicing dealer (if different from selling dealer)
- Nature of problem
- Names of dealership personnel involved with the situation
- Record of service performed and approximate dates.

When contacting Wellcraft Marine, keep in mind that your problem will most likely be resolved at the dealership, using the dealership's facilities, equipment, and personnel.

It is the boat owner's responsibility to deliver the boat to the dealer for warranty service.

Construction Standards:
All our boats meet or exceed the construction standards set by the U.S. Coast Guard and the American Boat and Yacht Council (ABYC) concerning:
- Navigational lights
- Factory installed fuel systems
- Engine and fuel tank compartment ventilation
- Floatation
- Steering systems
- Backfire flame arresters

We recommend that you see your dealer if you wish to modify factory-installed equipment or add new equipment. Your dealer is qualified to make such modifications or additions without placing the safety or design integrity of your boat at risk and without invalidating the warranty.

Dealer Responsibilities:
Your dealer will complete the pre-delivery checklist with you when you take delivery of your boat. A copy of the checklist is at the end of this section. Your dealer will also provide the following services:

- Take time to sit with you and review the terms and the process for registering all warranties. The dealer should also brief you on obtaining warranty service for the boat and major components and introduce you to the Service Manager.

- Review the pre-delivery service record with you. The service record form must be signed by you and the dealer to certify that the work was performed to your satisfaction and that your boat is in top-notch condition and that all components are working properly.

- Sea trial the boat with you and provide a thorough orientation on the operation of the boat and its systems. If requested, provide you with comprehensive instruction in the operation of your boat and all its installed systems and components.

Boat Owner Responsibilities:

- Sit down with your dealer and a review the terms of all warranties. Complete the Wellcraft, engine and major component warranty registration cards and mail them to the manufacturers.

- Fill out the boat information form located in this manual.

- Inspect the boat at the time of delivery and review the pre-delivery service record form with your dealer. The record should be signed by you when the orientation is complete and you are satisfied with the operation of all systems.

- Read the boat and equipment owner's manuals and operate the boat and all equipment as instructed.

- Read and follow the engine manufacturer's instructions for initial inspection, break in, and service.

- Schedule the 20 hour service and make sure all periodic maintenance is performed as outlined in the boat, engine, and component owner's manuals.

- Know your boat and the rules of the road before you use your boat.

Important: Make sure that your dealer checks the engine alignment during your boat's commissioning and at the 20-hour checkup. The engine alignment check should be performed in accordance with the recommended procedures as stated by the engine manufacturer in your engine owner's manual. Failure to do so could result in drive train damage which is not covered under the warranty.

- We recommend that you reference your engine warranty certificate for initial inspection and service requirements.

Product Changes
Wellcraft is committed to the continuous improvement of our boats. As a result, some of the equipment described in this manual or pictured in the catalog may change or no longer be available. ***Wellcraft reserves the right to change standard equipment, optional equipment and specifications without notice or obligation.*** If you have questions about the equipment on your Wellcraft, please contact your dealer or the Wellcraft Customer Service Department.

Discharge of Oil
The Federal Water Pollution Control Act prohibits the discharge of oil or oily waste into or upon the navigable waters of the United States or the waters of the contiguous zone if such discharge causes a film or sheen upon or a discoloration of the surface of the water or causes a sludge of emulsion beneath the surface of the water. Violators are subject to a penalty of $5,000.00.

Disposal of Plastics & Other Garbage
Plastic refuse dumped in the water can kill fish and marine wildlife and can foul boat propellers and cooling water intakes. Other forms of waterborne garbage can litter our beaches and make people sick. U.S. Coast Guard regulations prohibit the dumping of plastic refuse or other garbage mixed with plastic into the water anywhere, and restrict the dumping of other forms of garbage within specified distances from shore.

Marpol Treaty
Boats 26 feet or longer must display a sign stating the disposal regulation of the Federal Water Pollution Control Act. The U.S. Coast Guard has issued these regulations to implement Annex V of the International Convention for the Prevention of Pollution from Ships, 1973, commonly known as Annex V of the Marpol (Marine Pollution) Treaty 73/78. They apply to all U.S. boats wherever they operate (except waters under the exclusive jurisdiction of a State) and foreign boats operating in U.S. waters out to and including the Exclusive Economic Zone (200 Miles.) It is important to know these regulations and adhere to them.

The regulations require U.S. recreational boaters, if your boat is 26 feet or more in length, to affix one or more USCG Trash Dumping Restrictions placards to your boat. The placard warns against the discharge of plastic and other forms of garbage within the navigable waters of the United States and specify discharge restrictions beyond the territorial sea. (The territorial sea generally ends three nautical miles from the seashore.) In addition, the placard must contain the warning that a person who violates these requirements is liable to civil ($25,000) and criminal (imprisonment) penalties. The placard also must note that State and local regulations may further restrict the disposal of garbage.

Operators shall display one or more placards in a prominent location and in sufficient numbers so they can be observed and read by crew and passengers. These locations might include embarkation points, food service areas, galleys, garbage handling spaces and common deck spaces frequented by crew and passengers. We recommend that these placards be installed on all boats. The placards may be purchased from local marinas, boat dealerships and marine equipment suppliers. A special placard is available for boats operating on the Great Lakes.

Important: It is illegal to discharge waste from your marine sanitary device (toilet) into the water in most areas. It is your responsibility to be aware of and adhere to all local laws concerning waste discharge. Consult with the Coast Guard, local marina or your dealer for additional information.

Note: Some states and localities have legal limits on speed, noise and trailer specifications. It is your responsibility to be aware of these laws and limits and to insure that your boat complies. Consult with your local Marine Patrol or local Coast Guard office.

Registration and Numbering
Federal law requires that all undocumented vessels equipped with propulsion machinery be registered in the State of principal use. A certificate of number will be issued upon registering the boat. These numbers must be displayed on your boat. The owner/operator of a boat must carry a valid certificate of number whenever the boat is in use. When moved to a new State of principal use, the certificate is valid for 60 days.

In order to be valid, the numbers must be installed to the proper specifications. Check with your dealer or state boating authority for numbering requirements. The Coast Guard issues the certificate of number in Alaska; all others are issued by the state.

Insurance
In most States the boat owner is legally responsible for damages or injuries he or someone else operating the boat causes. Responsible boaters carry adequate liability and property damage insurance for their boat. You should also protect the boat against physical damage and theft. Some States have laws requiring minimum insurance coverage. Contact your dealer or State boating authority for information on the insurance requirements in your boating area.

Reporting Boating accidents
All boating accidents must be reported by the operator or owner of the boat to the proper marine law enforcement authority for the state in which the accident occurred. Immediate notification is required if a person dies or disappears as a result of a recreational boating accident.

If a person dies or there are injuries requiring more than first aid, a formal report must be filed within 48 hours.

A formal report must be made within 10 days for accidents involving more than $500.00 damage or the complete loss of a boat. The 1994 Recreational Boating Act may impose a $1,000.00 civil fine for people who fail to submit a boating accident report.

A Boating Accident Report form is located near the back of this manual to assist you in reporting an accident. If you need additional information regarding accident reporting, please call the Boating Safety Hotline, 800-368-5647.

If you see a distress signal, you must assume it is a real emergency and render assistance immediately. The master or person in charge of a boat is obligated by law to provide assistance to any individual in danger at sea. However, you should not put your boat or crew in a dangerous situation which exceeds your capabilities or those of your boat. The 1971 Boating Safety Act grants protection to a Good Samaritan boater offering good faith assistance, and absolves a boater from any civil liability arising from assistance given.

Required Equipment
U.S. Coast Guard regulations require certain equipment on each boat. The Coast Guard also sets minimum safety standards for vessels and associated equipment. To meet these standards some of the equipment must be Coast Guard approved. "Coast Guard Approved Equipment" has been determined to be in compliance with USCG specifications and regulations relating to performance, construction, or materials. The equipment requirements vary according to the length, type of boat, and the propulsion system. Some of the Coast Guard equipment is described in the Safety Equipment chapter of this manual. For a more detailed description, obtain "Federal Requirements And Safety Tips For Recreational Boats" by contacting the Boating Safety Hotline 800-368-5647, the Coast Guard Office of Boating Safety at www.uscgboating.org or your local marine dealer or retailer.

Some state and local agencies impose similar equipment requirements on waters that do not fall under Coast Guard jurisdiction. These agencies may also require additional equipment that is not required by the Coast Guard. Your dealer or local boating authority can provide you with additional information for the equipment requirements for your boating area.

Briefing Passengers
Before each outing, ensure that at least one passenger is familiar with the proper operation and safety aspects of the boat in case of emergency. Show all passengers the location of safety equipment.

Courtesy On-The-Water
- Know the rules of the water and practice them at all times.
- Be familiar with traffic patterns of the body of water on which you are boating.
- Give fishermen, sailboats (not under power), and water skiers plenty of room.
- You are responsible for spotting and avoiding swimmers and slow-moving vessels.

- You are also responsible for damage caused by your wake.
- Operate at slow speeds in restricted and congested areas.
- Keep a lookout for personal watercraft. They have the same rights and responsibilities as you do.
- Contact your local or state boating authorities for information on boating and safety courses.
- Keep boating safe and fun for everyone!

Education

If you are not an experienced boater, we recommend that the boat operator and other people that normally accompanies the operator, enroll in a boating safety course. Organizations such as the U.S. Power Squadron, United States Coast Guard Auxiliary, State Boating Authorities and the American Red Cross offer excellent boating educational programs. These courses are worthwhile even for experienced boaters to sharpen your skills or bring you up to date on current rules and regulations. They can also help in providing local navigational information when moving to a new boating area. Contact your dealer, State Boating Authority or the Boating Safety Hotline, 800-368-5647 for further information on boating safety courses.

Contacts

American Red Cross (For local address consult the telephone directory)

Boat U.S. Foundation for Boating Safety Hotline
800-336-BOAT
800-245-BOAT (in Virginia)

Coast Guard Boating Safety Hotline and Office of Boating Safety
800-368-5647
www.uscgboating.org

Skippers Course
GPO Superintendent of documents
Washington, DC 20012

United States Coast Guard Auxiliary
Local Flotilla or contact appropriate Coast Guard District Headquarters
United States Coast Guard Headquarters
202-512-1800
202-512-2250 (fax)

United States Power Squadron
P.O. Box 30423
Raleigh, NC 27617

Recommended Reading

Damford, Don. Anchoring
(ISBN 0-915160-64-1) Seven Seas

United States Coast Guard Auxiliary. Boating Skills and Seamanship. LC74-164688. (illus.)
(ISBN 0-930028-00-7) U.S. Coast Guard.

Bottomley, Tom. Boatman's Handbook, (Illus.) 316 p. pap. (ISBN 0-688-03925-1, Hearst Marine BK.) Morrow.

Whiting, John and Bottomley, Tom. Chapman's Log and Owner's Manual. 192 p. (ISBN 0-87851-801-0);
(ISBN 0-686-96737-2) Hearst Bks.
Strahm, Virgil. Does Your Fiberglass Boat Need Repair? LC81-90093. 46 P. PAP (ISBN 0-9606050-0-2) Strahm.

Chapman, Charles F, and Maloney. E.S. Chapman's Piloting, Seamanship and Small Boat Handling. (illus.) 62 p. (ISBN 0-87851-814-2, Pub. by Hearst Bks); deluxe ed. (ISBN 0-87851-815-0) Morrow

National Fire Protection Association, Fire Protection Standard for Pleasure and Commercial Motor Craft. (ISBN 0-317-07388-5, NFPA 302) Natl. Fire Prot.
Brotherton, Miner. Twelve/Volt Bible. Plastic comb. (ISBN 0-915160-81-1) Seven Seas.

WELLCRAFT LIMITED
2006 Model Year Limited Warranty

Wellcraft, warrants to you, the first North American retail purchaser of this 2006 model year boat, that it will repair or replace defects in materials or workmanship it finds to its satisfaction to occur within the applicablewarranty periods, subject to the what "This Warranty Does Not Cover" section set forth below.

For boats sold at retail more than twelve (12) months after delivery at the dealership, you will be entitled only to the coverage as stated in the Wellcraft Limited Warranty–Level II. See your Wellcraft dealer for a copy. All other terms and conditions of this warranty will apply. All warranties run concurrently from the date of delivery to you.

Defects in non-structural parts and components: One (1) year Warranty Period.
Defects in structural components of the deck and liner: Five (5) year Warranty Period.
Defects in structural components of the hull, stringer and transom (all models except Wellcraft 330 Coastal model), Ten (10) year Warranty Period.

Defects in structural components of the hull, stringer and transom (Wellcraft 330 Coastal model only): Five (5) year Warranty Period.

Your sole and exclusive remedy is the repair or replacement, at Wellcraft's sole option, of parts and components covered by this warranty.

This Wellcraft boat, including any alleged defective part, must be returned to an authorized Wellcraft dealer within the applicable warranty period to obtain warranty service. The Wellcraft dealer will carry out the warranty procedures on the owner's behalf. All warranty work will be performed at an authorized dealer, at the Wellcraft factory, or at another repair facility that Wellcraft selects. The owner is responsible for the expense associated with transporting the boat to and from the repair facility.

Coverage remaining under the Warranty Periods may be transferred by an authorized Wellcraft dealer to a 2nd purchaser for an established fee. The transfer must occur within five (5) years of the original retail sale. The transfer fee must be paid within 15 days of purchase of the used boat to transfer the warranty. Proof of purchase date is required. The warranty may only be transferred **once**. Wellcraft reserves the right to reject a warranty transfer request for a Wellcraft boat that has been damaged, neglected, or otherwise previously excluded from warranty. Wellcraft will confirm all warranty transfers in writing to the dealer and the second owner.

An action for breach of warranty shall be barred unless it is commenced within four (4) years from the date the cause of action accrues. An action for breach of any duty or obligation to repair or replace shall be barred unless it is commenced within one year from the date the cause of action accrues regardless of the time remaining in the Warranty Period.

This Warranty **DOES NOT COVER:**

1. A boat purchased from any party other than an authorized Wellcraft dealer.
2. A boat, including its components that has been altered or modified so as to adversely affect its operation, performance or durability.
3. Engines, outdrive, controls, propellers, batteries, appliances and other equipment or accessories which are not manufactured by Wellcraft, whether or not warranted by other manufacturers.
4. Gelcoat finishes (including blistering and osmotic blistering, cracking crazing or discoloration), mirrors, window glass, varnishes, paints, fabrics, chromium plated and stainless steel finishes, because of thevarying effects resulting from different climatic and use conditions.
5. The cost of removal or re-instatement of parts or disassembly of units to repair or replace components covered by this warranty.
6. Any boat which has been misused, used in a negligent manner, used for racing, used for rental, char ter, military or other commercial purposes, used without normal maintenance, operated contrary to any instruction furnished by Wellcraft, or operated in violation of any Federal, State, Coast Guard or other governmental agency laws, rules or regulations.
7. Any representation relating to speed, range, fuel consumption or other estimated performance characteristic.
8. Loss of time, inconvenience, boat payments, retail charges, improper lifting or trailering, travel expense, loss of use, in-and-out-of-water charges, towing and storage charges, loss of or damage to personal property, or other remedies not specifically allowed.
9. Dealer preparation, cleaning, final adjustments and alignments in preparing the boat for delivery or commissioning.
10. Leakage around windshield, hatches or other designed openings.
11. Fit and adjustment of exterior canvas tops, enclosures, and weather covers.
12. Sacrificial deterioration of anti-fouling paint or zinc anodes.

Remedy under this warranty is expressly limited to repair or replacement of defects in materials or workmanship, **and does not include incidental or consequential damages** that are specifically **DISCLAIMED**. Note: SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTIAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU. The express limited warranty described above is exclusive. **IMPLIED WARANTIES** are **LIMITED IN THEIR DURATION TO ONE (1) YEAR FROM THE DATE OF PURCHASE.** ALL IMPLIED WARRANTIES, if any, INCLUDING **MERCHANTABILITY and FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED** IN THEIR ENTIRETY AFTER ONE (1) YEAR FROM THE DATE OF PURCHASE. There are no warranties that extend beyond the description on the face hereof. **NOTE**: SOME STATES DO NOT ALLOW LIMITATION ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS THAT VARY FROM STATE TO STATE.

This document contains the entire warranty given by Wellcraft. Wellcraft does not authorize any person or persons, including Wellcraft dealers, to change the terms of this express limited warranty, which is Wellcraft's only warranty. Wellcraft reserves the right to change or improve the design or manufacture of Wellcraft boats without obligation to modify any boat previously manufactured.

Wellcraft · 1651 Whitfield Avenue · Sarasota, FL 34243 · 941.753.7811

Warranty Registration Transfer Request

Original Owner Name & Address: _____

_____

_____

Original Date of Purchase: _____

Hull Identification Number: _____

Boat Model: _____

Selling Dealer: _____

Name & address of second purchaser: _____

_____

_____

Telephone Number: _____

Date of Purchase: _____

1995 – 1998 Model year transfer fee: $100.00 all models

1999 Model year and newer transfer fees:

16’	-	21’	boats	$200.00
22’	-	26’	boats	$300.00
27’		and up	boats	$500.00

The remainder term of the Wellcraft warranty may be transferred to a new owner upon written request. The transfer must occur within five (5) years of the original retail sale. **The warranty may only be transferred once.** Written inspection by a current Wellcraft dealer or an authorized Wellcraft representative must accompany Warranty Transfer Application form below. The Warranty Transfer Application must be received by Wellcraft within 15 days of purchase by the Second Retail Purchaser. Please complete the application, and return with payment made payable to Wellcraft to the address shown below. **The request must be accompanied by copy of the title/registration, warranty registration transfer request form completed in its entirety.**

This warranty registration request, if accepted, transfers the warranty coverage remaining on the boat to the second purchaser. Acceptance of the request does not create any additional warranties or obligation on Wellcraft.

To be completed by Dealer or Authorized Representative:

Boat Transfer Inspection Date: _____ Inspected By: _____

Condition: Exterior _____ Mechanical _____

Interior _____ Overall Condition _____

To be completed by Manufacturer:

Warranty Expiration Date: _____

Wellcraft Authorized Acceptance Date: _____

Wellcraft Authorized Signature: _____

Mail to: **Wellcraft,** 1651 Whitfield Ave., Sarasota, FL 34243, Attn: Customer Service

THIS PAGE WAS LEFT BLANK
INTENTIONALLY

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

Chapter 1:

PROPULSION SYSTEM

1.1 General

The Wellcraft 360 Coastal is designed to be powered with twin diesel inboard engines. Each manufacturer of the various marine power components provides an owner's information manual with their product. It is important that you read the manuals very carefully and become familiar with the proper care and operation of the engines and drive system. A warranty registration card has been furnished with each new engine and can be located in the engine owner's manual. All information requested on this card should be filled out completely by the dealer and purchaser and then returned to the respective engine manufacturer as soon as possible.

WARNING

DO NOT ATTEMPT TO SERVICE ANY ENGINE OR DRIVE COMPONENT WITHOUT BEING TOTALLY FAMILIAR WITH THE SAFE AND PROPER SERVICE PROCEDURES. CERTAIN MOVING PARTS ARE EXPOSED AND CAN PROVE DANGEROUS TO SOMEONE UNFAMILIAR WITH THE OPERATION AND FUNCTION OF THE EQUIPMENT.

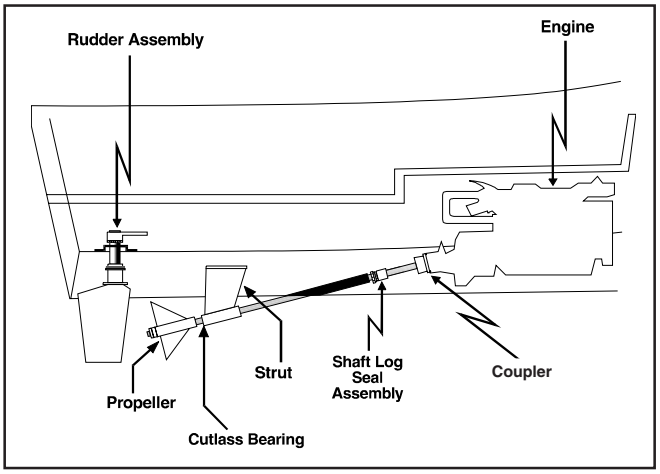
1.2 Drive Systems

On inboard propulsion systems, all shifting and gearing components are installed inside the hull. Only the propeller shafts, and associated equipment are under water. The engines are mounted below the bridge deck sole. A transmission, also called a gearbox, which performs desired shifting functions, is directly coupled to each engine. The propeller shaft extends through the hull and connects the transmission output coupling with the propeller. The transmissions have built-in reduction gearing. This gearing reduces the speed of the propeller in relation to engine speed.

CAUTION

ALWAYS RETURN THE ENGINE THROTTLE LEVERS TO THE EXTREME LOW SPEED POSITION BEFORE SHIFTING. NEVER SHIFT THE UNIT WHILE THE ENGINE SPEED IS ABOVE 1000 RPM.

All transmissions require oil or fluid of some type for lubrication. This level should be checked at the same interval as the engine oil level.



Propulsion System

Your boat is equipped with transmissions supplied by the engine manufacturer. For details on the transmissions, refer to the engine or transmission owner's manual.

1.3 Engine Exhaust System

Engine exhaust exits the rear of the boat through the exhaust system. The system consists of engine exhaust manifolds, exhaust hoses, mufflers, and thru-hull exhaust fittings.

Inboard boats use the exhaust system to expel exhaust gases and cooling water. A periodic inspection of the hoses, mufflers and related parts should be made to ensure that leaks or heat deterioration have not resulted. Periodically inspect these items for signs of deterioration, loose hose clamps or damage. Replace them as necessary.

WARNING

DO NOT INHALE EXHAUST FUMES! EXHAUST CONTAINS CARBON MONOXIDE THAT IS COLORLESS AND ODORLESS. CARBON MONOXIDE IS A DANGEROUS GAS THAT IS POTENTIALLY LETHAL.

1.4 Engine Cooling System

All marine engines use surface water as a cooling medium. The cooling water enters the system through a water intake in the hull and is expelled through the exhaust system. Water is pumped through the water inlets, circulated through the

engine block or heat exchanger, and relinquished with the exhaust gases through the exhaust system. The water pump uses a small impeller made of synthetic rubber. The impeller and water pump cannot run dry for more than a few seconds.

Inboard engines use a thru-hull water intake scoop and strainer for each engine. The scoop is located on the hull bottom and must be kept free of mud, weeds and other debris. The strainer is mounted in the engine compartment bilge. A ball valve is provided on each intake thru-hull. Be sure these valves are in the open position before operating the boat engines.

The in-line sea strainers are mounted in the bilge, in front of each engine. The strainers should be visually inspected frequently, by looking through the glass case, for accumulation of marine growth, weeds, and other foreign objects. If clogged or dirty, the strainer should be cleaned.

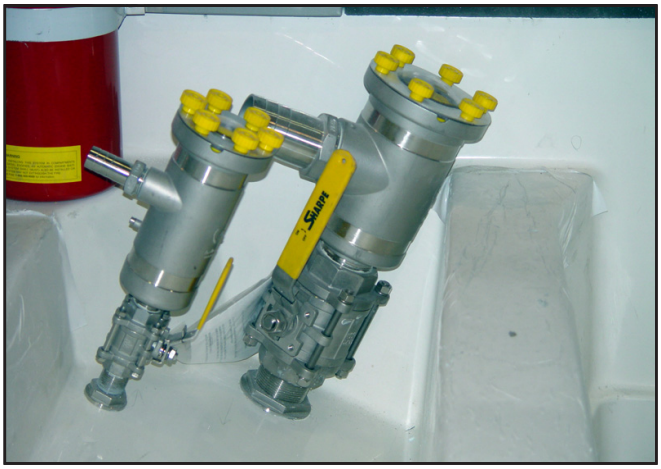
CAUTION

A CLOGGED SEA STRAINER CAN RESTRICT THE SUPPLY OF COOLING WATER TO THE ENGINE AND EXHAUST COMPONENTS, WHICH COULD RESULT IN SEVERE ENGINE AND EXHAUST SYSTEM DAMAGE.

Cleaning the sea strainers

- Turn off the engines.
- Close the engine water intake valve.
- Remove the plastic thumb nuts to open the top of the strainer and remove the screen.
- Thoroughly flush the screen and the inside of the strainer to remove foreign matter.
- Lubricate the seal.
- Reassemble the strainer making sure that all fasteners are tight.
- Open the intake valve.
- Start the engine and inspect the strainer for leaks.

Inboard boats utilize an exhaust hose to expel/discharge cooling water. A periodic inspection of the hose, mufflers and related parts should be made to ensure that leaks or heat deterioration have not resulted.



Port Engine and Accessory Sea Strainers and Ball Valves

A "freshwater" or "closed" cooling system that is cooled by a heat exchanger and the seawater cooling system provides adequate engine cooling without exposing the internal engine cooling system to the harmful effects of surface water. This system is standard with all diesel engines. The engine owner's manual provides additional information regarding the service and maintenance of this equipment.

CAUTION

SHOULD AN ENGINE INTAKE, EXHAUST OR COOLING HOSE RUPTURE, TURN OFF THE ENGINE AND CLOSE THE ENGINE WATER INTAKE VALVE IMMEDIATELY. PROCEED, UNDER TOW IF NECESSARY, TO A SERVICE FACILITY FOR APPROPRIATE REPAIRS. MAINTAIN A CLOSE VISUAL WATCH ON THE PROBLEM HOSE AND THE BILGE WATER LEVEL.

1.5 Emergency Pump Out System (Optional)

There is an optional emergency pump out system located in the intake line for the starboard engine that enables the operator to use the starboard engine seawater pump to remove water from the bilge in an emergency. A Tee fitting in the intake line between the sea strainer and the starboard engine is connected to a tube that extends close to the bottom of the bilge. There is a ball valve on the tube that can be opened to allow the engine pump to consume accumulated water in the bilge. This valve should always be completely closed during normal operation.

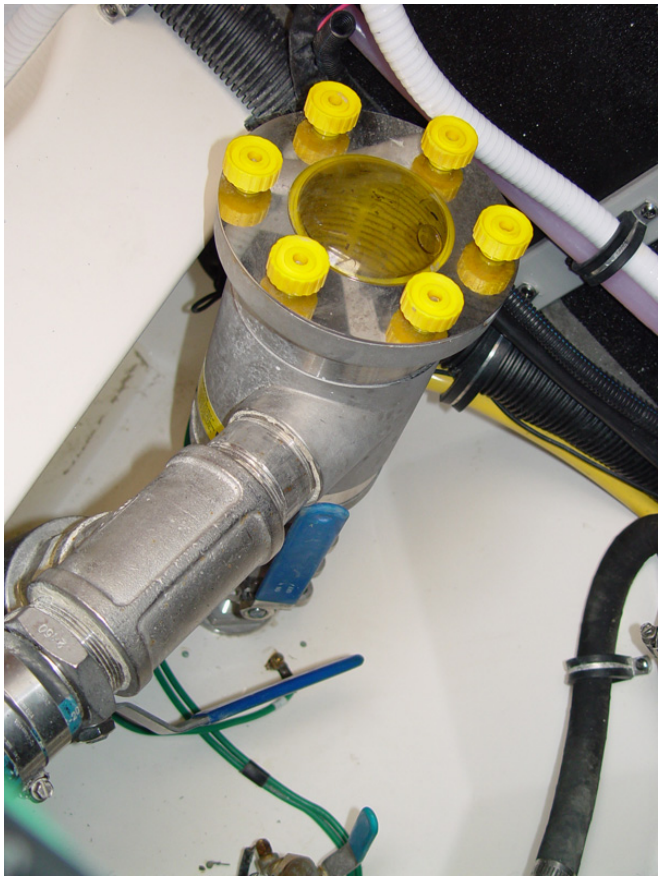
If the boat should develop a leak serious enough to overcome the bilge pump system, the emergency pump out system can be engaged to assist the bilge pumps. Since diesel engines use a large quantity of seawater to cool the heat exchanger and exhaust system, the engine seawater pump can remove much more water than the bilge pumps and could save the vessel from sinking.

The following steps must be followed exactly to engage the emergency pump out system:

- Turn off the engines and enter the engine room.
- Assess the flow of water into the bilge and confirm that the bilge pumps are not able to keep up with the water entering the bilge. Also make sure that there is enough water in the bilge to cover the emergency pickup tube by at least 2 inches.
- Once you have determined that you need the emergency pump out, turn off the thru-hull valve for the starboard engine located just below the sea strainer. Turn the valve on the emergency pick up tube on.
- Return to the bridge deck and start both engines.
- Leave the starboard engine in neutral and use the port engine to control the speed and direction of the boat. Apply just enough power to maintain control.
- Advance the starboard engine throttle to 1500 RPM and have a crew member closely monitor the water level in the bilge.

Note: Large diesel engines consume a large volume of water to cool the heat exchanger and exhaust system and there is a good chance that the engine will evacuate the bilge quickly. Additionally, the seawater pump impeller will be damaged if it is allowed to run dry for more than a couple of seconds. Therefore, the bilge must be monitored closely and the starboard engine shut down before the pump runs dry.

- Use the engine throttle to control the volume of water being discharged. It may be possible to reduce the engine RPM and maintain the water level as the it gets within 2 or 3 inches of the bottom of the intake tube.
- Turn the starboard engine off if the water level in the bilge gets within one inch of the bottom of the emergency pick up tube. Restart the engine as necessary to control the water.
- If possible, have another crew member find the problem and try to reduce the flow of water into the boat.
- If the problem is found and corrected, turn off both engines and enter the engine room.
- Close the valve the emergency pickup tube and open the valve just below the starboard engine sea strainer.



Starboard Engine Sea Strainer and Emergency Pump Out Valve

- Return to the bridge, start both engines and return to port. A crew member should constantly monitor the bilge to ensure there are no problems.
- Monitor the starboard engine temperature closely to make sure the seawater pump is operating properly.

1.6 Oil Change Pump (Optional)

Your boat may be equipped with an oil change pump system designed to change and fill the oil in the main engines, transmissions, and generator. It is mounted in the engine compartment aft of the engines. The pump is powered by the 110-volt AC electrical system and is equipped with a cord that plugs into the AC outlet in the engine compartment.

The system is designed with a manifold system that enables one pump to service multiple engines. Oil hoses are run from the engine oil pan fitting directly to valves on the manifold. The valves are labeled and are used to select the engine being serviced. The reversible pump is controlled by a switch near the valves. In one direction it will pump oil out of the engines. In the other direction it will pump fresh oil into the engines.

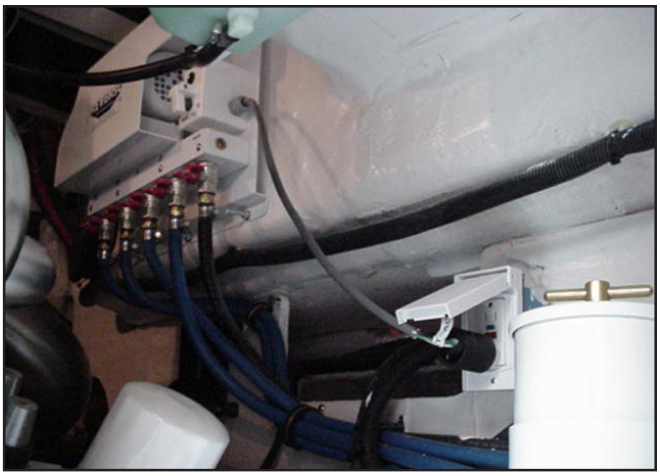
Another valve in each engine oil drain hose provides additional protection from oil leaks and damaged hoses in the oil change system. These valves must be opened when changing the oil and closed when the service is complete. The valves are located on the inboard stringers next to each engine.

Draining Oil from Engines:
Place the drain/fill hose, in an empty container. Plug the power cord into the engine compartment AC outlet. Open the valve on the manifold which connects to the engine to be serviced and the valve on that engine oil drain hose. Switch the pump to draw oil from the engine. Repeat this process for each engine or generator to be serviced.

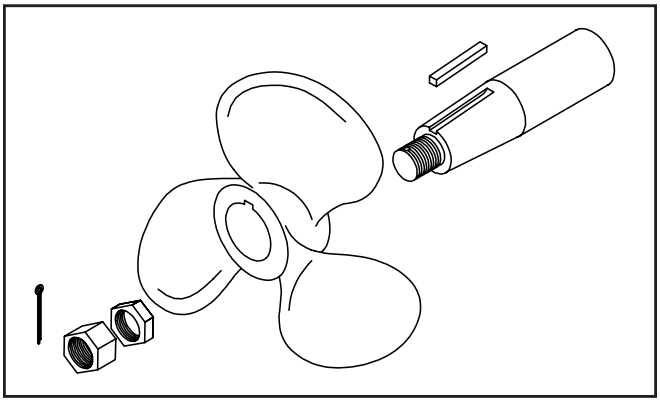
Filling/Adding Oil to Engines:
Place the drain/ fill hose into a container of new oil. Plug the power cord into the AC outlet. Open the valve on the manifold which connects to the engine to be serviced. Make sure the valve on the engine oil drain hose is open. Switch the pump to draw oil from the new oil container.

NOTE: Operate pump with only one valve open at a time. Be sure that a valve is open prior to pump operation. Be sure to close all valves when oil change is completed.

Refer to the oil change system owner's manual for specific information on the system installed in you boat. It is important that you completely understand the operation of the pump and valves before using the system.



Engine Oil Change System



Propeller Installation

1.7 Propellers

The propellers are installed by your dealer or at the factory. Should it be necessary to change propellers, always use an appropriate removal tool or "Prop Puller." Do not attempt removal using a hammer. Damage to the propeller, propeller shaft, or transmission can result.

A few simple steps will enable you to install a propeller. First, make sure that there are no burrs or rough edges on the shaft, key, and both keyways. Try the key into the keyways. It must slide freely into position without having side play. It might be necessary to file the key with a flat file to create the correct tolerance.

To ensure the proper fit of your propeller, follow these procedures:

Step 1: Without the key installed, slip the propeller on the shaft by hand as far as it will go. Mark the location at the front of the hub with a dry-marker and remove the propeller. ***Do not use a pencil to mark the shaft. Pencil lead contains graphite which will damage the propeller shaft.***

Step 2: Install the key in the shaft.

Step 3: Again, slide the propeller into position by hand. Please note that the key should not extend beyond the forward edge of the propeller hub. The propeller should reach the same spot as before. If it does not, the key has probably moved up the keyway, or the key does not fit properly in one or both of the keyways.

Step 4: Install the propeller nuts. When installing the shaft nuts, take care not to tighten them too much. Do not force the nut into a tighter position by using a hammer or extension on the arm of the wrench. Tighten the thin nut, then lock the wide nut tight against the thin nut and insert the cotter pin.

If not properly installed, the propeller will be off balance. This is a frequent cause of vibration and it could cause the propeller hub to split.

CAUTION

DO NOT ATTEMPT TO OPERATE THE BOAT IF THE PROPELLER DOES NOT FIT PROPERLY ON THE SHAFT. PROBLEMS SUCH AS SHAFT VIBRATION, PROPELLER HUB FAILURE OR SHAFT FAILURE MAY OCCUR.

1.8 Performance and Propellers

Your boat was shipped with propellers that typically provide optimum performance for your boat. However there are factors that can affect performance and propeller requirements. Some are as follows:

- Before changing propellers to correct boat performance problems, be sure other factors such as engine tuning, bottom and running gear growth, etc., are not the source of performance changes. You also should be sure the load conditions are those normally experienced. If the boat ran in the required RPM range when it was new and you have not added any additional gear or heavy equipment and have not damaged the propellers, there is a good chance the propellers are not the problem.

- It is extremely important that the boat is propped to run at or very near the recommended top RPM with an average load. If the top RPM is above or below the recommend range, the propellers must be changed to prevent loss of performance and possible engine damage.

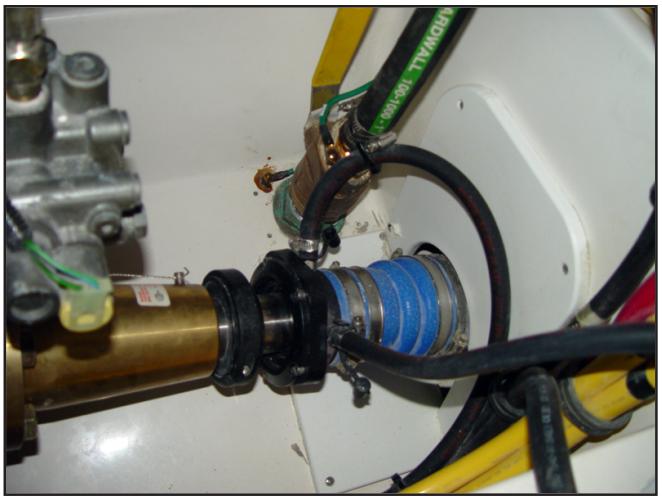
- Large diesel or gas engines can be damaged and the warranty void if the boat is not propped correctly. Always consult your Wellcraft or authorized engine service dealer when making changes to the propellers or if the boat does not run near the top recommended RPM.

- The addition of a Marlin or Tuna tower, heavy equipment like life rafts, personal water craft, additional coolers, etc., will cause additional load on the engines. Consequently, different propellers may be required.

- Boats operated at high altitudes (above 2000 feet). Engines operated at high altitudes will not be able to develop as much horsepower as they do at or near sea level. Consequently, different propellers may be required.

WARNING

KEEP AWAY FROM THE PROPULSION MACHINERY DURING ITS OPERATION OR WHENEVER THE BOAT IS IN MOTION. MOVEMENT OF WATER PAST A PROPELLER CAN CAUSE THE PROPELLER, SHAFT AND OTHER PROPULSION MACHINERY TO ROTATE EVEN IF THAT EQUIPMENT IS NOT BEING OPERATED INTENTIONALLY.



Dripless Shaft Seal, Bonding Connection and Water Hose

1.9 Running Gear

Shaft Logs and Dripless Seal

The shaft logs, which are fastened into the hull bottom, allow the propeller shaft to extend and rotate through the hull. The shaft log is equipped with a special "Dripless" propeller shaft seal. To lubricate this seal, seawater from the engine cooling system is injected into each shaft seal through a hose that is connected to the engine and the shaft seal housing. There is another hose connected to each seal that allows water to be injected into each seal from either engine. This provides cooling and lubrication for both seals when operating on one engine.

The shaft seal must have positive water injection any time the propeller shaft is rotating. The water flow to each seal should be tested annually by removing the water injection hose from the seal fitting and running the engine at idle with the transmission in neutral. There should be a positive flow of water from the hose. If no water is flowing from the hose, contact your dealer or the Wellcraft Customer Service Department before operating your boat. Some water will leak into the bilge from the hose fitting on the seal assembly during this test. The hose should immediately be reattached and the hose clamps tightened securely when the test is completed. Please refer to the seal manufacturer owner's manual for additional information on the shaft seal.

Proper performance of the shaft seal is directly dependent upon correct propeller shaft alignment. Propeller damage, a bent strut or shaft, or abnormal wear, settling, etc. are common reasons for misalignment. This can cause such problems as repeated shaft leakage, excess seal wear, shaft log and assembly damage, premature strut bearing wear, etc. It is, therefore, important that the alignment be periodically checked and adjustments are made when necessary.

CAUTION

ALWAYS BE SURE TO USE THE SHAFT REMOVAL SLEEVE AND FOLLOW THE SEAL MANUFACTURER'S INSTRUCTIONS WHEN REMOVING OR INSTALLING A PROPELLER SHAFT. IMPROPERLY REMOVING OR INSTALLING A PROPELLER SHAFT CAN PERMANENTLY DAMAGE THE SHAFT SEAL AND CAUSE IT TO LEAK.

Struts

The struts are the metal castings bolted to the bottom of the hull to secure the aft end of the propeller shafts. A replaceable cutlass bearing, also called a strut bearing, is used to minimize shaft wear. The strut bearing should be inspected once a year, or whenever the boat is hauled, to ensure that there has been no damage or deterioration and that the strut bearing is not worn excessively. Upon inspection of the bearing, a small amount of play between the propeller shaft and bearing, .008" to .010", is normal. This gap allows water to pass between the bearing and the shaft to lubricate the bearing surface. If the rubber bearing shows signs of deterioration, or excessive wear, greater than .015" play between the bearing and the shaft surfaces, the bearing should be replaced and you should contact your Wellcraft dealer. It is advisable, during lay-up periods, to insert some castor oil into the rubber bearing to keep it from "freezing" to the shaft. Never use machine oil or grease on the rubber bearing.

CAUTION

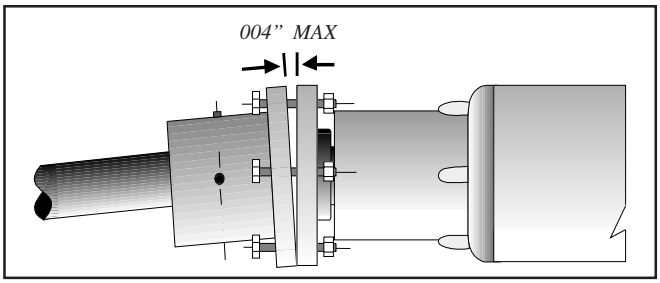
THE OPERATION OF THE BOAT IN HEAVILY SILTED OR POLLUTED WATER, WITH A DAMAGED PROPELLER, A DAMAGED PROPELLER SHAFT OR WITH THE ENGINE OUT OF ALIGNMENT, CAN SIGNIFICANTLY SHORTEN THE LIFE OF THE STRUT BEARING. IF YOU EXPERIENCE ANY OF THESE SITUATIONS, THE BEARING SHOULD BE CHECKED MORE FREQUENTLY.

ALWAYS CHECK THE ENGINE ALIGNMENT AFTER REPLACING THE STRUT BEARING.

Propeller Shaft Alignment

The propeller shaft coupling and the transmission coupling should be checked for proper alignment beginning with the first launching, again after 20 hours of engine operation, and annually thereafter. The alignment should especially be checked if noise or vibration occurs.

Excessive vibration, abnormal strut bearing wear, or broken propeller shaft coupling bolts are an indication of misalignment. Misalignment can also cause severe damage to the shaft log, shaft seal, strut, shaft and the engine transmission. Realignment should only be performed by a qualified service person.



Propeller Shaft Coupling

The correct procedure for checking the shaft alignment so a boat owner can determine if service is required, is as follows:

Step 1: Remove the bolts that secure the propeller shaft flanges.

Step 2: Hold the propeller shaft flange firmly against the transmission flange.

Step 3: Try to insert a .004" feeler gauge at the top, the bottom and at both sides between the flanges. If it can be easily inserted between the flanges in any area, try inserting a larger feeler gauge until you determine the amount of variance.

Step 4: While holding the transmission flange, turn the prop shaft 90 degrees and repeat step 3. A straight shaft in proper alignment will not allow the insertion of a feeler gauge larger than .004", regardless of the prop shaft position.

Step 5: If a gap larger than .004" is found and the gap moves as the shaft flange is rotated, the flange or the prop shaft is bent out of tolerance and must be replaced or removed and straightened. If the gap remains at the same position regardless of the propeller shaft rotated position, the engine must be realigned. At this point, a Wellcraft dealer should be contacted.

NOTE: The boat should always be at rest in the water when checking or aligning the propeller shaft.

CAUTION

MAKE SURE THE PROPELLER SHAFT FLANGE BOLTS ARE TIGHTENED SECURELY AFTER CHECKING THE ENGINE ALIGNMENT AND BEFORE OPERATING THE BOAT.

NOTE: Lifting the boat with lifting straps over the prop shafts will cause the shafts to become bent. Always position lifting straps so they are clear of the running gear.

1.10 Engine Instrumentation

The helm station is equipped with a set of engine instruments and alarms. These instruments allow the pilot to monitor the engine operational conditions. Close observation of these instruments allows the pilot to operate the engines at the most efficient level and could save the engines from serious costly damage.

Your boat is equipped with electronic diesel engines and electronic display systems that monitor all of your engine functions. Typically, these systems provide complete vessel information on a single display. They continuously monitor and report detailed information that can be displayed in a digital or simulated analog format.

The instrumentation is unique to the type of engines installed on your Wellcraft. Some or all of the following gauges may be present.

Tachometer

The tachometer displays the speed of the engine in revolutions per minute (RPM). This speed is not the boat speed nor necessarily the speed of the propeller.

CAUTION

NEVER EXCEED THE MAXIMUM RECOMMENDED OPERATION RPM OF THE ENGINE. MAINTAINING MAXIMUM, OR CLOSE TO MAXIMUM RPM FOR EXTENDED PERIODS CAN REDUCE THE LIFE OF THE ENGINE.

Temperature Gauge

The temperature gauge indicates the temperature of the engine cooling system. A sudden increase in the temperature could signal a blocked cooling passage or a water pump malfunction.

CAUTION

CONTINUED OPERATION OF AN OVERHEATED ENGINE CAN RESULT IN ENGINE SEIZURE. IF AN UNUSUALLY HIGH TEMPERATURE READING OCCURS, SHUT THE ENGINE OFF IMMEDIATELY. THEN INVESTIGATE AND CORRECT THE PROBLEM.

Oil Pressure Gauge

The oil pressure gauge monitors the engine lubrication system pressure. The oil pressure indicated when the engine is new is usually the reference for normal oil pressure for that engine. A drop in oil pressure is a possible indication of oil pump problems, a leak or fuel diluted oil.

Fuel Gauge

The fuel gauge indicates the amount of fuel in the fuel tank. This gauge is merely a relative indication of the available fuel supply and not a calibrated instrument.

Helm and Volvo Penta Multi Display

Voltmeter

The voltmeter displays the voltage for the battery banks and the charging system. The normal voltage is 11 to 12.5 volts with the engines off, and 13 to 14.5 volts with the engines running.

Hour Meter

The hour meter keeps a record of the operating time for the engine. The hour meters are located in the helm instrument panel, in the engine compartment, or integrated into the electronic display system.

Rudder Position Indicator (Optional)

The rudder position indicator shows the current position of the rudders. The rudder indicator gauge is not a calibrated instrument and is intended to show the approximate position of the rudders, primarily as a reference when maneuvering in tight quarters. Wind and currents will cause a deviation in the rudder indicator reading.

Fuel Management (Optional)

Fuel management systems are optional and could be installed on your boat. The fuel management gauge is used to monitor the gallons per hour and also total gallons used. If you have a fuel management system installed on your boat, please refer to the engine or fuel management manual for information on that system.

Engine Alarms

Most inboard engines are equipped with an audible alarm system mounted in the helm area that monitors selected critical engine systems. The alarm will sound if one of these systems begins to fail. Refer to the engine owner's manual for information on the alarms installed with your engine.

Typically, the alarm will sound in the event of: low engine oil pressure and high engine water temperature. It could also sound in the event of: excessive transmission temperature or low transmission oil pressure and excessive water in the fuel filters if your engines and filters are equipped with these sensors.

The engine alarm will sound during engine start-up or whenever the ignition switch is positioned to "ON" and the engine is not operating. The alarm sounds under these conditions because engine oil pressure is low. The alarm will cease to sound when the engine oil pressure rises to the proper level.

If an engine alarm sounds, immediately shut off the engine until the problem is found and corrected.

Refer to the engine owner's manual for information on the alarms installed with your engine.

Volvo Penta Multi Display System

Boats with Volvo diesel engines are equipped with an electronic display system that monitors all of your engine functions on one instrument at the touch of a button. Engine speed, coolant temperature, battery voltage, and boost pressure can be monitored in analog or digital display in 8 different languages. In addition to monitoring basic engine information, you can switch modes to monitor current or average fuel consumption.

The display can also communicate with the navigation system in the boat to provide boat speed and miles per gallon from data received from the GPS or fish finder log. The type of navigation equipment you have installed in your boat will determine the functions available.

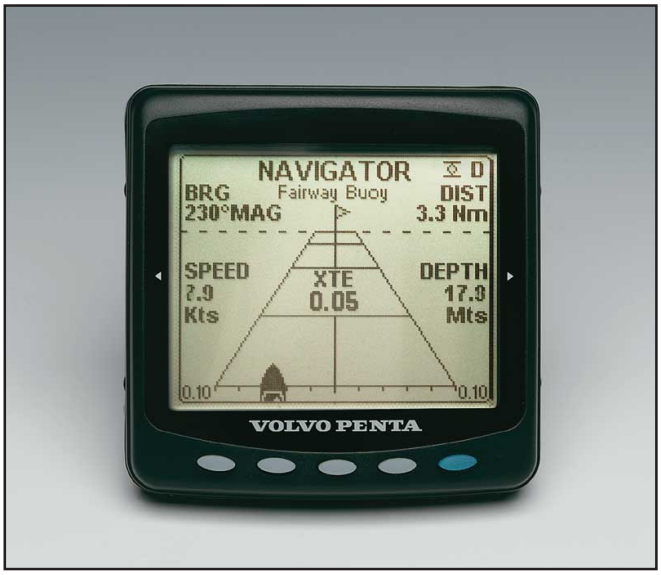
Refer to the Volvo engine and multi display owner's manuals for more information on the Volvo electronic engine monitoring system.

SmartCraft SC5000 Engine Monitoring System

The SmartCraft SC5000 engine monitoring system is installed with Cummins diesel engines. It provides complete vessel information on a single display. It continuously monitors and reports detailed information ranging from basic engine operating data, to water or waste tank levels. It is also capable of monitoring water temperature and depth, engine trim status, boat speed, and steering angle, if these optional items are integrated into the system. It can also be fully integrated with the boat's navigation system to provide up to the minute course, speed, and fuel-to-destination information, as well.

Additionally, it provides automatic engine maintenance reminders and a log recorder for periodic propulsion maintenance. The automatic system diagnostics center notes any alarms and displays information concerning alarm causes.

