





Table Of Contents

1 INTRODUCTION

Regal Owner's Manual	1-4
Owner's Information Packet	1-4
General Information	1-5
Regal Marine Limited Warranty	1-12

2 SAFETY ON BOARD

Safety Labels	2-1
General Boating Safety	2-2
Required Safety Equipment	2-4
Fire Extinguishers	2-6
Visual Distress Signals	2-7
Sound Protecting Devices	2-10
Radio Communications	2-10
Navigation Lights	2-10
Marine Sanitation Devices	2-10
EBIRB	2-12
Life Rafts	2-13
United States Coast Guard Minimum Equipment Requirements	2-13
Exhaust & Carbon Dioxide	2-14
Boating & Alcohol	2-17
Boating Accidents	2-18
Water Sports	2-20
Weather & Water Conditions	2-21

3 RULES OF THE ROAD

Navigation Rules Defined	3-1
Navigation Rules	3-1
Night Running	3-8
Bridge Clearance	3-8

4 SYSTEMS

Fuel	4-2
Electrical	4-12
Generator	4-68
Air Conditioner	4-73
Fresh Water	4-78
Waste Water	4-90
Sump Inspection Hatch	4-99
Trim Tabs	4-100
Sun Roof	4-102
Windlass	4-104
Entertainment	4-109
Electronics	4-126

Table Of Contents

5 ENGINE & CONTROLS

Overview	5-1
Helm Displays	5-7
DTS Control	5-12
Joystick Control	5-16
Precision Pilot	5-18
Cummins Engine Package	5-20
Zeus Propulsion Package	5-38

6 VESSEL OPERATION

Getting Underway	6-1
Starting & Stopping	6-4
Fenders	6-5
Dock Line Basics	6-6
Knots	6-8
Anchoring	6-9
Towing	6-10
Admiralty Law	6-10
Emergencies	6-11
Environmental Awareness	6-13

7 AUXILIARY EQUIPMENT OPERATION

Interior Equipment Component

Machinery Components-Interior View	7-3
Carbon Monoxide Detector	7-4
Door-Companionway	7-5
Fresh Water Pump	7-6
Fresh Water Booster Water Pump	7-6
Grey Water System	7-7
Hatches	7-8
Lighting-Cabin	7-9
Monitor-Water/Waste	7-11
Portlights	7-12
Range/Stove	7-13
Refrigerator	7-14
Salon Furniture-Dinette	7-17
Seat-Helm	7-18
TV-LCD Monitor Precautions	7-19
Vacuum Cleaner	7-20
Washer-Dryer Combo	7-22



Table Of Contents

7 AUXILIARY EQUIPMENT OPERATION

Exterior Equipment Component

Machinery Components-Exterior View	7-26
Aft Transom Bench Seat	7-27
Antennae	7-28
Bilge Pump/Float Switch	7-29
Bottom Paint	7-30
Camera Monitoring System	7-31
Compass	7-32
Cool Cockpit	7-33
Dingy Launch/Retrieval System	7-34
Door-Transom	7-40
Electronics-General	7-41
Fire Extinguisher-Automatic	7-42
Garmin Anchor Drift Alarm	7-45
Generator	7-46
Hard Top Enclosure	7-47
Hatch-Engine	7-48
Heater-Hot Water	7-49
High Water Alarm	7-51
Markers-For Slings	7-52
Oil Change System	7-54
Overboard Discharge Pump	7-56
Satellite Radio	7-57
Sea Chest Filtration System	7-58
Seakeeper Stabilizer	7-60
Shower-Transom	7-67
Sirius Marine Weather	7-68
Spotlight	7-70
Sunpads	7-71
Sureshade	7-73
Swim Ladder	7-75
Swim Platform	7-76
Swim Step	7-77
Trim Tabs (Auto-Glide)	7-78
Underwater Lighting	7-80
Water Maker	7-82
Windshield Defroster System	7-83
Windshield Center Vent System	7-84
Windshield Wiper-Washer System	7-85

Table Of Contents

8 COSMETIC CARE & MAINTENANCE

Cosmetic Care	8-1
Maintenance	8-25

9 TROUBLESHOOTING

Diagnostic Charts	9-1
-------------------	-----

10 STORAGE & WINTERIZATION

Checklists	10-1
------------	------

11 GLOSSARY & INDEX	11-1
---------------------	------

12 TECHNICAL

Technical Information	12-1
Technical Drawings	12-5



Table Of Contents

Note:

The information found in this manual may change at any time. Designated items referred to may not be installed on your vessel. In keeping with its commitment to continued product improvement Regal Marine Industries, Inc. reserves the right to modify the vessel at any time without notice including changes in specifications, colors, fabrics, materials and equipment or to discontinue a model. Regal is not obligated to make similar changes or modifications to models sold prior to the date of such changes.

All specifications are approximate including weights, fuel figures and speeds.

Speeds are calculated at sea level with a temperature of 70 to 85 degrees. Increases in altitude and/or temperature will reduce horsepower and thereby reduce the speed of the vessel.

Introduction



Boating is becoming more popular each and every year. There are numerous types of recreational vessels on our waterways today involved in an every growing number of activities. Therefore, as a Regal yacht owner it is of the highest priority to learn about general boating practices before operating your craft.

Your Regal yacht dealer will answer many questions and provide valuable “hands on” information during the completion of the new boat delivery process. In addition, your dealer has received special factory training on the product line and his services should be employed to solve any technical problems and periodic maintenance beyond the scope of this manual. Also, your Regal yacht dealer carries a line of factory approved parts and accessories.

Your Regal yacht dealer can provide information regarding national training organizations such as the U.S. Power Squadron and United States Coast Guard Auxiliary. Along with other organizations and literature, they can help build your “boating savvy” by developing the necessary skills and awareness to be a safe and confident skipper.

Also, your local library can assist in providing recommended boating literature such as Chapman Piloting Seamanship & Boat Handling by Elbert S. Maloney.

Remember, the waterway conditions can change from normal to abnormal in a heartbeat. Knowing how to react quickly comes from experience and knowledge which can be gained through boating education. Welcome aboard!



Chapter 1

WELCOME TO REGAL

I know I speak for everyone at Regal when I welcome you to the ever-growing family of Regal yacht owners. You've chosen a yacht that is recognized worldwide for its standard of excellence. Each step in construction has been carefully scrutinized to assure safety, performance, reliability and comfort for both your passengers and yourself.

Your yacht is certified by the National Marine Manufacturers Association. It also complies with the applicable standards set by the United States Coast Guard, American Boat and Yacht Council and the International Marine Certification Institute. Your Regal yacht was built with the same attention to detail and quality of construction that we would expect in a yacht we would purchase ourselves.

Whether you're a veteran boater or a newcomer, we strongly urge you to read this yacht owner's manual thoroughly. Familiarize yourself with the various components of your yacht, and heed the safety precautions noted herein.

If you have questions that are not covered in this manual, please consult your authorized Regal yacht dealer for assistance, phone the Regal factory at 407-851-4360 or E-mail us at www.regalboats.com.

Thank you, and welcome to the "World of Regal!"

*Duane Kuck
President & CEO*

Introduction

REGAL MARINE INDUSTRIES, INC. MISSION STATEMENT

With God's help

and a steadfast commitment to integrity,

we will develop a team

of exceptional people and relationships

to provide exceptional customer satisfaction.



Chapter 1

REGAL OWNER'S MANUAL

Your Regal yacht owner's manual has been compiled with information to assist you in operating your craft with safety and pleasure. **This manual targets specific details of Regal related systems and components along with their location, operation and maintenance that normally is not found in the vendor information. In addition, vendor related equipment information is located within the yacht documentation package and to a smaller degree within this manual.**

The Regal yacht owner's manual is not to be thought of as a complete shop technical document. In addition to the system chapters, there is troubleshooting information devoted to select current standard and optional equipment. Beyond the owner's manual your Regal yacht dealer has received special factory training and his services should be employed to solve more technical problems. Call 407-851-4360 or go to the internet at www.regalboats.com to find the closest Regal yacht dealership.

In keeping with its commitment to improvement Regal Marine Industries, Inc. is continually upgrading the product line. Regal notes that all dimensions, specifications, models, standard and optional equipment is subject to change without notice at any time.


OWNER'S PACKET



An owner's information packet is located on the vessel. *Read and become familiar with the materials.* This packet contains valuable literature on your propulsion package,

standard and optional equipment, systems, various care and cleaning instructions along with component warranty information.

Keep the information packet stored in a clean, dry location. The packet is found in the master stateroom inside the port hanging locker. A dedicated drawer with hanging folders will hold the majority of manuals and vendor supplied literature.

**WARNING**

PREVENT INJURY, DEATH, OR
PROPERTY DAMAGE!
READ AND UNDERSTAND
THE PROPULSION OWNER'S MANUALS
BEFORE ATTEMPTING
TO OPERATE THE VESSEL.

Introduction

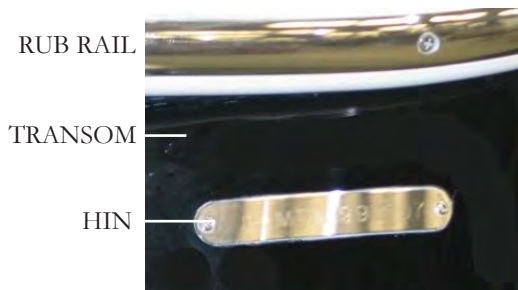
GENERAL INFORMATION

HULL IDENTIFICATION NUMBER (HIN)

The United States Coast Guard has established a universal system of numerically recognizing vessels by using a hull identification number or “HIN.” This number identifies your Regal yachts’ model, hull number, month and year of manufacture. The HIN is normally found on your yacht’s transom, on the starboard side, just below the rub rail on the transom vertical surface or on the starboard hullside close to the transom. The HIN is stamped on a plate and reinforced with a special adhesive. The HIN consists of 12 alpha or numeric characters.

It is recommended that you locate and write down the HIN for future reference. It can be especially useful when ordering parts from your Regal yacht dealer. A second HIN number is found in a hidden location. This second HIN is useful to authorities if the vessel is stolen and/or the original transom HIN is modified or eliminated.

HULL IDENTIFICATION NUMBER



VESSEL INFORMATION SHEET

It is recommended that you fill out the information on the following page. It will supply vital statistics on your vessel. Make a copy of the data for safe keeping at home.

VESSEL FLOAT PLAN

Formulate the float plan on the following page before departing. Leave it with a responsible person who will notify the United States Coast Guard or local law enforcement authorities if you do not return as planned. If you change your plans be sure to notify this person. Make copies of the float plan and use one each time you go boating. This will help people know where to find you should you not return on schedule. Do not file the float plan with the United States Coast Guard.

NMMA YACHT CERTIFICATION PLATE

In the helm (dash) area you will notice a metal plate which recognizes that your yacht was built to design compliance in effect on the date the certification was verified. The plate also states that your vessel complies with U. S. Coast Guard safety system standards in effect on the date of certification.





Chapter 1

YACHT INFORMATION

Owner: _____

Address: _____

City & State: _____

Home Phone: _____ Cell Phone: _____

In Case Of Emergency Notify: _____

Address _____

City _____ State _____

Phone _____

Insurance Agent's Name: _____

Policy#: _____

USCG Phone: _____ Local Police: _____

Marina Phone: _____ Slip (Dock#): _____

Hull Serial #: RGM _____

Key #: _____ Port Engine: _____ Stbd Engine: _____

Key #: _____ Cabin Door: _____

Selling Dealer: _____

Address: _____

City & State: _____

Phone: _____ Fax: _____

Servicing Dealer: _____

Address: _____

City & State: _____

Phone: _____ Fax: _____

Introduction

YACHT FLOAT PLAN

Fill out this form before departure. Leave it with a responsible person who will notify the Coast Guard or police if you don't return as planned. If you change your plans be sure to notify this person. Make copies of the float plan and use one each time you go on a trip. This will help people know where to find you should you not return on schedule. **Do not file this plan with the Coast Guard.**

Owner: _____

Address: _____

City & State: _____

Telephone#: _____

Person Filing Report: _____

Name _____

Telephone# _____

Make Of Yacht: _____

Length _____ Boat Name _____

Color _____ Trim _____ Hp _____

Inboard _____ Stern Drive _____

Hull I.D.# _____

Documented Vessel # _____

Other Information _____

Safety Equipment Aboard: _____

Life Jackets

First Aid Kit

Flares

Flash Light

VHF Radio

Cell Phone __#_____

Computer __Desk Top ____Lap Top____

E-mail address _____

Food _____Water _____

State Registration# _____

Destination:

Leave From _____

Time Left _____

Going To _____

Fuel Capacity _____

Est. Day Of Arrival _____

Est. Time Of Arrival _____

If Not Back By _____o'clock Call Authorities

Persons Aboard:

Name

Age

Address

Phone

____See Other Side For Additional Persons



YACHT CRUISE CHECKLIST

- ☐ Obtain a current weather update.
- ☐ Periodically hoist the yacht & inspect the hull bottom and propellers for damage. Marine growth such as barnacles will affect performance and fuel efficiency. Check sacrificial anodes located on the IPS propulsion unit, transom and engine. Replace anode if less than 2/3 remaining.
- ☐ Check the electrical system and all safety related equipment. Carry extra fuses. Ensure they are of the proper capacity and type.
- ☐ If your yacht has been in the water, run the bilge pump until the flow of water stops.
- ☐ If your yacht has been out of the water, check to see that all bilge water has drained.
- ☐ Check that all required safety equipment is on board and in good working condition. Examples include personal flotation devices (PFD's), horn, bell, hand held fire extinguishers, and visual distress signals.
- ☐ Check fuel level. Fuel tanks should be filled to slightly less than capacity. Allow for fuel expansion. Remember the "one third rule".
- ☐ Open engine compartment. Inspect for fuel odors and visible leaks in the fuel, oil, coolant, exhaust and power steering systems.
- ☐ Check the diesel fuel filters for the presence of water .
- ☐ Check fluid levels of engines, drives and generator.
- ☐ Visually inspect engine for cracked hoses, worn or loose V-belt, and loose hardware.

Introduction

RECOMMENDED ONBOARD EQUIPMENT

TOOLS

Allen Wrenches
Jack Knife
Phillips Screwdriver
System
Regular & Needle Nose Pliers
Combination Box & End Wrench Set
Screwdriver Set (One With Various Tips)
Side Cutters
Ratchet & Socket Sets- 1/4, 3/8", 1/2", 3/4" drive
Electrical Crimper, Cutter, Stripper Combo
Hammer
VOA Electrical Tester
Water Pump Pliers
Vise Grip Pliers
Floating Flashlight/Lantern
Foot Pound Torque Wrench
Gear Lube (Mercury)
Tape Rule

BASIC GEAR & SUPPLIES

Tow Line
Mooring Lines
Dock Fenders
Distress Signals
First Aid Kit
Boat Hook
Charts & Plotting Instruments/Back-up Use
Emergency Food & Water
EPIRB
Bailer or Hand Pump
Extra Hand Held Fire Extinguishers
Personal Floatation Devices
Clean Rags, Diapers (For Under Engine-Oil Leaks)
Sunscreen (SPF 30+)
Bucket/Pans w/Locking Lids-Draining/Storing Used Fluids
Mirror (For Inspection & Emergency Signaling)
Funnel

SPARE PARTS

Fuel Filters-Engines & Generator
Poly V- Belt (See Engine Manual)
Coolant For Engine Freshwater
Extra Light Bulbs
Seawater Filter
Fuses
Propeller Set (See Dealer)
Propeller Hardware
Flashlight Batteries
Engine Spare Parts
Generator Spare Parts
Air Filters-Engine & Generator
Oil Filters-Engine, Generator
Drive Oil Filters
Engine Oil/Fuel Filter Wrench

BASIC GEAR & SUPPLIES

Lubricating Oil, Liquid Wrench
Duct & Electricians Tape
Coolant (Engine Freshwater Side)
Engine, Drive, Power Steering Oil
Boat Soap (Not Dish Soap)
Woody Wax
Vinyl Cleaner
Hydrogen Peroxide (AC Pans)
Life Raft
Rust Stain Remover (Starbrite)
Corrosion Block
Bilge Cleaner
Nylon Windbreaker Suit
Shop Vac (1 Gal. Cap. Wet-Dry)
Squeegee
Binoculars
Food & Bottled Drinking Water



Chapter 1

Owner's Registration & Systems Checklist

Please note that your Regal yacht requires the proper registration by your authorized Regal yacht dealer. To initiate the vessel warranty your dealer must complete the owner's registration form and systems checklist at the time of delivery. The owner must sign the paperwork to acknowledge that the dealer has reviewed the boat systems and warranty provisions with the owner. The owner should keep the original paperwork that features a temporary warranty registration. A warranty certificate will be sent approximately 6 weeks after receipt of the paperwork at Regal World Headquarters.

Dealer's Responsibility

Your vessel has undergone rigid quality assurance inspections before leaving the factory. In addition, your dealer has been trained to perform final pre-delivery checks and to service your Regal yacht.

Your dealer's responsibilities include:

1. An orientation in the operation of your Regal yacht including matters relating to the safe operation of the vessel.
2. Completion and mailing of your boat registration warranty form to Regal.
3. Location of vendor warranties, registration materials, owner's manual, operation, installation and maintenance instructions for auxiliary equipment supplied with or installed on your Regal boat.
4. Fill out the engine warranty registration card completely and mail it to the Cummins factory immediately upon sale of the new product. All power packages must be registered for warranty purposes.

Introduction

Owner's Responsibility

You are entitled to all the benefits and services outlined in your Regal warranty. However, you have certain responsibilities to ensure warranty satisfaction.

These are:

To read the warranty materials and understand them fully.

To examine the yacht in detail at the time of delivery.

Apply the following: boating rules and regulations, safety equipment, environmental regulations, accident reports and warranty regulations terms and conditions.

To read thoroughly all literature supplied with your yacht including this owner's manual and to follow the recommendations in the literature.

To provide proper maintenance and periodic servicing of your yacht and equipment as set forth in the various manuals supplied.

Customer Service

Take the time to write down your yacht dealer's phone number and E-mail address for future reference. Along with your Regal yacht dealer information is a listing below of other phone numbers and web addresses which may prove useful.

Regal Yacht Dealer:

Phone: _____

E-mail: _____

Regal Marine Customer Service:

1-800-US REGAL (1-800-877-3425)

regal@regalboats.com

customer.service@regalboats.com



Chapter 1

REGAL MARINE INDUSTRIES, INC. LIMITED WARRANTY

Welcome to the Worldwide Family of Regal Owners! We are very pleased that you have chosen a Regal Powerboat!

This document is your Warranty Registration Certificate and Statement of Warranty. Please check the registration information section for accuracy. If this information is not correct or if you change your address at some future date, please notify us at the following address: Regal Marine Industries, Inc. Attention: Warranty Registrations, 2300 Jetport Drive, Orlando, Florida 32809; or E-mail at customer.service@regalboats.com.

Please read the warranty carefully. It contains important information on Regal's claims procedures and your rights and obligations under this warranty.

WHAT IS COVERED: This Limited Warranty applies only to Regal boats beginning with model year 2008.

LIFETIME LIMITED STRUCTURAL HULL WARRANTY: Regal Marine Industries, Inc. warrants to the original retail purchaser of this boat if purchased from an authorized Regal dealer that the selling dealer or Regal will repair or replace the fiberglass hull if it is found to be structurally defective in material or workmanship for as long as the *original* retail purchaser owns the boat. For purposes of this warranty, the hull is defined as the single fiberglass casting which rests on the water. This limited warranty is subject to all limitations and conditions explained below.

FIVE-YEAR TRANSFERABLE LIMITED STRUCTURAL HULL WARRANTY: In addition to the Lifetime Limited Structural Hull Warranty, Regal offers a Transferable Five-Year Limited Structural Hull Warranty. Under the Five-Year Transferable Limited Structural Hull Warranty, Regal will repair or replace the fiberglass hull if it is found to be structurally defective in material or workmanship within the first (5) years after the date of delivery to the original retail purchaser. Any remaining term of this Five-Year Limited Hull Warranty may be transferred to a second owner if within 60 days of purchase, the new owner registers the transfer with Regal and pays the established warranty transfer fee. Contact Regal Customer Service at the above address for details.

FIVE-YEAR LIMITED HULL BLISTER WARRANTY: Regal warrants that the selling dealer or Regal will repair any underwater gelcoated surfaces of the hull against laminate blisters which occur as a result of defects in material or workmanship within (5) years of the date of delivery, provided that the original factory gelcoat surface has not been altered. Alternation would include but is not limited to damage repair; excessive sanding, scraping, sandblasting; or from improper surface preparation for application of a marine barrier coating or bottom paint, any of which shall void this Five-Year Limited Hull Blister Warranty. Proper preparation must be applied to the hull bottom if the boat is to be moored in the water for periods in excess of sixty (60) days. Regal Marine shall repair or cause to be repaired any covered laminate blisters based on the following prorated schedule.

Less than two (2) years from delivery date - 100%, Two (2) to three (3) years from delivery date - 75%, Three (3) to four (4) years from delivery date - 50%, Four (4) to five (5) years from delivery date - 25%.

Reimbursement shall be limited to one repair, not to exceed one hundred (\$100.00) dollars per foot of boat length prior to prorating. Regal's prior authorization for the method and cost of repair, must be obtained before repairs are commenced. All costs to transport the boat for repairs are the responsibility of the owner.

LIMITED GENERAL WARRANTY: In addition to above hull warranties, Regal warrants to the original purchaser of this boat if purchased from an authorized Regal dealer that the dealer or Regal will repair or replace any parts found to be defective in materials or workmanship for a period of one (1) year from the date of delivery, subject to all exceptions, limitations and conditions contained herein.

LIMITED EXTERIOR FINISH WARRANTY: Regal warrants that the selling dealer or Regal will repair cosmetic defects in the exterior gelcoated finish including cracks or crazing reported to Regal within 90 days from the date of delivery to the original retail purchaser, subject to all limitations and conditions contained herein. All warranty work is to be performed at a Regal dealership or other location authorized by a Regal Customer Service Manager after it is established to Regal's satisfaction that there is a defect in material or workmanship.

REGISTRATION INFORMATION:

CUSTOMER OBLIGATIONS: The following are conditions precedent to the availability of any benefits under these limited warranties:

- (a) The purchaser must sign and the dealer must submit to Regal the "NEW BOAT DELIVERY CHECKLIST" within ten (10) days of the date of delivery and such information must be on file at Regal.
- (b) The purchaser must first notify the dealer from whom the boat was purchased of any claim under this warranty within the applicable warranty period and within a reasonable period of time (not to exceed thirty (30) days) after the defect is or should have been discovered; and
- (2) if such continued use causes other or additional damage to the boat or component parts of the boat.

Introduction

(c) Regal will not be responsible to repair any condition or replace any part, (1) if the use of the boat is continued after the defect is or should have been discovered; and (2) if such continued use causes other or additional damage to the boat or component parts of the boat.

(d) Based on the dealer's knowledge of Regal's warranty policy and/or consultations with Regal, the dealer will accept the claim and arrange for appropriate repairs to be performed, or deny the claim if it is not within the warranty.

(e) The dealer will contact the Regal boat owner regarding instructions for delivery of boat or part for warranty repair if it is covered by the limited warranty.

ALL COSTS TO TRANSPORT THE BOAT FOR REPAIRS ARE THE RESPONSIBILITY OF THE OWNER;

(f) If the Regal boat owner believes a claim has been denied in error or the dealer has performed the warranty work in an unsatisfactory manner, the owner must notify Regal's Customer Service Department in writing at the address listed for further consideration. Regal will then review the claim and take appropriate follow-up action.

WARRANTY EXCEPTIONS: THIS LIMITED WARRANTY does not cover and the following are not warranted:

(a) Engines, metal plating or finishes, windshield breakage, leakage, fading and deterioration of paints, canvas, vinyl, upholstery and fabrics;

(b) Gelcoat surfaces including, but not limited to, cracking, crazing, discoloration or blistering except as noted above;

(c) Accessories and items which were not part of the boat when shipped from the Regal factory, and/or any damage caused thereby;

(d) Damage caused by misuse, accident, galvanic corrosion, negligence, lack of proper maintenance, or improper trailering;

(e) Any boat used for racing, or used for rental or commercial purposes;

(f) Any boat operated contrary to any instructions furnished by Regal, or operated in violation of any federal, state, Coast Guard or other governmental agency laws, rules, or regulations;

(g) The limited warranty is void if alterations have been made to the boat;

(h) Transportation of boat or parts to and/or from the REGAL factory or service location;

(i) Travel time or haul outs, loss of time or inconvenience;

(j) Any published or announced catalog performance characteristics of speed, fuel and oil consumption, and static or dynamic transportation in the water;

(k) Any boat that has been repowered beyond Regal's power recommendations;

(l) Boats damaged by accident and boats damaged while being loaded onto, transported upon or unloaded from trailers, cradles, or other devices used to place boats in water, remove boats from water or store or transport boats on or over land;

(m) Water damage to, dry rot to, condensation to, or absorption by interior surfaces, wood structures or polyurethane foam; interior wood including, but not limited to, bleeding and/or discoloration as a result of condensation or moisture or water continually contacting the plywood causing staining to upholstery, carpet or other interior surfaces;

(n) Costs or charges derived from inconveniences or loss of use, commercial or monetary loss due to time loss, and any other special, incidental or consequential damage of any kind or nature whatsoever.

NO WAIVER OF THESE ITEMS: The terms, conditions, limitations and disclaimers contained herein cannot be waived except by the Customer Service Manager of Regal. Any such waiver must be in writing. Neither the dealer, nor the customer, nor any service, sales and/or warranty representative of Regal is authorized to waive and/or modify these conditions, limitations and/or disclaimers.

GENERAL PROVISIONS:

ALL GENERAL, SPECIAL, INDIRECT, INCIDENTAL AND/OR CONSEQUENTIAL DAMAGES ARE EXCLUDED FROM THIS WARRANTY AND ARE TOTALLY DISCLAIMED BY REGAL. IT IS THE INTEREST OF THE PARTIES THAT THE OWNER'S SOLE AND EXCLUSIVE REMEDY IS THE REPAIR OR REPLACEMENT OF THE VESSEL OR ITS ALLEGEDLY DEFECTIVE COMPONENT PARTS AND THAT NO OTHER LEGAL OR EQUITABLE REMEDIES SHALL BE AVAILABLE TO SAID OWNER. SOME STATES DO NOT ALLOW THE EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES SO THE FOREGOING MAY NOT APPLY TO YOU. THIS IS A LIMITED WARRANTY; REGAL MAKES NO WARRANTY, OTHER THAN CONTAINED HEREIN;

TO THE EXTENT ALLOWED BY LAW ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARISING IN STATE LAW ARE EXPRESSLY EXCLUDED TO THE EXTENT ALLOWED BY LAW. ANY IMPLIED WARRANTY OF MERCHANTABILITY IS LIMITED TO THE PERIOD OF THIS LIMITED WARRANTY. ALL OBLIGATIONS OF REGAL ARE SPECIFICALLY SET FORTH HEREIN. REGAL DOES NOT AUTHORIZE ANY PERSON OR DEALER TO ASSUME ANY LIABILITY IN CONNECTION WITH REGAL BOATS. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Regal's obligation with respect to this warranty is limited to making repairs to or replacing the defective parts and no claim for breach of warranty shall be cause for cancellation or rescission of the contract or sale for any boat manufactured by REGAL MARINE INDUSTRIES, INC.

Regal will discharge its obligations under this warranty as rapidly as possible, but cannot guarantee any specific completion date due to the different nature of claims which may be made and services which may be required. Regal reserves the right to change or improve the design of its boats without obligation to modify any boat previously manufactured. This limited warranty gives you specific legal rights, and you may also have other rights which may vary from state to state. Regal shall in no way be responsible for any repairs not PRE-AUTHORIZED by a Regal Customer Service Manager or repairs performed by a repair shop not PRE- AUTHORIZED by a Regal Customer Service Manager.



Notes



Safety On Board



Safety awareness can not be over emphasized. Safety on board needs to be the skippers number one priority. In this manual you will find many safety precautions and symbols

to identify safety related items. Heed all safety precaution information. Remember, the skipper is responsible for the safety of his passengers and crew.

SAFETY LABELS

SAFETY PRECAUTION DEFINITION

Safety precautions are stated as caution, warning and danger signal words. They are highlighted in this manual by font design and symbol usage. Also, a *notice* heading is included which provides operation and maintenance information but is not hazard-related. An information label provides tips on a variety of topics. **Become familiar and understand all safety precaution labels!**



WARNING

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



CAUTION

Indicates a potentially hazardous situation or unsafe practice that, if not avoided, **may** result in injury or property or product damage.

NOTICE

General or specific information which is important to correct operation or maintenance, **but is not hazard related.**



DANGER

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



INFORMATION

Educational tips for the skipper and crew.



PRECAUTIONARY LABELS

Read and understand all safety labels affixed to your Regal yacht or found in this manual and the vendor literature. Many of the safety labels are posted close to the helm, aft cockpit, cabin and swim platform. The location of the labels may vary.

Review the helm safety labels with passengers before disembarking.

Use common sense to analyze the result of an action on board your vessel. **Always think safety first!**

NOTICE

DO NOT REMOVE OR COVER
ANY PRECAUTIONARY LABELS.

KEEP HARSH CHEMICALS
AWAY FROM LABELS.

IF A LABEL BECOMES ILLEGIBLE,
CONTACT YOUR REGAL DEALER
FOR ORDERING REPLACEMENTS.

GENERAL BOATING SAFETY

We understand that you are eager to go boating. However, we strongly suggest that you thoroughly familiarize yourself and friends or members of your family with safe boating practices before setting out.

Remember, that along with the freedom and exhilaration of boating comes the responsibility that you have for the safety of your passengers and other boaters who share the water with you.

Boating regulations vary from state to state. Check with your local state and local authorities for the regulations pertaining to your area.

Check with local FM weather stations, U. S. Coast Guard, or on-line for the latest weather conditions. Remember getting caught in severe weather is hazardous. Check weather conditions periodically while you are boating. If you are forced to operate your boat in a storm condition, take common sense precautions; wear PFD's, store gear, reduce speed and if possible head for safe refuge.

It is best to avoid operating your boat in foggy weather. When fog sets in, take bearings, log courses and speeds. You are required to emit a five second blast from your horn or whistle once every minute. Also, have your passengers wear PFD's and observe for oncoming vessels.

Operation in shallow water presents a number of hazards including sand bars and water levels influenced by tides. If the vessel strikes an underwater hazard, check for boat and engine damage. If the engine vibrates excessively after striking an underwater obstruction, it may indicate a damaged propeller. If you run aground, seek help by radio or flares.

Make sure your boat and equipment are in top condition. Do this by frequently inspecting the hull, engine and propulsion components.



Safety On Board

You must provide a Coast Guard approved personal flotation device (PFD) for every person on board. These PFD's should be in good condition and easily accessible.

Insist that non-swimmers and children on board wear a PFD at all times. If you encounter rough weather conditions, make sure everyone on board is wearing a PFD, including yourself. Instruct your passengers in how to put on their PFDs and be sure they know their storage location on the boat. Remember, in an emergency, a PFD that cannot be quickly located and worn is useless.

Never allow anyone to sit anywhere on the boat not specifically designed as seating. While underway, ALWAYS insist passengers sit in a seat and set an example by doing this yourself.



Never drink and drive! As captain, you are responsible for the safety of your passengers. Alcohol and boating can be a dangerous combination. DO NOT mix them. Alcohol impairs the boat operators ability to make conscious decisions and react

to emergency situations quickly.

Never overload your boat! An overloaded boat, or one with uneven weight distribution can be difficult to steer. Balance the load before starting a cruise. Refer to the persons capacity drawing in the technical drawing chapter for passenger seating details.

Use maximum caution when fueling. Never allow any smoke or flame nearby while you are fueling. **ALWAYS** check for fuel leaks and fumes when fueling is completed.



Be certain there is enough fuel aboard for your cruising needs. Include any reserve that might be needed should you change your plans due to weather or an emergency. **Practice the “one-third rule:** Use one-third of your fuel going out, one-third to return

and retain one- third as a reserve.

Always check the weather before departure. Be particularly cautious of forecasted electrical storms and high winds.

Always have up-to-date charts aboard as a back-up to your plotter and auto pilot option. Charts can be obtained at your closet marina, on-line store or by contacting one of three federal government agencies.

Always file a float plan. Leave details of your trip with someone responsible who will be remaining on shore. Include expected return, plus name and phone number of a contact person in case of emergency.

Use care, courtesy and common sense when launching, docking or operating your boat.

Learn and obey the “Rules of the Road”. A weather resistant placard copy of the “Rules of the Road” is included in the on board Regal information packet. Additional information can be obtained from the U.S. Coast Guard Auxiliary or your local Power Squadron organization. In case of emergency know the international distress signals for your VHF radio. The spoken word “MAYDAY” is the international signal of distress and is for emergency use only. Under no circumstances should this word be used, unless there is danger at hand.



Posted speed limits, swimming areas, “no wake” zones and other restrictions should be red-flagged. They are so noted for a reason. Sensible boat use, plus courtesy, equals enjoyable and safe boating.

It is your responsibility to stay abreast of all federal, state and local rules, as some laws or regulations may change or be different from state to state. Contact your local boating agencies for updated information.

We can not stress safety enough! Remember, there are no brakes on your boat, and the water current and wind velocity both affect your ability to respond. The operator must use caution at all times to maintain control of his vessel and especially to keep a safe distance from other boats and obstacles.

Always keep all safety gear in optimum condition. Pay special attention to attached tags and plates indicating expiration dates on equipment such as fire extinguishers, and personal flotation devices. Encourage a periodic maintenance check on all safety equipment. Contact your Regal dealer or marine professional for more information. Again, remember that the captain is responsible for his crew, passengers and vessel.

REQUIRED SAFETY EQUIPMENT

PERSONAL FLOTATION DEVICES

All personal flotation devices (PFD's) must be Coast Guard approved, in good working condition, and must be the correct size for the wearer. All PFD's must be readily accessible. This means being able to wear them in a reasonable amount of time in case of an emergency (fire, boat sinking, etc.). They should not be stored or locked in closed areas. Also, make sure that all coverings are removed such as plastic from any PFD's. Throwable devices such as a ring buoy need to be available for immediate deployment. A PFD should be worn at all times when your boat is operating on the water. A PFD may save your life, but it must be worn to do so.

As a minimum U. S. Coast Guard requirement all recreational boats must carry one type I, II, III, or V PFD (wearable) for each person aboard. See the explanation following for each type. For type V to be counted they must be used according to the label instructions. **In addition, all boats over 16' must carry one Type IV (throwable) PFD.**

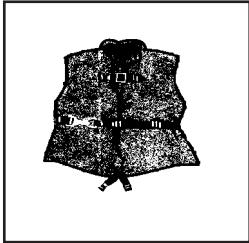
Some states require that PFD's be worn by children of specific ages at all times. Check with local and state boating agencies for particular requirements in your state before taking children on the water. Child life jackets are classified by the child's weight and should like all life jackets be sized before being purchased.

Remember PFD's will not necessarily keep you from drowning, even though they are designed to keep a person from sinking. When purchasing PFD's make sure it safely fits the person wearing it. It is a good idea to test PFD's in a life-guarded shallow pool before venturing on the water.



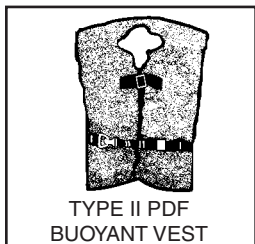
Safety On Board

Refer to the USCG minimum equipment requirements at the end of this chapter. It is meant to be a guide only. Contact state and local agencies for additional equipment requirements. Remember as the captain of your vessel you are responsible for its safe operation.



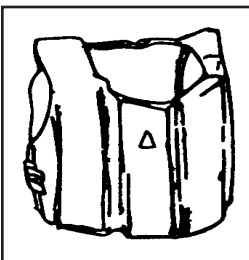
TYPE I- Also known as an off-shore jacket, it provides the most buoyancy. It is a PFD for all waters and is especially useful in rough waters where rescue may encompass additional time. It is designed to turn most unconscious users in the water to a true face-up

position. Type I PFD is available in adult & child sizes. Buoyancy minimum poundages are 15.5 adult, 11 medium child, and 7 for small child and infants.



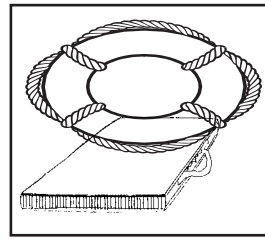
TYPE II- Also known as near-shore buoyant vest, it is recommended for calm, inland water where rescue time will be minimal. It will turn some unconscious people face-up in the water but not as numerous as Type I. They use the same buoyancy

minimum poundages as the type I PFD's.

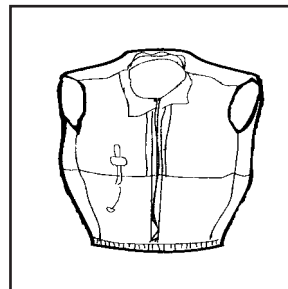


TYPE III- Known as a flotation aid it is good for calm, inland water or where there is a chance for quick rescue. It is designed so wearers can place themselves in a face-up position in the water. The wearer may have to tilt their head back to avoid face-down positions.

Type III offer the same buoyancy minimum poundages as the Type II. They are generally the most comfortable for continuous wear. Float coats, fishing vests, and vests featuring designs for various sport activities are examples of Type III.



TYPE IV- Intended for calm, inland water with heavy vessel traffic, where help is constantly present. It is designed to be thrown into the water for someone to grab on to and held until rescued. It is not designed to be worn. Type IV includes ring buoys, buoyant cushions, and horseshoe buoys.



TYPE V- Also known as a special use device this is the least bulky of all PFD's. It contains a small amount of inherent buoyancy, and an inflatable chamber. It is rated even to a Type I, II, or III PFD (as noted on the jacket label) when inflated. Some Type V devices provide significant hypothermia protection. Varieties include deck suits, work vests, board sailing vests and Hybrid PFD's. Remember that this Type V type PFD may be carried instead of another PFD **only if used according to the approval condition on the label.**

Note: A water skier or wakeboarder is considered on board the vessel and a PFD is required for the purposes of compliance with the PFD carriage requirements. It is advisable and recommended for a skier or wakeboarder to wear a PFD designed to withstand the impact of hitting the water at a high speed. "Impact Class" marking on the label refers to PFD strength, not personal protection. Some state laws require a skier or wakeboarder to wear a PFD.



PFD'S FOR PETS

If you are a skipper who needs to have his pet dog or cat on board or dockside then a PFD is recommended. The PFD will aid you in finding the pet if it should fall overboard. The device must fit the pet properly. Also, it may take a bit of training before the pet is comfortable wearing the PFD. Normally, dogs are easier to train wearing a life vest than a cat.

Marine type retail stores will fit a pet to a PFD by body weight.

MAINTAINING YOUR PFD'S

A PFD is only useful if it is well maintained. Always be aware of PFD age since it has a life expectancy like any other piece of equipment.

✓ Check periodically for broken zippers, frayed webbing, water soaked kapok bags, missing straps, and sewing that has become undone.

✓ Clean each PFD with mild soap and water only. Again, let dry sufficiently before storing.

✓ Keep PFD's out of grease and oil since they can deteriorate the jacket inner and outer materials.

✓ Check any kapok-bagged jackets by squeezing. If you hear air escaping the bag is defective and the PFD should be thrown away.

✓ Grab the cover with the fingers. If the cover material rips, the PFD is rotted and should be thrown away.

✓ If the kapok bag is hard the PFD should be discarded.

FIRE EXTINGUISHERS

GENERAL INFORMATION

Fire extinguishers are classified by a letter and numeric symbol. The letter references the type of fire the unit is designed to extinguish.

For example, type B extinguishers commonly used on boats are designed to put out flammable liquids such as grease, oil and gasoline.

The number indicates the general size of the extinguisher (minimum extinguishing agent weight).

Coast Guard Approved extinguishers are identified by the following marking on the label:

“Marine Type USCG Approved, Size..., Type..., 162.028/.../”, etc.

FIRE EXTINGUISHER CONTENTS				
CLASS	FOAM IN GALS.	CO2 IN LBS.	DRY CHEM IN LBS.	HALON IN LBS.
B-I	1.25	4	2	2.5
B-II	2.5	15	10	10

MINIMUM PORTABLE FIRE EXTINGUISHERS REQUIRED		
VESSEL LENGTH	NO FIXED SYSTEM	WITH FIXED SYSTEM

LESS THAN 26'	1 B-1	0
26' TO LESS THAN 40'	2 B-1 OR 1 B-II	1 B-1
40' TO 65'	3 B-1 OR 1 B-1 & 1 B-II	2 B-1 OR 1 B-2



Safety On Board

U. S. Coast Guard approved fire extinguishers are required on all Regal yachts. Besides the minimum Coast Guard requirements always check state and local agencies for additional requirements and equipment.

Coast Guard approved extinguishers are hand-portable, either B-I or B-II classification. U. S. Coast Guard approved hand-portable and semi-portable extinguishers contain a metal plate that shows the manufacturers name and extinguisher type, capacity and operating instructions. They have a special marine type mounting bracket which keeps the extinguisher solidly mounted until needed. The extinguisher needs to be mounted in a readily accessible location but one that will not be bumped by people while underway. All approved extinguishers shall have an indication gauge.

U.S.C.G APPROVED FIRE EXTINGUISHER TYPES & FEATURES



■ The dry chemical agent is widely used because of its convenience and low cost. The extinguisher canister is filled with a white dry chemical powder along with a pressurized gas. It is a good idea to shake this type periodically because they tend to “pack” on the canister bottom.



■ The foam type uses a chemical foaming agent plus water and is best when used for fires involving flammable liquids- solvents, gasoline, oil, grease and various paints. It will work on fires involving rubber, plastics, cloth, wood, and paper. It

leaves a messy residue. Do not use this extinguisher for electric fires.



■ The carbon dioxide unit uses CO₂ gas under high pressure, with a funnel discharge hose usually swivel mounted. This extinguisher leaves no residue and does not cause interior engine harm. To ensure workability, weigh the unit annually. A 10% maximum weight variance

is allowed.

Another type of liquified gas used today is FE-241. This gas is colorless and odorless, heavier than air and sinks to the lower bilge to extinguish fires. Since the year 2000 ingredients have changed to a more environmental friendly formula (Chlorotetrafluoroethane or FE-241). FE-241 is used in portable-hand units along with making up the majority of boat automatic fire extinguishing systems. The canister needs to be weighed once a year. These clean agent units feature a dash mount indicator.

Refer to the information regarding fire prevention in this manual.

VISUAL DISTRESS SIGNALS

All vessels used on coastal waters, any of the Great Lakes, territorial seas, and those waters connected directly to them up to a point where a body of water is less than two miles wide, must be equipped with Coast Guard approved visual distress signals.

Vessels owned in the United States operating on the high seas must be equipped with U.S.C.G. approved visual distress signals.



PYROTECHNIC DEVICES

Pyrotechnic visual distress signals must be Coast Guard approved, be ready for service and must be readily accessible. They all display a marking which is the service life, which must not have expired. A minimum of 3 devices are required for the day and 3 devices for night.

Some devices meet both day and night requirements. Pyrotechnic devices should be stored in a cool, dry location. Most of these devices can be purchased in an highly visible (orange) watertight container. Types of Coast Guard approved pyrotechnic distress signals and associated devices are:

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

All in all, each distress signal has certain advantages and disadvantages.

There is no distress signal that is best under all situations.

Pyrotechnics are recognized world-wide as superior distress signals. A downfall is they emit a very hot flame that can cause burns and or ignite flammable materials. Pistol launched and hand-held parachute flares operate consistant with firearms and therefore must be carefully handled. Check with local and state regulations since some of these device are considered firearms and are prohibited.

It is best to carry red aerial flares which are visible from a greater distance. Also, the red parachute flares burn for longer periods and therefore are more likely to be seen by another vessel.

NON-PYROTECHNIC DEVICES

Non-pyrotechnic devices must all be in serviceable condition, readily accessible, and must be certified by the manufacturer to comply with U.S.C.G standards. They include:

- Orange distress flag.
- Electric distress light.

The distress flag is for day use only. It must be 3 x 3 or larger with a black square and ball on an orange background. It can be spotted when attached to a boat hook, long fishing rod, or paddle with the person waving the flag back and forth overhead.

The electric distress light is for night use only flashing the international SOS distress signal (... _ _ ...).

Under Inland Navigation Rules, a high intensity white light that flashes at regular intervals from 50-70 times per minute is considered a distress signal.

Remember that regulations prohibit the display of visual distress signals on the water under any circumstances except when assistance is required to prevent immediate or potential danger to passengers on a vessel.



Safety On Board

INTERNATIONAL DISTRESS SIGNALS



BLACK SQUARE
AND BALL ON
ORANGE BACKGROUND



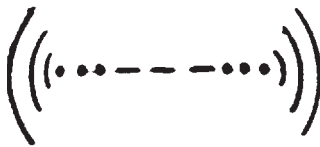
CODE FLAGS
NOVEMBER
& CHARLIE



SQUARE FLAG
& BALL



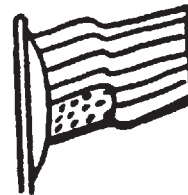
PERSON
WAVING
HANDS



MORSE
CODE S.O.S.



"MAYDAY"
BY
RADIO



ENSIGN
UPSIDE
DOWN



PARACHUTE
RED FLARE



RED METEOR
FLARES



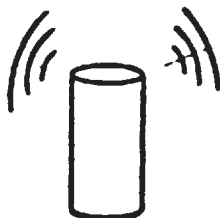
SMOKE



FOG HORN
SOUNDED
CONTINUOUSLY



GUN FIRED AT
1- MINUTE
INTERVALS



POSITION
INDICATING
RADIO BEACON



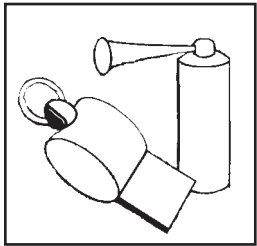
DYE MARKER
(ANY COLOR)



HAND-HELD
FLARE



SOUND PRODUCING DEVICES



According to both Inland and International Rules, all boats **must** carry a way of producing an efficient sound signal. If your vessel is 12 meters (39' 4") or longer, a power whistle or power horn and bell must be carried. Bell mouth must be at least 7 7/8"

diameter.

The sound signal made in all cases must be capable of a four or six second blast audible for one half mile. See the section discussing bridge and whistle signals for more information.

RADIO COMMUNICATIONS

VHF radios are used for distress and ship to shore and ship to ship communications today. Learn the specialized messages such as **Mayday, Mayday, Mayday**. It is only used when life or vessel is in imminent danger.

Many of the more recent VHF's feature DSC capability which offers the ability to place and receive digital calls directly with vessels and shore stations including USA and Canadian Coast Guards. Channel 70 is reserved exclusively for DSC calls. Refer to the VHF owner's information since you need to establish a Mobile Maritime Safety Identity (MMSI) number before using the DSC feature. A MMSI number identifies each DSC radio, like a telephone number. The FCC requires a ship station license for all vessels equipped with a marine VHF radio.

NAVIGATION LIGHTS

The U. S. Coast Guard requires recreational boats operating at night to display navigation lights between sunset and sunrise along with other periods of reduced visibility.

Navigation lights help avoid collisions by improving the night visibility of vessels. Red and green directional lights, white stern lights, white masthead lights and white all-around lights must be displayed in specified positions, depending on boat size, and mode of operation.

The configuration of visible lights tells an operator the size, direction of travel and means of propulsion (sail, power, rowing or at anchor) of another vessel.

This helps both operators determine who has the right of way. Larger boats are required to carry bigger, brighter lights that are visible over longer distances. See the light requirement chart for pleasure craft.

MARINE SANITATION DEVICES

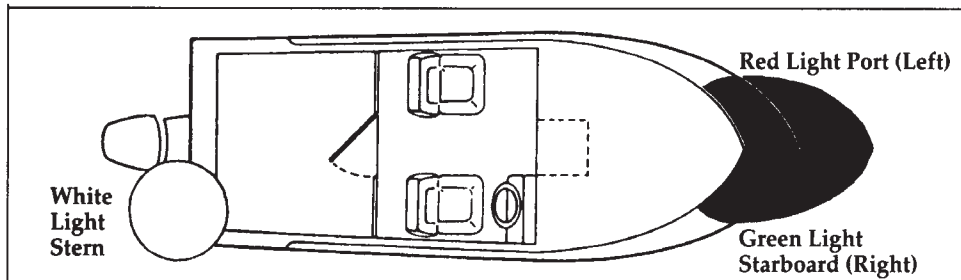
Recreational vessels under 65' with installed toilet facilities must have an operable marine sanitation device (MSD) on board. Vessels 65' and under may use Type I, II, or III MSD's. All installed MSD's must be U.S. Coast Guard certified. The MSD's are labeled to show conformity to the regulations.

NAVIGATION RULES

The navigation rules establish actions to be taken by vessels to avoid collision. They are divided into Inland/International. *Operators of vessels 39.4' or more shall have on board and maintain a copy of the Inland navigation rules.*



NAVIGATION LIGHT RULES



Location of lights on vessel	Visible Range		Degrees of arc lights
	Less than 12 m.	12 m. but less than 20 m.	
Masthead	2	3	225°
All-round	2	2	360°
Side lights	1	2	112.5° each color
Stern light	2	2	135°

figure 1

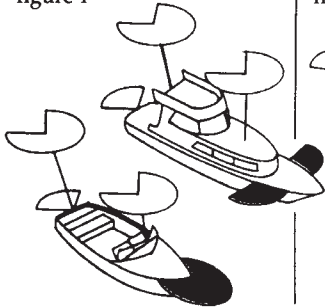


figure 2

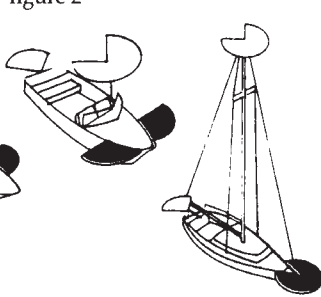
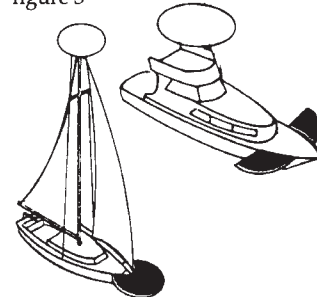


figure 3



Boats less than 12 meters in length

Motorboats or sailboats using power: The lighting arrangements to figure 1, 2 or 3 may be used.

Sailboat using sails alone: The lighting arrangements in figure 4, 5 or 6 may be used.

Boats 12 meters but less than 20 meters in length

Motorboats or sailboats using power: The lighting arrangements to figure 1 or 2 may be used.

Sailboat using sails alone: The lighting arrangements in figure 4, 5 or 6 may be used.

Location of lights

Lights should be located as shown in the drawings.

The masthead light (forward white light in figures 1, 2 and 7d) must be at least one meter higher than the colored lights on a boat less than 12 meters in length and at least 2.5 meters above the gunwale on a boat 12 meters but less than 20 meters in length.

Exceptions

Motorboat or sailboat using power, built before December 24, 1980: The lighting arrangement in figure 1, 2 or 3 may be used. However, the arrangement in figure 3 is not acceptable on a boat that is 12 meters or longer on international waters.

figure 4

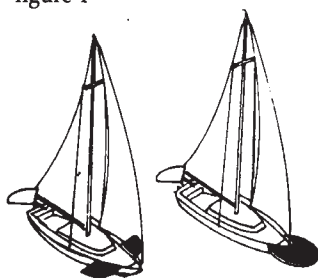


figure 5

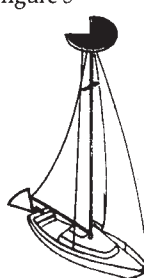


figure 6

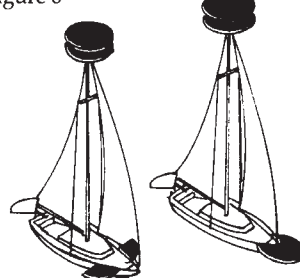
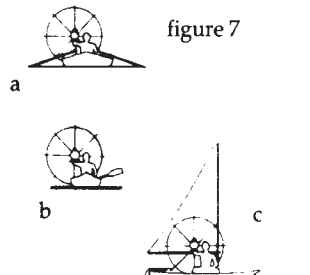


figure 7



Sailboat using sail alone, less than 7 meters in length: If impractical to display lights in figure 4, 5 or 6, a single white light may be displayed in time to prevent a collision (figure 7c).

Row Boats or Paddle Boats
One all-round white light ready to display in time to prevent a collision (figure 7 a or b).

Great Lakes

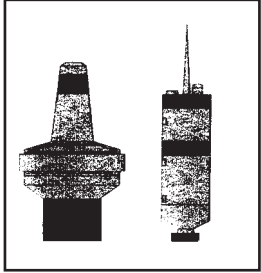
figure 7d



Motorboat or sailboat using power on Great Lakes: The lighting arrangements in figure 7d may be used instead of the arrangements in figures 1 and 2.



EPIRB



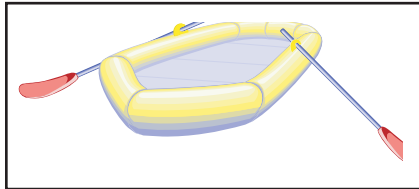
It is recommended that you carry communication gear such as a VHF-FM and/or HF transceivers set up for your operating area. Also, cell phones are useful in many coastal areas. Be sure to carry extra batteries. Also, mainly for offshore vessels, EPIRBs are designed to quickly and accurately alert rescue forces, indicate an

accurate distress position, and guide units to a distress scene. These devices operate from satellite signals sent to a ground station where the signal is downloaded. The downside is that they are relatively expensive but they are reliable even when other communications have been exhausted. Category 1 and 11 EPIRB's used in American waters must be registered with NOAA. Category 1 is an automatic deployment type and 11 is manually activated. Another Category called a "B" EPIRB or "Mini B" is currently being phased out.



Safety On Board

LIFE RAFTS



Inflatable life rafts are recommended for ocean going and vessels operating in a large body of water like the Great Lakes.

They provide a shelter for extended periods. If used, make sure it is large enough for all aboard and contains the proper emergency equipment pack. Also, periodically have the unit professionally serviced. Make sure the life raft is Coast Guard approved since it would require meeting a number of stringent material and performance standards.

USCG MINIMUM EQUIPMENT REQUIREMENTS

Use the chart below as a guideline for assuring your vessel is outfitted to meet USCG standards. Remember to check with local and state authorities for additional equipment requirements. Make sure your vessel certificate of numbers are on the boat, updated and displayed properly according to state requirements. Keep the paperwork on board in a watertight and safe environment. Make sure it is quickly accessible.

On documented vessels keep both the original and current certificate on board stored in a safe, dry, and accessible location. Also, on documented vessels make sure the vessel name/hailing port are marked on the hull exterior with letters not less than 4" in height. In addition, the Official Number must be permanently affixed on a clearly visible interior structure part of the boat-block type Arabic numbers not less than 3" in height.

USCG Minimum Equipment Requirements for Recreational Vessels					
Boat Size in Feet	16'	26'	40'	65'	165'
Personal Flotation Devices ¹	One Type I, II, III, or V per person		One Type I, II, III, or V per person plus one Type IV throwable		
Fire Extinguishers ²	One B-I, any type		One B-II or Two B-I	One B-II and one B-I, or three B-I	One or more B-II (vessels 0-50 tons gross) Two or more B-II (vessels 50-100 tons gross)
No Fixed System					
With Fixed System	No Portables Required		One B-I	Two B-I or one Class B-II	
Visual Distress Signals	Minimum of three day-use and three night-use (or three day/night combination) pyrotechnic devices ⁵				
Sound Producing Devices	Horn or whistle recommended to signal intentions or signal position			One bell, and one whistle or horn required to signal intentions or position	
Backfire Flame Arrestor	One CG-approved device on each carburetor of all gasoline-powered engines built after April 1940, except outboard motors				
Ventilation	CG standard system required on gasoline powered vessels with enclosed engine compartments built after August 1980				
Navigation Lights					
Under Power ^{3,4}	Sidelights, Stern Light and Masthead ^{6,7}				
Under Sail	Sidelights and Stern Light ^{6,8}				
Rowing	Same as "Under Sail"				
At Anchor	All-round light, 2nm (at night) or black anchoring ball (during the day) when outside a designated anchorage				
Visibility Range	1nm Sidelights, 2nm all others		3nm Masthead, 2nm all others		5nm Masthead, 2nm all others
Pollution Regulations	"Honor system" (no plaques required)		5" x 8" Oil Discharge placard and 4" x 9" Waste Discharge placard		
Marine Sanitation Devices	Vessels with installed toilet facilities must have an operable, CG-certified Type I, II or III Marine Sanitation Device (MSD). Subject to local laws!			Vessels over 40' with a galley must have a Waste Management Plan	
Navigation Rules	Familiarity with the Inland Navigation Rules required			The Inland Navigation Rules ("Rules of the Road") must be kept on board	
<div><div><div>1. Pfd's must be CG approved, wearable by the intended user and readily accessible.</div><div>2. Fire extinguishers required on boats with enclosed engine compartments (not outboards), enclosed living spaces or permanent fuel tanks.</div><div>3. Sailboats operating under engine power are considered power driven and must follow the "Under Power" rules. During the day, motorsailing vessels are required to fly a motoring cone.</div><div>4. Power-driven vessels under 23' and under 7 knots can substitute a white lantern or torch in place of the required lights.</div></div><div><div>5. Non-pyrotechnic substitutes: 1 orange distress flag (day-use) and 1 electric SOS signal light (night-use).</div><div>6. All boats under 65' can substitute a single bi-color light for sidelights.</div><div>7. Boats under power under 40' can substitute a single all-round light for separate stern and masthead lights.</div><div>8. Boats under sail under 40' can substitute a tri-color light for separate sidelights and stern light.</div></div></div>					
Additions to these requirements are prescribed by some individual state laws. Check your state's Boating Safety Handbook for a complete list.					



EXHAUST & CARBON MONOXIDE

Carbon monoxide (CO) in exhaust can be hazardous, especially from gasoline engines, gasoline generators, grills, stoves, space heaters and on a much smaller degree diesel engines.


CO is a natural by-product of the gasoline engine using an artificial spark. Diesels on the other hand detonate fuel using pressure and temperature. Looking at the two engines another way, gasoline engines use much more oxygen up in the combustion process which contributes to a much higher CO build-up. Although diesels do produce a small amount of CO the combustion process operates with much greater amounts of oxygen which the end result is a much lower CO level.

In conclusion, even though your vessel uses diesel propulsion ensure that you read the information and follow all the recommendations regarding CO as if it were gasoline powered. Familiarize your crew, passengers and yourself with the sources, symptoms and possible effects of carbon monoxide poisoning. Remember that boats in the same general vicinity can cause your vessel to accumulate dangerous CO levels in the cabin and or under the hardtop due to the above conditions and sources.

For safety sake avoid the following:

1. Do not park by other boats with their engine idling or generator cycling for an extended period of time.
2. Do not disable the carbon monoxide alarms that come with your Regal boat. Test the units in accordance with the alarm manufacturers instructions.
3. Do not operate an engine for extended periods of time while in a confined area or where exhaust outlets face a sea wall or bulkhead.
4. Do not operate the engine for an extended period of time with the canvas in the upright and installed position.
5. Have the engine exhaust system inspected when the boat is in for service.
6. Persons sleeping can easily be overcome by carbon monoxide without realizing it. Do not sleep on board while an engine or generator is running close-by.
7. Do not operate your vessel for extended periods with the bow up in slow cruise conditions especially close behind a vessel being towed or one operating at slow speeds.
8. When underway open all hatches, windshield vents, and main cabin entry door to allow proper airflow from bow to stern.
9. Never use a propane or LPG gas grill or stove in an enclosed area for a heat source.

Note: A yellow flame verses a blue flame is a sign of poor combustion in a cooking device.

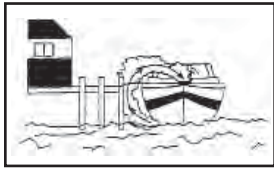
**WARNING**

**AVOID SERIOUS INJURY OR DEATH
FROM CO POISONING!**

**DO NOT OPERATE THE BOAT WITH PEOPLE
HOLDING ON TO THE SWIM PLATFORM
OR WITH PEOPLE IN THE WATER.**



Safety On Board

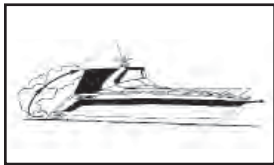


Blockage of exhaust outlets can cause carbon monoxide to accumulate in the cabin and cockpit area even when the hatches, windows, portholes and

doors are open. Sea walls and other confined spaces can cause CO levels to be dangerously elevated.



Exhaust from another vessel alongside your boat, while docked or anchored, can emit poisonous CO gas inside the cabin and cockpit areas of your boat.



The “station wagon effect” or backdrafting can cause CO gas to accumulate inside the cabin, cockpit/hardtop or bridge areas when the boat is under-way,

using protective weather coverings, high bow angle, improper or heavy loading, slow speeds, or when the boat is at rest. Also, this can occur when behind another boat.

How does CO affect us?

In high concentrations, CO can be fatal in minutes. However, the effects of lower concentrations over a extended period of time can be just as lethal.

Our blood uses hemoglobin to carry the oxygen we breathe to different body parts. Unfortunately, hemoglobin carries CO more readily than it does oxygen. The result is when we breathe in CO it replaces oxygen in our blood and we begin to suffocate. Also, when we are removed from the CO source it remains in our blood for hours causing long term effects. People have been known to become sick and even lose consciousness hours after exposure.

Carbon monoxide accumulation requires immediate attention! Thoroughly ventilate cabin and cockpit areas. Determine the probable source of the carbon monoxide and correct the condition immediately. Anyone with symptoms of CO poisoning should be placed in a fresh air environment and medical attention found immediately. Regal has installed CO detectors on your boat. Have these detectors professionally calibrated at regular intervals according to the equipment manufacturer’s recommendations.

A Few Notes About Diesel/CO Poisoning

The diesel engine under normal combustion produces much smaller amounts of CO. Therefore, it is far less likely to be fatal to a healthy person. Other factors including weather, temperature and engine condition can greatly affect the unsafe build-up of CO. The best approach is to respect and treat the engine, generator and other vessel components the same way you would a gasoline propulsion system giving particular attention to the sources and possible effects of CO poisoning.

Diesel exhaust in the combustion process produces various components and the captain must be aware that the build-up of these select components over a period of time can cause CO or seasickness like symptoms.

These include carbon dioxide, carbon monoxide (CO), nitrogen dioxide, nitric oxide, sulfur dioxide and others.

A healthy person breathing in sulfur dioxide over a period of time through a diesel engine or generator exhaust can develop nausea. This condition is not life threatening but the person may exhibit CO poisoning or seasickness symptoms. Just never rule out that it could be CO poisoning! Immediately find the source of the problem and move the individual to a fresh air environment.



Chapter 2

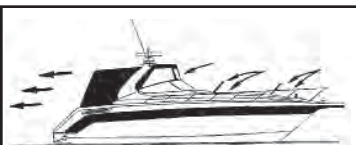
Symptoms of excessive exposure to carbon monoxide are:

- Dizziness
- Drowsiness
- Nausea
- Headache
- Ringing in the ears
- Throbbing temples
- Watering, itchy eyes
- Flushed appearance
- Inattentiveness
- Incoherence
- Fatigue or vomiting
- Convulsions



DANGER

CARBON MONOXIDE IS A TASTELESS, ODORLESS AND INVISIBLE GAS THAT CAN CAUSE DISCOMFORT, SEVERE ILLNESS, AND EVEN DEATH. EXERCISE CAUTION WHILE OPERATING GENERATOR OR ENGINES IN CONFINED SPACES OR AT DOCKSIDE. DO NOT ALLOW HULL EXHAUST OUTLETS TO BECOME BLOCKED OR EXHAUST FUMES CAN BECOME TRAPPED IN AND AROUND THE CONFINES OF YOUR BOAT. DURING IDLE AND SLOW CRUISE CONDITIONS, BILGE BLOWERS SHOULD BE USED.



DESIRED AIR FLOW
THROUGH BOAT

To help prevent carbon monoxide accumulation, ventilate your cabin and cockpit while underway. Open a forward hatch, porthole or window to allow air to travel through the boat's interior.

See the illustration for desired airflow.



WARNING

INSPECT THE EXHAUST SYSTEM. IMMEDIATELY REPAIR OR REPLACE LEAKING, CRACKED AND CORRODED, OR MISSING EXHAUST COMPONENTS.

- Before each trip inspect engine and generator:
- Make sure all exhaust hose clamps are in place and secure.
- Look for exhaust leaking from the exhaust system components, indicated by rust and or black streaking, water leaks, or corroded or cracked fittings.
- Inspect all rubber exhaust hoses for burned or cracked areas. All rubber hoses should feel soft and be free of kinks.
- Visually verify that water exits at the engine exhaust outlet.
- Keep an ear tuned for any change in exhaust sound that could indicate an exhaust component malfunction.

DO NOT OPERATE THE VESSEL IF ANY OF THE ABOVE CONDITIONS EXIST. CONTACT A MARINE PROFESSIONAL!

NOTICE

CARBON MONOXIDE PRECAUTIONARY LABELS ARE LOCATED AT THE HELM, TRANSOM AND CABIN. ENSURE THAT ALL ABOARD READ AND UNDERSTAND THE SIGNS AND EFFECTS OF CARBON MONOXIDE.



Safety On Board

CARBON MONOXIDE DETECTORS

Your Regal yacht features designated sleeping accommodations along with a galley sink and head compartments. The older yachts featured gasoline for propulsion and a gasoline generator. On these vessels a CO detector must be installed.

With diesel propulsion and diesel generation a CO detector is not required but “common sense” tells us we need to have them installed on board. They are standard equipment on your Regal diesel yacht. Mooring by boats running gasoline generators along with vessels using gas cooking/heating devices could lead to dangerous levels of carbon monoxide on your boat.

Read the owner’s manual and vendor information regarding the CO detectors installed on your vessel.

Follow the periodical service recommendations per the vendor regarding rec a libration of the carbon monoxide detector. Never attempt to repair a CO detector yourself. Get to know the signs of carbon monoxide poisoning.

Remember that carbon monoxide (CO) is known as the silent killer.

At Least Annually

To be performed by a marine professional:

- ☑ Replace exhaust hoses or mufflers if any evidence of cracking, charring or deterioration is found.
- ☑ Replace the engine water pump impeller along with the plate and housing if necessary. This will help prevent cooling system and exhaust system overheating.
- ☑ Inspect each of the metallic exhaust components for cracking, rusting, leaking or looseness. Pay detailed attention to the exhaust manifold, cylinder head, water injection elbows.

BOATING & ALCOHOL



WARNING

**FEDERAL LAWS PROHIBIT OPERATING
A VESSEL UNDER THE INFLUENCE OF
ALCOHOL OR DRUGS. THESE LAWS ARE
VIGOROUSLY ENFORCED
BY ALL ENFORCEMENT AGENCIES.**



Operating a vessel while intoxicated became a specific federal offense effective in 1988. The ruling set federal standards for determining when an individual is intoxicated. If the blood

alcohol content (BAC) is .10% (.08 in some states) or higher for operators of recreational vessels being used only for pleasure are subject to a civil penalty up to \$1,000 or criminal penalty up to \$5,000, one year imprisonment or both. In some states the fines and imprisonment may increase significantly.

The effects of alcohol and drugs account for the highest single cause of marine accidents and deaths. Most deaths in boating accidents occur when someone falls into the water. Balance is one of the first things you lose when drinking alcohol or under the influence of drugs. The problem arises out of not knowing your balance is restricted.

Overall vision is reduced by alcohol especially at night, along with double or blurred vision. Peripheral vision is lessened which restricts seeing vessels or objects on the side. Also, color awareness decreases especially with red and green which happen to be the colors of boat navigation lights, buoys, and channel markers.

Alcohol will greatly increase your heat loss so it increases the effects of hypothermia. Finally, your ability to make correct judgements in emergency situations is greatly reduced. Alcohol takes away the brains ability to process information quickly and delays a persons reaction time.

Don't drink and drive!



ALCOHOL MYTHS AND FACTS

Myth: Beer is less intoxicating than other alcoholic beverages.

Fact: One 12 oz. can of beer has about the same amount of alcohol as a 5oz. glass of wine or a shot of liquor.

Myth: Black coffee, fresh air, and a shower will sober the effects of alcohol.

Fact: After consuming alcohol time is the only thing that will sober you up. Our bodies average burning 1 oz. of alcohol every hour. If a person is drunk, it will take a person seven or more hours to sober up.

Myth: Telling if a person is too drunk to operate a vessel is easy.

Fact: Many experienced drinkers have learned to compensate for the visual effects of alcohol and can disguise their drunk condition.

Myth: You can judge if you are fit to operate a boat.

Fact: Judgement is one of the first elements you lose when drinking.

BOATING ACCIDENTS



The following is a list of common causes of boating accidents. Be aware of them and take the necessary steps to ensure that yourself and crew are educated and prepared to act in an emergency.

1. Mixing boating and alcohol. Remember, the skipper is responsible for his crew, passengers and vessel.
2. Trying to reach the bow by the deck walk-around at unsafe speeds. Use the center walk-through.
3. Someone sitting on the bow, deck, or swim platform while underway.
4. Choosing a boating outing day with inclement weather, especially in high winds and thunderstorms in the forecast or staying out when bad weather is approaching.
5. Disembarking without checking all the fluids or systems, and especially fuel system components.
6. Not monitoring the boating traffic or possible obstructions around you.
7. Emergency communications equipment, signaling devices, and navigation lights not working.
8. Improper boat handling especially high speed turns in rough water. Using trim improperly.
9. Being too far from shore with inadequate fuel supply or navigational aids.
10. Passengers, especially children that are not wearing the proper life saving devices.
11. Skipper or passengers not seated in the boat.



Safety On Board

REPORTING BOATING ACCIDENTS

According to the Federal Boat Safety Act of 1971 involving collision, accident or other casualty, the operator must make a formal report within 48 hours to the nearest state boating authority when the incident involves:

1. Death
2. Injury requiring treatment other than first aid
3. The disappearance of someone from a boat under death or injury circumstances.


A formal report must be made within 10 days for accidents involving more than \$2000 damage or complete loss of vessel.

For information regarding accident reporting, please call the **Boating Safety Hot-line** at 800-368-5647.

If there is no state provision for reporting boating accidents a report must be made to the Coast Guard officer in charge, Marine Inspection Unit nearest to the accident site or USCG station. The operator of a vessel is obligated by law to provide assistance that can be provided safely to any individuals in dangerous situation on the waterways. The operator is subject to fine and or imprisonment for failure to do so.

RENDERING ASSISTANCE

The operator of a vessel is obligated by law to provide assistance that can be provided safely to any individuals in a dangerous situation on the waterway. The operator is subject to fine and or imprisonment for failure to do so.

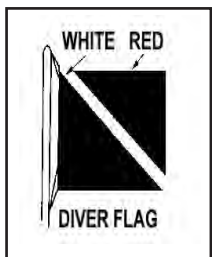
**DANGER**

AVOID BODILY INJURY OR DEATH!
TO AVOID FALLING OVERBOARD
STAY SEATED IN THE COCKPIT
WHILE THE BOAT IS RUNNING.



WATER SPORTS

Besides learning the safety precautions for safe boating, as well as understanding and knowing required rules and regulations, you are obligated to be particularly careful around other water sportsman, such as scuba divers, water skiers, wake boarders, and fisherman.



Whenever you see a “Diver Down” flag, maintain a distance of at least 100 feet on inland waters. In bays and open waters stay 300 feet away. The flag indicates a diver in the water. If a diver is operating from your boat, be certain to use this flag and post a lookout on board to observe the

diver’s air bubbles.

FISHING



Most boaters fish from time to time. With the propulsion systems of today it is possible to fish in out-of-the-way places. When cruising, stay clear of fisherman. They may have lines or nets out which might be cut or get caught in your propeller if you come too close. Slow down when approaching fishing

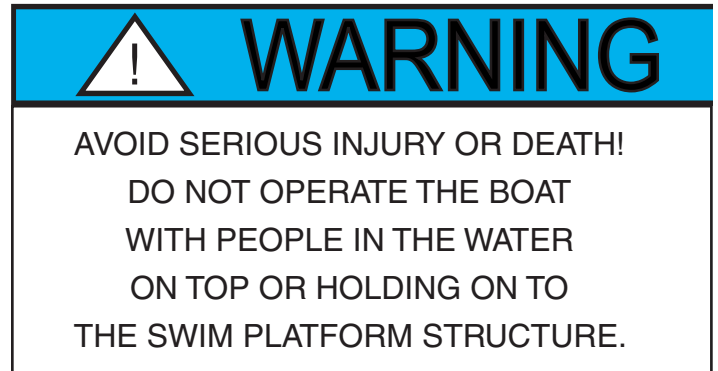
boats. Do not return to cruising speed until the boats have been passed. If a fishing boat should be anchored, a large wake could flip or swamp the boat, upset fishing gear, pull the anchor loose from the bottom or worse yet cause someone to fall overboard.

When fishing from your boat, never anchor in a shipping channel or tie up to any navigational aid. These must be kept clear of at all times.

Be sure to carry a local chart of the area to back up your plotter and be on the lookout for shallow water and hidden obstructions. Many times local conditions change and there is a time lag on the plotter chip until the next revision.

Pick up a tidal chart if appropriate so you do not end up grounded.

Read and understand the following warning label regarding “teak surfing.”



SWIM PLATFORM

On integrated or extended swim platforms you should make periodic inspections of the swim ladder and hardware that supports the platform to ensure that all connections and fittings are tight and in good condition. Use heed when operating the boat in reverse to insure that water does not accumulate excessively on the

platform or transom, especially in rough seas or strong currents. Do not exceed the platform recommended maximum capacity label! **Typical** label shown.





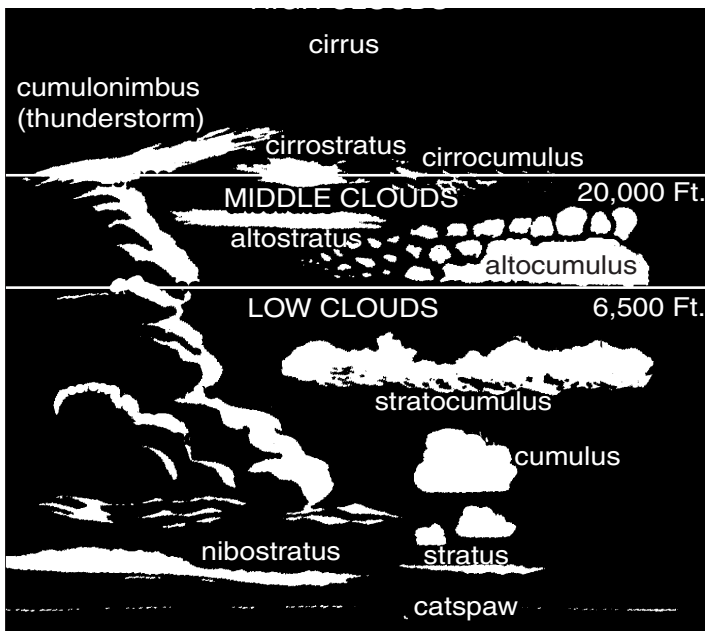
Safety On Board

WEATHER/WATER CONDITIONS WAVES & FOG

Before a boating outing check the weather conditions. As we all know the weather can change rapidly in many parts of the country. It does so sometimes without being predicted. NOAA weather radio reports are continuously available on designated frequencies installed on VHF radios and various handhelds. Also, many local radio stations carry weather reports along with on-line information.

CLOUD FORMATIONS

Clouds indicate the type of current weather and upcoming changes in the weather. Knowing the type of cloud formation can assist you in understanding current weather. Flat clouds (stratus) normally indicate stable air. Cumulus clouds indicate unstable air. Many times a “cottonball” or cumulus cloud builds vertical height in the afternoon and the result is a thunderstorm with increased winds and waves; sometimes these storms are quite violent. Also, water spouts with high vortex winds can develop over water. You can find additional weather information (meteorology) at your local library or on the internet.



As the wind blows across water waves are created. The stronger the wind and increased distance across the water enlarges the wave action.

Other factors that can cause problem situations for vessels are fog, currents, and tidal changes.

Fog can develop inland on clear, calm mornings. Coastal areas see large

“blankets” of fog roll in and stay for extended time periods sometimes causing hazardous navigation conditions. If you are caught in the fog, do not panic. Think of the best plan of action and proceed carefully. If you are limited in navigation equipment at the first sign of fog proceed to the nearest shoreline and wait until the fog lifts.

Boats equipped with navigation equipment, local waterway experience and charts should proceed to a safe harbor. Use extreme caution, signal as needed, and reduce to a speed where you can stop within half of your forward vision range.

If foul weather catches you at sea do the following:

1. Slow down. Proceed with caution and put on your life vests.
2. Try to reach the nearest safe shoreline.
3. Navigate your vessel slowly into the waves at a 45 degree angle.
4. Passengers should sit low in the center of the vessel.
5. Monitor your bilge pump. Make sure sump stays free of water.
6. Secure loose gear. Make ready emergency equipment.
7. If the engine stops, throw the anchor over the bow. If needed use a sea anchor. Never anchor off the stern.



Notes



Rules Of The Road

NAVIGATION RULES DEFINED



The Navigation Rules set forth actions to be followed by boats to avoid collision. They are referred to as the “Rules of the Road”. There are two main parts referred to as the

inland and international rules. The inland rules apply to vessels operating inside the boundaries of the United States. The international rules (referred to as COLREGS) apply to vessels operating on the high seas and all connected waters outside the established demarcation boundaries. Most navigational charts show the demarcation lines by red dotted lines and are published in the navigation rules. Remember to consult state and local agencies since areas such as “no wake zones,” swimming beaches, “diver down flag” and inland landlocked lakes fall under their jurisdiction. This section is only an introduction to the “rules of the road”. We strongly recommend additional training before getting behind the “wheel” of your boat.

You can order the Inland & International Navigation Rules from:

Superintendent of Documents
U. S. Government Printing Office
Washington, DC 20402
Tel: (202-512-1800) Fax: (202-512-2250)

NAVIGATION RULES

RIGHT OF WAY

1. Cross waves at right angles.
2. When caught in heavy water or squalls, head either directly into the waves or at a slight angle. Reduce speed, but maintain enough power to maneuver your boat safely.
3. Keep your speed under control. Respect the rights of other boaters engaged in all water sports. Give them plenty of operating room.
4. Whenever meeting a boat head on, keep to the right where possible.
5. When two boats cross, the boat to the right (starboard) has the right of way.



WARNING

TO AVOID INJURY AND DEATH
FOLLOW THE NAVIGATION “RULES OF THE
ROAD” TO PREVENT COLLISIONS.



6. When overtaking or passing, the boat being passed has the right of way.

In general, boats with less maneuverability have right-of-way over more agile craft. The skipper must keep his craft clear of the following vessels:

- A vessel not under command or aground; due to their circumstances, these vessels have no maneuverability.
- A vessel restricted in its maneuverability; these vessels usually are performing work which limits their maneuverability such as surveying, dredging, laying pipe or cable, or servicing navigational markers among others.
- A vessel engaged in fishing; these include boats fishing with lines, trawls or nets, but not trolling lines.
- Sailboats; they have the right-of-way over powerboats. However, if a sailboat is using a prop to move forward, it is considered a powerboat even if the sails are up.
- Remember the unwritten “rule of tonnage”. Basically a smaller tonnage vessel should take every effort to avoid close quarters with a larger tonnage vessel. One way to accomplish this is to have a designated human lookout to “eyeball” the horizon for any developing collision course.
- Use defensive driving skills on the waterway just as you do on the roadway. The other vessel may not know the “rules of the road”. Be alert and ready to take immediate action.
- If a collision course is unavoidable neither boat has the right of way. Both boats must react to avoid an accident according to the rules of the road.

LOOKOUTS

International and Inland navigation rules spell out the specifics of establishing a lookout. A lookout is legally defined by the court system as a person who has specifically charged duties on board such as observing sounds, echoes, lights and any inhibitors to navigation with complete thoroughness as permitted by the circumstances.

The term “specifically charged” means that the lookout has no other duties at that time that could prevent him from keeping a proper watch.

Of course the skipper must delegate the lookout duties to a seasoned crew member who can react to events quickly and communicate effectively with the captain with little notice. As captain of your yacht you are responsible for the vessel and the crew. Choose an experienced individual as lookout and review the navigation rules with this person so he can make the right call quickly as situations develop.

WHISTLE SIGNALS

- ONE LONG BLAST:** Warning signal
(Coming out of slip)
- ONE SHORT BLAST:** Pass on my port side
- TWO SHORT BLASTS:** Pass on my starboard side
- THREE SHORT BLASTS:** Engine(s) in reverse
- FOUR OR MORE BLASTS:** Danger signal

BRIDGE SIGNALS

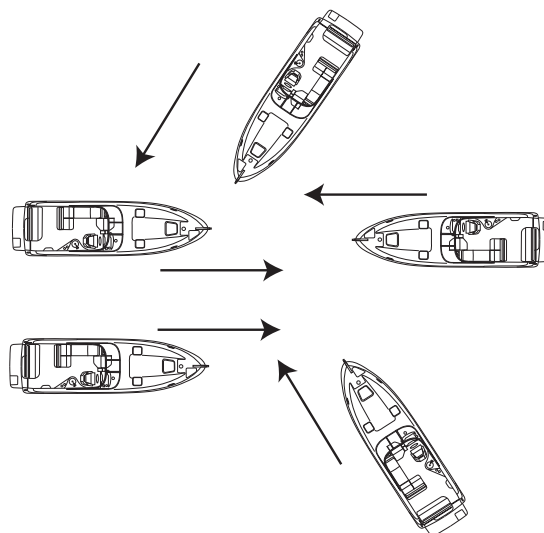
		DAY (Flag)	NIGHT (Lights)
SOUND	VISUAL		
VESSEL: Open	VESSEL: Open	↑	↑
BRIDGE: OK	BRIDGE: OK	↓	↓
No	No	Same	Same
VESSEL: Replies:			
RADIO: VHF CH. 13			



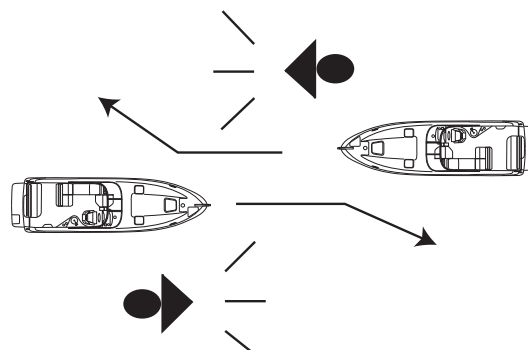
Rules Of The Road

NAVIGATION RULES

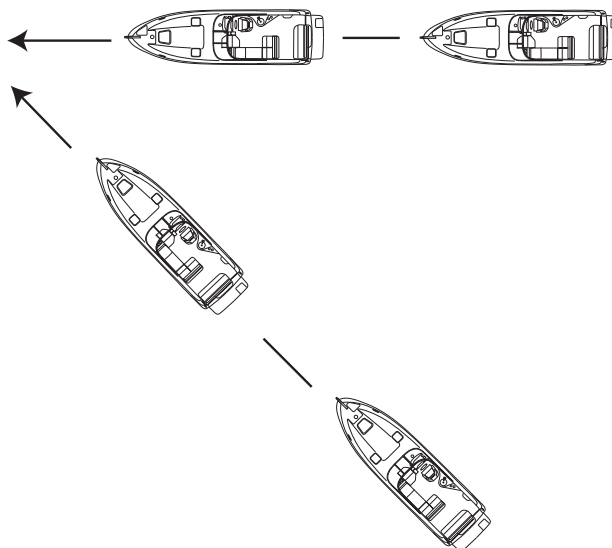
The Navigation Rules set forth 3 types of crossing situations- crossing, meeting, and overtaking. In each case, both boats are governed by special procedures.



In a head-on meeting, both vessels must sound a single blast to give way toward starboard and pass to port.



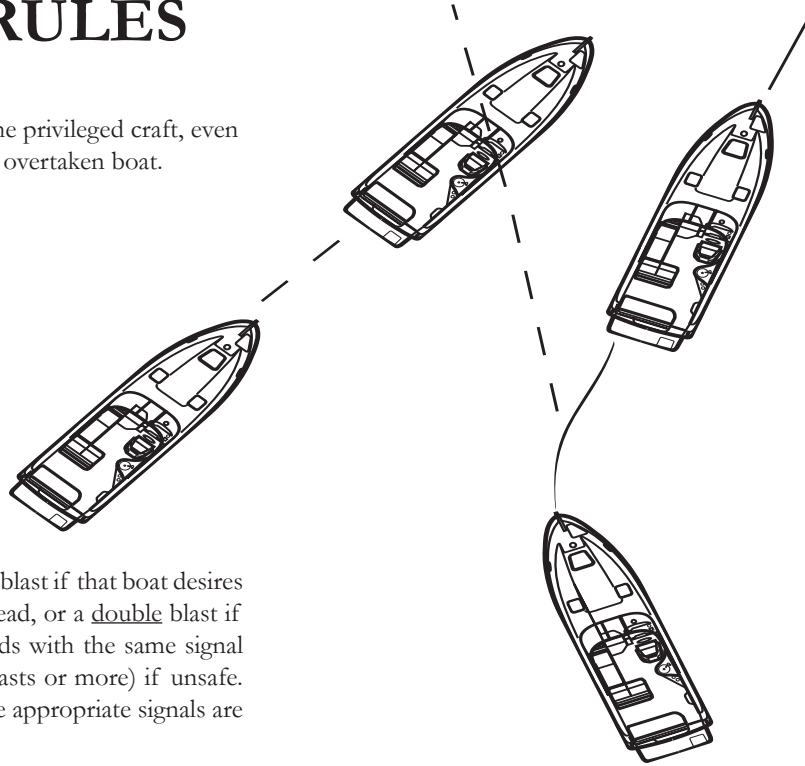
These rules appear when there is a risk of collision. In a crossing situation be aware of the other craft's position. For safety, there should be a noticeable change in the angle, bow or stern; a gradual change in position indicates possible danger.



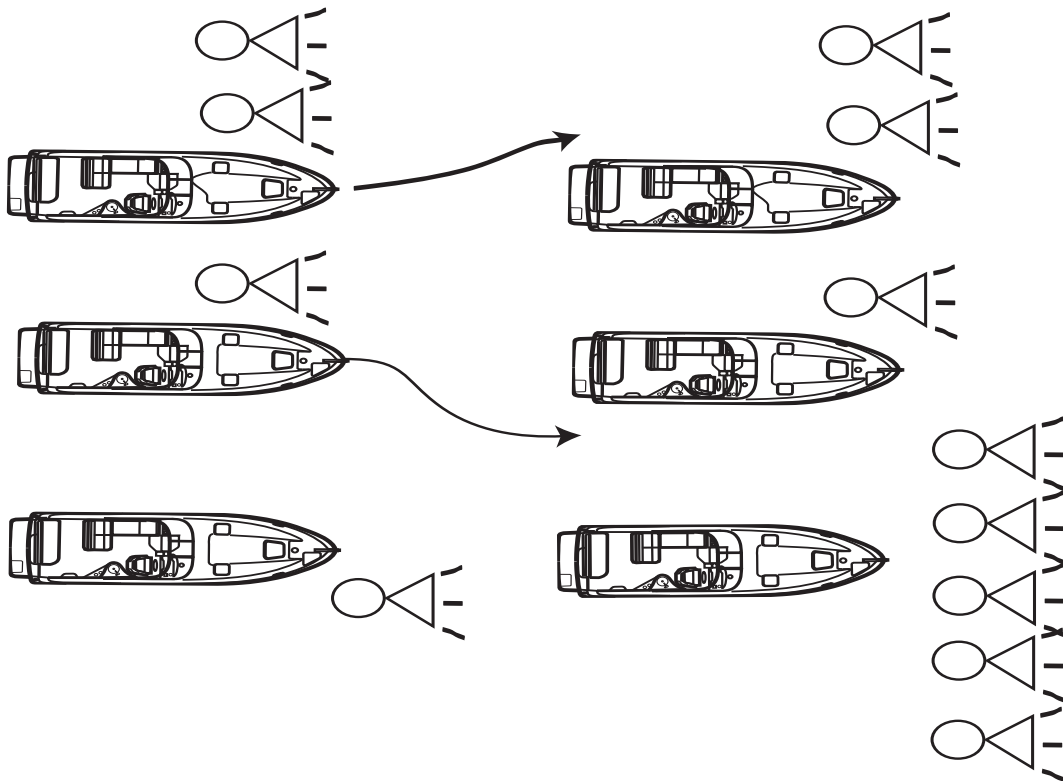


NAVIGATION RULES

An overtaking boat is burdened, and is not the privileged craft, even though it approaches the danger zone of the overtaken boat.



The overtaking boat first signals with a single blast if that boat desires to pass on the starboard side of the boat ahead, or a double blast if passing to port. The overtaken craft responds with the same signal if safe, or with the danger signal (5 short blasts or more) if unsafe. The boat overtaking must not pass unless the appropriate signals are sounded.





Rules Of The Road

NAVIGATION AIDS

Navigation aids are placed along coasts and navigable waters as a guide for mariners in determining their position in reference to land and hidden danger. Each aid provides specific information. They form a continuous system of charted markers for monitoring on the plotter or providing accurate piloting on paper as a backup.

Your on board plotter provides up to date navigation aids. Besides coastal maps a complete domestic interior waterway grid is featured on the plotter.

If desired, there are hand-held GPS devices that are available as back-up devices. In addition, nautical charts are provided by the National Ocean Service (NOS) and are distributed nationwide through marinas and outlet stores. These charts show the geography of the coast, water depth, landmarks, navigation aids (buoys and markers), marine hazards, and port facilities. Use only up-to-date charts for navigation. We recommend when purchasing a chart to look for the weather resistant ones.

Buoys provide a road map to keep the skipper on course and to avoid hazards. Buoys are identified by light, shape, color and in severe weather conditions by sound.

Buoys or beacons called lateral markers indicate the port and starboard sides of the waterway to be followed. U. S markers follow the buoyage system known as Red Right Returning. When returning from sea or traveling upstream, the green markers are to port (on your left) and the red markers are to the starboard side (on your right). When traveling downstream or out to sea the marker color would be reversed.

Before operating your vessel, learn to identify the various navigational aids such as lateral aids, mid-channel markers, information and regulatory markers.

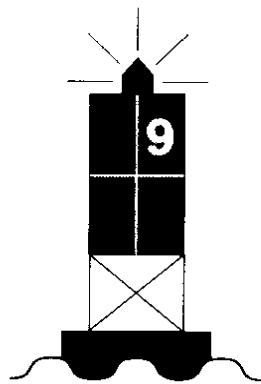
NOTICE

SKIPPERS MUST NOT RELY ON BUOYS
ALONE TO MARK THEIR POSITION.
SEVERE WEATHER CONDITIONS
AND WAVE ACTION CAN ALTER
A BUOYS POSITION.
NEVER TIE UP TO A BUOY.
IT IS ILLEGAL AND DANGEROUS.



LATERAL AIDS

Port Side
Odd Numbers

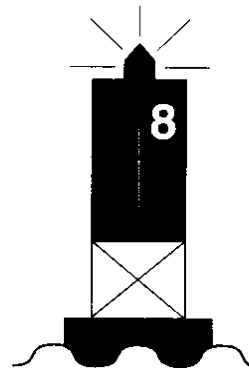


Lighted Buoy
(Green Light Only)

Chart Symbol

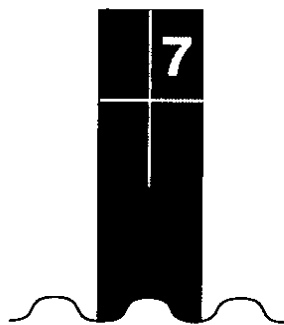


Starboard Side
Even Numbers



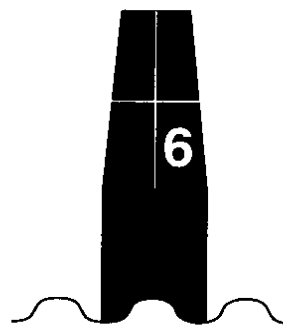
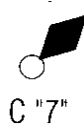
Lighted Buoy
(Red Light Only)

Chart Symbol



Can Buoy
(Unlighted)

Chart Symbol



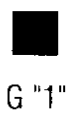
Nun Buoy
(Unlighted)

Chart Symbol



Daymark

-Chart Symbol



Daymark

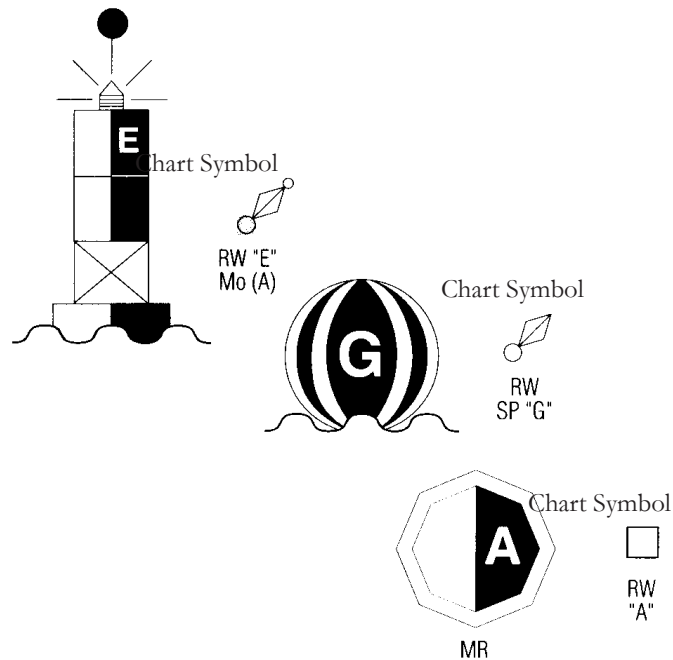
Chart Symbol



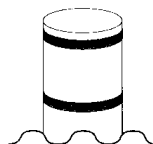


Rules Of The Road

MID-CHANNEL MARKERS



REGULATORY MARKERS



Diamond Shape
Warns Of Danger



Diamond Shape With Cross-
Boats Keep Out



Circle Marks Area Controlled
As Indicated



For showing information such as locations,
distances and directions



NIGHT RUNNING

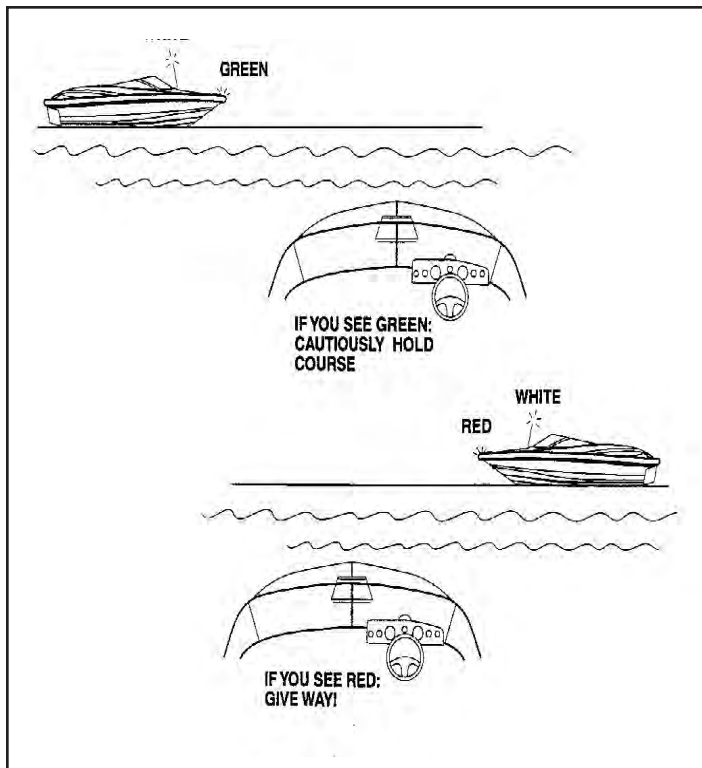


Boats operating between sunset and sunrise (hours vary by state), or in conditions of reduced visibility, must use navigation lights. Nighttime operation, especially during bad weather

and fog, can be dangerous. All Rules of the Road apply at night, but it is best to slow down and stay clear of all boats regardless of who has the right-of-way.

To see more easily at night, avoid bright lights when possible. Also, it is helpful to have a passenger keep watch for other boats, water hazards and navigational aids.

To determine the size, speed and direction of other vessels at night, you should use the running lights. A green light indicates starboard side, and a red light indicates port side. Generally, if you see a green light, you have the right-of-way. If you see a red light, give way to the other vessel.



BRIDGE CLEARANCE

Be aware that your vessel requires a specified bridge clearance height. This height is a measured estimate from the waterline to the top of the highest equipment height. The estimated height can change because of variances in the loaded condition of the vessel. Consult the bridge clearance specifications located in Chapter 12 (Technical Information section).

Some bridges are tendered. Know and use the proper bridge signals when approaching these bridges (see bridge signals in this chapter). You can also monitor and communicate on channel 13 of a VHF radio for bridge information in most domestic locals. Other bridges are marked with a clearance measurement and you are on your own. It is recommended that you have a look out posted for additional visual assistance when entering a bridge zone.

After determining your vessel will clear the bridge proceed with caution at a safe idle speed. Keep your eye on vessel traffic at all times in order to react quickly. Keep both hands on the helm since you may need to change course because of current and wind conditions. Resume a safe speed once clear of the bridge structure and acknowledgment of clear visibility.

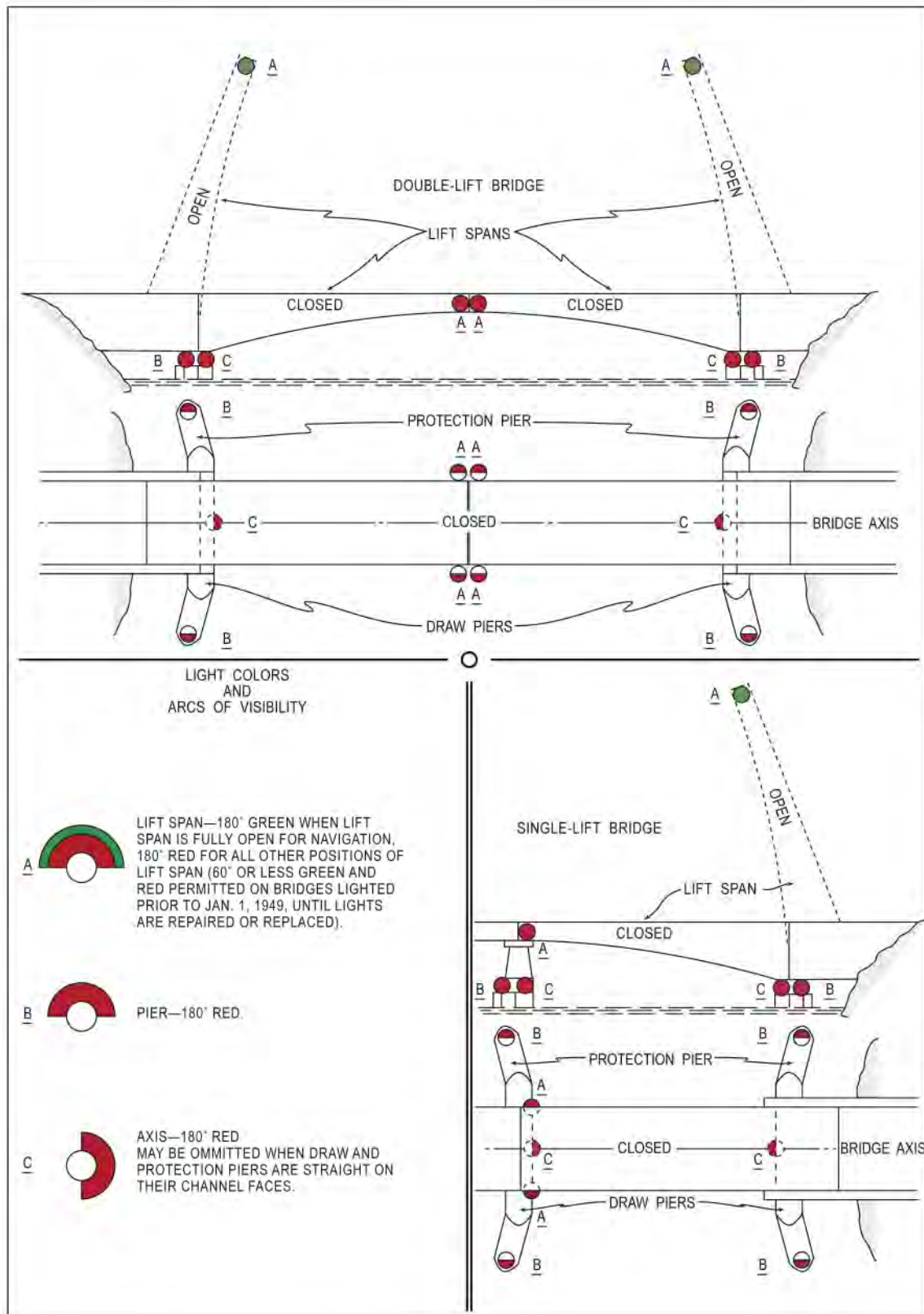
Just use common sense around any type of bridge structure!

BRIDGE LIGHTING

Bridge lighting is maintained by the Department of Homeland Security. On the following pages are 2 typical examples of night-time bridge lighting. As the skipper approaches bascule and fixed bridges light position (arc of visibility) and color will indicate the safe channel through the bridge. Notice green denotes the “safe” entry location on single-span bridges and green or white on multiple-span bridges designates the main channel. In addition, green denotes the “up” position for single and double lift bridges.

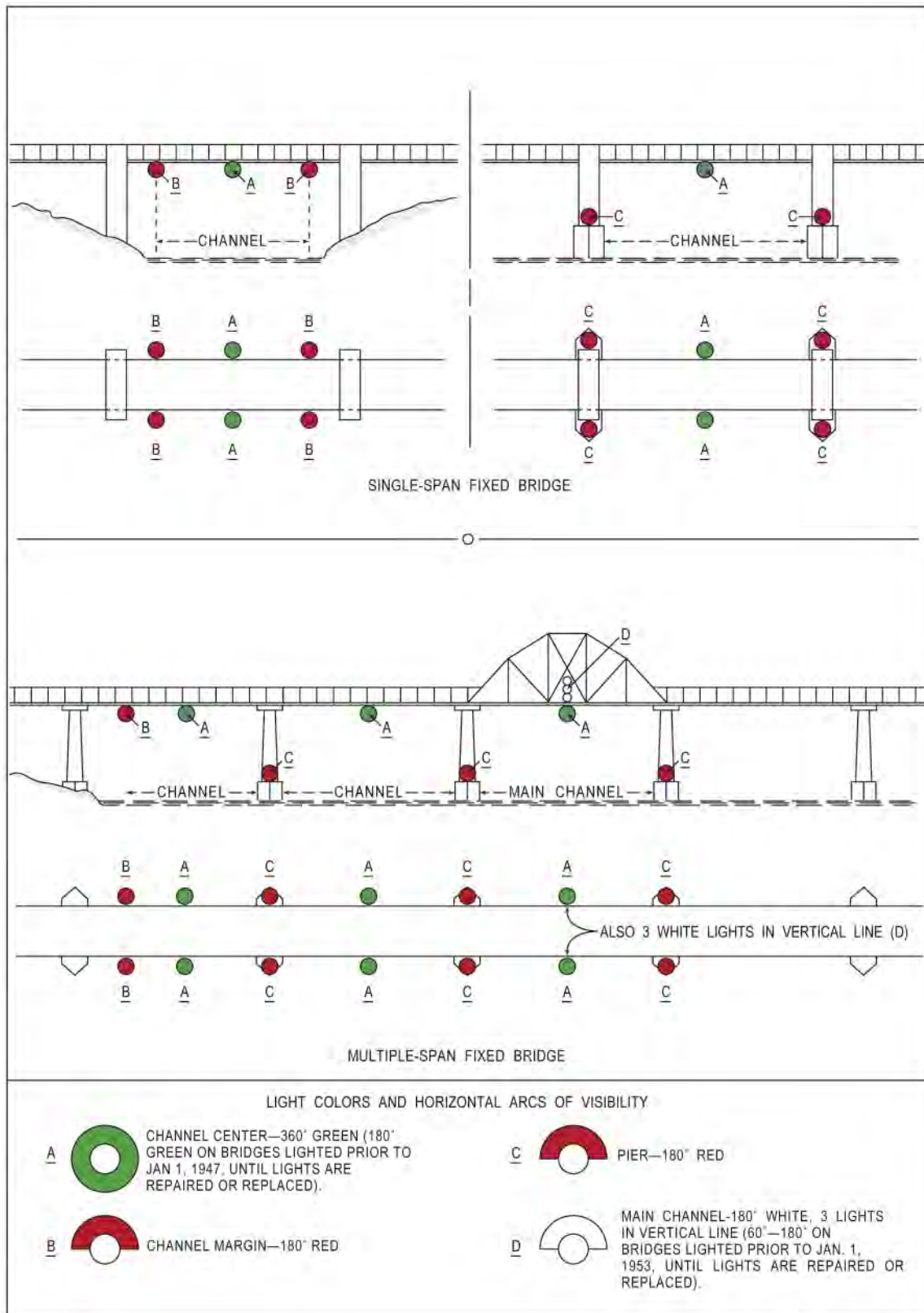


Rules Of The Road





Chapter 3





Systems



OVERVIEW

In this chapter the Regal yacht on board systems are introduced. They include several main systems including fuel, electrical, air conditioning (AC), windlass, water, waste, electronics, and entertainment. Also, various other systems are found in this section. A portion of these systems may or may not be installed on your vessel.

A system description, location of components, operational information along with common problems and solutions are covered with each of the system components.

Be sure to read and follow any danger, warning, or caution labels in reference to the yacht's systems or individual equipment components.

Your Regal yacht may not contain all of the equipment or systems shown. **Regal has the right to modify, update and/or add equipment and systems at anytime.**

Refer to the vendor documentation located in the owner's information packet for further details of individual yacht system components.



FUEL SYSTEM INTRODUCTION

In this section, the basic diesel fuel system components are introduced. The fuel system includes the fuel tank, fuel supply and return lines, fill and vent fittings along with fuel filters and the ventilation system.

Diesel fuel today is processed in a different manner than it was a few years ago. As a result it has become more unstable and the product shelf life has been shortened. A summary of so called diesel fuel “algae” along with its causes and effects will be outlined in this chapter.

As part of the Cummins product features the engines, and the MerCruiser Zeus transmissions are all protected by a fault handling system. A portion of this fault system is used to monitor the diesel fuel system.

Select codes warn the captain with a “buzzer” sound while others will display on the helm tachometer, display, or alarm panel. The “pop-up” will alternate between the cause of the fault and a task to perform to aid in eliminating the situation.

Note that Cummins Inc. recommends the use of ASTM number 2D fuel. The use of number 2 diesel fuel will result in optimum engine performance.

It is important to read and understand your engine and propulsion owner’s manuals in order to react to a fault code should a malfunction display on the instrumentation or an alarm sound.



WARNING

PREVENT INJURY, DEATH, AND/OR PROPERTY DAMAGE!
LEAKING FUEL IS A FIRE AND EXPLOSION HAZARD. INSPECT SYSTEM REGULARLY. EXAMINE FUEL SYSTEM FOR LEAKS OR CORROSION AT LEAST ANNUALLY.



WARNING

PREVENT INJURY, DEATH, OR PROPERTY DAMAGE!
READ AND UNDERSTAND THE PROPULSION OWNER’S MANUAL BEFORE ATTEMPTING TO OPERATE THE VESSEL.



WARNING

PREVENT INJURY, DEATH, AND/OR PROPERTY DAMAGE
DUE TO FIRE OR EXPLOSION!
DO NOT MIX GASOLINE, ALCOHOL, OR GASOHOL WITH DIESEL FUEL.



CAUTION

DUE TO THE CLOSE TOLERANCES OF DIESEL INJECTION SYSTEMS. IT IS EXTREMELY IMPORTANT THAT THE FUEL BE KEPT CLEAN AND FREE OF DIRT OR WATER. DIRT OR WATER IN THE SYSTEM CAN CAUSE HEAVY DAMAGE TO THE INJECTORS OR THE FUEL INJECTION PUMP.



WARNING

PREVENT INJURY, DEATH, AND/OR PROPERTY DAMAGE DUE TO FIRE OR EXPLOSION. DO NOT STORE GASOLINE OR OTHER FLAMMABLE LIQUIDS ON BOARD THE VESSEL!



DIESEL FUEL PROCESSING BASICS

Diesel fuel properties have changed in recent years due to the way the product is processed today at the refineries.

A couple of decades ago diesel fuel, gasoline, home heating oil among other distillation products were processed by heating the crude oil. At different boiling temperatures, various parts of the crude oil were evaporated then condensed sending the final products to storage tanks for distribution. The distillation process generally produced stable diesel fuel with a storage life of several months. Around 50% of the oil left over from the distillation process was designated as heavy fuel oil being used for ship's, power plants, and industrial products such as nylon, plastics, and asphalt.

Refining crude oil today has changed dramatically due to increased demand for the product. A process called "chemical cracking" has allowed the refiner to extract more of the lighter distillates from the crude oil leaving about 16% of the residual as heavy fuel oils. Lowering the diesel fuel sulphur levels due to environmental concerns has led to further fuel instability. Due to these newer methods of refining diesel fuel is far less stable than the older distillation process.

There are different theorems on defining fuel system "algae" and how it develops in the vessel's fuel tank. Algae is slang for the fungus that grows in fuel tanks.

One school of thought isolates two of the key fuel components. Asphaltenes and paraffins in this premise begin to oxidize and re-polymerize forming clusters resulting in fuel tank "algae". As these clusters "grow" in size they cling themselves to tank walls and baffles.

Others state that "algae" is formed when water condenses in the boat's fuel tank. Water can enter the vessel's fuel tank through the fuel pumping process at the fuel dock since their tank may already be contaminated with algae-micro organisms. Once inside the tank these algae-microscopic organisms from the plant kingdom are able to combine with water and diesel to form tank sludge.

Keeping tanks free from water, dirt and micro organisms is almost impossible, but luckily you can eliminate them before they reach the engine and fuel injectors through the use of primary and secondary fuel filters. Algae ends up in the fuel system once the boat is running which breaks up the tank "algae" and/or sludge into mini clusters. Algae ends up in the fuel system once the boat is running which breaks up the tank "algae" and/or sludge into mini clusters. When this condition is present in the marine diesel fuel system the fuel does not combust rapidly as it should resulting in a loss of engine efficiency. Basically, with either school of thought this "algae" or fuel tank sludge is the result of aging diesel fuel. It can occur in as little as 60-90 days depending on the condition of the tanks and environment where the diesel fuel is stored.

Using diesel fuel in this condition may cause the following:

- Fuel tank sludge-remove manually or by chemicals
- Dirty engine oil
- Shortened engine component life
- Smoke emitting from the engine exhaust system
- Carbon deposits in the engine
- Incomplete combustion
- Loss of power and performance
- Clogged primary and secondary fuel filters
- Malfunctioning fuel injectors



SOLUTIONS FOR RECOVERING DIESEL FUEL QUALITY

As a Regal yacht owner you have a huge investment in your diesel propulsion system. Being the engines are key components in the system, keeping the fuel system clean is a high priority.

Following are some solutions to help clean up a diesel fuel “algae” problem:

Periodically use a biocide to *control* microbial activity which can lead to more rapid formation or clustering of solids such as wax and asphalt. Remember that biocides do not prevent microbes from forming but aid in breaking up the clusters. If the vessel is to be stored for over 2 months pour biocide in the semi empty vessel fuel tank. Fill the fuel tank with fresh diesel fuel to prevent condensation build up. Run the boat for a short run to better mix the biocide inside the fuel tank and fuel system before storing the vessel.

1. Always make sure the fuel tank fill cap is securely tightened to prevent any water infusion.
2. Always buy diesel fuel from a marina or fuel dock that moves a large amount of fuel through the pumps. Ask how often the fuel dock pump filters are changed and if their diesel fuel is blended with a biocide. Always carry a couple of extra primary and secondary diesel fuel filters. Use exact replacements in order to match micron filtering capacity.
3. Figure on changing both primary and secondary fuel system filters more often due to today’s diesel fuel shorter storage life.
4. Make sure to drain the 10 micron Racor water separator fuel filter and the engine secondary fuel filter before each outing. Look for sludge/water. Dispose of contaminated diesel fuel properly in approved containers. Do not drain diesel fuel in the bilge.
5. Never let diesel fuel remain in the boat’s fuel tank for more than six months. The cetane value will drop which is its ability to ignite easily. Good grades of diesel support a cetane rating around 50. When the cetane level drops the engine is more difficult to start. The combustion process moves from a controlled burn to an explosion. Pump out the old diesel fuel and replace with a fresh supply.

Old diesel fuel creates more stress on engine parts and produces more noise than normal resulting in the trademark diesel clatter.

Pour a cetane booster and conditioner in the fuel tank with the new batch of diesel fuel.

Note: In severe cases of “algae” the fuel tank may need to be pumped out. To remove the ability to generate the tank should be pressure washed which removes small deposits of “algae” from the baffle system and hard to reach areas. Add a biocide (not a conditioner) and then top off the tank.

Remember: LESS AIR MEANS LESS WATER AND LESS GROWTH!



VENTILATION SYSTEM

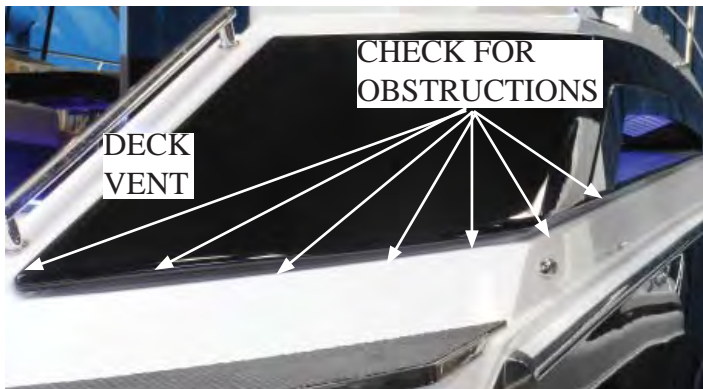
Diesel engines require a continuous supply of fresh air in order to generate peak horsepower and rpm. Because diesel fuel is far less likely to explode it does not require a blower system like gasoline powered vessels to evacuate dangerous fumes.

To deliver fresh air for the diesel engines a dual set of permanently mounted vents are integrated into the boat's deck on both port and starboard sides.

When the engines are started fresh air is drawn through the vent system. As the demand for air increases in relationship to the engine revolutions per minute (rpm's) the engine induction system supplies the required additional air supply by inhaling more air through the vents.

Check the vents periodically for any obstructions or foreign objects such as insect nests or spider webs. If the propulsion system is running at a lower than normal cruising rpm or seems to lack power or the vessel is slow to plane check the fresh air supply to the engines including the engine air filters.

Note: Do not obstruct or modify the ventilation system!

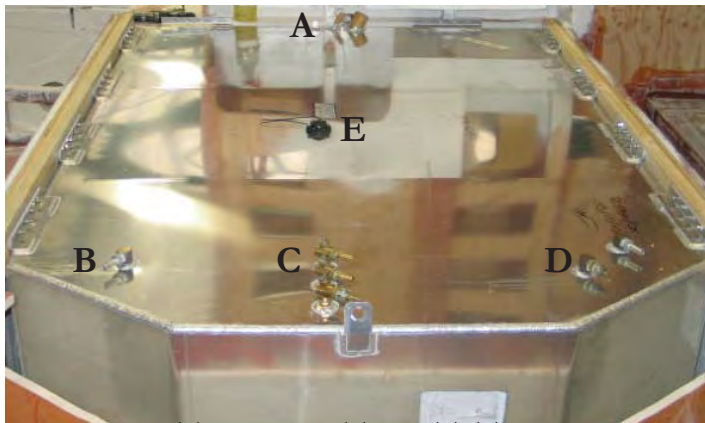




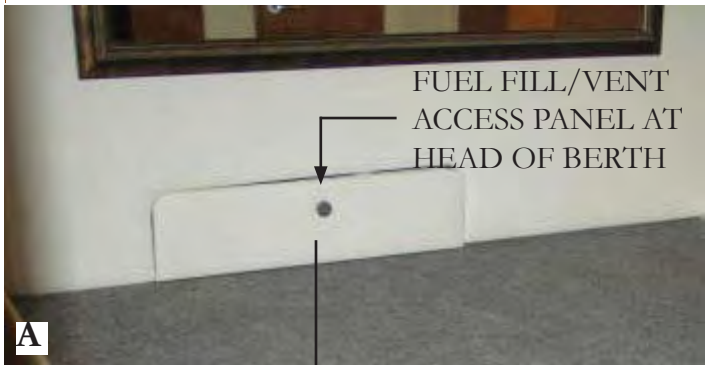
DIESEL FUEL SYSTEM COMPONENTS

FUEL TANK

The fuel tank capacity is close to 450 gallons. The fuel tank is located in the master stateroom under the berth. The fuel tank features shut-off valves for both engines and generator out bound lines. The tank fill and vent connections are located at the forward end of the fuel tank and are accessible by removing the cabinet insert at the center of the forward berth. Under the mattress are access panels for both the “in” and “out” bound diesel lines. See the illustrations for further information.



FUEL TANK-MASTER STATE ROOM



FUEL FILL/VENT
ACCESS PANEL AT
HEAD OF BERTH

A



FUEL TANK
VENT HOSE

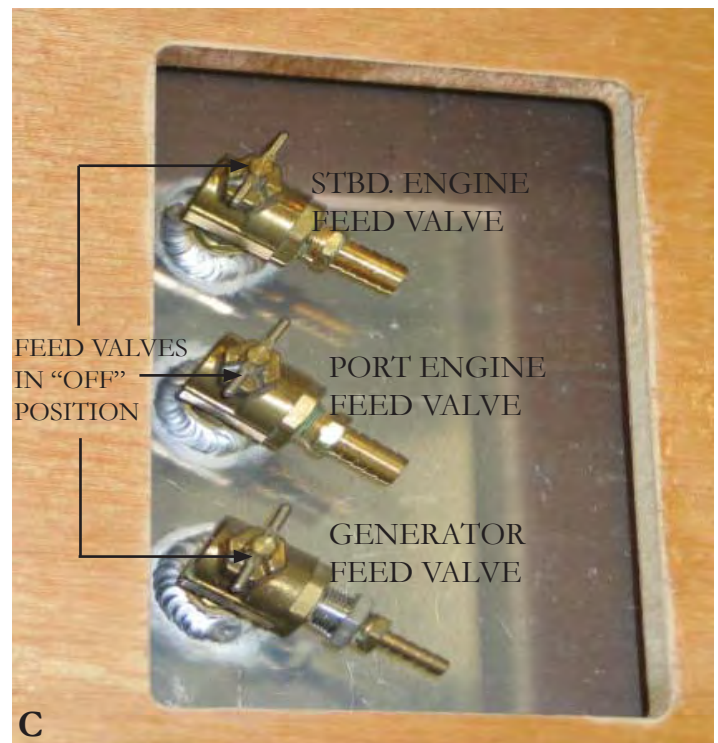
FUEL TANK
FILL HOSE

A



PORT ENGINE
RETURN VALVE

B



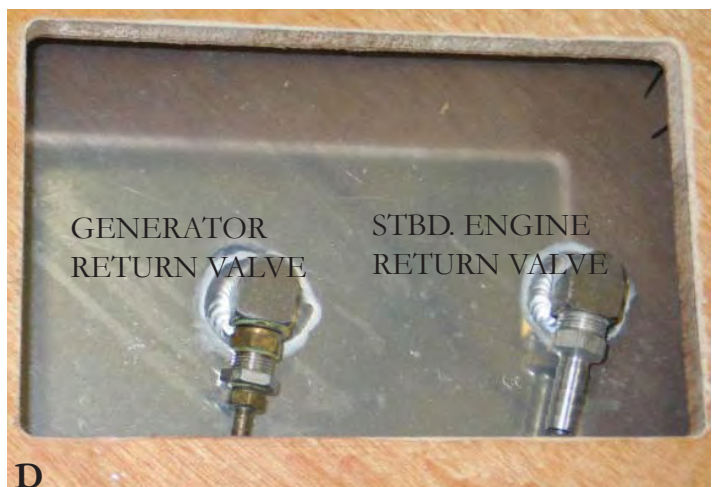
STBD. ENGINE
FEED VALVE

PORT ENGINE
FEED VALVE

GENERATOR
FEED VALVE

FEED VALVES
IN “OFF”
POSITION

C



GENERATOR
RETURN VALVE

STBD. ENGINE
RETURN VALVE

D

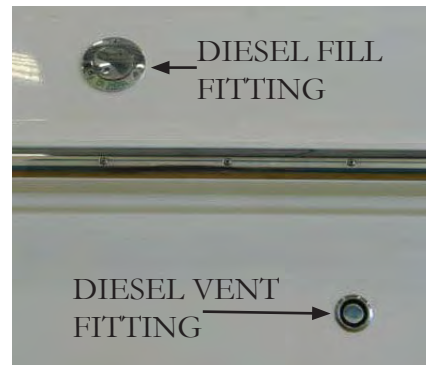


FUEL SENDER



Placed at the top center of the fuel tank is an electronic fuel sender. This device reads the amount of fuel remaining in the fuel tank and sends a signal to various displays including the fuel gauge located at the helm (dash). Always use the one-third rule with diesel fuel. One-third for outbound cruising, one-third for inbound cruising, and the remaining one-third fuel supply for reserve.

FUEL TANK FILL/VENT



The fuel tank fill fitting is located on the starboard deck above the rub rail. It is marked diesel. Never pump gasoline in a fuel tank designated for diesel fuel. After fueling use the fitting key tool to

close the fitting tightly. Failure to secure the fuel fitting tightly may allow water to enter the fuel tank and eventually the engine fuel system. Periodically lubricate the fuel fitting O-ring by coating with clean diesel fuel. This will help keep the O-ring pliable and retain its sealing properties.

The fuel vent serves as a pressure relief for the diesel tank and is a safety overflow device. The vent is found below the fuel fill fitting at the starboard hull side. It has a screen inside which needs to be periodically cleaned. Insects can cause the vent to clog resulting in increased pressure in the fuel system especially noticeable when filling the fuel tank. In extreme clogging cases the fuel will emerge from the fill because the vent is not able to relieve the air in the fuel tank that is being replaced with diesel fuel.

	WARNING
PREVENT INJURY, DEATH, OR PROPERTY DAMAGE! INSPECT THE FUEL SYSTEM PERIODICALLY FOR LEAKS, LOOSE CLAMPS OR FASTENERS.	



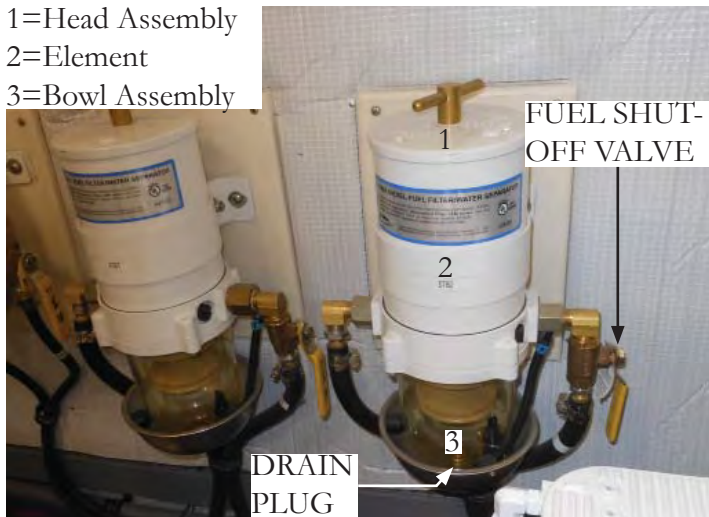
DIESEL FUEL SYSTEM FILTERS

Regal yachts feature a primary and secondary fuel filter system to provide maximum engine protection. Both engines offer in-line 10 micron Parker-Racor 900 MA water separator filters which are the first line of defense.

Note: The generator uses a primary Racor 500 MA filter which is also rated at 10 microns.

In addition, Cummins provides dual secondary filters mounted on the engine for enhanced protection from water, dirt and “algae” micro organisms/clusters. They are of a “spin on and off” variety. It is recommended that you always carry a spare set of these which can be purchased at most Cummins dealers along with the elements for the Turbine series primary water separator filters (shown on next page).

- 1=Head Assembly
- 2=Element
- 3=Bowl Assembly



RACOR PRIMARY WATER SEPARATOR DIESEL FILTERS

Notes-Element Replacement

Contamination level varies in fuels. As the fuel system slowly plugs the element fuel flow to the engine becomes increasingly restricted.

Replace the element every 500 hours, annually, or at the first sign of power loss or hard starting which ever comes first.

To Drain & Reassemble Racor Water Separator Filter

The Racor diesel fuel filter should be drained frequently and checked for water and other contaminants as needed:

1. Place filter fuel valve in the “off” position which is perpendicular (90) degrees to the fuel lines. Failure to turn valve off may allow a continuous flow of fuel due to siphoning.
2. Place a suitable container below the filter bowl assembly to catch the contaminants.
3. If needed use a flashlight and observe the bottom of the glass bowl. Remove drain plug at the bottom of the filter bowl assembly (14). Besides trash look for water which will settle in the bottom of the filter bowl (19) since it is heavier than diesel fuel. It will appear as a different color. Drain the contaminants into the container. Close container and retain for proper disposal. Replace the drain plug. In extremely humid conditions, the fuel system may require daily checks and draining of water.

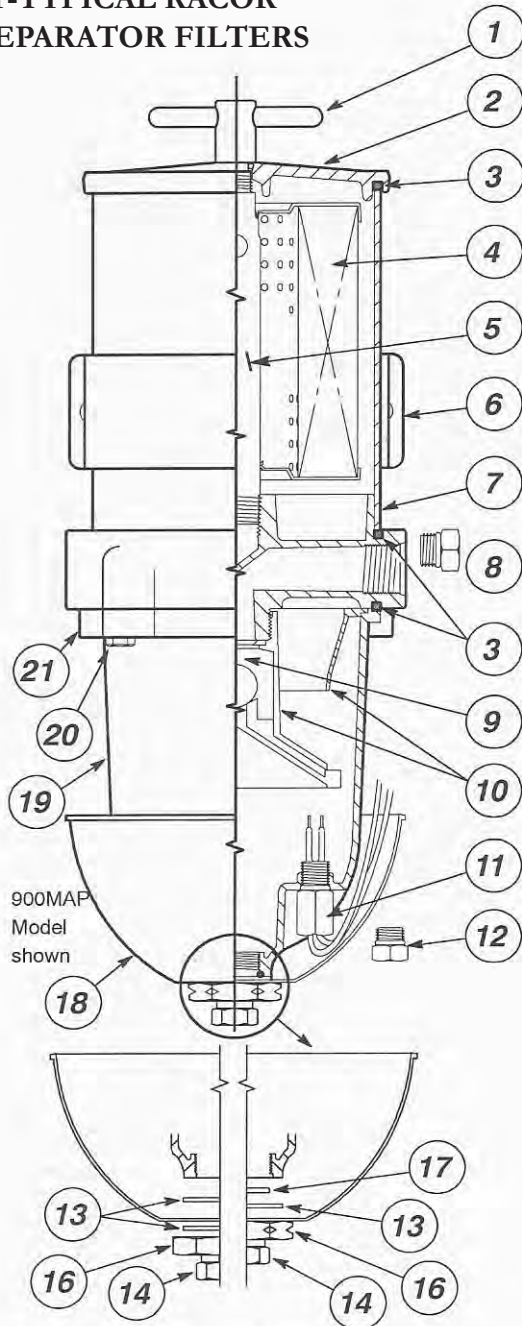
To Prime Racor Water Separator Filter

1. Place filter fuel valve in the “off” position which is perpendicular (90) degrees to the fuel lines. Failure to turn valve off may allow a continuous flow of fuel due to siphoning.
2. Open the filter top by turning the T-handle counterclockwise. Remove the lid. Make sure the O-ring is in good condition.
3. Pour a container of fresh diesel fuel into the head assembly until full.
4. Coat O-ring with diesel fuel and install it in the lid. Place lid on head.
5. Coat T-handle O-ring with fresh diesel fuel.
6. Reinstall T-handle into lid being careful not to damage T-handle O-ring.
7. Hand tighten T-handle by turning clockwise.
8. Open shut-off valve and start engine looking for any system leaks.

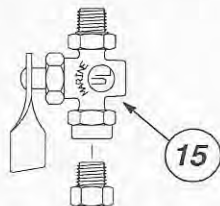
Note: See the troubleshooting chapter for more specific information on fuel filter problems and solutions.



CUTAWAY-TYPICAL RACOR WATER SEPARATOR FILTERS



Old Style³ New Style
Drain Fitting Configurations



Item	Part No.	Description
1	RK11888	T-handle
	11350	T-handle O-ring
2	RK11005B	Lid
	RK11005B-02	Lid with Vent Port and Plug Kit (not shown)
3	11007	Square-cut Gasket (Lid & Bowl ring)
4	2040TMOR	10 Micron Element with Seals
5	RK19001	Return Tube (w/ tapered pipe body-end threads)
	RK19474	Return Tube (w/ straight body-end threads)
6	RK11815-101	Body Clamp Bracket
7	RK19002	Outer Cylinder
8	RK11-1679	Plastic Body Plug
9	RK11028B	Check Ball and Seal
10	RK11026D	Turbine Centrifuge / Conical Baffle
11	RK21069 ¹	Water Probe Assembly
12	RK20022	Metal Water Probe Port Plug
13	RK11341	Bowl Drain Gasket Kit (for New and Old Styles)
	11041	Bowl Drain Washer (New and Old Style)
14	918-N4	Bowl Plug, 1/4" NPT (New and Old Style)
15	RK19492	Diesel Marine Shut-off Valve Kit.
16	11-1910	Bowl Drain Fitting (New Style)
	RK11-1910	Complete Bowl Drain Fitting Kit (New Style)
	11040	Bowl Drain Fitting (Old Style)
17	11340	Drain Fitting O-ring (New Style)
18	RK11868 ²	Heat Deflector Shield (MA)
19	RK11-1606-1	Clear Bowl with Water Probe Port
	RK11734	Metal Bowl (MAM -not shown)
	RK11734-01	Metal Bowl w/ 1/4"NPT Drain & Water Probe Port
20	RK11542	Hex/Washer Head Capscrew, 1/4"-20 x 1" (4)
21	RK11037A	Bowl Ring
22	RK11-1404	Seal Service Kit (all models- not shown)
	19466	Installation Instructions, 900/1000MA

¹ For diesel service only. Must be used with a Water Detection Kit.

² For replacement only. The Coast Guard does not accept 'FG' units converted to 'MA' configurations.

³ Units built prior to Fall, 1998

Note: 900 MA series filters typically use a round O-ring verses the square one shown here.



SECONDARY ENGINE MOUNTED DIESEL FUEL FILTER

To Drain, Prime Or Replace Secondary Fuel Filter Element

Refer to the Cummins operator manual for specific information or contact your Regal yacht dealer. Read and understand the procedures before attempting to service the secondary engine mounted fuel filter. Follow all safety requirements and environmental regulations when servicing the fuel system.

Note: These engine filters are of the “spin off and on” variety similar to automobile oil filters. An oil filter strap style tool is needed for loosening and tightening the engine secondary type fuel filter. These tools can be obtained at most retail auto parts stores. Use a metal pan for catching contaminated diesel fuel. Always dispose of properly.



POSSIBLE FUEL PROBLEMS/SOLUTIONS



1. Engines are hard to start or rough running- This problem may be caused by air in the fuel system or a restriction in the fuel supply which causes a lean condition.

Check all fuel system lines, clamps, fittings and filters for tightness. Prime and bleed the fuel filters if necessary.

2. Fuel filter elements contain “algae” or exhibit a brown or black color and/or show water in the fuel system.

Check fuel tank for “algae” clusters. Fuel tank may require pumping out and a cleaning with a pressure washer or a biocide being added to “kill” existing organisms which may be caused by water in the fuel system and fuel tank. Replace all filter elements and top the tank with fresh diesel fuel. Prime and bleed the system. Run the engines and check for fuel leaks and restrictions along with the possibility of further contamination moving within the fuel system lines and/or components. It may be necessary to replace diesel fuel system filter elements several times to rid the system of contaminants.

3. The fuel tank reads low and the engines are running rough. The pick-up tubes in the diesel fuel tank have sucked up air instead of fuel. The air has meandered through the fuel lines, filters and is effecting the engine performance. Top off the fuel tank as soon as possible. Also, the fuel system must be bled and primed.

Another possible result of running with a near empty fuel tank is the same pick-up tubes sucking water into the fuel system. Remember water is heavier than diesel fuel and will hug the tank bottom or baffle areas. Take a sampling of diesel fuel to identify any water in the fuel system.

4. Recommissioning after 6 months of winter storage with a full diesel fuel tank the engines are hard to start and exhibit a diesel clatter noise.

The diesel fuel in the tank may have deteriorated due to its age. The cetane value may have decreased causing more of an explosion inside the cylinder verses a controlled burn. To start with add a cetane booster and conditioner. If this fails take a sampling of diesel system fuel at the filters.

As a last resort pump out the fuel tank and replace with fresh, clean diesel fuel.



ELECTRICAL INTRODUCTION

In this section, basic DC (direct current) and AC (alternating current) electrical systems are introduced. Each electrical component is reviewed along with its location and function within the Regal yacht electrical system.

For more complicated issues outside the scope of this manual contact your closet Regal yacht dealer. They have undergone extensive training on the Regal yacht systems. Be sure to read and follow any danger, warning, or caution labels in reference to the yacht's electrical system or individual equipment components.



WARNING

PREVENT SEVERE INJURY OR DEATH!
DISCONNECT
ALL ELECTRICAL POWER SOURCES
BEFORE ATTEMPTING
TO REPAIR OR REPLACE
ANY ELECTRICAL COMPONENTS.



DIRECT CURRENT (12 VOLTS)

Your Regal yacht uses 12 volt DC electricity otherwise known as direct current. It is called DC because it flows only one way in a circuit. Specifically to name a few, helm gauges, batteries, battery cables, engine electrical components, engine wiring harnesses, dash switches, selected lighting, shower sump, bilge pumps, and vacuum style toilets are all components using a 12 volt DC system. With the DC system used in the U.S.A the red wire is designated as the “hot” or conductor wire and the black wire is referred to as the ground wire. At times other current carrying wires are color coded such as blue to identify their use as a low voltage conductor. This is especially helpful in troubleshooting and adding additional equipment. Be sure to review the wiring schematics in the drawing section of the technical chapter.

Direct current is stored in the ship’s batteries and *produced* through the engine alternators while the engines are running or by the battery charger at dockside.

The alternators charge the batteries by sending current through the main distribution panel relays, battery switches and harnesses to the appropriate battery. Normal DC voltage is between 12 and 15 volts. Lower or higher readings could indicate a charging malfunction or a weak battery.

The Cummins diesel engine alternators used on your yacht are internally self “excited” and initially produce DC current around 1200 rpm’s.

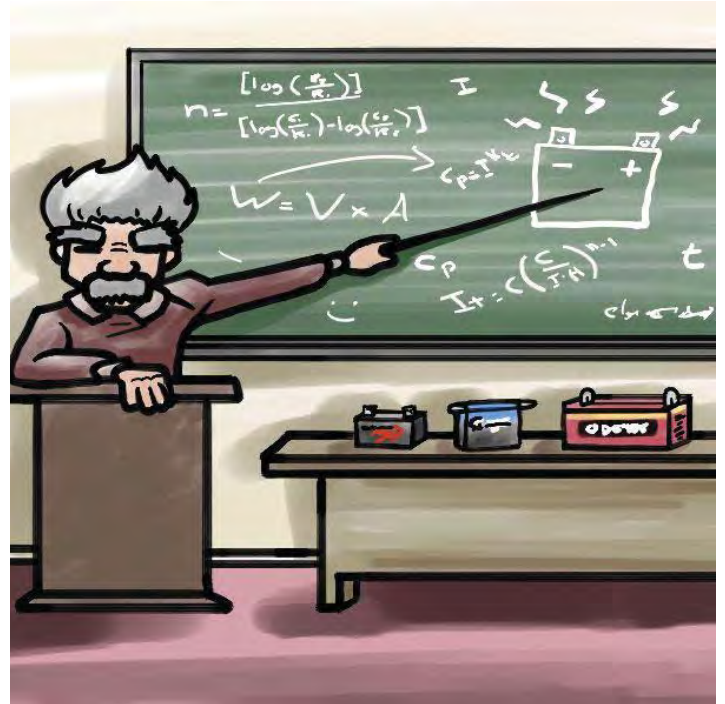
Current specifications for alternator output is between 130 and 160 amps.

Note: The port cranking battery controls the windlass, port engine and generator.

The starboard cranking battery controls the starboard engine

The house battery controls a variety of onboard equipment.

BATTERY (12 VOLTS) DESCRIPTION



On board direct current is *stored* in the ship’s AGM batteries. There are 2 engine starting batteries (one for each engine) and a deep cycle “house” battery.



Port Engine
Cranking
Battery

Typical
House Battery

Starboard Engine
Cranking
Battery



BATTERY SPECIFICATIONS			
Battery Type	Group	CCA @0 Degrees F.	Reserve Capacity
Engine Cranking	Specialty	1400	400 min.
House	8D	840	160 min.

