OWNER'S MANUAL

FUEL SYSTEMS

Boats manufactured for use in California for model year 2018 and after meet the California EVAP Emissions regulation for spark-ignition marine watercraft. Boats meeting this requirement will have the following label affixed near the helm.

⚠ WARNING

Operating, servicing and maintaining a recreational marine vessel can expose you to chemicals including engine exhaust, carbon monoxide, phthalates and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, service your vessel in a well-ventilated area and wear gloves or wash your hands frequently when servicing this vessel. For more information go to: www.P65warnings.ca.gov/marine

The fuel system in boats marketed in states other than California complies with U.S. EPA-mandated evaporative emission standards at time of manufacture using certified components.

CALIFORNIA AIR RESOURCES BOARD (CARB)

Outboard, sterndrive and inboard powered boats sold in the state of California are equipped with special components and certified to meet stricter environmental standards and exhaust emissions. All boats sold in California since 2009 are required to meet Super-Ultra-Low (four-star) emissions.

EXHAUST EMISSIONS

Sterndrive and inboard marine engine powered boats meeting CARB's exhaust emission standards are required to display the four-star label on the outside of the hull above the waterline. Outboard and personal watercraft marine engines may also comply with these standards.

⚠ DANGER

Carbon monoxide (CO) can cause brain damage or death. Engine and generator exhaust contains odorless and colorless carbon monoxide gas. Carbon monoxide will be around the back of the boat when engines or generators are running. Signs of carbon monoxide poisoning include nausea, headache, dizziness, drowsiness and lack of consciousness. Get fresh air if anyone shows signs of carbon monoxide poisoning. See engine manufacturer's manual for information regarding carbon monoxide poisoning.

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INTRODUCTION

Thank you for choosing CROWNLINE/FINSEEKER as your choice for the ultimate boating experience for you and your family. Every CROWNLINE/FINSEEKER boat is built with painstaking detail in order to provide its owner or operator with the maximum comfort, convenience and operating efficiency possible. Our boats are built to assure that they are of the very best quality and value in the industry.

We build our boats for long-lasting, trouble-free enjoyment so that boaters can travel in carefree style and convenience. It's what we do. All of us at CROWNLINE/FINSEEKER are passionately committed to your boating satisfaction.

To enhance your boating pleasure and safety, read this manual and the *Engine Operation and Maintenance Manual*. Then, keep them in a safe place onboard for easy reference.

We have designed this manual to inform you about the operating features and maintenance of your boat and to provide information about safe boating. Please pay particular attention to the safety statements labeled as **DANGER**, **WARNING**, **CAUTION**, **NOTE** and **IMPORTANT**. These statements alert you to avoid possible safety hazards so that you may have a safe and pleasurable boating experience. Preparation is the key to a safe and enjoyable boating experience. It is very important to us that you enjoy many years of boating in your CROWNLINE/FINSEEKER boat.

We know that our customers and owners have brought us to where we are today, and they are the ones who will keep us here. Have a safe and happy time on the water in your CROWNLINE/FINSEEKER boat!

WELCOME ABOARD!

We're sure that you will be completely satisfied with the unmatched performance, style and luxury of your new CROWNLINE/FINSEEKER whether you are the first owner or the second.

Your new CROWNLINE/FINSEEKER has been designed, assembled and tested to give you the maximum in boating enjoyment and safety. CROWNLINE/FINSEEKER is proud to say that every boat we build is carefully constructed by skilled craftsmen to meet or exceed all safety and quality standards established by the U.S. Coast Guard, ABYC or ISO where applicable.

THIS *CROWNLINE/FINSEEKER OWNER'S/ OPERATOR'S MANUAL* IS IN EFFECT UNTIL A NEWER VERSION SUPERSEDES IT.

This manual has been compiled to help you and others operate your CROWNLINE/ FINSEEKER boat safely and pleasurably. It contains details of the craft, the equipment it is supplied or fitted with, its systems, and information on its operation and maintenance. **Read the manual carefully, and familiarize yourself with the craft before using it.** Other publications may also be included to support components not covered in this manual. Become familiar with all the publications included with your boat; they too will have important information.

If this is your first craft, or you are changing to a type of craft you are not familiar with, for your own safety and comfort, make sure you obtain handling and operating experience before "assuming command" of the craft. Your dealer, national boating federation or yacht club will be pleased to advise you of local sea schools or competent instructors.

Your *CROWNLINE/FINSEEKER Owner's/Operator's Manual* provides an overview of systems and components on your boat. Additional information can be found in the supplied manufacturers' publications, boating reference books (available at various bookstores) or at the local library.

Not all equipment described in this manual is available on all models. See your dealer for equipment availability.

REFERENCES AND CONTACT INFORMATION

Use the following list of publications and organizations for reference and contact information concerning safe boating, navigational rules and other boating topics.

Publications

- Bottomley, Tom. *Boatman's Handbook*. Hearst Marine Book. Morrow
- Brotherton, Miner. *Twelve Volt Bible*. Seven Seas
- Calder, Nigel. *Boatowner's Mechanical and Electrical Manual*. McGraw-Hill Education
- Chapman, Charles F. and Maloney, E.S. *Chapman's Piloting, Seamanship and Small Boat Handling*. Hearst Marine Book. Morrow
- Hinz, Earl. *The Complete Book of Anchoring and Mooring*. Cornell Maritime Press
- National Fire Protection Association. *NFPA 302 Fire Protection Standard for Pleasure and Commercial Motor Craft*. National Fire Protection Association
- United States Coast Guard. *Navigational Rules for U.S. Waterways*. Visit https://www.navcen.uscg.gov/ to view or download this publication.

- United States Coast Guard Auxiliary. *Boating Skills and Seamanship Thirteenth Edition*. United States Coast Guard
- Whiting, John and Bottomley, Tom. *Chapman's Log and Owner's Manual*. Hearst Marine Book

Organizations

American Boat & Yacht Council

Boat building standards.
http://abycinc.org

American Red Cross

A resource for first aid training, emergency supplies and preparedness.
http://www.redcross.org or consult the local telephone directory

Boat Owners Association of The United States

Organization of recreational boaters offering marine services, education and protecting boater's rights.
http://www.boatus.com/

BoatU.S. Foundation for Boating Safety Hotline

Training and education outreach directly to boaters.
http://www.boatus.org/
Phone: 800-245-2628

National Association of State Boating Law Administrators

Boat safety training and education resources.
http://www.nasbla.org

National Marine Manufacturers Association

Boat, marine engine and accessory manufacturer trade association.
http://www.nmma.org

National Oceanic and Atmospheric Administration's National Weather Service

Nautical charting, weather, fishery, ocean and climate resources.
http://www.noaa.gov

National Safe Boating Council, Inc.

http://www.safeboatingcouncil.org

Sea Tow Services International, Inc.

Organization of recreational boaters offering in-water services, education and emergency assistance.
http://www.seatow.com
Toll free: 800-473-2869

U.S. Coast Guard

http://www.uscgboating.org (To contact the U.S. Coast Guard for an emergency while on the water, always use the onboard VHF-FM radio channel 16. Use cell phones only as a secondary means of communication. Call 9-1-1 to reach rescue personnel.)

U.S. Coast Guard Auxiliary

Information on boating safety classes and boat safety checks.
http://nws.cgaux.org; Phone: 877-875-6296

U.S. Coast Guard Navigation Center (NAVCEN)

USCG navigation information.
https://www.navcen.uscg.gov

U.S. Coast Guard Office of Boating Safety

USCG resources for recreational boaters.
http://www.uscgboating.org

U.S. Coast Guard's America's Waterway Watch Program

http://www.americaswaterwaywatch.uscg.mil (A program for recreational boaters to assist the U.S. Department of Homeland Security in reporting suspicious activity on U.S. waterways); Phone: 877-249-2824

U.S. Government Publishing Office

http://www.gpo.gov
(For information and documentation on FCC rules and regulations and Skippers Course information, and other government, marine and nautical related documents)

U.S. Power Squadrons

Boating courses and knowledge resources.
http://www.usps.org; Phone: 888-367-8777

Water Sports Industry Association

Water sports education, safety and risk management.
http://www.wsia.net

CERTIFICATION AND SPECIFICATION

All CROWNLINE/FINSEEKER boats meet or exceed U.S. Coast Guard requirements.

All CROWNLINE/FINSEEKER Boats are National Marine Manufacturers Association (NMMA) certified. NMMA certified vessels are in compliance with applicable federal regulations and American Boat and Yacht Council (ABYC) standards and recommended practices.

National Marine Manufacturers Association
231 S. LaSalle St.
Suite 2050
Chicago, Illinois U.S.A. 60604
Tel. (312) 946-6200

MODIFICATIONS PROHIBITED

CROWNLINE/FINSEEKER Boats does not condone or encourage modifications to CROWNLINE/FINSEEKER boats or engine packages, including modifications to enhance the performance of the boat or engine. **Modifications may create hazardous conditions that represent a risk of serious harm or death.** Persons making such modifications do so at their own risk and, by doing so, agree to assume any and all liabilities for any consequences which may occur as a result of such modifications. CROWNLINE/FINSEEKER Boats reserves the right to limit or refuse warranty coverage on any boat that has been modified beyond original factory specifications.

YOUR CROWNLINE/FINSEEKER DEALER RESPONSIBILITIES

The following outlines the responsibilities of your CROWNLINE/FINSEEKER dealer to ensure you receive maximum performance and enjoyment from your new CROWNLINE/FINSEEKER.

Your CROWNLINE/FINSEEKER dealer will be responsible for:

1. Discussing the terms of all warranties and registering each warranty with its respective manufacturer. Complete and return the CROWNLINE/FINSEEKER Boats Limited Warranty registration card.
2. Providing instructions on how to get warranty service.
3. Reviewing the pre-delivery service record with you, and then signing it to certify it is correct.
4. Ensuring you know the general operating procedures for your boat and you are familiar with its specific systems and components.

YOUR RESPONSIBILITIES

See Section 3 for more information.

The following outlines your responsibilities.

As the owner you are responsible for:

1. Scheduling an appointment with your dealer to review all warranties.
2. Inspecting the physical condition of the boat at time of delivery, and making sure that all systems and components are operating properly.
3. Using all equipment safely and in accordance with the manufacturer's instructions.
4. Obtaining periodic maintenance as outlined in the *CROWNLINE/FINSEEKER Owner's/Operator's Manual* and all Manufacturer Series Guides.
5. Scheduling your engine's service as detailed in the *Engine Owner's Manual*.

CROWNLINE/FINSEEKER LIMITED WARRANTY

1. **GENERALLY**. Subject to all limitations and conditions explained below, CROWNLINE/FINSEEKER BOATS (“Crownline/Finseeker”) warrants to the original retail purchaser (“PURCHASER”) that Crownline/Finseeker, or a dealer of Crownline/Finseeker chosen in Crownline/Finseeker’s sole discretion, will repair or replace those parts and components described in paragraphs 2, 3, 4, 5 and 6 below found to be defective in factory materials or workmanship during the applicable warranty periods set forth in such paragraphs. The PURCHASER’S right to the repair or replacement of items warranted hereunder shall be the PURCHASER’S sole and exclusive remedy against Crownline/Finseeker under this limited warranty.
2. **LIFETIME LIMITED STRUCTURAL WARRANTY**. Crownline/Finseeker warrants to the original retail purchaser of this boat that Crownline/Finseeker will pay all or a portion of the cost to repair or replace the fiberglass hull or deck if it is found to be structurally defective according to the following prorated schedule:
    a. Up to five (5) years after date of original retail purchase: Crownline/Finseeker pays 100% of repair or replacement cost;
    b. After five (5) years but up to six (6) years after date of original retail purchase: Crownline/Finseeker pays 90% of repair or replacement cost
    c. After six (6) years but up to seven (7) years after date of original retail purchase: Crownline/Finseeker pays 80% of repair or replacement cost
    d. After seven (7) years but up to eight (8) years after date of original retail purchase: Crownline/Finseeker pays 70% of repair or replacement cost
    e. After eight (8) years but up to nine (9) years after date of original retail purchase: Crownline/Finseeker pays 60% of repair or replacement cost
    f. After nine (9) years after date of original retail purchase and thereafter for so long as the original retail purchaser owns the boat: Crownline/Finseeker pays 50% of repair or replacement cost. For purposes of this limited warranty: (i) a structural defect is defined as a defect that causes the hull or deck to be unsafe or unfit for use under normal operating conditions; (ii) the hull is defined as the single fiberglass molded shell and integral fiberglass structural components including stringers, transom and related structural components which are below the hull flange; and (iii) the deck is defined as the single fiberglass molded shell and integral fiberglass structural components above the hull flange.

This Lifetime Limited Structural Warranty shall be in effect for so long as the original retail purchaser owns the boat. All repairs and replacements under this Lifetime Limited Structural Warranty shall be performed by Crownline/Finseeker or a dealer of Crownline/Finseeker chosen in Crownline/Finseeker’s sole discretion.

This Lifetime Limited Structural Warranty is further subject to all limitations and conditions explained below.

3. **FIVE-YEAR TRANSFERABLE LIMITED STRUCTURAL WARRANTY**. Crownline/Finseeker also offers to the first purchaser of this boat after the original retail purchaser a Transferable Limited Structural Warranty under which Crownline/Finseeker will pay 100% of the cost to repair or replace the fiberglass hull or deck if it is found to be structurally defective within five (5) years after the date of the original retail purchase of the boat. A Five-Year Limited Hull Blister Warranty may be transferred one time only by the original retail purchaser to a subsequent purchaser.
   All repairs and replacements under this Transferable Limited Structural Warranty shall be performed by Crownline/Finseeker or a dealer of Crownline/Finseeker chosen in Crownline/Finseeker's sole discretion. This Transferable Limited Structural Warranty is available to the first purchaser of the boat after the original retail purchaser (but to no other owner of the boat) provided the transfer of the boat occurs within five (5) years after the date of purchase by the original retail purchaser and the second purchaser registers the transfer with Crownline/Finseeker and pays the established warranty transfer fee in accordance with the requirements set forth below. To register the transfer, the second purchaser must acquire from the original retail purchaser the Transferable Warranty Registration stub, supply the information requested and mail it together with the required transfer fee payment to Crownline/Finseeker Boats, 11884 Country Club Road, West Frankfort, IL 62896. Crownline/Finseeker must receive the completed stub and payment within fifteen (15) days of purchase from the original retail purchaser. Proof of purchase date is required. Inquiries concerning the required transfer fee and unexpired term of warranty on a particular Crownline/Finseeker boat should be directed to Crownline/Finseeker's Customer Service Department at (618) 937-6426. The model, hull identification number and original retail purchaser's name will be needed to provide this information. **As of June 1, 2018, the established warranty transfer fee is $650.00 for boats with hull lengths of less than 25' and $750.00 for boats will hull lengths of 25' or more, but Crownline/Finseeker may, in its sole discretion, revise such fees from time to time without prior notice.** This Transferable Limited Structural Warranty is further subject to all limitations and conditions explained below.

4. **FIVE-YEAR LIMITED HULL BLISTER WARRANTY.** Provided that the original factory gelcoat surface has not been altered, Crownline/Finseeker warrants to the original retail purchaser of this boat that for a period of five (5) years after the date of the original retail purchase Crownline/Finseeker will pay all or a portion of the cost to correct or repair any osmotic blisters which occur on the underwater gelcoated surfaces of the hull according to the following prorated schedule:
   a. Up to two (2) years after date of original retail purchase: Crownline/Finseeker pays 100% of repair cost;
   b. After two (2) years but up to three (3) years after date of original retail purchase: Crownline/Finseeker pays 60% of repair cost;

c. After three (3) years but up to four (4) years after date of original retail purchase: Crownline/Finseeker pays 50% of repair cost;

d. After four (4) years but up to five (5) years after date of original retail purchase: Crownline/Finseeker pays 40% of repair cost;

e. After five (5) years after date of original retail purchase: Crownline/Finseeker pays 0% of repair cost.

Alterations which will void this Five-Year Limited Hull Blister Warranty include, without limitation, damage, accident repair, sanding, scraping, sandblasting, or improper surface preparation for application of a marine barrier coating or bottom paint. **A marine barrier coating must be properly applied to the hull bottom if the boat is to be mounted in water for periods of more than sixty (60) days in any ninety (90) day period and a marine barrier coating is also required if the boat is to be bottom painted (failure to take such actions in such circumstances will also void this Five-Year Limited Hull Blister Warranty).** For purposes of determining coverage under this Five-Year Limited Hull Blister Warranty, osmotic blisters are defined as those blisters larger than 1/8" in diameter and with a depth of 1/16" or greater which occur on the hull below the water line. All repairs and replacements under this Five-Year Limited Hull Blister Warranty shall be performed by Crownline/Finseeker or a dealer of Crownline/Finseeker chosen in Crownline/Finseeker's sole discretion. This Five-Year Limited Hull Blister Warranty is further subject to all limitations and conditions explained below.
In the event that the Transferable Limited Structural Warranty provided for in paragraph 3 above is transferred by the original retail purchaser of the boat to a subsequent purchaser within five (5) years after the date of the original retail purchase and the subsequent purchaser registers the transfer with Crownline/Finseeker and pays the established warranty transfer fee in accordance with the requirements set forth in paragraph 3, the remaining term of the foregoing Five-Year Limited Hull Blister Warranty shall also be transferred to the subsequent purchaser. This Five-Year Limited Hull Blister Warranty may be transferred one time only by the original retail purchaser to a subsequent purchaser.

5. **EXTERIOR COSMETIC GELCOAT LIMITED WARRANTY.** Crownline/Finseeker warrants to the original retail purchaser of this boat that Crownline/Finseeker will pay all or a portion of the cost to correct or repair any cracking, crazing or fading of the exterior gelcoat surface of the boat and of fiberglass options (such as radar arches) installed by Crownline/Finseeker at the factory according to the following prorated schedule:

   a. Up to twelve (12) months after date of original retail purchase: Crownline/Finseeker pays 100% of repair cost;

   b. After twelve (12) months but up to fifteen (15) months after date of original retail purchase: Crownline/Finseeker pays 50% of repair cost;

   c. After fifteen (15) months but up to eighteen (18) months after date of original retail purchase: Crownline/Finseeker pays 25% of repair cost;

   d. After Eighteen (18) months from date of original retail purchase: Crownline/Finseeker pays 0% of repair cost.

Crownline/Finseeker shall not, however, have any liability or responsibility to correct or repair any damage to the exterior gelcoat service of the boat under the following circumstances:

- If the original gelcoat surface has been altered in any way. Alterations which will void this Exterior Cosmetic Gelcoat Limited Warranty include, without limitation, damage, accident repair, sanding, scraping, sandblasting, or improper surface preparation for application of a marine barrier coating or paint.
- If damage to the exterior gelcoat surface results from or is attributable to the addition of items not installed by Crownline/Finseeker (such as but not limited to canvas and wakeboard towers) to the boat.

All repairs under this Exterior Cosmetic Gelcoat Limited Warranty shall be performed by Crownline/Finseeker or a dealer of Crownline/Finseeker chosen in Crownline/Finseeker's sole discretion. This Exterior Cosmetic Gelcoat Limited Warranty is further subject to all limitations and conditions explained below.
In the event that the Transferable Limited Structural Warranty provided for in paragraph 3 above is transferred by the original retail purchaser of the boat to a subsequent purchaser within eighteen (18) months after the date of the original retail purchase and the subsequent purchaser registers the transfer with Crownline/ Finseeker and pays the established warranty transfer fee in accordance with the requirements set forth in paragraph 3, the remaining term of the foregoing Exterior Cosmetic Gelcoat Limited Warranty shall also be transferred to the subsequent purchaser. This Exterior Cosmetic Gelcoat Limited Warranty may be transferred one time only by the original retail purchaser to a subsequent purchaser.

6. **CROWNLINE/FINSEEKER LIMITED WARRANTY FOR NON-STRUCTURAL PARTS AND COMPONENTS**. In addition to the above hull warranties, Crownline/Finseeker warrants to the original retail purchaser that the following described non-structural parts and components of the boat will be free of defects in materials or workmanship for the periods indicated below, subject to all limitations and conditions contained herein:

Description	Warranty Description
Gauges (Analog)	3 year warranty against defects in materials or workmanship with a nominal fee for shipping and handling – Direct customer service line 1-941-538-7775 x 350
Garmin Touchscreen Dashes	3 year warranty against defects in materials or workmanship with a nominal fee for shipping and handling – Direct Customer service line 1-800-800-1020
Raymarine Touchscreen Dashes	3 year warranty against defects in materials or workmanship with a nominal fee for shipping and handling – Direct Customer service line 1-800-539-5539. Product must be registered online at time of purchase.
Plywood (X-L Industrial Panels)	Lifetime warranty against defects in material or workmanship

Description	Warranty Description
Stainless Steel Rails, Cleats, Rub Rail Inserts, Thru-Hull Fittings, Boarding Ladders, Misc. Stainless Steel Hardware	Defects in materials or workmanship covered for a period of 5 years from date of original retail purchase
Generator	Defects in materials or workmanship covered for a period of 5 years from date of original retail purchase or 2000 hours of operation, whichever occurs first Limitations and deductibles apply in years 3 through 5
All Factory Installed Bucket Seats, Upholstery, Canvas, and Vinyl Coverings ***Clear Connectors Only Warrantied For One Year**	Defects in materials or workmanship (including seam separation and thread rot) covered for a period of 5 years from date of original retail purchase in accordance with the following prorated schedule: a. Up to 2 years after date of original retail purchase, Crownline/Finseeker pays 100% of repair or replacement cost. b. After 2 years, but up to 3 years after date of original retail purchase, Crownline/Finseeker pays 60% of repair or replacement cost. c. After 3 years, but up to 4 years after date of original retail purchase, Crownline/Finseeker pays 50% of repair or replacement cost. d. After 4 years, but up to 5 years after date of original retail purchase, Crownline/Finseeker pays 40% of repair or replacement cost.
Arch (Manual or Electric)	Defects in materials or workmanship covered for a period of 1 year from date of original retail purchase
Carpeting	Guaranteed against failure or fading due to the effects of sunlight for a period of 1 year from date of original retail purchase
Cockpit/Platform Soft Touch Mats	Defects in materials or workmanship covered for the period of 1 year from the date of original retail purchase.
Shock Absorbers	Defects in materials or workmanship covered for a period of 1 year from date of original retail purchase
Trim Tabs	Defects in materials or workmanship covered for a period of 1 year from date of original retail purchase
Stereo System	Defects in materials or workmanship covered for a period of 1 year from date of original retail purchase Direct customer service line 1-405-624-8510.
Seat Actuators (Electrical)	Defects in materials or workmanship covered for a period of 1 year from date of original retail purchase
Towers	Defects in materials or workmanship covered for a period of 1 year from date of original retail purchase
Graphics	Defects in materials or workmanship covered for a period of 1 year from date of installation in boat

7. **EXCLUSIONS FROM WARRANTY COVERAGE**. The limited warranties of Crownline/Finseeker set forth in paragraphs 1 through 6 above do not apply to:
   a. Engines, engine parts, outdrives, controls, propellers, instruments, fuel tanks, pumps, controls and any other equipment or boat accessory not manufactured by Crownline/Finseeker. Windshield damage or breakage is also excluded from Crownline/Finseeker's limited warranties.
   b. Any fiberglass product not manufactured by Crownline/Finseeker.
   c. Exterior gelcoat surfaces including, but not limited to, cracking, crazing, discoloration, blistering, chalking or fading, except only as provided in paragraphs 4 and 5 above.
   d. Damage or effects of damage caused by the installation of engines, outdrives, propellers, instruments, fuel tanks, pumps, controls, generators, air conditioners, batteries and other equipment and accessories installed by anyone other than Crownline/Finseeker.
   e. Any boat damaged by accident or 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.
   f. Any boat which has been misused or altered, used in a negligent manner, used for racing, used for rental or commercial purposes, operated contrary to any instructions furnished by Crownline/Finseeker, or operated in violation of any federal, state, coast guard or other governmental agency laws, rules or regulations, or any boat that has been overloaded or overpowered, or damaged due to unusual attitudes or impact.
   g. Normal wear, tear, deterioration (including rust) of hardware, vinyl coverings, vinyl and fabric upholstery, plastic, stainless steel and other metal, wood and trim tape.
   h. Any defect caused by the failure of the boat owner to provide reasonable care and maintenance.
   i. Water damage to, dry rot to, condensation to, or absorption by interior surfaces, wood structures or polyurethane foam.
   j. Costs or charges due to inconvenience 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.

8. **CONDITIONS TO WARRANTY COVERAGE.** The following are conditions to the availability of any benefits under the foregoing limited warranties:
   a. The warranty registration card must be completed and returned to Crownline/Finseeker within fifteen (15) days after the purchase of the boat by the original retail purchaser.
   b. No warranty coverage is provided for defects not reported to Crownline/Finseeker within the applicable warranty period.

c. Crownline/Finseeker must be given written notice within thirty (30) days from the date the defect was or should have been discovered. Notice must be sent to: CROWNLINE/FINSEEKER BOATS, ATTN: CUSTOMER SERVICE DEPARTMENT, 11884 COUNTRY CLUB ROAD, WEST FRANKFORT, IL 62896, FAX: (618) 937-2277.

d. Crownline/Finseeker will not repair any condition or replace any parts: (1) if use of the boat is continued after the defect is or should have been discovered; and (2) such continued use causes other or additional damage.

e. PURCHASER must deliver the boat at the PURCHASER'S expense to Crownline/Finseeker (at the above address) or to such other authorized facility as Crownline/Finseeker in its sole discretion may direct. PURCHASER must pay the freight for return of the boat to PURCHASER from the specified location after inspection and repair or replacement has been completed.

9. **Crownline/Finseeker** will discharge its obligations under this warranty as rapidly as possible, but cannot guarantee any specified completion date due to the different nature of claims that may be made and services that may be required.

10. **If the Crownline/Finseeker boat** owner believes a claim has been denied in error or that Crownline/Finseeker or its dealer has performed the warranty work in an unsatisfactory manner, the owner must notify Crownline/Finseeker's Customer Service Department in writing at the address listed in paragraph 8c above for further consideration. Crownline/Finseeker will then review the claim and take appropriate follow-up action.

11. **By accepting delivery** of the boat covered by this limited warranty, the PURCHASER and any subsequent owner of the boat agree as follows:

ANY LAWSUIT OR ARBITRATION REQUEST FOR ANY BREACH OF WARRANTY (EXPRESS OR IMPLIED) AGAINST CROWNLINE/FINSEEKER MUST BE FILED WITHIN ONE (1) YEAR AFTER THE CAUSE OF ACTION HAS ACCRUED (REGARDLESS OF THE TIME REMAINING IN THE WARRANTY PERIOD). ANY LAWSUIT MUST BE FILED IN FRANKLIN COUNTY, ILLINOIS. IN THE EVENT OF ANY DISPUTE BETWEEN THE BOAT OWNER AND CROWNLINE/FINSEEKER INCLUDING, WITHOUT LIMITATION, ANY DISPUTE ARISING FROM OR RELATED TO THIS LIMITED WARRANTY, THE BOAT AND COMPONENT PARTS COVERED BY THIS LIMITED WARRANTY AND/OR THE SCOPE OF THE ARBITRATION AGREEMENT UNDER THIS PARAGRAPH 11, EITHER THE BOAT OWNER OR CROWNLINE/FINSEEKER MAY CHOOSE TO HAVE SUCH DISPUTE RESOLVED BY BINDING ARBITRATION BY THE NATIONAL ARBITRATION FORUM UNDER ITS CODE OF PROCEDURE THEN IN EFFECT. THE ELECTION TO ARBITRATE MAY BE MADE AT ANY TIME BY EITHER PARTY MAILING OR PERSONALLY DELIVERING WRITTEN NOTICE OF SUCH ELECTION TO THE OTHER PARTY BUT NO LATER THAN THIRTY (30) DAYS AFTER THE ELECTING PARTY'S RECEIPT OF SUMMONS IN THE EVENT A LAWSUIT IS FILED BY THE OTHER PARTY.

ANY AWARD OF THE ARBITRATOR(S) MAY BE ENTERED AS A JUDGMENT IN ANY COURT HAVING JURISDICTION AND SHALL BE FINAL AND NON-APPEALABLE. IN THE EVENT A COURT HAVING JURISDICTION FINDS ANY PORTION OF THIS ARBITRATION AGREEMENT UNENFORCEABLE, THAT PORTION SHALL NOT BE EFFECTIVE AND THE REMAINDER OF THE ARBITRATION AGREEMENT SHALL REMAIN EFFECTIVE. INFORMATION REGARDING THE PROCEDURE FOR ARBITRATION MAY BE OBTAINED AT ANY OFFICE OF THE NATIONAL ARBITRATION FORUM, WWW.ARBITRATION-FORUM.COM, OR AT P. O. BOX 50191, MINNEAPOLIS, MINNESOTA 55405. UNLESS THE PARTIES MUTUALLY AGREE UPON A DIFFERENT LOCATION, THE ARBITRATION HEARING SHALL BE HELD AT A LOCATION SPECIFIED BY CROWNLINE/FINSEEKER IN ST. LOUIS, MO. IN THE EVENT OF ANY CONFLICT OR INCONSISTENCY BETWEEN THE TERMS OF THIS ARBITRATION AGREEMENT AND THE NATIONAL ARBITRATION FORUM'S CODE OF PROCEDURE THEN IN EFFECT, THE TERMS OF THIS ARBITRATION AGREEMENT SHALL PREVAIL AND BE CONTROLLING. THE PARTIES AGREE THAT THE TRANSACTION BETWEEN THEM INVOLVES INTERSTATE COMMERCE AND THAT THIS ARBITRATION AGREEMENT SHALL BE SUBJECT TO AND GOVERNED BY THE FEDERAL ARBITRATION ACT, 9 U.S.C., SECTIONS 1-16.

IF YOU DO NOT AGREE TO THE FOREGOING DISPUTE RESOLUTION METHOD, YOU MUST NOTIFY CROWNLINE/FINSEEKER IN WRITING AND RETURN THE BOAT COVERED BY THIS WARRANTY WITHIN FIFTEEN (15) DAYS AFTER TAKING DELIVERY OF THE BOAT.

12. Except only as provided in paragraphs 3, 4 and 5 above, the enforceability of this limited warranty is limited solely to the original retail purchaser of the boat covered by this limited warranty, and is not extended to, nor enforceable by any other person.
13. **ALL GENERAL, SPECIAL, INDIRECT, INCIDENTAL AND/OR CONSEQUENTIAL DAMAGES ARE EXCLUDED FROM THIS WARRANTY AND ARE HEREBY DISCLAIMED BY CROWNLINE/FINSEEKER.** Some States do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.
14. **THIS IS A LIMITED WARRANTY. CROWNLINE/FINSEEKER MAKES NO WARRANTIES OTHER THAN THOSE CONTAINED HEREIN. ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURCHASE ARISING IN STATE LAW WITH RESPECT TO ANY COMPONENT OR PART OF THE BOAT IS LIMITED TO THE DURATION OF THE LIMITED WARRANTY APPLICABLE TO SUCH COMPONENT OR PART, AS SET FORTH ABOVE. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.**
15. This warranty gives you specific legal rights, and you may also have other rights which vary from State to State.

16. **All obligations** of Crownline/Finseeker are specifically set forth herein. Crownline/Finseeker does not authorize any person (including agents, employees and dealers of Crownline/Finseeker) to bind Crownline/Finseeker to any warranty concerning its boats, other than as herein stated, or to assume any liability in connection with boats manufactured by Crownline/Finseeker. Crownline/Finseeker's obligation with respect to this limited 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 for sale of any boat manufactured by Crownline/Finseeker. **Crownline/Finseeker shall have the sole right and discretion to determine whether to repair or replace any defective parts or components covered by this limited warranty.**
17. Due to a continuing program of product development and improvement, Crownline/Finseeker reserves the right to change or improve the design of its boats without obligation to modify any boat previously manufactured and also reserves the right to change specifications, features and prices without prior notice.
18. No brochure, pamphlet or other written or pictorial presentation constitutes a warranty or representation as to any aspect of Crownline/Finseeker's boats or products.
19. Except as provided in paragraph 11 above, this limited warranty and the provisions set forth herein shall be governed by and construed in accordance with the laws of the State of Illinois.
20. This limited warranty applies only to 2019 model year boats manufactured by Crownline/Finseeker.
21. **These warranties apply to North America only.**

*__EXCEPTIONS TO WARRANTY COVERAGE:__ Warranty coverage is terminated for used product repossessed from a retail customer, purchased at auction, from a salvage yard, or from an insurance company that obtained the product as a result of an insurance claim. Severely limited warranty coverage applies to any product used as a rental.