The SmartCraft engine monitoring system provides detailed information, on a color LCD display, in five categories: Propulsion Information, Vessel Information, Fuel Management, Navigation Information, and Maintenance and Diagnostic Information.



Volvo Penta Multi Display System

SmartCraft Engine Monitoring System

Refer to the SmartCraft SC5000 owner's manual for detailed information on the features and operation.

Volvo SeaKey™ (Standard with Volvo, optional with Cummins)

Your Boat could be equipped with a satellite-based communication system called SeaKey. When installed onboard, the system will connect the boat and crew to Volvo Action Service (VAS). SeaKey messages arrive at VAS (available 24/7/365), where coordinators will carry out the boat owner's predetermined instructions.

SeaKey provides theft protection and can notify the owner of high water in the bilge or low battery voltage. It also enables the boat to be tracked on a personal computer via built-in GPS capabilities and the internet.

The system also has an emergency signal button that can be pushed by boaters in case the boat breaks down or encounters an emergency situation. A green light on the SeaKey panel indicates the distress signal has been received.

Compass

The compass is on top of the console. To adjust the compass for your area, read the instructions on "Compass Compensation" given to you in the literature packet. The compass cannot be adjusted accurately at the factory because it must be compensated for the influence of the electrical equipment and electronics unique to your boat. Therefore, the compass should be adjusted by a professional after the electronics are installed and before operating the boat.

Instrument Maintenance

Electrical protection for instruments and ignition circuitry is provided by circuit breakers located on the engines. The ignition switch and instrument wire connectors should be sprayed periodically with a contact cleaner/lubricant. The ignition switch and all instruments, controls, etc. should be protected from the weather when not in use. Excessive exposure can lead to gauge and ignition switch difficulties.

Volvo SeaKey Panel
(Standard with Volvo, optional with Cummins)

THIS PAGE WAS LEFT BLANK
INTENTIONALLY

Chapter 2:
HELM CONTROL SYSTEMS

2.1 General

The helm controls consist of three primary control systems: the engine throttle/shift controls, the steering system, and the trim tab control switches. These systems provide the operator with the ability to control the direction and attitude of the boat from the helm station.

Each manufacturer of the control components provides an owner's manual with its product. It is important that you read the manuals and become familiar with the proper care and operation of the control systems.

2.2 Engine Throttle and Shift Controls

The shift and throttle controls on your boat may vary depending on the engines used. Diesel powered boats are equipped with electronic controls. The following control description is typical of most inboard controls. Refer to the engine or control manuals for specific information on the controls installed on your boat.

CAUTION

ALWAYS RETURN THE ENGINE THROTTLE LEVERS TO THE EXTREME LOW SPEED POSITION BEFORE SHIFTING. NEVER SHIFT THE UNIT WHILE THE ENGINE SPEED IS ABOVE 1000 RPM.

Electronic Engine Controls

Diesel powered boats are equipped with electronic engine controls. The shift and throttle control features may vary depending on the engines used. The following control description is typical of most engine and control installations. Refer to the engine or control manuals for specific information on the controls installed on your boat.

The helm is designed for a binnacle style control with a single lever for each engine. If your boat is equipped with the optional tower, the upper station will also be equipped with a single binnacle style control. The electronic control system consists of three major components: the electronic control head with integrated or separate keypad, the control processors and applicable harnesses. The controls are completely electronic and there are no cables.

Movement of the helm control arm sends a signal to the control processor, located in the engine compartment, that operates the engine throttle and transmission control valve. The controls have a single lever for each engine that operates as a gearshift and a throttle. General operation will include a position for neutral (straight up and down or slightly aft of vertical), a forward position (the 1st detent forward of neutral), and a reverse position (the 1st detent aft of neutral). Advancing the control lever beyond the shift range advances the throttle in forward or reverse. Each control is equipped with a means of permitting the engine to be operated at a higher than idle RPM while in neutral for cold starting and warm-up purposes. The control levers are equipped with adjustable control head detent and friction settings.

Volvo Electronic Control Head

The control head key pad has integrated switches and indicator lights which allow the operator to control all aspects of the boat's propulsion system. The most common features activated or monitored by the keypad are:

Typical Volvo Key Pad

- Gear lockout, which allows the engine RPM to be advanced in neutral safely.
- Station transfer that allows the operator to transfer control from one station to another with the push of a button on boats with an optional tower and two helm stations. Each station must be selected before the controls will operate from that station.

- An engine synchronization feature that automatically keeps both engines at the same RPM. Refer to Engine Synchronizer in this chapter for more information regarding engine synchronization.

- Trolling valve control (optional with Cummins diesel engines) which enables you to control the speed of the propeller with the engines idling. When this feature is activated, the clutches slip and the speed of the propellers can be increased or decreased by movement of the control handles. Engine throttle speed is maintained at idle while system is Troll Mode. When Troll Mode is cancelled, the clutches and controls return to normal operation.

These features and others not mentioned require specific procedures to activate and operate them properly. Some of the procedures and features are unique to the engines, drive system and other options installed on your boat. It is essential that you read the owner's manual for the controls and be completely familiar with their operation before using your boat.

2.3 Engine Synchronizer

During most operations of a twin engine boat, it is advantageous for both engines to be operated at the same RPM. This reduces noise and vibration, and can increased engine efficiency. Setting the throttles so that the engines are running the same RPM (synchronized) can be done by listening to the engine sounds or with the engine synchronizer built into the electronic controls. Attempting to synchronize the engines solely by using the tachometer readings or control lever placement generally will not work. When the engines are in proper synchronization, the throttle levers may not necessarily be even.

Electronic Control Synchronizer

The electronic controls for diesel engines have a synchronizer feature built into the control system. Dual lever synchronization is automatic and only operates in Ahead. "Cruise-Command" or automatic synchronization will always power up with synchronization enabled. In order for synchronization to become active, both control head levers must be in the Ahead position and the command throttles must be within 10% of one another. The synchronizer feature will then adjust the speed of the engines automatically to keep them at or near the same RPM. A green light in the control head key pad indicates engine synchronization.

Alternatively, the system can also utilize a single lever to command both engines and gears. When activated, the synchronizer feature utilizes a single lever to command both engine throttles and gears. It will adjust the speed of the slave engine to match the lead engine speed. The result of this is that the boat operator can control the speed of both engines merely by adjusting the speed of the master engine. The synchronizer adjusts slave engine speed automatically and continually, without any effort on the part of the boat operator. Typically, a light in the control head keypad turns on to indicate that one lever mode is active. Please refer to the engine control owner's manual for detailed information on the operation of the engine synchronizer.

2.4 Neutral Safety Switch

Every control system has a neutral safety switch. This device prohibits the engine from being started while the shift lever is in any position other than the neutral position. If the engine will not start, slight movement of the shift lever may be necessary to locate the neutral position and disengage the safety cutout switch. Control system adjustments may be required to correct this condition, should it persist. See your Wellcraft dealer for necessary control adjustments.

The neutral safety switch should be tested periodically to insure that it is operating properly. To test the neutral safety switch, move the shift levers to the forward position with the engines off. ***Make sure the throttle levers are set to the idle position.*** Activate the starter switch for each engine just long enough to briefly engage the starter. ***Do not hold the starter switch in the start position long enough to start the engine.*** The starter should not engage for either engine. Repeat this test with the shift levers in reverse and the engine throttles at idle. Again, the starter should not engage for either engine. If the starter for either engine engages with the shift controls in any position other than the neutral position, then the neutral safety switch is not functioning properly and you should contact your dealer and have the neutral safety switch repaired by a qualified technician before using your boat. If an engine starts in gear during this test, immediately move the shift levers to the neutral position and turn the engine off.

IN SOME SITUATIONS, IT MAY BE POSSIBLE TO ACCIDENTALLY START THE ENGINES IN GEAR WITH THE THROTTLES ABOVE IDLE IF THE NEUTRAL SAFETY SWITCHES ARE NOT OPERATING PROPERLY. THIS WOULD CAUSE THE BOAT TO ACCELERATE UNEXPECTEDLY IN FORWARD OR REVERSE AND COULD RESULT IN LOSS OF CONTROL, DAMAGE TO THE BOAT, OR INJURY TO PASSENGERS. ALWAYS TEST EACH NEUTRAL SAFETY SWITCHES PERIODICALLY AND CORRECT ANY PROBLEMS BEFORE USING THE BOAT.

2.5 Steering System

Your boat is equipped with a hydraulic steering system. The steering system is made of two main components: the helm assembly and the hydraulic cylinder. The helm unit acts as both a fluid reservoir and pump. Turning of the helm or steering wheel pumps the fluid in the hydraulic hoses and activates the hydraulic cylinder, causing the rudders to turn. A slight clicking sound may be heard as the wheel is turned. This sound is the opening and closing of valves in the helm unit and is normal. Refer to the steering manufacturer owner's manual for specific information on the steering system.

The tilt steering wheel can be tilted to five different positions by activating the tilt lock lever located on the bottom side of the helm station. When the lever is released, it automatically locks the steering wheel at or close to that angle.
Refer to the manufacturer owner's manual for specific information on the operation and maintenance for the steering system.

Dual engine inboard boats have two rudders which are offset from the propeller shaft center line to allow shaft removal without having to remove the rudders. They are coupled together at the tiller arms by a tie bar. The rudders are toed-in $^{1}/_{2}$" at the front to provide maximum stability on straight ahead runs and proper tracking through corners. Rudder or steering system damage may require the rudders to be realigned.

Tilt Steering Wheel

Trim Tab Plane

2.6 Trim Tabs

The trim tabs are recessed into the hull on the transom. Dual rocker switches in the helm, are used to control the trim tabs. The switches are labeled and control bow up and down movements. They also control starboard and port up and down movements. Bow up and bow down will control the hull planning attitude, while port and starboard up and down provides control for the hull listing.

Trim Tab Switch

Before leaving the dock, make sure that the tabs are in the full "UP" position by holding the control in the bow up position for ten (10) seconds.

Always establish the intended heading and cruise speed before attempting to adjust the hull attitude with the trim tabs. After stabilizing speed and direction, move the trim tabs to achieve a level side to side running attitude being careful not to over trim.

After depressing a trim tab switch, always wait a few seconds for the change in the trim plane to take effect. **Avoid depressing the switch while awaiting the trim plane reaction.** By the time the effect is noticeable the trim tab plane will have moved too far and thus the boat will be in an over-compensated position.

When running at a speed that will result in the boat falling off plane, lowering the tabs slightly, bow down, will improve the running angle and operating efficiency. Too much bow down tabs can reduce operating efficiency and cause substantial steering and handling difficulties.

Be extremely careful when operating in a following sea. The effect of trim tabs is amplified under such conditions. Steering and handling difficulties can result from improper trim tab usage, particularly in a following sea. Always raise the tabs to the full bow up position in these conditions.

When running at high speeds be sure that the tabs are in the full "UP" position. Only enough trim plane action should be used to compensate for any listing. Trim tabs are extremely sensitive at high speeds. Adjust for this and be prepared to slow down if difficulties arise.

When running into a chop, a slight bow down attitude will improve the ride. Be careful not to over trim. Handling difficulties may result.

2.7 Control Systems Maintenance

Control Maintenance

Periodic inspection of the control systems and all connections should be made. Signs of rust, corrosion, wear, or other deterioration should be serviced immediately. Generally, periodic lubrication of all moving parts and connections with a light waterproof grease is in order.

Lubrication should be performed as often as necessary to keep the system operating smoothly.

Control system adjustments may become necessary. If adjustment becomes necessary, see your Wellcraft dealer.

WARNING **DO NOT ATTEMPT CONTROL SYSTEM ADJUSTMENTS UNLESS YOU ARE FAMILIAR WITH CONTROL SYSTEM SERVICING PROCEDURES. MISADJUSTMENT CAN CAUSE LOSS OF CONTROL AND SEVERE ENGINE OR TRANSMISSION DAMAGE.**

Steering System Maintenance

A periodic inspection of all steering hoses, linkage and helm assemblies should be made. Signs of corrosion, cracking, loosening of fastenings, excessive wear, or deterioration should be corrected immediately. The fluid level for the hydraulic steering should be checked frequently and maintained at the proper level. The steering fluid level at the vent/fill plug at the helm should be maintained at no less than 1/2" below the bottom of the filler cap threads. If your boat is equipped with a tower, the steering fluid level must be checked and filled at the upper helm.

Generally, periodic lubrication of all moving parts and connections with a light waterproof grease is in order. Failure to do so could lead to steering system failure that would result in loss of control.

When new, or after repairs, hydraulic steering systems may need to have all air purged from the system. Only use hydraulic steering fluid recommended by the steering system manufacturer. Difficult steering and premature seal failure can result if the wrong fluid is used in the steering system. Review the information provided by the steering system manufacturer for proper specifications and details on system service and maintenance.

Helm Vent and Fill

Inboard boats also should be inspected periodically for leakage around the rudder ports. The rudder ports contain a lip seal that provides 100% water tight operation. The seals are self-lubricating and require no maintenance. If a rudder port is found to be leaking, please contact your Wellcraft dealer or Wellcraft Customer Service.

If the rudders have to be removed for any reason, the red plastic seal protector must be used to prevent the keyway in the rudder shaft from damaging the lip seal in the rudder port. The seal protectors are shipped with the boat.

WARNING **FAILURE TO PROPERLY INSPECT AND MAINTAIN THE STEERING AND CONTROL SYSTEMS CAN LEAD TO A CONTROL SYSTEM FAILURE AND LOSS OF CONTROL. MAKE SURE YOU INSPECT AND SERVICE THE STEERING AND ENGINE CONTROL COMPONENTS FREQUENTLY.**

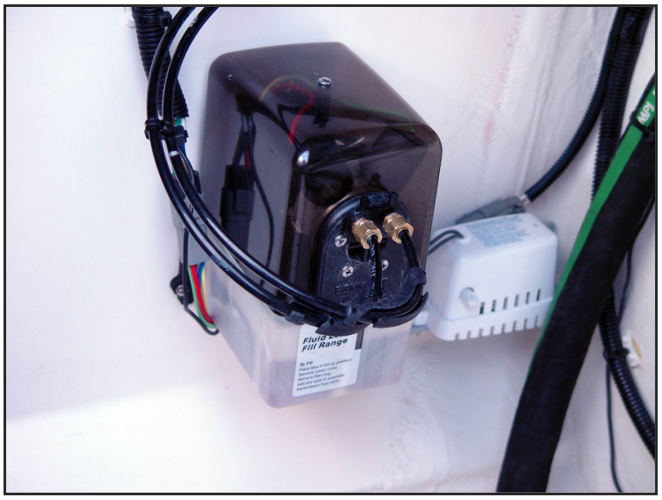
Trim Tab Maintenance

Marine growth can interfere with the proper operation of the trim tab planes and actuators. To reduce problems due to marine growth, always return the trim tabs to the full "UP" position after operating the boat and periodically inspect and clean marine growth from the actuators and planes.

The trim tab fluid should be checked often. Keep the fluid level between the marks on the trim tab pump reservoir. The pump and reservoir is located in the stern bilge below the aft cockpit hatch.

If your boat will be left in saltwater for extended periods, it will be necessary to install zinc anodes on the trim tab planes to prevent galvanic corrosion. Galvanic corrosion is the corrosion process occurring when different metals are submerged in an electrolyte. Seawater is an electrolyte and submerged metal components must be properly protected. The anodes will need to be monitored and changed when they are 50 - 75% of their original size.

Refer to the trim tab owner's manual for additional maintenance information, fluid specifications and operating instructions.



Typical Trim Tab Pump and Reservoir

THIS PAGE WAS LEFT BLANK
INTENTIONALLY

Chapter 3:
FUEL SYSTEM

3.1 General

The fuel system used in Wellcraft boats is designed to meet or exceed the requirements of the U.S. Coast Guard, the National Marine Manufacturer's Association, and The American Boat and Yacht Council in effect at the time of manufacture.

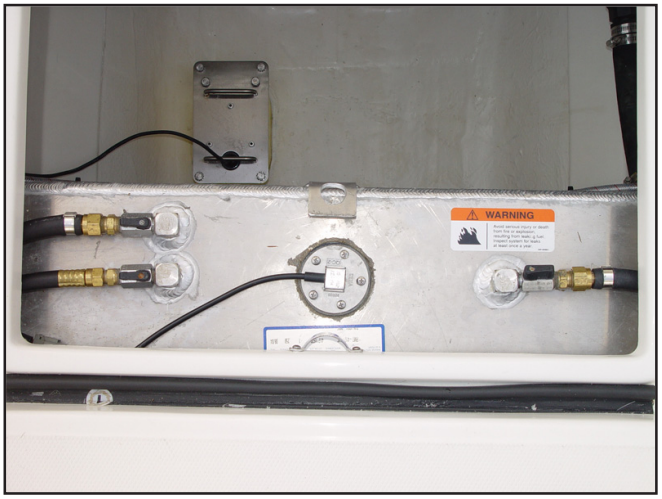
All fuel systems have been factory inspected and pressure tested in accordance with regulations in effect at the time of manufacture. This inspection assures that the system is air tight, leak proof and safe. It is the responsibility of the purchaser to maintain it in that condition. Make frequent inspections to assure that no deterioration or loosening of connections is resulting from vibration.

Fuel Fill

Fuel Withdrawal Tubes

The fuel withdrawal tubes are positioned in the fuel tank to achieve optimum fuel usage, fuel line routing, etc. At certain speeds and hull trim angles, the fuel supply at the withdrawal tank location can increase or decrease accordingly. Be extremely careful when attempting to operate the boat when low on fuel. Though some fuel may be in the tank, the relative trim angle of the boat may cause the fuel to flow away from the withdrawal tubes.

There is an on/off valve for each supply line located on the fuel tank near the withdrawal tube. The valves provide a means to turn off the fuel supply when servicing the fuel system. The rear access hatch in the cockpit sole provides access to the fuel valves, fuel gauge sending unit and other fuel system components.



Fuel Supply Valves and Fuel Gauge Sender

The optional generator is supplied fuel from a withdrawal tube that is shorter than the main engine tubes to prevent the generator from exhausting all the reserve fuel in the tank.

Fuel Gauge

This indicates the amount of fuel in the tank. Due to the mechanical nature of the fuel sender, variations in readings during various speeds of operation may occur. This system is merely a relative indication of the available fuel supply and not a calibrated instrument. The fuel gauge is located in the engine gauge cluster.

Fuel Fills

A fuel fill deck plate marked "Diesel" is located on each gunnel. The fuel fill is opened by turning it counter clockwise with a special key. After filling the tank, tighten the fill by turning it clockwise to secure the cap in the closed position.

Note: Do not over tighten the fuel cap. If the cap is over tightened, the O-ring seal could be damaged allowing water to contaminate the fuel system.

WARNING

DO NOT CONFUSE FUEL FILL DECK PLATES WITH THE WATER OR WASTE FILL DECK PLATES. THESE PLATES ALSO ARE LABELED ACCORDINGLY. IF FUEL IS ACCIDENTALLY PUMPED INTO THE WATER OR WASTE TANK, DO NOT ATTEMPT TO PUMP IT OUT YOURSELF. WATER AND WASTE PUMPS ARE NOT DESIGNED TO PUMP FUEL AND A FIRE OR EXPLOSION COULD RESULT. CONTACT YOUR SERVICE FACILITY OR THE WELLCRAFT CUSTOMER SERVICE DEPARTMENT FOR ASSISTANCE IN HAVING THE FUEL PROFESSIONALLY REMOVED.

3.2 Diesel Engine Fuel System

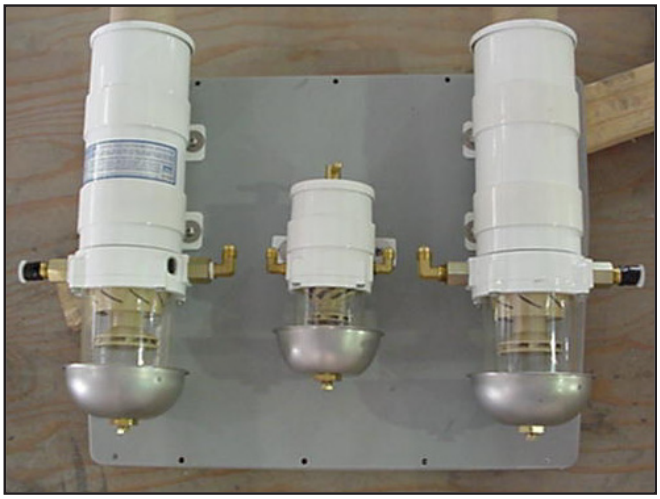
The fuel system on your boat has one fuel tank that fills from the starboard or port gunnel. Diesel engines circulate much more fuel than they consume to cool and lubricate the fuel injection system. There is a fuel supply and return line for each engine and the generator. The return lines return unused fuel to the fuel tank.

There is an on/off valve for each supply line located on the fuel tank near the withdrawal tube. The valves provide a means to turn off the fuel supply to service the fuel system. Always make sure all fuel valves are open when the engines are operating.

Proper diesel engine operation requires a good supply of clean, dry diesel fuel. Improper marina fuel storage techniques, limited boat usage, etc. can cause the fuel to become contaminated. Periodically, it may be necessary to pump accumulating water and contaminated fuel from the bottom of the fuel tank. If the fuel system on your boat becomes contaminated, contact your dealer or the Wellcraft Customer Service Department for assistance.

Bacteria, commonly called algae, can grow in the accumulated water in diesel fuel tanks. This condition is most prevalent in warm climates. Periods of storage or limited use allow the bacteria to accumulate, making the situation worse. Periodically adding a high quality diesel fuel conditioner containing a biocide may be required to control bacteria in your boating area. Please contact your Wellcraft dealer or engine manufacturer for additional information regarding fuels and additives.

Note: Do not allow the boat to sit unused for an extended period with the fuel tanks less than full. Changes in temperature and weather conditions can cause condensation in fuel tanks that are less than 3/4 full.



Diesel Engine and Generator Fuel Filters

Diesel Fuel Filters

The diesel fuel filters are installed in the engine compartment on the rear engine room bulkhead. A shut-off valve is located on each fuel line at the withdrawal tubes on the fuel tank. The valves should always be closed before servicing the fuel filters.

Check the filters for water before each use and replace the filter element as needed. Water is drained from the filters by placing a cup under the filter and draining through the plug at the bottom of the filter until clean fuel flows. It is particularly important to monitor the condition of the fuel filters frequently because diesel engines circulate much more fuel than they consume. Follow the filter or engine manufacturer's instructions for cleaning and replacing the filter elements.

Note: Diesel fuel systems may need to be primed after servicing. Refer to the engine owner's manual for information on priming the fuel system.

3.3 Generator Fuel System

The generator fuel system is much like the primary engine fuel system. Diesel engines have a fuel supply and a fuel return line. A fuel shut-off valve is located on the fuel line near the fuel tank. The valve should always be closed before servicing the fuel filter.

The generator withdrawal tube is shorter than the main engine withdrawal tubes to prevent the generator from consuming the reserve fuel. Therefore, the generator will run out of fuel if the fuel level drops below 1/4 of the tank.

A water separating fuel filter is located near the primary filters on the rear engine room bulkhead. Water is drained from the filter by placing a cup under the filter and draining through

the plug at the bottom of the filter until clean fuel flows. The filter should be checked for water before each trip and the cartridge replaced when the main engine fuel filters are changed.

DANGER

TO REDUCE THE POSSIBILITY OF A FIRE OR EXPLOSION, MAKE SURE ALL ELECTRICAL SWITCHES ARE IN THE "OFF" POSITION BEFORE SERVICING THE FUEL SYSTEM.

WARNING

DO NOT DRAIN ANY FUEL IN THE BILGE. THIS COULD LEAD TO A FIRE OR EXPLOSION.

CHECK ALL FUEL LINE FITTINGS FOR LEAKS BEFORE AND AFTER STARTING THE ENGINES FOLLOWING ANY FUEL SYSTEM SERVICE.

3.4 Fueling Instructions

WARNING

FUEL IS VERY FLAMMABLE AND CAN CAUSE A FIRE OR AN EXPLOSION. BE CAREFUL WHEN FILLING THE FUEL TANK. NO SMOKING. NEVER FILL THE TANK WHILE THE ENGINES ARE RUNNING. FILL THE FUEL TANK IN AN OPEN AREA. DO NOT FILL THE TANK NEAR OPEN FLAMES.

CAUTION

TO PREVENT DAMAGE TO THE FUEL SYSTEM, USE ONLY A GOOD GRADE OF DIESEL FUEL FOR DIESEL ENGINES. REFER TO THE ENGINE MANUFACTURER OWNER'S MANUAL REGARDING FUEL REQUIREMENTS FOR YOUR ENGINE.

To fill the fuel tank at a marina, follow this procedure:

1. Make sure all switches, including the blower, are in the "OFF" position.
2. Make sure the boat is securely moored.
3. Make sure all passengers leave the boat.
4. The engines should be turned off.
5. The windows and deck hatches should be closed.
6. Estimate how much fuel is needed.

Note: When the fuel tank is full, fuel will come out through the fuel tank vent. The fuel tank vent is located on the side of the boat. Monitor the vents closely while fueling to prevent fuel from spilling into the water.

5. A special key to open the fuel caps is supplied. Turn the key counter clockwise to open the cap.
7. Remove the cap.
8. Put the nozzle in the fuel opening.

WARNING

STATIC ELECTRICITY CAN BE GENERATED WHILE FUELING AND CAN CAUSE A FIRE OR EXPLOSION. TO PREVENT STATIC SPARKS WHEN FILLING THE TANK, MAKE SURE THE NOZZLE IS IN CONTACT WITH THE FUEL OPENING.

WARNING

SPILLED FUEL CAN CAUSE A FIRE OR AN EXPLOSION. MAKE SURE YOU DO NOT SPILL ANY FUEL. IF A SMALL AMOUNT OF FUEL IS SPILLED ON THE FIBERGLASS, USE A CLOTH TO REMOVE THE FUEL, AND PROPERLY DISPOSE OF THE CONTAMINATED CLOTH. IF FUEL IS SPILLED ON THE WATER, EXERCISE EXTREME CAUTION. FUEL FLOATS ON THE SURFACE OF THE WATER, AND CAN IGNITE. IF FUEL IS SPILLED INTO THE WATER, IMMEDIATELY EVACUATE THE AREA AND NOTIFY THE MARINA AND THE PROPER OFFICIALS.

9. Fill the tank slightly less than the rated capacity to avoid spilling fuel out of the vent or the fuel fill and to allow for expansion.
10. Remove the nozzle.
11. Install the fuel cap.
12. Check the fuel compartment and below the deck for fuel odors. If you smell fuel, do not start the engine. Investigate and correct any problems before using the boat.

3.5 Fuel System Maintenance

Periodically inspect all connections, clamps and hoses for leakage and damage or deterioration. Replace as necessary. Spray the valves, tank fuel gauge sender and ground connections with a metal protector.

Frequently inspect and lubricate the fuel fill cap O-ring seal with petroleum jelly or silicone grease. The O-ring seal pre-

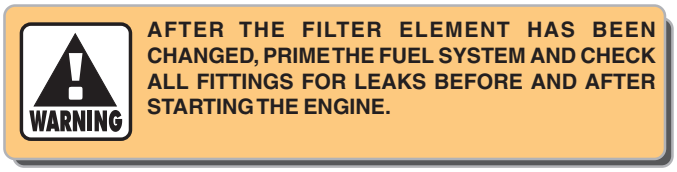
vents water from entering the fuel system through the fuel fill cap and it should be replaced immediately if there is any sign of damage or deterioration.

Contaminated fuel may cause serious damage to your engines. The filters must be checked for water and other contamination frequently. The filter elements must be changed at least once a season or more frequently depending on the type of engine and the quality of the fuel. Please refer to the engine or fuel filter manufacturer's instructions for information on servicing and replacing the fuel filter elements.

Algae can grow in the accumulated water in diesel fuel tanks. This condition is most prevalent in warm climates. Periodically adding a high quality diesel fuel additive containing an algaecide may be required to control algae in your boating area. Since algae also can grow in accumulated water in the fuel filters, it is important to run the main engines and the generator for at least 30 minutes after the algaecide has been added so it will be circulated throughout the fuel system. This is even more important during periods of storage or if the boat is not used enough to require refueling at least once a month.

Severe algae in a diesel fuel system can be extremely difficult and expensive to clean. You should be diligent in monitoring the fuel system by checking the filters for water frequently and being alert for signs of algae in fuel that is drained from the filters. Most algae appears as black, carpet like, fibers suspended in fuel and water drained from the filters. Severe cases of algae will produce a black jelly like substance that quickly clogs the filters and starves the engines for fuel.

Please contact your Wellcraft dealer or engine manufacturer for additional information regarding fuels and additives.



Chapter 4:

ELECTRICAL SYSTEM

4.1 General

Your Wellcraft is equipped with 120-volt AC and 12-volt DC electrical systems. The AC system can draw current from one of two sources, either shore power outlets at dock side or the optional generator. The DC system draws current from on board batteries.

Your boat and engine charging system is designed for 12-volt, lead acid, wet cell marine batteries. They will require similar maintenance as those found in automobiles. Do not attempt to use gel cell, absorbed wet mat or other non wet cell batteries. The engine charging system is not designed to recharge these batteries which could cause unusually short battery life or engine starting problems. You also should not mix the size or brand of the wet cell batteries. Always consult your Wellcraft dealer before changing the type of batteries in your boat.

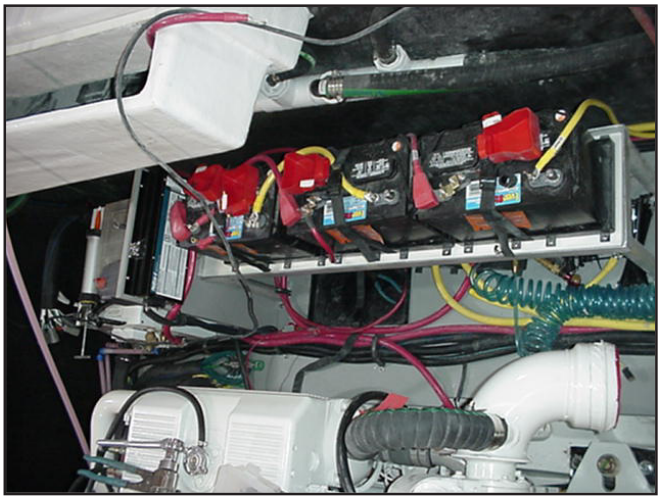
All wires in the AC or DC electrical systems are color coded to make identifying circuits easier. Wiring schematics and a wire code identification list have been included with this manual to aid in following an individual circuit of the boat.

4.2 12-Volt System

The 12-volt system is a typical marine system. There are three primary battery banks, one for the starboard engine, one for the port engine and house or accessories and one to supply power to the optional bow thrusters and for starting the generator. The batteries can be charged by the engines or by the battery charger when hooked to shore power or when operating the optional generator.

All 12-volt power is distributed to the 12-volt accessories through individual circuit breakers located in the 12-volt breaker panel in the cabin and the breaker panel in the helm. Main fuses located near the batteries protect the primary DC systems from an overload. "Push to reset," continuous power circuit breakers on the cabin breaker panel protect the automatic circuits for the bilge pumps, high water alarm and bilge pump, CO monitor, ECM for each engine, stereo memory, cabin drain sump pump, SeaKey and entry lights. Another heavy duty "Push to Reset" breaker protects the circuit for the windlass.

Main breakers located on each engine protect the ignition systems and gauges. Some 12-volt accessories are operated directly by a circuit breaker in the breaker panels while others are operated by a switch fed by the breakers. Most of the 12-volt accessories on the deck and cockpit are operated by switches in the helm switch panels.



12-Volt Battery Banks

The system is equipped with a battery parallel feature that will connect both engine battery banks in parallel for extra battery power while starting the engines. A momentary switch located in the helm switch panel activates the battery parallel relay located near the battery switches in the engine compartment. When the switch is pressed, the relay is engaged to connect both engine starting battery banks, when the switch is released, the relay is deactivated and the battery banks are isolated.

CAUTION

PROPER FUSE OR BREAKER PROTECTION MUST BE PROVIDED FOR ALL 12-VOLT EQUIPMENT ADDED. DO NOT OVERLOAD THE ACCESSORY CIRCUIT BREAKERS OR OTHER CIRCUITRY THROUGH ADDITIONAL 12-VOLT EQUIPMENT.

Battery Switches

There are three ON - OFF battery switches located on the DC breaker panel in the cabin. The switches are labeled and activate the heavy duty battery switch relays located near the batteries in the engine room. Each battery switch relay has a manual override that can activate or deactivate the switch if the relay fails. The manual override is a red knob on each battery switch/relay that can rotated to select the "ON" or "OFF" position.

The port battery switch activates the port engine and the 12-volt breaker panel in the cabin and all other 12-volt accessories, the starboard battery switch activates the starboard engine, and the genset battery switch activates the generator engine circuit and the circuit for the optional bow thruster. Make sure that the port engine, starboard engine, generator and the DC accessory breakers are in the "ON" position whenever the engines are running to insure that all 12-volt accessories will operate when they are needed.

When the engines are started and the battery switches are on, the engine alternators will recharge the batteries. The batteries are also charged automatically whenever the AC system is activated by shore power or the generator and the battery charger is activated. The battery switches do not have to be on to charge the batteries with the battery charger.

An automatic isolator controls the charging of all three battery banks whenever one or both of the engines is operating. When one or both engines is started, the engine alternators start to recharge the batteries. This charging current passes through the isolator sensing circuit. This circuit senses the charge and connects the charging current for the engine battery banks in parallel with the generator starting battery bank. Thus the charge from the engines is split between the batteries, with the lowest battery bank receiving the most charge. When the engines are turned off, the charging stops and the sensing circuit disconnects the battery banks, thereby automatically isolating the battery banks from one another. The system is equipped with a battery parallel feature that will connect the engine starting batteries in parallel for extra battery power while starting the engines.

Note: Some diesel engines may have induction air heaters to reduce smoke and improve cold weather starting. These heaters cycle on and off every 20 to thirty seconds while the engines are warming up and will cause the voltmeters to fluctuate, The fluctuation is particularly noticeable at idle. Once the engines are started, monitor the voltmeters carefully. If one or both of the voltmeters read below 12 volts after one minute, raise the engine RPM to 1200 for several seconds then return them to idle. This will "excite" the alternators and cause them to activate.

When in port or at anchor, the switch that supplies the starboard engine and the switch that supplies the generator engine should be off. Only the port battery switch should be on. This will keep the starboard engine and generator starting batteries in reserve for starting the engines. All three battery switches should be in the "OFF" position when leaving the boat unattended. If all the battery switches are left "ON" when the boat is at rest and unattended, it is possible for all of the primary engine starting batteries to go dead if 12-volt accessories are left on.

Battery Switches and Main Fuses

Port Helm Switch Panel

Port Helm Switch Panel

Note: Current is supplied to the automatic float switches for the bilge pumps, high water alarm and bilge pump, engine ECM circuits, SeaKey, CO monitor, entry lights and the stereo memory when the batteries are connected and the battery switches are off.

4.3 12-Volt Accessory Switch Panels

Helm Switch Panels

The main accessory switch panels are located at the helm. Most circuit breakers that protect the accessories are located in another panel on the helm below the starboard helm switch panel.

The following is a description of the accessories controlled by the main accessory switch panels:

Fwd Bilge

Activates the forward bilge pump below the cabin sole. The pump moves water out through the thru-hull fitting in the hull. To start the pump manually, place the switch in the "ON" position.

Mid Bilge

Activates the bilge pump which is installed in the engine room bilge. The pump moves water out through the thru-hull fitting in the hull. To start the pump manually, place the switch in the "ON" position.

Aft Bilge

Activates the stern bilge pump which is installed in the rear center of the bilge near the transom. The pump moves water out through the thru-hull fitting in the trim tab pocket. To start the pump manually, place the switch in the "ON" position.

High Water Bilge

Activates the stern high water bilge pump which is installed in the rear center of the bilge near the transom. The pump moves water out through the thru-hull fitting in the trim tab pocket. To start the pump manually, place the switch in the "ON" position.

Note: The bilge pumps will start automatically when there is sufficient water in the bilge to activate the float switches. The float switches are protected by "Push to Reset" circuit breakers on the cabin DC breaker panel and are always supplied current when the batteries are connected.

Courtesy Lights

Activates the lights that illuminate the cockpit area.

Helm Switch Panel

Engine Room Lights

Activates the lights that illuminate the engine room.

Anchor/Nav Lights

The switch is a three-position switch. The middle position is "OFF." Moving the switch in one direction will activate the navigation and gauge lights. Moving the switch in the opposite direction activates the anchor light.

Horn

Activates the boat horn.

Windlass Switch

The windlass control switch is located in the helm. This switch controls the windlass which is mounted to the deck directly above the rope locker. It is protected by a main circuit breaker of the type and rating recommended by the windlass manufacturer located in the cabin DC breaker panel and another circuit breaker in the helm circuit breaker panel.

Windshield Actuator

Activates the electric ram that opens and closes the center windshield panel that provides ventilation for the operator and cockpit.

Red Lights/White Lights

Activates the overhead lights in the hardtop. The switch is a three-position switch. The middle position is "OFF." Moving the switch in one direction will activate the white overhead lights. Moving the switch in the opposite direction activates the red overhead lights.

Note: Red lights have less effect on night vision and should selected if you need to illuminate the bridge deck while navigating at night.

Blowers
This switch supplies electrical current to the blowers that provide ventilation and cooling to the engine room while operating the main engines or the generator. ***It should always be activated prior to start up and while operating below cruise speed.***

Always check the blower exhaust vents for proper air flow when the blowers are activated. A substantial amount of air should be exhausted by the blower.

The blowers are protected by circuit breakers located in the helm circuit breaker panel.

Dimmer
Controls the intensity of the instrument lights in the helm.

Forward Spreader
Activates the forward flood light located on the hardtop or optional tower. This light provides lighting for the forward deck area.

Wiper
Activates the windshield wipers. The wipers automatically park to the side of the windshield panel when the switch is turned off.

Battery Parallel
The battery parallel switch is a momentary switch that will connect both engine starting battery banks in parallel for extra battery power while starting the engines.

Accessory
Protects additional equipment that may have been installed by Wellcraft or your Wellcraft dealer. If no accessories are activated by this switch, It remains wired in the panel in reserve.

Accessory
Protects additional equipment that may have been installed by Wellcraft or your Wellcraft dealer. If no accessories are activated by this switch, It remains wired in the panel in reserve.

Accessory
Protects additional equipment that may have been installed by Wellcraft or your Wellcraft dealer. If no accessories are activated by this switch, It remains wired in the panel in reserve.

Aft Spreader
Activates the aft flood lights located on the hardtop or optional tower. These lights provide additional lighting for the rear of the cockpit.

Typical Ignition Switches and Spot Light Control Panel

Additional Accessory Switch Panels

Additional switch panels are located in various locations in the helm, cockpit and cabin. The following is a description of additional panels that may be on your Wellcraft and the accessories they control:

Ignition Switches
Some ignition switches require keys and some are toggle switches. The port switch activates the port engine and the starboard switch activates the starboard engine. Most switches have an off, on and momentary start position. To start the engine, make sure the shift lever is in the neutral position and your hand is on the throttle lever in the idle position. Turn the key or switch to the start position. When the engine starts release the switch and it will automatically return to the run position. Stop the engine by turning the switch to the off position. The ignition switches are protected by the main breaker located on the engine and breakers in the cabin DC breaker panel.

Note: Some Diesel engines use a separate stop switch or momentary stop position on the key switch to turn off the fuel and stop the engine. If your boat is equipped with diesel engines and stop switches, make sure that you leave the ignition switches on until the engines are stopped. If the key switches have a momentary stop position, make sure you turn and hold the key in the stop position until the engine stops running before selecting the "OFF" position. The alternators could be damaged if the ignition switches are turned off while the engines are running.

Trim Tab Switch Panel
Located on the helm. These switches control the trim tab planes located on the transom of the boat. It is protected by a circuit breaker in the helm breaker panel. Please refer to Helm Control Systems chapter for detailed information on the operation of the trim tab controls.

Automatic Fire Extinguisher Indicator Panel and Override Switch
The panel is equipped with lights that indicate the status of the automatic fire extinguishing system. The green light indicates the system is charged and ready. The red light indicates the system has discharged.

The system is completely automatic and will shut down the engines when it is activated. The panel on diesel powered boats is equipped with an override switch that enables the operator to restart the engines when he has determined it is safe to do so. This is because diesel engines will consume fire extinguishing agent and must be shut down by the system when it is activated. Refer to the Automatic Fire Extinguishing System in the Safety Equipment chapter and the manufacturer's owner's manual for more information on the operation of the automatic fire extinguishing system.

Stereo Control Pad
Located in the helm. Controls the stereo that is mounted in the dinette. Refer to the stereo owner's manual for details on operating the stereo control pad.

Bow Thruster (Optional)
This touch pad control panel is located in the helm and controls the optional bow thruster that is mounted to the hull in the bilge below the V-berth. The bow thruster provides the operator additional control of the bow while docking or anchoring the boat in tight quarters or high winds and strong currents.

The momentary touch pad buttons are activated by the rocker switch next to the touch pad and control port and starboard movement of the bow. The arrow on each button indicates the direction the bow will move when it is pressed. The bow thruster will stop when the button is released. Always turn the rocker switch off to deactivate the touch pad when the thruster is not being used.

Bow Thruster Control Panel

Refer to the bow thruster owner's manual for details on operating the bow thruster and using the control pad.

Spot Light (Optional)
Located in the helm. Controls the spot light that is mounted on the hard top. Refer to the spot light owner's manual for details on operating the control pad.

Helm Accessory Circuit Breakers
Power is distributed to most of the 12-volt accessories activated by the helm switch panel through individual "push to reset" circuit breakers located in the DC breaker panel below the helm switches. A main fuse, located near the batteries in the engine compartment and the Helm Main breaker in the cabin DC breaker panel protects the system from an overload. Some 12-volt accessories are operated directly by the circuit breaker in the panel while others are operated by switches fed by the panel breakers.

Cockpit Switch Panel
The cockpit switch panel is located on the starboard side of the cockpit, next to the transom door. The shore power inlet plugs and circuit breakers are also in this panel. There are also inlet plugs for the TV cable and telephone. The switches are protected by circuit breakers in the cabin DC breaker panel. The following is a description of the switches and the accessories they control:

Hatch Lift
It is a momentary switch that controls the electric actuator for the engine hatch. The center position is off. Hold the

switch up to raise the hatch and hold the down to close it. Refer to the Exterior Equipment chapter for additional information on the engine hatch lifter.

Fishbox Pump Out
This is a momentary switch that activates the overboard macerator discharge system for the fishbox. The macerator pump should not be allowed to run dry. You should monitor the pump discharge and turn the switch off as soon as the fishbox is pumped out. A momentary switch is used because the pump could be damaged if it is allowed to run dry for long periods.

Raw Water Washdown
This switch activates the pump that supplies water to the raw water washdown. The pump is the pressure demand type and is protected by a circuit breaker in the panel and an automatically resetting breaker on the pump motor.

Baitwell Pump
This switch activates the pump that supplies water to the baitwell and the baitwell light.

Note: Please refer to the Raw Water System chapter for more information on the baitwell and washdown systems.

Entry Lights
Activates the lights that illuminate the cockpit.

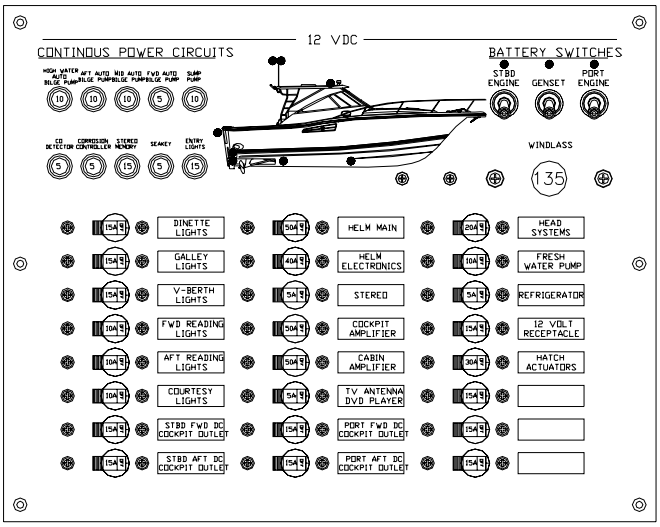
Head Switch Panel
Controls the lights and the marine toilet system in the head compartment. The following is a description of the switches and the accessories they control:

Head Lights
Activates the lights that illuminate the head compartment and shower.

Head Blower
Activates the exhaust blower for the head compartment.

VacuFlush/Overboard Discharge
A three position switch that controls the marine toilet and overboard discharge system. The middle position is "OFF." Moving the switch in one direction will activate vacuum pump for the marine head. Moving the switch in the opposite direction activates the overboard macerator discharge system. There is a key switch next to the switch that must be on in order to activate the overboard macerator discharge system.

Cockpit Switch Panel and Shore Power, TV and Telephone Inlet Plugs



Cabin DC Panel

4.4 Cabin DC Accessory Breaker Panel

Power is distributed to the cabin 12-volt accessories through individual circuit breakers located in the cabin DC breaker panel. A main fuse located near the batteries in the engine compartment protects the system from an overload. Some 12-volt accessories are operated directly by the circuit breaker in the panel while others are operated by switches fed by the panel breakers. LED lights on the boat profile outline on the DC panel indicate the activation of selected critical systems. There is a delay of approximately 2 seconds from the time the system is activated until the light glows.

The following is a description of the accessories controlled by the cabin DC breaker panel:

Continuous Power Circuits
The continuous power circuits are always activated whenever the batteries are connected. These "Push to Reset" breakers supply power to critical systems and do not turn off when the battery switches are turned off. The accessories they protect are as follows:

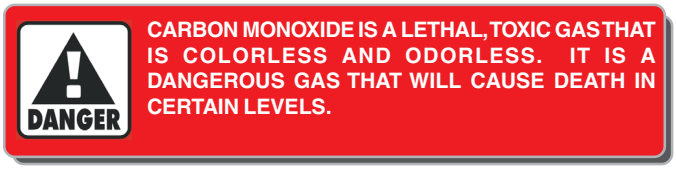
High Water Auto Bilge Pump
Protects the circuit for the automatic switches that sound the alarm and activate the high water bilge pump. A red light in the DC breaker panel and a horn will activate to warn the operator if the bilge water level rises above the normal operating range of the bilge pump automatic switches. This system should be tested periodically and prior to operating the boat offshore to make sure it is operating properly.

Aft Auto Bilge Pump
Protects the circuit for the automatic switch that activates the stern bilge pump located in bilge below the stern access hatch. A red light in the DC breaker panel will light whenever the pump is activated.

Mid Auto Bilge Pump
Protects the circuit for the automatic switch that activates the bilge pump located in engine room bilge. A red light in the DC breaker panel will light whenever the pump is activated.

Fwd Auto Bilge Pump
Protects the circuit for the automatic switch that activates the bilge pump located in bilge below the cabin sole. The pump and switch are accessed through a hatch below the cabin steps. A red light in the DC breaker panel will light whenever the pump is activated.

CO Detector
Protects the circuit for the carbon monoxide detector in the cabin. The power indicator on the carbon monoxide detector should be lit whenever someone is occupying the cabin. If the breaker has tripped, it indicates that there is a problem with the carbon monoxide detector, the breaker, or the wiring from the breaker panel to the detector. Always determine the cause of the problem and correct it before resetting the breaker.



Corrosion Controller
Protects the Active Corrosion protection unit located on the transom below the waterline. This unit is always activated and provides additional protection for the running gear and other metal hardware below the waterline. It is a solid-state device that provides protection by impressing a reverse blocking current that stops or reduces the destructive flow of galvanic currents and typically increases the life of the sacrificial anodes.

Note: The electronic corrosion control is not to be connected until the boat is in the water. Then, it takes up to two weeks for the red light to turn green. When the boat is hauled the device is to be disconnected from power.

Sump Pump
Protects the circuit for sump pump for the galley sink, head sink, and shower drain. The sump is fully automatic and is accessed through a hatch below the cabin steps.

Stereo Memory
Protects the circuit that supplies continuous 12-volt electrical current to the memory circuit in the stereo.

SeaKey (Standard w/ Volvo and Optional w/ Cummins)
Protects the circuit that supplies continuous 12-volt electrical current to the SeaKey system. SeaKey provides theft protection and can notify the owner of high water in the bilge or low battery voltage. It also enables the boat to be tracked on a personal computer via built-in GPS capabilities and the internet.

Entry Lights
Protects the circuit that supplies continuous 12-volt electrical current to the Entry Light switch near the transom door in the cockpit. This switch activates the lights that illuminate the cockpit.

Battery Switches
These switches activate solenoids on the main battery switches located in the engine room near the batteries. Each battery switch is equipped with a manual override to enable the operator to activate the switch in the event that the remote circuit fails. A green "Power Available" light glows when the switch is activated. There is typically a two second delay from the time the battery switch is activated until the Power Available light glows. The battery switches should always be turned off when leaving the boat unattended.

Stbd Engine
An ON/OFF switch that activates the primary circuit for the starboard engine. The starboard engine circuit is the only circuit activated by this switch. This switch should be off whenever the boat is in port or at anchor to keep this circuit

in reserve for starting the engines in the event that the other battery banks become discharged.

Genset
An ON/OFF switch that activates the primary 12-volt circuit for the generator and the circuit for the optional bow thruster. The Generator switch should be off whenever the boat is in port or at anchor to keep this circuit in reserve for starting the engines in the event that the other battery banks become discharged. Always make sure this switch is activated with the engine circuits to ensure the bow thruster will be available when needed.