Your Regal yacht utilizes AGM (Absorbed Glass Mat) batteries which their construction allows the electrolyte to be suspended in close proximity with the plates active material. The design allows oxygen to recombine with hydrogen gas, thus replenishing the battery's water content and alleviating the need for refilling. This set-up normally enhances both the discharge and recharge efficiency. Other AGM battery features allow easy storage and less sulfating or degrading verses "wet cell" batteries. Also, there is little chance of a hydrogen gas explosion or corrosion when using these batteries.

HOUSE BATTERY

The deep-cycle house battery employed to supply many of the ship's DC components use energy at a much slower rate and often do not get completely re-charged until the end of the day. This deeper and more strenuous discharge is hard on a battery and requires different design specifications; the result is a battery with AGM sandwiched between much thicker plates than the cranking battery that will withstand the demands of deep cycling. It is recommended that if one house battery is defective replace the whole bank as the older ones left will tend to bring down the new one.

CRANKING BATTERIES

The engine cranking batteries used to supply starting amperage use energy at a much quicker rate. They are made with AGM sandwiched between much thinner plates but many more layers than deep-cycle types which contribute to delivering quick and massive amounts of energy for tough starting assignments. This type battery replenishes its energy quickly through the engine alternator system.

BATTERY TERMINOLOGY

Group- Batteries are divided into groups which identify the height, length, and width of the battery. This is useful information should a replacement battery become necessary.

Cold Cranking Amps (CCA)- This rating measures the cranking power a full charged marine battery has available to start at 0 degrees F. Basically, the higher the rating the greater starting power of the battery. Note: This is not an important specification for deep cycle batteries.

Reserve Capacity (RC)- As usage on the boat increases so does the need for more reserve capacity. The reserve capacity represents the length of time in minutes at 80 degrees a new fully charged battery can maintain the yacht's electrical needs without the engine running or in the event the alternator fails.

In general, the higher the minute rating, the greater the battery's ability to run the yacht's electrical accessories with the engines off or in the event an alternator or belt fails.

Battery Age- Normally located on the top or side of the battery is a label showing the month and year the battery was shipped from the factory. The letter corresponds with the **month**, starting with "A" for January, "B" for February, and so on.

The number represents the **year** with "9" standing for 2009, 0 for 2010, and so on. A9 would be January, 2009. CO would be March, 2010 and G1 would be July, 2011.

Battery age is a factor used to determine replacement needs. See Chapter 8 for battery maintenance tips.



BATTERY TESTING

For all battery testing you must first fully charge the battery and then remove the surface charge. This could be done by discharging the fully charged battery for several minutes by activating an object that draws heavily from this battery.

If a digital volt meter is used to check an AGM battery expect readings in the 12.8 to 12.9 range. Readings in the AGM battery around the 10.5 range typically indicate a shorted cell.

If a load meter is used to test a AGM battery, the actual draw typically needs to be 1/2 of the CCA rating. Before load testing the battery needs to be fully charged.



CAUTION

AVOID EYE DAMAGE/SKIN BURNS!
WEAR GOGGLES & RUBBER GLOVES
WHEN WORKING WITH BATTERIES.

AVOID CONTACT WITH SKIN,
CLOTHING OR EYES.

IN CASE OF CONTACT,
FLUSH WITH WATER
FOR AT LEAST 15 MINUTES.

IF SWALLOWED,
DRINK LARGE QUANTITIES
OF WATER OR MILK.

FOLLOW WITH MILK OF MAGNESIA,
BEATEN EGG OR VEGETABLE OIL.

GET MEDICAL ATTENTION IMMEDIATELY.



CAUTION

TO PREVENT BATTERY ARCING
FIRST REMOVE THE NEGATIVE BATTERY
CABLE FROM THE BATTERY.

POSSIBLE PROBLEMS/SOLUTIONS



1. Weak battery- The AGM engine cranking batteries require no water. They do feature a different chemistry that does consume less water. Inside the cells as gases are released condensation is formed which aids in maintaining the cell electrolyte level. These batteries incorporate a deeper layer of electrolyte over the plates, but eventually it can run dry. On the 31 series engine cranking batteries keep all terminals clean, connections tight and your electrical system in top shape to extend the battery life.

2. Dead Battery- Either the AGM battery will not accept a charge, hold a charge or the charging system is not supplying a charging current through the battery charging system and/or engine alternators.

The battery charger output can be checked by monitoring the lights on the charger front face.

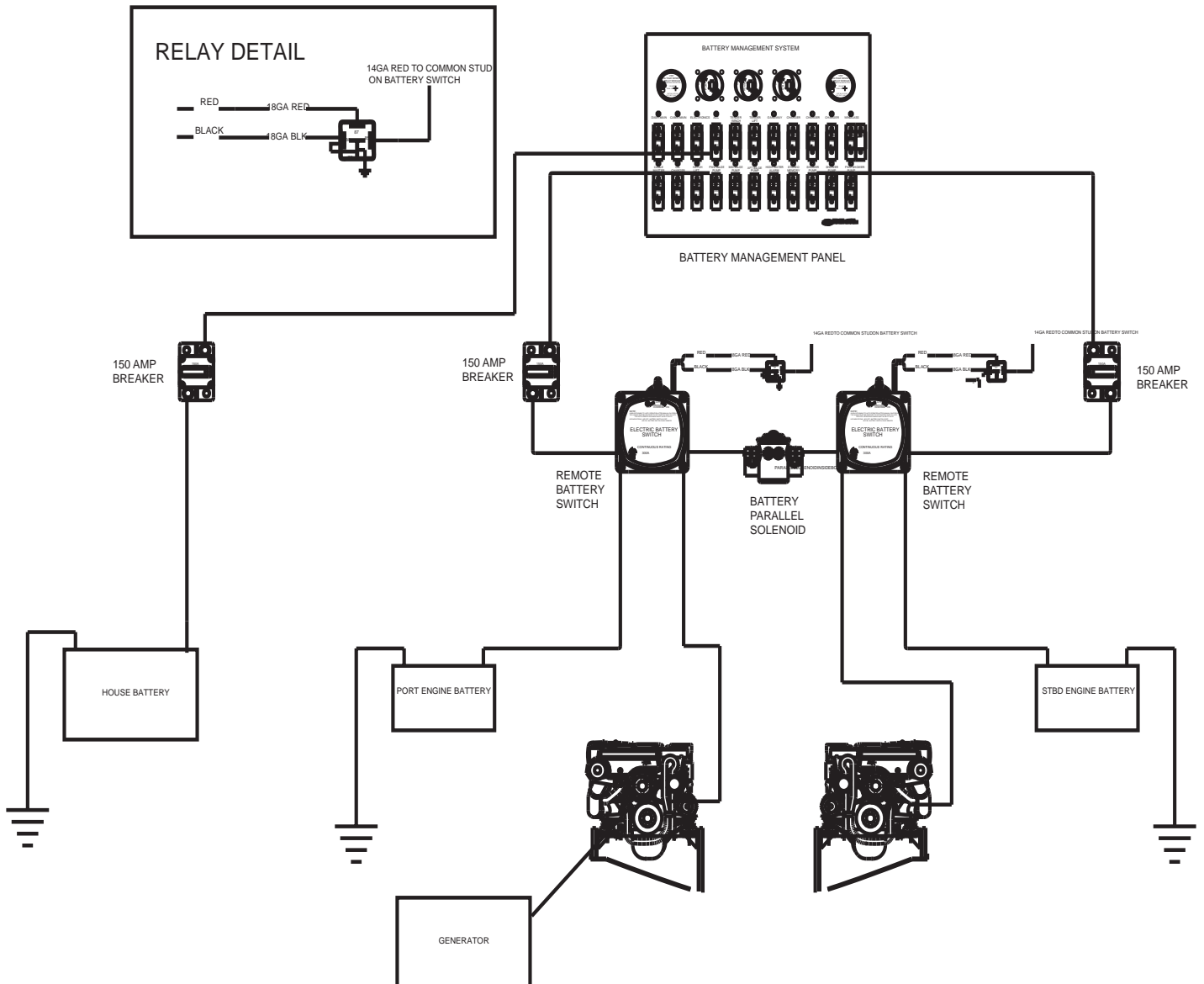
To begin with check the battery post connections for tightness and corrosion.

With the engines running the displayed voltage of the port or starboard engine battery and house battery should be between 12.5 up to 14.6 volts. If less than 12 volts check for voltage across the battery terminals.

Note: If one of the house batteries goes “dead” it is recommended that the **entire battery bank** be replaced.



BATTERY MANAGEMENT SYSTEM COMPONENTS





REMOTE BATTERY SWITCH

As part of the battery management system remote battery switches are located in the engine room.

A remote battery switch is wired between each engine and the “on-off” universal battery switches located at the battery management system panel. See the illustration.

Their purpose is to break up the long battery cable runs from the batteries to the management center panel. Also, they offer a shorter run from the battery to the starter motor. In addition, the remote battery switch from the bilge (sump) provides an avenue to shut down the battery system during engine or sump routine maintenance functions. Remote battery circuits normally feature 150 volt breaker protection.

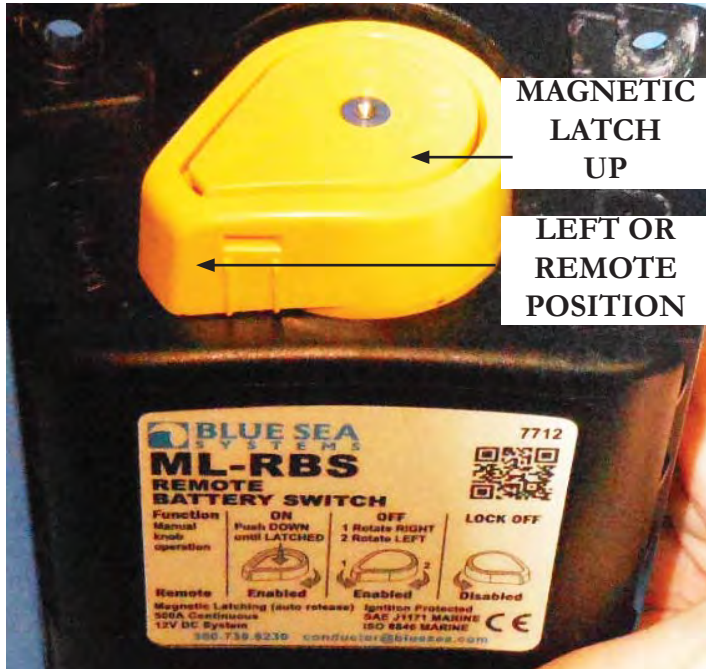
Each remote battery switch provides a continuous rating of 300 amps DC and a cranking rating of 1250 amps DC. Both remote battery switches are “in line” between each cranking battery and the engine. The “house” battery does not employ a remote battery switch.

NOTICE

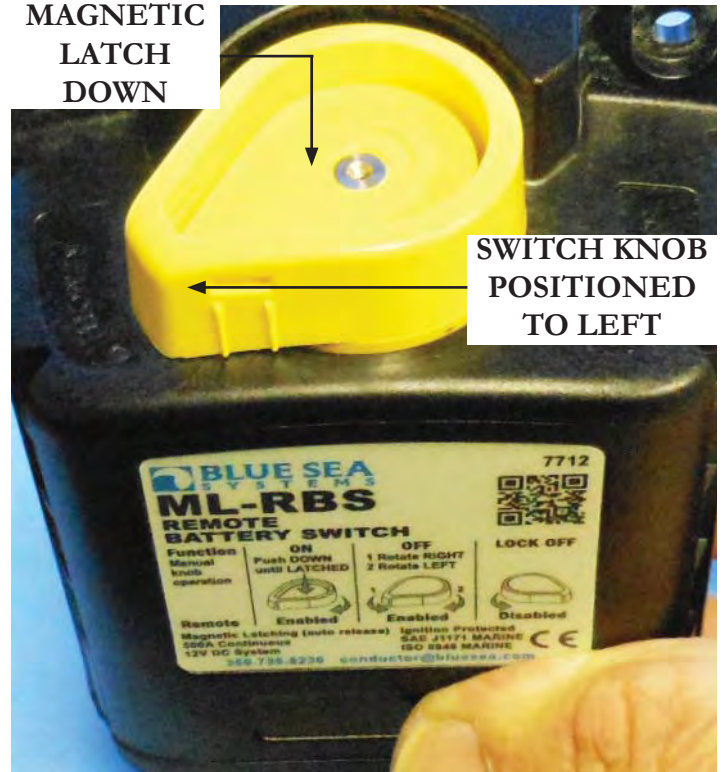
IF THE REMOTE BATTERY SWITCH POSITION IS CHANGED IT MUST BE REPOSITIONED BY PUSHING THE MAGNETIC LATCH DOWN TO REACTIVATE THE REMOTE BATTERY SWITCH OR THE ENGINE WILL NOT CRANK. THIS MAY NEED TO BE PERFORMED AFTER PERIODIC MAINTENANCE SCHEDULES WHEN THE REMOTE BATTERY SWITCH IS TEMPORARILY DISABLED.



REMOTE BATTERY SWITCH OPERATION



MAGNETIC LATCH DOWN

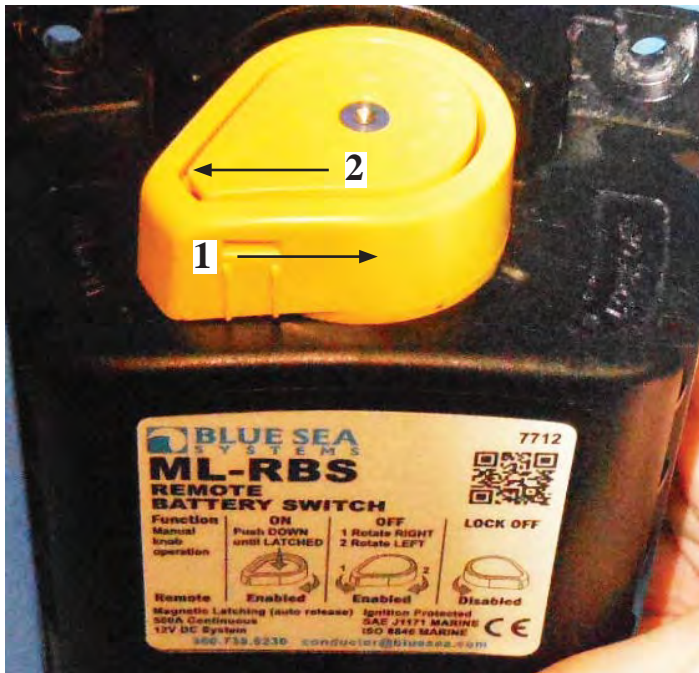


1. **Normal operation** of the remote battery switch is completely to the left in the auto or “remote” position. Notice latch position is up (manually disengaged). When you turn on the dash ignition 12 volts is sent to the remote battery switch and you may hear the magnetic latch being engaged as it is being thrust downward. It makes a sound similar to a solenoid.

2. If the remote battery system fails for some reason the skipper can override the remote battery switch manually through the magnetic latch which is located on top of the switch. Just turn the switch to the left and push the magnetic latch down until it engages.



Chapter 4



3. To disconnect the manual control override position of the remote battery switch (should it be used) first (1) rotate the switch to the **right** to release button from latch on mode (button pops up). Next, (2) rotate switch knob to the **left position** (remote position).

4. To turn the remote battery switch in the “Lock” position (disengaged) turn the switch to the right. With the magnetic latch disengaged or up the battery circuit is now in the “off” position and service maintenance on that circuit can be performed.



POSSIBLE PROBLEMS/SOLUTIONS

Some of the more common problems with the remote battery switch could be:



1. Engine will not crank over- The remote battery switch is sensed to be in the “off” position because it was not properly reset to the “auto” position. Reposition the remote battery switch to the “auto” position by switching it to the “off” position first, then back to the “auto” position.

2. Intermediate cranking of engine with remote battery switch in the “remote position”. Check for loose hardware connections at the lower section of the remote battery switch or loose wiring and tighten as required.



BREAKER-BATTERY CIRCUIT

As part of the battery circuit protection from the battery to the battery management system panel a 150 amp breaker is installed within 40" of the battery. All 3 battery circuits utilize one of these breakers which is located in the forward engine room.

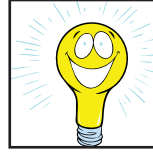
If the breaker would draw excessive amperage it is possible it could "blow". At this point it would need to be reset.



Always determine the reason why the breaker blew before resetting the breaker.

To reset the breaker move the lever from the "off" position to the "on" position as indicated by the red arrow above.

POSSIBLE PROBLEMS/SOLUTIONS



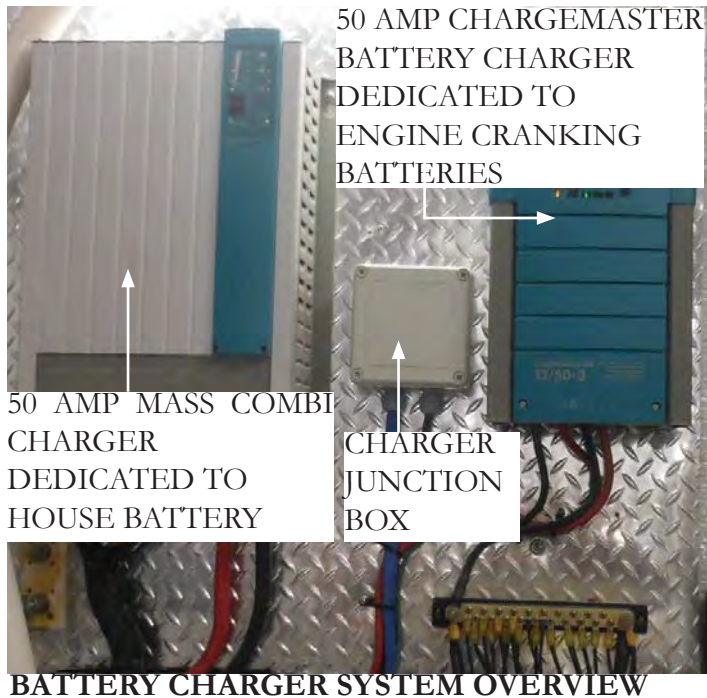
1. One of the three universal battery switches and breakers at the battery management panel do not function-

The breaker is blown. Reset the 150 amp breaker after determining the cause of the problem.

2. One of the 150 amp breakers has blown- it is possible that the circuit has drawn excessive amperage. Check the circuit components and wiring before resetting the breaker.



BATTERY CHARGERS



The following information covers the typical yacht 50 amp Chargemaster battery charger dedicated to the engine cranking batteries located in the bilge. It is located on the forward starboard side of the engine compartment. The battery charger operates on 120 volt AC power made available from the dockside shore power or from the on board generator. The charger changes AC to DC current internally to enable battery charging. When the diesel engines are running the alternators produce DC current to charge the batteries.

The cranking batteries are selectively charged through a set of relays called DVSR's located on the battery management panel. They sense which batteries need a charge. The relay circuit closes and sends a charge to the appropriate battery. The battery charger features a set of dip switch settings to enable different configurations. DIP switch #1 needs to be set to the "on" position for AGM type batteries which are outfitted as original equipment. If for some reason the battery type changes and new types are installed the dip switch settings on the battery charger need to be reset. Never mix battery types such as AGM and lead acid types.

The charger will function on AC voltage from 95 to 277 volts and either 50 or 60 hertz (cycles). The charger automatically sets itself for the voltage available. This is helpful at docks that carry low voltage; it works down to 95 volts. It is also helpful in international markets where 230 volt 50 hertz voltage exists. On this vessel, the charger is used as a 120 volt component not 240 volts. This battery charger is fully automatic, microprocessor controlled and is multi-staged to provide the most efficient service for the customer.

The face of the battery charger displays status, battery type and fault LED's.

Periodically check the battery charger output current (DC ammeter) to visually monitor the charging circuit. The levels will vary depending where the system is as far as recharging the batteries. This can also be accomplished by choosing a source battery on the display and by selecting amps which will show a level at the load bar. See the display illustration on the next page.

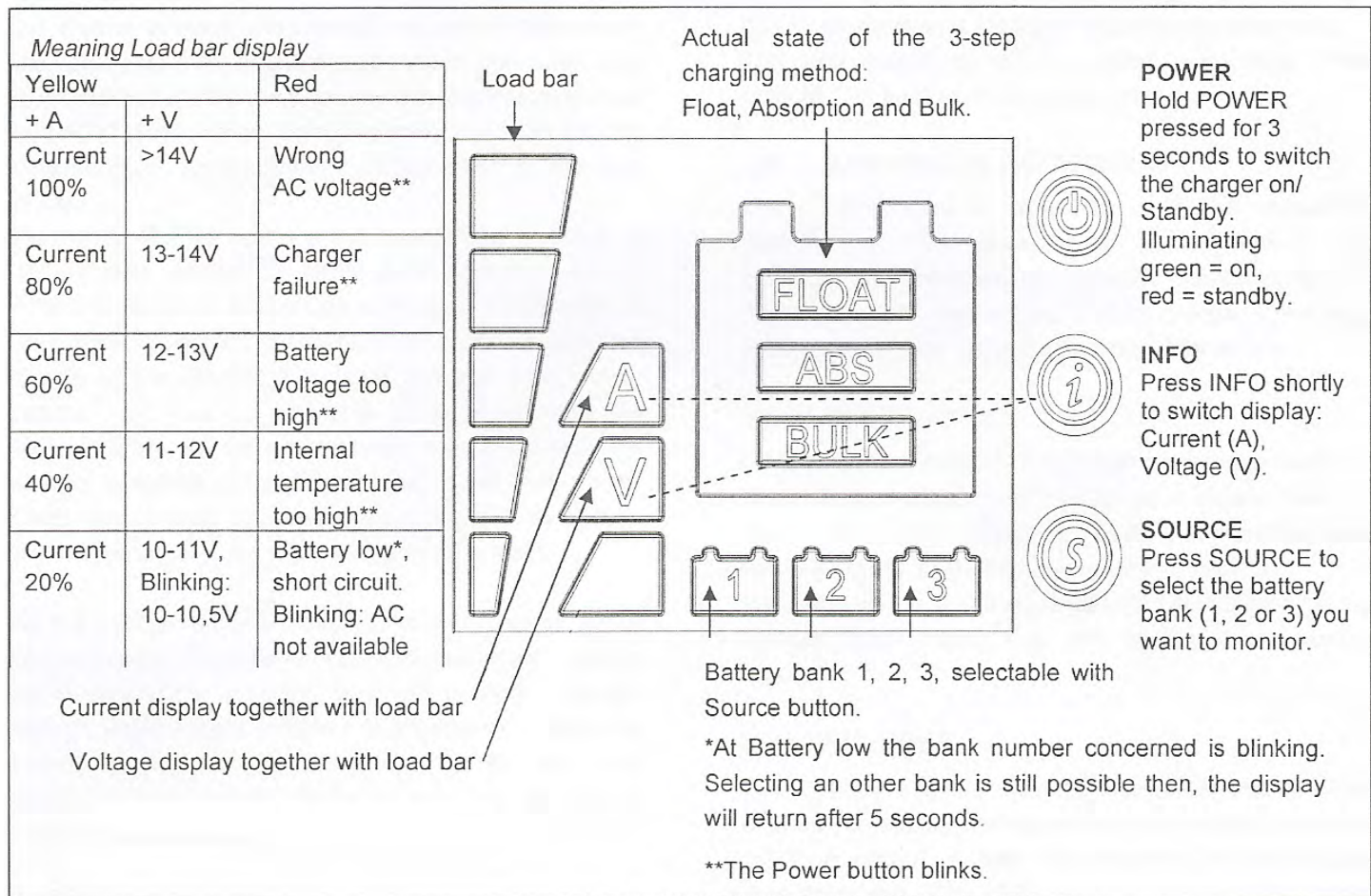
With a correct functioning charging system as the batteries become charged the amp rate should diminish. Batteries that are highly discharged will demand a greater initial charge rate and the output meter may show on the high side of the readout and slowly diminish as the battery over time becomes fully charged. This is a normal condition.

Another way to check the battery charger output is at the AC/DC panel. With all battery charger breakers "off" the volt meter should show around 12.5 volts. Energize several breakers and flip on the battery charger breaker. The ship's main panel volt meter should slowly begin to show charging current above battery voltage levels.

The charger junction box serves as a relay and connection point for battery charger wiring. See photo above.



CHARGEMASTER BATTERY CHARGER DISPLAY



The battery charger features a LED multicolor display. Different LED colors and combinations have different meanings. Combination of the current display (A) with the load bar shows the percentage of maximum current, of the total banks. Combination of (V) with the load bar shows the actual charging voltage.

This charger is protected against overload, short circuit, over heating and under or over voltage. If a fault condition occurs, a load bar segment on the display illuminates red. The LED position indicates the failure which the cause can be found in the charger operator's manual.

Note that this battery charger normally feeds both engine cranking AGM batteries but should these batteries be fully charged the VSR's can close and the house battery could receive residual charge current through this charger.

For the charger to function the battery charger breaker on the main AC ship's panel must be activated.



The status LED's denote the type of charge being distributed to the batteries.

1. The BULK (FAST) CHARGE indicates the battery charger is sending a higher output which reaches deeper into the battery plates. This cycle stops once the battery reaches 14.4 volts. The duration of this phase depends on the ratio of battery to charger capacity, and also on the degree to which the batteries were originally discharged. This sets the stage for the next charging cycle.

2. The ABSORPTION CYCLE is calculated by the charger software for an optimum recovery and time frame. Individual adjustable settings then are used to provide a safe and perfect charging cycle for individual batteries. The absorption cycle begins when the battery voltage has reached 14.4 volts. With this cycle, battery voltage remains steady at 14.25 volts and the charge current depends on the degree to which the battery was initially discharged. Normal cycle time is around 3 hours for AGM batteries.

3. The FLOAT CYCLE voltage stabilizes voltage at 13.25 volts which will maintain the battery(ies) in an optimum condition. Any connected DC loads are powered directly by the charger. If the load is higher than charger capacity, the required additional power will come from the battery, which will be progressively discharged until the charger automatically switches back to the bulk phase. Once the consumption decreases, the charger goes back to normal operation of the 3 step charge process.

Note: If a continuous load should discharge a battery the charger output returns to the high current FAST CHARGE cycle.

Periodically, check the wiring and connections. For further information on the battery charger refer to the vendors manual in the owner's packet.



WARNING

PREVENT SEVERE INJURY OR DEATH
DUE TO HIGH VOLTAGE!
ANY WORK ON THE BATTERY CHARGER
SYSTEM SHALL BE DONE ONLY
BY A LICENSED ELECTRICIAN.



WARNING

PREVENT SEVERE INJURY OR DEATH
DUE TO HIGH VOLTAGE!
DO NOT ATTEMPT TO ACCESS
BATTERY CHARGER INTERNAL
CONNECTION COMPARTMENT
COMPONENTS.



WARNING

PREVENT INJURY, DEATH, OR
PROPERTY DAMAGE FROM HIGH VOLTAGE!
DISCONNECT ANY AC POWER SUPPLY
BEFORE ATTEMPTING TO BEGIN ANY
BATTERY CHARGER SERVICE WORK.



CAUTION

PREVENT POSSIBLE BATTERY,
BATTERY CHARGER SYSTEM
AND PROPERTY DAMAGE!
SHORT CIRCUITS OR REVERSING POLARITY
CAN LEAD TO SEVERE COMPONENT
DAMAGE NOT COVERED BY WARRANTY.
OBSERVE CORRECT POLARITY
AT ALL TIMES!



MASS COMBI BATTERY CHARGER FOR HOUSE BATTERY/INVERTOR OPTION



The Mastervolt Mass Combi is a battery charger, inverter, and an AC transfer system in one enclosure. This is an option which allows the house battery current to invert to AC current to run refrigerators when the vessel is not using generator or shore power.

The battery charger is electronically controlled. It is dedicated to charging the yacht's "house" battery. Just as the other Chargemaster battery charger on board it features 3 automatic stages: Bulk, Absorption, and Float. Review the Chargemaster section several pages back for stage information since both chargers are similar in battery charging functions..

Battery Charging Operation

Again, the optional Mass Combi battery charger (50 amp) is dedicated to the **house battery**.

Note that residual charging affecting the cranking batteries could take place if the house battery was fully charged, the Mass Combi charger was off, and the voltage sensitive relays close.

The 3 position status panel switch needs to be in the "down position" for charging the house battery on vessels without inverters. In this position, the inverter is disabled. Also, make sure the battery charger breaker labelled inverter on the port side of the AC main ship's panel is activated.

The middle switch setting is off. The upper switch setting is for vessels with the inverter. The switch signifies inverter/charger activation when activated.

Once the charging process is started you will be able to monitor the results on the remote status panel located at the starboard side of the salon main ship's panel. It is an exact duplicate of the status panel located on the charger in the bilge.

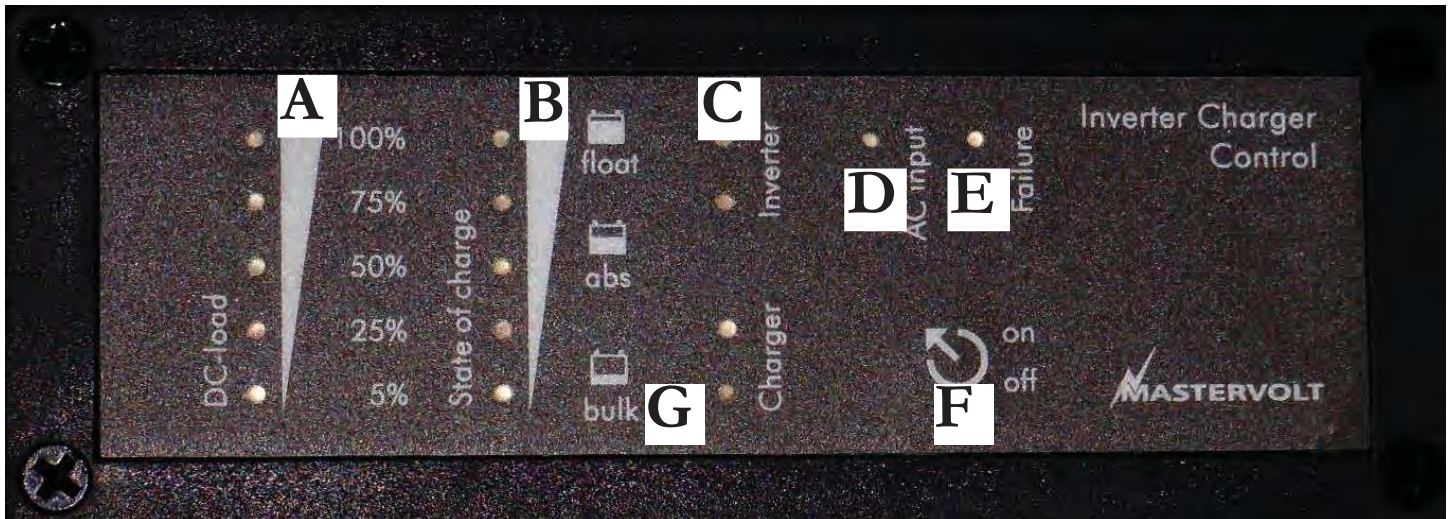
Note in the system wiring diagram there is a temperature sensor run to the house battery. This circuit terminates in the Mass Combi unit. The house battery is protected against overheating. If house battery overheating is detected the Mass Combi unit will shut down.



There is an inverter fuse (250 amp, type ANL) located on the starboard engine battery switch board. This fuse protects the house battery DC circuitry. The fuse is located between the house battery and the Mass Combi unit positive battery terminal.



MASS COMBI BATTERY CHARGER REMOTE DISPLAY PANEL



Located inside the salon main ship's cabinet is a remote display panel for the optional mass combi battery charger. This display shows current DC load, charger state mode, and charger mode status. If an optional inverter sub panel is installed the display indicates inverter mode, AC input, and battery voltage.

Refer to the function letter above and descriptions below.

A. Charger Mode- Displays the DC charge current as a percentage of the maximum current.

Inverter Mode- Displays the AC power as a percentage of the maximum power.

B. Charge Cycle- Displays the state of charge, bulk, absorption or float.

Invertor Mode- Displays the approximate battery voltage.

C. Inverter LED- Green LED: the mass combi is operating in inverter mode
Red: an error is detected.

D. AC Input- Illuminates when the incoming AC power is available.

E. Failure LED- When illuminated red, a failure is detected.

F. On/Off Switch- This switch will not operate if the main switch on the bilge component is set to "off".

G. Charger LED- Green; the Mass Combi is operating in charger mode. Red; an error is detected.

Note that when the bilge mounted face panel switch is turned to the off position the remote panel on switch will be inoperative.



MASS COMBI BATTERY CHARGER-INVERTER SIDE

Inverter Theory- The purpose of the inverter as part of the Mass Combi component is to change 12 volt DC to 120 volt AC. It has the ability to pass 120 volt AC current through its internal contacts to the 3 position 120 volt sub panel located at the ship's MDP. This panel supplies AC current to feed downstream components.

Operation- In operation the components function as a “feed through device”. Shore power most often travels through the shore cord hose reel to the isolation transformer and finally to the inverter breaker on the star-board 120 volt leg of the main distribution panel (MDP). When this breaker is activated, the current travels to the Mass Combi AC input contacts. Then the Combi unit passes the AC current to a set of “fast break” output terminals. At this point the AC current travels back to the MDP where the current is terminated at a 3 position 120 volt sub panel shown to the right.

As the sub panel breakers are activated 120 volt power is sent to select components. Refer to the following sub panel for more detailed information.

When shorepower is not available, the inverter unit will automatically utilize the HOUSE 12 volt battery to invert voltage from 12 volt DC to 120 volt AC at the 3 position MDP sub panel.

There are two ways to stop the inverting process. The inverter can be turned off at either the Mass Combi unit face switch, or by using the remote control panel at the MDP to cycle the combi unit off. Simply press the touch screen to the off position. See the ICC remote panel in this chapter.

Before attempting any Mass Combi maintenance it is important to remember the invert process is programed to be automatic.

The inverter may be turned off in two ways in order to safely service the Mass Combi unit. One method is to turn off the 120 volt inverter breaker on the 240v/120v MDP or by removing shore power from the vessel. Another way is to turn the Mass Combi unit off by using the Combi face switch.



SUB PANEL FOR INVERTER/COMPONENTS

The sub panel located at the MDP provides the following components breaker protection:

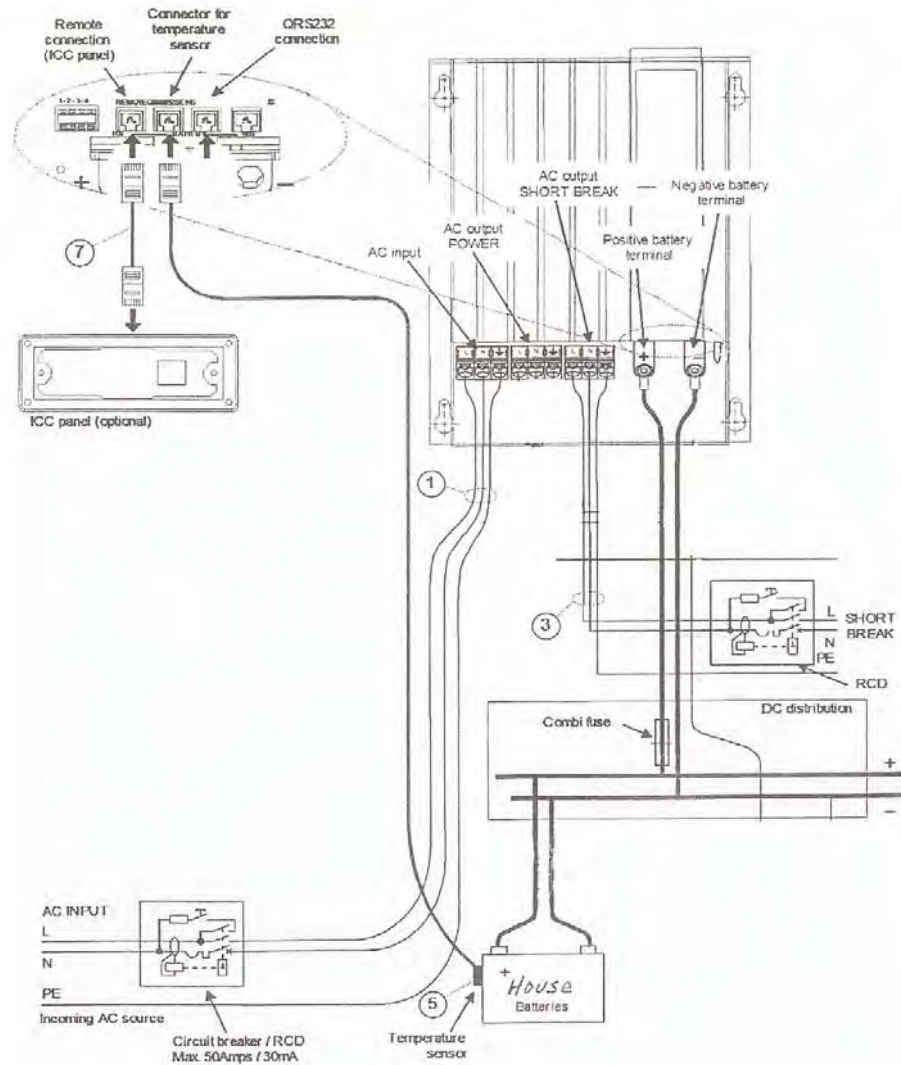
15 Amp/ Refrigerator- This breaker provides circuit protection for the sub-zero galley refrigerator.

15 Amp/ Cockpit Refrigerator- This breaker provides circuit protection for the cockpit refrigerator.

15 Amp/ Entertainment Center- This breaker must be activated to use the optional satellite television or to use the main cabin entertainment functions. It is run through the inverter to eliminate the need to run the generator at sea to watch television.



MASS COMBI TYPICAL SYSTEM WIRING/HOUSE BATTERY





DVSR (DIGITAL VOLTAGE SENSITIVE RELAY)

Located on the battery management panel next to the universal battery switches are 2 DVSR's (digital voltage sensitive relays).

The purpose of the DVSR is to protect the engine batteries from being discharged. Also, when the engine batteries are fully charged it sends current to charge the house battery. When the cranking battery(ies) rise above 13.7 volts DC the DVSR switches to charge (cranking and house) both batteries in parallel simultaneously. When the battery voltage drops to 12.8 volts DC the DVSR's open and both batteries become isolated from each other.

This DVSR capability is referred to as "dual sense". This permits the DVSR to sense the voltage of both batteries that it is connected between. If one of the batteries is receiving a charge the DVSR will close by paralleling both battery banks to charge the house battery along with the 2 engine cranking battery.

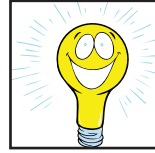
Notice the illustration shows a LED light which indicates when lite that the DVSR is closed and is sending a charging current to a battery(ies).

If the DVCR senses the engine batteries are being discharged at a fast rate it will open and will not allow those batteries to be overly discharged to the point that the engines will not crank over.

An example of the above situation would be if the vessel was stationary at sea for an extended period with various electronic and entertainment equipment energized along with the engines and generator off the batteries would normally discharge.

Note in the troubleshooting chapter there is a page devoted to the DVSR testing procedure.

POSSIBLE PROBLEMS/SOLUTIONS (VSR)



1. Red LED light not visible at DVSR-

- A. One cause could be the system voltage not high enough to activate the DVSR.
- B. Check for a faulty ground.
- C. Defective DVSR.

2. Red LED light stays on after the engine is turned off- This is a normal condition. The residual battery voltage because of battery charging has not yet dropped below 12.8 volts for the DVSR to cut out.



CHARGING SYSTEM- SUMMARY NOTES

Following is a series of general notes regarding the charging system or specific charging system components.

1. If one of the cranking batteries is weak or “dead” first start the generator up and let it run awhile as it will send an initial charge to the weak battery. Then engage the battery parallel switch to start the engine.
2. Always turn the universal battery switches on the battery management panel to the “off” position when leaving the vessel for extended periods. Select breakers that control specific safety functions of the boat will operate as normal.
3. When leaving the vessel after connecting your dock-side power cord turn the battery charger breaker at the management panel to the “on” position. This will permit the battery charging system to energize the appropriate batteries as needed.
4. Note: Since this type of battery charger is equipped with a 3 step Plus charge system, the batteries can also remain connected to the Chargemaster in cold climates (winter season). One hour every 12 days the charger automatically switches to absorption to keep the battery running properly and to prolong the life of the battery.



BATTERY PARALLEL SWITCH



The battery parallel switch is connected through the engine ignition switches to each of the engine cranking batteries. If one of the engine cranking batteries is weak this system will use the good battery from the one engine to provide cranking power for the weak battery on the other engine.

It is always recommended to let the weak battery recharge awhile before using the battery parallel switch. This can be done by using dockside power or by running the generator. This process will supply some initial charging energy to the weak battery. It is even more important to follow the above procedure if the battery is “dead.”

To activate the battery parallel switch first start the engine with the charged battery. Let the engine run for a few minutes. Now activate the battery parallel momentary toggle switch while simultaneously cranking over the weaker battery's engine. After the engine starts release the switch.

The battery parallel solenoid is located in the forward bilge bulkhead on the port engine battery switch board immediately above the engine panel box.

Periodically check all hardware for tightness along with ensuring the protective boots are in place.





ENGINE IGNITION SWITCH

Cummins dual ignition switches are used to crank over and start the diesel engines. The left ignition switch controls the port engine and the right ignition switch controls the starboard engine.

Each ignition switch features 3 used positions rotating left to right starting from the vertical position:

STOP- SPRING LOADED TO THE LEFT.

AUXILIARY- NOT USED

ON- SUPPLIES IGNITION POWER TO ENGINE.

START- SPRING LOADED TO THE RIGHT.

Refer to the Cummins operator's manual for further information.



WARNING

AVOID POSSIBLE BODILY INJURY OR DEATH!
REMOVE KEYS FROM THE IGNITION
SWITCHES WHEN THE ENGINES
ARE NOT RUNNING.



TYPICAL BATTERY MANAGEMENT SYSTEM

The battery management system is an important ingredient of the yacht's 12 volt direct current (DC) system. The battery management panel consists of 3 universal battery switches, 2 VSR's and 2 banks of DC breakers plus the wiring itself. Note the breaker sizes on the diagram below. Should a replacement become necessary the breaker amperage is listed with each breaker.

In some cases the breaker protects a component; in other cases it may also control a sub-panel or parts of a sub-panel.

Note: The breakers can be reset. Use the procedure described in the following pages.

The universal battery switch marked port is part of the port engine cranking battery circuit. The universal battery switch marked starboard is part of the starboard engine battery circuit. Likewise, the switch marked house is part of the "house" battery circuit. The port VSR is connected to both the port cranking battery and the house battery. The starboard VSR is connected to the starboard cranking battery and the house battery.





BATTERY MANAGEMENT SYSTEM-COMPONENT BREAKER DESCRIPTION

DASH MAIN- protects dash operation switch functions, hardtop control panel, and engine hatch panel. In addition, it controls components located on the helm breaker sub-panel located in the main stateroom electronics locker. See the illustration for more information. Engine functions are not controlled by the dash main breaker.

CABIN MAIN- protects the cabin main DC panel which controls direct current switch functions.

ELECTRONICS- protects all electronic dash equipment components along with the Fusion stereo components. In addition, this breaker controls all breakers from the electronic through the sirius weather on the helm breaker panel located at the main stateroom electronics locker. See the illustration for further information.

SALON WINDOW- protects motor circuitry.

ACCESSORY (ACC)- protects any add-on equipment components. If adding components ensure that the amperage does not exceed the safe limits of the breaker.

TENDER WINCH- protects the power winch in the dinghy garage (option).

AMPLIFIER- protects the stereo system amp.

UNDERWATER LTS- protects LED circuitry.

CHARGER- This breaker protect the 50 amp Mass Combi battery charger circuitry.

SUNROOF- protects the sunroof motor.

CHARGER- This breaker protects the 50 amp cranking battery charger circuitry.

WINDLASS- protects the deck mounted anchor windlass circuitry. Notice this is a double pole breaker at 150 amps mainly because of the high current draw required by the motor to retrieve the anchor and the length of the windlass wire runs.

CABLE MASTER- protects the shore power hose reel.

OIL CHANGER- protects the engine and generator oil changer pump circuitry located in the bilge.

HATCH LIFT- protects the aft engine hatch circuitry.

FWD. BILGE PUMP- protects the forward most bilge pump.

MID BILGE PUMP- protects the middle bilge pump circuitry.

AFT BILGE PUMP- protects the aft bilge pump located in the engine room under the center diamond plate floor section between the engines.

HIGH WATER ALARM- protects the bilge high water alarm. This audible alarm sounds at the dash should bilge water reaches a predetermined level. Normally this would indicate large volumes of water are entering the bilge since normal amounts would be drawn overboard via the bilge pump system.

STEREO MEMORY- protects the stereo system memory circuit and the stereo unit itself.

SEA- protects the sea chest motor and circuitry.

SHOWER PUMP- protects the bilge located shower pump.

FWD. SHOWER PUMP - protects the mid shower sump pump (located under salon floor) circuitry. Also, this shower sump box is used to capture and evacuate the forward and aft air conditioning condensation pan water.

Note that selected equipment breakers are part of optional equipment not installed on your vessel. Also, due to panel vintage select breakers may or may not be present on your battery management panel.



The battery management system panel breaker circuitry employs a lighted icon for each breaker. When lighted that circuit is energized and protected.

With all 3 universal battery switches in the “off” position the following common breaker circuits are considered “on” and should show a lighted icon above the breaker name.

ALL 3 UNIVERSAL BATTERY SWITCHES “OFF”

1. Battery chargers
2. Fwd. bilge pump
3. Mid bilge pump
4. Aft bilge pump
5. High water alarm
6. Stereo memory
7. Sea Chest pump
8. Shower pumps

Other possible universal battery switch positions are:

“HOUSE” UNIVERSAL BATTERY SWITCH ONLY “ON”

Dash main, cabin main, electronics, tender winch, amplifier, underwater lights, cable master, oil changer, hatch lift, stereo memory, sea chest, shower pump, and fwd. shower pump.

“PORT” UNIVERSAL BATTERY SWITCH ONLY “ON”

Salon window, port charger, windlass, aft bilge pump, and high water alarm.

“STARBOARD” UNIVERSAL BATTERY SWITCH ONLY “ON”

Sunroof, starboard charger, forward bilge pump, and mid bilge pump.

NOTICE

AS A SAFETY FEATURE
THE FORWARD, MID, AND AFT BILGE PUMP
CIRCUITS ALONG WITH THE HIGH WATER
ALARM ARE CONTINUOUSLY “ON” EVEN
WITH THE UNIVERSAL BATTERY
SWITCHES OFF.



WARNING

PREVENT POSSIBLE FIRE/EQUIPMENT
DAMAGE!
NEVER TURN THE UNIVERSAL BATTERY
SWITCHES TO THE “OFF” POSITION WHILE
THE ENGINES ARE RUNNING.

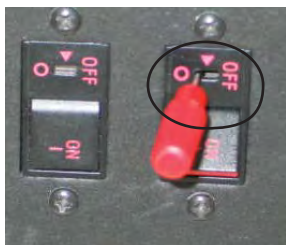
Note: As stated above the diesel engine alternators or electronics may be damaged from the current spike created by turning off a universal battery switch with the engine running.



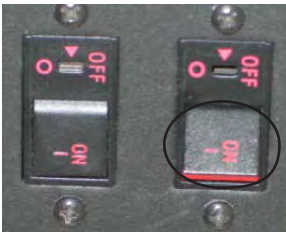
POSSIBLE PROBLEMS/SOLUTIONS



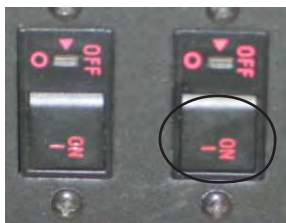
1. It is possible that one of the battery management system breakers may trip from long-term arcing and heat. The breaker may need to be reset- This might happen occasionally with one of the battery charger breakers. To trip and reset this style of breaker do the following:



A. Take a small slotted screwdriver from your on-board tool kit and insert it in the breaker slot until it trips. You will hear a snapping type noise. See the illustration.



B. Notice that the breaker has pushed outward from its original flush position indicating the breaker has been tripped. See the illustration.



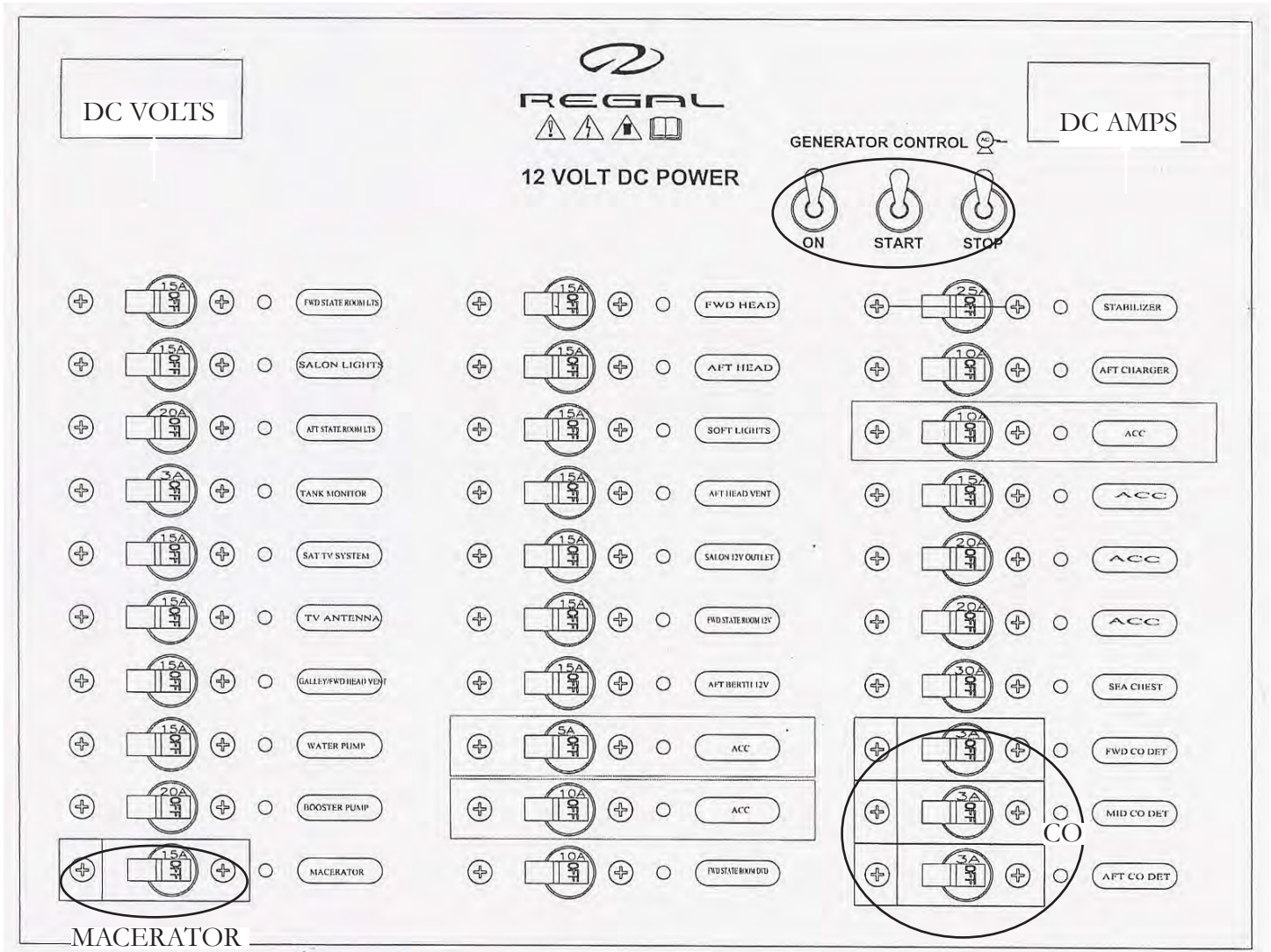
C. To reset the breaker use your finger to press the breaker down until it locks in the “on” position. You may hear a slight noise. This is normal. The icon light should be lighted after this procedure. See the illustration.

2. Breaker will not reset- Replace the breaker. Contact the nearest Regal yacht dealer for replacement parts.

3. Breaker continues to “trip”. Check the affected equipment to determine if it is responsible for the excessive draw to trip the breaker. If the equipment is determined to be within specifications check for a “short” in the wiring circuit. Also, the breaker may be faulty. Contact the nearest Regal yacht dealer.



TYPICAL MAIN DC PANEL METER/SWITCH FUNCTIONS



The main DC control panel is located in the aft starboard salon behind the overhead cabinet doors. This panel is protected by the cabin main breaker at the battery management center. The panel features an analog 12 volt DC volt meter and amp meter to monitor electrical flow and current. These 2 instruments can be valuable aids in basic electrical troubleshooting.

A triple Westerbeke generator switch cluster facilitates gen-set operations. A 3 amp in-line fuse located on the rear side of the panel protects the blue soft indicator icon for each breaker. Notice the 3 CO and macerator covered breakers. These switches require a 2 step operation to actuate the component. The cover must be lifted before the switch can be activated. For more information read the sections on carbon monoxide and pumping waste overboard. Macerator usage requires the same 2 step process.



TYPICAL 12 VOLT MAIN DC PANEL METER/BREAKER SWITCH FUNCTIONS

FWD. STATEROOM LTS- (15 AMP) protects the overhead and reading lights.

SALON LTS- (15 AMP) protects the main cabin overhead and counter top lights.

AFT STATEROOM LTS- (15 AMP) protects overhead and reading lights.

TANK MONITOR- (3 AMP) protects the fresh water and waste tank monitor located at salon main AC panel.

SATELLITE TV SYSTEM- (15 AMP) protects the system's mechanical-electronic components.

TV ANTENNA- (15 AMP) protects the antenna mounted on the hardtop.

GALLEY/FWD HEAD VENT- (15 AMP) protects the fan that runs the vent. This fan also serves the forward head.

WATER PUMP-(15 AMP) protects fresh water pressure pump located in the main cabin forward floor.

BOOST PUMP- (20 AMP) an additional fresh water pressure pump to provide more system hose pressure.

MACERATOR- (15 AMP) protects the overboard discharge pump which pumps waste overboard. To activate first pull the cover up and then turn on the breaker.

FWD. HEAD- (15 AMP) protects forward head circuit.

AFT HEAD-(15 AMP) protects the aft head circuit.

SOFT LIGHTS- (15 AMP) protects the soft lights in the salon, forward and aft stateroom behind the blind valence.

AFT HEAD VENT- (15 AMP) protects aft head vent fan motor.

SALON 12 VOLT OUTLET- (15 AMP) protects accessory plug.

FORWARD STATEROOM 12 VOLT OUTLET- (15 AMP) protects accessory plug.

AFT BERTH 12 VOLT OUTLET- (15 AMP) protects accessory plug.

ACC- (5 AMP) provides aftermarket accessory protection.

ACC- (10 AMP) provides aftermarket accessory protection.

FORWARD STATEROOM DVD- (10 AMP) protects the forward cabin DVD player.

STABILIZER- (25 AMP) protects the DC side of the optional Seakeeper® option functions.

AFT CHARGER (10 AMP)- protects the circuitry that operates the battery charger for the optional electric dingy motor.

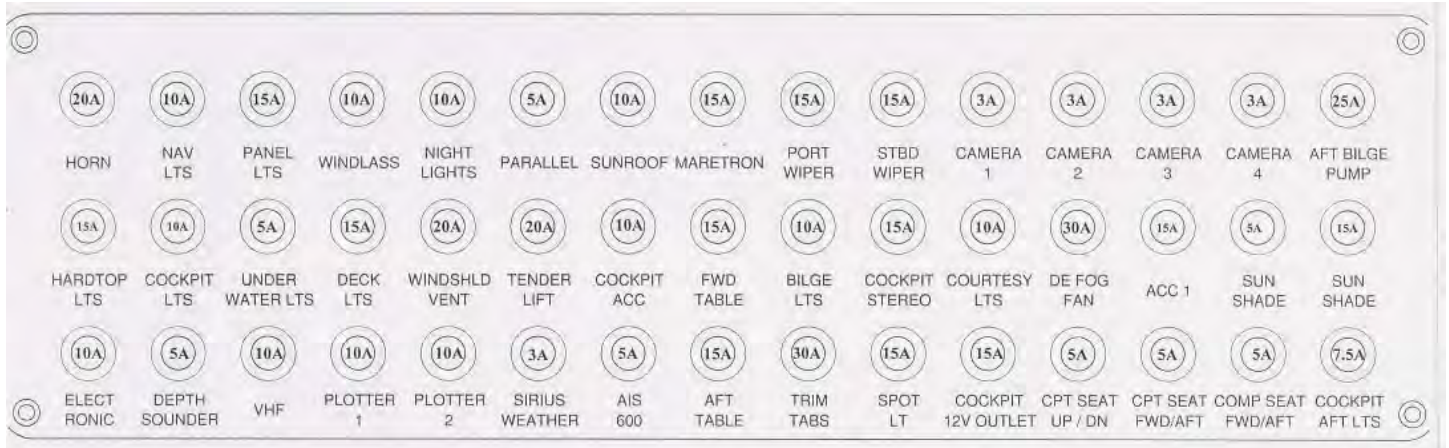
ACC- (10, 15 , & 20 AMP) protects each of the 4 accessory breakers. Notice that the sizes of the breakers vary. This is important when adding additional components.

SEA CHEST- (30 AMP) protects the sea chest pump circuitry.

CO MONITOR- (3 AMP EACH) protects separately the 3 CO detectors located in the forward, salon and master staterooms. To access these breakers first pull the cover up from right to left. At this point the breaker can be turned off. For protection purposes these breakers shall be left in the "on" position.



TYPICAL 12 VOLT HELM BREAKER SUB-PANEL



HELM BREAKER SUB-PANEL-ELEC. LOCKER

The helm breaker sub-panel protects various components located in the vicinity of the helm area. The sub-panel is controlled in part by the dash main breaker and the electronics breaker both located on the battery management center panel.

The white rectangle shows the breakers controlled by the management center **electronics** breaker. The remainder of the breakers in the sub-panel above are controlled by the **dash main** breaker located in the battery management panel.

The sub panel is located in the main cabin stateroom on the starboard side of the berth at the electronics locker.

In addition, various electronic controllers are found here. Also, inside the electronics cabinet in a protective case is stored the engine and generator documentation.

The skipper should learn the location of all DC breakers on the vessel and the equipment they protect. For example, a breaker may trip on the sub-panel but may not trip the breaker on the battery management panel. Knowing his breaker location will aid the skipper in troubleshooting problems faster.

Remember, always find why the breaker blew before resetting it. Refer to the technical drawing section for additional information.





12 VOLT HELM BREAKER SUB PANEL DESCRIPTION

HORN- protects the air horn located on the hardtop.

NAV LTS- protects the port and starboard deck navigation for night cruising.

PANEL LTS- protects the helm (dash) back-lighted icons.

WINDLASS- protects the windlass deck mounted foot switches.

NIGHT LTS- protects the 2 forward cockpit ceiling lights.

PARALLEL- protects the battery parallel wiring system.

SUNROOF- protects the open and close helm mounted switch.

MARETRON- This breaker is currently inactive.

PORT WIPER- protects port windshield wiper circuit.

STBD. WIPER- protects the starboard windshield wiper circuit.

CAMERA 1-3- protects the camera circuits. 4 not used.

AFT BILGE PUMP- protects the aft engine room bilge pump.

HARDTOP LTS.- protects the sunroof ceiling lights.

COCKPIT LTS.- protects the cockpit installed light circuit.

UNDERWATER LTS.- protects the transom mounted LED light (under platform) circuit.

DECK LTS.- protects the deck light circuit.

WINDSHIELD VENT- protects the fresh air windshield vents.

TENDER LIFT- protects the lift circuitry.

COCKPIT ACC.- protects accessory switch on icemaker switch panel.

FWD TABLE- protects the table lift circuitry.

BILGE LTS.- protects the garage and engine room light circuitry.

COCKPIT STEREO- protects the dash stereo power circuit.

COURTESY LTS.- protects the stairway soft lights.

DE FOG FAN- protects the driver side blower fan.

ACC 1- protects aftermarket accessory circuit.

DE-FOG FAN- protects the windshield defogging system.

SUN SHADE- protects the sun shade switch circuitry.

SUN SHADE- protects the sun shade ram circuitry.

ELECTRONIC- protects the dash electronics switch.

DEPTH SOUNDER- protects the dash mounted depth sounder.

VHF- protects the marine radio circuitry.



12 VOLT HELM BREAKER SUB PANEL DESCRIPTION (CONTINUED)

PLOTTER 1- protects the GPS/Plotter **starboard** dash mounted circuitry.

PLOTTER 2- protects the GPS/Plotter **port** dash mounted circuitry.

SIRIUS WEATHER- protects the satellite weather circuit.

AIS 600- protects the VHF automatic identification system circuitry.

AFT TABLE- protects the aft cockpit table lift circuitry.

TRIM TABS- protects the transom mounted electric-hydraulic trim tab circuit.

SPOT LIGHT- protects the deck mounted spotlight circuit.

COCKPIT 12 V OUTLET- protects the accessory outlet circuit.

CPT. SEAT UP/DN- protects the helm seat's up/down movement circuitry.

CPT. SEAT FWD/AFT- protects the helm seat's forward and aft movement circuitry.

COMP. SEAT FWD./AFT- protects the companion seat fore and aft travel circuitry.

COCKPIT AFT LTS- protects the 2 aft hardtop lights.



DC (12 VOLT) WIRING COLOR CODE & SIZES		
BLACK	16,14,12,10,8,6,4,2,2/0,40	GROUNDS
BLACK/WHITE	16	HALON INDICATOR
BLACK/YELLOW	10,16	GRD. DIESEL TRANSFER PUMP, MERC DIESEL STOP CIRCUIT
BLACK/WHITE	10	HALON MAIN GRD. FEED
BROWN/BLACK	10	MACERATOR, SUN ROOF
BROWN	10	SUN ROOF
BROWN	14	AFT BILGE PUMP-MANUAL
BROWN/WHITE	14	AFT BILGE PUMP-AUTO
BROWN/RED	14	FWD. BILGE PUMP-AUTO
BROWN/BLUE	14	FWD. BILGE PUMP-MANUAL
BROWN/PINK	16	CO DETECTOR
BROWN/BLACK	16	SHOWER SUMP PUMP
YELLOW	12,10	BLOWER
YELLOW/WHITE	16	HEAD VENT FAN MOTOR
YELLOW/BLACK	16	STEREO MEMORY
YELLOW/RED	14	ENGINE START CIRCUIT

Note: The list above applies to a number of vessels. Vessel components/wiring may vary depending on the model.



DC (12 VOLT) WIRING COLOR CODE & SIZES		
ORANGE	10,12	VACUUM TOILET, REFRIGERATOR, HATCH RAM
ORANGE	16	WIPER RUN
ORANGE/WHITE	16	WIPER PARK
ORANGE/BLACK	10,12,16	HORN, HATCH RAM
BLUE	14	INTERIOR LIGHTS, SWITCHED CIRCUIT
BLUE/RED	14	INTERIOR LIGHTS, CONSTANT HOT CIRCUIT
BLUE/BLACK	16	COCKPIT SOFT LIGHTS
BLUE/GREEN	16	INTERIOR SOFT LIGHTS
BLUE	10	CABIN LIGHT MAIN CIRCUIT FEED
GRAY	14	NAVIGATION LIGHTS, RUNNING, BOW, TRANSOM LIGHTS
GRAY/BLACK	14	NAVIGATION LIGHTS, AFT ANCHOR, MASTHEAD
GRAY/WHITE	14	NAVIGATION LIGHTS, MASTHEAD, FWD. RUNNING LIGHTS
RED	16	POSITIVE FEED- ELECTRONICS, GAS VAPOR DETECTOR, BREAKER TO DASH SWITCH FEEDS

Note: The list above applies to a number of vessels. Vessel components/wiring may vary depending on the model.



DC (12 VOLT) WIRING COLOR CODE & SIZES		
RED/WHITE	16	WINDLASS CONTROL-DOWN
RED/BLACK	16	WINDLASS CONTROL-UP
RED/WHITE	14	BATTERY PARALLEL-LOAD
RED	14	POSITIVE FEED-ELECTRONICS
RED	12	POSITIVE FEED-ELECTRONICS
RED	10	POSITIVE FEED-AUTO PILOT
RED/VIOLET	10	FUEL TANK TRANSFER PUMP AMPLIFIER POWER
RED	8	POSITIVE FEED- MAIN ALTERNATOR CHARGE
RED	6	POSITIVE FEED- MAIN ALTERNATOR CHARGE
RED	4	POSITIVE FEED-MAIN
RED	2	POSITIVE FEED- MAIN START- ER, BATTERY, GENERATOR
RED	2/0	POSITIVE FEED- MAIN, START- ER, BATTERY
PURPLE	16	STBD.IGNITION, HOUR METER- WINDSHIELD VENT
PURPLE/WHITE	16	PORT IGNITION, HOUR METER, WINDSHIELD VENT
PINK	16	STBD. FUEL TANK SENDER
PINK/BLACK	16	PORT FUEL TANK SENDER
TAN/BLUE	16	ENGINE ALARM CIRCUIT
GREEN	16	TANK LEVEL MONITOR, SPOT- LIGHT
GREEN	10	SPOTLIGHT
GREEN	8	BONDING

Note: The list above applies to a number of vessels. Vessel components/wiring may vary depending on the model.



MAIN SWITCH PANELS-LOCATION AND FUNCTION



PORT HELM-

1. HTOP LTS- controls the enclosure LED overhead hardtop lights.
2. HTOP LTS- regulates the illumination intensity of the hard top lighting circuit.
3. COCKPIT LTS- controls cockpit patio seating LED lighting circuit.
4. UNDERWATER LTS- controls the transom mounted underwater lighting circuit.
5. DECK LTS- controls the blue LED lighting throughout the deck including the stairway.
6. COMP SEAT- controls the up and down motion of the companion helm seat.
7. WIND SHLD VENT- controls the vertical motion of the center windshield vent. Circuit uses an electric-hydraulic ram system.
8. DEFROST- controls the blower-heater for defogging the windshield. This feature is especially useful in high humidity and colder environments where the A/C tends to cause water vapor to condense on the windshield glass.



STARBOARD HELM-

1. HORN- controls the air horn located on the hardtop.
2. NAV/ANC- regulates the side navigation lights when depressed forward. Aft depression will light the masthead mounted all-around light.
3. PANEL LTS- controls the helm instrument panel back lighting
4. PANEL LT- controls the illumination intensity of the instrument panel back lighting.
5. ELECT- controls power to the helm mounted electronic components.
6. AFT BILGE PUMP- controls the engine room bilge pump.
7. WINDSHIELD WASHER- controls the port wiper and washer fluid.
8. WINDSHIELD WASHER- controls the starboard wiper and washer fluid.



MAIN SWITCH PANELS-LOCATION AND FUNCTION (CONTINUED)



PORT SIDE AT CABIN ENTRANCE-

1. SUN ROOF- controls the sun roof opening and closing.
2. TABLE- controls the cockpit table up and down motion.
3. SALON WINDOW- regulates the cockpit enclosure aft port window up and down motion. Window uses an electric-hydraulic system.
4. COURTESY LTS- controls cockpit courtesy light circuit.



AFT COCKPIT STAIRWAY-

1. DECK LTS- controls the blue LED lighting throughout the deck including the stairway.
2. GARAGE BILGE LTS- controls the aft deck garage bilge LED lights for the optional dingy launch.
3. HTOP LTS- controls the enclosure LED overhead hardtop lights.
4. UNDERWATER LTS- controls the transom mounted underwater lighting circuit.
5. TENDER LIFT- controls DC power to the garage lift mechanism for the optional dingy.
6. HATCH LIFT- controls the electric-hydraulic hatch lift circuitry.



MAIN SWITCH PANELS-LOCATION AND FUNCTION (CONTINUED)



PORT DECK-

1. TABLE- controls up and down motion of an optional table located in the aft cockpit.
2. SHADE- controls the optional cockpit sunshade that covers the patio area aft of the enclosure hardtop.
3. COCKPIT LTS- controls cockpit patio seating LED lighting circuit.
4. ACC- currently is not used.



PORT AFT DECK-

1. UNMARKED- controls the retrieval system for the optional dockside cord reel.

STARBOARD AFT DECK-

1. UNMARKED- controls the retrieval system for the optional washdown hose reel.



(AC) ALTERNATING CURRENT-GENERAL INFORMATION

OVERVIEW

As standard equipment alternating current sometimes called AC current is available by bringing it on board through the use of a dockside (shorepower) cord, cord reel system, or it may be produced on board through the generator. Just as a home uses 120/240 volts to run various household appliances and equipment the same holds true on your yacht.

With AC current electrons “cycle” in one direction a short distance and reverse themselves traveling in the opposite direction. This is how AC became known as alternating current. The rate that the current reverses itself is referred to as its frequency. In the United States the alternating current frequency is 60 cycles per second. Overseas a 50 cycle frequency per second is standard. Component specifications must match the country’s frequency.

BASIC ELECTRICAL TERMS

Voltage is a measurement of the electrical potential that an electrical power source contains for doing some type of work for us. Think of it as electrical pressure. An example might be a battery.

Amperage is a particular amount of electricity flowing through some part of a circuit. Think of it as the rate of electrical flow.

Resistance is measured in ohms and inhibits the electrical flow through a circuit. An example would be in a light bulb. The resistance in the light bulb element allows it to glow and brighten a dark room along with giving off heat as a by-product.

It is important that you understand and respect the alternating current system used on board. Be sure to read and follow any danger, warning, or caution labels in reference to the yacht’s electrical system or individual equipment components. **Never attempt any electrical repairs with the power in the “on” position.** *Most of all, use common sense!*

TYPICAL DOCKSIDE (SHORE POWER) CORD SYSTEM

This manual presents the latest standard and select optional alternating current system components. You will be able to quickly tell which system is installed on your vessel by visually spotting the components on the deck or in the bilge (sump) and by reviewing the system drawings.

As standard equipment the 50 foot dockside cord is the basic component used to deliver up to 50 amps of electricity from the marina dock power box to the yacht itself. *Before plugging in the dockside power cord check to see that all yacht AC breakers are off. This includes the incoming as well as both the main and equipment breakers at the AC ship’s control panel. See the AC panel illustration later in this chapter.*



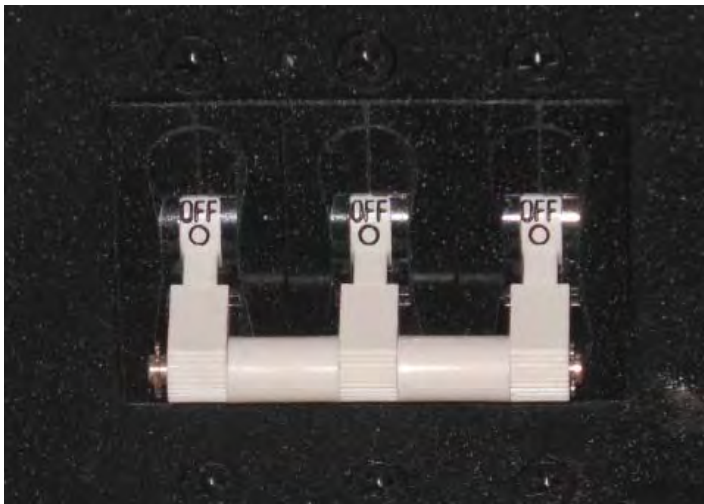
50 FT. 50 AMP CORD MARINA PLUG IN END

When connecting the shore power cord be sure to twist the cord into the yacht inlet plug first. The inlet plug is located on the aft deck. The cord installs one way only. Align

the pins or use the imprinted arrows and detentes located on the stainless steel part of the inlet), insert the cord end straight into the inlet plug and twist in a clockwise direction to lock in place. Note that on vessels with standard shorepower equipment the shore power cord makes use of the neutral wire. Therefore, all 4 cord pins are used. Screw the threaded sealing ring into the shore power inlet until tight. This protects the inlet and cord pins from moisture.



YACHT INLET



STANDARD 3 POLE INLET BREAKER

Installed inside the port aft locker as standard equipment is a single throw 3 pole inlet breaker. This breaker when activated with the dockside cord installed in the inlet permits AC current a path to the ship's main distribution panel. This path terminates at the panel main AC breakers. Once the panel main breakers are activated current can flow downstream to each of the component breakers. Before **disconnecting** the dockside cord make sure the main ship's panel AC breakers are turned off.

Also, when **connecting** the dockside cord ensure the main ship's AC breakers are off until all components are installed.

Remember to plug the power cord into the marina dock power box last. This reduces the possibility of a shock hazard. There may be several types of inlet plugs located at the marina dock power center. The 30 amp plug is much smaller looking and the 50 amp cord will not physically fit it.

Also, marina dock power centers have breakers that must be activated after installing the dockside cord. Make sure the dockside cord has enough slack to weather changing tides if applicable and at the same time does not come in contact with the water. Check with the marina dockmaster for more information on their shore power operation and requirements.

Before attempting to disconnect the shore power cord turn off all equipment and main AC breakers on the ship's control panel and shore power inlet breaker (3 pole) to prevent any component damage.

When disconnecting the shore power cord first turn the breaker to the "off" position at the marina dock power center. Then remove the dockside cord from the marina outlet. Always remove the cord from the yacht's power inlet last. Roll the cord neatly and store it in a dry environment. **READ AND UNDERSTAND THE LABEL BELOW!**

WARNING

TO MINIMIZE SHOCK AND FIRE HAZARD:

1. TURN OFF SHORELINE BREAKER AT A.C. SWITCHING PANEL BEFORE CONNECTING OR DISCONNECTING SHORELINE CORD SET.
2. CONNECT SHORELINE CORD SET AT BOAT FIRST.
3. DISCONNECT SHORELINE CORD SET AT SHORE OUTLET FIRST.
4. SECURE RECEPTACLE COVERS WHEN NOT IN USE.



The dockside cord (sometimes called the shore power cord) as standard equipment contains four conductors;

White-neutral ungrounded conductor

Green-grounding conductor

Red-ungrounded conductor containing 120 volts

Black-ungrounded conductor containing 120 volts

Select shorepower cords use a set of lighted icons which indicate the condition of the plugged in connection. When plugged in correctly a “green” LED light illuminates indicating there is power in the cord.

If a “red” LED light illuminates, there is incorrect wiring at the power source (marina shore post). Call for marina personnel to investigate the problem before attempting to energize the circuit.

Note: Yachts with an optional isolation transformer minus the cord reel option create a neutral connection at the output of the transformer to isolate the shore-side earth grounded power from the boat’s AC system. This system uses the 50 amp dockside cord but the neutral leg stops at the yacht’s shore power inlet. These units do not use galvanic isolators.



DANGER

PREVENT BODILY INJURY, DEATH OR FIRE!
NEVER USE EXTENSION CORDS
OR IMPROVISED CORDS
IN SHORE POWER/MARINA INLETS.
USE ONLY APPROVED MARINE
SHORE POWER CORDS
MATCHING THE ORIGINAL
WIRE GAUGE AND AMPACITY .



WARNING

PREVENT SEVERE INJURY OR DEATH!
ALTERNATING CURRENT (AC) CAN KILL YOU!
DISCONNECT
ALL ELECTRICAL POWER SOURCES
BEFORE ATTEMPTING
TO REPAIR OR REPLACE
ANY ELECTRICAL COMPONENTS.



DOCKSIDE CORD REEL OPTION



Select yachts feature a powered cord reel system for reeling in the dockside cord. The dockside cord is rated at 50 amps and is attached to a reel which releases the needed cord length when pulled out. The power cord is accessible from just above the aft platform. The reel is located in the aft bilge. The power cord retrieval is accomplished by pushing a switch which powers the 12 volt DC motor.

The yacht end of the cord is directly wired into the cord reel. Therefore, there is nothing to be plugged into the yacht.

The marina end must be plugged into the marina dock power center using the same procedure as the standard dockside cord.

Note:

If the cord reel system option is ordered with an isolation transformer option the cord is configured from the cord reel manufacturer without the neutral wire and prong because the isolation transformer actually produces the “neutral” on board by magnetic induction.

If the cord reel system option is ordered in boats without the isolation transformer the cord is configured with the normal 50 amp male footprint (includes a neutral wire).



The illustration above shows a typical transom layout with the optional cord reel system. When disconnected make sure to close and secure the inlet cover plate.



POSSIBLE PROBLEMS/SOLUTIONS



1. After the dockside cord is hooked up to the yacht and the marina dock power center and the AC ship's panel main breaker for shorepower 1 or 2 is activated no voltage is shown on the ship's main panel AC volt meter.

Check the breaker on the marina dock power center to ensure it is activated.

Check the triple pole single throw breaker located on the bulkhead if the isolation transformer option is present.

Check the breaker near the shore power inlet on vessels without the isolation transformer option.

2. The marina dock power center lacks a 50 amp plug.

Call the dock master or marina personnel. An adapter cord may be available. **NEVER IMPROVISE ANY TYPE OF CORD OR POWER INLET CHANGES!**

Also, an adapter cord may be purchased that delivers twin 30 amp service and is adaptable to the 50 amp yacht dockside cord. Adapters can be found at retail boating outlets.

3. The cord reel switch fails to retrieve the dockside cord.

Check the cord reel breaker located on the battery management panel.



ISOLATION TRANSFORMER

OVERVIEW

To this point we have covered the process of bringing AC electricity from the marina dock power center to the yacht through the standard shore power inlet including the optional cord reel.

THEORY



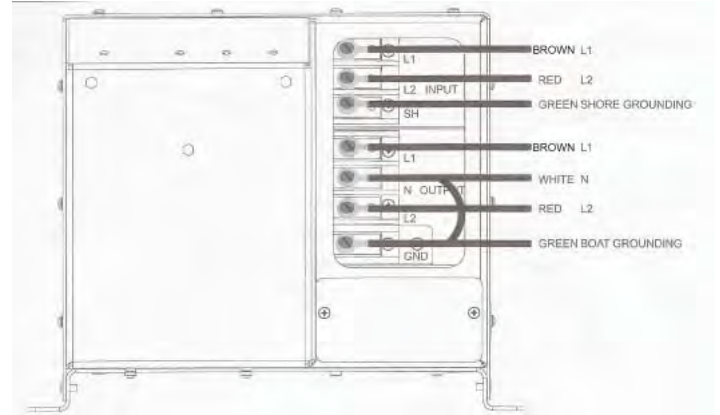
2 POLE INLET BKR.

Many yachts use an optional system to distribute AC electricity that includes a double pole single throw inlet breaker, isolation transformer, triple pole single throw breaker after the transformer coupled with the ship's AC main control

panel and auxiliary equipment breakers. This is accomplished through an isolation transformer. The cord reel is an option that usually ends up as part of this system. The isolation transformer component is a 50 amp isolation and boosting transformer installed within the engine room after the shore power inlet. This unit eliminates the need for a standard galvanic isolator. Another feature of the transformer is it has voltage boosting capabilities, when shore power voltages are compromised due to length of run, amongst other factors.

As installed on an isolation transformer configured boat, the entrance breaker is a two pole breaker. This 2 pole breaker will provide circuit protection to Line 1 and Line 2 conductors only, as there will be no neutral conductor coming aboard the boat through the shore power inlet or automatic cord reel. **The shore cord male plug is actually without the neutral pin.** With the cord reel the shore inlet wires will land on the Line side of the entrance breaker, and the wires to the isolation transformer will land on the Load side of the entrance breaker.

Current then travels to the input side of the isolation transformer.



ISOLATION TRANSFORMER WIRING



3 POLE BREAKER



OPERATION NOTES

By grounding one leg of the isolation transformer on the secondary side the “creation” of a neutral exists. The “neutral” wire (blue) along with the 2 conductor (red & brown) wires travel to a triple pole breaker located at the output side of the transformer and eventually to the main AC control panel. The green earth (bonding) ground is connected as another continuing leg of the AC grounding side of the circuit.

When energized the breaker passes AC current with a transformer induced neutral wire to the ship’s main AC breakers.

Summary of Iso Boost Isolation Transformer-

A. The Iso Boost system increases the output voltage up to 15% if the supplied voltage is too low.

B. The boat’s electrical system and grounding conductor are not actually connected to the shoreside system when in use.

C.. Power is transferred from shore power to the boat’s electrical system by magnetic coupling. This means there is no direct connection between the earth-grounded shore AC power and boat AC power. The shore grounded conductor is connected to a shield that is wound between the primary (shore) and secondary (boat) transformer windings. This shield assures isolation on the boat by providing a protective layer between primary and secondary windings within the transformer.



WARNING

PREVENT SEVERE INJURY OR DEATH
DUE TO FIRE HAZARD!
DO NOT STORE EQUIPMENT IN THE ENGINE
COMPARTMENT INCLUDING ANY TYPE
OF FLAMMABLE PRODUCTS.
BILGE COMPONENTS ARE NOT
IGNITION PROTECTED.

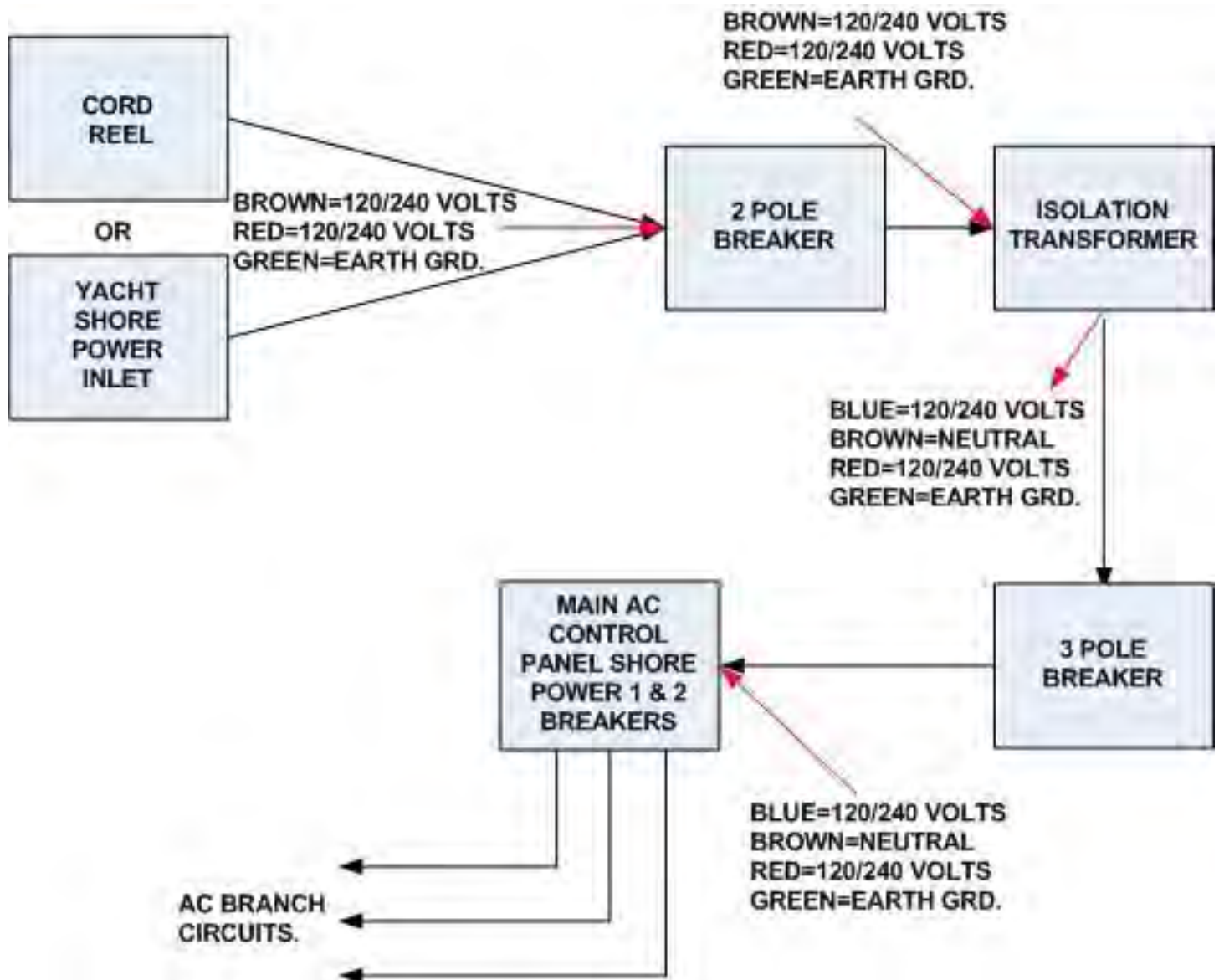


WARNING

PREVENT SEVERE INJURY OR DEATH
DUE TO HIGH VOLTAGE ELECTRICAL SHOCK!
DISCONNECT SHORE POWER SUPPLY
BEFORE ANY MAINTENANCE.
MAINTENANCE TO BE PERFORMED
ONLY BY A CERTIFIED MARINE
ELECTRICIAN.



TYPICAL AC CIRCUITRY FLOW CHART WITH ISOLATION TRANSFORMER





ISOLATION TRANSFORMER OPERATION LIGHT STATUS

Manual Override (red)	Power (green)	Boost (yellow)	Low Voltage (red)	IsoBoost Status
Off	Off	Off	Off	No power. Either the shore power is turned off or the circuit breaker to the unit is off. If the shore power and/or circuit breaker are on refer to the section in this manual on <i>Troubleshooting</i> .
Off	On	Off	Off	Boat voltage equals shore voltage.
Off	On	On	Off	Boat voltage is boosted 15% higher than shore voltage.
Off	On	On	Blinks	Boat voltage is between 204 VAC and 192 VAC.
Off	Off	Off	On	No output. Output voltage went below 192 VAC for more than 4 seconds.
On	Off	Off	Off	The unit has been switched to the manual override mode. Boat voltage equals shore voltage.

THERMAL PROTECTION

The optional IsoBoost unit is outfitted with a built in thermostat (temperature switch) that is sunk into the transformer windings. When a sustained overload or overheating occurs the switch kicks in to shut down the unit. When this happens, the power to the unit shuts down, status lights will be “Off” and there will be no output power from the unit. Allow the unit to cool down which may take up to 1 hour. At some point the temperature switch will reset and the unit will resume normal operation.



ISO BOOST ISOLATION TRANSFORMER




MANUAL OVERRIDE

This switch permits the user to disable the monitoring and control circuitry. This may be the case if the unit continuously disables the output due to going beyond low voltage limits or the troubleshooting section recommends switching to this mode. Refer to the vendor operator's manual for more information.

Step	Action
1.	Turn off all power to the unit
2.	Remove the small door labeled "Access to Manual Override Switch" with a Philips screwdriver
3.	Locate the toggle switch labeled "Standard Operation" or "Manual Override"
4.	Flip the switch to "Standard Operation" or "Manual Override"
5.	Replace the access door
6.	Apply power to the IsoBoost.

Note: In manual override mode only the red light will be on and the boat voltage will equal the shore voltage. Isolation is maintained in manual override mode.

**CAUTION**

POSSIBLE EQUIPMENT DAMAGE!
THE USER ASSUMES THE RISK
OF APPLYING VOLTAGE OUTSIDE THE BOAT'S
ELECTRICAL EQUIPMENT SPECIFICATIONS
IF THE MONITORING CIRCUITRY
IS DISABLED WITH THE MANUAL
OVERRIDE SWITCH.



GALVANIC ISOLATOR



As standard equipment a 60 amp (60 hertz) galvanic isolator for domestic use is connected in series with the AC grounding “green” wire. Overseas yachts use a 30 amp (50 hertz) galvanic isolator.

The purpose of the galvanic isolator is to isolate the yacht’s grounding system from the shorepower ground. The galvanic isolator allows AC voltage to travel back to the green ground wire at the marina power center in the event a short exists on the boat. Also, the isolator blocks any DC current from traveling on the green ground wire. This eliminates the possibility of galvanic interaction from other boats in the vicinity.

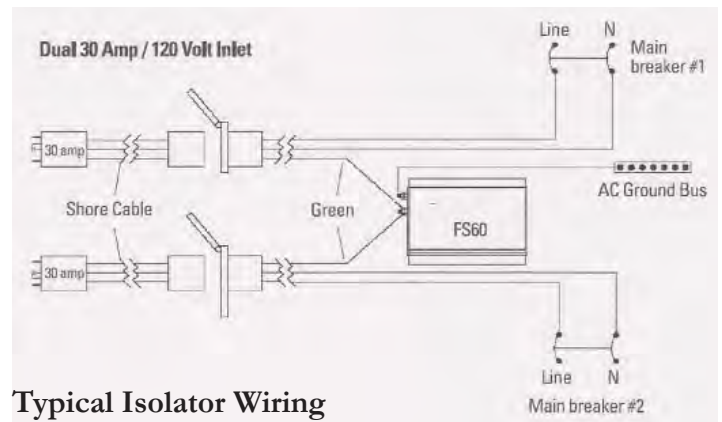
The green ground or “bonding wire” runs from the yacht’s shore power inlet or optional cord reel to the galvanic isolator. From the output of the galvanic isolator it runs to the AC ground buss located behind the AC main control panel in the salon.

Since the galvanic isolator is not polarized either terminal can be used as the inlet or output side for the green grounding wire. See the illustration.

There is a fan located inside the isolator. If you ever hear the fan running the **isolator has failed**. Disconnect the shore power from the boat and check the system. Call your closest Regal yacht dealer for more information.

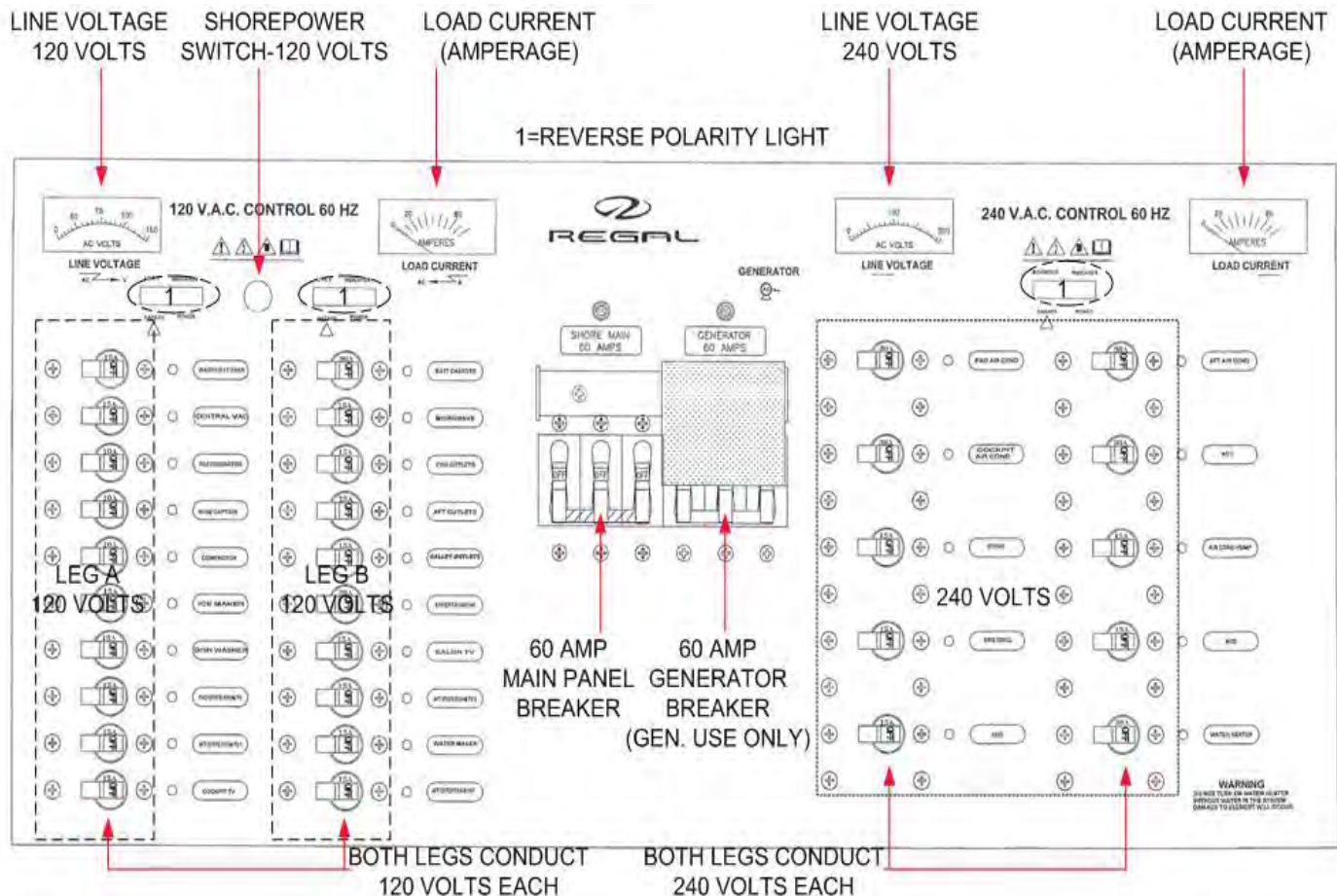
Do not store objects near the isolator that might inhibit air flow to the fan.

Note that the galvanic isolator is not needed and therefore is not installed on vessels with the optional ISO Boost Isolation Transformer.





MAIN AC PANEL METER/SWITCH FUNCTIONS



The vessel's main AC 120/240 volt control panel is located at the starboard aft salon. Lift the overhead cabinet door to gain access to the panel. The main call outs on the panel will be addressed. This panel serves as the main distribution for the incoming shore power from the marina power center or from the ship's generator when at cruise. The ship's main DC panel is located along side of the AC panel. Information on the DC panel is found earlier in this chapter.

SHOREPOWER PANEL DISTRIBUTION

As noted earlier the shore power cord delivers AC electricity through the yacht's shore power inlet or the optional cord reel system. The AC current travels through the vessel's electrical system to the main AC 120/240 volt control panel. The AC electricity is now ready to be distributed to the various equipment components.



120/240 VOLT MAIN YACHT CONTROL PANEL

REVERSE POLARITY INDICATOR

Before activating the 60 amp main breaker visually check for a green light at the reverse polarity indicator. The green light indicates there is no reverse polarity. There are 3 reverse polarity indicators identified on the illustration by the numeral 1. If the red light appears on the reverse polarity indicator a hot wire and ground are probably reversed somewhere in the circuit from the dock to the main panel. In either case do not activate the main 60 amp breaker. Take immediate corrective action to find the cause of the reverse polarity situation. At this point, disconnect the shorepower cord from the marina power center and call for professional assistance.

60 AMP MAIN BREAKER

This main breaker controls power to the 120 and 240 volt sections of the panel and eventually delivers electricity through a system of sub breakers to the entire yacht. Before you energize the breaker it is always a good idea to check all the legs on both the 120 volt and 240 volt side for breakers that are in the “on” position. Turn any breakers to the “off” position. This prevents any excessive equipment motor draws and may eliminate any system arcing.

With the reverse polarity indicator showing the green icon, activate the main breaker by pushing the single throw arm up. AC electricity now is distributed to both the 120 and 240 volt legs of the panel. Turn on the sub breakers as needed.

60 AMP AC GENERATOR BREAKER

When the yacht is under generator power at sea AC electricity is distributed through the 60 amp main generator breaker located on the AC main ship's panel beside the main breaker. See the previous illustration and the generator section for further information.

Before activating the generator AC breaker it is recommended to make sure all the equipment breakers are “off.” Slide the bar to the left so the generator 60 amp breaker arm will clear when activated. Push the single throw arm up to energize generator AC current to the sub panel breakers. Switch on the sub panel breakers as needed.

LINE VOLTAGE/CURRENT METERS

After the shore power 60 amp main breaker or generator breaker is activated line voltage up to 240 volts will display on the 240 volt (right side) of the main panel. As sub panel 240 volt equipment breakers are activated the load current meter (extreme right side of 240 volt panel) will show an amperage draw. Normally the amperage will ascend as more equipment breakers are activated and will descend as equipment breakers are deactivated.

After the 60 amp main panel breaker or generator breaker has been activated no voltage will appear on the 120 line voltage meter at the extreme left side of the main control panel with the 120 shore power switch in the “off or center” position. This is normal. See the illustration.

The 120 volt shore power switch is located between the line voltage and load current meters. See the illustration.

As stated above with the shore power switch in the “center” position it is off. When the shore power switch is moved to the left the line voltage meter will display up to 120 volts available at leg A. As equipment breakers are activated the load current (amperage) meter will ascend and descend as equipment breakers are deactivated.

When the shore power switch is moved to the right the line voltage meter will display up to 120 volts available at leg B. As equipment breakers are activated the load current (amperage) meter will ascend and descend as equipment breakers are deactivated.

When leaving the vessel for extended periods with the dockside cord system activated it is recommended to leave the inverter breaker on the 120 volt side of the ship's main AC panel on along with the refrigerator and cockpit refrigerator breakers on the sub-panel to the right of the ship's main AC panel. This will protect the salon sub-zero refrigerator items along with the cockpit unit.



120 VOLT MAIN PANEL BREAKER DESCRIPTION

Leg A

Washer/Dryer- This 15 amp breaker controls both the stackable washer and dryer units located in the master stateroom armoire.

Central Vac- This 15 amp breaker controls the yacht central vacuum system.

Refrigerator- This 10 amp breaker controls the galley refrigerator. when the inverter is deactivated.

Wine Captain- This 10 amp breaker protects the optional beverage cooler unit.

Acc- This 6.5 amp breaker controls any after market installed accessories.

Ice Maker- This 15 amp breaker controls the cockpit ice-maker unit.

Dishwasher- This 15 amp breaker controls the galley dishwasher unit.

FWD. State Room TV- This 15 amp breaker controls the forward stateroom television set.

Aft State Room TV 1- This 15 amp breaker protects the master stateroom television.

Cockpit TV- This 15 amp breaker controls the optional cockpit television.

Note: A portion of the listed equipment may be optional.

Leg B

Inverter- This 30 amp breaker controls the Mass Combi battery charger/inverter. When the inverter breaker is activated this unit runs the sub-zero and cockpit refrigerator from the inverter which through a transformer changes DC voltage to AC voltage. Then the current is stepped up to 120 volts AC.

Microwave- This 15 amp breaker controls the galley overhead microwave.

Fwd. Outlets- This 15 amp breaker controls the 120 volt GFCI in the starboard master stateroom, down stream receptacles located at both ends of the sofa and forward state room.

Aft Outlets- This 15 amp breaker controls the 120 volt GFCI in the starboard master state room and down stream receptacles in the aft head, engine room, cockpit and starboard stairway locker.

Galley Outlets- This 15 amp breaker controls the 120 volt GFCI in the port master stateroom and down stream receptacles in the port galley area and forward head.

Entertainment- This 20 amp breaker at one time controlled the main cabin entertainment system but at the present time these functions use the inverter. This breaker can be used for accessories. Note that the breaker label still says entertainment.

Salon TV- This 15 amp breaker controls the salon TV.

Aft State Room TV 2- This 15 amp breaker controls the aft (master) state room television set.

Water Maker- This 15 amp breaker is presently an unused accessory breaker.

Aft Entertainment- This 15 amp breaker controls the aft (master stateroom) entertainment unit.



240 VOLT MAIN PANEL BREAKER DESCRIPTION

Left Leg

Fwd. Air Cond- This 35 amp breaker controls the forward air conditioning unit located under fwd, state room berth..

Cockpit Air Cond- Sometimes referred to as “cool cockpit” this 35 amp breaker controls the optional air conditioning unit located in the bilge.

Stove- This 15 amp breaker controls the galley stove.

BBQ Grill- This 15 amp breaker controls the barbecue grill located at the starboard cockpit.

Batt Charger- This 15 amp breaker protects the 50 amp battery charger.

Note: Select equipment may be optional.

Right Leg

Salon Air Cond- This 20 amp breaker controls the air conditioning unit located under the salon floor closest to the starboard hullside.

Master Air Cond.- This 20 amp breaker controls the master stateroom air conditioning unit located under the salon floor facing inboard.

Air Cond Pump- This 25 amp breaker controls the air conditioning pump located in the engine room (bilge). This pump is supplies water to both the forward air conditioning unit and the air conditioning unit located in the engine room (bilge).

Stabilizer.- This 20 amp breaker controls the high voltage side of the optional Seakeeper® stabilizer circuit.

Water Heater- This 20 amp breaker controls the water heater located in the engine room (bilge). Never turn on this breaker without water in the system as the water heater element will be damaged and replacement required.



WARNING

TO PREVENT POSSIBLE ELECTRICAL
SYSTEM DAMAGE OR FIRE
DO NOT TRY TO ACTIVATE
SHORE POWER MAIN BREAKERS
IF REVERSE POLARITY LIGHT IS
DISPLAYED.

AC WIRE USAGE

4/4 Romex Boat Cable	Opt. Generator Output
6/4 Romex Boat Cable	Std. Generator Output
6/4 Romex Boat Cable	50 Amp Service
10/3 Romex Boat Cable	Cool Cockpit A/C
12/3 Romex Boat Cable	Other A/C Units
12/3 Romex Boat Cable	Stove Power Supply
14/3 Romex Boat Cable	A/C Pump, Power Pump Relay
14/3 Romex Boat Cable	Receptacles, Microwave, Water Heater, Refrigerator, Ice maker, Central Vacuum System



ALTERNATING CURRENT LOAD MANAGEMENT

Alternating current brought on board through the shore power cords dockside and/or produced at sea through an onboard generator must be managed to achieve the most from the limited power available. It is completely opposite from our homes where available voltage, numerous breakers and an abundance of circuits serve an almost unlimited supply of appliances, lights and other components.

As you activate sub breakers at the main ship's panel either on shore power or generator power some desecration must be used. Monitor the load current (amperage) meter at the top right side of the main ship's panel. Note that the load current meter serves shore power 1 and 2 separately depending on the position of the on-off-on center located switch. As you activate more equipment breakers the amperage use will advance (travel to the right) at the load current meter. As you position the switch for shore 1 or 2 make sure the amperage does not exceed 30 on either circuit.

If you are using generator power do not exceed 40 amps as shown on the load current meter.

Note: The air conditioner is part of the shore 2 circuitry. In some cases it may be necessary after running the air conditioner awhile to turn the thermostat to the "fan" position before attempting to activate other breakers on the same shore 2 circuit. This will shutdown the compressor motor but the system will still circulate cooled cabin air for a temporary period. This procedure will provide more available amperage for other selected components while the air conditioner system is in the "fan" mode.



GFCI Outlet-Typical

Sometimes current in a circuit escapes its normal route and finds a “ground fault”. If that vehicle ends up to be your body and the current passes through your heart the results could be deadly.

A ground fault interrupter or GFCI senses the difference between the hot and neutral wire current before a fatal dose can be conducted and in a fraction of a second cuts the current.

The GFCI devices used in homes are normally not ignition protected. Your yacht uses 120 volt receptacles. By using a GFCI as the first receptacle in the circuit all the receptacles down stream on the same circuit are protected by the initial GFCI. This is accomplished by attaching the hot wire to the line terminal of the GFCI receptacle and the out-going hot wire to the load terminal. The neutral wires also use line and load terminals on the opposite side of the GFCI receptacle.

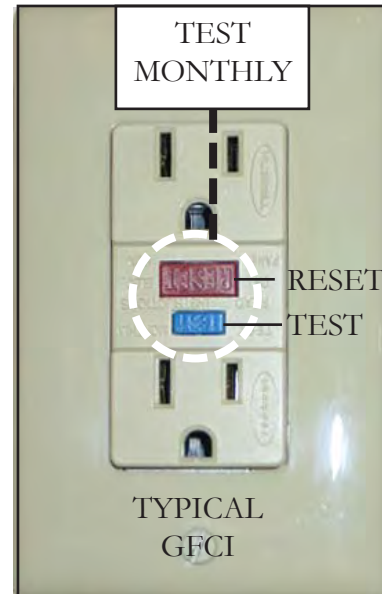
You can identify the GFCI primary receptacle by the test and reset breaker in the center of the device. Check the GFCI protection monthly. If a problem develops with the GFCI circuitry call a marine electrician to access the situation.

The GFCI outlets are especially useful when electrical equipment is employed such as a drill or in the bathroom with the use of personal devices such as curlers and hair dryers. Never use any electrical devices when puddling water is present to prevent possible shock hazard.

Notes on GFCI's (Always seek a certified marine electrician preferably with ABYC certification to replace any electrical components.

1. If the unit fails disconnect all shore power before attempting to replace duplex plug.
2. Pay special attention to the line and load connection points. Brown conductors are placed on the appropriate line/load terminals. These are the “hot” current carrying conductors. The blue conductor wires must be connected to the terminals labeled “white” which are the neutral return conductors.

GFCI'S (TYPICAL GROUND FAULT CIRCUIT INTERRUPTER)



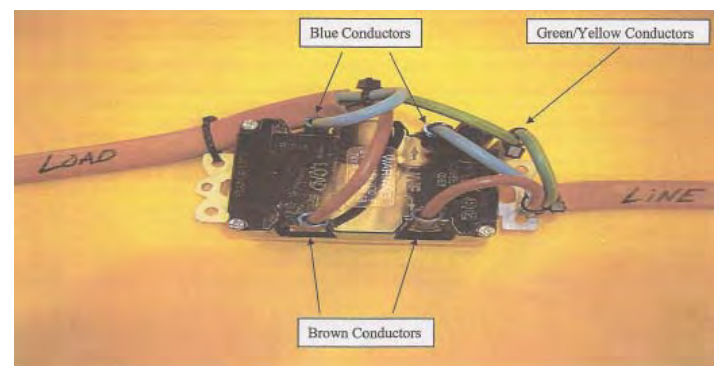
The GFCI is programmed to protect a person from line to ground shock hazards which could occur from various electrical devices operating off of the device or receptacles down stream. It does not prevent line to ground electric shock, but does cut down the exposure time to a fraction of a second before the device trips. It does not protect people against

line to line or line to neutral faults. Also, it does not protect against short circuits or overloads; this is the circuit breakers job.

All GFCI's should be tested monthly to make sure they and the receptacles they protect “downstream” are protecting against ground-faults.

To test:

- a. Depress the test button.
- b. Reset by pressing the reset button.





GFCI OUTLET COLOR CODED WIRING (USA)




TYPICAL GFCI PROTECTED RECEPTACLE LOCATIONS

At Main AC Breaker Panel

 Galley Outlets Bkr.

 Fwd. Outlets Bkr.

 Aft Outlets Bkr.

RECP= Protected Receptacle

GFCI= Ground Fault Circuit
Interrupter Outlet



Note: There are 3 GFCI circuits as represented by the numbers 1,2,3



Testing GFCI'S

To test a GFCI on your yacht find a 120 volt night light or small lamp to plug into the GFCI outlet. Try it in another circuit first to make sure it lights.

After the lamp is plugged into the GFCI outlet the lamp should light. Now press the “test” button at the GFCI receptacle center. The GFCI’s “reset” button should pop and the lamp should go out. This means the GFCI itself is functioning properly. Press the “reset” button to restore power to the outlet.

You can use the lamp to check receptacles down stream from the GFCI. All receptacles should light the lamp and should go out when the “test” button is pressed.



Also, GFCI down stream receptacles can be tested with a plug-in type GFCI tester. This tester contains a GFCI test button which accomplishes the same thing as the GFCI receptacle built-in test button. This tester can be purchased at electrical supply houses or marine retailers.

Ignition Protected Devices

Many electrical devices in everyday use tend to “arc” or spark when being used. These include motors, fans, switches, relays, etc.

Select equipment in the 53 SC engine room is **not** ignition protected. Obviously, the diesel engine room is not an explosive environment but care still needs to be taken in this local.

Never store any gasoline containers or any other flammable products in the engine compartment to prevent the possibly of an explosion or fire. Leave any flammable products or containers shore side. Use common sense!

POSSIBLE PROBLEMS/SOLUTIONS (GFCI'S)



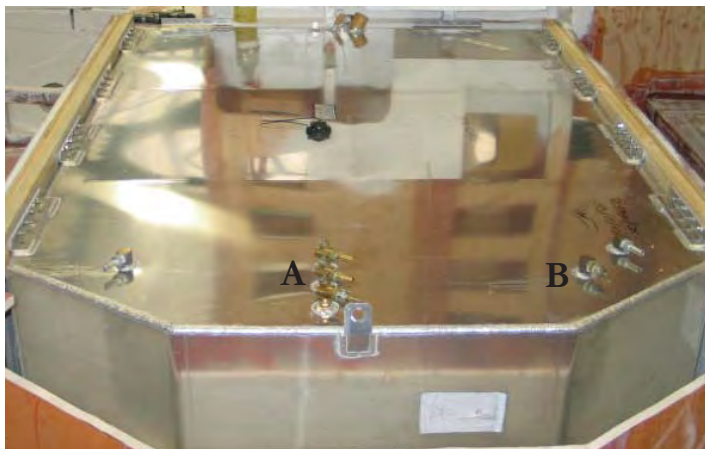
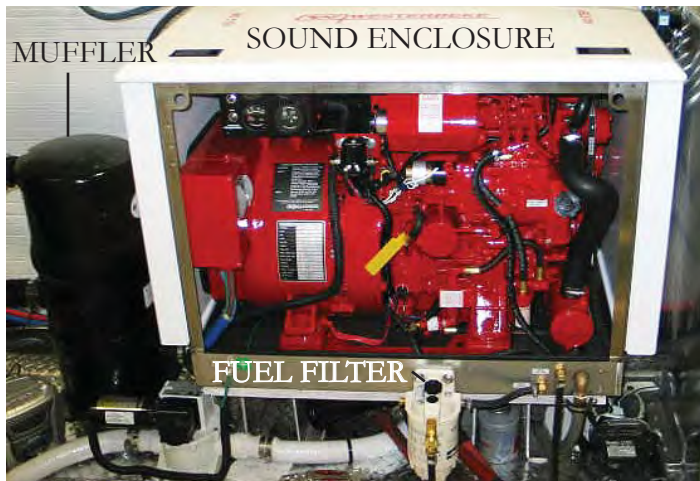
1. If the “reset” button does not pop out, the GFCI is defective and should be replaced.
2. If the “reset” button pops out one time but tends to stick the next the GFCI should be replaced.
3. The GFCI “reset” button pops out when something is turned on. This may indicate an internal wiring problem with the GFCI or there may be a ground-fault down stream.
4. The GFCI “reset” button is in the pressed position and nothing works. Check the appropriate breaker at the main ship’s AC control panel to make sure it has not “tripped” or as been deactivated. With this situation the GFCI needs to be reset after the breaker is reset.



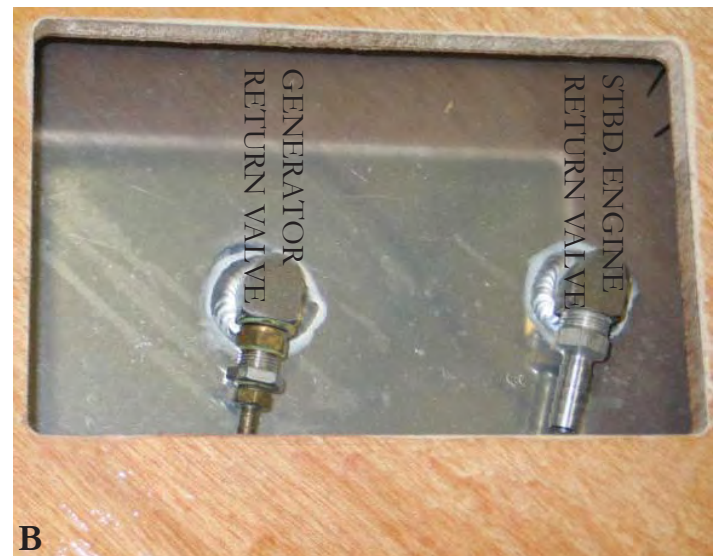
AC GENERATOR (GEN-SET)

OVERVIEW

The diesel generator is used on board to provide alternating current (AC) when the vessel is unplugged from the dockside cord. Generator frequency known as hertz is domestically set at 60 while overseas countries normally require a setting of 50. As the generator reaches full rated no load output (amps) at 60 hertz it should display 120 volts. At 50 hertz it should display 230 volts. The generator is located in the port engine room. Some basic system components are identified below.



The generator features a sound enclosure which reduces noise and enables quick access for most inspections and routine maintenance.



Fuel System

The generator uses the same diesel fuel tank as the engines which is located under the master state room berth. The generator fuel and return valve is marked for identification purposes. The feed valve features off and on positions. “Off” position is 90 degrees perpendicular to the valve. “On” position is in line with the valve. Familiarize yourself with the location of all equipment and valves. See the illustrations and the vendor operation manual for further information.



The generator fuel system features an in-line remote fuel filter. Its job is to keep fine particles and water out of the generator fuel injection system. Refer to the vendor information for periodic maintenance schedules. Clean fuel is the life line of diesel engine performance.

Notes-Element Replacement

Contamination level varies in fuels. As the fuel system slowly plugs the element fuel flow to the engine becomes increasingly restricted.

Replace the element every 500 hours, annually, or at the first sign of power loss or hard starting which ever comes first.

Note: The generator uses a primary Racor 500 MA filter which carries an element filtration rating of 10 microns.



TYPICAL GENERATOR FUEL FILTER

To Drain & Reassemble Racor Water Separator Filter

The Racor diesel fuel filter should be drained frequently and checked for water and other contaminants as needed:

1. Place filter fuel valve in the “off” position which is perpendicular (90) degrees to the fuel lines. Failure to turn valve off may allow a continuous flow of fuel due to siphoning.
2. Place a suitable container below the filter bowl assembly to catch the contaminants.
3. If needed use a flashlight and observe the bottom of the glass bowl. Remove drain plug at the bottom of the filter bowl assembly (14). Besides trash look for water which will settle in the bottom of the filter bowl (19) since it is heavier than diesel fuel. It will appear as a different color. Drain the contaminants into the container. Close container and retain for proper disposal. Replace the drain plug. In extremely humid conditions, the fuel system may require daily checks and draining of water.

To Prime Racor Water Separator Filter

1. Place filter fuel valve in the “off” position which is perpendicular (90) degrees to the fuel lines. Failure to turn valve off may allow a continuous flow of fuel due to siphoning.
2. Open the filter top by turning the T-handle counterclockwise. Remove the lid. Make sure the O-ring is in good condition.
3. Pour a container of fresh diesel fuel into the head assembly until full.
4. Coat O-ring with diesel fuel and install it in the lid. Place lid on head.
5. Coat T-handle O-ring with fresh diesel fuel.
6. Reinstall T-handle into lid being careful not to damage T-handle O-ring.
7. Hand tighten T-handle by turning clockwise.
8. Open shut-off valve and start engine looking for any system leaks.

Note: See earlier part of chapter for filter parts and the troubleshooting chapter for more specific information on fuel filter problems and solutions.



Electrical System

The generator starting system uses the port cranking battery. The generator is normally started at the 12 volt ship's control panel located in the salon but it can also be started using the remote instrument panel located at the generator itself as needed. The latter is especially useful while maintenance is being conducted. The generator remote instrument panel features temperature, oil, DC volts, hour meter gauges and pre-heat, start and stop switches. The starting switches can be reached through an access panel at the sound shield.

One of the switches is set up different on the ship's main control panel. Here the pre-heat switch is called an "on" switch. The start and stop switches by name and function are identical to the switches on the remote panel.



ILLUSTRATION A



ILLUSTRATION B



TYPICAL GEN-SET SWITCH CLUSTER- MAIN PANEL

Note the illustrations showing the remote instrument and start panel. As part of the generator electrical system an 8 amp fuse protects the remote instrument panel wiring circuit. See illustration B.

Above the fuse is a switch. This switch must be in the "run" position or the generator will not start. The emergency stop switch shuts the fuel off to both the remote and ship's main control panel and is normally for maintenance purposes. See illustration B.

A 20 amp DC manual reset breaker protects excessive current draw or electrical overload anywhere in the generator engine wiring. Should this breaker trip the generator will shut down. Reset the breaker only after the cause of the problem has been determined. See illustration A.

An AC breaker will automatically disconnect any generator AC power from reaching the main ship's control panel in case of an electrical overload. It can be manually shut off when performing generator maintenance to ensure no AC power is coming out of the generator. See illustration A.

NOTICE

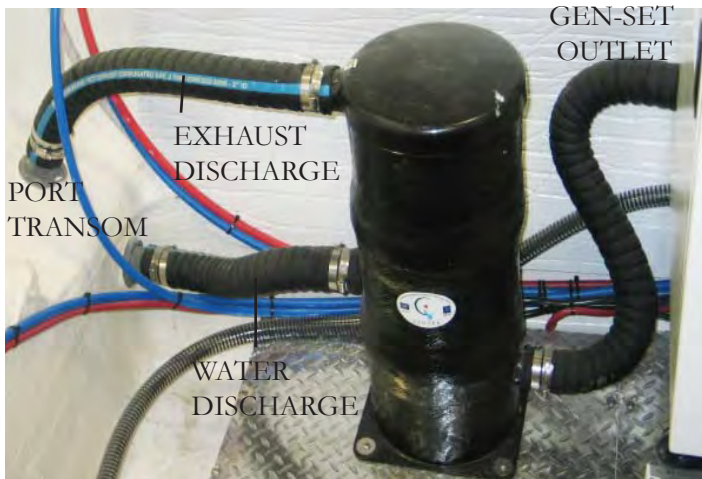
TO PREVENT POSSIBLE GENERATOR DAMAGE ALL SHORE POWER BREAKERS AND AC SWITCHES NEED TO BE DEACTIVATED BEFORE STARTING OR STOPPING GENERATOR.



Exhaust System

The diesel generator exhaust system features a dual tier operation. As the water and exhaust exit the generator they travel to the muffler. The muffler discharges the heavier water out the muffler bottom and through the hull. The exhaust itself is exited out the muffler top and through the hull. The benefits of the system are two-fold. First, the actual decibel or sound level is decreased. In addition, the lower resonating sound is more pleasing to the ear. For colder climates, a drain plug is installed in the muffler.

TYPICAL GENERATOR MUFFLER



Periodically, check the hose connections for signs of water and air leaks. Tighten hose clamps as needed.

Before Starting Generator

The following items should be checked each time before starting the generator. This covers the basic system components.

- ☑ Turn generator seacock off. Check strainer for debris. Turn generator seacock on before starting generator.
- ☑ Ensure that all main panel and equipment breakers are off.
- ☑ Inspect the generator for fuel, oil, exhaust or water leaks.
- ☑ Check generator engine oil level. Top off with correct viscosity as required.
- ☑ Check coolant for proper level at recovery tank. Add as needed.
- ☑ Check the main fuel tank to ensure there is adequate diesel for both the generator and the engines. Apply the one-third rule.
- ☑ Check for loose wires at the alternator.
- ☑ Check the port side cranking battery (weekly).
- ☑ Check drive belts for wear and proper tension (weekly).
- ☑ Record the hour meter reading to meet maintenance scheduling.



Starting Generator-Salon Ship's Main Control Panel



the last page has been completed and all system components are in good condition. For further information, contact your closest Regal yacht dealer or refer to the generator operation manual.

The following generator starting information is specified for use at the ship's main control panel located in the salon. *It also assumes that the checklist on*

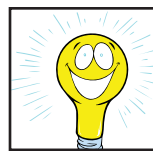
1. Turn "on" the generator seacock in the engine room.
2. Check the ship's main control panel to ensure shore main and all equipment breakers are deactivated.
3. At the ship's main control panel find the generator switch cluster. Push down on the "on" switch and hold approximately 4 to 5 seconds. This provides a preheat cycle for the generator.
4. While holding the "on" switch down push down on the "start" switch. This will engage the generator starter to crank over the gen-set engine.
5. Once the generator starts, release both the "on" and "start" switches.
6. Let the generator run without a load for several minutes.
6. At the ship's main control panel slide the transfer bar completely to the left. This will permit the 60 amp AC generator breaker to be activated. To activate the breaker flip it up. At this point AC voltage should display on the AC line voltage meter.
7. At this point activate the desired AC equipment breakers.

Stopping Generator

To stop the generator follow these steps at the ship's main control panel.

1. Turn to the "off" position all AC equipment breakers.
2. Turn to the "off" position the 60 amp AC generator breaker. At this point, no AC line voltage will be displayed at the AC volt meter. Let the generator run for 3-5 minutes without a load to cool down.
3. Stop the generator by pressing down the "stop" switch at the main panel generator switch cluster. Hold it down until the generator stops running.
4. If desired plug in the appropriate dockside cord. Slide the transfer bar completely to the right. Flip up the shore main 60 amp breaker for dockside power. AC voltage should display on the AC line voltage meter.

POSSIBLE PROBLEMS/SOLUTIONS



1. With generator main control panel activated there is no voltage at the AC line voltage meter. Check AC output breaker on the generator. It may of tripped due to an overload.
2. The generator quit do to overheating. Check the generator strainer for obstructions such as seaweed, plastic, or shellfish. Be sure to turn off seacock before removing the strainer basket.
3. The generator will not start from the main ship's panel after being serviced. Make sure the generator mounted switch is in the "run" position.
4. The generator will not crank over to start. Check the port cranking battery by starting the port engine. If it starts battery is up. Then check all generator battery connections. Tighten any loose connections.



AIR CONDITIONING SYSTEM

Overview

The air conditioning dual zone system features a total output of 36,000 BTU's (British Thermal Units). The system utilizes a single 230 volt pump which delivers cooler seawater to both evaporators/condensers found under the main cabin floor. Warmer seawater exits the yacht through a manifold and various thru-hull fittings.

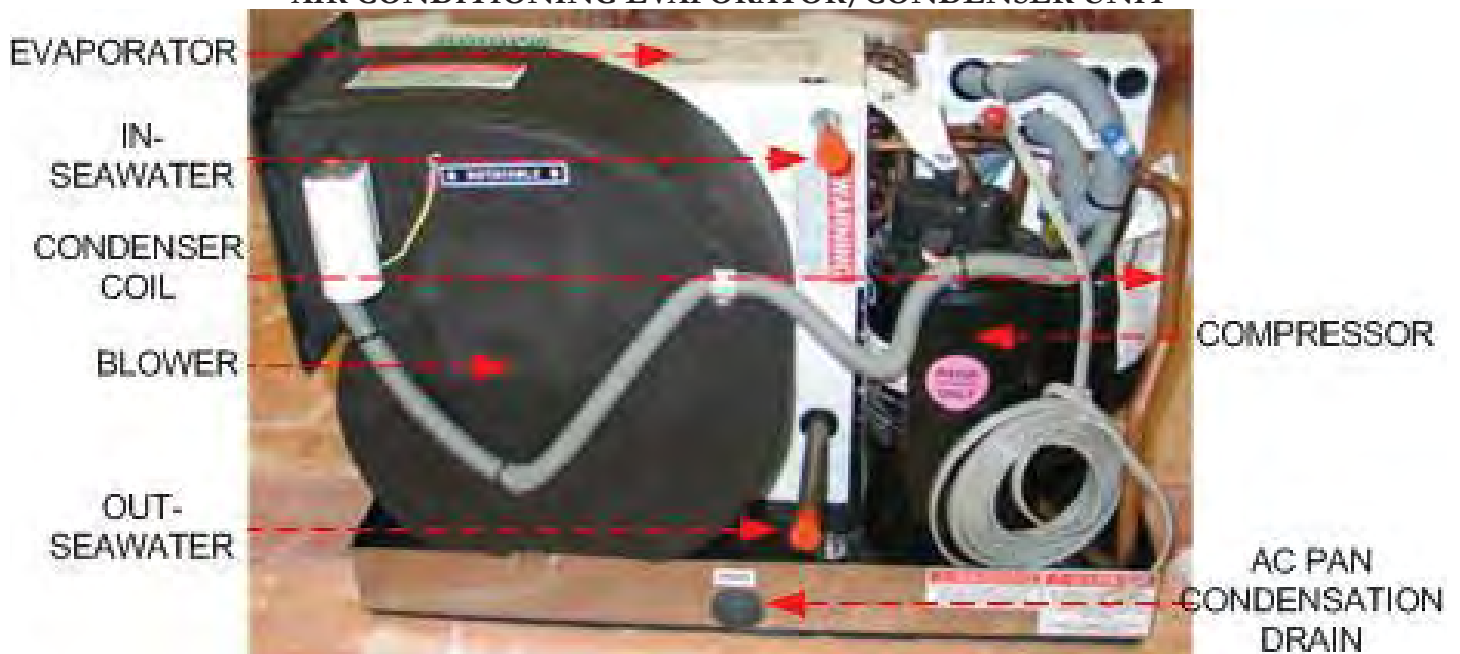
The starboard salon based 18,000 BTU evaporator/condenser unit is part of the salon air conditioning system. The port salon based 18,000 evaporator/condenser unit is connected to the master stateroom A/C unit. Each of the evaporator/condenser units incorporate a compressor to compact the refrigerant.

The forward air conditioner located under the fwd. berth serves the forward cabin and forward head.

Optional "cool cockpit" air conditioning is featured at 36,000 BTU's. The evaporator/condenser unit is located in the bilge. Seawater is delivered through a single 230 volt pump located in the engine room.

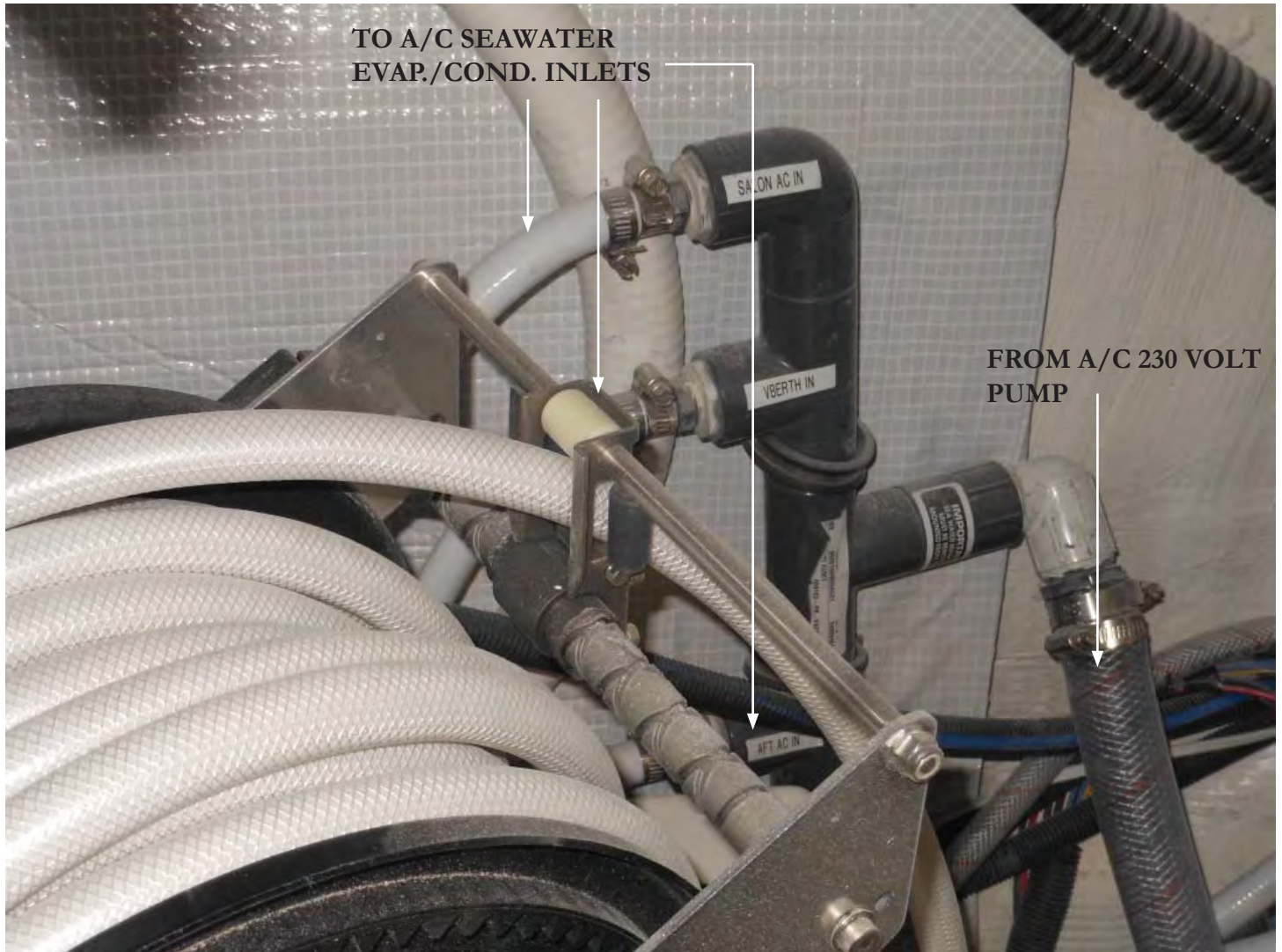
Find the Elite control panel (thermostat) for each of the units and become familiar with its operation and the fault codes. For more information refer to the operator's manual.

TYPICAL
AIR CONDITIONING EVAPORATOR/CONDENSER UNIT





AIR CONDITIONING HOSE IDENTIFICATION



Overview

The air conditioning evaporator/condenser units require a constant supply of seawater to function correctly. The seawater uses a seacock/stainer to send seawater to the 230 volt A/C pump. (Note that a Sea Chest pump option may be installed between the seacock and the A/C pump. The Sea Chest pump (macerator) filters the seawater thus eliminating the need for a strainer in the system). At this point the water travels to a manifold where it is distributed to the evaporator/condenser units.

The A/C manifold is located at the starboard aft engine room. Periodically inspect all fittings and connection points for leaks. Also, tighten hose clamps as required.



Reverse Heat

Your yacht air conditioning system features a reverse heat cycle. This can be extremely valuable to boater's in colder climates especially for early spring and late fall cruising. To accomplish reverse cycle heating, the refrigerant flows in the opposite direction through a reversing valve located on the evaporator/condenser unit. Heat is transferred from the seawater in the coil of the condenser to the refrigerant and then to the air as it is blown through the evaporator to the cabin.

Obviously, the temperature of the seawater will effect the air conditioner efficiency.

The temperature variance for cooling efficiency is:

Up to 90 Degrees F. (32.2 Degrees C.)

The temperature variance for heating efficiency is:

Down to 40 Degrees F. (4.4 Degrees C.)

Air Conditioning System Operation

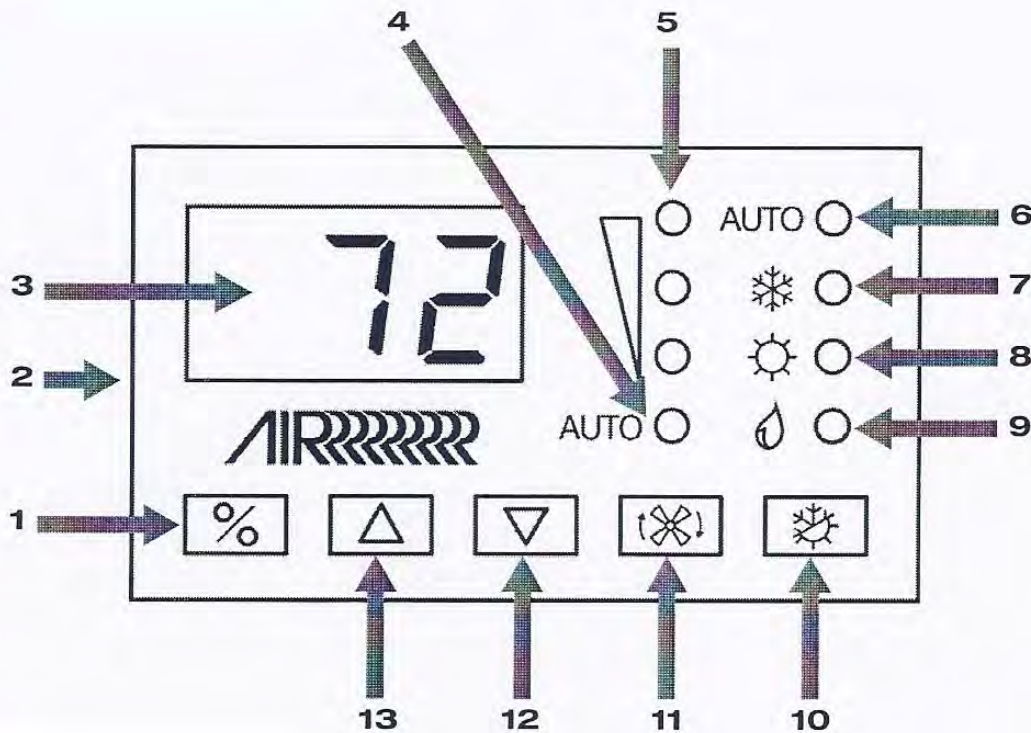
Below is a basic quick start-up checklist for the air conditioning system. **For more in depth information, refer to the vendor operation manual found in the owner's documentation folder** located in the port aft set of drawers in the aft master stateroom cabinet.

Operations Quick Start-Up Checklist:

1. Check the AC seawater strainer for debris.
2. Make sure the AC seawater pump seacock located in the engine room is opened completely (handle should be in-line with the hose).
3. Depending which air conditioning unit you desire to use (forward, aft, cockpit) activate that breaker on the yacht's main AC control panel located in the starboard aft salon overhead cabinet.
4. Activate the air conditioner pump breaker located at the ship's main AC control panel.
5. Check the hullside thru-hulls for a steady stream of seawater. Seeing water here is normal. If stream is diminished or no water emits from the fitting immediately turn the 230 volt AC pump off and investigate the cause of the problem. If optional cockpit air is installed check the transom thru-hull fittings for a steady water stream.
5. Press the Elite thermostat Power button once to activate the air conditioning system. A blank screen displays when system is off and indicates present cabin temperature.
6. For cooling or heating press and release the Mode button until the desired LED is illuminated ie; automatic mode.
7. Press the Up or Down button to set the desired cabin temperature. To view the set point, momentarily press and release the Up or Down button.
8. Auto fan LED lights when Auto fan speed is selected.



TYPICAL ELITE AC CONTROL



Elite Display - Diagram Legend

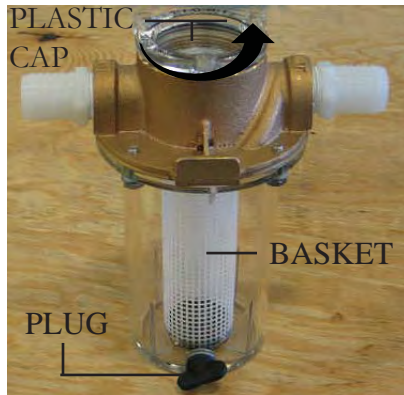
1	Power button	8	Heat Mode indicator
2	Temperature sensor	9	Moisture Mode indicator
3	Digital display	10	Mode button
4	Auto Fan indicator	11	Fan button
5	Manual Fan indicator (high, medium, low)	12	Down button - Lower temperature set point
6	Auto Mode indicator	13	Up button - Raise temperature set point
7	Cool Mode indicator		

Note: The Elite display continually monitors the system components. Should a problem develop it sends a diagnostic code to the control (thermostat) display. Refer to the vendor air conditioning manual (troubleshooting) to assist in identifying the problem.



AIR CONDITIONER MAINTENANCE TIPS

Seawater Strainer




TYPICAL A/C SEAWATER STRAINER

The air conditioner seawater strainer located in the engine room should be cleaned periodically of debris which can inhibit or stop the fresh seawater supply. Always turn the seacock to the off position (90 degrees to the hose fitting) before cleaning a seawater

strainer. Remove the basket by turning the plastic cap in a counterclockwise direction. Set the cap and the O ring aside. Pull the basket from the unit, rinse with water, air dry and reinstall. Sediment at the bottom can be removed by just turning the plug in a counterclockwise direction. Set the plug and O ring aside. Place a container under the strainer to catch the sediment. Coat the O rings with waterproof grease containing a silicone or teflon base. Reinstall O rings along with the plug and plastic cap. Turn on the seacock and check for leaks.

Return Air Filters

Once a month check the return air filter located on the face of each evaporator. To clean rinse with fresh water, air dry and reinstall.



WARNING

PREVENT SEVERE INJURY OR DEATH!
DISCONNECT
ALL ELECTRICAL POWER SOURCES
BEFORE ATTEMPTING
TO OPEN, REPAIR OR REPLACE ANY
AIR CONDITIONING COMPONENTS.

Drain Pans

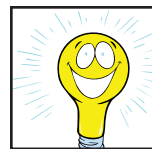
As noted on an earlier page the AC evaporator/condenser units feature a 2" deep drain pan connected by a hose that runs to a sump pump and eventually exits overboard. Periodically just like your home AC, the pan needs to be rinsed clean of debris and possible mold.

You can use a purchased product or mix laundry bleach and water (1 part bleach to 5 parts water) in a quart container with a lid. Disconnect the outlet hose from the AC pan and install a made up hose (5/8") that will catch the used bleach solution to fill the container. Dispose of the container in accordance with federal, state and local regulations. Pour the solution into the pan and allow time for it to drain. Reconnect the original drain pan hose.

Condenser Coil Cleaning

Periodically the condenser coils are recommended to be cleaned. This procedure should be done by a professional since an acid solution must be used.

POSSIBLE PROBLEMS/SOLUTIONS (A/C)



1. No or little water is noticed at the thru-hull fittings and a HPF shows on the display which means the high pressure switch is open.

The strainer or intake hose may be clogged, seacock may be closed or a hose may be collapsed or kinked. Check AC pump breaker to verify pump operation.