***** Any items not specifically listed or mentioned in this warranty will be subject to a one year warranty. *****

CROWNLINE/FINSEEKER BOATS
11884 Country Club Road
West Frankfort, IL 62896
(618) 937-6426

2020 SPECIFICATIONS

SS Series

Specifications	205SS	215SS	225SS	235SS	255SS	265SS	280SS	290SS
Length Overall (LOA)	19' 11" (6.07 m)	21' 5" (6.53 m)	22' 3" (6.78 m)	23' 5" (7.14 m)	25' 2" (7.67 m)	26' 3" (8.0 m)	27' 11" (8.51 m)	28' 8" (8.74 m)
Overall Length w/Swim Platform	21' 9" (6.63 m)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Beam	96" (2.44 m)	8' 6" (2.59 m)	8' 6" (2.59 m)	8' 6" (2.59 m)	8' 6" (2.59 m)	8' 6" (2.59 m)	8' 6" (2.59 m)	8' 6" (2.59 m)
Deadrise	18	16	16	16	16	19	19	19
Angle of Entry at Bow	28	37	32	32	27	33	33	33
Maximum Dry Weight	3,945 lb (1,789 kg)	4,300 lb (1,950 kg)	4,726 lb (2,144 kg)	5,011 lb (2,273 kg)	5,664 lb (2,569 kg)	5,842 lb (2,650 kg)	6,100 lb (2,767 kg)	6,350 lb (2,880 kg)
Fuel Capacity	41 gal (155 L)	45 gal (170 L)	45 gal (170 L)	45 gal (170 L)	55 gal (208 L)	55 gal (208 L)	78 gal (295 L)	78 gal (295 L)
Water Capacity	8.5 gal (32 L)	8.5 gal (32 L)	8.5 gal (32 L)	8.5 gal (32 L)	15 gal (57 L)	15 gal (57 L)	15 gal (57 L)	15 gal (57 L)
Waste Capacity	N/A	N/A	N/A	N/A	15 gal (57 L)	15 gal (57 L)	15 gal (57 L)	15 gal (57 L)
Maximum Capacity USA	1,280 lb (581 kg)	1,530 lb (694 kg)	1,442 lb (654 kg)	1,650 lb (748 kg)	1,828 lb (829 kg)	Yacht	Yacht	Yacht
Person Capacity USA	9	10	10	11	12	Yacht	Yacht	Yacht
Maximum Power	250 hp (187 kW)	300 hp (244 kW)	350 hp (261 kW)	430 hp (321 kW)	430 hp (321 kW)	430 hp (321 kW)	430 hp (321 kW)	430 hp (321 kW)

E Series

Specifications	E235 / E235 SURF	E255 / E255 SURF	E275 / E275 SURF	E285	E305 Single	E305 Twin
Length Overall (LOA)	23' 0" (7.01 m)	25' 3" (7.70 m)	26' 10" (8.18 m)	27' 10" (8.48 m)	30' 0" (9.14 m)	30' 0" (9.14 m)
Beam	8' 6" (2.59 m)	8' 6" (2.59 m)	8' 6" (2.59 m)	8' 6" (2.59 m)	9' 2" (2.79 m)	9' 2" (2.79 m)
Deadrise	16	19	19	19	19	19
Angle of Entry at Bow	29	32	32	32	31	31
Maximum Dry Weight	5,090 lb (2,309 kg)	5,701 lb (2,586 kg)	6,031 lb (2,736 kg)	6,388 lb (2,898 kg)	8,526 lb (3,867 kg)	9,100 lb (4,128 kg)
Fuel Capacity	37 gal (140 L)	55 gal (208 L)	55 gal (208 L)	78 gal (295 L)	144 gal (545 L)	144 gal (545 L)
Water Capacity	15 gal (57 L)	15 gal (57 L)	15 gal (57 L)	16 gal (57 L)	15 gal (57 L)	15 gal (57 L)
Waste Capacity	15 gal (57 L)	15 gal (57 L)	15 gal (57 L)	15 gal (57 L)	15 gal (57 L)	15 gal (57 L)
Maximum Capacity USA	1,733 lb (786 kg)	1,736 lb (787 kg)	Yacht	Yacht	Yacht	Yacht
Person Capacity USA	12	13	Yacht	Yacht	Yacht	Yacht
Maximum Power	350 hp (261 kW)	380 hp (283 kW)	430 hp (321 kW)	430 hp (321 kW)	430 hp (321 kW)	700 hp (422 kW)

XS/XSS Series

Specifications	19XS	E205XS	E215XS	E235XS	E255XS	E275XS
Length Overall (LOA)	19' 0" (5.79 m)	20' 4" (6.2 m)	21' 2" (6.45 m)	22' 11" (6.99 m)	25' 2" (7.67 m)	26' 9" (8.15 m)
Beam	7' 8" (2.34 m)	8' 6" (2.59 m)	8' 6" (2.59 m)	8' 6" (2.59 m)	8' 6" (2.59 m)	8' 6" (2.59 m)
Deadrise	18	16	19	16	19	19
Angle of Entry at Bow	37	27	28	29	32	32
Maximum Dry Weight	2,850 lb (1,293 kg)	3,728 lb (1,691 kg)	4,060 lb (1,842 kg)	4,503 lb (2,043 kg)	5,271 lb (2,391 kg)	5,410 lb (2,454 kg)
Fuel Capacity	23 gal (87 L)	43 gal (163 L)	45 gal (170 L)	55 gal (208 L)	55 gal (208 L)	78 gal (295 L)
Water Capacity	N/A	N/A	15 gal (57 L)	15 gal (57 L)	15 gal (57 L)	15 gal (57 L)
Waste Capacity	N/A	N/A	N/A	15 gal (57 L)	15 gal (57 L)	15 gal (57 L)
Maximum Capacity USA	1,805 lb (819 kg)	2,140 lb (971 kg)	2,370 lb (1,075 kg)	2,620 lb (1,188 kg)	2,905 lb (1,318 kg)	Yacht
Person Capacity USA	8	10	11	12	13	Yacht
Maximum Power	175 hp (130 kW)	200 hp (149 kW)	250 hp (186 kW)	300 hp (224 kW)	350 hp (261 kW)	350 hp (261 kW)

Specifications	E285XS	255XSS	270XSS	280XSS	290XSS	E305XS
Length Overall (LOA)	27' 9" (8.46 m)	25' 1" (7.65 m)	26' 9" (8.15 m)	27' 10" (8.48 m)	28' 7" (8.71 m)	29' 0" (8.84 m)
Beam	8' 6" (2.59 m)	8' 6" (2.59 m)	8' 6" (2.59 m)	8' 6" (2.59 m)	8' 6" (2.59 m)	9' 2" (2.79 m)
Deadrise	19	16	19	19	19	19
Angle of Entry at Bow	32	27	33	33	33	31
Maximum Dry Weight	5,705 lb (2,588 kg)	TBD	5,700 lb (2,585 kg)	5,850 lb (2,654 kg)	5,832 lb (2,645 kg)	8,175 lb (3,708 kg)
Fuel Capacity	78 gal (295 L)	55 gal (208 L)	78 gal (295 L)	78 gal (295 L)	78 gal (295 L)	144 gal (545 L)
Water Capacity	15 gal (57 L)	15 gal (57 L)	15 gal (57 L)	15 gal (57 L)	15 gal (57 L)	15 gal (57 L)
Waste Capacity	15 gal (57 L)	15 gal (57 L)	15 gal (57 L)	15 gal (57 L)	15 gal (57 L)	15 gal (57 L)
Maximum Capacity USA	Yacht	TBD	Yacht	Yacht	Yacht	Yacht
Person Capacity USA	Yacht	TBD	Yacht	Yacht	Yacht	Yacht
Maximum Power	350 hp (261 kW)	350 hp (261 kW)	350 hp (261 kW)	350 hp (261 kW)	350 hp (261 kW)	700 hp (422 kW)

FINSEEKER

Specifications	200CC	206CC	220CC	230CC
Length Overall (LOA)	20' 6" (6.25 m)	20' 6" (6.25 m)	21' 7" (6.58 m)	22' 7" (6.88 m)
Beam	8' 6" (2.59 m)	8' 6" (2.59 m)	8' 6" (2.59 m)	8' 6" (2.59 m)
Deadrise	17	17	19	19
Angle of Entry at Bow	38	38	38	38
Maximum Dry Weight	4,202 lb (1,906 kg)	4,202 lb (1,906 kg)	4,778 lb (2,167 kg)	4,876 lb (2,212 kg)
Fuel Capacity	75 gal (284 L)	75 gal (284 L)	105 gal (397 L)	105 gal (397 L)
Water Capacity	8.5 gal (32 L)	8.5 gal (32 L)	8.5 gal (32 L)	8.5 gal (32 L)
Maximum Capacity USA	2,183 lb (990 kg)	2,183 lb (990 kg)	2,365 lb (1,073 kg)	2,565 lb (1,163 kg)
Person Capacity USA	9	9	11	11
Maximum Power	225 hp (168 kW)	225 hp (168 kW)	300 hp (224 kW)	300 hp (224 kW)

CR-SY Series

Specifications	264CR	294CR SGL	294CR TWIN	350SY
Length Overall (LOA)	26' 4" (8.02 m)	29' 6" (8.99 m)	29' 6" (8.99 m)	36' 0" (11 m)
Beam	8' 6" (2.59 m)	9' 8" (2.95 m)	9' 8" (2.95 m)	11' 11" (3.6 m)
Deadrise	17	17	17	18
Angle of Entry at Bow	38	34	34	37
Maximum Dry Weight	7,559 lb (3,429 kg)	9,570 lb (4,341 kg)	10,516 lb (4,770 kg)	16,300 lb (7,394 kg)
Fuel Capacity	75 gal (284 L)	105 gal (397 L)	105 gal (397 L)	193 gal (731 L)
Water Capacity	26 gal (98 L)	26 gal (98 L)	26 gal (98 L)	38 gal (144 L)
Gray Water Capacity	21 gal (79 L)	25 gal (95 L)	25 gal (95 L)	25 gal (95 L)
Waste Capacity	25 gal (95 L)	25 gal (95 L)	25 gal (95 L)	35 gal (132 L)
Maximum Capacity USA	Yacht	Yacht	Yacht	Yacht
Person Capacity USA	Yacht	Yacht	Yacht	Yacht
Maximum Cabin Height	72.5" (1.84 m)	6' 3" (1.9 m)	6' 3" (1.9 m)	6' 6" (1.98 m)
Maximum Power	430 hp (321 kW)	430 hp (321 kW)	600 hp (447 kW)	860 hp (642 kW)

BOAT INFORMATION FORM

BOAT	
Boat Manufacturer:	
Hull Colors:	
Weight:	
Length:	
Draft:	
Beam:	
Vertical Clearance:	
Dealer:	
Dealer Representative:	
Dealer Phone:	
Boat Model:	
Hull ID Number (HIN):	
Registration Number:	
Registration State:	
Purchase Date:	
Delivery Date:	
Warranty Expiration Date:	
Manufacturer Representative:	
Manufacturer Phone:	
ENGINE, DRIVE AND PROPELLER	
Engine Make:	
Engine Model Number:	
Engine Serial Number:	
Ignition Key Number:	
Drive Make:	
Drive Model Number:	
Drive Serial Number:	
Propeller	**Make/Type:**
	Size/Material:
	Part Number:
SYSTEMS	
Fuel Filter Part Number:	
Battery Make:	
Battery Size:	

TRAILER	
Trailer	Make:
	Model Number:
	Serial Number:
	GVWR:
	Tire Size:
ACCESSORIES	
Manufacturer:	
Model:	
Serial Number:	
Manufacturer:	
Model:	
Serial Number:	
Manufacturer:	
Model:	
Serial Number:	
Manufacturer:	
Model:	
Serial Number:	
Manufacturer:	
Model:	
Serial Number:	

VENDOR SUPPLIER LIST

This is a list of some of the quality products used to build your CROWNLINE/ FINSEEKER. This list will also help you identify or contact the supplier in the event questions arise.

Item Description	Supplier	Website
Air Conditioners	Dometic	www.dometicusa.com
Battery Switch	Perko	www.perko.com
Bilge Pumps	Rule	www.rule-industries.com
Canvas	Great Lakes	www.greatlakesboattop.com
Carbon Monoxide Detector	MTI Industries	www.mtiindustries.com
Compass	Ritchie	www.ritchienavigation.com
Depth Sounder	Veethree	www.v3instruments.com
Display (MFD)	Garmin	www.garmin.com
Engine	Mercury	www.mercurymarine.com
Engine	Suzuki	www.suzukimarine.com
Engine	Volvo Penta	www.volvo.com
Engine	Yamaha	www.yamahaoutboards.com
Engine Extended Warranty	BPPC	www.boatwarranty.com
Exhaust	Corsa Exhaust	www.corsaperf.com
Fire Extinguisher	Kidde	www.kidde.com
Fire Extinguishers	Fireboy-Xintex	www.fireboy-xintex.com
Galvanic Isolators	DEI Products	www.dairyland.com
Generators	Kohler	www.kohlerpower.com
Gelcoat	Cook Composites	www.ccponline.com
Navigation Light	Attwood	www.attwoodmarine.com
Navigation Light	Perko	www.perko.com
Seat Slide	Springfield	www.springfieldgrp.com
Shipping Covers	Transhield	www.transhield-usa.com
Shore Power	Marinco	www.marinco.com
Steering	SeaStar	www.seastarsolutions.com
Stereos and Speakers	Kicker	www.kicker
	Wet Sounds	www.wetsounds.com
Stoves	Kenyon	www.kenyonappliance.com
Toilet	Johnson Pump	www.johnson-pump.com
	SeaLand	www.dometicusa.com
Trim Tabs	Lenco	www.lencomarine.com
Vinyl	Spradling	www.spradlingvinyl.com
Wash-Down Pump	Shurflo	www.shurflo.com
Windlass	Lewmar	www.lewmar.com
Windshields	Taylor Made	www.taylormadeproducts.com
	Pacific Coast Marine Windshields	www.pcmw.ca

NOTES

The popularity of boating and other water sports has undergone an explosion of growth in the past few years, making safety an important issue for everyone who shares in the use of the waterways.

⚠WARNING ***Operation Hazard: Read and understand this Basic Boating and Safety Manual, the Engine Operator's Manual and all manufacturer-supplied information regarding the operation of equipment. The boat operator must understand all safety information responsibilities, regulations, controls and operating instructions before attempting to operate the boat. Improper operation could result in death or serious injury.***

The safety content and precautions listed in this manual and on the boat are not all-inclusive. If a procedure, method, tool or part is not specifically recommended, the operator must feel confident that it is safe for them and others, and that the boat will not be damaged or become unsafe as a result of the operator's decision. REMEMBER – ALWAYS ASSESS EACH SITUATION AND USE SOUND JUDGMENT!

The boat operator is responsible for their own safety, as well as that of passengers and other boaters.

GOOD BOATING PRACTICES

Boating-related accidents are generally caused by the operator's failure to follow basic safety rules or written precautions. Most accidents can be avoided if the operator is completely familiar with the boat, its operation and the navigational rules of the road and can recognize potentially hazardous situations.

In addition to everyday safety, failure to observe safety recommendations may result in severe personal injury or death to the operator or to others. Use caution and sound judgment when operating the boat. Do not take unnecessary chances! Failure to adhere to these warnings could result in death or severe injury to the operator and/or others.

Boats less than 26 feet in length have a capacity label at the helm area. Do not exceed the posted maximum person or weight capacities.

Read this entire manual and be aware of other specific safety guidelines not listed in this manual. Seek additional safety information from the USCG and state and local authorities. In addition to specific safety statements noted in this manual, a general list of safety guidelines and recommendations is listed below:

- The boat must comply with USCG safety equipment regulations.
- Before each outing, check all safety equipment such as fire extinguishers, life jackets, flares, distress flags, flashlights and engine emergency stop switch. Make sure they are operable, in good condition, readily visible and easily accessed.
- Onboard equipment must always conform to the governing federal, state and local regulations.

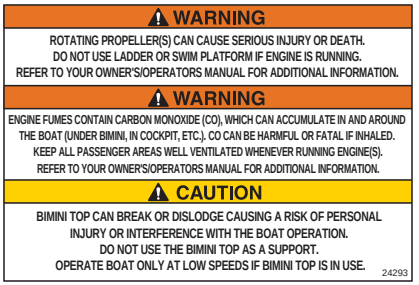
- Never allow any type of spark or open flame on board. It may result in fire or explosion.
- Take the keys/FOBs when leaving the boat to keep untrained and unauthorized persons from operating the boat.
- Know how to react correctly to adverse weather conditions, have good navigation skills and follow navigational rules as defined by USCG, state and local regulations.
- Check local weather reports before casting off. Do not leave the dock area when strong winds and electrical storms are in the area or predicted to be in the area.
- Seek shelter from open water if lightning is an imminent threat.
- Tell someone of the travel plans before departing.
- Know the weight capacity of the boat. Never overload the boat.
- Never operate the boat while under the influence of drugs or alcohol.
- Look before turning the boat. The boater is obligated to maintain a course and speed unless it is safe to alter course and speed. Look before turning.
- Operators must read and understand all operating manuals supplied with the boat before operation.
- Whenever planning an outing, make sure that at least one passenger is familiar with the operation and safety aspects of the boat in case of emergency.
- Passengers should avoid obstructing the operator's view.
- Show all passengers the location of emergency equipment and explain how to use it.
- Never allow passengers to drag their feet or hands in the water, or sit on the bow, bow pulpit, deck or gunwale while the engine is running.
- Never use or hold on to the boarding platform while the engine is running.
- Never stand or allow passengers to stand in the boat or sit on the transom, seat backs, engine cover or sides of the boat while the engine is running. The operator or others may be thrown from the boat.
- Children and nonswimmers must wear a life jacket at all times.
- Never leave children in the boat without adult supervision.
- Improper operation of the boat is extremely dangerous.
- Securely attach the engine emergency stop switch lanyard to a part of your clothing, such as a belt loop, when operating the boat.
- Operate slowly in congested areas such as marinas and mooring areas.
- The foredeck may be slippery. Do not go forward while the engine is running.
- Slow down when crossing waves or wake in order to minimize the impact on passengers and the boat.
- Never replace the boat's marine parts with automotive parts (if applicable).
- Never remove or modify any components of the fuel system. Always have qualified personnel perform fuel system maintenance. Tampering with fuel components may cause a hazardous condition.

- Avoid contact with engine exhaust gases—engine exhaust contains carbon monoxide.
- Never operate the engine in a confined space.
- Never go under the boat cover with the engine running or shortly after the engine has been running.
- Allow adequate ventilation with fresh air before entering any enclosed areas.
- Watch for other boats, swimmers and obstructions in the water. Stay away from other boats and personal watercraft (PWCs).
- Never swim near a boat when the engine is running. Even if the boat is in the NEUTRAL position, the propeller may still be turning and carbon monoxide may be present.
- Never dive from the boat without being absolutely sure of the depth of the water; severe injury or death may occur from striking the bottom or submerged objects.
- Never wrap ski lines or mooring lines around any body part. You could become entangled in the line if you fall overboard while the boat is moving.
- Keep track of ski lines and dock lines so they do not become entangled in the propeller.
- Have an experienced operator at the helm and always have at least three people present for safe towing—one to drive, one to observe, and one to ski or ride.

SAFETY DECALS AND STATEMENTS

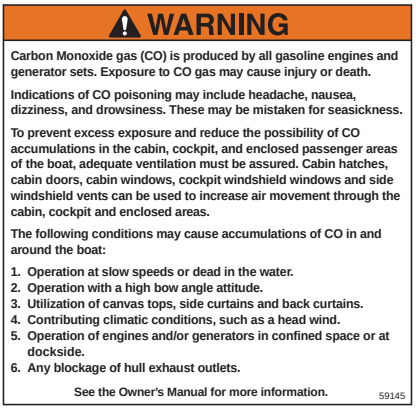
Safety Decals

The boat is affixed with various hazard and safety decals at the time of manufacture. These decals appear in specific locations on the boat and on equipment where safety is of particular concern. All operators of the boat must read and understand all hazard and safety decals and advise all passengers on the safety concerns and proper practices. Hazard and safety decals must remain legible. If the operator suspects a decal is missing or damaged they should contact the dealer for immediate replacement.



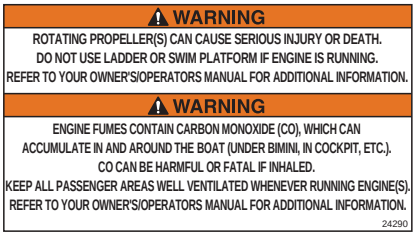
CRO_080

Helm



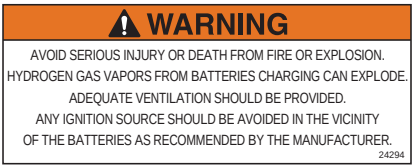
CRO_081

Head Compartments



CRO_082

Ladder/Transom

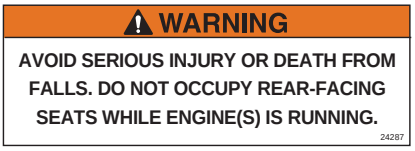


CRO_083

Battery Charger

CRO_084

Transom Gate



CRO_085

Rear-facing Seats

⚠ WARNING

TO MINIMIZE SHOCK AND FIRE HAZARDS:

1. TURN OFF THE BOAT'S SHORE CONNECTION SWITCH BEFORE CONNECTING OR DISCONNECTING SHORE CABLE.
2. CONNECT SHORE POWER CABLE AT THE BOAT FIRST.
3. IF POLARITY WARNING INDICATOR IS ACTIVATED, IMMEDIATELY DISCONNECT CABLE.
4. DISCONNECT SHORE POWER CABLE AT SHORE OUTLET FIRST.
5. CLOSE THE SHORE POWER INLET COVER TIGHTLY.

59146

CRO_086

Shore Power Inlet

⚠ WARNING

DO NOT STORE FUEL OR FLAMMABLE LIQUIDS HERE.

VENTILATION HAS NOT BEEN PROVIDED FOR EXPLOSIVE VAPORS

91340

CRO_087

Outboards – Large Aft Storage Areas

⚠ WARNING

AVOID SERIOUS INJURY OR DEATH FROM FALLS

- **DO NOT OCCUPY FOREDECK WHILE UNDERWAY**
- **CLOSE AND LATCH DOOR BEFORE USING STEPS**
- **FACE THE STEPS WHILE ASCENDING AND DESCENDING**

44265

CRO_088

Cabin Boats – Foredeck

⚠ WARNING

AVOID SERIOUS INJURY OR DEATH FROM FIRE OR EXPLOSION RESULTING FROM LEAKING FUEL. INSPECT SYSTEM FOR LEAKS AT LEAST ONCE A YEAR.

33061

CRO_089

Engine Compartment

⚠ WARNING

AVOID SERIOUS OR FATAL INJURY FROM FALLS. DO NOT OCCUPY SEAT WHEN SPEED EXCEEDS 5 M.P.H.

24292

CRO_090

Center Bow Seat

⚠ WARNING

AVOID SERIOUS INJURY OR DEATH FROM FIRE OR EXPLOSION. GASOLINE VAPORS CAN EXPLODE.

- **BEFORE FUELING, STOP ENGINE, EXTINGUISH ALL FLAMES AND SOURCES OF IGNITION.**
- **KEEP BOAT LEVEL AND DO NOT OVERFILL.**
- **REGULARLY INSPECT FUEL SYSTEM FOR LEAKS, REFER TO THE OWNER'S/OPERATOR'S MANUAL FOR ADDITIONAL INFORMATION.**

24291

CRO_091

Fuel Fill

⚠ WARNING

AVOID SERIOUS INJURY OR DEATH FROM FIRE OR EXPLOSION. GASOLINE VAPORS CAN EXPLODE. BEFORE STARTING ENGINE, OPERATE BLOWER FOR 5 MINUTES AND CHECK ENGINE COMPARTMENT BILGE FOR GASOLINE VAPORS.

24295

CRO_092

Ignition Panel

Safety Statements

There is no substitute for sound judgment and careful practices. Improper practices or carelessness can cause burns, cuts, mutilation, asphyxiation, other bodily injury or death. This information contains general safety precautions and guidelines that must be followed to reduce risk to personal safety. Special safety precautions are listed in specific procedures. Read and understand all of the safety precautions before operation or performing repairs or maintenance.

NOTE — This safety alert symbol appears with most safety statements. It means attention, become alert, your safety is involved! Please read and abide by the message that follows the safety alert symbol.

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

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

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

NOTICE *Indicates a situation that can cause damage to the boat and accessories and/or the environment, or cause the equipment to operate improperly.*

Safety Precautions

⚠ DANGER ***The safety messages that follow have DANGER level hazards. These safety messages describe hazardous situations that, if not avoided, will result in death or serious injury.***

Training Hazard: Do not permit anyone to launch, operate or retrieve the boat without proper training.

- ***Read and understand this Basic Boating and Safety Manual and all manufacturer-supplied information before operating or servicing the boat to ensure that you follow safe operating practices and maintenance procedures.***
- ***Safety signs and decals are additional reminders for safe operating and maintenance techniques.***
- ***See the boat dealer for additional training.***

Exhaust Hazard: Carbon monoxide (CO) is a colorless and odorless gas produced by all engines, fuel-burning appliances and any material that contains carbon and is burned. Direct or prolonged exposure to carbon monoxide will cause brain damage or death.

Electrocution Hazard: Docks and other boats nearby can carry sources of electricity. Faulty wiring or the use of damaged electrical cords and other devices not approved as "shore or marine rated" can cause the surrounding water source to become energized from electricity leakage. Never enter the water or swim in a marina.

⚠ WARNING ***The safety messages that follow have WARNING level hazards. These safety messages describe hazardous situations that, if not avoided, could result in death or serious injury.***

Fire/Explosion Hazard: Gasoline is extremely flammable and highly explosive under certain conditions.

- ***Compartments for fuel, flammable liquids or gases must be properly ventilated to prevent explosive vapors from accumulating. Most vapors are heavier than air and will accumulate in the bilge, posing a fire and explosion hazard.***
- ***Inspect fuel system for leaks at least once a year.***

Fire/Explosion Hazard: Hydrogen gases produced by a lead-acid battery while it is charging, or the engine is running, can cause an explosion and/or a fire.

- ***Always wear personal protective equipment when working on or around batteries.***
- ***Keep the area around the battery well-ventilated.***
- ***Do not smoke or bring an open flame or any other form of ignition near a battery.***
- ***Do not check for a dead battery by placing a metal object between the battery posts. Sparks could cause an explosion.***
- ***Do not place your head directly above a battery when making or breaking electrical connections.***

Sever Hazard: Make sure nobody is near the propeller before starting the engine(s).

- ***Do not allow swimmers to approach or use the ladder when the engine is running.***
- ***The operator should walk to the stern and check the water for people near the propeller, as people in the water may not always be noticeable from the helm.***
- ***Turn off the engine(s) before allowing people to board or exit the boat. The propeller may continue rotating even when the engine is idling or in NEUTRAL.***
- ***Show passengers the location of the propeller and teach them to keep their distance from it at all times, even when the propeller is not in motion.***
- ***Show passengers the propeller warning labels around the boat and discuss propeller dangers.***
- ***Be particularly alert when boating in high-traffic areas and never operate in swimming zones.***
- ***Exercise caution when operating near boats that are towing skiers and tubers.***
- ***Never allow passengers to sit in areas where they could fall overboard, including the bow, gunwale, transom, seat backs, or other locations.***
- ***Carefully watch children aboard the boat at all times.***
- ***Instruct passengers on the rules for using the swim platform, boarding ladders and seats. If possible, instruct them to stay seated at all times while the boat is underway.***

Man Overboard Hazard: Always remain seated in the boat manufacturer's designated seating arrangement, use handholds and never block the view of the boat operator while underway. The boat's bow, gunwale, transom platform and seat backs are not intended for use while underway.

- ***If someone falls overboard, slowly turn the boat around while keeping an eye on the victim. Ask a passenger to help monitor the victim. Always STOP THE ENGINE before rescuing a victim from the water.***
- ***Never put the engine in REVERSE to retrieve a person from the water. Slowly circle back to the person again if necessary.***

Entanglement Hazard: Rotating or moving parts can entangle or sever body parts.

- ***Do not wear jewelry, unbuttoned cuffs, ties or loose-fitting clothing.***
- ***Tie long hair back when working near moving or rotating parts such as the flywheel or propeller shaft.***
- ***Keep hands, feet and tools away from all moving parts.***
- ***Keep all guards in place when the engine is operating.***
- ***Use caution when working with ski or mooring lines so they do not become entangled with the propeller.***

Exposure Hazard: Wear personal protective equipment, including appropriate clothing, gloves, work shoes, eye and hearing protection, as required by the current task.

Control Hazard: Do not operate the boat while you are under the influence of alcohol or drugs or if feeling ill. Federal laws prohibit operating a boat under the influence of alcohol or drugs. These laws are vigorously enforced.

⚠CAUTION ***The safety messages that follow have CAUTION level hazards. These safety messages describe hazardous situations that, if not avoided, could result in minor or moderate injury.***

Slip/Trip Hazard: Keep the boat free of water, oil, mud and other foreign matter. Do not wax deck and swim platform surfaces. Remove anything that creates slippery areas around the boat.

NOTICE *The safety messages that follow have NOTICE level hazards. These messages are used to indicate a situation that can cause damage to the boat and accessories and/or the environment, or cause the equipment to operate improperly.*

- *Unapproved modifications to the boat or systems may impair the boat's safety and performance characteristics and shorten the boat's life. Any alterations to the boat may void its warranty. Always consult the boat manufacturer before making modifications or adding equipment.*
- *ALWAYS be environmentally responsible. Follow the guidelines of the EPA or other governmental agencies for the proper disposal of hazardous materials such as engine oil and fuel. Consult the local authorities or reclamation facility.*

Carbon Monoxide (CO)

⚠ DANGER ***Exhaust Hazard: CO gas is colorless, odorless and extremely dangerous. All engines and fuel-burning appliances produce CO as exhaust. Direct and prolonged exposure to CO will cause brain damage or death. Always avoid exposing your passengers or yourself to CO.***

Even with the best boat design and construction, plus the utmost care in inspection, operation and maintenance, hazardous levels of CO may still be present in accommodation areas under certain conditions. To reduce CO accumulation, always provide adequate ventilation in the boat interior by opening the deck hatches, windows or canvas.

Do not confuse carbon monoxide poisoning with seasickness, intoxication or heat stress. If someone complains of irritated eyes, headache, nausea, weakness, dizziness or drowsiness, or you suspect carbon monoxide poisoning, immediately move the person to fresh air, investigate the cause and take corrective action. Seek medical attention if necessary.

Always use a CO detector in confined areas where there is a possibility of CO buildup, such as enclosed canvas, sleeping quarters, galleys and head compartments. Regularly check the condition of the CO detector for proper operation.

Test the carbon monoxide detector operation before each trip, at least once a week and after the boat has been in storage. Also have the CO detectors professionally tested at regular intervals. Most CO detectors are required to be replaced every 5 years – see the OEM manual.

In the Event of an Alarm

1. Operate reset/silence button.
2. Call your emergency services (fire department or 911).
3. Immediately move to fresh air – outdoors or by an open door/window. Check that all persons are present. Do not re-enter the premises or move away from the open door/window until emergency services responders have arrived, the premises have been aired out and alarm remains in its normal condition.
4. After following steps 1-3, if your alarm reactivates within a 24-hour period, repeat steps 1-3 and call a qualified appliance technician to investigate for sources of CO from fuel burning equipment and appliances, and inspect for proper operation of the equipment. If problems are identified during this inspection, have the equipment serviced immediately. Note any combustion equipment not inspected by the technician and consult the manufactures' instructions, or contact the manufacturers directly, for more information about CO safety and their equipment.

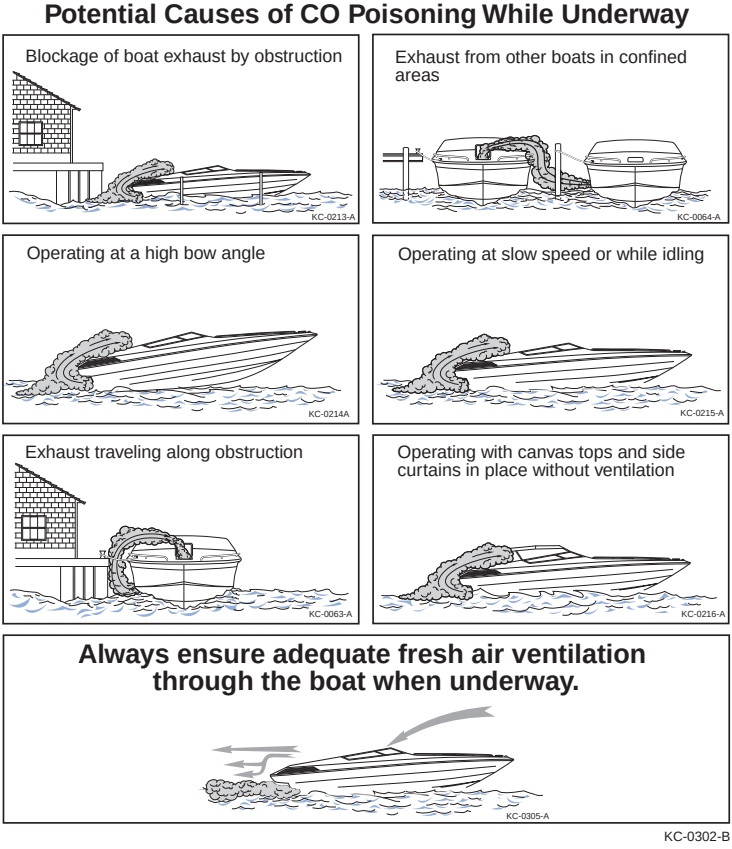


Figure 2-1: Causes of CO Poisoning

REQUIRED BOATING SAFETY EQUIPMENT AND REGULATIONS

U.S. Coast Guard Minimum Onboard Personal Safety Equipment Required (Your boat may be equipped with one or more requirements by the manufacturer.)