Port Engine
An ON/OFF switch that activates the primary 12-volt circuit for the port engine and the 12-volt accessory circuits. The Port Engine switch should be on whenever the boat is in port or at anchor to activate the house and cockpit DC accessories.

Windlass Circuit Breaker
The windlass breaker is a "Push to Reset" breaker located below the battery switches in the cabin DC panel that protects the primary circuit for the optional windlass. It is a heavy-duty breaker that requires a firm push to be reset.

Accessory Circuit Breakers
Dinette Lights
Supplies 12-volt electrical current to the light switches in the dinette.

Galley Lights
Supplies 12-volt electrical current to the light switches for the galley.

V-Berth Lights
Supplies 12-volt electrical current to the light switches in the V-Berth.

Fwd Reading Lights
Supplies 12-volt electrical current to the switches built into the light fixtures on the forward V-Berth bulkhead. The knob on the switch rotates to control the intensity of the light.

Aft Reading Lights
Supplies 12-volt electrical current to the switches built into the light fixtures above each end of the dinette lounge seat. The knob on the switch rotates to control the intensity of the light.

Courtesy Lights
Supplies 12-volt electrical current to the courtesy lights near the cabin sole. The lights are activated by a switch next to the cabin door.

Stbd Fwd DC Cockpit Outlet
Supplies 12-volt electrical current to the DC accessory outlet in the cockpit below the gunnel near the baitwell.

Stbd Aft DC Cockpit Outlet
Supplies 12-volt electrical current to the DC accessory outlet in the rear cockpit below the gunnel near the starboard hawse pipe.

Helm Main
Supplies 12-volt electrical current to the helm switch panels and accessories. It also supplied current to the aft cockpit switch panel located next to the cockpit door.

Stereo
Supplies 12-volt electrical current to the stereo.

Cockpit Amplifier
Supplies 12-volt electrical current to the amplifier for the speakers in the cockpit.

Cabin Amplifier
Supplies 12-volt electrical current to the amplifier for the speakers in the cabin.

TV Antenna/DVD Player (Optional)
Supplies 12-volt electrical current to the optional DVD player. Also supplies current to the TV gain control located behind the TV in the galley.

Rotate the knob to adjust the TV antenna amplification for best picture quality. Turn up the gain to full where the stations are weak, or attenuate where the signals are strong. Refer to the TV antenna owner's manual for information on the TV antenna and gain control.

Port Fwd DC Cockpit Outlet
Supplies 12-volt electrical current to the DC accessory outlet in the cockpit below the gunnel near the bait prep station.

Port Aft DC Cockpit Outlet
Supplies 12-volt electrical current to the DC accessory outlet in the cockpit below the gunnel near the port hawse pipe.

Head Systems
Supplies electrical current directly to the vacuum pump on the electric head system and the overboard macerator pump out system. A vacuum switch on the pump automatically controls the pump and maintains proper vacuum in the system.

Fresh Water Pump
Supplies 12-volt electrical current to the fresh water system. The pump is the pressure demand type and is protected by the circuit breaker in the panel and an automatically resetting breaker on the pump motor.

Refrigerator
Supplies 12-volt electrical current directly to the refrigerator when 120-volt AC current is not being used.
12-Volt Receptacle
Supplies electrical current for portable 12-volt equipment.

Hatch Actuators
Supplies 12-volt current to the switch that activates the actuators that raise the bridge deck. Note that the House battery switch must be turned on for the hatch lifter to operate.

Spare
Reserved for additional 12-volt equipment.

Spare
Reserved for additional 12-volt equipment.

Spare
Reserved for additional 12-volt equipment.

Additional DC Fuses and Circuit Breakers
Port DC Main
The DC power fuse is located near the port engine battery bank and provides protection for the port engine primary circuit and all DC power to the Cabin DC breaker panel.

Starboard DC Main Fuse
A main DC power fuse that is located near the Starboard engine battery bank and provides protection for the starboard engine primary circuit.

Port DC Main Fuse
A main DC power fuse that is located near the port engine battery bank and provides protection for the port engine and all DC power to the Cabin DC breaker panel.

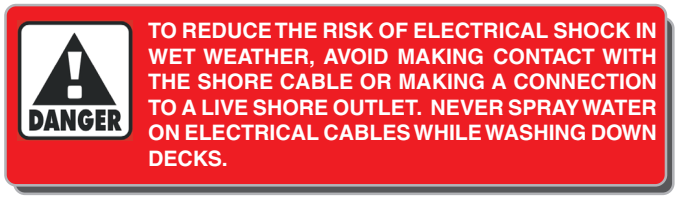
Generator DC Main Fuse
A main DC power fuse that is located near the generator engine battery bank and provides protection for the generator engine primary circuit and the circuit for the optional bow thruster.

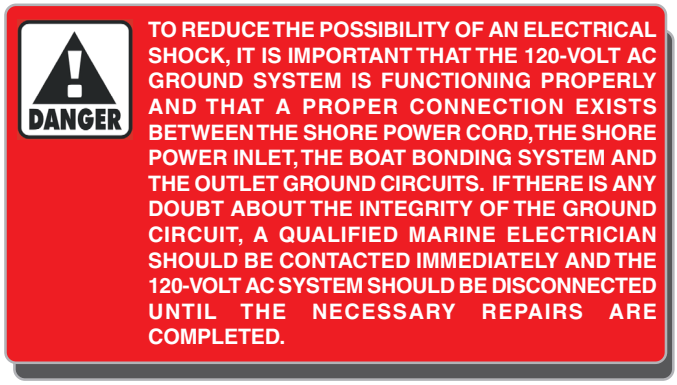
Engine Circuit Breakers
There are circuit breakers located on each engine that provide protection for the ignition systems, charging system and other accessories unique to the engines installed in your boat. Please refer to the engine owner's manual for information on the circuit breakers installed on your engines.

4.5 120-Volt System

Your boat is equipped with two 30 amp shore power cords and inlets located below the gunnel on the starboard side of the cockpit near the transom door. There is a main circuit breaker for each power cord located near the inlets and a main breaker for each circuit in the AC breaker panel located in the cabin. The AC system can be fed by either the shore power inlets or by the generator. It is wired totally separate from the 12-volt DC system and is equipped with an on board isolation system. The main breakers in the AC panel are used to select the source of power desired, Shore 1, Shore 2, or the Generator. The AC main breakers must be switched to the "OFF" position before selecting a different power source.

All AC current is distributed to the AC accessories through individual circuit breakers located in the cabin AC panel. The main breakers in the panel protect the system from an overload and the reverse polarity lights indicate any problems due to an improper shore power supply. All AC outlets in the cabin are protected by ground fault interrupts to protect against electrical shock. While moored dockside, 120-volt, 60 cycle, AC power should be utilized from dockside power, if available. A cord set is provided to supply power from the shore power outlets to the boat's 120-volt AC system.





Recommended procedure for making a shore connection
Turn the AC main breakers to the "OFF" position. If the dock side outlet includes a disconnect switch or circuit breaker, turn it to the "OFF" position also.

To avoid strain on the cables make sure they have more slack than the mooring lines. Dress the cables so they cannot be

damaged by chafing between the boat and the dock. Make sure the cables don't come in contact with the water. Then connect the cables in the boat plug inlets and then the dock-side outlets, making sure the connection plugs include a three-prong plug with a ground wire. Tighten the lock rings on both the shore and the boat connector plugs.

Turn the dock side disconnect switch or circuit breakers to the "ON" position. Then turn the circuit breakers at the boat inlet plugs on and check for proper polarity. If reverse polarity has been achieved, the red polarity indicators in the 120-volt panel will light. If this should happen, make sure the main breakers on the AC panel are in the "OFF" position and turn the inlet breakers and dock power switch or breaker off. Special relays attached to the main breakers in the cabin AC panel will automatically turn the main breakers off whenever reverse polarity is achieved. Notify a qualified electrician to check the wiring at the dock outlet. If the red polarity lights do not illuminate and the green, power available lights are lit when power is supplied to the panel, the polarity is correct and the AC main switches can be moved to the "ON" position.

Your boat is equipped with two 30 amp power cords that activate shore circuit # 1 and shore circuit # 2. A transfer main switch enables power from shore circuit # 1 or the generator to be directed to accessories on shore circuit # 2 when two 30 amp shore power supplies are not available or when operating on the generator. The procedure to connect to shore power is the same for both circuits.

DANGER

DO NOT OPERATE THE AC ELECTRICAL SYSTEM FROM SHORE POWER WITH REVERSE POLARITY. REVERSE POLARITY WILL DAMAGE THE SYSTEM AND EXPOSE PASSENGERS TO ELECTROCUTION HAZARDS. THIS CONDITION COULD ALSO CAUSE A FIRE IN THE ELECTRICAL SYSTEM.

WARNING

DO NOT ATTEMPT TO CORRECT THE WIRING YOURSELF. ELECTRIC SHOCK CAN CAUSE SEVERE INJURY OR EVEN DEATH. ALWAYS HAVE A QUALIFIED ELECTRICIAN CHECK WIRING.

KEEP CHILDREN AWAY FROM ANY ELECTRICAL CABLES OR EQUIPMENT AND ALWAYS USE GROUNDED APPLIANCES ON BOARD YOUR BOAT.

Shore Power and TV/Phone Inlet Plugs

WARNING

UNDETECTED FAULTS IN THE AC ELECTRICAL SYSTEM COULD CAUSE THE WATER AROUND THE BOAT TO BECOME ENERGIZED. THIS COULD CAUSE A SEVERE SHOCK OR EVEN DEATH TO SOMEONE IN THE WATER NEAR THE BOAT. NEVER SWIM OR ALLOW SWIMMING AROUND THE BOAT WHEN THE 120-VOLT AC SYSTEM IS ACTIVATED BY THE GENERATOR OR THE SHORE POWER CONNECTION.

Disconnecting procedure for shore power connection

Turn the main breakers on the cabin AC panel and the inlet panel off. Then turn the disconnect switch or breaker on the dock side outlets to the "OFF" position.

Disconnect the cables from the dock side outlet and replace the outlet caps. Disconnect the cables from the boat and close the inlet caps. Store cables.

4.6 120-volt AC Accessory Breaker Panel

The AC breaker panel is located in the cabin near the door. The following is a description of the AC panel equipment and the breakers that protect the accessories:

AC Volt/Amp Multimeter

The multifunction meter located in the AC breaker panel can monitor the voltage, current load or frequency. A selector switch below the voltmeter allows you to monitor Shore Line 1 (Load Group 1) or Shore Line 2 (Load Group 2.) There are buttons on the meter that are used to adjust the brightness and select the meter to display volts, amps, frequency, watts or to scroll the display. It also can be programed to sound an alarm for high and low voltage or high current.

The voltage should be checked each time the AC system is activated. The AC system and accessories can be damaged by voltage that is below 105 volts or above 125 volts. You should monitor the voltage and never operate your AC electrical system if the voltage is below or above this range.

The amp or current load should be monitored, particularly when operating the boat on one shore power cord or when using the generator. Avoid excessive current load that can overload the circuits or the generator.

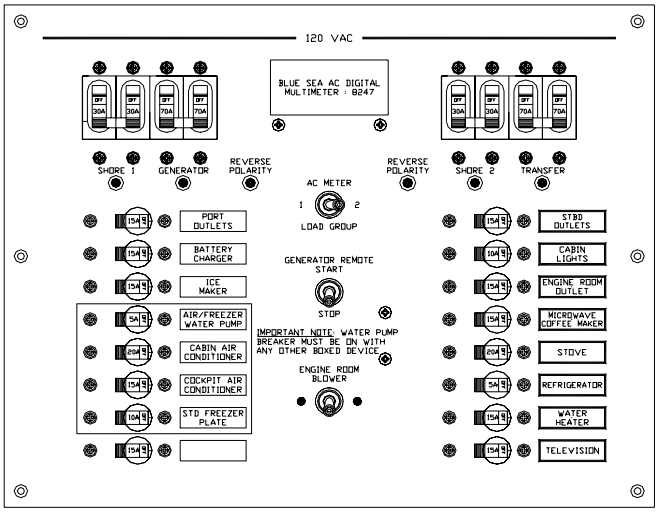
The frequency should be monitored when the generator is operating. In the U.S., AC accessories are designed to operate on a frequency of 60 cycles per second. The generator should be able to maintain this frequency within + or - 3 cycles. Do not operate the AC electrical system if the frequency is not in the proper range.

Refer to the multimeter owner's manual for more information on the features and operation of the multimeter.

AC Main Breakers
Protect the general distribution network. There is a main breaker for each shore circuit and the generator. A transfer main breaker enables power from shore circuit 1 or the generator to be directed to accessory breakers on shore circuit # 2 when two 30 amp shore power supplies are not available or when operating on the generator. Sliding safety covers on the main breakers prevent activating circuits for the generator and shore line # 1 simultaneously or shore line # 2 and the transfer main simultaneously.

These breakers are very sensitive. The resulting power surge that occurs when connecting the dock side cord may cause the main breakers to trip. To avoid this surge, always turn the main breaker to the "OFF" position before plugging or unplugging the shore power cord. The main breakers are equipped with a relay that will cause the main breaker to trip when reversed polarity current is detected.

Care must be taken when operating the AC system from the generator or one shore power supply line, particularly when the transfer main breaker is activated. On some boats it may be possible to overload the generator or shore power circuit if too many AC accessory breakers are activated. Too much amperage being supplied through the panel will cause the main line or generator breaker to trip and could damage the system. This is particularly important when operating the air conditioner, stove or the water heater. You should always be aware of the electrical load needed to activate accessories and manage the amperage being supplied using the multifunction meter so the load can be kept within safe limits. If you have any questions about managing the power in your boat, contact your dealer or Wellcraft Customer Service.



Cabin AC Breaker Panel

Reversed Polarity Lights
The red lights indicate reverse polarity current supplied to the panel. This situation will cause the red light to remain lit. Additionally, a special relay attached to the main breaker will automatically turn the main breaker off whenever reverse polarity is achieved. If reverse polarity is achieved, immediately turn off all cabin 120-volt breakers, the power inlet breakers and dockside outlet breakers. Disconnect the power cable from the dockside outlet and notify a qualified electrician to check the dockside wiring.

Power Available Lights
The green light for each line indicates that 120-volt AC current is being supplied to the panel. Other green lights indicates the power is being supplied by the generator or being transferred from Line # 1 to Line # 2.

<u>Line # 1 Circuit Breakers</u>
Port Outlets
Supply electrical current to the cabin ground fault interrupter (GFI) electrical outlets on the port side of the cabin.

Battery Charger
Supplies electrical current directly to the automatic battery charger. The battery charger charges and maintains the 12-volt batteries simultaneously when activated. It is fully automatic and equipped with an amp meter to monitor charging. See the battery charger manual for more information.

The charge to the engine and house batteries can be monitored by using the voltmeters in the engine gauge cluster or the amp meter on the charger in the engine compartment. To monitor the engine and house batteries with the engine gauge voltmeters, activate the charger and turn the engine battery switches on. Turn the ignition key switch for each engine to the "ON" position ***(DO NOT START THE ENGINES)*** and read the voltage on the voltmeter for each engine.

If the batteries are in good condition and charging properly, the voltmeters will indicate between 12 and 14.5 volts. If the reading is below 12 volts, then the battery bank is not accepting a charge or the charger is not working properly. Always turn the ignition switches off immediately after the monitoring is complete. Refer to the battery charger manual for more information.

The wires that supply DC charging current to the batteries are protected by an internal fuse in the battery charger and external fuses, one for each battery output wire, located near the batteries. The external fuses protect the DC charging circuit from the batteries to the charger. The internal fuses in the charger protect the DC charging circuit from the charger to the batteries.

Ice maker (Optional)
Supplies AC electrical current directly to the optional ice maker when AC power is available. See the ice maker manual for more information.

Note: Always make sure the Fresh Water Pump is activated and there is fresh water in the tank before activating the ice maker.

Air/Freezer Water Pump and Optional Cockpit Air Conditioner
Supplies electrical current to the raw water pump that supplies the freezer and the optional cockpit air conditioner. This breaker should always be activated when the freezer or cockpit air conditioner is activated.

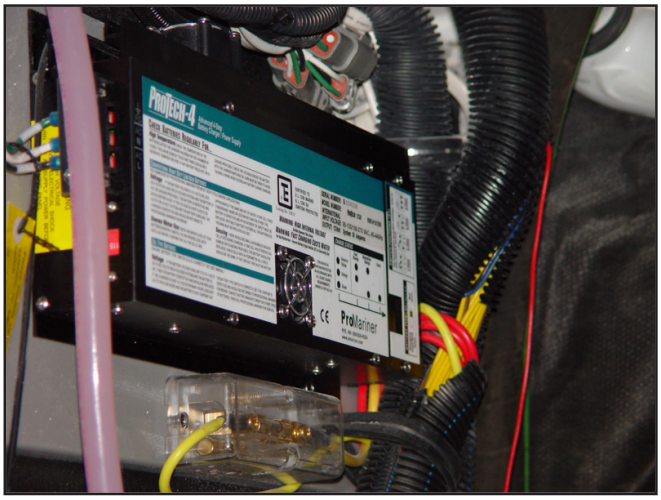
Note: Water pump breaker must be on with any other boxed device.

Cabin Air Conditioner
Supplies electrical current to the AC control panel located in the cabin and the air conditioner raw water pump.

Cockpit Air Conditioner (Optional)
Supplies electrical current to the AC control panel located in the L-lounge on the bridge deck. The air/freezer water pump must be activated whenever this air conditioner is operating.

Note: The breakers for the freezer or air conditioners will trip if seawater is not being supplied to the unit. If the breaker trips, reset and check for water flow out of the thru hull. See air conditioner or freezer owner's manual for more information.

Std Freezer Plate
Supplies electrical current to the freezer control panel located in the bait prep station. The air/freezer water pump must be activated whenever this freezer plate is operating.



Typical Battery Charger

Spare
Reserved for additional AC accessories.

Spare
Reserved for additional AC accessories.

<u>Line # 2 Circuit Breakers</u>
Stbd Outlets
Supplies electrical current to the cabin ground fault interrupter (GFI) electrical outlets on the starboard side of the cabin.

Cabin Lights
Supplies electrical current to the switch near the cabin door that activates the AC lights in the cabin headliner.

Engine Room Outlet
Supplies electrical current to the ground fault interrupter (GFI) electrical outlet on the starboard side aft in the engine room.

Note: All AC electrical outlets are provided with ground fault interrupts to protect against electric shock. These outlets should be tested periodically to insure proper operation by pressing the test/reset buttons in the center of face plate. GFI outlets do not protect against short circuits and overloads. This is done by the outlet breaker on the AC panel.

WARNING
GFI OUTLETS DO NOT PROVIDE 100% PROTECTION FROM ELECTRIC SHOCK. EVEN THOUGH GROUND FAULT INTERRUPTERS PROVIDE PROTECTION BY REDUCING EXPOSURE TIME FROM LINE TO GROUND SHOCK HAZARDS, IT IS STILL POSSIBLE TO RECEIVE AN ELECTRIC SHOCK FROM DEFECTIVE APPLIANCES OR POWER TOOLS AND MISUSED ELECTRICAL EQUIPMENT.

Microwave/Coffee maker
Supplies 120-volt current directly to the microwave oven and coffee maker. See the microwave and coffee maker owner's manual for more information.

Stove
Supplies electrical current directly to the galley stove.

Refrigerator
Supplies 120-volt electrical current directly to the refrigerator when 120-volt power is available and chosen over the 12-volt power supply. See the refrigerator manual for more information.

Water Heater
Supplies electrical current directly to the water heater circuit. The water temperature is automatically controlled by a thermostat in the water heater control panel. Before operation, you must have water in the water heater (see the water heater manual for more information.)

Television (Optional)
Supplies electrical current to the television.

Generator Operation Panel
Controls the starting, running, and stopping of the generator. The procedures may vary depending on the model and type of generator installed in your boat. Circuit breakers on the generator in the engine room protect the generator ignition and 120-volt AC systems. An owner operator's manual for the generator has been supplied with this manual. Please refer to it for details on the generator operation.

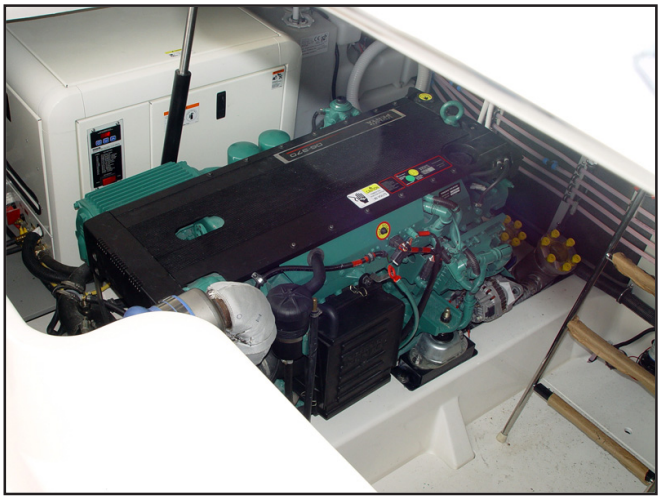
Always activate the blowers before starting the generator. The blowers provide ventilation and help cool the engine room. They should remain activated the entire time the generator is running.

Blower
This switch supplies electrical current to the blowers that provide ventilation to the generator and engine room while the generator is operating.

Shore Power Inlet Breakers
Located in the cockpit near the shore power inlet plugs. These breakers protect the AC system between the shore power inlet plugs and the main AC panel.

4.7 Generator

The generator is activated by the generator battery switch located in the cabin DC panel and the control switches on the cabin AC panel. The generator oil and coolant should be checked whenever you check the oil and coolant in the main engines.



Generator

There is a momentary switch in the cabin DC panel that controls the starting, running, and stopping of the generator. The generator can also be operated from a control panel on the generator. The circuit breakers that protect the generator AC and DC circuits are also on this panel. An owner's manual for the generator has been supplied with this manual. Please refer to it for details on the generator operation.

The generator engine uses a closed cooling system with a seawater-cooled heat exchanger. There is an expansion tank for the engine coolant mounted near the generator. Make sure the fluid level in the expansion tank is kept between the maximum and minimum lines of the tank. You should also check the exhaust port for water flow each the generator is started. If there is no discharge within thirty seconds, shut down the generator and find and correct the problem.

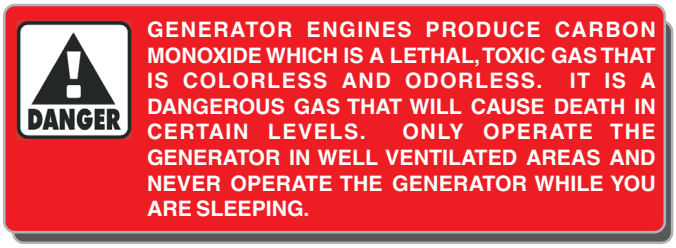
The seawater cooling system operates exactly like the cooling system on the main engines. It includes a strainer that prevents debris in the seawater from entering the cooling pump. The strainer is located in the bilge just forward of the port engine. It is important to check and clean the strainer regularly to insure the seawater system can circulate enough water to provide cooling for the closed cooling and exhaust systems on the generator. Refer to the Propulsion Systems chapter for instructions on cleaning the sea strainers.

The generator fuel system is equipped with a water separating fuel filter and operates much like the fuel system for the main engines. Please refer to the Fuel System chapter for more information on generator fuel system.

You also should read the generator owner's manual for detailed information on the safe operation and maintenance of the generator.

Note: **Diesel generators charge the battery bank just enough to compensate for the DC electrical current the engine requires to operate. Therefore, it is important to activate the battery charger to maintain the generator, house and engine batteries whenever the generator is running.**

Note: **The generator used in the 360 Coastal may not be able to operate all 120-volt accessories at the same time. POWER MANAGEMENT PRACTICES may need to be observed depending on the AC power load.**



4.8 Bonding System and Galvanic Isolator

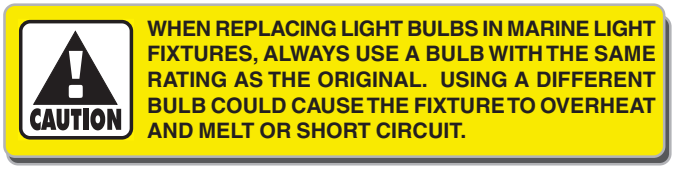
Your boat is equipped with a bonding system that interconnects all underwater hardware and thru-hull fittings to ensure that they are of the same electrical potential. Zinc anodes are attached to the bonding system at the transom and trim tabs. The Zinc anodes deteriorate before the other metals, thereby protecting the underwater metals from galvanic corrosion or stray electrical current. Since the zincs are sacrificial, it is important to monitor them and replace the zincs when they have deteriorated to 50 - 75% of their original size. The bonding system is connected to the DC ground and the earth ground wire for the AC electrical system. It provides a path for dangerous short circuits in the AC electrical system to the safety earth ground in the event of a fault in the shore earth ground connection and when the boat is away from the dock.

When the boat is connected to shore power at a marina or city dock, all boats connected to shore power are connected to a common shore safety earth ground connection. This circuit provides essential protection against electrical shock from faults or short circuits in AC equipment and, unfortunately, provides a path for low voltage galvanic current to flow between the bonding system of other boats in the circuit. If one or more of the boats in the circuit has a stray current electrical problem or is not equipped with proper galvanic protection, it will seek protection from your boat's bonding system through the safety ground circuit. This could cause accelerated deterioration of the zinc anodes and/or severe damage to the underwater hardware. To prevent damage from other boats in the circuit, a galvanic isolator is installed in the shore ground circuit that isolates your boat's bonding system from the other boats. It prevents the flow of low voltage galvanic current while still providing a path for dangerous short circuit currents in the AC system to the shore safety ground.

4.9 Electrical System Maintenance

12-Volt DC Electrical System Maintenance

At least once a year, spray all exposed electrical components behind the helm and in the plugs, with a protector. Exterior light fixture bulbs should be removed and the metal contact areas coated with a non-water soluble lubricant like petroleum jelly or silicone grease. The sockets should be sprayed with a protector. Care must be taken not to get any oil or petroleum jelly on the glass portion of the bulbs as this will cause the bulb to overheat and burn out.



Check all below deck wiring to be sure it is properly supported, that the insulation is sound, and that there are no loose or corroded terminals. Corroded terminals should be thoroughly cleaned with sandpaper, or replaced, tightened securely and sprayed with a metal and electrical protector. Inspect all engine wiring.

Check the electrolyte level in the batteries regularly and add distilled water as necessary. If the batteries are frequently charged by the automatic battery charger, the electrolyte level will have to be checked more often. The correct fluid level in the cells is usually approximately 1/4 to 1/2 inch above the plates. If fluid is needed, fill to the proper level with distilled water. **Do not over fill!** Please note that some batteries are sealed and cannot be filled.

Keep the battery tops clean and dry. Dirt and water can conduct electricity from one post to the other causing the battery to discharge.

The battery posts should be kept free of corrosion. Remove the cables and clean the posts and cable clamps with a battery post cleaner or sandpaper as required. Coating the battery posts and cable clamps with petroleum jelly or silicone grease will protect them and reduce corrosion. Battery cables, both hot and ground, must be replaced when they show signs of corrosion or fraying. Deteriorated cables cause a considerable voltage loss when high currents are drawn, as for starting the engine.

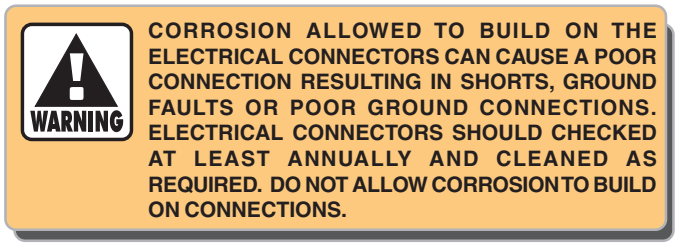
120-volt AC Electrical System Maintenance

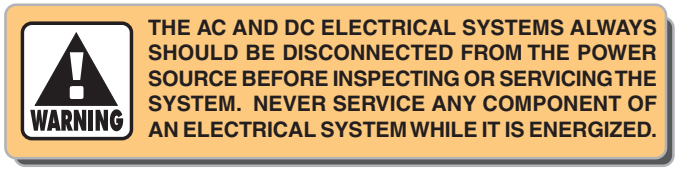
Periodically inspect all wiring for nicks, chafing, brittleness, improper support, etc. Examine the shore power cords closely for cracks in the insulation and corrosion in electrical connectors. Spraying receptacles and electrical connections with an electrical contact cleaner or a metal and electrical protector will reduce corrosion and improve electrical continuity.

Inspect all wiring for proper support, sound insulation, and tight terminals, paying particular attention to portable appliance cords and plugs.

The entire 120-volt circuitry, especially the shore power cords, should be seasonally tested for proper continuity by an experienced electrician. This will detect any shorts, open wires, or ground faults. Ground fault interrupts should be tested periodically to insure proper operation by pressing the test/reset buttons in the center of face plate. The polarity indicator system also should be inspected for proper operation. The engine maintenance required on the generator is similar in many ways to the main engines. The most important factors to the generator's longevity are proper ventilation, maintenance of the fuel system, ignition system, cooling system, lubrication system and the AC alternator.

Maintenance schedules and procedures are outlined in your generator owner's manual. They should be followed exactly.





4.10 AC Line Load Estimator

Depending on the AC power load your boat requires and the power available from the shore supply or the generator, you may not be able to operate all 120-volt AC accessories at one time. POWER MANAGEMENT PRACTICES may need to be observed particularly when only one 30 amp shore supply outlet is available or when supplying power from the generator. You should be aware of the load each accessory draws and make sure you don't overload the circuit.

The table in this section will assist you in documenting the load AC accessories on your boat require and managing the electrical load on each circuit. An owner's manual for each AC accessory installed on your boat at the factory has been included with your boat. Additionally, you should make sure you have the manuals for accessories installed by your dealer or that you bring aboard. The specification section of the owner's manual will provide the wattage or amperage the accessory requires. Enter the load requirements in the table provided and use the information as a quick reference tool to calculate the electrical load. If only watts are given in the specifications, divide the watts by the voltage to determine the amps.

Appliances	Start-up Watts/Amps	Running Watts/Amps	Line 1 Amps	Line 2 Amps
Air Conditioner – 1				
Air Conditioner – 2				
Battery Charger				
Blender				
Coffee Maker				
Crock Pot				
Computer				
Curling Iron				
Electric Blanket				
Freezer Plate				
Fan				
Fry Pan				
Hair Dryer				
Ice Maker				
Iron				
Microwave				
Refrigerator				
Space Heater				
Television				
Toaster				
Stove – Per Element				
VCR				
Water Heater				
		Line Totals		

Chapter 5:
FRESH WATER SYSTEM

5.1 General

The fresh water system consists of a potable water tank, distribution lines and a distribution pump. The pump is equipped with an automatic pressure switch and is located on the forward engine room bulkhead. The tank is below the engine room floor and filled through a labeled deck plate located on the starboard gunnel.

CAUTION

DO NOT FILL SYSTEM WITH ANYTHING OTHER THAN WATER. SHOULD THE SYSTEM BECOME CONTAMINATED WITH FUEL OR OTHER TOXIC FLUIDS, COMPONENT REPLACEMENT MAY BE NECESSARY.

WARNING

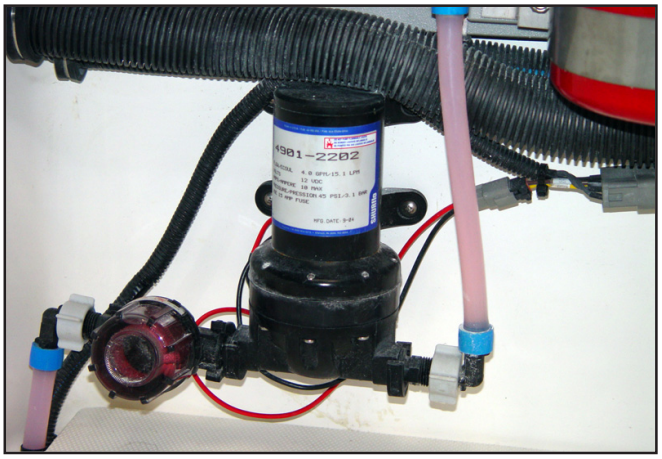
DO NOT CONFUSE FUEL FILL DECK PLATES WITH THE WATER OR WASTE FILL DECK PLATES. THESE PLATES ALSO ARE LABELED ACCORDINGLY. IF GASOLINE OR DIESEL FUEL IS ACCIDENTALLY PUMPED INTO THE WATER OR WASTE TANK, DO NOT ATTEMPT TO PUMP IT OUT YOURSELF. WATER AND WASTE PUMPS ARE NOT DESIGNED TO PUMP FUEL AND A FIRE OR EXPLOSION COULD RESULT. CONTACT YOUR DEALER OR THE WELLCRAFT CUSTOMER SERVICE DEPARTMENT FOR ASSISTANCE IN HAVING THE FUEL PROFESSIONALLY REMOVED AND COMPONENTS OF THE FRESH WATER SYSTEM REPLACED AS NECESSARY.

5.2 Fresh Water System Operation

Fill the water supply tank slowly through the labeled deck plate. After filling the water tank, partially open all faucets. The Fresh Water Pump breaker on the cabin DC panel should be on. Allow the pump to run until all of the air is purged from the system and a steady stream of water is flowing from each outlet. Next, turn off the faucets one by one. As the pressure builds, the pump will automatically shut off.

When properly primed and activated the water system will operate much like the water system in a home. An automatic pressure sensor keeps the system pressurized. If the system has been recently filled or has not been used for an extended period, air bubbles may accumulate at the pump and the system may have to be reprimed.

Whenever the boat is left unattended, the Fresh Water Pump breaker should be placed in the “OFF” position.



Fresh Water Pump and Strainer

Fresh Water Washdown Faucet in Engine Room

The Fresh Water Washdown Hose Connection

There are freshwater washdown hose connections located in the cockpit below the gunnel and in the rear of the engine room that use a standard garden hose connection. Make sure the washdown faucet valves or the hose spray nozzles are off when the freshwater system is activated.

CAUTION

DO NOT ALLOW THE FRESH WATER PUMP TO RUN DRY. THE FRESH WATER PUMP WORKS ON DEMAND AND WILL NOT SHUT OFF AUTOMATICALLY WHEN THE TANK IS EMPTY. THIS CAN RESULT IN DAMAGE TO THE PUMP. ALWAYS TURN THE FRESH WATER BREAKER OFF WHEN THE FRESH WATER SYSTEM IS NOT IN USE.

5.3 Water Heater

The water heater is located on the starboard side of the engine room. It has a 120-volt element that is thermostatically controlled at the heater and activated by a circuit breaker located in the cabin AC panel.

A high pressure relief valve protects the system from excessive pressure. Always make sure all air is purged from the water heater and lines before activating the water heater breaker. Refer to the water heater owner's manual for additional information.

CAUTION

DO NOT SUPPLY CURRENT TO AN EMPTY WATER HEATER. DAMAGE TO THE HEATER WILL RESULT. THE SYSTEM MUST BE FILLED AND PRIMED BEFORE USING THE WATER HEATER.

5.4 Shore Water Connection

The shore water connection allows the direct connection of the water system to a shore side water supply. This provides the system with a constant supply of fresh water and minimizes the pressure pump operation. A female inlet fitting is mounted in the cockpit. A pressure reducer is installed in the system along with two check valves. One check valve keeps water from running out of the shore water inlet fitting when the pressure pump operates. The second provides protection for the pressure pump when the shore water is connected.

To use shore water, connect a hose from the shore water faucet to the shore water fitting on the boat. Next, turn on the shore water. The pressure pump will not run and the water in the boat's water tank will not be used.

CAUTION

THE SHORE WATER CONNECTION PROVIDES AN UNLIMITED SUPPLY OF WATER THAT COULD SINK THE BOAT IF A WATERLINE RUPTURES. NEVER LEAVE THE BOAT UNATTENDED WITH SHORE WATER CONNECTED TO THE BOAT.

Note: The water tank will not be filled by connecting to shore water. Do not modify or change the shore water inlet connector with another type without consulting Wellcraft Customer Service or your dealer. The use of the wrong type of inlet connector can damage the freshwater system.

5.5 Shower Operation

The shower is located in the head compartment. Make sure the Fresh Water Pump breaker in the DC breaker panel are on, then turn the water on. Adjust the hot and cold water faucet until the desired temperature is obtained. Some minor variations in the water temperature may occur as the pressure pump cycles.

Shower water is drained from the head compartment by the cabin drain sump pump system connected to the shower drain. An automatic float switch in the sump controls the pump. The pump is activated by the Sump Pump continuous power breaker in the cabin DC panel. After showering, let the cold water flow for a period of time to flush the drainage system of soap residue.

The cabin sump system is located in the bilge below the cabin sole. It is essential that the shower drain strainer is cleaned regularly and the sump is inspected periodically for accumulated debris that needs to be removed.

5.6 Fresh Water System Maintenance

Information supplied with water system components, by the equipment manufacturers, is included with this manual. Refer to this information for additional operation and service data.

Routine Maintenance

The following items should be done routinely to maintain your fresh water system:

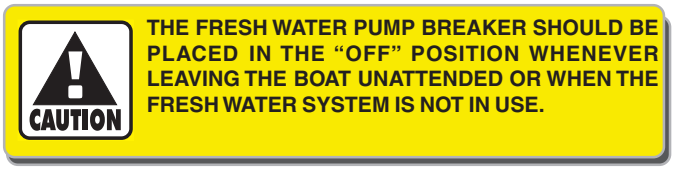
- Periodically clean the screen in the water strainer located near the intake side of the freshwater pump. The screen is cleaned by unscrewing the cap on the strainer, removing the screen and flushing it with fresh water.
- Remove the filter screens from the faucet spouts and eliminate any accumulation of debris. A build up of debris can cause the pump to cycle excessively.
- Periodically remove the lid on the cabin drain sump assembly. Clean debris from the sump and flush with clean water.

- Periodically spray the pumps and metal components with a metal protector.

- The batteries must be properly maintained and charged. Operating the pressure pump from a battery with a low charge could lead to pump failure.

- Add a commercially available potable water conditioner to the water tank to keep it fresh.

Note: The fresh water system must be properly winterized prior to winter lay-up. Refer to the section on winterizing for more information.



Sanitizing the Fresh Water Tank

The freshwater system should be sanitized if it has not been used for a long period or you are unsure of the quality of the water in the system.

The following steps can be used to sanitize the system:

- Activate the system, open all hot and cold faucets and pump out as much water as you can.

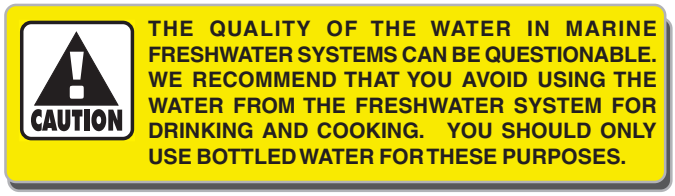
- Make a chlorine solution by mixing two ounces of household chlorine bleach in a gallon of water. This mixture will treat approximately fifteen gallons. If the water tank on your boat is larger or smaller than 15 gallons, then adjust the mixture accordingly. Always mix the chlorine with water in a separate container first and never add straight chlorine to the fresh water tank.

- Fill the water tank half full with freshwater and pour the mixture into the water tank. Top off the tank.

- Activate the system and allow the water to run for about one minute at each faucet. Let the treated water stand for 4-6 hours.

- Drain the system by pumping it dry and flush with several tank fills of freshwater.

- The system should now be sanitized and can be filled with freshwater. If the chlorine smell is still strong, it should be flushed several more times with freshwater.



THIS PAGE WAS LEFT BLANK
INTENTIONALLY

Chapter 6:
RAW WATER SYSTEM

6.1 General

In the raw or seawater systems, all water pumps are supplied by hoses connected to ball valves and thru-hull fittings located in the in the engine room bilge. Always make sure the ball valves are open before attempting to operate any component of the raw water system. 12-volt pumps supply seawater to most of the various accessories.

The air conditioners and freezers use a 120-volt AC seawater supply pumps. These are the only 120-volt AC pumps in the system and they are automatically activated when the air conditioning or freezer systems are in use.

Priming the System

Make sure the ball valves are open. The raw water washdown and optional freezer and cockpit air conditioner pumps are supplied seawater from the same thru-hull fitting and sea strainer located just forward of the port engine. The thru-hull fitting and sea strainer for the cabin air conditioning pump is located forward of the water tank. The thru-hull fitting and strainer for the baitwell is located aft of the starboard engine.

To prime the system, open the valve on the washdown hose connector and activate the Raw Water Washdown pump. Run the pump until all of the air is purged from the system and then turn the switch off and close the valve. Activate the baitwell pump. Run the pump until all of the air is purged from the system and turn the pump off.

When the generator is operating or shore power is connected and activated, turn on the cabin air conditioner and the optional cockpit air conditioner and/or freezer and monitor the discharge fittings for the air conditioning/freezer seawater systems. Water should begin to flow from the discharge fittings within 30 seconds. If water does not flow, the system may have an air lock or debris in the strainer causing the unit to automatically shut down. Investigate and correct the problem, then restart the air conditioner or freezer.

The intakes for the cockpit air conditioner/freezer and cabin air conditioner pumps are equipped with a scoop and ball valve. If the pump runs but will not prime after cleaning the strainer or at the time of launching, make sure the valve is open. If the pump still won't prime, it may be air locked. Make sure the valve is open and run the boat at or above 15 M.P.H. The water pressure from the scoop will force the trapped air through the pump and allow it to prime. If this procedure doesn't work, contact your Wellcraft dealer.

High Pressure Washdown Hose Connection

Closing the thru-hull ball valves before the boat is hauled from the water will help to eliminate air locks in raw water systems. The valves should also be closed whenever you leave the boat unattended.

Note: It may be necessary to reprime the raw water system if the system is not used for an extended period and at the time of launching from a trailer or lift.

6.2 High Pressure Washdown

A 12-volt high pressure pump, controlled by a pressure sensor, supplies the raw water hose outlet located below the gunnel in the aft cockpit. The pump is activated by the Raw Water Washdown switch in the shore power inlet panel next to the transom door. The switch should be turned to the "ON" position just before using the washdown and be turned to the "OFF" position when the washdown is not in use.

When activated, the pressure switch will automatically control the pump. As the pressure builds in the supply hose, the pump will shut off. When the washdown hose is in use and the pressure drops, the pump will turn on.

The generator and raw water washdown share the generator strainer forward of the port engine. The air/freezer, optional bridge deck air conditioner and cabin air conditioner share a pump and strainer forward of the water tank.

The washdown hose connection is located in the rear of the cockpit and uses a standard garden hose. It is equipped with a valve that allows the flow of water to be turned on or off at the hose connection.

6.3 Kodiak Baitwell

The baitwell is located on the starboard side of the cockpit. Seawater is provided to the baitwell pump by a thru-hull fitting and strainer located in the engine compartment bilge, aft of the starboard engine. The pump is designed to carry a constant flow of water to the baitwell. The pump and a light in the baitwell are activated by a switch in the shore power inlet panel next to the transom door.

Kodiak Baitwell

An overflow drain fitting in the port side of the baitwell automatically controls the water level. To fill the baitwell, push down and turn the knob at the top of the tube on the port side of the baitwell clockwise to seat it in the overflow fitting. Make sure the valves at the intake thru-hull fitting are open and activate the baitwell pump. When the water level reaches the overflow, it will begin to circulate.

There are valves on the overflow tube that can be adjusted to control the water level in the baitwell. To adjust the water level, release the overflow tube by turning the knob on the port side of the baitwell counterclockwise while pulling it up. When the tube releases, pull it all the way out. Adjust the water level by sliding the PVC valves on the overflow tube to achieve the desired level and flow. Reinsert the tube and activate the baitwell.

Baitwell Overflow Tube and Adjustable Valves

To drain the baitwell, turn off the baitwell pump and pull out the overflow tube. When the baitwell has completely drained, use the washdown hose to flush the baitwell and drain of debris.

Note: Do not use the baitwell as a dry storage area when it is not in use. Seawater could accidently be delivered to the baitwell from the thru-hull fitting and damage equipment stored there.

CAUTION

A RUPTURED RAW WATER INTAKE OR PRESSURE LINE COULD CAUSE THE BOAT TO TAKE ON WATER AND SINK. ALWAYS TURN THE RAW WATER SYSTEMS OFF AND CLOSE THE THRU-VALVES WHEN LEAVING THE BOAT UNATTENDED.

6.4 Air Conditioning and Freezer Pumps

Air conditioners and freezer units are self-contained and seawater cooled. An AC centrifugal raw water pump supplies seawater that cools the condensing unit as it circulates through the system and is discharged overboard. The pump for the air conditioners is located in the engine compartment bilge just forward of the water tank.

Seawater is supplied to the pumps from a thru hull fitting located in the hull near the pump. A sea strainer between the pump and thru hull fitting protects the system from contaminants that could damage the pump or the air conditioning system. Make sure the seawater pump receives adequate seawater by periodically cleaning the sea strainer basket.

You should refer to the air conditioner owner's manual for more information on the operation and maintenance of the air conditioner.

Air Conditioner Seawater Pump, Thru-Hull Valve and Strainer

6.5 Raw Water System Maintenance

The following items should be done routinely to help maintain your raw water system:

- Check hoses, particularly the seawater supply lines, for signs of deterioration.
- Periodically remove and clean the water strainers located near the intake side of the pumps. To clean the strainer, make sure the raw water accessories are off and close the valve at the thru-hull fitting. Rotate the strainer bowl counterclockwise to release it. Remove and clean the screen with freshwater. Lubricate the O-ring lightly with petroleum jelly and reinstall the strainer bowl.
- Spray pumps and thru-hull valves with a protective oil periodically.
- The fishboxes and baitwells should be drained and cleaned after each use.
- Operate all thru-hull valves at least once a month to keep them operating properly.

CAUTION

SHOULD A HOSE RUPTURE, TURN THE PUMP OFF IMMEDIATELY. ALWAYS CLOSE THE THRU-HULL VALVE WHEN PERFORMING MAINTENANCE ON A SEA WATER PUMP.

THE BATTERIES MUST BE PROPERLY CHARGED. OPERATING ANY PUMPS FROM A BATTERY WITH A LOW CHARGE MAY LEAD TO A PUMP FAILURE.

CAUTION

THE RAW WATER SYSTEM MUST BE PROPERLY WINTERIZED PRIOR TO WINTER LAY-UP. SEE SECTION ON WINTERIZING.

DO NOT RUN ANY OF THE PUMPS DRY FOR EXTENDED PERIODS AS DAMAGE TO THE PUMP WILL RESULT.

THIS PAGE WAS LEFT BLANK
INTENTIONALLY

Chapter 7:
DRAINAGE SYSTEMS

7.1 General

All water is drained to overboard thru-hull fittings located in the hull. Some cockpit component drain thru-hull fittings are equipped with ball valves that are always open under normal operating conditions. It is important to check and operate the drain valves at least annually to make sure they are in good condition and operating properly. You also should check the drain system frequently to ensure it is free flowing and that the hoses on the thru-hull fittings are secure and not leaking.

The cabin sinks drain to the drain sump system below the cabin sole. The cabin sump, bridge deck sinks and most cockpit components drain to manifolds located on each side of the engine compartment, outboard of the engines.

It is important review the drainage schematic to become familiar with the location of the thru-hull drain valves.

7.2 Half Tower & Tower Drains (Optional)

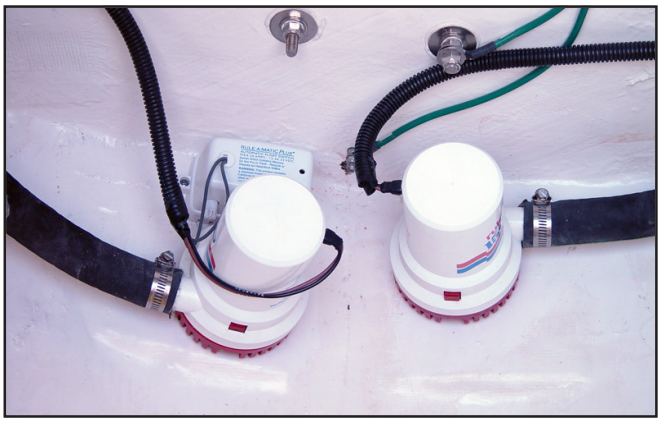
There is a hole drilled in one of the leg bases to prevent water from being trapped within the leg and provide a wire chase for accessories. A small hole is drilled in the tubing at the base of the other legs, which are not drilled for a wire chase, that allows water to drain.

Note: Always make sure the leg drain holes are clear when the boat is laid up for the winter. Water trapped inside the legs could freeze and cause the legs to split.

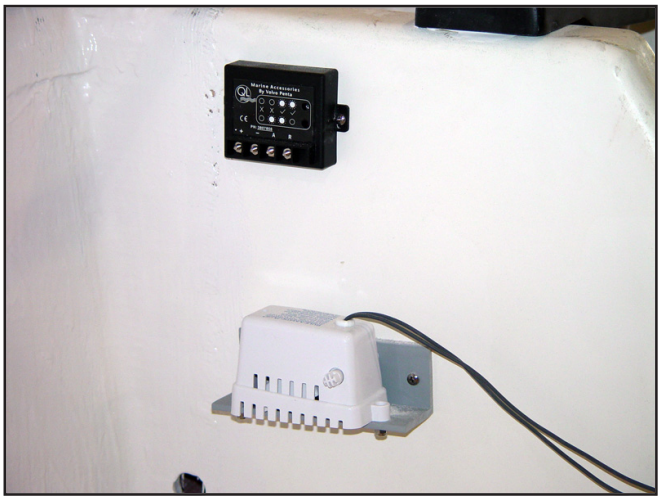
7.3 Bilge Drainage and High Water Alarm

Bilge Pumps and Drainage

The bilge pumps are activated both manually by switches in the helm station and automatically by float switches located next to the pumps. The automatic float switches are connected to the batteries. They are protected by circuit breakers located on the cabin DC panel and remain activated when the battery switches are in the "OFF" position and the batteries are connected. The manual switches are supplied current when the battery switches are activated. An LED light in each switch in the helm indicates when the pump is operating. The manual circuit is protected by the breaker in the helm accessory breaker panel.