2. Air conditioner will not start. Ensure the proper AC breaker is actuated on the ship's main control panel.

3. No cooling or heating. Lower or raise set point on thermostat control to offset set point being satisfied. Check for obstructed seawater flow. Remove discharge side of pump hose to purge air (air-lock). Seawater temp too high for cooling and too low for heating.

4. Fan coil is iced. Raise or lower control set point. Clean return air filter. Switch AC to heat until ice melts or as a last resort use a hair dryer to melt ice as needed.



FRESH WATER SYSTEM

Overview

Your vessel is equipped with a fresh water supply system. It consists of a fresh water tank, deck fill/vent fittings, monitor panel, 2 pressure water pumps with filters, distribution system, dual manifolds, wash down spigots and hot water heater. The system features dual water storage tanks located in the engine room. As needed the pressure demand type pump is energized, or the dockside system distributes water through the vessel .

The system is normally winterized from the factory utilizing a product called “Freeze Ban”. It is best to completely drain the Freeze Ban before adding any water to the tank in order to minimize the taste of Freeze Ban. Freeze Ban will not harm you but it does have a peculiar taste.

The system requires little maintenance except occasional cleaning of the water filter and winterizing in cold weather climates.

For more specific information on the water system contact your closest Regal yacht dealer.

Filling Water Tank At the Deck Fill



The fresh water system 2 tanks total capacity is approximately 125 gallons or 143 liters. The water fill is located at the deck rope locker. Make sure you do not mistake the water fill cap for waste or diesel. To fill the system turn the water fill cap counterclockwise.

Remove the cap and insert

the supply hose. **Make sure the water source is pure and drinkable.**


Fill until you see water emerging from one of the vents on either side of the hull close to the water tanks. Since there are two water tanks, it is normal that one will fill before the other. Keep filling the tanks until water emerges from the other vent. At this point both water tanks are full.

Using Fresh Water (Potable) System

After filling the fresh water tanks do the following to activate the system:

1. Check the potable water tank valve to ensure it is in the “off” position.
2. Make sure both the cold and hot water supply valves along with other desired equipment supply valves located at the engine room water system manifold are in the “on” position. Note: All cold water lines are **blue** and all hot water lines are **red**. See illustration E.
3. Ensure all the desired equipment supply valves are in the “on” position at the forward water system manifold located under the salon aft floor just left of center. See illustration D.
4. Flip “on” the water pump and booster pump breakers at the 12 volt ship’s control panel located in the starboard salon aft overhead cabinet. At this point, fresh water is drawn out of the potable water tank and distributed through out the vessel by the in-line fresh water pressure pumps.. The water pumps will shut off when the lines are filled with water. Both pumps are on individual electrical circuits with individual overcurrent circuit breaker protection. One of the water pumps is a booster pump which provides additional system pressure.
5. Initially turn on a sink faucet to purge any air in the system.

Note: It is not necessary to turn “off” the city water fill valve since there is a one-way valve that prevents the system from back feeding.



WARNING

**PREVENT PROPERTY DAMAGE!
DISCONNECT
THE DOCKSIDE WATER HOSE
BEFORE LEAVING THE VESSEL.**



Fresh Water Pressure Pump

Both fresh water pressure pumps **may** feature a removable strainer basket which collects any debris which has entered the fresh water system. The clear strainer cover highlights any debris.

To clean the basket make sure the pressure water pump is off at the 12 volt ship's control panel. Unscrew the clear cover to access the strainer basket. Remove the strainer basket, clean, rinse with fresh water and reinstall basket and cover. Do not overtighten or use tools. Turn on the pressure pump breaker and check for leaks.

Note: It is recommended that the fresh water pressure pump and booster pump breakers be flipped to the “off” position when leaving your yacht to help prevent damage should a leak develop in the cold or hot water system.

Note that the dual fresh water pump system provides extra water pressure which will be beneficial when using any deck washdown hose or faucet.

Also, each pump includes a valve system which automatically turns the pump off when correct system pressure is reached.



TYPICAL FRESH WATER PRESSURE PUMP



Chapter 4

Operating Dockside Fresh Water System

Using Standard Dockside Water Inlet

Yachts **without** the electric hose water reel system should perform the following steps to use dockside water after making sure the dockside water supply is safe and pure.



1. Near the potable water valve will be found a dockside water fitting. Unscrew the cap. Connect a clean hose to the yacht's dockside water inlet fitting and the marina dockside water supply.



A STD. WATER TANK VALVE

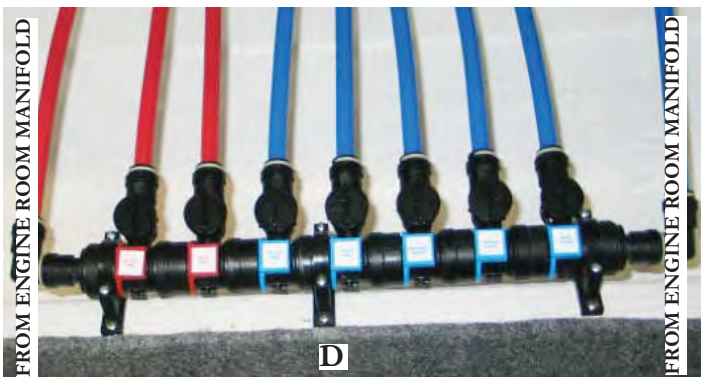
2. Turn the potable water tank valve to the "off" position (90 degrees to the tubing) which will bypass the ship's water tanks. See photo A.

3. Open the marina water supply spigot (faucet)

which at this point will distribute dockside water to the yacht.

4. Open onboard faucets as needed to help eliminate any air in the lines.

Note: Open the potable water tank valve when the onboard potable water tanks need to be filled.



FWD. FRESH WATER MANIFOLD-MAIN CABIN

Using Optional Electric Hose Reel System

If installed near the transom in the engine room is a dockside water inlet hose reel. This option permits dockside marina (city) water to be used onboard while the vessel is moored eliminating the need to use the water stored in the water tanks.

Follow these steps to activate the system after verifying the water supply is safe and pure.



DOCKSIDE HOSE

1. The dockside inlet hose is located at the **starboard** aft outside deck. Unscrew the inlet cover. Next, unscrew the protective cap on the dockside inlet hose. Pull the length of hose needed to reach the dockside water supply. See photo B.

2. Find the potable water tank valve. By closing the valve (at 90 degrees to the tubing as shown in illustration B) incoming dockside water by-passes the ship's water tank.

3. Make sure the city water valve located at the engine room manifold is in the "on" position.



FRESH WATER MANIFOLD-ENGINE ROOM

4. Open the marina water supply spigot (faucet) which at this point will distribute dockside water to the yacht.

5. Open onboard faucets as needed to help eliminate any air in the lines.



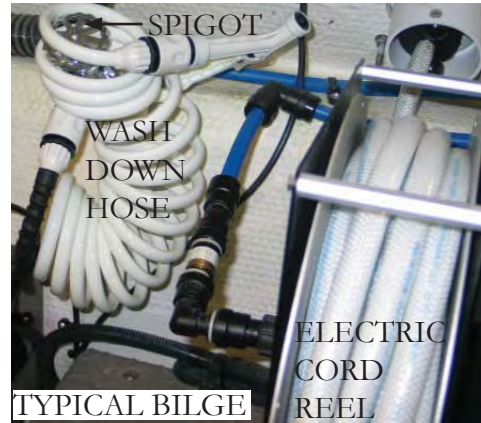
To use the on board potable water system with the hose reel disconnect the dockside inlet hose and reinstall the cap tightly. Retrieve the dockside water hose by using the remote control or by pushing the retrieval switch until the unit is fully retrieved. Read and understand the vendor owner's manual before using the reels and the remote control. There is a retrieval switch for each electric wash down hose reel.

The electric wash down reel switches are controlled by the *cable master breaker* on the battery management panel and use 12 volt DC power for retrieval purposes.

Position the potable water tank valve to the "on" position. At the 12 volt ship's main control panel flip the fresh water pressure pump and booster pump breakers to the "on" position which will activate both pumps.

Note: Open the potable water tank valve when the onboard water tanks need to be filled.

Engine Room Wash Down Hose



The coiled hose in the engine room is for cleaning the bilge floor surface only. To use the feature with the ship's potable fresh water system make sure the pressure water

and booster pump breakers are activated at the ship's main control panel. Connect the female hose fitting to the engine room spigot and turn on the spigot.



WARNING

PREVENT INJURY AND PROPERTY DAMAGE
DUE TO FIRE OR ELECTRICAL SHOCK!
NEVER WASH DOWN ENGINE ROOM
ELECTRICAL COMPONENTS. WASH DOWN
HOSE IS FOR BILGE FLOOR
SURFACE USE ONLY.



WARNING

PREVENT PROPERTY DAMAGE!
DEACTIVATE THE FRESH WATER
PRESSURE PUMP AND BOOSTER PUMP
BREAKER
BEFORE LEAVING THE VESSEL.



Monitor Panel

The water system features a water/waste system monitor panel which senses the amount of water left in the potable water tank system. It is located at the ship's main electrical control panel in the aft starboard salon.

To use the panel, press the switch in toward the freshwater tank position and hold. The amount of potable tank water will be displayed. The sender for the fresh water monitor is located on the top of the starboard fresh water tank which is located in the engine room. Since both fresh water tanks drain at approximately the same rate only a single system sender is needed to monitor the fresh water remaining in both fresh water tanks.

The key switch is used for overboard discharge. Read and understand the section on using the macerator in the waste system before attempting to operate the overboard discharge system. *Laws in many locals prevent the use of overboard discharge. A person could be severely fined so know the restrictions before using the macerator pump-out.*

Sanitizing Water System

If the vessel has been in a storage condition or you suspect the water system may be contaminated, then the system should be sanitized.

You can purchase a water treatment kit with ingredients that will sanitize the system. Follow the directions with the treatment kit. If a water treatment kit is not available follow these steps to sanitize the water system.

1. Make sure the water tank is pumped until empty. Shut off the *water pressure* breaker at the 12 volt ship's panel. Do not run the fresh water pump dry.
2. Use the potable water system disinfection information and chart located on the next page.
3. Follow the step by step procedure using the supplementary chart as needed to mix the ingredients.





DISINFECTION OF POTABLE WATER SYSTEM

The following information is taken from the Handbook on Sanitation of Vessel Water Points and is available from the public health service publication #274.

It is a good idea to disinfect the potable water system when entering long periods of storage, at the beginning of your boating season or if you suspect your fresh water is contaminated.

Following is a suggested method in proper order to accomplish system disinfection:

1. Flush entire system completely by permitting potable water to flow through it.
2. Drain system completely.
3. Fill entire system with a chlorine solution having a strength of 100 parts per million, and allow to sit for one hour. Shorter time frames will require more concentrations of chlorine solution. See the chart.

4. Drain chlorine solution from entire system.

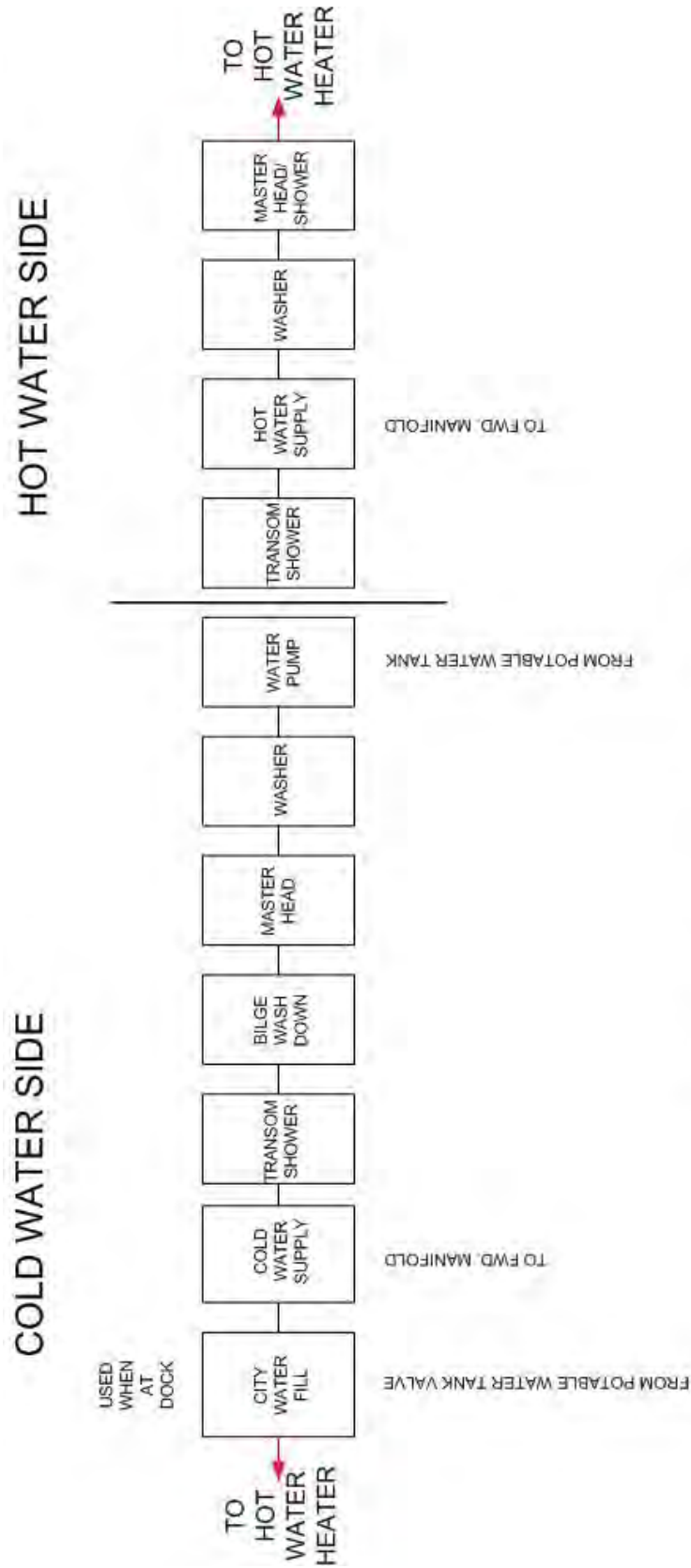
5. Flush whole system thoroughly with fresh potable water.

6. Fill system with fresh potable water.

The chart below indicates how much disinfecting agent is needed to make up various quantities of 100 parts per million chlorine solution.

CHLORINE COMPOUND AMOUNTS REQUIRED FOR 100 PPM SOLUTION			
SOLUTION (GALLONS)	CHLORINATED LIME 25% (OUNCES)	HIGH TEST CALCIUM HYPOCHLORITE 70%	LIQUID SODIUM HYPOCHLORITE 1% (QUARTS)
5	0.3	0.1	0.2
10	0.6	0.2	0.4
15	0.9	0.3	0.6
20	1.2	0.4	0.8
30	1.8	0.6	1.2
50	3.0	1.0	2.0
100	6.0	2.0	4.0

NOTE: Information from this chart taken from Handbook on Sanitation of Vessel Water Points- US Public Health Service Publication No.274 reprinted June 1963



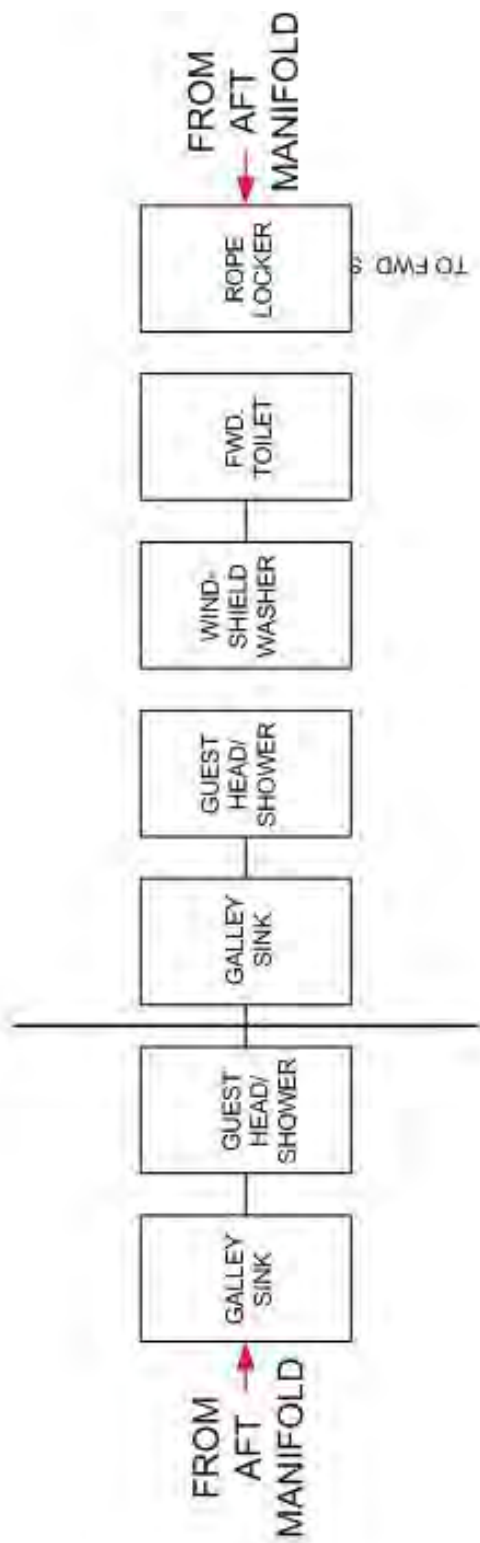
AFT FRESH WATER MANIFOLD-(LOCATED IN ENGINE ROOM BILGE)

NOTE: THE MANIFOLD CONFIGURATION WILL VARY BY DESCRIPTION & NUMBER OF VALVES DEPENDENT ON ORIGINAL EQUIPMENT INSTALLED AND OPTIONS SELECTED



HOT WATER SIDE

COLD WATER SIDE



FWD. FRESH WATER MANIFOLD-(LOCATED UNDER SALON FLOOR)



Transom Shower

Your yacht offers a hot and cold transom shower located at the port stairway near the swim platform. To use, make sure the fresh water pressure pump breaker is activated at the ship's AC/DC control panel. Open the hot and cold sides and regulate the temperature. Always test the water temperature before using the shower nozzle.

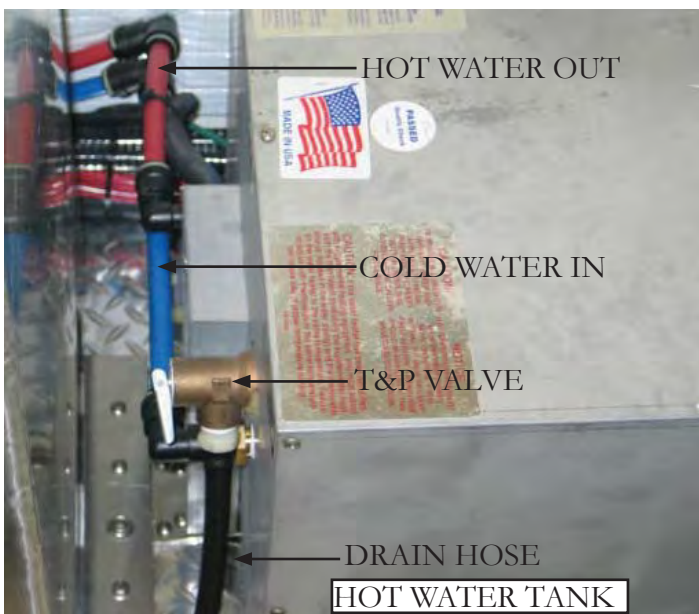





Hot Water Heater

Your yacht offers a hot water heater (240 volts) which is controlled by the generator at sea or shore power while at dockside. Like home water heaters the unit uses a T and P valve which protects the hot water tank from excessive pressure due to overheated hot water. Should this occur the valve would open and direct steam through a hose overboard.

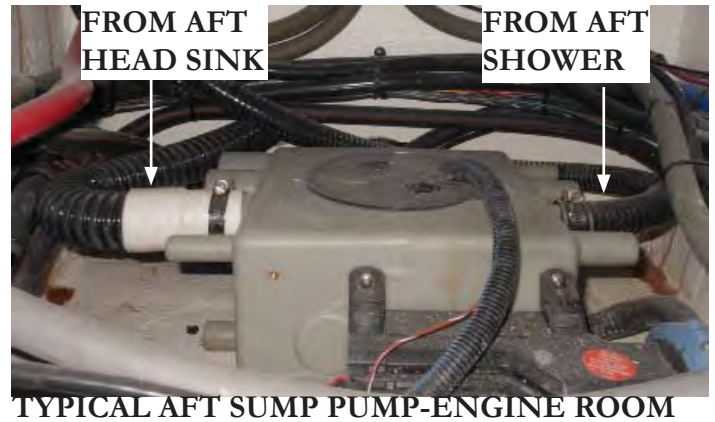
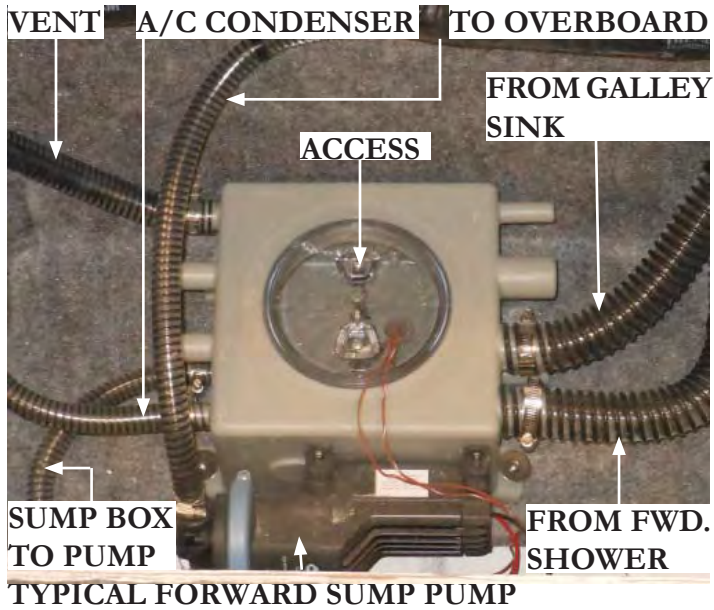
Also, there is a one-way valve that keeps the hot water from back flushing into the cold water supply. The hot water heater incorporates a drain valve to purge the system of mineral deposits.





WARNING

TO PREVENT HOT WATER HEATER DAMAGE!
NEVER ACTIVATE THE BREAKER
WHEN THE HOT WATER HEATER
IS NOT FULL SINCE
THE ELEMENT WILL BE DAMAGED!



Shower System

Your yacht features master and guest room heads/showers. The head/shower water supply is controlled by the forward water system manifold located under the main salon floor access and forward engine room floor.

As part of the drainage system a self-contained shower sump pump collects all water and debris. After the water reaches a predetermined level the float switch permits an external pump to send the used shower water to an overboard thru-hull fitting.

After showering, always let about one gallon of water settle through the shower drain to help rid the shower, drain, lines, and shower sump pump of debris, hair, and mineral deposits.

Note the removable access plate on the top of the sump pump. It can be removed for cleaning and maintenance purposes.



POSSIBLE PROBLEMS/SOLUTIONS- FRESH WATER SYSTEM



1. Both fresh water pressure pumps cycle on and off. Normally this type of action indicates a water leak in the system. Check all fresh water system related equipment on the deck, cabin, and engine compartment for leaks. Do not forget wash down equipment including spigots. Look for puddled or dripping water.

2. Using potable water system the water pressure is weak. If installed, check both fresh water pressure pump filters for debris. Also, make sure the potable water tank level is sufficient at the salon monitor.

3. Water at sink or shower is hammering and has air bubbles in it. Check for air leaks in the system along with low water levels in the potable water tank.

4. Water is backing up in the shower. There could be a clog at the shower drain screen. The biggest culprit here is human hair. Clean drain as needed. There is an expensive strip you can buy at box stores that will penetrate the drain pipe (Take off screen before using) and catch debris.

5. There is no water at any of the fresh water related equipment such as faucets, showers and wash downs. Check to make sure the fresh water pressure pump breaker is on. Also, check the fresh water monitor for tank levels at the main cabin control panel.

6. The water system has a bad odor. Use the fresh water pressure pump to drain the fresh water system. Do not drink the water as it may be contaminated. Sanitize the water system as explained earlier in this chapter.

7. There is no hot water. Turn the hot water heater breaker to the off position. Remove the back cover on the water heater and check the reset button. Push to reset. Also, the heating element may have malfunctioned. At this point, call a service technician.

8. There is little or no hot/cold water. There could be debris or minerals in one side of the shower supply valve cartridge keeping the ball and spring from opening. Replace cartridge.

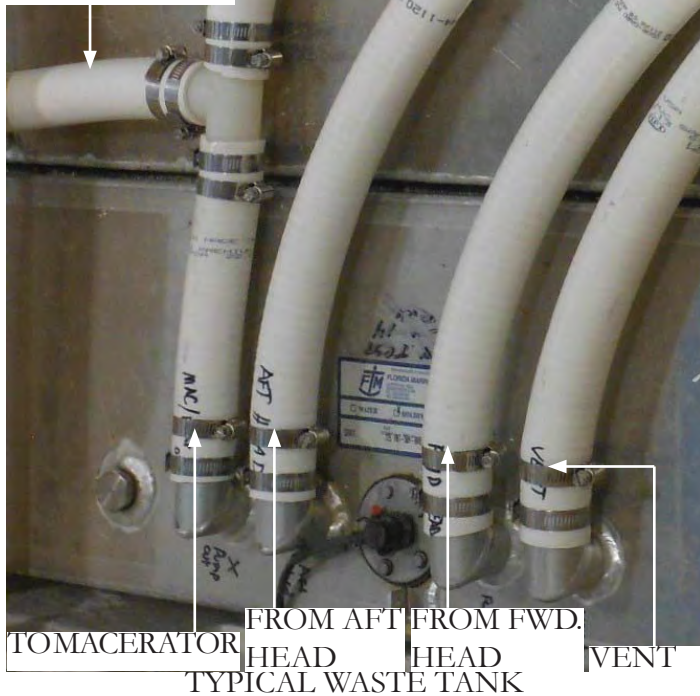


WASTE WATER SYSTEM

Overview

The waste water system includes the 65 gallon capacity waste tank located under the main salon floor. Besides the tank the system features two toilets and waste pump-out fitting mounted at the starboard amidships deck. A monitor panel shared with the fresh water system displays the waste tank level when activated. If installed, a macerator (overboard discharge pump) diverts waste through a hull bottom seacock (where dumping laws permit).

TO PUMP-OUT
DECK FITTING



Periodically check the waste hoses for any leakage. Tighten all hose clamps as needed.

Waste Filter



There is a waste filter installed in the *vent* line between the waste tank and the port thru-hull fitting (accessible behind the aft galley). The filter's purpose

is to keep objectionable odors to a minimum from the waste tank. It is recommended that the filter be changed yearly. It can be ordered from your Regal yacht dealer or from marine supply stores.

The vent filter is comprised of a union on both ends. This makes it easier to change out the main filter body. Unscrew the unions and remove the filter. It may require the use of water pump type pliers to brake the unions loose.

Use teflon tape on the new filter ends before reinstalling on the unions. Normally wind 2 to 3 even bands on the threads to assure proper thread sealing. Tighten the unions making sure you do not cross thread. Make final connections with adjustable water pump pliers.





Gray Water System

If installed, the gray water system is used in areas where dumping the fresh water waste products overboard is prohibited. Gray water originates from onboard sinks and showers. With this system all the gray water is pumped into the waste holding tank (65 gal. capacity) via the shower sump pump system versus directly overboard. The holding tank periodically needs to be pumped out by a marina pump out station through the “waste” fitting on the starboard deck. Use the waste water portion of the monitoring panel at the ship’s main control panel to check waste water levels.

Head (Toilet) System

The onboard head system features a two toilet system taking advantage of minimal water usage. Both feature vitreous china bowls, minimal maintenance, easy cleaning and a wall switch keyboard.

The toilets are powered by 12 volt DC electricity and are each controlled by 30 amp breakers located at the ship’s main salon control panel.

Under normal conditions, the head system operates from the onboard freshwater tank. If dockside water is being used the toilets still draw water from the freshwater tank.

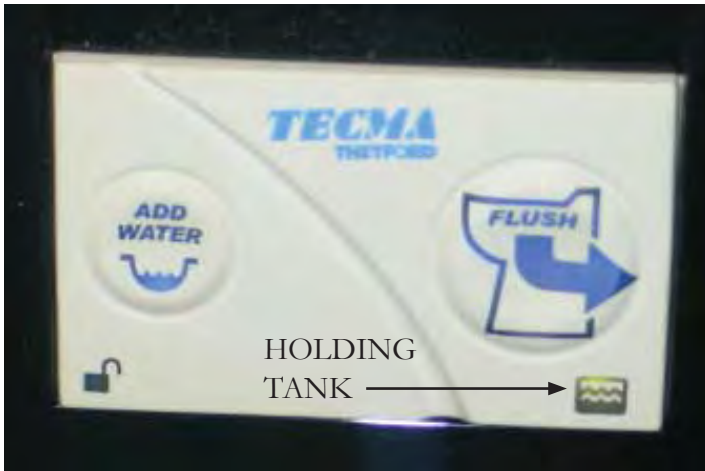
A Few Notations About The Head System:

- Only human waste and toilet paper should be put in the toilet. Never flush foreign materials such as paper towels, pre-moistened wipes, condoms, feminine hygiene products, dental floss or household garbage down the toilet.
- Always disconnect the dockside water system if boat is left unattended to avoid property damage due to leakage.
- Refill the toilet as soon as possible after emptying the bowl to prevent objectionable odors.
- Use only RV-Marine toilet tissues that disintegrate rapidly. Do not use household type tissues.
- If repairs are needed, use only a trained and qualified marine technician or electrician.



Using Toilet-

To use the onboard toilets first make sure the forward and aft 12 volt breakers are activated at the main control panel. If using dockside water make sure water is flowing from the marina spigot.



TYPICAL WALL CONTROL SWITCH

The wall control switch is used to add water to the bowl and to flush the toilet. Select cycle information is noted below. For more complete information, refer to the toilet vendor information located in the information packet.


1. To add water (est. 17 ounces each cycle) to the bowl press the add water button momentarily and release. The system prevents overfilling the bowl.
2. To flush the bowl press the flush button momentarily and release. The attached bowl motor will macerate the waste and flush it. The cycle ends with a small amount of water being added to the bowl to help prevent odors. This completes the minimal water usage flush cycle.

Wall Control Panel Blue Backlighting Description:

- The holding tank icon in the lower right hand corner of the control panel is not lighted. Toilet system is off or not receiving power.
- The holding tank icon is normally green. This means the holding tank is less than full.
- The holding tank icon is red. The holding tank is full or near full with the flush lockout (prevents Flush operation when holding tank is full) activated.
- Tank icon flashes
- Sleep mode (non-use for 8 hours) causes the lights to go out. Pushing the fill or flush button momentarily will return lighting cycle.

Single Flush Override of Flush Lockout

1. If the holding tank is full the flush lockout cycle will not allow the bowl to be flushed and the flush button will be lighted red.
2. For emergency use only the flush button can be held for 8 seconds and a flush will occur. This can be accomplished because the full sensor connected to the holding tank is usually placed a bit below the actual full capacity of the tank. Flushing more than 5 times using the override feature may force waste into plumbing system. **Regal is not responsible for damage to equipment, or injury or death due to overflow of waste due when flush lockout is overridden.** Again, refer to toilet vendor information in the owner's information packet.

**CAUTION**

POSSIBLE OVERFLOWING
OF THE WASTE HOLDING TANK
CAN OCCUR DUE TO USING
THE SINGLE FLUSH OVER-RIDE FUNCTION.
FOR EMERGENCY USE ONLY.



Dockside Pump-Out



There is a fitting located on the deck amidships labeled “waste.” This fitting is used to pump out the waste tank. Normally a pump out station is located at most marinas.

After removing the fitting cover a special hose is inserted into the fitting and the machine then removes the waste. Normally there is a charge for the service. Make sure they connect the hose to the “waste” fitting. Of course when cruising in international waters the overboard discharge pump may be used. See the section on using the macerator.

It is recommended that after pumping you flush the hose with fresh water to eliminate any debris caught on the hose walls. Tighten “waste” fitting when finished.



Macerator (Overboard Discharge Pump)

Theory Of Interlock Valve



The optional macerator (overboard discharge pump) is located in the engine room. It is connected to a normally closed interlock type of seacock. In locals where it is approved

the seacock is opened and the macerator is activated through a key switch and button located at the ship's main salon control panel (shown above). At that point waste travels from the waste holding tank through the macerator pump where it is ground up and then exits through the hull bottom at the open seacock.



As mentioned previously, there is a special macerator interlock valve to pump waste overboard on vessels with the macerator discharge option. The interlock valve is a type of valve which magnetically through a sealed unit opens the valve when energized by the macerator monitor panel key switch allows waste to pump through the hull bottom after being

ground up by the discharge pump.

To explain another way when the macerator is energized, the valve receives the signal to open but will not supply power to the macerator pump until fully open. This prevents the hoses and head plumbing systems from being pressurized and potentially bursting hoses or causing the holding tank to discharge via the waste vent fitting.

When the monitor key switch is deactivated the macerator stops pumping waste and the interlock valve receives a signal to close. It closes automatically thus eliminating the need to crawl into the engine room to turn a manual seacock off and to secure it shut with tie wraps.



Macerator (Overboard Discharge Pump)

To Use Macerator (If Installed):

- ☒ Make sure it is legal to pump waste overboard before starting the operation.
- ☒ Open the seacock handle. It should be positioned in line with the seacock as shown in the photo.
- ☒ Activate the macerator breaker at the 12 volt salon main DC control panel.
- ☒ At the level monitor panel shown above turn the key to the “on” position. With the key switch being held in the “on” position push in on the macerator button to start the opening cycle of the macerator interlock valve. Once the interlock valve opens the overboard discharge pump will begin to cycle. Continue to discharge the waste until the monitor panel shows empty for the waste tank.
- ☒ At this point, deactivate the macerator button and key switch and turn macerator breaker to the “off” position.
- ☒ The interlock valve handle should now be at a 90 degree angle to the valve.
- ☒ At this point you may desire to add an approved holding tank deodorant by flushing the correct amount down the toilet.



POSSIBLE PROBLEMS/SOLUTIONS- WASTE SYSTEM



1. Toilet does not flush or flushing performance is poor. The holding tank indicator is lighted red at the toilet control panel wall switch. The holding tank is full and needs to be pumped out. Also, there could be a clog at the water pump inlet.

2. No water in bowls during flush or add water cycle. Check to make sure the main water supply has not been turned off along with the fresh water pressure pump.

3. There is no light on the toilet wall control panel or it does not stay lighted. Check the head breaker on the main ship's control panel. Also, the wall panel could of entered the Sleep mode cycle after 8 hours of inactivity.

4. There is an odor of sewage onboard. Check the vent filter. It should be replaced annually at the beginning of the boating season. Also, check the waste tank, fittings, and related hoses throughout the vessel.

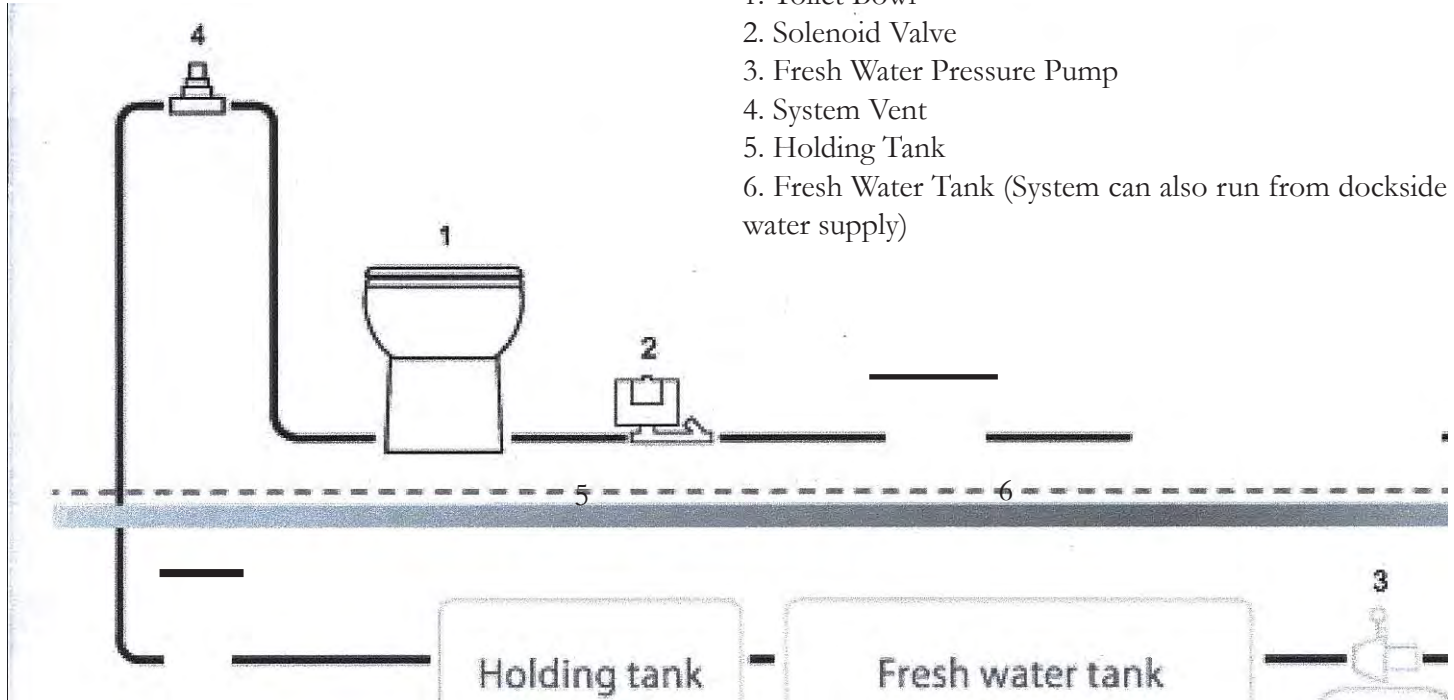
5. When running the overboard discharge system it is not pumping out the waste. Check to make sure the deck waste cap is securely fastened and O ring is not missing.

6. Macerator pump will not operate. Check breaker on main ship's DC panel. Check to see that interlock valve is opening since it controls power to the overboard discharge pump.



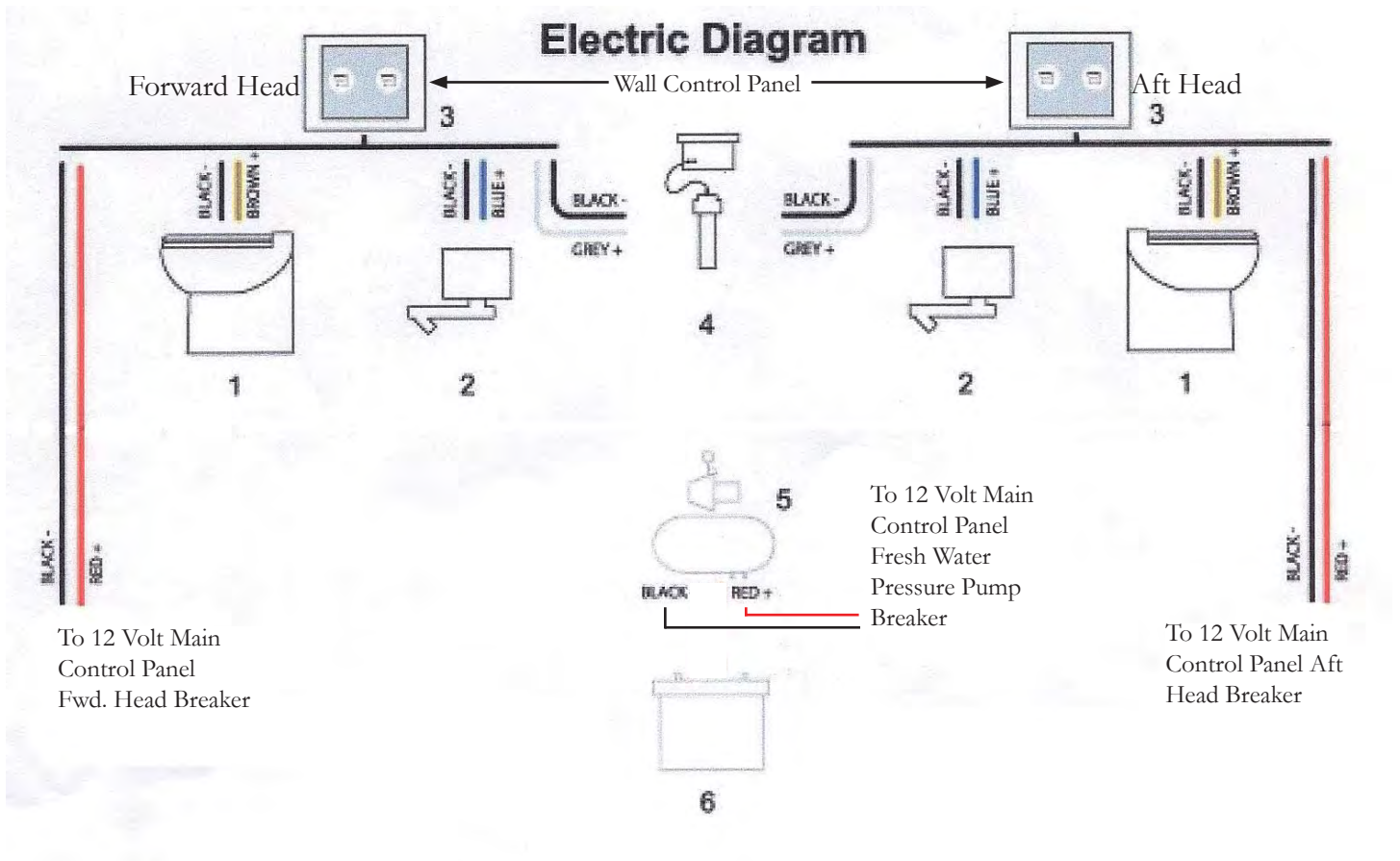
WASTE SYSTEM-LATER MODELS

1. Toilet Bowl
2. Solenoid Valve
3. Fresh Water Pressure Pump
4. System Vent
5. Holding Tank
6. Fresh Water Tank (System can also run from dockside water supply)





Chapter 4





SUMP INSPECTION HATCH

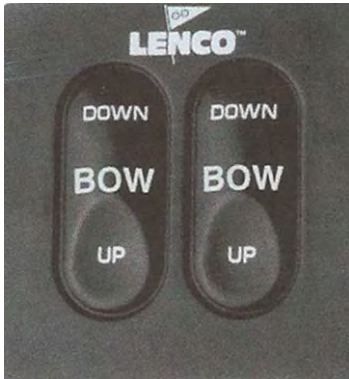


The cockpit floor just aft of the enclosure features a floor inspection hatch. This hatch along with a ladder provides engine room (sump) access. This is handy for performing pre-cruise fluid and component checks. Activate the engine room lights before using the ladder. Make sure you are wearing anti-slip footwear that covers the toes before entering the engine room.



TRIM TABS-MANUAL

Operational Overview



Standard trim tabs are installed on the lower hull outside transom area. Note that an optional Auto Glide™ boat control system is found in Chapter 8.

The standard trim tabs measure 24" wide by 16" deep. Water is deflected and redirected as the trim

tabs are raised and lowered from the dash switches. This change in water flow creates upper pressure under the tabs, and raises the stern. When the stern rises, the bow is lowered. Lowering the port tab will cause the port stern to rise, making the starboard bow lower. Lowering the starboard tab will cause the starboard stern to rise, making the port bow lower.

Using trim tabs will compensate for uneven weight distribution, listing, water conditions, wind velocity and other factors that cause inefficient operation.

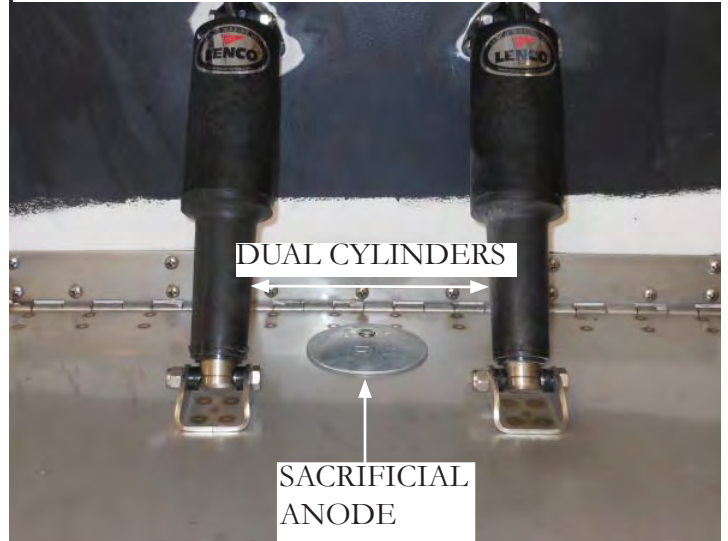
Your Regal yacht reaches a planing position at a designated speed determined by bottom design, weight distribution, water conditions, and on board equipment. As the throttle is advanced the stern squats and the bow rises initially. The trim tabs allow your boat to plane at a slower speed than natural conditions allow.

As the boat breaks over the bow high attitude the boat speed accelerates and visibility increases.

If the boat is over trimmed, it will plow the bow and the boat will lose maneuverability.

As the operator gains more confidence and experience he will develop a feel for the tabs effect on the vessel to achieve the best running angle for sea conditions.

Note that anodes should be replaced when one-third sacrificed. Anodes help defend against electrolysis.

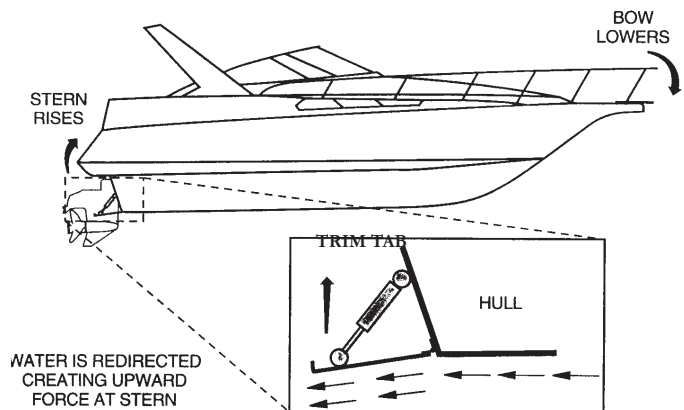


TRIM TAB TRANSOM OVERVIEW

When trimmed or in the bow down position, the bow spray is farther forward, the wake is smaller, and positioned further behind the vessel. Also, when trimmed you will notice that the tachometers show an increase in rpm's with less load on the engines.

Your vessel can use the trim tabs to rectify a list. The trim tabs adjust the boat's attitude in the direction of the helm. Porpoising is a running condition where the bow "bounces" up and down similar to a porpoise motion. This condition can be eliminated with the proper deflection of the standard trim tab helm switch.

It is recommended that the Zeus tabs first be used in the "AUTO" mode and then the standard tab switch be used for fine tuning the ride.





System Components

Main parts of the trim tab system include the helm mounted switch, control box, wiring, trim tab cylinders tab plates and anodes.

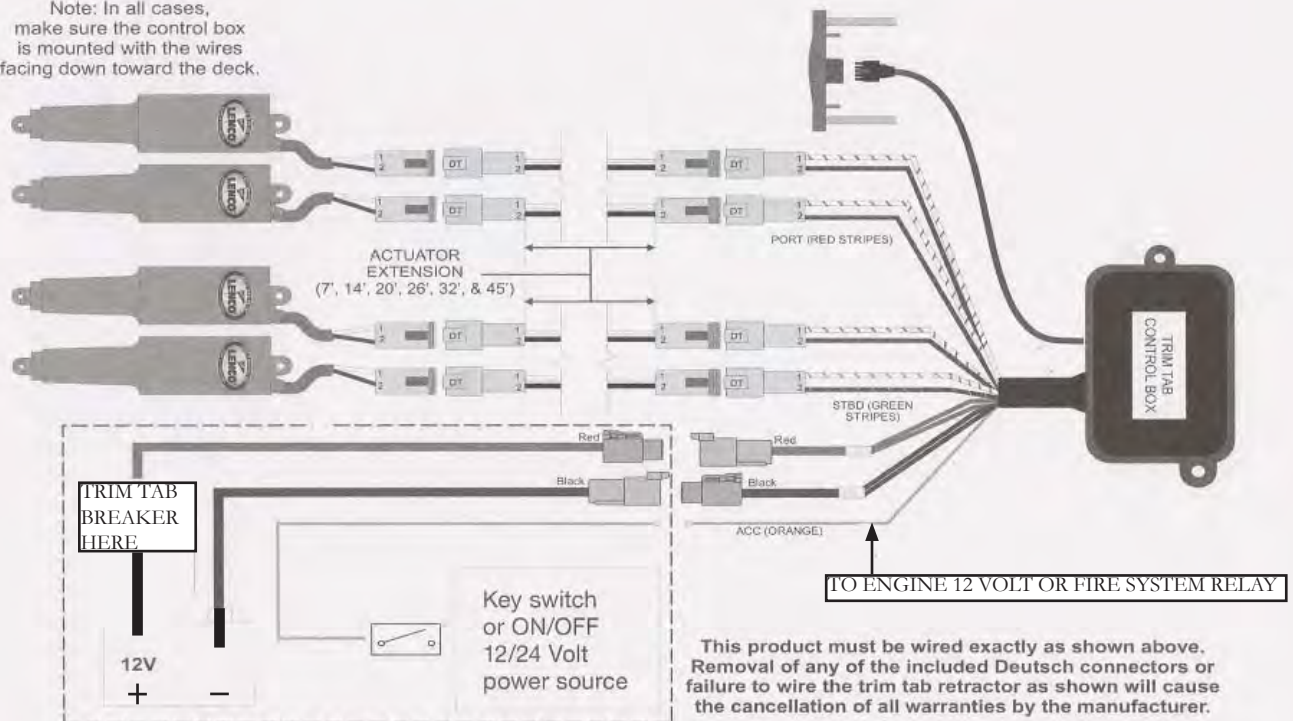


WARNING

READ AND UNDERSTAND THE TRIM TAB
OPERATOR'S MANUAL
BEFORE ATTEMPTING TO OPERATE THE
SYSTEM!

STANDARD TRIM TAB SYSTEM OVERVIEW

Note: In all cases,
make sure the control box
is mounted with the wires
facing down toward the deck.






SUNROOF OPERATION



Your Regal yacht features a hardtop sunroof. It uses an electric-hydraulic system to open and close. The slide mechanism travels forward and aft on dual rails as hydraulic pressure in the system pushes the required fluid through the system. Read and understand the warnings regarding the sunroof/hardtop.

To open or close the sunroof:

1. Find the sunroof switch. It is located on the switch panel located at the cockpit companion side of the helm
2. Press sunroof switch (A) to open or close the sunroof sliding panel.
3. Should the switch fail to operate check the sunroof breaker located at the electronics sub-panel locker.
4. Close the sunroof when leaving the vessel for extended periods.

**WARNING**


TO PREVENT POSSIBLE BODILY INJURY
KEEP ALL BODY PARTS
AWAY FROM THE SUNROOF!

NOTICE

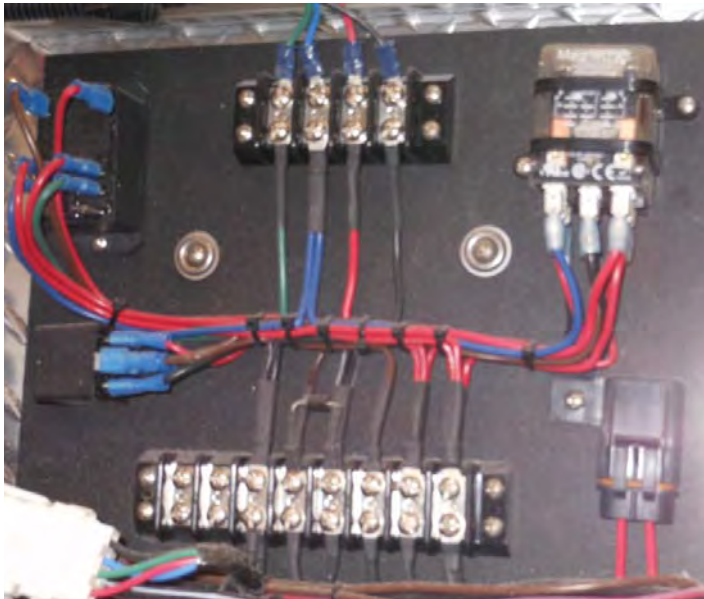
TO PREVENT POSSIBLE EQUIPMENT FAILURE ONLY USE LIGHT JACK HYDRAULIC OIL. IF THE RESERVOIR RECOMMENDS USING DEXTRON TRANSMISSION OIL DISREGARD THE LABEL AS THIS PRODUCT CAN STAIN BOAT COMPONENTS IF A SYSTEM LEAK DEVELOPS.



Note that when filling the reservoir use only light hydraulic jack oil. Fill reservoir to 1/2 " from the top with cylinders collapsed.

**WARNING**

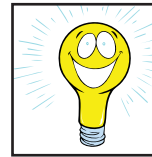
TO PREVENT BODILY INJURY
DUE TO FALLING
DO NOT STEP ON THE SUNROOF HARDTOP!
USE THE WALK-AROUND LOWER DECK
AND HANDRAIL SYSTEM
TO ACCESS ANY HARDTOP OR SUNROOF
COMPONENT.



SUNROOF ENGINE ROOM CIRCUIT PANEL

The sunroof uses a reservoir located in the engine room along with a 12 volt DC circuit board shown above. When activated the reservoir sends fluid through a set of hydraulic rams attached to dual tracks which in turn opens up the sun roof. There is a micro switch on the track end to stop the travel of the sun roof at a predetermined distance.

POSSIBLE PROBLEMS/SOLUTIONS- SUNROOF



1. Sunroof does not open. Check the breaker located at the electronics locker (master stateroom). If breaker is good contact your closest Regal yacht dealer.

2. Sunroof does not open or seems to work in a jerky fashion. System could be low on oil and is sucking air into the hoses. Check the reservoir located in the engine room. Make sure the light jack oil level is to the full mark. Add recommended light jack oil as needed. It is a good practice to keep extra jack oil on board in a safe storage area.



WINDLASS

INTRODUCTION

Using the anchor windlass requires knowledge of the anchoring process to understand the correct amount of rode and scope required. Read the section on anchoring, the windlass operation manual and understand all safety information before attempting to run the windlass. Also, since anchoring is one of the skills the skipper should master for cruising “peace of mind” visit your local library or surf the internet to locate further information regarding anchoring techniques.

WINDLASS SAFETY TIPS & WARNINGS

- Never use the windlass to tow or pull a boat.
- Never use the windlass for securing the anchor line. Instead use a deck cleat.
- Never drop anchor in the vicinity of divers or swimmers.
- Never wrap chain around the drum.
- Never use the windlass to pull up a person.
- Never use windlass to break anchor loose.
- Always strive under normal conditions for a 7:1 scope ratio on the anchor line.
- Always remove the handle from the gipsy when operating windlass from the foot controls.
- Always turn the windlass deck switch to the “off” position when not in use.
- Always secure the anchor chain lock in “locked” position in foul weather.
- Always keep an eye on the rope/chain locker to avoid rope buiding up under the hatch.
- Always manage the retrieval process carefully to prevent the anchor from hitting the boat.



WARNING

TO PREVENT POSSIBLE BODILY INJURY
KEEP ALL BODY PARTS AND LOOSE
CLOTHING AWAY FROM
WINDLASS MOVING PARTS!



WARNING

TO PREVENT POSSIBLE BODILY INJURY
TURN OFF ALL WINDLASS POWER SOURCES
BEFORE PREFORMING ANY WORK ON
ANY WINDLASS COMPONENTS!

WINDLASS ANCHOR LINE

Although several variations exist the windlass is outfitted with 3/4 “ twisted nylon line and 7/16” chain. With this combination the vessel meets normal working load conditions and the rope/chain combination protects the rode. The heavier chain lowers the angle of pull and helps bury the plow anchor which increases the holding power.

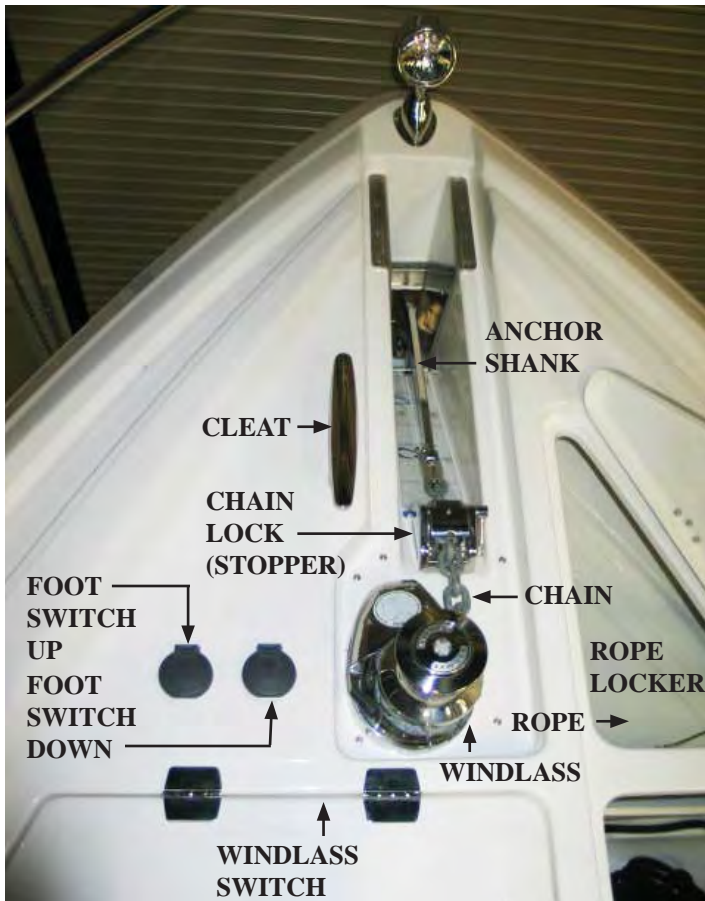
When the plow anchor is buried the chain is protected from bottom chafing as the vessel is moved around due to current, waves and wind conditions.

Several methods of securing the anchor to rode are used today including eye splices, thimbles and shackles. Regal uses a set of hexagon threaded pins which are lock tightened in place. This method provides a clean finish and prevents loosening due to vibration. The bolts may be removed when necessary by using a hex fitting on a ratchet wrench.

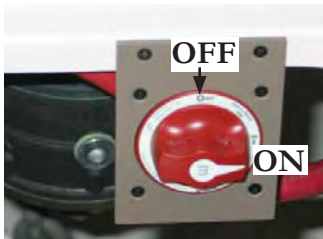
The plow anchor featured on your Regal yacht has demonstrated to be efficient in a variety of sea bottoms. Experts say the verdict is still out on a grassy bottom but unfortunately some grasses or weeds resist penetration by any anchor.



WINDLASS SYSTEM



WINDLASS COMPONENTS



SWITCH SHOWN IN "ON" POSITION

The windlass is used to automatically raise and lower the anchor. Before attempting to lower the rope/chain rode check the rope locker for tangled rope or chain. On earlier models, remove the safety lanyard from the anchor chain.

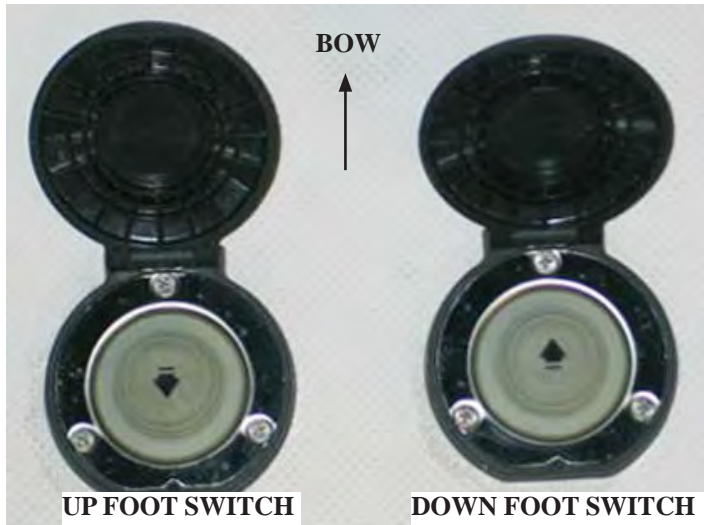
As seen in the illustration above open the center deck locker to gain access to the windlass switch. The switch "off" position is at 12 o'clock. With the switch "on" position (shown above) at 3 o'clock the foot switches are energized. If the foot switches have no power check the breaker located in aft stateroom electronics locker.

The chain lock (stopper) is used to hold the chain portion of the anchor line assembly and does not effect the nylon anchor line. Before using the windlass make sure the chain lock (stopper) is positioned with the lever pointing toward the stern.

The chain lock "dances" or ratchets over the chain while the process of retrieving the anchor rode is underway. The chain stopper will lock the chain once the anchor is completely retrieved into the bow pulpit chute.



Note: Make sure the chain lock (stopper) is positioned to engage the chain once the anchor is retrieved. This prevents the chain from paying out under abnormal conditions or when a weakened gypsy clutch condition exists.



On select models bow foot switches are used to control the windlass. To use the foot switches remove the protective caps. When you energize the up foot switch the anchor is retrieved. When you energize the down foot switch the anchor is payed out. After the anchoring process is completed close the protective caps.

WINDLASS OPERATION

Paying Out Anchor

1. Ensure both the battery switch at the battery management panel and deck foot switch are energized.
2. Check the anchor rope locker for proper anchor line alignment. Untangle any crossed lines.
3. Check the proposed anchoring area for swimmers or divers.
4. Position vessel at proposed anchor drop site.
5. Check that pawl is in disengaged position.
6. Make sure chain stopper is in a released position.
7. Step on the **down** foot switch to pay out the chain and anchor line. When the anchor hits the sea bottom disengage the foot switch.
8. While the captain “bumps” the vessel in slow speed reverse pay out the anchor line until the correct scope is reached.
9. When scope is reached secure the anchor line around a cleat. Never use the windlass as the sole means of holding the anchor.
10. Check the anchor position by checking the position using the GPS. The GPS features an anchor alarm. Refer to the GPS owner’s manual for further information.



Retrieving Anchor

1. Check the anchor locker for any tangled lines.
2. Ensure both the battery switch at the battery management panel and deck foot switch are energized.
3. Undo the anchor line at the cleat.
4. Step on the **up** foot switch to retrieve anchor line as the captain “bumps” the vessel toward the anchor while maintaining a relatively straight anchor line position. Note: Breaker may blow if the captain does not bump the engines in gear due to the pressure on the windlass.
5. Once the vessel is over the anchor and it is broke free continue to retrieve the anchor. Check the anchor locker for tangled line and sweep the looped line out of the way if locker is filling up with line.
6. Once the anchor is approaching the bow slow down the windlass to ensure proper entrance at the chute and to avoid hitting the bow.
7. Once the anchor is completely retrieved “bump” the down foot switch to lock the chain.
8. As soon as possible after the cruise use the bow locker washdown to rinse off the anchor, chain and line. Coil the line on deck to air dry. This will aid in preventing mildew and salt deposit build-up.

Independent Warping

Once the primary rode is secure the drum can be used for docking or an additional rope only rode. To use this feature:



TYPICAL WINDLASS

- Make sure the chain lock is secured.
- Pawl to be in disengaged position.
- Disengage clutch by inserting the winch handle (mounted in deck locker) in top nut and turn counter-clockwise 1/2 a turn.
- Remove handle and store in its designated location.
- The drum will operate independently from the gipsy.
- When finished using drum, insert winch handle in top nut and turn clockwise 1/2 turn to re-engage clutch.



Manual Free Fall

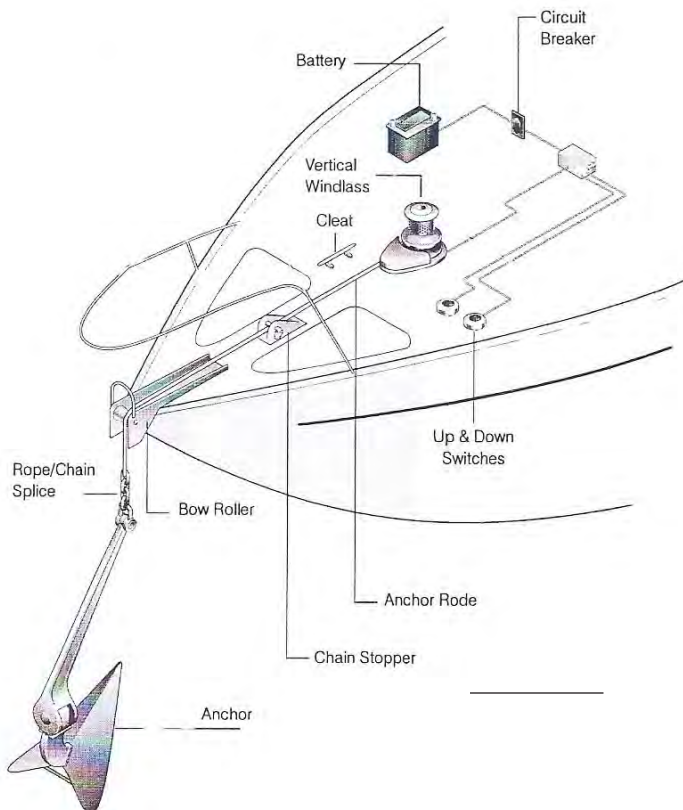
The anchor can be dropped without the use of battery power with this feature.

To use:

- Check that pawl is in disengaged position.
- Release the chain stopper.
- Insert winch handle in top nut. Loosen top nut by turning counter-clockwise until anchor drops.
- Control the rate of fall with handle.
- Once paid out fully tighten top nut.

To avoid possible bodily injury and/or property damage read and understand the windlass operation manual before attempting to use the windlass or anchor components.

TYPICAL WINDLASS SYSTEM OVERVIEW



WINDLASS-SAFETY WARNINGS

Ensure that limbs, fingers, hair and clothing are kept clear of the windlass and anchor during operation.

Check to see that there are no swimmers or divers nearby before dropping the anchor.

Remove the handle from the gipsy when operating the windlass from the foot controls or helm switch power.

Always turn the windlass power supply to the “off” position when not in use.

While at anchor, the load on the chain/rope must be transferred to a cleat.

Do not use a windlass as a holding device for towing.

Never use a windlass to lift a person, boat, etc.

Check to make sure the permit switch is locked when the windlass is not in use.

Remove the anchor safety lanyard before powering up the windlass.

Fasten the anchor safety lanyard immediately after the anchor is positioned at the bow.

Do not attempt to pull a load greater than the rated load of the windlass.

Always use the vessel's engines to aid anchor recovery.

Refer the the windlass manufacturer's owner manual for more detailed operating and maintenance information.



ENTERTAINMENT SYSTEM

Overview

Your yacht features a variety of standard components that provide both visual and audio entertainment. In addition, there are optional systems that are noted in the following pages. **Regal reserves the right to delete, add, or change both standard and optional components at anytime without notice.**

Note: [The information found here is for current models only.](#)

Refer to the individual owner's manuals and the technical section (schematics) for further entertainment system information.

Entertainment System Breakers

Before using any portion of the entertainment system it is necessary to activate the 12 volt "house" battery switch located at the battery management panel. In addition, the generator (at sea) or the dockside cord (at mooring) must be activated to supply AC voltage for the TV monitors.

Also, depending on the entertainment component desired the following breakers may need to be activated:

12 Volt Panel- TV Antenna, Satellite TV System, Dash Main (Fusion System)

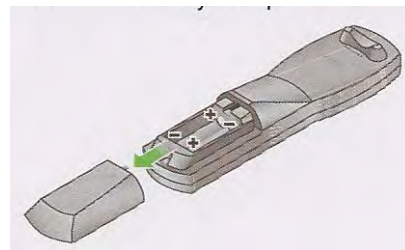
120 Volt Panel- Salon TV, Aft Stateroom TV 1, Fwd. Stateroom TV, Fwd. Stateroom TV, Cockpit TV, Entertainment (Invertor) and Aft Entertainment.

Universal Bose® Remote Control

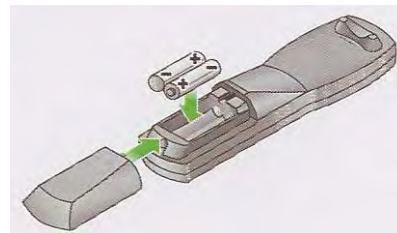
The Bose master remote control is used to operate the different entertainment system components.

Ensure that the remote control contains good AA type batteries. It is recommended that you carry extra batteries since worn batteries will cause the remote to have problems changing sources. To replace the remote control batteries proceed as follows:

1. Slide the remote control battery compartment cover off the body. There are symbols inside the compartment that show the polarity to follow when inserting new batteries.



2. Insert the new batteries observing polarity. Make sure they are completely inside the metal holders.



3. Slide the remote control cover on until it snaps into place.



Chapter 4



The universal remote is programmed from Regal. If any reprogramming is necessary refer to the Bose operator's manual for more information.

Use the quick reference guide on the following pages to operate the various source systems available on your yacht including TV, Blu-ray player, Garmin, satellite TV, and Fusion stereo.

Note: there should be a plastic card in the owner's information package. Keep the card handy inside the salon entertainment unit.

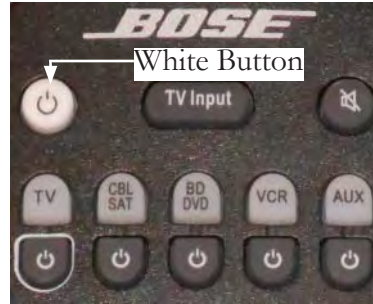
The salon entertainment door does not need to be open for the remote control to function. When you point the remote at the salon TV photo eye the RF signal travels through an RF repeater control mounted in the salon entertainment locker. At that point the signal is sent to the Bose Cinemate

interface box. Also, this remote control allows you to turn the speakers on, change the volume, mute or turn off the speaker system and of course to source different components in the entertainment system.

Television Remote Control



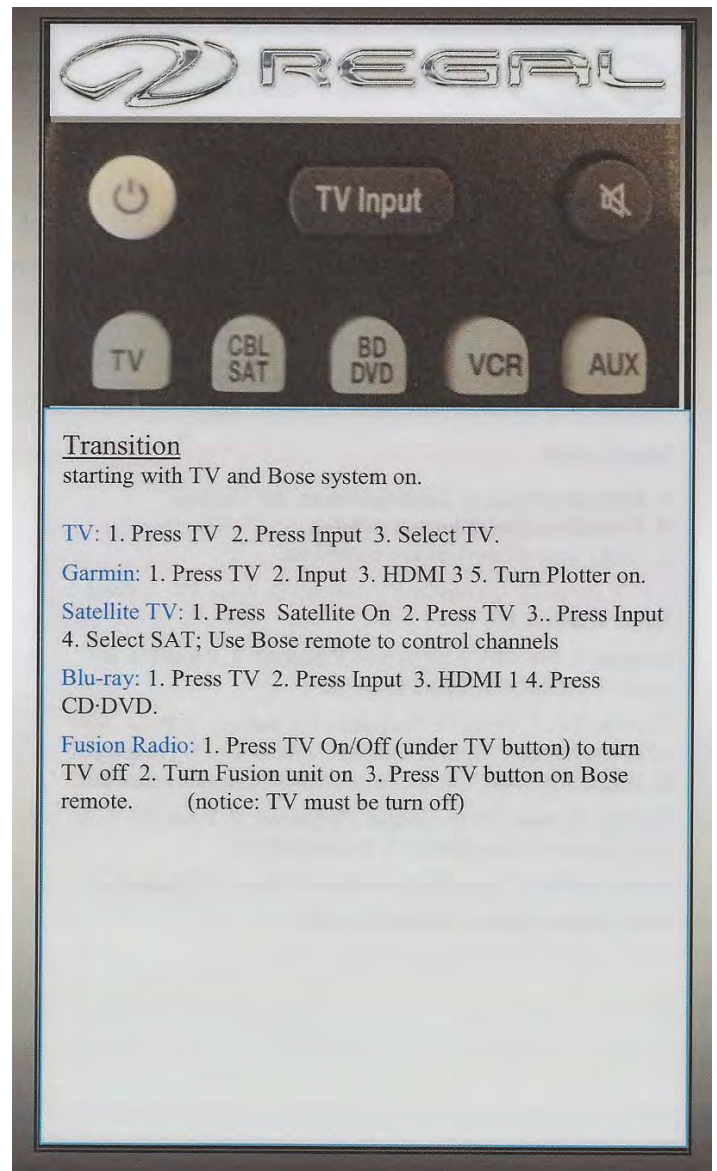
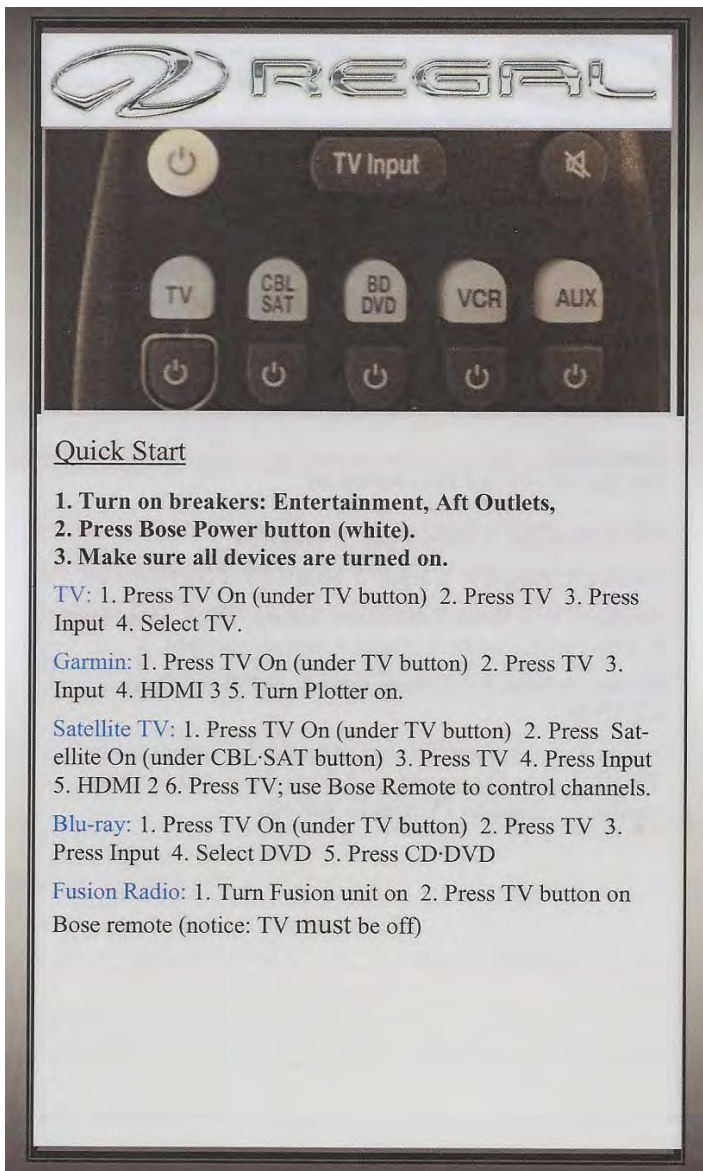
The Samsung television remote control is still used to control select television functions including set-up menus such as language, station settings and internal picture controls including brightness, contrast and screen pixels.



Note: When deciding to make any source changes first make sure the Bose® On/Off white button is activated.

Remote Controls-Do's and Don'ts

1. Always keep extra AA batteries for the remote control. Symptoms of worn out batteries may be problems changing channels or sourcing components.
2. When leaving the vessel for extended periods take out the batteries before leaving. This is especially true in high humidity climates where corrosion may develop inside the remote control battery chamber.
3. As with most electronic equipment keep away from water.
4. Periodically clean the area around the buttons. Use a cotton swab dipped in rubbing alcohol to gently clean the crevices surrounding the remote buttons. It may take several swabs to get the area completely clean depending on how much debris is built up. Use a toothpick to extract any gunk from the seam between the two halves of the remote, but be careful it does not break off and fall inside the remote.
5. Using a lint-free cloth wipe down the entire remote with rubbing alcohol (or electronics cleaning wipe). Make sure to clean the top, bottom and sides of the remote as well as inside the battery compartment.



Quick Reference Entertainment Guide

Located in the owner's information packet there is a plastic card (see above) to assist you in using the basic entertainment systems. This card on one side displays a **quick start** page and on the other side displays a **transition** page. *Note that the salon television and entertainment system must be powered on before the transition page can be used. Use the Bose master remote control to operate the salon entertainment components.*

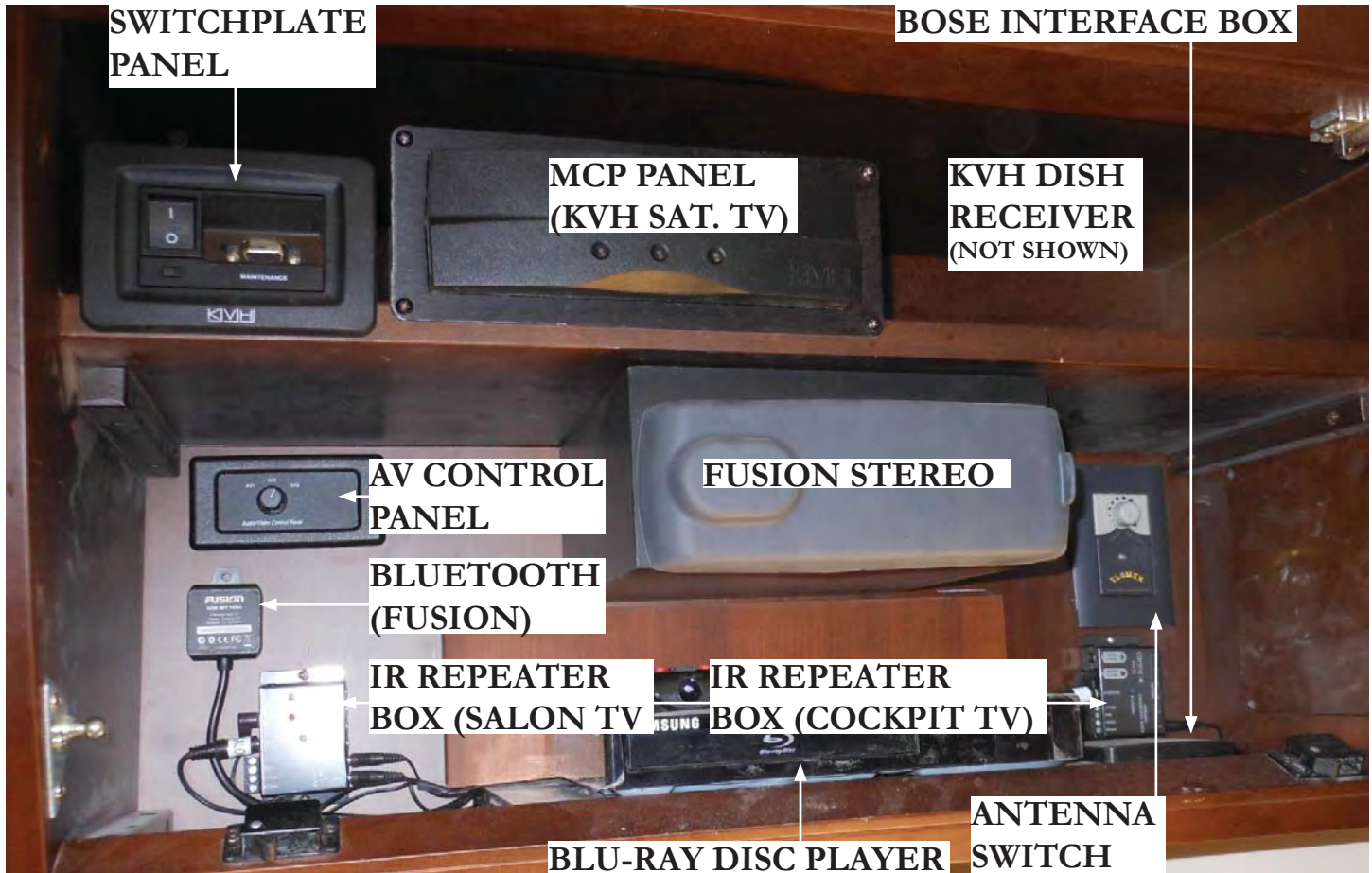
Read and understand the outlined information on both sides of the cards before operating the entertainment system components.

In addition, please become familiar with each of the entertainment component owner's manuals which are located with the owner's information packet.

Note that a portion of the equipment may not be installed on your yacht since that component may be optional.



MAIN CABIN (SALON) ENTERTAINMENT SYSTEM-TYPICAL BOSE



SALON ENTERTAINMENT SYSTEM **OVERVIEW**

The Bose Cinemate® II is a digital home theater speaker system bringing Bose® performance on-board for HDTV's. The premium speakers and a hide-away module deliver lifelike sound that seems to surround you for movies, sports, gaming and music.

The system utilizes a "user friendly" universal remote control which simplifies TV operation and expanded sources such as Fusion stereo, Blu-ray disc player and satellite TV.

Selected components shown above may be optional equipment not installed on your vessel.

Note that the Bose remote control works similar with the master stateroom Cinemate II unit. This unit uses a Plexi-glas panel door which allows the interface box to receive the IR signal via the remote control.

For further information refer to the operator's manual for each of the components.



Salon Entertainment System Components & Function

Acoustimass® Module-



This module controls the speaker system volume. It is located in the salon under the stairway storage cabinet where it is the properly located from the TV to prevent any interference. Do not relocate

the module. There is a bass knob located at the rear of the module that permits the system base level to be configured. Normally the knob is set to the middle position. Turn the knob counterclockwise to decrease the base level. Turn the knob clockwise to increase the base level.

TV Antenna Switch



Inside the salon entertainment locker is a switch mounted on the aft vertical wall. This TV antenna switch/amplifier operates as follows:

Shoreside- When the switch is turned as far left as possible (counterclockwise) it is in the shoreside position.

At this point the television signal is ready providing the coaxial cable is plugged into the power inlet and the marina dock box.

At Sea- Turn the switch clockwise to activate the sea/amplifier portion of the switch. As the switch is positioned clockwise it is permitting you to monitor the antenna gain, expressed in DB's. It is adjusting the signal power in order to optimize TV sea reception. It amplifies the weaker signals and drams the stronger ones.

When cruising you may encounter a marina without a working shore signal so your backup is to use the ship's antenna. This is more common with older marinas located away from the more traveled waterways.

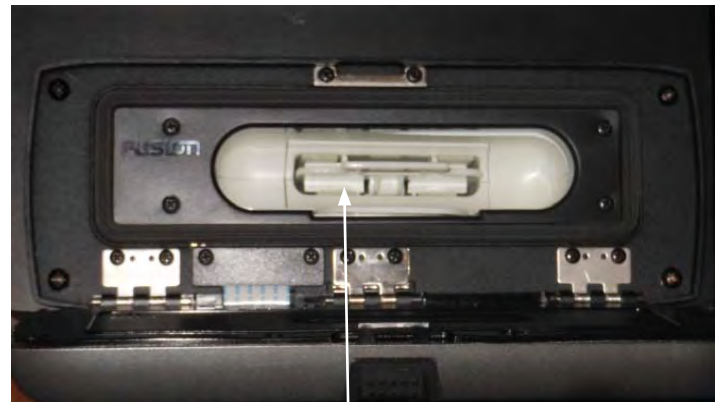
Fusion AM-FM Stereo-

The salon entertainment center features a Fusion AM-FM stereo that can be controlled by the Bose® master remote. The Bose speakers distribute the stereo sound. Turn on the stereo. Press the TV button on the remote.

Note that the salon TV must be OFF to receive the Fusion audio signal.



FUSION STEREO



iPOD-INSIDE FUSION COVER

iPOD

Note that under the stereo cover is an iPod dock which permits music to be played through the salon Bose speaker system.

Simply find the compatible Apple holder and insert with the device into the Fusion dock. Note that a compatible iPhone or iPad can be connected to the dock. Close the control door firmly. Choose auxiliary. Select the audio source ie; iPod, MTP device or USB.

Note: if you select one of the sources without first connecting the device, the message "Not connected" is displayed on the screen.



Chapter 4

Interface Box

The Bose® interface box receives signals from the appropriate IR repeater box and sends it to the appropriate entertainment device.

AV Control Box



The AV control box splits the usage of several functions.

Note there are the following panel functions; AV 1, OFF, AV 2.

In the AV 1 position the cockpit television sound can be heard through the hardtop mounted Fusion speakers.

In the AV 2 position the XM radio/weather audio signals are transmitted if the option is installed. Outside the above functions retain the panel switch in the OFF position.



Plotter-Mouse

The Garmin plotter can be viewed on the salon television by following the directions on the quick reference cards. *Remember that the Garmin plotter must be turned ON for any of the related systems to work.* Besides viewing the exist-

ing course information plotter course functions can be changed using the Garmin mouse. This feature is especially useful and can be accomplished at night while relaxing on the salon sofa. The Garmin mouse functions similar to a computer type mouse.

Bluetooth® (MS-BT100)



There is a Bluetooth® module located in the salon entertainment locker that is designed to provide Bluetooth audio streaming from a compatible smartphone or media player to the Fusion stereo. It is connected to the satellite radio connector of the stereo unit. Note that the Bluetooth

cannot be operated simultaneously with a satellite radio receiver.

To enable (pair) the source such as a smartphone do the following:

On the phone select Settings>Bluetooth>Devices (will show device as paired or not paired).

Bluetooth pairing-

To pair with the Bluetooth you first need to discover it from your streaming device. Refer to your smartphone or media device to start the Bluetooth discovery mode.

The name of the MS-BT100 in discovery mode is "Fusion MS-BT100". Please select this device to connect.

The MS-BT100 does not require a PIN number to pair.

If the MS-BT100 is currently connected to a smartphone or media player it cannot be discovered by any other device.

When the MS-BT100 is powered off it and on it always enters discovery mode.

After your smartphone or media player is paired, you can use your music player on this device to select and play music over Bluetooth.

Please ensure that your marine head unit source selection is set to Aux In. The play, pause, next track, previous track controls on the marine head do not control the MS-BT100. All music selection is controlled through your smartphone or media player.

After phone is paired, Bluetooth music is able to be selected and played. Make sure Fusion head unit is set to Aux input.



Blu-Ray® Player



A Samsung Blu-ray disc player permits playing DVD's on the salon television. Also, this unit can be shared with the forward stateroom and cockpit television if installed.

To watch DVD on main cabin (salon) TV do the following:

1. Make sure all associated breakers are energized.
2. Press TV on (under TV button).
3. Press TV 3
4. Press Input 4
5. Select DVD
6. Press CD-DVD

The forward television has limited Blu-ray capability when sharing the salon player (limited to volume control enhancements).

The cockpit TV circuitry includes an IR repeater. This feature provides the use of the salon based satellite television and Blu-ray component usage. The cockpit TV remote must be utilized for these functions to operate. Simply point the remote at the IR receiver on the cockpit TV front panel and choose the proper remote function.



DVD-CD

The media center houses the DVD-CD disc tray.

Follow the directions on the quick reference cards to play the desired disc.

As an option, the control buttons can be used on the top of the media center.

Note: When you use the Source button on the media center to select a component for play such as DVD-CD the Bose master remote *will not* control that source.

Checking For Disc Compatibility

If you encounter a problem when attempting to play a disc, check to make sure it is one of the compatible types as shown below.

- Video DVD 
- Video CD 
- DVD-R, DVD-RW
- Audio CD 
- CD-R
- SACDs (CD-compatible content only)
- MP3 CDs:
 - burned in a single closed session
 - in disc format ISO9660
 - with .mp3 as the extension and no other periods in the file name.

Disc Care

Dirt or scratches on a disc can prevent it from playing properly.

You can avoid this problem by:

1. Handling all discs by their edges to prevent fingerprints and scratches. Return them to their cases after use.
2. Avoiding exposing discs to chemical products that can cause damage
3. Writing directly on a disc or on a label attached to the disc.
4. Direct sunlight, high temperatures, and humidity.
5. Always use a soft, dry and lint-free cloth to clean the disc. Wipe straight out from the center to the edge.

WIPE STRAIGHT OUT

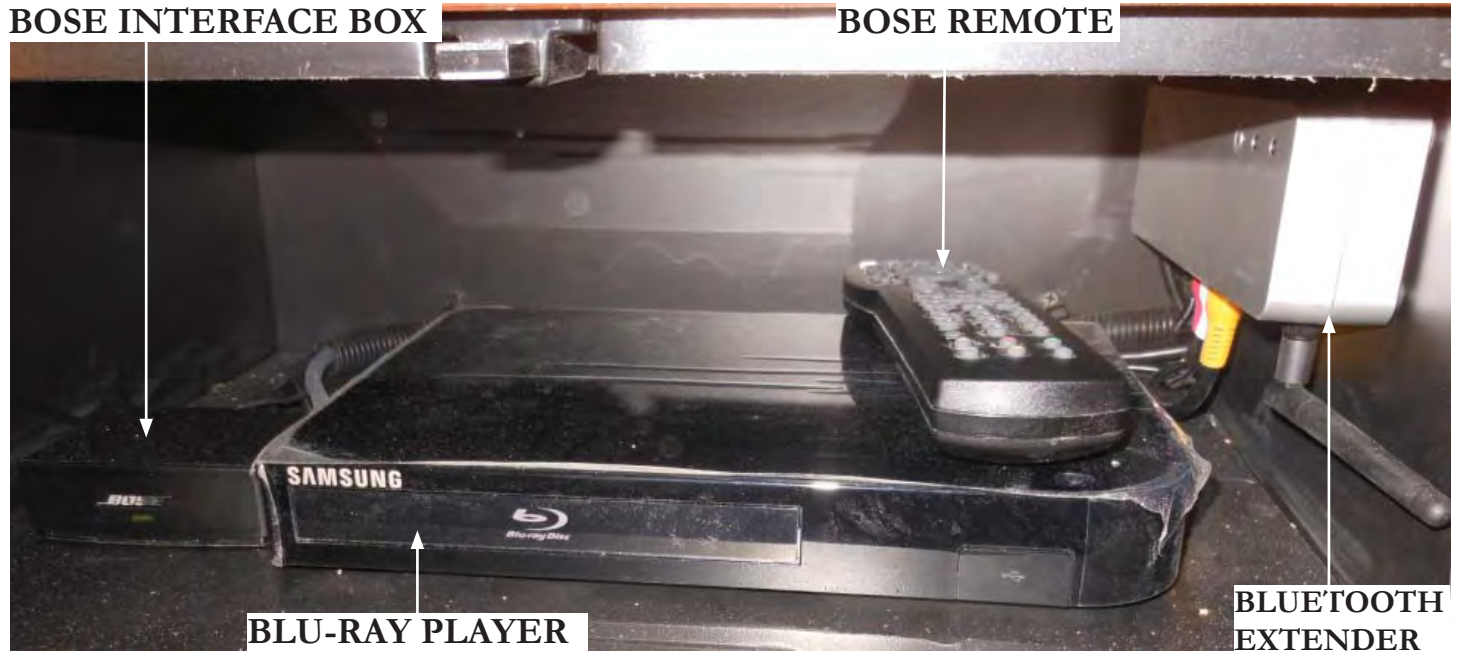


DO NOT USE A CIRCULAR MOTION





MASTER STATEROOM ENTERTAINMENT SYSTEM OVERVIEW



In addition to the salon based Bose Cinemate® II a similar digital home theater speaker system is installed in the master stateroom. The premium speakers and hide-away Acoustimass® module deliver lifelike sound that seems to surround you for movies, sports, gaming and music. The system utilizes a “user friendly” universal remote control which simplifies TV operation and expanded sources such as Fusion stereo, Blu-ray disc player and satellite TV.

Note that the satellite TV requires an additional optional receiver for the master stateroom to use satellite TV.

The Bose® remote control in the master stateroom works similar to the salon unit. The difference being this unit uses a plexiglass panel door which allows the interface box to receive the IR signal via the Bose remote control instead of using IR repeater boxes.

For further information refer to the operator's manual for each of the components.

Selected components shown above may be optional equipment not installed on your vessel.

Energize the aft entertainment breaker on the ship's main AC panel to activate the master stateroom entertainment components.

The master stateroom Bose media center is programmed to operate using the quick reference cards like the salon unit with a few exceptions noted below.

The Garmin plotter system will not display on the master stateroom TV. Therefore, disregard that portion of the quick reference card.

Cockpit Fusion speakers are controlled through the dash mounted remote control.



iPod Dock

On select vessels the master stateroom iPod system includes a base unit and an extender with Bluetooth® technology. This permits the iPod to be inserted into the hand set enabling you to transport music files (audio only) wirelessly through the master stateroom entertainment system. For video play from an iPod the hand-set must be attached to the base unit. The iPod hand-set is compatible with many iPod units through an adjustable iPod handset.

Note: When using the Bluetooth handset you must press and hold the paring button on the side of the hand-set for 5 seconds or more until the flasher icon next to the paring button shows alternating red and blue lights. This indicates the process of the hand set trying to locate the extender. When found the handset will display a blue light. The unit will then prepare automatically for wireless.



HDMI SPLITTERS



There are HGMI splitters located in the master state-room. More specifically, the splitters are accessible in the forward most overhead starboard cabinet. Depending on what options are installed, the HDMI splitters permit the signal from Garmin, satellite, or Blu-ray player to be viewed in various locations which may include the forward stateroom, salon, master stateroom and/or cockpit. The device is powered by 120 volts. Each splitter uses a HDMI input cable and various output cables to the device to view that devices' signal.

Note that this system contains no serviceable parts. If an end component loses a signal from the home device first check for a loose or damaged cable.



Satellite TV Overview

If installed, the satellite television option features viewing hundreds of television channels using the salon TV. Basically, the signal is transmitted through an antenna system installed on the hardtop which features a satellite tracking system that automatically finds the satellite for crystal-clear television reception. Refer to the satellite TV user's guide in the owner's information packet for additional in-depth information or go to the KVH Industries, Inc. web-site.

System Components-Antenna

The antenna is small yet powerful. The antenna uses modern technology to quickly acquire and track the correct satellite, switch between satellites, and send signals to the interface box. Internal gyros allow the antenna to track the satellite at all times, even with the vessel on the move! See the photo for antenna location.

MCP (Multi-stat control panel)

The MCP is the system's user interface box, providing system access to functions through an LED with 3 buttons. The MCP serves as the system's junction box, permitting configuration and operation of the antenna. The interface box is located in the salon entertainment cabinet.

Television Receiver

The Dish network receiver has been chosen because of its compatibility with the KVH components. This unit receives HD (high definition) signals from 3 DISH network satellites. The antenna then switches between these 3 satellites as needed as you change channels using the Bose master remote control. See the photo for location.

Television

The salon television delivers true high definition reception and is multi-functional with other entertainment components.

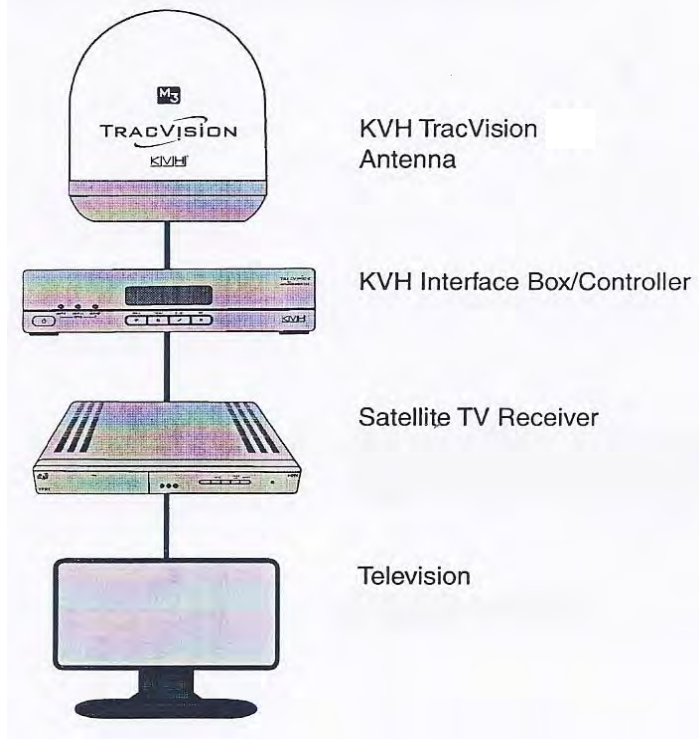
Switchplate



The switch plate located in the salon entertainment cabinet controls power to the antenna through the on/off switch. The switch must be activated for the antenna to receive satellite images.



SATELLITE TV COMPONENTS



Satellite television is a 53 SC option. The satellite television operation is user friendly. Refer to the quick reference cards to activate the satellite functions. *Use the Bose® master remote control to change channels when in the satellite mode.*

Note: If the optional 2nd satellite television system is installed the master stateroom will have separate satellite television capability using the 2nd Bose system master remote control.

This will enable both the salon and master stateroom the ability to receive and view television channels independently from each other.

Receiving Satellite TV Signals

Television satellites are located in fixed positions above the Earth's equator and beam TV signals down to certain regions of the planet. To receive signals from a satellite, you must be located within that satellite's unique coverage area.

Furthermore, since TV satellites are located above the equator, the TracVision antenna must have a clear view of the sky to receive satellite signals. Anything that stands between the antenna and the satellite can block the signal resulting in lost TV reception. Common blockage causes are boat masts, buildings, trees, and bridges. Heavy rain, ice, or snow might also temporarily interrupt satellite reception.

Turning System On/Off

Avoid turning the vessel or changing channels for one minute after turning on the system.

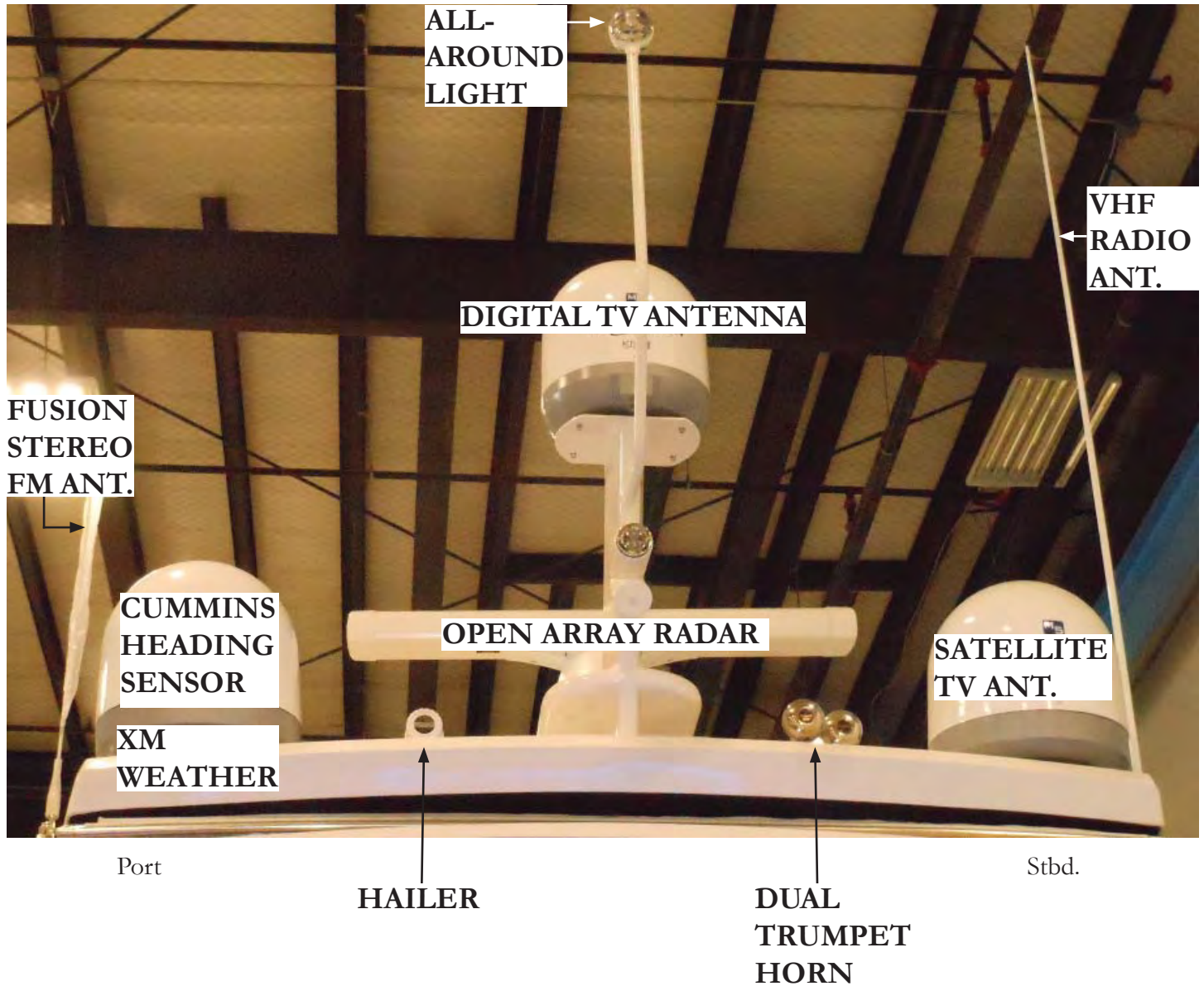
1. Make sure the antenna has a clear view of the sky.
2. Flip on the appropriate breakers. At the ship's main AC panel activate the entertainment breaker. With newer vessels the entertainment breaker is on the inverter panel verses the main AC panel. On the DC side activate the SAT TV system breaker.
3. Turn on the switch plate power switch to start the satellite tracking process. Wait 1 minute for system start-up.

Turning System Off

1. Set the switch plate power switch to the Off position.
2. Turn off the satellite TV receiver to the Off position.
3. Turn the Sat TV breaker Off.
4. Turn the TV Off.
5. Flip the entertainment breaker Off. This completes the Off process for the standard 1 receiver in the salon.



HARD TOP/RADOME LOCATED COMPONENTS



Note: :Photo taken looking stern to bow.



Forward Stateroom Television Option



If installed, the forward stateroom may include a TV set and a DVD-CD player. This TV uses its own remote. There is a system aux. input which can be used for various video functions. There is limited capability in using the salon fea-

tures from this television. The salon Blu-ray player and Garmin also can be played through the forward TV since there is a HDMI splitter linking the 2 components. Only the volume control can be adjusted in this shared function.



Cockpit Television Option



If installed, an optional 50" flat screen cockpit television set is integrated into a refreshment center cabinet. *The television should be hidden under the cabinet (down position) when the vessel is underway to prevent any possible movement due to sea conditions.*



To operate the lift mechanism activate the cockpit TV breaker at the ship's main panel. Ensure the cockpit TV cabinet top is free of any object that could interfere with the TV being raised. At this point use the dedicated "up" and "down" remote control features to raise the television unit. Since the cockpit television circuitry includes an IR repeater in the salon entertainment cabinet, satellite television and Blu-ray player functions are available in the cockpit using the Bose® universal remote control.

Furthermore, the salon based Fusion stereo sound can be played through the cockpit speakers. Note that the salon TV must be "Off" to operate this function.



CAUTION

PREVENT DAMAGE DUE TO HIGH SPEEDS
AND/OR SEA CONDITIONS.
COCKPIT TV SHALL BE IN FULL HIDE-AWAY
(DOWN) POSITION WHILE UNDERWAY!

There may be times when there occurs a power fluctuation that causes the cockpit TV remote control switch (built in the cabinet) to become inoperative. The brain box may need to be reset. With the cockpit TV main panel breaker activated, simply press and hold the "down" button for 5 seconds and the unit should be reset to normal functions.



Fusion Stereo Remote

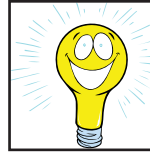
If installed, the Fusion remote control replicates most of the base stereo functions including volume, balance and sub woofer levels. These units are waterproof making their helm and various deck locations ideal. To operate any remote control the salon based Fusion radio unit must be activated.

When not in use install the protective cover. If used in salt environments remove any residue with a clean, damp cloth, especially around the chrome trim. See the remote control manual for further information.

Note that the electronics helm switch must be activated for the remote control units to operate.



POSSIBLE PROBLEMS/SOLUTIONS



1. TV channels using the master remote control are sluggish to change or will not change up or down.

Change out the remote control batteries.

2. After a cruise and hooking up coaxial cable to the dock box the on board television sets do not display a picture.

Check to make sure the antenna switch is in the shore position.

3. The Fusion cockpit stereo does not play with the salon television on.

The salon television must be in the “off” position for the cockpit stereo audio to be heard through the salon entertainment system speakers.

4. Starting with the transition quick reference guide the desired components do not function.

Remember to use the transition guide the TV and the entertainment center must already be on.



ELECTRONICS

Regal yachts feature Garmin electronics. *If installed, the package may include* waterproof cameras with true day/night operation, dual chartplotters, heavy duty open-array radar, auto pilot, sonar with full-featured depth sounder functions, VHF radio with DSC capability and XM satellite weather radio. Detailed operating electronic information can be found at www.garmin.com or in the owner's information packet.

Note: The operation of the above electronic components will be outlined. A portion of the components are optional and may not be installed on your yacht.

Please refer to each vendors owner's manual for in-depth information regarding individual electronic components.

Regal reserves the right to upgrade, change, modify, or eliminate any system or component at anytime.

System Operation Overview

To operate the electronics the following switches need to be activated:

1. Make sure the electronics breaker is activated on the battery management panel.
2. Activate the "electronics" switch at the helm panel which controls power to the GPS antenna and the auto pilot along with the NMEA 2000 "backbone" circuit.
3. At this point each individual component can be activated.

Refer to the illustrations for further information.



Notice the electronics breaker as shown above. If the electronics group does not power up, check to ensure this breaker is activated. Always find the problem source of a tripped breaker before reactivating it. Press the breaker in to reset it.



Electronics: Helm Switch



Chartplotter



Single chartplotters are standard on your yacht. Dual chartplotters are optional but are required for a portion of the other electronic options. The unit(s) feature a 12" diagonal touchscreen, NMEA 2000 compatible,

multifunction display, pre-loaded with U. S. coastal maps and interfaces with other electronic components through the Garmin Marine Network. It displays graphics with crisp, video-quality resolution. With the dual chartplotters and the optional 4 camera monitoring system, you can keep tabs of your engine room, forward and aft decks along with the main salon on the chartplotter.

In addition, the plotter(s) can integrate sonar, apps, engine data and media with the ability to control the Fusion system where link enabled.

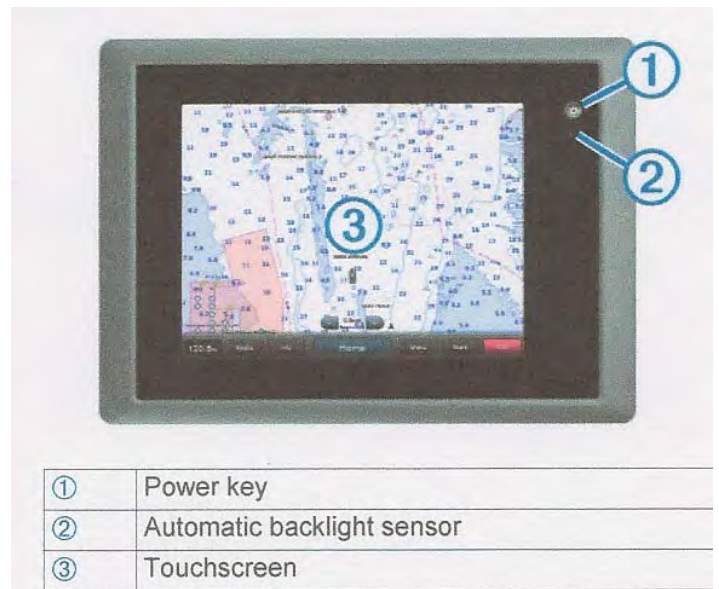
As mentioned before some yachts display the optional dual chartplotters.

Before operating the chartplotter(s) read and understand the vendor supplied owner's manual including all the warning information found in the owner's information packet. This info is usually located in the port aft lower locker of the master stateroom or go www.garmin.com.

Using the touchscreen

1. Tap the screen to display an item.
2. Swipe or drag your finger across the screen to scroll or pan.
3. Pinch two fingers together to zoom out.
4. Spread two fingers apart to zoom in.

To insert a memory card refer to the Garmin chartplotter owner's manual. You can use optional map cards for satellite imagery or various reference points. Also, blank memory cards can transfer data to another compatible Garmin plotter or a computer.



①	Power key
②	Automatic backlight sensor
③	Touchscreen

Note the positions of the power key and backlight sensor. Select Settings>System>Beeper and Display>Backlight

To adjust the color mode:

Settings>System>Display>Color Mode. Then select an option.

A. To power the system up turn the "house" battery switch to the "on" position at the battery management panel.

B. Next, turn the helm electronics switch to the "on" position. This powers up the GPS antenna and the auto pilot. The chartplotter(s) is now ready to power up.

C. Momentarily press and release the chartplotter power button.

Note: If dual chartplotters are installed, you can power up either one by momentarily pressing and releasing the power button or by pressing and releasing both power buttons. A message appears which needs to be acknowledged.

D. On powering OFF, press the power button on each chartplotter.



Chapter 4



Chartplotters feature “touch” screens. On one type of home screen when you want to enter a menu item you just touch that part of the screen.

These menu items are for this display only. The starboard home screen may resemble the one above. Each of the menu items are highlighted below.

Preset Home Screen

Charts- Selects navigational charts and radar overlay functions.

Video- Selects the camera functions.

Sonar- Sets up and provides sonar information through the optional transducer.

Charts 3d- Selects navigational charts and displays in 3d imagery.

Radar- Sets up and displays radar (requires open array radar option) Radar unit is installed on hardtop.

Media- Sets up and displays Fusion stereo sound system. Control all speaker functions from salon stereo source through helm plotter.

The other type of “home screen” is known as “Smart-Mode™” as it contains menu items which are geared toward activities such as cruising and docking. With this feature, when a menu item is selected unique information can be displayed. As an example, when Cruising is selected from the home screen, one display can show the navigation chart and the other display can show the radar screen.

Note: You can move between the home screens by using the arrows shown above.



Waypoints

Waypoints are locations you record and store in the device.

Marking Your Present Location as a Waypoint

From any screen, select **Mark**.

Creating a Waypoint at a Different Location

- 1 Select **Nav Info > Manage Data > Waypoints > Create Waypoint**.
- 2 Select an option:
 - To create the waypoint by entering position coordinates, select **Enter Coordinates**, and enter the coordinates.
 - To create the waypoint using a chart, select **Use Chart**, select the location, and select **Move Waypoint**.

Marking and Navigating to an MOB Location

When you mark a waypoint, you can designate it as a man overboard (MOB) location.

Select an option:

- From any screen, select **Mark > Man Overboard > Yes**.
- From any screen, select **Man Overboard > Yes**.

An international MOB symbol marks the active MOB point and the chartplotter sets a direct course back to the marked location.

Navigation

Navigating to a Point on the Chart

⚠ CAUTION

The Auto Guidance feature is based on electronic chart information. That data does not ensure obstacle and bottom clearance. Carefully compare the course to all visual sightings, and avoid any land, shallow water, or other obstacles that may be in your path.

When using Go To, a direct course and a corrected course may pass over land or shallow water. Use visual sightings, and steer to avoid land, shallow water, and other dangerous objects.

NOTE: The offshore Fishing chart is available with premium charts, in some areas.

NOTE: Auto Guidance is available with premium charts, in some areas.

- 1 From the Navigation chart or Fishing chart, select a location.
- 2 If necessary, select **Select**.
- 3 Select **Navigate To**.
- 4 Select an option:
 - To navigate directly to the location, select **Go To**.
 - To create a route to the location, including turns, select **Route To**.
 - To use Auto Guidance, select **Guide To**.
- 5 Review the course indicated by the magenta line.

NOTE: When using Auto Guidance, a gray segment within any part of the magenta line indicates that Auto Guidance cannot calculate part of the Auto Guidance line. This is due to the settings for minimum safe water depth and minimum safe obstacle height.

- 6 Follow the magenta line, steering to avoid land, shallow water, and other obstacles.

Creating and Navigating a Route From Your Present Location

You can create and immediately navigate a route on the Navigation chart or the Fishing chart. This procedure does not save the route or the waypoint data.

NOTE: The offshore Fishing chart is available with premium charts, in some areas.

- 1 From the Navigation chart or Fishing chart, select a destination.
- 2 Select **Navigate To > Route To**.
- 3 Select the location of the last turn before the destination.
- 4 Select **Add Turn**.
- 5 If necessary, repeat step 3 and 4 to add additional turns, working backward from the destination to the present location of your vessel.

The last turn you add should be the first turn you make, starting from your present location. It should be the turn closest to your vessel.
- 6 If necessary, select **Menu**.
- 7 Select **Navigate Route**.
- 8 Review the course indicated by the magenta line.
- 9 Follow the magenta line, steering to avoid land, shallow water, and other obstacles.



Satellite Weather

If installed, the satellite weather option features a weather receiver located under the port radome. It looks like a hockey puck. The receiver sends satellite weather information to the chartplotter for display. Along with the receiver an active subscription is required to receive satellite weather.

The weather information is received from reputable weather data centers such as the National Weather Service. Since weather information is broadcast at five-minute intervals the weather receiver must obtain new data before it can be shown. Therefore, there might be a delay before new weather data appears on the map.

Read and understand the XM weather information located in the chartplotter owner's manual before attempting to use the weather option.

As a summary, satellite weather permits you to choose a weather chart, view precipitation information, hurricane information, weather bulletins, forecast information, sea conditions, fishing information, visibility and viewing buoy information.



Engine Management

The digital gauges used on your yacht can be displayed on the chartplotter(s) through the home screen. The system uses the on board NMEA 2000 communication system which senses engine and fuel data.



To navigate to the engine and fuel gauge screen:

Select Info>Gauges

Note the following engine, fuel and data information that is programed on the screen. Normally engine rpm, oil pressure, trim, individual engine voltage and engine temperature functions are pre-set from the factory along with a fuel gauge.

Additional data functions found include speed, and odometer. with hour meter.

Remember that many detailed functions can be added to the basic monitoring process. Read the chart plotter owner's manual for more detailed information.

Refer to the Garmin chart plotter for additional information on system functions.



VHF Marine Radio



The standard yacht VHF marine radio features up to 25 watts of transmitting power and DSC capability. There are 3 dedicated soft keys linked to a 3.2" screen to select and view the information the yachtsman needs.

The radio is interfaced to the chartplotter which permits you to obtain mayday signaling and a digital broadcast of your boat's position. The unit offers premium sound quality so each message is loud and clear. Also, the VHF receives NOAA weather alert information.

For more information refer to the Garmin VHF owner's manual.


Using the VHF Marine Radio

1. Ensure that the "house" battery switch and electronics helm switch are activated.
2. Press and hold the red 16/9 (power) key to turn the unit to the "on" position.
3. Press and hold the red 16/9 (power) key to turn the unit to the "off" position.
4. Familiarize yourself with the VHF owner's manual before attempting to use the component. Learn the functions of the front panel keys and the microphone.
6. On the following pages are several quick-start guides on the basic components and screens. Refer to the VHF owner's manual for more complete information.



5. *Note: You must enter an MMSI number before attempting to use the emergency DSC capabilities of the VHF marine radio. The DSC function is outlined in the VHF owner's manual.*

VHF Quick Reference Guide




Undesignated DSC Distress Call

Lift the spring-loaded door, and then press and hold the **DISTRESS** key  for at least three seconds.


Designated DSC Distress Call


1. Lift the spring-loaded door, and then press and release the **DISTRESS** key .
2. Use the **Channel** knob to select the type of distress call.
3. Press and hold the **DISTRESS** key  for at least three seconds.


Scanning Priority Channels


1. Press  to switch to Channel 16.
2. Press  again to switch to your second-priority channel.
3. Press  a third time to return to your previous current working channel.

Radio Controls

H/L  Press to select between local and distant receive settings or to bypass 1 W transmission power for some channels.

DSC  Press to display a menu of DSC options. Press again to return to the Home screen.

MENU  Press to display a menu of configuration options. Press again to return to the Home screen.

CLEAR  Press to return to the previous screen when you are in the menu options. This key also cancels or mutes an incoming DSC call.

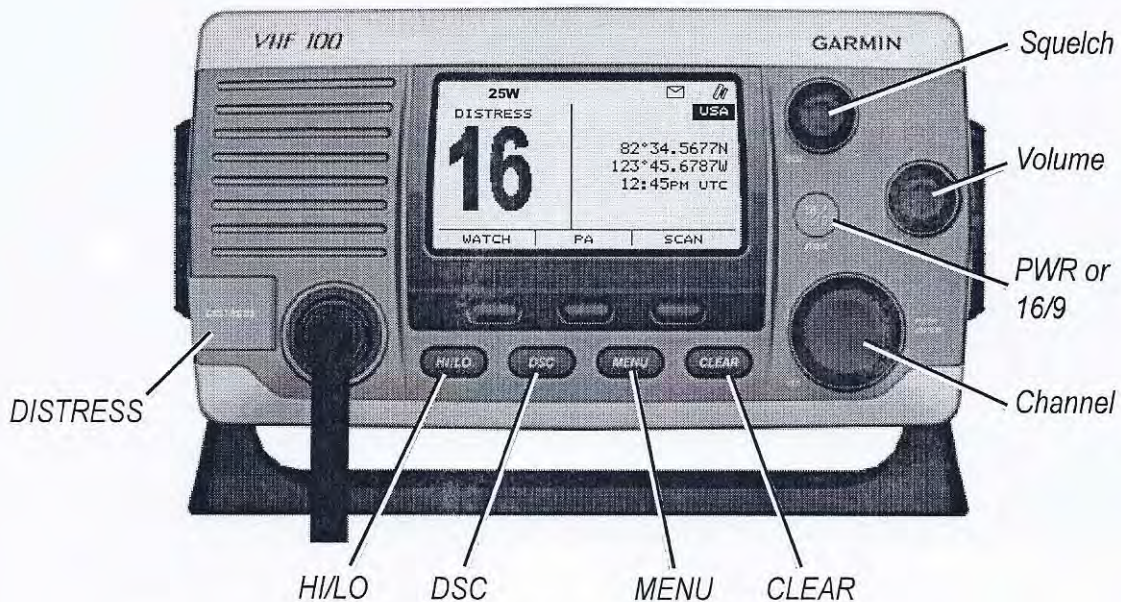
Channel—rotate to change the channel on the radio, or press to select a menu item.

VOL—rotate to adjust the volume.

SQL—rotate to adjust the squelch level.



VHF Key Descriptions



DISTRESS—press to start a DSC distress call if you have programmed your radio with an MMSI number.

Squelch—rotate to adjust the squelch level.

Volume—rotate to adjust the volume.

PWR or 16/9—press and hold this key to turn the radio on and off. When the radio is on, press and release this key to toggle the radio between Channel 16, your second-priority channel, and your original channel.

Channel—rotate to change the channel on the radio, or press to select a menu item. When on the Home screen, press to access WX (weather) channels (VHF 100 and VHF 200 only).

HI/LO—press to select between local and distant receive settings or to bypass 1 W transmission power for some channels.

DSC—press to display a menu of DSC options. Press again to return to the Home screen.

MENU—press to display a menu of configuration options. Press again to return to the Home screen.

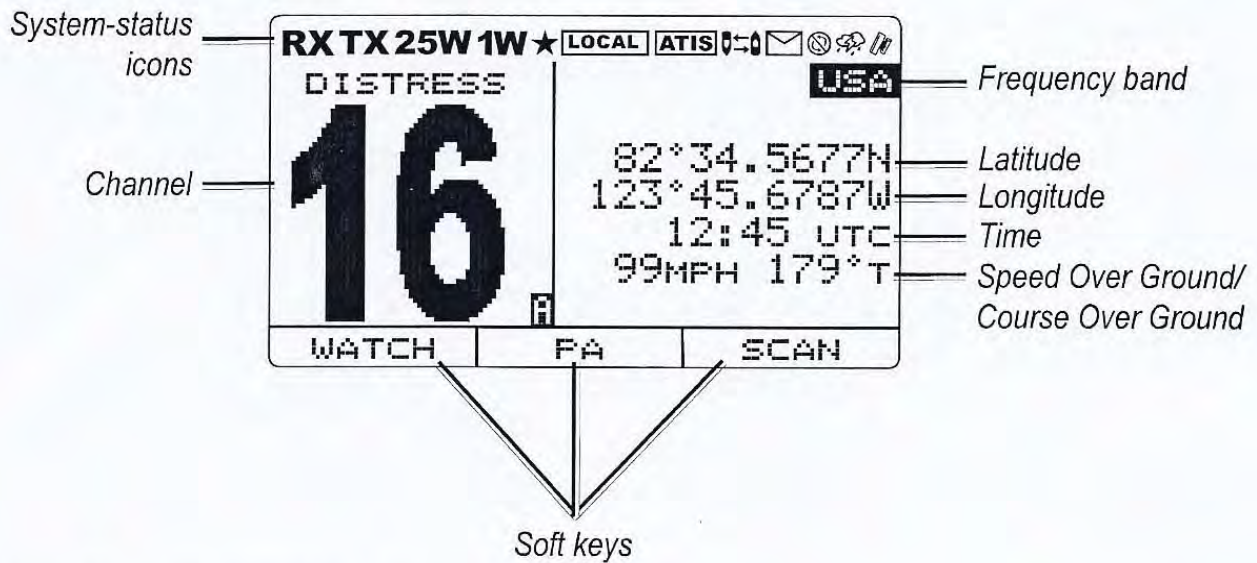
CLEAR—press to return to the previous screen when you are in the menu options. This key also cancels or mutes an incoming DSC call.



VHF Home Screen Description

Transceiver and Handset Display

The Home screen is the most-viewed screen in the system. It displays all of your current information, such as the current channel, the frequency band, and the channel name.



Channel—current working channel.

Frequency band—current frequency band: International, Canadian, or USA.

Latitude, Longitude, and Time—current latitude, longitude, and time are displayed if the transceiver is connected to a GPS device. If the transceiver is not connected to a GPS device, you can manually enter the position and the time that you entered the position data.

Speed Over Ground (SOG)/Course Over Ground (COG)—current SOG or COG is displayed if the transceiver is connected to a GPS device.

Soft keys—used to select items. The function of these keys changes depending on what you are doing.



VHF Microphone Key Descriptions

With the exception of adjusting the volume and the squelch, the handset works the same as the radio.



PTT (Push-to-talk)—press to exit the current menu and return to the Home screen to begin broadcasting.

DISTRESS (GHS 10 and GHS 10i)—press to start a DSC distress call if you have programmed your radio with an MMSI number.

Up and Down Arrows (Microphone)—press to change the channel on the radio.

Channel—rotate to change the channel on the radio, or press to select a menu item

CLEAR—press to return to the previous screen when you are in the menu options. This key also cancels or mutes an incoming DSC call.

DSC—press to display a menu of DSC options. Press again to return to the Home screen.

16+ (VHF 100i/200i; GHS 10i) or 16/9 (VHF 100/200; GHS 10)—press and release to toggle between Channel 16, your second-priority channel, and your original channel.

HI/LO—press to select between local and distant receive settings or to bypass 1 W transmission power for some channels.

MENU—press to display a menu of configuration options. Press again to return to the Home screen.

Volume/Squelch—press to toggle the function of the Channel knob to adjust the volume and squelch levels.



VHF 300 Radio Option



The VHF 300 features a 2-way 30 watt hailer system for vessel communication to other boats or deckhands and uses the vessel NMEA 2000 communication system. This unit features a voice mail function where it permits you to pre-record a 15 second message and deliver the message to any DSC radio. Also, you can replay the last 90 seconds of any incoming voice transmissions with the touch of a button.

AIS™ 600 VHF Option

As an VHF option (at the time of publication only with the VHF 300) this transceiver device aids in collision avoidance by helping you track and contact anyone in the area with an MMSI number. Whether you are in touch with mariners in the area or tracking other vessels on a similar course, you will be able to share information between boats for improved safety and greater confidence while on the waterways.

The Clear Track™ technology assures there is no interruption of the AIS traffic position while the marine radio is in use. This is integrated through the chart plotter using the NMEA “backbone” communication system and the “call and “radio” function.

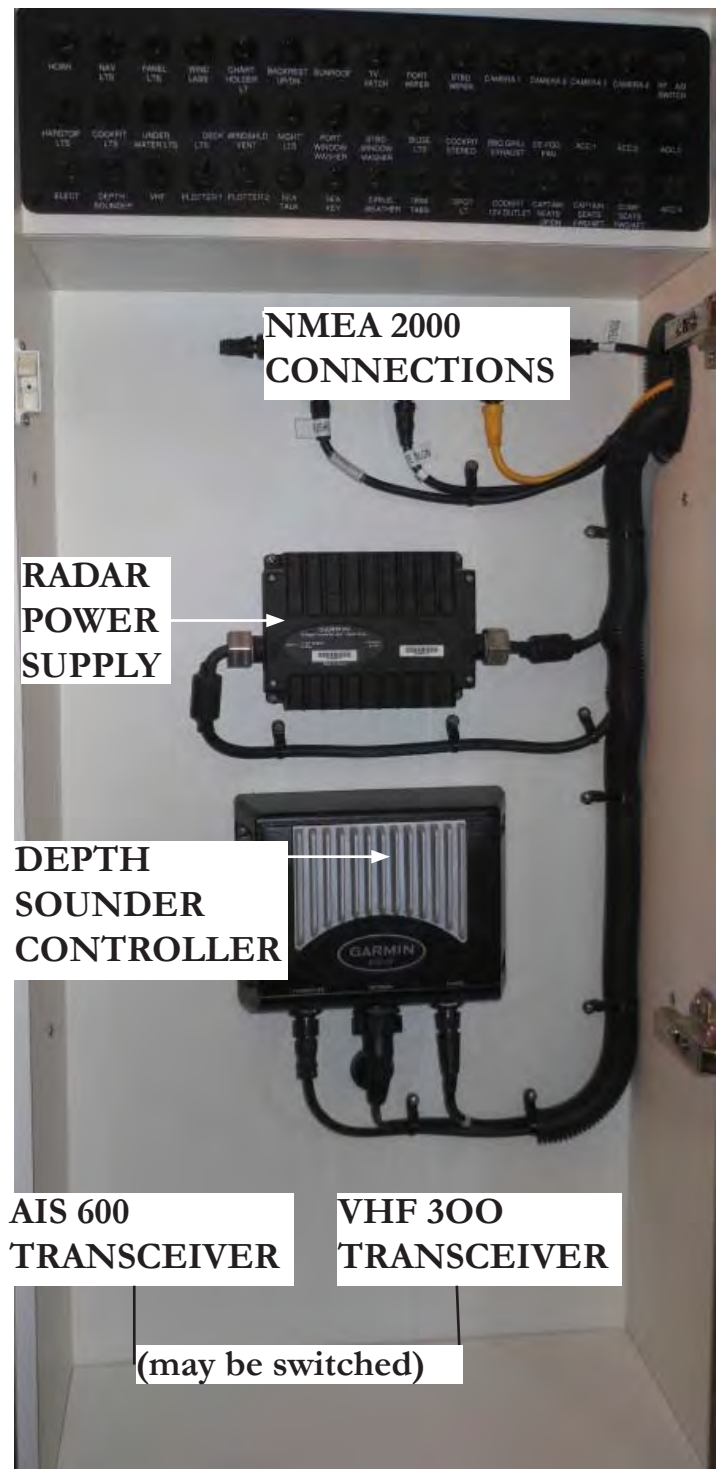
The black box transceiver is located in the master state-room electronics locker. A compatible GPS antenna for this device is located amidships under the “whisper wall” ceiling material.

DC volt power sources at the electronics main breaker as part of the battery management panel in the engine room.



Electronics Locker

Located in the master stateroom forward bulkhead is an electronics locker. A portion of the electronic power suppliers and system brain boxes are mounted inside. Up above the locker is a 12 volt breaker panel. Depending on standard equipment and options installed. The unit may also contain the radar power supply, depth sounder controller, AIS transceiver box, VHF 300 black box and NMEA 2000 “backbone” connections.





Engines & Controls

OVERVIEW



This chapter introduces the propulsion system-both the Cummins diesel engine and Mercruiser “Zeus” drive system. This is not to be thought of as a complete

workshop manual. This manual will highlight a portion of the engine and drive information. *Read the Cummins QSB6.7 engine owner’s manual carefully and understand the operation as well as the necessary maintenance requirements of the engines. Also, read the related “Zeus” drive system manual before operating the vessel.* Always begin maneuvering in a controlled environment where you can practice shifting and docking operations at your own pace. Learn how the vessel’s engines, propulsion systems and related components behave at different speeds, in varied sea conditions, and under light and heavy loads. Always keep the safety of others in mind as you practice docking with the joystick control.

Learn to monitor the helm gauges, electronic equipment, and warning systems as they are your on board friends. Read all safety labels and practices.

Review with a crew member all the component operations in case the captain would become unable to carry out his duties as skipper.



Note: Your Regal yacht dealer has been factory trained on the various yacht systems. Consult your Regal yacht dealer for further

information regarding technical support and parts.



WARNING

AVOID SERIOUS INJURY OR DEATH!
READ ALL MANUFACTURER’S ENGINE
AND PROPULSION MANUALS
BEFORE STARTING OR OPERATING
THE VESSEL.



CAUTION

NEVER RUN ENGINES OUT OF THE WATER.
DAMAGE TO THE WATER PUMP, IMPELLER,
AND OTHER ENGINE PARTS
WILL OCCUR.



VENTILATION SYSTEM- DIESEL

Ventilation
Ducting



With diesel engines large amounts of air are required to perform the combustion process. The higher the revolutions per minute of the

engine the more air is required to meet the demand. Since diesels compress the air at a much higher ratio than similar gasoline models that require a spark in the process the chance of explosion or fire is much lower with diesel power. Therefore, it is not necessary to force the exhaust from the sump with a powered ventilation system like the gas engine.

Diesel engines exhaust large amounts of incoming air by mixing it through the combustion process and forcing the air through the engine exhaust system into the water. The same deck cowlings are used to funnel incoming air for combustion. The remaining air exits through the cowlings into the atmosphere.

This “breathing cycle” occurs naturally within the diesel with more oxygen being required as the throttle speeds are increased.

As part of diesel maintenance, ensure the cowlings are free of debris including animal nests such as wasps and birds. Check and replace the diesel engine air filters as required. Note that the diesel air filter can not be cleaned so scrap it and replace as needed. See your nearest Regal yacht dealer for filter parts.

Also, it is recommended that after a cruise you let the engines and generator idle under a ‘no load’ condition for several minutes. Perform a visual check for exhaust and fluid leaks in the bilge. Since there is a light gelcoat color in the bilge bottom it will be easier to spot any fluid leaks.

Note: **“Do not obstruct or modify the ventilation system”.**

CUMMINS® ENGINE BREAK-IN

The Cummins 6.7 litre engine **does not** require a “break-in” procedure. For longevity purposes though the engine should not be run at a full load condition for extended periods. Various engine load and speed conditions assist the internal engine parts such as bearings, valves and piston rings to “seat” properly which will help ensure a longer engine life.

During the early life of the engine it is a good idea to check the engine oil more frequently since it is normal that the engine will use more oil. If engine oil is required be sure to check the engine manual for proper grade and viscosity.

Check the maintenance schedule in your engine owner’s manual and contact your Regal yacht dealer to set up the first and subsequent maintenance inspections. Normally the inspections are scheduled according to engine hours of operation which are displayed on the helm information gauges. Never exceed a 12 month period between oil changes especially with diesel power since sulfur tends to enter the lubrication system through the fuel combustion process over a period of time.



ENGINE MAINTENANCE SCHEDULES OIL CHANGES (ENGINE & DRIVE)

Maintenance schedules at recommended intervals in of the utmost importance in maintaining optimum engine performance and engine longevity as well in meeting warranty criteria. Refer to your Cummins owner manual for interval schedules.

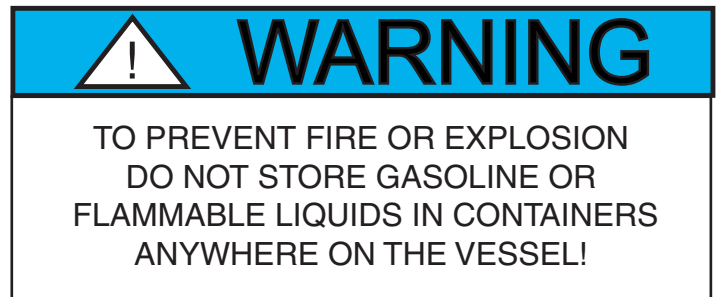
There are items that need to be maintained on a day to day interval when using the vessel on a continuous basis.

These include:

- Zeus gear oil-check
- Sea water strainer-clean
- Coolant level-check
- Fuel-water separator filter-drain
- Lubricating oil level-check
- Leaks
- Loose or damaged parts
- Worn or damaged belts
- Worn or damaged low & high voltage harnesses
- Any change in system appearance
- Odor of fuel
- Odor of electronic devices
- Static waterline levels
- Battery charge levels

Be sure to read the owner's manual regarding engine oil change recommendations. Follow the recommended oil type and viscosity. The engine oil change is an important factor in obtaining engine longevity since impurities enter the crankcase through the combustion process and build up in the engine oil.

Be sure to check the engine and drive oil before each cruise and change it using the recommended type per the "Zeus" drive owner's manual.





CUMMINS DIESEL IGNITION SWITCH

The Cummins ignition switch design features a 4 position footprint from left to right. The key should be facing up and down when inserted in the switch which is the OFF position.

Note that the first detent position after OFF is non-functional. The next positions turning the key from left to right are the ON, and START positions.

To start an engine, turn the key to the right spring loaded START position. When the engine starts release the key. It will spring back to the ON position. Do not crank the engine over 20 seconds as damage to the starting system may result.

To stop the engine, turn the key to the OFF position.



DANGER

PREVENT SEVERE INJURY OR DEATH!
SHUT OFF IGNITION SWITCHES
NEAR SWIMMERS
TO AVOID ROTATING PROPELLER BLADES.

NOTICE

TO PREVENT ELECTRICAL SYSTEM
DAMAGE, NEVER TURN "OFF" THE
BATTERY SWITCHES WITH THE
ENGINE(S) RUNNING.

NOTICE

WITH THE ELECTRIC BATTERY SWITCHES
IN THE "OFF" POSITION
THERE IS NO POWER TO THE DASH
KEY SWITCHES.



WARNING

TO PREVENT FIRE, EXPLOSION, PERSONAL
INJURY AND/OR PROPERTY DAMAGE
NEVER USE STARTING FLUID
TO START AN ENGINE.



EMERGENCY ENGINE STOP SWITCH



There is an emergency stop switch mounted on the dash. It is used for instances such as an individual falling overboard or a tangled prop. When activated, the switch disconnects the power supply to the engine and transmission. Both engines would be shut down.

Note there is a “lock” mechanism to prevent unintentional activation as indicated in the above photo. When the tab is positioned upward an “unlocked” position exists permitting the E-switch to be activated.

To disable the E-switch push the lock tab downward to the “lock” position. At this point the E-switch can not be activated.

Remember that the E-switch stops the engines immediately but the boat may continue forward because of sheer force and speed of the vessel. As the boat is coasting the following events may happen:

- A. Occupants could be thrown forward due to quick loss of forward motion, and passengers in the front of the boat could be ejected overboard and could be struck by the vessel.
- B. The operator can lose maneuverability and power in a rough sea, strong wind or current.
- C. The operator can lose control when docking.

If an engine is restarted after an E-stop shutdown without first turning the key(s) to the off position for 30 seconds, the engines when started will show fault codes. Contact your closest Cummins/MerCruiser diesel repair facility.



TYPICAL 53 SC-CUMMINS HELM OVERVIEW



- Fusion Stereo Remote
- A/C Duct
- Port Switch Panel
- Spotlight Control
- Garmin GMI 20
- VHF w/ Active Speaker
- Garmin 8212 Plotter
- Vessel View
- Precision Pilot
- Key Switches Battery Parallel
- Cummins Port
- Stbd. Switch Panel
- ABYC Yacht Plate
- Panel- Helm Seat Control
High Water Alarm
Auto Fire Ext. Gauge
- A/C Duct
- Remote Control
- Trim Tab Controls
- Joy Stick

Note: Select Parts Shown
May Be Optional Equipment



HELM DISPLAYS/COMPONENTS

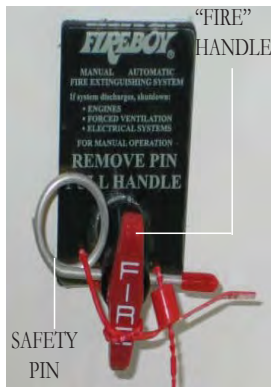
Engine Shutdown Gauge-Fire Ext. System



This helm mounted display unit provides the operator with a system status of a charged or uncharged condition with an audible alarm. With the ignition switch on a green light indicates the fire extinguisher system is normal. If the system should discharge

the alarm will sound and the ignition system will be instantaneously interrupted. Should this occur shut down any electrical system components along with closing any open hatches. Once the vessel is determined to be clear of fire the engines can be started with the switch in the override position.