	LESS THAN 16 FT (4.9 M)	CLASS 1: 16 TO LESS THAN 26 FT (4.9 TO LESS THAN 7.9 M)	CLASS 2: 26 TO LESS THAN 40 FT (7.9 TO LESS THAN 12.2 M)	CLASS 3: 40 TO 65 FT (12.2 TO 19.8 M)
LIFE JACKETS AND PERSONAL FLOTATION DEVICES (PFDs)	One U.S. Coast Guard-approved Type I, II, III or V wearable life jacket for each person on board	One U.S. Coast Guard-approved Type I, II, III or V wearable life jacket for each person on board and one throwable Type IV PFD device		
VISUAL DISTRESS SIGNALING DEVICES	One (1) electric distress light OR three (3) day and night combination red flares	One orange distress flag or one electric distress light OR three floating or handheld orange smoke signals and one electric distress light OR three day and night combination red flares, handheld, parachute or meteor type		
AUDIBLE SIGNALING DEVICES	A boat less than 39.4 ft (12 m) must have on board and efficient sound-producing device. (Example: hand or mouth whistle OR a compressed or powered air horn)		A boat less than 39.4 ft (12 m) must have on board an efficient sound-producing device. (Example: hand or mouth whistle OR a compressed or powered air horn) A boat 39.4 ft (12 m) but less than 65.6 ft (20 m) in length operating in inland waterways must carry a power whistle OR powered air horn AND a bell	
NAVIGATION LIGHTS	Regulations require that navigational lights be clearly lit and properly displayed at all times between sunset and sunrise and always when operating in reduced visibility while boating			

	LESS THAN 16 FT (4.9 M)	CLASS 1: 16 TO LESS THAN 26 FT (4.9 TO LESS THAN 7.9 M)	CLASS 2: 26 TO LESS THAN 40 FT (7.9 TO LESS THAN 12.2 M)	CLASS 3: 40 TO 65 FT (12.2 TO 19.8 M)
FIRE EXTINGUISHERS	One B-I type (U.S. Coast Guard-approved) If the boat meets any one or more of the following conditions, the boat must carry one B-I type USCG-approved extinguisher on board: • Inboard/sterndrive engine powered • Has closed compartments where portable fuel tanks can be stored • Has double bottom construction that has areas where air or gases can be open or trapped • Has an enclosed living space • Has compartments where flammable, combustible or explosive materials are stored • Has permanent fuel tanks installed • Boat is 26 ft (7.9 m) or more in length		One B-II OR two B-I type (USCG-approved) (A fixed extinguishing system is equal to one B-I.)	One B-II AND one B-I OR three B-I type (USCG-approved) (A fixed extinguishing system is equal to one B-I OR two B-II.)

Fire Extinguisher

USCG-approved fire extinguishers are required on all Class I, II and III boats. Mount all handheld fire extinguishers in readily accessible areas away from the engine compartment and other combustible devices. All passengers must know the location and operating procedure of each extinguisher. Follow the manufacturer's instructions for proper use and operation of the fire extinguisher.

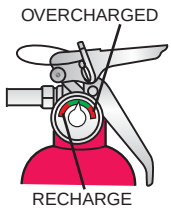


Figure 2-2: Fire Extinguisher

All fire extinguishers used on marine boats must be classified to extinguish type B fires (gasoline, oil or grease). The size and number of required fire extinguishers depend on the size of the boat. The two type B fire extinguishers commonly used are B-I and B-II. Type B fire extinguishers are classified by the different extinguishing compound amounts used in each.

Check the fire extinguisher condition and pressure gauge regularly, if not before every trip, to ensure that the fire extinguisher is in good operating condition and is fully charged. If the fire extinguisher is damaged or not properly pressurized, replace it.

See the ***U.S. Coast Guard Minimum Onboard Personal Safety Equipment Required section of this manual*** for specific onboard requirements.

Engine Emergency Stop Switch and Lanyard

The engine emergency stop switch, sometimes inaccurately called a kill switch, is an extremely important safety device. Use the engine emergency stop switch when operating the boat's engine. This safety device prevents the boat from becoming a runaway if the operator is accidentally thrown from the seat or away from the helm. The USCG recommends and many states require the use of the emergency stop switch by law. Check with local and state authorities about usage requirements to avoid potential fines.

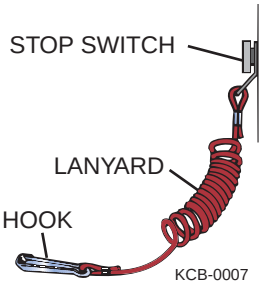


Figure 2-3: Emergency Stop Switch and Lanyard

⚠WARNING ***Control Hazard: Never remove or modify the engine emergency stop switch and/or lanyard.***

- ***Always check the switch for proper operation. With the engine running, pull the lanyard. If the engine does not stop, have the switch repaired before continuing to operate the boat. Never operate the boat if the engine emergency stop switch does not work.***
- ***Avoid accidentally pulling the cord lanyard during normal operation. Loss of engine power means loss of most steering control. Also, without engine power, the boat could slow rapidly. This could cause people and objects in the boat to be thrown forward.***

Life Jackets

Boaters enjoy the feel of sun and spray, so it's tempting to boat without wearing a life jacket, especially on nice days. However, the failure to wear life jackets is by far the number one cause of boating fatalities.

Modern life jackets are available in a wide variety of shapes, colors, sizes and technologies. Many are thin and flexible. Some are built right into fishing vests or hunter coats. Others are inflatable and as compact as a scarf or fanny pack until they hit water and automatically fill with air.

There's no excuse for not wearing a life jacket on the water. Boat dealers or marine stores are the best sources for guidance when selecting this most important piece of safety equipment.

Things to Know About Life Jackets:

- Certain life jackets are designed to keep the head above water and help you remain in a position that permits proper breathing.
- To meet USCG requirements, a boat must have a USCG-approved life jacket for each person aboard. Boats 16 feet and over must have at least one Type IV throwable device as well.
- All states have regulations regarding children wearing life jackets.
- Adult-sized life jackets will not work for children. Special life jackets for children are available. To work correctly, a life jacket must be worn, fit snugly and not allow the child's chin or ears to slip through.
- Life jackets can be equipped with whistles, strobe lights, handheld VHF radios and personal locator beacons.
- Life jackets are recommended for open water.
- Test life jackets for wear and buoyancy at least once each year. Discard waterlogged, faded or leaky jackets.
- Properly stow life jackets but make them easily accessible.
- A life jacket, especially a snug-fitting flotation coat or deck-suit style jacket, can help people survive in cold water.

Life Jackets Must Be:

- USCG-approved
- In good and serviceable condition
- Appropriately sized for the intended user
- The best life jacket is the one you will wear

Accessibility

- Wearable life jackets must be readily accessible.
- Boaters must be able to locate and put them on in a reasonable amount of time in an emergency.
- They should not be stowed in plastic bags, in locked or closed compartments or have other gear stowed on top of them.
- Throwable devices must be immediately available for use in emergency situations.
- Though not required, a life jacket should be worn at all times when the boat is underway. A life jacket can save a boater's life, but only if the boater wears it. Set the example and wear it whenever near the water.

Child Life Jacket Requirements

No person may operate a recreational boat underway with any child under 13 years old aboard unless each such child is either: (1) Wearing an appropriate PFD approved by the Coast Guard; or (2) Below decks or in an enclosed cabin.

Some states require that children wear life jackets at all times; check with the state boating safety authorities.

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

Child life jacket approvals are based on the child's weight. Check the "user weight" on the label, or the approval statement that will read something like "Approved for use on recreational boats and uninspected commercial boats not carrying passengers for hire, by persons weighing XX lbs." They can be marked "less than 30," "30 to 50," "less than 50," or "50 to 90."

Since children grow quickly, many boat launches now feature free use of children's life jackets in several different weight categories.

Life Jacket Requirements for Certain Boating Activities Under State Laws

The USCG recommends, and many states require, wearing USCG-approved life jackets:

- For waterskiing and other towed/surf activities, use a life jacket designed for waterskiing. **It is illegal in many states to participate in towed water sports without a USCG-approved life jacket. Be aware that some specialized water sports vests are NOT USCG-approved and should be worn in addition to a USCG-approved life jacket.**
- While operating personal watercraft (PWC) use a life jacket marked for PWC or waterskiing use.

Check with the state boating safety authorities. Other rules may apply if boating in an area under the jurisdiction of the Army Corps of Engineers or a federal, state or local park authority. Special local rules are usually posted at the boat launch.

Type I Life Jacket

This life jacket is designed so that the person wearing it turns to a face-up position when conscious or unconscious. Type I life jackets are the most buoyant and are effective on all waters, especially when rescue is delayed or flotation time is extended.

CRO_093

Figure 2-4: Type I Life Jacket

Type II Life Jacket

This life jacket is recommended for use in calm water near shore on most inland waters where quick rescue is likely. A Type II life jacket is similar to a Type I life jacket, but it is not as buoyant or effective in turning the wearer to a face-up position.

CRO_094

Figure 2-5: Type II Life Jacket

Type III Life Jacket

This life jacket is designed for personal buoyancy when the wearer is alert and conscious. Type III life jackets require users to turn themselves to a face-up position. Type III life jackets are recommended in most inland water applications where quick rescue is likely or when used in the presence of other people.

CRO_095

Figure 2-6: Type III Life Jacket

Type IV Personal Flotation Device

These PFDs are designed to be thrown to a person in the water who can grab and hold it while being rescued. Never wear a Type IV PFD.

CRO_096

Figure 2-7: Type IV Life Jacket

Type V Life Jacket

This life jacket is designed for special activities and may be TYPE V worn instead of a Type I, II or III life jacket if used in accordance with the approval conditions on the label. If a Type V life jacket is part of the minimum onboard life jacket requirements and if it has a label that indicates “required to KC-0005C-A be worn,” it must be worn at all times. Otherwise one additional Type I, II or III life jacket must be on board to satisfy the minimum life jacket requirements. Some Type V life jackets provide increased protection against hypothermia.

CRO_097

Figure 2-8: Type V Life Jacket

Visual Distress Signaling Devices

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

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

Boats less than 16 feet (4.9 meters) must have USCG-approved visual distress signals (VDS) on board when operating between sunrise and sunset in coastal waters, including ocean bays, gulfs and sounds, as well as the Great Lakes, seas, bays and river mouths that are 2 or more miles wide and only to the point proceeding inland where the water narrows to less than 2 miles. Visit the U.S. Coast Guard website for additional information on specific VDS requirements for the boat.

Ensure all passengers on board understand how to operate all VDS. Keep VDS in a readily accessible area and within immediate reach at all times when boating.

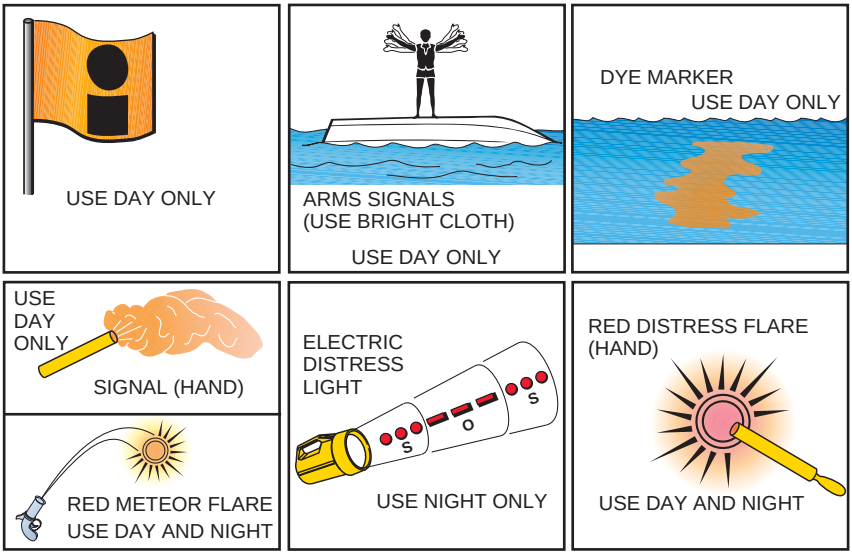


Figure 2-9: Visual Distress Signals

Regulations prohibit using pyrotechnic VDS or any VDS in non-emergency situations.

VDS must be:

- USCG-approved
- In proper operating condition
- Safely stowed and readily available
- Within the clearly marked expiration date stamp on the device (where applicable)

Types of VDS vary by emergency situation. VDS are classified as either pyrotechnic or non-pyrotechnic.

NOTE: Some pyrotechnics may be restricted on certain bodies of water. Check with local authorities, or visit the National Association of State Boating Law Administrators (NASBLA) website: http://www.nasbla.org or the U.S. Coast Guard website: http://www.uscg.mil for additional information.

See the ***U.S. Coast Guard Minimum Onboard Personal Safety Equipment Required section of this manual*** for specific onboard requirements.

Audible Signaling Devices

Audible (sound) signals are required to be on board all boats to alert other boats of your presence. A boat less than 39.4 feet (12 meters) must always have an efficient sound-producing device on board (Example: hand or mouth whistle, or a compressed or powered air horn).

A boat at least 39.4 feet (12 meters) but less than 65.6 feet (20 meters) operating in inland waterways must always have a power whistle or powered air horn and a bell on board.

All devices must be acceptable for use in marine environments, audible for 1/2 nautical mile and maintain a continuous four- to six-second sound duration. The diameter of the bell's mouth must be a minimum of 7.9 inches (20.0 centimeters).

Ensure all passengers understand how to operate all audible distress signaling devices on board. Keep these devices in a readily accessible area and within immediate reach at all times when boating.

See the ***U.S. Coast Guard Minimum Onboard Personal Safety Equipment Required section of this manual*** for specific onboard requirements and see the Navigational Lights and Night Operation section of this manual for usage information.

Navigational Lights

Navigational lights are intended to alert other boats to your presence and course.

Regulations require that navigational lights be clearly lit and properly displayed at all times between sunset and sunrise, and always when operating in reduced visibility. The placement, shape and visibility requirements of navigational lights may vary depending on usage. Do not allow passengers, gear or stowed items to block navigation lights. Check with local authorities, or visit the NASBLA or U.S. Coast Guard website for additional information.

For additional information, see the ***Navigational Lights and Night Operation section of this manual***.

LED Lighting

The navigational lighting required by the USCG from sunset to sunrise and in inclement weather is extremely important to boat navigation. The lighting rules are not only designed to indicate direction and right-of-way, but are also designed to prevent night blindness and confusion with navigational aid, emergency and shore-based lights.

NOTICE *Onboard accessory equipment containing red/blue/green (RBG) LED lighting should never be used when underway.*

Installing supplemental RGB lighting for “show” can be very dangerous, confusing and distracting to other boaters, and may be illegal. Use caution when changing RGB light color, as some light colors may not be compliant with certain local ordinances. The operator is responsible for complying with local laws and must be familiar with local marine lighting regulations before use, even with certain factory-installed lighting. Blue lighting is typically reserved for law enforcement use only.

Be sure to switch off accessory lighting (not navigation lights) when underway. Use only factory-installed, low-intensity courtesy lighting while on the water.

Never add lighting above the waterline. Avoid lighted accessories such as speakers or light rope.

RECOMMENDED SAFETY EQUIPMENT

Carry and know how to use the following equipment in addition to the required equipment on board at all times as an extra safety precaution:

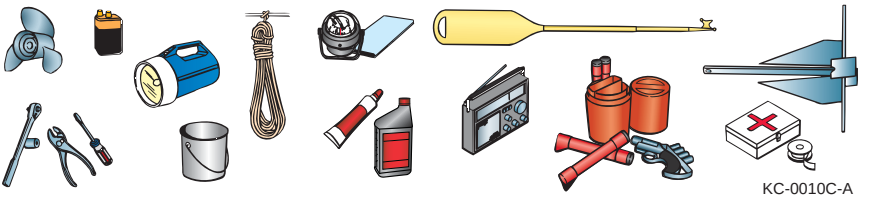


Figure 2-10: Recommended Safety Equipment

Anchor and line with minimum 75 feet (23 meters) of line	GPS Global Positioning Device
Auxiliary starting battery	Insect repellent
Binoculars	Local charts and compass
Boat hook	Mirror, whistle and strobe light
Cellular phone with waterproof case and lanyard	Mooring lines
Compass	Navigational and interior light bulbs
Dock fenders	Oar/paddles
Dry bag	Propeller, nut and washer
Duct and electrical tape	Radio
Electrical wire	Sharp folding pocket knife
Emergency food and water	Solar USB charger and cable
Emergency Position Indicating Radio Beacon (EPIRB)	Spark plugs
Engine lubricant	Sunglasses and sun block
Extra drain plug	Thermal clothing
Extra transom plug	Throwable life ring
First aid kit and manual	Tool kit including propeller replacement tools
Flashlight and radio batteries	Tow line
Foul weather gear/clothing	VHF-FM/AM with weather band radio
Fuses	Waterproof flashlight

Safety and Training

There is a vast amount of recreational boating regulatory, safety and training information online, and much of it is free. This information covers laws, aids to navigation, rules of the road, hands-on boating safety courses, boat safety checks and much more for both novices and experienced boaters. Go to the following sites for more information:

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

Situational Awareness

A good captain knows that it is important to continuously observe the surroundings and traffic when operating. Good captains also use their eyes to track things around the boat and their ears to hear engine and mechanical issues. Technology should only be used to supplement the conditions and events happening around you and is not meant to replace situational awareness. While available technology and automation help captains see the big picture, the captain is responsible for knowing what is going on around the boat. If possible, post a lookout or lookouts when underway.

Do not get immersed in the boat's technology or blindly follow GPS routes without keeping watch or consulting depth charts. Study the manuals for each piece of equipment and monitor the information for the task at hand, be it depth, traffic, infrared camera, engine data, course or weather.

Driving Defensively

Sharing boats is becoming more popular in the boating culture. Boating has seen an influx of new, inexperienced and untrained boaters due to peer-to-peer boat-sharing apps. It is increasingly probable that someone on the water "tried" boating because it looked fun. Many of the boat owners sharing their boats do little more than cover safety equipment, starting, stopping and docking instructions. With shares lasting half a day or less, there is little time for much training, let alone covering the rules of the road and navigation.

Boat-sharing is in a legal gray area and is not clearly defined in maritime law. Enforcement of existing rules is nearly impossible and almost always after-the-fact. Operators should assume that the other boat operator is untrained and should drive defensively. Boaters choosing to share their boat should discuss the issue with their insurance agent first and consider a mandatory captain requirement. Use only reputable sharing services and frequently check for new or updated USCG and state requirements.

Small Boats and Swimmers

Canoes, kayaks, paddleboards and swimming inflatables have become impulse purchases for many, as they appear fun to use and prices have fallen. Most of these operators are new to the sport and have no training on rules of the road or navigation. This is further complicated by the low, thin profile that makes these small boats difficult to see, especially in the sun, glare and rough water. Operators should keep a close lookout for these boats, swimmers and other boats. Assume that the person is untrained and give them plenty of space.

Knowing the Boat

Be thoroughly familiar with onboard systems and other equipment, especially the critical equipment such as throttle and shift controls, steering, backup steering, running lights, fuel filters, sea strainers, etc. Should an emergency arise, the captain will need to act safely and efficiently.

Special Needs Passengers

Keep these special precautions in mind when enjoying a day on the water with passengers who have special needs.

Toddlers

- Never leave children in the boat without adult supervision.
- Must weigh at least 18 pounds (8.2 kilograms), since that is the smallest children's life jacket approved by the USCG. Life jacket must be worn whenever near the water.
- Any device the child is placed in must have flotation.
- Child-proof the boat just like a home. Be sure all gates and compartments are closed and latched.
- Keep a close watch on the child's reaction to speed and conditions and react accordingly.
- Use a higher than normal SPF waterproof sunscreen and re-apply more often than usual.
- Find a safe area to put the child down without risk of going overboard. Allow the child to get accustomed to the surroundings before launching/leaving.
- Keep trips short, but let them have some fun if possible.

Pregnant Women

- Go boating during the day and in calm seas.
- Avoid sharp turns and slow down for large wakes.
- Drink more water than usual to stay hydrated.
- It is a good idea to stay seated in the accommodation deck area while underway.
- Stay close to the home port in the third trimester.

People with Handicaps and Elderly People

Depending on the disability, there are many marine-specialized options available to make boats safer and friendlier. Researching on the internet for your specific needs is the best way to start.

Pets

- Not all pets can swim; consider a life jacket.
- If playing fetch in the water, get a pet-friendly boarding ramp to make re-boarding easier.
- Provide a shaded area and plenty of fresh drinking water.
- Consider foot protection for hot sand and boat surfaces.
- Allow the pet to get accustomed to the surroundings before launching/leaving. Keep the first outing short to allow the pet to get used to the boating environment.

Very High Frequency (VHF) Radio

The VHF radio is used to communicate with others on and off the water. VHF channel 16 (156.8 MHz) is designated as the international distress, safety and calling channel and is used to summon rescue services such as the USCG and to make initial contact with ports, marinas, bridges, locks and other boaters in the area. Use a VHF radio. The best way to clearly understand and deal with crossing, overtaking and meeting situations in open water is to communicate with the other boat on the radio.

The responder may then ask the caller for other information to help the caller. It is important to remain calm, speak slowly and be succinct. Short and concise communications are best no matter what the situation is.

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

In other communications, call the other party on channel 16 using your call sign. Bridges and locks will instruct boaters on what to do. Harbors, marinas and other boaters in the area will inform boaters to switch to a particular channel. Most VHF radios transmit in “simplex,” where communication can only take place in one direction at a time. For this reason, standard etiquette is to never interrupt a transmission and to wait 15-30 seconds before making a transmission. There are many channel options available for both commercial and non-commercial use.

NOTICE *The USCG is the lead agency for maritime search and rescue (SAR) in U.S. waters, but that mission is compromised every time the service receives a hoax distress call. Making a false distress call is a violation of federal law (14 U.S. Code § 88) and may result in up to six years in prison, a $250,000 criminal fine, a $5,000 civil fine, and reimbursing the U.S. Coast Guard for the cost of performing the search.*

Using a VHF radio in foreign waters with a U.S.-registered boat may require a federal Ship Station License by law or treaty. Traveling to a foreign port (for example, Canada, Bahamas, British Virgin Islands and Mexico) requires a Ship Station License as well as a restricted radiotelephone operator permit (RR). Go to *www.fcc.gov/wireless/bureau-divisions/mobility-division/ship-radio-stations* for more information.

Read the VHF manufacturer’s information on the special features and use of the radio.

CRUISING LIMITATIONS

- Scan constantly for people, objects and other watercraft. Be alert for conditions that limit your visibility or block your vision of others.
- Operate defensively at safe speeds and keep a safe distance from people, objects and other watercraft.
- Do not follow directly behind other watercraft.
- Do not go near others to spray or splash them with water.
- Avoid sharp turns or other maneuvers that make it hard for others to avoid you or understand where you are going.
- Avoid areas with submerged objects or shallow water.
- Operate within your limits and avoid aggressive maneuvers to reduce the risk of loss of control, ejection and collision.
- This is a sophisticated boat—not a toy. Sharp turns or jumping waves or wakes can increase the risk of back/spinal injury (paralysis), facial injuries, broken legs, ankles and other bones. Do not jump waves or wakes.
- Do not operate the boat in rough water, bad weather or when visibility is poor; this may lead to an accident causing injury or death. Be alert to the possibility of bad weather. Take note of weather forecasts and the prevailing weather conditions before setting out in the boat.

- Leave a “float plan” with a responsible person on shore. Tell where you plan to go and when you plan to arrive, and provide a description of your boat. Advise this person if your plans change and also when you arrive to prevent false alarms. Refer to Float Plan in this manual for additional information.

HAZARD INFORMATION

- Never start the engine or let it run for any length of time in an enclosed area. Exhaust fumes contain carbon monoxide, a colorless, odorless gas that may cause death within a short time. Always operate the boat in an open area.
- Do not use the reverse function to slow down or stop the boat, as it could cause you to lose control, be ejected or impact the steering wheel or other parts of the boat. This could increase the risk of serious injury. It could also damage the shift mechanism.
- Reverse can be used to slow down or stop during slow speed maneuvering, such as when docking. Once the engine is idling, shift to REVERSE and gradually increase engine speed. Make sure that there are no obstacles or people behind you before shifting into REVERSE.
- Stop the engine and remove the clip from the engine stop switch before removing any debris or weeds that may have collected around the propeller.

Re-boarding

⚠WARNING ***Personal Injury Hazard: Always turn the engine off whenever anyone is in the water near the boat.***

Your boat is equipped with a ladder as a means to re-board the boat from the water. The ladder is located at the stern of the boat and will be either under or on top of the swim platform. The ladder can be deployed by a person in the water or on the swim platform. When pulled from its storage position, the ladder will extend into the water, allowing the person to re-board the boat.

Life Raft Consideration

Preparing for the safety of you and your passengers should always be your highest priority. A life raft should be a consideration for safe boating. If you decide to have a life raft on-board, make sure it is stored properly in a location known to all passengers.

WATER SPORTS

⚠WARNING ***Control Hazard: It is unlawful to participate in water sports while under the influence of alcohol or other drugs.***

Some boats are not designed or recommended to be used for water sports. Use boats equipped with a ski-tow eye or other specially designed line attachment device to pull persons or equipment engaged in a water sport.

Water sports may include, but are not limited to, any activity performed in the water such as swimming, diving, snorkeling, knee boarding, tubing, skiing, parasailing, kiting, gliding or any activity using a device that may be pulled or pushed by a boat.

Check with local and state authorities or water sports clubs and affiliations for additional information.

Platform Dragging

Every year tragic deaths occur from the negligence of unsafe boating and dangerous activities.

NOTICE *It is UNLAWFUL to be on or holding on to the boarding platform, swim deck, swim step, swim ladder or any portion of the exterior of the transom at any time while the boat is running or underway in any direction and at any speed.*

⚠WARNING ***Personal Injury Hazard: Body, teak or platform dragging is extremely dangerous and can be fatal. Never hold on to the transom of a boat while in the water when the boat is running or underway.***

- ***Do not use the boarding platform or ladder for any purpose other than boarding the boat or entering the water.***
- ***Do not use the boarding platform or ladder while the engine is running.***
- ***Do not swim under the boarding platform when the engine is running.***

These dangerous and even fatal activities can lead to any or all of the following, as well as other dangers not listed here:

- Carbon monoxide poisoning
- Severe injury from a rotating propeller
- Drowning or entrapment under the water

Water Sports Guidelines

Boat Operator, Occupants and Participants

The following water sports guidelines only cover the general conditions that frequently arise. The participants must respond to the constantly changing weather and the conditions of the sea by using reasonable and safe judgment in light of the circumstances.

- Always ensure that all water sports participants and occupants of the boat, especially the operator, are fully aware at all times of the participants' condition and location in the water, as well as the surrounding environment.
- Make safety the primary concern of all involved during the activity. Only allow safe and capable participants to engage in the activity.
- The boat operator and water sports participants must always know their limitations in the activity and never exceed them.
- Never perform water sports in or near:
  - Congested areas
  - Restricted areas
  - Navigation or other waterway markers
  - Other boats
  - Other water sports participants
  - Obstructions in the water
  - Shorelines
  - Shallow water
  - Hazardous weather conditions
  - Hazardous waterways, rapid moving water, dams, spillways, etc.
  - Areas or times of restricted visibility
  - Hours between sunset and sunrise
  - Locations too far from shore that could hinder immediate rescue or emergency help if needed
- Always engage in water sports activities in safe waterways only.
- Always attach the water sports tow rope to approved attachment points on the boat.
- Never jump from a boat that is moving at any speed, and do not enter or exit the water when the engine is running.
- Never use different length ropes simultaneously for water sports activities.
- Always make sure that participants know and use approved skiing hand signals and common skiing courtesy.
- Before starting, always agree to speed and communication hand signals between the boat operator, spotter/observer and participants.

- Before starting, always inspect the water sports equipment and tow eye, tow point and tow line for safe operating condition, or damage that may lead to failure.

Know Water Sports Hand Signals

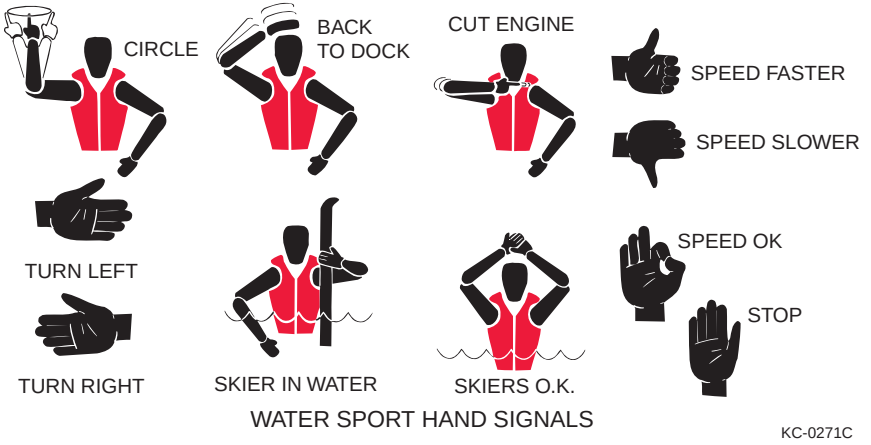


Figure 2-11: Water Sports Hand Signals

Boat Operator Specific Guidelines

The following guidelines are for the boat operator while a participant is in the water.

- Always have a “spotter” (designated observer) other than the boat operator on board to ensure the safety of the participants in the water and provide communication to and from the boat operator and the participants.
- Always turn the engine off from a safe distance when approaching participants in the water and allow them to reach the boat. Never run the engine near a person in the water.
- Never operate the boat in reverse to retrieve anyone in the water.
- Always return immediately to a fallen water sports participant. Always approach the participant on the operator’s side while keeping the participant in view from a direction opposite the wind or seas.
- Never drive directly at a person in the water or directly behind another boat.
- Always maintain a safe distance from people and objects in and on the water.
- Always look in the direction you plan to turn before turning the boat to pick up a fallen skier.
- Never retrieve any object from the water while the engine is running.
- Always keep the skier in view when the skier is entering or exiting the boat.
- Always watch the skier as the line begins to tighten (in case the rope wraps around ski or skier).

- Always look ahead before starting.
- Always start from a safe place with good forward and peripheral visibility.
- Always check direction of steering before starting, ensuring that the boat steers straight.
- Always be aware of what is occurring in front of the boat, and of a participant's condition.
- Always display a "skier down" flag whenever a skier is in the water and not skiing.
- Always follow the approved towing pattern for the waterway in which you are operating.

Additional Guidelines for Participants in the Water

The following guidelines are for the water sports participant.

- Never participate in water sports if you cannot swim.
- Always wear a bright-colored USCG-approved activity life jacket at all times. Wear suitable protective clothing or gear and/or a wet suit to prevent impact injuries, abrasions and hypothermia.
- Never approach or enter the boat if the engine is running.
- Always avoid the boat's propeller. Even when the propeller is not rotating, its sharp edges can cause serious injury.
- Never put any part of your body through the handle of the ski line or wrap the line around any part of your body.
- Never enter the water from a boat that is running or moving at any speed.
- Always indicate that you are clear of the boat prior to the operator starting the boat or putting the boat into gear and tightening the rope.

Water Sports Safety

IMPORTANT: The following water sports safety warnings and practices represent some (but not all) common risks encountered by users. Always use common sense and good judgment.

Before skiers/riders get in the water: Waterskiing or riding instruction is recommended in advance. Instruction will teach general safety guidelines and proper waterskiing or riding techniques, which may reduce their risk of injury. For more information on waterskiing or riding schools, contact the dealer, association or local waterskiing club.

Inspect all equipment prior to each use. Check bindings, fins, tube, attachment, tow rope and flotation device. Do not use if damaged.

Special boat considerations: A knowledgeable and responsible driver along with a separate observer is the most important safety device on any boat.

- Some states have specific regulations for allowable propulsion systems that can be used for tow sports, especially wake surfing. It is the operator's responsibility to know the applicable regulations.
- Never exceed the passenger or weight limitations of the boat.
- Never allow passengers to hang outside the boat or towed device or sit on the gunwales or anywhere outside of the normal seating area.
- Never allow water to overflow the bow or gunwales of the boat.
- Uneven weight distribution or additional weight may affect the handling of the boat.

Tow ropes: Tow ropes come in different lengths and strengths for different activities. Make sure any rope used is suited for that activity and that it is in good condition.

- Never use a rope that is frayed, knotted, unraveling or discolored from use or being left in the sun. If a rope breaks while in use, it can recoil at the skier/rider being towed or into the boat where it might strike passengers. Replace tow ropes with any sign of damage.
- Never use a tow rope with elastic or bungee material to pull skiers or riders.
- Rope should be attached to the boat in an approved fashion with hardware designed for towing. Refer to the boat manual for instructions on proper tow rope attachment.
- Always keep people and tow ropes away from the propeller, even when idling.
- If a tow rope should become entangled in a propeller, shut off the engine, remove the key and secure it in a safe location before retrieving the rope.
- Tow ropes should be neatly stowed in the boat when not in use.

Preparing to ski or ride: Always have a person other than the driver act as an observer to look out for the skier/rider.

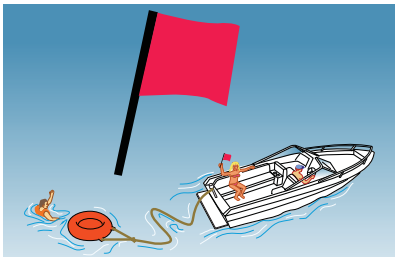
- Be sure the driver is aware of the experience and ability level of the skier/rider.
- The driver, observer and skier/rider need to agree on hand signals before skiing or riding. Signals should include READY, STOP, SPEED UP and SLOW DOWN.
- Start the engine only after making sure that no one in the water is near the propeller.
- Turn off the engine when people are getting into or out of the boat, or in the water near the boat.
- Always make sure the tow rope is not wrapped around anyone's hands, arms, legs or other parts of the body.
- Start the boat and move slowly to remove slack until the tow rope is tight.

- When the skier/rider signals READY “hit it” and there is no traffic ahead, take off in a straight line. Adjust the speed according to the signals given by the skier/rider.

Skiing or riding: The boat and skier/rider should always maintain a sufficient distance from obstacles so a skier/rider falling or coasting and/or boat will not encounter any obstacle.

- Do not use in shallow water or near shore, docks, pilings, swimmers, other boat or any other obstacles.
- Use only on water.
- Never attempt land or dock starts or stops. This will increase the risk of injury or death.
- The faster the skier/rider skis or rides, the greater their risk of injury. The skier/rider should be towed at an appropriate speed for his or her ability level.
- Never make sharp turns that may cause a slingshot effect on the skier/rider’s speed.

Fallen skier or rider: Falling during water sports is commonplace and injuries can occur from a variety of causes.