Stern Bilge Pumps and Automatic Switch



Stern High Water Automatic Switch

All bilge pumps pump water out of thru-hulls located above the waterline in the hull. The rear bilge pumps and automatic switches are located near the transom below the stern access hatch in the cockpit. The mid bilge pump and automatic switch are located in the front of the engine room and the forward pump and automatic switch are located below a hatch near the steps in the cabin sole.

There are two pumps in the stern bilge. One is fully automatic and will not be activated by the manual switch in the helm. It is activated only by the automatic float switch near

the pump or by the high water switch mounted above the pumps. The other pump is manually activated by a switch in the helm and will not be activated automatically by the float switches.

The manual bilge pumps should be activated briefly each time the boat is used. This will ensure that they are operating properly and increase the service life of the pumps. The automatic switches should be manually activated to verify operation. This is particularly important before operating the boat offshore.

Note: See Electrical Systems for additional information on bilge pump operation.

Note: Any oil spilled in the bilge must be thoroughly removed and properly disposed of before operating the bilge pump. The discharge of oil from the bilge is illegal and subject to a fine.

CAUTION

THE FEDERAL WATER POLLUTION CONTROL ACT PROHIBITS THE DISCHARGE OF OIL OR OILY WASTE INTO OR UPON THE NAVIGABLE WATERS OF THE UNITED STATES OR THE WATERS OF THE CONTIGUOUS ZONE IF SUCH DISCHARGE CAUSES A FILM OR SHEEN UPON, OR A DISCOLORATION OF THE SURFACE OF THE WATER, OR CAUSES A SLUDGE OR EMULSION BENEATH THE SURFACE OF THE WATER. VIOLATORS ARE SUBJECT TO A PENALTY OF $10,000.

High Water Alarm and Pump

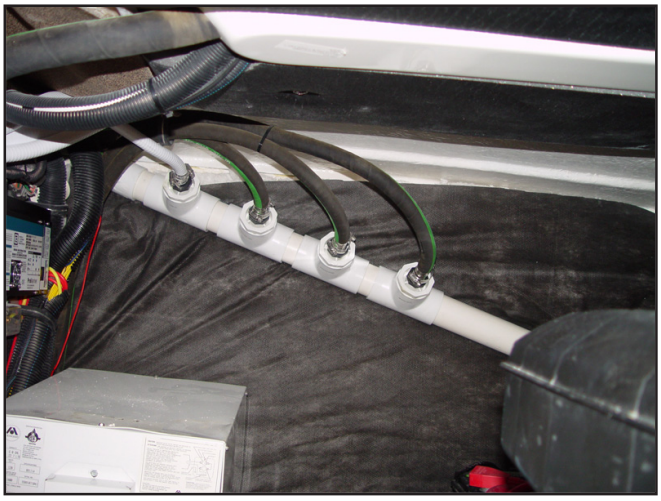
Additional automatic float switches, located above the stern pumps near the transom, sounds an alarm, activate a light at the helm and activate the stern bilge pump if the bilge water level rises above the normal operating range of the bilge pump automatic switches. The alarm and high water float switches are connected to the batteries. They are protected by a circuit breaker located on the cabin DC circuit breaker panel and remain activated when the battery switches are in the "OFF" position and the batteries are connected. The switches should be tested periodically by turning the knob on the side of each switch until the alarm sounds or the pump runs. If the alarm or pump does not activate, you should find and correct the problem as soon as possible.

7.4 Cockpit and Deck Drains

Scuppers and Cockpit Hatches

Your Wellcraft has two scupper drains located in the rear of the cockpit at the transom. Flaps built into the scuppers help reduce the surge of sea water through the scuppers and into the cockpit.

Cockpit Scuppers



Drain Manifold in Engine Compartment

Water is channeled away from all cockpit hatches by a gutter or drain rail system. The water then drains overboard through fittings in the drain rails to thru-hull fittings above the waterline in the trim tab pockets.

Fishboxes , Baitwell, and Cockpit Sink Drains

The fishboxes below the cockpit floor are drained overboard by a macerator pump out system. The macerator is activated by a switch located in the shore power inlet panel near the transom door. Monitor the water level as the macerator drains the fishboxes and turn the pump off immediately when draining is complete. The pump could be damaged if it is allowed to run dry for extended periods.

The baitwell, freezer and cockpit bait prep sink are drained by gravity to manifolds on each side of the engine compart-

ment and then to thru-hull fittings in the hull side. The overflow in the baitwell drains into the overboard drains.

Bridge Deck Drainage
Water on the bridge deck drains to the stern cockpit by drain rails located below the bridge deck. Water is channeled from the day hatch drain rail to the drain manifold in the engine compartment and then overboard. It is important to clean the drain rails frequently to prevent water from backing up and dripping on components in the engine compartment.

Bridge Deck L-Lounges, Storage Compartments and Icemaker (Optional)
These compartments and the ice maker are drained by gravity to the bridge deck and then to the cockpit sole.

Cockpit Air Conditioner
The optional cockpit air conditioner condensation pan is drained to the manifold drain system in engine compartment and then overboard.

Rope Locker Drains
The rope locker drains overboard through a drain fitting located in the hull side at the bottom of the rope locker. It is important to inspect the drain frequently to remove any accumulated debris.

7.5 Cabin Drains

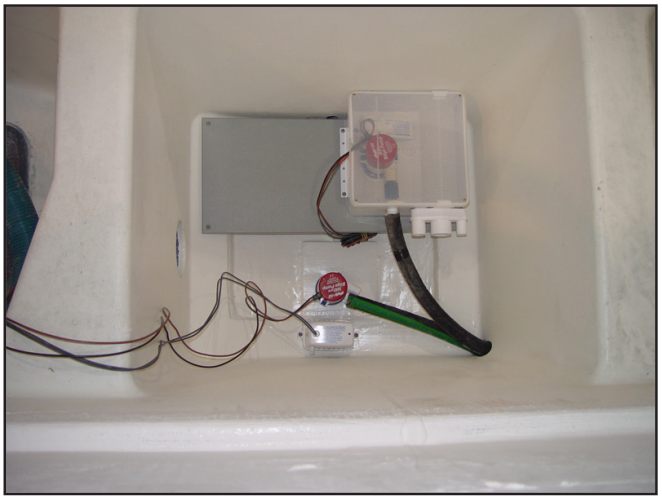
The galley sink, head sink, shower, and air conditioner condensation pan are drained by the cabin sump pump system. The sump pump discharges to the drain manifold in the engine compartment and then overboard.

The sump pump is located in the bilge below a hatch near the steps in the cabin sole. It is equipped with a strainer that must be inspected and cleaned periodically. It is protected by the Sump Pump circuit breaker in the DC breaker panel. After showering, it is important to let the cold water flow for a period of time to flush the drainage system of soap residue.

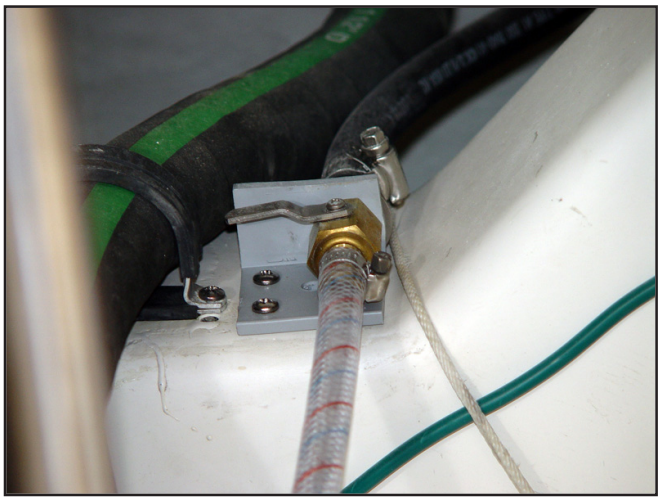
7.6 Muffler Drains

The exhaust system for the main engines is sea water cooled and equipped with drain valves for the mufflers. There is a valve and drain hose for each muffler that are located in the stern bilge on each side of the stern access hatch in the cockpit sole. The water from the exhaust system is drained to the stern bilge when the valves are open.

It is extremely important to open the valves and drain the mufflers when the boat is laid up for the winter. Water trapped inside the mufflers could freeze and cause the mufflers to split. It also is important to make sure the valves are closed and the exhaust system is inspected when the boat is recommissioned to make sure they are not leaking.



Cabin Drain Sump System and Forward Bilge Pump and Automatic Switch



Muffler Drain Valve and Hose

WARNING

DAMAGED MUFFLERS OR OPEN MUFFLER DRAIN VALVES WILL ALLOW EXHAUST GASES CONTAINING CARBON MONOXIDE AND SEA WATER TO ENTER THE BILGE. THIS WILL CAUSE A SIGNIFICANT SAFETY HAZARD FOR THE CREW, DAMAGE TO BILGE AND ENGINE COMPARTMENT EQUIPMENT AND COULD CAUSE THE BOAT TO SINK. MAKE SURE THE DRAIN VALVES ARE CLOSED AND THE MUFFLERS ARE NOT LEAKING WHEN THE BOAT IS RECOMMISSIONED AFTER WINTER STORAGE.

7.7 Drainage System Maintenance

It is essential that the following items be done periodically to maintain proper drainage of your boat:

- Clean the cockpit and bridge deck drain rails with a hose to remove debris that can block water drainage.
- Clean the hardtop and tower leg drain holes. This is especially important just before winter lay-up.
- Clean the bilge pump strainers of debris and check the bilge for foreign material that can cause the automatic switches to malfunction.
- Frequently test the automatic bilge pump switches for proper operation. This is accomplished by lifting the float switch until the pump is activated. You can also use a garden hose to flood the bilge until the water level is high enough to activate the pump.
- Flush all gravity drains with freshwater to keep them clean and free flowing.
- Flush the air conditioner condensation pan drains with fresh water at least once each season to remove mold and debris. This is particularly important because mold tends to accumulate in condensation pan drains and if they are not cleaned regularly, the drains can clog and flood the cabin sole or cockpit storage compartment when the air conditioners operate.
- Clean and inspect the cabin drain sump system. Remove accumulated debris and flush with freshwater. Frequently test the automatic pump switch for proper operation.
- Clean and flush the fishbox and cooler/freezer storage boxes with soap or a bilge cleaner and freshwater after each use to keep them clean and fresh.
- Operate the thru-hull valves once a month and service as required.

Note: All drains and pumps must be properly winterized before winter lay-up.

Note: Never use harsh chemical drain cleaners in marine drain systems. Permanent damage to the hoses and fittings may result.

Chapter 8:
VENTILATION SYSTEM

8.1 Cabin Ventilation

Ventilation to the cabin area is provided by three deck hatches and two port windows.

Deck Hatches

The deck hatches in the cabin and hardtop are supported in the open position by one or two adjustable hatch adjusters. They are secured in the closed position by one or two cam levers on the inside of the hatch. To open a hatch, rotate the cam lever to the open position. Raise the hatch and secure it by tightening the hatch adjusters. To close the hatch, loosen the hatch adjusters and lower the hatch. Secure in the closed position with the two cam levers and slide locks.

The cam levers can secure the hatch in two positions, the vent position or fully closed. The hatch is secured in the vent position by opening hatch slightly until the cam levers align with the notch in the hatch frame just above the fully closed, watertight position. With the cam levers secured in this position, the hatch will be open just enough to let air circulate into the cabin. Always secure the hatch in the water tight position when leaving the boat unattended or when running offshore.

When the hatch is open, a removable screen can be installed in the hatch trim ring to prevent insects from entering the cabin. The screen is secured in place by two or four twist locks. The screen must be removed to access the cam levers to open or close the hatch.

Port Windows

Opening port windows are located in the main salon and head compartment. Each window opens to provide ventilation into the cabin area and is equipped with a removable screen.

The windows are secured by adjustable cam levers. The cam levers should be adjusted so they are tight enough to seal the windows in the closed position, but not so tight that the window becomes difficult to secure.

Always make sure the windows are closed and secured with the cam levers whenever the boat is underway. Sea spray could enter the cabin through an open window and damage upholstery, woodwork and cabin equipment.

Deck Hatches

Main Hatch Adjusters and Cam Locks

Cabin Port Window

8.2 Windshield Ventilation

Ventilation through the windshield is provided by an opening center panel forward of the cabin door. The center vent panel is opened and closed by an electric actuator controlled by the Windshield Actuator switch in the helm switch panel. To open the vent, press the switch and open the windshield to the desired position. To close the panel, press the switch until the panel is completely closed. A limit switch automatically stops the actuator when it reaches the full open or closed position to prevent damage to the windshield or the actuator. Always release the switch immediately when vent panel reaches the full open or closed position.

Power Windshield Vent

8.3 Carbon Monoxide and Proper Ventilation

DANGER

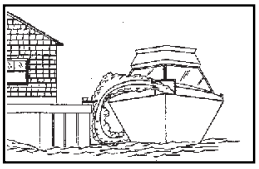
FAILURE TO PROPERLY VENTILATE THE BOAT WHILE THE ENGINES ARE RUNNING MAY PERMIT CARBON MONOXIDE TO ACCUMULATE WITHIN THE CABIN AND OPEN AREAS OF YOUR BOAT. CARBON MONOXIDE IS A COLORLESS AND ODORLESS GAS THAT IS LETHAL WHEN INHALED. CARE MUST BE TAKEN TO PROPERLY VENTILATE THE BOAT AND TO AVOID CARBON MONOXIDE FROM ACCUMULATING IN THE BOAT WHENEVER AN ENGINE IS RUNNING.

A by-product of combustion, carbon monoxide (CO) is invisible, tasteless, odorless, and is produced by all engines and gas heating and cooking appliances. The most common sources of CO on boats are gasoline and diesel engines, auxiliary generators and propane or butane stoves. These produce large amounts of CO and should never be operated while sleeping. The hazard also may be created by a boat nearby whose exhaust fumes are entering your boat. Boats also have a problem due to the "station wagon effect" where engine exhaust fumes are captured in the vacuum or low pressure area, usually the cockpit, bridge deck and cabin, that can be created by the forward speed of the boat.

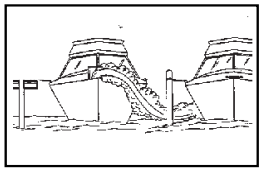
Boats underway should close all aft facing hatches and doors. The forward facing deck hatches should be open whenever possible to help pressurize the living spaces of the boat. No sleeping in the cabin should be permitted while underway. Proper ventilation should be maintained on the bridge deck by opening windshield or forward clear connector vents, as far as possible to help pressurize the cockpit area. The canvas drop or aft curtain must be removed and the side curtains should be opened or removed to increase air flow and maintain proper ventilation whenever the engines are running. ***Under no circumstances should the engines be operating with side curtains closed and the aft or drop curtain installed.***

Extreme caution must be taken while at anchor or in a slip when an auxiliary power generator is operating. Wind still nights can easily allow exhaust fumes, containing high concentrations of CO, from the generator on your boat or from an adjacent boat's generator to enter the boat. The exhaust fumes may enter your boat through open hatches or windows.

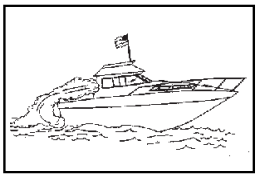
A carbon monoxide detector has been installed in your cabin as standard equipment. While a CO detector enhances your protection from CO poisoning, it does not guarantee it will



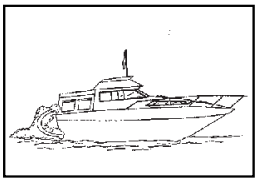
Onboard Generator Exhaust - exhaust accumulates because of bulkhead.



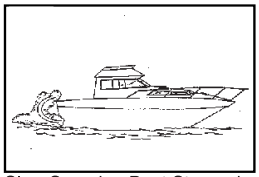
Nearby Generator Exhaust - wind carries exhaust to the other boat



Back Drafting / Station Wagon Effect - at cruising speed with no forward ventilation



Back Drafting / Station Wagon Effect - at cruising speed with canvas closed



Slow Speed or Boat Stopped w/ engines running - CO can accumulate in cabin, cockpit & bridge

not occur. Do not use the carbon monoxide detector as a replacement for ordinary precautions or periodic inspections of equipment. Never rely on alarm systems to save your life, common sense is still prudent and necessary. Remember, the operator of the boat carries the ultimate responsibility to make sure the boat is properly ventilated and the passengers are not exposed to dangerous levels of carbon monoxide. You should always be alert to the symptoms and early warning signs of carbon monoxide poisoning. You also should read the "Carbon Monoxide Monitoring System" in the Safety Equipment chapter of this manual, and the owner's manual supplied by the CO detector manufacturer for operation instructions and additional information regarding the hazards and symptoms of carbon monoxide poisoning.

DANGER

ACTIVATION OF THE CARBON MONOXIDE DETECTOR INDICATES THE PRESENCE OF CARBON MONOXIDE (CO) WHICH CAN BE FATAL. EVACUATE THE CABIN IMMEDIATELY. DO A HEAD COUNT TO CHECK THAT ALL PERSONS ARE ACCOUNTED FOR. DO NOT REENTER THE CABIN UNTIL IT HAS BEEN AIRED OUT AND THE PROBLEM FOUND AND CORRECTED.

Periodically test the carbon monoxide alarm per the manufacturer's instructions. Please refer to the carbon monoxide alarm manual or contact the manufacturer for more information on maintaining and calibrating the alarm.

8.4 Engine Compartment Ventilation

All Wellcraft inboard boats are equipped with an engine compartment ventilation system consisting of intake ducts and intake/exhaust blowers. The ventilation system is designed to meet or exceed the requirements of the United States Coast Guard in effect at the time of manufacture and remove fuel vapors and excess heat from the engine room.

Free Air System

A flow of air into the engine compartment is provided by two vents located on either side of the hull. The vents are designed with special baffles that prevent seawater or spray from entering the engine compartment while providing adequate air movement for the engines. The baffles are drained to the overboard drain manifolds in the engine compartment.

Forced Ventilation

Electric blowers provide ventilation to the engine compartment prior to start up and while operating below cruise speed. The blowers are activated by a switch at the helm or in the cabin DC panel. The blowers are located in the vents on each side of the engine compartment. When activated, the blowers will remove bilge fumes and excessive heat through the bilge exhaust vents. Refer to the Electrical Systems chapter for more information on blower operation.

Engine Compartment Blower and Vent Baffle

Engine Compartment Vent

Inspect the blowers frequently to make sure they are operating properly. Always replace worn or defective components with new components of the same type.

WARNING

ALWAYS RUN THE EXHAUST BLOWERS WHEN OPERATING THE BOAT BELOW CRUISE SPEEDS OR WHEN THE GENERATOR IS RUNNING TO ENSURE ADEQUATE VENTILATION AND COOLING OF THE ENGINE COMPARTMENT.

8.5 Maintenance

- Periodically lubricate all hinges and latch assemblies with a light oil.

- Periodically clean and coat gasket materials with silicone to help keep them pliable.

- The opening cabin deck hatches and the cabin door are made of acrylic plastic glass. Acrylic glass scratches easily. Never use a dry cloth or glass cleaning solutions on acrylic glass. Use a soft cloth and mild soap and water for routine cleaning. Solvents and products containing ammonia can permanently damage acrylic glass. Please refer to the Routine Maintenance chapter for more information on the proper maintenance for acrylic plastic glass.

- Periodic inspection and cleaning of the engine compartment ventilation ducts is necessary to ensure adequate air circulation. A buildup of leaves, twigs, or other debris can severely reduce ventilation. It also is important to be sure that the drains in the vent baffles are open to prevent excessive seawater from accumulating in the vents and overflowing into the engine compartment.

- The bilge blowers are permanently lubricated and require no maintenance. Blower operation can and should be tested by placing a hand over the exhaust vents. Do not rely on the sound of the blowers. A substantial amount of air should be exhausted by the blower. Frequently check the vents for obstructions, preferably before each cruise.

Note: Should blower noise become excessive, the source of the noise should be found and corrected before operating the boat.

Chapter 9:
EXTERIOR EQUIPMENT

9.1 Deck

Rails and Deck Hardware

The rail system and hardware fittings have been selected and installed to perform specific functions. Bow and hand rails are installed to provide a handhold in certain areas of the boat. You should make sure you keep at least one hand on the handholds as you move about the boat.

Mooring lines should be secured to the cleats and not to rails or stanchions. The stern is equipped with a hawse pipe and cleat system. Mooring lines should be fed through the hawse pipes then secured to the stern cleats. Be sure a clear lead exists when running dock lines or anchor lines. A line inadvertently run around a stanchion or over the rail could cause damage.

Note: All fittings must be inspected periodically for loose fit or wear and damage. Any problems should be corrected immediately.

Deck Hardware, Bow Rail and Windlass

WARNING

WELLCRAFT BOATS ARE NOT EQUIPPED WITH HARDWARE DESIGNED FOR TOWING PURPOSES. THE MOORING CLEATS ARE NOT TO BE USED FOR TOWING ANOTHER VESSEL OR HAVING THIS BOAT TOWED.

Bow Pulpit and Roller

The bow pulpit is built into the hull and is equipped with a roller assembly that allows the anchor to be operated and stored at the pulpit. The anchor line is stored in the rope locker and routed out the windlass or anchor locker hatch, through the roller and connected to the anchor chain. A cleat and chain binder is provided on the deck near the pulpit to secure the anchor. Always make sure the anchor is properly secured when it is in the stored position on the pulpit.

Anchor Rope Locker

The anchor locker is in the bow of the boat and accessed through a hatch in the deck. The anchor line is always stored in the rope locker and there is an eye fitting to secure the bitter end of the anchor line.

The locker is designed for the anchor line and not for storing anchors or additional anchor lines. Do not store additional anchors or any heavy objects in the anchor locker. Lunch hooks and weights for floating markers will bounce and damage the hull or anchor locker if they are stored there. Always store and secure additional anchors and weights in a storage compartment in the cockpit, as far aft as possible.

The anchor locker is drained by a hole in the bottom of the locker. It is very important to check the drain frequently to make sure it is clean and free flowing.

Periodically remove the anchor line from the rope locker, rinse it with fresh water and allow it to dry in the sun. Cleaning the anchor line regularly will reduce odors in the anchor locker and increase the life of the line.

The line should also be inspected for abrasions or signs of deterioration. Replace the line if it shows any sign of damage or deterioration. Your boat is equipped with a windlass and it is important to replace the anchor line with a new line of the type recommended or supplied by the windlass manufacturer.

Windlass

The windlass is mounted to the deck near the rear of the pulpit above the rope locker. The anchor is stored on the pulpit and is raised and lowered by the windlass. The anchor line is stored in the rope locker and routed out through the windlass to the anchor chain.

The anchor is lowered by releasing the anchor from the cleat or chain binder near the pulpit and operating a "DOWN" control at the helm, or the foot switch at the bow. The windlass control switch is protected by a "Push to Reset" breaker located in the helm accessory breaker panel. Another circuit breaker in cabin DC panel protects the main windlass circuit.

Note: The button on the main breaker for the windlass requires firm pressure to reset.

After the anchor is set, the windlass must not be left to take the entire force from the anchor line. Boats lying to their anchor in a high swell or heavy weather conditions will snub on the line. This can cause slippage or apply excessive loads to the windlass. The line should be made fast to the cleat provided to relieve the load on the windlass.

The anchor is hauled in by releasing the line from the cleat and operating the "UP" control at the helm or the foot switch on the deck near the windlass. Always start the engines before hauling the anchor and motor up to the anchor as the line is retrieved to relieve the load on the windlass. Once the anchor is retrieved, independently secure the anchor to the chain binder or a cleat to prevent it from being accidentally released. This is especially important while the boat is under way.

The windlass manufacturer provides an owner's manual with its product. It is extremely important that you read the manual and become familiar with the proper care and operation of the windlass. Refer to the Operation chapter for tips on anchoring your boat.

WARNING

A WINDLASS MUST BE USED WITH CARE. IT IS EXTREMELY IMPORTANT THAT YOU READ THE OWNER'S MANUAL AND BECOME FAMILIAR WITH THE SAFETY INSTRUCTIONS AND PROPER OPERATION OF THE WINDLASS BEFORE USING IT WITH YOUR BOAT. ALWAYS ENSURE THAT LIMBS, FINGERS, HAIR AND CLOTHING ARE KEPT CLEAR OF THE WINDLASS AND ANCHOR LINE DURING OPERATION.

Windlass Foot Switches

Windshield

CAUTION

DO NOT USE A WINDLASS AS A SOLE MEANS OF SECURING AN ANCHOR IN THE BOW PULPIT. ALWAYS SECURE THE ANCHOR LINE OR CHAIN TO A CLEAT OR CHAIN BINDER BEFORE OPERATING YOUR BOAT.

Windshield

Your boat is equipped with a powder coated aluminum windshield with tinted glass and a vent. Ventilation through the windshield is provide by an opening center panel that is opened and closed by an electric actuator controlled by the Windshield Vent switch in the helm. Refer to the Ventilation chapter for instructions on operating the windshield vent.

The front and side panels are tempered safety glass. The curved glass panels on the port and starboard side of the windshield are made of tinted glass.

The welded aluminum windshield frame is powder coated. Powder coated aluminum is very durable and provides excel-

lent protection for aluminum, however it must be maintained properly and certain precautions must be observed when mounting snaps or hardware to the windshield.

The windshield should be washed after each use with soap and water to keep it clean. Saltwater allowed to remain on the aluminum will eventually penetrate the coating and attack the aluminum, usually around fasteners and hardware mounted to the frame. Snaps or any hardware mounted to the windshield must be properly sealed and isolated with fiber washers and/or caulk or a teflon sealer to prevent salty moisture and galvanic corrosion from damaging the aluminum frame. Poor maintenance or improperly mounted hardware and snaps can void the warranty on the windshield.

Refer to the Routine Maintenance chapter for more information on the care and maintenance of powder coated aluminum.

Windshield Vent Actuator

9.2 Hull

Swim Platform and Boarding Ladder (Optional)

Your boat could be equipped with an optional fiberglass swim platform and ladder in the stern of the boat.

The swim platform should only be installed by the Wellcraft factory at the time of construction or by an authorized Wellcraft dealer. Improper swim platform installation can damage the boat's transom or interfere with the transom door.

The telescoping boarding ladder is mounted to the swim platform. To use the ladder, rotate it from the swim platform into the water. Then pull the bottom step until the ladder is fully extended. The ladder must be closed and rotated onto the platform and secured before starting the engines.

Swim Platform, ladder, Hand Rail and Transom Door and Gate

Boarding Steps and Hand Rail

Emergency boarding steps and a hand rail on the starboard side of the transom are standard equipment on your boat. They are intended to assist in boarding a swimmer or someone who has accidentally fallen overboard. The bottom step is below the waterline and connected to the bonding system to prevent galvanic corrosion. It should be painted with bottom paint and kept clear of marine growth so it can be used without causing difficulty or injury to someone attempting to board the boat.

WARNING

MOVING PROPELLERS ARE DANGEROUS. THEY CAN CAUSE DEATH, LOSS OF LIMBS, OR OTHER SEVERE INJURY. DO NOT USE THE SWIM PLATFORM OR SWIM LADDER WHILE THE ENGINES ARE RUNNING. STOP THE ENGINES IF DIVERS OR SWIMMERS ARE ATTEMPTING TO BOARD. ALWAYS PROPERLY STORE THE LADDER BEFORE STARTING THE ENGINES.

DANGER

CARBON MONOXIDE (CO) CAN CAUSE BRAIN DAMAGE OR DEATH. ENGINE AND GENERATOR EXHAUST CONTAINS ODORLESS AND COLORLESS CARBON MONOXIDE GAS. CARBON MONOXIDE WILL BE AROUND THE BACK OF THE BOAT WHEN ENGINES OR GENERATORS ARE RUNNING. MOVE TO FRESH AIR IF YOU FEEL NAUSEA, HEADACHE, DIZZINESS, OR DROWSINESS.

Ground Plate

A radio ground plate may be installed on the hull below the waterline. This plate is designed to increase the ground plane and improve the performance of marine electronic equipment. Please refer to the owners manuals for the electronics installed on your boat for information on the ground plate connection.

Transom Anode and Active Corrosion System

A zinc anode is attached to the transom below the waterline. It protects the underwater hardware from galvanic corrosion. A badly corroded zinc anode will not provide proper protection and damage to the hardware will result. The anode should be checked monthly and changed as needed. Refer to the routine maintenance section for more information on maintaining zinc anodes.

The Active Corrosion protection unit is located in the stern bilge and has an anode and cathode mounted on the transom below the waterline. It is a solid-state device that provides protection by impressing a reverse blocking current that stops or reduces the destructive flow of galvanic currents and typically increases the life of the sacrificial anodes. This unit is always activated and provides additional protection for the running gear and other metal hardware below the waterline. Refer to the Active Corrosion unit owner's manual for more information on operation and maintenance.

Trim Tabs

The trim tabs are recessed into the hull at the transom. The trim tabs are an important part of the control systems. Please refer to the Helm Control Systems chapter for detailed information on the trim tabs.

9.3 Cockpit

General

The hatches in the cockpit sole and bridge deck are raised with flush mounted handles that store flush in the hatch. Automatic pressure latches secure most cockpit hatches in the closed position. Gas charged springs or spring struts are used to help raise most hatches and hold them in the open position.

Some hatch latch handles must be rotated to the correct position to store flush. Other hatches require firm down pressure to secure the pressure latches. Always make sure the hatches are secured with the pressure latches and that the handles are in the flush position before operating the boat above idle speed.

WARNING

IN CERTAIN CONDITIONS, OPEN EXTERIOR DOORS AND HATCHES THAT ARE NOT SECURED PROPERLY CAN SLAM CLOSED UNEXPECTEDLY AND CAUSE INJURY TO PASSENGERS OR DAMAGE TO THE BOAT. MOST DOORS AND HATCHES ARE EQUIPPED WITH SPECIAL FASTENERS, HATCH LIFTERS, OR SNAPS AND/OR STRAPS, TO SECURE THEM IN THE OPEN POSITION. ALWAYS MAKE SURE THAT THESE HATCHES AND DOORS ARE PROPERLY SECURED WHENEVER THEY ARE IN THE OPEN OR CLOSED POSITIONS.

Transom Zinc Anode and Active Corrosion Anode and Cathode

Engine Access

Access to the engines is provided by a day hatch, located in the bridge deck or by raising the bridge deck above the engine compartment. The bridge deck is raised by two electric hatch lifters activated by a switch in the shore power inlet panel near the transom door. The hatch lift circuit is energized by the port engine battery switch. The aft end of the bridge deck is lifted and lowered by the electric actuators. Another switch in the helm switch panel activates the engine room lights.

The bridge deck is designed to raise high enough to provide adequate access to service the components in the engine compartment. It lifts high enough to cause the helm seat to hit the helm module and steering wheel when it is lifted to the full up position if the wheel is not tilted up and the seat is not in the full aft position. Additionally, the forward jump seat in the L-lounge will hit the bulkhead if it is not in the down position and L-lounge back rest will hit the jump seat backrest/bolster if the bolster is not removed. This can cause severe damage to the seats, helm and bridge deck. ***Therefore, it is critical that the helm seat is in the full aft position, the steering wheel is tilted up and L-lounge forward jump seat is down and the backrest/bolster removed before raising the bridge deck. Additionally, you should monitor the clearance for the seats as deck is raised and not raise the bridge deck higher than 39" at the rear.***

The hatch lifters are equipped with ratcheting clutches and travel at slightly different speeds as the bridge deck raises or lowers. It is important to hold the switch in the down position for a couple of seconds after the bridge deck closes to fully seat the bridge deck and synchronize the hatch lifters. The clutches will slip and make a ratcheting sound as the lifters seat the deck and synchronize. This is normal and will not hurt the hatch lifters.

The weight of water in the baitwell and/or freezer puts additional strain on the bridge deck and hatch lifters. You should never lift the bridge deck with the baitwell and/or freezer full.

There are safety struts mounted on the inside rear of the bridge deck. The struts are designed to prevent the bridge deck from closing accidentally if a hatch lifter was to fail. The struts should always be inserted whenever someone is in the engine compartment with the bridge deck raised. To use the safety struts, raise the bridge deck to the full up position. Swing the struts to the vertical position then carefully lower the bridge deck until it presses slightly against the struts. The pressure from the weight bridge deck will hold the struts in place and prevent them from being knocked out. Raise the bridge deck and secure the struts in the stored position when you are ready to close the deck.

Raised Bridge Deck, Hatch Lifters and Safety Struts

CAUTION

TO AVOID CONTACT WITH HELM SEAT, BRIDGE DECK MUST BE LIMITED TO A HEIGHT OF 39" AT AFT END.

CAUTION

TO AVOID POSSIBLE DAMAGE TO THE COCKPIT AND BRIDGE DECK, SOME EQUIPMENT MAY HAVE TO BE MOVED OR STOWED BEFORE THE BRIDGE DECK IS RAISED. BE CERTAIN ALL EQUIPMENT AND LOOSE ITEMS ARE CLEAR AND ALL HATCHES ARE CLOSED BEFORE LIFTING THE BRIDGE DECK. DO NOT STAND ON THE BRIDGE DECK DURING OPERATION.

WARNING

A FULL BAITWELL AND/OR FREEZER DRAMATICALLY INCREASE THE WEIGHT OF THE BRIDGE DECK AND COULD CAUSE DAMAGE TO THE BRIDGE DECK OR THE HATCH LIFTERS WHEN IT IS LIFTED. DAMAGE TO THE BRIDGE DECK OR HATCH LIFTERS COULD CAUSE THE BRIDGE DECK TO DROP CAUSING SEVERE INJURY TO SOMEONE IN THE ENGINE COMPARTMENT . ALWAYS EMPTY THE LIVEWELL AND FREEZER BEFORE LIFTING THE BRIDGE DECK AND ENGAGE THE SAFETY STRUTS BEFORE ENTERING THE ENGINE COMPARTMENT.

Bait Prep/Tackle Center

Bait Prep/Tackle Center

A bait prep and tackle center equipped with a sink, freezer and tackle storage is on the port side of the cockpit. It has two drawers with latches located below the sink.

The hatch is equipped with a gas charged hatch lifter that holds the hatch in the open or closed position. An automatic pressure latch secures the hatch in the closed position. The sink is plumbed to the fresh water system. The sink and cooler/freezer compartment are drained by gravity to a thru-hull fitting in the hull side above the waterline. The freezer is activated by a circuit breaker in the cabin AC breaker panel.

Stern Fishboxes

A fishbox is located on each side of the cockpit, below the cockpit sole. The fishbox hatches are equipped with gas hatch lifters that hold the hatches in the open position. Flush twist latches secure each hatch in the closed position.

The fishboxes are drained by a macerator pump located in the stern bilge and activated by a switch in the shore power inlet panel near the transom door. Be sure to monitor the water level in the fishboxes and turn the pump off as soon as pumping is complete. The pump could be damaged if it is allowed to run dry for extended periods. The fishboxes should be pumped out and cleaned after each use. Refer to the Drainage Systems chapter for more information on the fishbox drainage.

Fishbox and Flush Latch

Baitwell

A baitwell is located in the cockpit, aft of the helm seat. The insulated baitwell has a light and is supplied by a raw water circulating pump. It drains overboard through a fitting in the hull side. Refer to the Raw Water System chapter for additional information on the baitwell system.

Baitwell

Cockpit Jump Seat (Optional)

An aft facing jump seat is located on the rear of the baitwell. To use the seat, release the straps on the lower edge of the seat. Then pull the bottom of the seat toward the cockpit. The seat will move into the proper position as it slides out from the stored position. Make sure the rear of the seat locks into the slot in the seat track. To store the seat, pull the seat forward and simultaneously lift the rear of the seat. This will release seat and cause it to fold against the baitwell. Secure the seat in the stored position with the straps.

Transom Door and Gate

A transom door and gate is incorporated into the transom. The gate is hinged and can be opened by releasing the latch and lifting the starboard side. The door can be opened when the gate is open or closed. It is secured by a special latch mounted on the inboard side of the door. The door and gate latches have a spring loaded safety pin. When the transom door and gate are closed, make sure the latches are completely closed and that the safety pin is snapped into place to prevent the latch from opening accidentally.

The transom door and gate should only be opened when the boat is not in motion. The door must be latched in either the full "OPEN" or full "CLOSED" position. Never leave the transom door unlatched.

Cockpit Jump Seat

Note: **Periodically inspect the transom door and gate fittings for wear, damage, or loose fit. Any problems should be inspected and corrected immediately.**

WARNING

THE TRANSOM DOOR AND GATE SHOULD BE CLOSED AND PROPERLY LATCHED WHENEVER THE ENGINES ARE RUNNING. NEVER OPEN THE TRANSOM DOOR WHILE UNDERWAY OR IN ROUGH SEA CONDITIONS. IN CERTAIN SITUATIONS, AN OPEN TRANSOM DOOR COULD ALLOW A SUBSTANTIAL AMOUNT OF WATER TO ENTER THE COCKPIT CREATING A POTENTIALLY DANGEROUS CONDITION.

WARNING

OPERATING THE BOAT UNDER POWER WITH THE TRANSOM DOOR AND GATE OPEN MAY ALLOW PERSONS TO FALL OVERBOARD AND INTO BOAT PROPELLERS OR TO BE LOST IN OPEN WATER. ALWAYS CHECK TO MAKE SURE THE TRANSOM DOOR AND GATE IS PROPERLY CLOSED AND LATCHED BEFORE STARTING THE ENGINES AND NEVER OPERATE THE BOAT UNDER POWER WITH THE TRANSOM DOOR AND GATE OPEN.

Transom Door and Gate

Gate Latch and Safety Pin

Transom Door Latch and Safety Pin

L-lounge Passenger Seat

The L-shaped lounge passenger seat is mounted on a storage compartment. The compartment is accessed through a door on the side of the lounge. The bait center is built into the rear of the L-lounge seat and there is a storage compartment forward of the bait center that is accessed by a hatch below the seat cushion. If the boat is equipped with the optional cockpit air conditioner, it will be installed in this compartment with the control panel mounted on the side wall forward of the lounge.

The operation of the cockpit air conditioner is similar to the cabin air conditioner. Refer to the Raw Water Systems chapter, the Interior Equipment chapter and the air conditioner owner's manual for additional information on the operation of the air conditioning system.

A hinged seat on the forward side of the L-lounge swings up and automatically latches to extend the lounge. A removable, wrap around backrest/bolster on the side wall and forward bulkhead complete the extension. The hinged seat cushion is lowered by holding slight down pressure on the front of the cushion and pressing the release levers on the seat support brackets below the seat. The bolster is on a slide track and can be removed when the bridge deck is raised and for storage.

L-lounge Forward Folding Seat and Latches

Helm Seat

The helm seat slides fore and aft. There is friction latch on the port side of the seat. Loosen the friction latch to adjust the seat and tighten it to secure the seat in the desired position. The helm seat must be secured in the full aft position and the steering wheel tilted up before raising the bridge deck.

Ice Maker (Optional)
An ice maker is supplied as optional equipment and is mounted below the helm seat. The ice maker operates on AC power only. The ice maker door has a special latch to secure the door while under way: make sure the door is properly secured whenever the boat is moving. Refer to the ice maker owner's manual for additional operating and maintenance instructions.

The fresh water system supplies the water for the ice maker. Make sure the fresh water pump is activated and there is water in the fresh water system before turning on the ice maker. Refer to the ice maker owner's manual for additional operating and maintenance instructions.

Helm Seat Friction Knob and Ice Maker

Starboard Passenger Seat
There is a passenger seat and tackle storage behind the helm seat. The cushions are removable and secured to the base with hidden snaps. There are two tackle lockers located below the seat that are equipped with removable trays mounted in slide tracks.

Starboard Passenger Seat and Tackle Storage

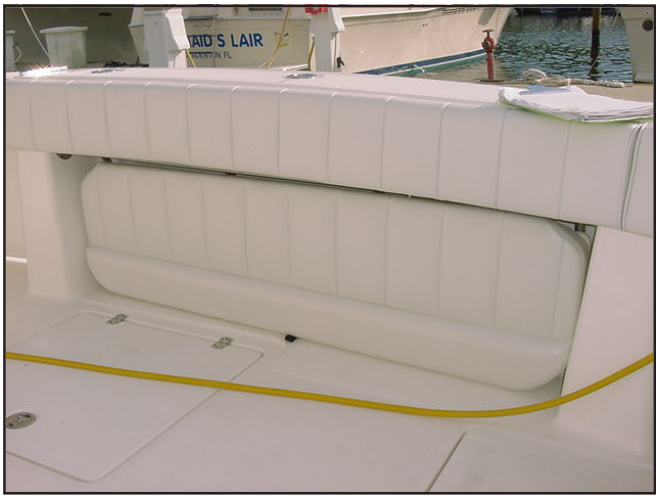
Aft Seat (Optional)
Your boat could be equipped with an optional aft bench seat. The seat is designed with two hinged support legs that allow the seat to fold against the rear of the cockpit when it is not in use.

Leg Bracket and Button

To use the seat, pull the bottom of the seat toward the cockpit. The seat will move into the proper position as it swings out from the stored position. A gas strut will help raise the seat and make it easier to hold while the legs are put in position. To release legs, push the button located on the bracket and swing each until it locks in the down position. Then lower the seat until the legs contact the cockpit sole.

To store the seat, raise the seat off the sole and release the legs by pushing the button on the side of the bracket. Swing each leg until it locks in the stored position. Push down on the front of the seat to overcome the lifting pressure of the gas strut and fold it against the rear of the cockpit. The gas strut will hold the seat in the stored position.

The stern seat cushion is removable by unsnapping it from the seat base. The seat cushion will last much longer if it is removed and stored out of the weather while the boat is not being used.



Aft Seat Folded

Note: Periodically inspect the folding seat fittings for wear, damage, or loose fit. Any problems should be inspected and corrected immediately.

CAUTION

MAKE SURE THE AFT SEAT LEGS ARE IN THE DOWN POSITION BEFORE USING SEAT.

Aft Seat Open

Helm

The steering, engine controls, engine instruments and switches for exterior equipment and navigation lights are located on the helm station. Molded-in electronics storage is located forward of the engine controls. An air conditioning duct provides cooling to helm station whenever the cabin air conditioning system is operating.

The helm station is hinged at the bottom and opens to provide access to service the helm equipment or to install electronics. A heavy duty cable holds the helm in the open position and prevents it from opening too far. Extra terminal strips and ground busses are provided make it easier to add 12-volt accessories and electronics.

To open the helm station, make sure the engines are not running, tilt the steering wheel to the full up position and slide the helm seat back as far as it will go. Remove the two bolts on each side of the helm. Hold the helm in the closed position while removing the last bolt. Carefully lower the helm to the full open position.

Note: The helm is heavy and could open unexpectedly when the last bolt is removed. This could break the retainer straps or damage the helm. Make sure you hold the helm closed while removing the last bolt.

Close the helm by pushing it to the closed position. Secure the port bolt first then install the starboard bolt. Always make sure the helm station bolts are properly tightened when the helm is closed.

WARNING

ALWAYS MAKE SURE THE HELM STATION BOLTS ARE PROPERLY INSTALLED AND TIGHT BEFORE OPERATING OR TRANSPORTING YOUR BOAT. IF THE HELM STATION IS NOT PROPERLY SECURED, IT COULD OPEN UNEXPECTEDLY AND DAMAGE THE BOAT OR CAUSE LOSS OF CONTROL.

Helm

WARNING

UNDER NO CIRCUMSTANCES SHOULD THE HELM BE OPENED WHEN THE ENGINES ARE RUNNING. IN SOME SITUATIONS IT IS POSSIBLE TO ACCIDENTALLY ENGAGE THE ENGINE SHIFT INTO GEAR AND/OR ADVANCE THROTTLE CONTROLS AS THE HELM IS OPENING. THIS COULD RESULT IN LOSS OF CONTROL, DAMAGE TO THE BOAT, AND INJURY TO PASSENGERS.

Chart Cover

A chart cover is located forward of the L-lounge. The compartment drains to the bridge deck and has a clear Plexiglas hatch that is hinged and held closed by a friction latch.

Cabin Door

The sliding cabin door is made of acrylic plastic glass and slides on a top and bottom track. A lockable latch secures the door in the closed position. A special vinyl-covered latch near the bottom door track secures the door in the open position.

It is very important that the cabin door is secured properly in the open or closed position. The cabin door is heavy and if the door is not properly latched, it could slide when the boat rocks and pinch someone's fingers between the door and the bulkhead or damage the door.

When closing the door, make sure you push the door against the door jam with enough pressure to allow the latch to secure the door. When the door is open, it must be properly secured with the latch near the bottom door track and to the port side of the companionway. To latch the door in the open position, open the door completely, then rotate the latch to lay on the track in front of the door preventing the open door from sliding as the boat rocks.

The door is made of acrylic plastic glass. Acrylic glass scratches easily and can chip. Always make sure the vinyl-covered latch is in good condition. It should be changed whenever it shows signs of deterioration from the exposure to elements. Please refer to the Routine Maintenance chapter for information on the proper care and maintenance of acrylic plastic glass.

Cabin Door

CAUTION

NEVER LEAVE THE CABIN DOOR UNLATCHED. THE CABIN DOOR IS HEAVY AND SLIDES EASILY. IF THE DOOR IS LEFT UNLATCHED, IT COULD SLIDE UNEXPECTEDLY AS THE BOAT ROCKS, DAMAGING THE DOOR OR CAUSING AN INJURY TO A PASSENGER. ALWAYS MAKE SURE THE DOOR IS PROPERLY LATCHED IN THE OPEN OR CLOSED POSITION.

SECURE THE DOOR WHEN CRUISING. DO NOT SIT STAND OR PLACE HEAVY OBJECTS ON THE DOOR.

Vinyl Covered Cabin Door Latch at Bottom of Door

WARNING

CARBON MONOXIDE (CO) CAN CAUSE BRAIN DAMAGE OR DEATH. CARBON MONOXIDE CAN BE PRESENT IN THE CABIN. SIGNS OF CARBON MONOXIDE POISONING INCLUDE NAUSEA, HEADACHE, DIZZINESS, DROWSINESS, AND LACK OF CONSCIOUSNESS. GET FRESH AIR IF ANYONE SHOWS SIGNS OF CARBON MONOXIDE POISONING. GET FRESH AIR IF CARBON MONOXIDE DETECTOR ALARM SOUNDS. CARBON MONOXIDE DETECTOR MUST BE FUNCTIONING AT ALL TIMES."

Hard Top

The hard top consists of a laminated fiberglass top mounted to a welded aluminum frame that is bolted to the deck. The top and frame are designed to accommodate radio and GPS antennas and radar antennas. It could also be equipped with optional outriggers or a spot light.

The hard top is equipped with built in port and starboard running lights, a mast head light, spreader lights, stereo speakers, courtesy lights and rod holders. There are also two vent hatches that provide additional ventilation and light for the bridge deck. The courtesy and spreader lights are activated by switches in the helm. The spot light is activated and controlled by the spot light switch panel in the helm. A toggle switch activates the optional spot light and a joy stick controls the direction and angle of the beam. Refer to spot light owner's manual for additional instructions on the operation of the spot light.

Electronics antennas must be mounted to the hard top between the front and rear legs. Antennas mounted on towers may require extensions if they are mounted on the hard top. There is a molded in radar antenna mount on the forward part of the hard top.

Do not mount any antennas or equipment to the brow area forward of the front legs. The frame is not designed to support the weight of accessories in this area and could be damaged. The rear legs are used as the wire chase for lights and antennas mounted to the hard top.

The warranty for the hard top will be void if the structure is modified in any way or if heavy accessories like life rafts are mounted to the top. Additionally, if items like radar antennas spotlights and other accessories are mounted in the wrong location, the warranty could be void. If you intend to add equipment or make modifications to the hard top, you should contact Wellcraft Customer Service to make sure the equipment you would like to add or the intended modification will not void the warranty on the fiberglass top or the aluminum structure.

Because the aluminum frames vary slightly, the side curtains, front clear connector and drop curtain are custom made to each boat at the factory. To install the curtains, begin with the front connector and do one curtain at a time. To install the curtains, slide the front clear connector into the slide track at the front of the top and snap it to the windshield beginning with the center snaps. The clear connector will have to be stretched just enough to pull out the wrinkles to reach the snaps on the windshield or the deck.

Once the clear connector is completely installed, the side curtains can be put on. Slide the side curtains into the slide tracks on the sides of the top and to the zippers on the front connector. Snap the curtains to windshield and deck beginning with the forward snaps. The side curtains will have to be stretched slightly to pull out the wrinkles and reach the snaps.

If you have a drop curtain, slide it into the slide track on the back of the hard top and attach it to the rear of the side curtains. Snap the drop curtain to the deck and cockpit.

Note: Cold weather can make the clear vinyl material on the curtains stiff and difficult to stretch to the bottom zipper or snaps. This can be particularly difficult with new canvas that has been stored off the boat. Laying the curtains in the sun for 30 minutes during the heat of the day will make installing them much easier in cold whether.

9.4 Aftermarket Hardtop or Tower

Wellcraft does not recommend installing an after market hardtop or tower. An improperly designed or installed fabrication can cause structural damage to the deck structure and void the Wellcraft Limited Warranty. Additionally, Wellcraft will not be responsible for any damage resulting from the installation of a fabrication not installed at the Wellcraft factory. If you intend to install an aftermarket hardtop or tower on your boat, please contact your dealer or Wellcraft Customer Service.