Manual Fire Extinguisher Shutdown-



The manual fire shutdown is located in the cockpit. If a fire has started in the engine compartment find the system manual cable assembly. Remove the safety pin from the "Fire T Handle" and pull firmly on the "Fire" handle which will activate the fire extinguisher unit in the engine compartment. A loud "rushing air" sound may be heard. Complete discharge will take several seconds. Keep

the compartment closed for a period of time sufficient to permit the agent to soak all areas of the protected space. This allows hot metals and fuel time to cool. Refer to the manufacturer's owner's manual for additional information.

High Water Alarm



Using a bilge float sensor this helm display determines a high water situation and sends a signal to the dash alarm. This may indicate that a large amount of water has entered the hull or there is a leak in the engine water circulation system and the bilge

pump cannot evacuate water overboard fast enough or has failed to operate. Periodically manually activate the bilge pump to check operation. The bilge pump sensor is located in the engine room setting a few inches above normal bilge water accumulation.



Read and understand the engine and drive operator's manuals along with any vendor information that may cover the various display components and their readouts before operating your yacht. The Regal yacht manual provides in-depth information on many on board Regal systems but does not or is not to be thought of as a detailed engine manual, drive or the related systems such as the remote control, joystick and other display equipment.

The Regal yacht helm station (dash) is equipped with various devices specifically designed to monitor the condition of the Cummins engines and the "Zeus" propulsion system along with nautical information of many types. Close observation of the displayed information is the responsibility of the captain while cruising. Periodically scan the various displays for engine and propulsion system digital readouts. Become familiar with the various displays and their normal operating specifications as outlined in the various propulsion and component manuals.

After educating yourself in the functionality of the various display devices be sure to train another person as the skipper's backup. This person should know how to read and respond to the system readouts.

Many of the engine and drive components utilize a system of audible alarms and "fault codes" that may indicate a possible problem with a propulsion component or process. Again, the skipper needs to recognize the importance of these alarms and codes since some require immediate action to prevent equipment or system damage. These codes are explained in the engine, drive and vendor manuals.

Once you are orientated to the on board information highway you will be able to pick and choose which information you show on the various available displays.

As a note, many skipper's set up their plotters to display GPS information and use the vessel views to show both port and starboard engine and drive data independently. The NEMA 2000 "backbone" is a on board information highway which permits masses of data to be shifted for one location to another.

We will cover the basics of these available displays. Read each manual as needed for additional set-up and operation details.

CHART PLOTTER(S)

A single Garmin chart plotter is standard on the 53 SC although dual chart plotters are found and required because of certain on board optional components. It can be configured to display various data groups including navigation, engine and personalized cruise information. Read chapter 4 which covers the basic operation of the plotter display. Refer to the Garmin plotter manual for specific set-up details and quick-start recommendations. Note that the factory set information headings can be changed in the manufacturer's manual.





Engine & Controls

GMI™ 20 DISPLAY

This Garmin dash display communicates with NMEA 2000 sensors and devices. The unit can display speed, water depth, heading, and fuel data when connected to the proper sensors. Note that select functions may not be available due to missing the sensors.

The unit uses profiles made up of instrument pages that display like information including engine and fuel data.

During set-up, you can select one of four preset default profiles including powerboat, sailboat, fishing, or engine/fuel or you can set up a custom profile (3 empty profiles). Below is the basic button function information. For further data, refer to the Garmin GMI 20 owner's manual located in the owner's information packet or use the on-line Google search agent from your computer or smartphone.



VESSELVIEW

VesselView is the primary source of information for the Zeus propulsion unit. This unit is universally compatible with a variety of Mercury Marine products. Since the display unit functions for several different propulsion packages some functions may not be available.

VesselView recognizes twin diesel applications such as your Cummins package. Dual displays are helm mounted and each propulsion package features its own display unit. It constantly reports and monitors basic operating information depth, seawater temperature, trim status, steering angle, vessel speed, and the status of the fuel tank levels. VesselView can be fully encapsulated into the vessel's global positioning system (GPS) or the NMEA 2000 system for updated speed, navigation, and fuel-to-destination data.

VesselView is a display extension for joystick and auto pilot operations. The functioning of these piloting features are controlled through the Mercury Marine audio pilot control area network (CAN pad). VesselView will exhibit if a mode of control is active or in stand-by; pop-ups will appear as the vessel arrives at a way-point asking to acknowledge the turn, or indicate by text how to adjust the engine and drives to achieve maximum efficiency.

VesselView is equipped with a micro SD card which is loaded at the factory with a personalized default configuration which permits the selecting of various information cells.

On the next pages is a brief introduction to the VesselView display unit. Refer to the VesselView owner's manual in the owner's information for detailed set-up and display operational instructions. For additional sourcing use an internet search agent.

	Select to return to the previous menu or to the instrument screen.
	Select to view the menu for an instrument or screen.
or	Select to scroll through instrument pages and menus.
	Select to view the display settings. Select twice to view backlight settings. Hold to view the power off settings.



A

B

C

D

A=Pages Button

B=Left Arrow Button

C=Right Arrow Button

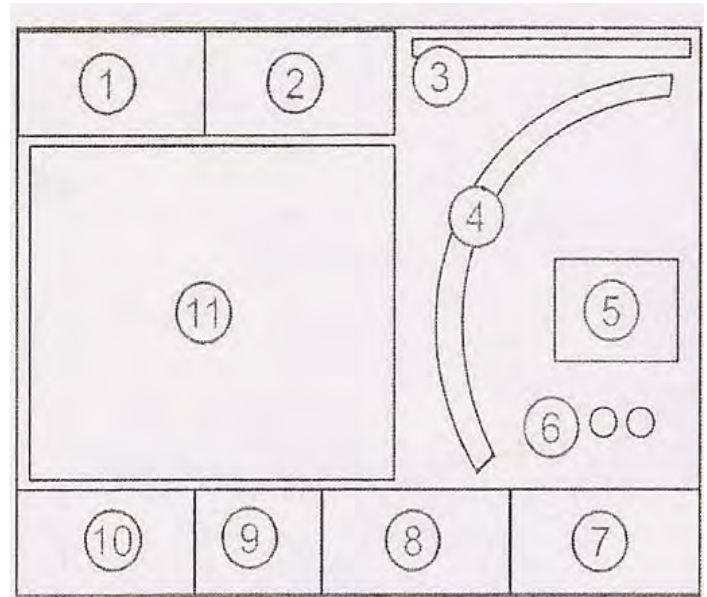
D=Enter Button

Basic Button information:

When you press the pages button it will activate the scroll bar menu. If the pages button is pressed again you exit the scroll bar menu.

When you use the right and left arrow buttons you navigate (highlight) through the contextual information parameter segment.

To enter an icon or function area, press the enter button when the correct icon is highlighted.



Screen Display Locations/Descriptions

Use the drawing above to compare with the actual display on the left. The boundary boxes above in real time display specific engine information and only active modes. A basic description of each box will be outlined below. Refer to the VesselView operator's manual for further information.

1. Volts or Depth: This data box can be set by the user. A list of available data parameters can be modified in the settings menu. If your vessel utilizes the depth/fish finder option the transducer permits you to read depth data. Without the depth/fish finder option, volts will replace the depth information.

2. Fuel: This data box displays total fuel remaining on board from the master stateroom installed fuel tank. This data box can be set by the user. A list of available data parameters can be modified in the settings menu.

3. Steering Angle: This data box when programmed in the settings menu reads the "Zeus" drive steering angle.



Engine & Controls

4. RPM (revolutions per minute): This data bar features twin moving bars which displays individual engine rpm.

5. Speed: This data box displays the speed number, GPS as the speed source along with the unit of measurement (mph is the default).

6. Gear Position: This data box displays the gear position for individual engines. The defined gear positions are “F” for forward, “N” for neutral and “R” for reverse.

7. Trim: This data box is user definable by modifying the list of applicable parameters in the Settings menu. Note that a trim pop-up is available in the contextual data area of the screen. You can turn the pop-up on or off in the Settings area.

8. Tabs: This data box is user definable by modifying the available information parameters found in the Settings menu. The port tab will be displayed on the left side of the trim data. Starboard tab will be displayed on the right side of the trim data.

9. Scroll Bar Icon: An icon represents the current data shown in the contextual data area of the screen. By pressing the pages button the scroll bar opens. You can select an icon in the scroll bar and the contextual data will be displayed.

10. System Tray: This data box displays the current active and any warnings.

11. Contextual Data Area: This box displays all contextual data which may include all warnings, maintenance schedules, messages and the initial start up scan process.

NOTICE

WHEN THE DISPLAYS ARE NOT IN USE,
INSTALL THE SUN COVERS. THIS WILL
PREVENT UV DAMAGE TO THE SCREEN AND
THE RUBBER BUTTON KEYS.

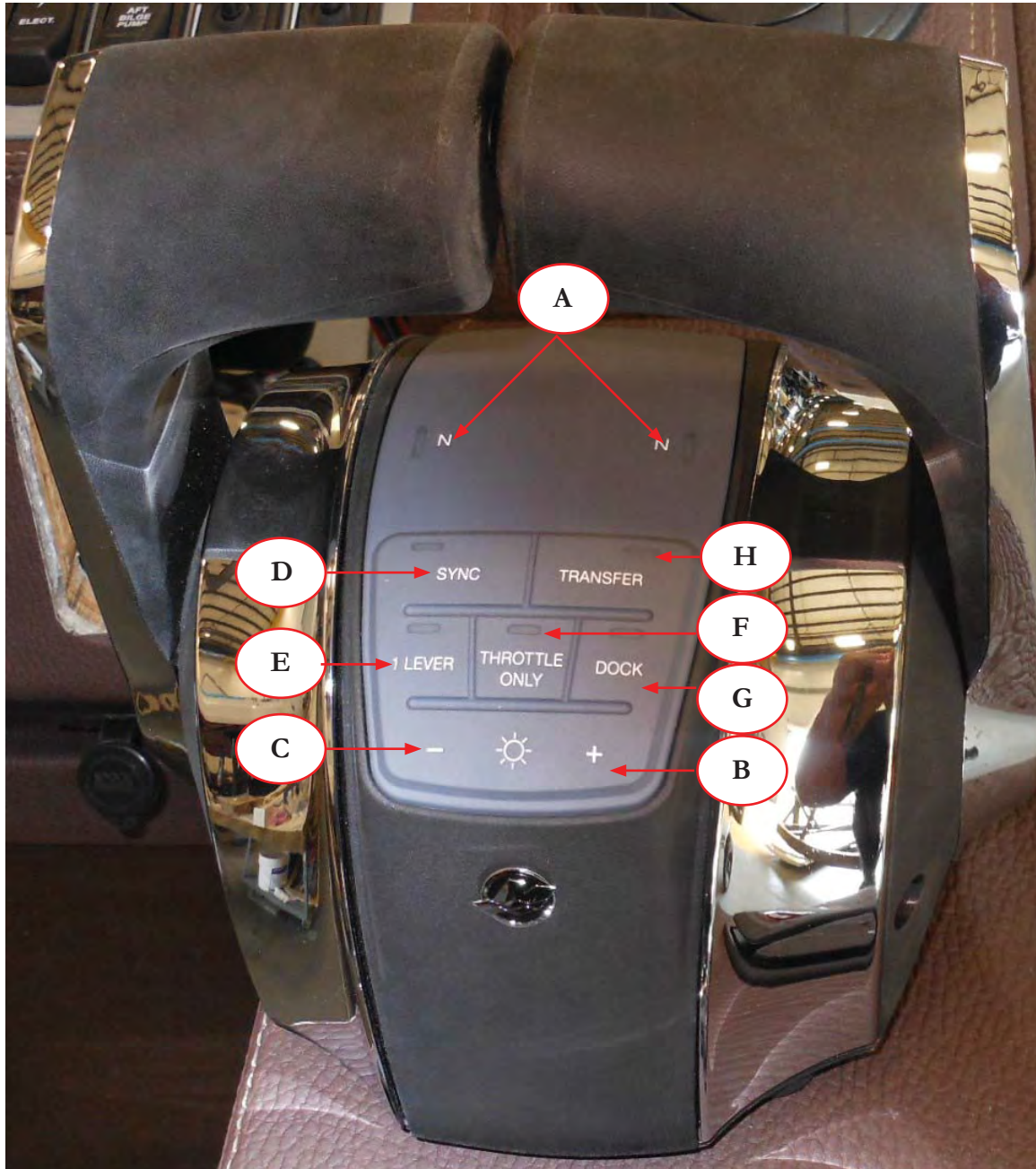
Refer to the VesselView owner's manual for expanded information on system startup, contextual data, setup and calibrations, along with screen navigation.

NOTICE

TO CLEAN DISPLAY SCREEN USE THE
PACKAGED CLOTH AND FRESH WATER.
MOISTEN THE CLOTH WITH FRESH WATER
TO REMOVE ANY SALT BUILD-UP!



DIGITAL THROTTLE AND SHIFT (DTS) HELM CONTROL BOX





Engine & Controls

DTS CONTROL FUNCTION DESCRIPTION

The Cummins engine and Zeus propulsion system features MerCruiser “Smartcraft” technology which assures effortless, smooth shifting along with immediate throttle response and several alternate operational modes for the (ERC) electronic remote control levers.

Below is an introduction to select remote control functions. *Read and understand the remote control operation before attempting to operate your vessel. Practice in a controlled environment before attempting any close tracking docking and maneuvering.* Always train another crew member on operation principles should the operator become disabled. Understand the movement of each control handle and how it effects movement of the vessel.

Refer to the control box on the opposite side of this spread for basic function location and description. Read the “Zeus” operation manual for further detailed information.

ITEM	CONTROL	FUNCTION
A	“Neutral lights”	Light up when transmission is in neutral position. Lights flash when engine is in the throttle only position.
B	“+”	Increases brightness settings for CAN pad, Vesselview and Smartcraft displays.
C	“-”	Decreases brightness settings for CAN pad, Vesselview and Smartcraft displays.
D	“Syn”	This turns the auto-synchronization feature off or on which keeps the throttle handles within 10% of each other and permits equal rpm for each engine.
E	“1 Lever”	This mode permits shift and throttle positions of both engines to be controlled by the <i>port</i> lever.
F	“Throttle only”	Permits the vessel operator to increase engine warm-up rpm’s without having to engage the transmissions into gear.
G	“Dock”	Available to use with both joystick and control levers. Joystick operation reduces throttle capacity to est.70% of normal joy stick thro This mode reduces the control throttle limits to about 50% of full throttle.
H	“Transfer”	2nd helm connection feature- not used on the Regal 53 SC.



DTS CONTROL-BASIC FUNCTION OVERVIEW

Sync:

The Sync engages automatically at key-up. The Sync mode feature monitors both control lever positions. If both levers are within 10% of each other, all engine synchronize to the same rpm. Note that the trackpad Sync light will show “yellow” if the control levers are not 10% of each other. The light will show “green” when the engines synchronize. The Sync light shows “gray” when Sync mode is disengaged.

To engage Sync mode:

1. Press the Sync button.

To disengage Sync mode:

Place the ERC levers in any detent.

Press the Sync button.

Dock:

Dock mode decreases the percent of throttle throughout the range by 50%. This is useful in docking where close quarter maneuverability is required.

To engage the Dock mode:

1. Place both remote control levers in neutral.
2. Press the Dock trackpad button.
3. The Dock button light activates.
4. Place either remote control lever into gear.
5. The engines increase the rpm at a proportionally lower rpm for the remote control position, and with 50% less power than is normally available.

To disengage Dock mode:

1. Bring both remote control levers to forward, neutral or reverse detent.
2. Press the Dock button. Dock mode deactivates and the Dock button light goes out.

1 Lever:

This is a Zeus feature which in rough sea conditions permits the operator to grasp a single control lever to command both engines simultaneously.

To engage the single lever mode:

1. Place both remote control levers in neutral.
2. Press the 1 Lever trackpad button.
3. The 1 Lever button light illuminates.
4. Place the port remote control into gear.
5. The engine rpm increases or decreases simultaneously while the Zeus drives remain in the same gear.

To disengage the 1 Lever mode:

1. Place both control levers in neutral.
2. Press the 1 Lever button; the 1 Lever button light turns off.

Throttle Only:

To engage the Throttle Only mode:

1. Place both control levers in neutral.
2. Press the Throttle Only trackpad button.
3. The Throttle Only button light activates and the neutral lights blink.
4. Place either remote control lever into gear.
5. The engine rpm can be increased while the Zeus drives remain in neutral.

To disengage Throttle Only mode:

1. Return both remote control levers to neutral. Throttle Only will not disengage unless the remote control levers are in neutral.
2. Press the Throttle Only button and the light will deactivate.
3. Note that the neutral light remains illuminated.



Engine & Controls

Operation-

The electronic remote control (ERC) handle controls the shift and throttle operation. Push the remote control handle forward from neutral to the first detent which is forward gear. Continue pushing the handle forward will result in increased speed.

Pull the control handle from the forward position to the neutral position to decrease speed. Pull the control handle back from neutral to the first detent for reverse gear. Continue pulling the handle back to increase speed in reverse.

Note that the control handle tension and detent tension may require periodic adjustment. using the adjustment screws. See the maintenance section and the ERC control box owner's manual.

Maneuvering- Using Remote Control Levers

Illustration A



The control levers can be used at idle speeds to maneuver around tight marina fuel docks, moorings, etc.

To rotate the bow to port, engage the starboard remote control lever in forward and the port remote control lever in reverse. This control position will

cause a port bow rotation. See illustration A.

Illustration B



To rotate the bow to starboard, engage the port remote control level in forward and the starboard remote control lever in reverse. This control position will cause a starboard bow rotation. See illustration B.

Note: The control handle that is in reverse will always be the direction that the vessel's bow will rotate. Use the reverse control to regulate the throttle which depending on position will cause the bow to rotate faster or slower.

Note that the joystick is another control device that permits easy maneuvering in tight quarters.



JOYSTICK OVERVIEW



All the captain needs to do is move the joystick in the direction he wants the boat to move. Since the controls are proportional, the further the stick is pushed forward, the faster the boat takes headway in that direction. The operator can slide a boat sideways into a dock, pin point it diagonally, spin the vessel on its axis, or do all three almost simultaneously.

This technology takes much of the panic and confusion out of low speed maneuvering around close quartered marina fuel docks, entrance channels and on-the-water restaurants with your yacht.

NOTICE

USE THE JOYSTICK ONLY IN DOCKING
SITUATIONS. USE THE STEERING WHEEL
AND CONTROLS IN ALL OTHER
APPLICATIONS.

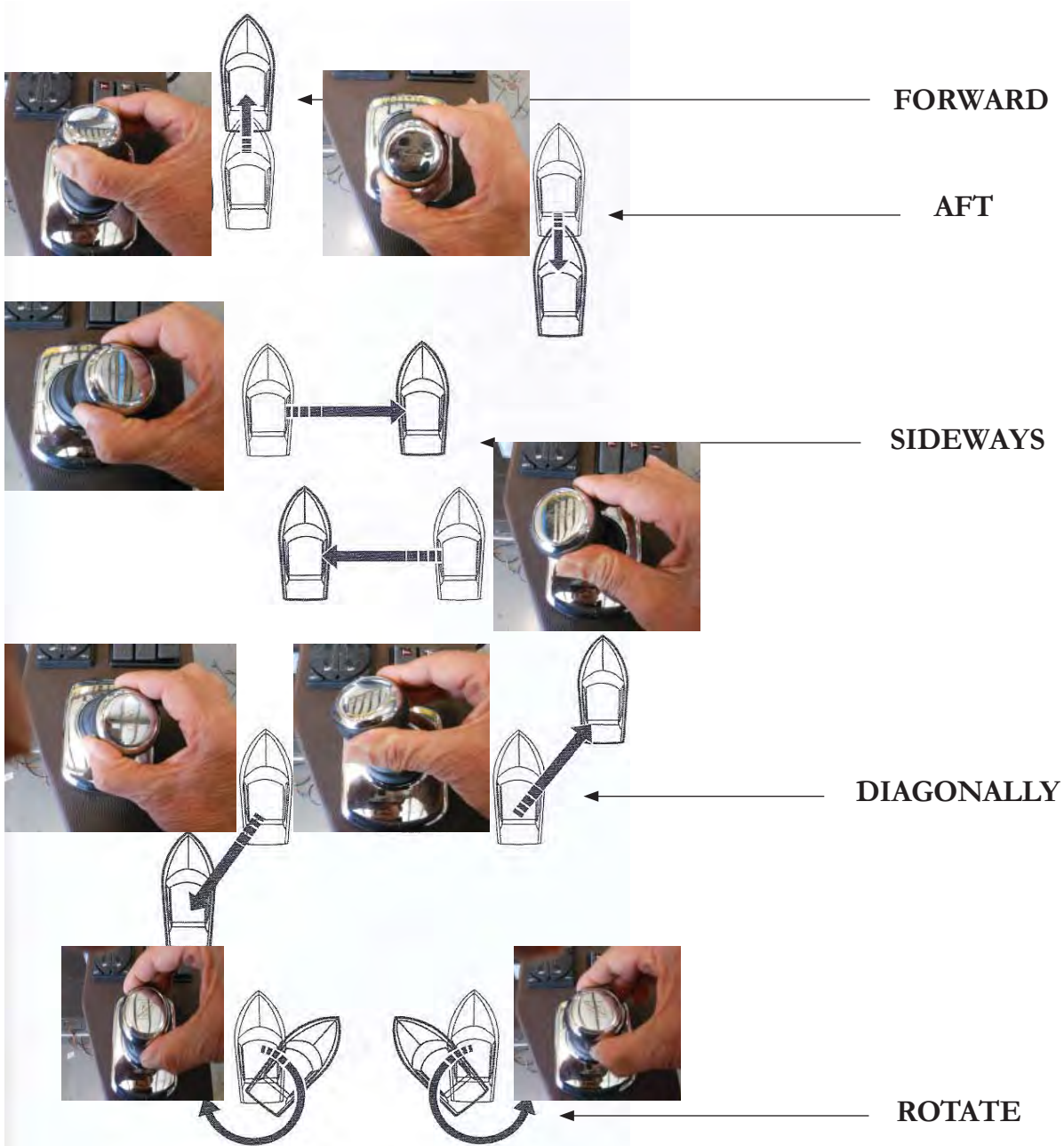
A joystick using Mercury “Smartcraft” technology is standard equipment with the Cummins/Zeus Axius Premier propulsion package. The Axius joystick piloting system uses a joystick to control yacht steering, throttle and shift simultaneously; basically offers complete vessel slow speed maneuverability and undermines the need for bow thrusters.

With the Axius system, your stern drives move independently of each other, allowing them to achieve the lateral movement needed to obtain close-quarter maneuvers with the greatest of ease.



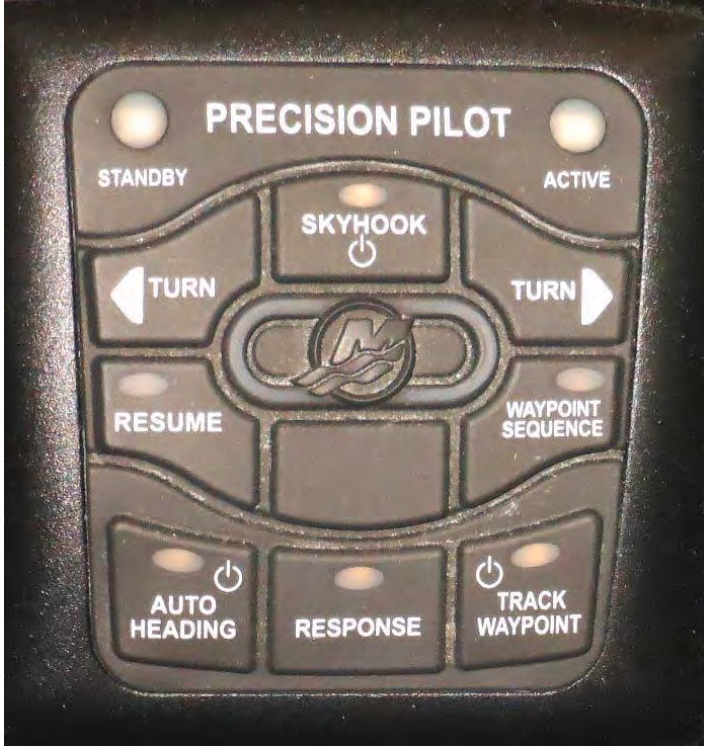
Engine & Controls

JOYSTICK BASIC FUNCTIONS





PRECISION PILOT OVERVIEW/FUNCTIONS



The following information is introductory and basic in nature. Read and understand the Zeus operator's manual before attempting to use this equipment. The Zeus manual supplies both general and supplementary information on Precision Pilot navigation modes along with their associated display units such as VesselView.



WARNING

PREVENT PERSONAL INJURY FROM COLLISION WITH OTHER VESSELS, RUNNING AGROUND, OR STRIKING OBJECTS IN THE WATER.

WHEN USING PRECISION PILOT MAINTAIN A DILIGENT LOOKOUT AT ALL TIMES.

THE PRECISION PILOT SYSTEM CANNOT REACT TO AVOID OTHER BOATS, SHALLOW WATER, OR OBJECTS IN THE WATER.

The Precision Pilot is a type of navigation system using a "touch pad" (shown to the left) which displays on the VesselView helm (Autopilot) screen select functions.

The touch pad includes the following buttons:

1. "Turn" buttons that feature a 10 degree course correction to the port or starboard course each time the button is pressed.
2. "Auto Heading", "Track Waypoint", and "Waypoint Sequence" buttons to engage automatic course and heading modes.
3. A "Skyhook" button to engage and disengage a station keeping feature called "Skyhook". *The remote control handles and the joystick must be in the neutral position for this feature to function.* This feature uses the Cummins GPS located at the hardtop under the port dome and an electronic compass.
4. A "Resume" button to activate an earlier course reading.
5. By using the "Response" button the operator can increase or decrease how aggressively the vessel reacts to programmed changes (while in Auto Heading mode).

Note that the trackpad displays lights to indicate when a Precision Pilot mode is activated (engaged) or in a standby (disengaged) mode of operation. The standby light is located on the port top touch pad. The active light is located on the starboard top touch pad.

There are 3 trackpad modes with power icons including Skyhook, Auto Heading, and Track Waypoint. These buttons engage or disengage the Precision Pilot function they perform.

- If you press a button that has the power icon when that button is on, the light turns off for that button and the "Standby" light illuminates.



Engine & Controls

- If you press a button with the power icon when the button light is off, the light turns on for that button, a single beep sounds, and the “Active” light illuminates.
- If you press a button that has the power icon when that button light is off, the light turns on for that button, a single beep sounds, and the “Active” light illuminates, unless another mode is currently active. If another mode is currently active, press the button on the active mode to disengage it, then press the button for the new mode.



WARNING

BEFORE ACTIVATING SKYHOOK:
CHECK THAT NOBODY IS IN THE WATER.
DO NOT LET PASSENGERS ENTER WATER.
SKYHOOK CAUSES THE PROPELLERS
TO ROTATE WHICH CAN CAUSE SERIOUS
INJURY TO SWIMMERS.



WARNING

TO AVOID INJURY DUE TO A MOVING VESSEL
WHILE USING SKYHOOK
THE OPERATOR MUST REMAIN
AT THE HELM, WATCH FOR ANYONE
NEAR THE VESSEL IN THE WATER,
DISENGAGE SKYHOOK IF ANYONE
ENTERS THE WATER OR APPROACHES
THE VESSEL FROM THE WATER.
IF AN APPROACHING VESSEL IS ON
A COLLISION COURSE DISENGAGE
SKYHOOK.



FLUX-GATE COMPASS

The flux gate compass is located under the cabin headliner whisper wall and is not a serviceable item. This component is part of the precision pilot system. See your Regal yacht dealer for further information.



CAUTION

AVOID PERSONAL INJURY FROM
UNEXPECTED TURNS AT HIGH SPEEDS.
ENGAGING THE TRACK WAYPOINT OR WAY-
POINT SEQUENCE FEATURE WHILE ON
PLANE CAN CAUSE THE BOAT TO TURN
SHARPLY. CONFIRM THE DIRECTION OF
THE NEXT WAYPOINT BEFORE ENGAGING
THESE AUTOPILOT FEATURES. WHEN
UNDERWAY IN WAYPOINT SEQUENCE MODE,
BE PREPARED TO TAKE APPROPRIATE
ACTION WHEN REACHING A WAYPOINT.



CUMMINS 6.7L ENGINE PACKAGE

SPECIFICATION	DETAIL
HORSEPOWER	CHECK ENGINE PLATE FOR INFORMATION
BORE AND STROKE	107 MM 4.21
DISPLACEMENT	6.7 LITERS, 408 C.I.D.
FIRING ORDER	1-5-3-6-2-4
APPROXIMATE ENGINE DRY WEIGHT	657 KG, 1448 LB
CRANKSHAFT ROTATION-VIEWED FROM FRONT	CLOCKWISE
INTAKE VALVE CLEARANCE	0.254 MM, 0.010 IN
EXHAUST VALVE CLEARANCE	0.508 MM, 0.020 IN
MAXIMUM OVER SPEED CAPABILITY	15 SECONDS MAXIMUM, 3700 RPM
MINIMUM AMBIENT AIR TEMPERATURE.-UN-AIDED COLD START	0 DEGREES C, 32 DEGREES F
ENGINE IDLE SPEED	600 RPM MINIMUM
MINIMUM CRANKING SPEED	150 RPM
ALTITUDE LIMIT	198M, 650 FT
ALTERNATOR OUTPUT	135 AMPS

TYPICAL CUMMINS 6.7 L ENGINE





CUMMINS TECHNICAL SERVICE

Use the RegalBoats.com web-site to locate your closest Regal yacht dealer. Also, for engine technical information contact Cummins Care at 1-866 549-6458. The Cummins Care office will provide support for Cummins engine related situations along with the Mercruy stern drive pod system. Outside of North America contact the closest regional office by finding the number in the International Directory.

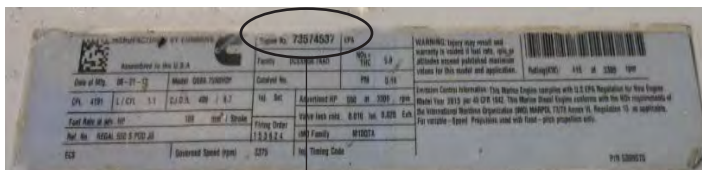
If you navigate to <https://quickservice.cummins.com> this web-site is very informative for basic and advanced information on Cummins engines and Zeus drive units. The web-site covers operation, maintenance guidelines, product service bulletins and troubleshooting procedures.

To register on the site you need to *insert your engine serial number* which is on the top of the engine valve cover. This serial number can be used to order parts, components and service literature. Below is a typical Cummins engine data plate. It is recommended that you write the engine and drive serial numbers down and store them onboard in a safe location for quick reference as needed.

NOTICE

TO AID OPERATORS OFFSHORE,
CUMMINS CARE INFORMATION
ON NEWER VESSELS IS
PROGRAMMED INTO THE VESSEL VIEW
DISPLAY SYSTEM.

ENGINE DATA PLATE



ENGINE SERIAL NUMBER

Also, there is a ECM data plate located on the engine. It shows information on how the electronic control module was programmed. It is recommended that you write down the information from this black rectangular plate which is especially useful when communicating with a Cummins authorized repair location. If this plate was not installed at the manufacturing plant, calibration data can be located on the engine data plate.



CUMMINS ENGINE INFORMATION

Read and understand the Cummins engine owners manual along with the Zeus drive owners manual before attempting to operate the vessel. These manuals supplement in detail the basic information found in this manual. In this section each of the main engine systems will be outlined including general data, fuel, lubrication, coolant, start-up and shutdown information.

NOTICE

BECOME FAMILIAR WITH THE ENGINE FAULT CODE SYSTEM. SHOULD A ENGINE MALFUNCTION DEVELOP THE OPERATOR WILL BE ABLE TO REACT FASTER TO THE SITUATION.

The Cummins engine package will provide a longer life span if the engine is correctly maintained including operating within Cummins specifications. Daily engine maintenance checks need to be performed,

The new Cummins engine package installed in your yacht does not require a “break in” procedure. Use the various vessel displays to constantly monitor critical engine indicators such as oil pressure, temperature, voltage and fault codes.

One important Cummins operation recommendation is that on new engines after the engines are started they need to reach 140 degrees as shown on the display unit before the engine is run hard at higher cruising rpm’s..

This permits the internal engine components to meet the proper wear tolerances.

During daily maintenance checks listen for any unusual system noises that may indicate immediate service.



Engine & Controls

FUEL

The basic mode of the electronic controlled fuel system regulates fuel delivery and timing. This system limits the engine speed operating range, optimizes engine performance while maintaining EPA and IMO MARPOL engine emission guidelines.

Fuel Recommendations

Cummins Inc. recommends the use of ASTM number 2 diesel which will provide maximum engine performance. In colder climates where temperatures are below 32 degrees F or 0 degrees C a diesel blend of 2D and 1D will provide acceptable performance. Lighter fuels can reduce fuel economy.

The fuel viscosity must be kept above 1.3 cST at 40 degrees C (104 degrees F) to generate adequate pumping and lubrication to all diesel fuel system components.

A Bosch HPCR pump with hardened components ensures most fuels will be delivered without jeopardizing fuel quality safety.

The dual engine mounted secondary fuel filters require changing fuel filters every 500 hours.

Read the owner's manual and perform all factory maintenance functions on time and by authorized personnel.



WARNING

TO PREVENT AN EXPLOSION OR FIRE
DO NOT MIX GASOLINE, ALCOHOL, OR
GASOHOL WITH DIESEL FUEL.



CAUTION

AVOID FUEL SYSTEM COMPONENT
DAMAGE! DUE TO CLOSE TOLERANCES
OF DIESEL INJECTION SYSTEMS, IT
IS OF THE HIGHEST IMPORTANCE TO
KEEP FUEL CLEAN AND FREE OF DIRT
AND WATER. DIRT AND WATER IN THE FUEL
SYSTEM CAN CAUSE SEVERE DAMAGE TO
THE FUEL PUMP AND THE FUEL INJECTORS.



ENGINE LUBRICATION OILS

The use of quality engine lubricating oils, along with appropriate oil drain and filter maintenance is a critical factor in engine performance and longer life.

As the engine oil becomes contaminated, many of the important additives are depleted. Lubricating oils protect the engine as long as these oil additives are functioning properly. Continuing contamination of the oil between oil changes is normal. The accrued contamination will vary, depending on the engine operation, hours used, fuel used, and new oil added.

When cruising constantly monitor the oil pressure on the helm displays.

Use the chart below to recognize acceptable levels of oil pressure at various engine rpm's.

Cummins® recommends the use of SAE 15-40 heavy duty engine oil for temperatures above 5 degrees F. Brands include Valvoline®, Premium Blue-(USA) and Valvoline Premium Blue Extra (International). A range of accepted engine oils are listed in the Cummins owner's manual.

Multigrade oil reduces deposit formation on pistons, rings and valves, reduces friction which increases engine cranking in lower temperature environments, and increases engine longevity by maintaining lubrication at higher operating temperatures. The use of synthetic oils (those manufactured with API group 3 or 4 base stocks) is permitted, subject to the same viscosity limitation and performance of petroleum (mineral) based engine oils.

Since multigrade oils provide an estimated 30% lower oil consumption compared to single grade oils, it is important to use multigrade oils to ensure the engine will continue to meet all applicable emissions requirements.

Refer to the Cummins owner's manual for additional information along with the Cummins QuickServe web-site.

NOTE that it is the responsibility of the yacht owner to follow the engine manufacturer's recommendations. If the recommendations are ignored, engine warranty may be affected.



CAUTION

AVOID POSSIBLE VALVE & PISTON DAMAGE
DUE TO EXCESSIVE OIL CONSUMPTION.
CUMMINS RECOMMENDS A SULFATED
ASH LIMIT OF 1.85% ON ALL ENGINE
LUBRICATING OILS.
CHECK PRODUCT CONTAINER.

NOTICE

SPECIAL "BREAK-IN" OILS ARE NOT
RECOMMENDED FOR YOUR CUMMINS
ENGINE. USE THE SAME OIL TYPE
DURING BREAK-IN AS USED IN
NORMAL OPERATION.

NOTICE

DO NOT USE AFTER TREATMENT OIL
ADDITIVES. IT IS POSSIBLE THAT
THESE ADDITIVES MAY REDUCE
THE FINISHED OIL'S ABILITY TO
PROTECT THE ENGINE.



CAUTION

TO AVOID POSSIBLE ENGINE DAMAGE
OR POOR ENGINE PERFORMANCE,
NEVER OPERATE THE ENGINE
WITH THE OIL LEVEL BELOW
THE LOW (L) MARK
OR ABOVE THE HIGH (H) MARK.



Engine & Controls

Checking Engine Oil

The Cummins engine must be level when checking the oil level itself or incorrect readings will be observed. Make sure the engine is up to normal temperature. Then wait at least 15 minutes before checking the engine oil level. Shut off the engine. This allows the oil to drain into the oil pan.

For additional lubricating oil recommendations and oil pan capacity information, refer to Maintenance Specifications.

Note: If you are not sure of the type/oil capacity of each engine oil pan contact the Cummins Care at 866-549-6458 or determine the oil pan capacity by using QuickServe Online and the engine serial number.

Fill the lubricating oil pan to the smallest oil pan capacity listed for your marine engine. See the “Lubricating Oil System” information sheet. Then add 0.95 litres (1 qt.) of oil at a time until it reaches the high point on the dipstick. Record the number of liters/quarts added for future oil change information.

Removing Oil Dipstick



TURN COUNTERCLOCKWISE TO REMOVE

Shown above is the engine mounted dipstick. To remove from the tube, turn the handle counterclockwise until the dipstick clears the tabs. Next, pull the dipstick up until free from the tube. Wipe the tube with a clean, dry cloth and reinsert until the tube bottom out. Once again remove the dipstick and read the oil level.

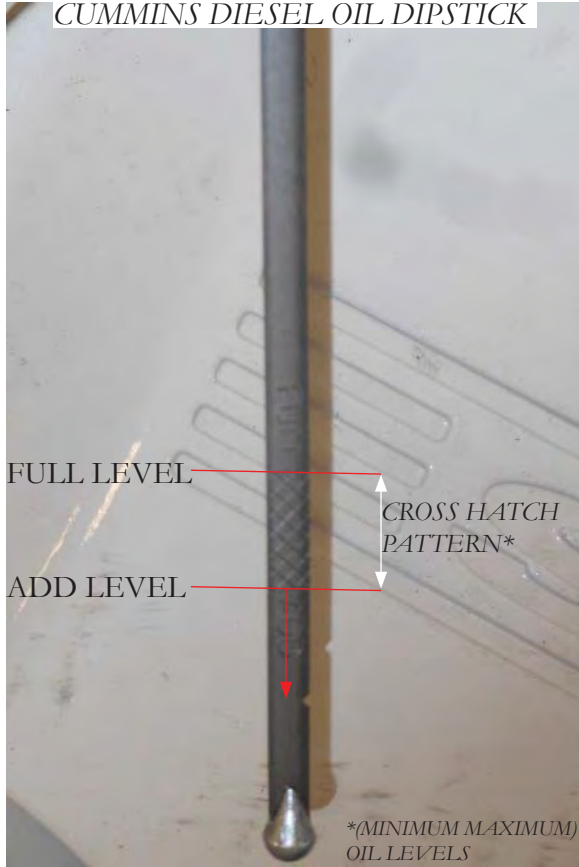


Oil should be between the minimum and maximum cross hatch patterns. Remove the valve cover oil threaded fill by turning it counterclockwise. Fill with the correct type multi-grade oil as needed. Reinstall valve cover oil fill knob by turning clockwise

until you hear a ratchet type noise which means it is secured properly.



CUMMINS DIESEL OIL DIPSTICK



CAUTION

EXTENDING THE OIL AND FILTER CHANGE INTERVAL BEYOND THE RECOMMENDATIONS WILL DECREASE THE ENGINE LIFE DUT TO FACTORS SUCH AS CORROSION, DEPOSITS, AND WEAR.



CAUTION

A SULFATED ASH LIMIT OF 1.85% HAS BEEN PLACED ON ALL ENGINE LUBRICATING OILS. USE IN CUMMINS ENGINES. HIGHER ASH OILS CAN CAUSE VALVE AND/OR PISTON DAMAGE AND LEAD TO EXCESSIVE OIL CONSUMPTION.

LUBRICATION SPECIFICATIONS

OIL PRESSURE

LOW IDLE	10 PSI
AT RATED SPEED	30 PSI
OIL REGULATING VALVE OPENING PRESSURE RANGE	65 PSI TO 75 PSI
OIL FILTER DIFFERENTIAL PRESSURE TO OPEN BYPASS	50 PSI

LUBRICATING OIL CAPACITY OF STANDARD ENGINE-STANDARD OIL PAN

PAN ONLY	15 QTS.
TOTAL SYSTEM	17.6 QTS.
HIGH TO LOW (DIPSTICK READING)	2 QT.
LUBRICATING OIL FILTER CAPACITY	1 QT.

LUBRICATING OIL CAPACITY OF STANDARD ENGINE-HIGH CAPACITY OIL PAN

PAN ONLY	18.5 QTS.
HIGH TO LOW-DIPSTICK READING	3 QTS.
LUBRICATING OIL FILTER CAPACITY	1 QT.
MAXIMUM OIL TEMPERATURE	280 DEGREES F.



Engine & Controls

Oil Filters



Viewing from the front of the engine the spin-on oil filter will be on your port and the secondary spin-on fuel filter will be to starboard.

Change the oil filter per maintenance schedules found in your engine manual. Use only filters that are recommended by Cummins.

When changing oil/oil filters make sure to catch all contaminated oil and dispose of in an environmentally approved fashion.



WARNING

TO AVOID PERSONAL INJURY AVOID DIRECT CONTACT WITH HOT OIL.

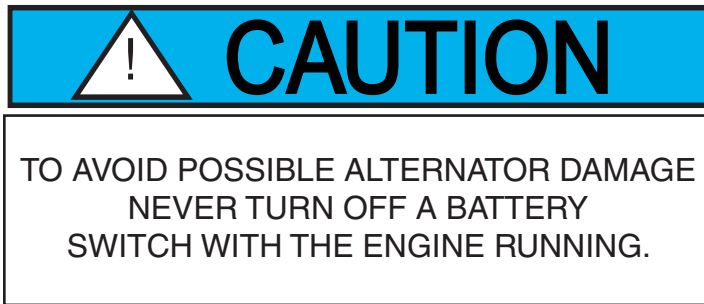


WARNING

SOME STATES AND FEDERAL AGENCIES HAVE DETERMINED THAT USED ENGINE OIL CAN BE CARCINOGENIC AND CAUSE REPRODUCTIVE TOXICITY. AVOID INHALATION OF VAPORS, INGESTION. AND PROLONGED CONTACT WITH ENGINE OIL. DISPOSE OF USED OIL IN ACCORDANCE WITH LOCAL ENVIRONMENTAL REGULATIONS.



The alternator produces DC current to charge up the batteries while the vessel is cruising. The Cummins alternators are solid state construction with an output of 135 amps per alternator. They are self-excited which means that current output is triggered at lower idling rpm's. Periodically check the belt tension and adjust as necessary.





COOLING SYSTEM



HEAT EXCHANGER WITH EXPANSION TANK CAP



WARNING

TO AVOID PERSONAL INJURY DUE TO HEATED COOLANT SPRAY OR STEAM, DO NOT REMOVE THE PRESSURE CAP FROM A HOT ENGINE. WAIT UNTIL THE TEMPERATURE IS BELOW 50°C (120°F)

General Information

The role of the cooling system is to maintain a specified operating temperature for the boat's engines. A portion of the heat generated by the engine is absorbed by the engine coolant flowing through the passages in the cylinder block and head. Heat is then removed from the engine coolant as it flows through the heat exchanger.

As part of the cooling system the water pump is a belt-driven, centrifugal-type pump with the inlet and bypass as integral parts at the front of the engine.

If water pump replacement is needed, verify the correct design type pump before installing a new one. The largest difference is the drive pulley size. Using the incorrect pump can cause decreased water flow and damage due to overheating conditions.

The thermostat controls the engine coolant temperature. It is located at the engine front in the cylinder head. The opening and closing of the thermostat is controlled by a wax motor.

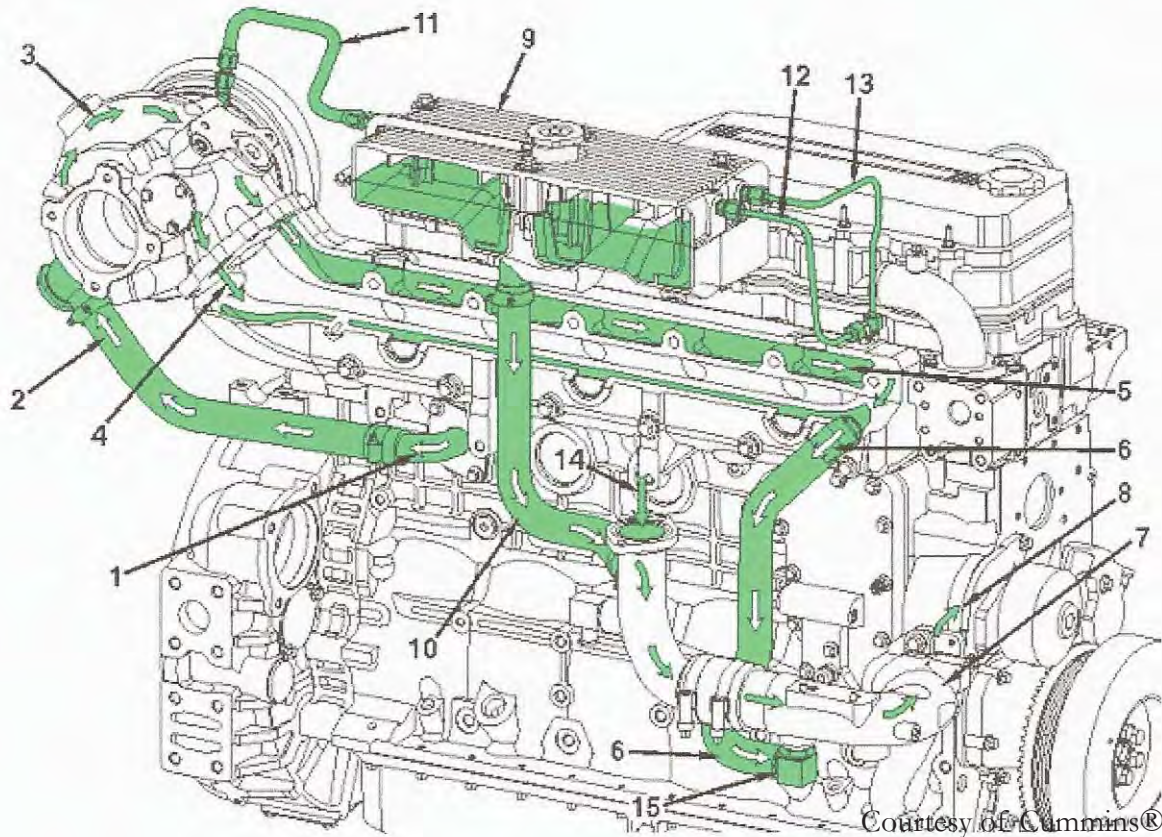
The thermostat features two vent holes to vent air past the thermostat when it is closed. This is needed to fill the cooling system.



When the coolant temperature is below the operating range of the thermostat, engine coolant is bypassed back to the inlet of the water pump. When the coolant temperature is below the operating range of the thermostat, engine coolant is bypassed back to the inlet of the water pump. When the engine coolant temperature reaches the operation range, the thermostat opens, sealing off the by pass, forcing engine coolant to flow to the heat exchanger. The cooling system is designed to use a pressure cap to prevent boiling of the coolant. If cap replacement is necessary it is important to match the original cap specifications. A malfunctioning cap can result in the loss of coolant and an engine overheating condition.

The expansion tank creates positive pressure in the cooling system to control coolant boiling. The expansion tank removes air bubbles from the coolant. It contains a coolant reserve to help with small leaks without overheating the engine and the system uses a coolant level sensor that warns of low coolant condition.

The heat exchanger is a two pass, tube design and is located on the exhaust side of the engine. The end cover plates are removable for cleaning the tubes; the cooler bundle is **not** removable. A sacrificial plug is located in the front cavity of the heat exchanger sea water passage. The engine coolant flows from the thermostat housing outlet into the top front of the heat exchanger and is directed over the tubes by baffles. The engine coolant exits the cooler at the bottom rear of the heat exchanger. The engine coolant is returned to the engine coolant pump inlet via a transfer tube. The coolant sea water enters the bottom rear of the heat exchanger cavity and is diverted to the lower half of the cooler tubes by a divider plate in the cavity. The sea water flows through the tubes to the front, nondivided cavity. The sea water then flows through the tubes on the upper half of the cooler and is discharged out of the top rear of the heat exchanger, and into the outer shell of the exhaust elbow. The sea water is then discharged overboard.



Engine Flow (with Heat Exchanger)

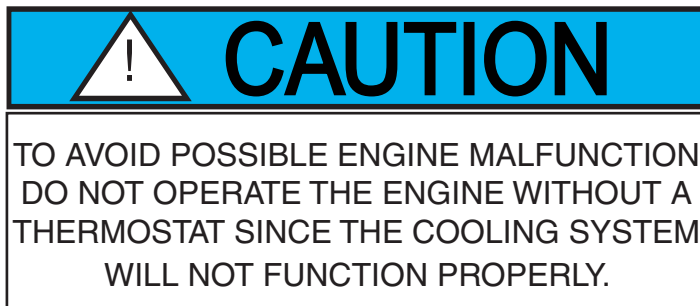
1. Coolant flow from cylinder block
2. Coolant flow to turbocharger
3. Coolant flow through turbocharger
4. Coolant inlet to exhaust manifold
5. Coolant flow through exhaust manifold
6. Coolant return to coolant inlet connection
7. Coolant inlet connection
8. Water pump inlet
9. Expansion tank
10. Coolant make-up line
11. Turbocharger vent line
12. Exhaust manifold vent line
13. Cylinder head vent line
14. Coolant return from heat exchanger
15. Coolant orifice plug, if equipped.



The belt system has two separate belts. The primary belt is an 8 rib design and drives the engine coolant pump and alternator.

The secondary belt is a 4 rib design used to drive the seawater pump. Both belts provide extra flexibility over standard belts and do not require a tensioning.

The 8 rib design commonly referred to as a “serpentine” belt and is used to drive the various front engine-mounted accessories. When replacing belts, sketch the routing of the belt around the various pulleys, etc.



Cooling System Flow

Refer to the flow diagram on the next page for referencing purposes. Through the water/coolant inlet connection, engine coolant is drawn into an integral water pump cavity machined into the block. The cylinder block-mounted-water pump is belt driven and pressurizes the coolant before flowing into the cylinder block water jacket. The coolant first flows around the lubrication oil cooler plates and enters the water jacket cavity around the cylinders. Coolant flows around the cylinders, but not between the inner cylinder bores. From the cylinder block water jacket, the coolant flow continues through holes around and between each cylinder in the cylinder block combustion deck to the cylinder head.

From the cylinder block, the coolant flows into the cylinder head through orifices in the cylinder head gasket. The orifices in the cylinder head gasket control the coolant flow from the cylinder block to the cylinder head.

Coolant flow continues around the valve guide and injector areas before continuing to the exhaust side of the cylinder head.

Before the engine reaches thermostat-opening temperature, a bypass port is opened to allow engine coolant to flow back to the inlet of the water pump. Until the thermostat opens, engine coolant is continuously recirculated through the engine only. Once the engine reaches the thermostat-opening temperature, the thermostat opens, allows the coolant to flow to the heat exchanger. This action also closes the bypass passage to the water pump. Finally, from a port in the cylinder block near the engine rear, coolant is supplied from the cylinder block to the turbine housing of the turbocharger. Coolant flows through the turbine housing into the exhaust manifold. Coolant returns to the water pump inlet from the port at the front of the exhaust manifold.

Antifreeze Notes

Cummins recommends the use of fully formulated antifreeze/coolant meeting their strict standards. Many antifreeze footprints do not meet the Cummins specifications regarding low-silicate levels.

Cummins Inc. recommends using a product called Fleetguard® Compleat ES™. It is available in both glycol forms (ethylene and propylene). Do not substitute.

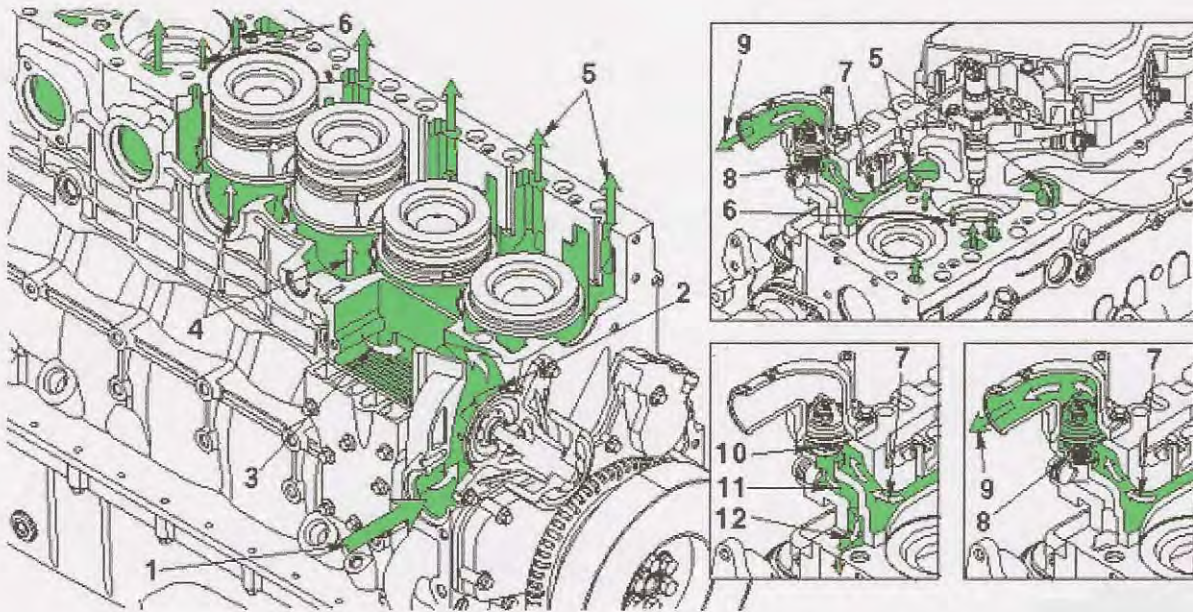
Cummins Inc. recommends using either a 50/50 mixture of good quality water and fully formulated antifreeze, or fully formulated coolant when filling the marine engine cooling system.

Good quality water is important for cooling system performance. Excessive levels of magnesium and calcium contribute to scaling problems, and large amounts of sulfates and chlorides cause cooling system corrosion.

Fully formulated antifreeze must be mixed with good quality water at a 50/50 ratio (40 to 60 percent working range). A 50/50 mixture of antifreeze and water provides a -36°C (33°F) freezing point and a 108°C (226°F) boiling point which is fine for North American locations. The actual lowest freezing point of ethylene glycol antifreeze is at 68%. Using higher concentrations of antifreeze will raise the freezing point of the solution and increase the possibility of a silica gel problem.



Flow Diagram



Primary Loop

Courtesy of Cummins®

1. Coolant inlet
2. Water pump impeller
3. Coolant flow past lubricating oil cooler
4. Coolant flow past cylinders
5. Coolant flow from cylinder block to cylinder head
6. Coolant flow between cylinders
7. Coolant flow to thermostat housing
8. Thermostat open - bypass passage closed
9. Coolant flow back to heat exchanger
10. Thermostat closed - bypass passage open
11. Coolant bypass passage in cylinder head
12. Coolant flow to water pump inlet



Chapter 5

Other Cooling System Information

Do not use sealing additives in the cooling system. They cause buildup in coolant low-flow areas, plug the radiator and oil cooler and could damage the water pump.

Do not use any soluble oils in the cooling system since they will corrode brass and copper, damage heat transfer surfaces along with seals and hoses.

When checking coolant a refractometer must be used. It is a Fleetguard® part and is available through Cummins. Do not use a floating ball hydrometer since it may provide inaccurate readings.

WATER QUALITY	
Calcium Magnesium (hardness)	Maximum 170 ppm as (CaCO ₃ + MgCO ₃)
Chloride	40 ppm as (Cl)
Sulfur	100 ppm as (SO ₄)

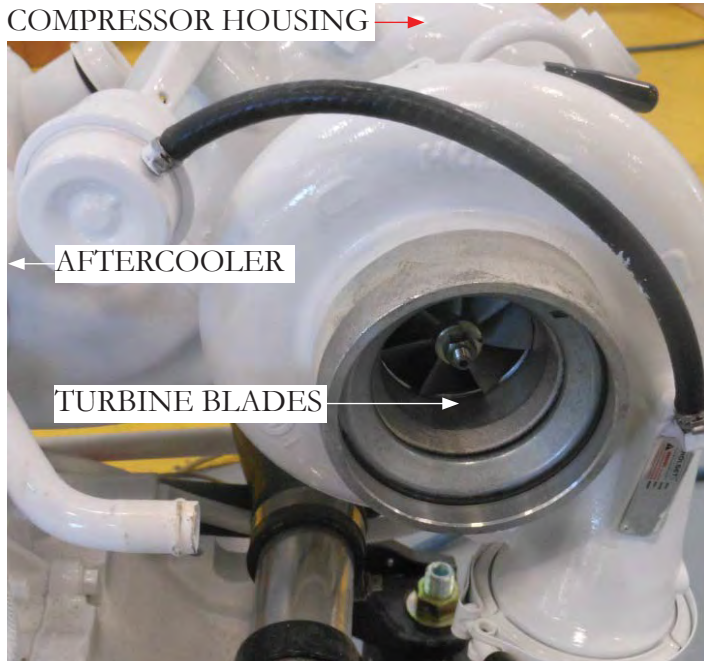
ppm=parts per million.

COOLING SYSTEM SPECIFICATIONS	
Coolant Capacity- Includes block, cylinder head, water pump, EGR cooler, EGR plumbing	11.5 liters (3.0 gals.)
Standard Modulating Thermostat- Range	86 to 97°C (186 to 207°F)
Maximum Allowed Operating Temperature	107°C (225°F)
Minimum Recommended Operating Temperature	71°C (160°F)
Minimum Recommended Pressure Cap	90 kPa (13 psi)
Maximum Recommended Pressure Cap	172 kPa (25 psi)




Engine & Controls

Turbocharger



CUMMINS 6.7 L TURBOCHARGER

**CAUTION**

TO AVOID POSSIBLE DAMAGE TO THE TURBOCHARGER DUE TO THE LACK OF BOOST PRESSURE, DO NOT OPERATE THE ENGINE WITH THE CHARGE-AIR PIPING REMOVED.

The turbocharger uses large amounts of air so it is important that all intake ducting be free of debris for maximum engine air intake. The turbocharger as used on the Cummins 6.7 L engine increases the engine's efficiency by forcing extra air into the combustion chamber. It is a turbine-driven device. The main turbocharger system components include the turbine, compressor and aftercooler.

A turbocharger draws the engine exhaust gases into the compressor where the air develops increased pressure before entering the intake manifold. All in all, more air enters the cylinders on each intake stroke. An aftercooler is used to cool down the intake air. The process allows the engine to be much more efficient than a natural aspirated engine.

Periodically inspect the turbocharger compressor impeller blades for damage. If the compressor impeller is damaged, inspect the inlet piping and filter element for damage. If damage is found replace the turbocharger before operating the engine.

Inspect the turbine wheel for damage.



VIP SMARTSTART SWITCH

Starting engines using the VIP SmartStart switch

At times there may be a reason to start the vessel from the engine room where dual VIP SmartStart switches are located (one for each engine). The normal helm key switch system may be inoperative or if maintenance work is being performed it may just be more practical to start an engine from engine room switch. The port engine SmartStart switch is located at the forward portside engine room bulkhead. The starboard engine SmartStart switch is on the starboard side of the forward bulkhead. Note on the VIP panel the start/stop switch is green. *The other switch is red and it is for emergency stopping only.*

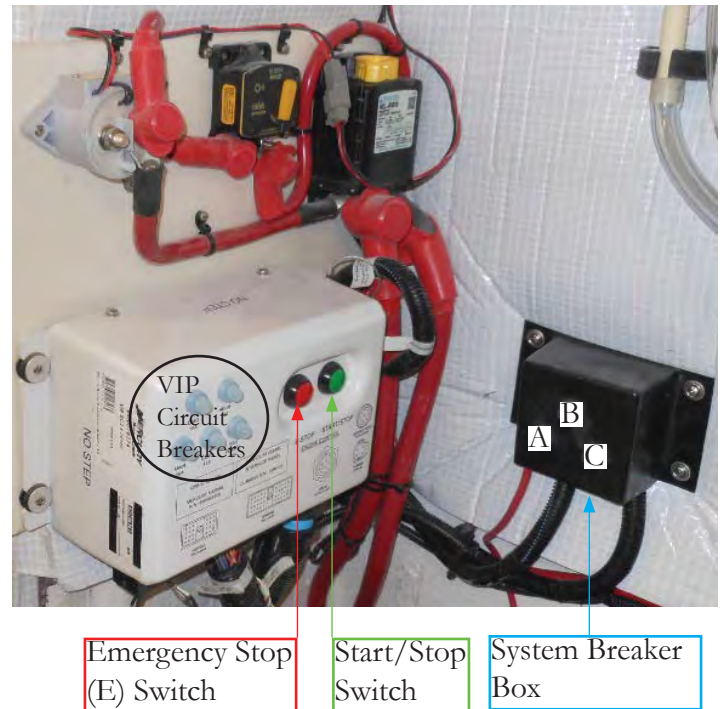
To use the SmartStart switch perform the following:

1. Make sure the Zeus seacock is in the “open” position.
2. At the helm move the ERC remote control handles to the neutral position.
3. For each engine to be started, turn the helm ignition switch to the “on” position.
4. Make sure it is safe to start the engine(s).
5. Find the corresponding SmartStart switch for the engine to be started.
6. Press and release the SmartStart switch for the engine to be started. The engine starter will automatically begin to crank and stop once that engine is started.

Stopping engines using the VIP SmartStart switch

For the same reasons mentioned above the operator may want to stop an engine or engines using the VIP SmartStart system located in the engine room.

To stop the engine(s) using the SmartStart switch perform the following:



1. At the helm move the ERC remote control handles to the neutral position.
2. For each engine to be started, find the corresponding SmartStart switch.
3. Make sure it is safe to shutdown the engine(s).
4. Press and release the “green” start/stop switch for each engine that you want to stop.

Overcurrent Protection-VIP SmartStart Display

There are system overcurrent breakers located on both the port and starboard engine SmartStart displays. Note the breaker sizes and the systems they protect on each panel as shown in the chart on the following page. Should a breaker “pop” be sure to locate the source of the problem before “resetting” the breaker.



VIP SMARTSTART SWITCH DISPLAY BRKRS.

CIRCUIT BRKR. SIZE	PROTECTION	VIP DISPLAY LOCATION
25 AMP	MAIN	LOWER LEFT
5 AMP	VIP DIAGNOS- TICS	UPPER LEFT
10 AMP	HELM	UPPER RIGHT
10 AMP	SIM/VESSEL	LOWER RIGHT
15 AMP	GEAR	LOWER CENTER

Note there is a black box close to each VIP SmartStart switch display (Refer to the photo on the previous page). These are overcurrent protection devices for Cummins wiring and the Mercathode system and unswitched harness leads.

SYSTEM BREAKER BOX- (1 per engine)

CIRCUIT BRKR. SIZE	PROTECTION	LOCATION
30 AMP	VIP UN- SWITCHED	A
30 AMP	UNSWITCHED ENGINE POWER SOURCE	C
20 AMP	MERCATHODE	B



ZEUS® PROPULSION PACKAGE

INTRODUCTION

The Zeus® pod propulsion package provides customer-friendly ease of use along with optimum performance and dependability. Add the features of Mercury Smartcraft technologies and your boating experience is that much more enjoyable.

Another Zeus system feature is saving money on the water. The unit can improve fuel efficiency by 30% along with up to 15% better cruise and top vessel speed.

The advanced joystick control system using on hand dramatically improves close quarter maneuvering even with strong wind and current conditions.

Using rear-facing propellers and a tunnel mounted design the vessel is protected more from underwater debris. Should the drive unit come into contact with a large object the skeg is designed to shear below the torpedo, minimizing drive damage.

Zeus uses innovations like Skyhook™ to pull up to a busy marina fuel dock or on-the-water restaurant and wait in line without constantly using the controls to hold a position; press the Skyhook button and through a fixed heading maintain a tight position as long as necessary.

Read and understand the Zeus MerCruiser Diesel Owner's Manual. Since information here is basic and introductory it should be reinforced by referencing the owner's manual.



ZEUS® PROPULSION PACKAGE



WARNING

AVOID SERIOUS INJURY OR DEATH!
READ ALL MANUFACTURER'S ENGINE
AND PROPULSION MANUALS
BEFORE STARTING OR OPERATING
THE VESSEL.

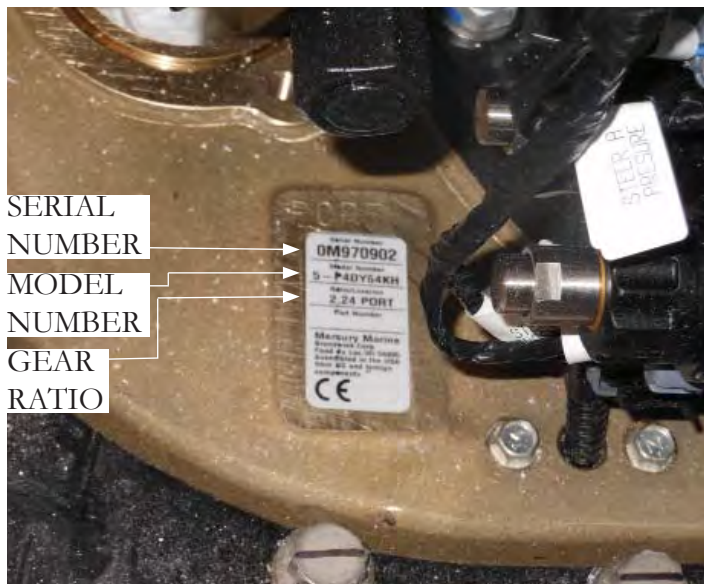


Engine & Controls

ZEUS® SERIAL NUMBER IDENTIFICATION

The Zeus® pod propulsion package provides customer-friendly ease of use along with optimum performance and dependability. Add the features of Mercury Smartcraft technologies and your boating experience is more enjoyable.

The drive serial numbers are key elements for parts and service details regarding your Cummins MerCruiser Diesel product. When contacting Cummins MerCruiser Diesel about service always specify model and serial numbers. The drive serial number is located on the lower base casting. See the photo below. Both port and starboard serial numbers on each drive should be notated for future reference.



The ZF planetary gear set serial number is found on a tag on top of the drive unit. Note that the cover assembly needs to be removed to access plate. See photo below.



ZEUS® CONTROLS & DISPLAYS

Read the earlier segment of this chapter regarding engine controls and displays since both engine and pod propulsion information can be viewed via the displays. Get to know your helm mounted displays as they reveal important propulsion data during a cruise.

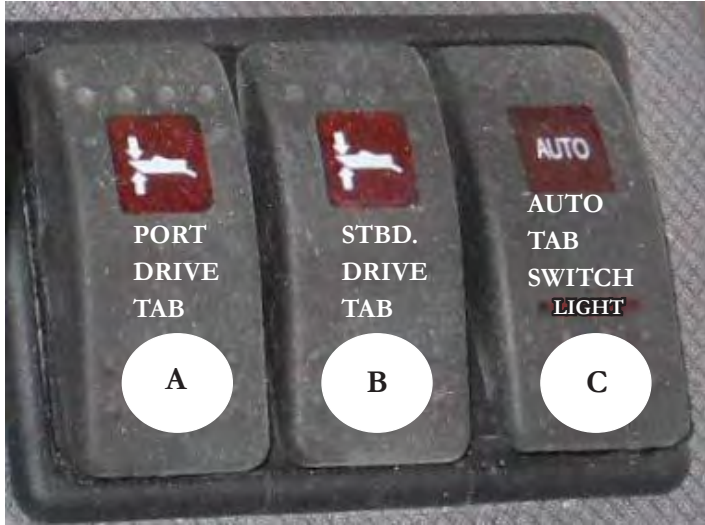
A portion of the displays will alert the operator to a “situation” by displaying a fault code. Know how to follow up on each fault code as select ones require immediate action. Train another person on all onboard systems in case the captain should become disabled.

A portion of these components include:

- DTS Remote Control
- VesselView
- Skyhook
- Joystick
- GMI 20
- GPS/Plotter



ZEUS TRIM TABS



Zeus trim tabs are standard equipment on your yacht. This system is used to adjust the vessel running angle using both stern drives. The system may be used in conjunction with the onboard Lenco Easy Glide system. The trim tab switch panel is located behind the remote control box for the operator's convenience. The goal is to achieve the best running plane for the conditions encountered along with trying to provide the most economical ride.

Note from the photo above there are individual switches to manually activate the port and starboard drive trim tab function. (A) is the port drive control switch and (B) is the starboard drive control switch.

Also, there is an independent "automatic control" switch (C) located to the far right. This switch uses an icon to represent when both drive units are engaged in the automatic mode. To engage the automatic trim simply press the "automatic" trim tab button. The outdrive trim tabs will automatically adjust to the speed of your yacht as it is changed. If you press the automatic switch again, it will disengage this function.

Note that in the manual mode that particular drive tab will sustain the position the operator chose until the key switch is cycled off and on or the "Auto" switch is pressed in. When accelerating on plane using the manual mode the individual tabs (A) and (B) will not "trim" until the switches are pressed.

The Zeus trim tab system can be used to offset various running conditions by using the stern drive trim tabs in the manual or automatic mode. Some of these conditions include:

- Accelerating on to a plane
- Offsetting a rough ride
- Correcting an unbalanced load (list)
- Low speed trim

The information found here is general and limited in detail. Read the Zeus owner's manual for further detailed information regarding the operation of drive trim tab system.



ELECTRONIC HELM STEERING

Through the use of electronic signals the helm steering system operates over a set mode of travel. The computer controlled electric motor is attached to the helm steering wheel. It simulates the same basic motion found in hydraulic steering systems (Note that there are times when the operator may not feel the stop points but the drives are still turning as needed lock to lock).

To determine the steering range of your vessel from stop to stop do the following:

1. Turn the key switch to the “on” position (The engines do not need to be running).
2. Turn the wheel to starboard (right) until the wheel terminates at the starboard end-stop or lock. The end stop (through the attached electric motor) is electronically pre-set at the factory when the engine personality is set up.
3. Turn the wheel to port (left) and keep track of the revolutions until the wheel reaches the port lock.
4. The number of revolutions you counted moves the drives from the maximum starboard angle to maximum port angle with the center (straight-away position at zero°). Normal lock to lock position is $2\frac{3}{4}$ revolutions of the steering wheel.

POSSIBLE STEERING PROBLEMS/SOLUTIONS



1. Steering system does not permit the operator to feel the lock to lock end-stop positions.

Possible areas of problems could be a faulty helm steering wheel motor, a low starboard battery voltage, or the starboard key switch in the “off” position.

2. Steering wheel does not steer vessel.

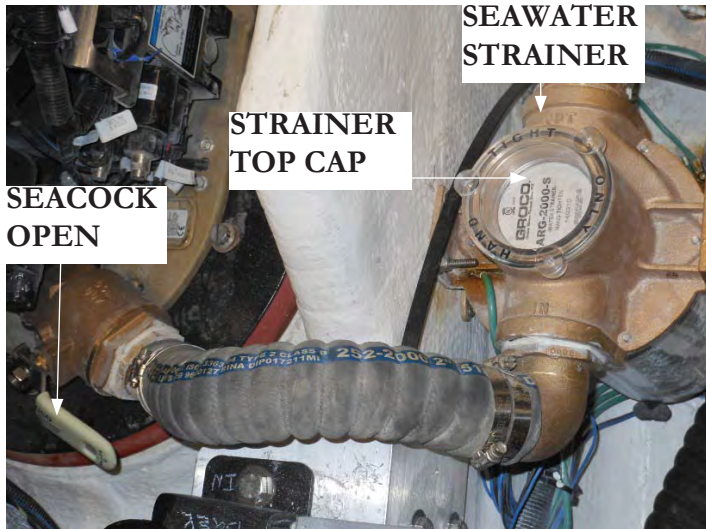
As alternative use joystick. Check steering actuator fluid level and fill as necessary. Check owner’s manual for fluid specifications.

3. Steering operates but is not as responsive.

Turn key off and key on. Check and start port engine. Check trim tab function. Check steering actuator fluid level and fill as necessary. Check owner’s manual for fluid specifications.



ZEUS INTAKE SEACOCK



CAUTION

TO AVOID POSSIBLE DAMAGE DUE TO A LACK OF SEAWATER, DO NOT OPERATE THE PROPULSION UNIT WITH THE INTAKE SEACOCK IN THE CLOSED POSITION.

On the forward end of the Zeus propulsion unit is an intake seacock. The purpose of the seacock is to let seawater into the engine via the strainer. The seacock handle must be positioned (open) in line with the fitting.

The strainer contains a basket style filter that protects the engine(s) by catching debris. Both port and starboard engines feature seawater strainers. A daily visual check of the basket is recommended before each cruise.

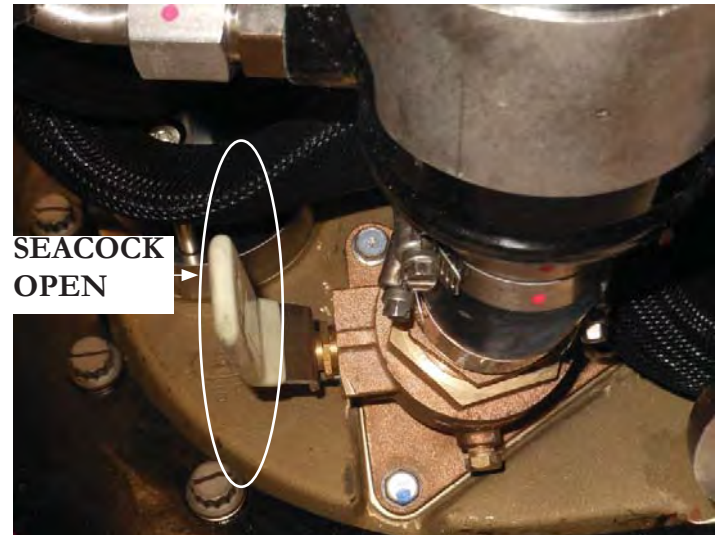
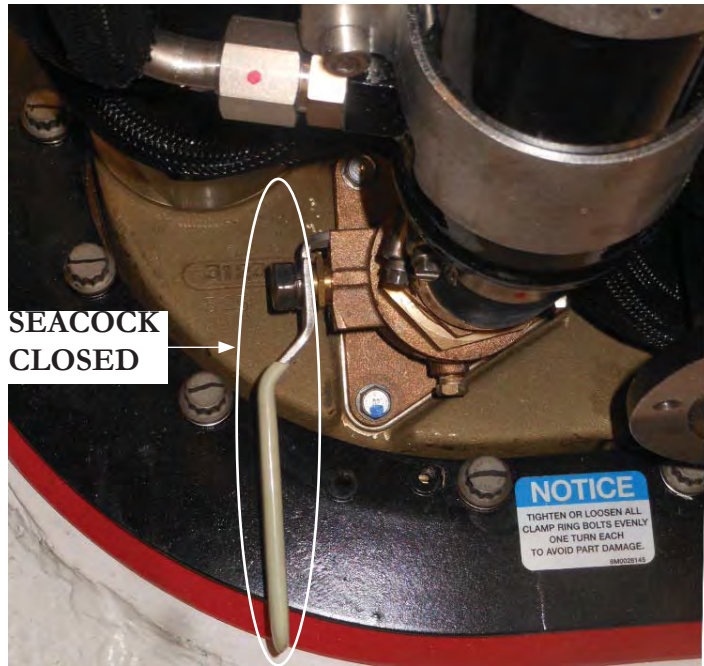
If necessary remove any accumulated debris in the strainer basket. Turn the top strainer cap *counterclockwise* to access the strainer basket. Lubricate the O ring by applying a water pump grease. Hand tighten the strainer cap by turning in a *clockwise* direction.

Make sure the intake seacock handle is positioned in the closed position (vertical) before opening the strainer or water will continue to be ingested into the vessel. Be sure to open the seacock handle after cleaning the strainer basket.


See the strainer vendor documentation for more detailed information.



ZEUS EXHAUST RELIEF SEACOCK



On the aft end of the Zeus propulsion pod is a seacock. Before starting the engines check to see that the Zeus propulsion exhaust relief seacock is in the “open” position as seen in the right photo above. The handle should be in a vertical position which permits excess engine seawater to exit through the cooler and the exhaust manifold. This system assists in cooling the hydraulic valve system by sending exhaust seawater through a heat exchanger and then out through the drive unit. It also relieves pressure in the exhaust system.



CAUTION

TO AVOID POSSIBLE DAMAGE DUE TO
EXCESSIVE EXHAUST BACK PRESSURE
MAKE SURE THE EXHAUST RELIEF
SEACOCK IS IN THE OPEN POSITION.



ZEUS PROPULSION POD LUBRICANT CHECKS

NOTICE

DISCHARGE OF OIL, COOLANT, OR OTHER ENGINE/DRIVE FLUIDS INTO THE ENVIRONMENT IS RESTRICTED BY LAW. DISPOSE OF FLUIDS AS REQUIRED BY LOCAL RESTRICTIONS.

Overview

The Cummins MerCruiser Diesel propulsion package features the Zeus® drive pod. These drives feature 60 degrees of individual unit turning which affords maximum control and maneuverability. With the Zeus drive system propellers face backwards which provide the unit superior damage protection. The upper drive pod provides a customer friendly system of checking lubricant and fluid levels. All service points are well marked for easy dipstick checks.

The drive lubricants/fluids shall be checked before each cruise or on a daily vessel usage schedule. Pay close attention to periodic maintenance required by Cummins. This information is available in your engine/drive operator's manuals. Contact your closest Cummins MerCruiser Diesel facility for more information or use the Cummins Quick Serve web-site.

See the maintenance chapter of this manual for more detailed information.

The following pages illustrate routine checks on the Zeus pod.



A=Drive Gear Lubricant

B=Transmission Oil

C=Steering Actuator & Trim-Hydraulic Oil



Engine & Controls

Overview- Drive Gear Lubricant

Note: The Zeus drive gear lubricant feature break-in gear lube recognized by the brown color. This break-in gear lube must be changed at 25 hours and no more than 30 hours. Drain the drive and gear lube monitor of the break-in lube and fill with the specified gear lubricant which is 80-90 weight Synthetic Merc Oil (Merc # 92-858064K01).

After break-in continue to use a 80-90 weight Synthetic Merc Oil (Merc # 92-858064K01). This oil will be recognized by a bluish color.

A few notes concerning the drive gear lubricant monitor (reservoir).

A monitor switch is featured to detect a low level of gear lubricant through an audio-visual alarm system.

The following procedures for checking and filling are for situations where the drive gear lubricant level in the monitor is low but still visible. Filling the monitor to the specified level whenever lubricant is still visible in the monitor is correct.

If gear drive leaks out due to a seal problem an audio or visual warning should alert the operator to a low lubricant level. If an alarm sounds and the reservoir is empty do not fill the reservoir monitor. This situation requires a different set of steps. Refer to the Zeus operator's manual for more information.

Note: The drive gear lubricant on the gear lubricant monitor changes during drive operation; always check the drive gear lubricant when the engine is "off" and the drive oil is cool.

Note: If drive lubricant is continually below the "cold fill level" and/or the operator is frequently adding drive lube to the monitor there may be a drive seal leak. Contact your Cummins MerCruiser Diesel Authorized Repair Facility.

Checking Drive Gear Lubricant

Follow these steps to fill the drive gear monitor (reservoir).

1. If necessary remove the top cover.
2. Remove the black cap from the drive gear monitor.
3. Visually inspect the monitor gear lubricant level. It should be between the "cold fill level" (cold full line) and the "max. operating level" (hot full line). Note that after running the drive the lubricant expands and may be up to the "max. operating level".
4. Check to see that the monitor cap gasket is positioned properly and reinstall cap.



If the level is lower than the "cold full level" (cold full line), refer to **Filling**.



Filling Drive Gear Lubricant

Perform the following steps to fill the drive gear monitor.

1. Remove the drive gear lube monitor cap.
2. Fill the drive gear lubricant monitor with the after-break-in high performance gear lubricant (80-90 weight synthetic Merc oil 92-858064K01) so the gear lubricant is level with the “cold fill level” (cold full line). Make sure not to overfill the monitor (reservoir).
3. Check that the cap rubber gasket is in place and install the cap.

Changing Drive Gear Lubricant

Note: It is recommended to change the gear drive when the drive is at operating temperature. At this point, the used lubricant will flow more freely, and will carry away more impurities, and is easier to remove it.

The gear drive lubricant can be changed in different ways; one with the boat in the water and the other with the boat out of the water.

If the vessel is in the water an attachment to drain and fill the drive unit is found at the steering actuator. If the vessel is out of the water drain the gearcase into a container and dispose of properly. A pump connected to a jug of Merc drive gear lubricant through a special adapter is used to fill the drive unit to the “cold fill level”.

Refer to the Zeus operator’s manual for detailed instructions on the above procedure.



Engine & Controls

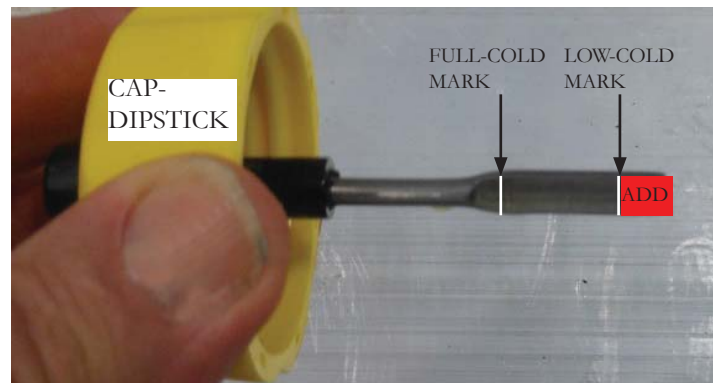
Overview-Steering Actuator & Trim- Hydraulic Oil

The steering actuator and trim system use a common hydraulic pump, filtering system, and hydraulic oil storage reservoir for pressure and lubrication purposes. These components require a common Merc lubricant- Synthetic 0-W30 oil (92-858076K01).

Checking Hydraulic Reservoir



1. Using a lint-free cloth, wipe any dirt and debris from the hydraulic reservoir to prevent contamination of the fluid.
2. Push down on the cap and turn the cap counterclockwise about 1/3 of a turn to remove the cap.
3. Lift the cap-dipstick combo from the neck of the reservoir.
4. Inspect the dipstick level which should be at the full-cold mark.
5. If the level is low. see **Filling**.
6. If the level is correct, insert the cap-dipstick combo into the reservoir neck and turn clockwise while holding the cap down until the cap locks in place.

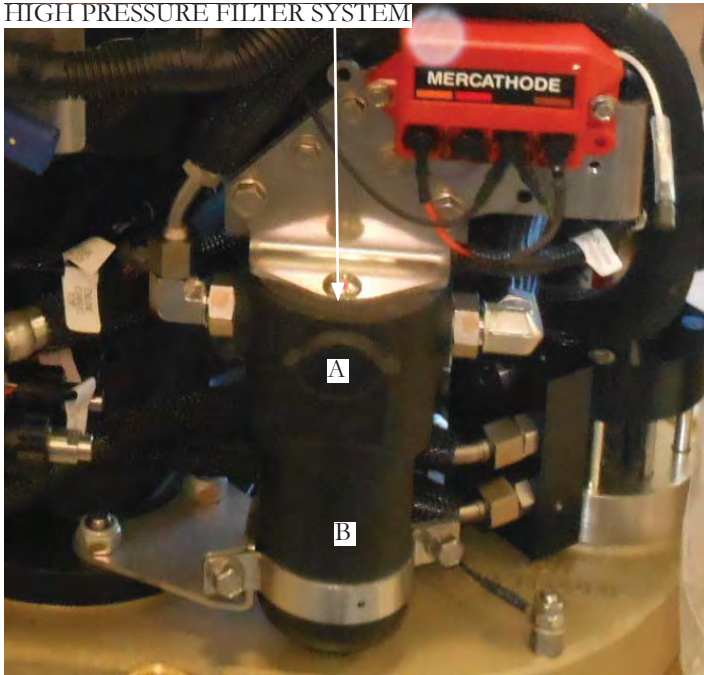


Filling Hydraulic Reservoir

1. Using a lint-free cloth, wipe any dirt and debris from the hydraulic reservoir to prevent contamination of the fluid.
2. Push down on the cap and turn the cap counterclockwise 1/3 of a turn to remove the cap.
3. Fill the hydraulic reservoir with Merc lubricant- Synthetic 0-W30 oil (92-858076K01). Fill to the full-cold mark. Do not overfill.
4. When the level is correct, insert the cap-dipstick combo into the reservoir neck and turn clockwise while holding the cap down until the cap locks in place.



HIGH PRESSURE FILTER SYSTEM



A= FILTER HEAD WITH SWITCH (SWITCH NOT SHOWN)
B= FILTER HOUSING WITH FILTER ELEMENT

Filling Steering Actuator & Trim System Oil & Filter

Under normal conditions the trim and steering actuator swim system oil and filter do not require changing unless they become contaminated with water or debris.

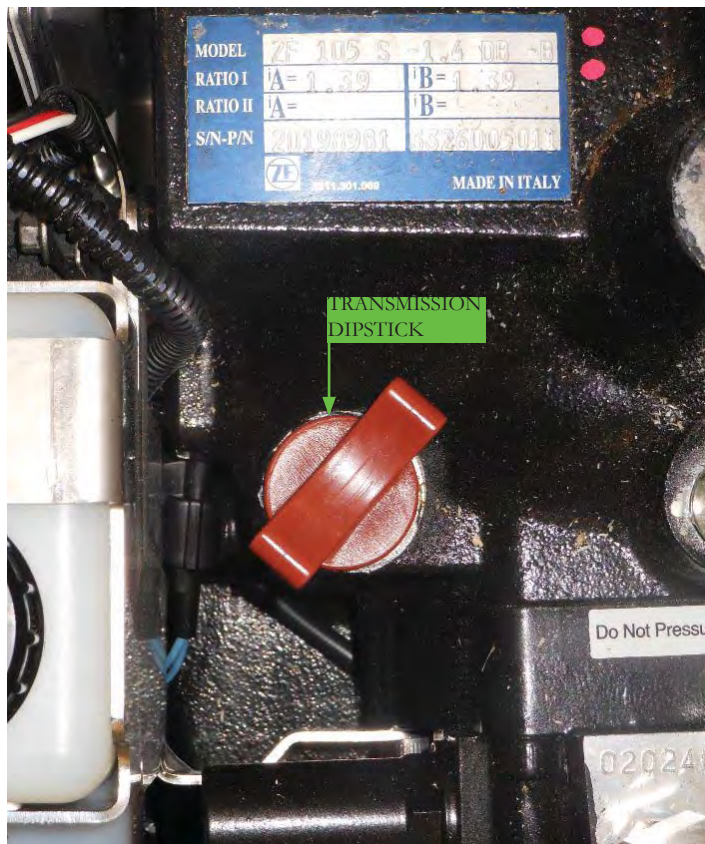
If the VesselView displays a code like “Filter Dirty Fault” or “Service Steering Filter” then these items need to be serviced immediately if possible. See photo on next page. Contact your closest Cummins Customer Care.



Engine & Controls

Overview- Transmission Oil (Fluid) & Filter

The transmission planetary gear set (ZF) is lubricated by Mercury 0W-30 Synthetic Oil (92-858076k01). This oil blend helps the internal gears provide a more friction-free surface less prone to wear.



Checking Transmission Oil (Fluid) & Filter

1. The transmission dipstick can be accessed and removed through the opening in the Zeus top cover or with the cover removed.
2. Remove the dipstick by turning it counterclockwise. Wipe with a clean, lint free cloth.
3. Insert the dipstick, resting it on top of the threaded hole.

4. Remove the dipstick and check the oil level indicated. The level should be between the minimum and maximum dipstick marks as shown.



5. If the oil level is correct, reinstall the dipstick.
6. If the level is low, add the specified transmission oil through the dipstick threaded hole to bring up to the maximum mark on the dipstick.

Note: Your vessel incorporates along with the transmission a drop box assembly which requires additional power steering fluid to fill it. Use synthetic power steering fluid SAE 0W-30 weight (92-858077K01 Mercury part number).

7. Start the engine and run for three minutes at 1500 rpm's to fill the hydraulic circuits. Do not operate the engine above 1500 rpm's to avoid excessive exhaust aeration which can damage the Zeus seawater pumps.
8. Stop the engine and check the oil level.
9. Add the specified transmission oil to bring a low oil reading up to the maximum dipstick level.
10. Install the dipstick.
11. If needed, install the Zeus top drive cover.



Filling Transmission Oil

1. The transmission dipstick can be accessed and removed through the opening in the Zeus top cover or with the cover removed.

2. Remove the dipstick by turning it counterclockwise. Wipe with a clean, lint free cloth. Check the oil level as outlined in the previous checking section.

3. Add the recommended transmission oil through the dipstick threaded hole to reach the maximum dipstick mark. Normally with a transmission and drop box along with a remote transmission oil filter the system uses 5.5 L or 6 US quarts.

Note: For the most accurate measurement operate the engine at 1500 rpm's for 3 minutes before immediately checking the oil level.

4. Start the engine and run for 3 minutes at 1500 rpm's to fill all the hydraulic circuits and empty cavities.

5. Stop the engine and unscrew and remove the dipstick quickly.

6. Check the oil level per the Checking section.

7. If the oil level is low add the appropriate transmission oil to the maximum mark on the dipstick. See the photos in the checking section.

8. Install the transmission dipstick.

9. If needed reinstall the Zeus top cover.

Changing Transmission Oil

To change the transmission oil refer to the Zeus Operator's manual or consult your closest Cummins Repair Facility.



Engine & Controls

Zeus Propellers

The Cummins Zeus propulsion package features stainless steel propellers matched to ensure the best all-around performance. Currently the 53 SC is outfitted with a M-11 propeller set.

It is recommended to carry an extra set of propellers and hardware since the vessel operator on extended cruises could find replacement parts difficult to obtain in certain locals. Parts can be ordered from the closest Cummins MerCruiser diesel repair facility.

Note that at times propellers can be repaired.

When installing propellers lube the propeller shaft with 2-4-C Mercury lubricant. Make sure all parts are installed in the correct order.

Torque the front propeller nut to 100 ft. lbs.

Torque the rear propeller nut to 60 ft. lbs.

Zeus Propeller Removal

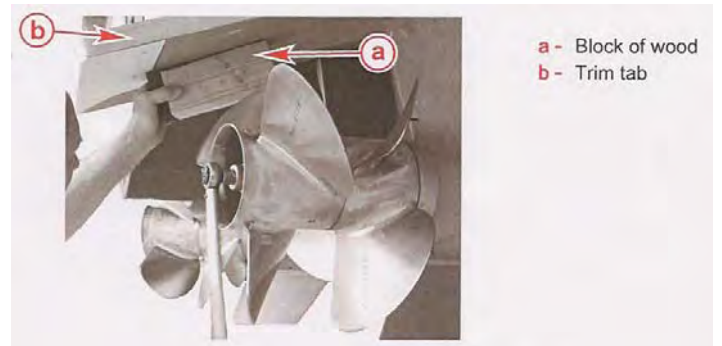
Read and understand the warning label on this page before removing propellers!

In most cases the vessel will need to be hoisted to remove damaged propellers or components. At other times a diver may need to be hired to change out damaged propellers.

1. Place an appropriately sized block of wood between the rear propeller and the trim tab.


(Note it is recommended that heavy gloves be worn when handling propellers due to their sharp edges).

2. Turn the rear propeller nut counter-clockwise to remove the nut.



3. Remove the propeller and thrust hub from the propeller shaft.

4. Using the propeller nut tool (Mercruy # 91-805457T1) turn the front propeller nut counter-clockwise and remove the nut.



WARNING

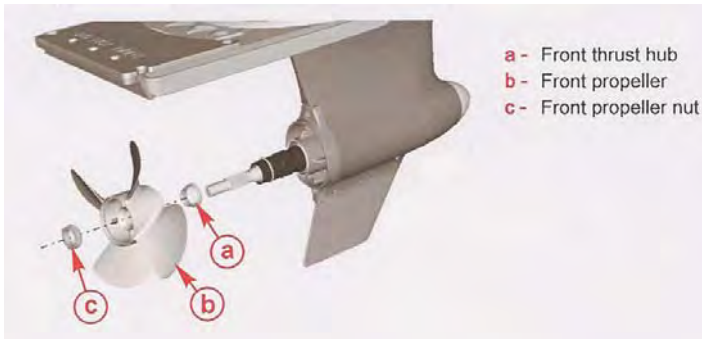
**AVOID SERIOUS INJURY OR DEATH!
NEVER OPERATE THE VESSEL OUT OF THE
WATER WITH PROPELLERS INSTALLED!
BEFORE REMOVING OR INSTALLING
PROPELLERS. REMOVE THE KEY FROM THE
SWITCH, PLACE THE DRIVE IN NEUTRAL,
AND ENGAGE THE E-STOP HELM SWITCH TO
PREVENT THE ENGINE FROM STARTING!**

NOTICE

**NEVER CONTINUOUSLY RUN WITH A
DAMAGED PROPELLER SINCE
TRANSMISSION AND/OR ENGINE HARM
COULD RESULT.**



Chapter 5



5. Slide the front propeller and front thrust hub off the propeller shaft.

Zeus Propeller Installation

Read and understand the warning label on page 51 before installing propellers!

Note that in most cases the vessel will need to be hoisted to remove damaged propellers or components. At other times a diver may need to be hired to change out damaged propellers.

1. Coat the propeller shaft spline with one of the Mercury Quicksilver lubricants.

a. Special lubricant 101- propeller shaft splines (Mercury part # 92-802865Q02).

b. 2-4-C marine lubricant with teflon- propeller shaft splines (Mercury part # 92-802859A1).

Note: Anti-Corrosion grease is for saltwater application only.

2. Slide the front thrust hub onto the propeller shaft with the tapered side toward the propeller hub.

3. Align the splines and place the front propeller on the shaft.

4. Install the front propeller nut.

5. Place an appropriately sized block of wood between the trim tab and the propeller.

6. Torque the front propeller nut (100 ft. lbs.) using the same propeller nut tool you used to remove the nut.

7. Check the propeller rotation, The propeller must not contact the lower drive housing.

Note that the drives require an alignment procedure to make them parallel. This procedure must be performed with the aft propellers either not mounted or removed. A special MercCruiser G3 tool must be used to align the stern drives. The procedure verifies that the mechanical drive offset is greater than -2 degree and less than 2 degree. This needs to be performed by the closest Cummins MercCruiser diesel repair facility.

8. Slide the rear thrust hub on the propeller shaft with the tapered side toward the propeller hub.

9. Align the splines and put the rear propeller on the shaft splines. The propeller must fit freely on the propeller shaft splines.

10. Install the rear propeller nut.

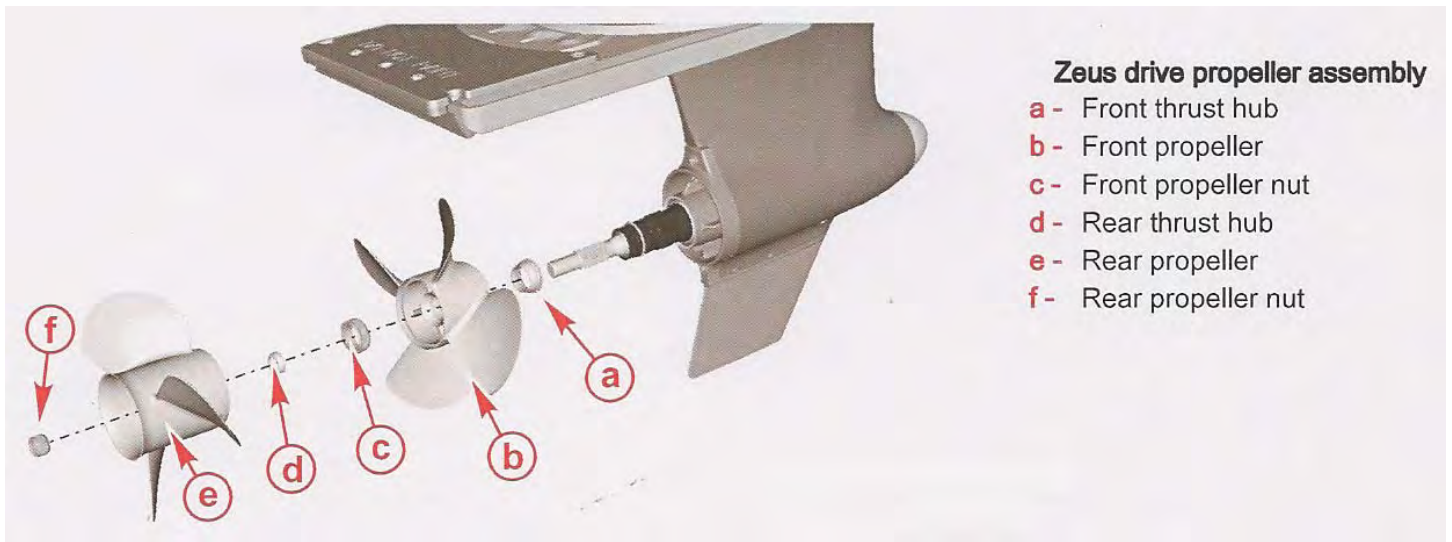
11. Place an appropriately sized block of wood between the trim tab and the propeller.

12. Tighten the rear propeller nut to specifications (60 ft. lbs.).





Engine & Controls





ALTERNATIVE OPERATIONS

Steering-Emergency Procedures

If the electronic steering wheel fails, the engine remote control handles, trim tabs, and the vessel joystick will still operate. Engine throttles and trim tabs can be utilized in open water situations where there are no other vessels or objects in close vicinity.

The joystick can serve as an alternative method of steering in tight environments. Remember that engine rpm is limited with the joystick.

Steering-Port Engine Only Operation

When the starboard key switch is in the “on” position the force feedback feature of the steering wheel is still operational. If the starboard key switch is “off” or there is damage to the starboard electrical system, the steering wheel will be monitored by the port control system.

If the port side is operational, or only the port key switch is in the “on” position, the steering wheel will be missing the “end” stops. Here the drive will always turn to in the direction that the steering wheel is being turned until the mechanical limits of the propulsion pod are reached. If there is damage to the port electrical system, the steering wheel will operate normally with complete force feedback and end stops.

The vessel can operate as a single engine craft. The joystick and station keeping will not function. The auto heading and track way points modes are functional as a single engine driven craft.

Gear Engagement-Emergency Guidelines

If there is damage to the electrical system or transmission or if the transmission fault code will not permit the unit to respond to helm controls, it is possible to manually engage a gear. In an emergency situation for example you can insert a wrench into the forward gear solenoid hex fitting and by turning the hex wrench clockwise until it stops a forward gear position can be found.

Note that this procedure outlined below is only used when both drives are not responding to the helm controls. If one drive is operating correctly from the helm it would be recommended to use the working one over trying to have one working well and the other drive being forced into a manual driven gear syndrome.

To engage into forward gear:

1. Determine which drive you want to engage the gear.



CAUTION

TO AVOID POSSIBLE BODILY INJURY AND PROPERTY DAMAGE DUE TO LOST STEERING OR TRIM FUNCTIONS, REDUCE VESSEL SPEED TO OPERATE SAFELY.



Engine & Controls

2. Remove the key from the ignition switch.
3. Remove the drive top cover.
4. Locate the forward gear solenoid on the port side of the propulsion pod. The forward solenoid is located just behind the drive lubricant reservoir. Also, it is tagged so do not end up with the reverse gear.
5. With a 3mm hex wrench turn the solenoid screw located in the center of the top of the forward gear solenoid clockwise until movement stops.
6. The drive is now manually engaged in forward gear and will not respond to the helm remote controls.
7. Make sure the area around the affected drive propellers is clear since the propellers will be turning in forward gear when the engine starts.
8. Before starting the engine put the remote control in neutral position before turning the key switch.
9. Remember that the drive is in forward gear and to stop forward thrust you must turn off the key switch.
10. Upon reaching port call for service assistance.

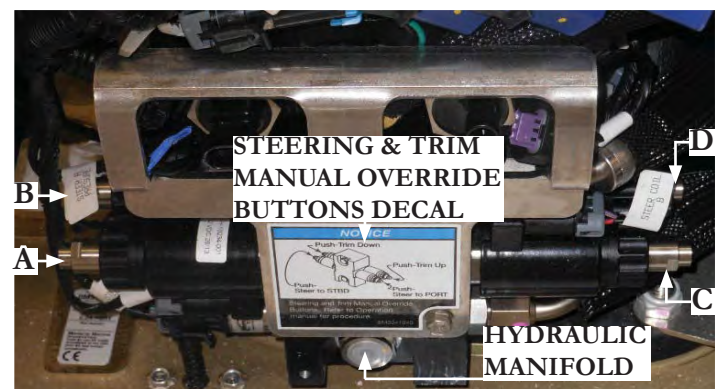
Steering and Trim-Manual Override

The trim and steering systems use a hydraulic manifold containing control valves. If a malfunction occurs in the manifold for the trim and steering system, a code will show on the VesselView display. The steering actuator, trim cylinder, or both may not respond to the helm controls which could result in the loss of normal trim and steering.

In an emergency, if a trim or steering control valve is stuck, it may be possible to clear the steering fault code by manually overriding the system. An informational decal describing the location of specific control valves can be found on the steering manifold. Refer to the procedure for a stuck steering or trim control valve.

Stuck Steering Control Valve Procedure

1. Determine which drive is not responding to steering controls.
2. Shut the engine down and turn the key switch off. Wait at least 30 seconds.
3. Restart the engine. Determine that the steering fault is cleared.
4. If the steering fault did not correct itself, repeat the start/stop up to 3 times.
5. If steering fault continues to exist after the above procedure, shift the transmission into neutral, shut down the engine, turn the key switch off, and alternately push the port and starboard steering manual-override buttons to release the spool. Refer to the manifold bracket decal shown below.
6. Restart the engine. At the helm, steer the drive to the port and starboard to confirm the fault has cleared. If the Steering Spool Stuck fault remains, then shut down the engine and turn the key switch off on the unresponsive drive. Use the other engine and drive. Refer to **Port Engine Only Operation**, if the starboard drive is shut down. Note that vessel speed and maneuverability will be reduced.



- A=STEER-TO-STARBOARD OVERRIDE BUTTON
B=TRIM DOWN OVERRIDE BUTTON
C=STEER-TO-PORT OVERRIDE BUTTON
D=TRIM UP OVERRIDE BUTTON



Notes



Vessel Operation



This chapter explores select parts of running your vessel from casting off to docking and handling emergencies. We recommend further reading to enhance your information on the chapter topics. Also, become familiar with your engine owner's manual since many of the items discussed are found there in further detail.

GETTING UNDERWAY

Pre-Departure Questionnaire

- Have all fluid levels been topped off?
- Is the fuel tank full?
- Are the propellers in good condition?
- Is the drain plug in place (dry stored vessels)?
- Have all passengers been briefed on all emergency procedures and seated for departure? Is the boat load balanced?
- Is all safety equipment accounted for and easily accessible?
- Are navigation lights and sound signals in good working condition?
- Is the bilge free of water and do the bilge pumps operate?
- Is the operator sober, alert and ready to skipper the vessel?
- Have all passengers been fitted for the proper size life jackets?
- Has a float plan been filed and left with a competent person?
- Has the bilge been sniffed and the fuel system leak checked?
- Are the appropriate sea cocks open?
- Is all communication equipment in good operating condition?
- Has a second person been briefed on operational, emergency, and VHF procedures should the skipper become disabled?



- Are all gauges and electrical switches functioning properly?
- Has weather information been gathered and analyzed?

UNDERWAY QUESTIONNAIRE

- After casting off have all dock lines and fenders been stowed?
- Are all passengers seated?
- As skipper are you monitoring the dash gauges and chart plotter for changes?
- As skipper are you on the lookout for changing weather?
- As skipper are you checking for abnormal vibration or steering?

DISSEMBARKING QUESTIONNAIRE

- Have you removed the keys from the ignition and secured them?
- Have all systems been checked for leaks?
- Have the battery switches been turned to the “off” position?
- Are all storage compartments and seacocks closed?
- Has the fuel tank been filled enough to assist in preventing condensation?
- Is the vessel properly tied and covered with equipment stored?



WARNING

PRACTICE “NO SMOKING” AND EXTINGUISH ALL FLAMMABLE MATERIALS WITHIN 75 FEET OF ANY FUEL DOCK.



WARNING

PREVENT INJURY OR DEATH FROM FIRE CAUSED BY LEAKING DIESEL FUEL. INSPECT ENTIRE FUEL SYSTEM AT LEAST ONCE A YEAR.



WARNING

TO PREVENT INJURY OR DEATH USE ONLY GENUINE MARINE ENGINE/DRIVE REPLACEMENT PARTS

NOTICE

SINCE DIESEL IS AVAILABLE IN VARIOUS SEASONAL BLENDS, REFER TO THE ENGINE MANUFACTURER’S OPERATION MANUAL FOR ACCEPTABLE TYPES.



BEFORE FUELING

Note: To be extra safe the skipper should follow the procedures below for fueling diesel that are normally defined for petrol. Gasoline exhibits much greater flammable/explosive characteristics but diesel can ignite and burn under the right conditions.

- Make sure a working fire extinguisher is at close hand.
- Stop engines while fueling.
- Disembark all passengers and crew not needed for fueling.
- Fuel if possible during the daylight hours.
- Check to ensure nobody is smoking in the boat or near the fueling dock.
- Close all enclosures to keep vapors from blowing aboard and settling in the bilge.
- Tie up your boat securely at the fuel dock.
- Identify the fuel fill.
- Make sure that diesel is selected at the pump and the correct fill nozzle is used.
- Visually inspect all fuel system components before each filling.

DURING FUELING

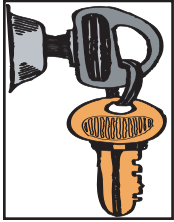
- Keep the fuel nozzle in contact with the fuel fill to guard against static sparks. The fuel fill pipe is grounded through the fuel system wiring to protect against static electricity.
- Avoid overfilling the fuel tank. Leave room for expansion.
- Avoid spilling any fuel. Clean up any fuel accidentally spilled with a clean rag and dispose of it on shore.

AFTER FUELING

- Close all fuel fill openings tightly.
 - Open all hatches.
 - Sniff in the lower bilge and engine compartment for diesel fumes. If fumes are detected find the cause of the diesel odor until the odor is gone. Look for any traces of fuel droplets or spillage.
- Do not start the engines, smoke or run any electrical components until the fumes can no longer be detected.**



STARTING & STOPPING



The following general information covers starting and stopping your engines. Read and understand all previous information on remote controls, fueling and operational procedures. Pay particular attention to all labels. Refer to the engine operation manual for in depth propulsion system information.

Review all pre-departure information. Before starting your engines make sure all canvas is removed and stored. Start engines only in a well ventilated location to avoid diesel exhaust buildup. Make sure all battery switches are activated. Close and lock the center windshield section.



CAUTION

TO PREVENT INJURY DUE TO FALLING
DO NOT OCCUPY SUNPADS WHILE
VESSEL IS MOVING!



WARNING

AVOID PERSONAL INJURY OR DEATH!
WHEN ENGINES ARE RUNNING
TRANSOM DOOR MUST
BE CLOSED AND LOCKED.
SWIM PLATFORM
AND LADDER MUST NOT BE IN USE.



WARNING

AVOID SERIOUS INJURY OR DEATH!
THE OPERATOR OF THE CRAFT
MUST HAVE COMPLETE CONTROL
OF THE HELM STEERING STATION
WHILE THE VESSEL IS MOVING.
NEVER LEAVE THE HELM
STEERING STATION UNATTENDED
WHILE THE VESSEL IS MOVING.



SHIFTING GUIDELINES

Before shifting into reverse or forward make sure the coast is clear. When shifting to either gear from neutral make sure the throttle is in the idle position. Allow your vessel to lose all headway before shifting into reverse or forward gear. Practice shifting! You will become more familiar with the procedure and self-confidence will build especially in tight docking situations. Most importantly, stay alert! When maneuvering into a tight slip or pier be sure to use the joystick. If the current or wind is strong use the joystick boost button which will supply higher idling speeds for any unusual docking circumstances.

STOPPING GUIDELINES

Before stopping the engine make sure it is in neutral and idle speed. After an outing let the engine cool down at idle speeds for a few minutes before turning the ignition off. Glance at the gauges one last time to monitor their readings. Never turn the engine off while in forward or reverse gear or back up in excessive speeds since water could enter the engine through the exhaust system and cause extensive damage. Above all, use common sense.



CAUTION

AVOID ENGINE DAMAGE!
CHECK THE OIL GAUGE IMMEDIATELY
AFTER STARTING ENGINE.
IF LOW OR NO READING
SHUT DOWN ENGINE IMMEDIATELY
AND INVESTIGATE THE PROBLEM.

FENDERS

FENDER USAGE



Fenders are normally made of a rubberized plastic and are usually filled with air. Most have a fitting like a basketball so they can be inflated or deflated. Fenders are available in a wide range of sizes and shapes to fit both small and large vessels. Fenders are normally designated in inches. They are used for protection between piers, docks, sea walls and the vessel. They protect the topsides of the boat from rubbing against rough objects. Most fenders have attachment eyes which allow a line

to be inserted vertically or horizontally. This will permit the fender to be tied off to fit individual dock and tidal situations. Be sure the fender is correct for the vessel size. The standard fenders specified for your Regal yacht are 10" in diameter and 26" long. It is a good idea to carry extra fenders but half a dozen is normally an acceptable number. Remember to store fenders on board so they can be easily accessed. The forward stairway locker stores 2 fenders. Sometimes people call fenders "bumpers" but this is not correct nautical terminology.

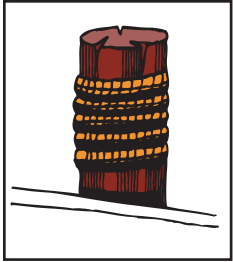
FENDER TYPES



Additional yacht fenders can be ordered through your Regal yacht dealer. Explain how you moor and use your vessel so your dealer can recommend the best fender type for you. We suggest the type with a fill plug so you can inflate them with a hand pump like the ones used for bicycles or a 12 volt compressor (plugged into the 12 volt vessel accessory plug).



DOCK LINE BASICS



Most skippers use dock line terminology fairly loose but there is more to the basics than just bow or stern lines. There are several lines that can be secured to the bow and stern and depending on their direction and use, can be called other names. Remember that “forward” and “aft” refer to the direction that

a spring line runs from the vessel, and not where it is secured on board.

BOW AND STERN LINES

There is only one true bow line. It is secured to the forward cleat and run forward along the dock to prevent the vessel from moving to the stern. The stern line leads from a rear cleat to a piling or cleat on the dock astern of the vessel. This line keeps the boat from moving ahead. For small vessels these are the only lines needed for normal wind and current conditions. If located in a tidal environment, keep slack in the lines.

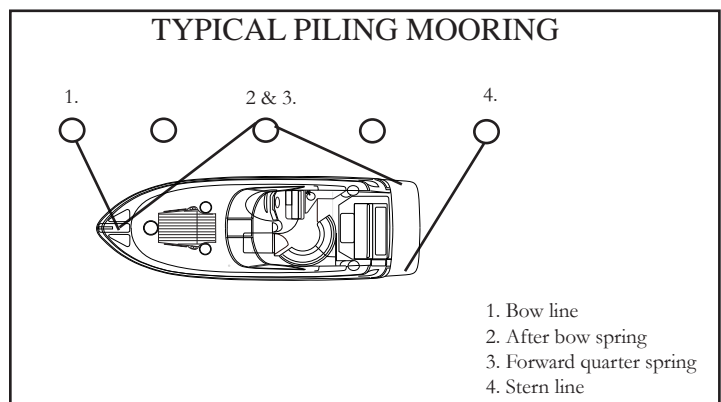
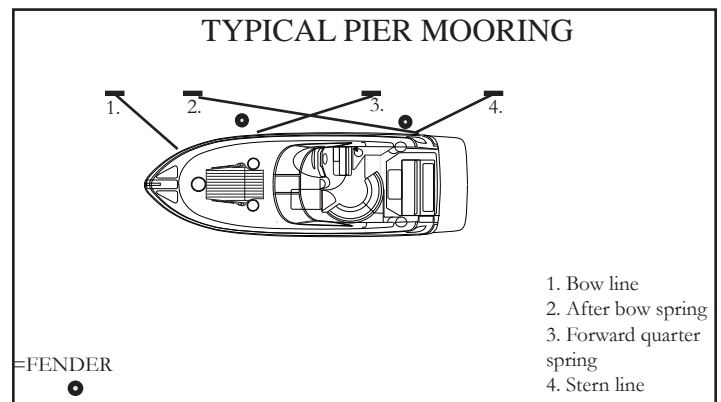
BREAST LINES

These lines are attached to the bow and stern that lead to nearly right angles from the center of the vessel to the dock. They help keep larger vessels from moving away from the dock, or are pulled in to help people board the vessel. Bigger vessels may use bow or quarter breast lines.

SPRING LINES

Most boats use two spring lines although it is possible to have four. They are called the after bow spring and forward quarter spring.

Bow springs are secured at the vessel’s bow area. Forward spring lines lead forward from the boat to the dock and control movement stern ward. After springs stem aft from the vessel, and stop movement ahead. Spring lines are used to prevent movement in a berth, ahead or astern. They are really useful in controlling the effects of a real active tidal surge. Spring lines are useful where fenders need to be kept in place against piles.



BOAT MOORING

Most boats can be secured to a dock using four lines. The after bow spring is crossed with the forward quarter spring and secured to individual dock cleats or pilings. This ensures longer springs and can be snugged up tighter for more efficient tidal control. Remember, if you only have one piling available, position the vessel so this point is opposite amidships. Run both spring lines to it. These lines will be shorter but still useful.



The bow and stern lines should be relatively at a 45 degree angle with the dock. The stern line can be attached to the near-shore quarter cleat, but will work more efficiently to the offshore quarter cleat. The longer line will allow the boat flow with the tide with less time checking the vessel.

DOCK LINE SIZING

Most dock lines today are made of nylon, either of twisted rope or braided core and cover. The most often used material is nylon because of its stretching abilities absorbing shock loads. It is chafe resistant for extended life and is easier on bare hands.

The line's size varies with the vessel. Normally, a vessel in the 50' range will use 5/8" diameter nylon lines.

Dock lines need to have the strength to hold the vessel and have enough density to resist chafing. They shouldn't be too heavy that they lose their shock-absorbing capabilities. Use the right size line for the vessel since a line too large for the boat will pull hard against the vessel since it won't be forced to stretch. If the line is too small for the vessel, there is no margin for wear and chafe when under strain.

SECURING LINES

When mooring your boat, make sure the dock lines are secured at both ends. Depending on your situation you may need to loop the eye splice of the dock line around a piling. Sometimes the mooring line will lead down sharply from the piling to the deck cleat. Loop the eye splice around the piling twice to keep it from being pulled up off the pile. Pull the line through the looped eye if the mooring line is too small to go around the piling twice or too small to fit over once.

If you must drop a line over a piling that already holds another boat's line, run the eye of the line up through the first eye from below, then loop it over the pile. This will allow either line to be removed without disturbing the other. If another line is dropped over yours, simply reverse the process.

Secure a little slack in the other dock line, then slip your eye up through its loop and over the top of the pile. Your line can be dropped through the other eye.

DISEMBARKING-LEAVING THE DOCK

When debarking from a dock, it is easier to release the line from a cleat or piling, from on board the boat, as soon as you leave the dock. Loop a long line around the cleat or pier and leading both ends on board you can release the line easily. Slip one end around the cleat or pile, then pull it back on board. Release the line without the eye splice, so it will run freely from around the pile without hanging up on the splice.



KNOTS

Knots are useful in docking, towing and other emergency situations. Learning to tie knots requires practice. As they say “Practice makes perfect”. Some of the knots used in boating are the square, bowline, anchor bend, clove hitch, figure eight and half hitch. There are several periodicals available that explain various knots and how to tie them effectively. An experienced skipper will know the basic nautical knots and will use them when on the water. Take the time to know the basic knots.

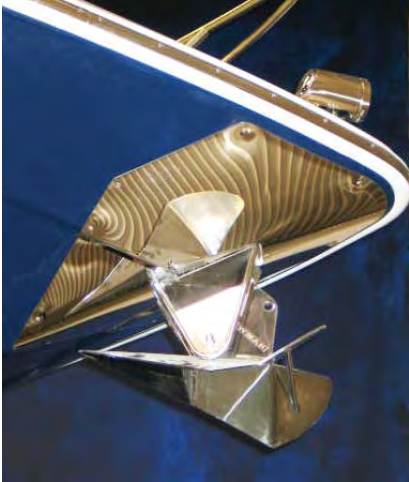
**Figure 8 Knot
Tied To Cleat**



A useful knot to learn for general docking is the figure eight with one end reversed. By turning the free end of the line back under, the knot can be released without disturbing the boat. After some practice one person can secure a vessel easily to a dock or pier in a variety of weather conditions. This knot normally is used to tie the bow and stern. Then the vessel can further be fastened by tying the spring lines in the figure eight knot. Wrap it around the cleat 2 or 3 times.



ANCHORING



Your Regal yacht features a stainless steel plow type anchor. The anchor will set quickly in a variety of bottoms because of its unique shank profile and ballasted tip. It is a high holding type anchor made from high grade manganese steel and stainless steel for maximum

tensile strength. The anchor weight is 55 pound or (25) kg. Anchoring is easier with another person on board. First be certain that the line for the anchor is properly attached, to avoid losing the anchor and anchor line overboard.

For more efficiency, a 25' length of galvanized chain has been added to the rode length. The chain will stand up to the abrasion of sand, rock, or mud on the bottom much better than a nylon line. Being galvanized the chain will resist corrosion. Approximately 175' of 3 strand nylon line has been added to ensure a adequate scope in different depths and weather situations. The nylon will stretch under a heavy strain cushioning the impact of waves or wind on both the boat and the anchor.

To anchor, select an area preferably with a flat bottom. Mud, sandy clay and firm sand afford the best bottoms for anchoring. Grassy bottoms often resist the anchor taking hold and end up pulling out grass and roots. Contrary to modern belief, you do not anchor while the boat is making headway, or moving forward. In fact, the bow of the boat should be brought slowly backward, while releasing the anchor until it hits the bottom. To "snub the line" means to stop its outward "pay" or movement.

Usually the length of anchor line used should be 5 to 10 times the depth of the water depending on weather conditions. This ratio is called the "scope"; the minimum scope under average conditions is 7 or 8:1. If the scope is too short the anchor's efficiency is diminished. A longer scope cushions the shock load on the entire system.

Once a scope is determined sometimes it is difficult to know how much line to let out to reach the desired scope especially at night. One way to mark an anchor line that will identify the amount of line is to paint wide and narrow bands from about 50' to 150' in 10' intervals. The wide bands equal 50' and each narrow band would equal 10'. Distinguish each 50' band with a different color paint. This can be done with "see in the dark" paint. Simply tape each length for the appropriate band before painting it.

After you have anchored, check your position with landmarks if possible. You need to continue to monitor these landmarks to make sure you are not drifting. Since anchoring can also be an emergency procedure, the anchor and line should be readily accessible. Check anchor locker to ensure an untangled anchor line.

Once anchored the anchor line must be secured to a strong tie such as a cleat.

Do not rely on the windlass brake to carry the anchor rode load.

Use a series of full turns and half-hitches around the cleat horn to prevent any line slippage or jamming. This is important as the scope may need to be adjusted over a period of time and you need swift access to the line.

For increased holding power in windy conditions, two anchors are sometimes set. If your primary anchor drags, you can run out your secondary anchor without picking up the primary one. The important thing is to lay them out at an angle. When setting two anchors, make sure they are fastened to separate strong ties such as cleats. This is done in case you need to adjust one later so the line must be accessible.

Note: In times of high waves a buoy on the rode works as a shock absorber and allows the vessel's bow to ride the wave crests without large strains being transmitted to the set anchor. These plastic foam buoys can be purchased at boating retail outlets.



TOWING

In case you find yourself aground or in need of a tow, or should you want to tow another vessel, keep in mind that you **never use deck hardware or cleats to secure lines for towing!**

Deck hardware is intended for mooring and anchoring, and is not designed to withstand the strain and pull of towing. Rather than tie the line to your cleats on deck, it is suggested that you tie a bridle by passing a line completely around the hull of your boat to avoid structural damage.

When towing, always stand clear of a taut line, as any type of line breaking under stress can be extremely dangerous. The preferred line for towing is double-braided nylon, as it has sufficient elasticity to cushion shock loads. Move slowly and cautiously.

ADMIRALTY LAW

The Admiralty law sometimes referred to as the salvage law was founded primarily on English law fundamentals and basically says that a vessel distressed, in danger of flounder, if rendered assistance from a towing company or private agency, can be forced to relinquish a portion of the vessels' worth for the assistance received.

NOTICE

IN THE EVENT YOUR VESSEL
IS IN DISTRESS
PRIOR TO ALLOWING
ANY TOWING COMPANY
OR PRIVATE AGENCY THE RIGHT
TO PASS A LINE TO YOUR VESSEL,
BE SURE TO ESTABLISH THAT YOU
DO NOT AGREE TO ANY SALVAGE RIGHTS.
ESTABLISH WITH THE CAPTAIN
OR OPERATOR
THAT YOU WISH TO BE ASSISTED
IN A CONTRACT BASIS
AND ESTABLISH A PRICE.
OF COURSE IN CERTAIN SITUATIONS,
YOU MAY NOT HAVE THIS OPTION.
USE YOUR BEST JUDGEMENT!



DANGER

AVOID DEATH OR SERIOUS BODILY INJURY!
DO NOT USE DECK HARDWARE
INCLUDING CLEATS FOR TOWING
OR LIFTING PURPOSES.



EMERGENCIES

Always be ready to help others on the water if possible, but do not take any unnecessary risks. Use equipment to save a life, but do not risk a life to save equipment. Consult earlier information in this manual concerning accidents, etc. Also, read other literature concerning on the water emergencies. Be alert and prepared!

FIRE

Fire aboard a vessel can spread quickly and can cause tremendous alarm among everyone. Most fires can be prevented by keeping the bilge free from oil and debris. Keep all equipment stowed and maintained in working order. Carry backup fire extinguishers on board. If something becomes a possible fire hazard, remove that possibility at once.

Never use water on gasoline, oil or electrical fires. When you dump water on an electrical fire you can be shocked since water conducts electricity.

Follow these instructions if a fire breaks out:

1. Fit everyone aboard with a life jacket. Turn off the ignition switch.
2. Try to keep the fire downwind. If the fire is to the stern, head the bow toward the wind. If forward, put the stern to the wind.
3. If the engine should catch fire, shut off the fuel supply. Usually there is a fuel tank access that you can crimp the fuel feed line.
4. Use a hand fire extinguisher. Make sure to point it at the base of the flames. Use short bursts and sweep the extinguisher side to side. **Remember: (A 4 pound extinguisher discharges in approximately 20 seconds)**

These actions help prevent the fire from spreading to other parts of the boat. You can extinguish fires quickly if you act swiftly. Have a plan of action in motion in case a fire breaks out.

FIRST AID

Knowing first aid can save lives. A first aid kit and the ability to use it are important ingredients for the safety of a skippers' passengers, crew and vessel. Having confidence and competence in handling medical emergencies on board is a must for the skipper. Invest your time in a first aid course available at the American Red Cross.

CPR (BASIC LIFE SUPPORT)

If someone is seriously injured have someone call for help while the injured person is being attended.

Check for possible danger signs; loss of breathing, unconsciousness, severe bleeding and heartbeat. If you determine the individual is not breathing or unconscious place the victim on their back on a hard surface and do the following:

1. If unconscious, open the airway. Neck lift, head lift or chin head lift.
2. If not breathing, begin artificial breathing. Pinch the nose. Give 4 quick breaths. If airway is blocked, try back blows, abdominal or chest thrusts and finger probe until airway is open.
3. Check for pulse. Begin artificial circulation. Depress sternum. Fifteen compressions rate 80 per minute. 2 quick breaths. Continue uninterrupted until advanced medical support is available.



HYPOTHERMIA

Hypothermia is a condition where the body temperature decreases because the body can't generate enough heat to maintain its normal temperature. It can be serious and usually occurs where victims have been immersed in water (under 68 degrees) for periods of time. If you encounter a possible hypothermia victim call for help on the radio and get the person out of the water.

Symptoms are:

1. Shivering that if condition is advanced may stop.
2. Confusion, clumsiness or slurred speech.
3. Rigid muscles.
4. Semiconscious to unconscious.

Treat hypothermia by the following:

- Remove wet clothing.
- Monitor the victim's pulse and breathing.
- Rapidly apply heat to the body core by using blankets, naked bodies or warm water.
- Do not give the person any food or drink.
- Do not warm the arms and legs. Warming of these extremities can be fatal.

Follow up immediately with medical authorities!



ENVIRONMENTAL AWARENESS

CALIFORNIA PROP 65


CALIFORNIA AIR RESOURCE BOARD (CARB) LABEL

Your Regal boat may have a star shaped label affixed to the bow port hullside. It is located at the front of the state registration numbers. This label is part of the California Air Resource Board (Carb) SD/I rule. If your boat is operated in the state of California and/or bordering waters, this label **MUST** remain intact. The label shows that the engine installed as original equipment meets a currently approved California state regulatory emission level. See the example below which shows the current California ultra low 3 star label.



Proposition 65 relates to the state of California and is an additional requirement added to their Safe Drinking & Toxic Enforcement Act of 1986. Prop 65 basically summarized states that: “No person in the course of doing business shall knowingly discharge or release a chemical known to the state to cause cancer or reproductive toxicity into water or onto land where such chemical passes or probably will pass into any source of drinking water ...” and it goes on to say “ no person in the course of doing business shall knowingly and intentionally expose any individual to a chemical known to the state to cause cancer or reproductive toxicity without first giving clear and reasonable warning to such individual”

For more information, contact the California Office of Environmental Health Hazard Assessment at 916-445-6900 or <http://www.oehha.ca.gov/prop65.html>.



WARNING

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

EXAMPLES INCLUDE:

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

TO AVOID HARM:

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



MARPOL TREATY

The USCG now enforces the International Convention for the Prevention of Pollution from ships, referred to commonly as the MARPOL TREATY (marine pollution). This international treaty prohibits the overboard dumping of all oil, garbage, ship-generated plastic and chemicals. There is a placard on board your boat (typical example shown below) that explains the garbage and plastic dumping laws in detail. Normally this placard is found near a waste receptacle in the cabin or cockpit.

GARBAGE PLACARD

THE DISCHARGE OF PLASTIC OR GARBAGE WITH PLASTIC INTO ANY WATERS IS PROHIBITED. THE DISCHARGE OF ALL GARBAGE IS PROHIBITED IN THE NAVIGABLE WATERS OF THE UNITED STATES AND IN ALL OTHER WATERS, WITHIN THREE NAUTICAL MILES OF THE NEAREST LAND.		
THE DISCHARGE OF DUNNAGE, LINING, AND PACKING MATERIALS THAT FLOAT IS PROHIBITED WITHIN 25 NAUTICAL MILES FROM THE NEAREST LAND.	OTHER UNGROUND GARBAGE MAY BE DISCHARGED BEYOND 12 NAUTICAL MILES FROM THE NEAREST LAND.	OTHER GARBAGE GROUND TO LESS THAN ONE INCH MAY BE DISCHARGED BEYOND THREE NAUTICAL MILES FROM THE NEAREST LAND.
A PERSON WHO VIOLATES THE ABOVE REQUIREMENTS IS LIABLE FOR A CIVIL PENALTY OF UP TO \$25,000, A FINE OF UP TO \$50,000, AND IMPRISONMENT FOR UP TO FIVE YEARS FOR EACH VIOLATION, REGIONAL, STATE, AND LOCAL RESTRICTIONS ON GARBAGE DISCHARGES MAY ALSO APPLY.		



SPILLAGE

The federal water pollution control act prohibits the discharge of oil or oil waste (such as from the sump bilge pump) into or upon the navigable waters of the United States or the waters of the contiguous zone. Violators are subject to substantial civil fines and criminal sanctions.

A placard is found inside the engine hatch area or in the sump warning of overboard discharge of oil or oily waste. Immediately notify the USCG if your vessel discharges oil or hazardous substances in the water. Call toll free 1-800-424-8802. Report the following information: location, source, size, color, substances and time observed.

No vessel may intentionally drain oil or oily waste from any source into the bilge of any vessel. A bucket or bailer is suitable as a portable means of discharging oily waste.

There are numerous vessels operating on our waterways on a daily basis. Each boat has as impact on our environment. Boat operation habits, marine sanitation, and maintenance all play a role in a delicate battle to keep the ecosystem clean. Each of us has a role in doing our part as a environmentally conscious skipper to conserve our waterways.

The National Marine Manufacturer's Association lists their top ten of Eco-Boating Practices as follows:

1. Observe all regulatory agency policies regarding marine toilets.
2. If equipped with a holding tank, use marina pump-out facilities.
3. If used, make sure bottom paints are legal and ecosystem friendly.
4. Use only biodegradable cleaning agents.
5. Dispose of all garbage and liter on shore properly, not on the water.
6. Don't top off fuel tanks. Leave expansion room. Clean up spills.
7. Watch your wake and propeller wash.
8. Make sure your engines are well tuned and maintained.
9. Control your bilge water.
10. When fishing, practice the "catch and release" principle.

NOTICE

DISCHARGE OF OIL PROHIBITED

THE FEDERAL WATER POLLUTION CONTROL ACT PROHIBITS THE DISCHARGE OF OIL OR OILY WASTE INTO OR UPON THE NAVIGABLE WATERS AND CONTIGUOUS ZONE OF THE UNITED STATES IF SUCH DISCHARGE CAUSES A FILM OR SHEEN UPON, OR DISCOLORATION OF THE SURFACE OF THE WATER, OR CAUSES A SLUDGE OR EMULSION BENEATH THE SURFACE OF THE WATER.

**VIOLATORS ARE SUBJECT TO
A PENALTY OF \$5,000**



Notes

Auxiliary Equipment Operation

AUXILIARY COMPONENTS



Note: Equipment or vendors may change during a boat's life cycle as we are constantly upgrading our product line. Regal Marine Industries, Inc. retains the right to change vendors, equipment, specifications and other technical data at any time.

OVERVIEW

In addition to the main components and systems reviewed in Chapter 4 there are other auxiliary equipment components outlined here.

Note that equipment mentioned may or may not be installed on your vessel as standard or optional components. Equipment changes over the manufacturing life of a boat. To locate more detailed information for the auxiliary components refer to the appropriate manufacturer's owner's manual found in the owner's information packet. Also, further updated information may be available on the internet by using the proper name of the component and the Goggle® search vehicle.



QUICK REFERENCE GUIDE

Interior Equipment Component	Page	Exterior Equipment Component	Page
Carbon Monoxide Detector	7-4	Aft Transom Bench Seat	7-27
Door-Companionway	7-5	Antennae	7-28
Fresh Water Pumps	7-6	Bilge Pump/Float Switch	7-29
Grey Water System	7-7	Bottom Paint	7-30
Hatches	7-8	Camera Monitoring System	7-31
Lighting-Cabin	7-9	Compass	7-32
Monitor-Water/Waste	7-11	Cool Cockpit	7-33
Portlights	7-12	Dingy (Tender) Launch/Retrieval System	7-34
Range/Stove	7-13	Door-Transom	7-40
Refrigerator-Main Cabin (Salon)	7-13	Electronics-General	7-41
Salon Furniture-Dinette	7-17	Fire Extinguisher-Automatic	7-42
Seat-Helm	7-18	Garmin Anchor Drift Alarm	7-45
TV-LCD Monitor Precautions	7-19	Generator	7-46
Vacuum Cleaner	7-20	Hard Top Enclosure	7-47
Washer-Dryer Combo	7-22	Hatch-Engine	7-48
		Heater-Hot Water	7-49
		High Water Alarm	7-51
		Markers-For Slings	7-52
		Oil Change System	7-54
		Overboard Discharge Pump	7-56
		Satellite Radio	7-57
		Sea Chest- Stainer Filtration System	7-58
		Seakeeper- (Stabilizer)	7-60
		Shower-Transom	7-67
		Sirius Marine Weather	7-68
		Spotlight	7-70
		Sunpads	7-71
		Sunshade- (Sureshade)	7-73
		Swim Ladder	7-75
		Swim Platform	7-76
		Swim Step	7-77
		Trim Tabs- (Auto-Glide System)	7-77
		Underwater Lighting	7-81
		Water Maker	7-82
		Windshield Defroster System	7-83
		Windshield Center Vent	7-84
		Windshield Washer-Wiper System	7-85

Auxiliary Equipment Operation

INTERIOR VIEW MACHINERY COMPONENTS





INTERIOR EQUIPMENT

CARBON MONOXIDE DETECTORS

Carbon monoxide known as CO is indeed the silent killer. It is a by-product of combustion. CO is invisible, tasteless, odorless and is produced by all internal combustion engines, heating and cooking appliances. The most common forms of CO on board vessels are the engines, generator and if applicable, propane heating and cooking devices.

Never operate these devices when people are sleeping. A slight amount of CO in the human body over several hours causes headaches, nausea and symptoms close to food poisoning, motion sickness or flu. High concentrations can be fatal within minutes.

HOW THE SYSTEM WORKS

The CO detector uses a mini computer to measure and accumulate CO levels. Using the principle of “time weighted averaging” the detector monitors CO concentrations, temperature, humidity and time to calculate COHb levels. To explain COHb, our bodies prefer to absorb CO to oxygen and COHb is the absorbed ratio stated in a percent.

If the detector senses high levels of CO the alarm will sound in a few minutes. If lower levels are sensed, the detector will accumulate the data and sound an alarm when the appropriate level is reached. *Read and understand the CO owner's manual in the information pouch.*

To turn the CO detector system on:

1. Notice the CO breaker on the 12 volt main DC panel. It must be turned off in a two-step sequence. This is for safety purposes. The system should be always left ON. You must flip back the switch cover before you are able to deactivate the breaker.

The CO circuitry works to its best performance when continually activated plus it accords advanced warning when entering an area high in CO.

2. When power is applied to the detector, the power indicator (top) will flash on and off, followed by the (red) lower alarm indicator flashing off and on as part of a 8-14 minute warm-up period. The green (top) power indicator will indicate a solid green when the unit has reached correct operating temperature. Never operate a cooking device with the canvas up or the cabin door completely closed to prevent CO concentration build-up

CO DETECTOR



3. The test cycle should be activated frequently. Simply press the button. When it is released, the (top) power indicator will flash off and the lower indicator light will flash on. Then, the lower indicator will flash off and the upper indicator light will come back on.

The top indicator light being on solid green indicates *normal* operation.

Refer to the CO detectors owner's manual for an explanation of the test cycle indicators.

4. When an alarm sounds take action immediately. The danger alarm indicator flashes red and the horn beeps 4 times, pauses and repeats the cycle. This indicates a rate of 10% COHb has been reached.

- a. Operate reset/silence button.
- b. Call your emergency services (911)
- c. Immediately move to fresh air. Do not re-enter the vessel until emergency personnel have arrived, aired the vessel out and the alarm is in a normal condition.
- d. After following steps a-c and your alarm reactivates within a 24 hour period call a qualified technician to inspect the vessel. Note that the CO detector will clear when the CO concentration has dropped below 70 ppm.

Auxiliary Equipment Operation

DOOR-COMPANIONWAY



Keep the cabin door secured closed when the boat is moving. When at mooring, the cabin entry door can be held open by sliding the door and securing it open with the door stop. This will prohibit the door from accidentally closing, a great safety feature. If installed the built-in screen door functions independently on its own track.



With the screen door closed and the hatch screens in place cross ventilation can be achieved along with the ability to keep insects out of the cabin.

Periodically, remove any accumulated door track debris and lubricate the tracks to keep the door sliding freely.



FRESH WATER PUMP

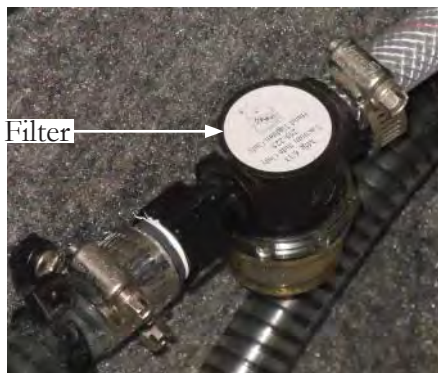


Your vessel features variable speed fresh water pressure pumps. The variable speed allows for additional water flow at peak times such as using the forward and aft showers at one time. It is important not to operate the pump unless there is water in the fresh water tank. The pump is controlled by a breaker on the main DC control panel. Energizing the switch allows the pump

to build the water pressure in the distribution lines to 35 psi's.

When the pump reaches a level of 35 psi the pump should automatically shut off. If the system drops below a certain pressure then the variable speed pump will restart. If the pump cycles on and off with no water being used, a leak in the water system is likely.