KC-6017

Figure 2-12: Fallen Skier or Rider

- If the skier/rider does not immediately indicate that they are “OK,” assume that they need assistance.
- Circle a fallen skier/rider slowly to return the tow rope handle or, pick up the fallen skier/rider.
- Turn off the engine when near a fallen skier/rider.
- Always keep the fallen skier/rider in view and on the driver’s side of the boat.
- Display a red or orange “skier down” flag to alert other boats that a skier/rider is down if required by the state in which you are operating.

Water Sports and Towing Safety

Boat operators, skiers and boarders must all be aware of current boating and water sports rules and pay attention to safe operating procedures and skiing practices at all times. If skiing or boarding is a new sport to you, seek certified training before starting. Thoroughly read all information provided by the water sports equipment manufacturer.

Always remember that the majority of water sports injuries are the result of impacts with other objects. Know the area you are boating in.

Always maintain a clear vision of where you are going and be aware of what is going on around you. Constant vigilance will go a long way toward preventing accidents. Skiers, boarders and other water sports participants must always wear a USCG-approved life jacket. It's the law!

Contact with rotating propellers is one of the most dangerous hazards that occurs from negligence of operators, passengers and bystanders. A propeller is designed to travel in the water and rotates at a speed that can cause death if it comes into contact with a human. Severing, deep lacerations, blood loss, trauma and exposure to microorganisms in the water that enter the bloodstream can result in death or serious injury.

STOP PROPELLER STRIKES by always using caution and:

- OBSERVING all warnings and keeping all safety equipment in use and in place.
- STOPPING the engine when swimmers are near the boat and in the water.
- MAKING SURE all passengers are seated on a horizontal seat cushion whenever the boat is in gear or moving.
- NOT ALLOWING passengers to enter the water when the engine is running.
- USING the boat's emergency stop switch at all times.
- MAKING SURE all operators are properly trained and qualified to operate the boat.
- KEEPING your eyes on your path as well as the water sports participant.
- NOT ALLOWING water sports participants to be in the path of other boaters.
- STAYING CLEAR of swimmers and other water sports participants by maintaining visual surveillance.
- KNOWING the correct water sports hand signals.
- NOT ALLOWING children under 11 years of age to occupy the open bow area unless accompanied by an adult.
- USING an observer during water sports activities.

Water Sports Responsibility Code

BE AWARE there are risks in boating and water sports that good judgment and personal awareness can help reduce. To increase enjoyment of water sports, follow the 10 points of the code.

In water sports, it is the boater's responsibility to:

- ALWAYS become familiar with applicable laws, waterways and inherent risks.
- ALWAYS have a capable observer in addition to the driver, and use agreed-on hand signals.
- ALWAYS wear a properly fitted life jacket approved by your country's agency.
- ALWAYS read the user's manual and inspect equipment before use.
- ALWAYS ski and ride under control, at proper speeds and within your limits.
- ALWAYS turn the ignition off when anyone is near the boat power drive unit.
- ALWAYS stay clear of engine exhaust to avoid carbon monoxide poisoning.
- NEVER "platform drag" or touch boarding platform while the engine is running.
- NEVER ski or ride near swimmers, shallow water, other boats or obstacles.
- NEVER operate boat and never ski or ride under the influence of alcohol.

Driver: Best Practices

- The boat driver plays a critical role in the enjoyment and safety of all towed water sports participants. Do not allow inexperienced drivers to drive for skiers/riders without thorough instruction and training. We encourage all boat operators to take a boater's education course. See the state's boating authority for available courses or other operating requirements.
- Keep music at reasonable levels. Sound travels well over water.
- Wait for a clear boat path ahead before accelerating.
- Make sure to use the proper rope for the sport. A rope designed to pull a skier is not the recommended rope for towing a tube.
- If skiing, boarding or tubing with more than one person, make sure all tow ropes are the same length.
- Keep a 150-foot buffer zone on all sides of the boat and stay in water that is safe for the skier/rider and draft of the boat.
- Make sure the tow line unwinds smoothly without getting snagged on anyone or anything.
- Idle forward to make the rope tight.
- Accelerate only when the tow rope is completely tight and the skier/rider has given the "hit it" signal. The words GO and NO can be easily confused with nearby wind, water and engine noise. It is best to find another signal other than GO to tell the driver to power up. "Hit it" or "boat driver" are better options.
- Always approach fallen skiers/riders in the water from the driver's side so the driver does not lose sight of them.

- Minimize repetitive passes on any one portion of shoreline. Once you've run the same line for a while, move on to another area.

TURN OFF ENGINE when a skier/rider is near the boat, rather than running the engine in NEUTRAL. An accidental bump of the throttle when the engine is running could put the boat in gear.

- DO NOT let the tow rope slip under the boat and become tangled in the propeller. It is a good practice to keep a knife on board should this situation occur.
- Always pay attention to the water ahead, the surrounding traffic and the onboard observer. The observer must always keep the boater aware of the skier/rider status.
- DO NOT whip skiers or riders near shores, docks, other boats or fixed obstructions; they can glide 100 feet or more after they let go of the rope.

⚠WARNING ***Entanglement Hazard: Never accelerate before the rope is 100% tight and before the skier/rider gives the "hit it" signal. Accelerating before the "hit it" signal is given could result in the skier/rider becoming entangled in the rope.***

Driving Pattern

Check with local lake laws before driving any pattern. Some areas require operators to drive skiers/riders in preset patterns.

Operators who want to minimize the rough water for the skier/rider should use a dog-bone pattern when driving. A dog-bone pattern follows the same path from one end of the course to the other, with tight controlled turns at each end. Use this pattern where few other boats are operating.

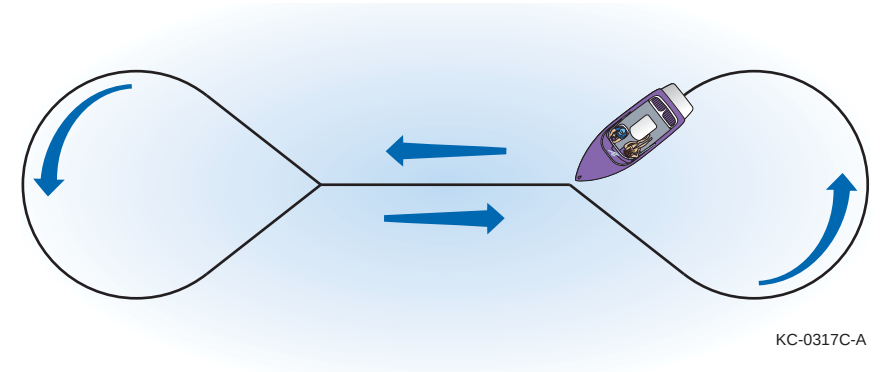


Figure 2-13: Dog-Bone Pattern

In areas where many boats are operating, use a large racetrack pattern.

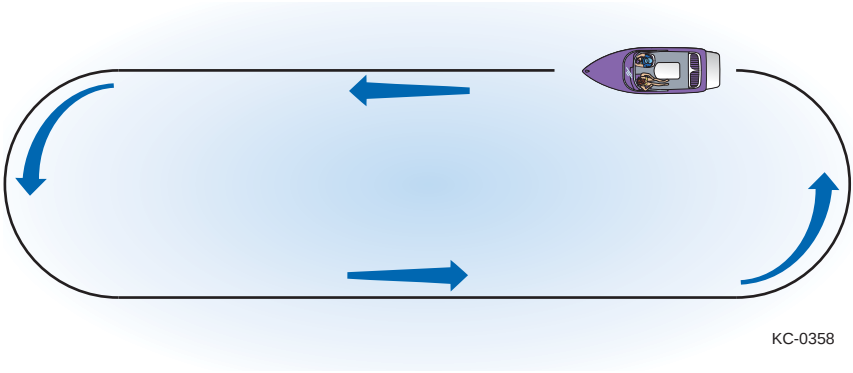


Figure 2-14: Racetrack Pattern

Falling Tips for Every Sport

- Sudden falls happen. DO NOT put any body parts (arms, legs, head) inside the rope handle.
- Tighten the life jacket straps for a snug fit.
- Let the handle go as soon as you sense you're about to fall. Falling is better than dragging.
- Roll with it. Bow your head, bend your knees, tuck in your arms and make like a beach ball.
- Signal the observer to let them know you are OK after a fall.
- After you fall, lift the ski or board above the water so other boaters can see you.
- When learning advanced maneuvers, it's best to seek training from a professional.
- A little advice will cut down on falls, shorten the learning time and reduce the chances of an injury.

Water Sports Tips

These tips are designed to help speed learning while ensuring safety. Practice, training from a professional and advice from experienced boaters are the best tools for learning safety when it comes to water sports.

For additional information visit: *www.usawaterski.org*

REMEMBER: It is important to follow the manufacturer's recommendations for the intended use of the water sports equipment.

REMEMBER: It is illegal in many states to participate in towed water sports without a USCG-approved life jacket. Be aware that some specialized water sports vests are NOT USCG-approved and should be worn in addition to a USCG-approved life jacket.

BE AWARE: The boater is responsible for their own wakes. Be considerate of other boaters, especially small fishing boats, canoes, kayaks, paddleboards and other low-profile boats that can overturn easily. Also, be aware of your wakes in relation to swimmers, docks and boats tied to docks.

Boating Regulations and Your Responsibilities

The U.S. Coast Guard (USCG) is the federal authority on U.S. coastal and inland waterways, but state and local regulations may exist that exceed USCG regulations. The purpose of all these regulations is to assist the boating public and maintain navigational order on waterways.

Many state equipment requirements go beyond USCG requirements. Contact state and local boating authorities for further information. Equipment requirements for coastal and inland waters differ. Check with local authorities or the USCG for further information about coastal water requirements.

Boating regulations are enforced by USCG, state and local authorities. Operators/owners are subject to marine navigation regulations for both federal and state waterways. Operators/owners must comply if enforcement officers signal them to stop the boat or if they ask to board the boat.

Many USCG, state and local resources are available. For additional and current information on regulations, safety and navigation, contact the local USCG unit or local marine authority.

See the References and Contact Information section of this manual for a list of resources.

BOAT OWNER/OPERATOR RESPONSIBILITIES

As a boat owner/operator, understand and be aware of USCG federal regulations as well as state and local regulations where operating the boat. Boating regulations include, but are not limited to, boat regulations, boat equipment regulations and navigational regulations.

Operators/owners must have on board at all times all mandatory safety and boat equipment as regulated by the governing authorities. All equipment must be maintained in proper working order.

SAFETY

Boat owners/operators are legally responsible for their safety, the safety of their passengers and the safety of other boaters. In addition, they are responsible for the operation and navigation of the boat under all operating conditions. The boat must be in compliance with USCG safety equipment regulations.

REGISTRATION

The USCG requires that all power boats operated on the navigable waters of the United States be currently registered in the state in which they are principally used. Many states require current registration in that state whenever boating on waters within their state boundary. Always contact state boating authorities (and authorities in neighboring states) for registration information on boats and trailers.

Registration numbers must be current and clearly displayed on the boat according to the defined regulations. Registration certificates must be current and on board at all times.

State and local authorities may require additional registration for boating on certain waterways. Check with state and local authorities for additional registration information.

For more information visit:

- U.S. Coast Guard Office of Boating Safety: *http://www.uscgboating.org*
- National Association of State Boating Law Administrators: *http://www.nasbla.org*

INSURANCE

Boat owners are legally responsible for any damage or injury caused when they operate the boat when an accident or collision occurs. They are also legally responsible even when someone else operates the boat and causes damage or injury. Individual states have laws detailing minimum insurance needs. Contact the insurance agent to verify the type of insurance needed BEFORE operating the new boat.

REPORTING ACCIDENTS

The USCG requires the owner/operator of a boat involved in an accident to report the incident to the proper marine law enforcement agency for the state in which the accident occurred. If a person dies or disappears as a result of a recreational boating accident, the boat owner/operator must immediately notify the nearest state boating authority. If a person dies or has injuries requiring more than first aid, the owner/operator must file a formal report within 48 hours of the accident. An owner/operator has 10 days to file a formal report for accidents exceeding $500 in property damage or complete loss of the boat. Go to *http://uscgboating.org/recreational-boaters/*, Accident Reporting, for information and form download.

BOATING UNDER THE INFLUENCE

KCB-0011

Federal and state laws prohibit the operation of a boat while under the influence of alcohol or drugs, and authorities actively enforce these regulations. If the operator's blood alcohol content is at or above the legal limit, violators are subject to civil and criminal penalties and imprisonment. Operating a boat under the influence can also result in a loss of motor vehicle driving privileges.

Alcohol and drugs slow reaction time and affect judgment. This type of impaired operation may result in death or severe personal injury.

Owners/operators are responsible for their passengers, including alcohol and drug use and onboard behavior.

Regulations and penalties for operators and passengers may vary from state to state. Contact local and state boating authorities for specific information.

OPERATOR'S LICENSE AND EDUCATION

This manual does not provide complete training on all aspects of boating safety, operation or regulations. Boating authorities highly recommend that all boat operators and passengers seek additional training in boating safety and seamanship from a USCG-approved course.

Licensing requirements can vary widely from state to state. Most states require operators under the age of 18 to be licensed; however, some states require all operators to be licensed and have the license on the boat during operation. Some states require boat operators to complete a boating education/safety course to obtain a safety certificate before licensure. Pay special attention if you will be operating on boundary waters shared by two or more states, as the requirements may change once you cross the boundary.

Check with state and local authorities for requirements of an operator's license, certificate or training before you or anyone operates the boat.

See the ***References and Contact Information section of this manual*** for a list of some of the agencies and organizations that offer water/boating safety courses, first aid/CPR, or other recommended training and/or information.

OPERATION BY MINORS

Minors must always be supervised by an adult whenever operating a boat. Many states have laws regarding the minimum age and licensing requirements of minors. Regulations may vary from state to state. Contact local and state boating authorities for specific information.

EMERGENCY ASSISTANCE

An operator seeing a distress signal or suspecting a boat is in trouble must assume it is a real emergency and render assistance immediately as long as it can be done safely.

In accordance with Federal law, in U.S. waters, the operator must render assistance to any individual found at sea in danger of being lost, so far as the operator can do so without serious danger to the operator's vessel or individuals on board. An operator who fails to render such assistance can be fined not more than $1,000, imprisoned for not more than 2 years, or both. The 1971 Boating Safety Act grants protection to a "Good Samaritan" boater providing good faith assistance, and absolves the boater from any civil liability arising from such assistance.

Under general maritime law in international waters on the other hand, if the operator undertakes to perform acts to rescue or aid those in distress, the operator is subject to liability for reckless or wanton conduct or, for failure to exercise reasonable care (negligence) if he worsens the position of the victim.

NOTICE *The operator in charge of the boat is obligated to provide assistance to any individual in danger if such assistance can be provided safely. Carefully assess the situation at hand and assist if possible. If the operator does not possess the skills to safely assist another boat in trouble with the highest degree of care, call for help and stay in the area until help arrives.*

NEGLIGENT OPERATION

Federal law prohibits the negligent or grossly negligent operation of a boat and/or interference with the safe operation of a boat so as to endanger lives and/or property. Some actions that may constitute grossly negligent operation (criminal offense) are:

- Operating a boat in a designated swimming area
- Excessive speed in the vicinity of other boats or in regulated waters
- Hazardous waterskiing or other water sports practices
- Bow riding, or riding on a seat back, gunwale, boarding platform or transom
- Operating a boat while under the influence or alcohol or drugs (severe penalties may be imposed for boating under the influence [BUI])

Other actions that constitute negligent operation, such as, but not limited to:

- Failure to use handhold
- Overloading or improper loading
- Using a boat in weather or sea conditions beyond the intended design of the boat or beyond the skill or experience of the operator
- Continued operation with operator's visibility blocked or impaired
- Modification to boat causing an unsafe operating condition

RESTRICTED AREAS

Security Zones

Operators must avoid all waterways and areas that are restricted, such as military installations, power plants and petroleum and chemical facilities. Because of the threat of terrorism, the U.S. Coast Guard has implemented and will continue to enforce strict limits on boats near U.S. Navy and U.S. Coast Guard ships and other potential targets.

Naval Vessel Protection Zones

Do not approach within 100 yards of any U.S. Naval vessel. Slow to minimum speed within 500 yards of any U.S. Naval vessel. Operators needing to approach within 100 yards to ensure a safe passage in accordance with the Navigation Rules must contact the U.S. Naval vessel or the U.S. Coast Guard escort vessel on the boat's VHF radio (channel 16) for authorization.

Commercial Shipping Safety Zones

Do not operate the boat near cruise liners or certain waterfront commercial installations such as ferry terminals. Observe and avoid all security zones and commercial port operations.

Bridges and Shipping Channels

Do not stop or anchor beneath bridges or in shipping channels. Operators doing so should expect to be asked to move and/or be boarded by law enforcement officials. Anchoring in these areas is dangerous for the operator and others on the water.

America's Waterway Watch

Boat operators can help the U.S. Coast Guard in keeping waterways and coastal installations safe and secure. Boat operators can do this by participating in America's Waterway Watch (AWW). Boaters reporting suspicious activities to AWW should call 877-24WATCH if noticing suspicious activity or behavior on or near the water.

In cases of immediate danger to life or property, call the U.S. Coast Guard on channel 16 VHF-FM or dial 911 for emergencies.

FISHING

Fishing can be very exciting and distracting for the operator when the action gets intense. Operators must always be conscious of the primary responsibility, which is the safe operation of the boat and the safety of passengers and other boats in the area.

Always make sure the helm is properly manned and is never left unattended while trolling. If the boat is equipped with a tower, exercise caution and sound judgment whenever someone is in the tower. Remember, weight in the tower raises the boat's center of gravity and the boat's motion is greatly exaggerated for the person in a tower.

An operator fishing in an area that is crowded with other fishing boats may have difficulty following the rules of the road. This situation can become especially difficult when many boats are trolling. Being courteous and exercising sound judgment is essential. Avoid trying to assert the right-of-way and concentrate on staying clear of other boats. Prevent the boat from becoming entangled in lines and from cutting into lines. Also keep in mind that fishing line wrapped around a propeller shaft can damage seals in the engine lower unit.

There is currently a tremendous drain on our fishing resources. Excessive fishing and hunting, as well as pollution, have strained the fish and game population. Help out by keeping only what you will eat; practice catch-and-release and obey bag limits.

MONOFILAMENT FISHING LINE

Wildlife can experience harm from becoming entangled in or ingesting monofilament fishing line if it is left in the water or on shore. Line in the water can also endanger swimmers and divers and become tangled in boat propellers, causing damage. It can last for years in water, posing a threat for a long time. Fishing line can remain a problem even if put in the trash, because birds can take it from an open bin and become entangled or it can entangle wildlife at landfills.

Many states and private boating/wildlife organizations sponsor programs to collect used line for recycling into new products. Operators who carry used line or happen upon it while boating can dispose of it in recycling bins located at many marinas, launches, tackle shops and state service centers.

WAKE

Boat owners/operators are responsible for the wake the boat creates. Regulations may vary from state to state. Contact local and state boating authorities for specific information, as owners/operators may be responsible for any damage or injury their wake causes. Always be alert for no-wake zones and be courteous of others while boating. Excessive and unexpected wakes can cause dangerous and even life-threatening situations.

NOISE

Boat owners/operators are responsible for the noise the boat creates. Many state and local boating authorities enforce noise limits that may restrict engine noise, radio volume or even loud talking. Regulations may vary from state to state. Contact local and state boating authorities for specific information.

SPEED

Boat owners/operators are responsible for maintaining the boat under control at a safe speed. Many state and local boating authorities enforce speed limits. Regulations may vary from state to state. Contact local and state boating authorities for specific information.

SHALLOW WATER BOAT STABILITY

Boat designs for flats, bays, poles and skiffs are very similar. Because of the unique requirements for a shallow draft, stability issues can arise under certain conditions, especially during quick turns. Take time to learn the characteristics of the boat alone and in open water away from other boaters. Make gradual increases in speed and radius to get the feel of stability under various conditions and be ready to make adjustments quickly. Slow down when boating with passengers to avoid possible ejection from the boat.

PROTECTING THE ENVIRONMENT

Our lake, river and ocean resources must be protected to be enjoyed by future generations. Boat owners/operators are responsible for protecting the natural environment and wildlife by keeping waterways clean.

U.S. waters are covered by several water pollution regulations administered by numerous federal and state agencies. Laws vary between local, inland, coastal, ocean and international waters. Laws can be enforced by local and state authorities as well as the USCG. For recreational boats, U.S. Federal Water Pollution Control, Oil Pollution Control and Refuse Acts cover U.S. waters, and the MARPOL treaty covers international waters. In any case, pollution prevention centers around three areas:

- Sewage pollution
- Garbage (solid waste) pollution
- Oil pollution

As a boater, make it a point NOT to dump or discharge ANYTHING into waters and tell passengers to respect this rule. Return all trash after boating and dispose of it properly on shore.

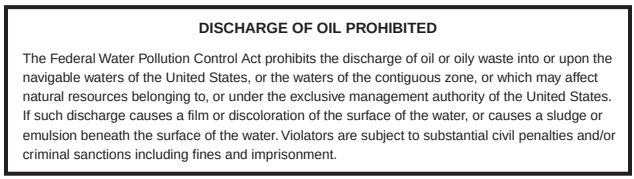


Figure 3-1: Discharge of Oil Prohibited

Marpol Treaty

The USCG enforces the International Convention for the Prevention of Pollution from ships, commonly referred to as the MARPOL Treaty (MARine POLlution). This treaty prohibits the overboard dumping of all ship-generated plastics, chemicals, garbage and oil. Contact the USCG for further information.

Aquatic Invasive Species (AIS)


KC-6027

Aquatic Invasive Species (AIS) are plants and animals that occur in waters in which they are not native and whose introduction causes or is likely to cause economic or environmental damage or harm to human health. AIS have a negative impact on the waterway, its native species, and recreational and commercial uses of the waterway. As responsible boaters and citizens, each boat owner should do their part to prevent the spread of these aquatic hitchhikers.

In many cases, it is also required by law. Check local regulations for any waterway where you will boat.

After each boating trip, follow these three simple steps before you leave the water access to stop the spread of AIS: Clean, Drain, and Dry. This is the boater's way to help protect the environment from the damage that AIS can cause.

Clean

- Inspect and remove all aquatic plants, animals, mud, and debris from the boat, engine, trailer, anchor, and any watersports equipment.
- Rinse, scrub or wash, as appropriate, away from storm drains, ditches, or waterways.
- Rinse watercraft, trailer, and equipment with hot water, when possible.
- Flush motor according to owner’s manual.

Drain

Completely drain all water from the boat and its compartments, including but not limited to the bilge, wells, lockers, ballast tanks or bags, bait containers, engines, and outdrives.

Dry

Allow the boat to completely dry before visiting any other bodies of water.

NOTE: Some localities may require inspection or decontamination before and/or after launching. Check state and local laws and regulations for requirements prior to traveling to go boating.

Paints

Boat owners are responsible for the environmental regulations that may govern the use of antifouling paint. If the boat is kept in water where marine growth is a problem, the use of antifouling paint may reduce the growth rate. Regulations may vary from state to state. Contact local and state boating authorities for specific information.

Cleaning Agents

Boat owners are responsible for the environmental regulations that may govern the use of cleaning agents. There are many “green” cleaner choices available for most any material on the boat. If using household cleaners, use them sparingly and never discharge them into waterways. Do not mix cleaners and be sure to use plenty of ventilation in enclosed areas. Avoid using chlorine, solvents and products that contain phosphates, as well as non-biodegradable or petroleum-based products. Regulations may vary from state to state. Contact local and state boating authorities for specific information.

Exhaust Emissions

Boat owners are responsible for the exhaust emissions from the boat. Increased exhaust (hydrocarbon) emissions, which are regulated by the EPA, pollute the water and air. Contact the dealer and the engine manufacturer for more information. Additional restrictions may apply and vary from state to state. Contact local and state boating authorities for specific information.

Additional Proposition 65 Information

A wide variety of components used on this boat contain or emit chemicals known to the state of California to cause cancer, birth defects and other reproductive harm.

Examples include:

- Engine and generator exhaust
- Engine and generator fuel and other liquids, such as coolants and oil, especially used motor oil
- Cooking fuels
- Cleaners, paints and substances used for boat repair
- Waste materials that result from wear of boat components
- Lead from battery terminals and from other sources, such as ballast or fishing sinkers

To avoid harm:

- Keep away from engine, generator and cooking fuel exhaust fumes.
- Wash areas thoroughly with soap and water after handling the substances above.

NOTES

Be prepared to deal with emergencies before they happen. Try to formulate a plan for each type of emergency in advance in order to make decisions quickly and without hesitation. Precious moments lost can mean the difference between losing and saving a life.

Before operating the boat, review ***Safety in Section 2***.

FIRST AID/MEDICAL EMERGENCIES

Every second counts toward preventing injury or death in case of a medical emergency. Boaters must have proper training and take necessary preventive measures to properly assist in times of need. Carrying an adequate and current first aid kit is critical in the immediate response and care of someone in need of medical attention. Always have dry blankets readily accessible to help prevent hypothermia. For additional information on medical, first aid and safety training such as CPR, contact your state and local authorities, or visit the Red Cross website:

http://www.redcross.org.

EMERGENCY PREPARATION CHECKLIST

In addition to a safety equipment list, have an emergency checklist on board to assist in times of emergency. Use the following topics as a guideline to develop a list of emergency procedures and instructions for the use of visual and audible distress signaling devices, radios, first aid kits and all related information that could assist you or others in the event of an emergency.

USING DISTRESS SIGNAL DEVICES AND CALLING FOR HELP

Ensure all passengers understand how to operate all onboard visual and audible distress signaling devices and communication equipment. Keep all distress signaling devices and communication equipment in a readily accessible area and within immediate reach at all times.

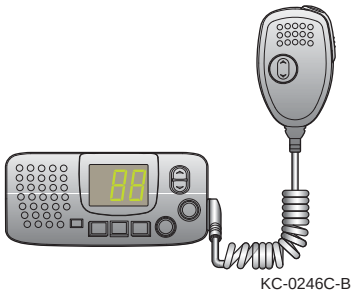


Figure 4-1: Distress Signaling Device

An emergency can occur when you least expect it. Be sure you and your passengers know how to use all types of distress signaling devices.

See the ***Markers, Warnings and Advisories section of this manual*** for more signaling devices.

Seconds count during emergencies. Knowing the proper way to use the distress signaling devices aboard the boat can help save lives.

- **MAYDAY radio call** – A mayday call is reserved for life-threatening situations, such as fire, severe weather or sinking, where lives are in imminent danger or the boat is in danger of sinking. Start the broadcast clearly and calmly with ***"Mayday - Mayday - Mayday."***
- **PAN-PAN (pahn-pahn) radio call** – A pan-pan call is used for urgent but non-life-threatening situations where there is no immediate danger to lives or the boat, such as a loss of steering control or taking on water of any amount. Start the broadcast clearly and calmly with ***"Pan - Pan - Pan."***
- **Securite (se-cure-ih-tay) call** – A securite call is used for non-life-threatening situations to notify authorities and others in the vicinity of important navigation and weather alert calls. Start the broadcast clearly and calmly with ***"Securite - Securite - Securite."***

In an emergency situation the responder needs to know four important pieces of information:

- The exact nature of the emergency and an assessment of the severity
- Number of people on board
- The location (navigation marker, visual reference or GPS coordinates in open water)
- What the boat looks like (hull and top colors, unique features, flags, etc.)

For additional information on the safe and proper use of distress signaling devices and the safe and proper use of emergency communication equipment, contact state and local authorities. Additional information can be found on the USCG website:

http://www.uscgboating.org.

REQUESTING ASSISTANCE (NON-DISTRESS CALL)

If a boater contacts the USCG on Channel 16 VHF-FM or Channel 70 DSC regarding a non-distress situation, the USCG will offer to contact any assistance provider (commercial or friend) the boater requests or will issue a Marine Assistance Request Broadcast (MARB) if the boater has no preference of service.

LAW OF SALVAGE

If boaters require assistance while cruising in the Great Lakes, coastal or ocean waters, they should use caution **before** allowing any towing company or private agency to pass a line to the boat. The law of salvage says, among other things, *"…any vessel, if rendered assistance from a towing company or private agency, can be forced to relinquish a portion of the vessel's worth for the assistance received."* While this is very rare with recreational boats, it can happen.

Before taking the line boaters must establish that they do not agree to any salvage rights and wish to be assisted on a contract basis. Boaters must then establish the contract price and payment terms. Boaters should accept the tow line only when the captain of the company/agency acknowledges the contract price and payment. Most tow companies are reputable and post terms and pricing on their websites.

If boating in the Great Lakes, coastal or ocean waters, it is a good idea to have a membership in a national towing service. This membership can significantly reduce the costs of towing if ever needed.

FIRE AND EXPLOSION

⚠WARNING ***Fire/Explosion Hazard: Gasoline is extremely flammable and highly explosive under certain conditions.***

- Do not smoke or allow open flames or sparks nearby when refueling.
- Do not store fuel in any containers or compartments which are not designated for fuel storage.
- Static electricity can be generated while fueling and can cause a fire or explosion. To prevent electrostatic spark when refueling, make sure the nozzle is in contact with the fill pipe at all times.
- Avoid damaging fuel lines and connectors and make sure fuel does not contact hot engine parts.
- Do not confuse the fuel fill deck plate with the water or waste fill plates, if equipped. All deck plates are properly labeled. If fuel is accidentally pumped into any other deck plate, do not attempt to pump it out. Water and waste pumps are not designed to pump fuel and a fire or explosion could result. Contact the dealer to have the fuel professionally removed.
- USCG-approved fire extinguishers are required on all Class I, II and III boats.

A fire or explosion may occur when least expected. The decision to abandon the boat or stay to fight the fire is difficult and depends on many factors. Formulate a fire plan in advance to make that decision quickly and without hesitation. Keep in mind the following guidelines:

- Many fires are the result of gasoline and oil accumulating in the bilge, careless fueling practices and electrical KC-0074C-A problems. In the event of a fire, try to stop the boat and turn off the engine as quickly and safely as possible. Immediately use a fire extinguisher at the base of the flames in a sweeping motion to reduce or extinguish the fire. Ensure that all passengers are safe from immediate danger and are wearing life jackets. If the fire is located in the engine compartment (if equipped), make sure the bilge blower (if equipped) is off and do not open the engine cover.
- Once the fire is extinguished, check for other immediate fire threats and personal injuries and call for assistance immediately.

- If you are unable to easily extinguish the fire, or if the fire is uncontrollable, attempt to get yourself and all passengers off the boat and into the water. If possible, ensure that all passengers are wearing life jackets or have access to one by the time they are in the water. Before leaving the boat, if possible, verify that there is no immediate danger of fuel sitting or burning on the water's surface where you and your passengers will be floating. Immediately swim to a safe position upwind from the boat and use distress signals to get assistance.

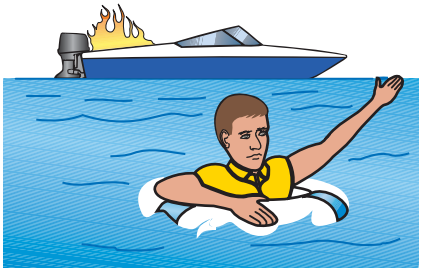


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Figure 4-2: Fire/Explosion

MAN OVERBOARD (MOB)

A high percentage of boating fatalities are the result of people falling overboard, many of whom were not wearing life jackets. If someone falls into the water unexpectedly, react quickly, as every second counts toward preventing injury or death. Keep these guidelines in mind:

- Brief passengers before leaving the dock on the proper procedures should someone fall overboard. Add this briefing to the passenger safety equipment overview.
- At the first sign that a person has fallen overboard, loudly yell "man overboard" and state which side of the boat such as "man overboard—port!" In heavy seas, throw a floatable item toward the MOB as quickly as possible to serve as a marker.
- The operator should immediately reduce speed and determine whether or not to come to a full stop or circle around.
  - If stopped, throw a flotation device (Type IV is best, but any can be used) to the victim, shut down the engines, and throw the victim a line if necessary.
  - If circling around, assign one passenger to throw a flotation device as a marker, keep the victim in sight and continuously point to the victim. Carefully navigate back to the victim, staying at a safe distance, and position the boat safely to retrieve the victim. Keep current, wind and waves in mind so the victim drifts toward the boat. Shut down the engines and throw the victim a line if necessary.
- Move passengers to the rescue side of the boat to assist the victim back into the boat.

- Avoid going into the water to assist the victim unless there is no other way to retrieve the victim. If a rescuer must go into the water, the rescuer should be wearing a life jacket. The rescuer should also be prepared for the possibility of being pulled under water by the victim if the victim is panicking.

CAPSIZING AND FLOODING

A boat may capsize or flood when least expected. Formulate a plan in advance in case of capsizing or flooding. Review the following guidelines:

- If the boat capsizes, locate all passengers and guide them to a safe flotation device or the forward hull if the boat is floating upside down.
- If possible, provide life jackets to all persons in the water and assess them for alertness and injuries.
- STAY WITH THE BOAT! Climb up on the hull and try to get assistance.
- Do not try to swim to shore, as it can be farther than it appears.

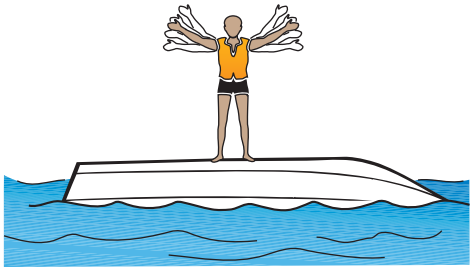

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Figure 4-3: Capsized Boat

If the boat starts to flood, slow the boat to a safe speed and stop as quickly as possible. Activate the bilge pump(s) immediately. Try to locate the cause of the flooding. If the cause is not readily apparent or not easily corrected, head for shore or shallow water as quickly as possible and call for help.