Refer to the Routine Maintenance section for more information on maintaining aluminum fabrications and precautions for adding additional equipment and fasteners.

THIS PAGE WAS LEFT BLANK
INTENTIONALLY

Chapter 10:
INTERIOR EQUIPMENT

10.1 Head Compartment and Marine Toilet

The head compartment is equipped with a shower and a sink with a hot and cold faucet. The shower head is equipped with a valve that allows the shower water to be turned on and off without affecting the temperature to conserve water while showering. The shower is drained by the cabin drain sump pump located below the cabin floor. A hinged seat above the toilet is provided to make showering more comfortable. Make sure the shower seat is down whenever the boat is cruising.

VacuFlush Head, Shower Seat, and Vanity

Ventilation is provided by an air conditioning duct and opening port window. There is also a 12-volt overhead light and 120-volt G.F.I. duplex outlet. The light is activated by a switch in the vanity below the sink. The holding tank fluid level monitor is located on the wall next to the toilet.

There is a mirror with storage and another storage cabinet next to the mirror above the vanity and toilet. The mirror and cabinet doors are secured with push to release latches on the bottom of each door. Additional storage and the toilet paper holder is behind the door below the sink.

Marine Head System

Your boat is equipped with a VacuFlush™ marine head system as standard equipment. VacuFlush systems use a small amount of water (one pint to one quart) and vacuum which is generated by the 12-volt vacuum pump to flush. The toilet is connected to the pressurized fresh water system. Using fresh water results in less odor in the head compartment.

Head Light, VacuFlush, Overboard Discharge and Overboard Lockout Switches

To use the toilet, make sure the Head System and Freshwater Pump breakers on the cabin DC breaker panel are on. The VacuFlush switch in the vanity switch panel should also be on. Then add water to wet the bowl by depressing the foot activated flush lever slightly until the desired water level is reached. Flush the toilet by activating the flush lever all the way for approximately three seconds or until contents clear the bowl. A sharp popping noise is normal when the vacuum seal is broken and flushing action begins. It is also normal for a small amount of water to remain in the bowl after flushing.

The waste is transferred into the holding tank where it remains until it is pumped out by a waste dumping station or the optional overboard macerator discharge system. The waste moves through a one-inch opening in the toilet base. Incom-

ing air fragments the waste as it passes through the base opening. This process eliminates the need for macerators or mechanical motors in the toilet base.

The vacuum generator is mounted on the holding tank and contains stored vacuum. System vacuum is monitored by a vacuum switch which is located on the vacuum generator tank. When the switch senses a drop in vacuum in the system, it automatically signals the pump to energize and bring the vacuum back to operating level. This process is normally completed in less than two minutes. It is normal for the stored vacuum to leak down slightly between flushes, causing the vacuum pump to run for a short period. The pump should not run more than once every three hours after the last flush for recharging the system.

A holding tank fluid level monitor is located near the toilet and an Overboard Discharge switch and a key activated Overboard Discharge lockout is located in the switch panel below the vanity sink. Please refer to the toilet manufacturer owner's manual for more information on the operation of the marine head system.

Holding Tank and Optional Macerator Discharge Pump

The holding tank and vacuum generator is located in the engine compartment. The macerator pump is near the holding tank and discharges waste to a thru-hull fitting in the hull side at the waterline.

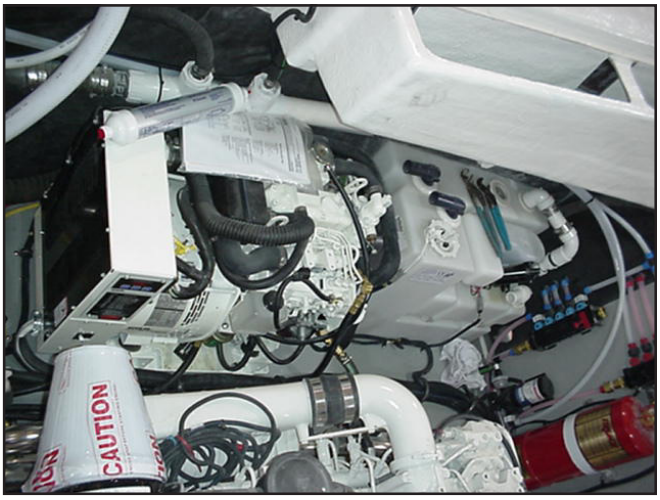
When the tank is full, the tank monitor in the head compartment will show full and the vacuum pump will not run. The tank must either be pumped out by an approved waste dumping station through the waste deck fitting or be pumped overboard with the optional macerator discharge pump, when legal to do so.

To operate the macerator discharge pump, turn the key lockout switch in the head vanity switch panel to Overboard Discharge. Then activate the Overboard Discharge switch located next to the key switch. Turn the Overboard Discharge switch and key lockout off the key when pumping is complete.

Note: Monitor the waste level with the Tank Watch Monitor as the macerator drains the tank and turn the pump off immediately when draining is complete.

Note: In order to comply with current State, Federal and Coast Guard regulations, the Overboard Discharge lockout key switch must be off and the key removed whenever the boat is operating in areas in which the discharge of sewage is prohibited.

Tank Watch Holding Tank Monitor



VacuFlush Vacuum Pump and Holding Tank

CAUTION

IN MANY AREAS IT IS ILLEGAL TO PUMP HEAD WASTE DIRECTLY OVERBOARD. VIOLATION OF THESE POLLUTION LAWS CAN RESULT IN FINES OR IMPRISONMENT. ALWAYS KNOW THE LAW FOR THE AREAS IN WHICH YOU BOAT. NEVER DUMP HEAD OR HOLDING TANK WASTE OVERBOARD ILLEGALLY.

Maintenance

The head should be cleaned and inspected for leaks regularly.

The holding tank should be pumped out and flushed as needed. Periodically add chemical to the head to help control odor and to chemically break down the waste. The vent hose is equipped with a charcoal filter to reduce odors. During normal operation, the filter should be changed annually. If the holding tank is allowed to become overfilled, waste will get into the charcoal filter and plug it. If this happens, the filter will have to be replaced before the head system can be reac-

tivated. See the manufacturer owner's manual for additional operating and maintenance information.

10.2 Cabin and V-Berth

Cabinet Door and Drawer Latches

Most cabinet doors and drawers in the cabin and V-berth are secured in the closed position with special latches that are flush to door or drawer when latched. To open, press and release the knob. The knob will pop out one inch, releasing the locking mechanism and providing a means to pull the door or drawer open. To close, make sure the door is completely closed and push the knob in. The knob will stay in and the locking mechanism will be activated.

Some doors are held closed by automatic friction latches. Most friction latches have a ball and spring that engages the latch strike to hold the door closed. The tension can be adjusted by turning screws on each side of the latch.

Cabin Light Switches

Most of the overhead cabin lights are controlled by switches on the cabin wall near the cabin door. Most lights in the cabin are powered by the DC electrical system. There is one set of overhead lights in the cabin ceiling that are powered by the AC electrical system. These are activated by one of the switches next to the cabin door and are the only AC lights in the boat.

Some of the lights are controlled by electronic dimmer switches. Pressing and holding the top of the switches will turn the lights on and make them brighter. Pressing and holding the bottom of the switches will dim the lights or turn them off.

Some light fixtures in the dinette and V-berth are equipped with dimmer switches on the light base. Rotating the knob on the switch clockwise turns the light on and makes it brighter. Rotate the knob counter clockwise to dim the light or turn it off.

Galley and Sink

The galley is equipped with storage and a fresh water sink with a single lever faucet with hot and cold water. Water is supplied to the sink by a 12-volt pump located in the engine compartment. When activated by the Fresh Water Pump breaker in the cabin DC panel, the water system will operate much like the water system in a home. An automatic pressure sensor keeps the system pressurized. The sink drains overboard through the cabin drain sump system. See the Fresh Water System chapter for more information on operating the fresh water system.

Daylight and fresh air is provided to this area by an opening port window and an overhead hatch. The hatch and window

Push to Release Cabinet Door and Drawer Latches

Galley

are equipped removable screens. Refer to the Ventilation System chapter for more information on the hatch and screen. Additional lighting is provided by lights above the galley. There is also a 120-volt GFI outlet located in the cabinet between the microwave and the coffee maker.

The sink counter tops are made of Corian and there is a microwave and a coffee maker mounted in the cabinet above the galley counter. A cabinet between the microwave and coffee maker and a shelf above provides additional storage. Storage cabinets and drawers are located below the sink and counter top. The AC/ DC refrigerator is mounted below the counter top.

The optional LCD TV is mounted to the cabinet door above the galley. The AC electrical plug and antenna gain control is in the cabinet behind the TV. The TV and gain control are activated by breakers in the cabin DC and AC breaker panels. Refer to the electrical system chapter for more information on the gain control. When the TV is installed, the cabinet door is equipped with a special strut and friction knob that allows the TV to be viewed from the V-berth or dinette. Always secure the TV in the desired position by tightening the

friction knob. The TV cabinet door should always be closed and latched whenever the boat is underway.

A hanging locker is located on forward side of the galley. The hanging locker has a 12-volt light that is activated automatically when the door is opened.

Stove

The galley is equipped with a two burner electric stove recessed into the counter top. To activate the stove, make sure the Stove breaker in the AC breaker panel is on. Then turn the control knob on the stove clockwise to turn the burner on. A manual for the stove is included with your boat. It is extremely important that you read the manual and become familiar with the proper care and operation of the stove before attempting to use it.

After cooking, be sure the element is turned off. Always be sure the burner is off and allowed to cool before placing anything on the stove.

CAUTION

THE STOVE IS DESIGNED AS AN APPLIANCE FOR COOKING FOOD. DO NOT ATTEMPT TO USE THE STOVE TO HEAT THE CABIN. USING THE STOVE TO HEAT THE CABIN COULD CAUSE THE STOVE TO OVERHEAT RESULTING IN DAMAGE TO THE STOVE OR A CABIN FIRE.

AC/DC Refrigerator

A dual voltage refrigerator is supplied as standard equipment. This unit will operate on 120-volt AC or 12-volt DC power. The refrigerator switches to 12-volt DC automatically when the AC power is disconnected and the Refrigerator breaker is activated on the cabin DC panel. When 120-volt AC current is provided by the Refrigerator circuit breaker on the AC panel, the refrigerator automatically switches to AC power.

Care should be exercised while operating the refrigerator on 12-volt power without the engine running. It draws a substantial amount of current and can severely drain a battery through extended use. The refrigerator door has a special latch to secure the door while under way, make sure the door is properly secured whenever the boat is moving.

Refer to the refrigerator owner's manual for additional operating and maintenance instructions.

Microwave Oven

A microwave oven is provided as standard equipment. The microwave operates on AC power and is protected by the Microwave breaker in the AC breaker panel. Please refer to the microwave owner's manual for detailed information on the microwave oven installed in your boat.

Microwave, TV and Coffee Maker

Typical Stereo and DVD/CD Player

Main Cabin

Dinette and Rod Locker

The dinette table, lounge seat and a hanging locker are on the starboard side of the cabin. There is also a storage locker for fishing rods above the dinette lounge seat. The hanging locker has a 12-volt light that is activated automatically when the door is opened. The cabin air conditioning unit is located below the aft cushion and a compartment for storage is below the forward cushions.

The cabin AC/DC breaker panels, overhead light switches, DVD/CD player, stereo, amplifiers and storage is built into the cabinet at the rear of the dinette. The optional TV is built into the upper galley cabinet. The stereo is activated by the Stereo, Stereo Amplifier and Sub Woofer breakers in the DC electrical panel. The DVD/CD player and TV gain control is activated by the TV Antenna DVD Player breaker. The TV is activated by the Television breaker on the AC panel.

The table is mounted on an adjustable pedestal that allows the dinette to be converted to a double berth. To convert the dinette to a double berth, loosen the friction knob on the pedestal base. Then carefully push the table down until it seats in the full down position. Secure the table in the down position by tightening the friction knob. Place the separate berth cushions on the table top to complete the berth conversion. The table also should be lowered to the down position whenever the boat is run offshore or in heavy sea conditions to reduce the load on the pedestal base. A gas charged spring will raise the table from the down position to the up position when the friction knob is loosened.

The dinette backrest cushion is hinged at the top and converts to a single pilot berth. To convert the backrest to a berth, raise the bottom of the backrest up until it is horizontal and secure it with the straps from the bottom of the berth to the eye brackets in the cabin headliner and deck. Install the separate insert cushion, usually stored in the cabin rod locker, to complete the conversion. Always put the berth down before operating the boat.

The rod locker/storage cabinet door above the dinette is secured in the closed position with push to release latches and held open with ratcheting hatch supports. To open the door, release the latches and lift the door until the door is slightly above horizontal and the ratchets click. The supports will hold the door in the open position. To close the door, raise it slightly above horizontal to release the ratchet locks and lower the door. Push the latch knobs in to secure it in the closed position.

Daylight and fresh air is provided to this area an opening port window and by an overhead opening hatch. Additional lighting is provided by 12-volt lights with dimmer controls on either end of the dinette. Refer to the Ventilation System chapter for more information on operation the hatch and screen.

The forward bilge pump and cabin sump pump is located below a hatch in the cabin sole near the rear of the dinette and below the cabin steps. The steps must be removed before the hatch can be opened. To remove the steps, remove the quick release pin on each side of the ladder. Then remove the ladder and place it in a safe place out of the way. Always replace the ladder and install both quick release pins when you are done servicing or inspecting the equipment below the hatch.

Cabin Sole Hatch

There is a large hatch in the floor of the main cabin that provides access to removable storage bins, additional rod storage and the cabin bilge. The three storage bins and support frames lift out to provide access to the rod storage and the

Dinette Rod Locker and Cabin Window

Table and Dinette with Table Up

Table Down for Berth and While Cruising

forward cabin bilge. Always make sure the rods are secure in the rod racks and the storage bins and support frames are properly installed before closing the hatch.

Carbon Monoxide Detector

A carbon monoxide (CO) detector is installed in the cabin on the port rear V-berth wall. If excess carbon monoxide fumes are detected, an audible beeping will sound indicating the presence of the toxic gas. This detector is always activated when the batteries are connected and is protected by the continuous power CO Detector breaker in the cabin DC breaker panel. A green light on the detector indicates that it is activated. Always make sure the green light is on whenever the cabin is occupied.

A by product of combustion, carbon monoxide is invisible, tasteless, odorless, and is produced by all engines and some heating and cooking appliances. The most common sources of CO on boats are the engines and auxiliary generators and propane or butane stoves. These produce large amounts of CO and should never be operated while sleeping.

You should read the owner's manual supplied by the detector manufacturer for operation instructions and additional information regarding the hazards of carbon monoxide gas. Also read more about carbon monoxide, carbon monoxide detectors, and proper ventilation in the Ventilation System and Safety Equipment chapters in this manual. This is especially essential if your boat is equipped with the optional generator. If you did not receive a manual for your carbon monoxide detector, please contact the Wellcraft Customer Service Department.

WARNING

ACTIVATION OF THE CARBON MONOXIDE DETECTOR INDICATES THE PRESENCE OF CARBON MONOXIDE (CO) WHICH CAN BE FATAL. EVACUATE THE CABIN IMMEDIATELY. DO A HEAD COUNT TO CHECK THAT ALL PERSONS ARE ACCOUNTED FOR. DO NOT REENTER THE CABIN UNTIL IT HAS BEEN AIRED OUT AND THE PROBLEM FOUND AND CORRECTED.

V-Berth

A large V-berth is located in the bow area, forward of the main salon. The berth is set against the forward bulkhead with two storage drawers built into the aft end of the berth. There are two hatches below the mattress that provide access to additional storage and to the bilge. There is another hatch in the floor of the rear compartment that provides access to the forward bilge and optional bow thruster. The carbon monoxide detector is mounted to the port rear wall of the V-berth.

Cabin Ladder and Access Hatch for Drain Sump and Forward Bilge Pump

CO Detector and V-Berth GFI and Overhead Light Switch

V-Berth and Access to Optional Bow Thruster

Daylight and fresh air is provided to this area by an overhead opening hatch with a removable screen. Additional lighting is provided by two 12-volt lights with dimmer switches on the forward bulkhead. There is also an overhead light that is controlled by a switch in the GFI plug near the CO detector and next to the cabin door. Refer to the Ventilation System chapter for more information on operation the hatch and screen.

10.3 Air Conditioner

The air conditioning unit is the reverse cycle type and operates on AC power. The unit is equipped with reverse cycle heat and can be operated as a cooling or heating unit. It is protected by the Air Conditioning breaker in the AC breaker panel.

To operate the system, make sure the thru-hull valve for the air conditioner seawater supply pump is on. The valve is located in the engine compartment bilge, forward of the starboard engine. Turn the Cabin Air Conditioner breaker in the AC breaker panel on. The air conditioning or heat then will be controlled by the electronic control panel in the cabin. When activated, water should continuously flow from the overboard drain thru-hull.

The air conditioning system produces heat when it is operated in the reverse cycle mode. The ability of the unit to produce heat is affected by the temperature of the seawater. As the seawater temperature lowers, the air conditioner's ability to produce warm air decreases. When the seawater temperature drops below 40 - 45 degrees, the unit will not be able to produce heat. You should not operate the air conditioner to produce heat when the water temperature is below 40 degrees.

You should always keep the cabin door closed when operating the air conditioner. If the cabin door is left open, it could cause the air conditioner unit to run continuously and not cycle enough to defrost the coiling condenser. This could cause the coils to develop enough ice to reduce the unit's ability to cool the boat.

The air conditioner is below the rear of the dinette seat. The air conditioning unit creates condensation that drips into the pan at the base of the unit. A hose attached to the pan drains the water to the cabin drain sump.

It is normal for some water to be in the pan whenever the air conditioner has been used. The condensation pan should be checked periodically to make sure it is draining properly. The drain hoses, condensation pan and sump should be flushed clean if they become restricted by mold or debris.

Bow Thruster

Cabin Overhead Light Switches and Air Conditioner Control Panel

Cabin Air Conditioner and Drip Pan Drain Hose

The intake line for the pump is equipped with a sea strainer that must be checked for debris frequently and cleaned as necessary. Refer to the Raw Water System chapter for information on the air conditioning pumps and cleaning the sea strainers.

You should also refer to the air conditioner owner's manual for additional operating and maintenance instructions.

Note: Air conditioners use surface water as a cooling medium. The boat must be in the water and the raw water supply system must be properly activated prior to use. Operation without proper cooling could cause the air conditioning circuit breaker to trip and could cause system damage. Always check for proper water flow out of the air conditioning pump discharge thru-hull when the air conditioner is operating.

Cherry and Maple Cabin Sole and Access Hatch to Cabin Sump Pump and Forward Bilge Pump

10.4 Cabin Woodwork

Cabin Sole and Steps

The optional wood cabin floor is made of cherry and maple. The steps are made of solid cherry. The floor and steps are finished with a high quality urethane finish that will provide years of protection with proper care and treatment. It is important to avoid tracking sand and dirt on the cabin floor and steps. Sand and dirt acts like sand paper and will eventually sand off the finish in the traffic areas. The wood can be sanded and refinished as necessary.

Use caution when varnishing wood steps. The wood grain is a natural nonskid and too much varnish or polyurethane will fill the grain and make the wood slippery. You should use a satin or flat varnish and only apply one or two coats. A nonskid material mixed with the varnish may be required to keep the cabin steps from becoming slippery when they are refinished.

Carpeted or wood floors and steps can be cleaned with a vacuum. The wood floors can be washed with a mixture of water and Murphy's Oil Soap. Wipe the wood dry with a clean towel.

Wood Walls, Cabinets and Trim

The hardwood used for the cabin walls and cabinets is finished with a high quality varnish. It can be routinely cleaned with a damp cloth. For heavy duty cleaning, use a mixture of water and Murphy's Oil Soap or a mixture of white vinegar (one cup vinegar to one gallon water) and water to clean the wood. Wipe it dry with a clean towel. Apply a furniture polish to add luster and help to preserve the finish.

Chapter 11:
SAFETY EQUIPMENT

11.1 General

Your boat and inboard engines have been equipped with safety equipment designed to enhance the safe operation of the boat and to meet U.S. Coast Guard safety standards. The Coast Guard or state, county, and municipal law enforcement agencies require certain additional accessory safety equipment on each boat. This equipment varies according to length and type of boat and type of propulsion. The accessory equipment typically required by the Coast Guard is described in this chapter. Some local laws require additional equipment. It is important to obtain "Federal Requirements And Safety Tips for Recreational Boats," published by the Coast Guard, and copies of state and local laws, to make sure you have the required equipment for your boating area.

Your boat is equipped with engine alarms, cabin monitoring equipment, and an automatic fire extinguishing system. These systems are designed to increase your boating safety by alerting you to potentially serious problems in the primary power systems, the engine compartment, and the cabin. Alarm systems are not intended to lessen or replace good maintenance and precruise procedures.

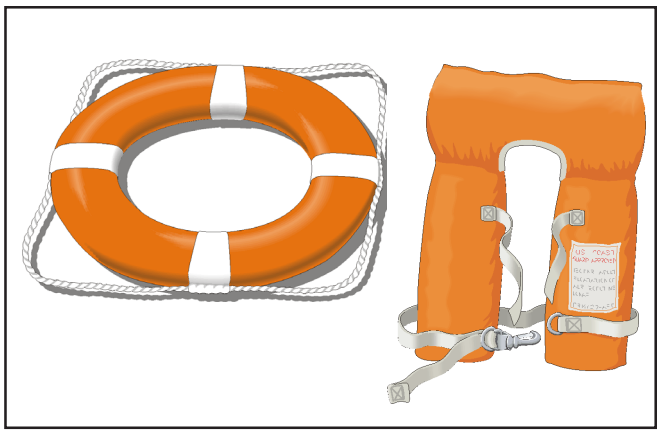
This chapter also describes safety related equipment that could be installed on your boat. This equipment will vary depending on the type of engines and other options installed by you or your dealer.

11.2 Engine Alarms

Your boat is equipped with engine alarms that monitor water temperature and oil pressure. The alarms are equipped with a buzzer and/or a light located in the helm. The alarm will sound if the water temperature reaches 205 degrees F. or the engine oil pressure drops below 6 P.S.I. It may also sound if the transmission oil pressure drops below a predetermined level.

If the alarms sound:

- Immediately throttle the engines back to idle.
- Shift the transmissions to neutral.
- Monitor the engine gauges to determine the cause of the problem.



Throwable Device and Personal PFD

- If necessary, shut off the engines and investigate until the cause of the problem is found.
- If the boat is equipped with water sensors in the fuel filters, be sure to check them for excessive water.

11.3 Neutral Safety Switch

Every control system has a neutral safety switch incorporated into it. This device prohibits the engines from being started while the shift lever is in any position other than the neutral position. If the engines will not start, slight movement of the shift levers may be necessary to locate the neutral position and disengage the safety cutout switch. Control or cable adjustments may be required to correct this condition should it persist. See your Wellcraft dealer for necessary control and cable adjustments. Please refer to the Helm Control Systems chapter for more information on the neutral safety switch.

11.4 Required Safety Equipment

Besides the equipment installed on your boat by Wellcraft, certain other equipment is required by the U.S. Coast Guard to help ensure passenger safety. Items like a sea anchor, working anchor, extra dock lines, flare pistol, life vests, a line permanently secured to your ring buoy, etc., could at some time save your passengers' lives, or save your boat from damage. Refer to the "Federal Requirements And Safety Tips For Recreational Boats" pamphlet for a more detailed description of the required equipment. You also can contact the U.S. Coast Guard Boating Safety Hotline, 800-368-5647, for information on boat safety courses and brochures listing the

Federal equipment requirements. Also, check your local and state regulations.

The Coast Guard Auxiliary offers a "Courtesy Examination." This inspection will help ensure that your boat is equipped with all of the necessary safety equipment. The following is a list of the accessory equipment required on your boat by the U.S. Coast Guard:

Personal Flotation Devices (PFDs)

PFDs must be Coast Guard approved, in good and serviceable condition, and of appropriate size for the intended user. Wearable PFDs must be readily accessible, meaning you must be able to put them on in a reasonable amount of time in an emergency. Though not required, the Coast Guard emphasizes that PFDs should be worn at all times when the vessel is underway. Throwable devices must be immediately available for use. All Wellcraft boats must be equipped with at least one Type I, II or III PFD for each person on board, plus one throwable device (Type IV).

In addition to the requirements set by the Coast Guard, individual states may have additional requirements for children and specific types of recreational activity. Please visit www.nasbla.org for state laws.

Visual Distress Signals

All boats used on coastal waters, the Great Lakes, territorial seas, and those waters connected directly to them, must be equipped with Coast Guard approved visual distress signals. These signals are either Pyrotechnic or Non-Pyrotechnic devices.

Pyrotechnic visual distress signals:

Pyrotechnic visual distress signals must be Coast Guard approved, in serviceable condition, and readily accessible. They are marked with a date showing the service life, which must not have expired. A minimum of three are required. Some pyrotechnic signals meet both day and night use requirements. They should be stored in a cool, dry location. They include:

- Pyrotechnic red flares, hand held or aerial.
- Pyrotechnic orange smoke, hand-held or floating.
- Launchers for aerial red meteors or parachute flares.

PYROTECHNICS ARE UNIVERSALLY RECOGNIZED AS EXCELLENT DISTRESS SIGNALS. HOWEVER, THERE IS POTENTIAL FOR INJURY AND PROPERTY DAMAGE IF NOT PROPERLY HANDLED. THESE DEVICES PRODUCE A VERY HOT FLAME AND THE RESIDUE CAN CAUSE BURNS AND IGNITE FLAMMABLE MATERIAL. PISTOL LAUNCHED AND HAND-HELD PARACHUTE FLARES AND METEORS HAVE MANY CHARACTERISTICS OF A FIREARM AND MUST BE HANDLED WITH CAUTION. IN SOME STATES THEY ARE CONSIDERED A FIREARM AND PROHIBITED FROM USE. ALWAYS BE EXTREMELY CAREFUL AND FOLLOW THE MANUFACTURER'S INSTRUCTIONS EXACTLY WHEN USING PYROTECHNIC DISTRESS SIGNALS.

Non-Pyrotechnic Devices

Non-Pyrotechnic visual distress signals must be in serviceable condition, readily accessible, and certified by the manufacturer as complying with U.S. Coast Guard requirements. They include:

- **Orange Distress Flag (Day use only)**
  The distress flag is a day signal only. It must be at least 3 x 3 feet with a black square and ball on an orange background. It is most distinctive when attached and waved from a paddle or boat hook.

- **Electric Distress Light (Night use only)**
  The electric distress light is accepted for night use only and must automatically flash the international SOS distress signal. Under "Inland Navigation Rules," a high intensity white light flashing at regular intervals from 50-70 times per minute is considered a distress signal.

Sound Signaling Devices

The navigation rules require sound signals to be made under certain circumstances. Recreational vessels also are required to sound fog signals during periods of reduced visibility. Therefore, you must have some means of making an efficient sound signal.

Navigation Lights

Recreational boats are required to display navigation lights between sunset and sunrise and other periods of reduced visibility (fog, rain, haze, etc.) Navigation lights are intended to keep other vessels informed of your presence and course. Your boat is equipped with navigation lights required by the U.S. Coast Guard at the time of manufacture. It is up to you to make sure they are operational and turned on when required.

Fire Extinguishers

Boats over 26 feet are required to carry one or two fire extinguishers, depending on the type of fire extinguishers used. Coast Guard approved fire extinguishers are hand-portable, either B-I or B-II classification and have a specific marine type mounting bracket. It is recommended that the extinguishers be mounted in a readily accessible position.

Fire extinguishers require regular inspections to insure that:

- Seals & tamper indicators are not broken or missing.
- Pressure gauges or indicators read in the operable range.
- There is no obvious physical damage, corrosion, leakage or clogged nozzles.

Refer to the "Federal Requirements And Safety Tips For Recreational Boats" pamphlet or contact the U.S. Coast Guard Boating Safety Hotline, 1-800-368-5647, for information on the type and size fire extinguisher required for your boat.

Please refer to the information provided by the fire extinguisher manufacturer for instructions on the proper maintenance and use of your fire extinguisher.

CAUTION

INFORMATION FOR AGENT FE-241 FIRE EXTINGUISHERS IS PROVIDED BY THE MANUFACTURER. IT IS ESSENTIAL THAT YOU READ THE INFORMATION CAREFULLY AND COMPLETELY UNDERSTAND THE SYSTEM, IN THEORY AND OPERATION, BEFORE USING YOUR BOAT.

Bilge and Fuel Fires

Fuel compartment and bilge fires are very dangerous because of the presence of diesel fuel in the various components of the fuel system and the possibility for explosion. You must make the decision to fight the fire or abandon the boat. If the fire cannot be extinguished quickly or it is too intense to fight, abandoning the boat may be your only option.

If you find yourself in this situation, make sure all passengers have a life preserver on and go over the side and swim well upwind of the boat. This will keep you and your passengers well clear of any burning fuel that could be released and spread on the water as the boat burns or in the event of an explosion. When clear of the danger, check about and account for all those who were aboard with you. Give whatever assistance you can to anyone in need or in the water without a buoyant device. Keep everyone together in a group for morale and to aid rescue operations.

Automatic Fire Extinguisher

WARNING

ALL TYPES OF FUEL CAN EXPLODE. IN THE EVENT OF A FUEL COMPARTMENT OR BILGE FIRE, YOU MUST MAKE THE DIFFICULT DECISION TO FIGHT THE FIRE OR ABANDON THE BOAT. YOU MUST CONSIDER YOUR SAFETY, THE SAFETY OF YOUR PASSENGERS, THE INTENSITY OF THE FIRE AND THE POSSIBILITY OF AN EXPLOSION IN YOUR DECISION.

11.5 Automatic Fire Extinguishing System

The engine compartment is equipped with an automatic fire extinguishing system. The equipment has been chosen and located to provide sufficient volume and coverage of the entire engine compartment area. While the system ensures excellent bilge fire protection, it does not eliminate the U.S. Coast Guard requirement for hand held fire extinguishers.

Typical Automatic Fire Extinguisher Monitor Panel

When the ignition switch is on, the green light on the fire extinguisher monitor panel will be on. The green light indicates that the system is charged and ready. Diesel powered boats have an engine cut out circuit that automatically shuts down the engines and generator when the system is activated

and a system override switch that enables the operator to override the shutdown circuit and restart the engines.

The red light on the fire extinguisher control panel will light and an alarm will sound if activation should occur. When sufficient time has elapsed for the fire to be extinguished and a flashback is no longer possible, find and fix the problem, then the override switch on the control panel can be moved to the "OVERRIDE" position and the engines can be restarted.

WARNING

IF ACTIVATION SHOULD OCCUR, IMMEDIATELY SHUT DOWN ALL ENGINES. TURN OFF ALL ELECTRICAL SYSTEMS, POWERED VENTILATION AND EXTINGUISH ALL SMOKING MATERIALS. DO NOT OPEN THE ENGINE COMPARTMENT HATCH IMMEDIATELY!! THIS FEEDS OXYGEN TO THE FIRE AND FLASH BACK COULD RESULT. ALLOW THE EXTINGUISHING AGENT TO SOAK THE ENGINE COMPARTMENT FOR AT LEAST 15 MINUTES AND WAIT FOR HOT METALS OR FUELS TO COOL BEFORE CAUTIOUSLY INSPECTING FOR CAUSE OR DAMAGE. HAVE AN APPROVED PORTABLE FIRE EXTINGUISHER AT HAND AND READY FOR USE. DO NOT BREATH FUMES OR VAPORS CAUSED BY THE FIRE!!

WARNING

DIESEL ENGINES WILL CONSUME EXTINGUISHING AGENT. IF THE SYSTEM DISCHARGES AND THE ENGINES DO NOT AUTOMATICALLY SHUT DOWN, THEY MUST BE IMMEDIATELY SHUT DOWN MANUALLY. IF A DIESEL ENGINE IS ALLOWED TO RUN IN THIS SITUATION, IT WILL CONSUME THE EXTINGUISHING AGENT AND FLASH BACK COULD RESULT.

WARNING

THE OWNER'S MANUAL PROVIDED BY THE FIRE EXTINGUISHING SYSTEM MANUFACTURER IS INCLUDED WITH YOUR BOAT. IT IS ESSENTIAL THAT YOU READ THE INFORMATION CAREFULLY AND COMPLETELY UNDERSTAND THE SYSTEM IN THEORY AND OPERATION BEFORE USING YOUR BOAT. IF YOU DID NOT RECEIVE THE FIRE EXTINGUISHING SYSTEM OWNER'S MANUAL, PLEASE CONTACT YOUR DEALER OR THE WELLCRAFT CUSTOMER SERVICE DEPARTMENT.

11.6 Carbon Monoxide Monitoring System

DANGER

CARBON MONOXIDE IS COLORLESS, ODORLESS AND DANGEROUS. ALL ENGINES, GENERATORS AND FUEL BURNING APPLIANCES EXHAUST CARBON MONOXIDE (CO). DIRECT AND PROLONGED EXPOSURE TO CO WILL CAUSE BRAIN DAMAGE OR DEATH. SIGNS OF EXPOSURE TO CO INCLUDE NAUSEA, DIZZINESS AND DROWSINESS.

The carbon monoxide (CO) detector is installed in the cabin as standard equipment and warns the occupants of dangerous accumulations of carbon monoxide gas. If excess carbon monoxide fumes are detected, the detector will sound an alarm indicating the presence of the toxic gas.

Should a very high level of carbon monoxide exist, the alarm will sound in a few minutes. However, if small quantities of CO are present or high levels are short-lived, the alarm will accumulate the information and determine when an alarm level has been reached. The carbon monoxide detector is automatically activated whenever the accessory battery switch is "ON" and the DC Main breaker on the cabin AC/DC panel is “ON”. The power light on the carbon monoxide detectors should be lit to indicate that the carbon monoxide detector is activated. ***Always make sure the accessory battery switch and the DC Main breaker are both "ON" and the power light on the carbon monoxide detectors is are whenever the cabin is occupied.***

A by-product of combustion, carbon monoxide (CO) is invisible, tasteless, odorless, and is produced by all engines, heating and cooking appliances. The most common sources of CO on boats are the engines, auxiliary generators and propane or butane stoves. These produce large amounts of CO and should never be operated while sleeping.

A slight buildup of carbon monoxide over several hours causes headache, nausea and other symptoms that are similar to food poisoning, motion sickness or flu. High concentrations can be fatal within minutes. Many cases of carbon monoxide poisoning indicate that while victims are aware they are not well, they become so disoriented they are unable to save themselves by either exiting the area or calling for help. Also, young children, elderly persons, and pets may be the first affected.

Drug or alcohol use increases the effect of CO exposure. Individuals with cardiac or respiratory conditions are very susceptible to the dangers of carbon monoxide. CO poisoning is especially dangerous during sleep when victims are unaware of any side effects. The following are symptoms which may

signal exposure to CO: (1) Headache (2) Tightness of chest or hyperventilation (3) Flushed face (4) Nausea (5) Drowsiness (6) Fatigue or Weakness (7) Inattention or confusion (8) Lack of normal coordination.

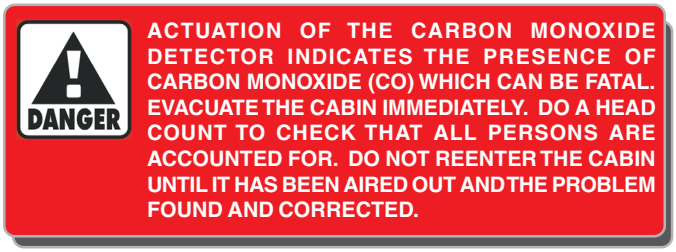
Persons who have been exposed to carbon monoxide should be moved into fresh air immediately. Have the victim breath deeply and seek immediate medical attention. To learn more about CO poisoning, contact your local health authorities.

Low levels of carbon monoxide over an extended period of time can be just as lethal as high doses over a short period. Therefore, low levels of carbon monoxide can cause the alarm to sound before the occupants of the boat notice any symptoms of carbon monoxide poisoning. CO detectors are very reliable and rarely sound false alarms. If the alarm sounds, always assume the hazard is real and move persons who have been exposed to carbon monoxide into fresh air immediately. Never disable the CO detector because you think the alarm may be false. Always contact the detector manufacturer or your local fire department for assistance in finding and correcting the situation.

Remember, carbon monoxide detectors do not guarantee that CO poisoning will not occur. Do not use the CO detector as a replacement for ordinary precautions or periodic inspections of equipment. Never rely on alarm systems to save your life, common sense is still prudent and necessary.

Please read the owner's manual supplied by the CO detector manufacturer and included with this manual, for operation instructions and additional information regarding the hazards of carbon monoxide gas. Refer to the Ventilation chapter for information on ventilating your boat properly while underway and other precautions while at anchor or in a slip. This is especially essential if your boat is equipped with the optional generator.

Many manufacturers of carbon monoxide detectors offer a testing and recertification program. We recommend that you contact the manufacturer of your carbon monoxide detector and have it tested and recertified periodically.



11.7 First Aid

It is the operator's responsibility to be familiar with the proper first-aid procedures and be able to care for minor injuries or illnesses of your passengers. In an emergency, you could be far from professional medical assistance. We strongly recommend that you be prepared by receiving training in basic first aid and CPR. This can be done through classes given by the Red Cross or your local hospital.

Your boat also should be equipped with at least a simple marine first-aid kit and a first-aid manual. The marine first-aid kit should be designed for the marine environment and be well supplied. It should be accessible and each person on board should be aware of its location. As supplies are used, replace them promptly. Some common drugs and antiseptics may lose their strength or become unstable as they age. Ask a medical professional about the supplies you should carry and the safe shelf life of prescription drugs or other medical supplies that may be in your first-aid kit. Replace questionably old supplies whether they have been used or not.

In many emergency situations, the Coast Guard can provide assistance in obtaining medical advice for treatment of serious injuries or illness. If you are within VHF range of a Coast Guard Station, make the initial contact on channel 16 and follow their instructions.

11.8 Additional Safety Equipment

Besides meeting the legal requirements, prudent boaters carry additional safety equipment. This is particularly important if you operate your boat offshore. You should consider the following items, depending on how you use your boat.

Satellite EPIRBS

EPIRBs (Emergency Position Indicating Radio Beacon) operate as part of a worldwide distress system. When activated, EPIRBs will send distress code homing beacons that allow Coast Guard aircraft to identify and find them quickly. The satellites that receive and relay EPIRB signals are operated by the National Oceanic and Atmospheric Administration (NOAA) in the United States. The EPIRB should be mounted and registered according to the instructions provided with the beacon, so that the beacon's unique distress code can be used to quickly identify the boat and owner.

Marine Radio

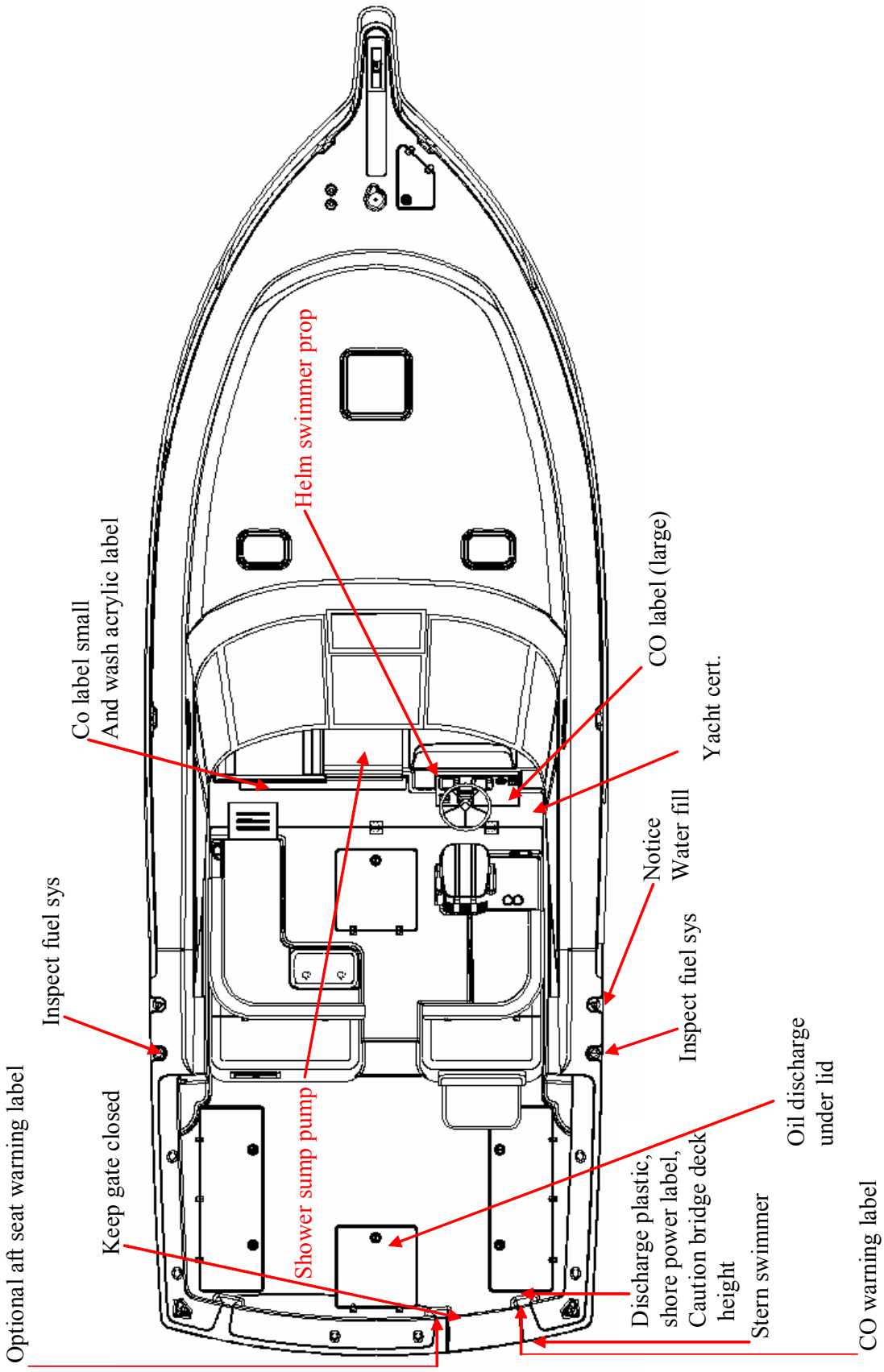
A marine radio is the most effective method of receiving information and requesting assistance. VHF marine radios are used near shore and single sideband radios are used for long range communication.

There are specific frequencies to use in an emergency. The VHF emergency channel is 16 in the United States. You should read the owners manual for your radio and know how to use it in an emergency or for normal operation. If you hear a distress call you should assist or monitor the situation until help is provided.

Additional Equipment to Consider:

VHF Radio	Life Raft
Spare Anchor	Fenders
Heaving Line	Mirror
First Aid Kit	Tool Kit
Flashlight & Batteries	Anchor
Searchlight	Boat Hook
Sunburn Lotion	Mooring Lines
Ring Buoy	Binoculars
Whistle or Horn	Extra Clothing
Portable Radio	Chart and Compass
Marine Hardware	Food & Water
Spare Keys	Sunglasses
Spare Parts	Spare Propeller

11.9 Caution and Warning Labels



Close transom door and gate warning. Located at transom near door and gate latch.

Leaking fuel is dangerous, inspect fuel system at least annually and fill water tank with potable water only warning label. Located next to port fuel fill.

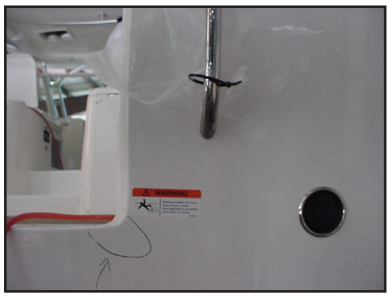
Discharge of plastics rules label. Located on the side of the cockpit, forward of the starboard cleat.

Operate shower sump pump when air conditioner is operating caution label.

Shore Power is dangerous warning label. Located on the starboard side of the cockpit next to the shore power inlet plugs.

Rotating props are dangerous to swimmers warning label. Located on the helm near the engine controls.

Rotating props are dangerous to swimmers warning label. Located on the outside of transom near the cockpit door.



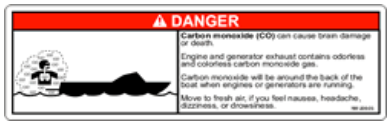
Latch cabin door, carbon monoxide hazard and cleaning acrylic plastic warning and caution labels. Located on outside of cabin door near latch.

Leaking fuel is dangerous Inspect fuel system at least annually warning label. Located next to port fuel fill.

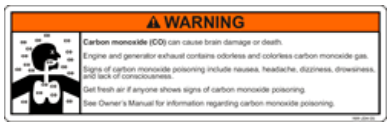
Windlass Caution. Located on the windlass at the bow.

Make sure aft seat legs are in the down position before using seat. Located near the starboard side of the seat.

Carbon Monoxide (CO) can cause brain damage or death. Carbon monoxide will be around the back of boat when engines and generator are running. Located on the transom near transom door.



Carbon Monoxide (CO) can cause brain damage or death. Located near the Helm.



THIS PAGE WAS LEFT BLANK
INTENTIONALLY

Chapter 12:
OPERATION

12.1 General

Before you start the engines on your Wellcraft, you should have become familiar with the various component systems and their operation, and have performed a “Precruise System Check." A thorough understanding of the component systems and their operation is essential to the proper operation of the boat. This manual and the associated manufacturers' information is provided to enhance your knowledge of your boat. Please read them carefully.

Your boat must have the necessary safety equipment on board and be in compliance with the U.S. Coast Guard, local and state safety regulations. There should be one Personal Floatation Device (PFD) for each person. Nonswimmers and small children should wear PFDs at all times. You should know and understand the “Rules of the Road" and have had an experienced operator brief you on the general operation of your new boat. At least one other person should be instructed on the proper operation of the boat in case the operator is suddenly incapacitated.

The operator is responsible for his safety and the safety of his or her passengers. When boarding or loading the boat, always step onto the boat, never jump. All passengers should be properly seated whenever the boat is operated above idle speed. Your passengers should not be allowed to sit on the seat backs, gunnels, bows, transoms or on fishing seats whenever the boat is underway. The passengers also should be seated to properly balance the load and must not obstruct the operator's view, particularly to the front.

Overloading and improper distribution of weight can cause the boat to become unstable and are significant causes of accidents. Know the weight capacity and horsepower rating of your boat. Do not overload or overpower your boat.

You should be aware of your limitations and the limitations of your boat in different situations or sea conditions. No boat is indestructible, no matter how well it is constructed. Any boat can be severely damaged if it is operated in a manner that exceeds its design limitations. If the ride is hard on you and your passengers, it is hard on the boat as well. Always modify the boat speed in accordance with the sea conditions, boat traffic and weather conditions.

Remember, it is the operator's responsibility to use good common sense and sound judgement in loading and operating the boat.

12.2 Rules of the Road

As in driving an automobile, there are a few rules you must know for safe boating operation. The following information describes the basic navigation rules and action to be taken by vessels in a crossing, meeting or overtaking situations while operating in inland waters. These are basic examples and not intended to teach all the rules of navigation. For further information consult the “Navigation Rules” or contact the Coast Guard, Coast Guard Auxiliary, Department of Natural Resources, or your local boat club. These organizations sponsor courses in boat handling, including rules of the road. We strongly recommend such courses. Books or videos on this subject also are available from your local library.

Note: Sailboats not under power, paddle boats, vessels unable to maneuver, vessels engaged in commercial fishing and other vessels without power have the right of way over motor powered boats. You must stay clear or pass to the stern of these vessels. Sailboats under power are considered motor boats.

Crossing Situations

When two motor boats are crossing, the boat on the right has the right of way. The boat with the right of way should maintain its course and speed. The other vessel should slow down and permit it to pass. The boats should sound the appropriate signals.

Meeting Head-On or Nearly-So Situations

When two motor boats are approaching each other head-on or nearly head-on, neither boat has the right of way. Both boats should reduce their speed and turn to the right so as to pass port side to port side, providing enough clearance for safe passage. The boats should sound the appropriate signals.

Overtaking Situations

When one motor boat is overtaking another motor boat, the boat that is being passed has the right of way. The overtaking boat must make the adjustments necessary to provide clearance for a safe passage of the other vessel. The boats should sound the appropriate signals.

The General Prudential Rule

In obeying the Rules of the Road, due regard must be given to all dangers of navigation and collision, and to any special circumstances, including the limitations of the vessels, which

may justify a departure from the rules that is necessary to avoid immediate danger or a collision.