If installed, periodically remove the water inlet filter and clean it. Be sure to turn the fresh water pump at the main salon DC panel off before performing any type of maintenance.



TYPICAL FRESH WATER PUMP FILTER

FRESH WATER BOOSTER PUMP

There is an additional fresh water booster pump. It is located in the forward main cabin floor storage locker. Remove the port screws that hold the port bulkhead to gain access to both water pumps. This pump is located on its own electrical circuit with its own dedicated breaker.

This water pump enhances the water pressure for wash-down hoses at the forward and aft ends of the vessel. It can be operated in conjunction with the other fresh water pump or by itself.

Auxiliary Equipment Operation

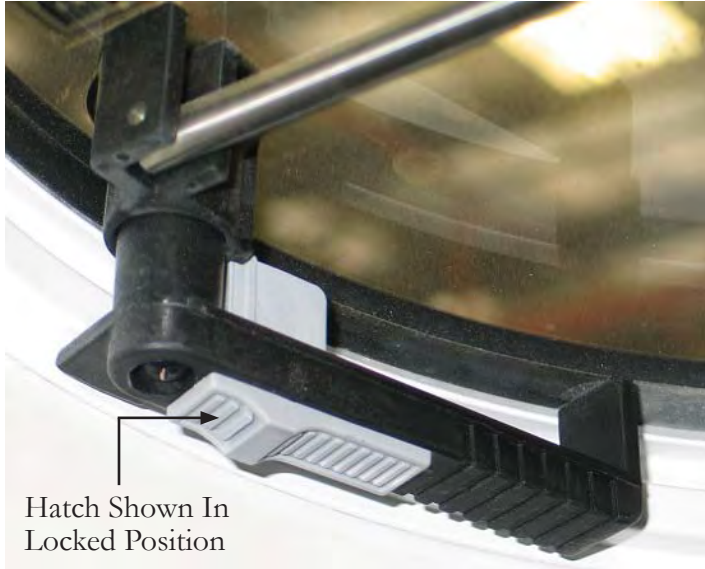
GREY WATER SYSTEM

If installed, the grey water system equipment collects all used water exiting from the shower sump pumps along with the galley and head sinks. The used water is stored in the ship's holding (waste) tank. This option is used in various locals where it is illegal to pump "grey" shower and sink water overboard. The automatic float switch pumps grey water to the holding tank.

Normally it would not require any special service unless there was blockage somewhere in the system or a hose leak developed. Since more liquid in the form of grey water is being returned to the holding tank pay closer attention to the waste monitor panel. The holding (waste) tank may need to be pumped out more frequently.



HATCHES (TYPICAL)

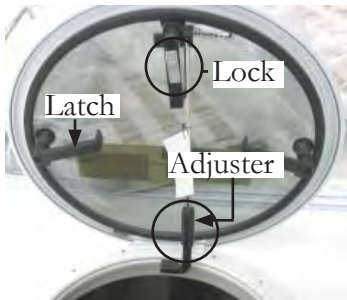


Most deck hatches feature a locked position. To lock the hatch first grab the handle and turn it so it engages the side of the seal ring as shown. Push the lock mechanism to engage the handle in the locked position.

To unlock the hatch pull the handle away from the seal ring (in line with adjuster) or 90 degrees from the locked position.

To open the hatch make sure the hatch is unlocked. Then push the rod up and lock at desired angle by turning the adjuster.

A screen is provided for cross ventilation and to protect against insects. Secure the screen by turning the tabs at a 90 degree angle to the screen framework.



Auxiliary Equipment Operation

LIGHTING OVERVIEW

Your vessel features various styles of lighting such as ceiling, hanging locker, reading and deck types. Most of the fixtures used incorporate LED technology to obtain the maximum lumens using the least amount of electrical energy.

Note: The bulbs listed in the following pages can be ordered through a Regal dealer or may be available at specialty lighting or box stores. When changing light bulbs it is always a recommended practice never to touch the bulb surface with your fingers as premature burn out can occur due to oil on the skin touching the bulb surface even though LED bulb types are less susceptible. Handle bulbs only from the ends if possible or use a tissue.

ENGINE ROOM FLUORESCENT LIGHTING

Fluorescent light fixtures are used in the engine room. The bulbs inside can be found at most box stores. Dispose of old tubes in an environmentally safe way. Never hose down any of the lights or components in the engine room other than the bilge floor. Water and electricity do not mix well together.



CABIN LIGHTING



The ceiling lights use LED pod fixtures which are known for their brightness. Where bulb replacement is necessary the entire fixture must be replaced. Order from your closest Regal yacht dealer.

This applies to cabin and hardtop light fixtures.

Indirect lighting fixture utilize an LED type known as rope lighting. The entire fixture must be replaced.

The same situation applies to engine room rope lighting fixtures.

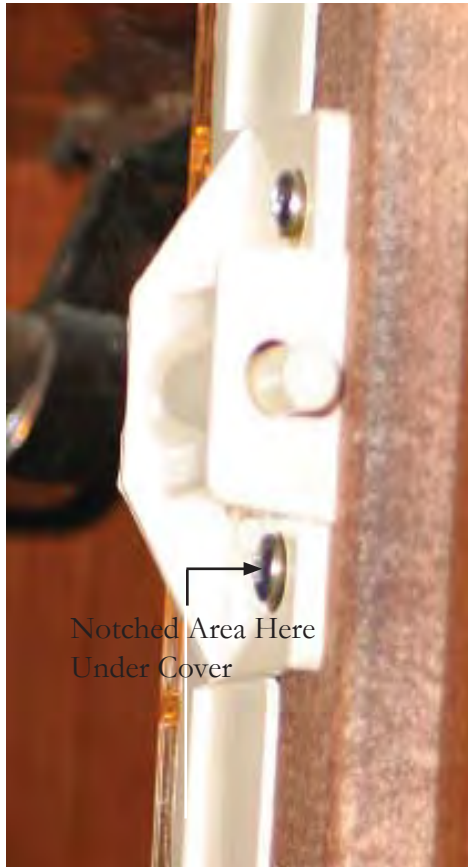
STORAGE COMPARTMENT LIGHTING

Lighting fixtures used in deck storage compartments such as the anchor locker use LED fixtures. Replace the fixture when the bulb quits functioning.





HANGING LOCKER LIGHTS



Lens Cover Removed

To change a hanging locker light bulb follow these steps:

- Remove the lens cover from the lamp base. There is a tab on the bottom of the lens cover. Push the lens cover at this point to remove the lens cover.
- Remove the defective bulb.
- Replace the bulb.
- Reinstall the lens cover by snapping it in place.

READING LIGHTS



To change a reading light bulb follow these steps:

- Remove the lens cover from the lamp base by turning the lens cover counterclockwise slightly and while in this position pull the lens cover out at the lamp body notches.
- Remove the defective bulb by turning it counterclockwise, and pulling it up. Works much like an automotive style tail light bulb.
- Replace the bulb by pushing down and turning the bulb in a clockwise direction until it hits the stop.
- Reinstall the lens cover by first lining it up with the notches on the lamp body. Let the lens cover/body enter the notched area and then lock it in place by turning the lens cover clockwise.

Auxiliary Equipment Operation

MONITOR-WATER/WASTE



Notice the key switch portion of the monitor. The key switch controls an overboard discharge pump (macerator) which can grind up the waste and send it through the hull bottom once it receives a signal from the interlock macerator valve. (See chapter 4 for more information). This interlock valve is normally in the closed position. Turn the macerator breaker on and then energize the monitor panel key switch. While the key switch is activated by turning it to the right and holding the key in position, press the red push button on the panel to activate the pumping process. At this point power is sent to the interlock valve which then opens completely before sending a signal to the overboard discharge pump to begin the macerating cycle. Monitor the waste tank until it shows empty.

To read either the fresh water or waste water monitor panel the breaker on the main DC panel must be activated.

The fresh water monitor displays the amount of potable water in the system. There are sensors located in the water tank that send a signal to the display panel when activated. Press and hold the top portion of the toggle switch and read the gauge display.

The waste portion of the display shows the amount of waste water in the holding tank. There are sensors located in the waste tank that send a signal to the display panel when activated. Press the bottom portion of the toggle switch and read the gauge display.

This portion of the system needs to be monitored periodically to prevent the system from being over full which could cause equipment damage and/or a possible leak in the vessel.

If the waste system is determined to be full it can be emptied by connecting a marina pump-out hose to the waste fitting located on the deck. The pump out device will actually remove the waste much like a vacuum cleaner. This is the easiest way to eliminate the vessel's waste and be environmentally friendly while performing the task.

An alternative method *which can be used in International waters only* is to pump the waste overboard using the waste seacock.



PORT LIGHTS



Shown Turn Latches To Open/Close
In Closed Position


Port lights provide cabin cross ventilation in addition to light. To open, turn the latches port or starboard until the port light cover clears. Lift the black handle to control the amount of fresh air. To close, shut the port light cover and turn the latches up to provide a seal. A screen is provided for insect protection.

Note: Make sure all hatches are closed in rough sea conditions to stop any water immersion.

Auxiliary Equipment Operation

COOK TOP RANGE/STOVE



**WARNING**

AVOID SERIOUS INJURY!
NEVER ALLOW SMALL CHILDREN
NEAR THE COOK TOP!

**WARNING**

AVOID SERIOUS INJURY!
OBSERVE ALL SAFETY INSTRUCTIONS
WHILE USING THE COOK TOP.

RANGE TOP CUT-OUT SWITCH

A cut-out switch shuts the power to the stove burners should a cooking fire develop. The micro-switch is located in the bottom of the top cavity. It can be seen when the stove cover is in position covering the stove.

When the cover is installed over the stove the burner power is then interrupted. At that point the stove breaker on the main AC panel should be turned to the “off” position. Always have the correct type portable fire extinguisher ready when cooking aboard the vessel.



REFRIGERATOR

OVERVIEW

Your refrigerator is designed to operate in the tough marine environment. It can withstand a heel angle up to 30 degrees for a short time which makes it very adaptable for marine use. A few tips regarding the refrigerator:

1. The refrigerator uses AC/DC current switching automatically as needed. Turn on the breaker at the ship's AC/DC service panel before activating the refrigerator.
2. Unnecessary opening of the refrigerator door will increase power consumption.
3. Keep the inside of the unit clean and dry.
4. Remove any water that may collect on the shelf under the freezer compartment.
5. When leaving the vessel for extended periods of time turn the breaker off at the ship's service panel. Remove any food from the unit. Prop the door open slightly before leaving the vessel. This helps air out the refrigerator.
6. Note: The unit will keep food cold 5-6 hours without any DC power providing the food is chilled already.
7. It is important that the refrigerator compressor/condenser be well ventilated so cooler air can enter from the bottom and warm air can exit the top of the unit. Never block any of the ventilation grilles.

OPERATION

To operate the sub zero refrigerator-freezer do the following:

1. Make sure the inverter breaker at the main ship's main panel is in the "on" position
2. On the inverter panel energize the "refrigerator" breaker.
3. Make sure the power button on the refrigerator control panel is activated.



Auxiliary Equipment Operation

TEMPERATURE SETTINGS



Soft Touch Refrigerator-Freezer Control Panel

Your sub-zero refrigerator is equipped with a manually controlled touch pad thermostat with digital read-outs.

There are separate soft key buttons for the refrigerator to starboard and freezer to port.

Each time a touch control button is pressed for either compartment the unit will adjust for a colder or warmer desired temperature.

The actual freezer temperature will show on the port side of the display panel and the refrigerator temperature will show on the starboard side of the display.

Note that there is a “ice” touch button which controls the ice making cycling .

The alarm button when energized will sound if the refrigerator or freezer compartment doors are left open for extended periods.

For further information refer to the sub zero refrigerator operator’s manual in the owner’s information packet.



Normal Refrigerator Operating Sounds

Your refrigerator/ice-maker combo features rigid foam insulated cabinets to provide high thermal efficiency and maximum sound reduction for its internal working components. In spite of this, the unit still may make some unfamiliar sounds.

Normal operating sounds may be more noticeable because of the unit's environment. Hard surfaces such as fiberglass floors have a tendency to reflect normal appliance operating noises.

Common refrigeration components, and a brief description of the normal operating sounds they make, are listed below.

Note: Your unit may not contain all of the components listed.

Compressor- The compressor may make a humming or pulsing sound during normal operation.

Evaporator- Refrigerant flowing through this unit may sound like boiling water.

Condenser Fan- May hear air moving through it.

Water Valve- At each cycle, a buzzing is heard.

Periods Of Non-Use

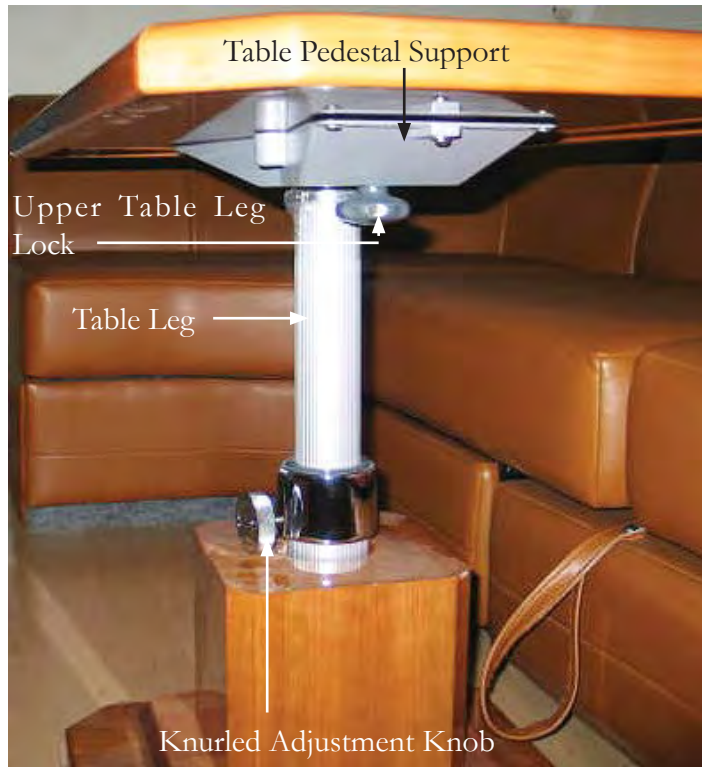
During extended periods of non-use take the following precautions.

1. Press the power button to the "OFF" position at the display panel.
2. Turn off the refrigerator breaker at the ship's AC inverter panel.
3. Turn the refrigerator breaker at the ship's main AC panel to the off position.
4. Empty the refrigerator of all items. Clean the interior of the unit with a mild non-abrasive detergent and warm water solution applied with a soft sponge or soft cloth. Rinse with warm water and a soft sponge. For rust spots use Bon-Ami® or Barkeepers Friend Cleanser®
5. Prop the door open.

Auxiliary Equipment Operation

SALON FURNITURE-DINETTE

DINETTE TABLE ADJUSTMENTS



The cherry dinette table is designed to be moved as needed to provide dining and lounging capabilities. To set up the table:

1. Set the table base where you want it.
2. For ease of installation set the table on the sofa with the table pedestal support facing up. Turn the upper table leg lock counterclockwise until the gap is large enough to accommodate the table leg diameter.
3. Install the table leg in the table pedestal support hole. Tighten the leg lock until secure.
4. Loose the knurled adjustment lock by turning it counterclockwise several turns.
5. Insert the table and table leg as an assembly into the adjustment knob hole.
6. Position the table to your needs. Turn the knurled adjustment knob clockwise until tight.



SEAT-HELM

The dual helm seat features individual controls for the captain and companion. The helm seat utilizes an electric hydraulic mechanism which moves the captain's seat fore-aft and up-down to accommodate different body types and cruising options.

Both seats feature a leaning post to gain extra height or additional standing room at the helm when maneuvering in close quarters.

There is a dual set of toggle style switches labeled **captain's seat** to the starboard side of the helm. Press the left switch to control the fore and aft movement. The right switch controls the seat's up and down movement.

The companion seat (labeled Comp. Seat) switch is on the helm being part of a 4 switch panel. This switch controls the seat's fore and aft movement.

To add seat height using the leaning bolster lift the front of the helm seat and pull the leaning bolster upward until fully extended. See the illustration.

There is a handle which controls the seat backrest angle. Loosen the handle by turning counterclockwise. Adjust the angle of the backrest to fit an individuals needs. Tighten the handle by turning clockwise.

Note there is a stainless steel push button on the armrest framework. To move the armrest to the vertical position press the button and pull the armrest up. To move the armrest to the horizontal position press the button while pulling down on the armrest.



CAPTAIN'S SEAT SWITCHES

Auxiliary Equipment Operation

TV (LCD) MONITOR PRECAUTIONS

The following safety information applies to all LCD flat screen television monitors. Refer to the antenna switch information in Chapter 4 for the proper connection depending where the vessel is moored.

SAFETY INSTRUCTIONS



CAUTION

RISK OF EQUIPMENT DAMAGE!
IN FREEZING CLIMATES
REMOVE THE TELEVISION SET
FROM THE VESSEL.



CAUTION

RISK OF ELECTRICAL SHOCK!
DO NOT REMOVE COVER
AT TELEVISION REAR.
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING
TO QUALIFIED PERSONNEL ONLY.

NOTICE

WHEN LEFT FOR EXTENDED PERIODS
TURN THE TELEVISION BREAKER
TO THE OFF POSITION
TO HELP PREVENT
POWER SURGES OR LIGHTNING
DAMAGE.

NOTICE

IF TV FEELS COLD TO THE TOUCH
THERE MAY BE A SMALL FLICKER
WHEN IT IS ACTIVATED.
THIS IS NORMAL.

NOTICE

THE FLUORESCENT LAMP USED IN
THIS TELEVISION CONTAINS A SMALL
AMOUNT OF MERCURY.
DISPOSE OF THIS PRODUCT
IN AN ENVIRONMENTAL FRIENDLY
MANNER USING LOCAL GUIDELINES.



VACUUM CLEANER SYSTEM

The vacuum system is located in the main cabin under the stairway locker. Included is a netted bag of hoses and various vacuum attachments.

SAFETY WARNINGS

1. This is a dry vacuum system. Do not use on wet surfaces.
2. Never operate the vacuum without filters and bags in place.
3. Use careful monitoring when children are around. Do not let the vacuum cleaner be used as a toy.
4. Do not try to repair the vacuum as the unit is sealed. Return the unit to InterVac or an authorized repair center for proper repairs.
5. Use only as described in this manual. Use only factory attachments and bags.
6. Do not use with any blocked openings. When the secondary filter becomes dirty, rinse in warm water or replace the filter. Filters must be completely dry before using.
7. Never drop or put any object into any opening.
8. Turn off the accessory breaker at the ship's AC panel to deactivate the vacuum cleaner.
9. Keep all body parts and clothing away from all moving parts.
10. Do not pick up anything that is burning or smoking such as cigarettes, matches, hot ashes or sharp objects. Do not use without dust bag or filters in place.
11. Do not attempt to operate or start the unit with a wet hose.

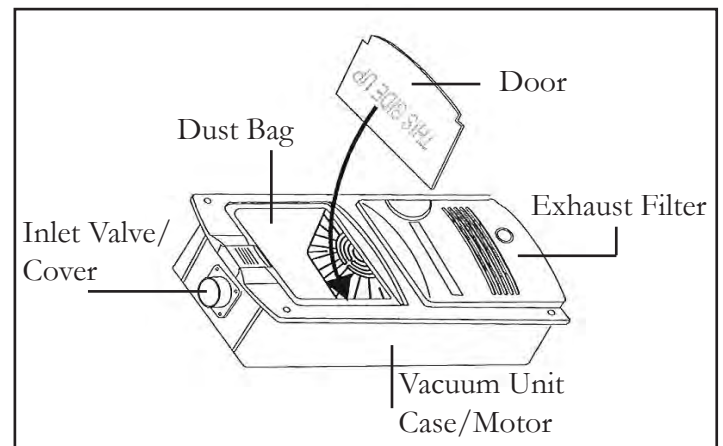
12. Do not store objects close to the vacuum unit.

13. Do not pick up flammable or combustible liquids such as gasoline, or use in areas where they might be present such as the bilge.

14. Do not step on the hose, nozzles or pull hard on the hose.

OPERATION

1. To operate the vacuum, the *accessory breaker* at the main ship's main AC panel must be turned to the "ON" position.
2. Lift the inlet cover on the vacuum unit.
3. Insert the hose cuff (one with the metal band) with a slight twist and the vacuum cleaner should start.
4. To remove, turn hose in either direction while pulling the hose toward you and the vacuum cleaner will stop.



Note:

If the motor stops the thermal protector on the unit will reset automatically after about 1/2 hour. This is normal for the vacuum cleaner.

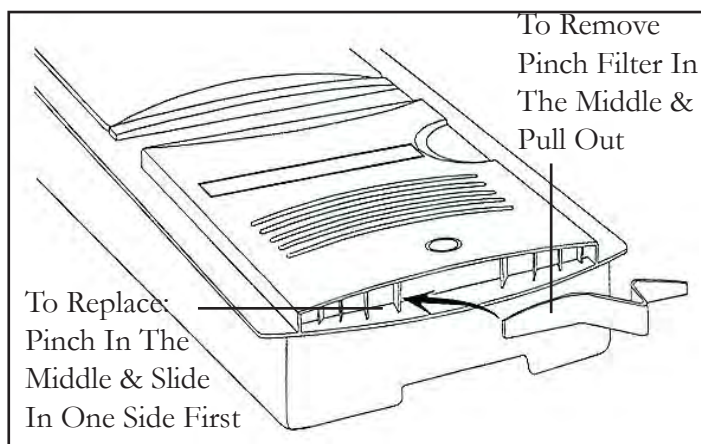
Auxiliary Equipment Operation



Insert Hose Cuff Here

If The Motor Stops Suddenly:

1. The most common cause is a clogged hose. Try to unclog the hose with a long object or by shaking the hose until the debris falls out.
2. The bag is overfilled and fine dust has clogged the bag.
3. The vacuum cleaning tools are clogged.
4. The motor (exhaust) filter is dirty and should be cleaned or replaced.
5. While the vacuum cleaner is being used keep the cushion up to provide additional air to the unit. This will help the unit from shutting down.



Replacing Exhaust Filter



WASHER-DRYER COMBO



The optional washer-dryer combo was developed for longevity and carefree service. The unit automatically switches from washer to dryer cycles.

The unit operates on 120 volts, single phase AC current and draws approximately 12 amperes and 1300 watts. A 15 amp breaker protects the circuitry.

Wash Only Procedure

1. Turn on the washer-dryer breaker on the AC distribution panel.
2. Ensure the door is completely shut.
3. Ensure that the hot and cold water supply is turned to the "on" position. (Remember to turn on the hot water heater an hour or so before washing if you want a hot water wash).
4. The Program Selector Knob (A) needs to be positioned on one of the "Reset" positions.

5. The ON/OFF button (I) is in the OFF position.
6. Select the program according to the type of garments you are washing. Refer to the "Guide To Wash Programs".
7. Turn the PROGRAM SELECTOR knob (A) clockwise until the selected program lines up with the knob mark.
8. Turn the WASH TEMP. knob (C) to the desired wash temperature for the load.
9. If needed, use buttons E, F, G, or H to run a special program. If these buttons are not being used, leave them in the OFF or out position.

Note: Should you wish to interrupt a program in progress or set a new one, advance the PROGRAM SELECTOR KNOB (A) to a "reset" position and wait 5 seconds. Icon light will flash slowly, then the appliance will be turned off.

At the end of the wash cycle:

- The STATUS/DOOR LOCK lamp (L) will quickly flash for up to 1-2 minutes to indicate the wash cycle is finished, but the door is still locked. The light will flash slowly when the door can be safely opened.
- When the STATUS/DOOR LOCK (L) flashes very slowly, turn the washer-dryer OFF by pressing the ON/OFF button (I) again.
- Open the washer-dryer door and remove the cleaned laundry.
- After removing the laundry, leave the door open if possible to allow fresh air circulation inside the drum to avoid formation of bad odors.

For more information refer to the drawings on the following pages.

Auxiliary Equipment Operation

NOTICE

**AVOID EQUIPMENT DAMAGE!
KEEP THE WASHER-DRYER
AND CABINET DOORS CLOSED
WHILE THE VESSEL IS IN MOTION.
USE THE WASHER-DRYER ONLY
WHEN THE VESSEL IS STOPPED.**

Helpful Hints:

1. The washer features a water level sensor control system that ensures the correct level of water is pumped into the machine for the load size.
2. Use one of the “EXPRESS” wash cycles to wash smaller loads of lightly soiled cotton heavy duty or permanent press fabrics in less time.
3. The EASY IRON button uses specifically studied wash motions to respect fabrics in the best possible way. During the rinse phase, it introduces more water and the spin cycle is shorter with a reduced speed, thus producing more outstretched fabrics for easier ironing (*See “Understanding the control panel” for more information*).



Dry Only Procedure

Once you have loaded the drum with the laundry that needs drying follow these steps:

- Close the door completely. The ON/OFF button (I) is in the OFF (out) position.
- Depending on the type of fabric being dried, turn the PROGRAM SELECTOR knob (A) clockwise until one of the 3 “Dry” programs is aligned with the mark on the knob.

NOTICE

A SPIN CYCLE IS CARRIED OUT DURING DRYING IF YOU SELECT THE COTTON HEAVY DUTY DRY PROGRAM. FOR COTTON LOADS LESS THAN 2.2 POUNDS USE THE DRYING PROGRAMS FOR PERMANENT PRESS FABRICS.

- Set the ON/OFF button (I) to energize the machine. The STATUS/DOOR lock lamp (L) flashes slowly, for 5 seconds, then will light steady to indicate that the program has been accepted.

At the end of the drying cycle:

- The STATUS/DOOR lamp (L) will flash quickly for up to 90 seconds to indicate that the cycle is finished, but the door is still locked.
- When the STATUS/DOOR lamp flashes slowly, turn the washer-dryer OFF by pressing the ON/OFF button (I).
- Open the door and remove the laundry.
- After removing the laundry, leave door open to allow for air circulation inside the drum to avoid forming bad odors.



WARNING

AVOID INJURY DUE TO BURN POTENTIAL. DURING THE DRYING PHASE, THE DOOR TENDS TO GET QUITE HOT. DO NOT ATTEMPT TO OPEN THE DOOR WHEN THE DOOR LOCK IS ENGAGED.



WARNING

AVOID INJURY DUE TO FIRE OR EXPLOSION! DO NOT USE THE APPLIANCE TO DRY CLOTHES THAT HAVE BEEN WASHED WITH FLAMMABLE OR CHEMICAL SOLVENTS (E.G. TRICHTHLORETHYLENE).



WARNING

AVOID INJURY DUE TO FIRE! DO NOT USE THE APPLIANCE TO DRY FOAM RUBBER OR SIMILAR MATERIALS. NEVER TRY TO MACHINE DRY ANY CANVAS RELATED PRODUCTS.

Auxiliary Equipment Operation

Wash And Dry Automatically Procedure

If you want your load to go automatically from wash to dry do the following:

- Follow the instructions for wash only and set the DRY TIME knob (C) before pressing the ON/OFF button (I).
- The Auto Dry lamp (M) will light to indicate the dry timer has been set and at the end of the wash cycle, the appliance will run the selected tumble drying cycle.

Notes: If the laundry load to be washed and dried is too large to dry, then follow the instructions for wash only. When the wash cycle has finished, you will need to remove some of the items (up to 50%) after the wash cycle to give the remaining laundry room to tumble freely while drying.

Follow the instructions for dry only. Repeat this procedure for the remainder of the load.

Notes: For your safety, the door stays engaged for the duration of the dry cycle. However, should you need to open the door during the drying cycle, two options are available:

NOTICE

TO PROTECT DELICATE FABRICS,
THIS MACHINE WILL NOT ALLOW
A DRY PROGRAM TO BE SET
WHEN THE SILK
OR WOOL PROGRAM IS SELECTED.

1. You can cancel the program by advancing the program selector knob (A) to a “reset” position and waiting 5 seconds. Pilot lamp (L) will flash quickly, then slowly when the door lock is released. Now turn the appliance off and open the door.

2. Press the ON/OFF button (I) to turn the appliance off. Wait 1-2 minutes for the door lock to release, then open the door. When finished, close the door and press the ON/OFF button again. The dry will automatically resume the selected program where it left off.

NOTICE

TO OPTIMIZE THE PERFORMANCE
OF YOUR MACHINE
WHEN GOING FROM WASH
TO DRY AUTOMATICALLY,
ALWAYS USE FABRIC SOFTENER
DURING THE WASH CYCLE.

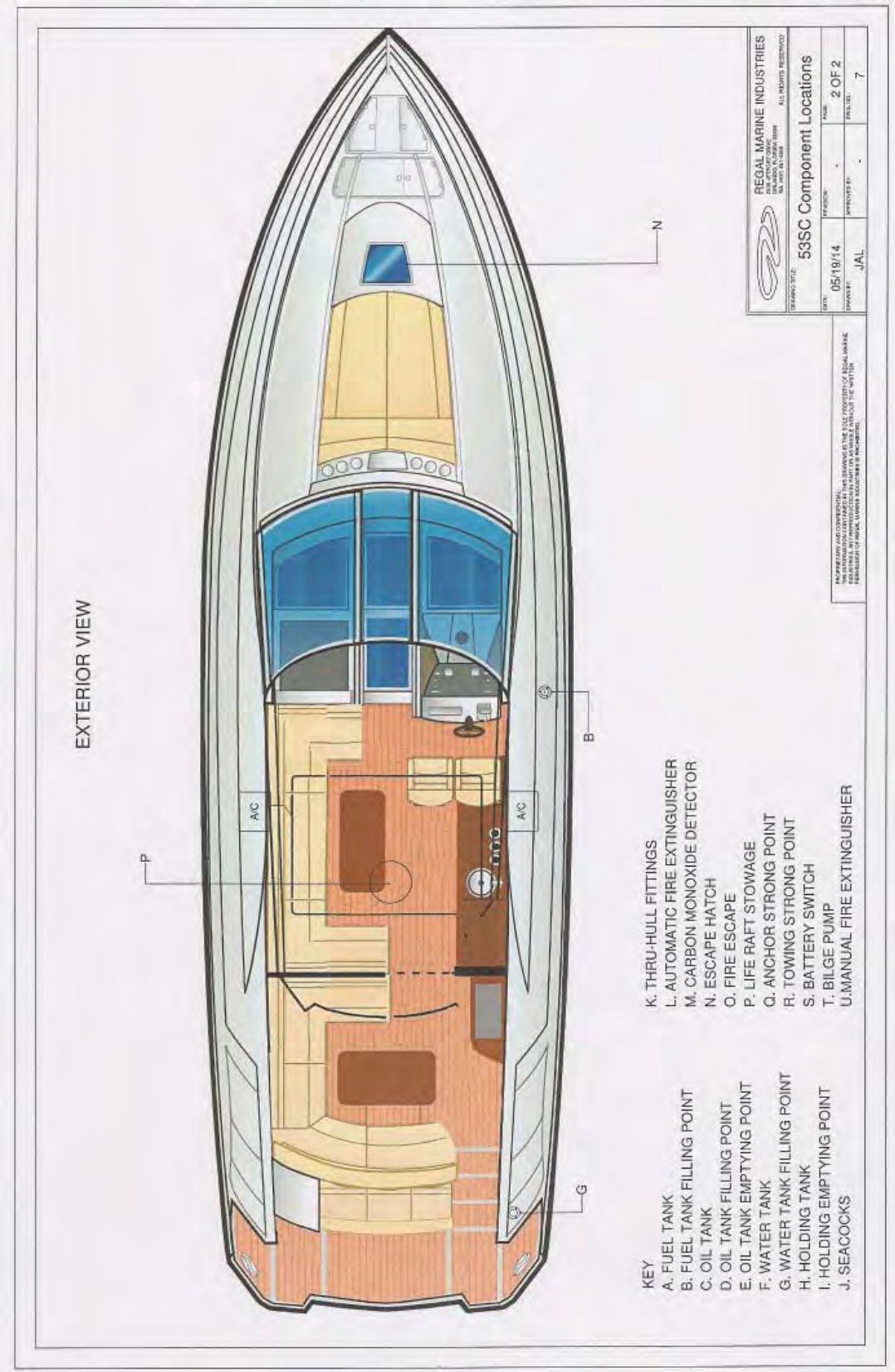


WARNING

AVOID POSSIBLE FIRE!
CLEAN OUT THE DRYER LINT TRAP
AFTER EACH LOAD.



EXTERIOR VIEW MACHINERY COMPONENTS



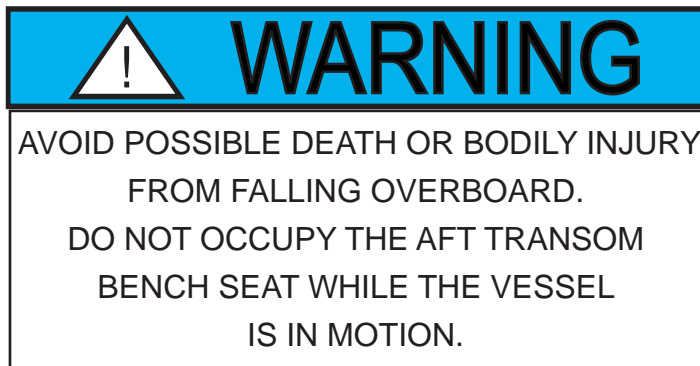
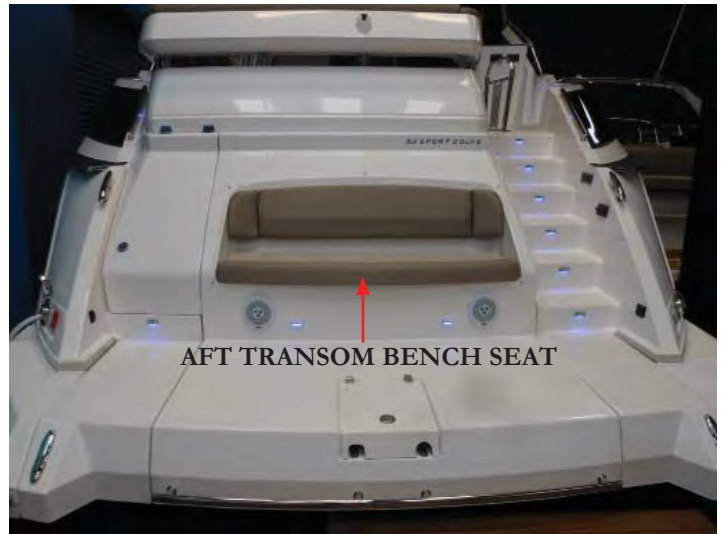
Auxiliary Equipment Operation

EXTERIOR EQUIPMENT

AFT TRANSOM BENCH SEAT

The aft cabin bench seat provides seating for three adults. Note that this seat is only to be used while the vessel is not in motion such as at mooring. Under no circumstances should this seat be occupied while underway. It is recommended to remove the ignition keys from the key switches when the seat is occupied.

Read and understand the warning label below. Make sure that all passengers are instructed as to the seats usage restrictions.





ANTENNAE

The GPS/plotter antenna is located on top of the aft hard top on early models or under the forward deck on later models. The antenna includes a built-in position fixing receiver. The GPS plotter features a filter that compensates for the rolling motion of your boat for clearer course and speed information. The antennae are protected by individual plotter breakers.



UNDER DECK ANTENNAES SHOWN

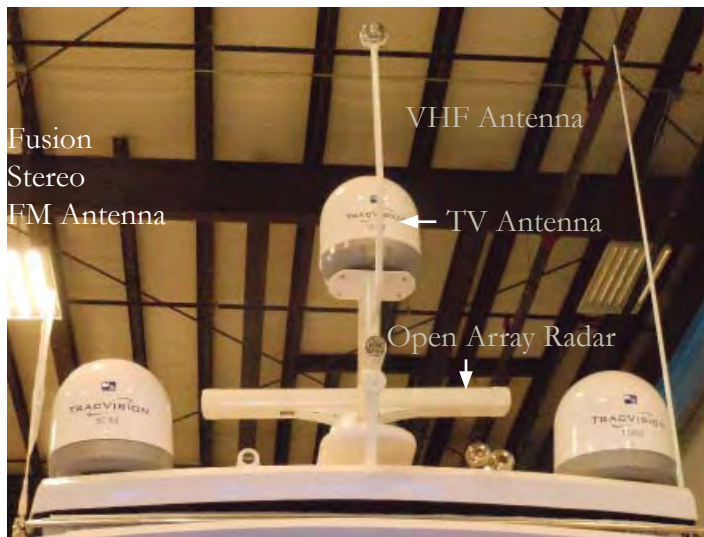
The Garmin electronics installed on your yacht are NEMA 2000 compatible which permits system components to share information with other marine-network compatible devices. Refer to your GPS/plotter owner's manual for further information.

Be aware of the vessel's bridge clearance specifications to avoid equipment/vessel damage due to impacting a bridge structure since a great portion of the antenna/receiving equipment is mounted on the hard top. Remember that the masthead light on the hardtop can be lowered if needed. The VHF radio uses a whip style fiberglass antenna which is "trimmed" to provide the best output and reception.

The TV antenna mounted inside the center dome on the hard top is shaped liked a saucer.

The satellite weather antenna is now located under the forward deck.

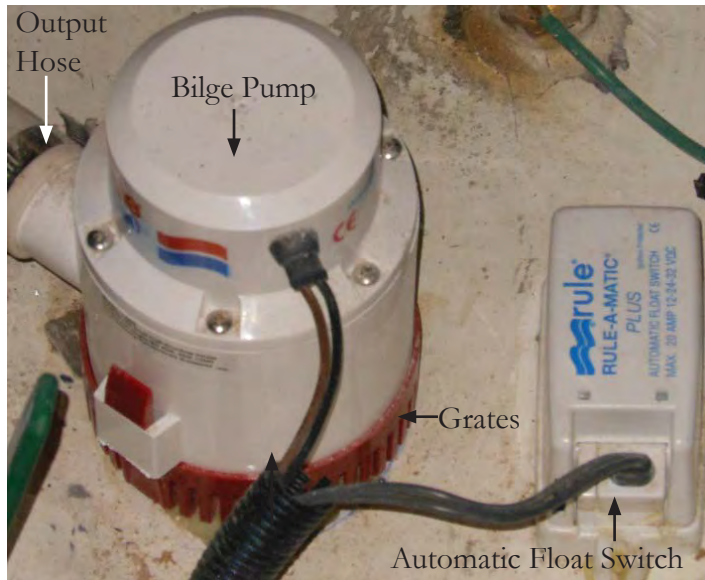
For further information on antennas refer to each vendor's owners manual.



TYPICAL HARD TOP ANTENNA LOCATIONS

Auxiliary Equipment Operation

BILGE PUMP/FLOAT SWITCH



Your yacht features bilge pumps and float switches in the sump (bilge), salon, and forward stateroom entrance. The middle and forward bilge pumps use automatic float switches and energize as needed.

The aft bilge pump features a helm switch with a manual override or in most cases uses the “automatic” position. In this “auto” position if the boat takes on water, the bilge pump will activate and pump excess water overboard. The center switch icon lights up when activated to alert the operator of aft bilge pumping activity. When this occurs the bilge compartment should be checked immediately to find the reason for pump activity.

Periodically check the grates of all pumps and automatic switches for debris and spray the units down with water. Make sure a steady stream of water exits through the hull fitting indicating the entire output hose system from the bilge pump itself is debris free.

In some cases the bilge pump can be lifted out of the grate casing by releasing the 2 tabs allowing any debris to be flushed out easier.



BOTTOM PAINT

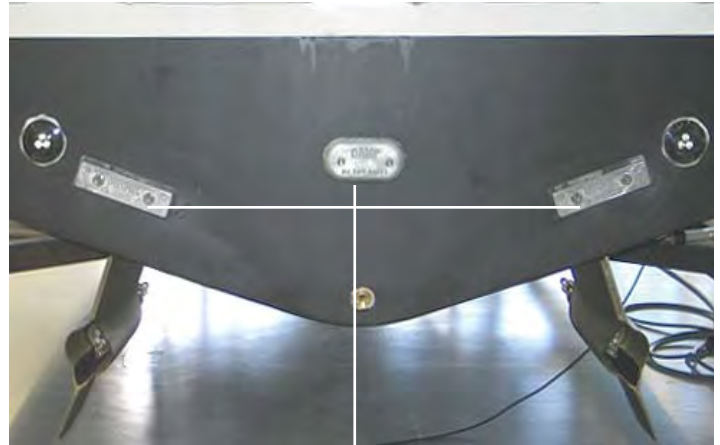
As a factory option two coats of bottom paint are applied to your vessel. This product provides top-of-the-line antifouling protection. It contains the highest percentage of croupous oxide to aggressively combat even the worst tropical conditions. This product will help reduce annual hull maintenance.

The hard epoxy base produces the most durable finish for long lasting performance. If your vessel is left in the water the paint provides effective year round service.

Periodically check the bottom of the boat for growth. The vendor recommends scrubbing the bottom with a soft brush to remove anything from the antifouling surface.

This scrubbing is particularly important with boats that are idle for extended periods.

Note: When touching up the bottom with epoxy paint wait at least 3 days before relaunching the vessel. On older models always leave at least 1" between any metal objects including anodes and the bottom paint to help prevent electrolysis. On later models there is a shim that assures the anode is a safe distance from the paint. These models can be painted right up to the anode edge. See the illustration.



Typical OceanTrac Bottom Using Shims Around Anodes

NOTICE

TO PROTECT AGAINST GALVANIC
CORROSION
DO NOT USE BOTTOM PAINT ON ANODES.

Auxiliary Equipment Operation

CAMERA MONITORING SYSTEM

Overview-

This option features day and night vision cameras. Normally a camera is mounted on the hardtop facing aft to assist docking operations. Another camera is located in the salon. The third camera is in the engine room. The cameras can be monitored from the helm “E” series GPS/plotter or from the salon television.

The cameras are a high quality resolution color unit offering superior clear viewing in pitch black darkness. The lights radiate a blue output. The units run on 12 volt power.

The cameras are part of the video display on the “E” series plotter. The cameras can be adjusted 90 degrees vertically and can be rotated as needed.



Camera Monitor

Operation

You can set-up the GPS/plotter display page to view all cameras at once. Typical instructions are:

- A. With the power on select OK.
- B. Choose MENU.
- C. Choose PAGE SET.
- D. Choose CUSTOM.
- E. Choose EDIT PAGE SET.
- F. Select the layout (page type you want; for example fourths, thirds, etc.) with arrow pad from the selections on the display. Select OK when finished.
- G. Choose the application (video w/camera icon) that you want to view in the window.
- H. Exit- Push OK button. Cameras should be ready.

Once the display is set-up as outlined above each time you want to view the cameras from the display do the following:

1. Press the red power button on the GPS/Plotter display to energize the display.
2. Select “VIDEO” 2-4 on the display to view the cameras. Three of the videos are designated for the cameras. Video 1 is vacant for add-on equipment such as a DVD player to be viewed from the display.

To view the cameras from the salon television turn on the TV set. At the television remote control choose the “MEDIA” button. The cameras should appear on the screen. If the set picture seems to be oblong you can adjust the picture format by pressing the “SRC” button. For viewing cameras the 4:3 format is correct. When watching regular television programming switch to the 16:9 format.



COMPASS

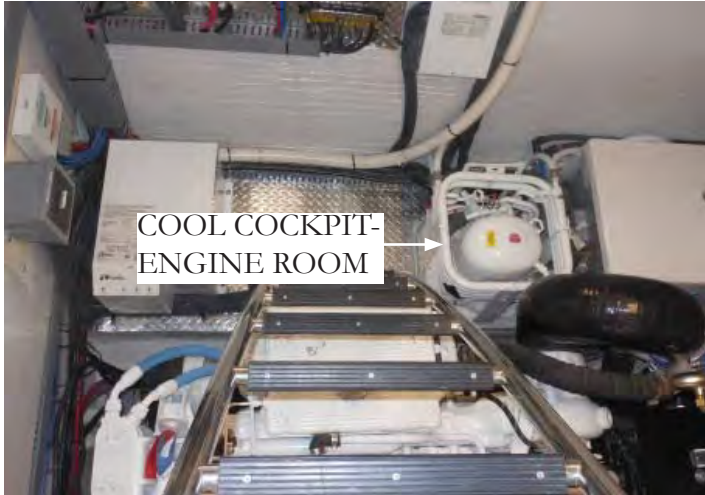


The helm installed compass is set by the manufacturer to ensure its accuracy. If in doubt it can be zeroed in by using a non-magnetic screwdriver and turning the compensator screws as recommended. A

compass can be checked while underway for variance and deviation by comparing your heading with a nautical chart. Compass error is part of the calculation. Refer to the compass manual in the owner's information packet for compensating details.

Auxiliary Equipment Operation

COOL COCKPIT AIR CONDITIONER



The cool cockpit option consists of an additional 36,000 BTU cooling unit, helm vents, and a cockpit “Elite” thermostat control to climate control the enclosure area.

To operate the cool cockpit:

1. Ensure the A/C seacock is opened.
2. Check the A/C sea water strainer for debris.
3. Energize the A/C pump breaker at the ship’s main panel. Make sure water is seen at the thru-hull fitting. It may take a short period to cycle.
Next, activate the cool cockpit breaker at the AC distribution panel.
4. Locate the Elite control (located behind the aft cockpit television cabinet door and follow the operating instructions as outlined in the A/C section of chapter 4.
5. By activating the aft air conditioner additional air flow is present at the starboard helm through the vents located there.
6. If open shut the enclosure window and door.
7. Adjust the cockpit and helm vents as needed.
8. The condenser/compressor for the cool cockpit A/C unit is located in the bilge. Periodically, check the condensation tray drain for debris (see photo) and pour a measured amount of premixed in the tray to purge the A/C drain line.
9. There is a return air filter located on the condenser unit. Once a month clean the filter by rinsing with water, air dry and reinstall.

Read the A/C owner’s manual for more detailed information.



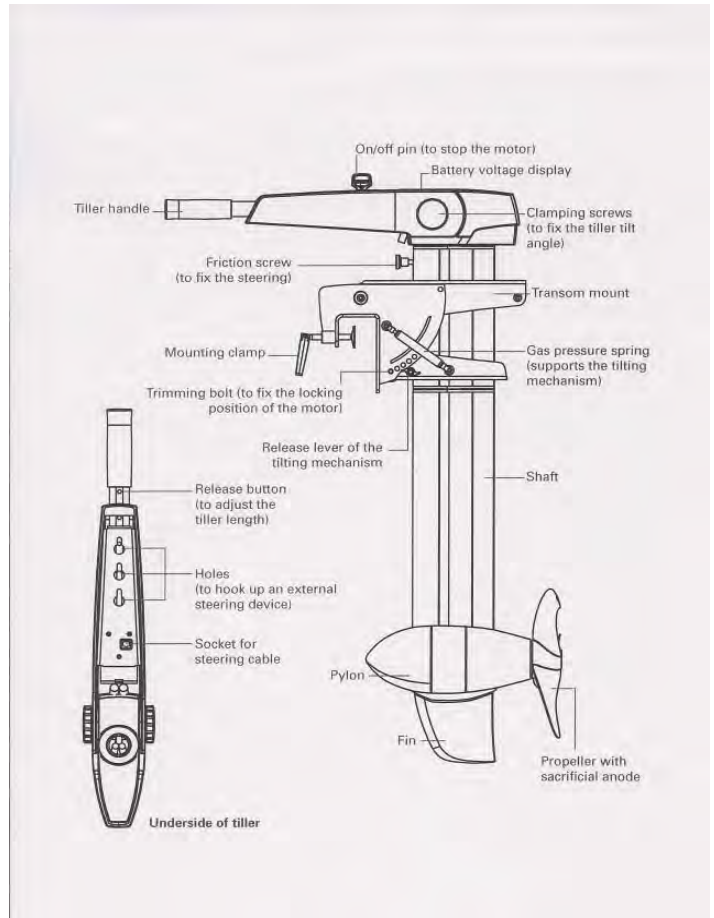
Chapter 7

DINGY (TENDER) LAUNCH/RETRIEVAL SYSTEM

A dingy (tender) option is available for your vessel. It features an 8' 5" dingy, outboard electric motor complete with battery, boarding ladder and dingy launch. Estimated running time is 10 hours at idle speed; 2 hours at full speed. Estimated engine weight is 40 pounds.

Before attempting to operate the tender be sure to read and understand the engine operating manual including all the danger, warning and safety notices found inside the document along with the dingy launch information on the following pages.

Become acquainted with all the dingy and engine components. On the following is a partial listing of the engine main component. It is recommended that the operator carry a spare propeller along with a set of propeller hardware especially if the vessel is on an extended cruise.



Note that the engine operating manual features important operating instructions along with care and maintenance information that the operator should read to ensure the product enjoys a long carefree life.



Auxiliary Equipment Operation

DINGY LAUNCH/RETRIEVAL SYSTEM-LAUNCHING (TYPICAL CONTINUED)

The following photos and descriptions are recommended to launch and retrieve the the optional 53 SC tender (dingy). Use a crew member to make the process easier.



1. Open the dingy garage by energizing the engine hatch switch at the aft cockpit stairway. Keep switch activated until the hydraulics make a “clicking” sound indicating the garage is at the end of its “up” travel.



2. Raise outboard as high as possible and engage engine latch to clear dingy retrieval mechanism.



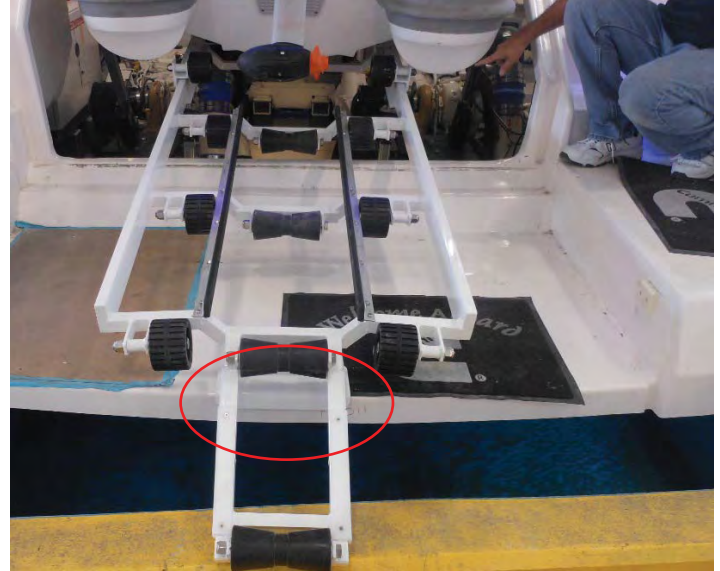
3. Activate the lower arrow on the winch switch located inside the garage. See illustration. Pay-out just enough winch line for the outboard engine to clear the garage top.



4. Using the tender lift switch at the stairway, raise the dingy launch mechanism to the “top” of its stroke. The mechanism will make a “clicking” noise at this point.

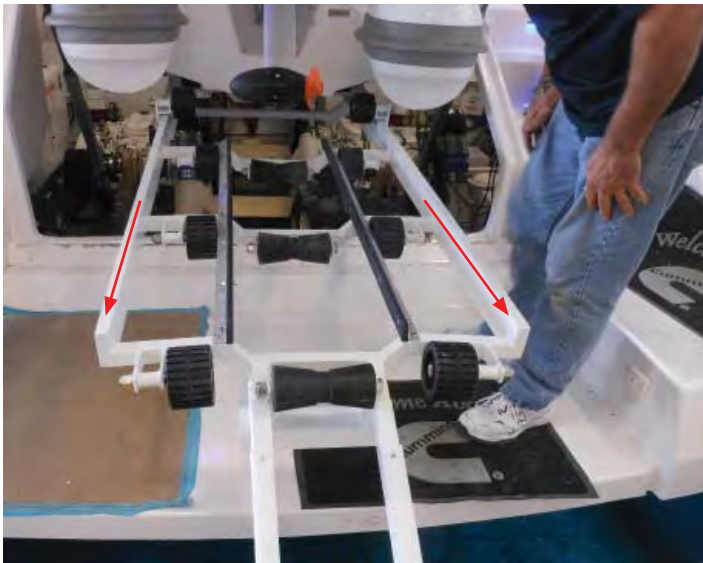


DINGY LAUNCH/RETRIEVAL SYSTEM-LAUNCHING (TYPICAL CONTINUED)



7. Lower cradle by using the tender lift switch until it touches the swim platform. See above.

5. This illustration shows the dingy lift in a complete “up” travel position.



6. Grasp and slide dingy launch/retrieval cradle to the full “out” or extended position. See the red arrows.



8. Press and hold the down “out” arrow on the winch switch to “pay-out” the dingy.

Auxiliary Equipment Operation

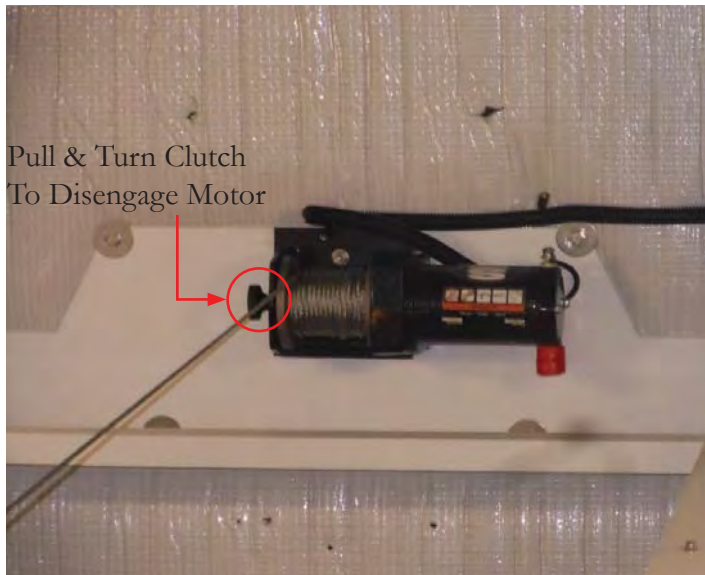
DINGY LAUNCH/RETRIEVAL SYSTEM-LAUNCHING (TYPICAL CONTINUED)



9. Illustration is a continuation of the dingy being launched with the winch switch held in the “out” activation mode.



11. Note: Do not remove winch line hook until dingy is fully deployed.



10. With a manual clutch mechanism the winch can be disengaged and manually used in case of power outage.



12. Note that the tether strap is still attached to engine. Release hook when launched.



DINGY RETRIEVAL SYSTEM-RETRIEVING (TYPICAL CONTINUED)



13. To retrieve the dinghy, attach the winch line hook to the dinghy bow line. Center the dinghy bow on the retrieval mechanism. Note that the engine is tilted up and the tether strap is attached.



15. For safety reasons maintain a safe distance while retrieving the dinghy. Keep body parts clear of machinery and dinghy components.



14. Watch for any obstruction between the dinghy and garage top while retrieving the dinghy. Use the forward “in” arrow on the winch switch. Keep the dinghy straight on dinghy cradle bunks as it is retrieved.



16. Stop the retrieval process **before** the outboard engine clears the opening. See arrow above.

Auxiliary Equipment Operation

DINGY RETRIEVAL SYSTEM-RETRIEVING (TYPICAL CONTINUED)



17. Using the tender lift switch at the stairway lift the cradle component completely to the “up” position.



19. Lower tender lift cradle down completely. Next, lower the outboard engine to clear the garage. Shut the engine hatch.



18. Push the cradle center bunk roller rail assembly as far forward as possible.




DOOR-TRANSOM (TYPICAL)



To open the transom door (gate style) pull up on the framework until the door hinge releases and swivels to an open position. Be sure it locks in the slots.

To close the door pull up on the framework until the door hinge releases and swivels to a closed position. Be sure it locks in the slots.

**WARNING**

PREVENT SERIOUS INJURY OR DEATH
FROM FALLING OVERBOARD!
KEEP THE TRANSOM GATE
IN THE LOCKED POSITION
AT ALL TIMES.

Auxiliary Equipment Operation

ELECTRONICS-GENERAL

The vessel features several electronic components matched for compatibility. This manual serves as an introduction to the on board electronics components. The **general** information found in Chapter 4 will enable the captain to bring his equipment “up and running”.

Manuals for each of the electronic components should be referenced for specific **detailed** operations. These manuals are part of the customer information packet.

Note: As an integral part of upgrading our product line Regal reserves the right to change specifications, components, and vendors at any time.



FIRE EXTINGUISHER- AUTOMATIC

OPERATION-AUTOMATIC



Fireboy systems are not nor are they intended to be explosion suppression devices. **Boat owner's still need to take normal precautions for checking gasoline fumes and using blowers.**

Read the information in chapter 4 regarding the dash installed portion of the fire extinguisher system. When the system actuation starts you may hear a loud sound similar to that of small arms fire, followed by a rushing air sound. The system will show actuation whenever the ignition key is ON and the indicator light is OFF. The actual actuation time when a fire occurs is dependent on the severity of the fire.

When the automatic fire extinguisher activates IMMEDIATELY SHUT DOWN ALL ENGINES, POWERED VENTILATION (BLOWER), ELECTRICAL SYSTEMS AND EXTINGUISH ALL SMOKING MATERIALS. DO NOT OPEN THE ENGINE COMPARTMENT IMMEDIATELY!

Allow the agent to “soak” the compartment for a period of time and wait for hot metals and any fuels to cool before inspecting for the fire cause. Premature opening of the engine compartment allows an in-rushing of oxygen and could result in a flash-back. When the engine compartment is opened have approved portable fire extinguishers ready to use.

OVERVIEW

The Fireboy automatic fire extinguishing system is located in the bilge at the forward engine bulkhead. See the illustration. The system uses an environmentally friendly agent HFC-227 which has been approved by the EPA and CE certification to replace the old Halon agent. This system is formulated only for use in the engine space or bilge of your vessel. HFC-227 is approved for “stalling” diesel engines.

Auxiliary Equipment Operation

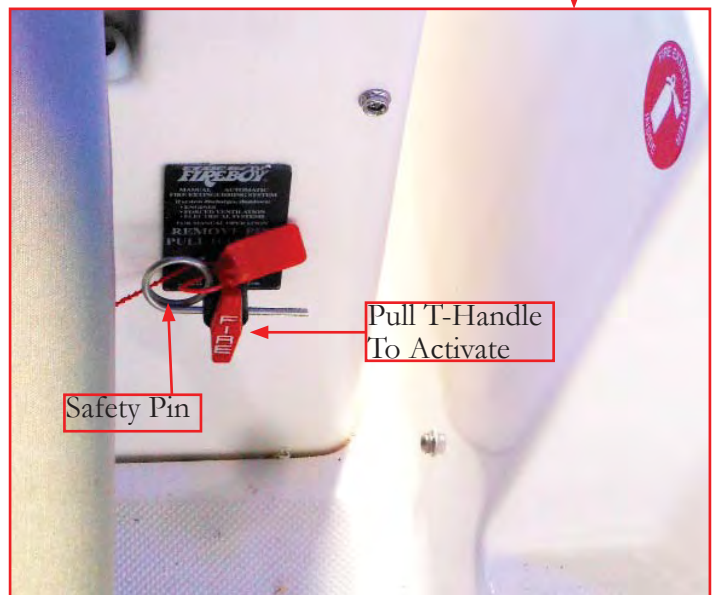
OPERATION-MANUAL

If a fire has started in the engine compartment where the Fireboy is located, **DO NOT WAIT FOR AUTOMATIC ACTIVATION. Release the system manually.** Close any opened hatches leading to the engine compartment, shut down all forced ventilation devices, engines, generators and electrical components.

The manual release lever is located on the vertical knee-wall midway in the port aft cockpit seating area. Remove the cushion to access the release assembly. **Remove the safety pin from the “Fire” T-handle, and pull T-handle firmly and release. A loud “rushing” or air” sound will be heard.** Complete discharge will take several seconds. **DO NOT OPEN THE COMPARTMENT IMMEDIATELY!** Keep the compartment closed for a period of time sufficient to allow the agent to soak all areas of the protected space. This allows hot metals to cool.

Premature opening of the compartment could cause a re-flash. When opening the engine compartment for inspection have hand held portable extinguishers ready.

Inspect the pressure gauge and system before and after each outing. Refer to the maintenance chapter for caring for your fire extinguisher system.





Chapter 7

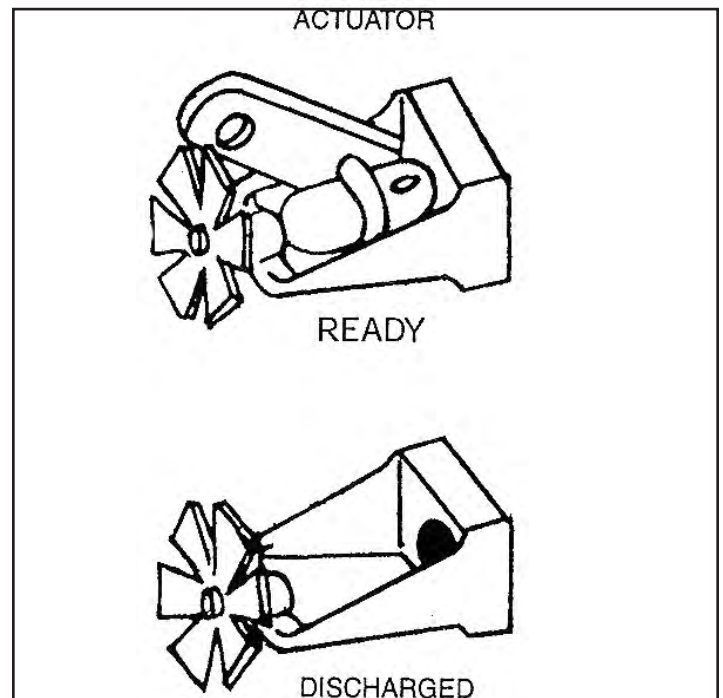
The illustration opposite shows the actuator not discharged at the top and one which has been discharged at the bottom.

Typical Portable Fire Extinguisher



Portable fire extinguishers are found in various cabin and cockpit lockers. A label may be present on the exterior cabinet doors identifying portable fire extinguisher locations. Educate passengers as to the location of portable fire extinguishers along with correct usage. Perform periodic

inspections as fire extinguishers are date sensitive. Local companies normally refill outdated units.



WARNING

AVOID SERIOUS INJURY OR DEATH!
DO NOT BREATHE FUMES OR VAPORS
CAUSED BY A FIRE AS THEY ARE
HAZARDOUS AND TOXIC.

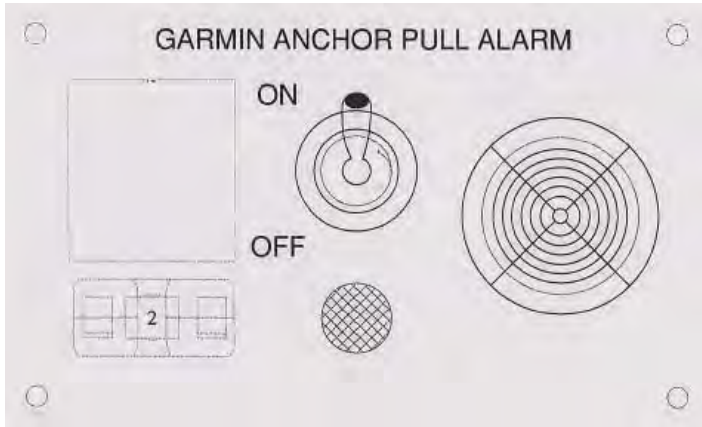


WARNING

AVOID SERIOUS INJURY OR DEATH!
ACCIDENTAL DISCHARGE COULD OCCUR
DURING HANDLING, INSPECTION,
OR WORKING IN THE ENGINE
COMPARTMENT.
WEAR EYE PROTECTION
AT ALL TIMES!

Auxiliary Equipment Operation

GARMIN ANCHOR DRIFT ALARM



As part of the Garmin system, an anchor drift alarm option is available. If installed the system features a display panel shown above including a warning light, alarm and 2 amp breaker for overcurrent protection for the switch and alarm. The footprint of the alarm is set on the chartplotter. Basically the operator sets the amount of anchor drift and activates the display switch to the “on” position. The alarm communicates through a NMEA 0183 port connected to the Garmin electronics.

If the amount of drift is outside the drift limits the light will illuminate on the display and the alarm will sound. To deactivate the alarm, turn the display switch to the “off” position. The red warning light will stay lighted until the anchor is within the drift perimeter either by the vessel drifting back or the chartplotter being recalibrated.

To set the anchor drift alarm:

Navigation Alarms

Select settings>Alarms>Navigation.

Anchor drag: Sets an alarm to sound when you exceed a specified drift distance while anchored.



GENERATOR-DIESEL



OVERVIEW

As standard equipment a diesel generator is featured on your yacht.

The domestic generator is rated at 11.5 kw. (240 volts, 60 hertz) and European units rated at 9.2 kw. (240 volts, 50 hertz). Both meet current EPA, CARB and CE emission requirements.

As part of the Seakeeper® stabilizer option a 15 kw. generator upgrade is included with this product.

Detailed maintenance information can be found in the generator operating manual.

For generator operating information see chapter 4 of this manual.

OPERATION

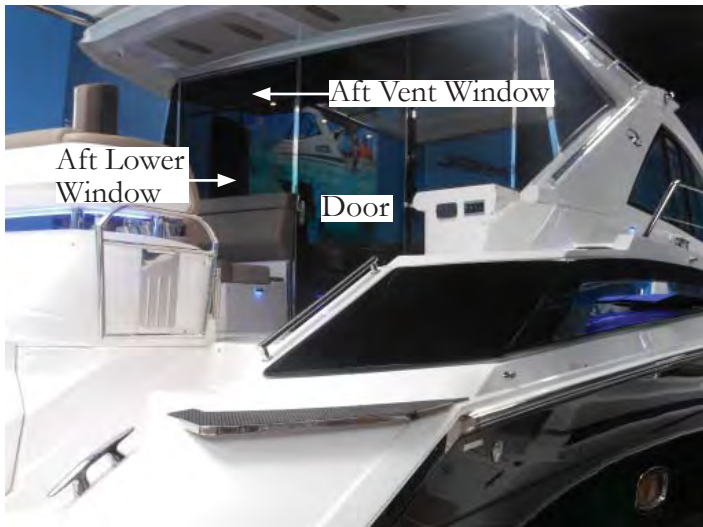
Perform the following inspections and checks before each startup, as designated, and at regular intervals as noted in the service schedule.

1. **Air Inlets-** Check for clean and unclogged air inlets.
2. **Air Shrouding-** Ensure the enclosure is securely fastened and positioned correctly.
3. **Battery-** Check for proper electrolyte level. Make sure all battery connections are secure.
4. **Coolant Level-** Check the reservoir for proper levels.
5. **Exhaust System-** Check for exhaust leaks and blockages. Check the silencer and piping condition and check for tight exhaust component connections. Inspect the exhaust parts (exhaust manifold, catalyst, exhaust hose, hose clamps, silencer and outlet flapper) for cracks, leaks and corrosion.
 - Check hoses for cracks, softness, dents, or leaks. Replace as necessary.
 - Check for corroded or broken metal parts. Replace as necessary.
 - Check for loose, missing or corroded hose clamps. Replace or tighten the hose clamps and hangers as needed.
 - Check that the exhaust outlet is unobstructed.
 - Visually inspect for exhaust leaks (blow-by). Check for carbon or soot residue on exhaust parts which indicate an exhaust leak. Seal leaks as needed.

Auxiliary Equipment Operation

HARD TOP ENCLOSURE

The standard hard top enclosure features a sliding door and opening window. The tempered glass is tinted and incased within a tough aluminum extrusion to form a complete weather-tight enclosure.



ENCLOSURE IN CLOSED POSITION



ENCLOSURE IN OPEN POSITION

The enclosure aft door features an easy slide track and can be locked for extra security. Open the door until it reaches the detent stop mechanism



To open the aft upper vent window pull the latch to the left until the window clears the latch. The hydraulics will pull the window up and lock it in the open position.

To close the aft upper vent window push in on the spilt hydraulic casing and pull the

vent window down. Check to make sure it is latched. See the illustration.

To open the **lower** aft enclosure window press and hold the lower portion of the “**window**” marked switch located at the port companionway entry way.

To close the **lower** aft enclosure window press and hold the upper portion of the “**window**” marked switch located at the port companionway entry way until the window unit is raised to the top. This window uses an electric-hydraulic cylinder to open and close.



Note that the hydraulic pump/circuit board that operates the aft enclosure vent window is located in the engine room on the forward bulkhead. If the window jerks when moving up or down it may be due to air in the lines or a lack of fluid in the hydraulic lines or pump. Fill the pump as needed with utility grade #22 hydraulic oil. This is a machine oil, non-detergent and SAE 5 weight oil. It

resists rust and oxidation. Also, known as turbine oil it is comparable to Regal R&O and Vitrea/Turbo.

ENCLOSURE VENT WINDOW HYDRAULIC PUMP-ENGINE ROOM



HATCH-ENGINE

The engine hatch provides easy access for periodic bilge and equipment inspections. Use the ladder and grate walkways to access the bilge from the day hatch. Be careful not to slip while climbing the ladder rungs especially if you are working around the engines. Your feet may have picked up some oil deposits or lubricants from engine components. The engine compartment (bilge) lights can be accessed at the starboard stairway exterior lighting panel. Also, additional overhead lighting is available at the engine area by activating the overhead and courtesy light switches on the same panel. All light switches are individually protected by circuit breakers.

Since the hatch is electric and forward facing it is easiest to access the engine compartment from the aft to check engine, drive and generator fluids.

The center grate is removable for accessing the engine, thru-hull and equipment such as the air conditioner pump found under this area. All other grates are hand removal or require a phillips screwdriver to remove select grates.

The engine hatch uses two synchronized electric-hydraulic rams to operate up and down. There is a synchronizer box mounted inside the starboard aft hatch surface which permits both rams to act as a single unit. The synchronizer is not a customer maintenance item but the location of it will be useful should professional troubleshooting services be required.



Typical Hatch

A GFCI duplex outlet is installed near the bottom of the day hatch ladder for any additional electrical needs.



WARNING

AVOID SERIOUS INJURY OR DEATH!
COMPONENTS IN ENGINE COMPARTMENT
ARE NOT IGNITION PROTECTED..
DO NOT STOW GASOLINE CONTAINERS,
FLAMMABLE PRODUCTS
OR MOTORS INSIDE.



Auxiliary Equipment Operation

HEATER-HOT WATER

The hot water heater features an twenty gallon capacity and has recirculating ability to keep water warm during cruising. This is accomplished by a set of hoses connected between the hot water tank and the circulating engine water pump. Engine coolant runs through a heat exchanger which keeps the tank water warm when the engines are running.

To initially fill the hot water heater, ensure the boat's fresh water tank is full. When the tank is full water will be ejected from the deck vent. At the DC side of the main ship's AC/DC panel, turn the fresh water pump to the "on" position. **Make sure the water heater is full of water by opening a hot water faucet until a steady stream flows out.** At this point with the generator running or the shore power connected, switch on the hot water heater at the AC side of the ship's service panel. The heating element will now begin to heat the hot water tank.

Should the hot water heater reset button need to be activated, turn off the hot water breaker at the AC side of the main control panel. Then remove the panel cover to expose the reset button. Press the red reset button. After refastening the access panel, energize the hot water breaker to continue the system operation.

Should the need arise there is a drain valve located at the rear of the heater. Always turn the hot water breaker to the "off" position before opening the drain valve. Make sure the water is cold before attempting to open the valve. **The valve runs through the shower sump pump and then overboard.** Never try to adjust the thermostat or open the drain valve before turning off the AC breaker. Contact a marine professional for further information.

There is a T and P relief valve on the aft water heater. If the unit temperature rises above the specified temperature of the T and P valve the unit will release the hot water into a hose and subsequently exits a thru-hull fitting. Turn the hot water breaker off and determine the cause of the overheating condition. Use exact replacement parts.



Typical Hot Water Heater



CAUTION

TO AVOID POSSIBLE BODILY INJURY DUE TO ELECTRICAL SHOCK DO NOT TRY TO OPEN UP THE HOT WATER TANK COMPONENTS WHILE THE AC POWER IS ACTIVATED. TURN HOT WATER BREAKER OFF AT THE MAIN AC PANEL.



CAUTION

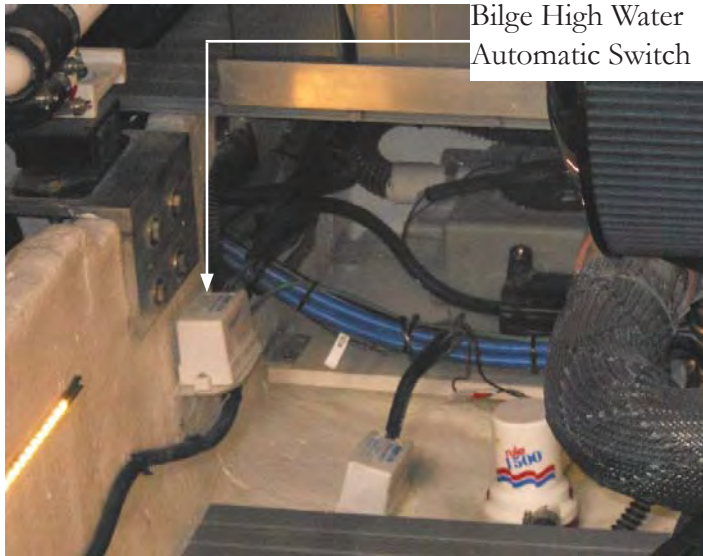
TO AVOID POSSIBLE BODILY INJURY DUE TO HOT WATER, BE SURE TO CHECK THE WATER TEMPERATURE BEFORE USING IT. THIS IS ESPECIALLY TRUE AFTER CRUISING WHEN THE WATER HAS BEEN TRAVELING THROUGH THE HEAT EXCHANGER HOSES.

NOTICE

TO AVOID EQUIPMENT DAMAGE DO NOT TURN ON THE HOT WATER BREAKER WITHOUT THE WATER HEATER BEING FULL. DAMAGE TO THE HEATER ELEMENT WILL OCCUR.

Auxiliary Equipment Operation

HIGH WATER ALARM-BILGE



The high-water alarm warns the skipper of a possible emergency in the bilge area. There is an automatic float switch installed in the center bilge on the side of a main stringer. The automatic float switch is mounted above the normal bilge water levels. See the illustration above. If the water rises over this predetermined level the bilge switch sends a signal to the helm mounted alarm. If the alarm sounds bring the vessel back to an idled neutral position and turn off the engines. Open the engine hatch and determine the cause of the problem.

Possible causes are:

1. Engine or generator hose leak.
2. IPS gasket leak between hull and drive.
3. Mufflers or exhaust hose leak.
4. Hull leak due to striking an object.
5. Water or waste tank leak.
6. Seacock leak.
7. Heat exchanger leak.
8. Transducer or underwater light leak.
9. Water heater tank or heat exchanger hose leak.



MARKERS-FOR SLINGS

Sling markers are located on the forward and aft deck near the rub rail. These markers provide a safe location to place straps to lift the boat. Failure to use marked sling marker locations could cause damage to the boat structure. When lifting the vessel close all doors, hatches and portholes. Make sure the spreader bars are adjustable enough to be wider than the sling beam area. This will allow the slings to hold the weight of the boat properly without forcing the boat structure inward. Make sure there is no pressure on the rub rail or swim platform wings. **Always use flat wide, belt-style straps as they distribute and hold the boat weight in a more supportive fashion.** Do not use the cable-style straps since they may cause hull or rub rail damage.

NOTICE

BOAT OWNER-LIFT OPERATOR

Before lifting boat place a fender or block between strap and hull just under the swim platform side wing (Both port and starboard) to relieve strap pressure on wing when lifting boat. When fender or block is positioned correctly strap will not put pressure on side wing when full weight is applied.

FAILURE TO FOLLOW THE ABOVE INSTRUCTIONS MAY CAUSE FIBERGLASS DAMAGE WHICH IS NOT COVERED UNDER THE REGAL LIMITED WARRANTY.

BEFORE LIFTING THE VESSEL SEE THE TECHNICAL DRAWING ON THE NEXT PAGE FOR FURTHER INFORMATION .

NOTICE

AS A SAFETY PRECAUTION,
WHEN THE BOAT IS LIFTED,
TIE A LINE BETWEEN BOTH STRAPS
TO PREVENT THE STRAPS FROM MOVING
FORWARD OR AFT.

NOTICE

TO AVOID POSSIBLE FIBERGLASS DAMAGE,
SET VESSEL FOR EXTENDED STORAGE
ON A FACTORY APPROVED
AND ADJUSTED STEEL CRADLE.
NEVER USE BLOCKING TO SUPPORT THE
VESSEL'S HULL BOTTOM.

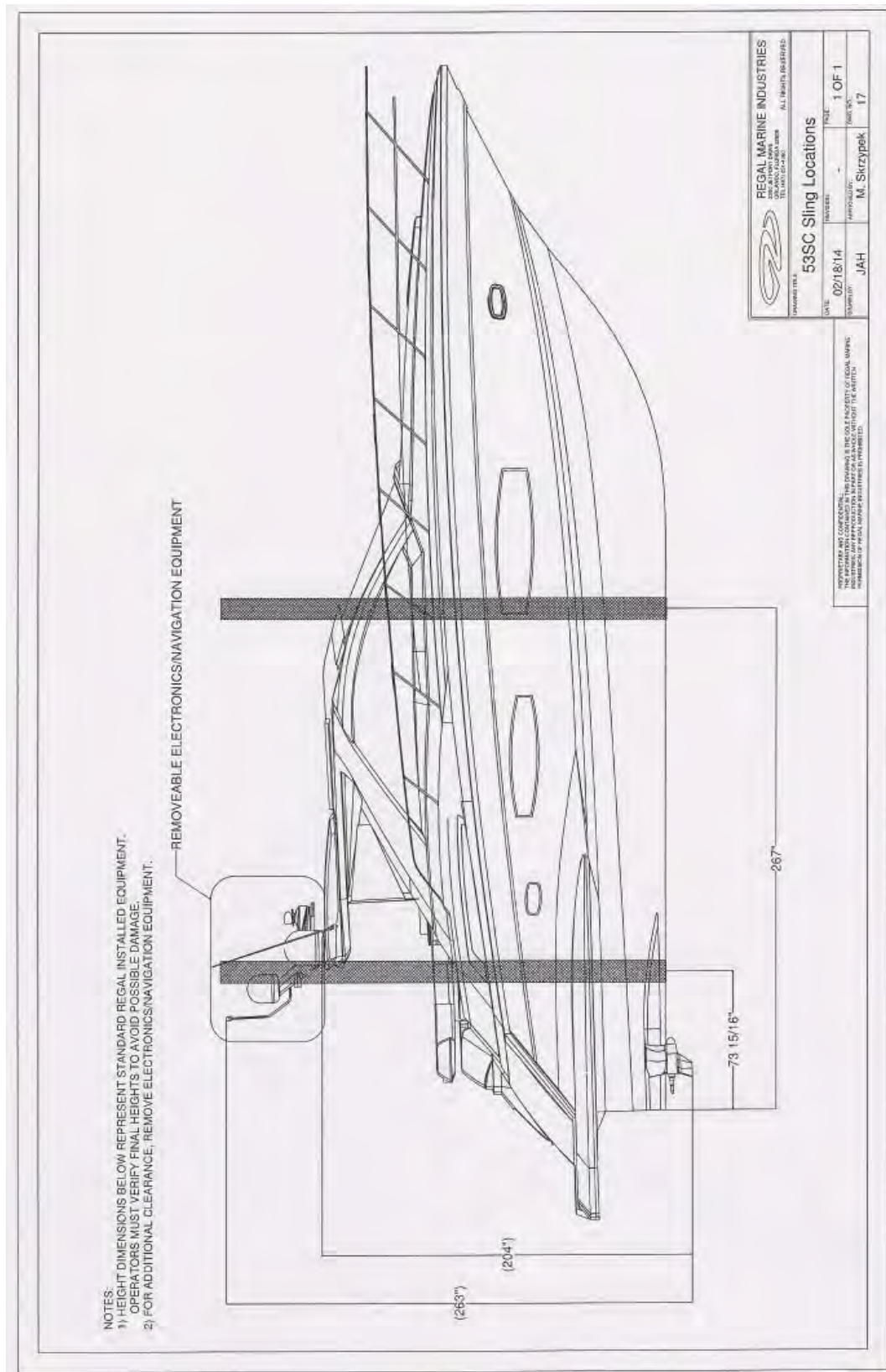
TYPICAL AFT SECTION



TYPICAL FORWARD SECTION



Auxiliary Equipment Operation





OIL CHANGE SYSTEM

An optional oil change system is installed on the forward bulkhead of the engine room. It is designed to remove crankcase oil from two diesel engines and a generator. Also, the unit refills each crankcase oil pan with fresh oil through a system of hoses and integrated pump. The unit features dry run protection.

The oil change system is housed in a fire retardant, high impact, high gloss case. The pump is solid brass with a special self-priming type impeller which pumps instantly whether in the drain or fill mode.

Power is supplied through the vessel's 12 volt DC system. There is a 25 amp breaker found on the DC distribution panel which is located on the forward engine bulkhead. It protects the system against overloads.

START-UP PROCEDURES

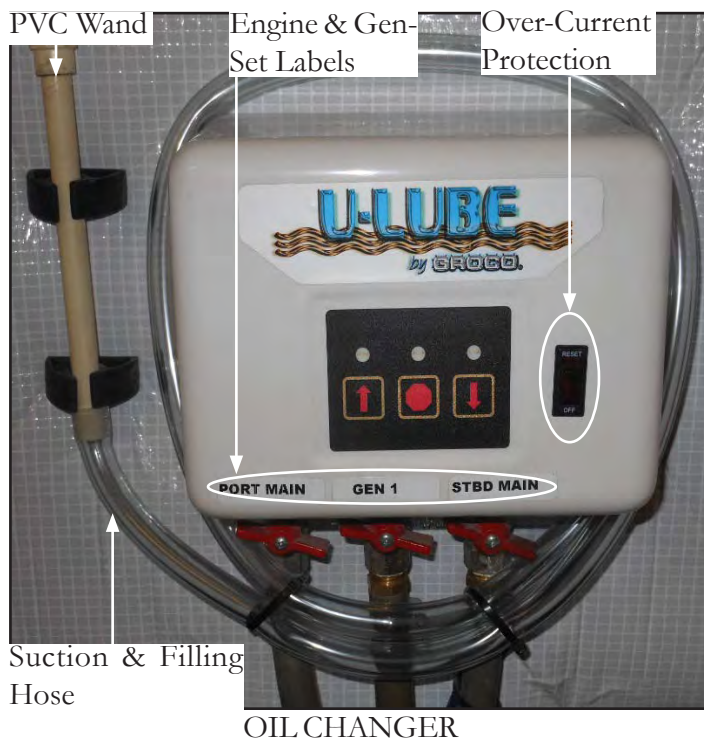
DRAINING OIL

When starting the system for the first time, air will be in all of the lines. To prevent pump and or system damage follow the procedure outlined below:

1. Ensure that the breaker is actuated.
2. Insert the PVC wand of the Drain/Fill Hose into a container and open the engine valve (turn clockwise). Press the panel circuit breaker to reset ; the stop symbol will illuminate indicating that power is present.
3. Press the appropriate arrow to start the pump. When the oil flow ceases press the stop symbol on the touch panel.

FILLING OIL

1. Place the PVC wand into a container with the recommended fresh oil, pre-measured with the correct amount of oil for the engine or generator.
2. Press the appropriate arrow that will allow fresh oil back into the correct engine.
3. Allow the pump to run for a few seconds after the bucket is empty to allow oil in the hose to be pumped into the engine.
4. When the engine(s) has been serviced press the panel circuit breaker to the off position.
5. Record the engine hours in your service log for the appropriate engine.



Auxiliary Equipment Operation

NOTICE

DISPOSE OF USED OIL IN AN
ENVIRONMENTALLY FRIENDLY FASHION
USING THE PROPER CONTAINERS.

NOTICE

DISCHARGE OF OIL PROHIBITED

THE FEDERAL WATER POLLUTION CONTROL
ACT PROHIBITS THE DISCHARGE
OF OIL OR OILY WASTE
INTO OR UPON THE NAVIGABLE WATERS
AND CONTIGUOUS ZONE
OF THE UNITED STATES IF SUCH DISCHARGE
CAUSES A FILM OR SHEEN UPON,
OR DISCOLORATION OF THE SURFACE
OF THE WATER, OR CAUSES A SLUDGE
OR EMULSION BENEATH THE SURFACE
OF THE WATER.

**VIOLATORS ARE SUBJECT TO
A PENALTY OF \$5,000**



OVERBOARD DISCHARGE PUMP (MACERATOR)

Theory- If installed, the overboard discharge pump (macerator)) can be used to pump out the holding tank in international waters. The overboard discharge pump utilizes an impeller type pump which grinds up the waste and passes the waste to a seacock located on the vessel bottom.



TYPICAL OVERBOARD DISCHARGE PUMP

There is a special interlock valve which works with the overboard discharge pump (macerator). This interlock valve is normally in the “closed” position when the macerator pump is off. The interlock valve features two sensors which react to a magnet imbedded in the underside of the handle. When the system is triggered power travels from the monitor panel “push” button switch to the valve which is opened and at that point activates the macerator. What makes the interlock valve such a unique feature is that the skipper does not need to manually open and close a seacock in the bilge each time the overboard discharge system is used.

The macerator system is protected by a 10 amp breaker located at the ship’s main DC distribution panel. For extended cruising it is recommended to carry extra macerator pump impeller.



TYPICAL INTERLOCK VALVE

For more detailed information on the interlock valve refer to the vendor literature. Also, see the wiring diagram in the technical section of this manual.

Auxiliary Equipment Operation

SATELLITE RADIO RECEIVER

This *option* is currently available on all Regal models. Sirius satellite radio features over 120 channels of music entertainment completely commercial-free along with sports and news channels. Sirius emphasizes the music and entertainment you want. Channels use the most updated digital filtering available for the clearest sound. Sirius uses three satellites flying over the United States for coast to coast coverage with high elevation angles. The result is a clearer line of sight and less signal blocking.

The system consists of the stereo receiver (sometimes called the head unit), radio tuner and antenna. With these components and an active account initialized by the customer on delivery) your Sirius system should be ready to operate.

Following are the activation steps to be taken:

A. Unit must be completely installed and the antenna must have a clear view of the sky.

B. Turn on the radio and go to satellite mode.

C. Confirm reception by tuning to SIRIUS WEATHER & EMERGENCY//CHANNEL 184. If you are not receiving Channel 184, please refer to the radio manufacturer owner's manual.

D. Call SIRIUS sales support 1-866-580-7234 or customer care 1-888-539-7474

E. Please have your name, address, phone number and the SIRIUS ID#ESN available for the agent.



SEA CHEST SELF-CLEANING STRAINER SYSTEM

Theory-

Normally seacocks with in-line raw water stainers feed raw water to multiple components including the engines, generator, air conditioners, and toilets. With that in mind these systems occasionally need to be shut down to clean the strainer baskets of debris.

The sea chest system employs a central macerator mechanism that grinds accumulated incoming line debris that would normally end up inside the strainer basket. This system eliminates the need for strainers and strainer cleaning on selected components.

An additional feature is connected to the generator system. A solenoid valve is found in line with the generator water intake for cooling the generator. This solenoid valve is normally closed. When the generator is cranked the valve assumes an open position and permits filtered sea-water to enter the generator water circulation system. See the sea chest diagram for more information.

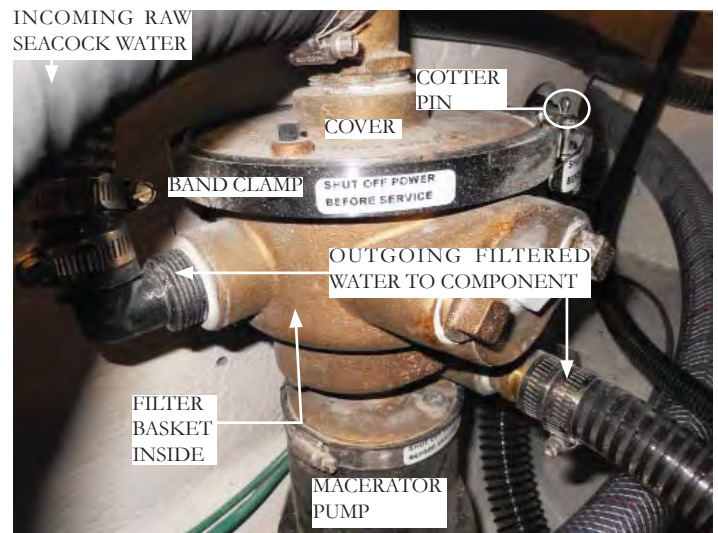
Operation-

With this option a large seacock with a grated scoop is attached to the outside hull. It forces raw water into the macerator and exits as filtered sea-water which is routed to selected auxiliary components mentioned above.

Electrically speaking there is a 30 amp breaker at the ship's main DC panel labeled SEA CHEST providing system over current protection.

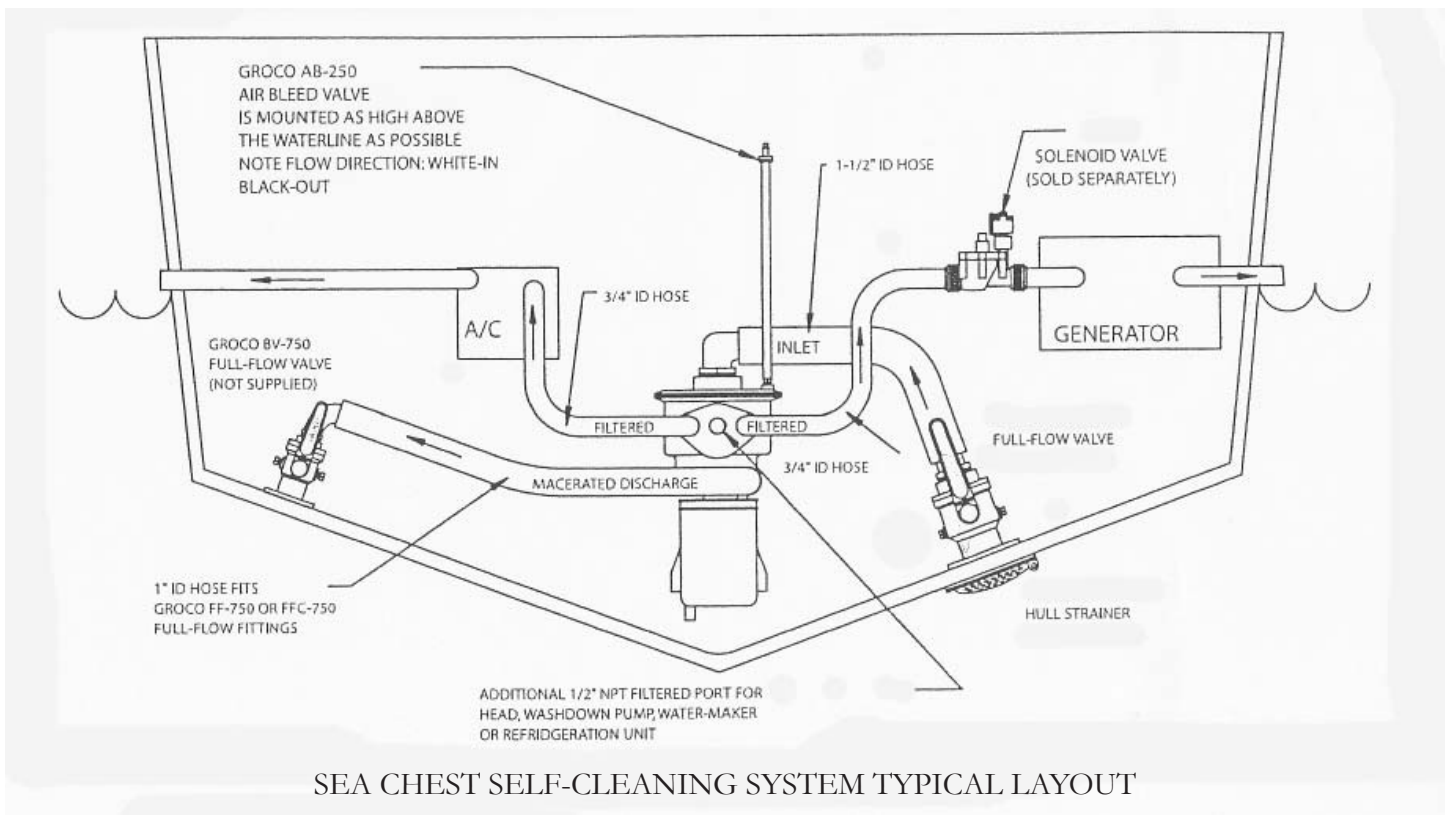
A 5 amp fuse protects the incoming circuit wiring and is located at the battery management panel. A 3 amp fuse is located on the bilge mounted operator's panel acts as a memory for the cleaning circuitry so it need not be reprogrammed when the main DC breaker is turned off. The house battery switch can be in either the ON or OFF position, as the Sea Chest memory breaker is a constantly energized circuit. See the operator's panel photo for more information.

*Note that the **engine strainer** baskets still require periodic cleaning, and are not part of the sea chest system.*



SEA CHEST OVERVIEW

Auxiliary Equipment Operation



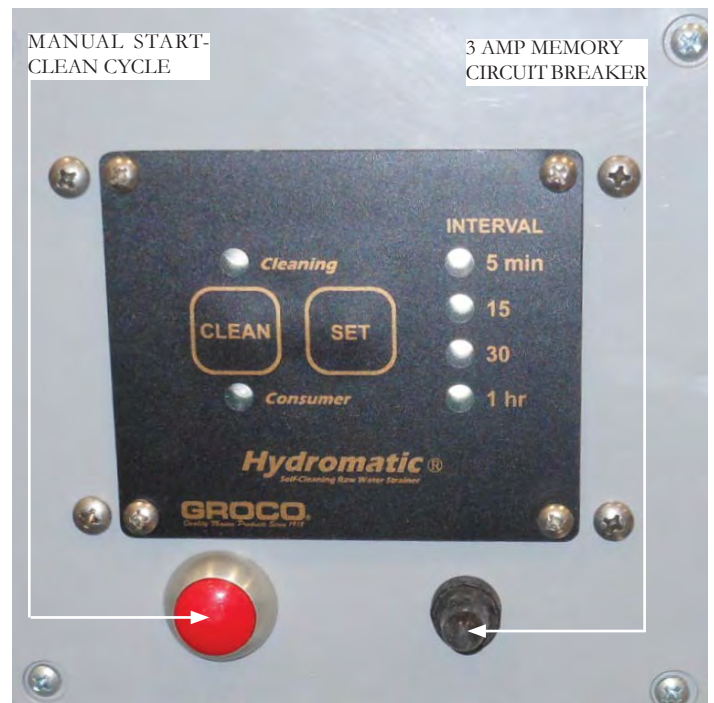
At the operator's panel clean, set, and interval functions can be programmed as follows:

1. To select an interval press "set" until the desired interval is displayed. If no light is illuminated, the control will not command a cleaning cycle.
2. To manually command a cleaning cycle press "clean" or the red button at the operator's panel. This will trigger a single cleaning cycle, and then return the control to the selected time interval.

Note: When power is initially applied, a self-test routine will occur during which all lights will illuminate alternately. Then all lights will go out.

Note: The operator panel lights illuminate when the main 30 amp breaker is turned off. This is a normal function and the system will assume the previous setting once breaker power is activated.

SEA CHEST SYSTEM OPERATOR'S PANEL





SEAKEEPER (Stabalizer)

Introduction-

Resonant boat roll is the most disorienting contrast with dry land experience and the least desirable motion on a boat. Uncomfortable, tiring, and probably the greatest cause of seasickness, it has been an unavoidable price to pay for many for the pleasure of being on the waterways. Seakeeper's® unique state-of-the-art motion control system actively regulates the hydraulic braking system to ensure the anti-roll torque is maximized for all hull designs and for the ever-changing operating and sea conditions.

Theory Of Operation-

Read the following pages for an introduction to operating the gyro. For more detailed information refer to the Seakeeper Operation Manual. Read and understand all safety warnings before attempting to operate the device.

If installed, the Seakeeper® uses a gyroscope (gyro) to reduce boat roll motion. The gyro gimbal rotation angle around a predetermined axis (precession rate) is the basis of its operation. The amount of torque applied to the vessel hull to counter a wave induced roll is directly proportional to the gyro precession rate.

The further the gyro is from a vertical zero degree position the lower the anti-roll torque. The entire cycle is actively controlled by an electronic controller and a hydraulic brake system during each roll. At this point the gyro supplies the maximum rolling torque and avoids mechanical contact with hard stops. The mechanism is limited to a maximum gimbal swing of +/- 60 degrees.

The gyro features a flywheel integrated inside a cast aluminum vacuum-tight enclosure. The flywheel spins around the vertical axis and is supported by bearings. A brushless motor found inside the enclosure turns the flywheel at high velocity.

The gyro enclosure is secured to two gimbal shafts that are supported by a pair of gimbal bearings on each side. These shafts produce an athwart ship gimbal axis for the gyro to precess to the specified angles.

The gyro enclosure is secured to two gimbal shafts that are supported by a pair of gimbal bearings on each side. These shafts produce an athwart ship gimbal axis for the gyro to precess to the specified angles.

Each gimbal bearing is supported by saddle beams which are bonded to the hull stringers. These beams transfer the loads that the gyro produces to the hull.

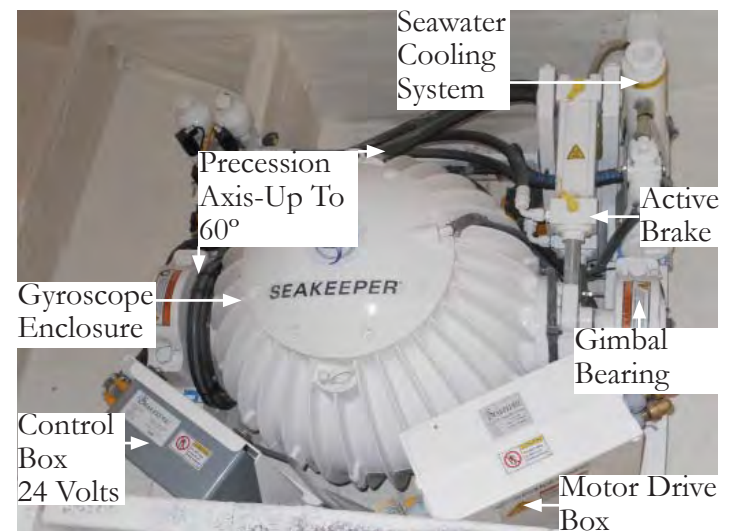
An active hydraulic brake mechanism regulates the rotation about the gimbal shaft.

The gyro features a closed cooling system with heat exchanger and reservoir, and temperature regulating valve. System uses glycol anti-freeze routed through the motor drive box, hydraulic manifold, and the end caps of the enclosure to remove heat.

There is a helm mounted display panel used to start, operate, monitor and shutdown the gyro.

Display provides information in the event of an alarm.

Alarms cause the precession process to stop (Lock) and the gyro to start coasting down (Stop).



Auxiliary Equipment Operation

Initializing-

To operate the Seakeeper start the 15 KW upgraded generator and let it run for a few minutes. Remember that the generator is the source of power while at sea. Refer to chapter 4 for generator information. The stabilizer circuit breaker found on the 240 volt side of the ship's AC panel needs to be energized. Next, there is a circuit breaker on the 12 volt (DC) side of the ship's panel marked stabilizer that needs to be activated. Power will now be available to the helm mounted display panel. At this point the Seakeeper can be powered up.

Read the following pages for an introduction to initializing the gyro. For more detailed information refer to the Seakeeper Operation Manual. Read and understand all safety warnings before attempting to operate the device.



Display Screens: Overview

- 1) When voltage is initialized at the Gyro Control Box, a splash screen will be shown.



- 2) After the DISPLAY has initialized the HOME screen will be displayed



- 3) The DISPLAY has a set of five buttons that are under the BUTTON ICONS that appear on the display screen. The BUTTONS are the means for selecting the functions of the DISPLAY.



Auxiliary Equipment Operation




a. HOME Screen BUTTON ICON function

i. GYRO ON/OFF and FAULT RESET


1. The ICON will change from red (GYRO OFF) to green (GYRO ON)
2. The ICON will turn red indicating the GYRO is off when a fault appears
3. When a FAULT occurs the BUTTON is used to reset the active fault

ii. GYRO LOCK/UNLOCK

1. When the GYRO control is initializing, or the GYRO off, the lock symbols will both be blue
2. When the GYRO is in LOCK mode, stabilization is off, the LOCK

symbol will be red 

3. When the GYRO is UNLOCK, stabilization is on, the UNLOCK symbol

will be green 

iii. DISPLAY DAY/NIGHT

1. Toggles the DISPLAY brightness between the Day and Night settings



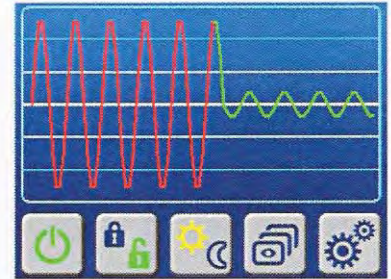
1. Switches the HOME screen views from an animation screen, to a screen displaying arrows with no animation, to a screen that shows GYRO rate on a graph



Home Screen with Animation:
Flywheel will be spinning and
gyro stabilizing




Home Screen with Arrows for
flywheel spinning and stabilizing



Home Screen indicating Gyro
Rate

- v.  SETTINGS SCREEN

1. Changes from the HOME screen to the SETTINGS screen

- 4) When the button is depressed for the SETTINGS screen  the DISPLAY changes to the SETTINGS screen



a. SETTINGS screen BUTTON ICON functions

Auxiliary Equipment Operation

SEAKEEPER SPECIFICATIONS

Rated RPM	8,000 RPM
Angular Momentum at Rated RPM	8,000 N-M-S
Anti-Rolling Torque at Rated RPM	17,143 N-M
Spool-up Time to Rated RPM	35 Minutes
Spool-up Time to Stabilization (75% Rated RPM)	20 Minutes
Spool-up Power	
AC Motor	3000 Watts Max
DC Motor	240 Watts
Operating Power	
AC Motor (Sea state dependent)	1500-2500 Watts
DC Control	240 Watts
Voltage	
AC Input	208-230 VAC ($\pm 10\%$), 50/60 Hz, Single Phase
DC Input	24 VDC @ 10 Amps
Sea Water Supply to Heat Exchanger	30 LPM (8 GPM) maximum 15 LPM (4 GPM) minimum
Maximum Ambient Air Temperature	60 Deg C (140 Deg F)
Weight	549 Kg (1210 Lbs)



WARNING

AVOID SERIOUS INJURY OR DEATH FROM HIGH VOLTAGE COMPONENTS.

THE COMPACT MOTOR DRIVE BOX CONTAINS HIGH VOLTAGE ELECTRONICS AND THE COVER SHALL NOT BE REMOVED WHILE THE FLYWHEEL IS SPINNING EXCEPT BY AN AUTHORIZED TECHNICIAN. THIS HIGH VOLTAGE EXISTS EVEN IF THE FLYWHEEL IS COASTING DOWN AND THE SUPPLY VOLTAGE HAS BEEN SHUT OFF.



WARNING

AVOID SERIOUS INJURY OR DEATH DUE TO REVOLVING COMPONENTS.

IF IT IS NECESSARY TO STOP GYRO MOTION PRESS THE LOCK/UNLOCK BUTTON; THE LOCK SYMBOL WILL TURN RED INDICATING THAT THE GYRO IS LOCKED. NEVER ATTEMPT TO WORK ON THE GYRO UNTIL THE FLYWHEEL HAS STOPPED SPINNING. IN THE EVENT THAT THE GYRO SYSTEM HAS AUTOMATICALLY LOCKED THE GYRO DUE TO AN ALARM OR FAILURE, NO ATTEMPT SHALL BE MADE TO BYPASS THE ALARM OR THE AUTOMATIC LOCK.

NOTICE

THE CIRCUIT BREAKERS SHOULD BE LEFT ON AS LONG AS POSSIBLE WHILE THE GYRO IS SPINNING TO REMOVE HEAT FROM GYRO. DURING NORMAL OPERATION, THE GYRO SHOULD BE STOPPED WHEN PULLING INTO PORT AND STABILIZATION IS NO LONGER REQUIRED. THIS MAXIMIZES LONG TERM LIFE AS IT ALLOWS THE GYRO TO START THE COAST DOWN CYCLE BEFORE COOLING IS SHUTOFF. ONCE THE VESSEL IS SECURED IN THE SLIP AND THE CREW HAS SHUT DOWN THE GENERATOR AND ENGINES, THE AC AND DC BREAKERS THAT CONTROL THE GYRO SHOULD BE SWITCHED TO THE OFF POSITION. THE GYRO WILL CONTINUE TO SPOOL DOWN TO ZERO RPM. NOTE GYRO WILL TAKE 4.5 HOURS TO COAST DOWN TO ZERO RPM FROM FULL SPEED. THE DISPLAY WILL INDICATE 0 RPM WHEN THE FLYWHEEL HAS STOPPED.

Auxiliary Equipment Operation

SHOWER-TRANSOM TYPICAL



The transom shower is located at the aft port cockpit. The shower head features a flexible extended hose with hot and cold water. Like residential plumbing, the red knob denotes hot water and the blue knob cold water. When using this feature balance the hot and cold knobs to achieve a desired operating temperature. Turn the knobs to the “off” position when not using the unit.



SIRIUS MARINE WEATHER

This option provides peace of mind and safety by allowing the captain to access the latest weather information through satellite. The data can be viewed through the Garmin GPS/Plotter (option) at the helm or the salon television.

The service provides comprehensive weather data and state-of-the-art forecasting including buoy reports, WSI NOWRad® (nationwide high-resolution weather radar imagery) to anticipate coming trouble and high-resolution sea surface temperatures that can help fisherman.

Subscribers can use the SIRIUS satellite footprint which blankets 48 contiguous states, most of Canada and Mexico; and waters extending hundreds of miles into the Atlantic and Pacific oceans, the Gulf of Mexico and Caribbean.

SIRIUS MARINE WEATHER ACTIVATION

1. Power up the receiver by activating the power button on the Garmin GPS/Plotter.
2. Dial 1-800-869-5480 to activate the service. The customer normally carries out this operation.
3. Be prepared with your billing information, subscription preferences and the SIRIUS ID# for your receiver.
4. The SIRIUS ID# of your receiver will be viewable via the Garmin GPS/Plotter.

OVERVIEW

The following information is for United States weather only. A Navtex receiver must be used for worldwide weather.

The weather application superimposes historical, live and forecasted weather graphics and their associated weather data on the “E” series GPS/Plotter. All this information allows the skipper to determine the actual conditions in his vicinity or at another location. Weather forecasts and warnings, detailing current and preferred conditions are updated often using the WSI NOWRad® system.

For types of warnings, watches and advisories, please refer to the NOAA website at www.nws.noaa.gov.

OPERATION

To operate SIRIUS marine weather:

1. The Garmin receiver must be up and running. Also, it will not work in a covered boat house or dwelling.
2. The “Garmin GPS/Plotter must be energized.
3. For your vessel to be displayed and for weather reports to be available at your position, you will need a fix for your boat’s position and be within US coastal waters.
3. You must customize a page to include a weather application. The weather application normally is not part of the pre-configured page sets. See the following page.
4. Specify the weather elements you want to display.
5. When you open the weather application, a map is displayed. If you have fixed a position for your vessel, the map will be centered on your boat.
6. Use the cursor to move around the map and view different locations. Use the range button to zoom in and out. For re-centering the map on your boat, use the FIND SHIP soft key.

Auxiliary Equipment Operation

Weather Application Set-Up

To customize a page on the Garmin GPS/Plotter for weather refer to the Garmin plotter literature in the owner's information packet.



SPOTLIGHT



The spotlight feature a 20,000 candle power light beam which can penetrate up to over 1/2 a mile in ideal conditions. The 2 speed searchlight provides up to 370° horizontal rotation and up to 135° vertical tilt

with a dash mounted fingertip control pad. The bulb provides superior light penetration. Included is a protective lens cover.

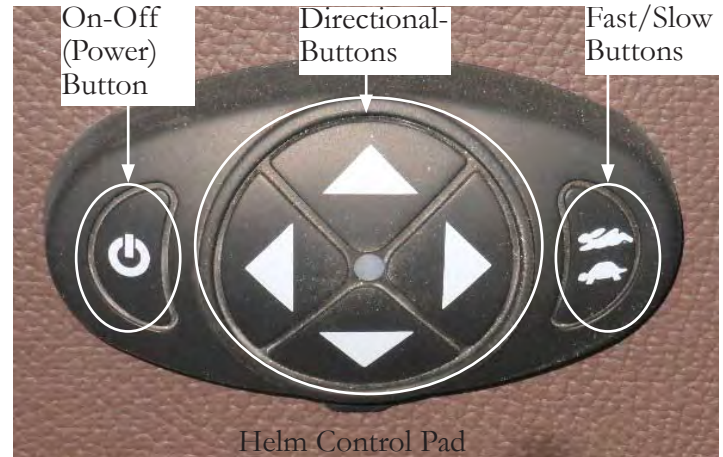
Note that the searchlight is a radio transmitter and operates at 433Mhz. When the light is activated, the internally mounted antenna sends out radio frequency (RF) energy. Note that it is possible that this component could affect other electronic equipment. Refer to operator's manual for possible solutions should this occur.

Operation-

1. Using the dash mounted remote control, turn the unit on by depressing the on/off button.
2. Using the same dash mounted remote control, rotate your light to the desired location.
3. The light speed can be controlled by depressing the fast/slow button one time and by depressing it again to restore the original speed.
4. The light should not be turned on when the snap on lens is attached. The hard wired dash control will be backlit when the bulb is illuminated.

The dedicated circuit is uses a 10 amp breaker on the power side for overcurrent protection.

The unit uses a Phillips 9011 bulb replaceable from Go-light, Inc. at 800-557-0098.



Note: If you remove the rubber cover from the helm control pad you will see 2 batteries. Should the unit not function correctly replace with 12 volt alkaline batteries. When purchasing check for correct type and amperage.

Auxiliary Equipment Operation

SUN PADS

The forward deck features dual sunpads. Each sun pad is lightweight making it easier to transport to the deck and easier to store. The dual foredeck sunpad must be used only when the boat is stopped to avoid anyone falling overboard. Make sure the cushions are snapped down securely. It is a good idea to store the sunpad cushions when not in use to prevent them being blown overboard should the yacht encounter inclement weather while underway.



WARNING

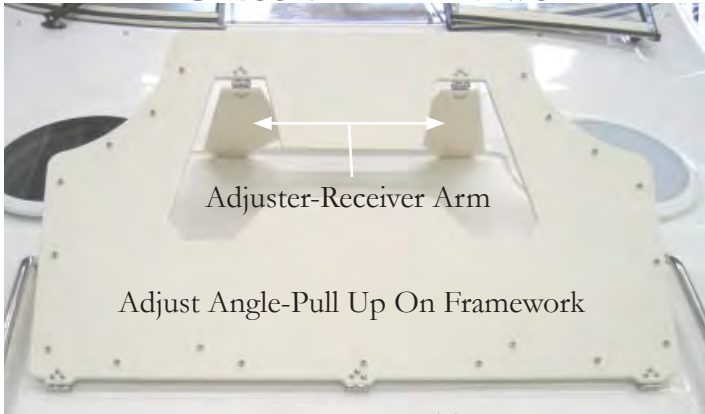
AVOID SERIOUS INJURY OR DEATH
DUE TO FALLING OVERBOARD!
DO NOT USE THE DECK
SUN PAD WHILE BOAT IS MOVING.



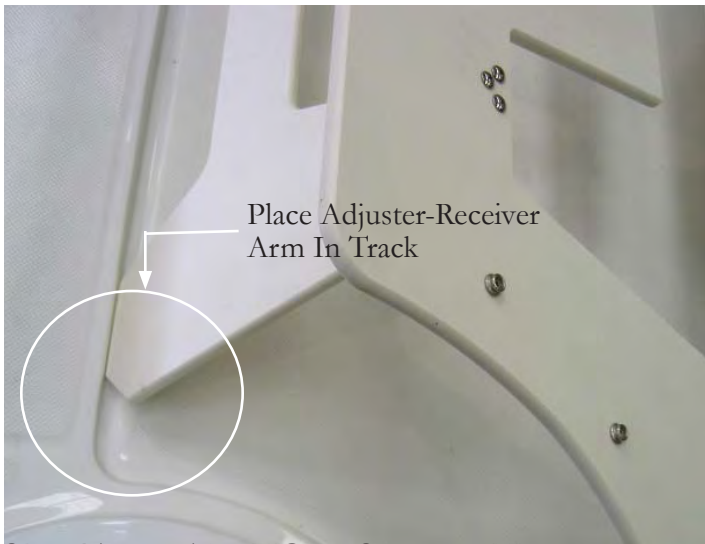
Chapter 7

To use the chaise lounge portion of the sun pad, pull up on the framework from a side position. Then pull the adjuster-receiver arm to stern which will lock it at the desired angle. Ensure that the arm is secured in the deck track. See the illustration.

TYPICAL SUN PAD FRAMEWORK



SUNPAD FRAMEWORK-FRONT VIEW



SUN PAD FRAMEWORK-SIDE VIEW

Auxiliary Equipment Operation

SUNSHADE-(SURESHADE™)



As an option, the Sureshade ATFT™ is an electric power driven retractable shade system that with the push of a button extends and retracts.

The system uses Sunbrella® solution dyed marine canvas (natural color) for optimum durability. Sunbrella canvas resists fading and mildew. Also, it carries the Skin Cancer Foundation's Seal of Recommendation for sun protection.

The Sureshade tele-frame system is integrated into the aft hardtop and is self-supporting. Dual synchronized 12 volt attached actuators drive the stainless steel tubes. The system draws a maximum of 7 amps. The synchronizer box is located in the starboard engine room at the firewall bulkhead below the battery management panel. It is normally not a serviceable item.

For additional information refer to the literature in the owner's information packet located in the port master stateroom drawer or go to the web-site.



SURESHADE™ SPECIFICATIONS

Functional Specification	
Extension length	6' or 7'
Width	Up to 12'
Hardware Specification	
Actuator Material	316SS
Framework Material	316SS
Mounting Component Material	316SS
Actuator Placement	Integrated w/in bridge or hardtop Top surface-mount Underside surface-mount
Roller Configuration	Straight or cambered spring-tension roller
Roller Position	Traveling or stationary
Canvas	Marine-grade acrylic, any color
Electrical Specification	
Voltage	12v or 24v
Amperage	6-7 amps
Operating Device	Toggle switch and remote control
Controller Type	Software-based synchronization
Controller Dimensions	5" x 7" x 1.5"
Structural Specification:	
Maximum wind speed:	55mph
Maximum weight displacement	300 lbs across framework
Deflection	Less than 3"

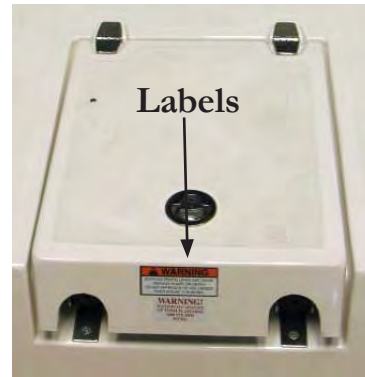
Auxiliary Equipment Operation

SWIM (BOARDING) LADDER

When using the swim (boarding) ladder open the hatch and slide the ladder out to the end of the travel. Then flip the ladder over and let it down gently. Make sure you keep your hands and fingers clear of any moving ladder parts especially the hinged top.

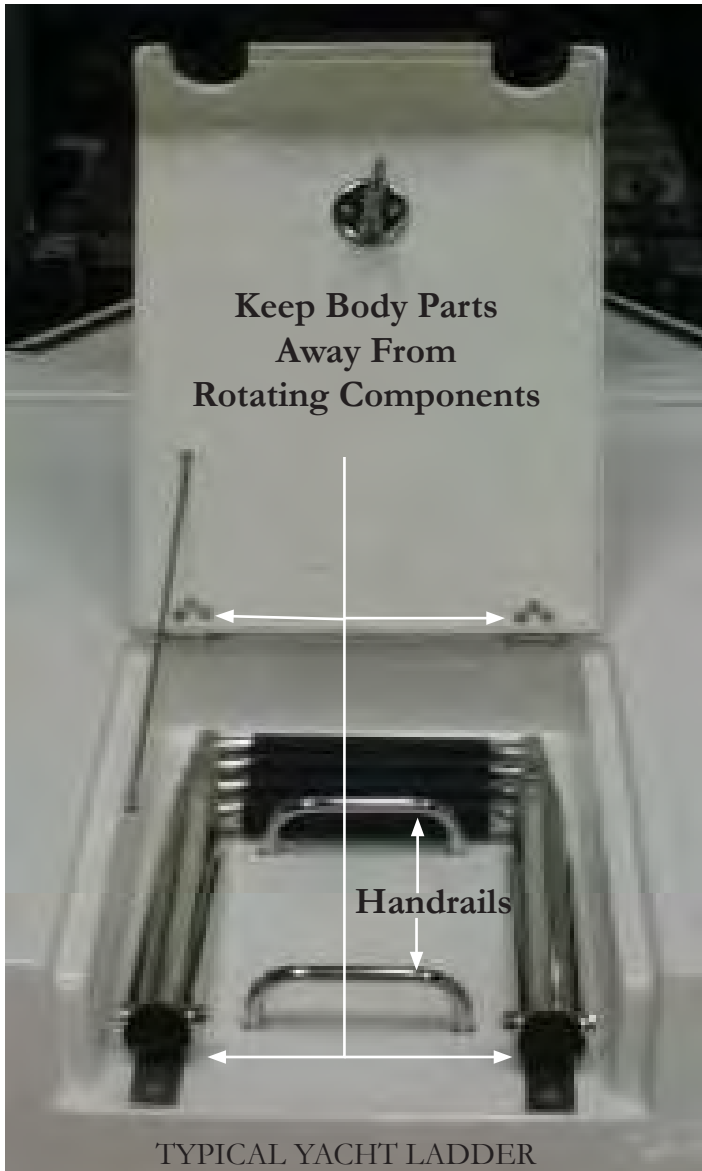
Use the safety handrails to ease water entry and exit. When not using the swim ladder be sure to keep the ladder cover over the ladder to prevent tripping and falling accidents.


Insist that only one person use the ladder at a time. When finished with the ladder flip up the lower section of the ladder and slide the ladder assembly in as far as possible. Lower the fiberglass ladder cover to secure it.



Periodically check the ladder hardware for tightness and corrosion. Replace fasteners and lubricate hinges as needed. Read and understand all warning and information labels found on the swim platform and ladder cover. Never exceed the maximum poundage recommended for the swim

platform as noted on the label.



	WARNING
TO AVOID BODILY INJURY TURN THE ENGINES AND GENERATOR OFF AND REMOVE THE IGNITION KEYS WHILE PEOPLE ARE SWIMMING NEAR THE VESSEL AND/OR USING THE SWIM PLATFORM OR LADDER.	



SWIM PLATFORM


The swim platform is used with the boarding ladder to enter and exit the water. Never dive from the swim platform or swim under it. The swim platform is not intended to be used for storing heavy objects. Keep the platform surface free of objects to prevent bodily injury due to falling. Periodically inspect all swim platform fasteners and stanchions under the platform for tightness and corrosion. Replace parts as needed.

Do not exceed the swim platform recommended poundage capacity.


Use the swim platform cleats for temporary tying only such as an on-the-water restaurant or fuel dock. Use the other deck cleats for permanent moorings. When securing lines leave enough slack for local tidal changes.

Never use the swim platform cleats for towing!

Never attempt to lift the boat using the swim platform or any other cleats on the vessel! See the section on sling markers. Never swim around or under the swim platform while the engines are running due to the effects of carbon monoxide poisoning. Read and understand all CO labels.

**WARNING**

TO AVOID BODILY INJURY
TURN THE ENGINES AND GENERATOR OFF
AND REMOVE THE IGNITION KEYS
WHILE PEOPLE ARE SWIMMING
NEAR THE VESSEL OR USING THE SWIM
PLATFORM OR LADDER.

**WARNING**

AVOID SERIOUS INJURY OR DEATH!
NEVER OPERATE THE VESSEL
WITH PEOPLE ON TOP OR HOLDING ON TO
THE SWIM PLATFORM
STRUCTURE OR HARDWARE.



TYPICAL YACHT SWIM PLATFORM

Auxiliary Equipment Operation

SWIM STEP

If installed, the swim step option provides an easy water entry for aquatic toys, divers, etc. This option is powered by dual actuators run by the ship's 12 volt DC system. The system is protected by a 30 amp breaker located on the forward engine room bulkhead.



TRIM TABS-AUTO-GLIDE™ SYSTEM

Overview

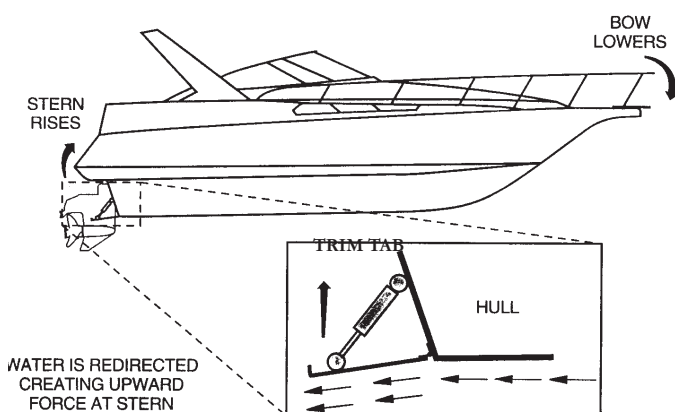
Auto-Glide trim tabs are installed on the lower hull outside transom area. They measure 24" wide by 16" deep. Water is deflected and redirected as the trim tabs are raised and lowered from the dash switches. This change in water flow creates upper pressure under the tabs, and raises the stern. When the stern rises, the bow is lowered. Lowering the port tab will cause the port stern to rise, making the starboard bow lower. Lowering the starboard tab will cause the starboard stern to rise, making the port bow lower.

Using trim tabs will compensate for uneven weight distribution, listing, water conditions, wind velocity and other factors that cause inefficient operation.

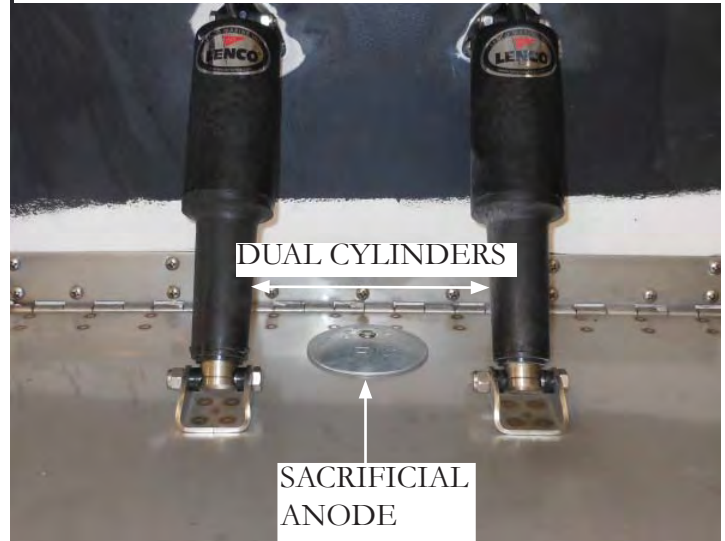
The Auto Glide™ boat control system option is the first fully automatic trim tab system available to yacht owners. These trim tabs can be used in an automatic or manual mode.

The system uses unsurpassed technology to monitor boat speed and position, and when in the auto mode adjusts the trim tabs position to accommodate any of the above boating conditions to provide a smoother, more comfortable ride.

This allows the captain to run his yacht the way it was designed to perform resulting in fuel savings and safety-improved visibility, hole shot mode and running angle. The trim tab electronics system is compatible with the CANBUS (Controller Area Network) network used on marine engines. The tab electronics are connected into the yacht's NMEA 2000 plug and play communication system.



Note that anodes should be replaced when one-third sacrificed. Anodes help defend against electrolysis.



TRIM TAB TRANSOM OVERVIEW

Your Regal yacht reaches a planing position at a designated speed determined by bottom design, weight distribution, water conditions, and on board equipment. As the throttle is advanced the stern squats and the bow rises initially. The trim tabs allow your boat to plane at a slower speed than natural conditions allow.

As the boat breaks over the bow high attitude the boat speed accelerates and visibility increases.

If the boat is over trimmed, it will plow the bow and the boat will lose maneuverability. The Auto Glide system can automatically compensate for stern drive over trimming. This will produce a drier and more comfortable ride.


When trimmed or in the bow down position, the bow spray is farther forward, the wake is smaller, and positioned further behind the vessel. Also, when trimmed you will notice that the tachometers show an increase in rpm's.

Your vessel can use the trim tabs to rectify a list. The trim tabs adjust the boat's attitude in the direction the helm. Porpoising is a running condition where the bow "bounces" up and down similar to a porpoise motion. With the Auto Glide system porpoising will recede and the vessel speed should increase.


Auxiliary Equipment Operation

System Components


Main parts of the trim tab system include the helm mounted switch, control box, NMEA 2000 cabling, wiring, trim tab cylinders and tab plates.

**WARNING**

READ AND UNDERSTAND THE TRIM TAB OPERATOR'S MANUAL BEFORE ATTEMPTING TO OPERATE THE SYSTEM!

**CAUTION**

MAKE SURE THAT ALL SET-UP FUNCTIONS ARE COMPLETED BEFORE USING THE ON BOARD TRIM TAB SYSTEM!

**WARNING**

DO NOT OPERATE THE AUTO GLIDE SYSTEM IN "AUTO" MODE WHEN ENCOUNTERING DANGEROUS SEA CONDITIONS OR ABNORMAL CIRCUMSTANCES!

Operation

The trim tab system is set at the factory before testing it. It is recommended by the trim tab manufacturer to go through the test mode cycles described in the operator's manual in order to verify the different functions. These include making sure the actuators are operating properly and that the Auto Glide™ system is receiving the CANBUS engine data required to make the automatic leveling decisions. Refer to the trim tab operator's manual.

In addition, the factory sets the basic home roll and pitch attitudes of your yacht, but 2 default positions must be set to properly control the automatic pitch and roll boat attitude. Refer to the trim tab operator's manual.

There is a trim tab circuit breaker located at the master stateroom electronics sub panel locker.

As a general rule for running and balancing loads with available Zeus and Lenco tab systems on your vessel, run the Zeus system in the Auto mode. Then do your fine tuning with the Lenco tab system.

Note that the Lenco Auto Glide control box is located under the headliner whisper wall and is not a serviceable component.

How-to-video's are available at www.lencoautoglide.com or by calling 772-288-2662.



LENCO AUTO GLIDE CONTROL BOX



AUTO GLIDE™ | Quick Reference Guide

AUTO DEFAULT HOME SETTING

"AUTO" mode is activated upon ignition. Press at any point to enable default home position.

DN PORT DOWN Press to manually lower the bow's port side. Light above illuminates to indicate activity.

PITCH INDICATOR

Indicates the boat's pitch position based on current settings.

UP PORT UP Press to manually raise the bow's port side. Light below illuminates to indicate activity.

FAV 1 CUSTOM SAVED SETTING

Press and hold until light flashes in order to save boat's current position.

or

Press briefly to activate your saved FAV 1 setting. Light will illuminate upon activation.



TO OVERRIDE AUTOMATIC SETTINGS (AUTO, FAV 1, FAV 2, OR HOLD) AND MANUALLY CONTROL THE TRIM TABS, SIMPLY PRESS ANY OF THE UP OR DN BUTTONS. AT THIS POINT, ALL AUTOMATIC BOAT CONTROL DECISIONS STOP AND YOU ASSUME FULL MANUAL CONTROL OF THE TRIM TABS.

HOLD CUSTOM TEMPORARY SETTING

Press briefly to hold boat's current position. Light illuminates upon activation. Custom setting will not be saved.

DN STARBOARD DOWN Press to manually lower the bow's starboard side. Light above illuminates to indicate activity.

ROLL INDICATOR

Indicates the boat's roll position based on current settings.

UP STARBOARD UP Press to manually raise the bow's starboard side. Light below illuminates to indicate activity.

FAV 2 CUSTOM SAVED SETTING

Press and hold until light flashes in order to save boat's current position.

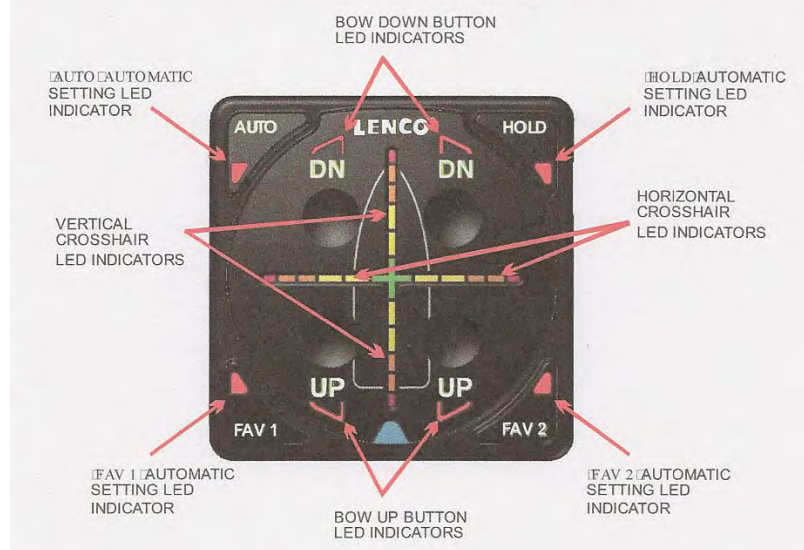
or

Press briefly to activate your saved FAV 2 setting. Light will illuminate upon activation.

SLIGHT TURN Your current automatic setting LED INDICATOR will blink slowly when the Auto Glide is in YAW LOCKOUT during slight turns. The Auto Glide will not correct for changes in ROLL angle.

SHARP TURN Your current automatic setting LED INDICATOR will blink faster when the Auto Glide is in YAW LOCKOUT during sharp turns. The Auto Glide will not correct for changes in ROLL or PITCH angle.

KEY PAD - LED INDICATOR OVERVIEW



Auxiliary Equipment Operation

UNDERWATER LIGHTING

OVERVIEW

The underwater light option provides high output, long life and low heat emission. The lights are made from a high impact resistant polycarbonate housing. The lights are installed under the transom for maximum efficiency. Their beam is blue for increased underwater penetration.

OPERATION

The underwater lights are energized through the dash underwater light switch or on the stairway switch panel. *Remember that which ever switch is used to turn on the lights must be used to turn the lights off since there is no 3 way switch technology used.*

They feature the latest LED (light emitting diode) technology which eliminates the filament found in older lighting products and therefore is more adaptable to the harsh marine environment along with not being affected by vibration. The LED circuit is solid state and does not contain any mercury so it is environmentally friendly. Furthermore, the life span of the LED unit is normally much longer over other light types.

Note that the underwater lights feature the ability to show a solid light stream, can be set to strobe or can assume a vendor set automatic fade or (dim) position.

1. To use the normal solid light stream turn the switch to the “on” position.
2. To strobe the lights, quickly press the switch to the off and on position.
3. To enter the fade (dim) automatic position. quickly press the switch again to the off and on position.

Note that what ever position the lights were left in will be assumed when the light switch is later reactivated.



LED Underwater Light



WATER MAKER



If installed the water maker utilize the principle of “reverse osmosis; a high pressure pump forcing sea-water through a membrane which allows water but not salt to pass. The system includes a 50 amp overcurrent protection breaker located in the engine room mounted on the forward firewall bulkhead.

Auxiliary Equipment Operation

WINDSHIELD DEFROSTER SYSTEM



Mounted under the main cabin whisper wall ceiling panel is a blower-heater motor for defogging the windshield. This feature is especially useful in high humidity and colder environments where the A/C tends to cause water vapor to condense on the windshield glass.

When the helm defrost switch is activated the blower motor sends warm air on to the windshield to assist with defogging it.



WINDSHIELD CENTER VENT

AIR
CYLINDER



AIR TANK W/
BLEED VALVE



The center windshield features an opening vent. The system features an air cylinder in the vent track along with an air pump located in the starboard engine room along with a regulator mechanism found under the main cabin overhead whisper wall fabric. When the port helm vent window momentary toggle switch is activated to the “up” position the air cylinder pushes the vent upward. To close the vent activate the “down” portion of the momentary toggle switch. The regulator does not normally need to be adjusted and it is a yacht dealer repair item since the headliner needs to be removed for access.



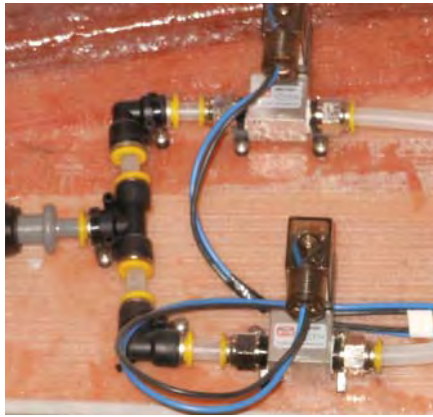
AIR REGULATOR

Auxiliary Equipment Operation

WINDSHIELD WASHER-WIPER SYSTEM



The windshield washer system utilizes on board potable water to clean both port and starboard windshields. Located on the starboard helm panel are 2 windshield wiper switches. As part of these switches there is a small button inserted in the upper switch when depressed sends fresh water through the windshield wiper assembly to the glass. By activating



the button alone, the windshield will output water and make 2 sweeps with the wiper before turning off.

Note that the both wiper switches feature low, high and off positions. The water originates at



the water manifold under the aft main floor. It is delivered by a system of relays and a solenoid valve (located under the main cabin headliner Whisper Wall). Note that the windshield wiper motors are located under the same headliner whisper wall area. Since working on the cabin headliner requires special procedure and tools the repairs should be left to an authorized Regal yacht dealer.

Cosmetic Care & Maintenance

COSMETIC CARE



This chapter covers the general care of your Regal yacht. Be sure to read and understand all vendor supplied information on cosmetic care. Many cosmetic care topics are described and expanded in the following pages. For selected items there may not be specific

vendor information available in the owner's information packet. Therefore, we have provided customer cleaning information as needed on each of these topics.

Where cleaning methods are suggested try them on a small area before applying to the entire surface. Never use toxic or caustic chemicals on your yacht. Read and understand each cleaning agent before using it. The labels will alert you to limitations and safety information for each cleaner.

Never mix cleaning agents since this may produce an unsafe chemical reaction which could be toxic, produce fire or explosion and/or effects that may be harmful to the human body.

Provide fresh air while using cleaning agents to reduce any effects of chemical inhalation by opening hatches, portlights and the main companionway door. It is recommended to vacate the area until any chemical odors are diminished.

Most of all, use common sense!





TABLE OF CONTENTS

COSMETIC CARE

Bilge-Engine Compartment
Bottom Paint
Cabinets
Carpet
Countertops- Solid Surface
Electric BBQ
Fabrics-Interior
Fiberglass & Gelcoat
Flooring
Gauges/Switch Panels
Granite
Hull/Deck
Microwave Oven
Plastics
Range
Spotlight
Stainless Steel
Stains
Upholstery
Vacuum Style Head Systems
Windshield Window Film
Whisper Wall

MAINTENANCE

3	Air Conditioner	26
4	Batteries	29
5	Battery Charger	31
6	Battery Parallel Switch	32
8	Bilge Pump/Float Switch	33
9	Carbon Monoxide Detector	34
9	Compass	34
10	Cord Reel System	35
12	Cummins Engines	36
13	Door-Cabin Entry	40
14	Electronics-General	40
16	Electronics- VHF Marine Radio	41
16	Fire Extinguishing System	42
17	Fuel System	43
17	Generator-Diesel	44
18	Ground Fault Outlet	54
18	Heater-Hot Water	55
19	High Water Alarm	56
20	Horn	57
23	Oil Change System	58
24	Plumbing Connections	59
24	Pump-Fresh Water	60
	Pump-Overboard Discharge	61
	Sea Chest Filtration System	62
	Seakeeper Stabilizer System	63
	Sirius Marine Weather	65
	Shower Sump Pump	66
	Stereo/DVD/TV	67
	Television Flat Screen Monitor	68
	Transformer- Isolation	69
	Trim Tabs	69
	Underwater Hardware (Seacocks)	70
	Vacuum Style Head System	72
	Vacuum Cleaner	73
	Washer/Dryer	74
	Windlass	76
	Zeus Stern Drive	77

Cosmetic Care & Maintenance

BILGE/ENGINE COMPARTMENT



Always keep the bilge pumped out and free of accumulated debris. If any oil accumulates on the engine compartment floor it is usually related to engine oil lines, a loose

component such as an oil filter, oil pan drain bolt or a leaky gasket/O-ring. Always find the cause of smaller problems before they become larger more expensive ones. The engine compartment, bilge or sometimes called the sump features a light colored gel finish that will be beneficial in finding leak sources.

A periodic bilge cleaning with a brush and bilge cleaner (purchase at a marina or supplier) will be helpful in maintaining an orderly and safe bilge since accumulated dirt and fluids could cause someone to fall. *Do not pump bilge contaminated oil overboard but deploy it to a waste receptacle for recycling.*

Check the fuel system including all hoses, tanks and connectors for possible leaks and deterioration. A stained area normally could suggest an ongoing hose or connection leak.

Inspect all wiring including connectors and hangers for tightness. Clean fuel filters as suggested by the engine manufacturer.