RUNNING AGROUND

When a boat runs aground, the stop is usually abrupt. Because passengers are not secured to a seat, abruptly stopping a boat while in motion can cause serious personal injury or even death. First, turn off the engine(s) immediately, locate all passengers and attend to any injuries, calling for emergency assistance as needed. Then, assess the damage to the boat and determine if there are any other immediate threats such as water leaking into the boat, or fuel or flammable materials leaking into the water or inside the boat. Immediately call for assistance if threats exist that could endanger the safety of passengers.

If there are no immediate safety threats to passengers and the boat is not damaged, attempt to propel it away from the obstacle. If the engine or drive system has been damaged and the engine restarts, be aware of excessive vibrations or uncommon noises, which usually indicate damage to the drive system. If this is the case, it is not safe to proceed. Call for emergency or professional towing assistance immediately.

⚠WARNING ***Personal Injury Hazard: Use extreme caution when using tow lines and when connecting tow lines to cleats. Death or serious injury could occur when lines and/or cleats fail while they are under extreme tension.***

If the engine restarts and the boat can be navigated safely back to port, proceed slowly to port and be ready to call for emergency assistance if needed. Even if the boat and engine appear to be in good operating condition after running aground, have the boat inspected by a qualified marine technician BEFORE returning it to service. Damage may have occurred that is not obvious to you as an operator.

DANGEROUS WEATHER

Take special precautions when encountering or operating in dangerous or hazardous weather conditions.

See the ***Severe Weather section of this manual*** for additional information.

ENGINE OR BOAT SYSTEM FAILURE

In the event of an engine or boat system failure and when not in immediate danger, try to troubleshoot or identify the problem before calling for assistance.

See the ***Troubleshooting section of this manual*** for additional information.

ACCIDENTS, COLLISIONS AND GIVING ASSISTANCE

A collision or accident may occur when least expected. Formulate a course of action in advance in case of a collision or accident. Keep in mind the following guidelines:

- If an accident or collision occurs involving the boat, locate all passengers first and verify and secure their safety. Check for injuries and provide all passengers with a flotation device.
- After determining that passengers are not in danger, provide assistance to passengers on the other boat.
- Immediately call for help and then assess the damage to the boats. Render necessary assistance to prevent further damage or personal injury.

The USCG requires the owner/operator of a boat involved in an accident to report the incident immediately to the proper marine law enforcement agency for the state in which the accident occurred.

See the ***Reporting Accidents section of this manual*** for additional information.

An operator who witnesses or is aware of an accident or collision while boating must report it immediately and provide assistance.

Operators seeing a distress signal or suspecting a boat is in trouble must assume it is a real emergency and render assistance immediately. After determining that a real emergency exists, call for help immediately and then provide assistance to all passengers to ensure their safety.

TOWING ON THE WATER

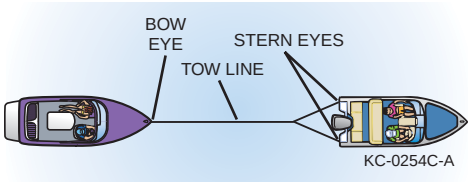


Figure 4-4: Towing

In situations where an operator is asked to tow or be towed for any reason, assess the situation and try to contact a professional towing service or other emergency assistance first. When encountering a boat in distress, always offer emergency or safety assistance and/or call for assistance for the distressed parties if necessary. Towing or being towed presents an increased risk of personal injury and boat damage.

⚠WARNING ***Personal Injury Hazard: Use extreme caution when using tow lines and when connecting tow lines to cleats. Death or serious injury could occur if lines and/or cleats fail while they are under extreme tension.***

Follow these guidelines when towing or being towed:

- Use extreme caution when throwing weighted lines to a boat in distress. When in rough seas, use a light throwing line with a weight secured on the throwing end and a heavier towing line secured to the other end.
- Never attempt to tow a boat larger or heavier than your own.
- Never attempt to tow a grounded, damaged or capsized boat.
- Use a tow line that is rated at least four times the gross weight of the boat being towed.
- Make sure tow lines are in good condition and are free of damage, cuts or abrasions.
- Attach a tow line to the bow eye on the disabled boat. Never attach a tow line to any point on the disabled boat other than the bow eye.
- Attach the tow line to the stern eyes of the towboat. Wrap the tow line with chafing gear where it rubs against the boat or any corners.

- Leave at least two boat lengths between the boats for adequate movement.
- Never allow anyone to be in line with the tow line. If the line breaks or pulls free, dangerous recoil could occur, resulting in severe injury or death to anyone in its path.
- Adjust the tow line to match wave action. Keep the boats on the crest or in the trough of the waves at the same time. In protected, calm waters, shorten the line for better handling.
- Tow at moderate speed, allowing for adverse wind and wave conditions.
- Have the operator of the towed boat steer with you if possible.
- Have a person on the tow boat watch the disabled vehicle and, if necessary, be available to signal the operator of the disabled boat.

Check with local and state authorities prior to towing for additional regulations and restrictions on towing other boats or equipment.

Before operating the boat, review ***Safety in Section 2***.

SEVERE WEATHER

Getting caught in severe weather can be dangerous and even fatal. Check with local weather stations, the USCG or weather-service broadcasts (162.55 or 162.40 MHz) for the latest conditions. Check the weather not only before you go out on the water, but also periodically while you are on the water. Consult the following websites for weather information:

- *www.weather.com*
- *www.nws.noaa.gov*
- *www.navcen.uscg.gov*

Storm Conditions

Take the following precautions if operating the boat in storm conditions:

- Have all occupants wear life jackets.
- Turn on navigation lights.
- Locate and have inclement weather gear and safety equipment ready.
- Mark or identify the boat's position.
- Close all ports, stow all gear and secure any loose equipment on deck.
- Reduce speed and head for port or a safe, easily reachable place.
- Keep a lookout for debris and obstructions in the water.
- When possible, head into the waves at a 45-degree angle. Allowing high waves to strike the side of the boat may cause it to capsize or swamp.
- If losing power, keep the boat headed into the waves by rigging a sea anchor off the bow.
- If a storm cell with lightning cannot be avoided, lower antenna and take down fishing poles.

Fog Conditions

Avoid operating the boat in foggy weather, if possible. Operators encountering fog conditions should return to port immediately. Also, take the following precautions:

- Reduce speed to a safe speed or idle.
- Take bearings and log the course and speed before the fog sets in. Use of a GPS is recommended.
- Have all occupants wear life jackets.
- Assign lookouts to the bow and stern to keep watch and listen.
- While navigating in fog, sound a five-second blast from the horn or whistle once every two minutes to alert other boaters of your position.
- If it is unsafe to continue navigating the boat, quickly find the best position to anchor. Sound a five-second blast from the horn or whistle once every minute while anchored to alert other boaters of your position.

Reduced Visibility

Natural environments and inclement weather can cause reduced visibility. Storm condition hazards can be compounded by reduced visibility while on the water. Always use common sense and take safety precautions if operating the boat in reduced visibility conditions.

Cold Weather and Cold or Frozen Water Conditions

Avoid operating the boat in cold water or weather conditions, and never operate in frozen or icy waters. Operating in these conditions significantly increases the risk of serious injury or death. Boating in these conditions can lead to cold-water immersion, shock or hypothermia. Weather conditions may hinder emergency rescue or assistance, and cold weather poses potential problems for onboard equipment, as well as the engine. See the *Engine Operator's Manual* and the equipment manufacturer's instructions for operating in cold weather.

WATER HAZARDS

Every waterway poses hazards that operators must be aware of and avoid. These hazards include shallow water, rocks, tree stumps, sandbars and submerged/semi-submerged cables and pipes. Ask local authorities and other boaters for information and consult a marine chart when boating on unfamiliar waters. As a boat operator, try to avoid all hazards, known and unknown.

Aquatic Vegetation/Weeds

Operating in weeded areas can be hazardous. Aquatic vegetation can be a threat to the boat's drive system. Vegetation and weeds can wrap around the propeller, causing loss of propulsion and steering control. They may also restrict the engine water cooling intake, causing the engine to overheat. Avoid operating in or near vegetation. If restricted because of vegetation, stop the engine. See the *Engine Operator's Manual* for recommendations on the removal of vegetation from the propeller and water cooling intake ports. Be extremely careful and never get into the water when clearing the propeller. Stay out of the water in highly congested vegetative areas, which can severely restrict your mobility and create a life-threatening situation.

NOTICE *Vegetation can sometimes be removed by shifting to NEUTRAL, pausing a moment, then shifting to REVERSE to unwind the vegetation from the propeller.*

Dams and Spillways

The waterways around dams and spillways are extremely hazardous. Dams and spillways are subject to rapid water flow changes, and may have floating and sunken debris in the nearby water. These areas are often marked as restricted, and it is best to always stay clear of them.

Shallow Water Operation

⚠WARNING ***Collision Hazard: Use caution in shallow water or where underwater/floating objects may be present. Hitting an object at high speed or severe angle can seriously injure people and damage the boat.***

Operating in shallow water presents a number of hazards. Sandbars in narrow inlets are constantly shifting, making it difficult to mark them with buoys. Sandbars are sometimes indicated by waves as they form into breakers when passing over the sandbar. In coastal areas, tides can affect water level as much as 30 feet (9 meters). Check with local marinas or Coast Guard stations for tide tables and current charts.

MARKERS, WARNINGS AND ADVISORIES

Find out from local authorities if hazards exist in areas where you intend to navigate, and know how these hazards are marked. You must also recognize flag designs that indicate hazards or activities that are present and keep well clear of those areas. Always watch for swimmers and stay clear of all swimming areas, marked or unmarked.

Figure 5-1: Warning Marker

Become familiar with navigation markers, which identify navigable routes and indicate water hazards. Always stay within marked boundaries and steer clear of hazards.

Flags and indicators are markers of potential emergencies and hazards. Become familiar with these flags and indicators. Additionally, understand your responsibilities when operating at these times and in these areas.

Boat Flags

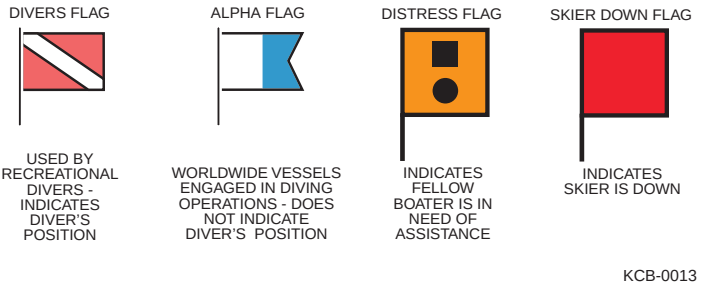
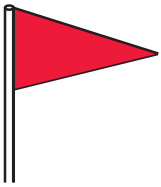
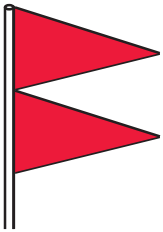


Figure 5-2: Boat Flags

Storm warning advisory flags and indicators alert boaters to impending weather conditions. Become familiar with these flags and indicators and understand the potential hazards associated with operating in these conditions.

Harbor Flags and Indicators

DAYTIME WARNING	DESCRIPTION	NIGHTIME WARNING
	**Small Craft Advisory** - Winds greater than 18 knots, sustained for two hours or more or hazardous wave conditions. Following a storm, hazardous wave conditions can persist long after the high winds have subsided.	
	**Gale Warning** - Sustained winds (2 or more hours), of 34-47 knots.	
	**Storm Warning** - Sustained winds of 48 knots or greater.	
	**Hurricane Warning** - Forecast winds of 64 knots and above. Displayed only in connection with a hurricane.	

Actual Signal in red

KC-0371C

Figure 5-3: Harbor Flags and Indicators

NOTES

Before operating the boat, review ***Safety in Section 2***.

The following information outlines basic navigational rules. Boating regulations are enforced by USCG, state and local authorities. You are subject to marine navigation regulations for both federal and state waterways. For more information, contact the USCG, state and local marine authorities. The navigational rules for U.S. waterways can be found in the “Navigational Rules” publication. This publication can be found at most marine supply stores, or you may contact the USCG or visit:

www.navcen.uscg.gov to view or download the publication.

Any boat 39 feet (12 meters) or longer must have a copy of the “Navigational Rules” publication on board at all times. Failure to have this document on board can result in penalties and/or fines.

RIGHT-OF-WAY

Boats with less maneuverability have right-of-way over more agile boats. You must stay clear of a boat with right-of-way. Examples of boats with right-of-way are:

- Boats aground or not under command
- Boats with restricted maneuverability
- Boats engaged in fishing
- Non-motor boats (having no power propulsion), i.e., rowboats, paddle boats, canoes and sailboats

Small pleasure boats must yield right-of-way to large commercial boats in narrow channels. A boat with right-of-way is sometimes referred to as the privileged boat.

The General Prudential Rule

The general prudential rule regarding right-of-way is if a collision appears unavoidable, neither boat has right-of-way. Both boats must act to avoid collision.

NAVIGATIONAL LIGHTS AND NIGHT OPERATION

Navigational lights alert other boats to your presence and course, especially when operating at night or in restricted visibility conditions.

Regulations require that navigational lights be clearly lit and properly displayed at all times between sunset and sunrise, and always when operating in reduced visibility. Where applicable, lights must appear on the sides, stern, masthead and all-around positions.

All navigational rules apply at night, but speed is restricted on many waterways. Night boaters must operate at a slow, safe speed and stay clear of all boats, regardless of which boat has right-of-way.

Protect your night vision by avoiding bright lights. If possible, have a passenger help keep watch for other boats, water hazards and aids to navigation.

The size, speed and direction of other boats are determined at night by white, green and red running lights.

- A green light indicates the starboard side of the boat. Generally, if you see a green light on another boat, you have the right-of-way. Hold your course.
- A red light indicates the port side of the boat. Generally, if you see a red light on another boat, they have right-of-way and you must yield your course.

AUDIBLE SIGNALS

It is not necessary to sound a signal every time a boat is nearby. It is typical for commercial boat operators to signal their intention, using a whistle, horn or bell, to avoid potentially confusing or hazardous situations. Privileged boat operators customarily signal first, then the yielding boat operators return the same signal to acknowledge they understand and will comply. Use the danger signal (five or more short, rapid blasts) if intent is not clear.

Use the following signal blasts early enough so other boaters notice and understand them:

AUDIBLE DISTRESS SIGNAL	DEFINITION
One long blast	Warning signal (coming out of slip or passing astern)
One short blast	Pass on port side
Two short blasts	Pass on starboard side
Three short blasts	Engine(s) in reverse
Five or more short blasts	Danger signal

OVERTAKING/PASSING

The boat overtaking or passing must yield right-of-way to the boat being passed. The overtaking boat must make any adjustments necessary to keep out of the way of the boat being passed. The boat being passed has the right-of-way and must hold its course and speed.

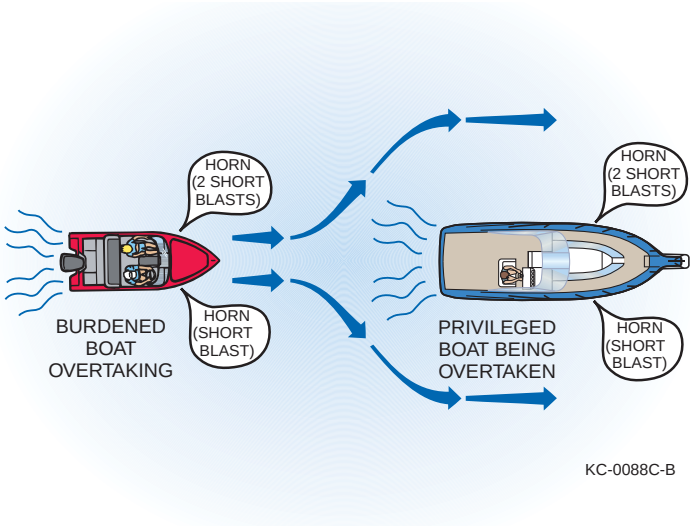


Figure 6-1: Overtaking and Passing

MEETING HEAD-ON

When two boats meet head-on, neither boat has the right-of-way. Both boats should decrease speed, turn to the right and pass port to port. If, however, both boats are on the left side of a channel, each vessel should sound two short horn blasts and pass starboard to starboard.

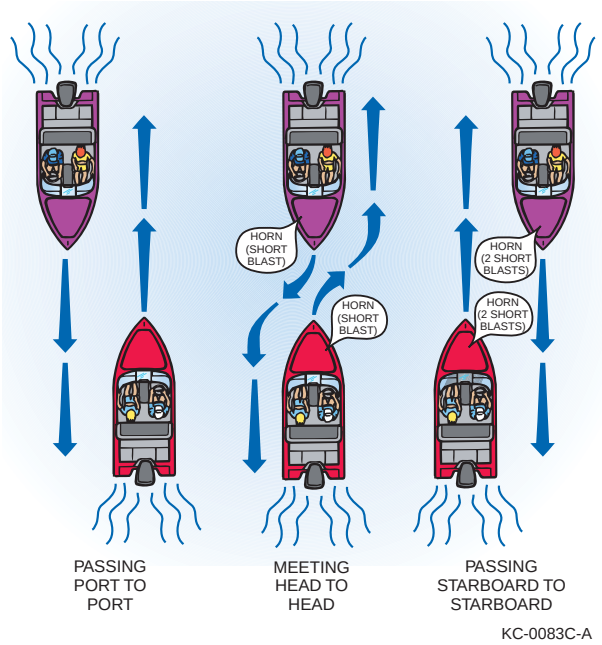


Figure 6-2: Meeting Head-On

CROSSING

In crossing situations, the boat to the right from the 12 o'clock to the 4 o'clock position has the right-of-way and must hold course and speed. The boat without right-of-way must yield and pass to the stern of the privileged boat. Boats going up and down a river have the right-of-way over boats crossing the river.

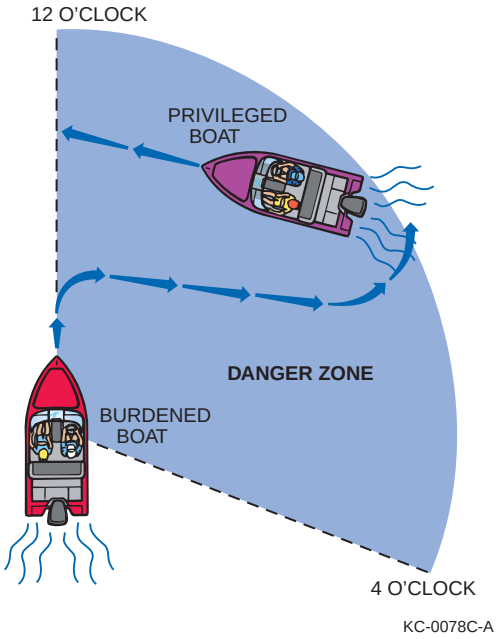


Figure 6-3: Crossing

AIDS TO NAVIGATION

Learn to recognize the different buoys and day markers; they are the signposts of the waterways. The United States Aids to Navigation System (USATONS) is the primary marking system used on inland water, coastal waters and rivers. This system is maintained by the USCG.

There are two other navigation marking system variations boaters must follow in the United States:

- Western Rivers Marking System – When on the Mississippi River, tributaries above Baton Rouge, and several other rivers that flow toward the Gulf of Mexico.
- Intracoastal Waterway (ICW) – Runs just inland and parallel to the Atlantic Ocean and Gulf coasts from Manasquan, New Jersey, to the Mexican border. *Since ICW routes may travel next to non-ICW routes in opposing directions, navigate by the yellow symbols when following the ICW.*

Both systems are similar to USATONS but have subtle differences that must be understood. If you boat in these areas, visit www.uscgboating.org for navigation rules.

Navigational aids are designed and placed accordingly to help you navigate safely on the water. Learn to recognize the different buoys and day markers.

The following information is based on the USATONS. For further information, contact the USCG and state and local marine authorities. Also visit www.uscg.boating.org for navigation rules.

The USATONS uses buoys, beacons and minor lights as markers.

NEVER tie or anchor to a navigational aid. This action is unlawful and dangerous to you, your boat and other boaters.

NEVER move or damage a navigational aid. This action is unlawful and dangerous for other boaters.

Buoys

Most anchored floating markers are generally referred to as buoys. Buoys have many uses and color schemes, and can vary in size and shape. The most commonly used buoy colors are white, red, green, yellow and black. Buoys may be unlighted or lighted. Some are audible; others have both an audible and a visual signal. Lights, bells and horns on buoys aid in night boating or poor visibility conditions. Buoys with unique light-flashing characteristics are identified on nautical charts with the specific flashing pattern.

Become familiar with the specific buoys used in the waters where you are boating. Contact local authorities for specific information and/or navigational aid charts for your waterways.

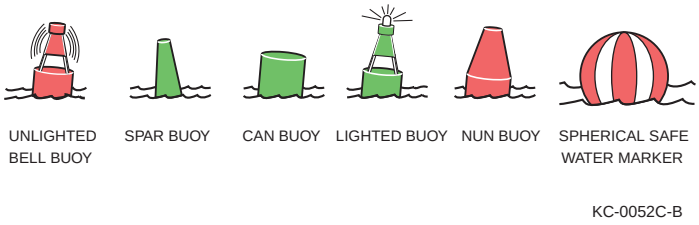


Figure 6-4: Buoys

Mooring Buoys

The only buoys you are permitted to moor to are mooring buoys. Mooring buoys are white with a blue horizontal stripe. Mooring to a navigation buoy, regulatory markers or lateral markers is illegal.

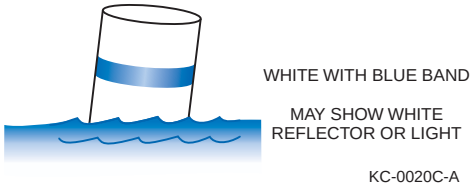


Figure 6-5: Mooring Buoys

Daymarks/Dayboards

Daymarks or dayboards are fixed visual markers in the water. The markers are commonly attached to a post or piling and are sometimes accompanied by a light. Daymarks are either red or green and are usually triangular- or square-shaped, though their shapes can vary. Daymarks often display numbers, which act as navigation guides. Red daymarks are usually triangular and sometimes show an odd number. Green daymarks are usually square and sometimes show an even number. The numbers on the markers are sequential and increase from seaward.

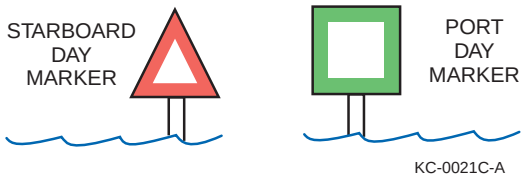


Figure 6-6: Daymarks

Lights and Lighted Structures

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

Minor Lights

Minor lights are colored according to the buoyage marking system in use. They are similar to lighted buoys, except they are usually higher and on more stable platforms to increase visibility. Most minor lights are part of a series to mark a channel, river, or harbor and fairways.

Range Lights

Range lights are usually visible in one direction and help a boat operator navigate safely. Steering a course to keep range lights arranged in a line (one on top of the other) will help guide a boat through a channel.

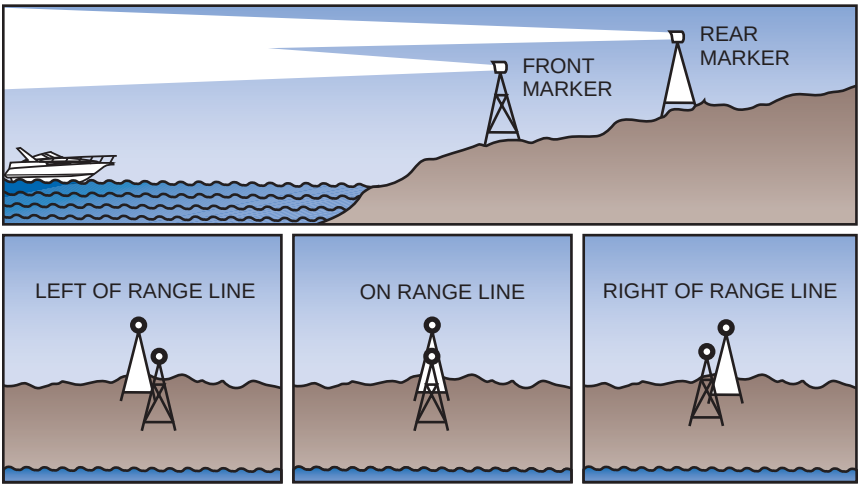


Figure 6-7: Range Lights

Lighthouses

Lighthouses can be found at harbor entrances, prominent headlands, isolated danger areas and along the coasts. These striped or patterned structures have unique flashing signals, which help boaters identify them.

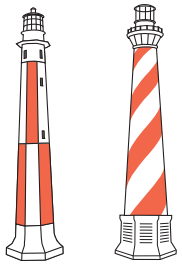


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Figure 6-8: Lighthouses

Markers

Seven (7) types of markers are used to assist the boat operator:

- Regulatory
- Range
- Special
- Lateral
- Safe Water
- Preferred Channel
- Isolated Danger

Regulatory Markers

Regulatory markers are used to display information or indicate danger. Regulatory markers can be fixed visual markers or anchored floating buoys.

Fixed visual markers are usually white with orange geometric shapes that display information. Anchored floating buoys are white cylinder-shaped buoys with orange bands at the top and orange geometric shapes that may display information.

Following are the various orange geometric shapes used on these markers:

- Diamond – Indicates danger
- Diamond with cross marks inside – Indicates that a boater must keep away
- Circle – Indicates a controlled area or speed limit
- Square – Displays important information

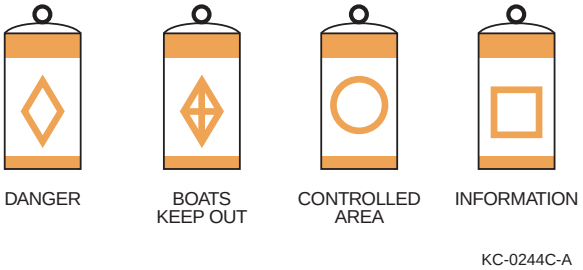

Figure 6-9: Regulatory Markers

Range Markers

Range markers have many color schemes, may have numbers or letters and may be lighted or unlighted. They are placed in pairs within close distance of each other. They are commonly used in channels to guide boats safely through the center or safe line of navigation. Keep range markers visually in line with each other while navigating the waterway to avoid obstacles or other invisible dangers.

Special Markers

Special markers are yellow and come in various styles and shapes. Lighted and unlighted daymarks and buoys vary in function. Many are used to display information and navigational direction rules. The most common special markers are those used in intercoastal waterways. Contact your state and local authorities for more information on special markers used in your boating area.

Lateral Markers

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

The basic nautical rule of lateral markers is the phrase “Red, Right, Returning.”

The term “sea” generally refers to the ocean or a large body of water. “Seaward” refers to traveling from the sea or a large body of water inland or to a smaller body of water.

When traveling seaward – keep red markers to your port (left) and green markers to your starboard (right).

When returning from seaward – keep red markers to your starboard (right) and green markers to your port (left).

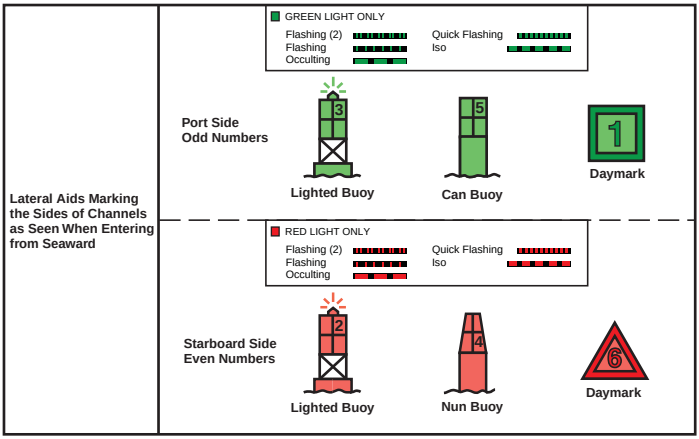

Figure 6-10: Lateral Markers

Safe Water Markers

Fairways and mid-channels may be marked with safe water markers or buoys. These markers indicate safe water all around. Safe water markers are red and white with vertical stripes, and are round or have a red spherical top mark.

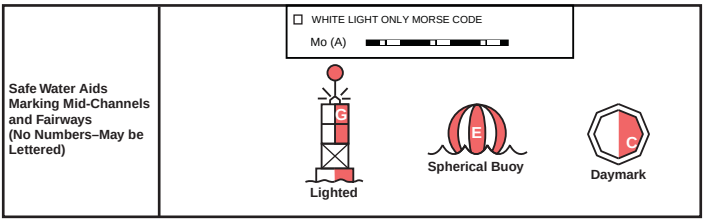

Figure 6-11: Safe Water Markers

Other Special Signs and Markers

Various signs and markers are used throughout U.S. waterways for different purposes. In Florida, special signs are used to warn of “manatee” areas. These signs help to control speed and/or restrict areas from boating to conserve this endangered species. As a boat owner and operator, be aware of special information and markers on the waterways. Contact your state and local authorities for more information on local restricted or controlled areas and their markers.

Preferred Channel Markers

Obstructions, channel junctions and preferred channels are marked with red and green horizontally striped can and nun-style buoys. The top band color indicates the preferred path to take. Use these markers in the same manner as lateral markers to follow preferred channels.

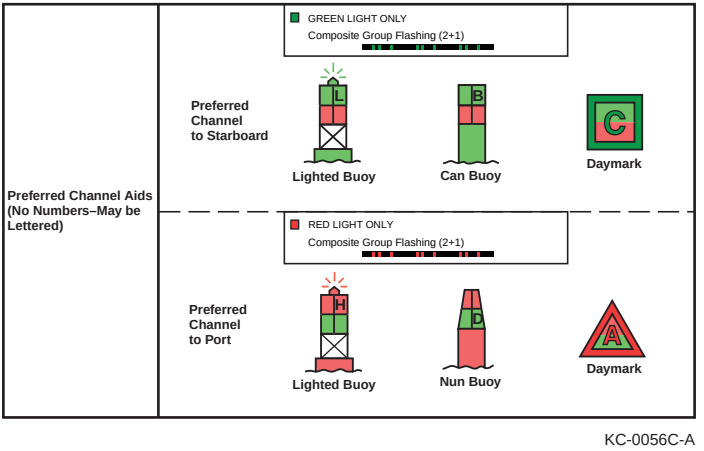

Figure 6-12: Preferred Channel Markers

Isolated Danger Markers

Isolated danger markers indicate an isolated danger which may be passed on all sides. These markers are black with one or more broad horizontal red bands and are equipped with a top mark of two black spheres, one above the other. On inland waters, a buoy with alternating vertical black and white stripes may be used to indicate that an obstruction or other danger exists between the buoy and the nearest shore. Do not pass between the buoy and the shore.

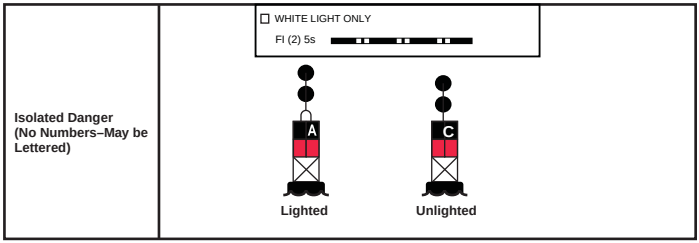

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Figure 6-13: Isolated Danger Markers

NOTES

Before operating the boat, review ***Safety in Section 2***.

⚠WARNING ***Control Hazard: Certain actions can cause you to lose control of the boat:***

- ***When accelerating the boat in the forward direction, the bow can rise and restrict visibility. Observe for obstacles and people before accelerating.***
- ***The rotational thrust of the propeller under rapid acceleration can create high steering torque and rapidly change the direction of steering, causing loss of control.***
- ***Do not trim the engine out too far or the boat may begin to "porpoise" (bounce up and down). Porpoising reduces control and visibility.***
- ***Improper use of trim tabs or moving them down at high speeds can cause loss of control.***
- ***If you lose control of the boat, pull back on the throttle and trim in at the same time.***

BEFORE GETTING UNDERWAY

Safety Equipment

Federal and local laws require certain safety equipment to be on board at all times. Responsible boaters carry additional equipment in case of emergency.

Float Plan

Complete a float plan before departure and leave it with a reliable person who is aware of your intentions while on the water. In case of emergency or if you do not return as planned, this information can be helpful to the USCG or others in rescuing or contacting you. There are several float plan apps that make it easy to fill out and email the plan. For more information on float plans or to download a float plan form, go to:

http://www.floatplan.uscgaux.info

Pre-Departure Safety Checklist

The following checks are essential to safe boating and must be performed before starting the engine or getting underway. Perform these checks every time you operate the boat so they become routine.

Never launch the boat or leave the safety of the dock if any problem is found during the pre-departure safety check. A problem could lead to an accident during the outing, causing severe injury or death. Have any problems corrected before proceeding:

- Check the current and forecasted weather reports, as well as wind and water conditions.
- Make sure the operator is qualified to operate the boat and does not use drugs or alcohol while at the helm.
- Make sure all required safety equipment is on board.
- Make all passengers aware of safety procedures.
- File a float plan.
- Have all required documents on board.
- Have all maps or navigational charts for the intended destination on board.
- Be sure all passengers are properly seated.
- Be sure the boat is not overloaded.
- Check the engine emergency stop switch lanyard for proper installation and operation.
- Be sure the fire extinguisher is fully charged.
- Check bilge drain plugs for proper installation.
- Be sure all water has been pumped from the bilge area.
- Have plenty of emergency food and water on board.
- Check the bilge blower (if equipped) for proper operation, and be sure no fumes are present in the bilge area.
- Be sure all required equipment is on board (mooring lines, anchor lines, tool kit, etc.).
- Be sure you have enough fuel for the return trip.
- Check all compartments for fuel fumes.
- Check that no fuel, oil or water is leaking or has leaked into the bilge compartment.
- Check all hoses and connections for leakage and damage.
- Check the hull and propeller for damage.
- Check the engine cooling water intake pickup for blockage.
- Check that batteries are fully charged and the battery terminals are clean and tight.
- Check the electrical systems and navigation lights for proper operation.