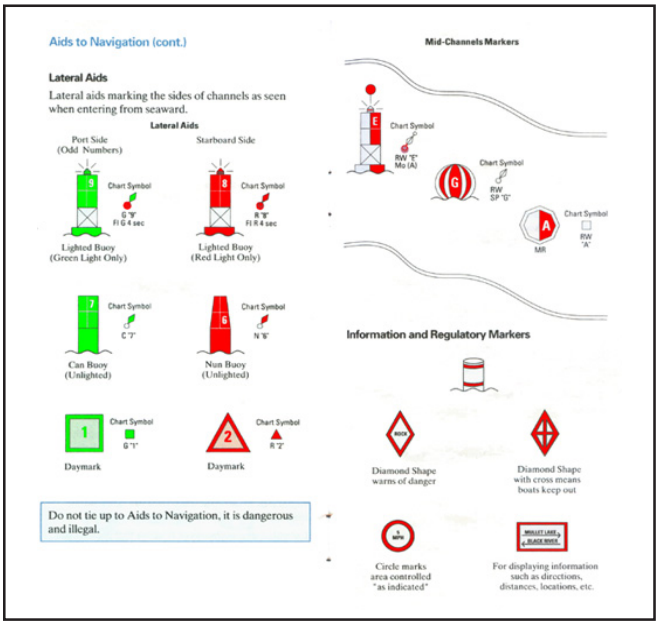
Night Operation

Recreational boats are required to display navigation lights between sunset and sunrise and other periods of reduced visibility such as fog, rain, haze, etc. When operating your boat at night you should:

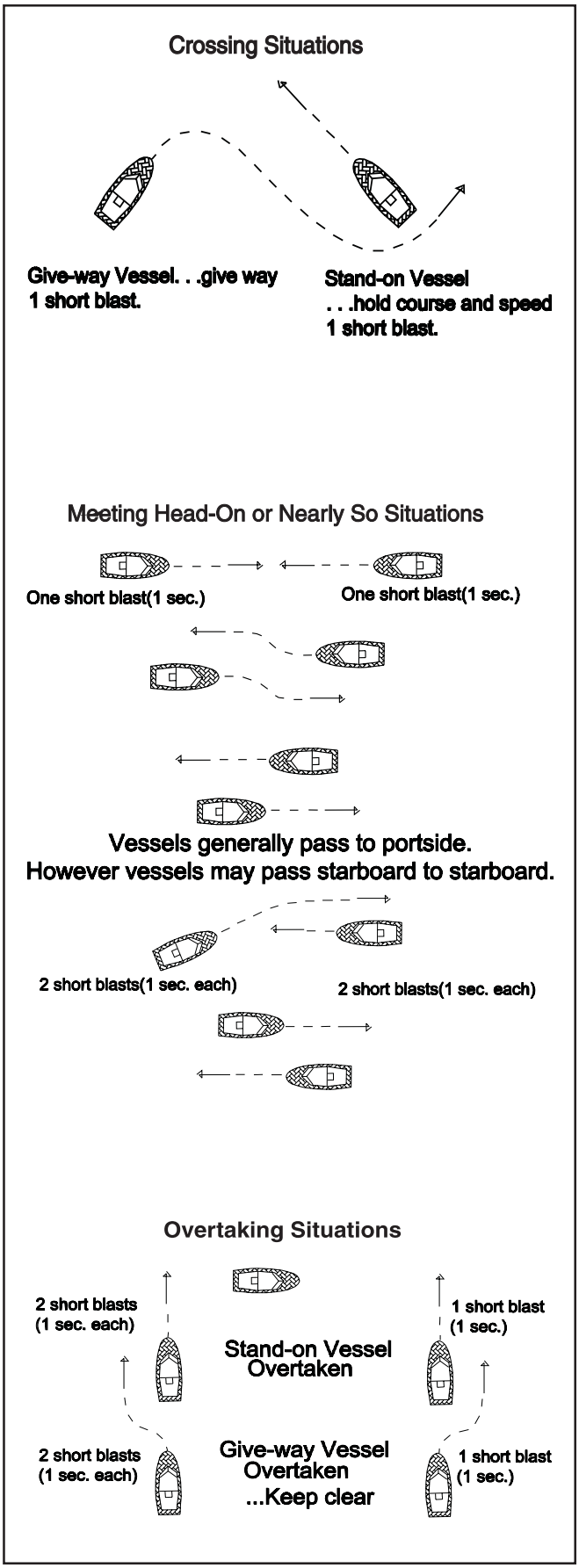
- Make sure your navigation lights are on and working properly. Navigation lights warn others of your position and course and the position and course of other vessels.
- All navigation rules apply. If the bow light of another vessel shows red, you should give way to that vessel, if it shows green, you have the right of way.
- Slow down and never operate at high speeds when operating at night, stay clear of all boats and use good common sense. Always be ready to slow down or steer clear of other vessels, even if you have the right-of-way.
- Avoid bright lights that can destroy night vision, making it difficult to see navigation lights and the lights of other boats. You and your passengers should keep a sharp lookout for hazards, other boats and navigational aids.

Navigation Aids

Aids to navigation are placed along coasts and navigable waters as guides to mark safe water and to assist mariners in determining their position in relation to land and hidden dangers. Each aid to navigation is used to provide specific information. You should be familiar with these and any other markers used in your boating area.



Channel Markers and Buoys



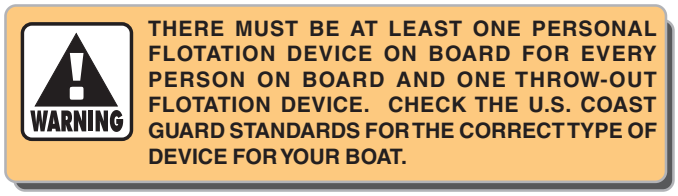
Note: Storms and wave action can cause buoys to move. You should not rely on buoys alone to determine your position.

12.3 Pre-Cruise Check

Before Starting the Engines:

- Check the weather forecast and sea conditions before leaving the dock. Decide if the planned cruise can be made safely.
- Be sure all required documents are on board.
- Be sure all necessary safety equipment is on board and operative. This should include items like the running lights, spotlight, life saving devices, etc. Please refer to Safety Equipment chapter for additional information on safety equipment.
- Make sure you have signal kits and flare guns aboard, and they are current and in good operating condition.
- Be sure you have sufficient water and other provisions for the planned cruise.
- Leave a written message listing details of your planned cruise with a close friend ashore (Float Plan). The float plan should include a description of your boat, where you intend to cruise, and a schedule of when you expect to arrive in the cruising area, and when you expect to return. Keep the person informed of any changes in your plan to prevent false alarms. This information will tell authorities where to look and the type of boat to look for in the event you fail to arrive.
- Check the amount of fuel on board. Observe the "rule of thirds": one third of the fuel for the trip out, one third to return and one third in reserve. An additional 15% may be consumed in rough seas.
- Check the water separating fuel filters for water. The engine fuel filters also should be checked for leaks or corrosion.
- Turn the battery switches on.
- Check the bilge water level. Look for other signs of potential problems. Monitor for the scent of fuel fumes.
- Test the automatic and manual bilge pump switches and high water alarm switches to make sure the systems are working properly. This is particularly important before running offshore.
- Turn on the bilge blowers and check the blower output. The blowers should be activated when operating below cruising speed and whenever the generator is operating.
- Have a tool kit aboard. The kit should include the following basic tools:

Hammer	Electrician's tape
Screwdrivers	Offset screwdrivers
Lubricating oil	Pliers
Jackknife	Adjustable wrench
Basic 3/8" ratchet set	Vise grip pliers
Hex key set	Needle nose pliers
Wire crimping tool	Wire connector Set
End wrench set	Medium slip-joint pliers
Diagonal cutting pliers	DC electrical test light



- Have the following spare parts on board:

Extra light bulbs	Spark plugs
Fuses and circuit breakers	Main 12-volt fuses
Assorted stainless screws	Assorted stainless bolts
Flashlight and batteries	Drain plugs
Engine oil and transmission oil	Propellers
Fuel filters	Propeller nuts
Fuel hose and clamps	Wire ties
Engine cooling pump impeller Kit	Hydraulic steering oil
Assorted hose clamps	Rags
Steering fluid	Pump & alternator belts

- Make sure all fire extinguishers are in position and in good operating condition.

12.4 Operating Your Boat

After Starting the Engines:

- Check the engine gauges. Make sure they are reading normally.
- Visibly check the engines to be sure there are no apparent water, fuel or oil leaks.
- Check the operation of the engine cooling systems by inspecting the transom exhaust ports for water flow.

- Check the steering and engine controls for proper operation.

- Make sure all lines, cables, anchors, etc. for securing a boat are on board and in good condition. All lines should be coiled, secured and off the decks when underway.

- Have a safe cruise and enjoy yourself.

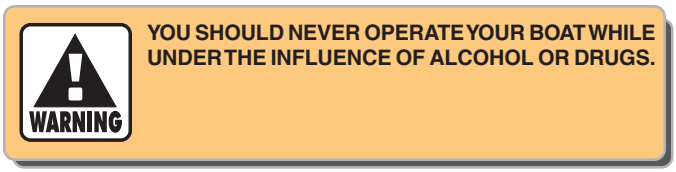
Remember:
When you operate a boat, you accept the responsibility for the boat, for the safety of passengers and for others out enjoying the water.

- Alcohol and any drugs can severely reduce your reaction time and affect your better judgement.

- Alcohol severely reduces the ability to react to several different signals at once.

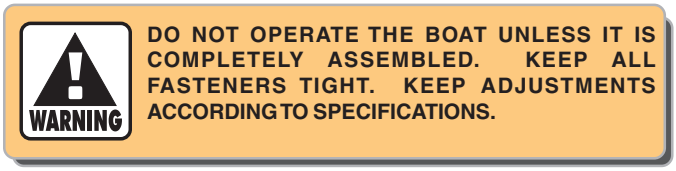
- Alcohol makes it difficult to correctly judge speed and distance, or track moving objects.

- Alcohol reduces night vision, and the ability to distinguish red from green.



- Make sure one other person on the boat is instructed in the operation of the boat.

- Make sure the boat is operated in compliance with all state and local laws governing the use of a boat.



- Always operate the blowers when operating the boat below cruising speed or when the generator is running to help cool the engine compartment.

- Avoid sea conditions that are beyond the skill and experience of you and your crew. Learn to understand weather patterns and indications for change. You should monitor NOAA weather broadcasts before leaving port and periodically while boating. If the weather deteriorates or a storm approaches, seek shelter in a safe harbor.

- Use caution during periods of reduced visibility due to weather or operation conditions. Reduce speed and designate a passenger to be a lookout for other boats, obstacles and navigational markers until you reach port or conditions improve.

- Your Wellcraft is a heavy boat that will produce a large wake at certain speeds. You are responsible for damage and injury caused by your boat's wake. Always observe no wake zones and be aware that your wake can endanger small vessels and their passengers. Always be courteous and slow down to reduce your wake when passing smaller boats.

- Before operating the boat for the first time, read the engine break-in procedures. The break-in procedures are found in the owner's manual for the engines. The manual is in the literature packet.

- As different types of engines are used to power the boat, have the dealer describe the operating procedures for your boat. For more instructions on "How To Operate The Boat," make sure you read the instructions given to you in the owner's manual for the engines you have selected.

Note: For more instructions on safety, equipment and boat handling, enroll in one of the several free boating courses offered. For information on the courses offered in your area, call the "Boating Course Hotline," 1-800-368-5647 or on the WEB at www.uscgboating.org.

Note: If the running gear hits an underwater object, stop the engines. Inspect the propulsion system for damage. If the system is damaged, contact your dealer for a complete inspection and repair of the unit.

To stop the boat, follow this procedure:

- Allow the engines to drop to the idle speed.

- Make sure the shifting levers are in the neutral position.

Note: If the engines have been run at high speed for a long period of time, allow the engines to cool down by running the engines in the idle position for 3 to 5 minutes.

- Turn the ignition keys to the "OFF" position.
- Raise the trim tabs to the full up position.

After Operation:

- If operating in saltwater, wash the boat and all equipment with soap and water.
- Check the bilge area for debris and excess water.
- Fill the fuel tanks to near full to reduce condensation. Allow enough room in the tanks for the fuel to expand without being forced out through the vent.
- Turn off all electrical equipment except the automatic bilge pumps.
- If you are going to leave the boat for a long period of time, put the battery main switches in the "OFF" position and close all seacocks.
- Make sure the boat is securely moored.

12.5 Docking, Anchoring and Mooring

Docking and Dock Lines

Maneuvering the boat near the dock and securing the boat require skill and techniques that are unique to the water and wind conditions and the layout of the dock. If possible, position a crew member at the bow and stern to man the lines and assist in docking operations. While maneuvering close to the dock consideration must be giving to the wind and current. You should anticipate the effect these forces will have on the boat and use them to help put the boat where you want it. It is important to practice in open water using an imaginary dock enough to develop a sense for the way your boat handles in a variety of docking scenarios. You must be able to foresee the possibilities and have solutions in mind before problems occur.

Approaching a dock or backing into a slip in high winds or strong currents requires a considerable amount of skill. If you are new to boat handling, you should take lessons from an experienced pilot to learn how to maneuver your boat in tight quarters in less than ideal conditions. You should also practice away from the dock during windy conditions.

Dock lines are generally twisted or braided nylon. Nylon is strong and stretches to absorb shock. It also has a long life and is soft and easy on the hands. The line's size will vary with the size of the boat. Typically a 30 to 40 foot boat will use 5/8-inch line and a 20 to 30 foot boat will use 1/2-inch line. The number of lines and their configuration will vary depending on the dock, the range of the tide, and many other factors. Usually a combination of bow, stern and spring lines is used to secure the boat.

Maneuvering to the Dock

Approach the dock slowly at a 30 to 40 degree angle. Whenever possible, approach against the wind or current. Turn the rudders straight & shift to neutral when you feel you have enough momentum to reach the dock. Use reverse on the outboard engine to slow the boat and pull the stern toward the dock as the boat approaches. Use both engines to stop the boat if it is still moving forward against the pilings. If you executed your approach properly, the boat will lightly touch the pilings at the same time the forward momentum is stopped. Have the dock lines ready and secure the boat as soon as it stops. Use fenders to protect the boat while it is docked. Keep the engines running until the lines are secured.

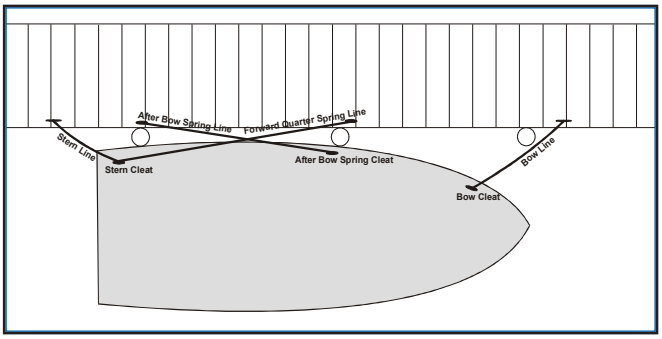
Backing into a Slip

Approach the slip with the stern against the wind or current and the rudders straight ahead. Use the engines to maneuver the boat into alignment with the slip. Reverse the engines and slowly back into the slip. Shift from reverse to neutral frequently to prevent the boat from gaining too much speed. Move the stern right and left by shifting the engines in and out of gear. When nearly in the slip all the way, shift to forward to stop. Keep the engines running until the lines are secured.

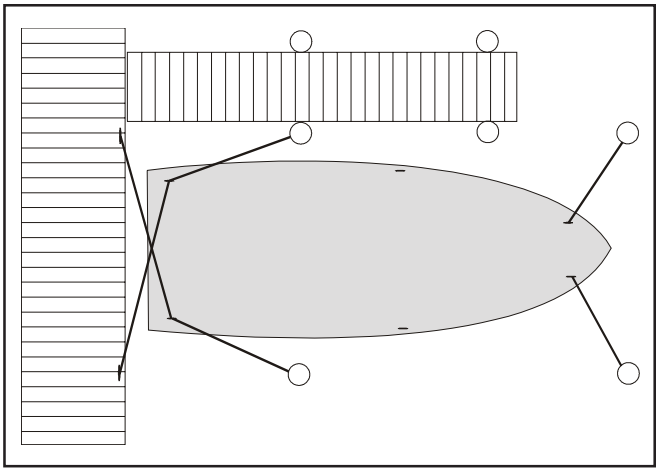
Securing Dock Lines

Securing a boat that is tied along side the dock typically requires a bow and stern line and two spring lines. The bow and stern lines are usually secured to the dock at a 40° angle aft of the stern cleat and forward of the bow cleat. The after bow spring line is secured to the dock at a 40° angle aft of the after bow spring cleat. The forward quarter spring is secured to the dock at a 40° angle forward of the stern cleat. The spring lines keep the boat square to the dock and reduce fore and aft movement while allowing the boat to move up and down with the tide.

Securing a boat that in a slip is somewhat different. It typically requires two bow lines secured to pilings on each side of the bow, two stern lines secured to the dock and two spring lines that prevent the boat from hitting the dock. The bow lines are typically secured with enough slack to allow the boat to ride the tide. The stern lines are crossed. One line runs from the port aft boat cleat to the starboard dock cleat and the other line runs from the starboard aft boat cleat to the port cleat on the dock. The stern lines center the boat, control the forward motion, and allow the boat to ride the tide. Two forward quarter spring lines typically are secured to the stern cleats and to mid ship pilings or cleats. The spring lines keep the boat from backing into the dock while allowing it to ride the tide.



Securing The Boat Along Side A Dock (Typical)


Securing The Boat In A Slip (Typical)

Leaving the Dock

Always start the engines and let them warm up for several minutes before releasing the lines. Boats steer from the stern and it is important that you achieve enough clearance at the stern to maneuver the boat as quickly as possible. Push the stern off and maneuver such that you get stern clearance quickly. Proceed slowly until well clear of the dock and other boats.

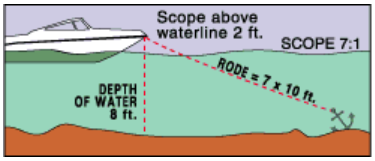
Mooring

Approach the mooring heading into the wind or current. Shift to neutral when you have just enough headway to reach the buoy. Position a crew member on the bow to retrieve the mooring with a boat hook and secure the line. Keep the engines running until the line is secured.

Leaving a Mooring

Start the engines and let them warm up for several minutes before releasing the mooring line. The boat will already be headed into the wind, so move it forward enough to loosen the line and untie it. Back the boat away from the mooring until you can see the buoy. Move the boat slowly away from the mooring.

Anchoring



Make sure the bitter end of the anchor line is attached to boat before dropping the anchor. Bring the bow into the wind or current and put the engine in neutral. When the vessel comes to a stop, lower the anchor over the bow. Pay out anchor line so that it is at least 5 to 7 times the depth of the water and secure the line to a cleat. Use caution to avoid getting your feet or hands tangled in the line. Additional scope of 10 times the depth may be required for storm conditions. Check landmarks on shore or your GPS position to make sure the anchor is not dragging. If it is dragging, you will have to start all over. It is prudent to use two anchors if your are anchoring overnight or in rough weather.

Releasing the Anchor

Release the anchor by driving the boat slowly to the point where the anchor line becomes vertical. It should release when you pass that point. If the anchor doesn't release right away, stop the boat directly above the anchor and tie the line to the cleat as tight as possible. The up and down movement of the boat will usually loosen the anchor within a minute. Make sure you secure the anchor and properly stow the line before operating the boat.

CAUTION

NEVER ANCHOR THE BOAT BY THE STERN. THE STERN OF THE BOAT IS VULNERABLE TO SWAMPING FROM WAVE ACTION AND WIND AND CURRENT WILL PUT MORE STRESS ON THE ANCHOR WHEN IT IS ATTACHED TO THE STERN. ONLY ANCHOR THE BOAT BY THE BOW

12.6 Controls, Steering, or Propulsion System Failure:

If the propulsion, control or steering system fails while you are operating the boat, bring both throttles to idle and shift to neutral. Decide whether you need to put out the anchor to prevent the boat from drifting or to hold the bow into the seas. Investigate and correct the problem if you can. Turn the engines off before going into the engine compartment to make repairs. If you are unable to correct the problem, call for help.

If only one engine has failed, you can usually run home on the other engine. Be careful not to apply too much power to the engine that is running. When only one engine is used to power a twin engine boat, that engine is over propped and can be overloaded if too much throttle is applied. You should contact your dealer or the engine manufacturer for the maximum power settings when running on one engine.

12.7 Collision

If your boat is involved in a collision with another boat, dock, piling or a sandbar, your first priority is to check your passengers for injuries and administer first aid if necessary. Once your passengers situations are stabilized, thoroughly inspect the boat for damage. Check below decks for leaks and the control systems for proper operation. Plug all leaks or make the necessary repairs to the control systems before proceeding slowly and carefully to port. Request assistance if necessary. Haul the boat and make a thorough inspection of the hull and running gear for damage.

12.8 Grounding, Towing and Rendering Assistance

The law requires the owner or operator of a vessel to render assistance to any individual or vessel in distress, as long as his vessel is not endangered in the process.

If the boat should become disabled, or if another craft that is disabled requires assistance, great care must be taken. The stress applied to a boat during towing may become excessive. Excessive stress can damage the structure of the boat and create a safety hazard for those aboard.

Freeing a grounded vessel, or towing a boat that is disabled, requires specialized equipment and knowledge. Line failure and structural damage caused by improper towing have resulted in fatal injuries. Because of this, we strongly suggest that these activities be left to those who have the equipment and knowledge, e.g., the U.S. Coast Guard or a commercial towing company, to safely accomplish the towing task.

DANGER

THE MOORING CLEATS ON WELLCRAFT BOATS ARE NOT DESIGNED OR INTENDED TO BE USED FOR TOWING PURPOSES. THESE CLEATS ARE SPECIFICALLY DESIGNED AS MOORING CLEATS FOR SECURING THE BOAT TO A DOCK, PIER, ETC. DO NOT USE THESE FITTINGS FOR TOWING OR ATTEMPTING TO FREE A GROUNDED VESSEL.

WARNING

WHEN TOWING OPERATIONS ARE UNDERWAY, HAVE EVERYONE ABOARD BOTH VESSELS STAY CLEAR OF THE TOW LINE AND SURROUNDING AREA. A TOW LINE THAT SHOULD BREAK WHILE UNDER STRESS CAN BE VERY DANGEROUS, AND COULD CAUSE SERIOUS INJURY OR DEATH.

WARNING

RUNNING AGROUND CAN CAUSE SERIOUS INJURY TO PASSENGERS AND DAMAGE TO A BOAT AND ITS UNDERWATER GEAR. IF YOUR BOAT SHOULD BECOME GROUNDED, DISTRIBUTE PERSONAL FLOTATION DEVICES AND INSPECT THE BOAT FOR POSSIBLE DAMAGE. THOROUGHLY INSPECT THE BILGE AREA FOR SIGNS OF LEAKAGE. AN EXPERIENCED SERVICE FACILITY SHOULD CHECK YOUR UNDERWATER GEAR AT THE FIRST OPPORTUNITY. DO NOT CONTINUE TO USE YOUR BOAT IF THE CONDITION OF THE UNDERWATER EQUIPMENT IS QUESTIONABLE.

12.9 Flooding, or Capsizing

Boats can become unstable if they become flooded or completely swamped. You must always be aware of the position of the boat to the seas and the amount of water in the bilge. Water entering the boat through the transom door or over the stern gunnels can usually be corrected by closing the door and turning the boat into the waves. If the bilge is flooding because of a hole in the hull or a defective hose, you may be able to plug it with rags, close the thru-hull valve or assist the pumps by bailing with buckets. Put a mayday call in to the Coast Guard or nearby boats and distribute life jackets as soon as you discover your boat is in trouble.

If the boat becomes swamped and capsizes, you and your passengers should stay with the boat as long as you can. It is much easier for the Coast Guard, aircraft, or other boats to spot, than people in the water. If your boat is equipped with an EPIRB, make sure it is activated. When activated, EPIRBs will send distress code homing beacons that allow Coast Guard aircraft to identify your boat and find you quickly.

12.10 Fishing

Fishing can be very exciting and distracting for the operator when the action gets intense. You must always be conscious of the fact that your primary responsibility is the safe operation of your boat and the safety of your passengers and other boats in the area.

You must always make sure the helm is properly manned and is never left unattended while trolling. If your boat is equipped with a tower, caution and good common sense must be exercised whenever someone is in the tower. Remember, weight in the tower raises the boat's center of gravity and the boat's motion is greatly exaggerated for the person in a tower.

If you are fishing in an area that is crowded with other fishing boats, it may be difficult to follow the rules of the road. This situation can become especially difficult when most boats are trolling. Being courteous and exercising good common sense is essential. Avoid trying to assert your right of way and concentrate on staying clear and preventing tangled or cut lines and other unpleasant encounters with other boats. Also keep in mind that fishing line wrapped around a propeller shaft can damage the strut bearing.

12.11 Man Overboard

If someone falls overboard, you must be prepared to react quickly, particularly when you are offshore. The following procedures will help you in recovering a person that has fallen overboard.

- Immediately stop the boat and sound a man overboard alarm and have all passengers point to the person in the water.
- Circle around quickly and throw a cushion or life jacket to the person, if possible, and another to use as a marker.
- Keep the person on the driver side of the boat so you can keep him in sight at all times.
- Make sure to approach the person from the downwind side and maneuver the boat so the propellers are well clear of the person in the water.
- Turn off the engines when the person is alongside and use a ring buoy with a line attached, a paddle or boat hook to assist him to the boat. Make sure you don't hit him with the ring buoy or the boat.
- Pull the person to the boat and assist him on board.
- Check the person for injuries and administer first aid if necessary. If the injuries are serious, call for help. Refer to the Safety chapter for more information on first aid and requesting emergency medical assistance.

WARNING

MOVING PROPELLERS ARE DANGEROUS. THEY CAN CAUSE DEATH, LOSS OF LIMBS, OR OTHER SEVERE INJURY. DO NOT USE THE SWIM PLATFORM OR SWIM LADDER WHILE THE ENGINES ARE RUNNING. STOP THE ENGINES IF DIVERS OR SWIMMERS ARE ATTEMPTING TO BOARD. ALWAYS PROPERLY STORE THE LADDER BEFORE STARTING THE ENGINES.

12.12 After Market Tower Operation (Optional)

Your boat could be equipped with an optional fabricated aluminum tower. Towers are normally equipped with full engine controls, trim tab controls, compass, engine alarms, restart buttons and tachometers. This allows for complete operation of the boat from the tower.

Operation of the Tower Controls

The engines should be started at the lower helm. Monitor the gauges to make sure all systems are normal and the engines have been allowed to warm up slightly before proceeding to the tower helm. The ignition or restart switches on the tower are only used to restart an engine in the event it should stall. The shift controls must be in neutral for the start switches to be functional.

Electronic engine controls are equipped with a station transfer button that allows the operator to transfer control from one station to another with the push of a button. Always make sure that you activate the controls as soon as you reach the helm in the tower.

Refer to the Control Systems chapter and the electronic engine control owner's manual for more information on the control system operation and selecting the controls on boats with dual stations.

The following is a list of safety precautions for tower operation:

- Do not operate the boat from the tower in rough sea conditions. The boat's motions are exaggerated in the tower and this motion may become excessive in rough seas.

- Be careful when using the trim tabs from the tower. The reaction of the trim tabs will be exaggerated in the tower. Use small tab corrections and wait ten (10) seconds for the tabs to react. Keep making small corrections until the hull is at the desired attitude.

- Do not overload the tower. Most towers are designed to hold the weight of only two or three average- sized people. Weight in the tower raises the boat's center of gravity. Too much weight in the tower could make the boat unstable.

- Do not operate the boat in tight quarters, such as marinas, from the tower. The operator is isolated from the boat while in the tower and will not be able to assist in docking procedures.

- Always pay close attention to your grip and footing on the tower ladders. Your ability to achieve a good grip and proper footing is reduced in wet or rough weather. Therefore, the tower should be avoided in those conditions.

- Only operate the boat from the tower in familiar waters or where running aground is not a possibility. Running aground while operating the boat from the tower could result in severe injury.

- Always be alert for waves and boat wakes when operating the boat from the tower. Remember that the boat's motions are exaggerated in the tower.

- Good common sense and judgment must be exercised at all times when operating a boat from the tower.

- If an engine alarm sounds, immediately put the boat in NEUTRAL and shut OFF the engine(s), if safe to do so, until the problem is found and corrected.

- Always put the boat in NEUTRAL before moving to and from the tower helm and cockpit.

GOOD COMMON SENSE, JUDGMENT AND EXTREME CAUTION MUST BE EXERCISED WHEN OPERATING A BOAT WITH SOMEONE IN THE TOWER. DO NOT ALLOW ANYONE IN THE TOWER WHEN THE WATER IS ROUGH OR WHEN OPERATING IN UNFAMILIAR WATERS WHERE RUNNING AGROUND IS A POSSIBILITY. REMEMBER, WEIGHT IN THE TOWER RAISES THE BOAT'S CENTER OF GRAVITY AND THE BOAT'S MOTION IS GREATLY EXAGGERATED FOR THE PEOPLE IN THE TOWER.

12.13 Trash Disposal

The discharge of plastic trash or trash mixed with plastic is illegal anywhere in the marine environment. U.S. Coast Guard regulations also restrict the dumping of other forms of garbage. Regional, State, and local restrictions on garbage discharges also may apply.

Responsible boaters store refuse in bags and dispose of it properly on shore. You should make sure your passengers are aware of the local waste laws and the trash management procedure on your boat. Refer to the placard mounted on your boat for more specific information regarding solid waste disposal.

Federal law requires that vessels of 26 feet or longer must display in a prominent location, a durable placard at least 4 by 9 inches notifying the crew and passengers of the discharge restrictions (Marpol Treaty). A label for this purpose has been shipped with the boat and is attached to the starboard side of the cockpit near the transom door. It is the boat owner's responsibility to make sure this placard remains mounted and legible in accordance with the law.

12.14 Transporting Your Boat

Your Wellcraft is a large boat and should only be trailered by professionals that have the knowledge and equipment to move large boats without causing damage.

Please contact your dealer or the Wellcraft Customer Service Department if you are planning to transport your boat and have any questions in regard to the proper equipment and support for the hull.

BOATS HAVE BEEN DAMAGED BY TRAILERS THAT DON'T PROPERLY SUPPORT THE HULL. ALWAYS MAKE SURE THE TRAILER BUNKS AND PADS ARE ADJUSTED SO THEY ARE NOT PUTTING EXCESSIVE PRESSURE ON THE LIFTING STRAKES AND ARE PROVIDING ENOUGH SUPPORT FOR THE HULL. HULL DAMAGE RESULTING FROM IMPROPER TRAILER SUPPORT IS NOT COVERED BY THE WELLCRAFT WARRANTY.

THIS PAGE WAS LEFT BLANK
INTENTIONALLY

Chapter 13:
ROUTINE MAINTENANCE

13.1 Exterior Hull and Deck

Hull Cleaning-Below The Water Line

When the boat is removed from the water, clean the outer bottom surface immediately. Algae, grass, dirt and other marine growth is easier to remove while the hull is still wet. Use a pressure cleaner or a hard bristle brush to clean the surface.

Bottom Painting

If the boat is to be left in saltwater for extended periods, the hull must be protected from marine growth by antifouling paint. Because of variations in water temperature, marine growth, and pollution in different regions, your dealer and/or a qualified boat yard in your area should be consulted when deciding what bottom paint system to apply to your hull. This is extremely important as pollution and marine growth can damage fiberglass hulls.

Osmosis blistering is caused by a chemical reaction between water and substances in the hull laminate below the waterline. If water breaches the exterior gelcoat and barrier layer, it can react with the chemical components in the laminate creating acidic substances. These substances create pressure behind the gelcoat which causes blisters. An epoxy barrier coating such as the Interlux Interprotect® system properly applied to the hull before bottom paint will help prevent this problem. A Barrier coating also provides an excellent base coat for the bottom paint.

Even though the hull on your Wellcraft is built with a layer of blister resistant resin, we recommend that additional protection from marine growth and pollution be provided by a barrier coating system and antifouling paint if the boat is to be left in the water for over two weeks. This is extremely important as pollution and marine growth can cause osmosis and damage fiberglass hulls.

SANDBLASTING THE HULL BOTTOM WILL DAMAGE THE FIBERGLASS. USE A FIBERGLASS WAX REMOVER AND SAND TO SCUFF THE GELCOAT SURFACE. THE INSTRUCTIONS AND RECOMMENDATIONS OF THE BARRIER COATING AND ANTIFOULING PAINT MANUFACTURERS SHOULD BE FOLLOWED EXACTLY.

BARRIER COATINGS AND BOTTOM PAINT SHOULD BE APPLIED ONLY BY QUALIFIED MARINE PROFESSIONALS IN A BOAT YARD OR DEALERSHIP THAT SPECIALIZES IN THEIR APPLICATION. USE ONLY STANDARD, HIGH QUALITY ANTIFOULING PAINTS AND BARRIER COATINGS FROM NAME BRAND MANUFACTURES SUCH AS INTERLUX AND PETTIT.

Most bottom paints require some maintenance. Proper maintenance is especially important when the boat is in saltwater and not used for extended periods or after dry storage. If the hull bottom has been painted with antifouling paint, contact your dealer for the recommended maintenance procedures.

Sacrificial Anodes

Sacrificial zinc anodes are installed on the inboard engines' freshwater cooling system and on the transom. The transom zinc anode is connected to the bonding system and protects the rudder assemblies, shaft logs and other underwater hardware that is bonded. The propeller shafts are connected to the bonding system by bonding wire that is connected to a contact brush that rubs on the shaft. You should check the brush frequently and make sure it is not worn and that it is making contact with the shaft. Additional zinc anodes are installed on the propeller shafts and should be on the trim tabs if the boat is to be left in the water.

The anodes are less noble than copper based alloys, aluminum and stainless steel. They will deteriorate first, protecting the more noble engine and underwater hardware against galvanic corrosion. Anodes should be checked monthly and changed when they are 50 - 75% of their original size. When replacing the anodes, make sure the contact surfaces are clean, shiny metal and free of paint and corrosion. Never paint over the anode. The bonding system should be inspected by a qualified marine electrician once a year to make sure all connections are sound and there is continuity throughout the system.

Boats stored in salt water will normally need to have the anodes replaced every six months to one year. Anodes requiring replacement more frequently may indicate a stray current problem within the boat or at the slip or marina. Anodes that do not need to be replaced after one year may not be providing the proper protection. Loose or low quality anodes could be the problem. There could also be a problem in the bond-

ing system. Contact your dealer for the proper size and type of zinc anodes to be used and the specific installation procedure.

Fiberglass Gelcoat Surfaces

Normal maintenance requires only washing with mild soap and water. A stiff brush can be used on the nonskid areas. Kerosene or commercially prepared products will remove oil and tar which could be a problem on trailered boats. Harsh abrasive and chemical cleaners are not recommended because they can damage or dull the gelcoat, reducing its life and making it more susceptible to stains. When the boat is used in saltwater, it should be washed thoroughly with soap and water after each use.

At least once a season, wash and wax all exposed fiberglass surfaces. Use a high quality automotive or boat wax. Follow the procedure recommended by the wax manufacturer. The washing and waxing of your boat will have the same beneficial effects as they have on an automobile finish. The wax will fill minute scratches and pores thus helping to prevent soiling and will extend the life of the gelcoat.

After the boat is exposed to the direct sunlight for a period of time, the color in the gelcoat tends to fade, dull or chalk. A heavier buffing is required to bring the gelcoat back to its original luster. For power cleaning use a light cleaner. To clean the boat by hand, use a heavier automotive cleaner. Before cleaning the surfaces, read the instructions given with the cleaner. After cleaning the surfaces, apply wax and polish all fiberglass surfaces except the nonskid areas.

If the fiberglass should become damaged and need repair, contact your dealer for an authorized repair person to make the repairs.

CAUTION

DO NOT WAX NONSKID AREAS AS THIS COULD MAKE THEM SLIPPERY AND CONSEQUENTLY INCREASE THE POSSIBILITY OF INJURY.

Stainless Steel Hardware

When using the boat in saltwater, the hardware should be washed with soap and water after each use. When a boat is used in a corrosive environment such as saltwater, water with a high sulfur content, or polluted water, the stainless steel will periodically develop surface rust stains. This is perfectly normal under these conditions. The stainless can normally be cleaned and protected by using a high quality boat or automotive wax or a commercial metal cleaner and protectant.

CAUTION

UNDER NO CIRCUMSTANCES SHOULD ANY ABRASIVE MATERIALS SUCH AS SANDPAPER, BRONZE WOOL, OR STEEL WOOL BE USED ON STAINLESS STEEL. DAMAGE TO THE HARDWARE WILL RESULT.

Anodized Aluminum Surfaces

Anodized aluminum should be washed periodically with soap and water to keep it clean. If the boat is used in saltwater or polluted water, the aluminum should be washed with soap and water after each use. Saltwater allowed to remain on anodized aluminum will penetrate the anodized coating and attack the aluminum.

Hardtops with anodized aluminum frames, bimini tops and towers with canvas and/or fiberglass tops require special attention to the anodized aluminum just below the top. This area is subject to salt build up from salty condensation and sea spray. It is also frequently overlooked when the boat is washed and will not be rinsed by the rain. Consequently, the aluminum just below the top is more likely to become pitted than the exposed aluminum on the structure. Make sure the aluminum in this area is washed frequently with soap and water and rinsed thoroughly. Pay particular attention to places where the top material contacts the frame. Once a month coat the entire frame with a metal protector made for anodized aluminum to protect against pitting and corrosion caused by the harsh effects of salt water.

CAUTION

ONE DRAWBACK TO METAL PROTECTORS IS THAT THEY CAN MAKE THE METAL SLIPPERY. THEREFORE, METAL PROTECTORS SHOULD NOT BE USED ON TOWER LADDERS, STEERING WHEELS AND OTHER AREAS WHERE A GOOD GRIP AND SURE FOOTING IS IMPORTANT.

Stains can be removed anodized aluminum with a metal polish or fine polishing compound. To minimize corrosion, use a caulking compound or teflon based sealer to bed hardware and fasteners mounted to aluminum fabrications. If the anodized coating is badly scratched it can be touched up with paint. With proper care, anodized aluminum will provide many years of service.

Powder Coated Aluminum

Powder coated aluminum should be washed periodically with soap and water to keep it clean. If the boat is used in saltwater or polluted water, the aluminum should be washed with soap and water after each use. Saltwater allowed to remain on powder coated aluminum will penetrate the coating and attack the aluminum, usually around fasteners and hardware mounted to the aluminum.

Pay special attention to the area just below the top on powder coated frames. This area is subject to salt build up from salty condensation and sea spray. It is also frequently overlooked when the boat is washed and will not be rinsed by the rain. Consequently, the powder coating near fasteners and hardware mounted just below the top is more likely to be attacked by the salt and become corroded than the exposed areas on the structure. Make sure the aluminum in this area is washed frequently with soap and water and rinsed thoroughly. Pay particular attention to places where the top material contacts the frame.

Once a month check the entire frame for damaged powder coating and corrosion around fasteners and hardware. Nicked or badly scratched powder coating can be sanded and touched up with enamel paint. Corrosion around fasteners will have to be sanded, then touched up with paint. The fasteners will require fiber washers and sealing with caulk or a teflon based sealer to isolate the fastener from the aluminum and prevent damage to the paint or powder coating when the fastener is installed. Periodically applying automotive or boat wax to the powder coating will provide additional protection from the harsh effects of saltwater.

Always repair scratches, nicks and corroded areas in powder coating as soon as possible. Corrosion left unaddressed will lift the powder coating allowing moisture to travel between the powder coating and the aluminum causing the corrosion to spread below the coating and damage the aluminum.

If excessive chipping and peeling occurs, it could be an indication of an electrical fault in the boat or aluminum fabrication. You should contact a qualified marine electrician to inspect your boat immediately and correct the problem if you suspect that your boat may have a fault in the aluminum frame. You should also contact Wellcraft Customer Service.

Note: Boats that are towed behind larger vessels require special attention to the aluminum hardware. The salt spray, salty steam, and chemicals in exhaust gases are particularly corrosive and will eventually penetrate and damage the surface of anodized or powder coated aluminum. It is imperative that the boat and the aluminum are cleaned thoroughly at the completion of each trip or at the end of each day on long cruises to reduce accelerated deterioration of the anodizing or powder coating and premature corrosion to the aluminum.

Note: You should contact Wellcraft Customer Service before making any modifications to aluminum fabrications. Unauthorized modifications can void the warranty.

Chrome Hardware

Use a good chrome cleaner and polish on all chrome hardware.

Acrylic Plastic Glass

Acrylic glass scratches easily. Never use a dry cloth or glass cleaning solutions on acrylic. Use a soft cloth and mild soap and water for routine cleaning. Solvents and products containing ammonia can permanently damage acrylic plastic glass.

Fine scratches can be removed with a fine automotive clear coat polishing compound. A coat of automotive or boat wax is beneficial to protect the surface.

Do not use the following on acrylic glass:

Abrasive cleaners	Acetone
Solvents	Alcohol
Glass cleaners	Cleaners containing ammonia

13.2 Upholstery, Canvas and Enclosures

Vinyl Upholstery

The vinyl upholstery used on the exterior seats and bolsters, and for the headliner in the cabin should be cleaned periodically with soap and water. Any stain, spill or soiling should be cleaned up promptly to prevent the possibility of permanent staining. When cleaning, always rub gently. Avoid using products containing ammonia, powdered abrasive cleaners, steel wool, strong solvents, acetone and lacquer solvents or other harsh chemicals as they can cause permanent damage or shorten the life of vinyl. Never use steam heat, heat guns or hair dryers on vinyl.

Stronger cleaners, detergents and solvents may be effective in stain removal, but can cause either immediate damage or slow deterioration. Lotions, sun tan oil, waxes and polishes, etc., contain oils and dyes that can cause stiffening and staining of vinyls.

The following are typical stains and cleaning tips for vinyl:

- Dry soil, dust and dirt - Remove with a soft cloth.
- Dried on dirt - Wash with a soft cloth dampened with water.
- Variations in surface gloss - Wipe with a water dampened soft cloth and allow to air dry.
- Stubborn dirt - Wash with a soft cloth dampened with Ivory Flakes® and water. Rinse with clean water.

- Stubborn spots and stains - Spray with either Fantastik Cleaner® or Tannery Car Care Cleaner® and rub with a soft cloth. Rinse with clean water.

- Liquid spills - Wipe immediately with a clean absorbent cloth. Rinse with clean water.

- Food grease and oily stains - Spray immediately using either Fantastik Cleaner® or Tannery Car Care Cleaner®, wiping with a soft cloth. Take care not to extend the area of contamination beyond its original boundary. Rinse with clean water.

Canvas and Side Curtains

Acrylic (Sunbrella) canvas should be cleaned periodically by using a mild soap and water. Scrub lightly and rinse thoroughly to remove the soap. Do not use detergents. The top or accessories should never be folded or stored wet.

After several years, the acrylic canvas may lose some of its ability to shed water. If this occurs, wash the fabric and treat it with a commercially available water proofing designed for this purpose.

Note: Some leakage at the seams is normal and unavoidable with acrylic enclosures.

Side curtains and clear connectors can be cleaned with mild soap and water. They should not be allowed to become badly soiled. Dirt, oil, mildew, and cleaning agents containing ammonia, will shorten the life of the vinyl that is used for clear curtains. After cleaning the curtains and allowing them to dry, apply a non-lemon furniture polish or an acrylic glass and clear plastic protector to extend the life of the curtains.

Vinyl curtains should be stored either rolled or flat, without folds or creases. Folding the curtains will make permanent creases that could cause the vinyl to crack.

Note: Do not use any polish containing lemon scents or lemon. The lemon juice will attack the vinyl and shorten its life.

Snaps should be lubricated periodically with petroleum jelly or silicone grease. Zippers should be lubricated with silicone spray or paraffin or a product designed to lubricate zippers in marine canvas.

The bimini top, side curtains, clear connector, back drop and aft curtain must be removed when trailering. Canvas enclosures are not designed to withstand the extreme wind pressure encountered while trailering and will be damaged. Always remove and properly store the enclosure before trailering your boat.

Do not operate engines, fuel consuming heaters or burners with the canvas enclosures closed. The cockpit must be open for legal ventilation and to prevent the possible accumulation of carbon monoxide fumes, which could be lethal.

WARNING

CARBON MONOXIDE IS A LETHAL, TOXIC GAS THAT IS COLORLESS AND ODORLESS. IT IS A DANGEROUS GAS THAT WILL CAUSE DEATH IN CERTAIN LEVELS.

13.3 Cabin Interior

The cabin interior can be cleaned just like you would clean a home interior. The wood floors and steps can be vacuumed and cleaned with a mixture of water and Murphy's Oil Soap or white vinegar and water. Wipe the wood dry with a clean towel. To preserve the cherry and maple woodwork, use furniture polish with wax. To maintain the carpeting, use a vacuum cleaner.

Because air and sunlight are very good cleansers, periodically put cushions, sleeping bags, etc. on deck, in the sun and fresh air, to dry and air out. If cushions or equipment get wet with saltwater, remove and use clean, fresh water to rinse off the salt crystals. Salt retains moisture and will cause damage. Dry thoroughly and reinstall.

Vinyl headliner material should be cleaned periodically as explained in the previous section. Avoid using products containing ammonia, bleach, or harsh chemicals as they can shorten the life of vinyl.

If you leave the boat for a long period of time, put all cushions on their sides, open all interior cabin and locker doors, and hang a commercially available mildew protector in the cabin.

CAUTION

ALWAYS READ THE LABEL CAREFULLY ON MILDEW PROTECTORS. REMOVE THE PROTECTOR AND ALLOW THE CABIN TO VENTILATE COMPLETELY BEFORE USING THE CABIN.

Corian Surfaces

A mild liquid detergent and water or ammonia-based cleaners will remove most dirt and stains from Corian. For heavy cleaning, oil, and grease, use Fantastik spray cleaner. Rinse with a clean cloth moistened with freshwater. Wipe dry with a clean cloth.

In most cases, Corian can be repaired if accidentally damaged. Minor damage, including scratches, general or chemical stains, scorches or burns, and minor impact marks, can be repaired with a light abrasive cleanser and a Scotch-Brite® pad. For heavier damage, light sanding and machine buffing may be necessary so contact your dealer or a professional.

- Avoid exposing Corian to strong chemicals, such as paint removers, oven cleaners, etc. If contact occurs, quickly flush the surface with water.
- Remove nail polish with a non acetone-based polish remover and flush with water.
- Do not cut directly on Corian counter tops.

13.4 Bilge and Engine Compartment

To keep the bilge clean and fresh, use a commercial bilge cleaner regularly. Follow the directions carefully. The engines and engine room should be kept clean and free of oil accumulation and debris. All exposed pumps and metal components, including the engines and drive gear, should be sprayed periodically with a protector to reduce the corrosive effects of the high humidity always present in these areas.

Periodically check the bilge pumps for proper operation and clean debris from the strainers and float switches. Inspect all hoses, clamps and thru-hulls for leaks and tightness on a regular basis and operate all thru-hull valves at least once a month to keep them operating properly.

Test the high water alarm system regularly by activating the automatic float switches by rotating the knob on the side of switch.

Note: The flow of air into the bilge is provided by vents located in the hull side. This air passes through baffles which should be inspected and cleaned routinely to ensure adequate air circulation.

Engines

Proper engine maintenance is essential to the proper performance and reliability of your inboard engines. Maintenance schedules and procedures are outlined in your engine owner's manual. They should be followed exactly.

Proper engine operation requires a good supply of clean, dry fuel. Improper marina fuel storage techniques, limited boat usage, etc. can cause the fuel to become contaminated. Periodically, it may be necessary to siphon accumulating water and contaminated fuel from the bottom of the fuel tanks.

Algae can grow in the accumulated water in diesel fuel tanks. This condition is most prevalent in warm climates. Periodically adding a high quality diesel fuel additive containing an algaecide may be required to control algae in your boating area.

The age of fuel can affect engine performance. Chemical changes occur as the fuel ages that can cause deposits and reduce the cetane rating of the fuel. Severely degraded fuel can damage the engine and boat fuel tank and lines. Therefore, if your boat is not being run enough to require at least one full tank of fresh fuel a month, a fuel additive should be added to protect it from degradation. Your dealer or the engine manufacturer can provide additional information on fuel degradation and fuel stabilizers recommended for your engine.

Generator

The engine maintenance required on the generator is similar in many ways to the main engines. The engine incorporates a pressure-type lubrication system and a fresh water cooled engine block which is thermostatically controlled. The most important factors to the generator's longevity are proper ventilation and maintenance of the fuel system, ignition system, cooling system, lubrication system and the AC alternator.

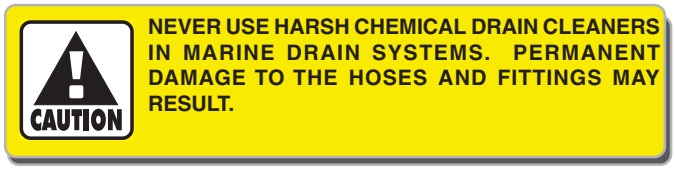
Maintenance schedules and procedures are outlined in your generator owner's manual. They should be followed exactly.

13.5 Drainage System

It is essential that the following items be done periodically to maintain proper drainage of your boat:

- Clean the cockpit drains with a hose to remove debris that can block water drainage.
- Clean the hardtop or tower leg drain holes. This is especially important just before winter lay-up.
- Frequently test the automatic bilge pump switches for proper operation. This is accomplished by lifting the float switch until the pump is activated. You can also use a garden hose to flood the bilge until the water level is high enough to activate the pump.
- Flush all gravity drains with freshwater to keep them clean and free flowing.
- Operate the thru-hull valves once a month and service as required.

Note: **All drains and pumps must be properly winterized before winter lay-up.**



Chapter 14:
SEASONAL MAINTENANCE

14.1 Lay-up and Storage

Before Hauling:

- Pump out the head and holding tank. Flush the holding tank using clean water and a deodorizer. Pump out the cleaning solution.

- The fuel tank should be left nearly full to reduce condensation that can accumulate in the fuel tank. Allow enough room in the tank for the fuel to expand without leaking out the vents.

  Bacteria, commonly called algae, can grow in the accumulated water in diesel fuel tanks. This condition is most prevalent in warm climates. Periods of storage or limited use allow the bacteria to accumulate, making the situation worse. Adding a high quality diesel fuel conditioner containing a biocide may be required to control bacteria in your boating area.