Check all engine and water/waste hoses for tightness and deterioration. Tighten all hose clamps as needed.

Check all battery hardware and terminal connections. Fill the battery cells with distilled water (wet-cell type only) to the battery manufacturer's suggested level.

Check the transom area for loose hardware. With IPS systems refer to the vendor owner's manual for any engine room maintenance on the stern drive system.

Do not use any flammable products in the bilge. Use environmentally approved procedures to dispose of oily or soiled cloths.

To access parts of the bilge remove the ramps as needed. Be careful not to step on any components.



WARNING

AVOID BODILY INJURY, DEATH
OR PROPERTY DAMAGE
DUE TO ELECTRICAL SHOCK OR FIRE!
DO NOT SPRAY ENGINE ROOM
COMPONENTS WITH A WATER HOSE
OR PRESSURE WASHER HOSE.
WATER CAN DAMAGE EQUIPMENT CAUSING
ELECTRICAL MALFUNCTION, FIRE,
EXPLOSION AND/OR SHOCK HAZARD!
USE A SOFT DRY CLOTH TO CLEAN
ANY ENGINE ROOM COMPONENTS.



WARNING

AVOID BODILY INJURY DUE TO
SHARP AND MOVING OBJECTS!
ALWAYS WEAR SOFT SOLED SHOES
THAT COVER THE TOES WHILE
WORKING IN THE ENGINE ROOM.
WEAR APPROPRIATE SAFETY GLASSES.
REMOVE ANY JEWELRY THAT MAY
BECOME CAUGHT ON MOVING OBJECTS.



BOTTOM PAINT

Bottom paint in fresh water normally accumulates a bit of algae and slime over a period of time even more so if the vessel is not used. Most of this can be wiped off with a turkish towel or the back side of a piece of rug while the boat is in the water. Stay away from using a stiff bristle brush, wire brushes or abrasive materials which may harm the bottom paint barrier.

If used in saltwater the bottom may have accumulated some barnacle growth. Sometimes a diver can be hired in lieu of hoisting the vessel to clean the growth.

Periodically, the best way to inspect the bottom is to have the boat lifted out. Make sure the straps are evenly lined up with the sling markers on the deck. Look for scrapes in the gelcoat along with any loose or damaged underwater hardware.

Also, this is an excellent time to check for damaged propellers and underwater hardware. The hull bottom and paint should be inspected annually and touched up as needed by your Regal yacht dealer.

Make sure to leave the required spacing (at least 1") when touching up to protect hull components ie; trim tabs, drive parts, anodes from electrolysis potential. Never paint any of the above mentioned parts with bottom paint.

NOTICE

WIRE BRUSHES, SCOURING PADS,
OR OTHER ABRASIVE TYPE MATERIALS
AND SOLUTIONS SHOULD NEVER
BE USED ON THE HULL OR DECK
OF YOUR BOAT.

THEY CREATE SMALL SCRATCH
MARKS THAT WILL COLLECT MARINE
GROWTH AND OTHER FOREIGN
MATERIALS.

Cosmetic Care & Maintenance

CABINETS



The handcrafted interior cherry cabinets feature a sprayed clear coat finish. This clear coat produces a hard finish which is baked on and is very resilient. Use a warm solution of water and mild detergent to keep the cabinet surfaces looking new. Wipe the surface with the solution using a soft damp cloth, and dry with a soft clean towel. This procedure should eliminate most stains and oily finger marks. Stay away from heavy scrubbers and compounds which may harm the surface. Avoid polishes containing silicones.

Use the specifications below as a guide for any cabinet repairs or interior refurbishing needs.

APPLICATION	ADHESIVE
WOOD TO WOOD	WOOD GLUE
WOOD TO FORMICA	CLEAR SILICONE
FORMICA TO FORMICA	CLEAR SILICONE
SINK INSTALL	CLEAR SILICONE
CORIAN TRIM	SIKA FLEX 291
MIRROR TO FORMICA	MIRROR MASTIC
GRANITE TO WOOD	SIKA FLEX 291



CARPET-INTERIOR

The interior cabin carpet is produced from 100% BCF nylon. The nylon is treated tropically with an anti-soil chemical that will assist in keeping your carpet looking beautiful longer.

General Care and Maintenance

Your carpet is a high luster nylon that can look great for years to come provided you follow some basic care and maintenance. Nylon is the highest performing synthetic fiber in the market and has dense pile that will give a long wear cycle and high performance.

The following will help maintain your carpet:

Regular Vacuuming

This is the most important single factor in keeping carpet beautiful is to vacuum it on a regular basis. Sand and dirt particles will abrade the carpet fibers in a faster manner. This abrasion will cause non-repairable damage to the fiber that will reduce the carpet's life expectancy. Use a vacuum with a beater bar verses a vacuum alone as it will lift the fiber and help open the carpet to allow the vacuum to remove grit.

Professional Cleaning

Interior carpet is the same as high-end residential carpet and the carpet should be treated accordingly. Periodic professional carpet cleaning using either the hot water extraction or dry cleaning powder method will help maintain the beauty of your carpet. This will remove the ground in soil.

Spills

At some point in the life of the carpet, there is always the potential for a spill. Remove the spill immediately. The quicker the spill is removed, the easier it is to clean up. The longer a spill stays on the carpet, the more likely it is to stain the fibers, regardless of the cleaning treatment used. When a spill occurs, always blot the area being cleaned. Do not rub or scrub. Follow the cleaning instructions.

Cabin Door/Cockpit Entrance Mats

Entrance mats on a boat are very important to help reduce the dirt and sand that is brought on to the carpet. Also, entrance mats reduce the amount of moisture being tracked on to the carpet, which will cause matting of the fibers.

Mats can be ordered from your Regal dealer. These mats fit the nautical decor and provide the best surface to catch dirt and sand particles. Also, entrance mats can be obtained from local sources. Look for mats with a non-skid backing.

Cosmetic Care & Maintenance

CARPET-COCKPIT

Regal cockpit carpets feature an *aqua tread* backing which permits the carpet to weep moisture and still retain steadfast non-slip characteristics. Also, this backing permits the cockpit carpet to lay flat on the fiberglass deck surface without buckling.

Also, your cockpit carpet is produced with 100% ultraviolet resistant fibers. The carpet boasts a special blend of resilient fibers to withstand traffic and retain its beauty.

Cockpit carpet is designed to take a lot of abuse from the sun and sea but it periodically needs to be cleaned which is a different procedure from household types.

To clean cockpit carpet follow these steps:

1. Scrub the soiled areas with a stiff nylon or soft bristle brush to loosen the dirt and grime.
2. Vacuum the carpet thoroughly using a wet-dry type of cleaner.
3. Pour one cup white vinegar into a 1-quart spray bottle; fill with water.
4. Spray the soiled areas with the vinegar solution until saturated; let stand 15 minutes.
5. Brush the soiled areas once more; the dirt and grime will be released from the carpet fibers.
6. Rinse the carpet, with a garden hose at low pressure.
7. Remove any remaining water with a wet-dry vacuum. Allow the carpet to dry completely.
8. Fluff up the clean, dry carpet with the brush or a carpet rake. If applicable, apply vaseline to the snaps.

Stain Removal

Olefin fiber used in the cockpit carpet is very resistant to stain. However, when a stain does occur, follow the stain removal chart on the following page. Remember, remove a stain as soon as possible, as this enhances the ability to remove it.

Most stains should easily be removed from olefin fibers. If the stain persists, the cleaning procedure should be repeated to ensure stain removal. Again, the sooner the stain removal process is started, the easier the stain will be to remove.

Under no circumstances should any solvents normally associated with the dry cleaning of apparel (perchloroethylene, carbon tetrachloride, etc.) be utilized, as permanent damage to the fiber will result.



To store cockpit carpet, roll it tightly. This will keep the carpet from developing wrinkles which result from folding the carpet.

Cockpit Carpet Stain Removal Chart

Miscellaneous Stains	Removal Process
Coffee, Tea, Coke, Fruit Juice, Ice Cream, Motor Oil, Egg, Grease, Catsup, Chocolate, Milk, Rust, Latex Paint, Water Colors, Berry Stains, Blood, Salad Dressing, Furniture Polish, Clay, Wine, Dye, Mayonnaise, Fish Formula or Urine	Apply warm water and household detergent in minimal amounts to the stained area. Sponge or scrape the stain until it is removed. Then wash thoroughly with clean water.
Persistent Stains	Removal Process
Chewing Gum, Crayon, Ink, Wax, Lipstick, Tar, Polish, Oil Paint	Apply warm water and household detergent. Work mixture well into the stained area, and then flush with warm water.



COUNTERTOPS- SOLID SURFACE

Regal has chosen Samsung® solid surface countertops because of its elegance and durability. Periodic maintenance will ensure its beauty. Solid surface countertops withstand heat much better than ordinary countertop materials but you must still use a hot pad or trivet when taking materials directly out of the oven or stove top to protect from damaging the surface. Avoid cutting directly on the surface. Another feature of a solid surface countertop is the non-porous nature of the material. Therefore, dirt and germs do not penetrate it. Solid surface countertops will not support the growth of germs and mildew. To disinfect or clean see the table. You can use a green Scotch-brite pad along with the table solutions to remove stubborn stains. Darker colors tend to require more frequent cleaning to maintain a uniform finish. Also, darker colors tend to show fine scratches more easily and require more attention than lighter colors.

The material is a matte or satin finish. To remove scratches and nicks, sand the surface with 180-220 grit sandpaper until the nick is gone. To restore the finish use an abrasive cleanser and a green Scotch-Brite® pad. Wrap the sandpaper around a block of wood. The block will sand the areas flat instead of creating hills and valleys.

PROBLEM	SOLUTION
Dirt and Residue	Use soapy water, ammonia based cleaner (not window cleaner), rinse and <u>wipe completely dry</u> . Commercially available solid surface cleaners such as Clean Encounters® will work well too.
Preventing Hard Water Marks	Rinse & <u>wipe completely dry</u> after cleaning; clean up spills before they dry.
Removing Hard Water Marks	Use a cleaner formulated for removing hard water marks such as CLR or Lime-A-Way
Difficult Residue	Spray residue with Deep Cleaner for DuPont Corian from Stone Care International. Follow instructions on the bottle. Wash area with soapy water, rinse and <u>wipe completely dry</u> .
Disinfecting	Occasionally, wipe surface with diluted household bleach (1 part water/1 part bleach). Rinse top thoroughly with water and <u>wipe completely dry</u> .

Cosmetic Care & Maintenance

ELECTRIC BBQ



FABRICS-INTERIOR

Clean flat good interior fabrics with dry cleaning fluid style cleaners approved for use with soft fabrics. Allow adequate ventilation and follow the label instructions carefully. Use protective eye wear and gloves. Do not inhale the chemicals.

Use a soft cleanser with feldspar to clean stubborn marks or stains on wallpaper.

Normal interior vinyl such as the headliner need a mild soap and water solution. Rinse immediately with clean water and wipe dry. Always test a small area with a cleaner before applying it to a larger area.

STAINLESS STEEL SURFACES


The best way to clean metal surfaces on your BBQ is to wipe them down using a damp cloth and then thoroughly dry. Stubborn spots caused by spillage and discoloration from heat may be removed using lemon juice, vinegar, or chrome polish. Keep these cleaning products away from porcelain enamel surfaces. Never use coarse cleaners, steel wool scouring pads or metal brushes to clean stainless steel. These methods will allow deep scratches to develop on the stainless steel that cannot be removed.

PORCELAIN ENAMEL

Porcelain enamel is glass fused on steel at very high temperatures. It is not overly delicate but must be treated like glass. Sharp blows, radical changes in temperatures, etc; will cause the enamel to crack or chip. Some foods contain acids which will dull the finish of the enamel.



FIBERGLASS & GELCOAT

**CAUTION**

AVOID BODILY INJURY!
WAXED GELCOAT SURFACES CAN BE VERY SLIPPERY. DO NOT WAX NORMALLY USED AREAS OF THE DECK, LINER, OR GUN-WHALES. DO NOT WAX ANY TEXTURED OR NON-SKID SURFACES SUCH AS FLOORS, WALKWAYS, STEPS, LADDERS OR SWIM PLATFORMS. ALWAYS WEAR NON-SLIP FOOTWEAR WHILE ON BOARD THE VESSEL.

Routine maintenance is the only practical way to keep the surface of your boat looking shiny and new. Most objects left outdoors will gradually deteriorate from exposure to the sun, water, dust and pollution. Such outdoor exposure can cause your boat's gelcoated surface to change or fade. Darker colors tend to fade more rapidly than lighter colors because they absorb more of the sun's rays (ultraviolet and infrared).

Basic maintenance includes monthly washing of the boat's surface to remove normal accumulation of soil and stain. Use a mild detergent such as dishwasher powder or liquid. Do not use automatic dishwasher detergent. Avoid any kind of alkaline cleaners such as tri-sodium phosphate (TSP), abrasives, bleaches and ammonia. For best results use cleaners that are recommended for fiberglass.

It is recommended that you wax the gelcoat surface twice yearly to prevent loss of gloss and to protect the finish. Use only waxes for fiberglass and follow the label instructions. Apply a 3' x 3' section at a time using clean applicator cloths or a buffing bonnet. When a haze develops, use a power buffer at low speeds (1200-2000 rpm) to remove the haze. Keep the buffer moving to avoid heat build-up. Never wax gelcoat in direct sun.

When the washing and waxing as recommended does not restore the shine it may be necessary to use a fine rubbing compound. Do not apply rubbing compound in direct sunlight. A power buffer at lower speeds does an excellent job to remove impurities from the gel coat that cause dulling. Use light pressure and keep the buffer moving. Re-wax after compounding to buff the surface.

"Hairline cracks" or "spider webbing" could develop in the gelcoat surface of a hull or deck. This can be caused by impact or other factors. Small air pockets or gouges may also occur through normal **wear**. These do not affect the strength of the hull or deck and can be repaired by yourself, a marine professional or a Regal dealer.

The affected area should be chipped or sanded away and a thin layer of color matched gelcoat applied. This layer is then sanded smooth and buffed to its original luster.

Most minor scratches, nicks, and dents can be removed by compounding the surface. Marine type compounds can be found at most auto body supply stores.

Specify a number 25 which is a coarser compound up to a number 55 being less coarse. Various glazes and polishes are available as needed. Ask your marine professional or Regal dealer for more information. Fiberglass hulls are strong but they can be damaged. A fiberglass hull has virtually no internal stresses. Thus when a part is broken or punctured, the rest of the hull retains its original shape. A severe blow will either be absorbed or result in a definite localized break. A break of this nature should be checked and repaired by a marine professional or a Regal dealer.

MINOR REPAIRS

You will need the following materials for minor repairs:

- Gelcoat
- Clear Liquid Catalyst
- Putty Knife
- Razor Blade
- Fine Sandpaper (400,600,1000)
- Wax Paper (to cover repair area)

Cosmetic Care & Maintenance



For minor repairs refer to the following procedure:

1. Clean the area to be repaired and get rid of any wax or grease residues.
2. Clean out scratches, chips, and nicks.
3. Sand area to be repaired so gelcoat will bond.
4. In a separate container, measure only the amount of gelcoat you will need. Mix a ratio of 2% ratio of catalyst to the amount of gelcoat being used (a spoonful of gelcoat will require only a drop or two of catalyst). Do not pour any unused portions of the gelcoat/catalyst mixture back into either original container.
5. Apply gelcoat to area leaving a slight lift above the surface.
6. Cover the area with wax paper. It will help the mixture to set up faster.
7. Remove wax paper and shave off any extra gelcoat with a razor blade.
8. After the area is shaved smooth, start with the 400, 600, and finally 1000 grit sand papers.
9. Buff the area with compound, polish and a finish wax. You may notice a difference between the repaired area and the original finish due to the natural weathering process.



FLOORS-HARDWOOD

Your Regal yacht may have hardwood floors highlighting the interior. Your flooring was chosen because of its beauty, durability and care-free maintenance. Several types have or are being used including birch or birch with rosewood.

Here are some do's and don'ts to follow in keeping your yacht flooring like new:

First, do remember that if you have been cleaning residential floors with vinegar and water, oil soap, furniture polish or window cleaner, you may be ruining your costly investment. These cleaners are a big no with hardwood floors.

Excessive wet mopping with water and vinegar can cause wood to expand, possibly permanently damaging the floor in addition to dulling the finish. Other cleaners that have silicone, wax or oil soaps can leave a residue on the finish and may cause the floor to be slippery which is what you do not need with a boat.

One residue-free, proven hardwood floor cleaner formulated specifically for polyurethane-finished hardwood floors is BonaKemi's Swedish Formula® Hardwood Floor Cleaner. This environmentally friendly, non-toxic, ph-neutral cleaner effectively cleans dirt, grease and sticky spills without leaving any dulling residue. Apply per container directions.

Preventative care of your floors is also extremely important for keeping hardwood floors looking like new. Vacuuming or sweeping floors regularly, promptly removing spills, and placing mats at cabin door and cabin stairway landing can be effective in trapping damaging sand and dirt particles before they can damage the floor. Avoid walking on floors with high heel shoes. Walking or tennis shoes with soft soles are better and safer to help prevent falls while on the vessel. The harder heels especially black ones tend to leave scuff marks on the floor surface. It is a good idea to keep the nails of pets trimmed, too.

Note: Use a soft application pad inserted in a long handle to apply product. Rinse often in a clean bucket with warm water which are available at most "box" stores.



Typical Hardwood Floor

Cosmetic Care & Maintenance

GAUGES/SWITCH PANELS

For normal dirt and dust accumulation clean with soft cloth and warm water. Dry with a soft cloth or chamois.

Near salt water environments deposits can build up on the instrument bezels and faces. Use a soft damp cloth to remove the deposits. Do not use abrasives or rough, dirty cloths to wipe instruments.

Follow the same procedure for all switch panels. Do not use any of the following on panels:

1. Lacquer Thinner
2. Dry Cleaning Fluid
3. Acetone
4. Carbon Tetrachloride
5. Benzine
6. Silicone Spray
7. Gasoline



Sometimes gauges develop condensation inside their faces. in high humidity environments. To eliminate the condensation droplets, energize the instrument lighting and the heat over a short period of time This process will evaporate the gauge condensation.



GRANITE



REGAL GRANITE OPTION

As an option on your Regal yacht granite offers a beautiful enduring and unique stone look. Little crystals found within the granite catch the light and change the appearance of the countertop. No two slabs of granite are identical.

Other features of your Regal installed granite counter tops are:

1. Easy to clean
2. Durable and hard to scratch
3. Burn resistant

Granite Countertop Maintenance Tips

Periodic care is as easy as cleaning with a gentle cleanser like Murphy's Oil Soap or mild dish washing liquid. If needed you can use a synthetic scrubbing pad to clean the counter. With the proper maintenance your yacht granite countertops will stay new-looking for a long time.

Here are some steps to follow:

1. Wipe up spills immediately
2. Use mild soap and water
3. Rinse
4. Use a soft cloth to dry

Removing Stains

All granite countertops will eventually experience a stain or two. How to remove the stain will depend on what caused it. Use the treatment chart on the next page.

Resealing Granite Countertops

Periodically most granite counters need to be resealed. This process generally depends on how often the kitchen is used. The time period varies normally from 1-2 years.

When re-sealing be sure to use a non-toxic sealer, since counters are used for food preparation.

Two types of sealers are available in the marketplace. A penetrating sealer penetrates into the stone. The topical sealer coats the top of the counter surface only.

- Penetrating sealers- Protecting the structure of natural stone, a penetrating sealer absorbs into the granite for three or four minutes. When almost dry, add a little more sealer to the counter and rub with a soft, dry rag. Apply a section at a time. Wait 2 hours and apply a second coat. When shopping look for a product that says it is an oil repellent impregnator, which stops oil from seeping into the stone.
- Topical sealers- These sealers form a film designed to protect the countertop surface. Usually made from some form of natural wax, acrylic, and other plastic compounds. Topical sealers are available in a strip-pable and permanent type. Topical sealers are made to be stripped or removed from the stone countertop with little work. With permanent sealers, once you apply it they become difficult to remove. Comprised of solvent-based or water-based polymers they are not recommended for granite.

Water Spill Test

Once you have sealed your counter, test it to be sure that it is adequately sealed. As a test, spill a little water on the surface and leave it set. After 30 minutes wipe it up. If the water leaves the surface darkened, the granite is not sufficiently sealed.

Cosmetic Care & Maintenance

How To Treat Stains On Granite Countertops		
Stain	Treatment	How To Use
Most Stains	1 cup flour, 1-2 T mild dish washing soap; create thick paste by mixing with water	Apply to stain, cover overnight with plastic wrap; in the morning scrape mixture from stain with wooden utensil and rinse.
Oil Based Stains	1 cup flour, 1-2 T mild hydrogen peroxide; form a thick paste by mixing with water	Apply to stain, cover overnight with plastic wrap; in the morning scrape mixture from stain with wooden utensil and rinse.
Organic Stains	Combine 12 percent hydrogen peroxide with 2-3 drops of ammonia	Good for removing coffee and tea stains.
Ink On Dark Granite	Lacquer thinner or acetone	Apply to stain and wipe dry.
Ink On Light Granite	Hydrogen peroxide	Apply to stain and wipe dry.
Wine	Make a mixture of molding plaster and bleach until it becomes a paste	Apply to stain for 30 minutes; remove and rinse.



HULL/DECK

HULL BOTTOM

Never use wire brushes or highly abrasive scouring pads on your hull bottom. It could damage the gelcoat surface or the bottom paint. The bottom of your boat needs to be clean since the build up of natural coatings from water or marine life can potentially create drag and affect boat performance. Use a turkish towel or for heavier build-up a piece of rug to clean the bottom.

HULL/DECK

For normal dirt and insect residue find a soft bristle brush on a long telescopic handle at an automotive store. A good brush is designed with a curved soft base to protect objects it comes in contact with while scrubbing. Rinse down the hull with a hose to loosen up the dirt. Use a mild soap solution in a bucket. Use up and down strokes to clean the hull sides. Rinse off until all residue is removed.

MICROWAVE OVEN

1. Turn off the oven.
2. Keep the inside of the microwave clean. When food splatters or spilled liquids adhere to oven walls, wipe with a damp cloth. A mild detergent may be used on extremely dirty surfaces. Avoid the use of sprays and other harsh cleaners as they may stain, streak, or dull the door surface.
3. The outside surfaces should be wiped with a damp cloth. To prevent damage to the operating parts inside the oven, water must not enter the ventilation openings.
4. Wipe the door and window on both sides, along with the door seals and related parts frequently with a damp cloth to remove any spills and splatters. Do not use any abrasive cleaner.
5. Do not allow the control panel to become wet. Clean with a damp cloth. When cleaning the control panel leave oven door open to prevent the oven from activating accidentally.
6. If steam accumulates inside or outside of the oven door, wipe with a soft cloth. This may occur when the microwave is used in high humidity conditions and this is normal.
7. It is occasionally necessary to remove the glass tray for cleaning. Wash the tray in warm sudsy water or in a dishwasher.
8. Remove odors from your oven by combining a cup of water with the juice and skin of one lemon in a deep microwaveable bowl, microwave for 5 minutes. Wipe thoroughly and dry with a soft cloth.



CAUTION

**AVOID BODILY INJURY!
GELCOAT SURFACES CAN BE VERY
SLIPPERY.
ALWAYS WEAR NON-SLIP FOOTWEAR
WHILE ON BOARD THE VESSEL.
ALWAYS RINSE SURFACES ADEQUATELY
TO AVOID SLIPPING
ON SOAPY SURFACES!**

Cosmetic Care & Maintenance

PLASTICS

There are different types of plastic aboard your vessel. Use plastic cleaners and polishes recommended for marine use only. Use proper applicators. Read all instructions carefully. Test the product in a small area first. Use a soft rag and always rinse the surface with water. Ammonia based cleaners will damage plastic parts.

One of the basic rules to cleaning plastic is never use abrasive cleaning products. Even hard plastic surfaces are easily scratched. Stay away from steel wool pads, powdered cleaners with abrasive qualities, or harsh detergents.

Instead use sponges, soft cloths, and mild detergents when cleaning plastic.

While cleaners in aerosol cans are convenient they may not be the best for certain types of plastic. Glass cleaner in a can or a spray bottle is not safe to use on your marine toilet fixture or toilet seat. Many times pits will develop over time and the toilet/seat will appear mottled and will not appear clean no matter how hard you scrub.

Refer to a marine store which possesses the expertise and experience to assist the boat owner in selecting the right cleaner for his marine plastic onboard needs.

RANGE

Clean the cook top before you use it for the first time. A thorough cleaning with a recommended product such as Cerama-Brite Cook Top Cleaner® will put a clean shiny coating on the cook top before its initial use.

Always remove food spills, grease splatters, and metal rub-off from utensils. First, use a razor blade scraper to remove all spills. Then clean the cook top with a paper towel or a clean soft cloth and a recommended cleaner. After using any cleaner always wipe the cook top with a clean, damp cloth (to avoid burned-on cleanser residue) and wipe dry. Do not use your dish towel or sponge to wipe off the cook top. This may leave a film of detergent or other matter that can cause discoloration the next time the cook top is heated.

Avoid abrasive scouring powders of any kind. Also, avoid using plastic, nylon or metal cleaning pads. They may scratch or melt onto the cook top. Avoid chemical cleaners such as chlorine bleach, ammonia, hydrofluoric acid or chemical oven cleaners. They may etch or discolor the surface.

Do not let anything that melts such as plastics, aluminum foil, or sugar to come in contact with your cook top surface when it is hot. Should something melt onto the surface, immediately move it to a cool area of your cook top with a razor blade scraper, and then remove it from the cook top as soon as possible.

NOTICE

NEVER CLEAN PLASTIC SURFACES WITH
A DRY CLOTH OR GLASS CLEANING
SOLUTIONS CONTAINING AMMONIA.
NEVER USE SOLVENTS
OR WIPE WITH ABRASIVES.



SPOTLIGHT



The spotlight lens should be wiped with a clean, dry soft cloth to remove any debris such as bugs, salt spray or general dirt. Install the cover to protect the lens from salt build-up when not in use.

Read the manufacturer's literature for more information.

STAINLESS STEEL



Stainless steel is an alloy made from nickel, chromium and iron. It has been very successful in marine environments due to its ability to resist rusting. If the stainless steel product such as a bow rail is exposed to elements such as ocean spray it will begin to rust over time.

If your stainless steel shows signs of rusting:

1. Wash with fresh water.
2. Clean with a good quality chrome polish periodically but no less than annually. "Brasso" is another product that works well.
3. Also, using a good quality wax will provide extra stainless steel protection.
4. For polished finishes that show grit lines an abrasive such as "Scotch Brite" or sand paper can be used. Always test a spot first and "go with the grain".

Do not use harsh solvents or cleaners on stainless steel. Do not use steel wool or wire brushes. They will damage the finish.

Do not use any type of acids.

Cosmetic Care & Maintenance

STAINS

Below is a listing of normal stains and clean-up methods.
The sooner the stain is removed there is less chance of permanent residue on the surface.

Do not use wire brushes, solvents or harsh chemicals on any stain. Damage to the surface will occur.

FREQUENT STAINS	CLEAN-UP STEPS		
	1	2	3
Coffee, Tea, Chocolate.....	B		
Permanent Marker*.....	E	B	C
Household Dirt.....	A	B	
Grease.....	D	B	
Ketchup, Tomato Products.....	A	B	
Latex Paint.....	A	B	
Oil Base Paint.....	D	B	
Mustard.....	A	B	C
Suntan Oil.....	A	B	
Asphalt/Road Tar.....	D	B	
Crayon.....	D	B	
Engine Oil.....	B		
Spray Paint.....	B		
Chewing Gum.....	D	A	
Shoe Polish*.....	D	B	
Ballpoint Pen*.....	E	B	A
Lipstick.....	A	B	
Eye Shadow.....	E	B	
Mildew*.....	C	B	A
Wet Leaves *.....	C	B	A

A= Soft brush; warm soapy water/rinse/ dry

B= Fantastik cleaner

C= One tablespoon ammonia, 1/4 cup of hydrogen peroxide, 3/4 cup of warm water/ rinse/dry

D= Scrape off residue (use ice to lift gum)

E= Denatured alcohol/rinse/dry

* These products contain dyes which leave permanent stains.



UPHOLSTERY

Cockpit vinyl requires periodic cleaning to maintain a neat appearance and to prevent the build up of dirt and contaminants that may stain and reduce the vinyl life if they are not removed. The frequency of cleaning depends on the amount of use and conditions to which the vinyl is subjected.

Most common stains can be cleaned using warm, soapy water and clear rinses. Scrubbing with a soft bristle brush will help loosen soiled material from embossed surfaces and under welting. If the stains are not removed with the above method use a mild cleaner such as Fantastic. This cleaner should be used only as needed and not the normal means.

With more stubborn stains, rubbing alcohol or mineral spirits may be tried cautiously. Widespread solvent use can severely damage or discolor vinyl.

Try to remove stains immediately before they have a chance to penetrate the surface of the vinyl.

Powdered abrasives, steel wool, or industrial strength cleaners are not recommended for cleaning our vinyl. Lacquer solvents will cause immediate damage. Dilute chlorine bleach before using. Do not wax the vinyl as it may cause cracking. Always wear protective gloves and make sure there is sufficient ventilation when cleaning vinyl. Wear eye protection.

Remember that suntan oil will damage vinyl. Use suntan lotion instead of suntan oil. Exposure to the sun is a natural enemy of vinyl upholstery. For maximum life, use a cockpit cover when the vessel is moored, docked or stored.

Ballpoint Pen Removal Instructions

1. Wipe the stain off with ethanol (rubbing alcohol).
 2. Prepare a solution of 50% non-chlorinated bleach, 50% water.
 3. Place a thin line of tissue over the ink stain.
 4. Apply the non-chlorinated bleach solution to the tissue. Be sure not to saturate the tissue.
 5. Cover tissue with polyethylene film (plastic wrap) to prevent the non-chlorinated bleach solution from drying.
 6. Check on stain repeatedly.
 7. Do not leave the non-chlorinated beach solution on for more than 1 hour.
- When the stain looks almost gone, remove the tissue and wash the stain with water.
9. To neutralize the bleached area, place tissues on the bleached area and apply 15% hydrogen peroxide solution.
 10. Leave on for 30 minutes, & then remove the tissues.
 11. Remove the peroxide residue with water.

Cosmetic Care & Maintenance

Ultra Leather- interior vinyl that may be used in the salon sofa, salon seating arrangements, and both aft and forward berths. It can be identified by its softer leather touch over a firmer cockpit vinyl.

Clean Ultra Leather by following the information below.

1. Remove the stain immediately.
2. Spot clean with mild soap and water.
3. Air dry or dry quickly with warm setting of a hair dryer.
4. For stubborn stains, use mild solvent.
5. For tougher stains Fantastik® and Formula 409® brand spray cleaner have been shown to be successful.
6. Disinfect with a 5:1 bleach solution.

For the following stains, a mild detergent may be used. Blot or wipe stains immediately.

- A. Ketchup, Mayonnaise
- B. Butter
- C. Red Wine, Liquor
- D. Coffee, Tea, Coca-Cola®
- E. Make-Up, Face Cream, Lipstick
- F. Machine Oil
- G. Urine, Blood
- H. Steak Sauce, Soy Sauce
- I. Chocolate
- J. Milk



Chapter 8

Patio Upholstery- The patio upholstery (wraparound seating aft of the cockpit enclosure and engine hatch bench seat if installed) is a different material and it is recommended that the owner read and understand the instructions for this upholstery location.

The fabric located above uses an advanced vinyl protection called PERMABLOK®. Use the steps below to clean this upholstery.

Step 1- Remove excess spill with a damp cloth. Clean with a 1:1 mix of Ivory® liquid and water. Next, rinse with clean water and dry.

Step 2- Use a straight application of concentrated cleaners such as Formula 409® or Fantastik® spray cleaner. Wipe with a clean cloth, rinse with clean water and dry.

Step 3- Use a 1:1 mix of ammonia and water, or a 1:4 mix of bleach and water. Rinse with clean water and dry.

Step 4- Use a straight application of naphtha (lighter fluid). Rinse thoroughly with clean water and pat surface dry.

Step 5- Use a 1:1 mixture of isopropyl alcohol and water. If the stain persists, use straight alcohol. Rinse thoroughly with clean water and pat dry.

Note: For cleaning that requires step 4 or 5, use a soft cotton cloth saturated with the cleaning material and rub the stain in circles 10 times. Pat dry with another soft cotton cloth and check the results.

Note 2: The information published above refers to the performance of PermaBlok® products in specific tests conducted under laboratory conditions. Results may vary under actual conditions. This information is not a guarantee and does not relieve the user from the responsibility of the proper and safe use of the product and all cleaning agents. The use of certain agents can be harmful to the surface appearance and lifespan of vinyl. We assume no responsibility from the use of such cleaning agents to the vinyl.



PATIO WRAP-AROUND BENCH SEATING



AFT BENCH SEAT WITH TABLE

Cosmetic Care & Maintenance

VACUUM STYLE HEAD SYSTEMS

The vacuum (suction) system requires periodic cleaning for maximum sanitation and operational efficiency. Use a bowl cleaner such as Bon Ami® which will not abrade the toilet bowl lining. Do not use chlorine solvents or caustic chemicals, such as the drain openers because the various system seals may be damaged.

After using a pump-out service make sure to rinse the waste hose with clean water which will help eliminate debris from accumulating on the waste hose.

Change the in-line waste filter at least once per year.





Chapter 8

WINDSHIELD WINDOW FILM



Your yacht front windshield features a protective coating that shields against infrared and ultraviolet radiation which results in a cooler cockpit.

During the curing process of the 7 protective film layers you may notice changes in the optical clarity which results in a cloudy appearance. If this happens, it is normal and will go away. After the moisture dries, the hazy appearance will disappear as the film bonds to the glass. Note that with a newer boat in a cooler climate the drying time may be accentuated. Average drying or curing time is 45-60 days after initial installation.

Cleaning instructions for treated windows;

1. Use a clean, soft towel, cloth or synthetic sponge.
2. Do not use solutions that contain abrasive materials.

WHISPER WALL CEILING COVERING

Your yacht features a “whisper wall” ceiling product. It is manufactured with solution dyed polyolefin and polyester staple fibers which resist stains, moisture, mildew and bacteria.

If a liquid should stain whisper wall clean the area immediately with a dry, white absorbent cloth or paper towel. Avoid scrubbing the area. This may spread the liquid stain or distort pile.

For solids, allow drying, remove with cloth, gently brush and vacuum the area.

Note that most stains will disappear when treated with a mild detergent. To prevent spreading, work from the edges of the stain to the center. After the stain has been removed, rinse with a mist sprayer of cold water and blot until dry. If you elect to use a cleaning solvent or spot removal agent, test in an inconspicuous area to make certain the solution does not alter color or damage fiber and blot dry.



Cosmetic Care & Maintenance

MAINTENANCE

This section covers maintenance procedures on selected standard and optional Regal installed and/or related equipment. *Engine and propulsion equipment, electronic and specific entertainment, water/waste components are found by referring to individual vendor information located in the owner's information packet.*

The engine/propulsion and generator owner's manual are quite detailed and should be read and understood before attempting to undertake any maintenance issues.

Heed special attention to all caution, warning and danger labels found in the engine/propulsion and generator manual. Also, the major electronic and entertainment components are outfitted with detailed system descriptions, wiring schematics, and contact information.

The internet can be helpful for select maintenance issues. Numerous web-sites are currently available from vendors on their particular product maintenance procedures and schedules.



AIR CONDITIONER:

Before each outing inspect the thru-hull fitting for leaks. Make sure the seacock is open. Also, the sea water strainers located under the engine room center walk-thru should be checked periodically for foreign objects and accumulated debris. To clean the strainer, first position the seacock handle to the “off” position. Unscrew the strainer fasteners by turning counterclockwise, remove the wire strainer, and blow it out if possible with compressed air. Reinstall the strainer, make sure the gasket on the top of the seacock is centered, and tighten the fasteners. Check for leaks since sucking air into the system could cause the seawater pump to malfunction. See the illustration.

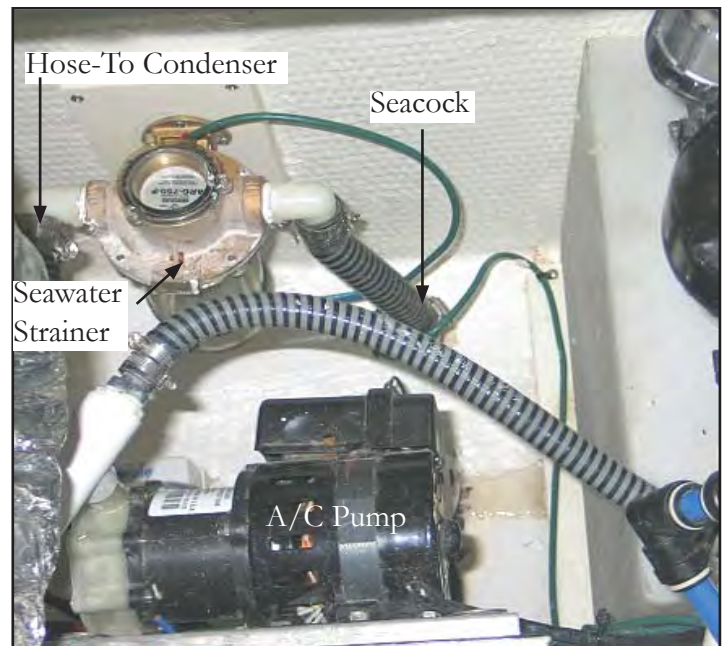
Inspect the air filter monthly. The air conditioner filter is located at the condensation unit at both forward and aft A/C units. To clean the filter remove it and rinse with plenty of fresh water. Blow with compressed air as needed.

Check the AC hose output located on the hull side insuring there is a full discharge when the AC pump is running. If there is little or no discharge shut down the unit and immediately find the cause of the problem.

Periodically check the drain located at the compressor to make sure the entrance to the hose at the AC pan is not clogged with foreign matter.

If clogging occurs, blow out the hose with compressed air and pour in a bleach/water solution at 5/1 parts water to bleach.

Be sure to read and understand the A/C owner’s manual before attempting any maintenance. It covers the operating system and equipment more thoroughly than can be done here. Pay close attention to all safety labels since both high pressure and high voltage are part of the A/C system.



TYPICAL COMPONENTS SHOWN



WARNING

TO PREVENT BODILY INJURY OR DEATH!
DISCONNECT THE A/C BREAKER AT THE
MAIN A/C PANEL BEFORE OPENING ANY
COVER ON THE A/C UNIT.



WARNING

TO PREVENT BODILY INJURY OR DEATH!
DUE TO THE HIGHLY PRESSURIZED
REFRIGERANT FOUND IN THE AIR
CONDITIONER UNIT, DO NOT LOOSEN
OR REMOVE ANY FITTINGS.

REVERSING VALVES

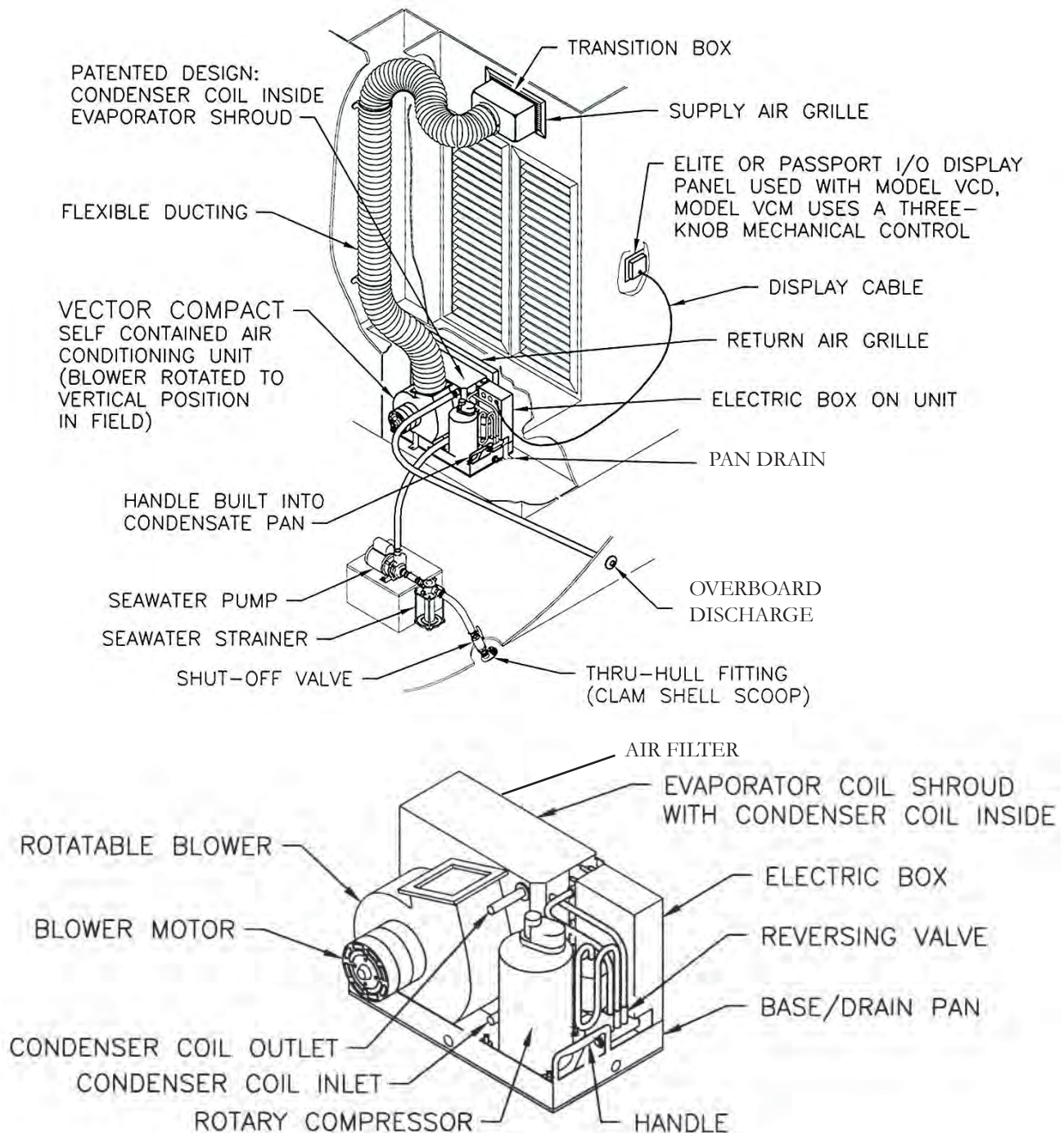
All reverse cycle units use a reversing valve: the valve must be energized periodically to keep the internal parts moving freely. To do this, switch the AC unit into heat for a few seconds once a month.

SEAWATER STRAINER

Check the AC pump for proper seawater flow by cleaning the seacock strainer basket. Check the overboard discharge for proper water flow. Check seawater intake speed scoop for obstructions. Make sure hoses are not looped, kinked or crushed.

Cosmetic Care & Maintenance

TYPICAL VECTOR COMPACT AC SYSTEM





CONDENSER COIL CLEANING

Note: It is best to get an air conditioning expert familiar with marine a/c to do the periodic maintenance mentioned below. The information will assist the technician.

1. With the system turned off at the ship's AC electrical panel, disconnect the inlet and outlet connections of the condenser coil.

2. Use chemical resistant hoses (MAS white PVC 5/8" I.D., etc.) to connect the inlet of the condenser coil to the outlet of a chemical resistant, submersible pump (MAS P-500 pump, etc.) and let the hose connected to the coil outlet flow freely into the container mentioned below.

3. Place a strainer or piece of screen over the inlet of the pump and submerge the pump into a container filled with a 5% solution of muriatic or hydrochloric acid and fresh water or use a premixed over-the-counter solution. Use as large a container as possible to hold the solution (2 to 5 gallons).



CAUTION

AVOID BODILY INJURY!
AVOID SPILLING OR SPLASHING
THE SOLUTION.
FOLLOW THE WARNINGS
AND RECOMMENDATIONS GIVEN
BY THE MANUFACTURER
OF ANY ACIDS
OR PREMIXED SOLUTIONS.

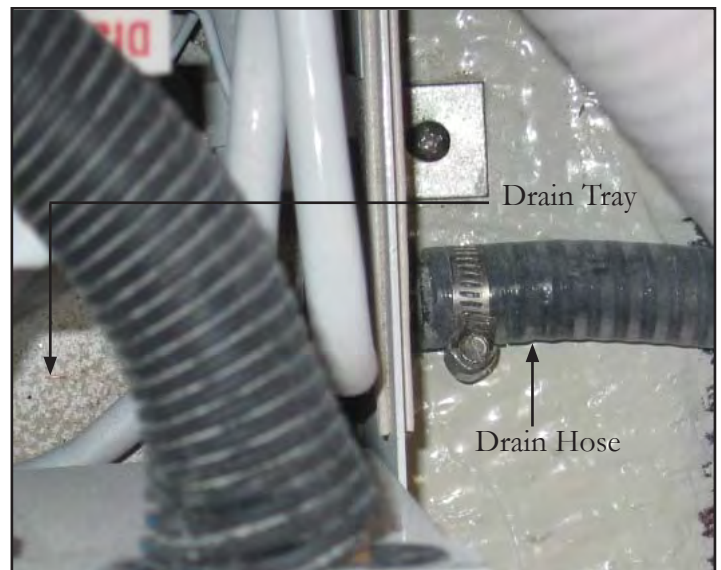
4. Power the pump and circulate the solution through the condenser coil for 15-45 minutes depending on the size of the coils and the extent of the contamination. Visual inspection of the solution in the container should indicate when the contamination removal has stopped.

5. Circulate fresh water through the coil to flush any residual acid from the system.

6. Restart the system and check operational parameters to ensure thorough cleaning has taken place. Additional cleaning may be necessary with extreme contamination.

NOTICE

FOR THE PURPOSE OF PROTECTING
THE ENVIRONMENT,
DISPOSE OF ANY CONTAMINATED
ACID SOLUTIONS IN ACCORDANCE WITH
FEDERAL, STATE AND/OR LOCAL
REGULATIONS



AIR FILTERS

Check the air filter located at both A/C condensation units monthly and clean as necessary. To clean the filter, remove it from the unit, rinse with water, air dry and reinstall. Blow with compressed air as needed. See the illustration on the preceeding page.

Cosmetic Care & Maintenance

BATTERY MAINTENANCE

AGM engine cranking and house batteries as installed on your vessel are not all together maintenance free. Unlike regular batteries there are no water fill caps to remove on this style battery but several other items need to be monitored periodically.

1. Check both positive and negative terminal hardware for tightness. Loose connections are known to discharge a battery very quickly.

2. Make sure all terminals are clean. If you find a greenish, powdery substance, remove the cable connections and clean both the terminals and the connectors with a wire brush. If not a battery cleaner tool (available at car parts stores) or old toothbrush should be used to clean both the positive and negative terminals. Use a small amount of baking soda and water. Remove any residue from the terminal area with a disposable damp cloth. Install corrosion protection (petroleum jelly or approved grease) to the posts before reinstalling the terminals.

3. Tighten all battery connectors securely. Check their tightness by pulling on the connectors. They should not move from their tightened position. Be sure to reinstall the positive boot over the battery terminal after tightening the battery post connection. While using the boat, keep an eye on the volt meters to monitor the charge level of each battery bank. Monitor the charge with the engines turned off (static condition).

The engine alternators recharge the batteries. A fully charged battery will indicate between 12 and 14 volts on the voltmeter. Readings below this could indicate a dead battery cell or a charging system malfunction which should be checked by a marine professional.





WARNING

TO PREVENT BODILY INJURY!
WEAR GOGGLES, RUBBER GLOVES
AND A PROTECTIVE APRON
WHEN WORKING WITH A BATTERY.
BATTERY POST CORROSION CAN CAUSE
SEVERE EYE DAMAGE AND SKIN BURNS.
IN CASE OF SPLASHING,
WASH AREA WITH A SOLUTION OF
BAKING SODA AND WATER.

Charging Batteries

Batteries should be charged outside the boat. Do not smoke or bring flames near a battery that is being or has recently been charged. The hydrogen gas generated by battery charging is highly explosive.

Set the batteries on a block of wood not concrete since the batteries will lose their charge if left on a cement surface.

Do not allow a metal object or loose wires to spark across battery posts while working close to the battery. Contact across terminals will cause a short circuit and possible electrical burns, fire, explosion or personal injury.

Cosmetic Care & Maintenance

BATTERY CHARGER



Periodically check the battery charger and Mass Combi terminal connectors for tightness. Loose connections must be corrected immediately. *Be sure the shore power is disconnected and the battery positive and negative terminals are unhooked before checking any terminal connectors.*

If necessary, use a soft clean cloth to clean the cabinet. Never use any liquids, acids and/or scouring cleaners.

Do not touch the equipment with clammy hands and do not use damp cloths for cleaning cabinet.

Repair procedures should only be accomplished by authorized personnel.

Do not subject the cabinets to rain, snow, or sprayed water from a washdown hose.



BATTERY PARALLEL SWITCH



If the battery parallel switch fails to operate, check the breaker located above the push button switch. Always find the cause of the problem before resetting the circuit breaker.

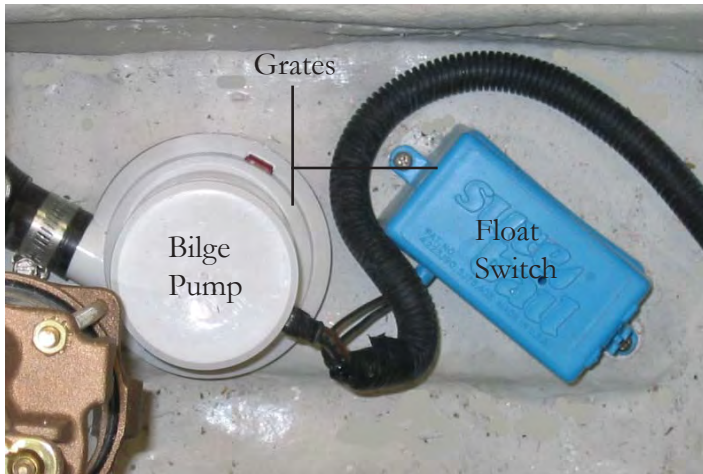
A second area to investigate is the battery solenoid located in the engine room. When the switch is pressed the solenoid

energizes the appropriate second battery for additional engine cranking capability.

Normally, if you hear a solenoid click it is operating properly. Check all solenoid and battery connections for tightness.

Cosmetic Care & Maintenance

BILGE PUMP/FLOAT SWITCH-TYPICAL

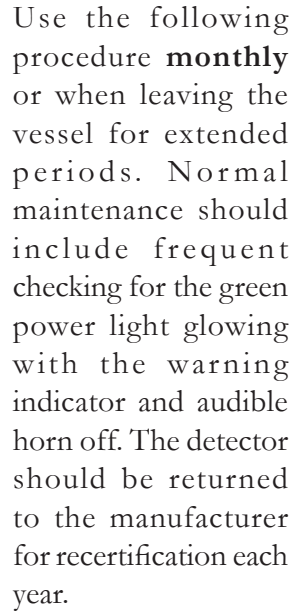


Your vessel offers as standard equipment dual bilge pumps. The forward bilge pump is located under the salon floor access. The aft bilge pump is located aft in the center bilge. Periodically check the grates for debris and test spray the units down with water. Make sure that a steady stream of water exits the through hull fitting indicating the hose from the bilge pump itself is clear.

Periodically check all hoses, clamps and electrical connections for tightness.



COMPASS



Note: do not try to adjust the compass yourself!

When not in use keep the compass protected with a cover. If the compass becomes erratic, sluggish or there is a loss of liquid it should be serviced by a repair station. See your compass operator's manual.

TO REMOVE CIRCUIT BOARD FROM BASE PLATE

1. Push "locking pins" outward and lift bottom portion of board toward you.

2. Holding the board with one hand, pull to remove the connector(s).

TO RE-INSTALL: Reverse this procedure.

TO INSTALL CIRCUIT BOARD INTO
BASE PLATE, FOLLOW THESE TWO
STEPS:

1. Insert top of board (with 45° angles) under holding tabs on base plate.
2. Gently lower bottom until board “snaps” into locking pins.



Cosmetic Care & Maintenance

CORD REEL SYSTEM



Using the optional cord reel system experience has shown that when only a partial length of the shore power cable is regularly used, the cable may be subject to sharper than normal coiling which in turn causes undue “kinking” of the cable. To relieve this condition, routinely pay the cable out completely and stretch it on any smooth surface. Allow the cord reel to then retract the cable into

the cable storage area.

At least annually, check all AC and DC wiring connections to be sure they are secure and free of corrosion.

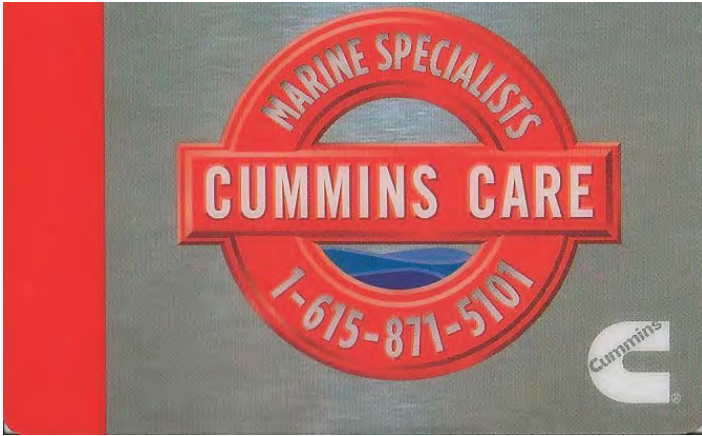
Periodically, inspect the exterior jacket of your shore power cable for nicks or cuts. If your shore power cable is dirty DO NOT USE any cleaner that will leave a waxy film on the shore power cable. This film will cause slippage between the reels main pulley and your shore power cable. It is recommended to use a mild soap and water to clean your cable.



Chapter 8

CUMMINS ENGINE

Owner & Operator Responsibilities



It is the operator's responsibility to perform all safety checks, to ensure that all lubrication and maintenance instructions are complied with for safe operation, and to contact Cummins Care for assistance with all periodic checkups.

Normal maintenance service and replacement parts are the responsibility of the vessel owner and as such, are not considered defects in workmanship or material within the terms of the warranty. Individual operating habits and usage contribute to the need for maintenance service.

Proper maintenance and care of your power package will ensure optimum performance, dependability and will keep your overall operation expenses at a minimum. Cummins Care can locate trained personnel to assist with periodic maintenance checks on your power package. In freezing environments use trained personnel to winterize vessel systems in the Fall and perform service maintenance prior to the boating season. This will help in reducing the possibility of any problems occurring during the mainstream boating season when you want trouble-free cruising.

Be sure to read and follow the recommended lubricants, fluids, as well as approved paints for the Zeus drive unit found in the operator's manual.

The Cummins Care line can be useful for maintenance and technical issues. Specialists are on duty to provide answers to propulsion system questions. They cover both Cummins/Zeus systems.

Note: Included in this section is general maintenance information. For more detailed maintenance procedures refer to the Cummins engine or Zeus propulsion manuals or contact Cummins Care.

Cosmetic Care & Maintenance

CUMMINS ENGINE

Maintenance Procedures Daily- Overview

Preventative maintenance is an important part of the engine and drive propulsion package life cycle. It starts with day to day awareness of the propulsion systems. Before checking systems, check all appropriate fluid levels. Refer to the Cummins/Zeus owners manuals for filling instructions and recommended fluids.

In the next section Cummins/Zeus recommended maintenance guidelines are listed. A portion of these procedures require special tools or must be completed by authorized personnel. Contact Cummins Care for more information. Note that in harsher environments maintenance intervals are shorter.

Use the maintenance form to record regular maintenance performed. Always use Cummins factory replacement parts. **Note that Zeus initial checks at start-up are noted with red type. Zeus interval tasks initiate on the upcoming pages and are highlighted by red.**

Before starting engines check for:

- Leaks puddling on hull bottom or stringer tops
- Loose or damaged parts
- Worn or damaged belts
- Debris in sea water strainers
- Any change in propulsion system appearance
- Leaky, dirty or water in fuel-water separator filters
- Odor of electronic or electrical devices
- Loose engine hardware or clamps
- Loose battery terminals or hold down components
- Specified engine oil level
- Specified engine coolant level

Marine gear oil level

Check the steering actuator and trim tab oil (fluid) level.

Check the transmission oil (fluid) level-planetary gears

After starting engines check for:

- Fuel leaks
- All engine helm gauges for proper operation
- Changes in power

- Engine surge
- Engine water/glycol leaks
- Erratic throttle response
- Unusual engine noise
- Excessive smoke either black or white
- Any flashing helm lights or ones that are staying on
- Loose engine hardware
- Air intake restrictions

Maintenance Procedures at 125 Hours or 3 Months

- Drive belt-Seawater pump-inspect for reuse
- Air intakes on boat-check
- Battery cables & connections-check
- Engine wiring harness-check
- Air cleaner (engine mounted)-check
- Sea water hoses-inspect

Maintenance Procedures at 250 hours or 6 months

- Fuel filter (spin-on-type) replace
- Engine lubricating oil and filters-drain*
- Engine coolant antifreeze-check
- Sea water pump-check
- Fuel-water separator filter-check
- Heat exchanger pressure cap-inspect for reuse
- Note*-The lubricating oil and filter change interval is 500 hours if ultra low sulphur diesel fuel is exclusively used.

Maintenance procedures at 500 hours or 1 year

- Sea water pump-check
- Drive belt, alternator-check
- Batteries-inspect
- Aftercooler assembly (sea-water)-clean
- Heat exchanger-flush
- Air cleaner (engine mounted)-check
- Engine mount hardware-mount locknut torque 130 ft.lbs
- Marine vibration isolator-check



CUMMINS ENGINE

Maintenance Procedures at 2000 Hours or 2 Years

Cooling system-drain, flush & fill
Vibration damper,viscous-clean
Heat exchanger pressure cap-inspect for reuse

Maintenance Procedures at 2000 Hours

Crankcase ventilation filter-inspect for reuse

Maintenance Procedures at 4000 Hours or 4 Years

Overhead set-adjust

Cosmetic Care & Maintenance

Maintenance Record Form

Maintenance Data

Maintenance Record					
Engine Serial No.:			Engine Model:		
Owner's Name:			Equipment Name/Number:		
Key to table headings:					
A = Date					
B = km [Miles], Hours or Time Interval					
C = Actual km [Miles] or Hours					
D = Maintenance Check Performed					
E = Check Performed By					
F = Comments					
A	B	C	D	E	F



DOOR-CABIN ENTRY

Periodically clean the lower door tracks since debris can clog the track resulting in a door that may jerk instead of slide to open or close. Use a vacuum or a soft damp cloth.

Lubricate the latch and lock mechanism sparingly with liquid graphite available at the big box stores. Stick the tube in the key hole and squirt in the graphite. Wipe off any excess with a soft cloth as it can leave a black stain.

ELECTRONICS- GARMIN

General Maintenance

Since there are no user-serviceable parts on electronic products they should be serviced only by specific marine electronic certified factory technicians.

Some products generate high voltages, and so never handle the cables/connectors when power is being applied to the equipment.

When powered up, all electrical equipment produces electromagnetic fields. These can cause adjacent pieces of equipment to interact with one another, with a consequent adverse effect on operation. In order to minimize these effects and enable you to get the best possible performance from your electronic equipment, guidelines are given in the installation instructions, to enable you to ensure minimum interaction between different items of equipment, i.e. ensure optimum Electromagnetic Compatibility (EMC).

In some installations, it may not be possible to prevent the equipment from being affected by external influences. In general this will not damage the equipment but it can lead to spurious resetting action, or momentarily may result in faulty operation.

Certain atmospheric conditions may cause condensation to form on the instrument window. This will not harm the instrument and can be cleared up by increasing the illumination setting.

Periodically clean any electronic display screens with a soft damp cloth. Do not use any harsh chemicals, solvents or abrasive materials to clean the instrument.

Note: For detailed information on each component refer to your electronics owner's manuals in the owner's information packet. Also, the vendor can be found on-line or phone your closest Regal yacht dealer.

Cosmetic Care & Maintenance

ELECTRONICS-VHF MARINE RADIO

If installed the VHF marine radio has been constructed to be virtually maintenance free. With a little attention to a few basic care points, the unit should provide years of service. Cleaning the unit's outer casing (except for the screen) using a cloth dampened with a mild detergent solution and then wipe dry. Avoid chemical cleaners and solvents that may damage plastic components.

The unit's lens is textured to reduce glare, and is sensitive to skin oils, waxes, and abrasive cleaners. Cleaners containing ammonia, alcohol, abrasives, or anti-grease detergents will harm the anti-reflective coating. It is important to clean the lens using an eyeglass lens cleaner (that is specified as safe for anti-reflective coatings) and a clean, lint-free cloth

Periodically inspect the radio case, electrical wiring and antenna for physical damage.

Note: For further information refer to your electronics owner's manuals in the owner's information packet. Also, the vendor can be contacted on-line or phone your closest Regal dealer.



FIRE EXTINGUISHING SYSTEM-AUTOMATIC

Inspect the pressure gauge before each outing. The illustration shows the ready and discharge condition of the actuator. Remove and weigh the unit (minus brackets) every 6 months on an accurate scale (Do not use any hand held scales). If weight is below that shown on the unit nameplate, it must be removed from service immediately. If leakage is suspected, brush liquid soap on all points of possible leaks, or submerge entire unit in clean fresh water and watch carefully for 5 or 10 minutes.

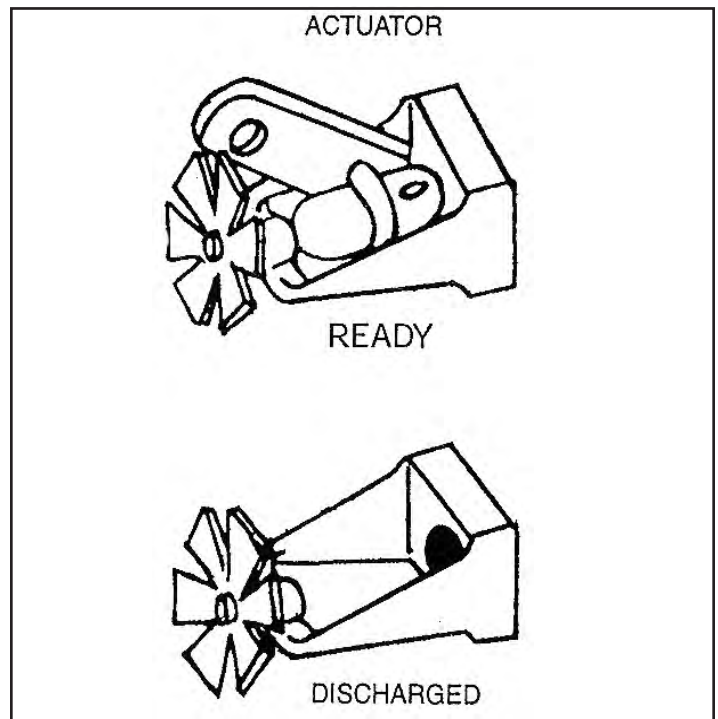
Leaks will appear as tiny bubbles. If leakage is found return to the factory immediately for repair or replacement.

Remember the two most important requirements to assure full charge and reliability of your Fireboy system are:

1. Visual inspection of the gauge and the actuator to determine if it has actuated.
2. Weighing to determine the true contents of the agent in the system.

All models from 75 cubic feet are rechargeable. Recharging is possible only if the unit has leaked out verses losing agent due to a fire.

Should the indicator light fail to come ON when the ignition key is ON, first check the pressure gauge and actuator to see if the unit has discharged. If not check the breaker. Next, using a continuity tester, check the electrical pressure switch on the system bottle itself. Pull the molded rubber connector off by pulling straight away from the manifold, and place the probes of the continuity tester directly on the spade connectors. This pressure switch should show a closed circuit.



Next, check the continuity of the entire wiring circuit. The indicator lamp is an LED (light emitting diode) and cannot be tested with a continuity tester.

A simple method to test LED'S is to remove the lamp and touch the red wire to the + terminal and the black wire to the - terminal of an ordinary 9 volt battery. Should the indicator lamp be faulty, replacement lamps are available from Fireboy.

Should the continuity of the pressure switch indicate an open circuit, the system will have to be returned to the factory for either replacement or repair.

Cosmetic Care & Maintenance

FUEL SYSTEM

Periodically (at least twice annually) inspect the fuel tank components for loose clamps at the vent, fill, return and feed locations. Examine each hose for signs of deterioration and leakage. Check the fuel sender for loose bolts, nuts, and leaks at all areas of contact. Also, inspect the fuel tank for signs of leakage or abrasion. Tighten all components as needed.

The starboard filler hose where it ties into the fuel fill can be accessed by opening the master stateroom starboard forward cabinet. Remove the top screws in the cabinet access plate for fill hose clamp inspection.

Note: Do a fuel system visual inspection before each cruise. Include the high pressure diesel engine fuel hose components along with the diesel fuel filters both in-line and connected to the engine.



DIESEL GENERATOR- TYPICAL

Overview

Your vessel features a diesel generator. Read and become familiar with the generator owner's manual. It provides a variety of operational, safety and troubleshooting information. The output voltage under a full load can be easily periodically checked by observing the AC voltage meter found on the AC/DC panel. The output voltage should be between 110 -120 volts AC (60 hertz-US), and 220- 240 volts AC at (50 hertz- International). Voltages outside these specifications could indicate a generator malfunction. Make sure all fluid levels are checked before starting the generator. The generator seacock handle must be in-line with the seacock and the sea water strainer must be free from debris.

The generator features an automatic shut down system of sensors controlling high exhaust temperature, high water, low oil pressure, and high RPM. If one of these sensors engages, the generator will shut down. The source of the problem then needs to be determined. Use the owner's manual troubleshooting section as a reference.

There is a fuel filter in the system that periodically needs checking and cleaning. Refer to the owner's manual.

Disconnect the battery cables before doing any generator maintenance. Inspect and clean the carburetor flame arrestor periodically by blowing off with compressed air.

Inspect all fuel system fittings for leakage periodically. Be sure proper ventilation is present when servicing the fuel system components. Inspect all water and heat exchanger fittings periodically for leaks. Repair or replace components as needed. Be sure the generator is completely cold before performing any maintenance on the water system due to possible hot water and or antifreeze filled components. Be sure to catch and dispose of any antifreeze coolant properly. Refer to the generator owner's manual regarding antifreeze recommendations for type and mixture concentrations.

There is a zinc anode located in the raw water part of the heat exchanger. Replace if 50% erroded. It is self sacrificing thereby reducing the effects of electrolysis to

the generator water system.

When refilling the crankcase with oil follow the specifications given in the owner's manual. Dispose of used oil in an environmentally friendly manner. Following are selected detailed maintenance functions on the diesel generator. Refer to the generator owner's manual for more information.

Note: Read and understand the following safety warnings before performing any maintenance procedures.



WARNING

AVOID SERIOUS INJURY FROM
ACCIDENTAL GENERATOR STARTING!
DISCONNECT THE BATTERY CABLES
BEFORE WORKING ON THE GENERATOR.



WARNING

AVOID SERIOUS INJURY FROM A HOT
GENERATOR AND EXHAUST SYSTEM.
DO NOT WORK ON GENERATOR
UNTIL THE UNIT COOLS.

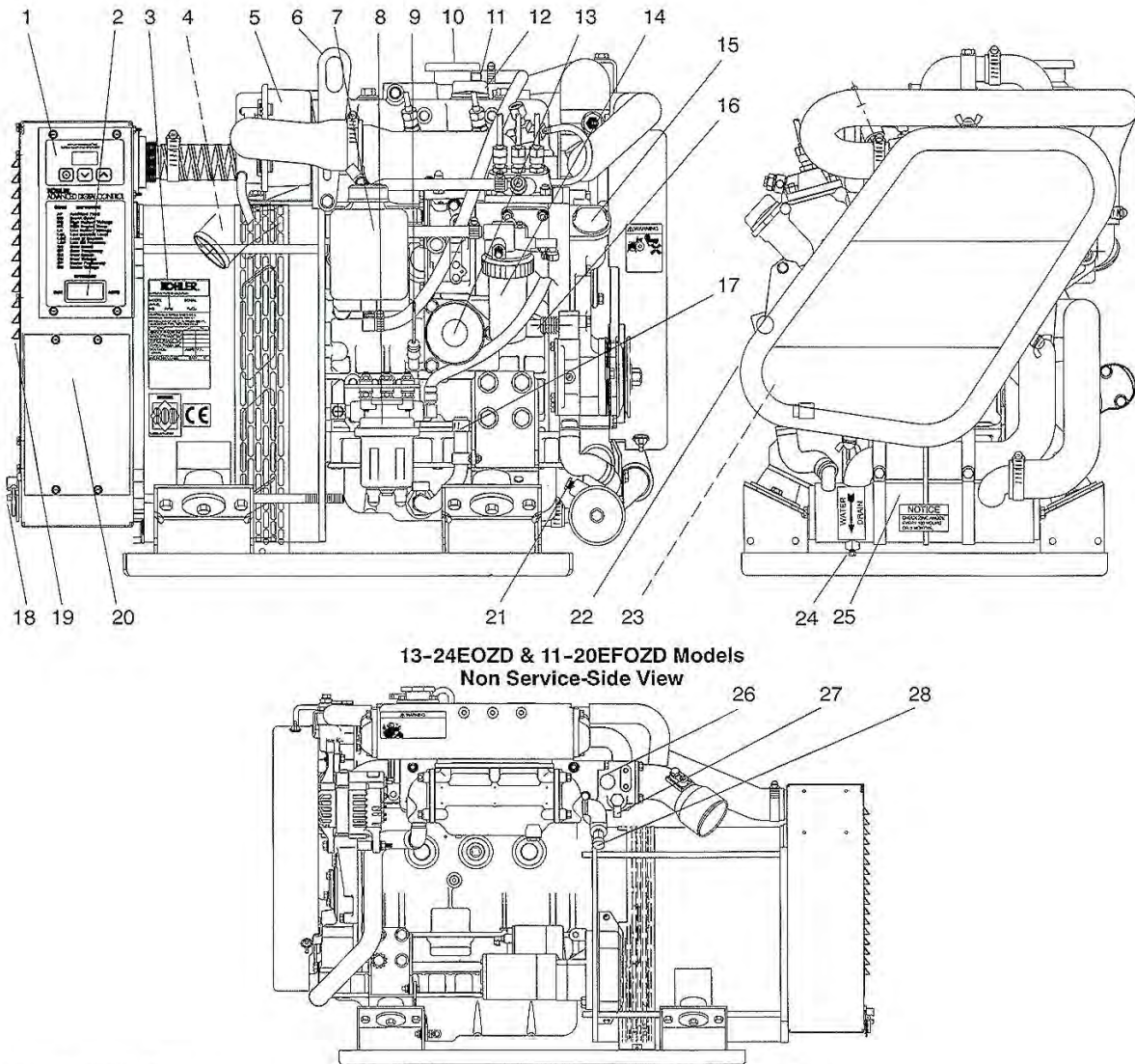


WARNING

AVOID SERIOUS INJURY
FROM ROTATING PARTS!
OPERATE THE GENERATOR ONLY
WHEN ALL SCREENS, COVERS &
GUARDS ARE IN PLACE.

Cosmetic Care & Maintenance

TYPICAL DIESEL GENERATOR PARTS DESCRIPTION

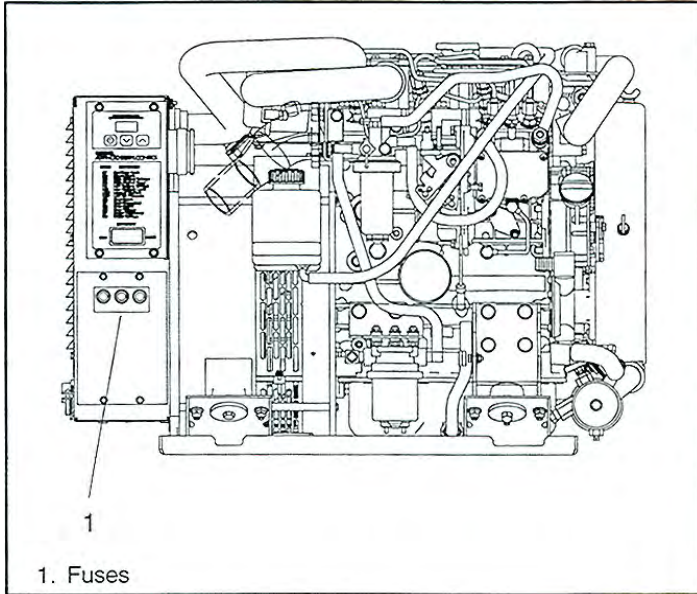


13-24EOZD & 11-20EFOZD Models
Non Service-Side View

- | | |
|---------------------------------------------------------|-------------------------------------------------------------|
| 1. ADC 2100 Control | 17. Oil drain valve and hose |
| 2. Run-Off/Reset-Auto switch | 18. Strain relief for the load lead cable |
| 3. Nameplate | 19. Alternator cooling air inlet |
| 4. Mixing elbow (water outlet/exhaust outlet), far side | 20. AC circuit breaker panel |
| 5. Air intake silencer/cleaner | 21. Anticorrosion zinc anode (seawater drain) |
| 6. Lifting eye | |
| 7. Coolant overflow bottle (location varies by model) | 22. Belt guard |
| 8. Fuel feed pump | 23. V-belts |
| 9. Oil check/dipstick | 24. Engine coolant drain (all models except |
| 10. Coolant pressure cap | 25. Heat exchanger (all models except 13-24EOZD & |
| 11. Coolant overflow tube | 26. Heat exchanger (13-24EOZD & 11-20EFOZD models, internal |
| 12. Oil fill (engine top) | to exhaust manifold) |
| 13. Lube oil filter | 27. Seawater drain (13-24EOZD & 11-20EFOZD models) |
| 14. Fuel filter | 28. Engine coolant drain (13-24EOZD & 11-20EFOZD models) |
| 15. Oil fill (front gear cover) | |
| 16. Seawater pump and water inlet | |



Diesel Generator-Checking/ Changing Fuses



A circuit breaker in line interrupts the generator output in the event of a fault in the wiring between the generator and the load. The line circuit breaker is shown in the typical parts description on the previous page. If the breaker “blows” reduce the load and switch the breaker to the OFF position.

On select generators various breakers/fuses protect various wiring circuits. Always identify the cause of a blown fuse before restarting the generator. See the troubleshooting section for more information or call your closest authorized dealer.

A replaceable fuse protects the controller circuitry. If the controller display is dark, check the battery and battery connections and then check the controller fuse.

Replace the fuse if it is blown.

A replaceable fuse protects the engine relays. If the generator set does not crank, check the battery and battery connections and then check the relay fuse. Replace the fuse if it is blown. A replaceable fuse protects the alternator.

Note: Some fuses are ceramic, others are of the glass type. Replace with identical type and amperage.

Note: Refer to the Westerbeke or Kohler generator operator’s manual for more detailed information.

Cosmetic Care & Maintenance

TYPICAL GENERATOR INFORMATION			Every 50 Hrs. or 1 Month	Every 200 Hrs. or 3 Months	Every 400 Hrs. or 6 Months	Every 1000 Hrs. or Yearly
Perform Service at Intervals Indicated (X)	Reference Section	Daily				
FUEL SYSTEM						
Check the fuel level and fill as necessary	3.5	X (Before operation)				
Check for any unusual noise †		X (During operation)				
Remove the sediment from the fuel tank and drain the fuel tank †§				X		
Clean the fuel filter *	3.5.2			X		
Fuel/water separator draining *†			X			
Fuel/water separator cleaning *†					X	
Replace the fuel filter element *	3.5.2				X	
Fuel injection valve— Check the injection condition *†‡	Eng. S/M				X (300 hrs.)	
Fuel injection pump— Check the injection timing *†‡	Eng. S/M				X (500 hrs.)	
LUBRICATION SYSTEM						
Check the crankcase oil level and add oil as necessary	3.4.2	X (Before operation)				
Replace the oil in the crankcase *	3.4.3		X (Break-in period)	X (150 hrs.)		
Replace the lube oil filter element *	3.4.3		X (Break-in period)		X (300 hrs.)	
COOLING SYSTEM						
Check the coolant level and fill as necessary *	3.8.2	X (Before operation)				
Check the seawater outlet and clean as necessary	3.7	X				
Adjust the seawater pump belt tension *	3.9.1		X (Break-in period)	X		
Check the function of the siphon break, if equipped	3.8.6			X		
Check the heat exchanger anticorrosion zinc condition, if equipped *	3.8.7			X (100 hrs.)		
Check/replace the seawater pump impeller *†	3.8.5				X (Check)	X (Replace)
Replace the coolant *†	3.8.3					X
Replace the heat exchanger anticorrosion zinc anode, if equipped *†	3.8.7					X

* Requires removal of the sound shield door, if installed

† Consult your local distributor/dealer for service

‡ Read the WARNING found at the beginning of the manual regarding moving parts

§ Consult the operating instructions supplied with the craft



Chapter 8

Perform Service at Intervals Indicated (X)	Reference Section	Daily	Every 50 Hrs. or 1 Month	Every 200 Hrs. or 3 Months	Every 400 Hrs. or 6 Months	Every 1000 Hrs. or Yearly
INTAKE/EXHAUST SYSTEM						
Inspect the exhaust system components *†	3.7	X (Before operation)				
Check the exhaust gas condition. If the exhaust is blue or black, contact your local distributor/dealer	3.7	X (During operation)				
Clean the air cleaner element *	3.6				X	
Replace the intake silencer element *	3.6					X
Clean the exhaust/water mixing elbow *†	3.7				X	
Check the breather pipe for obstructions *†					X	
Inspect the complete exhaust system †	2.2					X
ELECTRICAL SYSTEM						
Keep the battery charged and in good condition §	3.10	X (Before operation)				
Adjust the alternator driving belt tension *	3.9.2		X (Break-in period)	X		
Check and tighten the electrical connections *			X			
Clean the battery cables †						X
ENGINE AND MOUNTING						
Check for water, fuel, coolant, and oil leakage *†‡		X (After operation)				
Retighten any loose nuts and bolts *		X (Before operation)				
Check the mounting bolts/vibromounts and tighten if necessary *					X	
Adjust the intake/exhaust valve clearance *†					X	
Check the compartment condition (fuel, oil, or water leaks)		X (Before operation)				
REMOTE START PANEL						
Check the remote start panel operation, if equipped			X (Break-in period)			X
GENERATOR						
Test run the generator set			X (Weekly)			
Blow dust out of the generator *†	3.1					X

* Requires removal of the sound shield door, if installed

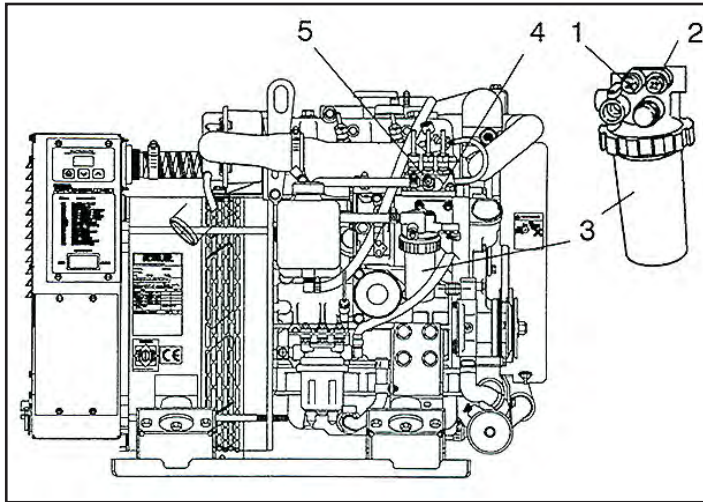
† Consult your local distributor/dealer for service

‡ Read the WARNING found at the beginning of the manual regarding moving parts

§ Consult the battery manufacturer's instructions

Cosmetic Care & Maintenance

Diesel Generator-Bleeding A Typical Fuel System



Initiate the auto/start sequence until the fuel appears free of bubbles as viewed from the vent screw at position 2.

Tighten the screw.

Loosen the fuel injection pump screw at position 5.

Initiate the auto/start sequence until the fuel appears free of air bubbles as viewed from the vent screw at position

Tighten the screw.

Periodically, the fuel system needs “bleeding” to prevent starting failures and rough or erratic operation. This can be caused from the generator running out of fuel, air leaks between the fuel tank and the engine fuel pump, and from replacing the fuel filter.

To bleed a typical system follow these steps:

Note: Have a cloth handy during the bleeding procedure. Wipe up all spilled diesel fuel after bleeding the system. Wash hands after any contact with fuel oil.

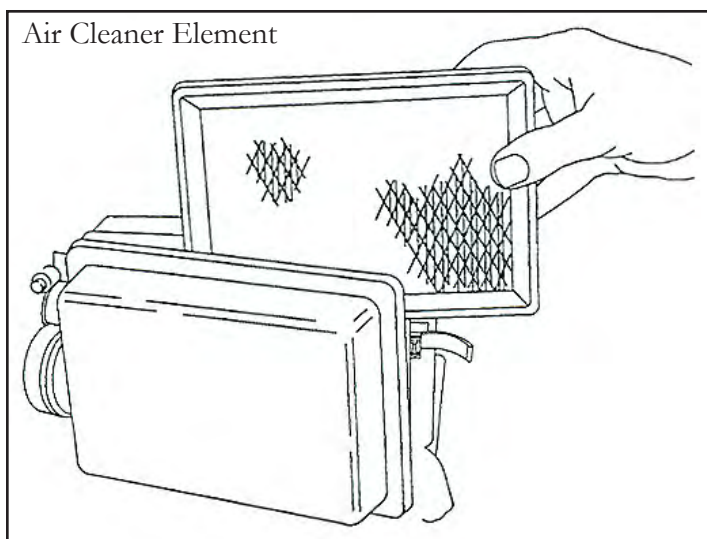
1. Loosen the fuel filter screw at position 1 (See illustration above).
2. Initiate the auto/start sequence until the fuel appears free of air bubbles as viewed from the vent screw at position 2. Tighten the screw.
3. Loosen the fuel filter screw at position 2.



Diesel Generator-Checking/Cleaning Typical Air Cleaner

Clean or replace the generator air intake filter according to the maintenance schedule. If unit is used in dusty or dirty environments maintenance will be required sooner.

A dry type air cleaner silences and filters the incoming air. The assembly connects to the intake manifold through a flexible hose.




To clean/replace air cleaner follow these steps:

1. Release the fasteners to open the housing and remove the air filter element.
2. Tap the element lightly against a firm surface to loosen any surface debris. Do not clean in any type of liquid or use compressed air as these types of filter elements will be damaged.
3. Examine the element and housing for damage and wear. Replace the element or housing if needed.
4. Wipe the cover and base with a clean cloth to remove any dirt. Make sure that the sealing surfaces fit correctly, and reattach the fasteners.

Cosmetic Care & Maintenance

Diesel Generator-Checking Typical Exhaust System

**DANGER**

CARBON MONOXIDE IS A TASTELESS, ODORLESS AND INVISIBLE GAS THAT CAN CAUSE DISCOMFORT, SEVERE ILLNESS, AND EVEN DEATH. EXERCISE CAUTION WHILE OPERATING GENERATOR OR ENGINES IN CONFINED SPACES OR AT DOCKSIDE. DO NOT ALLOW HULL EXHAUST OUTLETS TO BECOME BLOCKED OR EXHAUST FUMES TO BECOME TRAPPED IN AND AROUND THE CONFINES OF YOUR BOAT. DURING IDLE & SLOW CRUISE CONDITIONS, BILGE BLOWERS SHOULD BE USED.


Periodically inspect the exhaust system for cracks, leaks, and corrosion.

1. Check all hoses for rigidity, cracks, leaks, or dents. Replace as needed.
2. Check muffler for cracks, leaks, or weak walls.
3. Check for loose, corroded, or missing hose clamps.
4. Check the exhaust system for any obstructions including the generator hull exhaust. Make sure there are no insect nests at the outlet. Check for carbon or soot deposits which are indicators of exhaust leaks.
5. Make sure that all carbon monoxide detectors are working.



Diesel Generator-Checking Typical Cooling System

The generator features a closed cooling system. The seawater circulates through separate chambers within the heat exchanger or manifold to cool the engine coolant. The seawater mixes with the engine exhaust and exits at the hull exhaust outlet.



WARNING

**AVOID SERIOUS INJURY OR DEATH FROM
HOT COOLANT AND STEAM.
STOP THE GENERATOR
AND ALLOW IT TO COOL
BEFORE LOOSENING THE PRESSURE CAP
AND WORKING ON THE GENERATOR.**

Maintain the coolant level in the recovery tank at approximately 1/4 full. Before filling the cooling system, close all petcocks and tighten all hose clamps. Use a solution of 50% ethylene glycol and 50% clean, softened water to prevent rust/corrosion build-up and protect against freezing in colder climates. Add additional coolant solution, as necessary, to the coolant recovery tank.

Periodically check the coolant level by removing the pressure cap. Do not rely on the level in the coolant recovery tank. Add fresh coolant until the level is just below the overflow tube opening.

Note: A coolant solution of 50% ethylene glycol is required to provide freezing protection (-34 degrees F) and overheating protection to (265 degrees F).

Do not use or mix alcohol or methanol antifreeze or mix them with the recommended coolant.

Note: If the generator is overheated do not add the recommended coolant until the generator is cool to prevent engine or component damage.

Note: After the coolant drains, allow time when refilling the coolant for a complete refill of the engine water jacket.

A complete flushing periodically will keep the cooling system in optimum condition. Use the service schedule. To flush the cooling system do the following:

1. Open the pressure cap and open petcocks located at the heat exchanger, engine block, and cooling system, and let the system drain completely. Remove the pressure cap to simplify draining.
2. Drain, clean and flush the coolant recovery tank.
3. Flush the system with clean water.
4. Fill the system with recommended coolant.

The closed heat exchanger systems use a special pressure cap that raises the boiling point of the coolant, enabling a higher operating temperature. If the cap leaks or fails to hold pressure replace it with one of the same pressure. The pressure rating is stamped on the cap body.

GENERATOR MAINTENANCE RECORD

55



GROUND FAULT CIRCUIT OUTLET:

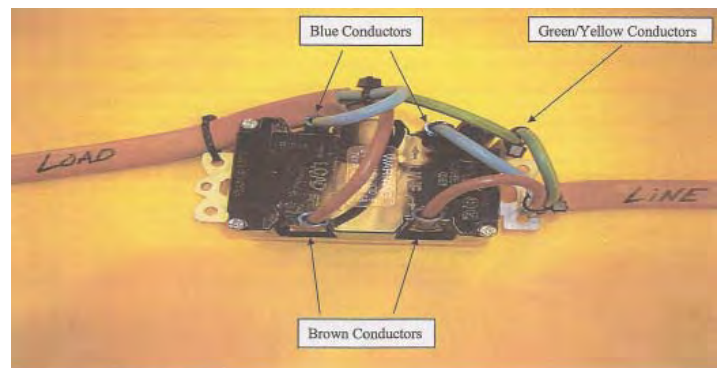


The GFCI (Ground Fault Circuit Interrupter, GFCI abbreviated) outlets should be tested monthly. To test the unit, depress the reset button. Then press the test button. The reset button should pop out. If it does not, contact a qualified electrician or marine professional to replace the device. Note that all GFCI devices are over time susceptible to humidity and internal contact corrosion.

Refer to Chapter 4 where it explains the system operation and shows the circuitry throughout the vessel. The GFCI is normally located at the beginning of a circuit so that all receptacles downstream are protected. That could be a reason why several components plugged into outlets will not work when a GFCI is not functioning.

Note the following information is for reference only. Notice the **Line** and **Load** high voltage connection points to the GFCI outlet. The wire labeled **Line** will be the incoming supply current from the branch circuit breaker, and the wire labeled **Load** will be the outgoing supply current from the GFCI to all other outlets downstream.

There are 3 different wire colors connected to the GFCI outlet for both the line and load cables. The connection points of the GFCI labeled “HOT” are the current carrying connections where the brown wires will connect. These connectors must be connected correctly with respect to the line and load side of the GFCI device. The connection points labeled “WHITE” are the “NEUTRAL” return conductor connections, and where the blue wires are connected. These connections must also be connected correctly with respect to the line and load side of the GFCI device.



Cosmetic Care & Maintenance

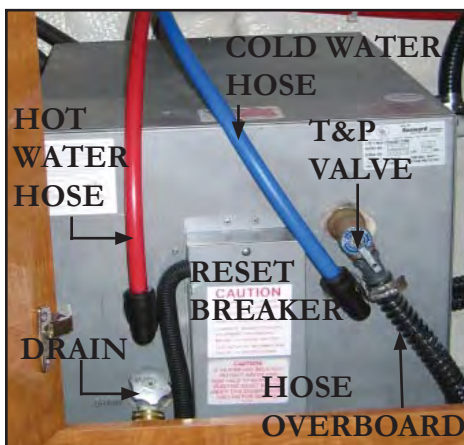
HEATER-HOT WATER

A. The most important maintenance factor with the hot water heater is that it is winterized with Winterban (RV anti-freeze; alcohol style) in freezing climates. Use the water heater drain valve to vacate water from the tank. The water will automatically drain into the shower sump pump and then will be sent overboard. *Make sure the water heater breaker is turned off before any winterization is started to prevent the element from being burned out.*

B. If the system is constantly being used in warmer climates it is a good idea to periodically drain the hot water valve for 30 seconds or so to eliminate any scale that has built up inside the hot water heater. Turn the breaker off just as a precaution.

C. The hot water heater and heat exchanger parts are made of aluminum. If engine flushing is required by the manufacturer be sure to disconnect the heat exchanger from the system temporarily.. The caustic chemicals will damage the hot water heater aluminum parts. Re-plumb the heat exchanger back after engine flushing.

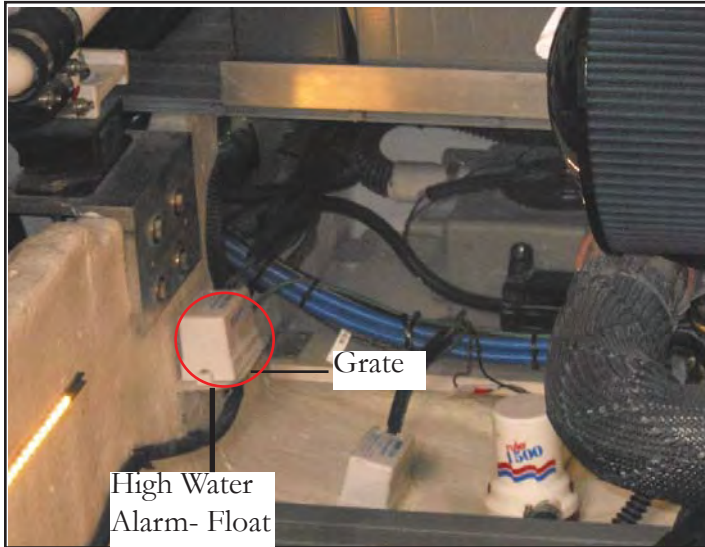
D. Test the T& P valve periodically to make sure it works properly. Its purpose is to let off excess water vapor (steam) if the thermostat should stick and a critical temperature situation develops within the tank. Pull on the valve to test it. The water will exit overboard as it is discharged through the valve.



TYPICAL WATER HEATER



HIGH WATER ALARM



The high water alarm float is located in the engine room installed several inches from the hull bottom. Obviously, when the helm alarm sounds there is a large amount of water filling the engine room cavity. Stop the vessel and determine the source of the leak.

Periodic maintenance consists of visually inspecting the float grate cover for debris and removing any accumulation.

Cosmetic Care & Maintenance

HORN



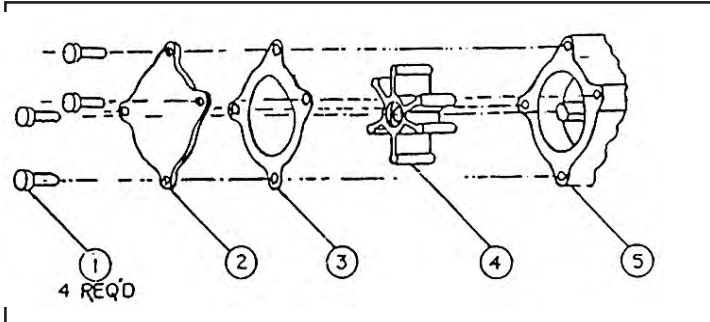
The typical electric horn is mounted on the hard top. At the aft end of the horn under the horn shell is a diaphragm adjusting screw. If adjustment is needed have someone depress the horn switch and hold it while the screw is adjusted for the loudest decibel.

Also, periodically check the horn assembly for debris and insect nests. Use an auto grade chrome cleaner on the horn assembly at least annually. After each cruise, rinse the horn assembly with fresh water. Check the fasteners for tightness annually along with the deck sealant for complete

sealing coverage.



OIL CHANGE SYSTEM



The oil changer system requires little maintenance up to the 500 hour period. At that time the impeller needs to be replaced. Earlier replacement may be necessary if the oil changer has been operated dry, foreign objects have broken the impeller vanes down, or improper liquids have been run through the system. For impellers and gaskets, call 1-800-922-4804.

To change the impeller:

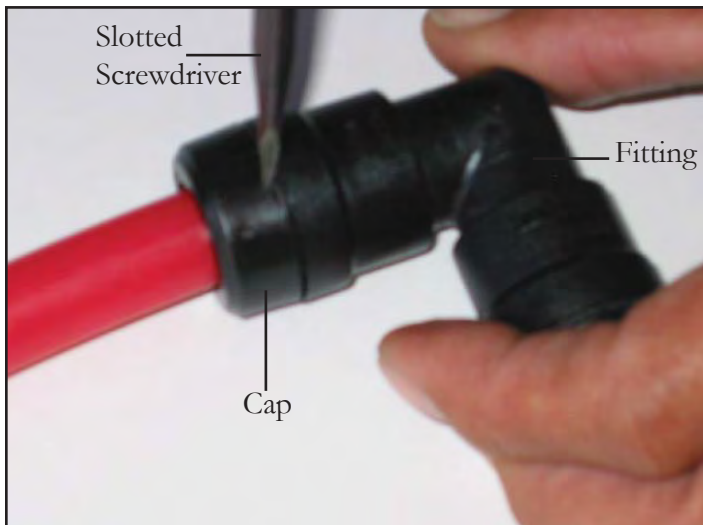
1. Remove the four screws(1).
2. Remove the cover plate (2) and old gasket (3).
3. With fingers, remove damaged or worn impeller (4).
4. Clean the inside of the pump looking for foreign materials and any partial impeller vanes that may be stuck in the chamber. Also, check the hose barbs and hoses leading to the outside for debris.
5. Apply Vaseline or similar lubricant to both the inside of the pump head (5) and to the outside of the impeller (4).
6. Align the flat surface on the inside of the new impeller with the flat surface on the motor shaft. Push into place while twisting the blades in a clockwise direction.
7. Place the new gasket (3) on the pump body face, align holes and replace cover (2). Tighten all 4 screws evenly.

Cosmetic Care & Maintenance

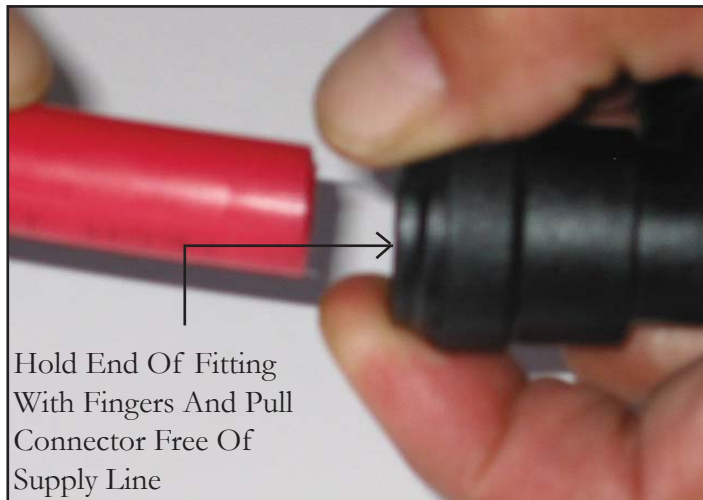
PLUMBING CONNECTORS

Plumbing connections to the red and blue fresh water lines require special instructions when they are to be removed or replaced due to leaks. Be sure to turn off the water for that circuit at the manifold before starting any plumbing repairs.

1. To remove a tee, 90 degree, or straight connector fitting first remove the cap on the end of the fitting by using a slotted screwdriver. Insert the screwdriver in the cap slot and turn 90 degrees. Cap will release from the fitting.



2. Push the connector and collar together. Hold the collar next to the connector with your finger. Pull and the connector/collar will release itself from the water line.



To reinstall a plumbing connection to a water line make sure the line is cut off square and the end is smooth. This will aid in ensuring a leakproof connection.

1. Install the cap on the supply line. You may need to use a slotted screwdriver to remove the cap from a new fitting.

2. Simply push the fitting on to the supply line until pressure is felt. This ensures it is completely in the fitting.

3. Push the cap on the collar until it snaps in place. Turn on the water pressure and check for leaks.

Note: With the connector in place, a movement between the line and connector is normal.



PUMP-FRESH WATER

The fresh water system in general requires very little maintenance. The fresh water pump and booster pump are located in the forward main cabin floor locker.

1. See the equipment operation chapter defining the recommended seasonal disinfection procedure.
2. The fresh water filter needs to be cleaned periodically. Simply remove the hose clamp and unscrew the fresh water filter to access the screen. Rinse the screen off to remove any foreign debris. Be sure to use teflon tape on the pump fitting threads before installing the filter. Reinstall the components and check for leaks.
3. Periodically check all fittings for leaks.
4. In colder climates, use Winterban or its equivalent in all the fresh water system components after draining the system.



Typical Fresh Water Pump Filter

Cosmetic Care & Maintenance

PUMP-OVERBOARD DISCHARGE

If your boat is equipped with an overboard discharge pump pay close attention to what materials are flushed through the waste system as it could become clogged. Do not pump garbage, rags, or sanitary napkins through the overboard discharge pump (macerator). Flush the waste tank and pump with fresh water with each pump out. Do not run the pump dry or for extended periods of time since the impeller can be damaged.

Pump the waste system out at decommissioning time and rinse fresh water through the entire system periodically to keep the hoses clean of debris especially the pump out hose.



Macerator
Pump



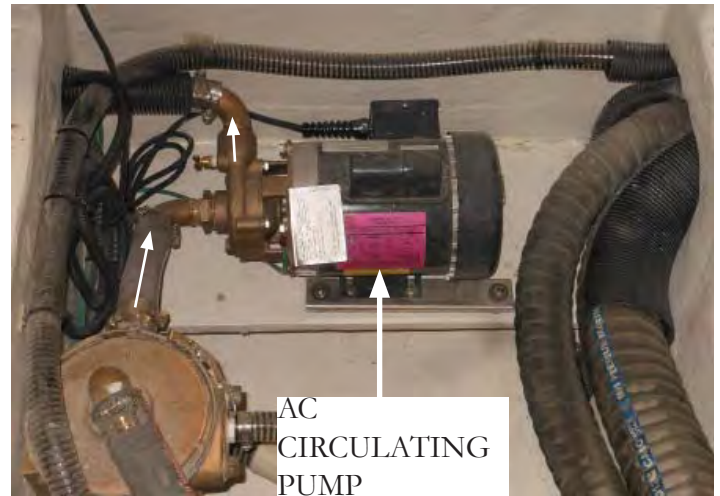
SEA CHEST FILTRATION SYSTEM

The optional sea chest system requires very little maintenance. All hardware including hose clamps and hoses should be inspected periodically for abrasion and leaks. Check all electrical connections for tightness.

Periodic inspection of the filter basket is recommended.

Close the inlet and discharge seacocks and shut power off at the ship's main DC panel before removing the cover to inspect the filter basket.

To access the cover, remove the cotter pin and release the band clamp that holds the cover in place. Reverse process for reassembly. When finished, turn on power and check for leaks while running the system.



AC
CIRCULATING
PUMP

The 230 volt air conditioner pump uses filtered water from the sea chest system (if installed) and pumps it to the A/C condenser units. Check each air conditioner thru-hull for water output once the pump activates. Shut the unit down if little or no water is observed.



Cosmetic Care & Maintenance

SEAKEEPER® STABILIZER SYSTEM

The optional Seakeeper is installed below the starboard aft floor connected to the stringers.

The gyro system is designed to require as little maintenance as possible. However, since the system is comprised of mechanical and electrical components that operate in a harsh marine environment, some periodic inspections and maintenance are recommended. Seakeeper recommends an annual inspection and a 2000 hour service interval to keep the gyro running trouble-free.

There are special tools required for the brake service therefore only authorized personnel should service the unit. Never attempt to relieve the brake pressure without the special tools required. Also, never charge the nitrogen charged accumulators with oxygen or shop air.

SYSTEM / COMPONENT	TASK PER SERVICE BULLETIN 90133	INTERVAL	PARTS / SPECIAL TOOLS
Mechanical / Corrosion	Inspect unit for severely corroded areas and clean and touch up with paint. See Service Bulletin 90026.	Annual	
Hydraulic / Hoses	Check for cracks or chafing. If chafing found, reposition hose to provide clearance around hose. If chafing is severe, replace hose. Charge system per Service Bulletin 90025.	Annual	Hydraulic hand pump kit
Cooling / Zinc Anode	Replace zinc anode as needed.	With other zincs or Annual	
Cooling / Hoses	Check for cracks or chafing. If damaged, replace hose. Fill cooling system and purge air.	Annual	Anti-freeze
Cooling / Seawater side	Inspect heat exchanger for signs of leaks.	With other zincs or Annual	
Cooling / Seawater side	Fill with environmentally safe, marine anti-freeze during winter or periods of in-operation.	Winter	
Electrical / Connectors	Inspect all connectors for corrosion, clean as necessary, and treat with corrosion inhibitor.	Annual	
Electrical / Grounds	Inspect all ground points for corrosion, clean as necessary, and treat with corrosion inhibitor.	Annual	
Electrical / Gimbal Angle Sensor	Check calibration of sensor. See Service Bulletin 90083 for instructions.	Annual	
Electrical / Cables	Check all cables for cracks or chafing.	Annual	
Electrical / Power Input	Check for seal at cable glands.	Annual	
Electrical / Motor Power	Check integrity of motor power cable jacket.	Annual	



SEAKEEPER® STABILIZER SYSTEM (CONT.)

SYSTEM / COMPONENT	TASK PER SERVICE BULLETIN 90134	INTERVAL	PARTS / SPECIAL TOOLS
Mechanical / Hydraulic Brake	Replace brake bushings, hydraulic accumulators and check valves, and flush hydraulic oil.	2000 hrs	Hydraulic hand pump kit, Brake bushing replacement tool kit, Hydraulic brake parts kit
Cooling / System	Cooling system flush	2000 hrs	Fill reservoir or jug and tubing, antifreeze
Electrical / Motor Drive	Check internal circulator fan inside Motor Drive J-Box.	2000 hrs	

Cosmetic Care & Maintenance

SIRIUS MARINE WEATHER

If installed, the Sirius weather system is a sealed unit. DO NOT remove the receiver cover. Adjustments require specialized service procedures and tools only available to qualified service technicians. There are no user serviceable parts or adjustments.

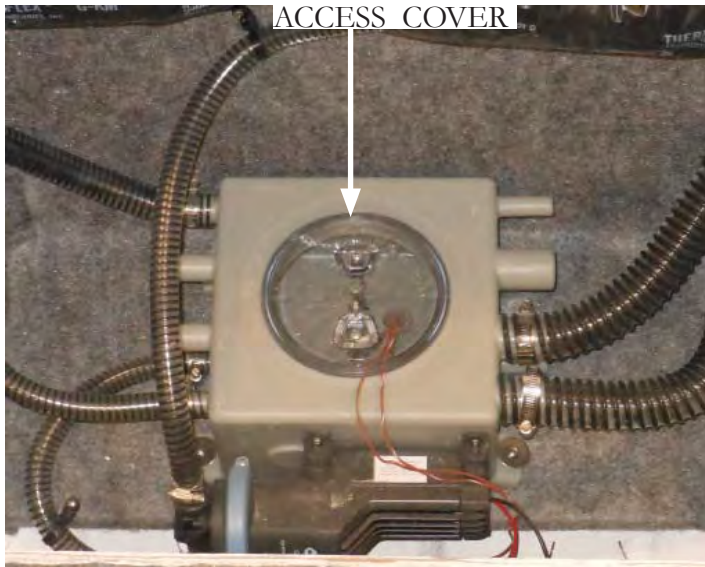
Always turn your weather system off before carrying out routine maintenance.

Perform the following periodically:

1. Examine the cables for signs of damage, such as chafing, cuts, or nicks.
2. Check that the cable connectors are firmly attached and dust caps are fitted to any connection not in use.



SHOWER SUMP PUMP- TYPICAL



The shower sump pump shown above is used to collect gray water waste from the sinks or the shower itself. After the liquid reaches a designated height, the sump pump energizes through a float switch and exits waste to a manifold then overboard. This system helps to protect our water supply by not dumping used water overboard. Periodically check the sump pump grate for debris such as hair and soap build up. Check to make sure the automatic float operates freely at all times. Also, clean out the box with a bleach/water solution as needed to kill bacteria. You can back flush using the bleach/water procedure. There are 2 shower sump pumps located on your vessel. One is in the aft floor section of the main cabin. The other is located at the forward center engine room floor.

Cosmetic Care & Maintenance

STEREO/DVD PLAYER/TELEVISION

Since most of the same cleaning and maintenance tips overlap on these entertainment components, they will be grouped together.

1. To clean the CD slots in stereos, DVD players use a dry or slightly water moistened swab to remove any buildup of debris. This monthly procedure will assist in preventing the CD discs from being scratched.
2. To clean the faceplates of the various units use a dry soft cloth. If the faceplate is stained badly, use a moist cloth with a neutral cleaner. Do not use harsh, caustic or alcohol based chemicals to keep the letters from coming off the faceplate. Do not use silicone spray or WD-40 since they could damage mechanical parts.
3. If these units will not play CD's properly it they may have developed condensation. Wait 1 hour and retry.
4. Keep all remote controls out of extreme heat and high moisture environments. Change batteries often for best operation.
5. Periodically check CD discs for scratched and dirty ones. Clean the dirty ones with a cleaning kit which can be purchased at most electronic stores.
6. With flat screen televisions, do not attempt to service the unit yourself since high voltage exists.
7. To clean the flat screen display, dampen a soft cloth with water or a mild detergent. The best cleaner is a screen cleaning tissue specifically designed for antistatic coating. Never use flammable cleaning materials or glass cleaners with ammonia since they attack the television screen surface.



TELEVISION FLAT SCREEN MONITOR

These cleaning recommendations cover TV's that may be installed in the main cabin, forward, master staterooms and cockpit. Regular cleaning of these units will help extend their life. Turn the power off at the breaker before you begin any cleaning procedure.

Cleaning The Screen

Wet a soft cloth in a mixture of warm water and fabric softener or dish washing detergent. Wring out the cloth until it is almost dry. Wipe the screen to remove dust and debris.

Remove any excess water from the screen and let the screen air-dry before you activate the television breaker and turn the unit on.

Cleaning The Cabinet

Use a soft, lint-free cloth to clean the cabinet off. Again, do not use a wet cloth.

NOTICE

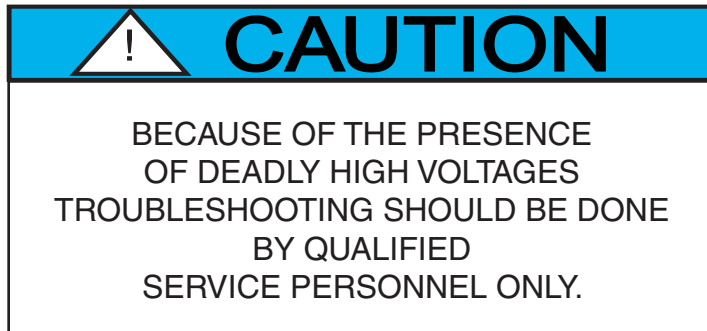
WHEN LEFT FOR EXTENDED PERIODS
TURN THE TELEVISION BREAKER
TO THE OFF POSITION TO HELP PREVENT
POWER SURGES OR LIGHTNING DAMAGE.

NOTICE

TO PROTECT THE INTERNAL TELEVISION
COMPONENTS OF THE TELEVISION
REMOVE THE TELEVISION FROM THE
VESSEL IN FREEZING CLIMATES.
CONTACT YOUR REGAL DEALER
FOR TECHNICAL SERVICE.

Cosmetic Care & Maintenance

TRANSFORMER-ISOLATION



The isolation transformer option contains no moving parts and requires very little maintenance because of its durable construction. Periodic inspection and care are recommended practices especially if the transformer is operating in a harsh environment.

A periodic inspection for loose connections, condition of terminal board, overheating, rust, paint, deterioration, and general condition of the unit by a qualified service technician is recommended.

The following information is included for the qualified service personnel only.

If there is a malfunction of the transformer, first check to see if all connections are tight and then retest.

Removal of dust, dirt and debris from the external enclosure surfaces is encouraged and may be performed while the unit is in operation (Do not use water).

Internal maintenance would include the inspection and tightening of bolted connections. Removal of dirt can be accomplished using a vacuum cleaner or low pressure (less than 20 psi) dry compressed air.

If a transformer is being inspected, cleaned or worked on, these safety steps must be observed.

1. Remove all power from the sources in the primary and secondary circuits.
2. Remove all fuses from the power source. Additionally, trip circuit breakers and take appropriate action to prevent the accidental resetting of the circuit breakers.
3. Short out transformer secondaries before connecting and disconnecting equipment.
4. Always connect a load to the secondary side of the transformer before applying power to the primary.

TRIM TABS

Trim refers to the running angle of the boat while underway to achieve the most efficient planning angle. Check all electrical connections for tightness, corrosion, and chafing. All mechanical trim tab components should be checked periodically. If a malfunctioning tab is suspected, run each tab in and out while someone looks at each tab to make sure it is moving up and down the proper distance. **Replace zinc anodes when at one half their life as determined by size. Check anodes twice a month in salt environments.**

The trim tabs may be painted for corrosion protection. **Do not paint the anodes** as they protect the tabs from galvanic corrosion.

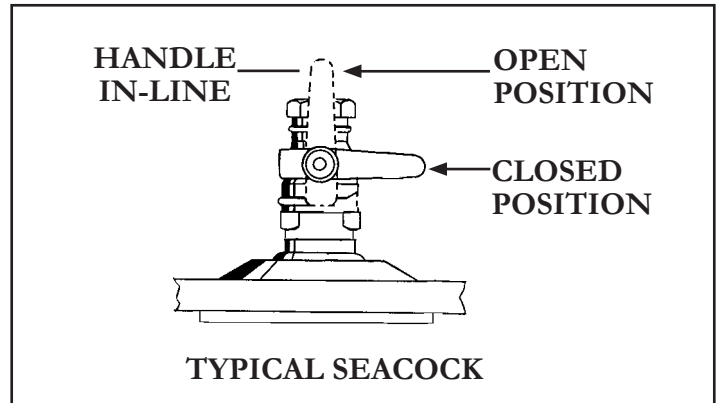
As these trim tabs are electrically operated there is no requirement for hydraulic oil.



UNDERWATER HARDWARE- SEACOCKS

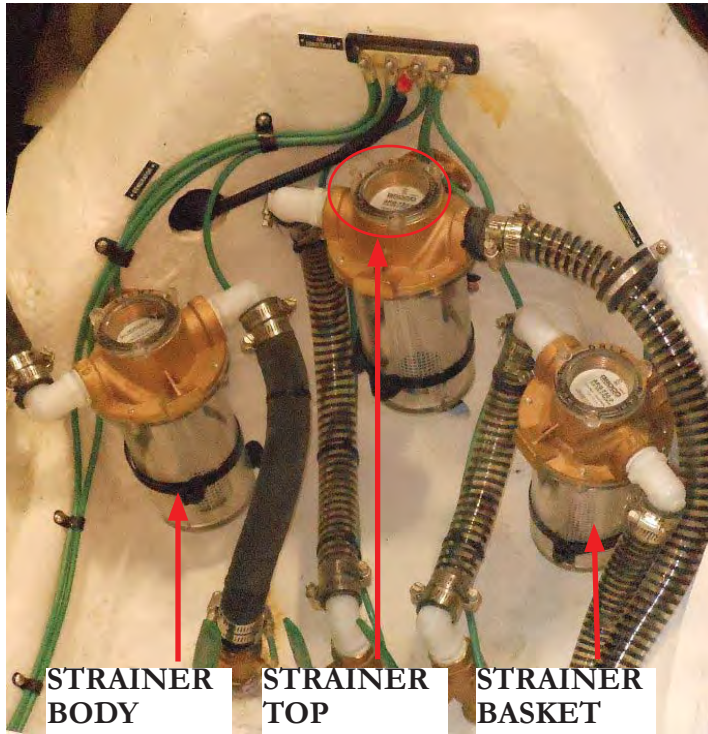
Inspect the thru-hull seacocks before each outing. Make sure the connections between the output hose and the valve are tight. Look for water leaks around the area where the valve and hull meet.

Every 30 days open and close each thru-hull valve several times. This will guard against the valve seizing in the open or closed position. Also, make sure the valve handle is tightly fastened. Secure any loose valve handles.



Cosmetic Care & Maintenance

Checking Sea Water Strainer



Before servicing the sea water strainer make sure the appropriate seacock has been **closed** to prevent water from entering the boat. Turn the strainer top counterclockwise to remove the top to access the strainer basket. Reach into the strainer body and lift out the strainer basket.

If possible blow out the strainer basket with compressed air or use a metal type brush to remove any accumulated material from the screen mesh. Make sure the strainer is centered on reinstallation.

Check all parts for wear and possible leaks including any gasket surfaces. Do not overtighten the strainer top which could cause strainer body damage.

. Use original replacement marine parts only. After all parts are reassembled open the seacock and check for leaks.

Notice there is a drain hole in the bottom of the strainer body.



VACUUM STYLE HEAD SYSTEM

Vacuum style toilet systems need to be cleaned periodically for maximum sanitation and operational efficiency. Clean the bowl with a cleaner such as Bon Ami which will not abrade the toilet bowl lining. Do not use chlorine solvents or caustic chemicals such as drain openers because the various system seals may be damaged.

Use the following procedure **monthly** or when leaving the vessel for extended periods.

1. Fill bowl with water.
2. Add 1 cup of biodegradable powdered laundry detergent.
3. Flush toilet by pressing the pedal for about 2 minutes. Release foot pedal to close flush ball.
4. Most marinas offer a service that uses a vacuum hose connected to the deck waste fitting that pulls the waste from the tank. We suggest using a hose after the process and shoot a few bursts of fresh water down the waste fitting at the deck. This helps the residue left from the pump-out process from building up in the waste hose.

If an odor is apparent from the system try the following:

1. Clean the system out using the above procedure.
2. Check to see that the vent from the holding tank to thru-hull fitting is not clogged.
3. Periodically add the correct holding tank deodorant either Secure or Sealand liquid.
4. Annually replace the in-line vent filter located in the main cabin. This filter can be ordered from a Regal dealer or your local marine supply store.

Cosmetic Care & Maintenance

VACUUM CLEANER

CLEANING STRETCH HOSE

The stretch hose on occasion has a tendency to get clogged especially if you have pets on board. To clean the hose:

1. Lift the hose up at both ends and dispense some liquid detergent into both ends.
2. With a garden hose, holding both ends still up, fill 3/4 with water.
3. Shake hose up and down, let detergent loosen the dirt and clogged debris.
4. Stretch the hose as far as you can (2 people required) and wash the dirt out with the full pressure of a garden hose. Repeat as necessary.
5. Hang hose up on one end. Let hose drain and dry completely.



WASHER/DRYER

■ Cleaning the exterior:

The exterior of your machine should be cleaned with a rag dipped in lukewarm water and soap. Do not use polish of any kind on the plastic trim. Some polishes contain agents, which may damage plastics.

■ Cleaning the Interior:

If you live in an area where phosphate detergents are banned, it may be necessary to recondition the washer periodically. If a non-phosphate detergent must be used, body oils and detergent may accumulate in the washer tub. This is particularly evident in hard water areas or homes where heavily soiled garments are regularly laundered. To remove this buildup, run the washer through a complete cycle using HOT water and 2 cups of a non-precipitating water conditioner. Do not add any clothes, laundry detergent, or other laundry aids. Once all the accumulation has been removed, your laundry should be satisfactory if you follow the preventative suggestions in this book.

Helpful Hints

Clean the exterior and rubber parts of the appliance gently with a soft cloth dipped in warm, soapy water. Never use solvents or abrasives to clean the external or rubber parts of the washer-dryer.

Vacations, or anytime the machine is not in use, it is recommended that you unplug the machine from the socket and turn off the water supply to limit wear to the machines' water circuit and to eliminate the risk of leakage. Also, leave the door ajar to allow for air circulation within the drum and door gasket area. This will prevent unpleasant odors.

Don't neglect the detergent dispenser. The detergent dispenser is removable and can easily be cleaned under running water (see "Detergent Dispenser Cleansing," p. 13).

Never leave the washer-dryer plugged in while cleaning. During cleaning and maintenance the appliance should always be unplugged.

■ General Maintenance:

Your washer-dryer is designed to provide reliable service over many years. A few simple steps will help to prolong its life and avoid problems:

- After washing is complete, the water faucets should be turned off to relieve water pressure on the hoses.
- Before moving your washer-dryer to a new location, you must reattach the transit screws/spacers you removed during installation (p. 5).
- Wipe the inside of the washer-dryer door with a soft cloth to remove any remaining moisture after washing. Periodically, a thin coat of paste wax should be applied to the inner door of the washer, especially to the area that is immediately next to the porthole window. This will protect the door finish from laundry aid spills and any discoloration that could result from these spills.
- Clear the pump pre-chamber if it gets clogged. See "When Needed, Check the Pump," p. 17).
- The use of a de-liming product is recommended every wash ONLY if the water is particularly hard or rich in lime content. Normal detergents already contain de-liming agents. A periodical wash cycle with a dose of a de-liming product (without detergents or laundry) may prove useful.
- Never use too much detergent or additives, because this could cause an excessive amount of foam, increasing the potential for damage to the component parts of your washer-dryer. See "About Laundry Aids, (p. 10).
- It is important to wash the detergent dispenser drawer regularly. If dried laundry aids accumulate, place the dispenser under running water for a few minutes until clean. See "Detergent Dispenser Cleansing," (p. 13).

Cosmetic Care & Maintenance

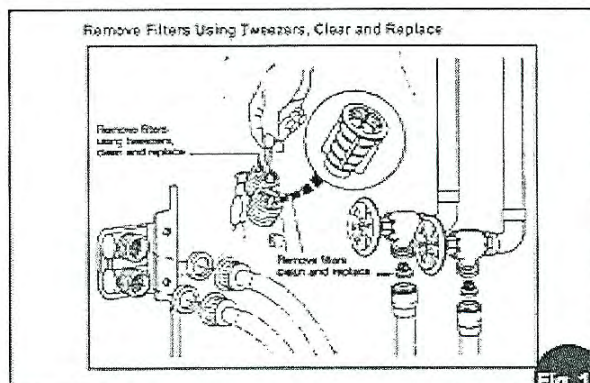
PERIODIC MAINTENANCE

■Check the Water Inlet Hoses

Periodically inspect and replace hoses if bulges, kinks, cuts, wear, or leaks are found. Remove and clean the filters and the water valves (Fig. 12). Replace inlet hoses as needed to reduce the risk of hose failure.



IMPORTANT: Replace inlet hoses at least every five years of use to reduce the risk of hose failure. Inspect and replace inlet hoses if bulges, kinks, cuts or leaks are found. NOTE: When replacing your inlet hoses, mark the date of replacement on the label with a permanent marker.



WARNING

AVOID POSSIBLE FIRE!
CLEAN THE LINT TRAP AFTER EVERY LOAD
AND PERIODICALLY INSPECT ALL DRYER
DUCTING FOR LINT AND ACCUMULATED
DEBRIS. SEE OWNER'S MANUAL
FOR ADDITIONAL INFORMATION.

■When Needed, Check the Pump

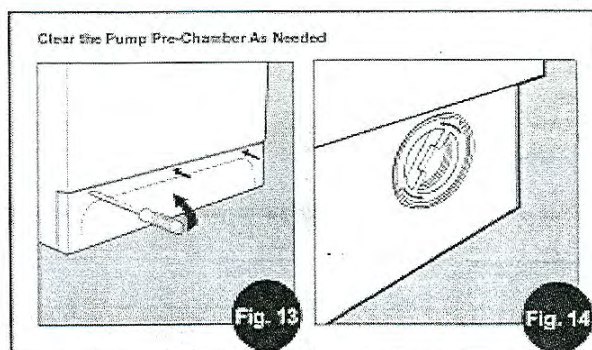
Your washer-dryer comes equipped with a self-cleaning pump that does not require regular cleaning and maintenance.

However, small objects may accidentally fall into the pump: coins, hair clips, loose buttons and other small items. To avoid possible damage, they are withheld in an accessible pre-chamber at the lower end of the pump.



IMPORTANT: Before attempting to examine this pre-chamber, first ensure that the machine has finished its program and is empty. As with any maintenance, unplug the machine.

- To gain access, gently ease down the top of the toe-kick panel (at the base of the front of the machine) with a screwdriver or similar item to release it. Then ease the top edge forward to allow it to be lifted clear (Fig. 13).
- Place a shallow dish or tray below the cover of the pre-chamber to catch the small amount of water present. Release the cover by turning counter-clockwise (Fig 14). Remove any items or debris.
- Securely replace the cover by turning clockwise. Refit the toe-kick panel by inserting the hooks on its lower edge into the slots and ease the top edge back into position.





WINDLASS

The typical windlass requires periodic maintenance to keep it in top running condition. Every 6 months the manufacturer recommends that the unit be disassembled and all the above deck parts be washed down with fresh water. Lightly oil (SAE 10) the seal, shaft, cone clutch and spline. Ensure that the base, below the gipsy, is cleaned well and the sealing ring is checked. Grease the threads on the chain pipe cover and stripper screws before re-assembly. The bearing is self lubricating and should not require servicing.

Below the deck check regularly the condition of the motor/gear box and terminals and re-apply grease when necessary. The motor/gear box is two part epoxy painted to protect it against corrosion as it is constructed of steel and lives in the harshest environment on your craft. If corrosion on the motor is evident, clean and repaint with marine grade oil based enamel paint.

Note: Refer to the windlass operator's manual for additional maintenance information.

	WARNING
TO PREVENT BODILY INJURY REMOVE THE CHAIN FROM WINDLASS BEFORE PERFORMING MAINTENANCE.	

Cosmetic Care & Maintenance

ZEUS STERN DRIVE MAINTENANCE INTERVALS

Maintenance Procedures After the First 25 Hours of Operation Not to Exceed 30 Hours of Operation

Change the transmission oil (fluid) and filter, including the transmission oil in the drop box.

Change the gear lube in the drive gearcase and gear lube monitor. (This procedure can be completed with the vessel in the water).

Every 6 Months

Check the trim tab anodes. Replace the anodes if they are 50% eroded.

Every 250 Hours of Operation or once per year (whichever occurs first).

Tighten the driveshaft connecting bolts and nuts to specifications.

Inspect & lubricate the driveshaft slip joint.

Inspect the driveshaft u-joints; lubricate if equipped with grease fittings.

Change the gear lube in the drive gearcase and gear lube monitor.

Change the transmission oil (fluid) and filter; including the transmission oil in the drop box.

Every 500 Hours of Operation or Once a Year (whichever occurs first).

Lubricate the propeller shaft splines and tighten the propeller nuts to specification.

Inspect the hydraulic system fittings and hoses found on the drive for leaks or damage. Check the hose fittings for tightness.

Check the bonding (continuity) circuit for loose or damaged connections. Test the MerCathode® unit output.

Inspect the electrical system for loose, damaged, or corroded connectors.

Inspect the cooling system components found on the drive for damage or leaks. Check the hose clamps on the hoses for tightness.

Check that the water inlet openings on the seawater pick-up are clean and not obstructed.

Inspect the exhaust system connections on the drive for damage and leaks. Check the hose clamps on the hoses for tightness.

Use Mercruy Corrosion Guard to protect the product from corrosion.

Whenever the Vesselview fault code “Filter Dirty Fault”, “Filter Clog Fault” or “Service Steering Filter” is displayed.

Change the hydraulic oil and filter for the steering and trim system. (Refer to the information regarding the steering actuator and trim hydraulic oil).

Maintenance-Zeus Key Torque Values

Pod rings= 65 ft. lbs.

Coupler bolts= 110 ft. lbs.

Turbo connections= 18 ft. lbs.

Drive exhaust elbow= 18 ft. lbs.

“T” bolt clamps= 30 to 60 inch lbs.

Large prop nut= 100 ft. lbs.

Small prop nut= 60 ft. lbs.



ZEUS STERN DRIVE MAINTENANCE

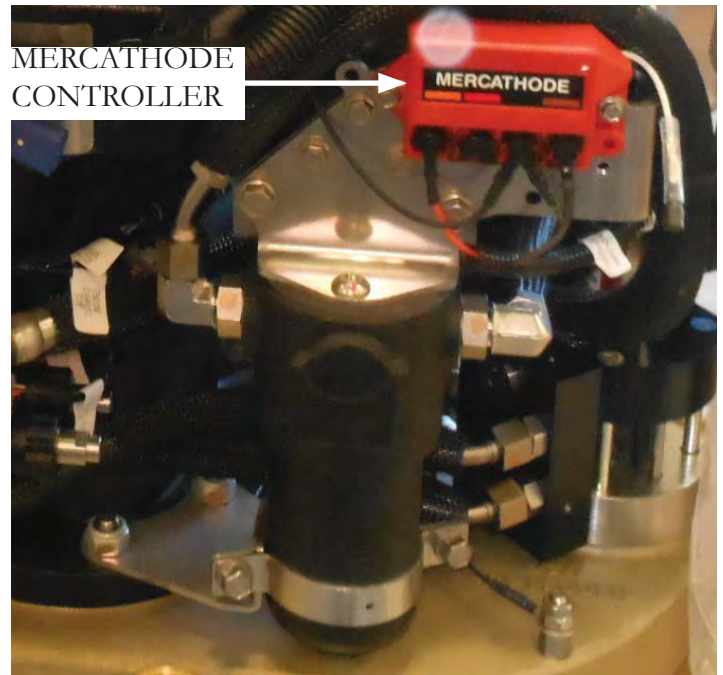
Corrosion Facts and Tips

On the drive unit unit there are 2 or more dissimilar metals. When the drive is submerged in a conductive solution such as saltwater, brackish or polluted water with a high mineral content a chemical reaction takes place causing electrical current to flow between the different metals.

The electric current flow called electrolysis or galvanic corrosion causes the metal that is most chemically active or anodic, to erode. This process in time will cause the need to replace power package components exposed to water.

The Cummins MerCruiser Zeus propulsion package uses anodes to help protect against moderate galvanic corrosion. The Zeus unit features a MerCathode System which along with sacrificial anodes will provide corrosion protection under ordinary conditions. Boats connected to AC shore power such as your vessel require additional protection to prevent damaging low-voltage galvanic currents from passing through the shore power earth ground wire. As standard equipment your Regal yacht features a 60 amp galvanic isolator installed to block the passage of galvanic current while providing a path to ground for the dangerous fault (shock) current. See the galvanic isolator in this manual for further information.

Furthermore, if your yacht incorporates the isolation transformer it does not allow the neutral ground conductor on board as it makes its own neutral through a magnetic induction process and therefore is not suspect to galvanic corrosion because that pathway is not available. Sacrificial anodes are mounted on the drive trim tab. Also, there is a set mounted on the vessel's transom under the swim platform along with the trim tabs. These need to be checked at least every 6 months and if 50% corroded they need to be replaced.



The MerCathode system uses an electrode and an anode assembly to help protect against galvanic corrosion. The MerCathode electrode and anode are mounted to the composite cover on the underside of the drive.

The controller is mounted on the transmission. The system needs to be periodically tested to ensure adequate output. Contact a Cummins MerCruiser Diesel Authorized Repair Facility.

Cosmetic Care & Maintenance

Inhibiting Corrosion

Additional steps can be undertaken to lessen the impact of corrosion especially in higher impact salt environments. These may include;

1. Painting the power package.
2. Spraying entire engine package annually with Corrosion Guard to protect finishes and slow corrosion cycle down.
3. Lubricating all points of lubrication.

Refer to the Zeus operator's manual for more in-depth information.

Painting Boat

The Zeus limited warranty does not cover corrosion damage as a result of improper paint application. Painting renders anodes inoperative and the MerCathode system is ineffective for controlling galvanic corrosion.

Note that the underwater portion of the drive can be painted to control marine growth such as algae and barnacles. Conventional anti-fouling coatings (bottom paint) can be used, When using bottom paint the copper oxide type with an algacide additive is recommended.

When painting a hull bottom and/or drive follow these recommendations:

- Observe the paint manufacturer's directions regarding application and preparation.
- Use a high quality, anti-fouling paint formulated for marine use.
- If using a copper or tin based product, make sure you comply with all federal and local laws prohibiting their use.
- Do not paint thru-hulls on the hull.
- Do not paint any anodes or MerCathode system components.
- Eliminate any electrical interconnection by leaving a 1 inch gap around the bolt-on tunnel rings and boat bottom. Failure to do this will render the MerCathode system ineffective.
- If needed, a non-conductive anti-fouling paint can be used in this area.



Troubleshooting

DIAGNOSTIC CHARTS

The following diagnostic charts will assist you in identifying minor electrical, electronic, fuel, and mechanical problems. Some of the items listed require technical training and tools.

Note: A portion of the troubleshooting charts may not apply to your vessel depending on standard and optional equipment installed. Additional information is available in the various vendor equipment manuals, or on the web along with your closest Regal yacht dealer. Become familiar with the troubleshooting chapter since a breakdown can occur anytime on the high seas. Many times the root cause of a problem can be found by using a step by step process of elimination.



WARNING

AVOID BODILY INJURY AND DEATH!
BEFORE PERFORMING ANY DIAGNOSTIC
WORK TURN OFF THE BATTERY SWITCH
AND REMOVE THE KEYS
FROM THE IGNITION SWITCH.



CAUTION

TO AVOID BODILY INJURY!
USE ONLY APPROVED MARINE
REPLACEMENT PARTS.



CAUTION

TO AVOID BODILY INJURY!
SOME EQUIPMENT CONTAINS HIGH
VOLTAGE. USE CAUTION WHEN SERVICING
ELECTRICAL COMPONENTS.



AIR CONDITIONER DIAGNOSTIC CHART

FAULT	POSSIBLE CAUSE	POSSIBLE FIX
A/C will not start	Circuit breaker off	Turn on at ship's main AC panel
	Shorepower voltage at dock too low	Check AC input voltage at ship's
No cooling or heating	Temperature set too low or too high	Raise or lower temperature as required
	Control program for heat or cool	Reprogram for heat, cool or auto
	Obstructed sea water flow	Clean sea water strainer Check output hose flow
	Sea water pump has airlock	Remove hose from pump discharge to remove airlock
Fan is not running	Air flow blocked	Locate obstruction, clean return filter and grill
Coil is iced over	Thermostat set too low	Raise thermostat
	Improper air flow	Clean return air filter; remove obstructions, check for restricted ducting
HHH is displayed	High pressure switch open Not enough sea water flow	Check seacock, hoses, strainer, AC pump for restrictions
PPP is displayed	Low pressure switch is open	Restart AC unit
AC or heat runs continuously	Temperatures are set too low for cooling; too high for heating	Raise or lower set temperature
	Porthole, window, hatch or door open	Close all appendages



AIR CONDITIONER (ELITE CONTROLS)

3.0 Elite Controls • Troubleshooting

3.01 General Troubleshooting

Also see specific digital or mechanical control troubleshooting sections following these general guidelines.

Fault: Will not start.

Possible Reason/Correction

1. **Air conditioner's circuit breaker is off.**
Turn circuit breaker on at ship's panel.
2. **Control is not turned on.**
See section 2.0 in this manual.
3. **Wrong wiring at terminal strip.**
Check wiring diagram and correct if necessary.
4. **Push-on butt connectors became disconnected during installation.**
Disconnect power supply and open electric box, check wiring diagram, correct if necessary.
5. **Input line voltage is insufficient.**
Check power source (shore/generator) for proper voltage. Check wiring and terminals for proper sizes and connections. Verify with a volt-meter that the power at the unit is the same as the power source.

Fault: Fan is not running.

Check specific control troubleshooting section

Fault: No cooling or heating.

Possible Reason/Correction

1. **Temperature set point is satisfied.**
Lower or raise set point.
2. **Obstructed seawater flow.**
Clean seawater strainer. Check for obstructions at speed scoop thru-hull inlet. Check for a good steady flow from the overboard discharge.
3. **Seawater pump may be air-locked.**
Remove hose from pump discharge to purge air from line.
4. **Loss refrigerant gas.**
Check air conditioning unit for refrigerant oil leakage, call service technician.

5. **Seawater temperature too high for cooling or too low for heating.**

Seawater temperature will directly affect air conditioning unit's efficiency. This air conditioning unit can effectively cool your boat in water temperature up to 90°F (32.2°C) and heat (if reverse cycle option is installed) in water as low as 40°F (4.4°C).

6. **Fan coil is iced (in cooling).**
Check your specific control troubleshooting section.
7. **Fan is not running.**
Check your specific control troubleshooting section.
8. **Seawater plumbing is air-locked.**
Ensure that seawater plumbing is installed per the guidelines in this manual.
9. **Digital control is programmed for Cool or Heat only, or mechanical control thermostat is rotated to far towards either Cooler or Warmer setting.**
See digital control manual for reprogramming or see mechanical control operation section in this manual.
10. **High pressure switch open (in cooling) due to improper seawater flow.**
Strainer or intake may be plugged, sea cock may be closed, check seawater hose for kinks or collapses. Verify pump operation. Check pump circuit breaker if applicable.
11. **High pressure switch open (in heating) due to improper airflow.**
Remove any obstructions in return air stream. Clean return air filter and grille. Check for crushed or restricted ducting, ducting must be as straight, smooth and taut as possible.
12. **High-pressure switch is open in heating mode.**
System may cycle on high-pressure if seawater temperature is above 55°F (12.8°C).
13. **Compressor's thermal overload is open due to either of the above reasons.**
Compressor needs to cool down. Turn system off for a while (it may take up to three hours to reset thermal overload).



AIR CONDITIONER (ELITE CONTROLS)

Fault: No heating.

Possible Reason/Correction

1. **Unit is cool only, or if reverse cycle, reversing valve may be stuck.**
Tap reversing valve lightly with rubber mallet while unit is in Heat Mode. Call for service if that does not correct the problem.

Fault: Low airflow.

Possible Reason/Correction

1. **Airflow is blocked.**
Remove any obstructions in return air stream. Clean return air filter and grille. Check for crushed or restricted ducting, ducting must be as straight, smooth and taut as possible.
2. **Fan Coil is iced.**
See below.

Fault: Fan coil is iced.

Possible Reason/Correction

1. **Thermostat set point is too low.**
Raise set point.
2. **Improper airflow.**
Remove any obstructions in return air stream. Clean return air filter and grille. Check for crushed or restricted ducting, must be as straight, smooth and taut as possible. See the Digital Controls Troubleshooting section below for reprogramming options.
3. **Supply air is short-cycling.**
Redirect supply air so that is not blowing into the return air stream. Seal any air leaks on duct.
4. **Humidity level too high.**
Close hatches and doors.
5. **When all else fails.**
Switch air conditioning to heat until ice melts or use hair dryer to melt.

Fault: Water coil is iced in the heating mode.

1. **Seawater temperature is below 40°F (4.4°C).**
Shut down system to prevent damage to condenser. Allow coil to defrost.

Fault: System runs continuously.

Possible Reason/Correction

1. **Set point temperature is improperly set: too low for cooling or too high for heating.**
Raise or lower set point.
2. **Porthole or hatches open.**
Close all port holes and hatches.
3. **Seawater temperature too high for cooling or too low for heating.**
Seawater temperature will directly affect the air conditioning unit's efficiency. This air conditioning unit can effectively cool your boat in water temperatures up to 90°F (32.2°C) and heat (if reverse cycle option is installed) in water as low as 40°F (4.4°C).
4. **Improper air sensor location.**
Check your specific control troubleshooting section.

3.02 Digital Controls Troubleshooting

Fault: Digital display panel is not lit.

Possible Reason/Correction

1. **8-pin display cable plugs are not making contact (unplugged, dirty, bent, or broken pins).**
With POWER OFF at the circuit breaker, remove connector and inspect. If damaged, replace connector or entire display cable.

Fault: Fan is not running or runs continuously.

Possible Reason/Correction

1. **Digital control is programmed for either fan cycling with compressor or continuous fan operation.**
Press and hold the Fan Button for five seconds to change to "con" so fan will stay on continuously or to "CYC" so the fan cycles with the compressor.

Note: After the compressor cycles off, the fan will continue to run for two minutes in cool mode and four minutes in Heat Mode regardless of parameter setting.



AIR CONDITIONER (ELITE CONTROLS)

Fault: Fan is not running but the compressor is.

Possible Reason/Correction

1. Failed triac on Passport I/O circuit board.
Send for repair or call local service technician.

Fault: Fan runs continuously although it is set to cycle with compressor.

Possible Reason/Correction

1. Failed triac on Passport I/O circuit board.
Send for repair or call local service technician.

Fault: No cooling or heating.