- Be sure no person or obstacle is near the propeller.
- Check that the throttle/shift control is in the NEUTRAL position.
- Check the steering system for proper operation.
- Inspect the steering, throttle and shift cables for kinks, wear and interference with other components.
- Check that all required maintenance has been performed.

Boarding

Helpful guidelines when boarding a boat:

- Always step, rather than jump, into a boat.
- Avoid stepping on fiberglass or other potentially slippery surfaces.
- Always board one person at a time.
- Never board while carrying gear. Set the gear on the dock, board the boat and then pick up the gear.
- Never use the engine unit as a boarding ramp.
- It is courteous to always ask for permission to board so the owner/operator is aware of your presence on the boat.

See the ***Using the Boarding Platform/Ladder section of this manual*** for re-boarding the boat from the water.

Boat Loading

The safety and performance of the boat depends on load, weight and the distribution of each.

The person/load capacity is determined by the USCG. A capacity plate is usually located within clear visibility of the boat operator or helm area. The capacity plate indicates limits for loading the boat, which are enforceable by law.

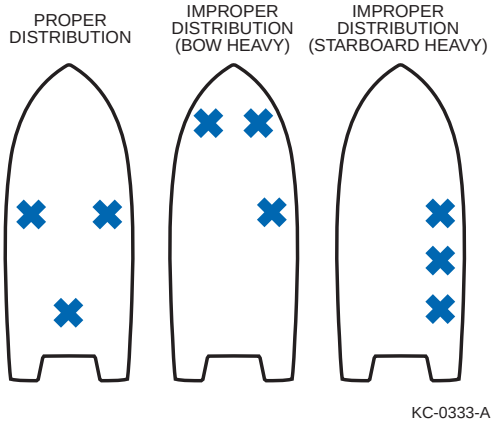

Figure 7-1: Weight Distribution

⚠WARNING ***Sinking Hazard: NEVER exceed the USCG certified maximum capacities under any circumstances. Exceeding the limitations stated on the capacity plate can cause the boat to sink or the passengers and/or operator to drown, resulting in death or serious injury.***

- Board passengers one at a time and distribute them equally to maintain equal buoyancy of the boat.
- Distribute weight equally from port to starboard and fore to aft. The shifting of weight may be required when underway to maintain an efficient trim position for optimum performance.
- Stow and secure all loose gear in stowage areas to prevent load shifting.
- Do not stow gear on top of safety equipment; safety equipment must be quickly accessible.
- In adverse weather, reduce the load in the boat. Person and load capacity ratings are calculated for normal boating conditions.

Occupant Seating Positions (Boats Less Than 26')

Boats longer than 26' are Yacht Certified and are exempt from specific seating locations while underway.

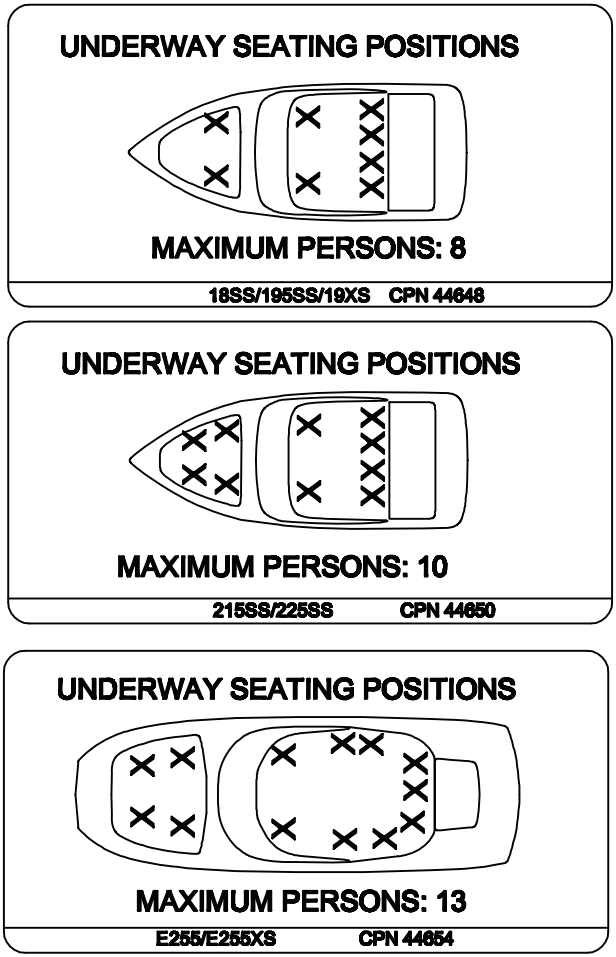

Figure 7-2: Seating Positions

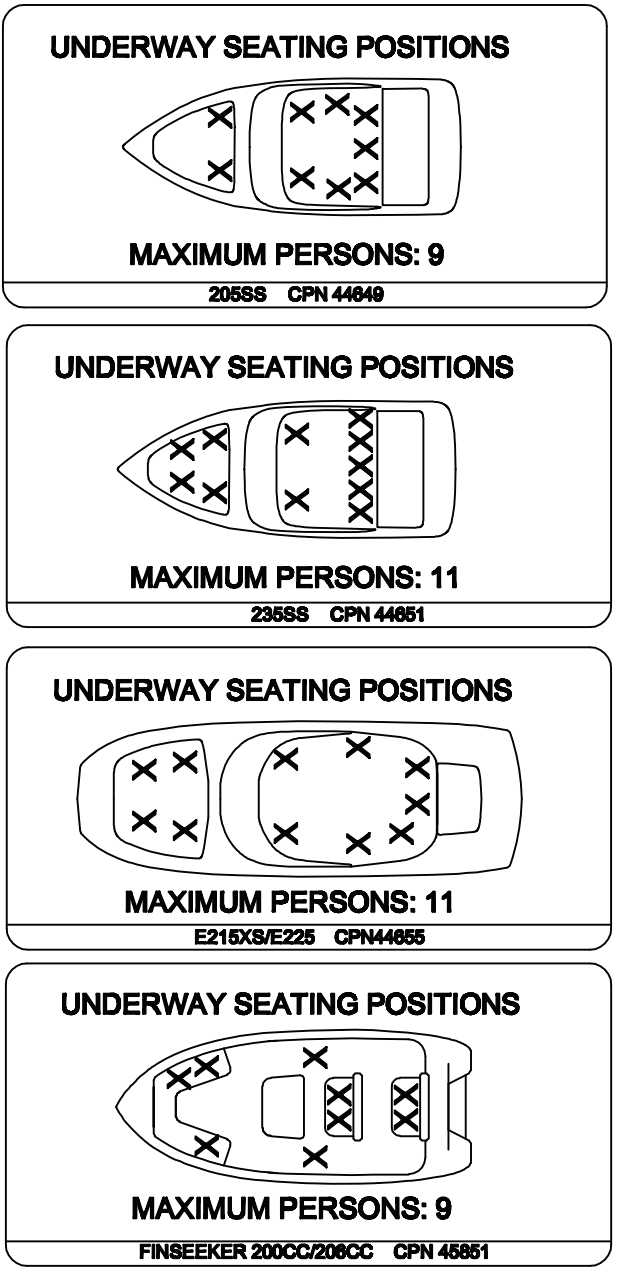

Figure 7-3: Seating Positions

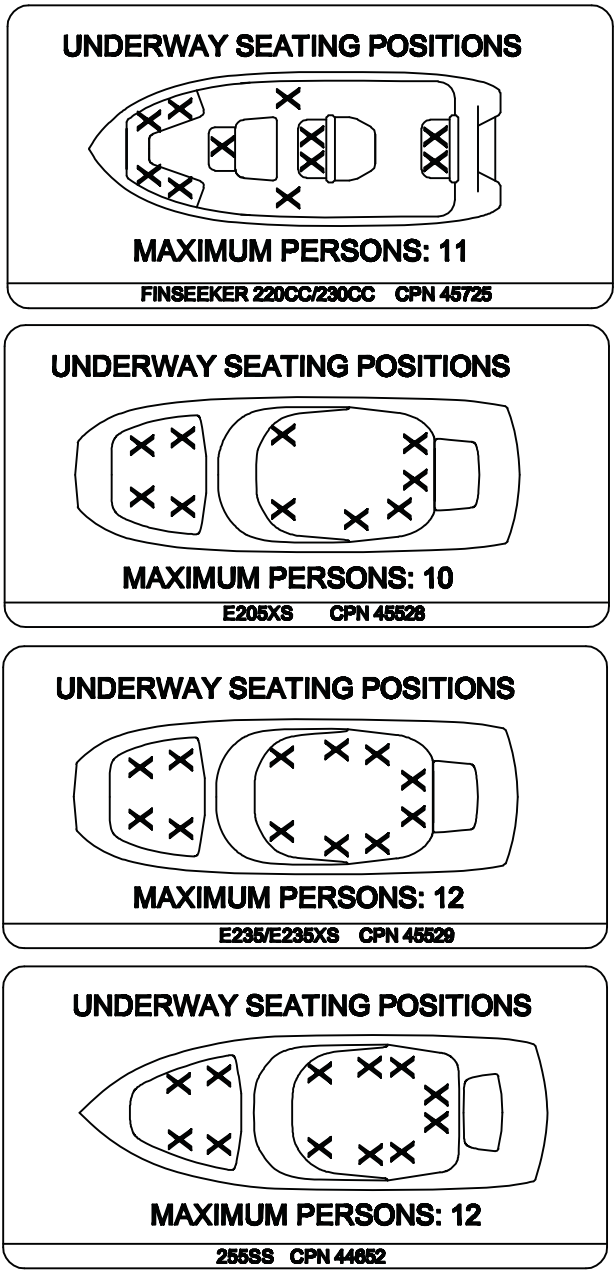

Figure 7-4: Seating Positions

FUELING

Fuel Management

Use the “one-third” rule for fuel management. Use one-third of the fuel to reach your destination, one-third to return and one-third as reserve fuel.

Fuel Suppliers

Refuel only at approved suppliers such as marina fuel docks or automotive fuel service stations. Approved suppliers have safeguards in place to lessen the likelihood of static discharge. Use only containers and funnels approved for use with gasoline fuels. See the ***Before Refueling section of this manual*** for additional information.

Static Electricity and the Fuel System

The boat’s built-in fuel tank has a bonding system that protects it from creating and discharging static electricity. The boat must be in contact with the water or on its trailer when refueling to complete the bonding system.

If the bonding system is not complete, an electrostatic spark may occur.

⚠WARNING ***Fire/Explosion Hazard: An electrostatic spark can ignite fuel vapors, causing a fire and/or explosion.***

Use extreme caution when filling the fuel system. In addition:

- Remove portable fuel tanks from the boat and place them on the ground to fill. The fuel tank must be properly grounded before refueling.
- Do not refuel a built-in fuel tank if the boat is suspended from a sling or another type of boat lift system. Suspending the boat from the water interrupts its bonding system. Using a portable fuel tank to refuel the boat while it is suspended may cause an electrostatic spark.

Fuel (Gasoline)

Fuel for marine gasoline-only engines must be carefully selected to avoid fines and possible catastrophic engine damage not covered under warranty. It is illegal for any person to tamper with emissions control devices such as the fuel system, and it is also illegal for any person to mis-fuel a marine gasoline-only engine with a blend of more than 10% ethanol.

KCB-0004

Figure 7-5: Reminder to Use E10 Fuel

While it is always preferable to use fuel that does not contain ethanol (usually labeled as “marine” or “recreational”), most marine engines are designed to tolerate E10 (10% maximum ethanol) fuel as long as the fuel meets the engine manufacturer’s octane requirements. When using fuel containing ethanol, buy fuel in smaller quantities that will be consumed during a weekend of boating. Fuel degrades quickly and the engine operates better on fresh fuel. Use marine fuel stabilizer to treat and reduce degradation of any remaining fuel.

KCB-0005

Figure 7-6: Warning to Use E10 Fuel

Fuels that contain bio-isobutanol at any percentage are safe to use in marine products and have none of the limitations of ethanol biofuel additives.

Do not use octane boosters or other fuel additives except NMMA-certified fuel stabilizer. Purchase fuel from a quality supplier selling high volumes to ensure the fuel is fresh. For more information go to: *www.toptiergas.com/licensedbrands/*

NOTICE *Fuels that are blended to contain more than 10% ethanol may damage the engine, oil system or fuel system and should not be used in marine engines. Fuels that contain more than 10% ethanol can corrode metal parts, deteriorate rubber and plastic, or weaken gaskets. Damages caused by the use of fuels that contain more than 10% ethanol or fuels that do not meet engine manufacturer octane requirements are not covered by your warranty.*

Gasoline Fuel in the U.S. Market

The majority of recreational boats are trailerable and often fueled at automobile gasoline filling stations. In the U.S. market, there are ever-increasing percentages of ethanol blended with gasoline with the most common being 10%. Since there is no standard for labeling gas pumps, it can be confusing to select the proper blend – LOOK BEFORE YOU PUMP!

Ethanol blends of more than 10% are tempting to use in your boat because they are cheaper. Ethanol blends of more than 10% are NOT meant for ANY outdoor power equipment and their illegal use will not only deteriorate rubber and plastic, causing an environmental hazard, but will cause permanent DAMAGE to the engine that is not covered by the Warranty – DO NOT BUY GAS BY PRICE!

	CONTAINS NO ETHANOL	UP TO 10% ETHANOL	UP TO 15% ETHANOL	UP TO 30% ETHANOL	UP TO 50% ETHANOL	UP TO 85% ETHANOL
OK for Boat Engines	Yes	Yes**	No	No	No	No
OK for Long-Term Storage	Yes*	No	No	No	No	No
Covered by Engine Warranty	Yes	Yes	No	No	No	No
Illegal to Use in Boat Engines	No	No	Yes	Yes	Yes	Yes
Price	Most Expensive	About 5% Less	About 10% Less	About 20% Less	About 30% Less	Least Expensive

* 3 – 6 months with marine-grade fuel stabilizer *added immediately*

** Not more than one month with NMMA-certified marine-grade fuel stabilizer *added immediately*

Before Refueling

⚠WARNING ***Fire/Explosion Hazard: Gasoline is extremely flammable and highly explosive under certain conditions. Be sure to check the fuel hoses and connectors for leaking and deterioration before fueling and on a monthly basis.***

- Refuel the tanks only in a well-lighted area.
- Know where the fire extinguishers are.
- Stop all engines, motors, blowers and appliances before refueling.

- Do not smoke or allow open flames or sparks nearby, within 50 feet (15 meters), of the fueling area.
- If equipped, close all doors, windows, hatches and ports.

Fueling

The fuel filler on boats with built-in tanks is usually located on the gunwale or aft area. The fuel tank is equipped with an antisiphon valve. The antisiphon valve operates automatically. Because gasoline fumes are heavier than air, they will sink to the lowest part of your boat, such as the bilge. Always evacuate fumes with the bilge blower (if equipped) before attempting to start the engine.

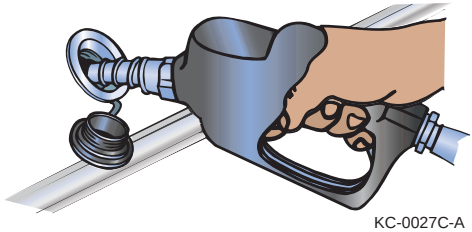

Figure 7-7: Fueling

NOTICE *To prevent unwarranted engine damage, refer to the Engine Operator's Manual for recommended fuel and oil specifications.*

⚠CAUTION ***The fuel tank may be under pressure. Remove fuel filler cap slowly to release any pressure.***

NOTICE *If the boat is unlikely to be used for two weeks or more, and you are using an ethanol-blended fuel, fill only the amount of fuel you need plus 15% as a safety factor. Unused ethanol-blended fuel deteriorates quickly.*

After Refueling

- Close the fuel fill cap thoroughly.
- Wipe up any spilled fuel completely. Dispose of rags properly onshore.
- Open all doors, windows, hatches and ports to ventilate all spaces. Check for fuel vapors before starting any engines or appliances.
- If equipped, operate the blower for a minimum of four minutes before starting the engine.

Outboard Engine Fueling Considerations

If the boat is powered with an outboard engine, one or more of the following may also apply:

- Two-stroke outboards mix oil with the fuel to be burned during combustion. During fueling and refilling on a two-stroke outboard, check the separate oil tank inside the boat or under the engine cover.
- Two-stroke outboard oil must meet the engine manufacturer's specification.

NOTE: To prevent engine damage not covered by the warranty, refer to your *Engine Operation and Maintenance Manual* for the recommended fuel type, octane rating and fuels extended with alcohol or alcohol derivatives.

Diurnal Fuel System

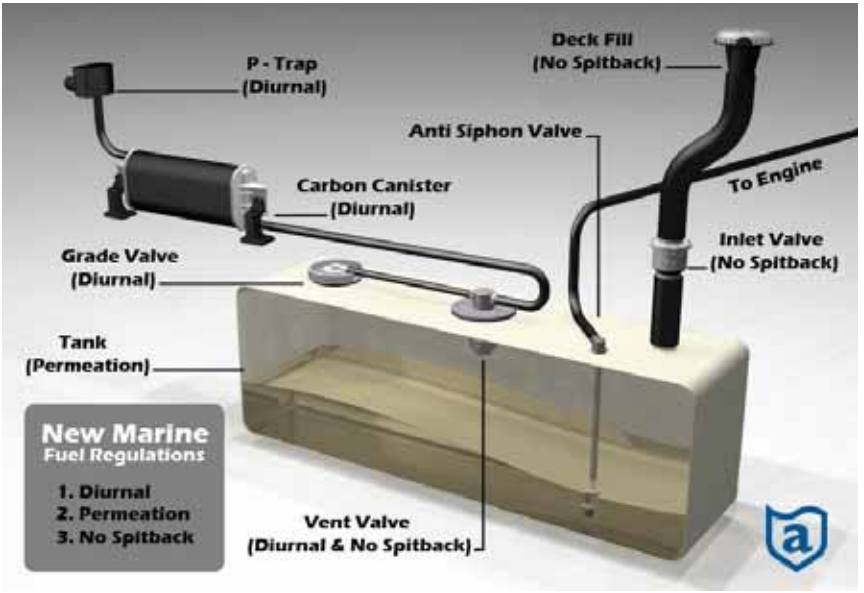

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Figure 7-8: Diurnal Fuel System

Your boat is equipped with a fuel system that has been designed and manufactured to meet the latest U.S. Coast Guard and EPA EVAP (evaporation) regulations.

Some of the new features in the fuel system:

- There is no "spitback" at the deck plate when fueling. The filler nozzle automatically shuts off when the tank is full. Do not attempt to continue fueling after the nozzle automatically shuts off, indicating the tank is full. "Topping off"

the fuel tank during filling will damage the carbon canister and defeat the purpose of the diurnal system.

- A carbon canister is present to capture hydrocarbon molecules before air is vented outside the fuel system.

When filling the tank for the first time:

- Fuel vapor will expand within the tank, causing back pressure that may close the inlet check valve and cause the filler nozzle to prematurely shut off. To eliminate this problem, slowly add only about 2 gal (7.5 L) of fuel and stop. Wait a few minutes to let the pressure within the system stabilize; then proceed filling the tank.
- During the first few fills, the new carbon canister within the vent line may generate heat from being initially saturated with hydrocarbons and cause water droplets to emit from the outside air vent. This is normal. After the first two or three fills, this should not happen.

THROTTLE AND GEAR SHIFT CONTROLS

⚠WARNING ***Improperly maintained controls are hazardous and could cause sudden loss of control. Make sure all throttle/gear shift hardware and cables are regularly inspected and maintained.***

The throttle control regulates the engine RPM. Throttle is achieved by advancing the control forward or backward. Idle in gear is at the closest position to NEUTRAL or in NEUTRAL. Moving the throttle lever forward of NEUTRAL increases forward engine speed and moving the throttle lever backward of NEUTRAL increases reverse engine speed.

Gear Shift – NEUTRAL is in the center detent position; push for FORWARD, pull back for REVERSE. Refer to the manufacturer's literature for more detailed information.

⚠WARNING ***Swamping boat or engine hazard. DO NOT accelerate at a high level in reverse. This could create a wake that could enter the craft over the transom.***

NOTE: DO NOT accelerate to full throttle until after the proper "engine break-in period." Read the *Engine Owner's Manual* and follow the correct engine break-in period. When shifting between forward and reverse, always pause in NEUTRAL for a few seconds before reversing the rotation of the propellers, then shift briskly from NEUTRAL into FORWARD or REVERSE. This will prevent unnecessary wear to the drive system.

IMPORTANT: When maneuvering forward at low speeds, shifting the engine into NEUTRAL and then REVERSE can assist in slowing the craft. Allow engine to slow to idle speed before shifting into reverse.

STEERING

WARNING ***Improperly maintained controls are hazardous and could cause sudden loss of control. Make sure all steering hardware, cables and fluid levels are regularly inspected and maintained.***

The standard steering system is a single rack-and-pinion system. Steering a boat is different from steering a car. Always use caution when turning. The stern will respond by pitching in the opposite direction of the bow.

Always use extreme caution when you are leaving the dock or trying to avoid an object in the water. Give yourself plenty of room to make a turn. Also, slow down while turning. All passengers should remain seated while underway.

GETTING UNDERWAY

The following basic boat maneuvering and operation principles do not cover all conditions or situations you may encounter during operation. It is important for you and anyone else operating the boat to have certified instruction before operating the boat.

Always advise all passengers on board of your steering, stopping and accelerating intentions. Brief passengers on:

- Obeying captain's orders
- Safety equipment location and operation
- Basic boat operation
- Radio operation
- Re-boarding procedure
- Man overboard procedure
- Emergency procedure
- Hazardous weather procedure
- Docking procedure
- Fueling procedure

Be sure all passengers are properly seated in designated seating positions and not riding on the bow, bow pulpit, deck, gunwale or rear sun deck while underway. Passengers must use caution when riding in the bow. Move to the aft passenger seats during rough water operation or if visibility is restricted.

START-UP

The *Engine Operation and Maintenance Manual* supplied with your CROWNLINE/FINSEEKER boat provides pre-start and starting instructions. The following information is a guideline and is not intended to explain, in detail, all starting procedures and instructions.

Before starting checklist:

1. Fuel supply – make sure you have enough fuel for your expected travel plan.
2. Engine fluid levels – make sure craft is level.
3. Throttle and gear shift control – detent, forward, neutral and reverse.
4. Leaks (water, fuel and oil).
5. Battery condition.
6. Visually inspect for any loose mounting fasteners.
7. Make sure the engine cooling water (raw water) valve is open and the raw water strainer is clean or coolant level of closed cooling system engine is at the correct level.
8. Make sure the engine stop switch is fully functional, the lanyard is not frayed or damaged, and the lanyard is secured to your body. Keep it attached at all times while you are driving.

⚠ DANGER ***Carbon Monoxide Hazard. A cold engine produces more carbon monoxide than a warm engine. Reduce the possibility of carbon monoxide accumulation. Prevent excessive exposure and reduce the possibility of carbon monoxide accumulation by providing adequate ventilation in the cabin, cockpit and enclosed passenger areas. Open any hatches, doors, windows and side vents, when necessary, to increase ventilation.***

Starting

Secure the craft to dock or mooring slip before attempting to START the engine. Craft should be kept secure until engine is warm and ready for departure.

1. Make sure the throttle and gear shift control is in the NEUTRAL position.
2. Move dual battery switch to number 1, 2 or ALL setting, if so equipped.
3. Run the bilge blower for five minutes.

⚠ DANGER ***Fire or explosion hazard from fumes accumulating in bilge area. Ventilate the engine compartment by running the blower for five minutes, especially after repairing or refueling, and check for fuel spills or leaks.***

An engine guard which is not in place or in contact with any moving parts can cause death or serious personal injury. The engine box cover is a machinery guard. DO NOT operate your boat with the cover open unless you are performing a check or maintenance. Keep your hands, clothing, hair and any other body parts away from any moving parts.

4. Turn the ignition key to the START position. Release the key immediately after the engine starts. If the engine fails to start, refer to Troubleshooting in your *Engine Owner's Manual*.

⚠CAUTION ***DO NOT continue to operate the starter for more than 15 seconds without pausing to allow the starter motor to cool off for three minutes. This allows the battery to recover between starting attempts.***

After the Engine Starts

Run the engine approximately one to two minutes at fast idle (1200 to 1500 RPM) and return to idle and normal operating temperature. This time may vary from the temperature of the cooling water. Once engine has warmed up and the RPM has returned to idle, check engine temperature gauge to make sure engine temperature is normal. If temperature reading is abnormally high, STOP engine immediately, and inspect engine to determine cause.

The voltmeter should show a reading between 12 V to 15 V while the engine is running.

Check steering operation. Turn steering wheel to FULL port and to FULL starboard.

Make sure the craft is still secure to the dock and engine is idling between 600 and 800 RPM momentarily. Move throttle and gear shift to FORWARD, then NEUTRAL and then to REVERSE, then NEUTRAL to check for proper shift operation.

Check other gauges to verify they are at normal operating ranges.

Repeat starting procedure for the second engine, if equipped. The second engine may be difficult to hear when it starts, due to the noise of the first engine. Verify the second tachometer of the second engine. When the engine RPM rises, release the ignition key immediately.

⚠WARNING ***Fire/Explosion Hazard: If equipped with a bilge blower switch, always operate the bilge blower for a minimum of 4 minutes prior to starting the engine. Gasoline vapors can explode, resulting in injury or death.***

- Check the bilge for fuel vapors.
- Verify that the blower is operating properly.
- Always run the blower when the boat is operating below cruising speed.
- Attach the engine emergency stop switch lanyard to the boat operator.
- Check that all passengers are seated properly.
- Position the lower drive power trim to the full DOWN position.
- Start the engine.

Steering

WARNING ***Control Hazard: If the engine is shut off (no thrust), you will have no steering control, and the boat's momentum will cause it to move forward even though the engine has stopped. Even at low engine speeds where thrust is reduced, a loss of steering control can occur.***

Steering a boat is very different from steering an automobile. Steering and maneuvering a boat is far more difficult and requires time and practice to master.

When steering a boat, it is important to understand the causes and effects of turning. Since both thrust and steering are at the stern of the boat, the stern will push away from the direction the steering wheel (helm) or tiller arm is turned. The boat seems to skid across the water while turning, which feels very different from an automobile making a turn.

Steering in reverse has its own challenges. Practice forward and reverse steering to gain comfort and to feel in control of the boat in any steering situation.

Be prepared for wind and current while steering the boat. Steering in wind or water currents is difficult and requires skill to be able to anticipate and compensate for these effects.

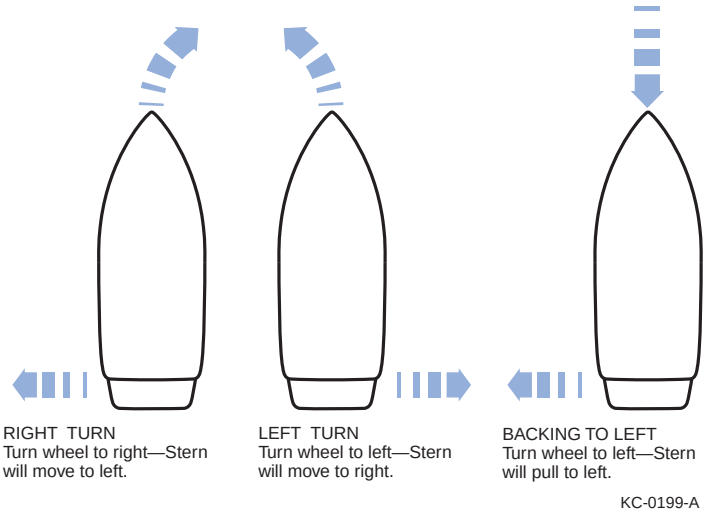

Figure 7-9: Steering Patterns

Rotational thrust of the propeller is an aspect most single propeller-driven boats share and needs to be compensated for at slow speeds. During rotational thrust, torque is transmitted to the helm and may cause the boat to drift either port or starboard when moving forward at a slow speed. Rotational thrust usually goes unnoticed at high speeds. While moving forward at a slow speed, constant helm corrections are usually necessary to maintain a straight course.

Twin-engine and dual-prop boats usually compensate for rotational thrust of the propellers by using one counterrotating drive with a counterrotating propeller, and one standard clockwise-rotating drive and propeller to reduce the effects of steering torque at all boat speeds.

Stopping

Reverse thrust is commonly used to slow and stop a boat. The amount of reverse thrust needed to stop will vary due to boat design, load and speed.

⚠ WARNING ***Control Hazard: Always reduce engine speed to idle and pause in NEUTRAL before shifting from FORWARD to REVERSE or REVERSE to FORWARD. Abrupt stopping and steering loss can occur if the propulsion unit is shifted quickly from FORWARD to REVERSE or REVERSE to FORWARD. Never shift into REVERSE at planing or high forward speeds.***

A boat does not have brakes. Controlling the boat to a stop and while stopped are important skills that must be learned. Reverse thrust is commonly used to slow and stop a boat. The continued momentum of a boat will vary according to the boat design, load and speed. You must also consider and learn to compensate for the effects of wind and current. Stopping in wind or water currents is difficult and requires skill to be able to anticipate and compensate for these effects.

- To stop or slow forward motion, always gradually return the throttle(s) to the slow IDLE position, pause and shift into NEUTRAL, then pause and shift into REVERSE.

⚠ WARNING ***Control Hazard: Gradually return the throttle(s) to the slow IDLE position. Failure to do so can cause loss of boat control and engine propulsion system damage.***

- If the boat has been driven for a long period of time at high speed, allow the engine a two- to three-minute cool-down period at low idle in NEUTRAL.
- Turn the ignition key to the OFF position.

NOTICE *Never pull the lanyard from the engine emergency stop switch for normal shutdown. Doing so may impair your ability to restart the engine quickly.*

- Avoid collisions; at high speeds the boat will require more time and distance to stop or slow.
- The proper use of trim tabs and outdrive trim angle is important when slowing to a stop. Qualified local boating authorities can provide proper instruction in slowing and stopping your boat.

Shifting

The following information is a basic guideline only and may not apply to the specific shift control. See the *Engine Operator's Manual* or control manufacturer's information for the shift control operation, adjustment and maintenance.

- Most side-mounted throttle and shift controls have a neutral detent lock that must be released before shifting from NEUTRAL.
- Always use a brisk and decisive movement when shifting into or out of gear.
- Always pause in NEUTRAL before shifting from FORWARD to REVERSE, or REVERSE to FORWARD. Most throttle and shift controls have a detent position for NEUTRAL, FORWARD and REVERSE engagement positions. These detent positions are important; when shifting into and out of gear, always pause in these positions.
- Never shift into REVERSE while your boat is in FORWARD gear when traveling at any speed above idle.
- Always keep the shift control clean and clear of obstructions.

Accelerating and Running Underway

You must understand the boat's equipment and controls in order to drive and control the boat in a forward direction at all speeds and in all conditions. Learning to drive and control the boat can be challenging; take this matter seriously and spend plenty of time practicing.

The phrase "on plane" is commonly used when referring to the running angle of a boat in forward motion. When a boat is "on plane," its hull is usually running level or almost level with the water's surface, which is considered level. The level "plane" of the water's surface is the most efficient angle to run in. This basically means that the boat is running on top of the water and not plowing through it.

Factors to consider when accelerating a boat forward and running at the most efficient planing angle are:

- Boat design
- Hull type and condition
- Boat load and distribution of weight
- Engine capability and condition
- Propeller type, size and condition
- Outdrive and boat power trim equipment and condition

Because all boats are different and vary in design, purpose and load, planing angles and characteristics will vary among all boats. Become familiar with the boat's characteristics and obtain qualified assistance.

ACCELERATION

⚠CAUTION ***DO NOT accelerate to full throttle until after the proper "engine break-in period." Read the Engine Owner's Manual and follow the correct engine break-in period. The engine break-in period coincides with the engine checkup and FULL throttle acceleration should not take place until after this checkup.***

The craft angle of trim increases and the bow rides high when you throttle UP and accelerate. Continued acceleration will reduce the trim. The maximum trim angle is commonly known as the hump. Accelerate through the hump as quickly as possible to reduce the limitation of visibility, handling and performance. This should only take a few seconds. Then throttle DOWN to cruising speed for better fuel efficiency.

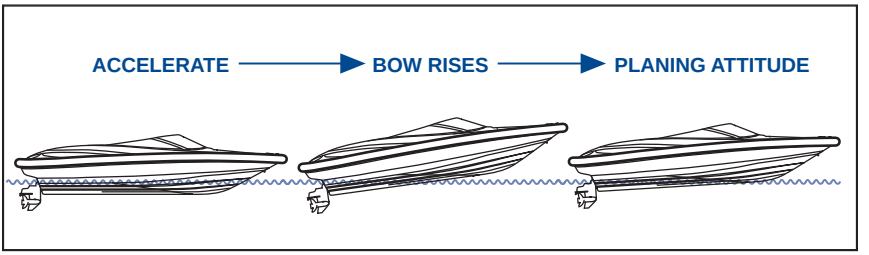

Figure 7-10: Boat Attitude

The following guidelines provide a basic understanding of forward acceleration and operating on plane while underway:

- Always look in front of and around you before proceeding. Avoid collisions before accelerating; be aware and stay clear of people and obstacles in the water.
- Always advise all passengers on board of your intention to accelerate and get underway.
- Stow and fasten all loose gear.
- Make sure the engine emergency stop switch lanyard is connected to the operator.
- If equipped, adjust the boat trim tabs up or to a neutral position with the hull.
- If equipped, adjust the engine power trim to the full-in position.
- Shift from NEUTRAL into FORWARD detent idle position.
- Adjust steering to the direction of travel.
- Using a controlled and constant motion, move the throttle control forward.