- The age of fuel can affect engine performance. Chemical changes occur as the fuel ages that can cause deposits and reduce the cetane rating of the fuel. Severely degraded fuel can damage the engine and boat fuel tank and lines. Therefore, if your boat is not being run enough to require at least one full tank of fresh fuel a month, a fuel additive should be added to protect it from degradation. Your dealer or the engine manufacturer can provide additional information on fuel degradation and fuel stabilizers recommended for your engines. Operate the boat for at least 15 minutes after adding the additive to allow the treated fuel to reach the engine.

  Your dealer or the engine manufacturer can provide additional information on fuel degradation and fuel additives recommended for your engine. For more recommendations for your specific area, check with your dealer.

- Drain water from the fresh water system.

- Consult the engine owner's manual for detailed information on preparing the engines for storage.

Lifting

It is essential that care be used when lifting your boat. Make sure the spreader bar at each sling is at least as long as the distance across the widest point of the boat that the sling will surround. There are sling tags on the side deck. Make sure the fore and aft slings are located at the tags and are tied together to prevent the slings from sliding on the hull.

The bow should always be slightly higher than the stern while lifting the boat. This will allow the water to drain from the engine exhaust system and prevent water from surging over the risers and into the engine.

CAUTION

BOATS HAVE BEEN DAMAGED FROM IMPROPER LIFTING AND TRANSPORTING WITH FORK LIFTS. THE FORKS PLACE EXTREME PRESSURE POINTS ON THE HULL AND COULD CAUSE SERIOUS STRUCTURAL DAMAGE. YOUR BOAT IS TOO HEAVY FOR ANY FORK LIFT. NEVER ALLOW ANYONE TO LIFT THE BOAT WITH A FORK LIFT.

CAUTION

SEVERE GELCOAT CRAZING OR MORE SERIOUS HULL DAMAGE CAN OCCUR DURING HAULING AND LAUNCHING IF PRESSURE IS CREATED ON THE GUNWALES (SHEER) BY THE SLINGS. SPREADERS ARE NOT REQUIRED IF BELTS ARE NOT CREATING PRESSURE (CABLE DRUMS FURTHER APART THAN BEAM OF BOAT). FLAT, WIDE BELTING SLINGS AND SPREADERS LONG ENOUGH TO KEEP PRESSURE FROM THE GUNWALES ARE ESSENTIAL. DO NOT ALLOW ANYONE TO HAUL YOUR BOAT WHEN THE SPREADERS ON THE LIFT ARE NOT WIDE ENOUGH TO TAKE THE PRESSURE OFF THE GUNWALES.

Supporting The Boat For Storage

A well-made cradle or proper blocking is the best support for your boat during storage.

When supporting the boat with blocking:

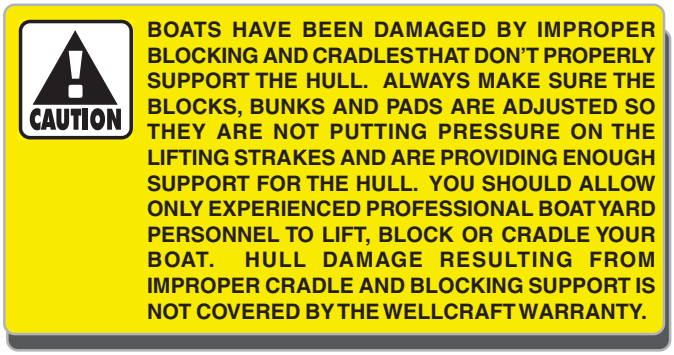
- Make sure the boat is blocked on a level surface and the bow is high enough so that water will drain from the bilge, cockpit and exhaust system.

- Make sure the keel is supported with large, solid wood blocks in at least three points.

- Use at least three heavy duty jacks on each side of the hull and make sure the boat is level from side to side. The jacks must be on a solid surface like packed gravel, concrete or pavement. All of the supports must be set up properly to prevent the boat from shifting while it is in storage.

When storing the boat on a cradle:

- The cradle must be specifically for boat storage and approved by Wellcraft.
- Make sure the cradle is well supported and placed on a level surface with the bow high enough so that water will drain from the bilge, cockpit and exhaust system.
- The cradle must be in the proper fore and aft position to properly support the hull. When the cradle is in the correct location, the bunks should match the bottom of the hull and should not be putting pressure on the lifting strakes.



Preparing The Boat For Storage

- Remove the bilge drain plug in the transom.
- Thoroughly wash the fiberglass exterior, especially the antifouling portion of the bottom. Remove as much marine growth as possible. Lightly wax the exterior fiberglass components.
- Remove all oxidation from the exterior hardware, and apply a light film of moisture displacing lubricant.
- Remove propellers and grease the propeller shafts using light waterproof grease.
- Remove the batteries and store in a cool place. Clean using clear, clean water. Be sure the batteries have sufficient water and clean terminals. Keep the batteries charged and safe from freezing throughout the storage period.

Note: Refer to the Electrical System chapter, for information on the maintenance of the AC and DC electrical systems.

- Coat all faucets and exposed electrical components in the cabin and cockpit with a protecting oil.
- Clean out, totally drain and completely dry the fishboxes, sinks and baitwells.
- Thoroughly clean the interior of the boat. Vacuum all carpets and dry clean drapes and upholstery.
- Remove cushions, open the refrigerator door and as many locker doors as possible. Leaving as many of these areas open as possible will improve the boat's ventilation during the storage period.

Note: It is recommended that a mildew preventer be hung in the boat's cabin before it is closed for storage.

- Clean the exterior upholstery with a good vinyl cleaner and dry thoroughly. Spray the weather covers and boat upholstery with a spray disinfectant. Enclosed areas such as the refrigerator, shower basin, storage locker areas, etc. also should be sprayed with this disinfectant.

14.2 Winterizing

Freshwater System

The entire freshwater system must be completely drained. Disconnect all hoses, check valves, etc. and blow all the water from the system. Make sure the water heater and freshwater tank are completely drained. Use only very low air pressure when doing this to prevent possible system damage. Because of the check valve mechanism built in the pump, blowing the lines will not remove the water from the freshwater pump. Remove the inlet and outlet hoses on the pump. Turn the pump on and allow it to pump out any remaining water....about a cupful. A recommended alternative to the above-mentioned procedure is the use of commercially available non toxic, freshwater system antifreeze. After draining the potable water tank, lines and water heater, pour the antifreeze mixture into the freshwater tank, prime and operate the pump until the mixture flows from all freshwater faucets. Be sure to open all hot and cold water faucets, including the freshwater washdown in the cockpit and engine compartment and the faucet in the bait prep station. Make sure antifreeze has flowed through all of the freshwater drains.

The cabin drain system must be properly winterized. Clean debris from the drains and sump and flush for several minutes with fresh clean water. After the system is clean, pump the drain sump as dry as possible. Then pour a potable water antifreeze mixture into the galley sink drain until antifreeze has been pumped through the entire system and out of the thru-hull.

For additional information refer to the Drainage System chapter.

Raw Water System

Completely drain the raw water systems. Disconnect all hoses and blow the water from the system. Use only very low air pressure when doing this to prevent possible system damage. Because of the check valve mechanism built in the raw water washdown and livewell pumps, blowing the lines will not remove the water from that raw water pump. Remove the outlet hose on the pump. Turn the pump on and allow it to pump out any remaining water....about a cupful. A recommended alternative to the above-mentioned procedure is the use of commercially available non toxic, potable water system antifreeze. If potable water antifreeze is used, pour the mixture into a pail and put the raw water intake lines into the solution. Run the pumps one at a time until the antifreeze solution is visible at all raw water faucets, discharge fittings and drains. Be sure antifreeze has flowed through all of the raw water drains.

Engine and Generator Raw Water Systems

Drain all of the sea strainers, heat exchangers and raw water supply and discharge lines for the engine and generator raw water supply pumps. Make sure all seawater has drained from the exhaust system. The main engine mufflers have a drain valve that must be opened to properly drain the muffler. The valves are located in the stern bilge on each side of the stern access hatch in the cockpit and connected to the mufflers with hoses. The generator muffler does not have a drain.

Once the system is drained, pour a non toxic marine engine antifreeze mixture into a large pail and put the engine raw water intake lines into the solution. Run the engines one at a time until the antifreeze solution is visible at the exhaust port, then shut the engine off. Put the generator raw water intake into the antifreeze solution and run the generator until antifreeze is visible at the exhaust port. Make sure the engines are run long enough to flush residual sea water out of the exhaust system and completely replace it with the antifreeze solution.

Note: Properly winterize the engines, generator and fuel system by following the engine manufacturer's winterizing procedures located in your engine owner's manuals or contact a Wellcraft dealer.

Refer to the Raw Water System chapter for additional information on the raw water system.

Marine Toilet

The marine toilet must be properly winterized by following the manufacturer's winterizing instructions in the marine toilet owner's manual. Drain the intake and discharge hoses completely using low air pressure if necessary. The head holding tank and macerator discharge pump must be pumped dry and three gallons of potable water antifreeze poured into the tank through the deck waste pump out fitting. After the antifreeze has been added to the holding tank, open the overboard discharge valve and activate the macerator pump until the antifreeze solution is visible at the discharge thru-hull.

Note: Make sure you follow the marine toilet manufacturer's winterizing instructions exactly.

Air Conditioner and Freezer

Disconnect and drain the seawater pump intakes and discharge hoses. Remove all water from the sea strainers and thru-hull fittings. Allow all water to drain from the systems. The air conditioner and freezer components must be properly winterized by following winterizing procedure in the manufacturer's owner's manual.

The cabin air conditioning and cabin drain sump system must be properly winterized. Clean debris from the drain and sump and flush for several minutes with fresh clean water. After the system is clean, pump the drain sump as dry as possible. Then pour a potable water antifreeze mixture into each air conditioning drain pan until antifreeze has been pumped through the entire system and out of the thru-hull.

Note: The air conditioning, freezer, engine control system, head, and steering systems have specific lay up requirements. Please refer to their owner's manuals for recommended winterizing procedures.

Bilge

Coat all metal components, wire busses, and connector plugs in the bilge with a protecting oil. It is also important to protect all strainers, seacocks and steering components. The bilge pumps and bilge pump lines must be completely free of water and dried out when the boat is laid up for the winter in climates where freezing occurs. Compartments in the bilge that will not drain completely should be pumped out and then sponged until completely free of water. Dry the hull bilge and self-bailing cockpit troughs. Water freezing in these areas could cause damage.

Seacocks

Most seacocks are winterized when the systems they serve are winterized. Check to make sure each seacock has been winterized and that the valve is open to allow the water to drain out of the valve. Water freezing in seacocks will damage the valves.

Hard Top

It is imperative that all drain holes in the legs are open and that the legs are completely free of water. Remove the enclosure and thoroughly clean and store in a safe, dry place. Re-

move all electronics. Coat all wire connectors and bus bars in the helm compartment with a protecting oil.

Clean the aluminum frame with soap and water and dry thoroughly. Apply an aluminum metal protector to the entire frame to reduce corrosion and pitting.

CAUTION

ALWAYS MAKE SURE THE LEG DRAIN HOLES ARE CLEAR WHEN THE BOAT IS LAID UP FOR THE WINTER. WATER TRAPPED INSIDE THE HARDTOP OR TOWER LEGS COULD FREEZE AND CAUSE THE LEGS TO SPLIT.

Special Notes Prior To Winter Storage

If the boat will be in outside storage, properly support a storage cover and secure it over the boat. It is best to have a frame built over the boat to support the canvas. It should be a few inches wider than the boat so the canvas will clear the rails and allow passage of air. If this cover is fastened too tightly there will be inadequate ventilation and this can lead to mildew, moisture accumulation, etc. It is essential to fasten the canvas down securely so that the wind cannot remove it or cause chafing of the hull superstructure. Do not store the boat in a damp storage enclosure. Excessive dampness can cause electrical problems, corrosion, and excessive mildew.

Whenever possible, do not use the enclosure curtains in place of the winter storage cover. The life of these curtains may be significantly shortened if exposed to harsh weather elements for long periods.

CAUTION

PLACING AN ELECTRIC OR FUEL BURNING HEATING UNIT IN THE BILGE AREA CAN BE POTENTIALLY HAZARDOUS AND IS NOT RECOMMENDED.

Proper storage is very important to prevent serious damage to the boat. If the boat is to be stored indoors, make sure the building has enough ventilation. It is very important that there is enough ventilation both inside the boat and around the boat.

Note: If the boat is to be stored indoors or outdoors, open all drawers, clothes lockers, cabinets, and doors a little. If possible, remove the upholstery, mattresses, clothing, and rugs. Then hang a commercially available mildew protector in the cabin.

14.3 Recommissioning

WARNING

DO NOT OPERATE THE BOAT UNLESS IT IS COMPLETELY ASSEMBLED. KEEP ALL FASTENERS TIGHT. KEEP ADJUSTMENTS ACCORDING TO SPECIFICATIONS.

Note: It is important and recommended that the fitting out procedure for the marine gear be done by a qualified marine technician. Read the engine owner's manual for the recommended procedure.

CAUTION

BEFORE LAUNCHING THE BOAT, MAKE SURE THE HULL DRAIN PLUG IS INSTALLED.

WARNING

MAKE SURE THE MUFFLERS HAVE NOT BEEN DAMAGED DURING WINTER STORAGE AND THAT THE MAIN ENGINE DRAIN VALVES ARE CLOSED. IF THE GENERATOR MUFFLER HAS A DRAIN PLUG, MAKE SURE IT IS INSTALLED AND PROPERLY TIGHTENED. LOOSE OR MISSING DRAIN PLUGS, DAMAGED OR LEAKING MUFFLERS OR EXHAUST HOSES AND OPEN MUFFLER DRAIN VALVES WILL ALLOW CARBON MONOXIDE, ENGINE GASES, AND WATER INTO THE BILGE CREATING A POTENTIALLY HAZARDOUS CONDITION.

Note: Not all mufflers are equipped with drain plugs.

Reactivating The Boat After Storage:

- Apply a fresh coat of bottom paint on the hull and running gear.
- Inspect running gear and thru-hull fittings.
- Inspect the sacrificial anodes and install new anodes if required.
- Install the propellers. Refer to the Propulsion System chapter for information on installing propellers.

- Install the drain plug in the hull.
- Charge and install the batteries.
- Check the engines for damage and follow the manufacturer's instructions for recommissioning.
- Check the engine mounting bolts to make sure they are tight.
- Perform all routine maintenance.
- Check all hose clamps and make sure they are tight and not corroded.
- Pump the antifreeze from the fresh and raw water systems and flush several times with fresh water. Make sure all antifreeze is flushed from the water heater and it is filled with fresh water before it is activated.
- Check and lubricate the steering system.
- Clean and wash the boat.
- Install all upholstery, cushions and canvas.

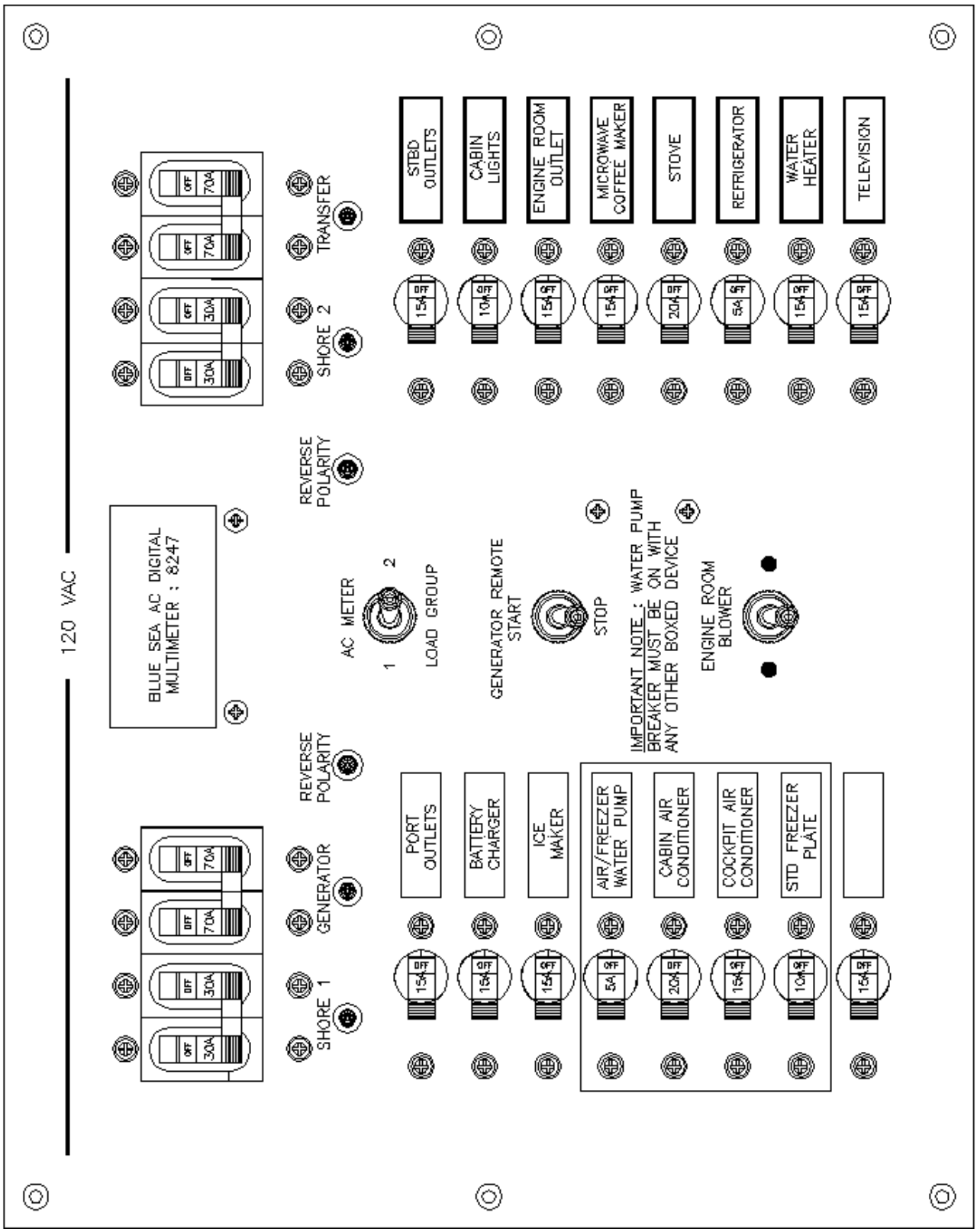
After Launching:

- Carefully check the engines and all water systems for leaks. Operate each system one at a time checking for leaks and proper operation.
- Check the bilge pump manual and automatic switches.
- Check the propeller shaft couplings for proper alignment. Allow the boat to remain in the water for several hours before checking the alignment.
- Prime the fuel system and start the engines. When each engine starts, check the exhaust ports for water flow. This insures that the cooling pump is operating.
- Carefully monitor the gauges and check for leakage and abnormal noises.
- Operate the boat at slow speeds until the engine temperature stabilizes and all systems are operating normally.
- Start the generator and monitor the exhaust port for a steady stream of water. It may take 20 or 30 seconds for the muffler to fill and for water to appear at the port. This ensures that the cooling pump is operating. Carefully inspect the generator and all hoses for leaks, paying particular attention to the muffler and exhaust hoses. Any leak, no matter how minor must be corrected immediately.

MAKE SURE THE GENERATOR MUFFLER OR EXHAUST SYSTEM HAS NOT BEEN DAMAGED DURING WINTER STORAGE AND THAT THE DRAIN PLUGS ARE INSTALLED AND PROPERLY TIGHTENED. LOOSE OR MISSING DRAIN PLUGS AND A DAMAGED OR LEAKING MUFFLER OR EXHAUST HOSES WILL ALLOW CARBON MONOXIDE, ENGINE GASES, AND WATER INTO THE BILGE CREATING A POTENTIALLY HAZARDOUS CONDITION.

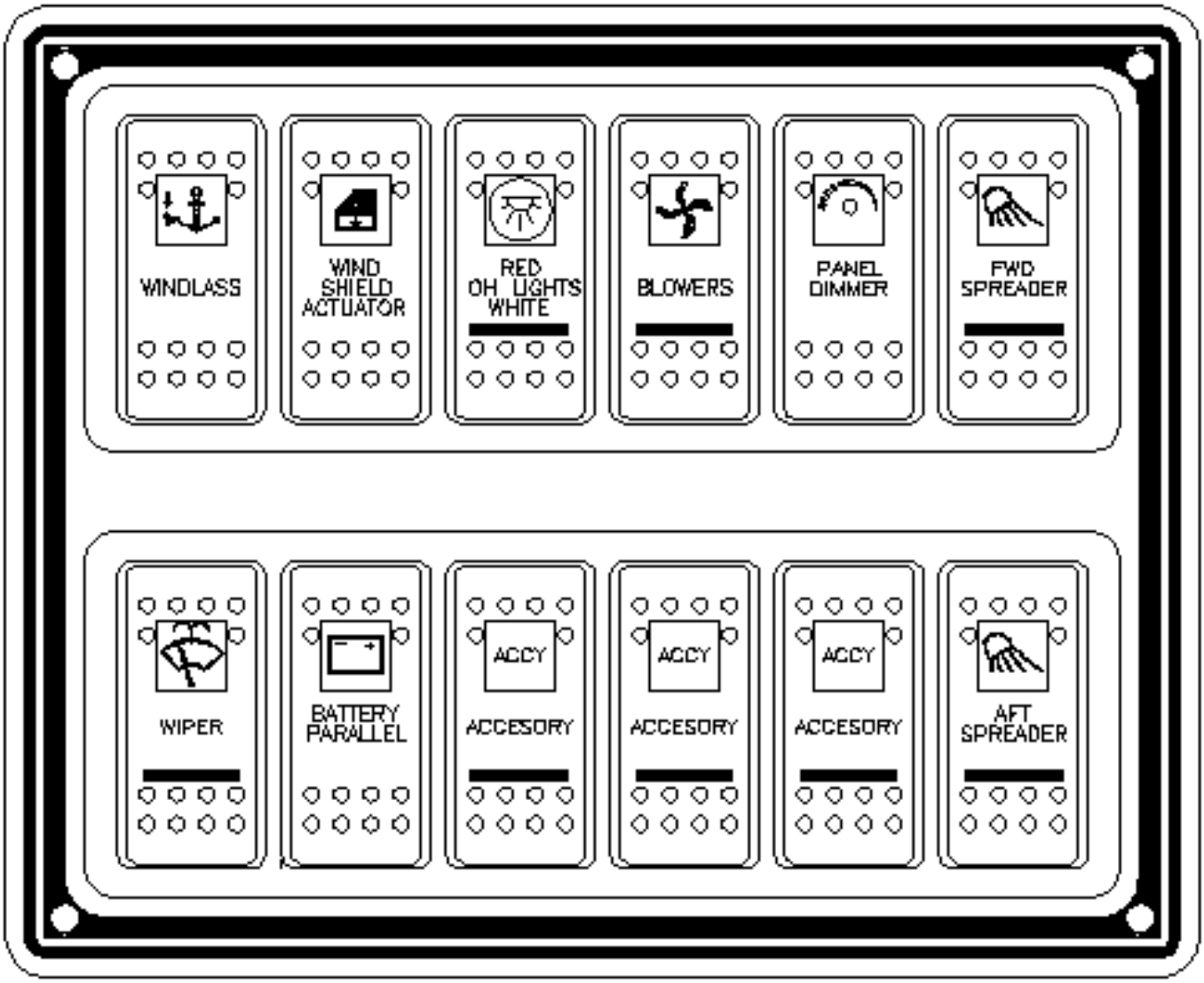
THIS PAGE WAS LEFT BLANK
INTENTIONALLY

Appendix A:
SCHEMATICS

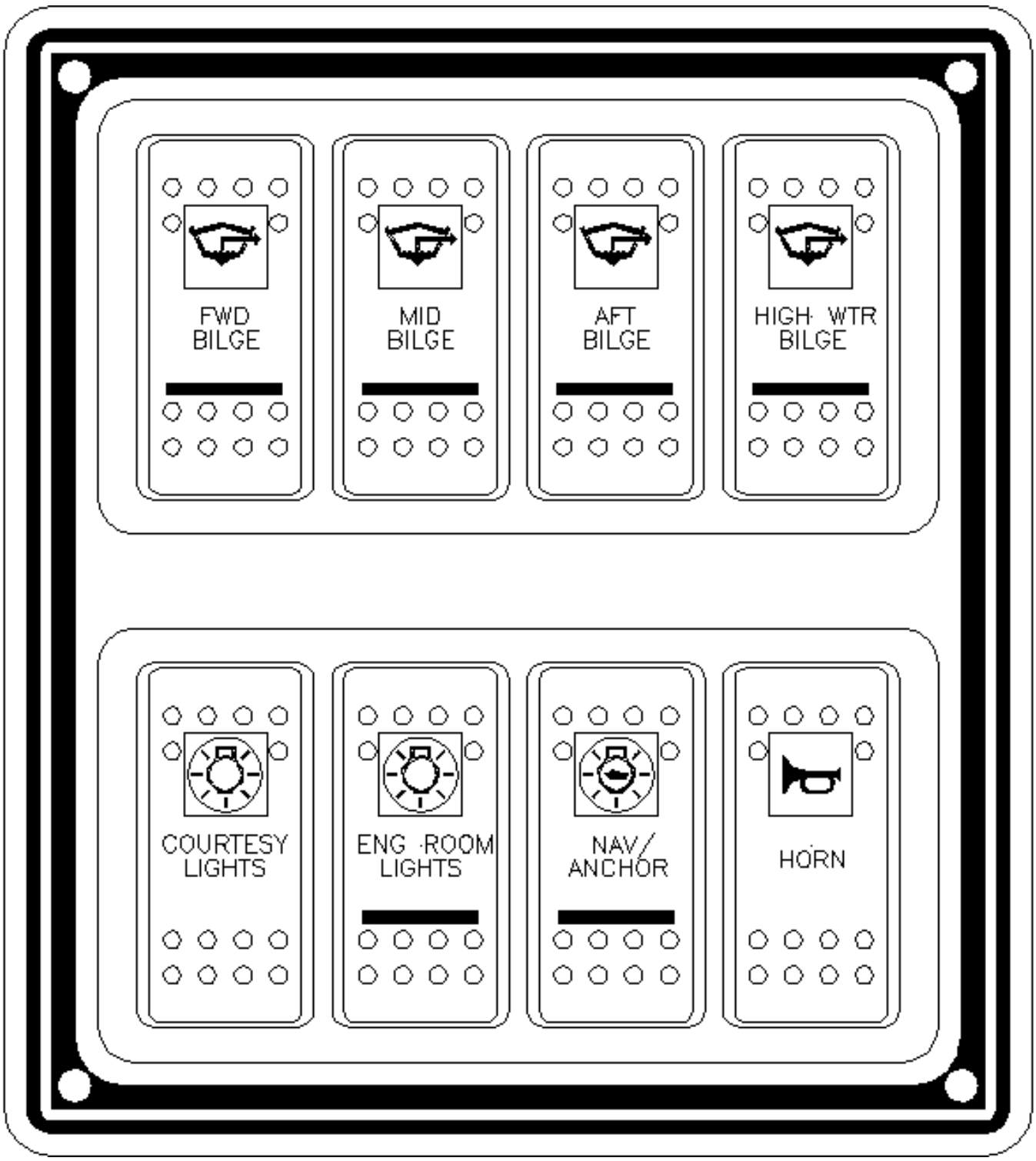


120-Volt AC Breakers

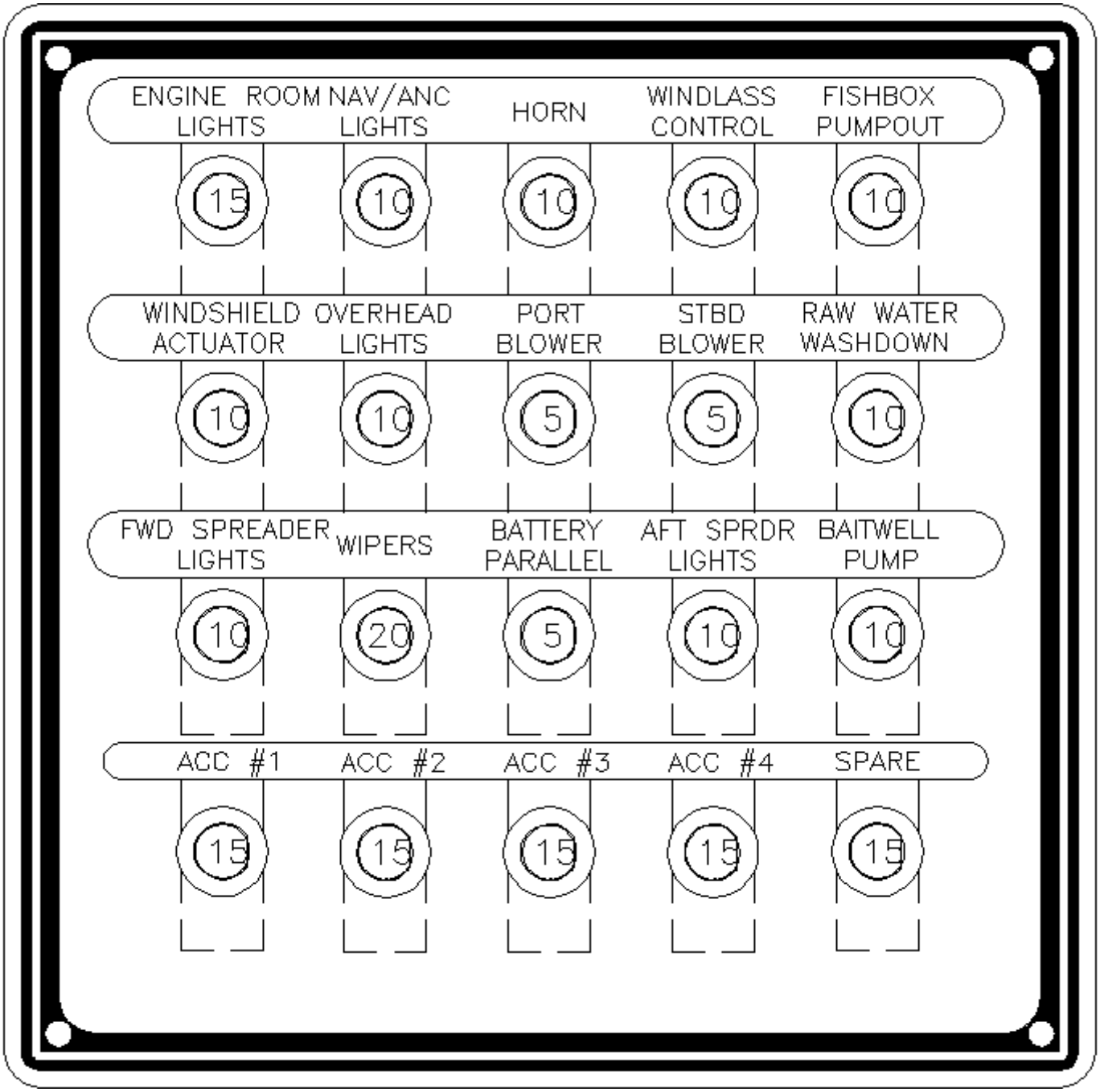
12-Volt DC Breakers



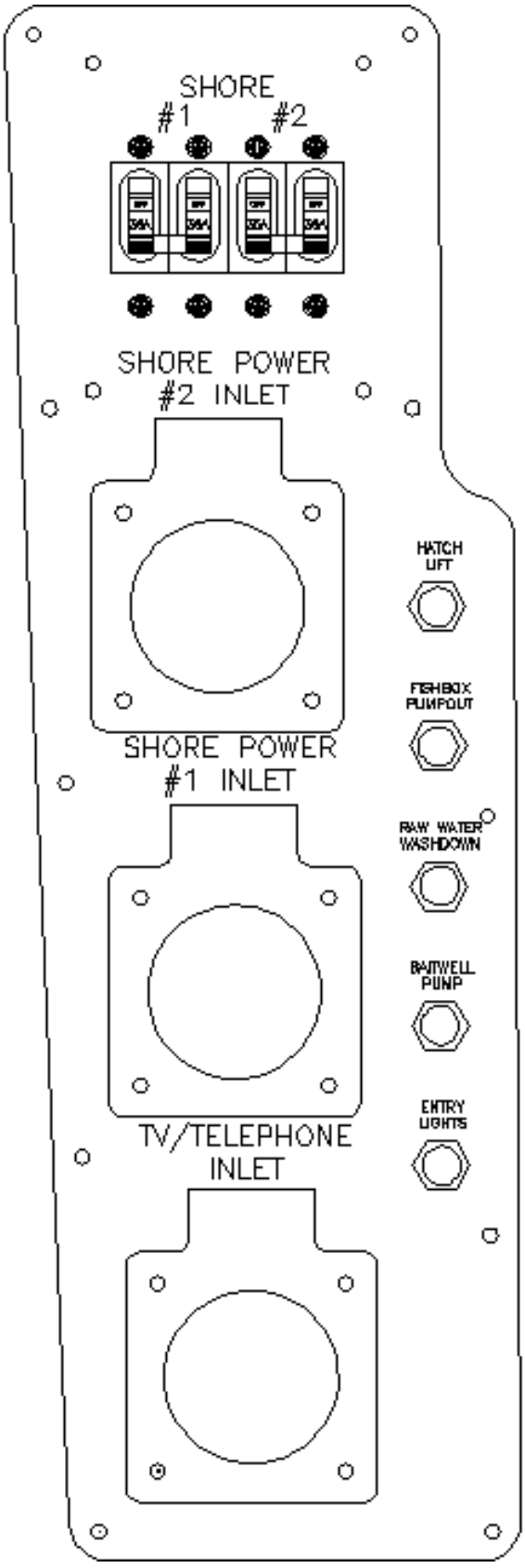
Helm Switch Panel



Helm Switch Panel



Helm DC Breaker Panel



Aft Deck Panel

AC Wire Code

Wire #	Function
01AC	Not Used
02AC	Cabin Lights
03AC	Stove
04AC	Water Heater
05AC	Battery Charger
06AC	Forward TV
08AC	Aft TV
09AC	Cabin Refrigerator
10AC	Coffee Maker
11AC	Microwave
12AC	Cockpit Icemaker
13AC	Outlet, Galley, GFCI
14AC	Outlet, Head, GFCI
15AC	Not Used
16AC	Not Used
17AC	Outlet, Port
18AC	Outlet, Stbd
19AC	Outlet, V-Berth, Port
20AC	Outlet, V-Berth, Stbd
21AC	Outlet, Dinette
22AC	Outlet, Engine Room
23AC	Not Used

Wire #	Function
24AC	Generator Line 1
25AC	Generator Line 2
26AC	Shore Power Line 1
27AC	Shore Power Line 2
28AC	Freezer/Chiller Plate - STD
29AC	Freezer/Chiller Plate - OPT
30AC	Not Used
31AC	Not Used
32AC	Controller power, Dual Air Cond
33AC	Galley Waterheater
34AC	Air Cond, Fwd
35AC	Not Used
36AC	Air Cond, Aft
37AC	Not Used
38AC	Not Used
39AC	Not Used
40AC	Central Vacuum
41AC	Not Used
42AC	Not Used
43AC	Not Used
44AC	Water Pump, Fwd A/C
45AC	
46AC	Water Pump, Aft A/C

AC Wire Code (Number)

DC Wire Code (Number)

Wire #	Color/Stripe	Circuit	Function
1			
2	Blu	Lights, Gauges	Gauges
3	Pur	Ignition	
4-1	Orn/Red	Power Seat - Aft	Aft
42	Wht	Speaker (+), Port Fwd (Cabin)	Port Fwd (Cabin)
4-2	Red	Power Seat - Feed	Feed
4-3	Red/Wht	Power Seat - Down	Down
4-4	Red/Yel	Power Seat - Fwd	Forward
4-5	Yel/Red	Power Seat - Up	Up
5-1	Red/Wht	Hatch,Engine - Up	Up
5-2	Yel/Blk	Hatch,Engine - Down	Down
6	Blu/Wht	Stereo, Remote Switching	Remote Switching
7	Pnk	Fuel Sender	(Tag Red for Port, Green for Stbd)
8	Yel/Red	Neutral Start	
9	Red	Spotlight	Power Feed
10	Brn/Blu	Pump, Livewell	Livewell
11	Brn/Yel	Pump, Fishbox	Fishbox
12	Red	Batt to Helm	Constant Hot
13	Lt Grn/Wht	Trim, Engine - Down	Down
14	Lt Blu/Wht	Trim, Engine - Up	Up
15	Pur/Wht	Trim, Engine - Pwr Feed	Power Feed
16	Brn	Pump, Aft Bilge manual	Aft Bilge Manual
17	Brn/yel	Blower, Engine Room	Engine Room
18	Gry	Lights, Bow navigation	Bow Navigation
19	Gry/Blu	Lights, Stern/Anchor	Stern/Anchor
20	Red	Electronics	Power Feed
21	Red	Helm	Power Feed
22	Yel	Grounds	Main
23	Brn/Red	Pump, Aft Bilge Auto	Aft Bilge Auto
24	Red	Exhaust	Corsa
25	Brn/Red	Pump, Fwd Bilge Auto	Fwd Bilge Auto
26	Red	Stereo Switched Power Feed	Switched Power Feed
27	Red/Yel	Stereo Memory	Memory
28	Tan/Blk	Extinguisher	Halon System
29	DK Grn	Bonds	Fuel System
30	DK Blu/Red	Lights, Entry	Entry Lights
31	DK Blu	Lights, Dinette	Dinette lights
32	Red/Pur	Trim, Engine - Trailer Power	Trailer Power
33	Orn/Red	Depth Sounder	Power Feed
34	Red	Mercathode	Power Feed
35	Tan/Yel	Alarm, Port Water Temp	Port Water Temp
36	Tan/Blk	Alarm, Stbd Water Temp	Stbd Water Temp
37	Grn	Speaker (+), Port Aft (Cockpit)	Port Aft (Cockpit)
38	Grn/Blk	Speaker (-), Port Aft (Cockpit)	Port Aft (Cockpit)
39	Pur	Speaker (+), Stbd Aft (Cockpit)	Stbd Aft (Cockpit)
40	Pur/Blk	Speaker (-), Stbd Aft (Cockpit)	Stbd Aft (Cockpit)
41	Dk Blu	Lights, Cabin Overhead	Cabin Overhead
43	Wht/Blk	Speaker (-), Port Fwd (Cabin)	Port Fwd (Cabin)
44	Orn	Wiper, Stbd Run	Stbd Run
45	Orn/Wht	Wiper, Washer	Washer
46	Gry	Speaker (+), Stbd Fwd (Cabin)	Stbd Fwd (Cabin)

DC Wire Code (Number)

DC Wire Code (Number)

Wire #	Color/Stripe	Circuit	Function
47	Gry/Blk	Speaker (-), Stbd Fwd (Cabin)	Stbd Fwd (Cabin)
48	Blu/Wht	Lights, Livewell	Livewell
49	Blu/Red	Lights, Courtesy	Courtesy
50	Yel/Blk	Horn	
51	Red	Receptacle, 12 VDC	12 VDC Outlets
52	Blu	Lights, Step	Step
53	Blu/Red	Wiper Park	Park Circuit
54	Pnk/Blk	Engine	Cutoff Circuit
55	Brn/Blu	Pump, Fresh Water	Fresh Water
56	Brn/Blk	Pump, Shower Sump	Shower Sump
57	Blu	Lights, Docking	Docking
58	Lt Blu	Alarm, Port Oil Pressure	Port Oil Pressure
59	Lt Blu/Wht	Alarm, Stbd Oil Pressure	Stbd Oil Pressure
60	Red	Trim, Tabs -Power Feed	Power Feed
61	Red	Ships Service DC	AC/DC Panel
62	Brn/Red	Pump, High Water Auto	High Water Auto
63	Brn	Pump, Aft Cabin Bilge Manual	Aft Cabin Bilge Manual
64	Brn/Red	Pump, Aft Cabin Bilge Auto	Aft Cabin Bilge Auto
65	Red	Helm Constant Hot	First Mate
66	Red	TV Antenna	Power Feed
67	Gry/Wht	Lights, Mast Anchor	Mast Anchor
68	Gry	Lights, Mast Nav	Mast Nav
69	Orn/Blk	CO Detector	Power Feed
70	Red	Head Systems	Accessory Panel Power Feed
71	Orn	Wiper, Center Run	Center Run
72	Brn	Pump, High Water Manual	High Water Manual
73	Orn/Blu	Wiper, Port Run	Port Run
74	Brn/Blk	Head Systems, Vacu-Flush	Vacu-Flush Power Feed
75	Brn/Yel	Blower, Head Vent	Head Vent
76	Brn/Yel	Blower, Generator	Generator
77	Brn/Blk	Head Systems - Macerator	Macerator
78	Red	Refrigerator, Cabin	Cabin
79	Red	Refrigerator, Cockpit	Cockpit
80	Brn	Pump, Fwd Bilge Manual	Fwd Bilge Manual
81	Red	Holding Tank, Indicator Power Feed	Indicator Power Feed
81-1	Lt Grn	Holding Tank, Indicator Empty	Indicator Empty
81-2	Lt Blu	Holding Tank, Indicator 1/2	Indicator 1/2
81-3	Tan	Holding Tank, Indicator Full	Indicator Full
82	Blu	Lights, Head	Head
83	Brn/Red	Pump, Mid Bilge Auto	Mid Bilge Auto
84	Brn	Pump, Mid Bilge Manual	Mid Bilge Manual
85	Red	Battery Parallel	Solenoid Feed
86	Brn/Blu	Pump, Raw Water	Raw Water
87	Blu	Lights, Galley	Galley
88	Blu	Lights, Spreader	Spreader
89	Coax	TV System, Antenna to Switch	Antenna to Switch
90	Coax	TV System, Cable to Switch	Cable to Switch
91	Blu	Lights, Engine Room	Engine Room
92	Red	Windlass, Power Feed	Power Feed
93	Red/Blu	Windlass, Anchor Up	Anchor Up

DC Wire Code (Number)

DC Wire Code (Number)

Wire #	Color/Stripe	Circuit	Function
94	Red/Grn	Windlass, Anchor Down	Anchor Down
95	Blu	Lights, Closet	Closet
96	Blu	Lights, Indirect	Indirect
97	Red	Freezer	Power Feed
98	Blu	Lights, V-Berth	V-Berth
99	Red	Downriggers	Power Feed
100			
101			
102			
103	Yel/Wht	Generator, Exhaust High Temp	Exhaust High Temp
104			
105	Coax	TV System, A/B Switch to Fwd TV	A/B Switch to Fwd TV
106	Coax	TV System, A/B Switch to Aft TV	A/B Switch to Aft TV
107			
108			
109	Blu/Wht	Lights, T-Top Overhead	T-Top Overhead
110	Pur	Generator, Run Light	Run Light
111	Yel	Generator, Remote Start/Stop Ground	Remote Start/Stop Ground
112	Red	Generator, Remote Start	Remote Start
113	Red	Generator, Remote Stop	Remote Stop
114	Blk or Grn	Electric Tab Up	Lenco / K-Plane Tab
115	Wht or Blu	Electric Tab Down	Lenco / K-Plane Tab
116	Blu	Trim, Tabs	BENNET UP
117	Yel	Trim, Tabs	BENNET DOWN
118	Red	Trim, Tabs	BENNET PORT
119	Grn	Trim, Tabs	BENNET STBD
120			
121	Wht	Water Tank	Sender
122	Red	Battery Charger, Port Battery	Port Battery
123	Red	Battery Charger, Stbd/House Battery	Stbd/House Battery
124	Red	Battery Charger, Gen Battery	Gen Battery
125			
126	Tan	Alarm, Port Eng Exhaust Temp	Port Eng Exhaust Temp
127	Tan/Orn	Alarm, Stbd Eng Exhaust Temp	Stbd Eng Exhaust Temp
128			
129			
130	22/4	Telephone	
131	Blu	Hatch, Fwd Storage	Fwd Storage
132	Yel	Hatch, Fwd Storage	Fwd Storage
133	Grn	Hatch, Fwd Storage	Fwd Storage
134	Orn	Speaker (+), Cockpit Subwoofer	Cockpit Subwoofer
135	Orn/Blk	Speaker (-), Cockpit Subwoofer	Cockpit Subwoofer
136	Red	Isolator, Alternator out to Isolator	Alternator out to Isolator
137	Red/Blk	Isolator, To Port Battery	To Port Battery
138	Red/Yel	Isolator, To Stbd/House Battery	To Stbd/House Battery
139			
140	Tan	Speaker (+), Port Aft (Cockpit Secondary)	Port Aft (Cockpit Secondary)
141	Tan/Blk	Speaker (-), Port Aft (Cockpit Secondary)	Port Aft (Cockpit Secondary)
142	Pnk	Speaker (+), Stbd Aft (Cockpit Secondary)	Stbd Aft (Cockpit Secondary)
143	Pnk/Blk	Speaker (-), Stbd Aft (Cockpit Secondary)	Stbd Aft (Cockpit Secondary)

DC Wire Code (Number)

Wire #	Color/Stripe	Circuit	Function
144			
145			
146			
147			
148			
149			
150	Red	Electronic Battery Switch Control	Electronic Battery Switch Control
151	Wht	Electronic Battery Switch Indicator	Electronic Battery Switch Indicator

All GROUND wires will be YELLOW. They'll be identified by the circuit number with a "G" suffix.

Example: Cabin Lights: wire # 41 Dk Blue (12V), wire # 41G Yellow (ground)

All POWER FEED wires will have an "A" Suffix.

Example: Cabin Light power feed wire #41A

All BRANCH wires will be numbered with a "numerical" suffix.

Example: Cabin Light wire from circuit breaker to first junction will be #41.