Possible Reason/Correction

1. Digital control programmed for heat or cool only.
Press and release the Mode Button (bottom right corner of display) until the desired mode LED is lit.
2. "HPF" or "LPF" is displayed.
See below.

Fault: No heat.

Possible Reason/Correction

1. Digital Control may be set to Electric Heat, not Reverse Cycle.
Reprogram parameter P-13

Fault: Unit switches to heat while in cool mode.

Possible Reason/Correction

1. De-icing feature enabled due to coil icing up.
Reprogram parameter P-7

Fault: Fan coil is iced.

Possible Reason/Correction

1. Improper airflow.
See the General Troubleshooting section above first, before reprogramming digital control.
Reprogram parameter P-7 to enable de-icing. If de-icing cycle does not melt ice, switch air conditioning unit to heat until ice melts or use hair dryer to melt ice.
If problem persists, reprogram Low Fan Speed Limit for maximum value. Set P-2 to 55.

Fault: System runs continuously.

Possible Reason/Correction

1. Improper air sensor location.
Verify display head location with criteria found in the control manual. Install alternate air sensor if necessary.

Fault: "HPF" is displayed.

Possible Reason/Correction

1. High-pressure switch is open (in cooling) due to improper seawater flow.
Strainer or intake may be plugged, seacock may be closed, check seawater hose for kinks or collapses. Verify pump operation; check pump circuit breaker if applicable.
2. High-pressure switch open (in heating) due to improper airflow.
Remove obstructions in return air stream. Clean air filter and grille. Check for crushed or restricted ducting, ducting must be as straight, smooth and taut as possible.
If problem persists, reprogram Low Fan Speed Limit for maximum value. Set P-2 to 55. And, set the Reverse Fan Speeds During Heating Mode parameter to "rEF" (P-12), or manually set fan speed to high.

Fault: "LPF" is displayed.

Possible Reason/Correction

1. Low-pressure switch is open due to low seawater and/or low return air temperatures.
Try restarting the air conditioning unit, the optional low pressure switch has a ten minute shutdown time delay that may be in affect.
2. Low pressure switch is open due to loss of refrigerant.
Check air conditioning unit for refrigerant oil leakage, call service technician.

Fault: "ASF" is displayed.

Possible Reason/Correction

1. Indicates failed face plate air sensor, alternate air sensor or display cable.
Unplug alternate air sensor if installed or plug in alternate air sensor if not installed. Try another display cable.
2. Damaged jack/socket in display head or on circuit board.
Visually check to see that pins inside socket are not bent or corroded. Repair or replace display or circuit board if needed.



AIR CONDITIONER (ELITE CONTROLS)

Fault: “PLF” is displayed.

Possible Reason/Correction

1. Indicates that seawater flow through the condenser coil is insufficient.

Check for adequate seawater flow. Verify pump operation. Inspect the condenser coil, it may need cleaning (see Maintenance section). Sensor may be faulty, replaced if necessary. Call for service technician.

Fault: “LAC” is displayed

Possible Reason/Correction

1. Indicates the AC input voltage is less than 95VAC (for 115VAC input power) or 195VAC (for 230VAC input power).

Check the AC input power supply source (generator or shore power) and the wiring connections to the system. Using a voltmeter, measure the voltage at the L1 and L2 terminals of the Passport I/O Circuit Board to verify that the problem has been corrected. Once the proper voltage has been restored (exceeds 95VAC or 195VAC), the fault will clear automatically and the system will resume normal operation.

Fault: “FIL” is displayed.

Possible Reason/Correction

1. Indicates that it is time to clean or replace the systems air filter.

Inspect the air filter. If it is the plastic mesh type, clean and replace. If it is a Dometic Breathe Easy® micro-particle anti-allergenic type, replace with the same size and model. Reset and clear the air filter cleaning/replacement reminder by setting programmable parameter P-19 to 0.



50 AMP BATTERY CHARGER DIAGNOSTICS

The Chargemaster 50 is protected against overload, short circuits, over heating and under and over voltage. If a fault condition occurs, a load bar segment on the display illuminates red. The LED position indicates the failure cause as:

1. Wrong AC voltage. Never connect to three phase current.
2. Charger failure; Power button blinks.
3. Battery voltage too high
4. Internal temperature too high
5. Battery low or short circuit. The battery bank should blink indicating source of problem.

The Chargemaster 50 is not protected against reversing polarity of the DC-output or 3 phase AC on the AC-input.

Note to monitor the battery temperature sensor. The charge voltages are automatically adjusted for changing temperatures. When the battery temperature is high, the charge voltage goes down. When the battery temperature is low, the charge voltage goes up. This prevents overcharging and gassing which in turn will extend battery life.

Note that if there are battery charger problems the first things to check for are loose connections and/or burnt wiring. Refer to the connection compartment terminal illustration.



WARNING

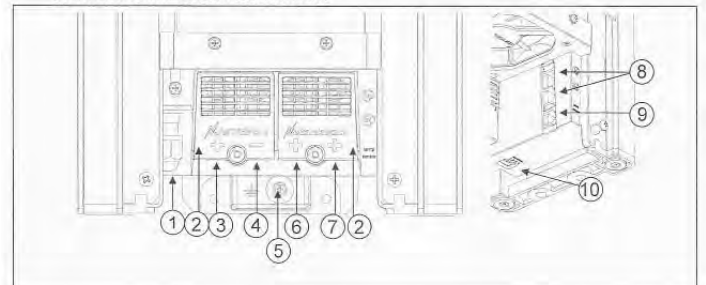
AVOID BODILY INJURY AND DEATH!
ANY DIAGNOSTIC WORK SHALL BE
DONE BY A LICENSED
OR ABYC CERTIFIED ELECTRICIAN



WARNING

AVOID BODILY INJURY AND DEATH
DUE TO ELECTRICAL SHOCK. BEFORE
STARTING ANY TROUBLE SHOOTING
PROCEDURES DISCONNECT THE
CHARGEMASTER FROM BOTH
AC AND DC ELECTRICAL SYSTEMS.

OVERVIEW CONNECTION COMPARTMENT



1. Cable gland for AC-wiring
2. Isolation caps for DC connections
3. Positive terminal charge output 1
4. Common negative output terminal
5. Common ground connection

6. Positive terminal charge output 2
7. Positive terminal charge output 3
8. MasterBus connectors
9. Temperature sensor jack
10. DIP switches



MASS COMBI CHARGER DIAGNOSTICS

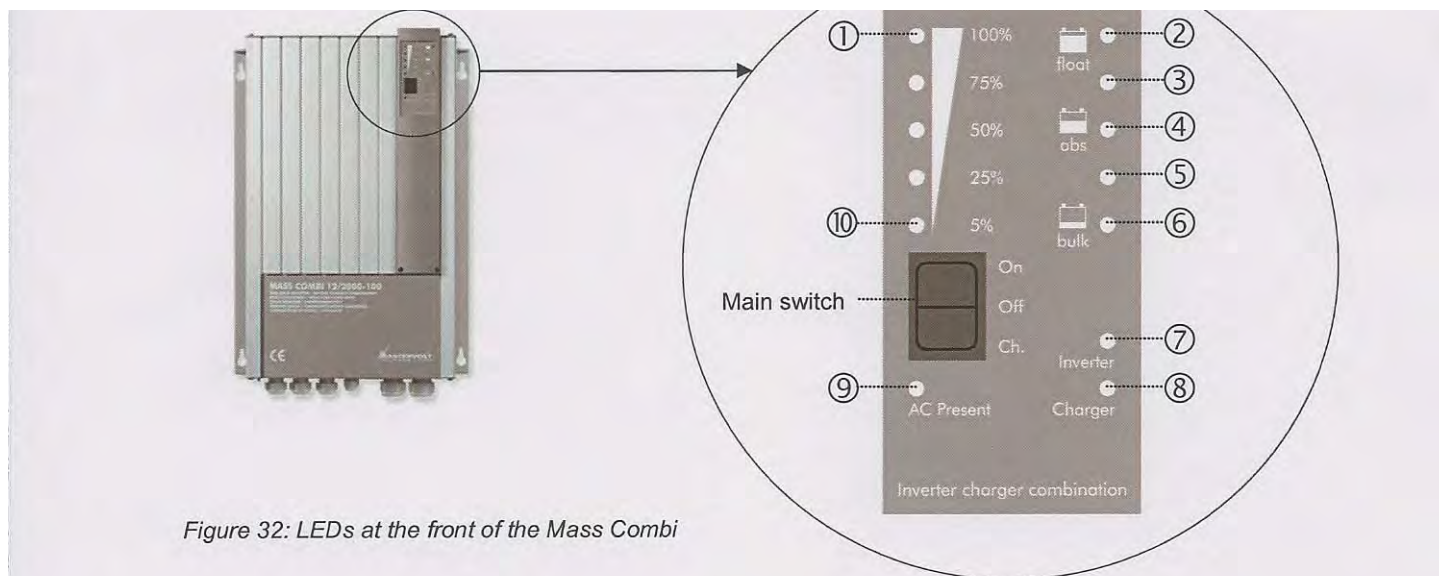


Figure 32: LEDs at the front of the Mass Combi

Mode	Illuminating LEDs	Explanation / Possible cause	What to do
--	None	The Mass Combi is switched off manually.	Switch on the Mass Combi by means of On/Off/Ch. -switch. Also check the on/c switch of the ICC remote panel
		DC-fuse is blown	Investigate the cause of the failure and replace the fuse.
	9 = solid green, all other LED's = off	External AC is present, but the Mass Combi is switched off by means of a remote panel	Switch on the Mass Combi by means of remote panel
	7 = solid green 8 = flashing fast red 9 = flashing fast green	Thermal fuse is blown.	Reset the thermal fuse. See 4.3.1.
	7 = solid green 9 = flashing fast green	Insufficient quality of AC-in (Shore or Generator)	Check AC wiring (Too thin and/or too lo cables) Check the generator (if applied), or char setting for Power Quality at incoming AC (see section 6.2.4).
	7 = solid red 9 = solid green	AC-in from Shore or Generator connected to the Short Break output.	Disconnect the AC-in cable from the Sh break output.
	7 = solid green 9 = solid green	Power support mode or Generator / Mains support mode active	No error
Charger	2 = solid yellow 8 = solid red	Temperature Compensation (TC) error. The temperature sensor on the battery gives an incorrect value.	Disconnect the sensor and if the LED's off then replace the battery temperature sensor.
	3 = solid yellow 8 = solid red	DC voltage error. The battery voltage is too high or too low.	Check the batteries.



MASS COMBI CHARGER DIAGNOSTICS

Mode	Illuminating LEDs	Explanation / Possible cause	What to do
	4 = solid yellow 8 = solid red	Short circuit error. The battery voltage is far too low. The charger reduces the output current till 25% of the maximum output current.	Check the batteries and the wiring.
	5 = solid yellow 8 = solid red	Overheating error. The charger current is reduced to zero in case of extreme overheating until the Mass Combi is cooled down.	Check whether the air flow of the Mass combi is blocked or whether the ambient temperature is too high.
	2,3,4,5,6 = blinking yellow, 8,9 = solid green	Equalizing mode is activated	See chapter 6.2.6
	2 = blinking yellow 3,4,5,6 = solid yellow 8,9 = solid green	Charger runs a compensation cycle for self discharge of the batteries	Nothing. See figure 28 for charging characteristics
	Inverter 1 = solid yellow 7 = solid red	Overload error. The inverter is loaded with more than 2500W	Reduce the connected load by switching off some equipment.
	3 = solid yellow 7 = solid red	DC voltage error. The battery voltage is too high or too low.	Check the batteries and the wiring.
	4 = solid yellow 7 = solid red	The inverter output voltage is less than 180V AC.	Reduce the connected load.
	5 = solid yellow 7 = solid red	Overheating error. The inverter is off because of high temperature.	Reduce the connected load and let the Mass Combi cool down.
	7 = flashing red	The inverter is permanently off until a manual reset by means of the main switch.	Disconnect all loads and restart the Mass Combi by switching the unit manually off and on with the main switch.
	6 = flashing yellow 7 = solid green	The battery voltage is running too low, but the inverter is still on.	Check the batteries. The inverter will switch off if the battery voltage stays low
	3,4,5,6 = solid yellow 7 = solid green	The battery voltage is running too high, but the inverter is still on.	Check the DC-input voltage. The inverter will switch off if the battery voltage rises too high
	2 = flashing yellow		



BLU-RAY™ DISC PLAYER

Use the following guide for troubleshooting the Blu-ray player along with the user manual which is located in the owner's information packet in the master stateroom dresser drawers.

WARNING

**AVOID BODILY INJURY AND DEATH
DUE TO SHOCK!**

DO NOT REMOVE THE BACK COVER!

THERE ARE NO SERVICEABLE PARTS!

**CALL FOR AUTHORIZED SERVICE
ON THIS UNIT.**

PROBLEM	SOLUTION
No operation can be performed with the remote control.	<ul style="list-style-type: none"> Check the batteries in the remote control. They may need replacing. Operate the remote control at a distance of no more than 20 feet from the player. Remove batteries and hold down one or more buttons for several minutes to drain the microprocessor inside the remote control to reset it. Reinstall the batteries and try to operate the remote control again.
Disc does not play.	<ul style="list-style-type: none"> Ensure that the disc is installed with the label side facing up. Check the region number of the Blu-ray Disc/DVD.
Disc Menu does not appear.	<ul style="list-style-type: none"> Ensure that the disc has disc menus.
The prohibition message appears on the screen.	<ul style="list-style-type: none"> This message appears when an invalid button is pressed. The Blu-ray Disc/DVD's software doesn't support the feature (e.g., angles). You've requested a title or chapter number or search time that is out of range.
Play mode differs from the Setup Menu selection.	<ul style="list-style-type: none"> Some of the functions selected in the Setup Menu may not work properly if the disc is not encoded with the corresponding function.
The screen ratio cannot be changed.	<ul style="list-style-type: none"> The Screen Ratio is fixed on your Blu-ray Disc/DVD. This is not a problem with the player.
No audio	<ul style="list-style-type: none"> Make sure you have selected the correct Digital Output in the Audio Options Menu.
The screen is blank.	<ul style="list-style-type: none"> If the HDMI output is set to a resolution your TV cannot support (for example, 1080p), you may not see a picture on your TV. Press the button (on front panel) for more than 5 seconds with no disc inside. All settings will revert to the factory settings. When the factory default settings are restored, all stored user BD data is deleted.

PROBLEM	SOLUTION
Forgot password	<ul style="list-style-type: none"> Press the button (on the front panel) for more than 5 seconds with no disc inside. All settings including the password will revert to the factory settings. Don't use this unless absolutely necessary. When the factory default settings are restored, all stored user BD data is deleted.
The picture is noisy or distorted	<ul style="list-style-type: none"> Make sure that the disc is not dirty or scratched. Clean the disc.
No HDMI output.	<ul style="list-style-type: none"> Check the connection between the TV and the HDMI jack of the player. Check if your TV supports 480p, 720p, 1080i, or 1080p HDMI input resolutions.
Abnormal HDMI output screen	<ul style="list-style-type: none"> If random noise appears on the screen, it means that TV does not support HDCP (High-bandwidth Digital Content Protection).
If you experience other problems.	<ul style="list-style-type: none"> Go to the contents and find the section of the user manual that contains the explanations regarding the current problem, and follow the procedure once again. If the problem still cannot be solved, please contact your nearest Samsung authorized service center.
DLNA function	
I can see folders shared through DLNA, but I cannot see the files.	<ul style="list-style-type: none"> DLNAs shows only files corresponding to the Image, Music, and Movie categories. Files that do not correspond to these categories are not displayed.
Video is played intermittently.	<ul style="list-style-type: none"> Check if the network is stable. Check if the network cable is properly connected and if the network is overloaded.
DLNA connection between Player and PC is unstable.	<ul style="list-style-type: none"> The IP address under the same subnetwork should be unique. If they are not, IP interference can cause this phenomenon. Check if you have a firewall enabled. If so, disable the firewall function.

PROBLEM	SOLUTION
BD-LIVE	
I cannot connect to the BD-LIVE server.	<ul style="list-style-type: none"> Check whether the network connection is working or not by accessing Network Status in Network Settings (Settings > Network Settings > Network Status). Check whether the USB memory device is connected to the player. The memory device must have at least 1GB of free space to accommodate the BD-LIVE service. You can check the available size in BD Data Management. Check whether the BD-LIVE Internet Connection menu is set to Allow(All). If all above fails, contact the contents provider or update the player to the latest firmware.
When using the BD-LIVE service, an error occurs.	<ul style="list-style-type: none"> The memory device must have at least 1GB of free space to accommodate the BD-LIVE service. You can check the available size in BD Data Management.



BOTTOM PAINT

Factory installed antifouling paint is a top-of-the-line product but does need periodic touching up. No paint can be effective under all exposure conditions. Man made pollution and natural occurrences can adversely affect antifouling paint performance. Extreme hot and cold water temperatures, silt, dirt, oil, brackish water and even electrolysis can ruin an antifouling paint.

Therefore, the vessel bottom needs to be checked periodically to make sure it is clean and no growth is occurring. Lightly scrub the bottom with a soft brush to remove anything from the antifouling surface. Scrubbing is particularly important with vessels that are idle for extended periods of time.

The coating is most effective when the boat is being used on a continuous basis.

On select yachts maintain a 1" to 1 1/2" clearance from all anodes, drive units and other underwater gear. Never paint over anodes.



CABLE CORD REEL

COMPLAINT	PROBABLE CAUSE	RECOMMENDED ACTION
Non-functional (either no power or unit has power and does not respond)	<ul style="list-style-type: none">○ Tripped breaker○ Power wire incorrectly connected to relay assembly○ Defective motor○ Defective relay box	<ul style="list-style-type: none">○ Reset breaker○ Replace relay assembly○ With power switch on and voltage across motor wires — if no response, replace motor
Pays out cable only	<ul style="list-style-type: none">○ In-Limit switch circuit open○ Power inputs reversed○ Defective relay or diode○ Bad power switch	<ul style="list-style-type: none">○ Check in-limit switch○ Check polarity on DC input wires○ Replace relay assembly○ Check power switch
Retracts cable only	<ul style="list-style-type: none">○ Out-Limit switch circuit open○ Defective relay○ Bad power switch	<ul style="list-style-type: none">○ Check out-limit switch○ Replace relay assembly○ Check power switch
Tripped DC breaker	<ul style="list-style-type: none">○ Main pulley too tight○ Cable jammed and kinking○ Defective motor	<ul style="list-style-type: none">○ Adjust pulley○ Check for adequate storage space and/or cable for undue kinking — see Cable Adjustment (pg. ?)○ Disconnect motor wires from relay box. Apply power directly to motor wires; motor should run one direction or other — no response from motor; replace motor



AC ELECTRICAL DIAGNOSTICS

PROBLEM	POSSIBLE CAUSE	POSSIBLE FIX
No AC power	Main shore power breakers tripped or in “off” position	Energize shore power inlet breakers
	Dock power in “off” position	Activate dock power
	Shore power cord not connected	Plug in shore power cord; twist to lock
	Faulty connection	Repair as needed
	Earlier yachts-Triple breaker tripped at output of isolation transformer	Repair as needed. Reset breakers
No power to AC outlets and/or equipment	Main AC ship’s panel breakers tripped or in “off” position	Reset or activate main breakers
	Shore power cord not connected	Plug in shore power cord
	GFCI tripped	Find cause of trip. Reset GFIC
Main ship’s breaker continues to trip	Faulty main breaker	Contact yacht authorized dealer
Inadequate AC power with genset running	Electrical demand greater than electrical output	Turn off appropriate equipment breakers to lessen load



DC ELECTRICAL DIAGNOSTICS

PROBLEM	POSSIBLE CAUSE	POSSIBLE FIX
No DC (12 volt) power	Battery switch in “off” position	Turn selector switch to “on” position,
	Weak or dead battery	Charge or replace battery
Battery not charging (engine running)	Loose belt	Tighten belt
	Faulty alternator	Repair/replace alternator
	Faulty volt meter	Replace volt meter
Battery will not hold charge	Faulty or old battery	Replace battery; use exact replacement
12 volt equipment not working	Equipment switch in “off” position	Switch to “on” position
	Circuit breaker blown	Push reset on circuit breaker
	Weak or dead battery	Replace battery
	Corroded connection	Eliminate corrosion
	Loose wire	Tighten connection
	Internal equipment short	Replace equipment component



ELECTRONICS- GENERAL

The Garmin electronic package currently installed are very system specific when troubleshooting. Each package is very unique and we could not cover all the systems here. Therefore, refer to the vendor supplied operator's manual for specific troubleshooting information related to an individual electronic component.

In addition, helpful information is readily available on the internet at each vendor site for the retail customer. Information can be downloaded as needed with additional on-line contact and tech services available. Also, contact your closest Regal yacht dealer where you will find factory trained professionals to assist you in solving more technical issues.



ELECTRONICS-CAMERAS

If the camera does not function check the following:

1. Make sure the cable is tightly connected and it is free of corrosion.
2. Check system fuses and breakers.
3. Check that the plotter is set up properly to view the camera image via the display. Check the optional equipment operation for more information.
4. The camera has no serviceable parts.



ENTERTAINMENT-BOSE CINEMATE GS

Problem	What to do
No power	<ul style="list-style-type: none">• Unplug the Acoustimass® module power cord from the AC wall outlet for one minute.• Make sure the power cord is inserted securely into the Acoustimass module.• Reconnect the power cord firmly into an operating AC wall outlet. The green LED should flash 10 times, then extinguish (the system will then be in standby).• Make sure the interface module is plugged into the Acoustimass module properly.• Make sure you use the remote control to power on the system.
No sound	<ul style="list-style-type: none">• Make sure the CineMate® system is turned on. The green LED on the front of the interface module should be lit when the system is on.• Increase the volume.• If your system is a CineMate GS series II, make sure you pressed the remote button for the source you want to hear.• Check to see if the TV is muted. If so, press the TV remote control Mute button to unmute it.• Make sure the interface module and speaker cables are both firmly connected to the Acoustimass module.• Check the connections on the back of the speakers.• Check that the correct TV Video input has been selected. See "Selecting the TV input" on page 20.• Check the connections from the interface module to the TV or other source.• Check that the TV's audio output is enabled. See your TV owner's guide for information.• If the TV's audio output is VARIABLE (VAR), make sure the TV's internal speakers are turned off and the TV volume is turned up.• If using a sound source other than the TV, check to ensure that the device is playing source material.



ENTERTAINMENT-BOSE CINEMATE GS

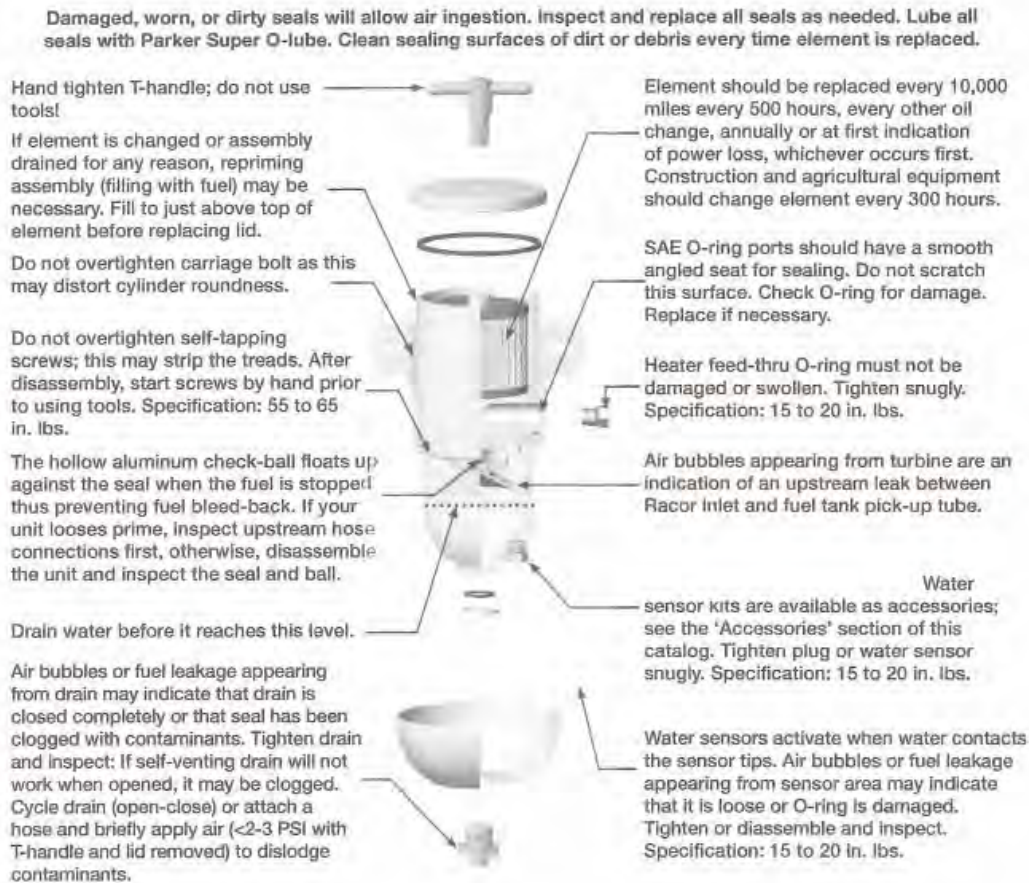
Problem	What to do
Sound but no picture	<ul style="list-style-type: none">• Make sure the TV is turned on.• Check that the correct TV/Video input is selected. See “Selecting the TV input” on page 20.
Remote control is inconsistent or does not work	<ul style="list-style-type: none">• Check the battery to be sure it is installed properly.• Point the remote control at the interface module.• Relocate the interface module, making sure it is in a clear line of sight to the remote and there are no obstructions.• Make sure the protective film is removed from the lens on the front of the interface module.• Check that the source button on the CineMate® GS series II remote flashes when a button is pressed.• Check that the green LED on the interface module flashes when a remote power, volume, or mute button is pressed.• There may be more than one device code for your brand of device. Find your device and brand in the <i>Universal Device Codes</i> book. Try programming another code, then check the device for improved functionality.
Sound is distorted	<ul style="list-style-type: none">• Make sure speaker cables are not damaged and the connections are secure.• Reduce the audio output level from the TV connected to the interface module.
Sound is coming from the TV	<ul style="list-style-type: none">• Turn off your TV's internal speakers. See “Turning off the TV internal speakers” on page 11.• Turn down the TV volume.



FRESH WATER DIAGNOSTIC CHART		
PROBLEM	POSSIBLE CAUSE	POSSIBLE FIX
Air in water system	Water tank empty	Fill water tank. With pump “on” bleed air from lines until water flows without air.
Fresh water pump cycles on and off	Water system leak	Locate & repair water leak.
No water at sink faucet	Breaker blown	Reset breaker
	Water tank empty	Refill water tank
	Switch turned off	Turn switch to “on” position
	Blocked water filter; pinched line	Clear obstruction or straighten line; clean water filter
	Manifold valve turned off	Turn on manifold valve
	Loose or disconnected wire	Check wire connections
Low water pressure	Defective fresh water, booster pump	Replace water pump
Weak pressure at transom shower	Line pinched	Find/Repair pinched line
Water to pump. No output.	Faulty fresh water pump/booster pump pressure switch	Replace fresh water/booster pump or pressure switch
Fresh water pump continues to cycle	Defective pump pressure switch	Replace pressure switch



FUEL FILTER DIAGNOSTIC-TYPICAL



Note that the 53 SC uses the 500 series water separator filter for the diesel generator. The 900 series is used on the Cummins diesel 6.7L engine carries a 10 micron element filtration rating.



GALVANIC ISOLATOR

Trouble Shooting Guide

CAUTION - Because of the presence of deadly high voltages troubleshooting should be done by a qualified service person only.

If your ProSafe One does not operate, check for AC power and check the blue wire fuse and the brown wire fuse and make sure they are in good working order.

"FAIL" indication of the reverse polarity

1. Turn off the AC panel "main breaker".
2. Using a volt meter, check the voltage between the green wire and white/blue wire at the main breaker input side. If the reading is not less than 6 volts (typical) and is instead close to or over 100 volts, this is an indication of reverse polarity.
3. If there has been no recent electrical work on the boat and/or you have moved to a different dock, it is probable that the reverse polarity is caused by an improperly wired electrical outlet in the dock post. This can be tested by checking the voltage between the ground and neutral slots in the connector of the dock post using the same process as above.
4. When using dual inlet shore system (ProSafe One dual shore cord part #22080) it is possible to isolate the mis-wired shore cord by connecting one shore cord at a time and noting its displayed polarity test results.

It is important to rectify this problem as it is the first of two mistakes that in conjunction will cause high voltage on the bonding system of the boat.

"FAIL" indication of the Galvanic Isolator

1. Be sure the shore power cable is disconnected at the dock post.
2. Check the connection point of the four wire connectors to the Galvanic Isolator. Look for corroded pins or broken wires. If no problems are found replace the Galvanic Isolator with a new Galvanic Isolator and retest.



GALVANIC ISOLATOR

CAUTION - Because of the presence of deadly high voltages troubleshooting should be done by a qualified service person only.

"FAIL" indication of the ground wire

WARNING!

DO NOT PERFORM THIS TEST IF THE PROSAFE ONE IS INDICATING A "REVERSE POLARITY FAIL". INSTALLING THE JUMPER WIRE IN STEP 2 BELOW DURING A REVERSE POLARITY CONDITION WILL PUT HIGH VOLTAGE ONTO THE BONDING SYSTEM. THIS IS A LIFE THREATENING CONDITION.

1. Be sure the shore power cable is disconnected at the dock post.
2. Using a length of jumper wire (18 ga. or larger) connect one end to the neutral wire (connection location of the ProSafe One blue wire) and the other end to the shore ground wire ("AC Shore Ground" stud on the Galvanic Isolator). With the boat's AC main breaker in the "off" position, reconnect the AC shore cord to the dock post and turn on the dock post breaker. After the five second test, the display should show a "NORMAL" condition on the ground wire indicator. With the display showing a "NORMAL", the problem could be a defective shore cable, a shore cable connector or faulty ground/neutral connection dockside.

In the event you are new at this dock and the ProSafe One has not given you a "FAIL" indication previously, it has been found that a bad ground/neutral connection at the dock is a likely occurrence.

If the ProSafe One shows a "FAIL" during this test of the system, the ProSafe One has failed and needs replacement.

UPON COMPLETION it is imperative that you disconnect the shore cord from the dock post and then remove the jumper wire. Not removing this jumper is in violation of ABYC standards.



DIESEL GENERATOR

Trouble Symptoms										Probable Causes	Recommended Actions
Does not crank	Cranks but does not start	Starts hard	No or low output voltage	Stops suddenly	Lacks power	Overheats	Low oil pressure	High fuel consumption	Excessive or abnormal noise		
Electrical System (DC circuits)											
x	x									Battery connections loose, corroded, or incorrect	Verify that the battery connections are correct, clean, and tight.
x	x									Battery weak or dead	Recharge or replace the battery. The spec sheet provides recommended battery CCA rating.
x				x						Engine harness connector(s) not locked tight	Disconnect the engine harness connector(s) then reconnect it to the controller.
				x						Fault shutdown	Reset the controller.
x	x									Starter/starter solenoid inoperative	Replace the starter or starter solenoid.
Engine											
	x	x			x			x		Air cleaner/backfire flame arrestor clogged	Clean or replace the filter element.
	x	x				x		x	x	Compression weak	Check the compression.†
			x		x	x		x	x	Engine overload	Reduce the electrical load. See the generator set installation manual for wattage specifications.
									x	Exhaust system leak	Inspect the exhaust system. Replace the inoperative exhaust system components.†
									x	Exhaust system not securely installed	Inspect the exhaust system. Tighten the loose exhaust system components.†
				x						Overspeed shutdown	Reset the controller. If the overspeed fault occurs again, contact the distributor/dealer.
		x	x		x			x		Governor inoperative	Adjust the governor.†
					x				x	Valve clearance incorrect	Adjust the valves.†
									x	Vibration excessive	Tighten all loose hardware.

+ Dealer Service Item



DIESEL GENERATOR

Trouble Symptoms										Probable Causes	Recommended Actions	Section or Publication Reference*
Does not crank	Cranks but does not start	Starts hard	No or low output voltage	Stops suddenly	Lacks power	Overheats	Low oil pressure	High fuel consumption	Excessive or abnormal noise			
Electrical System (DC circuits)												
x	x									Battery connections loose, corroded, or incorrect	Verify that the battery connections are correct, clean, and tight.	Section 3
x	x									Battery weak or dead	Recharge or replace the battery. The spec sheet provides recommended battery CCA rating.	Section 3, S/S
x				x						Engine harness connector(s) not locked tight	Disconnect the engine harness connector(s) then reconnect it to the controller.	W/D
				x						Fault shutdown	Reset the controller.	Section 2
x	x									Starter/starter solenoid inoperative	Replace the starter or starter solenoid.	Eng. S/M
Engine												
	x	x			x			x		Air cleaner/backfire flame arrestor clogged	Clean or replace the filter element.	Section 2
	x	x				x		x	x	Compression weak	Check the compression.†	Eng. S/M
			x		x	x		x	x	Engine overload	Reduce the electrical load. See the generator set installation manual for wattage specifications.	I/M
									x	Exhaust system leak	Inspect the exhaust system. Replace the inoperative exhaust system components.†	Section 3, I/M
									x	Exhaust system not securely installed	Inspect the exhaust system. Tighten the loose exhaust system components.†	Section 3, I/M
				x						Overspeed shutdown	Reset the controller. If the overspeed fault occurs again, contact the distributor/dealer.	
		x	x		x			x		Governor inoperative	Adjust the governor.†	Gen. S/M
					x				x	Valve clearance incorrect	Adjust the valves.†	Eng. S/M
									x	Vibration excessive	Tighten all loose hardware.	—
* Sec./Section—numbered section of this manual; ATS—Automatic Transfer Switch; Eng.—Engine; Gen.—Generator Set; I/M—Installation Manual; O/M—Operation Manual; S/M—Service Manual; S/S—Spec Sheet; W/D—Wiring Diagram † Have an authorized service distributor/dealer perform this service.												

+ Dealer Service Item



DIESEL GENERATOR

Trouble Symptoms										Probable Causes	Recommended Actions
Does not crank	Cranks but does not start	Starts hard	No or low output voltage	Stops suddenly	Lacks power	Overheats	Low oil pressure	High fuel consumption	Excessive or abnormal noise		
Controller											
x				x						Generator set master switch in the OFF position	Move the generator set master switch to the correct position (RUN or AUTO).
x				x						Controller fuse (F3) blown	Replace the blown controller fuse. If the fuse blows again, troubleshoot the controller.†
x				x						The relay interface board fuse (F2) blown	Replace the blown relay interface board fuse. If the fuse blows again, troubleshoot the controller.†
				x						The auxiliary winding fuse (F1) blown	Replace the blown auxiliary winding fuse. If the fuse blows again, troubleshoot the controller.†
x				x						Controller circuit breaker tripped	Reset the controller circuit breaker.
x										Controller master or start/stop switch inoperative	Replace the controller master switch.
				x						Controller fault	Troubleshoot the controller.†
				x						Remote stop command received from a remote switch or ATS	Check the remote switch position.
Cooling System											
						x		x		Air openings clogged	Clean the air openings.
						x				Impeller inoperative	Replace the impeller
						x		x		Seawater strainer clogged or restricted	Clean the strainer.
				x						High temperature shutdown	Allow the engine to cool down. Then troubleshoot the cooling system.
				x						Low coolant level shutdown	Restore the coolant to normal operating level.
						x				Coolant level low	Restore the coolant to normal operating level.
						x				Thermostat inoperative	Replace the thermostat.
						x				Cooling water pump inoperative	Tighten or replace the belt. Replace the water pump.

+ Dealer Service Item



DIESEL GENERATOR

Trouble Symptoms										Probable Causes	Recommended Actions
Does not crank	Cranks but does not start	Starts hard	No or low output voltage	Stops suddenly	Lacks power	Overheats	Low oil pressure	High fuel consumption	Excessive or abnormal noise		
Fuel System											
	x			x						Fuel tank empty or fuel valve shut off	Add fuel and move the fuel valve to the ON position.
	x	x		x	x					Fuel filter restriction	Clean or replace the fuel filter.
	x									Fuel solenoid inoperative	Troubleshoot the fuel solenoid.†
	x	x			x					Air in fuel system (diesel only)	Bleed the diesel fuel system.
	x	x			x					Fuel or fuel injectors dirty or faulty (diesel only)	Clean, test, and/or replace the inoperative fuel injector.†
	x	x			x			x		Fuel injection timing out of adjustment (diesel only)	Adjust the fuel injection timing.†
	x				x			x		Fuel feed or injection pump inoperative (diesel only)	Rebuild or replace the injection pump.†
Generator											
			x							AC output circuit breaker open	Reset the breaker and check for AC voltage at the generator side of the circuit breaker.
				x						Overcrank shutdown	Reset the controller. If the overcrank fault occurs again, contact the distributor/dealer.
x										Transfer switch test switch in the OFF position	Move the transfer switch test switch to the AUTO position.
			x							Wiring, terminals, or pin in the exciter field open	Check for continuity.
			x							Main field (rotor) inoperative (open or grounded)	Test and/or replace the rotor.†
			x							Stator inoperative (open or grounded)	Test and/or replace the stator.†
									x	Vibration excessive	Tighten loose components.†
Lube System											
				x		x	x		x	Oil level low	Restore the oil level. Inspect the generator set for oil leaks.
				x						Low oil pressure shutdown	Check the oil level.
	x	x					x		x	Crankcase oil type incorrect for ambient temperature	Change the oil. Use oil with a viscosity suitable for the operating climate.

+ Dealer Service Item



INSTRUMENT DIAGNOSTIC CHART

PROBLEM	POSSIBLE CAUSE	POSSIBLE FIX
No reading on gauge or gauge reads wrong	Faulty gauge	Replace gauge
	Wiring to gauge faulty	Inspect/repair wiring
	Faulty sender	Replace sender
Gauge reads erratic	Loose ground or hot wire	Repair/replace wire and/or connection



IPOD

Use this guide for troubleshooting, when you have difficulty in operating the unit or you cannot play a song with an error message displayed on Control unit.

? Currently selected Browsing (Music menu) item cannot be identified or not displayed.

- ✓ Control unit does not support a CD TEXT (disc title) display function.
 - ※ Slide the "1" of "SELECT SWITCH" to up position to lock on to "Playlists" (page 5). Next, press the reset button on Control unit.

? Browsing (Music menu) items cannot be selected.

- ✓ The "1" of "SELECT SWITCH" is set to up position.
 - ※ Slide the "1" of "SELECT SWITCH" to down position (page 5). Next, press the reset button on Control unit.

? Setting of the "SELECT SWITCH" is not enabled.

- ✓ The "SELECT SWITCH" might be set with KCA-iP500 connected to Control unit.
 - ※ Press the reset button on Control unit.

? Songs cannot be selected.

- ✓ If a resume function is enabled, a song of "track number 1, title number 1 in Playlist" is automatically played when you try to select a song.
 - ※ You can select a song after a song of "track number 1, title number 1 in Playlist" is played.

? "LOAD"/ "Reading" is continuously displayed on Control unit.

- ✓ Communication failure occurs between KCA-iP500 and iPod.
 - ※ Disconnect iPod from KCA-iP500, make sure "KENWOOD" is not displayed on iPod, then reconnect. If "LOAD"/ "Reading" is still displayed, reset iPod.

? iPod becomes inoperative after being disconnected from KCA-iP500.

- ✓ Communication failure occurs between KCA-iP500 and iPod.
 - ※ Reset iPod.

? Playback stops.

- ✓ An external unit such as headphones has been disconnected from iPod.
 - ※ Disconnect iPod from KCA-iP500, make sure "KENWOOD" is not displayed on iPod, then reconnect iPod. Before reconnecting iPod, be sure to disconnect all external units from iPod.

Messages

"RESUMING"

: Resume function is enabled. See <About resume function> on page 6.

"EJECT"

: Continuously displayed "EJECT" that iPod is not connected. Make sure that iPod is securely connected.

"NO DISC"

: A song corresponding to currently selected Browsing (Music menu) item or title (title of Playlist or album, for example) does not exist. Select other Browsing item or title.

"ERROR 18"/ "E-18"

: Software version of the connected iPod is not supported by KCA-iP500. See <Controllable iPod> on page 3.

"ERROR 60"/ "E-60"

: Communication failure occurs between KCA-iP500 and iPod. Disconnect iPod from KCA-iP500, make sure "KENWOOD" is not displayed on iPod, then reconnect iPod. If "ERROR 60"/ "E-60" is still displayed, reset iPod.



ISOBOOST TRANSFORMER

If there is an transformer problem, first check all electrical connections and retest. If all connections are good, look to the table below for assistance. If the malfunction continues after completing the procedure below, contact Charles Mairine for technical assistance.

Item	Condition	Solution
1.	The green (power) light will not come on.	Check breaker(s) in shoreside power pedestal, the boat's main AC breaker, and the breaker(s) for the IsoBoost. If breaker(s) is functioning correctly, check wire connections for tightness and proper color coding. Make certain no AC power is present when checking.
2.	The yellow (boost) and red (no output) lights go on and off in an alternating pattern.	The boat may be plugged into low voltage service. In this case, the IsoBoost will always be in a boost mode unless voltage drops below the preset "low voltage cutoff" point. A drop in voltage may be caused by a high current draw on-board placed on a highly-resistive line coming from the dock. Once the IsoBoost shuts off, the current draw is removed allowing the voltage to rise to an acceptable level for the unit to turn on and boost again. Again the current draw exists, dropping the voltage to the shut-off point, continuing the cycle. Be sure all connections are tight. Shortening unnecessarily long shore power cords or turning off some electrical load may also help.
3.	Unit will not boost	Check if the unit is in the "Standard" mode of operation. If the unit is in the "Standard mode of operation and will not boost contact Charles Marine Products for technical assistance, repair, and possible RGA information (see the section in this manual <i>Warranty & Customer Service</i>).
4.	Unit suddenly stops operating after functioning with a high current draw and all circuit breakers at the dock and in the boat are still in the "on" position.	The thermal protection embedded within the unit may have activated and shut down the unit. This will be more likely to occur in a very hot engine room. Allow the unit to cool. It may take an hour or so for AC power to return. To reduce the units operating temperature cool the engine room and remove some of the AC loads. If power does not return contact Charles Marine Products for technical assistance, repair, and possible RGA information (see the section in this manual <i>Warranty & Customer Service</i>).



PERFORMANCE DIAGNOSTICS

PROBLEM	POSSIBLE CAUSE	POSSIBLE FIX
Excessive vibration	Material obstructing propeller	Reverse engines to remove material
	Bent drive propeller shaft	Call authorized Regal/Volvo dealer
	Bent propeller blade	Repair/replace propeller
	Noisy drive bearing	Repair drive unit
	Damaged drive casting	Replace damaged casting
Poor performance	Trim incorrect	Adjust trim
	Unbalanced load	Adjust load
	Engine problem	Call authorized Regal/Volvo dealer
Engine speed/rpm is low	Growth on hull	Hoist vessel; clean bottom
	Poor quality fuel	Call authorized Regal/Volvo dealer
	Accumulation of bilge water	Check for leaks
	Trim tab in “up” position	Check trim tab functions/pump fluid levels



REFRIGERATOR DIAGNOSTIC CHART

PROBLEM	POSSIBLE CAUSE	POSSIBLE FIX
Refrigerator not cold	Compressor will not start	Turn breaker on at the main ship's service panel
	Thermostat set too high or on/off switch is in the off position	Reset thermostat or activate on-off switch
	Compressor starts but does not cool fridge	Contact repair center
	Door latch not closing or door seal not seated	Adjust latch or replace seal
	Condenser dirty	Remove fridge/clean coils with brush or vacuum
Not running on DC	Check for defective thermostat or converter, low battery	Replace thermostat, converter or battery
Not running on AC	Inadequate input voltage	Make sure proper voltage exists on ship's main AC panel.



REFRIGERATOR/ICEMAKER DIAGNOSTICS

PROBLEM	POSSIBLE CAUSE	REMEDY
Unit not cold enough	Door gasket not sealing properly	Adjust door (See MAINTENANCE; DOOR ALIGN, ADJUST, REVERSE).
	Item(s) interfering with door	Reposition or remove item(s).
	Dirty condenser coils	Clean condenser (See MAINTENANCE; CONDENSER CLEANING).
	Airflow to front grille blocked	Airflow must not be obstructed to front grille (See OPERATION).
	Temperature not set cold enough	Set control knob to cooler setting (See OPERATION). Allow 24 hours for temperature to stabilize.
The unit frosts up.	Unit is manual defrost model.	Models CO29 and CO75 are manual defrost (See MAINTENANCE; DEFROSTING).
	Door gasket not sealing properly	Adjust door (See MAINTENANCE; DOOR ALIGN, ADJUST, REVERSE).
	High ambient temperatures or humidity	Defrost unit manually (See MAINTENANCE; DEFROSTING).
Water is leaking out the back of the unit.	Water supply connection leaking	Tighten fitting as required.
Ice cubes sticking together	Door gasket not sealing properly	Adjust door (See MAINTENANCE; DOOR ALIGN, ADJUST, REVERSE).
	Infrequent use of cubes	Break apart cubes.
Noise during operation	Copper water supply tubing contacting internal components	Carefully bend tubing away from cabinet and components.
	Certain sounds are normal.	Soft sounds from the fan and water/dropping sounds from the ice maker will be heard.
No ice	Bin arm locked in upright position	Lower bin arm.
	No water to unit	Turn on water or contact plumber.
Not enough ice	Control set too cold	Adjust control to a warmer setting (See OPERATION).
	Ice cube size too large	Set cube size smaller (See MAINTENANCE; ICE MAKER; ICE CUBE THICKNESS ADJUST).
	Dirty condenser coils	Clean condenser (See MAINTENANCE; CONDENSER CLEANING).
Water leaks into ice bucket.	Water level set too high	Set cube size smaller (See MAINTENANCE; ICE MAKER; ICE CUBE THICKNESS ADJUST).
Fresh food section on Combo units too cold	Ice bucket not fully inserted	Push ice bucket into place.
	Flap door not closed correctly	Be sure flap door is closed correctly.
Unit too cold	Temperature control set too cold	Set control to warmer setting (See OPERATION).



SATELLITE TELEVISION (KVH)

The following troubleshooting matrix identifies potential operational symptoms and their causes and remedies. Refer to the user's guide for further information on the symptoms listed below or contact KVH technical support.

Should you experience problems with the antenna remember it is a sophisticated electronic device and authorized techs with specified tools and expertise are required. To find a KVH authorized dealer visit www.kvh.com/wheretogetservice.

SYMPTOM	CAUSES AND REMEDIES										
	Receiver fault or improper receiver configuration	Satellite coverage issue	Satellite signal blocked	Radar interference	Satellite frequency	Vessel turning frequency data changed	Insufficient power	Improper wiring	Loose RF connectors	Type of multiswitch used	Cable unwrap
Antenna non-functional							x	x			
Antenna not switching satellites	x	x	x				x	x	x	x	
No picture on TV set	x	x	x	x	x			x	x	x	
Certain channels do not work	x	x	x		x		x	x	x		
Intermittent picture for short intervals		x	x	x		x			x	x	x
System works at dock but not on the move			x			x					
System will not find satellite	x	x	x	x	x	x	x	x	x	x	
Snowy television picture	x						x	x	x		
Pixelating television picture	x	x	x	x		x	x	x	x		



SEA CHEST (SELF CLEANING RAW WATER STRAINER SYSTEM)

When doing maintenance work or troubleshooting be sure to deactivate the AC and DC power.

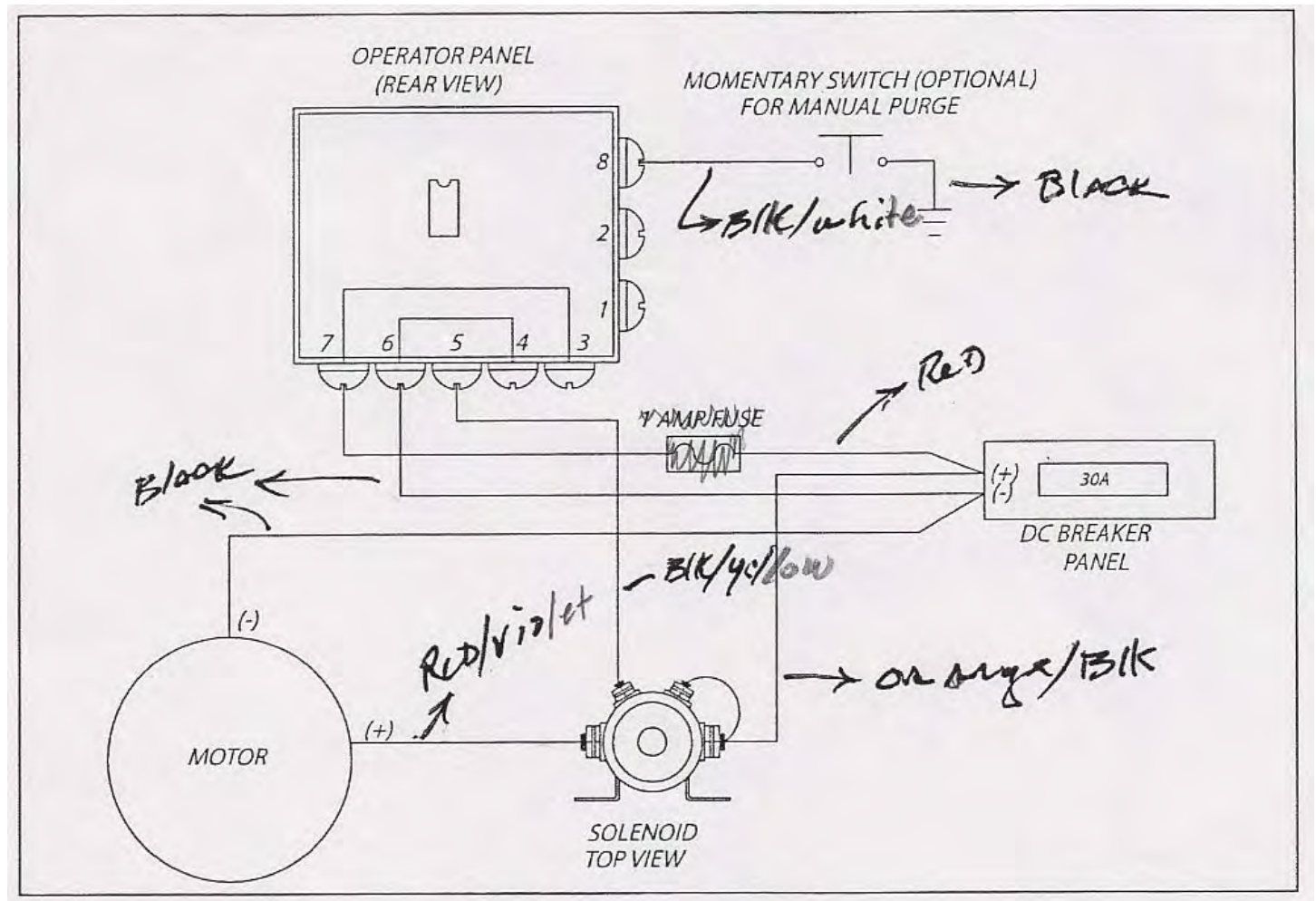
If the unit does not filter debris properly check the filter basket blades for wear. The four cutter blades are not engineered to be knife sharp. Inspect them for wear; they should extend slightly above the impeller surface.

To replace the shaft seal the impeller must be removed. Unscrew the impeller. Note it is a left-hand threaded component.

Install a new shaft seal carefully. The seal components are delicate and can be scratched which will result in non sealing. Push seal components gently but firmly in place. First install the rubber cup with ceramic facing away from the motor; then install carbon with smooth surface facing ceramic. The spring tensions the assembly after the impeller is reinstalled.

If dripping water is noticed tighten hose clamps. Also, make sure the drain plug and basket clamps are tight.

Use the follow wiring diagram to help troubleshoot any electrical problems.





SEAKEEPER® STABILIZER SYSTEM

The optional Seakeeper® stabilizer system uses two sources of power for the gyro and therefore power failure should be checked in any electrical troubleshooting sequence.

Power sources are;

1. 24 volts DC- power for the control box electronics.
2. 208-230 volts AC- power for the motor drive inside the gyro.

Refer to the appropriate drawing for cables 1 and 2 as noted in the Seakeeper Operation Manual. *Call for authorized personnel to conduct any troubleshooting measures on the gyro since it is a highly sophisticated piece of equipment.*

Another area of troubleshooting would be an alarm sounding at the helm display panel indicating a malfunction has taken place. Gyro damage or erratic operation may result at the sound of an alarm. When an alarm sounds the gyro switches to Stop and Lock, along with a message on the helm display. The alarm sound can be stopped by pressing the Power On/Off key on the display.

Note that the alarm will not clear until the reset condition is achieved and the operator presses the Power On/Off button. The operator can then press Lock/Unlock on the display home page to continue stabilization. The gyro **will not** automatically switch to Power On and Unlock.

Note that the gyro issues a warning when it detects a malfunction that is not hazardous but still should be corrected. Warning messages are displayed on the fault history page.

The tables are located in the Seakeeper Operation Manual.



SIRIUS MARINE WEATHER

LED STATUS

The LED on the connector panel provides valuable troubleshooting information on the status of your weather system.

The LED blinks green while the system is operating normally. If the unit detects a problem, the LED blinks amber to indicate a warning or red to indicate an error. The pattern of the LED blink is a code representing the nature of the problem. For multiple warnings/errors the codes are given in sequence with a 1.5 second pause between the indications.

It is normal during the first minute of initial power that the SR100 status LED shows no activity and remains off. During the second minute the status LED will start to flash the amber or red fault strings. Typically, during normal operation, a flashing green LED will occur within 90 seconds of initial power. If there is no LED indication of any sort displayed after 90 seconds you should check the circuit breaker.


A blinking red LED indicates an internal fault condition and a marine electronics technician should be contacted.

The following table shows the LED status codes and their meanings:



STEREO (FUSION)

TROUBLESHOOTING

Problem	Solution
General	
The unit does not respond to key presses.	<ul style="list-style-type: none"> Reset the unit by pressing the Reset button inside the control panel door. 
What is the best way to prevent corrosion on my 700 Series chrome finish?	As with all products exposed to the harsh marine environment, a little care will help to preserve the finish. FUSION recommends that you clean any salt water and/or salt residue from the front panel with a damp cloth soaked in fresh water.

Problem	Solution
SiriusXM	
When I press the tuner source button the SiriusXM screen is not displayed.	<p>Ensure you have the MS700i Tuner region set to 'USA'. Press Menu > Settings > Tuner region > and select 'USA'.</p> <p>Ensure the source is enabled. Select; Settings>Sources>Accessory then select the source to enable SiriusXM.</p> <ul style="list-style-type: none"> Ensure the SiriusXM module is plugged into the MS700i. Unplug the SiriusXM module and check the pins in the SiriusXM plug are not damaged.
SiriusXM message: 'Check Tuner'	<ul style="list-style-type: none"> Ensure the SiriusXM module is plugged into the MS700i. Ensure the SiriusXM cable has not been damaged.
SiriusXM message: 'Check Antenna'	<ul style="list-style-type: none"> Ensure the antenna is plugged into the SiriusXM Tuner module. Ensure the antenna is not damaged. Ensure the antenna cable has not been damaged
SiriusXM message: 'No Signal'.	<ul style="list-style-type: none"> Ensure the antenna is not damaged. Ensure the antenna has a clear view of the sky and is not obscured. Ensure the antenna cable has not been damaged
SiriusXM message: 'Channel xx Not Available'	<p>A SiriusXM message informing you that the current channel is unavailable. Possible causes are SiriusXM has removed the channel or your SiriusXM subscription has changed.</p> <ul style="list-style-type: none"> Contact SiriusXM to update your subscription. Online: Go to www.siriusxm.com/subscriptions Phone: Call 1-866-635-2349



STEREO (FUSION) CONT.

SiriusXM message: 'Channel xx Unsubscribed'	<ul style="list-style-type: none">• Contact SiriusXM to update your subscription.• Online: Go to www.siriusxm.com/subscriptions• Phone: Call 1-866-635-2349
SiriusXM message: 'Subscription Updated'	<p>A SiriusXM message informing you that you have either been granted access to or unsubscribed from various channels.</p> <p>For more information about your subscription:</p> <ul style="list-style-type: none">• Online: Go to www.siriusxm.com/subscriptions• Phone: Call 1-866-635-2349

Problem	Solution
Bluetooth	
Why does my FUSION Head Unit not see my MS-BT200 Bluetooth Module?	<p>If you have installed the MS-BT200 Bluetooth module or SiriusXM Tuner (USA Only) you will need to enable the source. This operation will be determined by the Tuner region you have selected.</p> <p>Tuner Region - USA</p> <p>When USA Tuner region is selected, press the menu button and select Settings>Sources>Accessory then select the source to enable SiriusXM or Bluetooth.</p> <p>Tuner Region - Australasia-Europe-Japan</p> <p>In these Tuner regions once the MS-BT200 is installed and connected the source will be available.</p>
Why does my Bluetooth source not display all song information	<p>The availability of song information such as song title, artist name, track duration and album cover artwork is dependent on the capability of your phone and music application. Album cover artwork and Shuffle/Repeat Status icons are not supported over Bluetooth.</p>
My Bluetooth audio is interrupted by short breaks.	<p>Bluetooth performs best with line-of-sight operation. Ensure the music device is not covered or obstructed and is located near the Bluetooth module. To prevent interruption to audio streaming over Bluetooth it is recommended that the Discoverable feature is turned off after pairing your device to the FUSION Stereo.</p>



STEREO (FUSION) CONT.

Problem	Solution
iPod	
Why does my FUSION Head unit keep locking up when connected to my iPod/iPhone?	<p>If you are experiencing software lock-ups or your unit freezes:</p> <ul style="list-style-type: none"> Reset the Head unit by pressing the reset button inside the face plate. Reset your iPod/iPhone (see Apple website from model-specific information). This should resume normal operation. Make sure you have the latest version of iTunes and the latest operating software in your iPod/iPhone. It is important to update software when Apple releases new versions. If you are connected via a dock, ensure you are using the correct sleeve and the connection to the Head unit is secure.
Will my iPod/iPhone connect to my FUSION product if the battery is flat?	No. It will take a number of minutes for the Apple product to get a minimum level of charge before it can connect and become operational. Please connect and wait for the unit to initialise.
My Apple Device has gone into thermal protection	<p>Caution: The internal dock temperature of the MS-IP700i will be slightly higher than the ambient temperature outside the head unit. Should your Apple iPhone or iTouch shut down due to exceeding the operating temperature please carefully remove it from the MS-IP700i and allow it to cool down before using again. Using your Apple device in a low charged state will increase the heat generated whilst it is charging. For more information relating to this please follow the Apple support web site link below.</p> <p>http://support.apple.com/kb/ht2101</p>
Why does my MS-IP700i Stereo not connect to my second iPod?	The MS-IP700i Stereo (with internal dock) does NOT support multiple iPods connected simultaneously. Correct operation is only guaranteed with a single device connected.
My iPod/iPhone will not connect to the Head unit while in the dock.	<p>If your Head unit displays "Not Connected" while using iPod as input source:</p> <ul style="list-style-type: none"> Check that you are using the correct sleeve combination. If you have the incorrect sleeve combination this could prevent the iPod connector from mating correctly. It could also damage the connector in the dock or your iPod/iPhone itself. If you are uncertain which iPod model you have, go to http://www.apple.com/support/ to get the correct model information for your iPod and sleeve. If you are still unable to connect once you know for certain you have the correct iPod/iPhone-sleeve combination: Ensure that you have the latest version of operating software installed in your iPod/iPhone and the latest iTunes version. To do this, connect your iPod/iPhone to iTunes and it will check and, if necessary, prompt you to download the latest version. If you are still unable to connect once you have confirmed that you have the latest software or you have updated your iPod/iPhone: Reset the iPod/iPhone (see the user manual for your Apple product) and also reset the Head unit (see FUSION user manual). If you are still unable to connect: Contact your FUSION dealer or contact FUSION via the tech email on the FUSION website.



STEREO (FUSION) CONT.

Problem	Solution
MTP Device	
Why has my MTP device become unresponsive?	FUSION recommends that folders contain no more than 300 files each. Exceeding this limitation may cause the phone to become unresponsive and the FUSION Stereo to reset the USB link to the phone. Note: Different operating systems and phones provide varying levels of support for MTP. Please refer to www.fusionelectronics.com for device compatibility information.
Why can't the FUSION stereo find my music files?	Music files must be located in a folder using one of the following names. The folder must be located in the root directory of your device. My Music My_Music mobile Music

Problem	Solution
Wireless Remote App for iPad and iPhone	
My FUSION-Link Wireless application displays "No stereo available"	The first thing to check is that you are connected to the correct wireless network for the 700 Series. Once you have confirmed this close the App on the device and restart it (consult the manufacturers website for instructions on restarting) . If this fails check that you have a valid IP address on the 700 Series and follow the instructions in the below tech support item
My FUSION-Link Wireless remote application will not connect to my 700 Series stereo	The first thing to check is that the 700 Series is displaying a valid IP address on the about screen. Select the settings menu then about to confirm. If the display is " IPNone " the router is either not a compatible DHCP product or not configured correctly. If the IP address starts with the prefix 169. it is not valid, this is a default address when the router is not sending a DHCP generated IP address or is configured incorrectly. Please review the Router's instruction manual or contact the manufacturers website for technical help.



SURE SHADE®

Troubleshooting Overview-

Below is a list of failure symptoms with possible causes and action to rectify problem. The main component used for most troubleshooting is the controller box. A digital volt meter is used to confirm readings. The controller is located in the cockpit. To access the controller box remove the cockpit refrigerator.

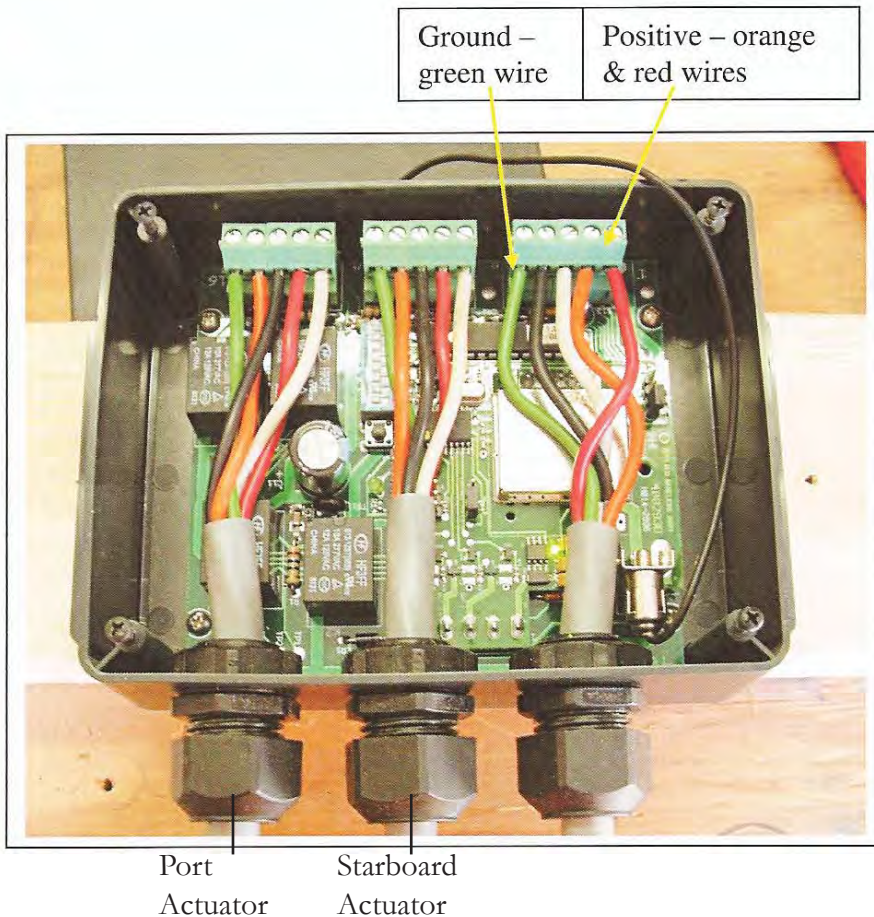
The controller uses a solid-state magnetic sensor attached to each actuator motors which provides rotation detection to the controller's microprocessor. The rotation detection process is used by the controller to set the extension and retraction parameters, maintain both motors in a synchronized state and detects and deviations in travel.

Failure Symptom		Cause	Action
1	NO MOVEMENT FROM THE SHADE	FUSE HAS BLOWN. NO POWER IS COMING INTO THE BOAT.	CHECK THE BREAKER. CONFIRM CONTROLLER IS RECEIVING POWER FROM THE BOAT.
2	THE SHADE IS MOVING IN ½ INCH OR SMALL INCREMENTS	INSUFFICIENT POWER COMING INTO THE BOAT. ROTATOR SENSOR MALFUNCTION.	CONFIRM CONTROLLER IS RECEIVING SUFFICIENT POWER FROM THE BOAT. CONFIRM THAT BOTH ACTUATORS' ROTATION SENSORS ARE RECEIVING POWER AND COMMUNICATING PROPERLY. CALL DEALER.
3	ONE ACTUATOR DOES NOT OPERATE AND THE OTHER ACTUATOR IS MOVING IN ½ INCH OR SMALL INCREMENTS	ROTATOR SENSOR MALFUNCTION. POTENTIAL MOTOR MALFUNCTION.	CONFIRM THAT BOTH ACTUATORS' ROTATION SENSORS ARE RECEIVING POWER AND COMMUNICATING PROPERLY. CALL DEALER. CONFIRM THAT THE ACTUATOR THAT IS NOT OPERATING PROPERLY IS RECEIVING POWER FROM THE CONTROLLER. CALL DEALER.
4	CANVAS IS NOT ROLLING UP WHEN RETRACTING	SOMETHING IS OBSTRUCTING THE CANVAS ROLLER. INSUFFICIENT TENSION ON THE ROLLER.	CONFIRM THAT THE ROLLER CANVAS IS NOT TOUCHING OR BEING OBSTRUCTED BY THE WALL OF THE FIBERGLASS CAVITY. CALL DEALER. PRELOAD THE ROLLER. CALL DEALER.



SURE SHADE® CONT.

Troubleshooting Overview-



1. Putting the voltage meter black lead on the Ground (**green wire**) and the voltage meter red lead on the 5amp incoming power wire for the controller circuit board (**orange wire**), it should read 12v
2. Putting the voltage meter black lead on the Ground (**green wire**) and the voltage meter red lead the 15amp incoming power for the actuator (**red wire**) should read 12v.

Checking controller box for incoming voltage both for actuator power and controller circuit board. Use a digital volt meter. Should show 12 volts DC.



TACHOMETER-ELECTRONIC DIESEL

Troubleshooting

Symptom recognition is the first step in effective instrumentation troubleshooting. Tachometers usually exhibit the following symptoms: a) dead, b) pegged, c) erratic, d) reading high, e) reading low, and f) sticky. More thorough tests of all tach's can be conducted using the *Faria® Instrumentation Tester*. (See Appendix III).

Symptom:

A. Dead - This is usually caused by: a) No power applied, b) No signal supplied, or c) Tach damaged by electrical transients caused by disconnecting the battery with the engine running.

1. Check to see if power is applied to tach by switching the instrument power supply switch on and off. As power is applied, the pointer should jump slightly. If it does not, check to see that the wires are installed on the correct terminals and that 12 volts are actually applied to the terminals themselves.
2. If tach indicates that power is applied, check for the presence of a signal on the signal terminal. Measure the signal between the signal and ground terminals. This should read in excess of 2 volts DC.
3. If power and signal are present, then it is possible that the tach has been damaged by electrical transients. See the enclosed technical bulletin for details.

B. Pegged - This condition occurs on tach's with internal mechanical pointer stops. It is caused by removing power from the tach while it is running in excess of mid-scale RPM's or by the switch on back of the tach being in between positions. When power is re-applied, the tach pointer attempts to go clockwise to zero but cannot because the internal stop is in the way. Read "Marine Instrumentation Facts" for details on how to correct this condition.

C. Erratic - This symptom is caused 99% of the time by an intermittent connection between the wire and the ring or spade connector. Often the wire's insulation is pushed into the crimp area and crimped. The center conductor casually touches the connector allowing the tach to work most of the time but causing a nightmare for the technician. Electrical noise also can cause erratic readings. See "Reading High" for further information.

D. Reading High - This is usually caused by the switch on the back of the tach being in the wrong position. If the number of cylinders or alternator poles selected by the switch is too low, the tach will read high. If a variable alternator or mag pick-up tach is being used, then further calibration may be necessary, as this calibration is done by the end user. See 'Calibration'. Excessive electrical noise may also cause the tach to read high. These noise spikes are counted by the tach as engine RPM's. The wire affected by the noise can be identified by connecting one wire at a time to the tachometer directly from the battery or the signal source on the engine.

E. Reading Low - If the number of cylinders or alternator poles selected by the switch is too high, then the tach will read low. If a variable ratio or mag pick-up tachometer is being used, further calibration by the end user may be necessary. See 'Calibration'.

F. Sticky - If the tach appears to "stick" during operation, slightly loosen nuts holding backclamp and check operation. If tach now operates properly and is not loose in panel, tach now should provide suitable service. If tach continues to stick during operation -- replace tach.



TACHOMETER-ELECTRONIC DIESEL

Calibration

Set up a calibrated “shop tach” or “strobe tach” to monitor the engine’s true RPM. Start the engine and (after an appropriate warm-up period and with the shift in neutral) increase it’s speed to the boat’s normal cruising RPM read on the shop tach. Set the coarse adjustment switch to the proper position described on it’s label. Remove the stop-plug or paper label corner (at the 8-o’clock position on the rear of the case for most) and insert a 5/64” Allen wrench into the “fine adjustment” trimpot, rotating it CW or CCW as necessary to indicate the true RPM.



TELEVISION DIAGNOSTIC CHART

PROBLEM	POSSIBLE CAUSE	POSSIBLE FIX
Screen is black. Power indicator is off.	TV breaker not activated	Activate TV breaker on ship's main service AC panel.
	TV and/or DVD not turned on.	Activate TV or DVD player.
TV signal weak.	TV antenna breaker not activated or wrong antenna breaker in use.	Activate TV antenna breaker. Check antenna switch for proper signal button.
Image too light or dark.	Brightness or contrast improperly adjusted.	Readjust brightness or contrast to owner's manual specifications.
Horizontal bars appear to flicker, jitter, or shimmer on the image.	Fine function not adjusted properly.	Adjust fine function to owners manual specifications.
Vertical bars appear to flicker, jitter or shimmer on the image.	Coarse function not adjusted properly.	Adjust coarse function. Then adjust fine function.
Screen is blank and power indicator light is steady amber or blinks every 1/2 or 1 second.	Power management system being used.	See power saver in owner's manual.
Image not centered on screen	Horizontal or vertical adjustments off.	Readjust horizontal or vertical controls.



TECHMA TOILET DIAGNOSTIC CHART

PROBLEM	CAUSE	ACTION/SOLUTION
Toilet does not flush or flush performance is poor	Waste tank is full (tank indicator light on wall switch is RED) Clog at pump inlet Solid object in macerator Low voltage	Empty waste tank before continuing to use toilet. Override full tank lock-out may cause waste tank to overflow Clear clog Call Tecma at (800-521-3032) Check for no more than 10% decrease in voltage when macerator is running. If voltage decreases more than this there may be wiring problem
Water does not enter bowl during flush or water add cycle	Water supply line kinked or not connected No power to water pump Water supply has been turned off Electronic control problem	Check that supply line is properly connected to fresh water supply. Check for kinks in water supply line Check that circuit breaker has not tripped, check all pump electrical connectors Check water supply valve at manifold Call Tecma at (800-521-3032)
Water level in bowl has changed after flush	Flush refill mode has been changed	Reprogram flush refill mode; see Techma owner's manual
Water continues dripping briefly into bowl after flush cycle is complete	Toilet is installed below water line with vacuum breaker in water supply line	Normal operation; if only a small amount drips from the nozzle
Bowl drains dry after flush	Water is siphoning out of the bowl	Discharge hose from macerator pump bent. Straighten hose
Wall switch does not appear to light up or does not stay lit	No power to toilet Wall switch not properly connected to toilet Wall switch has entered sleep mode	Check that breaker is not tripped. Check electrical connectors are mated Ensure wall switch electrical connector is fully engaged at controller Wall switch enters sleep mode after 8 hours of continuous inactivity but remains functional. No action needed
	Wall switch electronics problem	Call Tecma at (800-521-3032)
Toilet is inoperative and there is no lighting in the wall switch	No power to toilet	Check that breaker is not tripped. Ensure all electrical connectors are mated. Call Tecma.



TESTING A DVSR

Troubleshooting Notes

The DVSR unit is integrated into the battery management panel.

While troubleshooting can be done with a D.C. volt meter, the best tool would be an inductive amp meter, which will make the task faster and easier.

The DVSR unit has a RED LED indicator light on the face of the unit which will light up indicating the DVSR contacts are in a closed/current sharing condition. When the red light is not lit, the DVSR contacts are open and the two system batteries are isolated from each other, with a correctly working DVSR unit.

Testing Process;

1. Turn off battery charging sources including engine alternators.
2. Allow 30 minutes for the battery voltage to settle in their natural state of charge.
3. Deplete batteries below 13 volts or until the DVSR red LED indicators are no longer lit, to validate battery isolation.
4. Measure all battery voltages and note those values for future reference if needed,
5. Maintain a 20 to 25 amp load on the house battery to help keep that battery below 13 volts while testing.
6. Start engine, and with an inductive amp meter or D.C. volt meter check for charging circuit current at the engine battery.
7. If charging current cannot be validated, determine cause and repair before moving to step 8.
8. Use an inductive amp meter or D.C. volt meter, check for charging current/elevated voltage at the DVSR unit.

9. Using an inductive amp meter or D.C. volt meter, check for charging current/elevated voltage through the DVSR.

10. If step 9 cannot be validated, check for a good negative ground to the DVSR unit and correct if necessary.

11. If the negative ground is good to the DVSR, yet there is no charging current through the DVSR, the DVSR is defective and must be replaced.

12. If charging current or elevated voltage is validated through the DVSR to the house battery with the engine running, the DVSR unit and the system is functioning properly.



VHF MARINE RADIO

Alarms and Messages

Your VHF marine radio at times may generate an alarm or system message on the display.

Battery Alarm- When the radio senses a voltage greater than 15.8 Vdc or less than 10 Vdc, “high voltage” or “low voltage” is displayed on the radio display screen. Check the wiring if this should occur.

Main in Use- When the primary VHF 200 or VHF 200i unit is being used, “main in use” is displayed on the screen of all remote GHS 10 or GHS 10i handsets. The screen returns to normal three seconds after the last input on the primary station.

WX(weather alert)- If you set the WX alarm and an incoming weather alert is detected, the radio automatically tunes to the WX channel that is broadcasting the alert.

GPS Data Alarm- When GPS data from a NMEA network or position data you entered manually is over four hours old, the alarm tone beeps and “data is over 4 hours old” is displayed on the screen.

- Select ignore to disregard the alarm and to turn off the beeping alarm. When you take no action over 3 minutes, ignore is selected automatically.
- Select set to enter a new position.

Invalid GPS Data Alarm- When GPS data from a NMEA network or position data you entered is over 23.5 hours old, “data is invalid” is displayed on the screen. The radio will transmit position data that is more than 23.5 hours old.

- Select ignore to discard the old position data. The screen displays “NO GPS INFO” on the home screen. When you take no action after 3 minutes, ignore is selected automatically..

- Select set to enter a new position.

Position Tracking- After 5 consecutive failed attempts to request position information from a vessel, “NO POS FOR (VESSEL NAME)” is displayed on the screen.

- Select retry to reattempt the position request.
- Select remove to discontinue calling the vessel. When you take no action after three minutes, remove is selected automatically

Note: Refer to the VHF marine radio operator’s manual for further information.






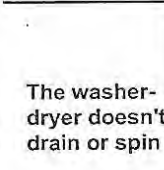
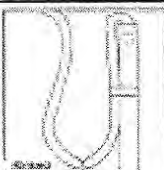
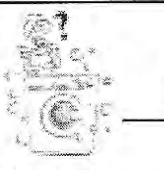


VACUUM CLEANER

If The Motor Stops Suddenly:

1. The most common cause is a clogged hose. Try to unclog the hose with a long stick or by shaking the hose until the clogged debris clears.
2. The bag is overfilled and fine dust has clogged the bag.
3. The vacuum cleaning tools are clogged.
4. The motor (exhaust) filter is dirty and should be cleaned or replaced.
5. It is a good idea to keep the cushion up where the main unit is stored to provide additional air to the unit. This will help prevent the unit from shutting down.



WASHER/DRYER

Operation	Possible Cause	What to do
<p>The washer does not start</p> 	<p><i>There is no power.</i></p> <p><i>Door is open.</i></p> <p><i>The Delay Start has been programmed (p. 14).</i></p> <p><i>Controls not set properly (p. 14).</i></p> <p><i>Water supply is turned off or the supply hoses are kinked.</i></p>	<p>Check that the plug has been correctly inserted into the socket and that there is electricity to the plug. Check house circuit breakers/fuses. Replace fuses or reset breaker. Washer should have separate outlet.</p> <p>Close the door.</p> <p>Move the program selector knob (A) to one of the Reset positions to cancel the program. Then reset the controls without setting the delay start.</p> <p>Refer to the "How to Wash" section (p. 14) to make sure your controls are set correctly.</p> <p>Turn both hot and cold faucets fully ON. Make sure hoses are not kinked or pinched.</p>
<p>The machine continuously fills and drains water</p> 	<p><i>Wall drainage system doesn't have a breather pipe.</i></p> <p><i>Drain hose is positioned too low causing siphoning (Fig. 6, p. 5).</i></p>	<p>Make sure that the wall drainage system has a breather pipe. If you live on an upper floor of your building, there may be a problem with your drain trap. To solve this problem, a special valve must be installed.</p> <p>Check that the standpipe is at least 25" high and not more than 34" high. Make sure that no more than 6" of drain hose is inserted into the standpipe. If the problem still persists after these checks, turn the water supply OFF and call for assistance.</p>
<p>Water does not enter the washer</p> 	<p><i>Hose is not connected correctly to the tap (p. 4).</i></p> <p><i>Water supply is not adequate (p. 2).</i></p> <p><i>Water inlet hoses are kinked or clogged.</i></p>	<p>Review the installation instructions and make sure the hoses are connected properly to the tap.</p> <p>Check water pressure. The water heater may be malfunctioning. Water may be being used elsewhere in your home. Make sure that the hot and cold water inlet faucets are turned fully ON.</p> <p>Free the inlet hoses of any kinks and clear them of any clogs. If the water is very calcareous, or if work has recently been carried out on the water piping, the tap filter could be clogged with particles and debris.</p>
<p>The program selector knob keeps turning</p> 	<p><i>The machine needs to be Reset.</i></p>	<p>Wait a few minutes for the drain pump to empty the tub, switch the washer-dryer OFF. Select one of the Reset positions on the knob, then switch it back ON. If the knob continues to turn, call for assistance.</p>
<p>The washer-dryer doesn't drain or spin</p> 	<p><i>The selected program incorporates a manual draining command (p. 8).</i></p> <p><i>The drain pump is clogged (p. 17).</i></p> <p><i>The drain hose is kinked or clogged.</i></p>	<p>When using the Easy Iron function without presetting a drying program, the machine will stop and wait for your command to drain. Simply press the Easy Iron button again and the machine will drain.</p> <p>Turn the water supply OFF, unplug the washer-dryer and follow the "When Needed, Check the Pump" instructions (p. 17) to unclog the pump.</p> <p>Make sure that the drain hose is not squashed or kinked. The drain hose should be as straight as possible. Check that nothing is blocking the water flow.</p>
<p>The washer produces too much foam</p> 	<p><i>The detergent used is not suitable for washing machines.</i></p> <p><i>Too much detergent or softener is being used (p. 10).</i></p>	<p>Check that the detergent you are using is labeled "For Machine Wash" or "Hand and Machine Wash" or any similar wording.</p> <p>Make sure that you are using only 1-2 tablespoons of low-sudsing powdered detergent (or liquid equiv.) and 1-2 tbsp. of softener per wash load.</p>
<p>Excessive vibration during the spin cycle</p> 	<p><i>The transit screws and spacers are still installed (p. 4).</i></p> <p><i>The washer-dryer is not leveled correctly (p. 5).</i></p> <p><i>Overloading (p. 12).</i></p>	<p>Make sure that the transit screws and spacers are removed.</p> <p>The level of the washer-dryer should be checked periodically. Adjust the feet and check the machine with a level.</p> <p>Make sure the drum is not overloaded.</p>
<p>The washer-dryer leaks</p> 	<p><i>The inlet hose is not properly attached (p. 4).</i></p> <p><i>The machine is not level (p. 5).</i></p> <p><i>The detergent dispenser is obstructed (p. 13).</i></p> <p><i>The drain hose is not positioned properly (p. 4).</i></p> <p><i>The drain pump is obstructed (p. 17).</i></p>	<p>Turn off the water supply, unplug the appliance and refer to the "Connecting the Water Inlet" section (p. 4) to tighten the attachment.</p> <p>Make sure the machine is resting level on a level surface.</p> <p>Remove the dispenser drawer and wash it under tap water to remove any detergent residue that has built up.</p> <p>Turn off the water supply, unplug the appliance, and position the drain hose correctly. Refer to the "Water Drainage" section (p. 4).</p> <p>Follow the "When Needed, Check the Pump" directions (p. 18) to remove any debris from the pumps pre-chamber.</p>



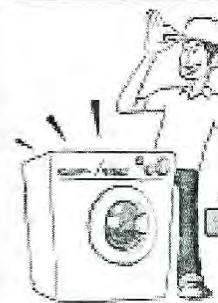
WASHER/DRYER

Operation	Possible Cause	What to Do
The dryer does not start	<i>There is no power.</i> <i>The door is open.</i> <i>The Delay Start has been programmed (p. 14).</i> <i>Water supply turned off, kinked.</i> <i>The controls are not set properly (p. 15).</i>	Check that the plug has been correctly inserted into the socket and that there is electricity to the plug. Check house circuit breakers/fuses. Replace fuses or reset breaker. Washer should have separate outlet. Close the door. Move the program selector knob (A) to one of the Reset positions to cancel the program. Then reset the controls without setting the delay start. Turn both hot and cold faucets fully ON. Make sure hoses are not kinked or pinched. Make sure that the program selector knob (A) is set to a Dry position and that the Dry Time knob (C) is set to your desired dry time.
The dryer does not dry properly	<i>End of drain hose under water.</i> <i>The drain pump is obstructed. (p. 17)</i> <i>The drum has been overloaded (p. 12).</i>	Make sure that the drain hose is positioned properly (p. 5). Follow the "When Needed, Check the Pump" directions (p. 17) to remove any debris from the pumps pre-chamber. Follow the "Choosing A Load" (p. 12) instructions in this manual for recommended load sizes for drying.
Lint or residue on clothing	<i>Washing is too long.</i> <i>Detergent not dissolving.</i> <i>Overloading (p. 12).</i>	Excess wash time may create lint. Select a shorter wash cycle (p. 9). Try a liquid detergent and/or use a warmer temperature setting. Make sure the drum is not overloaded. For wash loads, you should be able to close the door easily; items should not be tightly packed.
Stains on the load	<i>A fabric softener dispensing ball was used.</i> <i>Powdered detergent in low spin.</i> <i>Large load in Express wash.</i> <i>Incorrect sorting (p. 10).</i> <i>Overloading (p. 12).</i>	Dispensing balls will not operate correctly in this machine. Add liquid fabric softener to the fabric softener compartment. Consider using liquid detergent in wash cycles with low spin. For best results, use Express wash for small, lightly soiled loads. Avoid mixing heavy fabrics with light fabrics. Load your dryer so clothes have enough room to move freely in the drum while drying.
Wrinkling	<i>Incorrect wash cycle (p. 9).</i> <i>Clothes matted to drum after Spin (p. 10).</i>	Match cycle selection to type of fabric you are using. Repeated washing in water that is too hot may cause wrinkling. Use the recommended amount of fabric softener during the wash cycle.

Every Splendide washer-dryer comes with a Limited Warranty. Please read the Limited Warranty Statement that came separately with your machine for complete details. You'll find many answers to common problems in the "Avoid Service Checklist" section of this manual. If you review this section first, you may not need to call for service at all. **NOTE:** *You will be charged for a service call while the appliance is under warranty if the problems are not caused by defective workmanship or materials.*

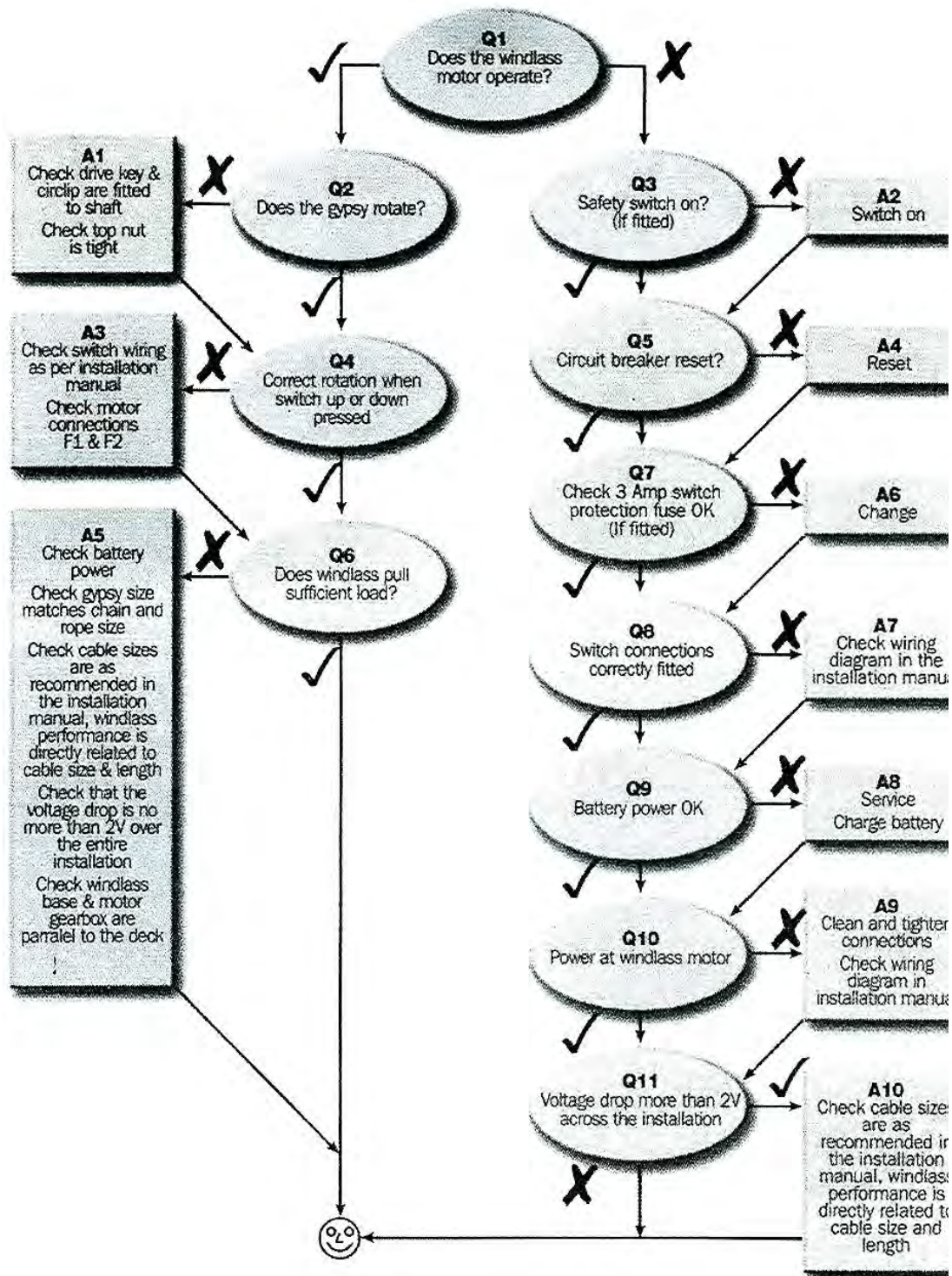
- If you do need service, you can relax knowing that help is only a phone call away. Call our Splendide Technical Service/Assistance Department toll-free at 1-800-356-0766 Monday-Friday 8:00AM-5:00PM Pacific Time.
- Please have the model number and serial number of your washer-dryer ready when you call.

"Knowledgeable Splendide Service Technicians are just a phone call away!"





WINDLASS





Storage & Winterization

NOTICE

YOUR WARRANTY DOES NOT COVER
DAMAGE TO YOUR BOAT IF IT IS NOT
PROPERLY STORED AND WINTERIZED.
CHECK WITH A REGAL YACHT DEALER OR
MARINE PROFESSIONAL ABOUT
WINTERIZATION PROCEDURES.

NOTICE

REMOVE ALL BATTERIES
WHEN VESSEL IS STORED
FOR EXTENDED PERIODS.



WARNING

EXPLOSION, FIRE & POLLUTION HAZARD!
DO NOT FILL FUEL TANK
TO RATED CAPACITY.
LEAVE ROOM FOR EXPANSION.

INTRODUCTION

Basic storage information is outlined in this chapter. These are general guidelines to follow in colder climates. Be sure to familiarize yourself with all relevant information in the owner's packet and seek professional services as needed. Special winterization procedures are necessary for the boat, equipment, and systems. Use the enclosed checklists to help you identify areas of concern and seasonal maintenance. These lists cover land stored boats either inside or outside.

All in all, it is best to contact your closest Regal yacht dealer for system information or Cummins/MerCruiser professional at Cummins Care for engine/drive information. They possess the advanced service know how and tools needed to tackle the more complex yacht systems especially the engine and drive components.

Therefore, the basic how to "nuts and bolts" winterizing information is not found in this manual.



DECOMMISSIONING CHECKLIST

BOAT

- ☐ Check hull bottom for any fiberglass damage. Repair as needed.
- ☐ Apply a coat of wax to hull and deck surfaces.
- ☐ Pour a pint of 50/50 antifreeze into bilge pump.
- ☐ Remove batteries. Charge as needed.
- ☐ Remove all loose gear from boat such as life jackets, etc. Inspect and store in cool, dry environment.
- ☐ Remove drain plug. Clean drain plug hole of debris as needed. Enclose drain plug in plastic bag and tie to steering wheel.
- ☐ Drain the waste system. Pump out the waste tank. .
- ☐ Clean all upholstery and store so it breathes.
- ☐ Conduct a visual inspection to ensure boat is balanced properly on a cradle. Do not use blocking on the hull bottom as structural damage may result which is not covered under warranty.
- ☐ Cover boat with tarp. Tie down for wind protection if outside. Prop tarp up as needed to provide proper ventilation. Be sure not to cover up the fuel vents.
- ☐ Drain the fresh water system including the fresh water tank, all hoses and lines.
- ☐ Send in appropriate equipment for calibration such as the automatic fire extinguisher canister or the CO detectors.
- ☐ *Never use blocking to support the hull bottom as structural hull damage may occur to the vessel.*

Contact your closest Regal yacht dealer or to make arrangements for winterizing your vessel.

ENGINES

The propulsion systems on your yacht are complex in scope. In colder climates, it is recommended that your Regal yacht dealer winterize your boat's engines and drive components. Regal dealers have undergone extensive factory training covering the Regal yacht product line. Also, the dealer is equipped with the parts and tools to perform a carefree winterization procedure. For Cummins/MerCruiser assistance call Cummins Care at 615-871-5101.

- ☐ Run engine. Pour a fuel stabilizer/conditioner in the fuel tank. Allow time for it to circulate through the fuel system. Fill fuel tank to help prevent condensation but leave room for expansion.
- ☐ Change all engine fluids as referenced in the engine manufacturer's owners manual.
- ☐ Drain cooling and exhaust system or "pickle" the engine with antifreeze.
- ☐ Spray all exterior parts with a rust preventative.



Storage & Winterization

GENERAL NOTES ON ANTIFREEZE

Engine cooling fluids must be replaced with a marine antifreeze solution; mix antifreeze according to directions for the lowest expected temperature. The above method is much more reliable than just draining the engines and manifolds because sometimes pockets of water can form which can freeze in cold temperatures and cause engine damage. Draining the system fosters rust in engine parts. Historically, antifreeze was originally made with methanol. It was because of its chemical nature to escape into the atmosphere and a high corrosion factor on engine metals that it was replaced.

Today, ethylene glycol is used in auto and marine engine applications because of its positive thermal properties. On the downside ethylene glycol contains silicate rust inhibitors that can clog up marine heat exchanger surfaces. This is why it is so important to follow the engine manufacturer maintenance schedules which include changing the antifreeze periodically. In addition, the unpleasant odor of antifreeze is caused by tolyltriazole which also contributes to it being environmentally hazardous. **Notwithstanding, ethylene glycol is poisonous to the human body along with animals.** Therefore, it cannot be used in potable marine water systems.

Propylene glycol is considerably less toxic and retail products are labeled as “non-toxic antifreeze”. It is the product of choice for marine water and waste tanks in freezing climates. It is available at marinas, RV dealerships, and at retail marine outlets.

ZEUS DRIVE UNITS

Since the drive units are located under the vessel it makes good sense to use a Regal yacht dealer to ensure the units are winterized. The yacht dealer can check all drive related systems along with the propellers. This is a great time to have the propellers checked for balance and nicks.

Also, when the the propellers and hardware are off the propeller shaft and seals can be checked for vacuum and pressure along with touching up the drive unit.

Seasonal inspections are a great time to inspect the anodes located on the hull and drive units. Replace as necessary.

Refer to your Cummins and Zeus operator’s manual for specific drive information and maintenance schedules.

NOTICE

USE A SPECIAL NON-TOXIC ANTIFREEZE
IN THE FRESH WATER & WASTE SYSTEM
WHICH IS AVAILABLE AT RV AND
MARINE DEALERS.

**DO NOT USE AN AUTOMOTIVE
TYPE ANTIFREEZE.
IT CAN BE HIGHLY
POISONOUS AND CORROSIVE.**



AIR CONDITIONING:

There are several methods of winterization; some work better than others. The 4 various methods employed using a 50/50 biodegradable antifreeze/water solution are:

1. Pumping of antifreeze solution into the overboard thru-hull fitting, and discharging through the intake thru-hull fitting.
2. Use of the seawater pump to move antifreeze solution through the system and discharging through the overboard thru-hull fitting. Close the seacock, remove the hose for the strainer outlet, raise the hose above the AC pump (to prevent lose of prime) and pour in antifreeze solution. Pump solution through system. The strainer and hose to seacock will also need to be drained.
3. Use of pressurized air to force water from the intake through the overboard discharge.

Note: Any method that causes the antifreeze solution to flow downward is the method of choice. By this means, the antifreeze solution will displace any water trapped and eliminate the possibility of freezing in hidden areas. In addition, since the seawater pump utilizes a magnetically driven impeller, the impeller would be removed from the wet end assembly, wiped with an alcohol solution, and stored in a warm, dry area until commissioning takes place. Check with your closest Regal yacht dealer.

BATTERIES:

Remove the batteries and check for voltage. Store in a cool, dry place. It is recommended that a load test be performed to gage the reserve left in the gel batteries. Monthly recharging or continuous trickle charging should be done to insure battery life during storage. Do not store a battery on cement as it may discharge.

FUEL TANK::

Fill the fuel tank to minimize condensation but do not overfill. Leave enough space for fuel to expand and add a fuel stabilizer to diesel prior to storage following the manufacturer's recommended procedures.

NOTICE

FOR THE PURPOSE OF PROTECTING
THE ENVIRONMENT,
DISPOSE OF ANY CONTAMINATED
ACID SOLUTIONS
IN ACCORDANCE WITH
FEDERAL, STATE AND/OR LOCAL
REGULATIONS.



Storage & Winterization

DIESEL GENERATOR (WESTERBEKE)

Your yacht features a Westerbeke diesel generator as standard equipment. If your vessel has Seakeeper a larger diesel generator is used. The generator must be decommissioned for storage in freezing climates. Your Regal dealer or marine professional has special training along with the necessary parts for winterizing your generator. The information below gives you a sampling of the procedures your dealer may employ when performing this seasonal procedure. Refer to your generator operator's manual for further information. The vessel must be in the water for the procedures below. Remove any sound shield enclosure as equipped.

A 50-50 solution of antifreeze and distilled water is recommended for use in the fresh water cooling system at all times. This solution may require a higher concentration depending on the area's winter climate. Check the solution to make sure the antifreeze protection is sufficient.

To add antifreeze, drain an appropriate amount from the engine block and add a more concentrated measure. Start the engine to ensure a complete circulation and mixture of the antifreeze concentration through out the cooling system. Then recheck the antifreeze solution's strength with a bulb type checker.

With the engine warm, drain all the engine oil from the oil sump. Remove and replace the oil filter and fill the sump with new oil. Use the correct grade of oil according to the engine lubricating oil section of your generator operator manual. Run the engine and check for proper oil pressure and make sure it is leak free.

Do not leave the old engine oil in the crankcase over the lay-up period. The old oil and combustion products combine to produce harmful chemicals which can reduce the life of your engine's internal parts.

Fill your fuel tanks off with number 2 diesel fuel but leave room for expansion. Fuel additives such as BIOBOR and STABIL should be added at this time to control algae and condition the fuel. Care should be taken that the additives used are compatible with the primary fuel filter/water separator used in the system. The element in the primary fuel filter/water separator should be changed and clean the separator sediment bowl.

Change the fuel filter elements on the engine and bleed the fuel system as needed. Start the engine and let it run for 5-10 minutes to make sure no air is left in the fuel system. Check for any leaks that may have been created in the fuel system during this servicing, correcting them as needed. Operating the engine 5-10 minutes will help allow movement of the treated fuel through the injection equipment on the engine.

Close the through hull seacock. Remove the raw water intake hose from the fitting. Place the end of this hose into a five gallon bucket of clean fresh water. Before starting the engine check the zinc anode found in the primary heat exchanger on the engine and clean or replace it as required and also clean any zinc debris from inside the heat exchanger where the zinc anode is located. Clean the raw water strainer.

Start the engine and allow the raw water pump to draw the fresh water through the system. When the bucket is empty stop the engine and refill the bucket with an antifreeze solution slightly stronger than needed for winter freeze protection in your area.

Start the engine and allow all of this mixture to be drawn through the raw water system. Once the bucket is empty, stop the engine. This antifreeze mixture should protect the raw water circuit from freezing during the winter lay-up, as well as providing corrosion protection.

Remove the impeller from your raw water pump (some antifreeze mixture will accompany it, so catch it in a bucket). Examine the bucket. Get a replacement if needed and a cover gasket. Do not replace the impeller (into the pump) until recommissioning, but replace the cover and gasket.

Again, the above is an overview of the main elements that your dealer may use to winterize the generator.



OIL CHANGER

If the system is used for oil changes only winterization is not required. If you are pumping fresh or salt water you must protect the system from freezing by draining the pump, valves, manifold and hoses. To drain, remove all hose connections and open all valves.



Storage & Winterization

SEA CHEST SELF-CLEANING SYSTEM

In freezing climates drain the pump and filter to winterize since the pump or filter could be damaged.

To drain, remove the black drain plug on the side of the pump/filter unit, and disconnect the hoses.

Replace and tighten the drain plug and or hose when draining is complete.

Another method of winterizing could be running ethylene glycol through the system and all connected components.



TELEVISION:

The television manufacturer recommends that the unit be removed from the vessel in freezing climates. To remove the flat screen do the following:

1. Pull out the power plug from the rear of the television.
2. Unscrew the antenna cable.
3. While someone holds the flat screen, remove the screws that hold the television to the bracket.
4. Remove the television and store at room temperature.



Storage & Winterization

WASHER/DRYER

■Winterizing Your Machine

If needed, follow these steps to winterize your machine:

- With the machine power OFF, put 1/2 quart of R.V.-type antifreeze in the drum. Close the door.
- Turn the Program Selector knob to Spin. Turn the power On. Let the machine spin for 1-2 min.
- Turn the power OFF. Unplug the washer or disconnect power.
- Shut off both water faucets. Disconnect water inlet hoses from faucets and drain. DONE!

To Use Again:

- Flush water pipes.
- Reconnect water inlet hoses to the corresponding HOT and COLD faucets. Turn on both water faucets.
- Plug in washer or reconnect power.
- Run the washer through the Express cycle with 1/2 tablespoon of powder detergent (or liquid equiv.) to clean out antifreeze. DONE!

■Optional RV Winterization:

If currently pumping antifreeze through the fresh water system, follow these steps to winterize your machine:

- With the machine power OFF, turn the Wash Temp. knob to WARM.
- Turn the Program Selector knob to Regular wash (located in the Cotton Heavy Duty section of the dial.) Turn the power ON.
- When you see antifreeze in the drum, turn the power OFF. Now advance the Program Selector knob to Spin.
- Turn the power ON. Allow the drum to spin for 30 seconds.
- Turn the power OFF. DONE!



WASTE/TOILET SYSTEM:

1. Pump out waste holding tank, flush the tank with fresh water and pump out again.
2. With non-toxic propylene glycol antifreeze in the fresh water tank, operate head until antifreeze flows into bowl of head. Allow time between flushes for the vacuum to build up.
3. Operate macerator until antifreeze has a steady flow coming from the discharge fitting. Pour non-toxic propylene glycol antifreeze solution in head and flush head as needed to produce enough flow to winterize the macerator.
4. Leave at least 2 gallons of non-toxic propylene glycol antifreeze solution in the holding tank during storage.

NOTICE

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IN THE FRESH WATER & WASTE SYSTEM
WHICH IS AVAILABLE AT RV AND
MARINE DEALERS.
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TYPE ANTIFREEZE.
IT CAN BE HIGHLY
POISONOUS AND CORROSIVE.**

WATER SYSTEM-FRESH

1. Turn on the fresh water pump switch.
2. Open all faucets including transom shower and allow tank to empty.
3. Drain the water heater; shut off water pump switch.
4. Mix **nontoxic antifreeze** with water in accordance with the manufacturer's recommendations.
5. Pour solution into the fresh water tank.
6. Turn on fresh water pump switch.
7. Open each cold water faucet one by one beginning with the one furthest away from the tank and purge the system until a steady stream flows from the faucet. Then close the faucet.
8. Repeat step 7 for hot water faucets.
9. Shut off water pump switch.
10. Pour a quart of non-toxic antifreeze into shower drain. Run the shower pump until a steady stream flows from the discharge fitting.
11. Leave at least 2 gallons of antifreeze solution in the holding tank during storage.



Storage & Winterization

Notes



Glossary & Index

Following is a brief list of nautical terms useful in everyday boating experiences and communications. For more detailed glossaries of nautical terminology we recommend you check your local library, the internet or a marine store for boating books.

GLOSSARY

Abeam: at right angles to the fore and aft line and off the boat

Aboard: on or in the boat

Aft, After: aft is the boat section toward the stern or back of the boat

Amidships: toward the center of the boat from either side to side or rear to front

Beam: the width of a boat at its widest part

Bilge: the lower interior of the hull of the boat

Bitter end: the end of a line also the end of an anchor line

Bow: the front, or forward part of the boat

Bulkhead: the vertical partition or wall of a boat

Cast off: to let go or release

Chine: the line fore and aft formed by the intersection of the side and bottom of the boat

Chock: deck fitting used to secure or guide anchor or tie lines

Cleat: deck fitting with protruding arms around which lines are secured

Cockpit: the seating footprint used to accommodate passengers

Deck: the open flooring surface on which crew and passengers walk

Draft: the depth from the waterline of the boat to the lowest part of the boat, which indicates how much water is required to float the boat



Chapter 11

Fathom: a measurement of depth; one fathom equals six feet

PFD: personal floatation device; required for each person aboard

Fender: a cushion hung from the side of a boat to prevent it from rubbing against a dock or against other boats

Port: the left side of the boat when facing forward (an easy way to remember the difference between “port” and “starboard” is that both “port” and “left” have four letters)

Fend off: to push off to avoid sharp contact with dock or other vessel

Shank: the main body of an anchor

Fore: the part of the boat toward the bow or front

Sheer: the curve of the boat’s deck from fore to aft when seen from the side

Freeboard: the height of the top side from the waterline to the deck at its shortest point. (The distance from the sheer or gunwale to the water)

Starboard: the right side of the boat when facing forward

Galley: cooking area

Stern: the aft end of the boat

Gunwale: rail or upper edge of the side of the boat

Stern drive: an inboard/outboard (IO) unit

Hatch: an opening in the deck to provide access below

Stringer: strengthening integral unit fastened from fore to aft inside the hull and fiberglass encapsulated for added strength: much like the skeleton system of our body

Head: toilet

Top off: to fill up a tank

Hull: the part of the hull from the deck down

Transom: the vertical part of the stern.

Keel: the lowest point of a boat

Trim: the boat’s balance when properly loaded

Knots: a measurement of speed indicating nautical miles per hour

Wake: the path of a boat left astern in the water

Lee: the side opposite that from which the wind is blowing; the side sheltered from the wind

Leeward: the direction toward which the wind is blowing



Glossary & Index

A		C	
AC Current	4-45	Cabinet Care	8-5
	9-10	Cord Reel System	4-52
AC Panel	4-60		8-35
Accidents	2-18		9-12
Accident Reporting	2-19	Camera Monitoring System	7-31
Air Conditioner	4-73		9-16
	8-26	Carbon Monoxide	2-14
	9-2	Carbon Monoxide Detector	7-4
Alcohol Myths & Facts	2-18		8-34
Antennae	7-28	Cardiopulmonary Resuscitation	6-11
Anchoring	6-9	Carpet-Cockpit	8-7
		Carpet-Interior	8-6
		Compass	7-32
			8-34
B		Cool Cockpit- Air Conditioning	7-33
BBQ	8-9	Control- DTS	5-12
Batteries	4-12	Control- Joystick	5-16
	8-29	Cord Reel System	8-35
Battery Charger	4-23	Cosmetic Care	8-1
	8-31	Countertops- Solid Surface	8-8
	9-7	Cummins Engine Package	5-20
Battery Parallel Switch	4-32		8-36
	8-32		
Battery Switches (Electronic Remote)	4-17	D	
Bilge-Engine Compartment	8-3	DVD/CD Disc Care	4-116
Bilge Pump	7-29	DVSR- Testing	9-47
	8-33	DC Electric- (Direct Current)	9-14
Blu-ray Player	9-10	DC Panel	4-38
Bottom Paint	7-30	Dealer Responsibilities	1-10
	8-4	Decommissioning	10-2
	9-11	Diagnostic Charts (Troubleshooting)	9-1
Breakers	4-38	Diesel Fuel Filter	4-8
	4-41	Dinette	7-17
	4-60	Dingy Launch/Retrieval	7-34
Breast Lines	6-6	Direct Current (DC)	4-38
Bridge Clearance	3-8		9-11
		Distress Signals	2-7
		Diver's Flag	2-20
		Dock Lines	6-6
		Dockside Power (Shorepower)	4-45
		Dockside Water Inlet	4-80
		Door (Companionway)	7-5
			8-40
		Door (Transom)	7-40
		Drain Plug	6-1



Chapter 11

E

Electrical Drawings	Technical
Electronics	4-126
	7-41
	8-44
	9-15
Anchor Drift Alarm	7-45
E- Series Plotter	4-127
Radar	4-128
Satellite TV	4-120
	9-133
Sirius Marine Weather	4-130
	7-68
	8-65
	9-36
Sirius Satellite Radio	7-57
Stereo	9-37
Engine	8-36
	9-30
Entertainment	4-112
	9-17
Environmental Awareness	6-13
Exhaust	2-14

F

Fabrics-Interior	8-9
Fenders	6-5
Fiberglass Maintenance	8-10
Fire Extinguishers	2-6
	7-42
	8-43
Fires	6-11
First Aid	6-11
Float Plan	1-7
Flooring	8-12
Fresh Water System	4-78
	9-19
Fuel Filter	9-20
Fuel System	4-2
	6-3
	8-43

G

Garbage Discharge	2-14
Gauges/Switch Panels	8-13
Gelcoat Maintenance	8-10
General Boating Safety	2-2
Generator	4-68
	9-23
	8-44
Getting Underway	6-1
Glossary	11-1
Granite	8-14
Grey Water System	7-7
Grill	8-9
Ground Fault Outlet (GFCI)	4-65
	8-55

H

Hardtop Enclosure	7-47
Hatch	7-8
	7-48
Heater-Hot Water	4-87
	7-49
	8-55
Helm Displays	5-7
High Water Alarm	7-51
	8-56
HIN	1-5
Horn	2-10
	8-58
Hull/Deck	8-16
Hypothermia	6-12

I

iPod Dock	7-118
	9-28
Ignition Switch	4-33
Index	11-3
Instruments (Gauges)	9-27
International Distress Signals	2-9
Isolator-Galvanic	4-59
	9-21

K

Knots	6-8
-------	-----



Glossary & Index

L		R	
Lights	2-11 7-9	Range	7-12 8-18
M		Refrigerator	7-13 9-24
Machinery Components	7-3	Refrigerator Icemaker Combo	9-25
Maintenance	8-25	Registration Information	1-10
Maintaining PFD'S	2-6	Remote Control	5-14
Markers-For Slings	7-52	Right-Of-Way	3-1
Mayday	2-10		
Microwave	8-16		
Minimum Required Equipment	2-13		
Monitor Panel	7-11		
Mooring	6-6		
N			
Navigation Aids	3-5		
Navigation Lights	2-11		
Navigation Rules	3-1		
O			
Oil Change System	7-54 8-58		
Overboard Discharge Pump	4-94 7-45 8-65		
Overloading	2-3		
Owner's Packet	1-4		
Owner Responsibilities	1-11		
P			
Personal Flotation Devices	2-4		
Plastics	8-17		
Plumbing Connectors	8-59		
Portlights	7-2		
Precision Pilot	5-18		
Pre-departure questionnaire	6-1		
Propellers	5-51		
Propulsion	5-38		
Pressure Pump-Fresh Water	7-6		
Pressure Pump- Fresh Water Booster	7-6 8-60		



Chapter 11

S

Safety Labels	2-1
Seacocks	4-77
	8-74
Seat- Helm	7-18
Seat- Aft Transom Bench	7-27
SeaChest Filtration System	7-58
	8-62
	9-34
Seakeeper	7-60
	8-63
	9-35
Shorepower	4-45
Shower-Transom	7-67
Shower Sump Pump	4-88
	8-66
Slings-(Lifting)	12-44
Sound Producing Devices	2-10
Specifications	Technical
Spotlight	7-70
	8-18
Spring Line	6-6
Strainer	4-77
Stainless Steel	8-18
Stains	8-19
Stern Line	6-6
Steering-Emergency	5-55
Stereo Remote	4-125
Sump Inspection Hatch	4-99
Sun Pads	7-71
Sunroof	4-102
Sureshade	7-73
	9-41
Swim Ladder	7-75
Swim Platform	2-20
	7-76
Switches (DC)	4-46

T

Tachometer	9-43
Technical Drawings	12-11
Technical Information	12-1
Television	7-19
	8-68
	9-45
Toilet-Vacuum Style	4-91
	8-76
	9-46
Towing	6-10
Transformer-Isolation	4-54
	8-69
	9-29
Trim Tabs	4-100
	8-69
Troubleshooting	9-1

U

Underwater Lighting	7-70
Upholstery	8-20

V

VHF	4-132
	8-45
	9-48
Vacuum Cleaner System	7-20
	8-73
	9-49
Ventilation System	4-5
Vessel Information Sheet	1-5
Visual Distress Signals	2-7



Glossary & Index

W

Washer/Dryer	7-22
	8-74
	9-50
Waste Vent Line Filter	4-90
Waste Water	4-90
Windlass	4-105
	8-76
	9-52
Windshield Center Vent	7-82
Windshield Defroster	7-81
Windshield Washer-Wiper System	7-83
Windshield Film	5-38
	8-23

Z

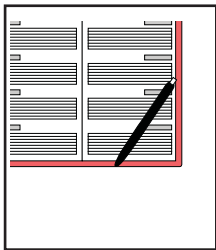
Zeus Propulsion Package	5-38
	8-77



Technical



TECHNICAL INFORMATION



Note that all product specifications, models, standard, optional equipment, systems, along with the technical information is subject to change without notice.

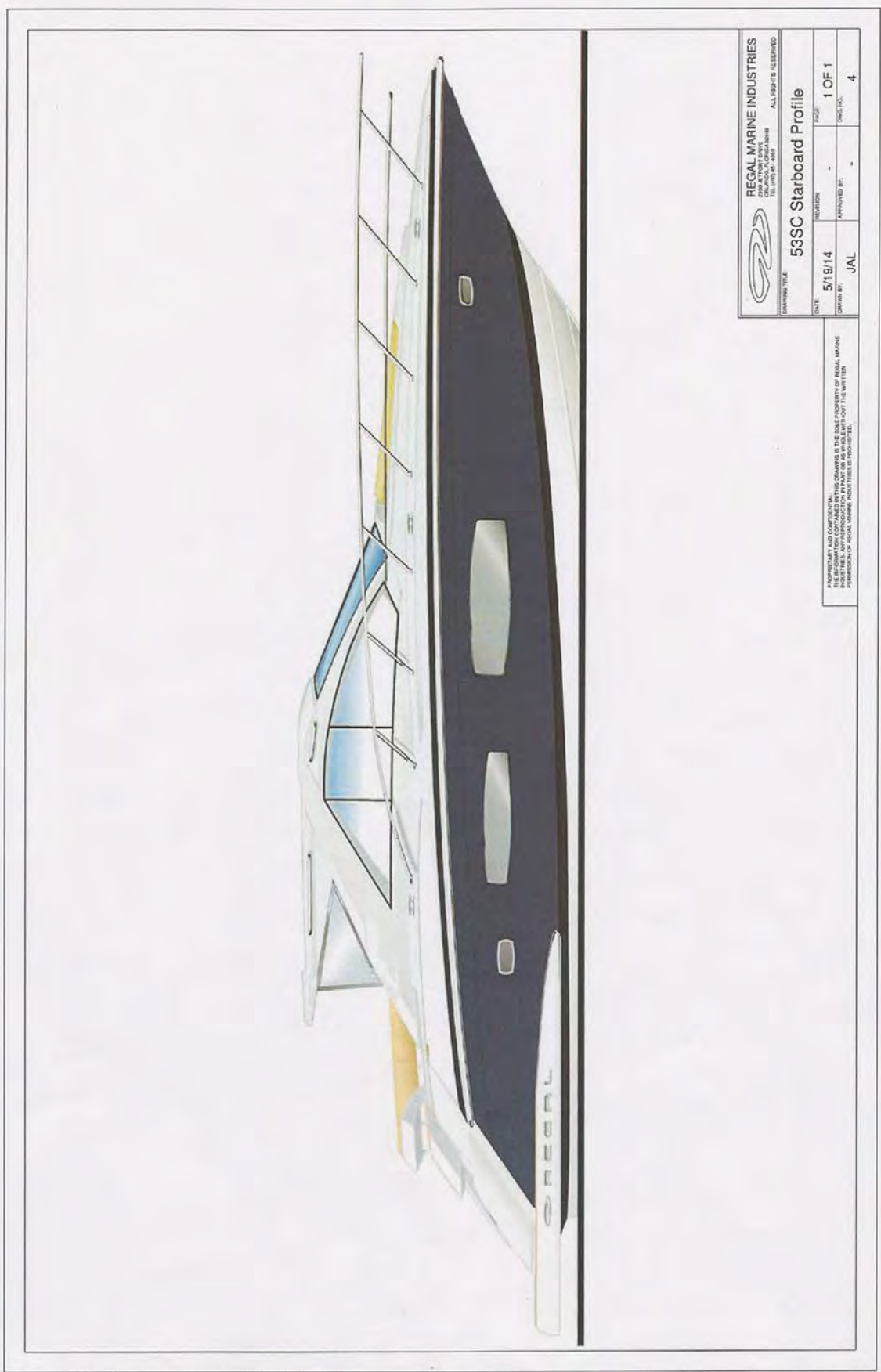
For more information contact your nearest authorized Regal dealer. For the location of your nearest authorized dealer call 407-851-4360

or you can contact Regal through the internet at : **www.regalboats.com**. Your Regal dealer has received special factory training on the entire product line and his services should be employed to solve more technical problems.

A portion of the technical drawings found in this chapter are actual product drawings from the Regal factory. These drawings should be of special interest for mechanical and electrical troubleshooting issues. The equipment in the drawings is discussed in the various sections of this manual. Understanding specific systems and related drawings will go a long way in solving vessel problems. Sometimes knowing the brand of a component or system can help identify the correct drawing along with using the particular schematic from the vendor file found in the owner's information packet.

Again, contact your closest Regal yacht dealer and/or seek professional help as needed.

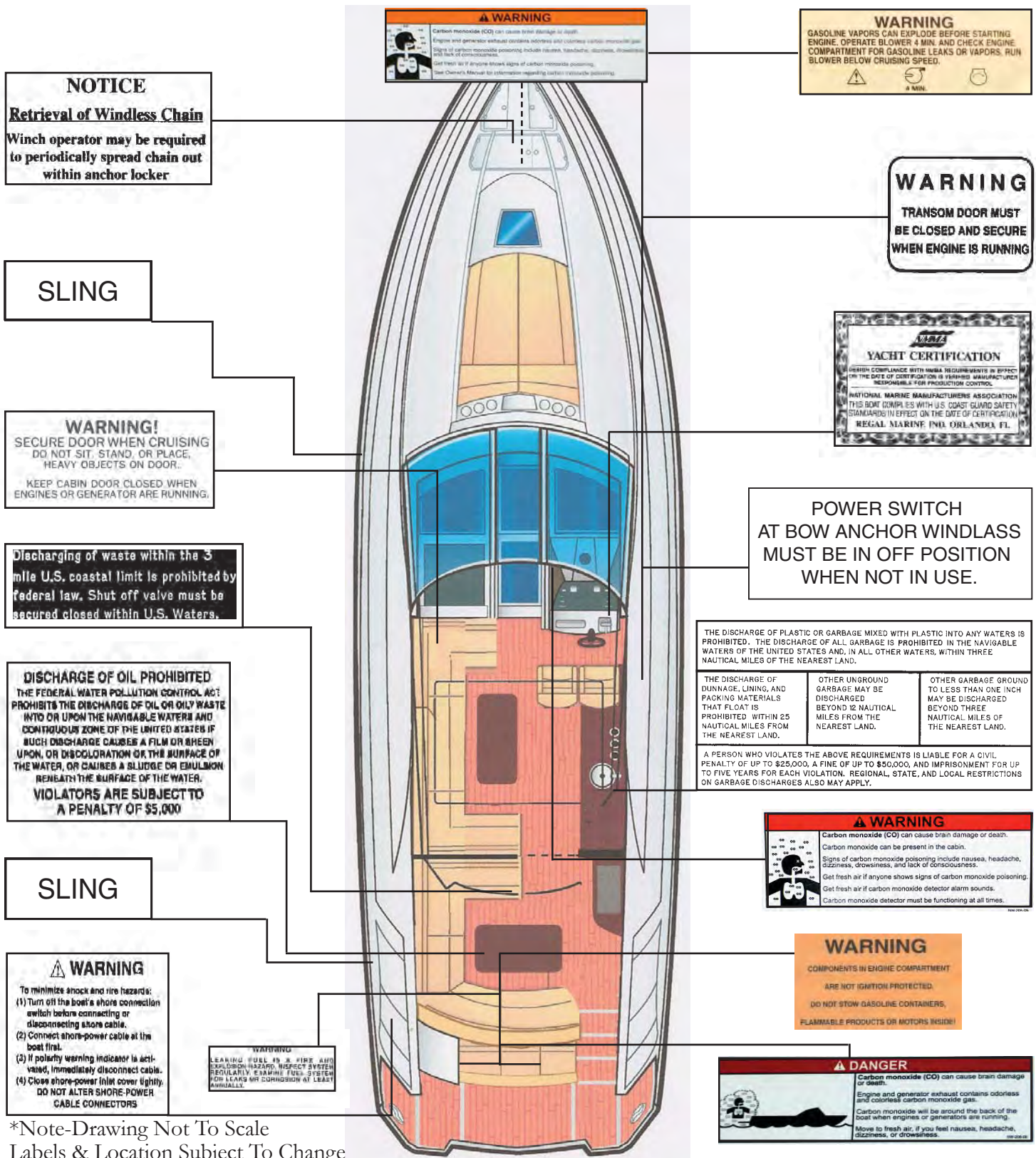
53 SC STARBOARD PROFILE





Technical Information

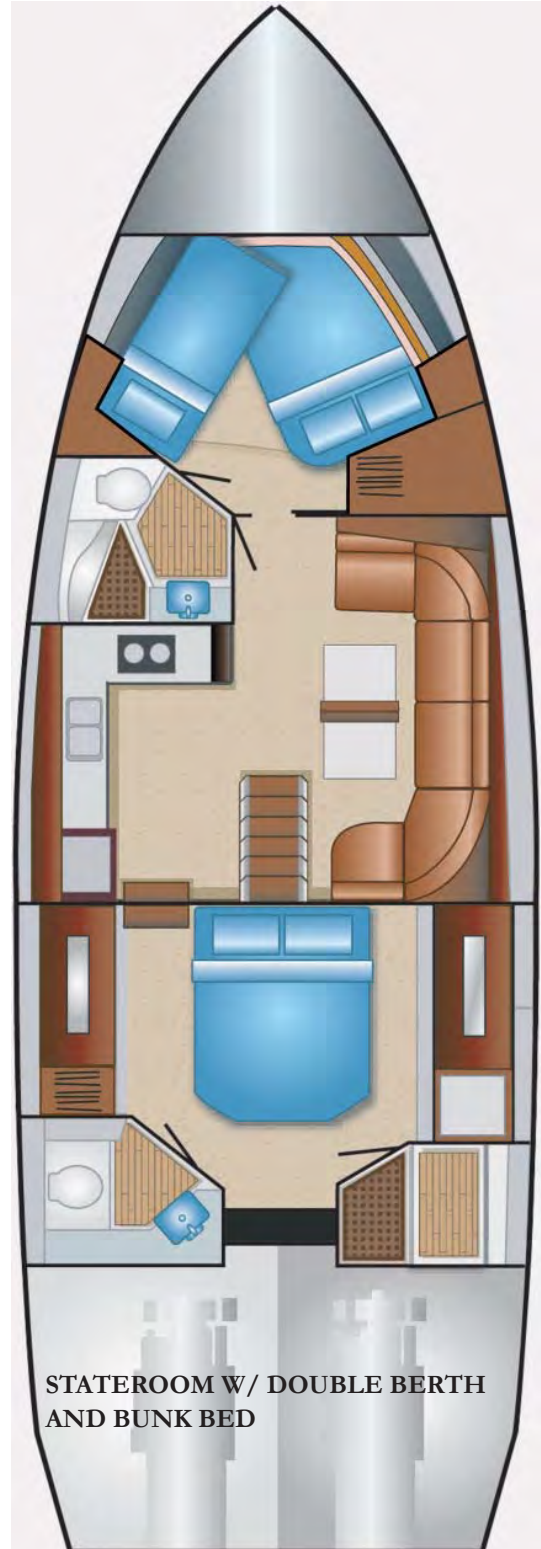
53 SC TYPICAL LABEL LOCATIONS



*Note-Drawing Not To Scale
Labels & Location Subject To Change



52 SC TYPICAL INTERIOR PLANS



*NOTE: NOT TO SCALE

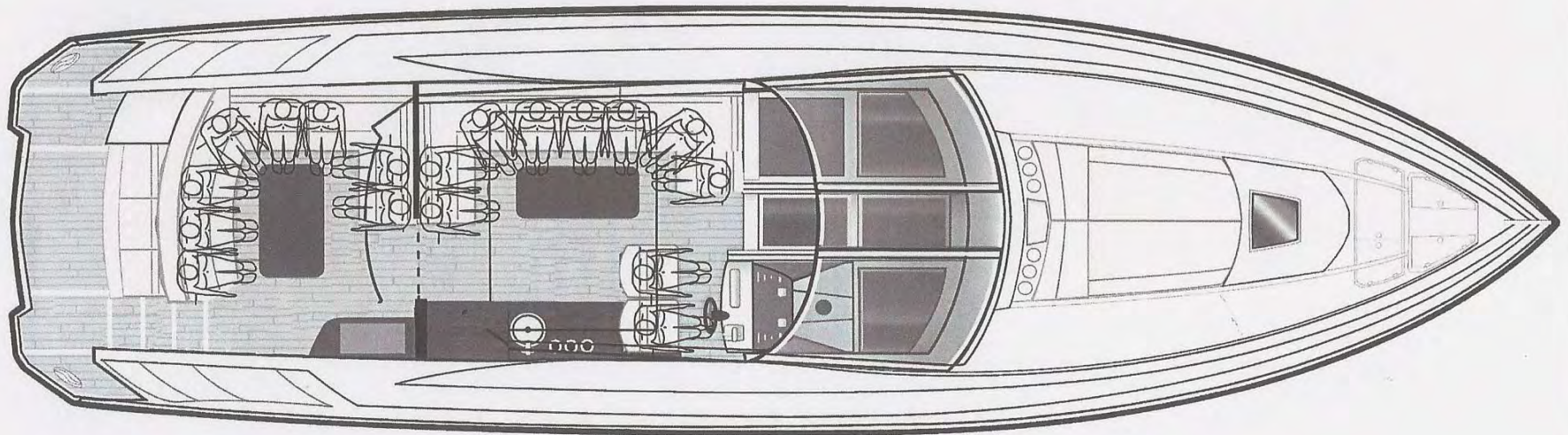


Technical Information

53 SC SPECIFICATIONS		
LENGTH OVERALL W/ EXTERIOR PLATFORM	USA 52' 81/4"	CE 16.05 M
BEAM	15' 6"	4.72 M
DEADRISE	18 DEGREES	
APPROXIMATE DRY WEIGHT W/ TW 6.7L CUMMINS	38,501.48 LBS.	1764.0 KG
APPROXIMATE BRIDGE CLEARANCE TO TOP OF ALL AROUND LIGHT	19' 61/2"	5.95 M
COCKPIT DEPTH	30"	.762 M
APPROXIMATE DRAFT	451/2"	1.15 M
FUEL CAPACITY	450 GALS	1703.43 L
WATER CAPACITY	100 GALS	378.54 L
WASTE CAPACITY	52 GALS	196.84 L
PERSONS CAPACITY	YACHT CERTIFIED	18
MAXIMUM RECOM- MENDED LOAD PERSONS & GEAR		1623 KG
PROPULSION TYPE	STERN DRIVE	STERN DRIVE
MAXIMUM RATED ENGINE POWER TWIN	1099 HP	820 KW.
DESIGN CATEGORY		B
VESSEL USAGE	PLEASURE	PLEASURE
MASS OF CRAFT IN LIGHT CONDITION	38,501.48 LBS.	17464.0 KG
MASS OF CRAFT IN FULLY LOADED CONDITION	46,274.97 LBS.	20,990.0 KG

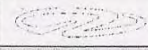
NOTE: SELECT SPECIFICATIONS ARE ESTIMATED- MAY CHANGE DURING VESSEL MODEL LIFE CYCLE

CE PERSONS CAPACITY:18



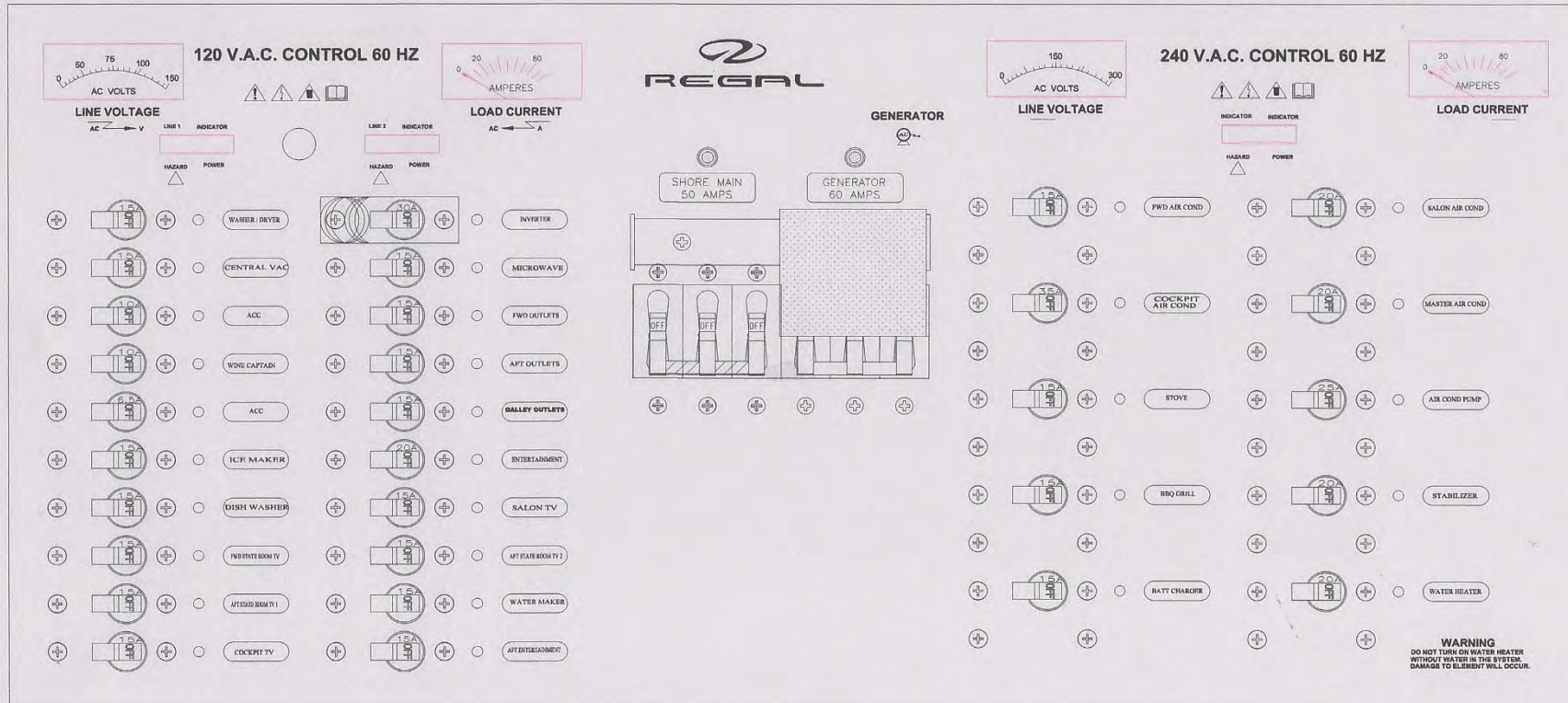
NOTE: DRAWING DISPLAYS EUROPEAN CALCULATED CAPACITY FOR CE CERTIFICATION PLATE.

PROPRIETARY AND CONFIDENTIAL
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF REGAL MARINE INDUSTRIES. ANY REPRODUCTION IN PART OR AS WHOLE WITHOUT THE WRITTEN PERMISSION OF REGAL MARINE INDUSTRIES IS PROHIBITED.

		REGAL MARINE INDUSTRIES 2300 85TH STREET DRIVE ORLANDO, FLORIDA 32809 TEL: (407) 851-4360		ALL RIGHTS RESERVED
DRAWING TITLE: 53SC Persons Capacity				
DATE: 05/19/14	REVISION:	PAGE: 1 OF 1		
DRAWN BY: JAL	APPROVED BY:	DWG NO.: 2		

Technical Information

4/22/2014 ADD LOCK-OUT TO INVERTER BREAKER & REFIG LABEL TO ACC



REVISED BY M JOURNEY 8/21/2013
BREAKERS 5A TO 15A 14 GAUGE WIRE DTP06-4S CONNECTOR WITH LABEL
BREAKERS 20A AND 25A 12 GAUGE WIRE DTP06-4S CONNECTOR WITH LABEL
BREAKERS 30A AND ABOVE 10 GAUGE WIRE MOLEX CONNECTOR
PART NUMBER CHANGE TO 531458

REVISED BY REGAL 11/12/07

REVISED BY M JOURNEY 12/9/2010

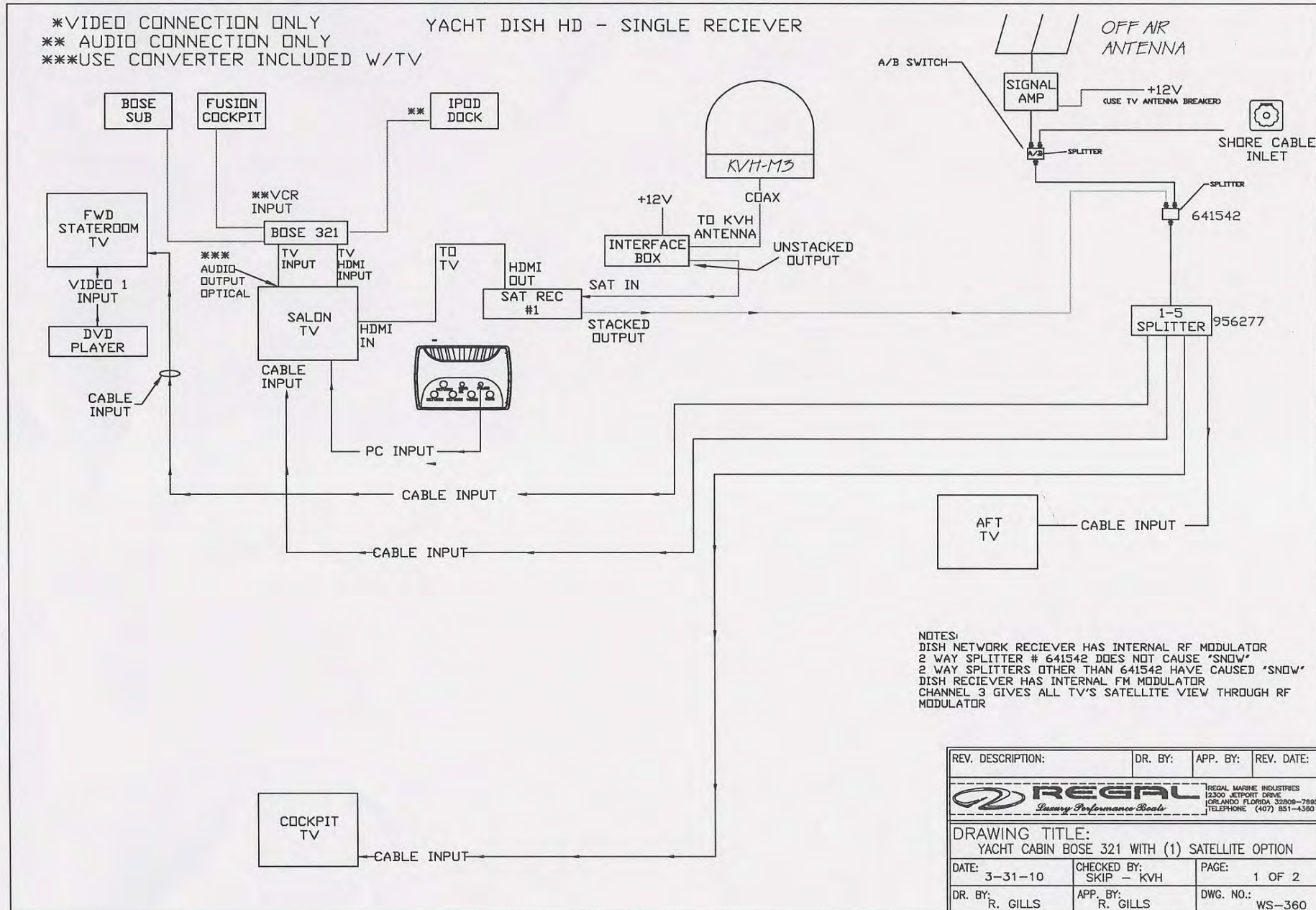
ADD 36" PIGTAILS WITH FLAT MOLEX CONNECTORS.