⚠WARNING ***Control Hazard: When accelerating forward, the bow can rise and restrict visibility. Never remove your hand from the steering wheel. The rotational thrust of the propeller under rapid acceleration can create high steering torque and rapidly change the direction of steering, causing loss of control.***

- As the boat begins to move, the bow will rise and the boat will tend to plow through the water. As acceleration increases, the boat will begin to plane or level out within a few seconds. If it will not plane to a near-level position and has sufficient horsepower, slowly reduce the throttle back to the FORWARD detent idle position. Recheck the load distribution and trim equipment position to determine the cause.
- Once the boat is on plane, the steering torque will diminish; however, never remove your hands from the helm while underway. While running at a planed position, you will notice greater throttle response and steering control as you continue to accelerate or achieve the most comfortable and safe speed for the conditions. You can achieve better performance, control and running efficiency using the engine's power trim and the boat's trim tabs, if equipped.
- Be aware of the wake you create and anticipate the effect it will have on others. During acceleration, deceleration and at speeds other than on plane, a heavy wake is usually created. You are responsible for the boat's wake and any damage or injury it causes.
- Obey no-wake areas and speed-controlled areas.
- Stay clear of or at a safe distance from other boats.
- Avoid collisions; at high speeds the boat will require more time and distance to stop or slow.

Checks During and After Operation

- Check gauges frequently for signs of abnormal conditions.
- Check that controls operate smoothly.
- Check for excessive vibration.

POWER TRIM AND TILT

The engine's power tilt generally operates in conjunction with the power trim system, which is commonly called power trim and tilt. This system allows you to raise and lower the lower drive unit and propeller to adjust trim (the planing and running angle of the boat while underway) and tilt (used to position the lower drive unit up beyond the power trim range used for trailering, launching or beaching). Never use power tilt while the engine is running.

Power Trim

The engine's power trim allows you to raise and lower the lower drive unit and propeller to adjust the planing and running angle of the boat while underway.

Boat trim adjustment while underway greatly affects boat performance and efficiency. During normal operation while underway at speed, trim the boat to the best possible position to reduce the wetted surface of the hull. With less boat in the water, both speed and fuel economy increase. Adjust systems with manual trim adjustment for best overall operation for the load and conditions. Engines with power trim allow for continuous adjustment for best results.

Adjust the power trim by using a switch at the helm area or on the throttle control. Trim gauges are available in most applications to provide a visual gauge-to-trim position. Most gauges indicate trim position between UP (out, away from the transom) and DOWN (in, closer to the transom).

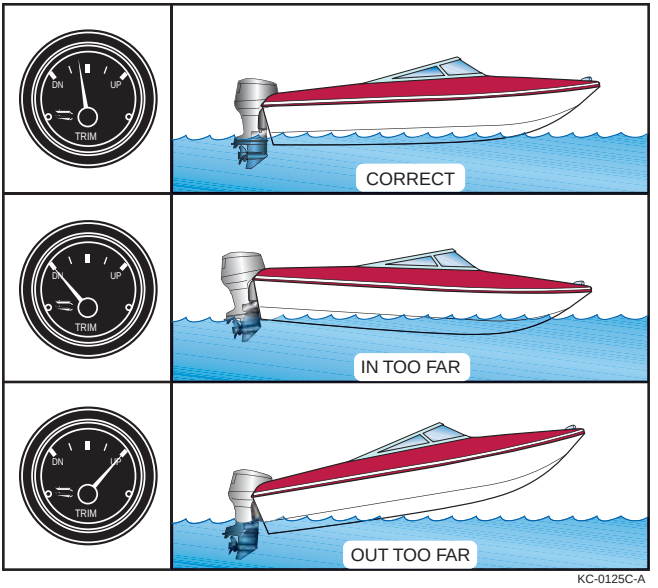

Figure 7-11: Power Trim

General effects of power trim underway:

Trim in too far (closer to the transom):

- Speed decreases.
- Fuel economy decreases.
- Boat may handle and steer poorly.
- Boat will have difficulty achieving a proper running, planing position.

Trim out too far (away from the transom):

- Steering torque increases.
- Speed decreases.
- Fuel economy decreases.
- Boat may handle and steer poorly.
- Boat will bounce or porpoise.
- Engine RPM increases.
- Propeller may ventilate as it nears the surface of the water and slip excessively as it pulls air from the surface. This will cause engine RPM to rapidly rise.
- Boat will have difficulty getting on plane from an idle position.

⚠WARNING ***Control Hazard: Do not trim the engine out too far or you may lose control of the boat. If you lose control of the boat, pull back on the throttle and trim in at the same time.***

See the ***Operating the Boat section of this manual*** for more details.

General power trim operation guidelines:

- When getting on plane from an idle position, start with the trim full in. As the throttle position increases, the boat speed will increase and drive the bow up. As acceleration proceeds, the bow will start to come down. When the bow starts to fall and the boat begins to plane, slowly start to trim out.
- Trimming out while underway generally causes the boat to rise up and plane. The boat begins accelerating without adjusting the throttle as less of the boat is dragging in the water. Trimming up causes the engine RPM to increase. It is very important to watch the engine tachometer to keep it at or near full throttle operating range and not to exceed the engine's wide-open throttle operation range. See the *Engine Operator's Manual* for the engine's wide-open throttle operation range.
- To find the optimum trim position while underway, run the boat at a stable planed angle with the least possible amount of the hull in the water. The boat reaches optimum trim position when it is not porpoising or plowing excess water.

High-speed operation on smooth water provides stability, but you must maintain control by using quick reactions and adjustments. Know your limits and stay within them. Keep one hand on the steering wheel and the other on the throttle controls at all times.

⚠WARNING ***Control Hazard: If you lose control of the boat, pull back on the throttle and trim in at the same time.***

Constant adjustments are necessary for rapidly changing conditions. Small inputs of throttle and steering are exaggerated at high speeds. Depending on the speed, keep watch well ahead so that you have enough time to react.

If the boat has trim tabs, you can achieve further boat trim adjustment by using the trim tabs in conjunction with the engine power trim equipment.

TRIM TABS

The electric/hydraulic trim tabs are adjusted at the helm. Water is deflected and redirected as the trim tabs move through the water and they are raised and lowered. This change in water flow creates upward pressure under the tabs and raises the stern. When the stern raises, the bow is lowered.

Trim tabs act in the same way as the power trim on the drive unit. This allows compensation for uneven loads by trimming up one side or the other. They also assist in providing maximum control of the hull in different water and load conditions. If used properly, trim tabs can greatly improve performance and fuel efficiency. The proper use of trim tabs requires a basic understanding of trim tab operation and some practice in calm water.

Your trim tab control has two (2) two-position, momentary switches labeled Bow Down and Bow Up:

- Depress front-starboard button to move trim plane on port side downward. This moves starboard bow downward when boat is planing.
- Depress front-port button to move trim plane on starboard side downward. This moves port bow downward when boat is planing.
- Depress back-starboard button to move trim plane on port side upward. This moves starboard bow upward when boat is planing.

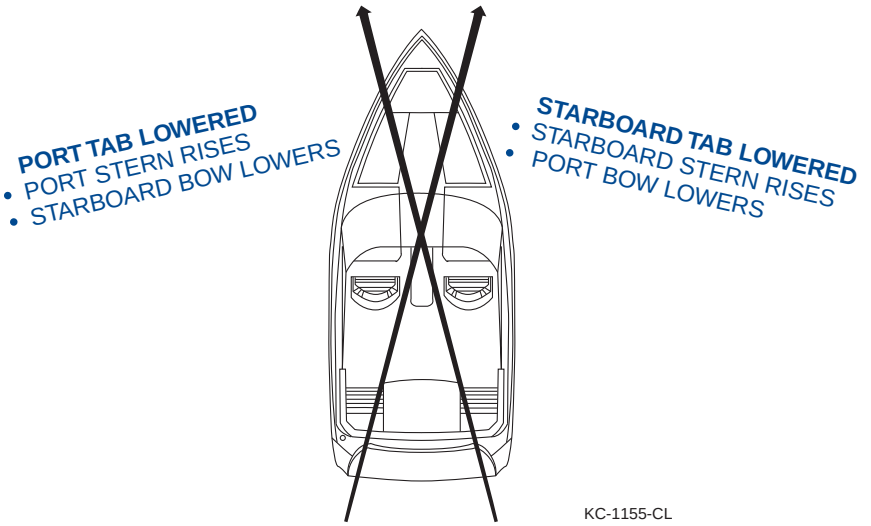

Figure 7-12: Trim Tabs

Using trim tabs in conjunction with the power trim will compensate for uneven weight distribution, listing, water conditions and other factors that cause inefficient operation. Remember that trim tabs are trimming the hull while power trim is trimming the engine drive.

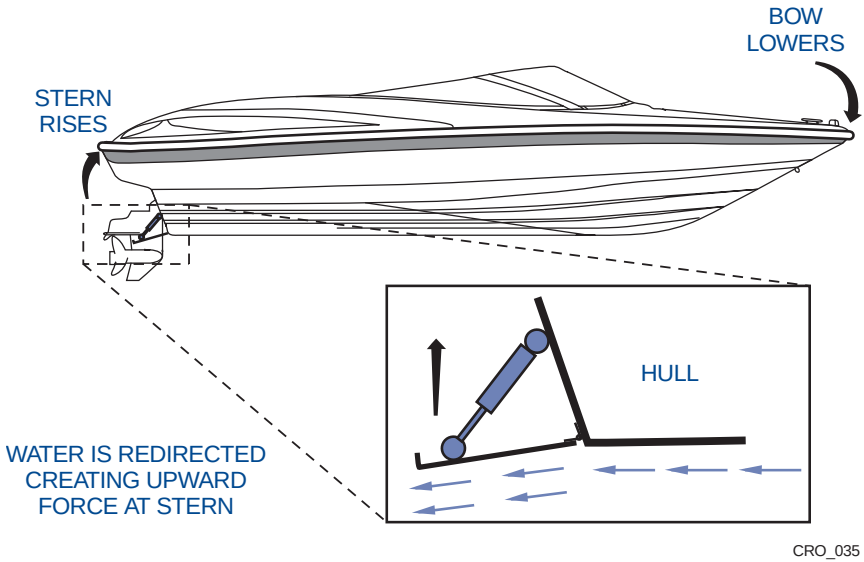

Figure 7-13: Power Trim and Water Redirection

To use the trim tabs with the power trim:

1. Adjust the trim tabs to achieve a planing attitude.
2. Use the power trim to position the propeller path parallel to the water flow.
3. Readjust the trim tabs to fine tune attitude.
4. DO NOT over-trim because bow will dig in, causing the boat to veer.
5. To avoid listing, DO NOT move one tab significantly further down than the other while underway.

IMPORTANT: Refer to your *Engine Operation and Maintenance Manual* or the drive unit instruction manual regarding power trim controls and drive unit installed on your craft.

ENGINE WATER INGESTION

To avoid possible ingestion of water that can damage engine components:

- DO NOT turn the ignition key off when the engine is running above idle speed.
- DO NOT use the lanyard stop switch to shut off the engine, except during an emergency.
- DO NOT come off plane quickly.
- DO NOT shift into reverse and shut off engine.
- When coming off plane, a large following wave may roll over the boat's transom, apply a short, light burst of throttle to minimize the wave action against the stern of the boat.

Engine water ingestion can also occur if your boat is heavily loaded at the stern. Distribute the weight of gear and passengers forward and aft to maintain a level trim. Engine water ingestion is not limited to these situations. Be sure to read and understand all the information provided in your *Engine Operation and Maintenance Manual* on engine water ingestion. Water ingestion is not covered by the CROWNLINE/FINSEEKER Boats warranty.

ANCHORS AND ANCHORING

Anchors are available for various applications and come in many sizes, types and shapes. Boat weight and size are primary factors in choosing an anchor. When selecting an anchor, consult other qualified boaters familiar with the waters or the boat dealer.

Anchor line is constructed from various materials and is available in many diameters and types. The anchor rode for recreational boats consists of the anchor line connected to a length of chain attached to the anchor. Consult with the boat dealer for a recommendation on appropriate lines for the boat anchor and application.

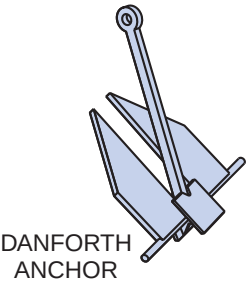

Figure 7-14: Danforth Anchor

For most applications, anchor line length should be at least six to seven times longer than the depth of the water in which you are anchoring. Always have plenty of additional anchor line on board. If anchoring in tidal waters, consider a rode chain about the length of the boat and increase the total anchor line length to ten times the depth of the water at low tide.

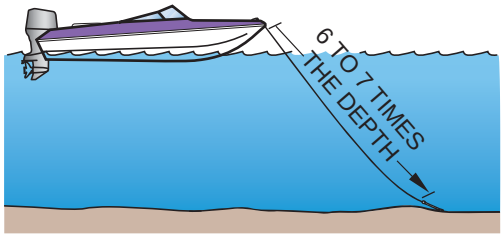

Figure 7-15: Anchor Line Length

⚠ WARNING ***Sinking Hazard: ALWAYS anchor from the bow; NEVER anchor from the stern. A small amount of current will make a boat unsteady. A strong current can pull a boat anchored by the stern under the water and keep it there.***

⚠ WARNING ***Collision Hazard: ALWAYS anchor in areas where the boat will not disrupt other boats. Do not anchor in a channel or tie up to any navigation aid. It is dangerous and illegal.***

Helpful guidelines when anchoring:

- Make sure the anchor line is tied to the anchor. Tie the other end of the line to the forward cleat or bow eye.
- Head the boat into the wind or current over the spot where you want to lower the anchor.
- Stop the boat before lowering the anchor.
- Slowly lower the anchor until it hits bottom.
- Allow the boat to back away, keeping tension on the line.
- Release at least six to seven times as much line as the depth of the water.
- Secure the anchor line to the bow cleat or eye.
- Firmly pull on the line to make sure the anchor is holding.
- Occasionally check your position against the shoreline. If the anchor is dragging and the boat is drifting, reset the anchor.

Helpful guidelines when weighing (pulling in) the anchor:

- Start the engine(s).
- If necessary, move forward until enough tension is off the anchor line to allow for retrieval of the anchor. Avoid running over the anchor line; retrieve the line as you approach the anchor.
- Once the anchor line is straight up and down, lift the anchor from the bottom.
- If the anchor is stuck, attach the anchor line to the bow cleat so it is tight. The up-and-down motion of the bow from wave action may loosen the anchor from the bottom. If the anchor remains stuck, let out a few more feet of line and attach it to the bow cleat. While keeping tension on the line, slowly maneuver your boat around the anchor to help loosen it. Avoid running over the anchor line.
- Always stow and secure the anchor and line before departing.

MOORING LINES

Use fenders to protect your craft from damage. Use good-quality, double-braided nylon line and chafing protectors to protect your craft's finish. Only use the cleats, bow eye and stern eyes to secure your craft. Do not use the handrails or windshield. The foredeck handrails should only be used for tying a "Jackline" in an emergency situation. Tie up the craft with the bow toward the waves and leave a little slack in the lines to allow for some wave movement or tidal action. Use the following procedures as guidelines only, since wind, weather, water conditions (tides) and traffic can affect mooring procedures.

When attaching mooring lines to deck cleats, make a loop in one end of the mooring line and pass it through the hole in the base of the deck cleat. Next, pass the loop back over the deck cleat. The mooring line can now safely be used to secure your craft. Mooring lines may remain attached to the cleats on your craft while underway. Always coil and place the lines where they cannot become tangled in deck gear or the propeller(s).

When you tie up, run the mooring line from your craft around the dock cleat and then back to your craft. This allows you to untie the mooring line without leaving your craft. Just heave off one end of the mooring line and bring the entire length of mooring line back into the craft.

The mooring lines you will use most often are the bow line (4), the stern line (1) and spring lines (2, 3). Each line has a specific purpose. The bow and stern lines secure your craft's bow and stern. The two spring lines keep your craft from moving forward or backward when you are moored alongside a dock.

If you are mooring your craft for a short time, bow and stern lines may be the only lines you will need. If you are mooring your craft for a longer time or the currents are swift, you should use spring lines. The stern spring line leads from the craft's stern cleat forward to the piling or cleat on the dock. The bow spring line leads from the bow cleat aft to the dock.

If you are mooring in a slip, bow and spring lines, port and starboard, will keep your craft in position.

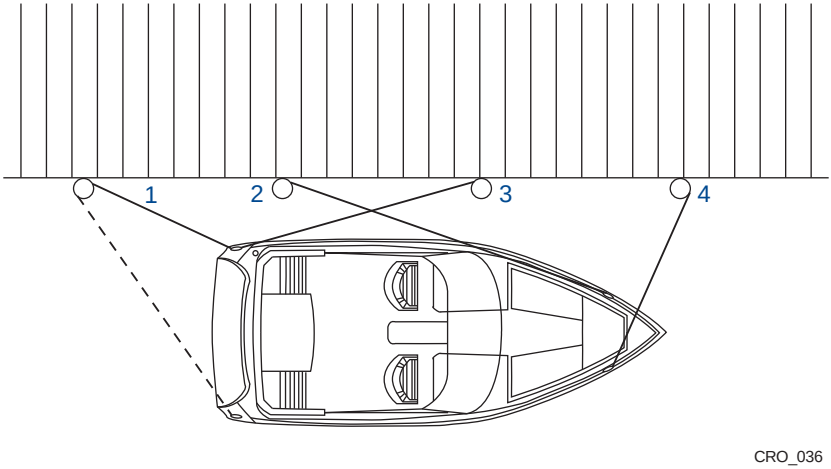

Figure 7-16: Mooring Lines

NOTE: Manila rope, the standard for many years, is not as strong as some ropes made of synthetic materials. For mooring, its ability to stretch is an advantage, but it tends to shrink whenever it gets wet. Nylon rope is strong and elastic. Because of its elasticity, it works well for mooring lines and anchor lines. Rope made of high tensile strength polyester fibers like Dacron™ is just about as strong as nylon rope, but it does not stretch. Kevlar rope is strong and does not stretch, but it is quite expensive. Polypropolene rope tends to deteriorate rapidly when it is exposed to sun light. Because it floats, it is well-suited for use as a tow rope for water skiing. Use for other nautical purposes is not recommended.

NOTES

IMPORTANT: The side supports should only be tight enough to keep the craft from leaning side to side. Any unnecessary pressure can damage the hull.

Make sure that the weight-distribution hitch on your vehicle is capable of handling the GVWR. The weight on the trailer should be evenly distributed and can be checked by determining the tongue weight. Tongue weight is measured as a percentage of the total weight of the loaded trailer on its tongue. Ideal tongue weight is not less than 5% and not more than 10% of the GVWR. For example, if the weight of the loaded trailer is 3000 pounds (1361 kg), the weight on the tongue should be more than 150 pounds (68 kg) but less than 300 pounds (136 kg). Excessive tongue weight will cause the front end of the towing vehicle to sway. Insufficient tongue weight will cause the trailer to sway or fishtail.

Most trailers with a GVWR of 1500 pounds (680 kg) or greater are required to have brakes, although this requirement may vary from state to state. Check with your CROWNLINE/FINSEEKER dealer for additional information.

Your craft should be fastened to the trailer with the winch line connected to the bow eye, PLUS a bow tie-down to the winch stand or trailer tongue. A safety chain or strap can be used as a suitable tie-down. The stern of your craft should be secured to the trailer from the stern eyes. If travel conditions require, use an additional tie-down strap across the rear of the craft from side to side to further secure the stern. Check all strapping material for damage or wear.

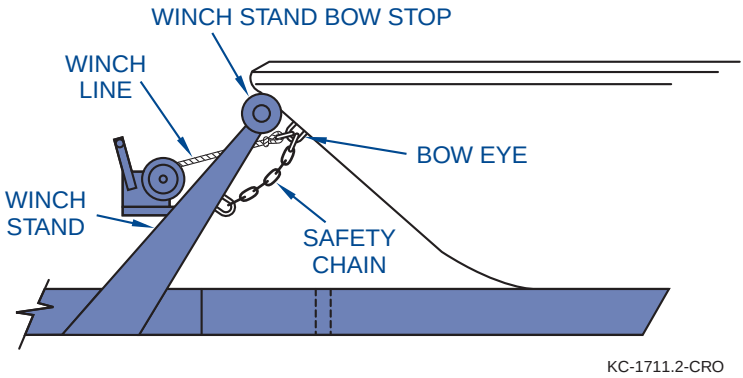

Figure 8-1: Fastening Boat to Trailer

BACKING UP

If you have never towed a trailer before, take time to practice and become comfortable with backing up the boat and trailer. Situations can arise in traffic, or when launching, that will require you to be able to back up the trailer safely.

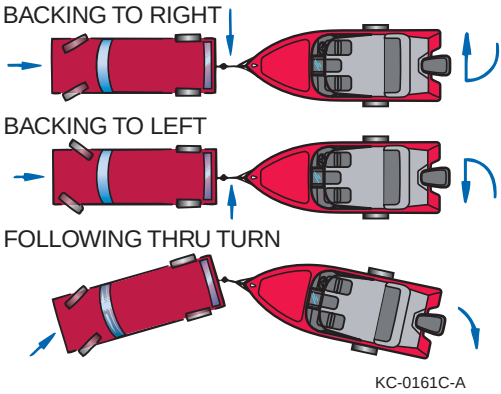

Figure 8-2: Backing Up

Follow these guidelines when backing a trailer:

- Back slowly and make small steering adjustments.
- Turn the car wheels in the direction opposite where you want the trailer to go.
- After the trailer begins moving, turn the car to follow it.
- Have a second person assist you with audible and hand signals.

LAUNCHING

Before launching, inspect the launch ramp for any problems that may hinder launching or make launching unsafe. Ramps can be slick and dangerous to drive or walk on, and may have unseen drop-offs beneath the water that would pose a safety hazard. Always be aware of water conditions and the effects of the wind when launching.

Before launching, inspect the boat and trailer for damage. Do not launch if you detect damage or find that the engine or propeller is not in good operating condition. Have any repairs made before launching.

Use courtesy when preparing the boat for launching by preparing away from the ramp on level ground before proceeding to the launch ramp.

When launching the boat on the trailer, have two or more people assist you. Since all launches are different, the following procedures are intended as guidelines only:

- Verify that the vehicle's brakes, including the parking brake, are in proper working order.
- Make sure the trailer is securely fastened to the vehicle.

- Remove the boat cover, if equipped.
- Check that the bilge drain plug is in place and all other plugs that allow water to leak into the boat are in place.
- Remove all tie-downs from the boat.
- Attach the bow and stern docking lines.
- Attach boat fenders if necessary.
- Disconnect the trailer's light harness from the car.
- If applicable, trim or tilt the engine/outdrive up to avoid damage.
- Make sure the bow winch and strap are securely locked and fastened.
- Make sure the bow winch safety chains, if equipped, are in place.
- Make sure all required documentation and safety equipment are on board.
- Verify that batteries are fully charged and in good condition.
- Check fuel level; add fuel if necessary.
- Always launch with the help of another person.
- Make sure there is no one on the ramp behind the boat.
- Keep the trailer/vehicle combination as straight as possible and at 90 degrees to the shoreline.
- Back slowly down the ramp until the transom of the boat is a few inches in the water; then stop the vehicle.
- Stop the vehicle and shift into PARK (automatic transmission) or REVERSE (manual transmission). Apply the brakes and/or parking brake. If possible, use wheel blocks.
- Position the mooring lines within reach of the dock.
- Disconnect the bow winch strap and safety chains, if equipped, from the bow eye.
- Manually back the boat clear of and off the trailer into the water and secure to the dock using mooring lines.
- Remove any wheel blocks and release the vehicle brakes. Pull the trailer slowly out of the water, and secure and park in a designated area.
- Board the boat.
- Lower the engine/outdrive, if applicable.
- Run the bilge blowers as required, if equipped.
- See the *Engine Operator's Manual* for starting procedures.
- Remove dock lines from the dock and proceed slowly away from the dock.

LOADING GUIDELINES

Follow these guidelines while loading the boat onto the trailer:

- When loading the boat on the trailer, have two or more people assist you.
- Stop, turn off the engine and secure it to the dock with dock lines at a position clear from where the trailer will be in the water.
- If applicable, trim or tilt the engine/outdrive up to avoid damage.
- Verify that the vehicle's brakes, including the parking brake, are in proper working order.
- Disconnect the trailer's light harness from the tow vehicle.
- Make sure the trailer is securely fastened to the vehicle.
- Back the trailer slowly down the ramp until it is positioned so that the boat can be loaded.
- Stop the vehicle and shift into PARK (automatic transmission) or REVERSE (manual transmission). Apply the brakes and/or parking brake. If possible, use wheel blocks.
- Position the mooring lines within reach of the dock.
- Manually position the boat onto the trailer using mooring lines. Make sure it is centered on the supports of the trailer.
- Position the bow eye into the bow stop and connect and secure the bow winch strap and safety chains, if equipped, to the bow eye.
- Secure the mooring lines inside the boat.
- Remove any wheel blocks and release the vehicle brakes. Slowly pull the trailer and boat up the ramp.
- Secure the transom to the trailer.
- Prepare for trailering as necessary.

Before operating any systems within this section, review ***Safety in Section 2***.

The boat may be equipped with a variety of systems to operate the boat and to provide other conveniences you may need while on the water. The following basic and typical information may not apply to your specific application. All of the boat's systems may not be covered in this section. See the *Equipment Manufacturer's Operator's Manual* for specific details.

Regularly inspect and maintain all components and systems to prevent unexpected hazards due to worn or faulty components. Be sure to replace components and hardware with marine-grade parts.

⚠WARNING ***Fire/Explosion Hazard: Never use parts not specified for marine use to replace marine-grade parts. Using non-marine specified parts in a marine environment may result in a fire and/or explosion.***

FUEL SYSTEM

The basic fuel systems consist of one or more fuel tanks, tank vents, level sensor and gauge, lines, pumps and valves.

Each tank has an antisiphon valve to prevent fuel from leaking out of the tank should a break occur in the system at a point other than the tank. Refer to the boat and *Engine Operator's Manual* for specific fuel system information and service information.

Powered ventilation systems consist of one or more sealed fans that replace vapors with fresh air through intake and exhaust vents. Always operate the blower for at least 4 minutes before you start the engine. Operate the blower continuously when at idle and during slow-speed operation.

Natural ventilation systems also have intake and exhaust vents; as the boat moves, air is forced into the intake vent and escapes through the exhaust vents.

AUTOMATIC FIRE EXTINGUISHING SYSTEM

Automatic fire extinguishing systems are self-contained systems that are designed to automatically activate to help extinguish fires. These systems include the extinguishing material lines, nozzles, valves, sensors, controls and indicators.

In the event of an extinguisher discharge, immediately shut down all electrical and mechanical systems and powered ventilation. Automatic fire extinguishing systems are added protection to your safety and the boat's fire protection, but do not eliminate the need for hand-held U.S. Coast Guard-approved fire extinguishers. See the *Automatic Fire Extinguishing Systems Operator's Manual* for specific operation and service information.

⚠WARNING ***Fire Hazard: If the fire system discharges, wait for at least 15 minutes before opening engine hatch. Fire system gas displaces oxygen to "smother" the fire. Opening the hatch too soon may feed oxygen to the fire and flashback can occur.***

STEERING SYSTEM

WARNING ***Control Hazard: Be sure to inspect the outboard's steering system for damage after striking an underwater object. Stop immediately to inspect for damage that may result in loss of steering control.***

WARNING ***Control Hazard: Improper maintenance of steering system is hazardous and can cause death or serious injury from sudden loss of control. Ensure all steering hardware, cables and grease fittings are regularly inspected and maintained. If any steering problems are noticed, do not operate the boat and contact your dealer immediately for service assistance.***

Steering systems vary in type and operation. The most common steering systems are mechanical, power-assisted and hydraulically operated.

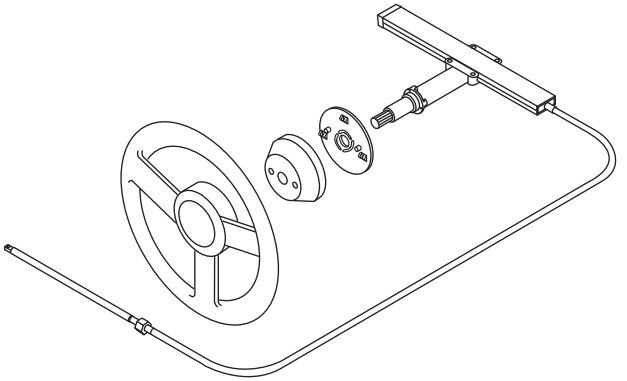

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Figure 9-1: Hydraulic Steering System

Boat steering controls are not self-centering. Always keep a secure grip on the steering wheel to maintain full boat control.

Mechanical steering helm controls transfer the rotary motion of the steering wheel to linear cable motion, which pushes or pulls the engine's steering arm.

Power-assisted mechanical systems use hydraulic force to assist the manual rotary motion of the helm's movement, providing easier steering for the operator.

Hydraulic systems use hydraulic pressure from a pump connected to the helm to move hydraulic fluid through hoses, and then to move hydraulic cylinders connected to the engine's steering arm. A reservoir, either separate or integral to the pump, holds extra fluid and maintains a pressure head to prevent air from entering the system.

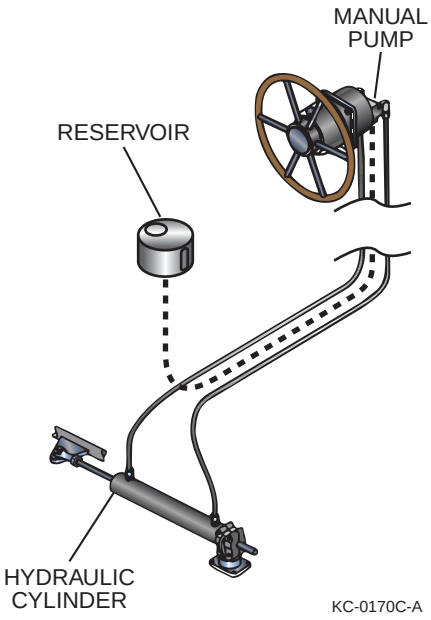

Figure 9-2

Electronic Steering System

The boat may be equipped with an optional electronic steering system. Most systems use a helm-mounted unit with a steering wheel that controls a cylinder mounted to the drives, outboards or rudder. The steering wheel can be tilted by activating the tilt lock lever located on the bottom side of the helm unit and automatically locks when released at or close to that angle.

Electronic or steer-by-wire systems consist of an electronic helm unit, helm-mounted display screen, aft-mounted pump control module, aft-mounted hydraulic pump/reservoir and drive/rudder-mounted hydraulic cylinder. The electronic components communicate over a data network to control the hydraulic pump to operate the cylinder and steer the boat. The steering pumps have an integral service valve that can be opened to bypass the pumps for service or in case of emergency. Refer to the *Steering Manufacturer Owner's Manual* for more information.

ELECTRICAL SYSTEM

Boats may be equipped with one or two types of electrical systems: Direct Current (DC) and Alternating Current (AC).

Most boats use a battery-powered direct current (DC) system; some boats also use a generator or shore-powered alternating current (AC) system. Most systems have a main load panel which serves as the main distribution panel.

DC System

⚠ WARNING ***Fire/Explosion Hazard: Always use caution when operating and maintaining the DC electrical system. Fire or explosion may result from improper use of the DC electrical system.***

Most boats use a 12-volt common negative ground DC system. DC systems are usually the primary electric supply for lights, pumps, blowers, engine starting, etc.

Boats require at least one battery per engine. Multiple-battery systems consist of a cranking battery for each engine and additional batteries that supply auxiliary power to DC electrical circuits.

Battery switches control battery power distribution and disconnect the batteries from the boat's electrical system. The engine's charging system charges batteries connected to the charging system when the engines are running.

Battery isolators prevent accessory loads and other batteries from depleting power from charged batteries. Isolators also allow the engine's charging system to isolate the alternator charging output and distribute the charge among all batteries according to individual need.

The main DC control panel may feature a voltmeter, fuses, circuit breakers and a master breaker switch.

⚠ WARNING ***Fire Hazard: Never reset a breaker that has been automatically tripped or replace a fuse that has blown without first identifying and correcting the cause of the problem. A fire could result.***

⚠ WARNING ***Fire Hazard: DO NOT exceed the recommended fuse sizes or bypass the fuse safeguard. Always install the proper (type and rating) fuses whenever replacing or changing fuses.***

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Figure 9-3: Typical DC Control Panel

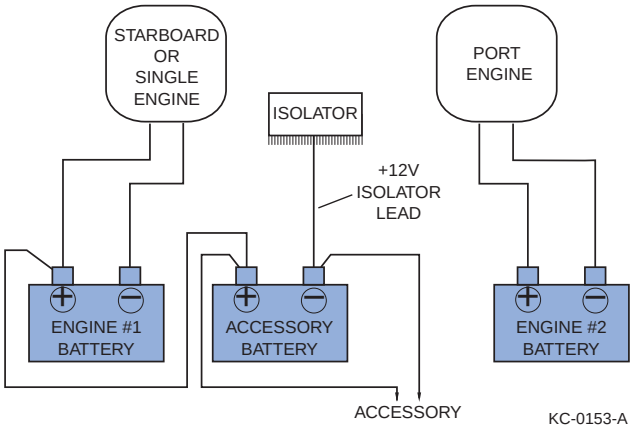


Figure 9-4: Batteries and Isolator

Battery

⚠WARNING ***Explosion, fire or burn hazard from vented fumes or burns from battery electrolyte can cause death or serious personal injury.***

- ***Wear eye protection and rubber gloves when working on or around batteries.***
- ***DO NOT use jumper cables or use a battery booster to start your engine.***
- ***Charge the battery outside of the boat.***
- ***DO NOT smoke or bring a flame near a battery at any time.***
- ***DO NOT have your head directly above a battery when making or breaking electrical connections.***
- ***DO NOT use a metal object to spark between battery posts to check if the battery is charged.***
- ***DO NOT disconnect or reconnect battery cables if gasoline fumes are present.***

If battery electrolyte spillage occurs, immediately wash area with a solution of baking soda and water.