From the first junction to the first light will be # 41-1
From the first junction to the second light will be # 41-2

DC Wiring (Function)

Wire #	Color/Stripe	Circuit	Function
126	Tan	Alarm, Port Eng Exhaust Temp	Port Eng Exhaust Temp
58	Lt Blu	Alarm, Port Oil Pressure	Port Oil Pressure
35	Tan/Yel	Alarm, Port Water Temp	Port Water Temp
127	Tan/Orn	Alarm, Stbd Eng Exhaust Temp	Stbd Eng Exhaust Temp
59	Lt Blu/Wht	Alarm, Stbd Oil Pressure	Stbd Oil Pressure
36	Tan/Blk	Alarm, Stbd Water Temp	Stbd Water Temp
12	Red	Batt to Helm	Constant Hot
124	Red	Battery Charger, Gen Battery	Gen Battery
122	Red	Battery Charger, Port Battery	Port Battery
123	Red	Battery Charger, Stbd/House Battery	Stbd/House Battery
85	Red	Battery Parallel	Solenoid Feed
17	Brn/yel	Blower, Engine Room	Engine Room
76	Brn/Yel	Blower, Generator	Generator
75	Brn/Yel	Blower, Head Vent	Head Vent
29	DK Grn	Bonds	Fuel System
69	Orn/Blk	CO Detector	Power Feed
33	Orn/Red	Depth Sounder	Power Feed
99	Red	Downriggers	Power Feed
115	Wht or Blu	Electric Tab Down	Lenco / K-Plane Tab
114	Blk or Grn	Electric Tab Up	Lenco / K-Plane Tab
150	Red	Electronic Battery Switch Control	Electronic Battery Switch Control
151	Wht	Electronic Battery Switch Indicator	Electronic Battery Switch Indicator
20	Red	Electronics	Power Feed
54	Pnk/Blk	Engine	Cutoff Circuit
24	Red	Exhaust	Corsa
28	Tan/Blk	Extinguisher	Halon System
97	Red	Freezer	Power Feed
7	Pnk	Fuel Sender	(Tag Red for Port, Green for Stbd)
103	Yel/Wht	Generator, Exhaust High Temp	Exhaust High Temp
112	Red	Generator, Remote Start	Remote Start
111	Yel	Generator, Remote Start/Stop Ground	Remote Start/Stop Ground
113	Red	Generator, Remote Stop	Remote Stop
110	Pur	Generator, Run Light	Run Light
22	Yel	Grounds	Main
131	Blu	Hatch, Fwd Storage	Fwd Storage
132	Yel	Hatch, Fwd Storage	Fwd Storage
133	Grn	Hatch, Fwd Storage	Fwd Storage
5-2	Yel/Blk	Hatch,Engine - Down	Down
5-1	Red/Wht	Hatch,Engine - Up	Up
70	Red	Head Systems	Accessory Panel Power Feed
77	Brn/Blk	Head Systems - Macerator	Macerator
74	Brn/Blk	Head Systems, Vacu-Flush	Vacu-Flush Power Feed
21	Red	Helm	Power Feed
65	Red	Helm Constant Hot	First Mate
81-2	Lt Blu	Holding Tank, Indicator 1/2	Indicator 1/2
81-1	Lt Grn	Holding Tank, Indicator Empty	Indicator Empty
81-3	Tan	Holding Tank, Indicator Full	Indicator Full
81	Red	Holding Tank, Indicator Power Feed	Indicator Power Feed
50	Yel/Blk	Horn	
3	Pur	Ignition	

DC Wiring (Function)

Wire #	Color/Stripe	Circuit	Function
136	Red	Isolator, Alternator out to Isolator	Alternator out to Isolator
137	Red/Blk	Isolator, To Port Battery	To Port Battery
138	Red/Yel	Isolator, To Stbd/House Battery	To Stbd/House Battery
18	Gry	Lights, Bow navigation	Bow Navigation
41	Dk Blu	Lights, Cabin Overhead	Cabin Overhead
95	Blu	Lights, Closet	Closet
49	Blu/Red	Lights, Courtesy	Courtesy
31	DK Blu	Lights, Dinette	Dinette lights
57	Blu	Lights, Docking	Docking
91	Blu	Lights, Engine Room	Engine Room
30	DK Blu/Red	Lights, Entry	Entry Lights
87	Blu	Lights, Galley	Galley
2	Blu	Lights, Gauges	Gauges
82	Blu	Lights, Head	Head
96	Blu	Lights, Indirect	Indirect
48	Blu/Wht	Lights, Livewell	Livewell
67	Gry/Wht	Lights, Mast Anchor	Mast Anchor
68	Gry	Lights, Mast Nav	Mast Nav
88	Blu	Lights, Spreader	Spreader
52	Blu	Lights, Step	Step
19	Gry/Blu	Lights, Stern/Anchor	Stern/Anchor
109	Blu/Wht	Lights, T-Top Overhead	T-Top Overhead
98	Blu	Lights, V-Berth	V-Berth
34	Red	Mercathode	Power Feed
8	Yel/Red	Neutral Start	
4-1	Orn/Red	Power Seat - Aft	Aft
4-3	Red/Wht	Power Seat - Down	Down
4-2	Red	Power Seat - Feed	Feed
4-4	Red/Yel	Power Seat - Fwd	Forward
4-5	Yel/Red	Power Seat - Up	Up
23	Brn/Red	Pump, Aft Bilge Auto	Aft Bilge Auto
16	Brn	Pump, Aft Bilge manual	Aft Bilge Manual
64	Brn/Red	Pump, Aft Cabin Bilge Auto	Aft Cabin Bilge Auto
63	Brn	Pump, Aft Cabin Bilge Manual	Aft Cabin Bilge Manual
11	Brn/Yel	Pump, Fishbox	Fishbox
55	Brn/Blu	Pump, Fresh Water	Fresh Water
25	Brn/Red	Pump, Fwd Bilge Auto	Fwd Bilge Auto
80	Brn	Pump, Fwd Bilge Manual	Fwd Bilge Manual
62	Brn/Red	Pump, High Water Auto	High Water Auto
72	Brn	Pump, High Water Manual	High Water Manual
10	Brn/Blu	Pump, Livewell	Livewell
83	Brn/Red	Pump, Mid Bilge Auto	Mid Bilge Auto
84	Brn	Pump, Mid Bilge Manual	Mid Bilge Manual
86	Brn/Blu	Pump, Raw Water	Raw Water
56	Brn/Blk	Pump, Shower Sump	Shower Sump
51	Red	Receptacle, 12 VDC	12 VDC Outlets
78	Red	Refrigerator, Cabin	Cabin
79	Red	Refrigerator, Cockpit	Cockpit
61	Red	Ships Service DC	AC/DC Panel
135	Orn/Blk	Speaker (-), Cockpit Subwoofer	Cockpit Subwoofer

DC Wiring (Function)

Wire #	Color/Stripe	Circuit	Function
141	Tan/Blk	Speaker (-), Port Aft (Cockpit Secondary)	Port Aft (Cockpit Secondary)
38	Grn/Blk	Speaker (-), Port Aft (Cockpit)	Port Aft (Cockpit)
43	Wht/Blk	Speaker (-), Port Fwd (Cabin)	Port Fwd (Cabin)
143	Pnk/Blk	Speaker (-), Stbd Aft (Cockpit Secondary)	Stbd Aft (Cockpit Secondary)
40	Pur/Blk	Speaker (-), Stbd Aft (Cockpit)	Stbd Aft (Cockpit)
47	Gry/Blk	Speaker (-), Stbd Fwd (Cabin)	Stbd Fwd (Cabin)
134	Orn	Speaker (+), Cockpit Subwoofer	Cockpit Subwoofer
140	Tan	Speaker (+), Port Aft (Cockpit Secondary)	Port Aft (Cockpit Secondary)
37	Grn	Speaker (+), Port Aft (Cockpit)	Port Aft (Cockpit)
42	Wht	Speaker (+), Port Fwd (Cabin)	Port Fwd (Cabin)
142	Pnk	Speaker (+), Stbd Aft (Cockpit Secondary)	Stbd Aft (Cockpit Secondary)
39	Pur	Speaker (+), Stbd Aft (Cockpit)	Stbd Aft (Cockpit)
46	Gry	Speaker (+), Stbd Fwd (Cabin)	Stbd Fwd (Cabin)
9	Red	Spotlight	Power Feed
27	Red/Yel	Stereo Memory	Memory
26	Red	Stereo Switched Power Feed	Switched Power Feed
6	Blu/Wht	Stereo, Remote Switching	Remote Switching
130	22/4	Telephone	
13	Lt Grn/Wht	Trim, Engine - Down	Down
15	Pur/Wht	Trim, Engine - Pwr Feed	Power Feed
32	Red/Pur	Trim, Engine - Trailer Power	Trailer Power
14	Lt Blu/Wht	Trim, Engine - Up	Up
116	Blu	Trim, Tabs	BENNET UP
117	Yel	Trim, Tabs	BENNET DOWN
118	Red	Trim, Tabs	BENNET PORT
119	Grn	Trim, Tabs	BENNET STBD
60	Red	Trim, Tabs -Power Feed	Power Feed
66	Red	TV Antenna	Power Feed
106	Coax	TV System, A/B Switch to Aft TV	A/B Switch to Aft TV
105	Coax	TV System, A/B Switch to Fwd TV	A/B Switch to Fwd TV
89	Coax	TV System, Antenna to Switch	Antenna to Switch
90	Coax	TV System, Cable to Switch	Cable to Switch
121	Wht	Water Tank	Sender
94	Red/Grn	Windlass, Anchor Down	Anchor Down
93	Red/Blu	Windlass, Anchor Up	Anchor Up
92	Red	Windlass, Power Feed	Power Feed
53	Blu/Red	Wiper Park	Park Circuit
71	Orn	Wiper, Center Run	Center Run
73	Orn/Blu	Wiper, Port Run	Port Run
44	Orn	Wiper, Stbd Run	Stbd Run
45	Orn/Wht	Wiper, Washer	Washer

DC Wiring (Function)

Wire # Color/Stripe Circuit Function

All GROUND wires will be YELLOW. They'll be identified by the circuit number with a "G" suffix.

Example: Cabin Lights: wire # 41 Dk Blue (12V), wire # 41G Yellow (ground)

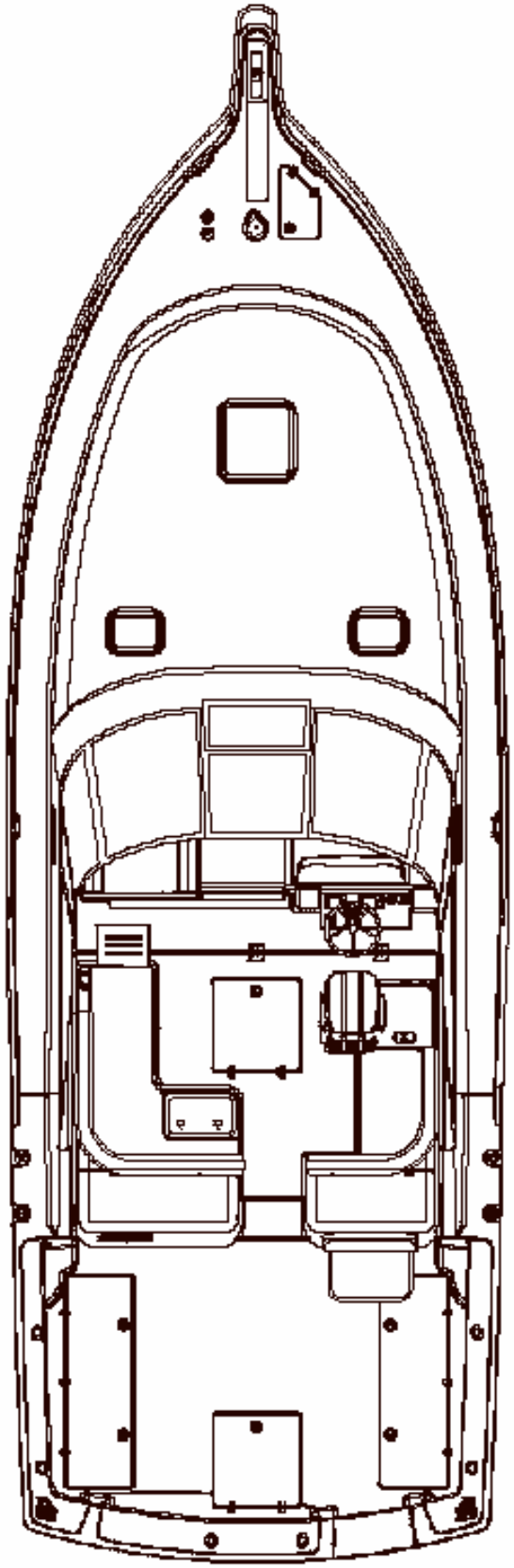
All POWER FEED wires will have an "A" Suffix.

Example: Cabin Light power feed wire #41A

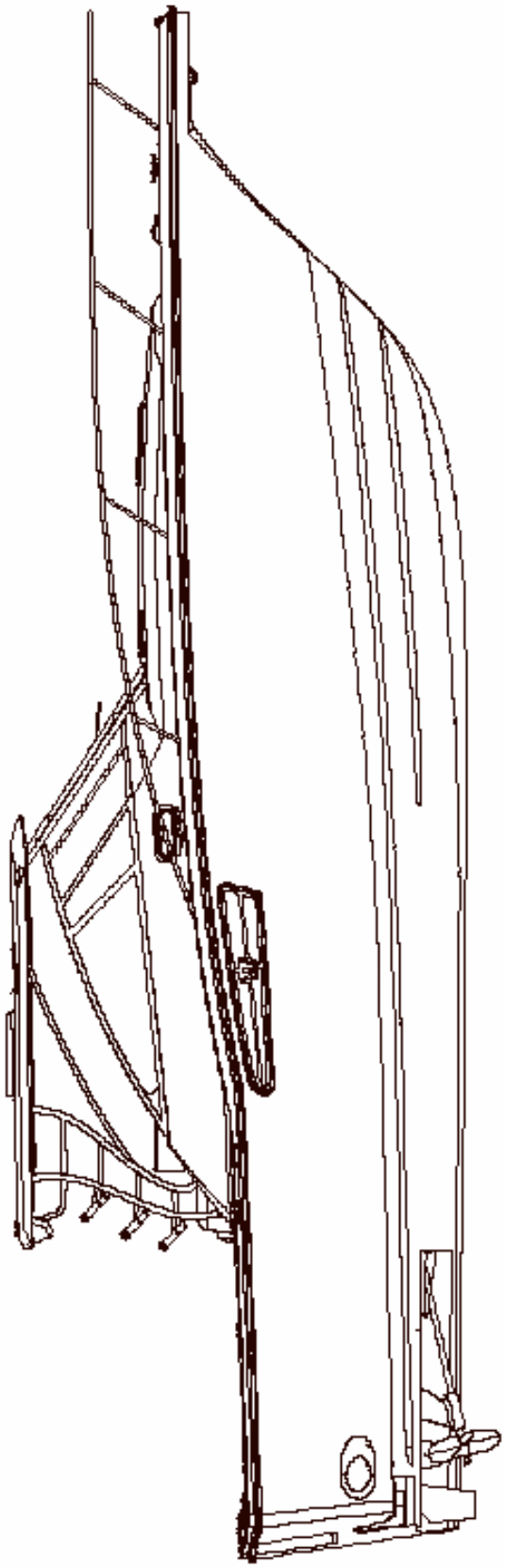
All BRANCH wires will be numbered with a "numerical" suffix.

Example: Cabin Light wire from circuit breaker to first junction will be #41.

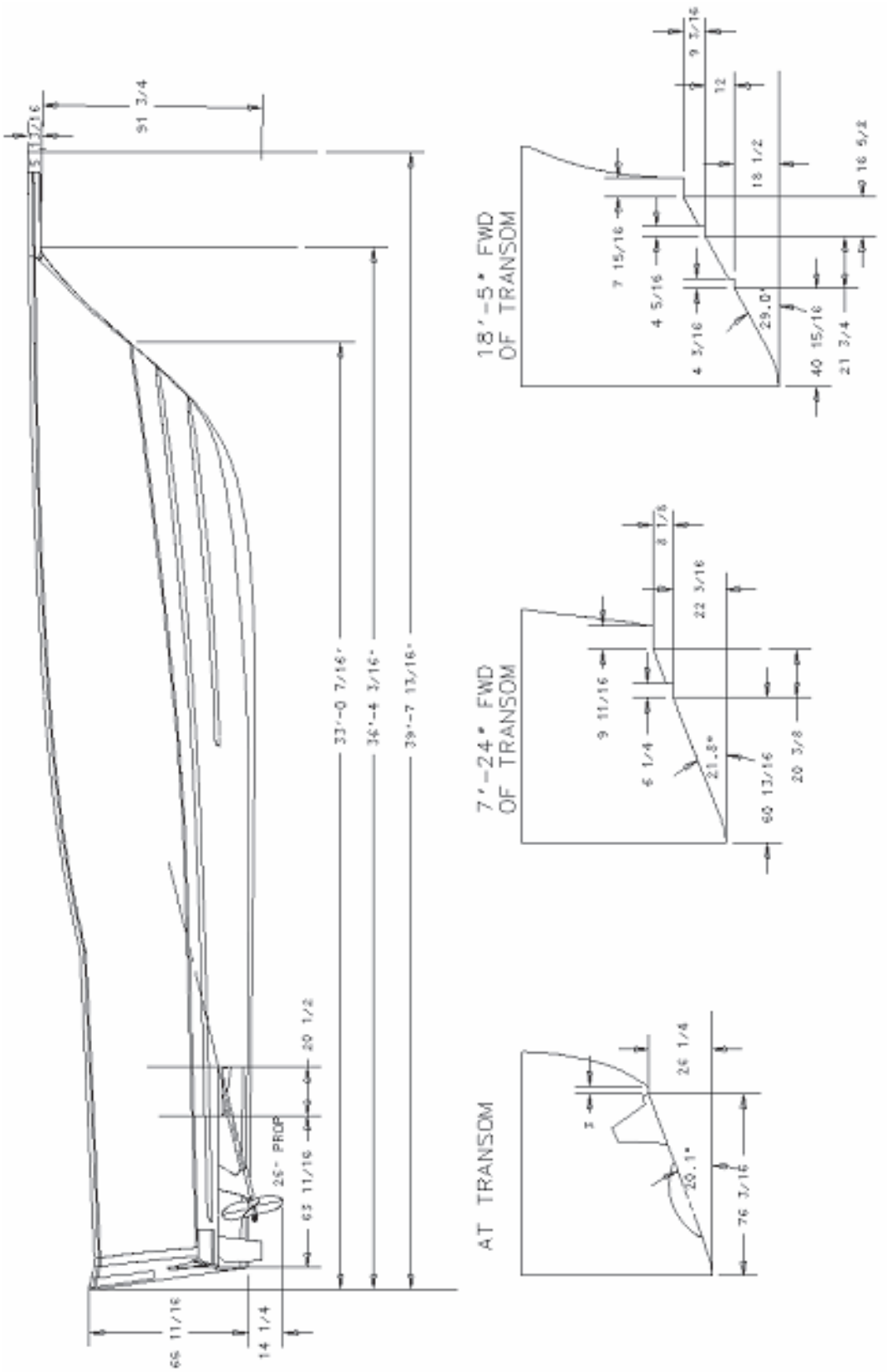
From the first junction to the first light will be # 41-1
From the first junction to the second light will be # 41-2



Overhead Layout



Side Profile



Trailer Support

Appendix B:

GENERAL MAINTENANCE SCHEDULE AND LOG

MAINTENANCE	Each Use	Weekly	Monthly	Each Season	Yearly	As Needed
Clean hull below the waterline				X		
Bottom paint hull					X	X
Check sacrificial anodes			X			
Replace sacrificial anodes					X	X
Wash boat canvas & hardware	X		X			
Wax exterior gelcoat				X		X
Clean & protect hardware						X
Polish & protect plastic glass				X		X
Clean exterior upholstery	X					X
Clean cabin & interior upholstery						X
Service & inspect cabin accessories				X		
Spray metal pumps & components in bilge with a protector			X			
Clean bilge				X		X
Check bilge thru-fittings & engine components, & exhaust system for leaks	X		X			
Check and clean sea strainers Inspect & operate thru-hull valves			X			
Check engine alignment & engine mounting hardware Check strut bearings and propellers for damage ** Always align engines after each haulout **					X	X
Check blower operation and safety equipment	X					
Inspect steering & control systems	X					
Service steering & control systems				X		
Inspect fuel system for leaks	X					
Inspect & service fuel system				X		
Inspect fuel tank vents & screens					X	
Replace fuel filters					X	X
Lubricate fuel and water fill O-rings Lubricate waste pump out O-rings			X			
Inspect fire extinguishers			X			
Test bilge pump & high water alarm auto switches			X			
Inspect & protect electrical components, wire & battery connections						
Check battery electrolyte & service			X			
Test and inspect AC electrical system, shore power cord, galvanic isolator and GFI outlets				X		
Inspect water systems for leaks & clean strainer				X		
Check neutral safety switch	X					
Check trim tab fluid level			X			

MAINTENANCE LOG

Date	Hours	Dealer	Service/Repairs

MAINTENANCE LOG

Date	Hours	Dealer	Service/Repairs

MAINTENANCE LOG

Date	Hours	Dealer	Service/Repairs

MAINTENANCE LOG

Date	Hours	Dealer	Service/Repairs

MAINTENANCE LOG

Date	Hours	Dealer	Service/Repairs

Appendix C:

FLOAT PLAN

Wellcraft recommends filling out a float plan each time you use your boat for an offshore day trip or a long cruise. Leave this information with a responsible person ashore, like a close friend or relative that you know well.

1. Name of person reporting and telephone number.

   _____

2. Description of boat.
   Type _____ Color _____ Trim _____
   Registration No. _____ Length _____
   Name _____ Make _____ Other Info _____

3. Engine type _____ H.P. _____
   No. of Engines _____ Fuel Capacity _____

4. Survival equipment: (Check as appropriate)

☐ PFDS	☐ Flares	☐ Mirror
☐ Smoke Signals	☐ Flashlight	☐ Food
☐ Paddles	☐ Water	☐ Others
☐ Anchor	☐ Raft or Dinghy	☐ EPIRB

5. Radio ☐ Yes ☐ No Type _____

6. Automobile license _____
   Type _____ Trailer License _____
   Color _____ and make of auto _____

7. Persons aboard _____
   Name _____ Age _____ Address & telephone No. _____
   _____
   _____
   _____

8. Do any of the persons aboard have a medical problem?
   ☐ Yes ☐ No If yes, what? _____

9. Trip Expectations: Leave at _____
   From _____ Going to _____
   Expect to return by _____ (time)
   and no later than _____

10. Any other pertinent info. _____

11. If not returned by _____ (time)
    call the COAST GUARD, or (Local authority) _____

12. Telephone Numbers.
    _____ _____
    _____ _____
    _____ _____
    _____ _____

THIS PAGE WAS LEFT BLANK
INTENTIONALLY

Appendix D:

DEPARTMENT OF TRANSPORTATION
U.S. COAST GUARD
C.G. 1865 (REV. 1/88)

BOATING ACCIDENT REPORT

FORM APPROVED
OMB NO.211-0010

The operator/owner of a vessel used for recreational purposes is required to file a report in writing whenever an accident results in: loss of life or disappearance from a vessel, or an injury which requires medical treatment beyond first aid: or property damage in excess of $200 or complete loss of the vessel. Reports in death and injury cases must be submitted within 48 hours. Reports in other cases must be submitted within 10 days. Reports must be submitted to reporting authority in the state where the accident occurred. This form is provided to assist the operator in filing the required written report.

COMPLETE ALL BLOCKS (indicate those not applicable by "NA")

NAME AND ADDRESS OF OPERATOR	AGE OF OPERATOR DATE OF BIRTH	OPERATOR'S EXPERIENCE This type of boat / Other boat operating Exp. [ ] Under 20 Hours / [ ] Under 20 Hours [ ] 20 to 100 Hours / [ ] 20 to 100 Hours [ ] 100 to 500 Hours / [ ] 100 to 500 Hours [ ] Over 500 Hours / [ ] Over 500 Hours
OPERATOR TELEPHONE NUMBER	OWNER TELEPHONE NO.	
NAME AND ADDRESS OF OWNER	RENTED BOAT [ ] YES [ ] NO / NUMBER OF PERSONS ON BOARD	FORMAL INSTRUCTION IN BOATING SAFETY [ ] None [ ] State [ ] U.S. Power Squadrons [ ] USCG Auxiliary [ ] American Red Cross [ ] Other (Specify) _____

VESSEL NO. (this vessel)

BOAT REGISTER. NO.	BOAT NAME	BOAT MAKE	BOAT MODEL	MFR HULL IDENTIFICATION NO.
TYPE OF BOAT [ ] Open Motorboat [ ] Cabin Motorboat [ ] Auxiliary Sail [ ] Sail (only) [ ] Rowboat [ ] Canoe [ ] Other (Specify)	HULL MATERIAL [ ] Wood [ ] Aluminum [ ] Steel [ ] Fiberglass [ ] Rubber/vinyl [ ] Other (Specify)	ENGINE [ ] Outboard [ ] Inboard gasoline [ ] Inboard diesel [ ] Inboard-outdrive [ ] Jet [ ] Other (Specify)	PROPULSION No. of engines _____ Horse Power (total) _____ Type of fuel _____ Has boat had a Safety Examination? [ ] Outboard [ ] NO For current year? [ ] YES [ ] NO Year _____ Indicate whether [ ] USCG Auxiliary Courtesy Marine Exam [ ] State/local examination [ ] Other	CONSTRUCTION Length _____ Year built (boat) _____

ACCIDENT DATA

DATE OF ACCIDENT	TIME am pm	NAME OF BODY OF WATER	LOCATION (Give location precisely) Lat Long
STATE	NEAREST CITY OR TOWN		COUNTY

WEATHER	WATER CONDITIONS	TEMPERATURE (Estimate)	WIND	VISIBILITY
[ ] Clear [ ] Rain [ ] Cloudy [ ] Snow [ ] Fog [ ] Hazy	[ ] Calm (waves less than 6") [ ] Choppy (waves 6" to 2') [ ] Rough (greater than 6') [ ] Strong Current	Air _____ F° Water _____ F°	[ ] None [ ] Light (0 - 6 mph) [ ] Moderate (7 - 14 mph) [ ] Strong (15 - 25 mph) [ ] Storm (Over 25 mph)	DAY NIGHT [ ] Good [ ] [ ] Fair [ ] [ ] Poor [ ]

OPERATION AT TIME OF ACCIDENT (Check all applicable)		TYPE OF ACCIDENT (Check all applicable)		WHAT IN YOUR OPINION CONTRIBUTED TO THE ACCIDENT (Check all applicable)	
[ ] Commercial Activity	[ ] Drifting	[ ] Grounding	[ ] Collision with Fixed Object	[ ] Weather	[ ] Alcohol use
[ ] Cruising	[ ] At Anchor	[ ] Capsizing		[ ] Excessive speed	[ ] Drug use
[ ] Maneuvering	[ ] Tied to Dock	[ ] Flooding	[ ] Collision with Floating Object	[ ] No Proper Lookout	[ ] Fault of Hull
[ ] Approaching Dock	[ ] Fueling	[ ] Sinking		[ ] Restricted Vision	[ ] Fault of Machinery
[ ] Leaving Dock	[ ] Fishing	[ ] Fire or explosion (fuel)	[ ] Falls Overboard	[ ] Overloading	[ ] Fault of Equipment
[ ] Water Skiing	[ ] Hunting	[ ] Fire or explosion (Other than fuel)	[ ] Falls in boat	[ ] Improper Loading	[ ] Hunting
[ ] Racing	[ ] Shin Diving/ Swimming	[ ] Fallen Skier	[ ] Hit by Boat or Propeller	[ ] Racing	[ ] Operator Inexperience
[ ] Towing	[ ] Being Towed	[ ] Collision with Vessel	[ ] Other (Specify)	[ ] Hazardous Waters	[ ] Operator Inattention
[ ] Other (Specify)				[ ] Other (Specify)	

PERSONAL FLOTATION DEVICES (PFDS)		PROPERTY DAMAGE	FIRE EXTINGUISHERS
Was the boat adequately equipped with COAST GUARD APPROVED FLOTATION DEVICES? [ ] Yes [ ] No Were they accessible? [ ] Yes [ ] No Were they serviceable? [ ] Yes [ ] No Were they used by survivors? [ ] Yes [ ] No What type? [ ] I, [ ] II, [ ] III, [ ] IV, [ ] V (specify) _____ Were PFD's properly used? [ ] Yes [ ] No Adjusted [ ] Yes [ ] No Sized [ ] Yes [ ] No	Was the vessel carrying NON approved flotation devices? [ ] Yes [ ] No Were they accessible? [ ] Yes [ ] No Were they used? [ ] Yes [ ] No If Yes, indicate kind.	Estimated amount This boat $ Other boat $ Other Property $	Were they used? (If yes, list Type(s) and number used.) [ ] Yes [ ] No [ ] NA Types:
Include any comments of PFD's under ACCIDENT DESCRIPTION on other side of form		**DESCRIBE PROPERTY DAMAGE** **NAME AND ADDRESS OF OWNER OF DAMAGED PROPERTY**	

BOATING ACCIDENT REPORT

If more than 3 fatalities and/or injuries, attach additional form(s)

DECEASED

NAME	ADDRESS	DATE OF BIRTH	WAS VICTIM?	DEATH CAUSED BY	WAS PFD WORN?
			[ ] Swimmer [ ] Non Swimmer	[ ] Drowning [ ] Other [ ] DISAPPEARANCE	[ ] Yes [ ] No What Type?
			[ ] Swimmer [ ] Non Swimmer	[ ] Drowning [ ] Other [ ] DISAPPEARANCE	[ ] Yes [ ] No What Type?
			[ ] Swimmer [ ] Non Swimmer	[ ] Drowning [ ] Other [ ] DISAPPEARANCE	[ ] Yes [ ] No What Type?

INJURED

NAME	ADDRESS	DATE OF BIRTH	NATURE OF INJURY	MEDICAL TREATMENT

ACCIDENT DESCRIPTION

DESCRIBE WHAT HAPPENED (Sequence of events. Include Failure of Equipment. If diagram is needed, attach separately. Continue on additional sheets if necessary. Include any information regarding the involvement of alcohol and/or drugs in causing or contributing to the accident. Include any descriptive information about the use of PFD's.)

VESSEL NO. 2 (if more than 2 vessels, attach additional form (s)

Name of Operator	Address	Boat Number
Telephone Number		Boat Name
Name of Owner	Address	

WITNESSES

Name	Address	Telephone Number

WITNESSES

SIGNATURE	Address	Telephone Number
QUALIFICATION (Check One) [ ] Operator [ ] Owner [ ] Investigator [ ] Other		Date Submitted

(do not use) - **FOR REPORTING AUTHORITY REVIEW** (use agency date stamp)

Causes based on (check one) [ ] This report [ ] Investigation and this report [ ] Investigation [ ] Could not be determined	Name of Reviewing Office	Date Received
Primary Cause of Accident	Secondary Cause of Accident	Reviewed By

Appendix E:

GLOSSARY OF TERMS

Aft: In, near, or toward the stern of a boat.

Aground: A boat stuck on the bottom.

Amidships: In or toward the part of a boat midway between the bow and stern.

Anchor: A specially shaped heavy metal device designed to dig efficiently into the bottom under a body of water and hold a boat in place.

Anchorage: An area specifically designated by governmental authorities in which boats may anchor.

Ashore: On shore.

Astern: Behind the boat, to move backwards.

Athwartship: At right angles to the center line of the boat.

Barnacles: Small, hard-shelled marine animals which are found in salt water attached to pilings, docks and bottoms of boats.

Beam: The breadth of a boat usually measured at its widest part.

Bearing: The direction of an object from the boat, either relative to the boat's direction or to compass degrees.

Berth: A bunk or a bed on a boat.

Bilge: The bottom of the boat below the flooring.

Bilge Pump: A pump that removes water that collects in the bilge.

Boarding: Entering or climbing into a boat.

Boarding Ladder: Set of steps temporarily fitted over the side of a boat to assist persons coming aboard.

Boat Hook: Short shaft of wood or metal with a hook fitting at one end shaped to aid in extending one's reach from the side of the boat.

Bow: The front end of a boat's hull.

Bow Line: A line that leads forward from the bow of the boat.

Bow Rail: Knee high rails of solid tubing to aid in preventing people from falling overboard.

Bridge: The area from which a boat is steered and controlled.

Bridge Deck: A deck forward and usually above the cockpit deck.

Broach: When the boat is sideways to the seas and in danger of capsizing; a very dangerous situation that should be avoided.

Bulkhead: Vertical partition or wall separating compartments of a boat.

Cabin: Enclosed superstructure above the main deck level.

Capsize: When a boat lays on its side or turns over.

Chock: A deck fitting, usually of metal, with inward curving arms through which mooring or anchor lines are passed so as to lead them in the proper direction both on board and off the boat.

Cleat: A deck fitting, usually of metal with projecting arms used for securing anchor and mooring lines.

Closed Cooling System: A separate supply of fresh water that is used to cool the engine and circulates only within the engine.

Coaming: A vertical piece around the edges of cockpit, hatches, etc. to stop water on deck from running below.

Cockpit: An open space, usually in the aft deck, outside of the cabin.

Companionway: Opening in the deck of a boat to provide access below.

Compartment: The interior of a boat divided off by bulkheads.

Cradle: A framework designed to support a boat as she is hauled out or stored.

Cutlass Bearing: A rubber bearing in the strut that supports the propeller shaft.

Deck: The floor-like platform of a boat that covers the hull.

Displacement: The volume of water displaced by the hull. The displacement weight is the weight of this volume of water.

Draft: The depth of water a boat needs to float.

Dry Rot: A fungus attack on wood areas.

Dry-dock: A dock that can be pumped dry during boat construction or repair.

Electrical Ground: A connection between an electrical connector and the earth.

Engine Beds: Sturdy structural members running fore and aft on which the inboard engines are mounted.

EPIRB: Emergency Position Indicating Radio Beacon. Operates as a part of a worldwide satellite distress system.

Even Keel: When a boat floats properly as designed.

Fathom: A measure of depth. One Fathom = 6 feet.

Fender: A soft object of rubber or plastic used to protect the topsides from scarring and rubbing against a dock or another vessel.

Fend off: To push or hold the boat off from the dock or another boat.

Flying Bridge: A control station above the level of the deck or cabin.

Flukes: The broad portions of an anchor which dig into the ground.

Fore: Applies to the forward portions of a boat near the bow.

Foundering: When a boat fills with water and sinks.

Freeboard: The height from the waterline to the lowest part of the deck.

Galley: The kitchen of a boat.

Grab Rail: Handhold fittings mounted on cabin tops or sides for personal safety when moving around the boat, both on deck and below.

Ground Tackle: A general term including anchors, lines, and other gear used in anchoring.

Grounds: A boat touches the bottom.

Gunwale: The upper edge of a boat's side.

Hand Rail: Rail mounted on the boat, for grabbing with your hand, to steady you while walking about the boat.

Harbor: An anchorage which provides reasonably good protection for a boat, with shelter from wind and sea.

Hatch: An opening in the deck with a door or lid to allow for access down into a compartment of a boat.

Head: A toilet on a boat.

Heat Exchanger: Used to transfer the heat that is picked up by the closed cooling system to the raw cooling water.

Helm: The steering and control area of a boat.

Hull: The part of the boat from the deck down.

Inboard: A boat with the engine mounted within the hull of the boat. Also refers to the center of the boat away from the sides.

Inboard/outboard: Also stern drive or I/O. A boat with an inboard engine attached to an outboard drive unit.

Keel: A plate or timber plate running lengthwise along the center of the bottom of a boat.

Knot: Unit of speed indicating nautical miles per hour. 1 knot = 1 nautical mile per hour (1.15 miles per hour). A nautical mile is equal to one minute of latitude: 6076 feet. Knots times 1.15 equals miles per hour. Miles per hour times .87 equals knots.

Lay-up: To decommission a boat for the winter (usually in northern climates).

Leeward: The direction toward which the wind is blowing.

Length On The Waterline (l.w.l.): A length measurement of a boat at the waterline from the stern to where the hull breaks the water near the bow.

Limber Hole: A passage cut into the lower edges of floors and frames next to the keel to allow bilge water to flow to the lowest point of the hull where it can be pumped overboard.

Line: The term used to describe a rope when it is on a boat.

Lists: A boat that inclines to port or starboard while afloat.

L.O.A.: Boat length overall.

Locker: A closet, chest or box aboard a boat.

Loran: An electronic navigational instrument which monitors the boat's position using signals emitted from pairs of transmitting stations.

Lunch hook: A small light weight anchor typically used instead of the working anchor. Normally used in calm waters with the boat attended.

Midships: The center of the boat.

Marina: A protected facility primarily for recreational small craft.

Marine Ways or Railways: Inclined planes at the water's edge onto which boats are hauled.

Moored: A boat secured with cables, lines or anchors.

Mooring: An anchor permanently embedded in the bottom of a harbor that is used to secure a boat.

Nautical Mile: A unit of measure equal to one minute of latitude. (6076 feet)

Nun Buoy: A red or red-striped buoy of conical shape.

Outboard: A boat designed for an engine to be mounted on the transom. Also a term that refers to objects away from the center line or beyond the hull sides of a boat.

Pad Eye: A deck fitting consisting of a metal eye permanently secured to the boat.

Pier: A structure which projects out from the shoreline.

Pile or Piling: A long column driven into the bottom to which a boat can be tied.

Pitching: The fore and aft rocking motion of a boat as the bow rises and falls.

Pitch: The measure of the angle of a propeller blade. Refers to the theoretical distance the boat travels with each revolution of the propeller.

P.F.D: Personal Flotation Device.

Port: The left side of the boat when facing the bow.

Porthole (port): The opening in the side of a boat to allow the admittance of light and air.

Propeller: A device having two or more blades that is attached to the engine and used for propelling a boat.

Propeller Shaft: Shaft which runs from the back of the engine gear box, aft, through the stuffing box, shaft log, struts, and onto which the propeller is attached.

Pyrotechnic Distress Signals: Distress signals that resemble the brilliant display of flares or fireworks.

Raw Water Cooled: Refers to an engine cooling system that draws seawater in through a hull fitting or engine drive unit, circulates the water in the engine, and then discharges it overboard.

Reduction Gear: Often combined with the reverse gear so that the propeller turns at a slower rate than the engine.

Reverse Gear: Changes the direction of rotation of the propeller to provide thrust in the opposite direction for stopping the boat or giving it sternway.

Roll: A boat's sideways rotational motion in rough water.

Rope Locker: A locker, usually located in the bow of a boat, used for stowing the anchor line or chain.

Rubrail: Railing (often rubber or hard plastic) that runs along the boat's sheer to protect the hull when coming alongside docks, piers, or other boats.

Rudder: A moveable flat surface that is attached vertically at or near the stern for steering.

Sea anchor: An anchor that does not touch the bottom. Provides drag to hold the bow in the most favorable position in heavy seas.

Scupper: An opening in the hull side or transom of the boat through which water on deck or in the cockpit is drained overboard.

Seacock: Safety valves installed just inside the thru-hull fittings and ahead of the piping or hose running from the fittings.

Shaft Log: Pipe through which the propeller shaft passes.

Sheer: The uppermost edge of the hull.

Sling: A strap which will hold the boat securely while being lifted, lowered, or carried.

Slip: A boat's berth between two pilings or piers.

Sole: The deck of a cockpit or interior cabin.

Spring Line: A line that leads from the bow aft or from the stern forward to prevent the boat from moving ahead or astern.

Starboard: The right side of a boat when facing the bow.

Steerageway: Sufficient speed to keep the boat responding to the rudder or drive unit.

Stem: The vertical portion of the hull at the bow.

Stern: The rear end of a boat.

Stow: To pack away neatly.

Stringer: Longitudinal members fastened inside the hull for additional structural strength.

Strut: Mounted to the hull which supports the propeller shaft in place.

Strut Bearing: See "cutlass bearing."

Stuffing Box: Prevents water from entering at the point where the propeller shaft passes through the shaft log.

Superstructure: Something built above the main deck level.

Swamps: When a boat fills with water from over the side.

Swimming Ladder: Much the same as the boarding ladder except that it extends down into the water.

Taffrail: Rail around the rear of the cockpit.

Thru-hull: A fitting used to pass fluids (usually water) through the hull surface, either above or below the waterline.
Topsides: The side skin of a boat between the waterline or chine and deck.

Transom: A flat stern at right angles to the keel.

Travel Lift: A machine used at boat yards to hoist boats out of and back into the water.

Trim: Refers to the boat's angle or the way it is balanced.

Trough: The area of water between the crests of waves and parallel to them.

Twin-Screw Craft: A boat with two propellers on two separate shafts.

Underway: When a boat moves through the water.

Wake: Disrupted water that a boat leaves astern as a result of its motion.

Wash: The flow of water that results from the action of the propeller or propellers.

Waterline: The plane of a boat where the surface of the water touches the hull when it is afloat on even keel.

Watertight Bulkhead: Bulkheads secured so tightly so as not to let water pass.

Wharf: A structure generally parallel to the shore.

Working Anchor: An anchor carried on a boat for most normal uses. Refers to the anchor used in typical anchoring situations.

Windlass: A winch used to raise and lower the anchor.

Windward: Toward the direction from which the wind is coming.

Yacht Basin: A protected facility primarily for recreational small craft.

Yaw: When a boat runs off her course to either side.

Appendix F:

TROUBLESHOOTING GUIDE

PROBLEM	CAUSE AND SOLUTION
CONTROL SYSTEMS	
Steering is slow to respond & erratic.	• Steering system is low on fluid. Fill and bleed system. • Steering system has air in it. Fill and bleed system. • A component in the steering system is binding. Check and adjust or repair binding component. • There is marine growth on the rudders. Clean running gear.
The boat wanders and will not hold a course at cruise speeds.	• There could be air in the steering system. Fill & bleed the system. • The rudders are bent or fouled with marine growth. Clean off growth or have rudders straightened.
An engine will not start with the shift control lever in neutral.	• The control is out of adjustment & not activating the neutral safety cut out switch. • The shift control lever is not in the neutral detent. Try moving the shift lever slightly. • There is a loose wire on the neutral safety switch on the control or transmission. Inspect wires and repair loose connections. • The starter or ignition switch is bad.
PERFORMANCE PROBLEMS	
Boat is sluggish and has lost speed & RPM.	• The running gear may need to have marine growth cleaned from hull and running gear. • Propeller may be damaged & need repair. • Weeds or line around the propellers. Clean propellers. • Boat is overloaded. Reduce load. • Check for excessive water in the bilge. Pump out bilge, then find & correct the problem. • One of the throttle adjustments has changed and the engine is not getting full throttle. Adjust the throttle control. • One or both of the engines is not producing adequate power. Have engines checked by a qualified technician.
The boat vibrates at cruising speeds.	• The engines are out of alignment. Realign engines. • A propeller or propeller shaft is bent. Repair or replace damaged components. • The strut bearing is worn & needs to be replaced. • The running gear is fouled by marine growth. Clean running gear. • A propeller is not installed properly and is binding on the shaft key. Remove the propeller and install it properly. • The engines are not at the same RPM. Synchronize throttles.

TROUBLESHOOTING GUIDE

PROBLEM	CAUSE AND SOLUTION
ENGINE PROBLEMS	
An engine will not start	• The engine battery switches are off. Turn on battery switches or ignition breakers. • There is a loose connection on the ignition switch. Repair the connections on the switch. • The circuit breaker on the engine has tripped. Reset the breaker and troubleshoot and correct the problem. • The engine controls are not in neutral position. Move controls to neutral. • Corroded battery terminals. Clean terminals and check all primary connections. • The battery is weak or discharged. Activate parallel switch to start engine. Charge or replace batteries.
An engine is running too hot.	• The sea strainer is clogged and needs to be cleaned. • The raw water supply line to the pump is kinked. Replace hose. • The engine raw water pump impeller is worn or damaged. Repair the pump. • The engine thermostat is faulty and needs to be replaced. • The intake thru hull valve is not open enough. Open valve. • The optional emergency bilge suction valve is partially open. Close valve.
An engine alternator is not charging properly.	• The engine alternator belt is loose or worn. Tighten or replace the belt. • The alternator is not charging and must be replaced. • The isolator or relay in the charging system is not working properly. Replace the isolator or relays. • A battery is defective and not accepting a charge.
An engine suddenly will not operate at or above cruise RPM.	• The engine emergency system has been activated. The on board computer has sensed a problem and has limited the RPM to protect the engine. Find & correct the problem. • The tachometer is bad and needs to be replaced.
An engine is loosing RPM. The boat is not overloaded and the hull bottom and running gear are clean and in	• The primary fuel filter on a diesel engine may be dirty. Inspect and replace the fuel filter. • The electronic engine control system on the engine is malfunctioning. Repair the engine control system. • The fuel injection system on the diesel engine is out of time or malfunctioning . Repair the fuel injection system.

TROUBLESHOOTING GUIDE

PROBLEM	CAUSE AND SOLUTION
ENGINE PROBLEMS	
Both engines suddenly shut down and won't restart.	• The automatic fire extinguisher in the engine compartment has activated and the engines were automatically shut down. Check the monitor panel for a red light. If the red light is lit, wait 15 minutes, if safe to do so, to insure a possible fire is out and inspect the engine compartment. Correct any problems found and activate the override switch and start the engines. • The automatic fire extinguisher automatic shutdown module has failed and interrupted the ignition circuit, shutting down the engines. Check the fire extinguisher monitor. If the green light is lit, carefully check the engine compartment to insure the system did not activate. If it did not, activate the override switch and start the engines.
ACCESSORY PROBLEMS	
The air conditioner or the freezer runs for a short time & then cuts out.	• The air conditioner pump sea strainer is clogged. Clean the strainer. • The raw water supply thru hull valve is closed. Open the valve. • The raw water system is air-bound. Make sure the thru hull valve is open and run the boat above 15 m.p.h. The speed scoop on the thru hull fitting will force the air lock out of the system. • The air conditioner raw water pump is not pumping and needs to be repaired or replaced.
The carbon monoxide detector sounds the alarm when the engines are running.	• The canvas curtains are up and none of the forward facing vents are open, allowing carbon monoxide to accumulate in the cockpit and cabin. Open the deck hatch, windshield vents and side curtains to provide proper ventilation. • The boat is operating at slow speed and the wind is on the stern pushing CO into the cockpit and cabin. Increase boat speed or change heading if possible. • The carbon monoxide detector is defective and needs to be calibrated by the manufacturer or replaced. Have the boat checked by a professional before condemning the CO monitor.
The fishbox macerator pump runs, but does not pump out the fishbox.	• The drain in the fishbox is clogged preventing the water and waste from getting to the pump. Clean the drain strainer. • The pump has been allowed to run dry and is damaged. Replace or rebuild the pump.

TROUBLESHOOTING GUIDE

PROBLEM	CAUSE AND SOLUTION
ACCESSORY PROBLEMS	
The freshwater pump runs, but will not pump water.	• The water tank is empty. Fill the tank. • The in-line strainer for the pump is clogged. Clean the strainer. • The intake hose is damaged and sucking air. Replace or repair the hose. • The pump is defective. Repair or replace the pump.
The washdown pump runs, but the pump will not pump water.	• The thru-hull valve is not open. Open valve. • The in-line sea strainer for the pump is clogged. Clean the sea strainer. • The intake hose is damaged and sucking air. Replace hose. • The pump is defective. Repair or replace the pump.
The washdown or fresh water pump fails to turn off after all outlets are closed.	• There is a leak in a pressure line or outlet. Repair the leak. • There is an air leak in the intake line. Repair the air leak. • The pressure switch is defective. Replace the pressure switch. • The voltage to the pump is low. Check for corroded or loose wiring connections or low battery. • The strainer is clogged. Clean strainer. • The pump is defective. Repair or replace the pump.
The livewell pump runs, but does not pump water.	• The thru-hull valve is not open. Open valve. • The strainer on the intake scoop is clogged preventing the water from getting to the pump. Put the boat in reverse to clean the strainer. • The in-line sea strainer for the pump is clogged. Clean strainer.
Reduction in water flow from the bilge pump.	• Impeller screen plugged with debris. Clean screen at the base of the pump. • The discharge hose is pinched or clogged. Check discharge hose and clean or repair. • Low voltage to the pump. Check the battery and wire connections.
The automatic float switch on the bilge pump raises but does not activate the pump .	• The circuit breaker for the automatic switch has tripped. Reset the circuit breaker. • The battery is dead. Charge or replace the battery. • The pump impeller is jammed by debris. Clean pump impeller housing. • The wire connections in the bilge have corroded. Replace connectors and secure above the bilge waterline. • The automatic switch is defective. Replace the switch. • The pump is defective. Replace pump.

TROUBLESHOOTING GUIDE

PROBLEM	CAUSE AND SOLUTION
ACCESSORY PROBLEMS	
The bilge pump will not run when the manual switch is activated.	• The circuit breaker supplying the switch has tripped. Reset the circuit breaker. Replace if defective. • The battery switch is off. Turn on the battery switch and bilge pump breaker. • The pump impeller is jammed by debris. Clean pump impeller housing. • The wire connections in the bilge have corroded. Replace connectors and secure above the bilge waterline. • The switch is defective. Replace the switch. • The pump is defective. Replace pump.
Head will not flush.	• Electric head breaker is not activated. Turn on breaker. • There is a vacuum leak at the flush valve or the waste hose. Repair the leak. • The holding tank is full and the sensor in the holding tank has deactivated the vacuum pump. Pump out the holding tank.
Head vacuum pump runs more frequently than it should.	• There is a slight vacuum leak in the system. Find and repair the leak.
Holding tank will not empty.	• Holding tank vent is clogged. Replace charcoal vent filter. • There is a vacuum leak in the hose from the holding tank to the deck pump out fitting. Tight loose fittings or replace damage hoses.
Excessive odor from marine head.	• Back pressure in the holding tank. Pump out holding tank or replace the vent filter. • Waste is in the discharge hose. Flush enough to move waste to the holding tank, particularly at the end of each day. • No deodorizer in the holding tank. Add deodorizer to the holding tank each time it is pumped out. • The waste in the tank is over two weeks old. Pump the holding tank if it has contained waste for two weeks or more.
The refrigerator compressor runs frequently and the house battery life seems shorter than it should be whenever the refrigerator is operating on DC power.	• The thermostat in the refrigerator is set too cold. Check the temperature in the refrigerator and set the thermostat to a warmer setting if possible. • The door gasket is dirty or moldy and not sealing properly. Clean or replace the door seal. • The battery is weak and not providing the proper voltage to the refrigerator compressor. Replace the battery. • The refrigerator is defective. Replace the refrigerator.

TROUBLESHOOTING GUIDE

PROBLEM	CAUSE AND SOLUTION
ACCESSORY PROBLEMS	
The generator will not start.	• The generator battery switch is off. Turn on the generator battery switch. • Generator battery is not charged. Charge or replace battery. • The generator fuel supply valve is off. Turn on fuel supply valve. • The fuel level is too low in the fuel tank that supplies the generator. Fill the fuel tanks. **Note: The fuel pick up tube for the generator is shorter than the main engine pick up. Therefore, the generator will run out of fuel before the boat engine. This is to prevent the generator from consuming reserve fuel.**
The generator runs for a short time and shuts down.	• There is a problem with the generator and the emergency shut down system has activated to shut down the generator. Find and correct the problem, the restart the generator. • The fuel level is too low in the fuel tank that supplies the generator. Fill the fuel tanks. • The generator is overloaded. Manage AC accessory use to reduce excess amperage draw.
No AC power to cabin breaker panel and shore cord is properly connected.	• The breaker at the shore outlet is off. Activate breaker. • The shore main breaker in the aft deck breaker panel near the transom door is off. Activate the breaker. • The shore power cord is damaged or defective. Replace the cord. • The shore main breaker in the aft deck breaker panel has tripped. Reset breaker. If it trips again, turn off AC power at dock outlet, disconnect power cord and contact a qualified marine electrician to correct problem. • The main breaker in the aft deck breaker panel is defective. Contact a qualified marine electrician to replace the breaker.
The cabin Main Breaker for AC Power trips when activating from shore power.	• The polarity at the shore outlet is reversed. Check for red reverse polarity light. If lit, turn off all AC breakers on the boat and at the shore outlet. Contact a qualified marine electrician to correct the wiring. • The AC accessory breakers are on and the power surge is tripping the breaker. Turn off all AC accessory breakers and reactivate main breaker. • The main breaker is defective. Contact a qualified marine electrician to replace the breaker.

TROUBLESHOOTING GUIDE

PROBLEM	CAUSE AND SOLUTION
ACCESSORY PROBLEMS	
The cabin AC main breaker activates the panel but trips while using accessories.	• There are too many AC accessories activated causing excess amperage draw. Manage AC accessory use to reduce excess amperage draw. • Voltage supplied from the shore outlet is low or high. Check the voltage. Contact the marina operator or qualified marine electrician to correct the problem. • The main breaker is defective. Contact a qualified marine electrician to replace the breaker.
No AC power at cabin outlets	• Outlet breaker in cabin AC panel is off. Activate breaker. • Ground fault interrupter has tripped. Push reset button on outlet to reset. • Accessory powered by the outlet has a fault that is tripping the interrupter. Turn the breaker in the cabin AC panel off and contact a qualified marine electrician to replace the defective accessory. • The GFI outlet is defective. Contact a qualified marine electrician to replace the outlet.

THIS PAGE WAS LEFT BLANK
INTENTIONALLY

www.wellcraft.com