ADD 108" TO THE ICEMAKER AND BBQ GRILL CABLES (144" TOTAL LENGTH)
BOAT CABLE WITH SHIELD MUST BE USED ON THESE APPLICATIONS

REVISION DESCRIPTION: ADDED TITLE BLOCK	DR. BY: M. GARCIA	APP. BY: M. GARCIA	REV. DATE: 12/30/07
K:\Test Selmoni\Raster Image\BW HOR LUX PERF LOGO.gif			REGAL MARINE INDUSTRIES 2300 JETPORT DRIVE ORLANDO, FLORIDA 32835-7895 TELEPHONE: 407-961-4383
DRAWING TITLE: 53 SC 120VAC MDP PANEL			
DATE: 11/19/07	REV. #: 1	PAGE #: 1	
DR. BY: R. SIFORD	APP. BY: M. GARCIA	DRAWING #: 531458	

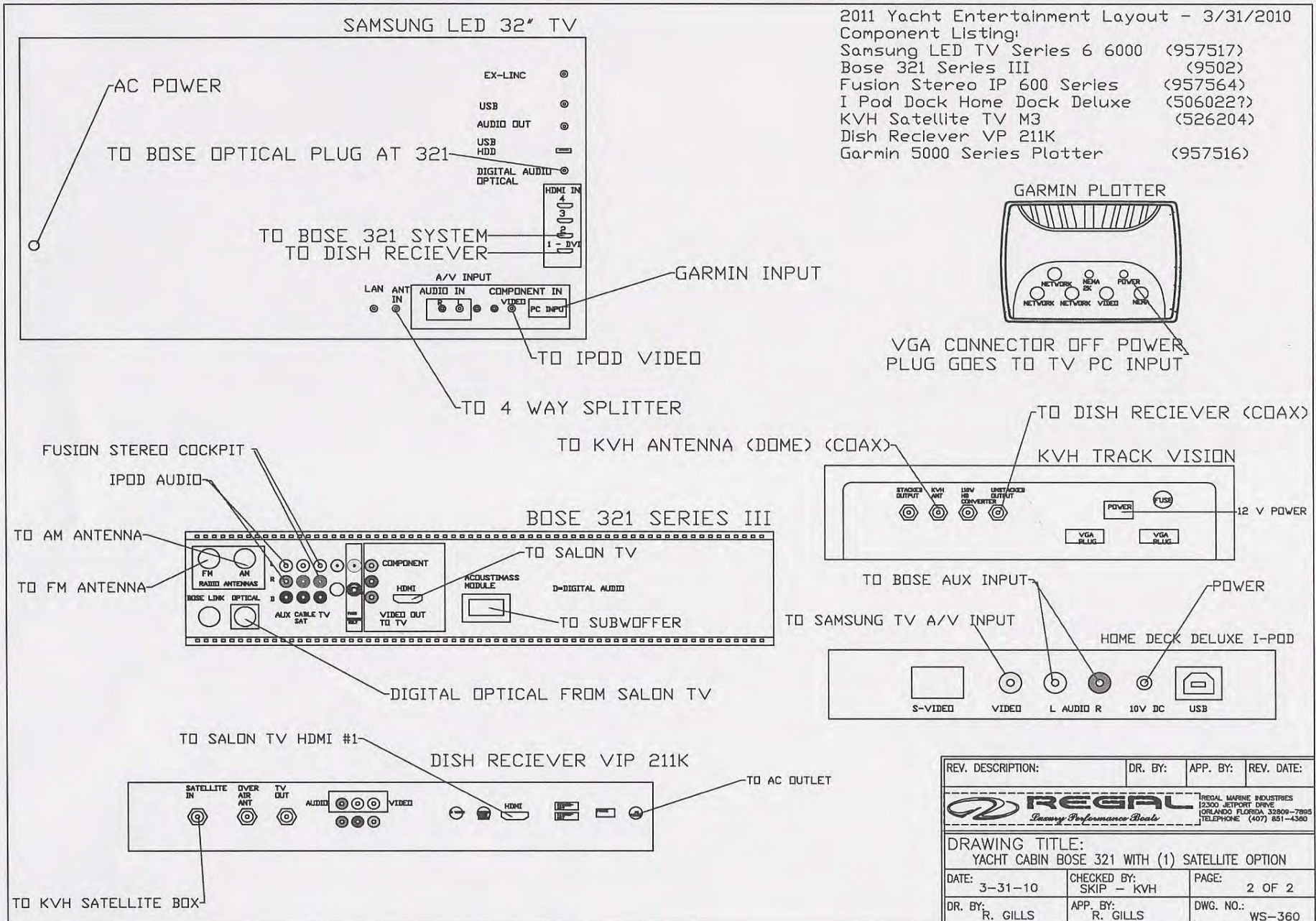
53 SC TYPICAL MAIN SHIP'S 120/240 VOLT AC ELECTRICAL PANEL WITH BREAKER SIZES

Technical Information

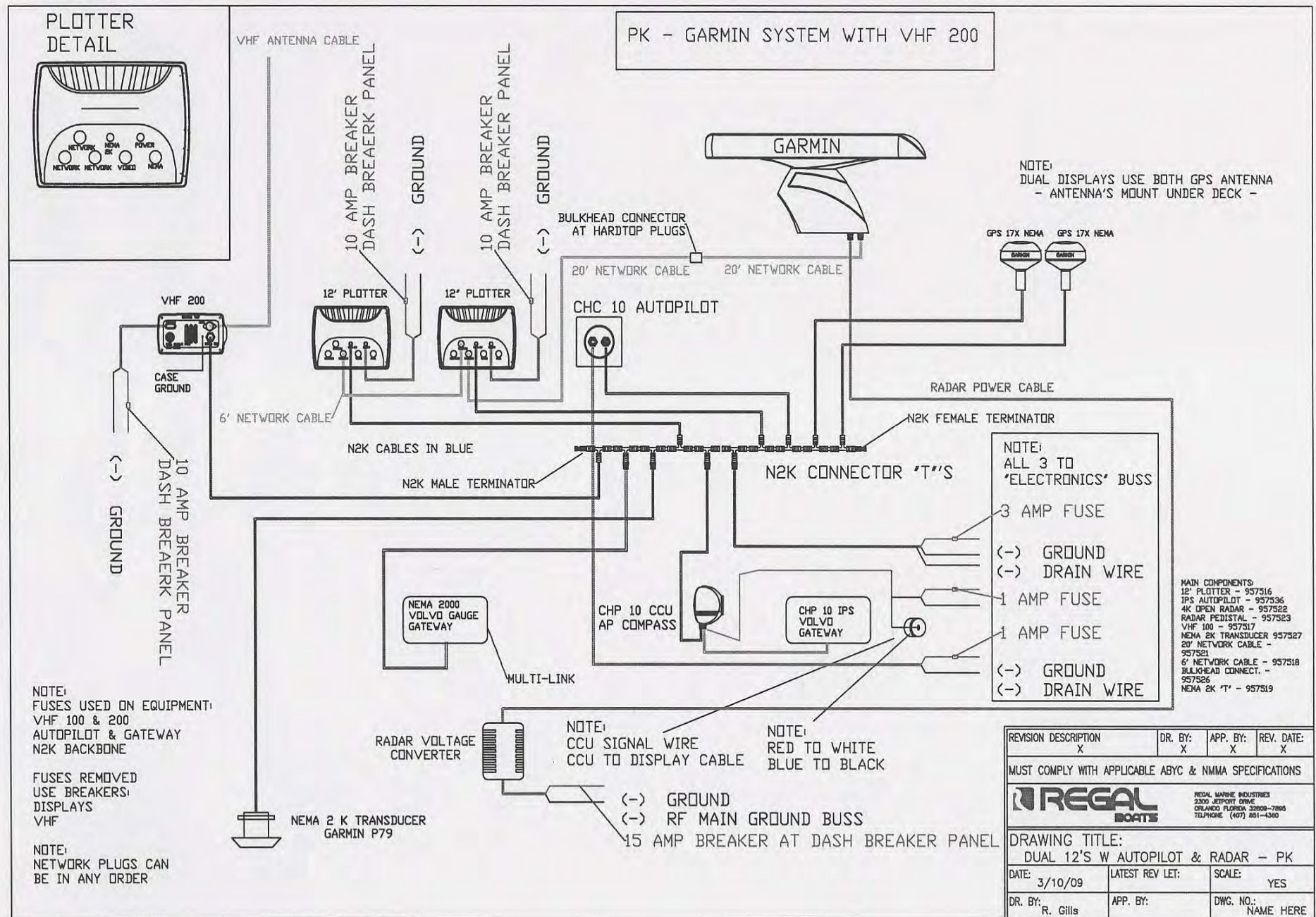


53 SC TYPICAL BOSE 321 SYSTEM WITH SATELLITE OPTION (1 OF 2) AS OF 8/2014

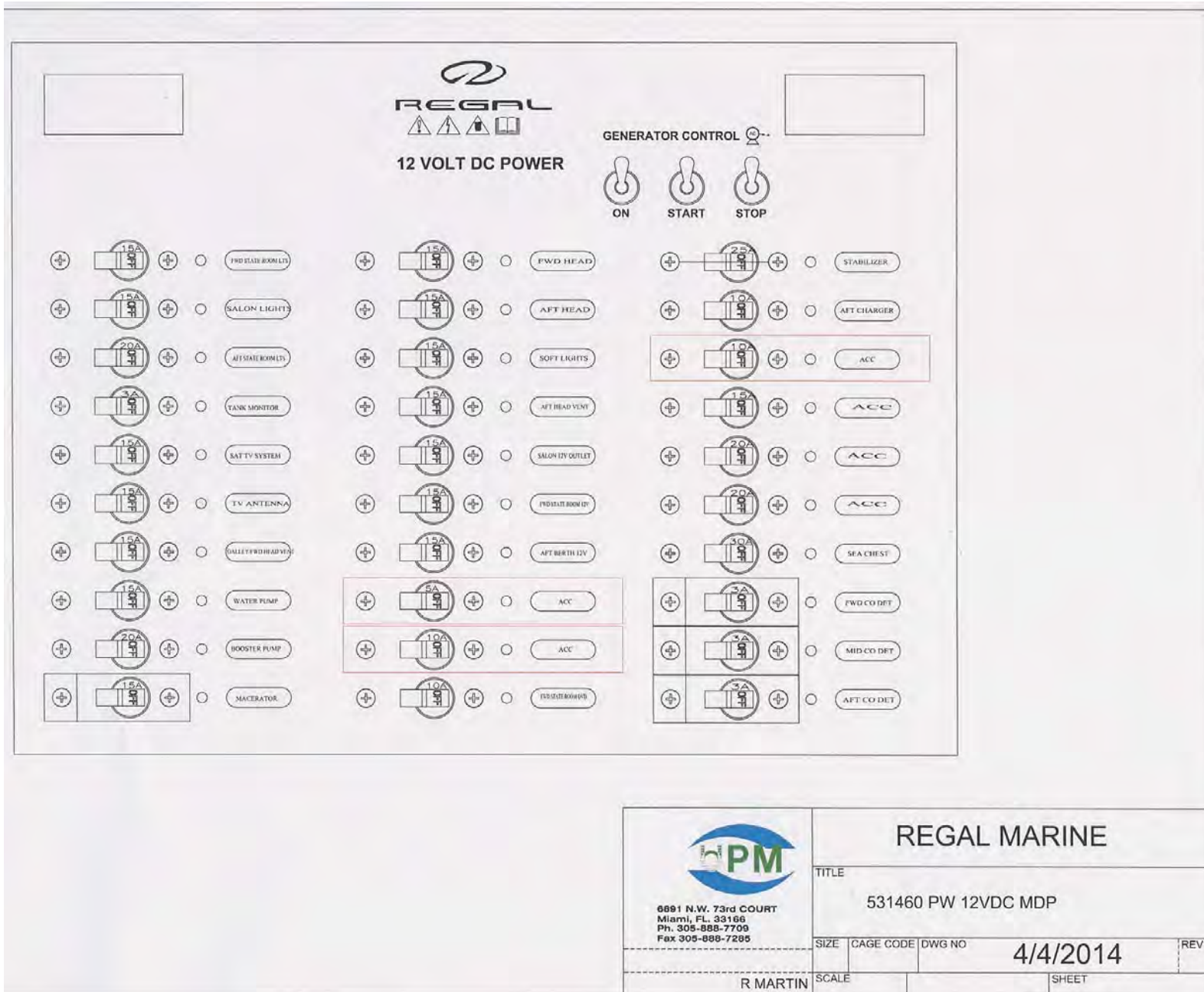
Technical Information



53 SC TYPICAL BOSE 321 SYSTEM WITH SATELLITE OPTION (2 OF 2) AS OF 8/2014



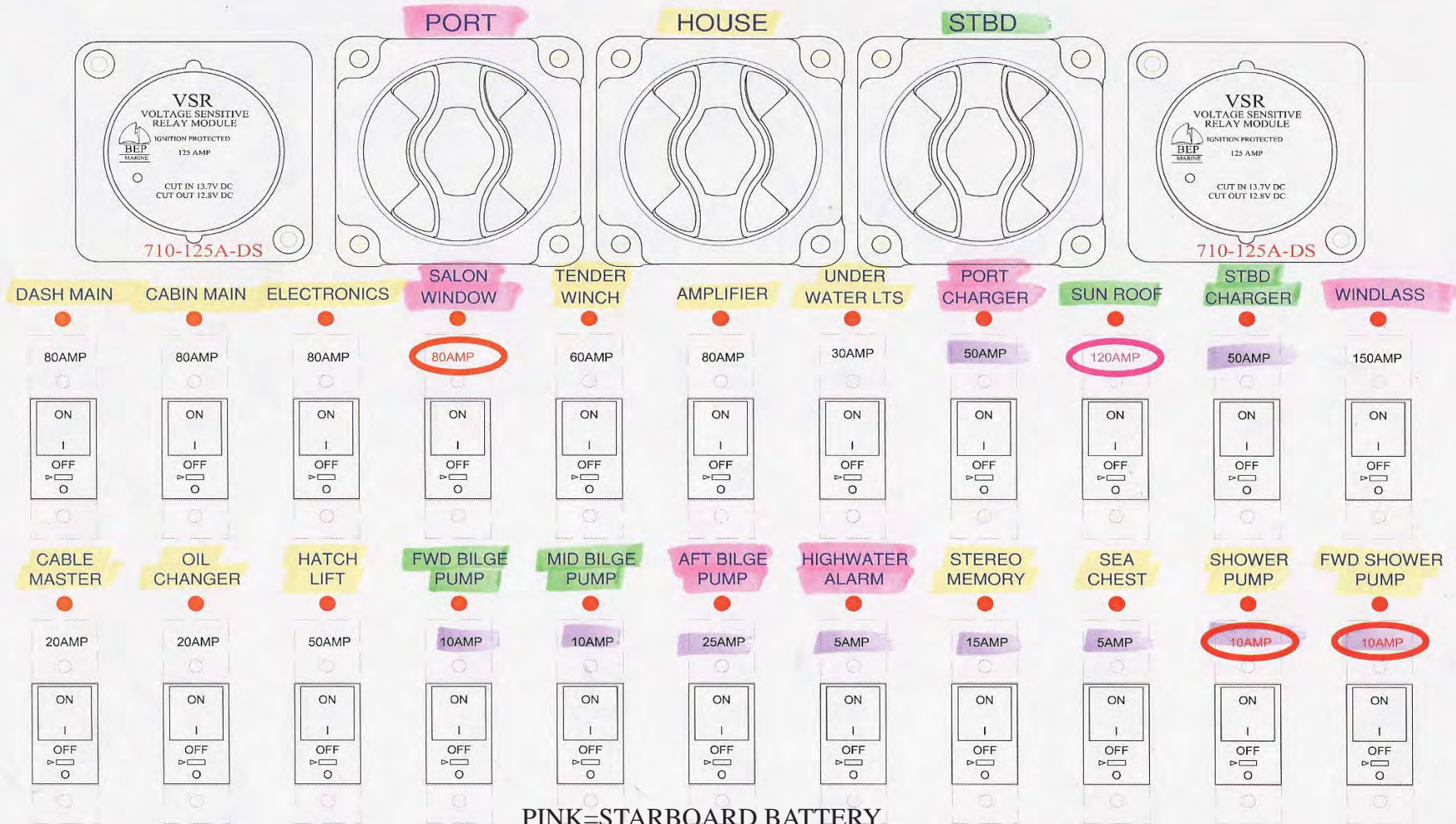
53 SC TYPICAL DUAL CHARTPLOTTER WITH AUTO PILOT AND RADAR



53 SC TYPICAL MAIN SHIP'S 12 VOLT DC ELECTRICAL PANEL WITH BREAKER SIZES



BATTERY MANAGEMENT SYSTEM



PINK=STARBOARD BATTERY

GREEN=PORT BATTERY

YELLOW=HOUSE BATTERY

NOTE:

CONSTANT ON CIRCUITS= PURPLE

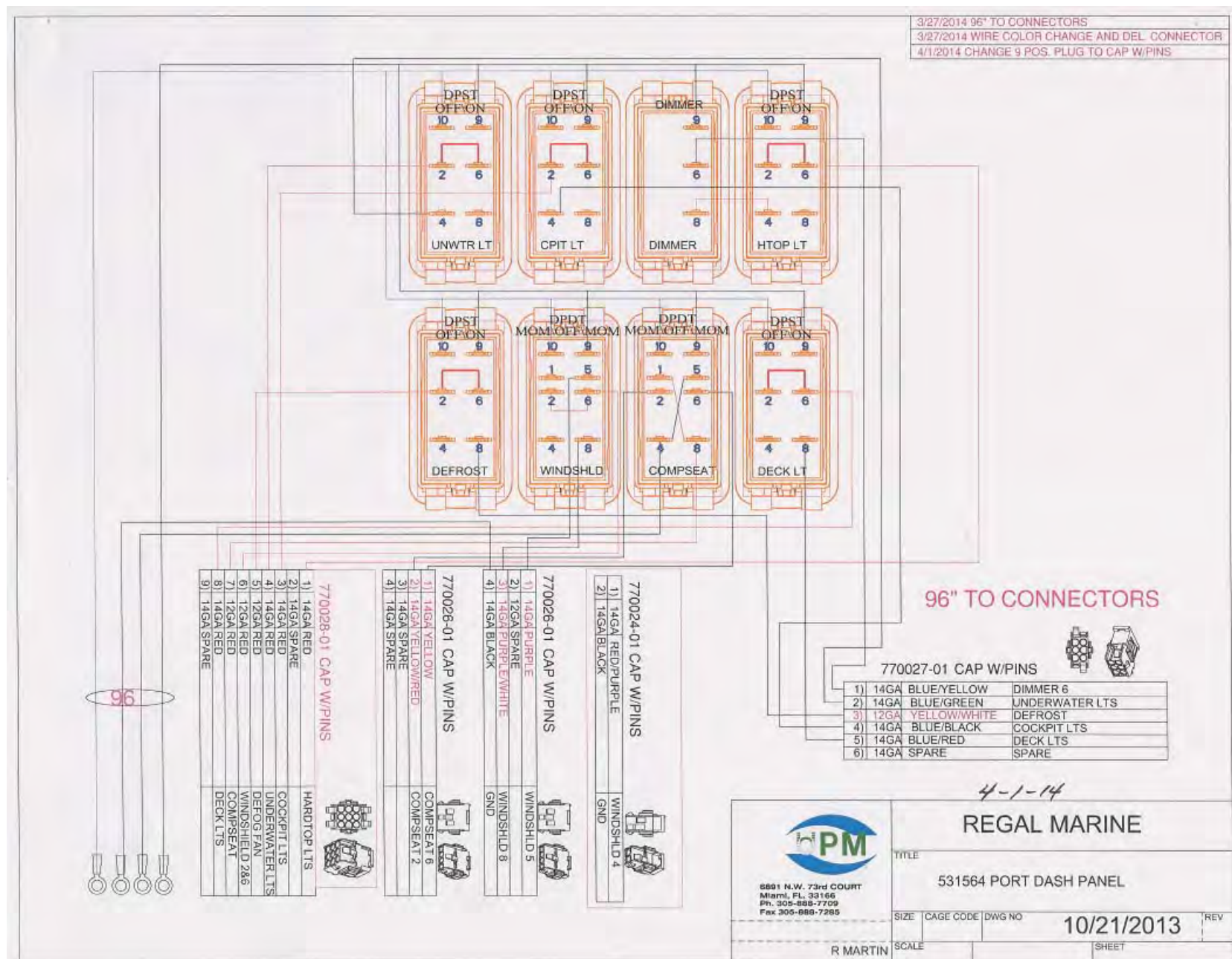
Technical Information

20A	10A	15A	10A	10A	5A	10A	15A	15A	15A	3A	3A	3A	3A	25A
HORN	NAV LTS	PANEL LTS	WINDLASS	SALON WINDOW	BACKREST UP / DN	SUNROOF	MARETRON	PORT WIPER	STBD WIPER	CAMERA 1	CAMERA 2	CAMERA 3	CAMERA 4	AFT BILGE PUMP
15A	10A	5A	15A	20A	20A	10A	10A	10A	15A	10A	30A	15A	5A	15A
HARDTOP LTS	COCKPIT LTS	UNDER WATER LTS	DECK LTS	WINDSHLD VENT	TENDER LIFT	ACC 2	ACC 3	BILGE LTS	COCKPIT STEREO	COURTESY LTS	DE FOG FAN	ACC 1	SUN SHADE	SUN SHADE
10A	5A	10A	10A	10A	3A	15A	15A	30A	15A	15A	5A	5A	5A	7.5A
ELECT RONIC	DEPTH SOUNDER	VHF	PLOTTER 1	PLOTTER 2	SIRIUS WEATHER	FWD TABLE	AFT TABLE	TRIM TABS	SPOT LT	COCKPIT 12V OUTLET	CPT SEAT UP / DN	CPT SEAT FWD/AFT	COMP SEAT FWD/AFT	COCKPIT AFT LTS

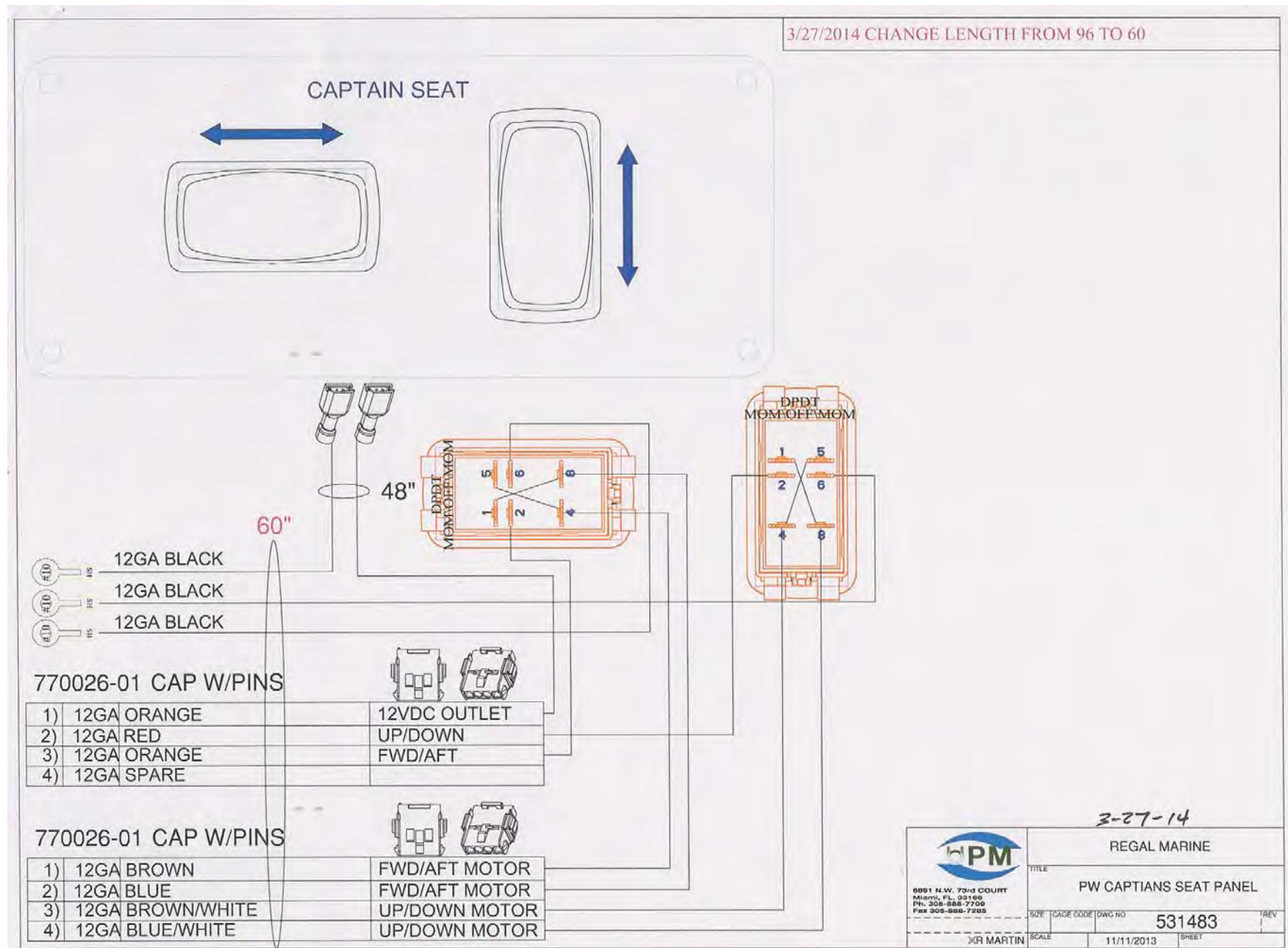
53 SC ELECTRONIC BREAKER PANEL BREAKER LISTING (MASTER STATEROOM ELECTRONICS LOCKER)

2/12/2014 ADD 14 BROWN BILGE PUMP WIRE
3/27/2014 CHANGE LENGTH FROM 96&144 TO 72

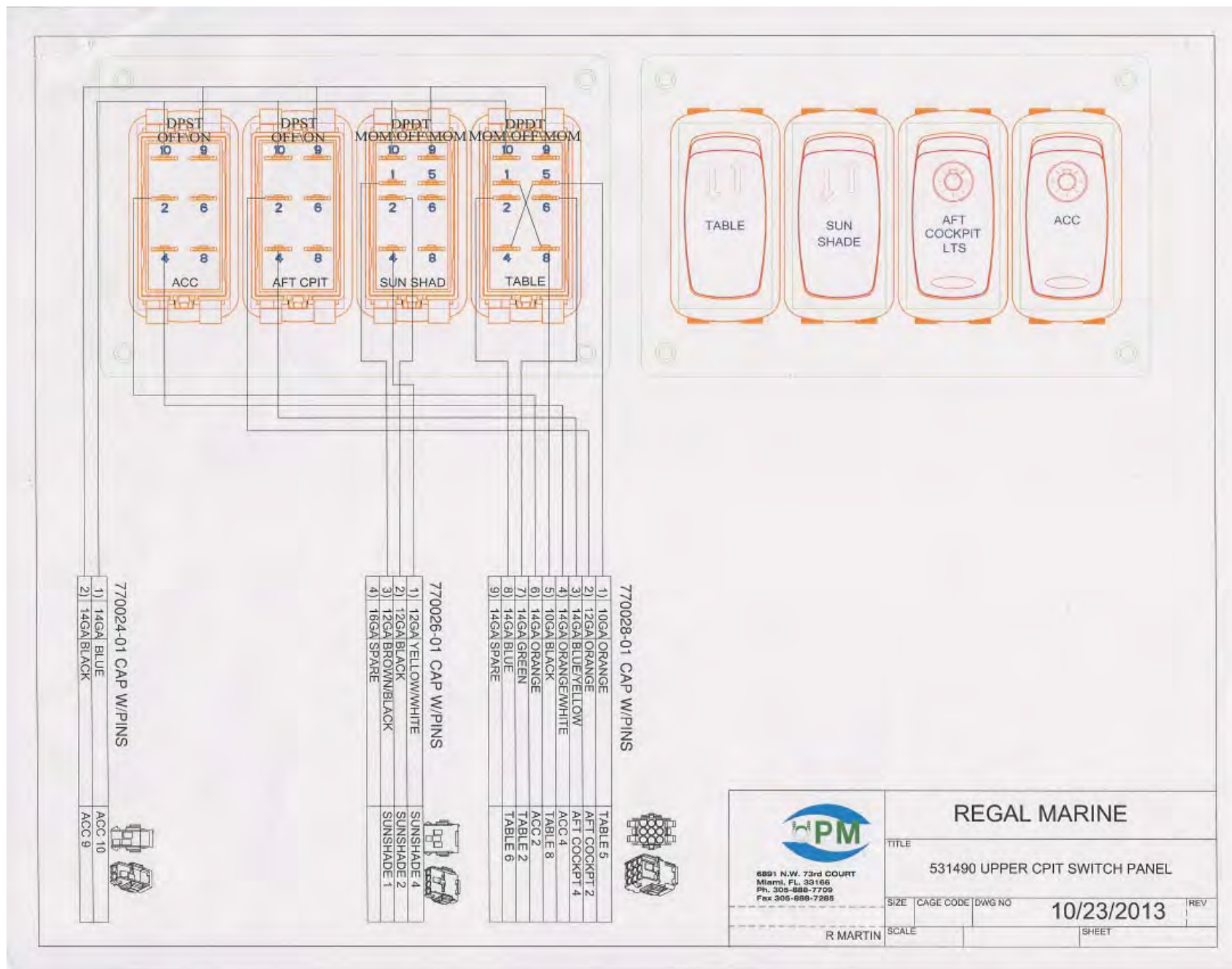




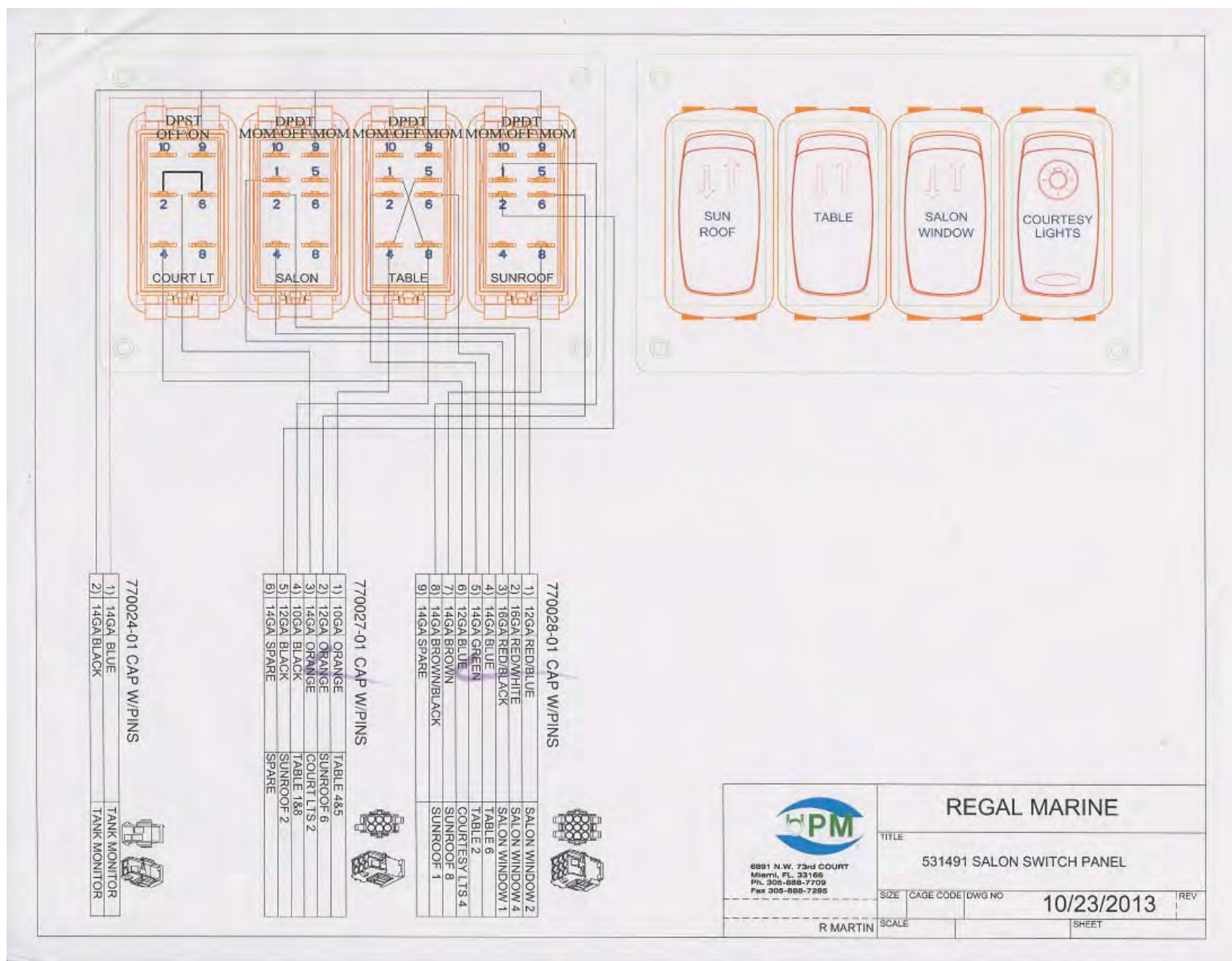
53 SC PORT DASH SWITCH PANEL-REAR



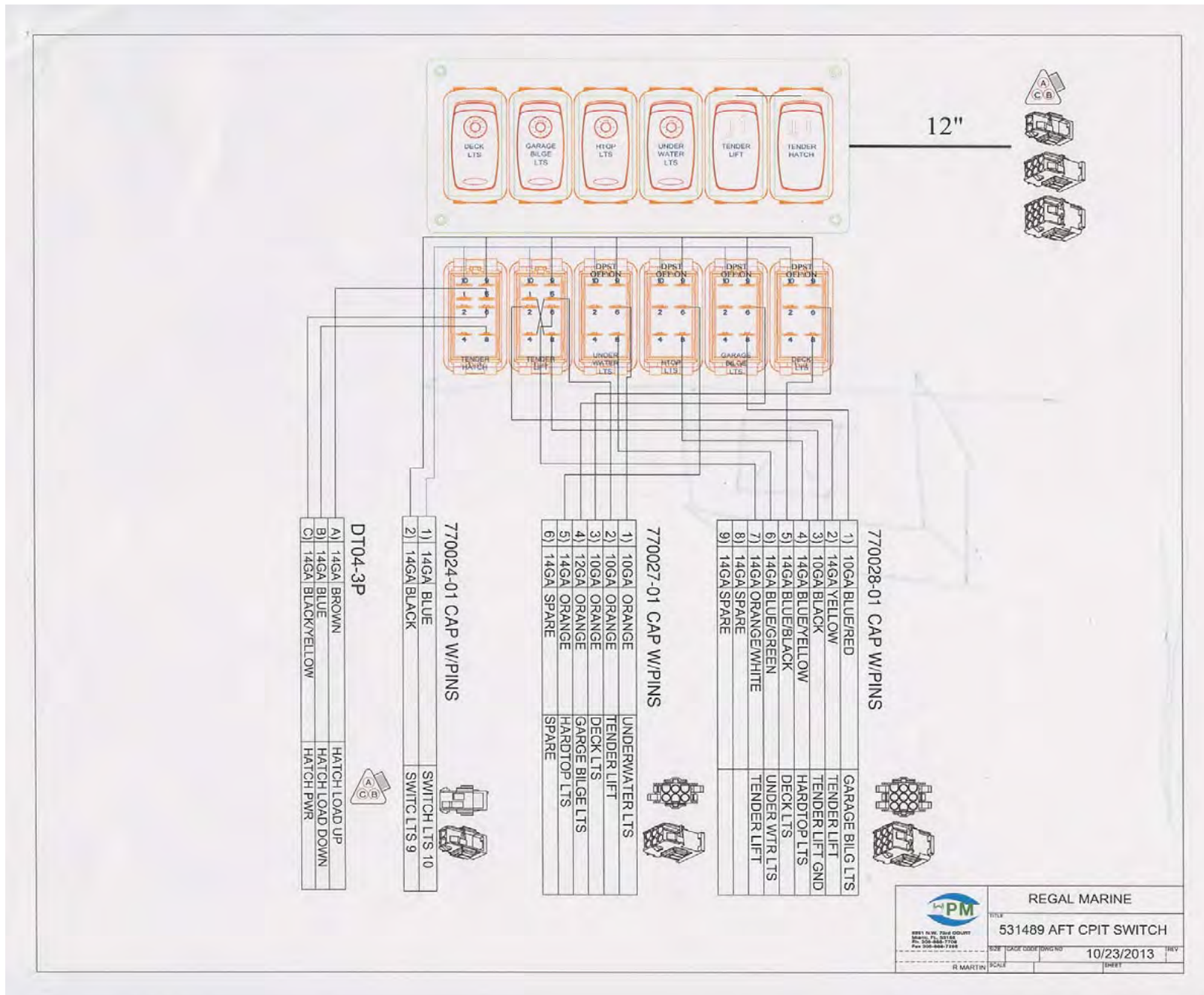
53 SC CAPTAIN'S SEAT SWITCH PANEL-REAR



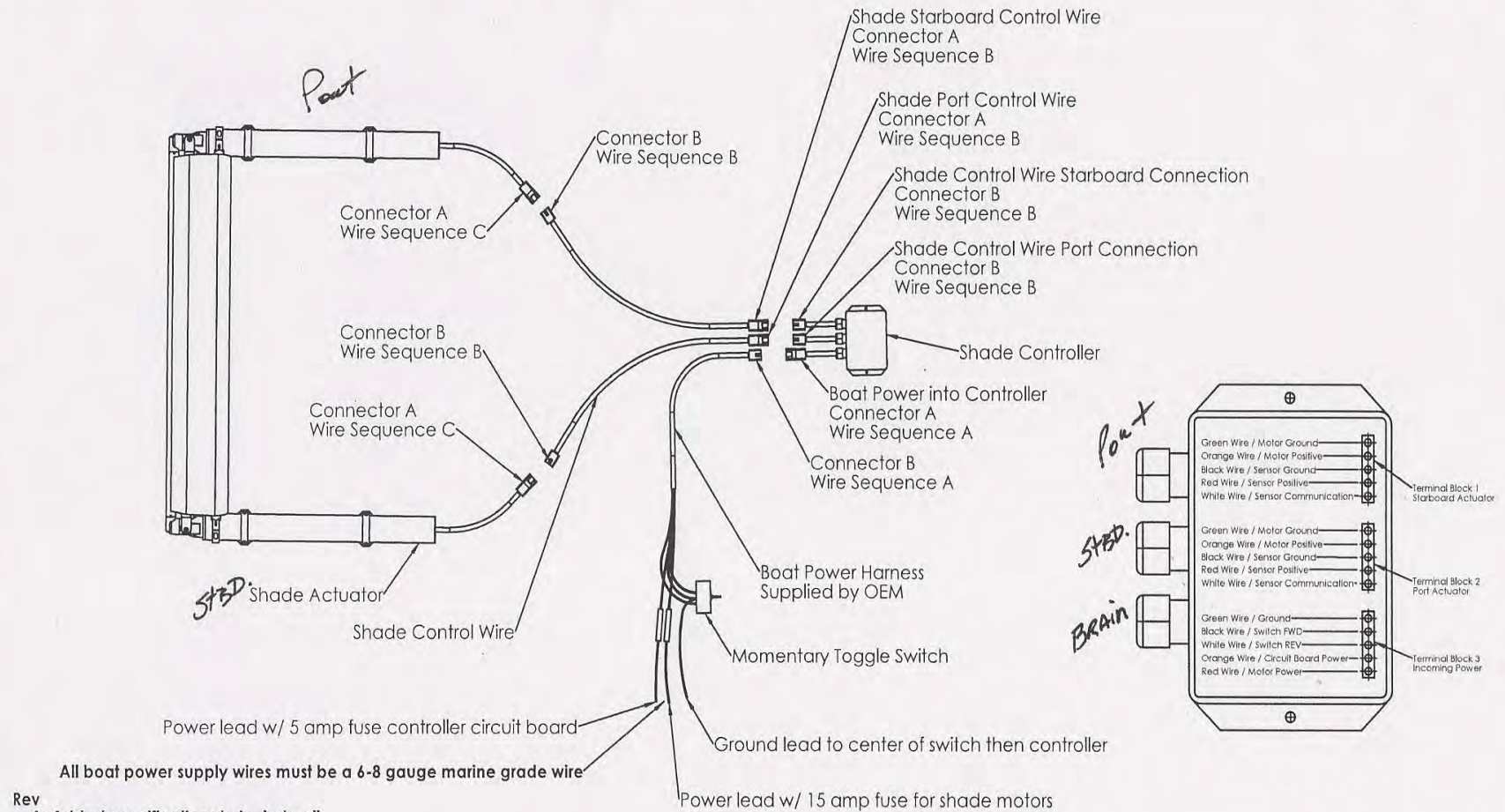
53 SC UPPER COCKPIT SWITCH PANEL



53 SC PORT COCKPIT SWITCH PANEL



53 SC AFT COCKPIT SWITCH PANEL



All boat power supply wires must be a 6-8 gauge marine grade wire

Rev
A: Added specifications to include all boat power supply wires to be 6-8 gauge wires

"Wire Sequence A" - Power Harness		
Connector Wire Position	Wire Color	Wire Description
1	Green	Ground
2	White	Switch Connection REV
3	Black	Switch Connection FWD
4	Red	Motor Positive Power
5	Orange	Circuit Board Positive Power

"Wire Sequence B" - Control Wire Leading to Actuators		
Connector Wire Position	Wire Color	Wire Description
1	White	Sensor Communication
2	Red	Sensor Positive Power
3	Black	Sensor Ground
4	Orange	Motor Positive Power
5	Green	Motor Ground

"Wire Sequence C" - Actuator Connections		
Connector Wire Position	Wire Color	Wire Description
1	White	Sensor Communications
2	Red	Sensor Positive Power
3	Black	Sensor Ground
4	Black	Motor Ground
5	Red	Motor Positive Power

Connector Part Number	
Connector A	Deutsch Part # DT04-6P
Connector B	Deutsch Part # DT06-6S

Revision History		DATE	BY	CHKD	APPD
1	Initial Release	01/01/01	JD	JD	JD
2	Added specifications to include all boat power supply wires to be 6-8 gauge wires	01/01/01	JD	JD	JD

Scale: 1:1 (Front)

Sheet 1 of 1

Isolation Transformer System with Single-Phase 240-Volt Input, 120/240-Volt Single-Phase Output with Boat Grounded Secondary. Shield grounded on shore and metal case grounded on boat. The ungrounded shore current-carrying conductors are connected from the power inlet to the primary winding of the isolation transformer through an overcurrent protection device which simultaneously opens both current carrying conductors. Do not connect the shore neutral. Fuses shall not be used in lieu of simultaneous trip devices.

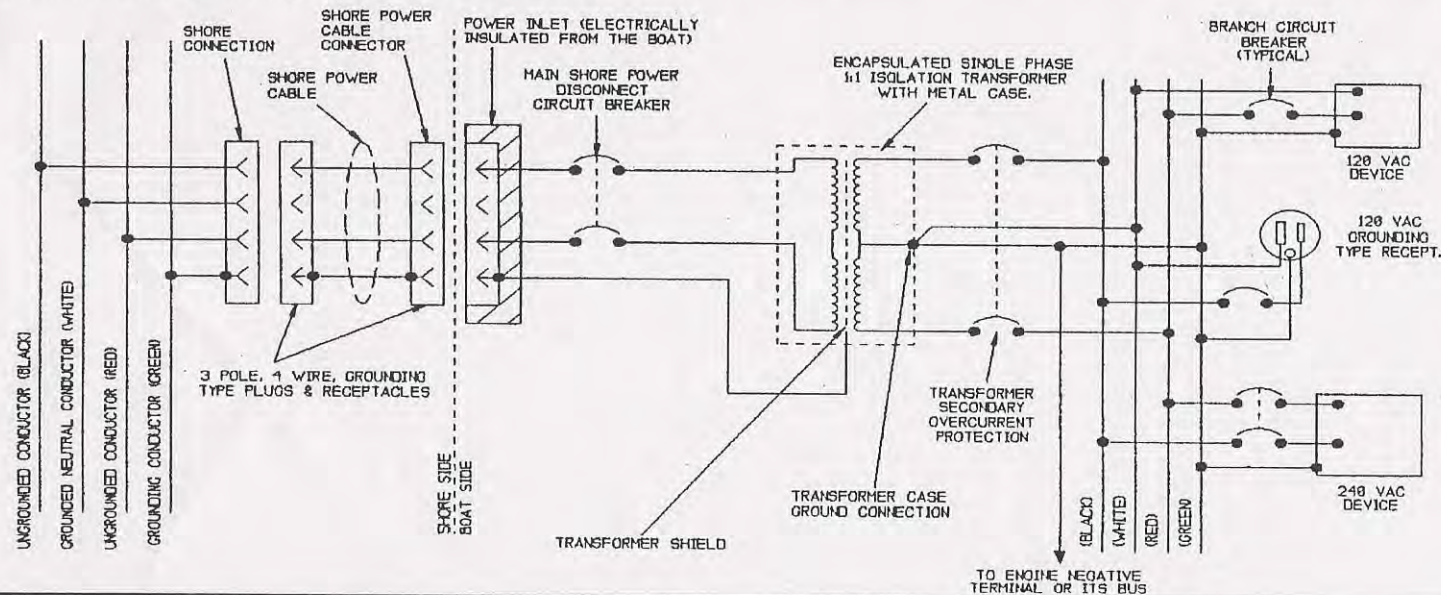
240-Volt branch circuit breakers and switches simultaneously open all current-carrying conductors.

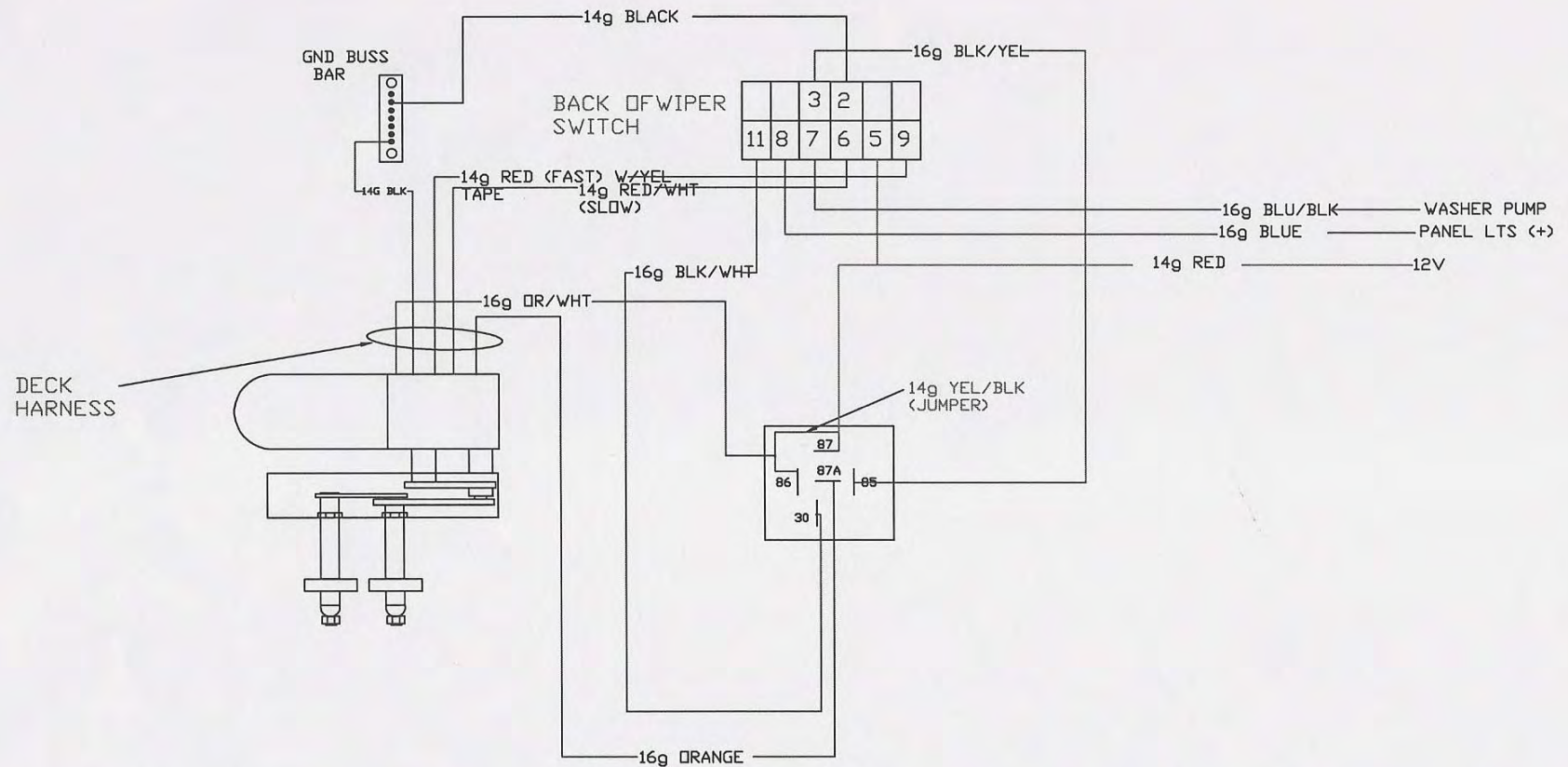
120-Volt branch circuit breakers are permitted to use single-pole breakers in the ungrounded current-carrying conductors.

Polarization of conductors must be observed in all circuits.

The green grounding wire from the shore is connected to the shore power inlet shell which is insulated from metal-hulled boats. Do not connect the shore green wire to the boat ground.

The grounded neutral from the secondary of the isolation transformer and the case of the transformer are connected to the system ground, neutral conductor and engine negative terminal or its bus.





REVISION DESCRIPTION	DR. BY:	APP. BY:	REV. DATE:
REGAL MARINE INDUSTRIES 2300 JETPORT DRIVE ORLANDO, FLORIDA 32809-7895 TELEPHONE (407) 851-4360			
DRAWING TITLE: (PK) 5260 WIPER SWITCH WIRING			
DATE: 3/27/08	CHECK BY:	PAGE NO. : 1 OF 1	
DR. BY: M. GARCIA	APP. BY: M. GARCIA	DWG. NO.: WI- 872	

53 SC TYPICAL WINDSHIELD WIPER WIRING

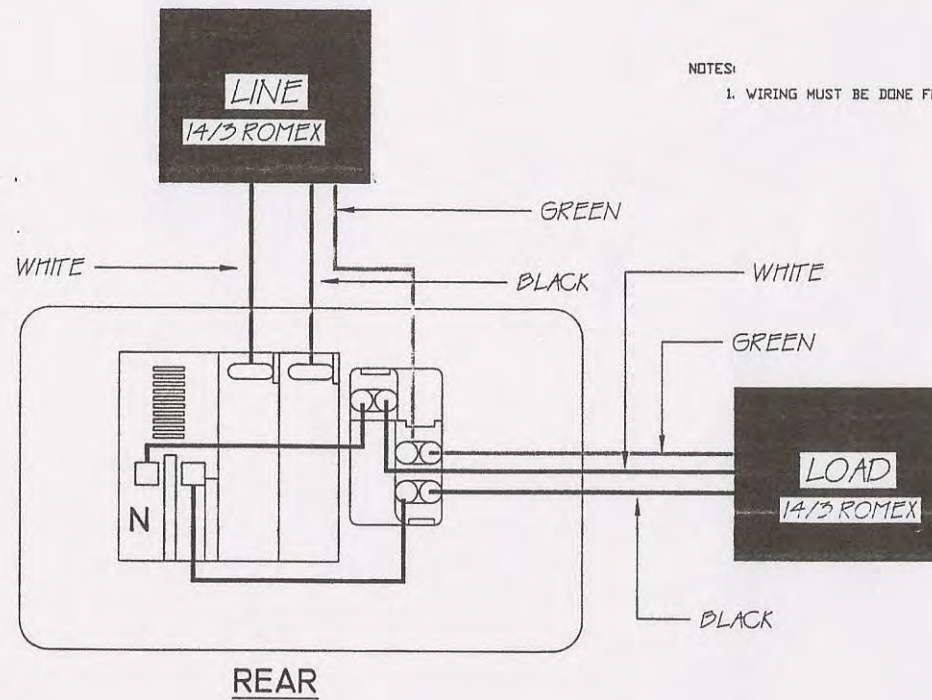
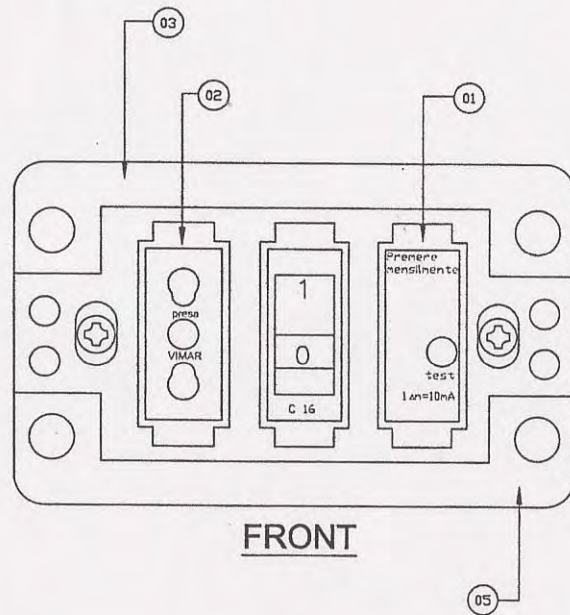
Technical Information

01	1	BREAKER/SWITCH
02	1	OUTLET
03	1	FACE PLATE
04	1	BOX
05	1	FRAME

NOT SHOWN

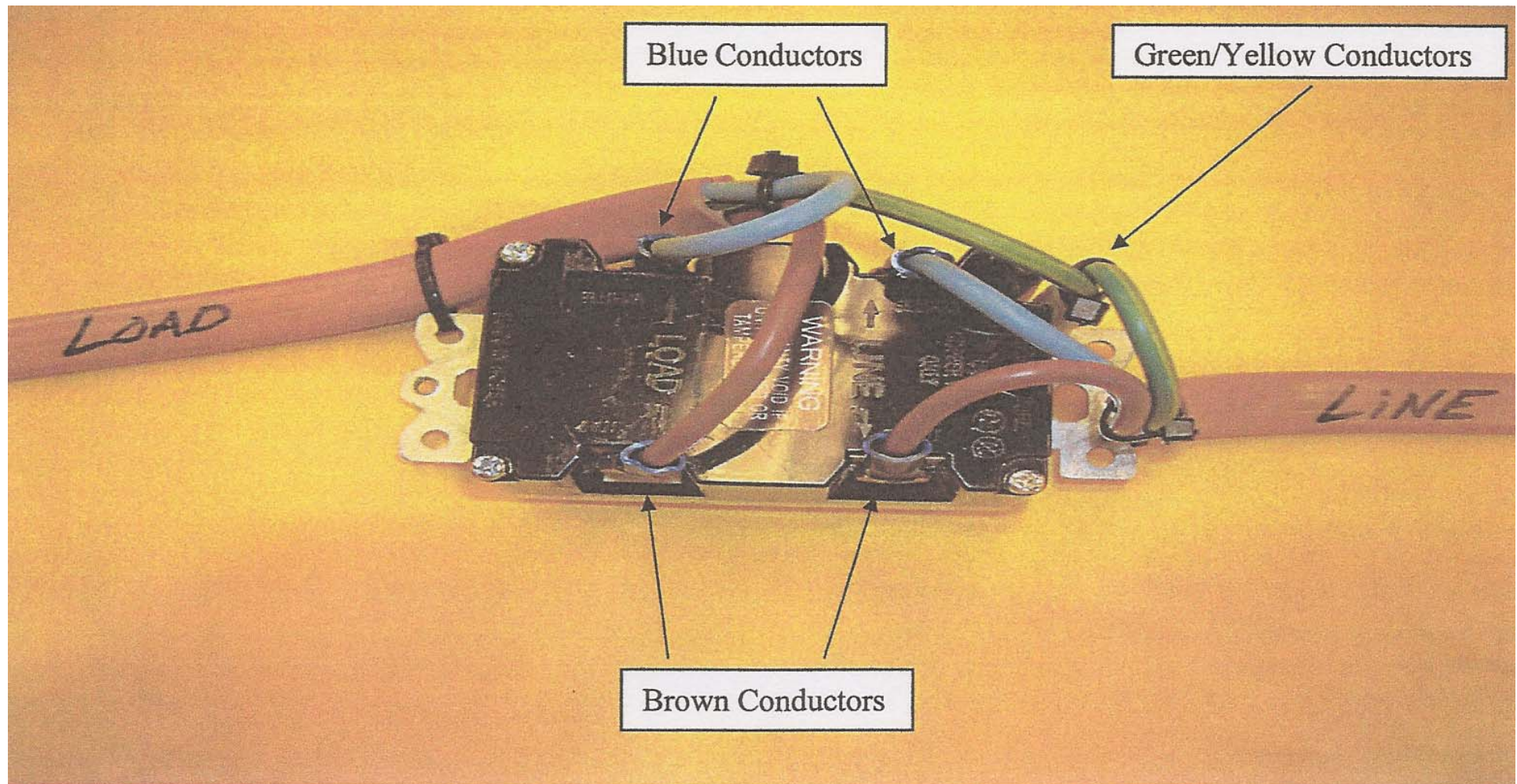
NOTES:

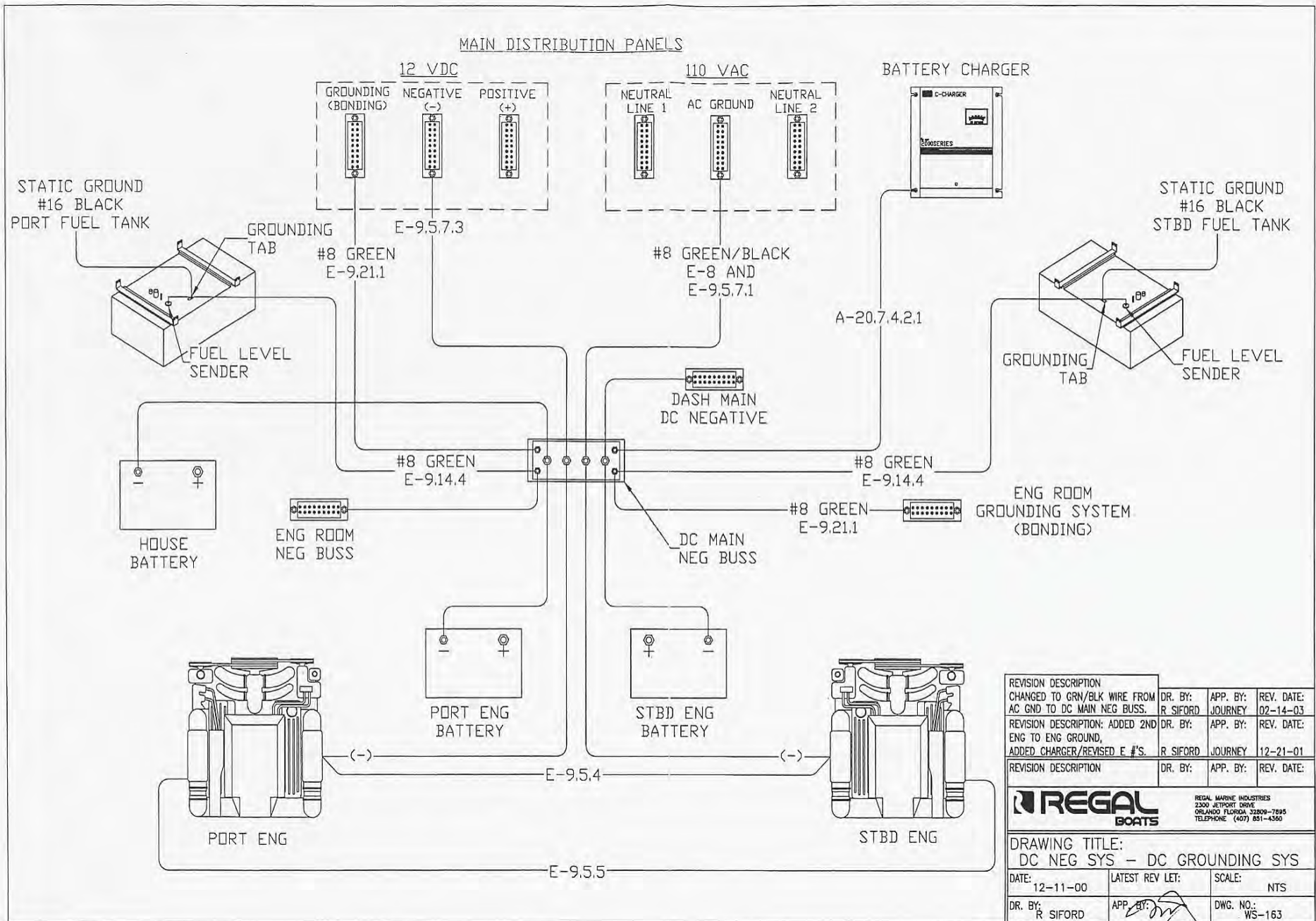
1. WIRING MUST BE DONE FROM BOTTOM OF BOX



REVISION	DESCRIPTION	DR. BY:	APP.
01	1		

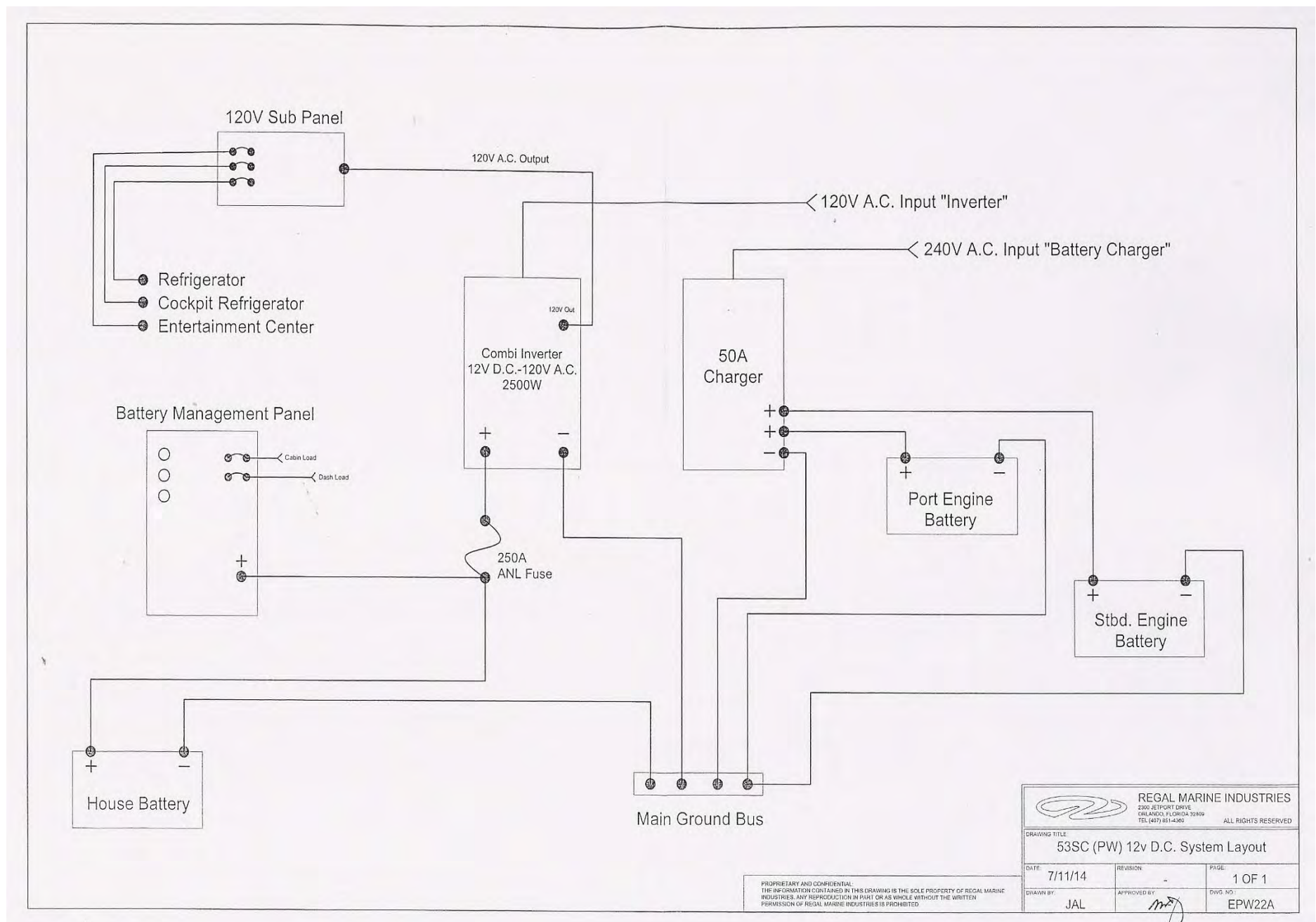
REGAL BOATS		REGAL MARINE 2300 JETPORT ORLANDO, FL 32817 TELEPHONE: (407) 321-1111
DRAWING TITLE: 220 VOLT GROUND FAULT CIRCUIT		
DATE: 6/24/99	LATEST REV LET:	SCALE:
DR. BY: IH	APP. BY: <i>[Signature]</i>	DWG.



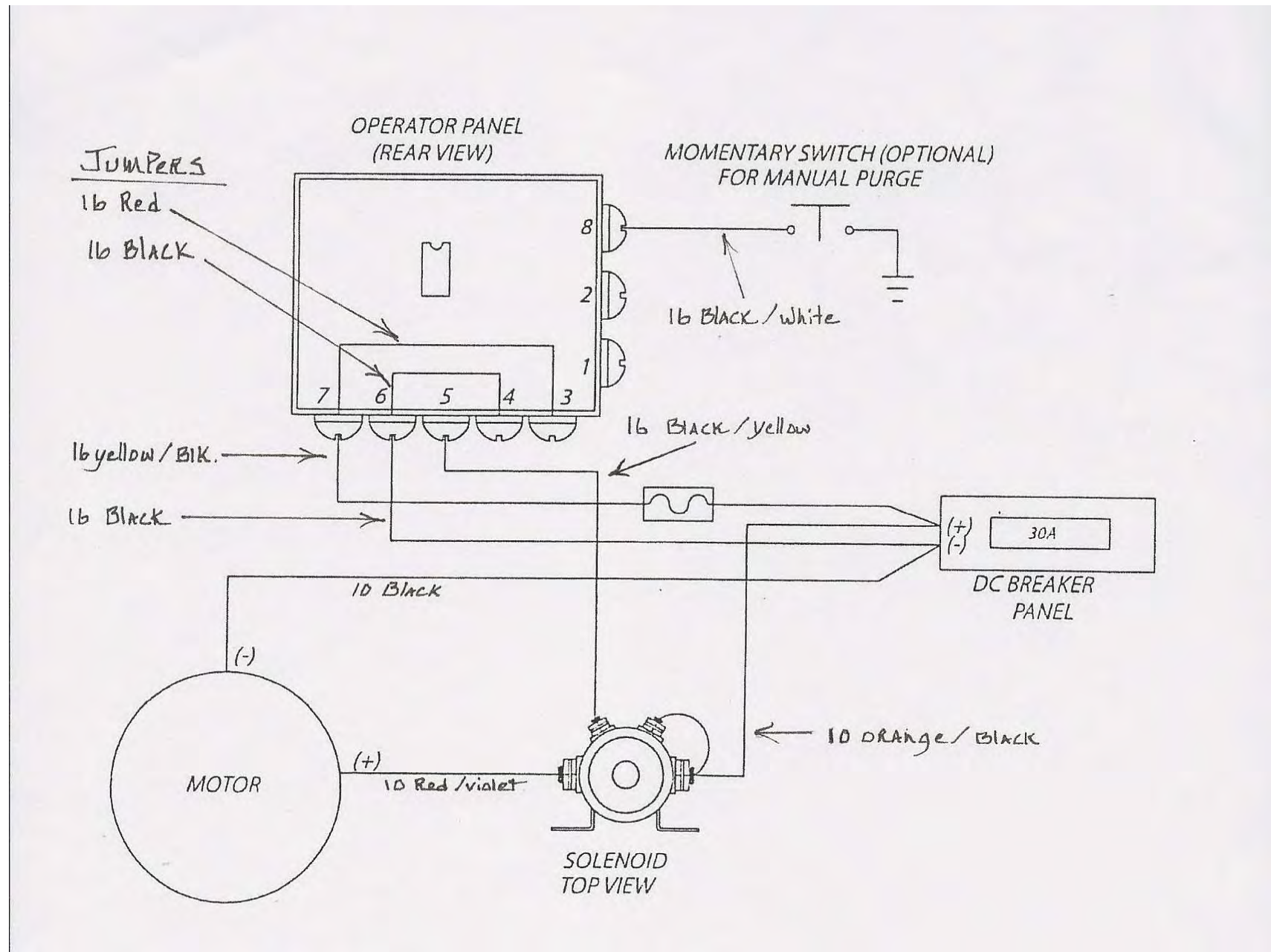


REVISION DESCRIPTION	DR. BY:	APP. BY:	REV. DATE:
CHANGED TO GRN/BLK WIRE FROM AC GND TO DC MAIN NEG BUSS.	R SIFORD	JOURNEY	02-14-03
REVISION DESCRIPTION: ADDED 2ND ENG TO ENG GROUND, ADDED CHARGER/REVISED E #'S.	R SIFORD	JOURNEY	12-21-01
REVISION DESCRIPTION	DR. BY:	APP. BY:	REV. DATE:
REGAL BOATS <small>REGAL MARINE INDUSTRIES 2300 JETPORT DRIVE ORLANDO FLORIDA 32809-7895 TELEPHONE (407) 851-4360</small>			
DRAWING TITLE: DC NEG SYS - DC GROUNDING SYS			
DATE: 12-11-00	LATEST REV LET:	SCALE: NTS	
DR. BY: R SIFORD	APP. BY: <i>[Signature]</i>	DWG. NO.: WS-163	

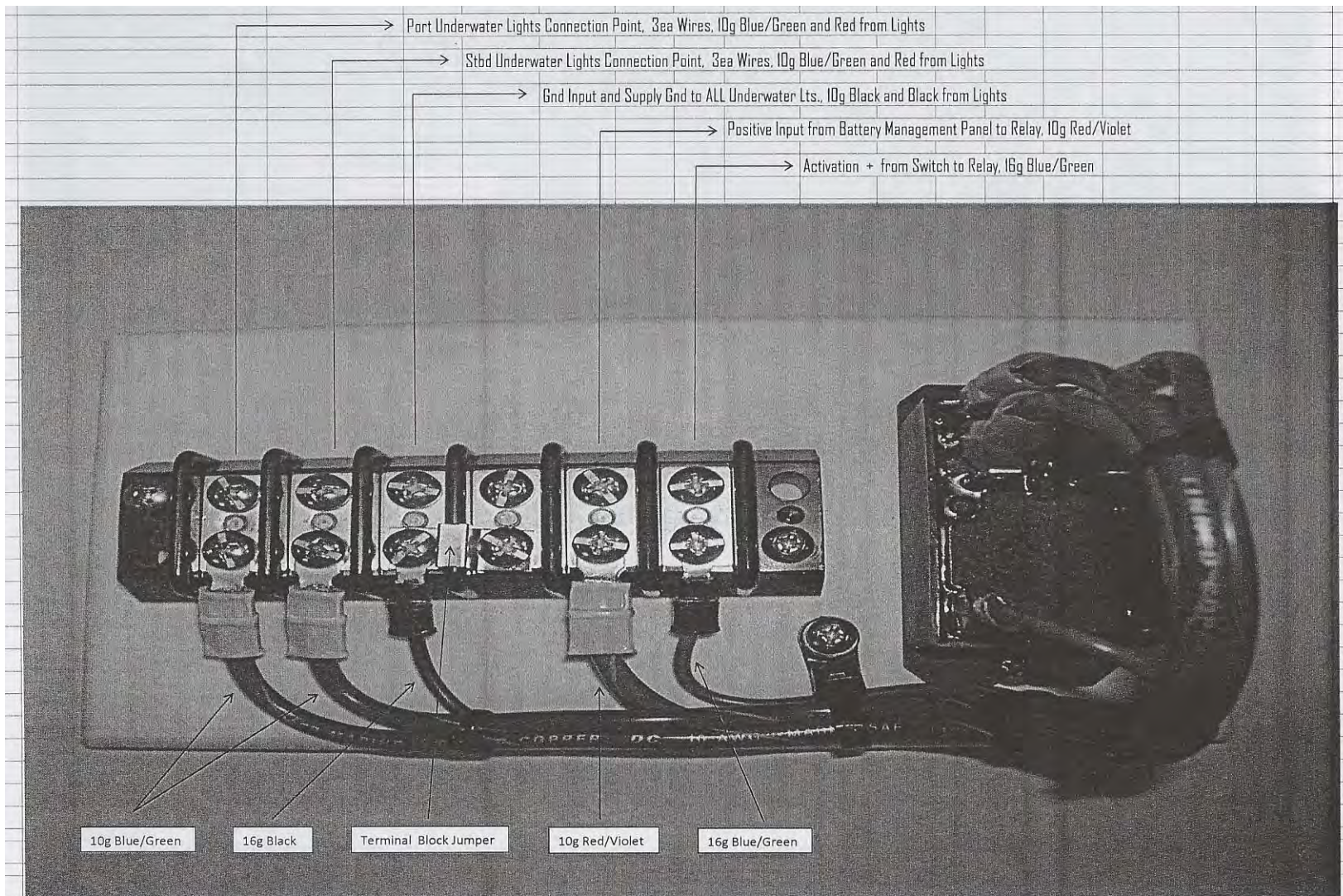
53 SC TYPICAL DC NEGATIVE (GROUND) WIRING CIRCUIT



53 SC TYPICAL 12 VOLT BATTERY CHARGER SYSTEM DC WIRING

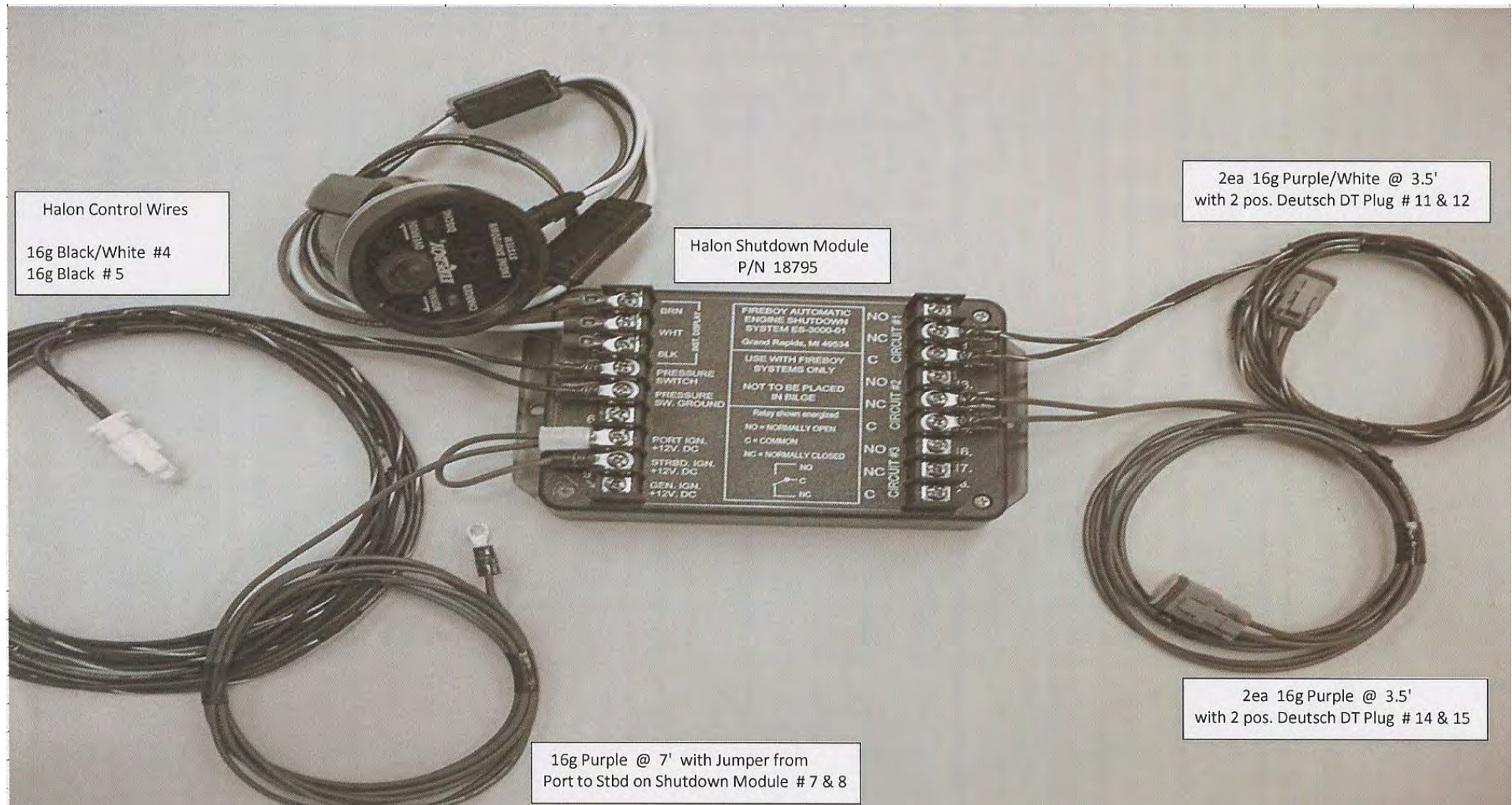






Parts Required

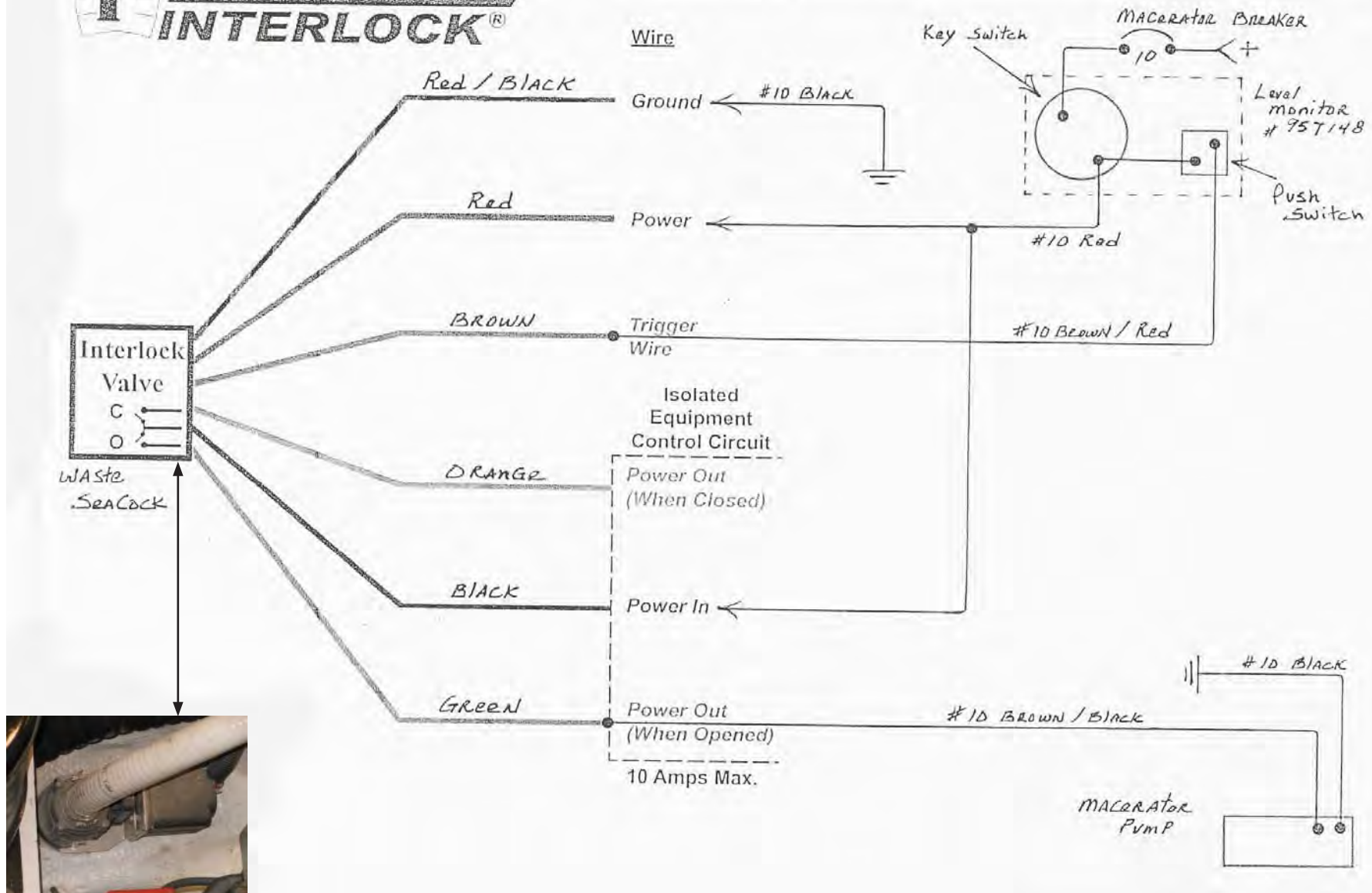
6 Position Terminal Block	Part Number 1298	10g Red/Violet - Power Supply to Relay
Terminal Block Jumper		10g Blue/Green - Output from Relay to Underwater Lts.
DPDT Relay, 12v	Part Number 351290	16g Black - Ground Supply to Relay
		16g Blue/Green - 12v + Activation to Relay
Lable Completed Assembly " Underwater Lights Relay "		



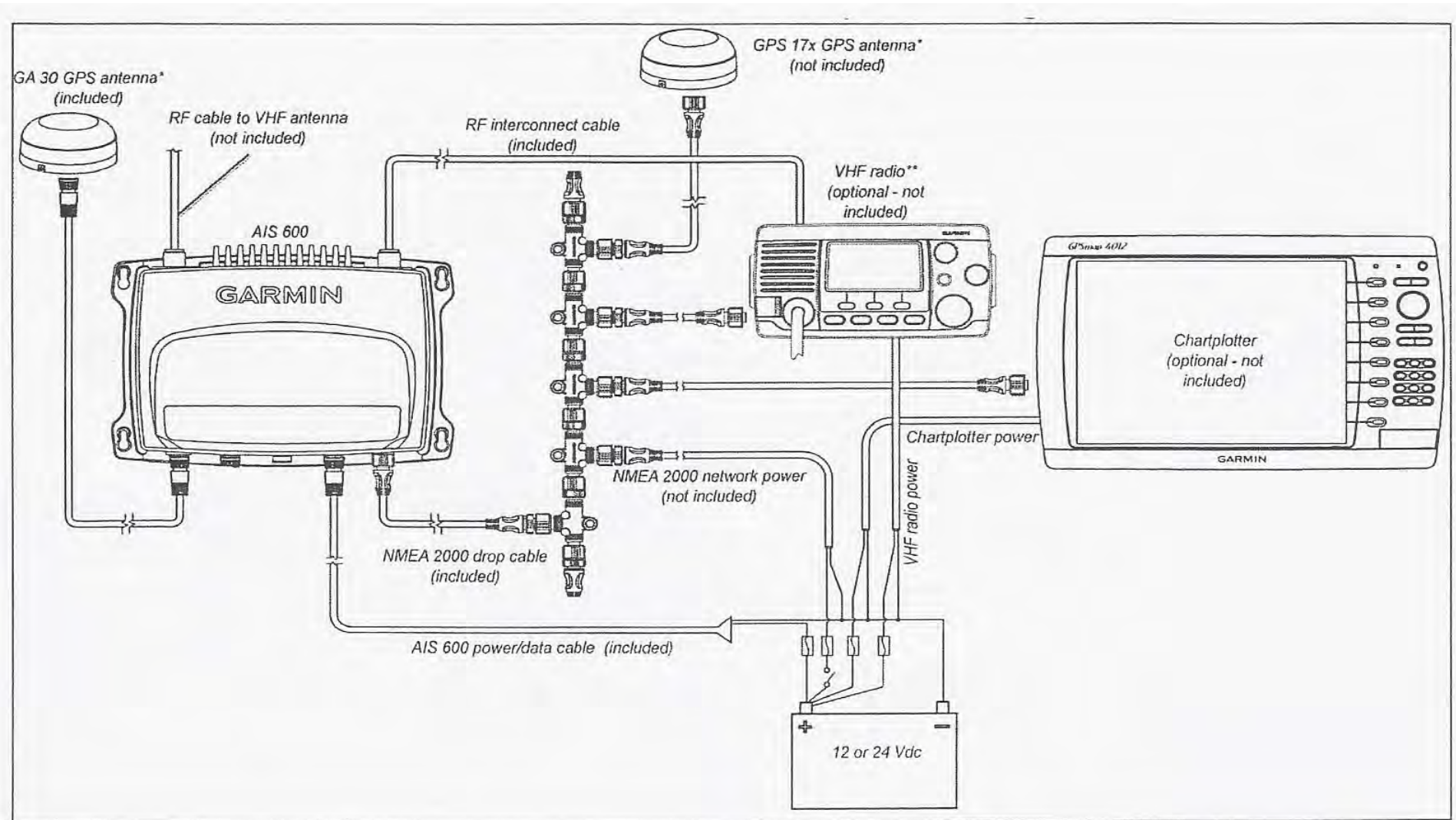
Technical Information

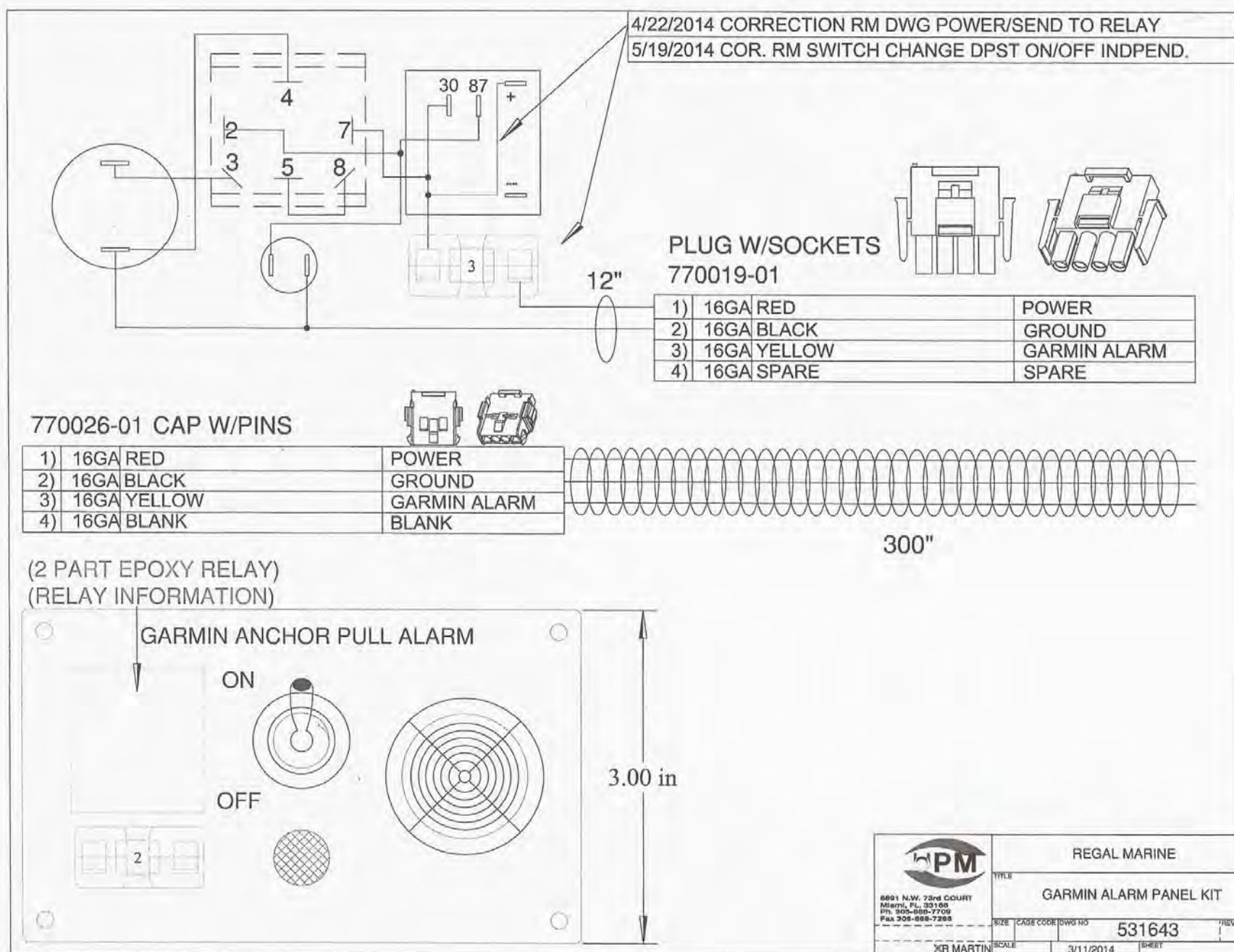


Subject Work Instruction: Electric Automatic Seacock Wiring	Issue Date: 1/6/2014	Rev: 0	Document No. WS-449
Approved By: Mark Journey	Written By: Mark Journey	Rev Date: ----	Page: 1 of 1

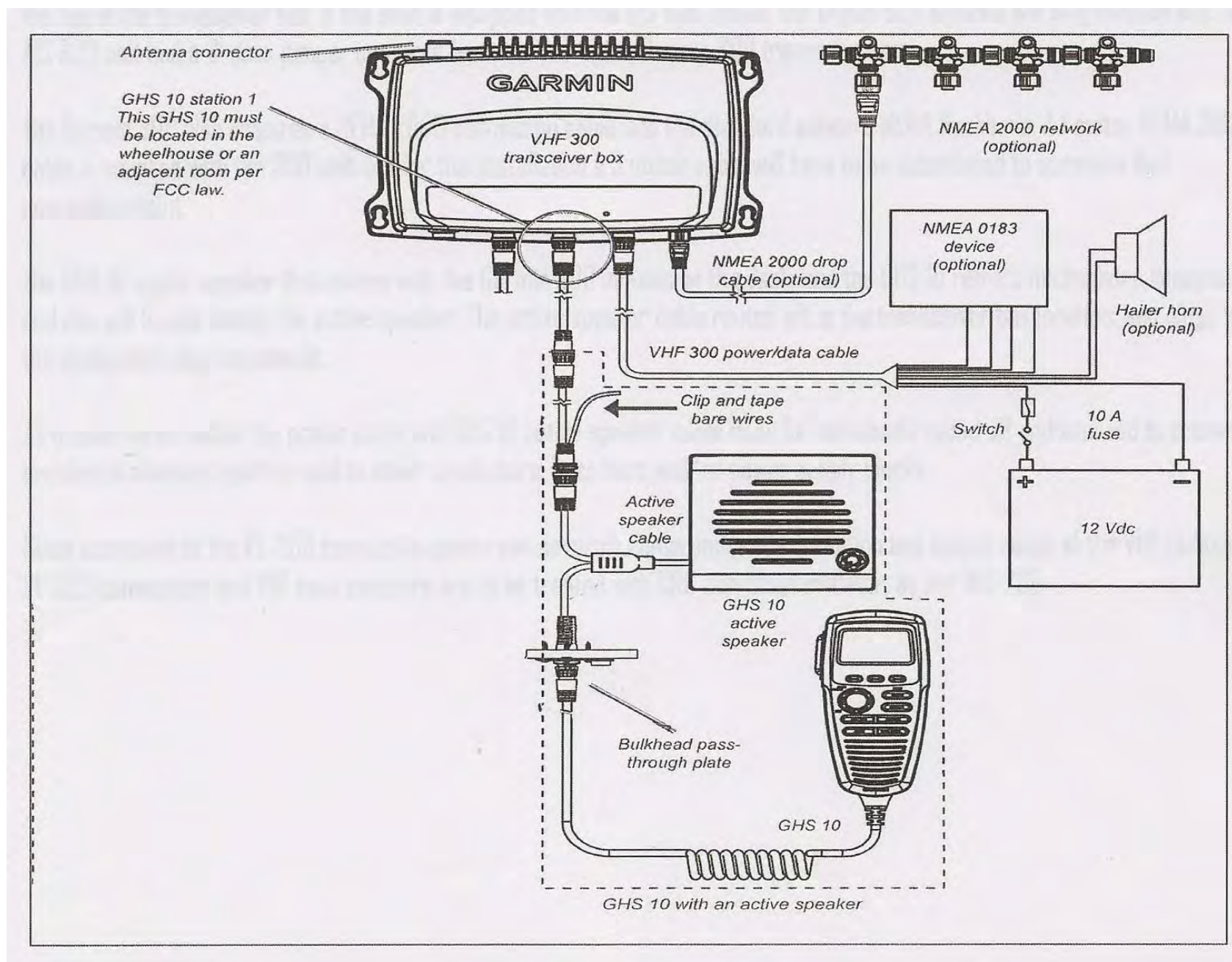


53 SC TYPICAL MACERATOR INTERLOCK VALVE WIRING

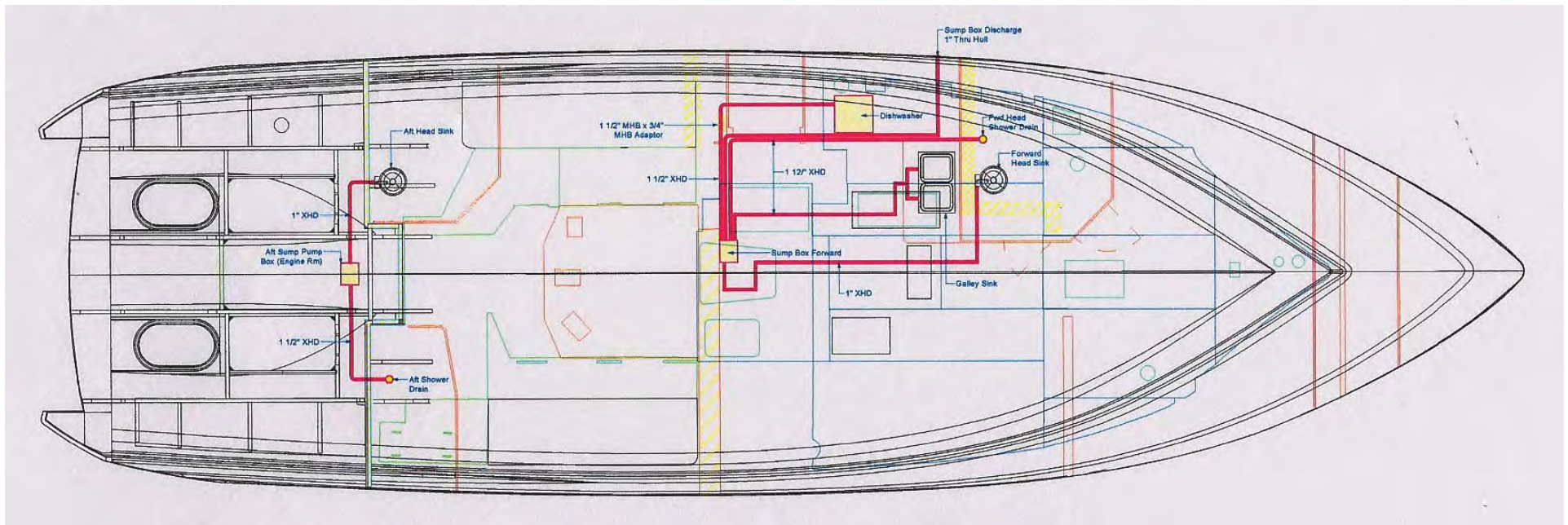




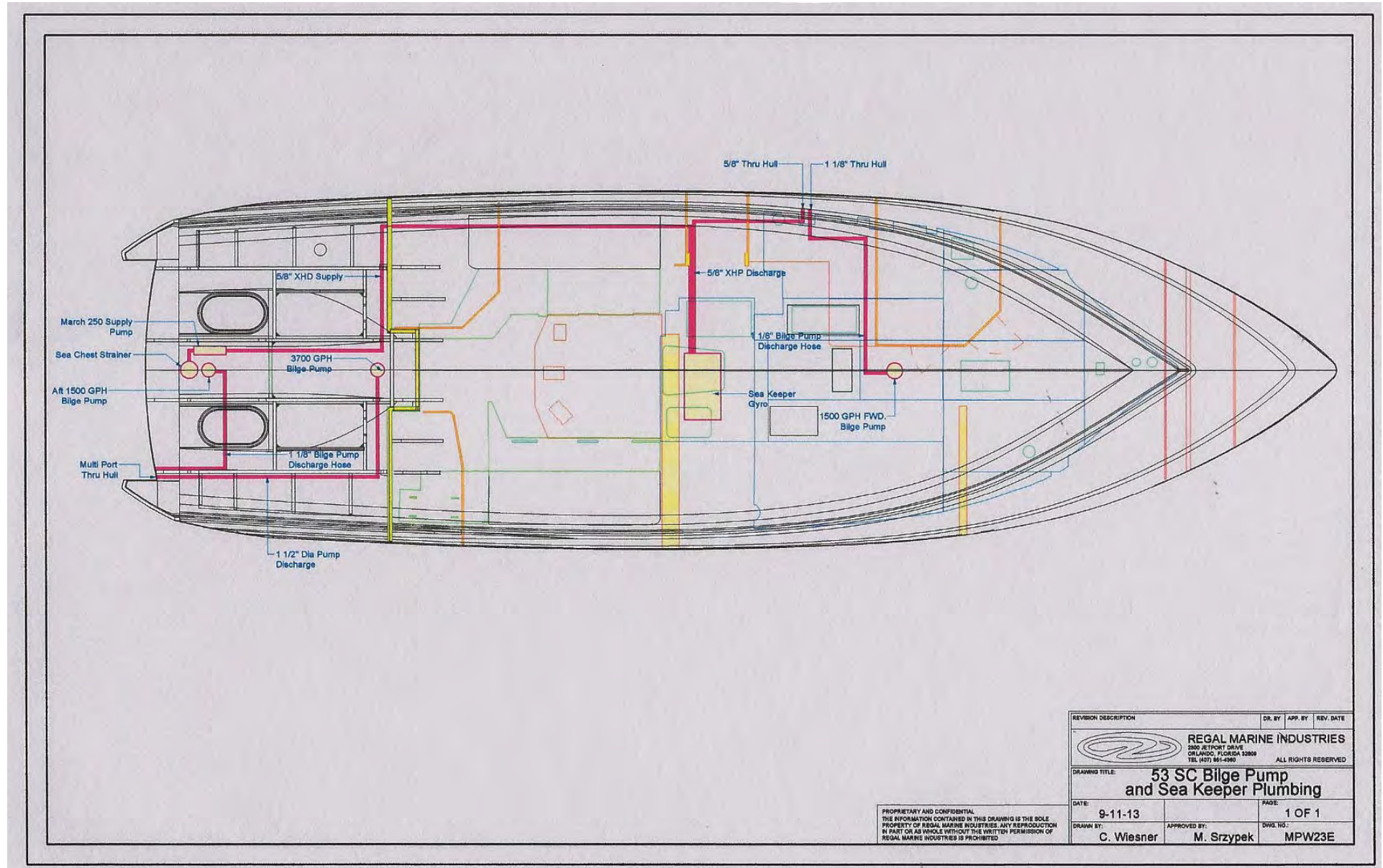
53 SC GARMIN OPTIONAL ANCHOR PULL ALARM



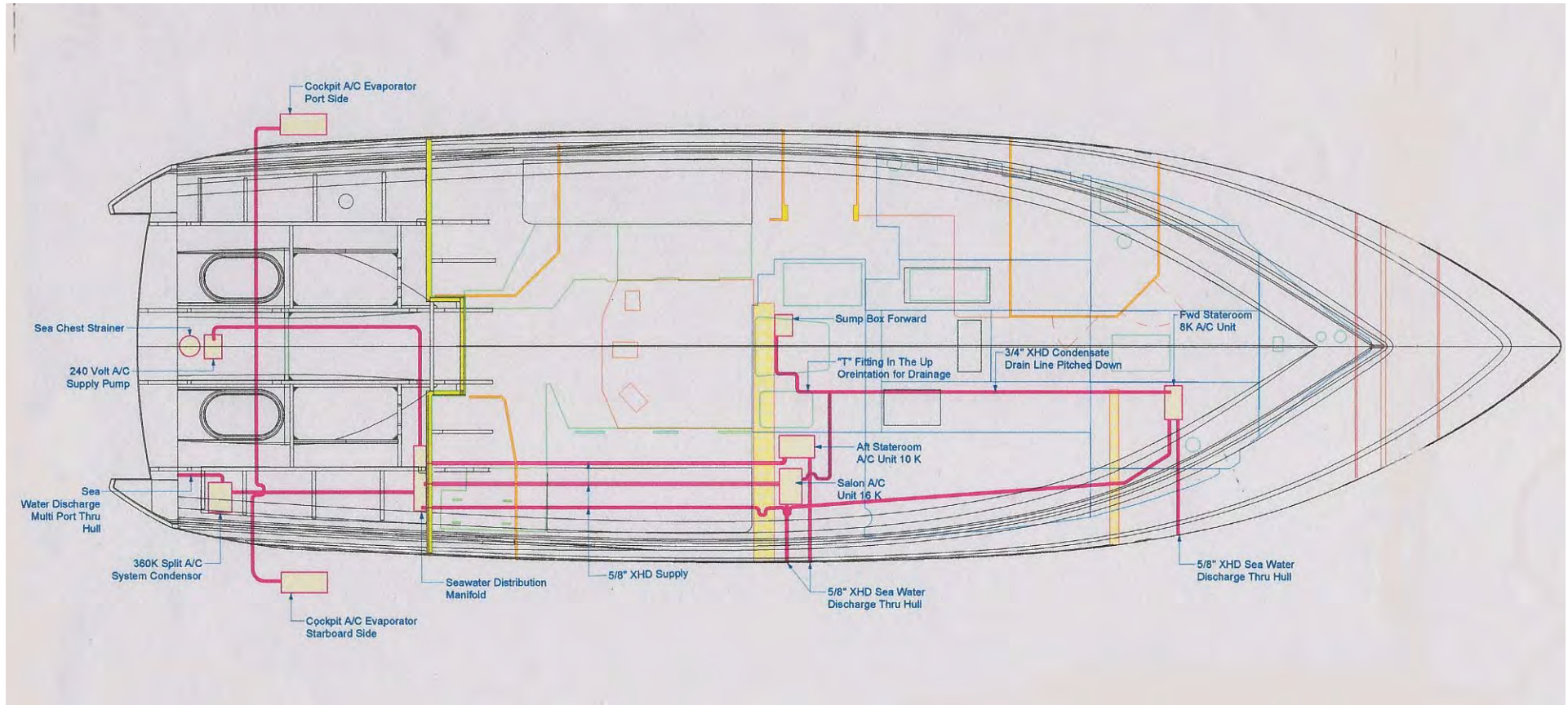
53 SC GARMIN 300 WIRING DIAGRAM



53 SC TYPICAL GREY WATER PLUMBING LAYOUT

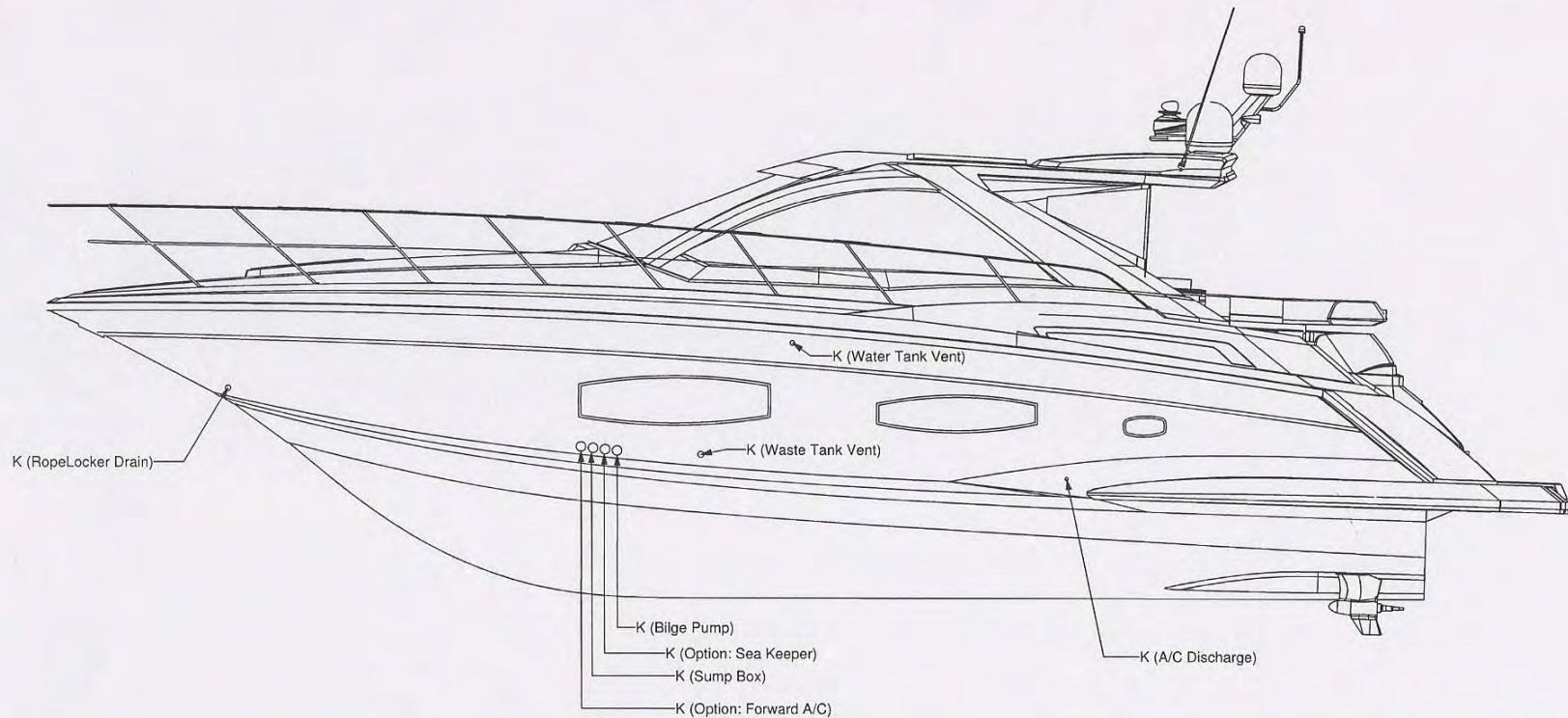


53 SC TYPICAL BILGE PUMP & SEAKEEPER PLUMBING LAYOUT



53 SC TYPICAL AIR CONDITIONER PLUMBING LAYOUT

PORT PROFILE VIEW




KEY

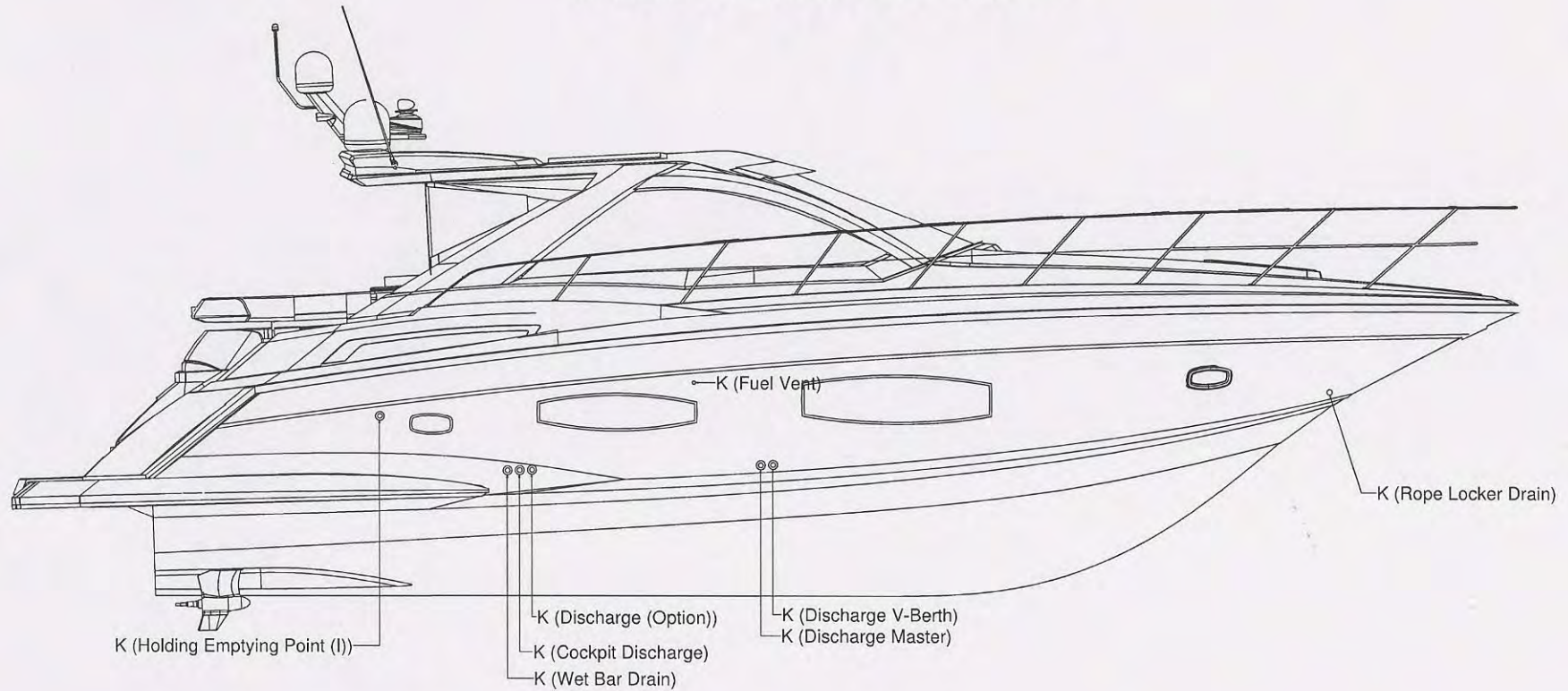
A. FUEL TANK
B. FUEL TANK FILLING POINT
C. OIL TANK
D. OIL TANK FILLING POINT
E. OIL TANK EMPTYING POINT
F. WATER TANK
G. WATER TANK FILLING POINT
H. HOLDING TANK
I. HOLDING EMPTYING POINT
J. SEACOCKS

K. THRU-HULL FITTINGS
L. AUTOMATIC FIRE EXTINGUISHER
M. CARBON MONOXIDE DETECTOR
N. ESCAPE HATCH
O. FIRE ESCAPE
P. LIFE RAFT STOWAGE
Q. ANCHOR STRONG POINT
R. TOWING STRONG POINT
S. BATTERY SWITCH
T. BILGE PUMP
U. MANUAL FIRE EXTINGUISHER

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STBD. PROFILE VIEW



KEY

- A. FUEL TANK
- B. FUEL TANK FILLING POINT
- C. OIL TANK
- D. OIL TANK FILLING POINT
- E. OIL TANK EMPTYING POINT
- F. WATER TANK
- G. WATER TANK FILLING POINT
- H. HOLDING TANK
- I. HOLDING EMPTYING POINT
- J. SEACOCKS

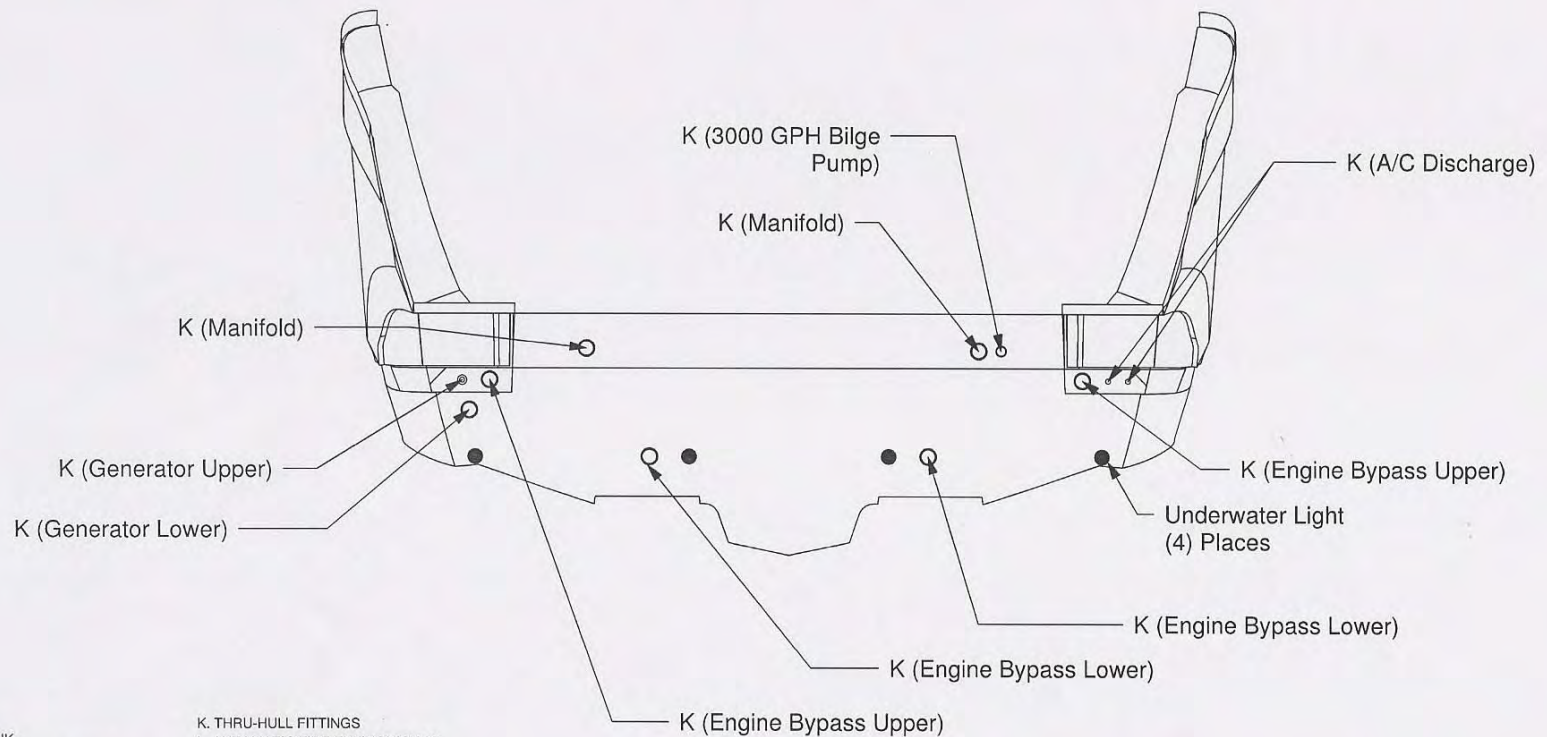
K. THRU-HULL FITTINGS

- L. AUTOMATIC FIRE EXTINGUISHER
- M. CARBON MONOXIDE DETECTOR
- N. ESCAPE HATCH
- O. FIRE ESCAPE
- P. LIFE RAFT STOWAGE
- Q. ANCHOR STRONG POINT
- R. TOWING STRONG POINT
- S. BATTERY SWITCH
- T. BILGE PUMP
- U. MANUAL FIRE EXTINGUISHER

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TRANSOM VIEW



KEY

- A. FUEL TANK
- B. FUEL TANK FILLING POINT
- C. OIL TANK
- D. OIL TANK FILLING POINT
- E. OIL TANK EMPTYING POINT
- F. WATER TANK
- G. WATER TANK FILLING POINT
- H. HOLDING TANK
- I. HOLDING EMPTYING POINT
- J. SEACOCKS

K. THRU-HULL FITTINGS

- L. AUTOMATIC FIRE EXTINGUISHER
- M. CARBON MONOXIDE DETECTOR
- N. ESCAPE HATCH
- O. FIRE ESCAPE
- P. LIFE RAFT STOWAGE
- Q. ANCHOR STRONG POINT
- R. TOWING STRONG POINT
- S. BATTERY SWITCH
- T. BILGE PUMP
- U. MANUAL FIRE EXTINGUISHER

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DATE: 5/19/14	REVISION: -	PAGE: 3 OF 3	
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NOTICE

BOAT OWNER-LIFT OPERATOR

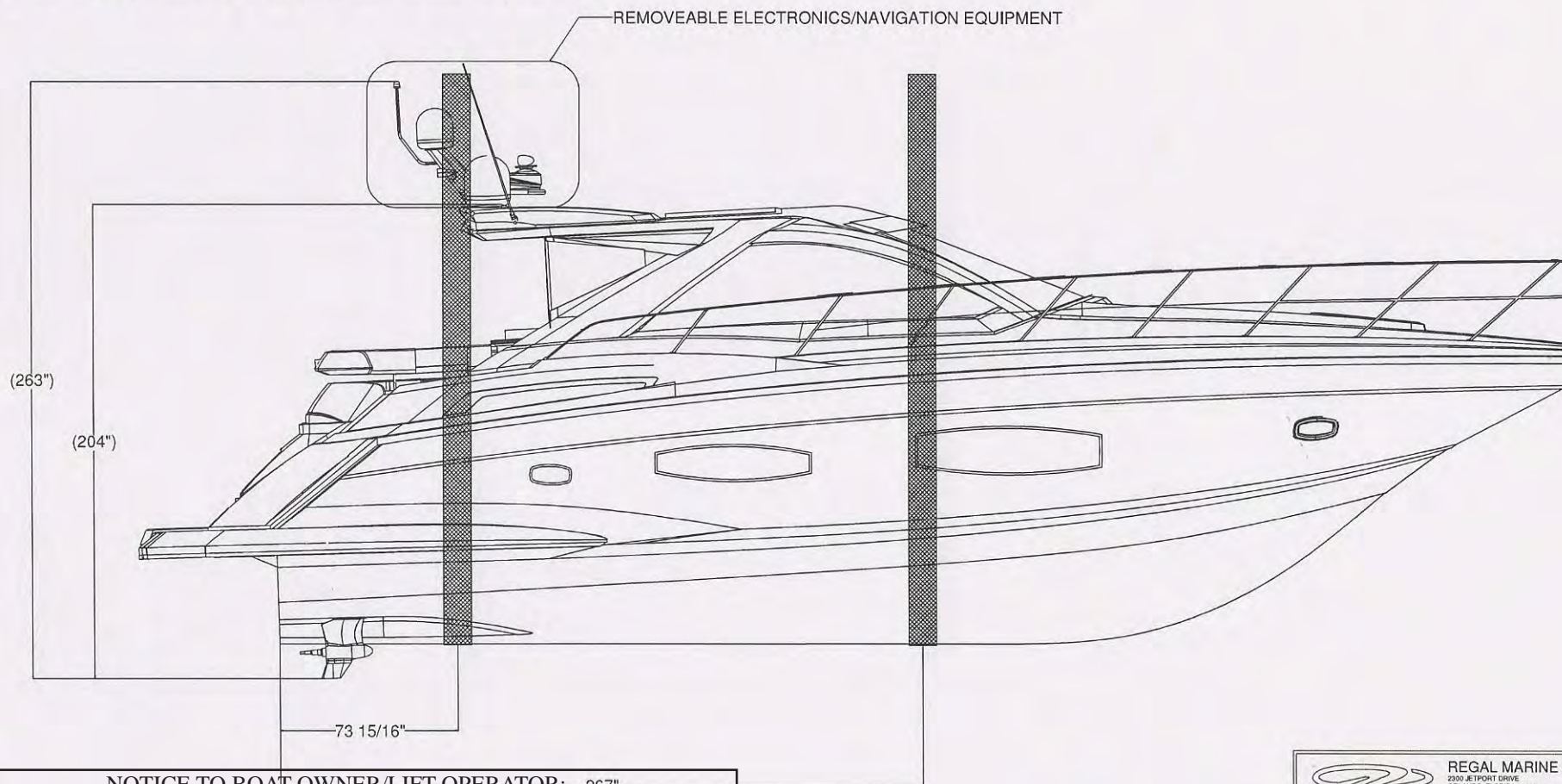
Before lifting boat place a fender or block between strap and hull just under the swim platform side wing (Both port and starboard) to relieve strap pressure on wing when lifting boat. When fender or block is positioned correctly strap will not put pressure on side wing when full weight is applied.

FAILURE TO FOLLOW THE ABOVE INSTRUCTIONS MAY CAUSE FIBERGLASS DAMAGE WHICH IS NOT COVERED UNDER THE REGAL LIMITED WARRANTY.

BEFORE LIFTING THE VESSEL SEE TECHNICAL DRAWING.. FOR FURTHER INFORMATION CALL YOUR REGAL YACHT DEALER OR THE REGAL FACTORY.

NOTES:

- 1) HEIGHT DIMENSIONS BELOW REPRESENT STANDARD REGAL INSTALLED EQUIPMENT.
OPERATORS MUST VERIFY FINAL HEIGHTS TO AVOID POSSIBLE DAMAGE.
- 2) FOR ADDITIONAL CLEARANCE, REMOVE ELECTRONICS/NAVIGATION EQUIPMENT.

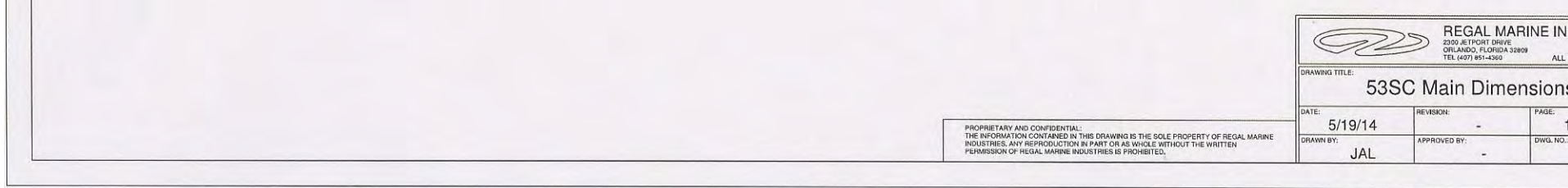


NOTICE TO BOAT OWNER/LIFT OPERATOR:—267"

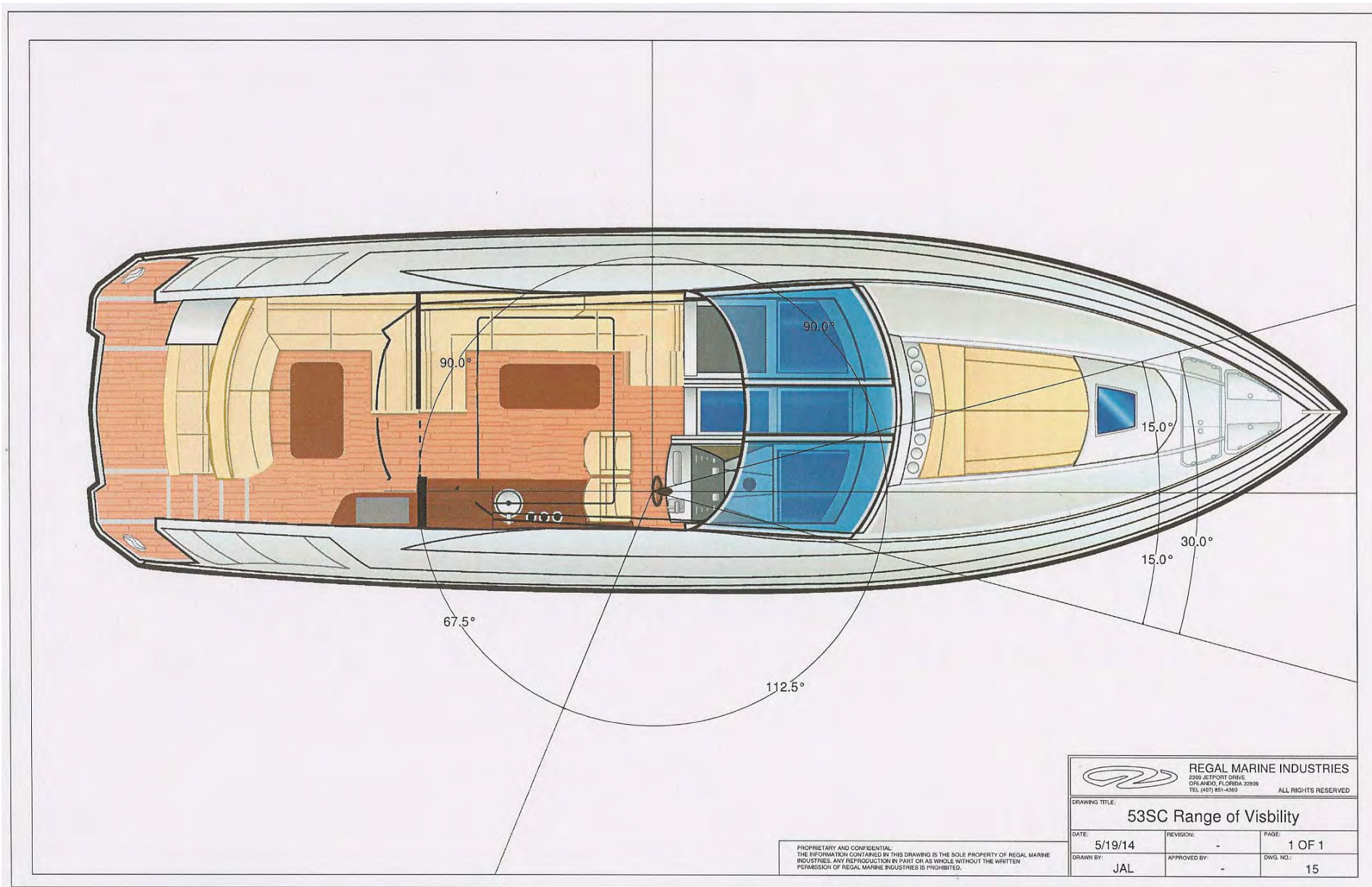
BEFORE LIFTING BOAT PLACE FENDER OR BLOCK BETWEEN STRAP AND HULL JUST UNDER THE SWIM PLATFORM SIDE WING (BOTH PORT AND STBD.) TO RELIEVE STRAP PRESSURE ON WING WHEN LIFTING BOAT. WHEN FENDER POSITIONED CORRECTLY STRAP SHALL NOT PUT PRESSURE ON SIDE WING WHEN FULL WEIGHT IS APPLIED.

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DRAWING TITLE:			
53SC Sling Locations			
DATE:	REVISION:	PAGE:	
02/18/14	-	1	
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JAH	M. Skrzypek	1	

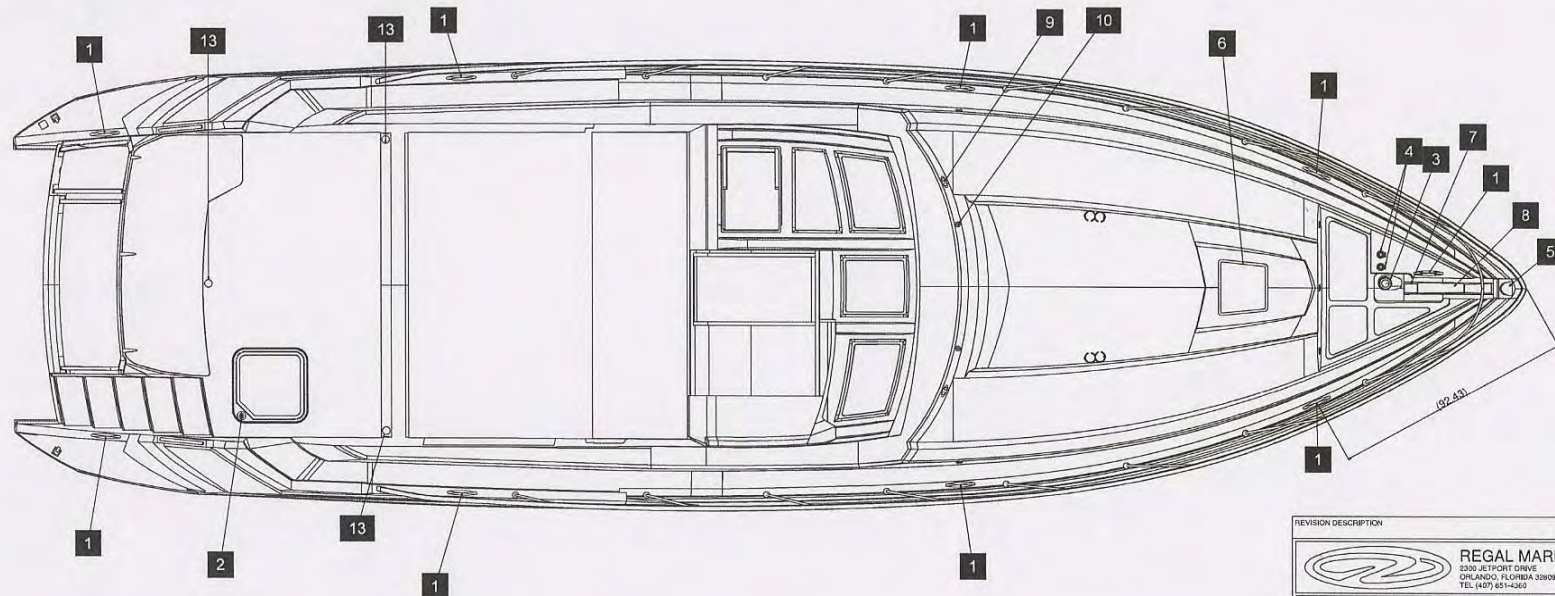


12-46



53 SC TYPICAL RANGE OF HELM VISIBILITY

Technical Information

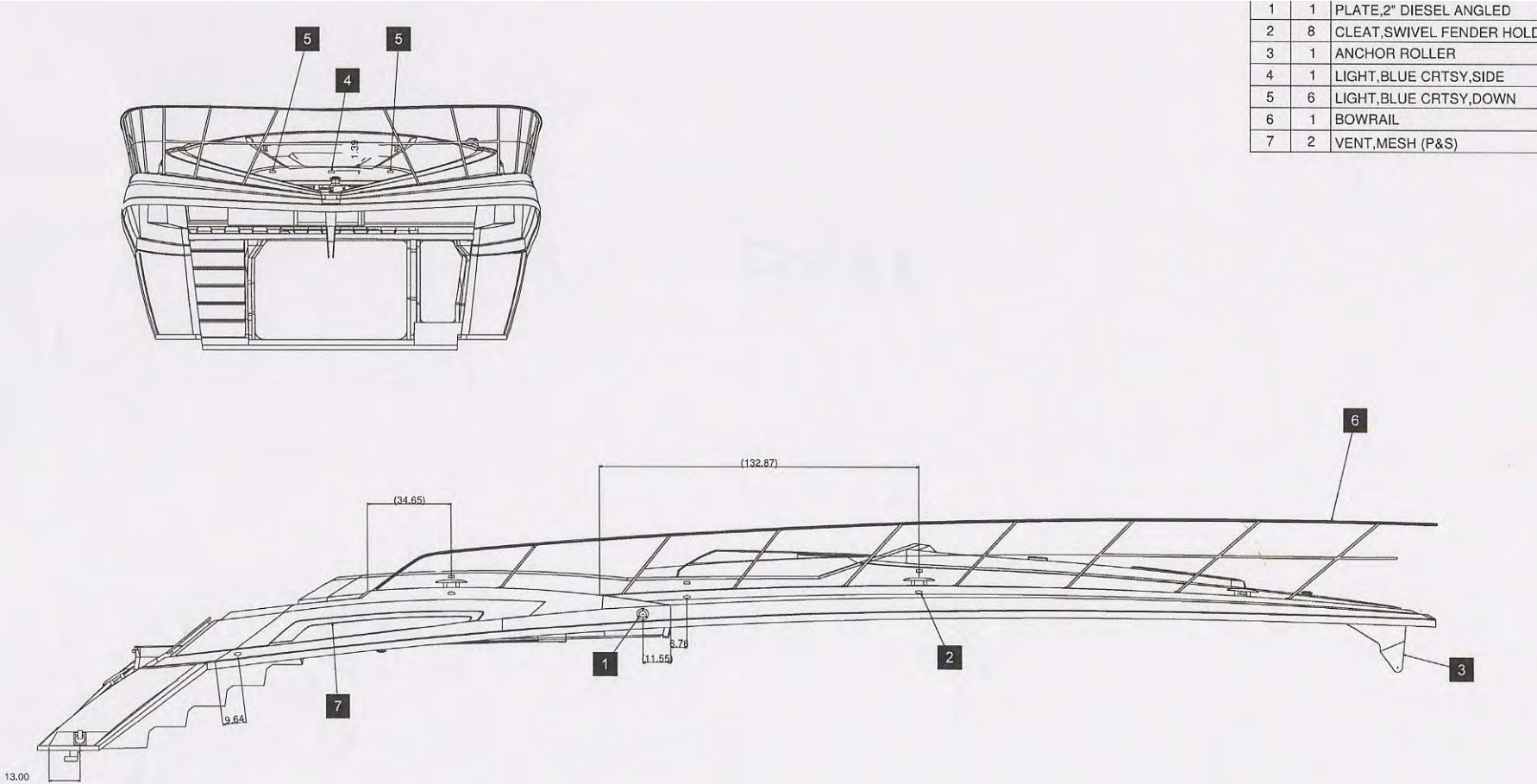


BILL OF MATERIALS		
ITEM	QTY.	DESCRIPTION
1	9	CLEAT, 12" W/BACKING PLATE
2	1	DRAIN, FLUSH MT
3	1	ANCHOR WINDLASS
4	1	FOOT SWITCH, F/ WINDLASS (UP/DWN)
5	1	SPOTLIGHT, REMOTE CONTROLLED
6	1	HATCH, TRAPAZOID
7	1	CHAIN STOPPER
8	1	PLATE, CHAIN GUARD
9	2	WIPER MOTOR
10	2	WASHER SYSTEM, F/ WINDSHIELD
11	2	RAIL, STAIRWAY, HAND
12	2	LIGHT, BLUE CRTSY, DOWN
13	3	Scuppers, 1.5" Diameter

NOTES:
1) FOLLOW REGAL WORKMANSHIP STANDARDS
FOR INSTALLATION AND ASSEMBLY.


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DRAWING TITLE:				
53SC DECK EXTERIOR HARDWARE				
DATE:	12/10/13	PAGE:	1 OF 2	
DRAWN BY:	J. Hodges	APPROVED BY:	-	DWG. NO.: 14

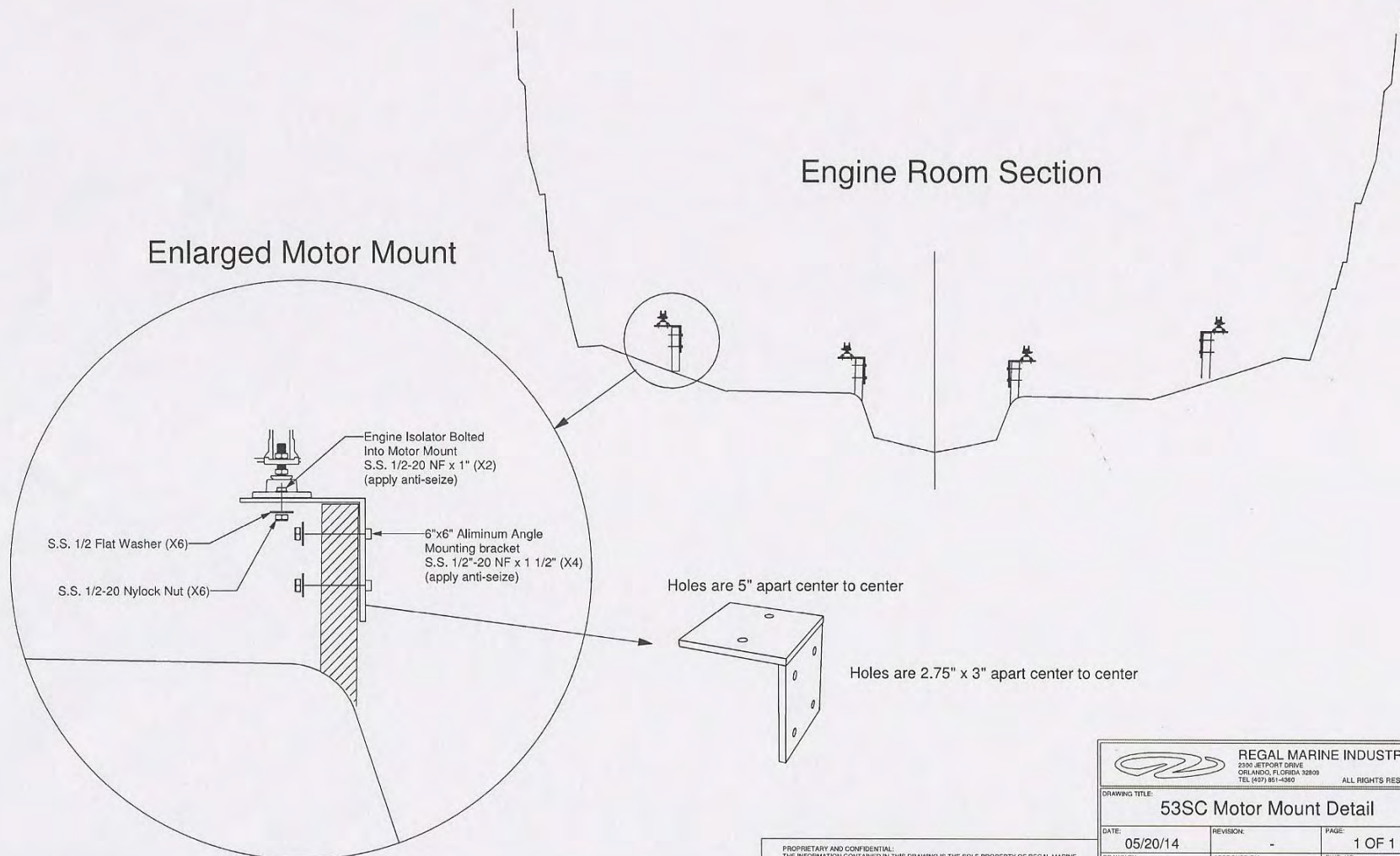


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DRAWING TITLE:		ALL PAGES	
53SC DECK EXTERIOR HARDWARE			
DATE:	12/10/13	PAGE:	2
DRAWN BY:	J. Hodges	APPROVED BY:	-
		DWG. NO.:	1

MOTOR MOUNT TORQUE (LOCK NUT) =130 FT. LBS.



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DRAWN BY: JAL	APPROVED BY: -	DWG. NO.: 11

53 SC TYPICAL MOTOR MOUNT ASSEMBLY