The battery installed in your craft supplies your craft with DC current for starting the engine and powering lights and accessories. Inspect the battery frequently for cleanliness and tight connections. Be sure that the battery compartment is well-ventilated.

Be careful when connecting or disconnecting a battery charger. Be sure the charger is turned OFF and unplugged from power source when you remove the connection.

Make sure you have a solid connection with the charging clamps.

Poor connections at the battery are common causes of electrical arcs and engine problems. Follow instructions.

DO NOT make or break electrical circuits at the battery terminals; a spark will occur when a live circuit is opened or made. Turn off all the components.

Use a voltmeter, hydrometer or your voltage gauge to check the battery charge condition.

Automatic Charging Relay (ACR) or Voltage Sensitive Relay (VSR)

Models equipped with an ACR or VSR automatically connect or isolate the engine starting and accessory house batteries as needed. Under normal conditions the starting batteries are isolated from the house batteries to prevent house battery discharge. If additional power is required for starting, the ACR automatically combines starting and house batteries but temporarily isolates other electronics for protection. The ACR also automatically combines batteries for charging from either starting or house battery charge sources.

AC System

AC systems supply AC electrical power to equipment and outlets requiring AC power, such as electric stoves, water heaters, microwaves and refrigerators. AC systems are normally used when your boat is moored to a dock or slip. AC systems rely on shore power or on-board AC generators.

NOTICE *NEVER modify or repair a boat's AC power system or components. Always consult a qualified electrician and ensure that repairs or modifications are in compliance with ABYC guidelines and National Electrical Codes.*

AC shore power systems are normally rated for 125 volts at 60 cycles. Source current is provided by a 110-volt, 60-cycle shore power station.

The AC control portion of the AC generator control panel may include the following components:

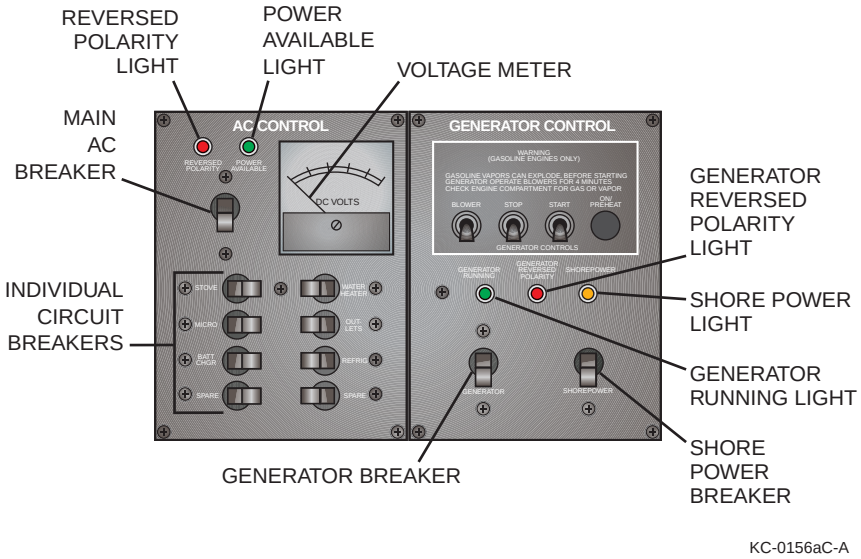


Figure 9-5: Typical AC/Generator Control Panel

Voltmeter

The voltmeter allows you to monitor the system AC voltage. Damage to components can occur if voltage entering the system is less than the minimum operating voltage.

Reverse Polarity Light

The reverse polarity light indicates if the polarity of the shore power source has been reversed, but will not indicate if the boat polarity (wiring) is reversed.

⚠WARNING ***Electrical Hazard: If a reverse polarity warning is indicated, do not use the shore power source. Immediately turn off the power source onshore and disconnect the shore power cord. An electrical hazard exists and must be corrected before using shore power.***

Power Available Light

The power available light indicates that power from the shore or from the generator is available to the panel for distribution. This indicator must be illuminated before you switch the main AC breaker on.

Main AC Circuit Breaker

Main AC circuit breaker provides overload protection for all circuits on the panel and allows the connection and disconnection of AC power to all individual circuits.

Individual Circuit Breakers

Individual circuit breakers provide overload protection for an individual circuit and allow the connection and disconnection of AC power to individual circuits.

WARNING ***Fire Hazard: Never reset a breaker that has been automatically tripped without first identifying and correcting the cause of the problem. A fire could result.***

Generator Main Circuit Breaker

The generator control portion of the AC generator control panel may include the following components:

Generator main circuit breaker provides overload protection for all circuits on the panel and allows the connection and disconnection of generator AC power to all individual circuits. Never switch the breaker while the generator is running.

Shore Power Circuit Breaker

The shore power circuit breaker provides overload protection for all circuits on the panel and allows the connection and disconnection of AC shore power to all circuits.

Generator Running Light

The generator running light indicates that generator power is being received by the AC control panel.

AC Shore Power Light

The AC shore power light indicates that shore power is being received by the AC generator control panel.

Shore Power

DANGER ***Electrocution Hazard:***

- ***Always use a shore power cable that is in excellent condition and with no cuts, nicks or abrasions in the exterior plastic cover. Electrical shock can occur from use of a damaged shore power cord.***
- ***Never allow the end of the shore power cable to hang in the water. An electrical field can result, causing danger to nearby swimmers.***
- ***Never swim or allow others to swim anywhere near the boat when the boat is connected to shore power. Stray voltage may leak from the shore power cable and/or boat shore power connector.***

WARNING ***Electrical Shock/Fire Hazard: To minimize shock and fire hazard:***

- ***Examine the shore power cable for damage. Never use the shore power cable if it appears cut or damaged.***
- ***Turn off the boat's shore connection switch before connecting or disconnecting the cable.***
- ***Connect the shore power cable to the boat's inlet before connecting to the shore power source.***
- ***If the boat is equipped with a polarity indicator that activates, immediately disconnect the shore power cable.***
- ***Disconnect the shore power cable at the shore outlet first. Never leave the shore power cable connected to the shore outlet when the cable is not in use.***
- ***Close the shore power inlet cover tightly.***
- ***Never alter the plug and connector on the shore power cable. Use only compatible cable connectors and shore power receptacles.***

WARNING ***Fire Hazard: Never supply power to the water heater when it is empty. Fire may result if the heating element is damaged.***

NOTICE *When extending shore power cables, be sure that there is enough slack in the cable at all times to account for the movement of the boat in its slip (side-to-side tidal action). If the shore power cable is held too tight, it may damage the cable.*

All shore power systems require a special marine-grade, three-conductor cable to make a proper connection to the shore. Cables and connection types are rated by their current-carrying ability in amperes. Dockside connections are plug-in, while boat-side connections plug in and lock into position with a threaded locking collar to prevent accidental disconnection and to provide water resistance. Always obtain authorized assistance when selecting cables and adapters, or when connecting to power.

Each time you plug into an unfamiliar shore station, inspect the outlet for signs of corrosion or damage before using it. Establish that the receptacle is correct for the cable and ensure the plug fits snugly and securely into the receptacle. If the shore power cord should ever feel warm to the touch when the power is on, follow instructions on how to disconnect the shore power cord and report the problem to the marina authorities.

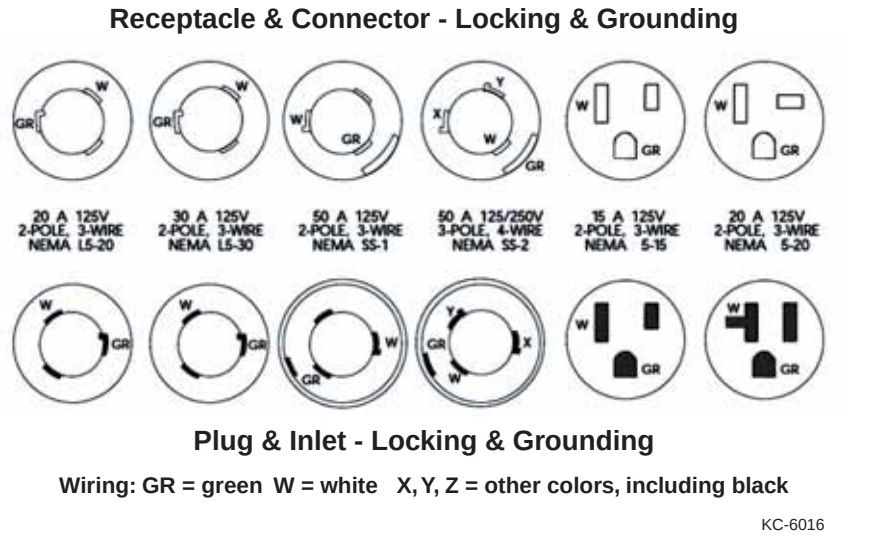


Figure 9-6: Shore Power Cable Connections

Use the following guidelines to minimize shock and fire hazards when connecting and disconnecting shore power cables.

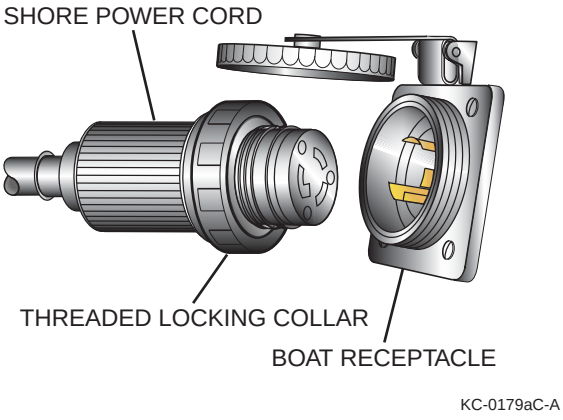


Figure 9-7: Boat-side Shore Power Connection

To connect:

- Shut down the generator if applicable. Turn off the generator breaker and the main AC breaker.
- Turn off your boat's main AC breaker switch.
- Turn off the dock or shore outlet switch.
- Connect the shore power cable to the boat connection.
- Make sure the cable has more slack than the mooring lines and cannot drop into the water.
- Remove the cap from the outlet on the pier and connect the other end of the shore cable to the outlet on the pier.
- Turn on the dock or shore outlet switch.
- Check the reversed polarity light. If it is on, immediately disconnect the cable.
- Turn the AC main or shore circuit breaker switch to the ON position.
- Turn the AC main panel circuit breaker switch to the ON position.
- Turn individual circuit breakers on.

To disconnect:

- Turn the AC main panel circuit breaker switch to the OFF position.
- Turn the AC main or shore circuit breaker switch to the OFF position.
- Turn off the dock or shore outlet switch.
- Disconnect the shore power cable at the shore outlet.
- Disconnect the power cable from the boat. Replace the cap over the inlet.
- Place the cable in storage for future use.

⚠ WARNING ***Shock Hazard: Some marinas have been known to "break" shore power ground circuits to prevent electrolysis. Opening the ground circuit creates a potentially dangerous on-board shock hazard. Ensure that your shore power cable ground circuit is always continuous.***

Generator

Generators can be used to supply AC electrical power to the boat's electrical system. Generators typically use the same type of fuel as the propulsion unit. Follow the generator manufacturer's information for operating instructions.

⚠ WARNING ***Fire/Explosion Hazard: Gasoline is extremely flammable and highly explosive under certain conditions. Handle gasoline with caution.***

Generators produce carbon monoxide (CO) gas when operating. Install a CO detector in the cabin area of your boat and be sure it works properly when you are using the generator.

⚠ DANGER ***Exhaust Hazard: Carbon Monoxide (CO) is a colorless and odorless gas that will cause death or serious injury.***

To reduce CO accumulation:

- Do not operate the generator with the canvas installed.
- Avoid idling or using the generator while at idle for extended periods.
- Regularly inspect the generator's exhaust system for proper operation.
- Do not use the generator or any fuel-burning appliances with a transom exhaust port when anyone is swimming from a stern swim platform.

Electronic Leakage Circuit Interrupter (ELCI)

On boats with shore power, the AC electrical system is also equipped with an electronic leakage circuit interrupter (ELCI) which will open (trip) under dangerous conditions. This situation can occur when there is a combination of a ground fault and a faulty ground, and is a hazard to both people in the boat and in the water. The ELCI is installed near the boat's shore power connector inlet and provides whole-boat protection for everything downstream of it. Some ELCI panels are equipped with a reverse polarity indicator; if the indicator is illuminated, turn off the main breaker, disconnect the shore power cord and notify the marina master of the fault. AC outlets are further protected with marine-grade ground fault circuit interrupters (GFCI) for protection in potentially wet environments.

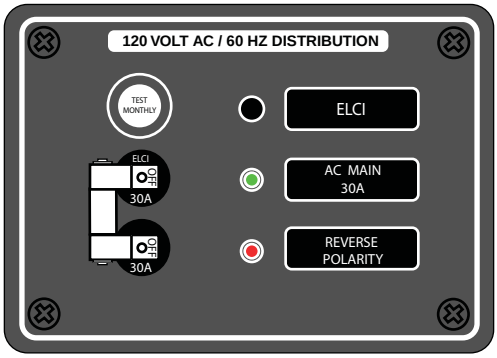


Figure 9-8: Electronic Leakage Circuit Interrupter

It is important that the ELCI is working properly to provide protection against Electric Shock Drowning (ESD). The boater should test the ELCI at least once each month to ensure proper operation by pressing the test/reset buttons in the faceplate. Refer to the ELCI manufacturer's instructions for testing details and fault codes. For more information go to: *www.esfi.org/resource/boating-and-marina-safety-263*

DANGER ***Electrocution Hazard:***

- ***To reduce the possibility of an electrical shock, it is important that the AC ground system is functioning properly and that a proper connection exists between the shore power cord, the shore power inlet, the boat bonding system and the outlet ground circuits. If there is any doubt about the integrity of the ground circuit, contact a qualified marine electrician immediately. The AC power should be disconnected until the necessary repairs are completed.***
- ***Reversed polarity and ground fault conditions will damage the system and expose passengers to electrocution hazards that will cause severe injury or death. This condition could also cause a fire in the electrical system. Never operate the AC electrical system with reversed polarity or a ground fault condition.***
- ***Electric shock can cause severe injury or even death. Do not attempt to correct the wiring yourself. Always have a qualified electrician check wiring. Keep children away from any electrical cables or equipment and always use grounded appliances on board the boat. Undetected faults in the AC electrical system could cause the water around the boat to become energized. This could cause a severe shock or even death to someone in the water near the boat. Never swim or allow swimming around the boat when the AC system is activated by the shore power connection or the generator.***

Ground Fault Circuit Interrupters (GFCI)

Each AC receptacle is protected by a Ground Fault Circuit Interrupter (GFCI). The GFCI measures both the amount of current flowing to the circuit's receptacles and the amount of current returning from the receptacles. The GFCI compares the two values once measured. If the values are not the same, the GFCI instantly trips, and power is shut off to the receptacles.

Testing GFCI Receptacles

GFCIs have TEST and RESET buttons located on the receptacles.

Switch the TEST button ON/OFF switch to ON to reset a GFCI that has tripped.

Press the RESET button to reset the GFCI after it has tripped. Resetting a GFCI allows electricity to flow again to the receptacle.

Test each GFCI circuit once per week.

⚠WARNING ***Shock Hazard: Never use a GFCI or any receptacle on a GFCI circuit if power is still available on that circuit after the test button has been pressed. Death or serious injury can occur by receiving an electrical shock from the AC electrical system including the Ground Fault Circuit Interrupter (GFCI) receptacle. Seek immediate medical attention after receiving an electrical shock. Contact a qualified electrician to make appropriate repairs.***

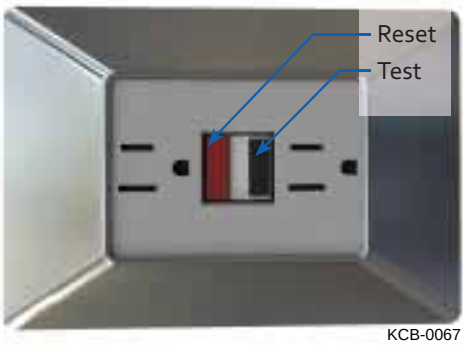


Figure 9-9: Testing GFCI Receptacles

1. Press the TEST button. If operating normally, it cuts the electricity to the receptacle on the GFCI.
2. Plug a lamp or other AC-powered device into the receptacle and turn ON the device. The device should NOT operate.
3. Press the TEST button. Never use the receptacle if the receptacle still has power. Contact a qualified electrician to make the appropriate repairs.
4. Reset the GFCI to restore power to the receptacle.

Bilge Pump

The automatic bilge pump with manual override removes excess water accumulation from the bilge area. If the pump motor runs but no water is discharged, it may be clogged. If there is no visible debris clogging the pump and water is still not being removed, inspect the discharge hose for kinks or obstruction. If the automatic bilge pump does not run, check the in-line fuse/breaker located near the battery(ies).

IMPORTANT: The Federal Water Pollution 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.

Windlass

The boat may be equipped with a windlass for deploying and retrieving the bow anchor using a notched wheel to engage chain links/rope. Windlasses on recreational boats are usually driven by an electric motor and controlled by rocker, foot or remote control switches and may be a vertical or horizontal style. Windlasses have a “chain locker” for storing the chain/rope, a chain stopper with a snubber and/or a tie-off cleat to secure the anchor in deployed or retrieved positions. The boat may be equipped with one or more up/down control switches and possibly a chain/rode counter.

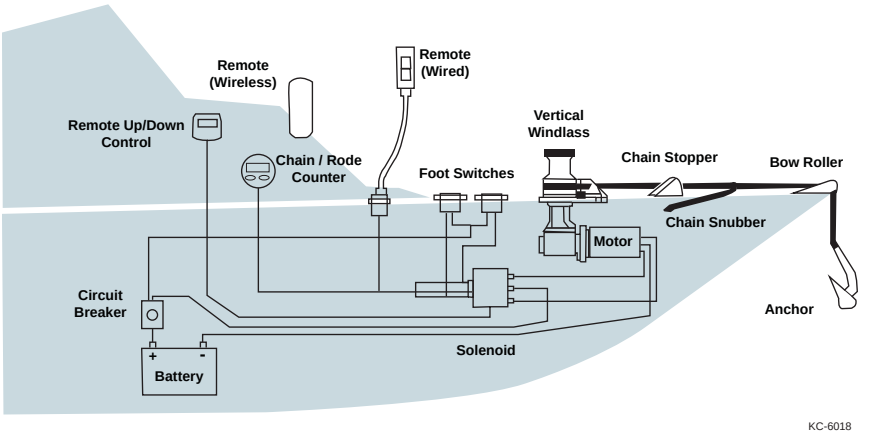


Figure 9-10: Windlass

WARNING ***Severe Injury Hazard: Always keep limbs, fingers, hair and clothing away from the anchor, rode and windlass during operation. Check that there are no swimmers in the water or divers nearby when dropping anchor. Be sure the anchor is fully secured after retrieval.***

HEAD AND WASTE CONTAINMENT SYSTEM

Always check state and local regulations before discharging waste overboard.

Head (marine toilet) and waste containment systems are available as manual or electrically-operated systems. Electrically operated systems use electric raw water pumps to flush waste from the marine toilet into the boatâ€™s waste tank. A waste tank indicator may be installed to provide a visual indication of the amount of waste in the tank.

All boats with heads are required to have a USCG-approved operable marine sanitation device installed. These devices, commonly called macerators or chlorinators, are used to break up solid and chemically treated waste and discharge it into waste tanks or overboard.

Waste Removal System Types

- *Dockside Discharge* – Waste tanks are emptied through a deck plate fitting marked “WASTE” by special waste removal equipment on the shore.
- *Overboard Discharge* – Waste tanks are emptied through the hull into the sea/lake. A “Y” valve is used to change discharge flow between the marine toilet and the waste holding tank.

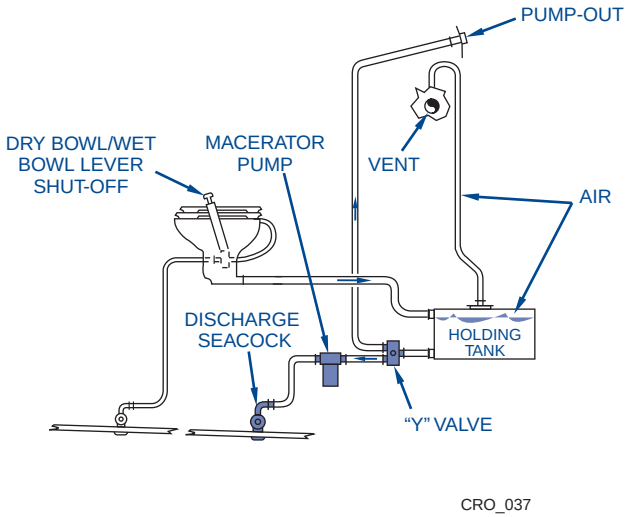


Figure 9-11: Typical Waste System

If your boat is equipped with an electric MSD system, the toilet is flushed by using the DC electric switch, located in the head compartment. This system uses fresh water instead of raw water to flush the waste and minimize odor problems.

Refer to the electric MSD system manufacturer’s *Owner’s Manual* for more detailed safety precautions, operation and maintenance instructions.

Portable Toilet

The standard head on select models is a portable toilet. This portable toilet provides simple operation and convenient disposal of waste. A dockside pump-out system for the portable toilet's built-in holding tank is an option. Proper use and operation of this portable toilet eliminates unnecessary measures and maintenance. Before using your portable toilet, refer to the portable toilet system manufacturer's *Owner's Manual* for more detailed safety precautions, operation and maintenance instructions.

LIVEWELLS

Livewells are designed to help protect and keep fish or bait alive. Some are equipped with an aeration pump that circulates and refills the water in the livewell to help keep fish alive.

Always clean and empty the livewells after each use to prevent contaminating the fish. Never use soap, detergents or other cleaners that may be harmful to fish to clean the livewell.

If a livewell system does not drain completely, you may have to bail remaining water by hand or remove your boat from the water.

NOTICE *To avoid freeze damage to the livewell system, be sure it is completely empty in freezing weather. Residual water in the system may freeze and cause damage.*

Livewell systems are usually manual, remote or recirculating. Do not use manual and remote livewell systems while your boat is in operation or on the trailer. Also, make sure the livewell pump is switched off, or pump damage will occur.

Recirculating Livewell

Recirculating livewells allow water recirculation while a boat is in operation or on the trailer. Like manual and remote types, this system continuously aerates the livewell with sea/lake water while you are fishing. While underway or when trailering, the system can be closed to recirculate the water in the livewell. During recirculation, keep in mind that sea/lake water is not used and water temperature increases quickly, which may kill the fish in the livewell.

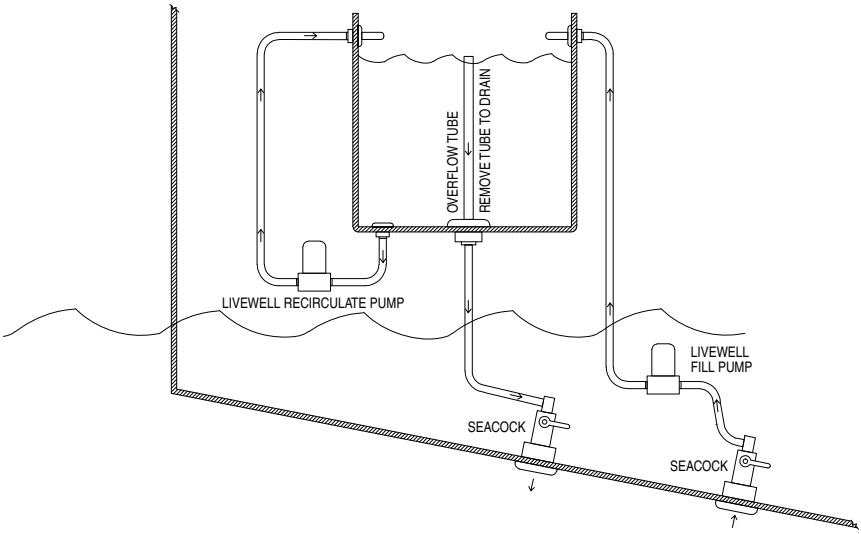


Figure 9-12: CROWNLINE/FINSEEKER Livewell/Baitwell

NOTICE *Keep seacocks closed during periods of inactivity. A downstream hose failure could flood your boat if the seacock is left open.*

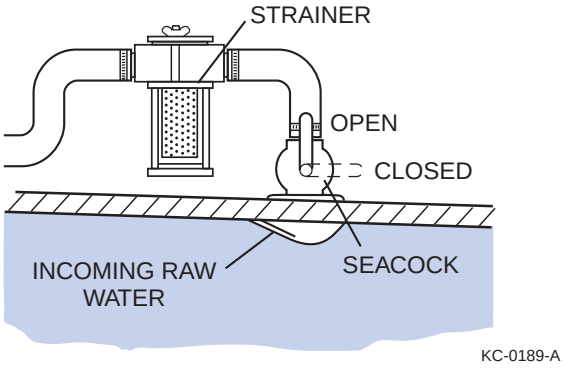


Figure 9-13: Typical Seacock and Strainer

AIR CONDITIONING SYSTEM

Your craft may have an optional air conditioning system. The air conditioning pump draws in seawater through a seacock in the bilge area. When the air conditioner is running it discharges the seawater through a thru-hull fitting above the waterline. Air conditioning units are controlled through a breaker switch at the AC control panel. When using an air conditioner, its breaker switch must be on.

When you operate the air conditioner:

1. Open the air conditioner seacock. The valve is open when the handle is in line with the seacock valve.
2. Check the sea strainer next to the seacock. Make sure it is clean and free of debris to ensure a steady flow of water to the unit.
3. Set the thermostat to the temperature desired.

IMPORTANT: Make sure the seacock is closed when air conditioner is not in use. Refer to the air conditioner manufacturer's literature for more safety precautions, a list of features and detailed operation.

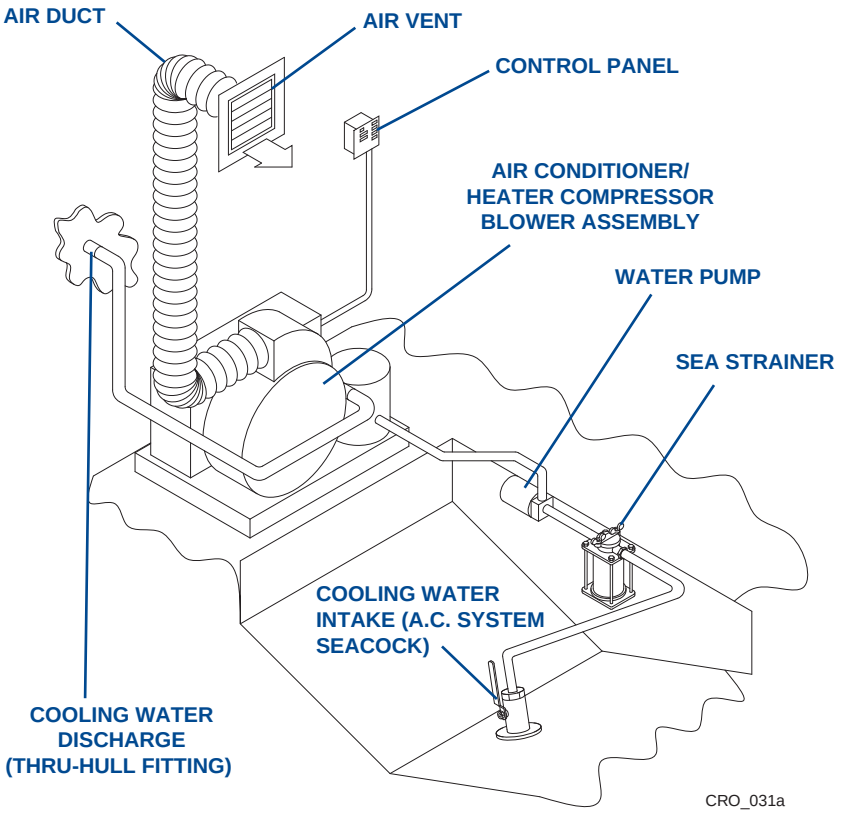


Figure 9-14: Typical Air Conditioning System

Schematics

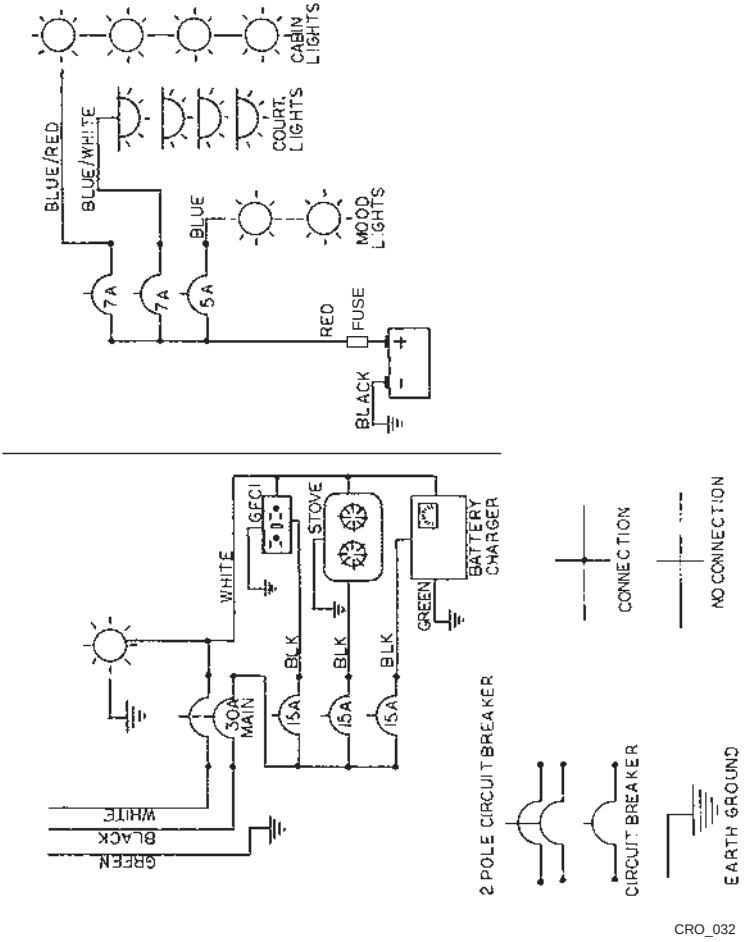


Figure 9-15: Typical DC and AC Electrical Schematic

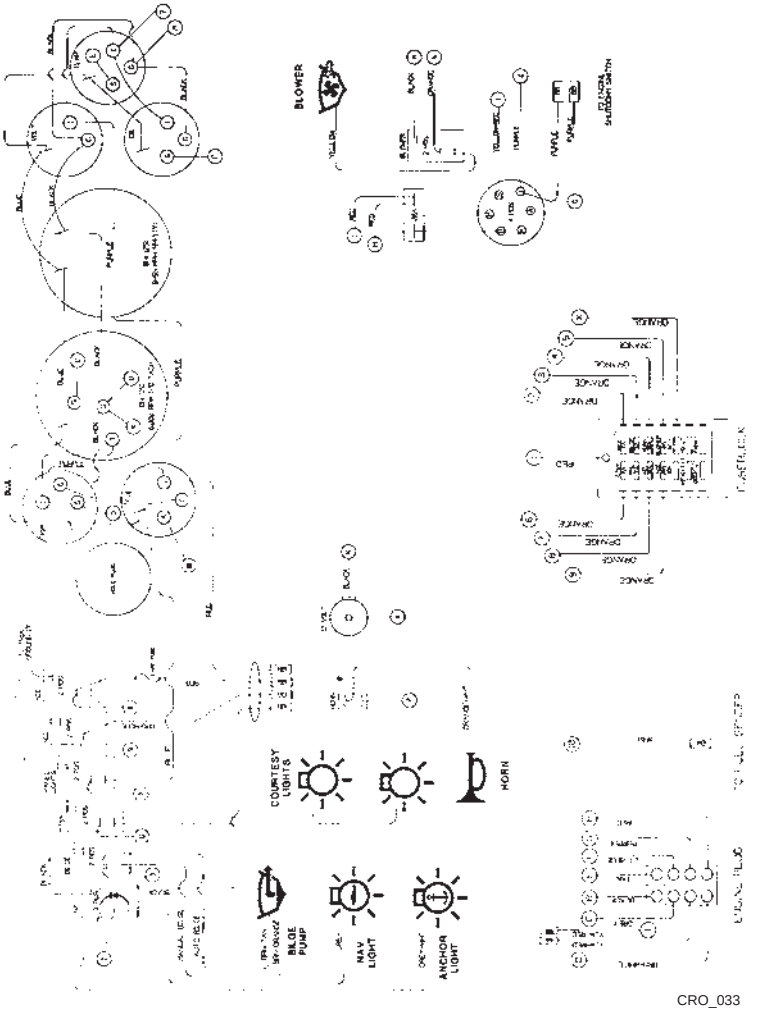


Figure 9-16: Typical DC Electrical Schematic

HELMS, INSTRUMENTATIONS AND CONTROLS

Your CROWNLINE/FINSEEKER may have more or fewer instruments and controls than those shown in the following illustrations based on how your CROWNLINE/ FINSEEKER was built. A description of the instruments and controls follows the illustrations. The topic will appear in alphabetical order.

OBD-M/MIL

Your boat, if equipped with a catalyst engine, will have an OBD-M/MIL system (On Board Diagnostics – Marine, with a Malfunction Indication Lamp). The MIL will be in the vicinity of the instrument panel. The lamp will state “ON BOARD DIAGNOSTICS, SERVICE ENGINE SOON.” When lit, the lamp indicates that there is a problem with the Emissions Control system on your boat; you should then contact your dealer for diagnostics and corrective action.

Helms

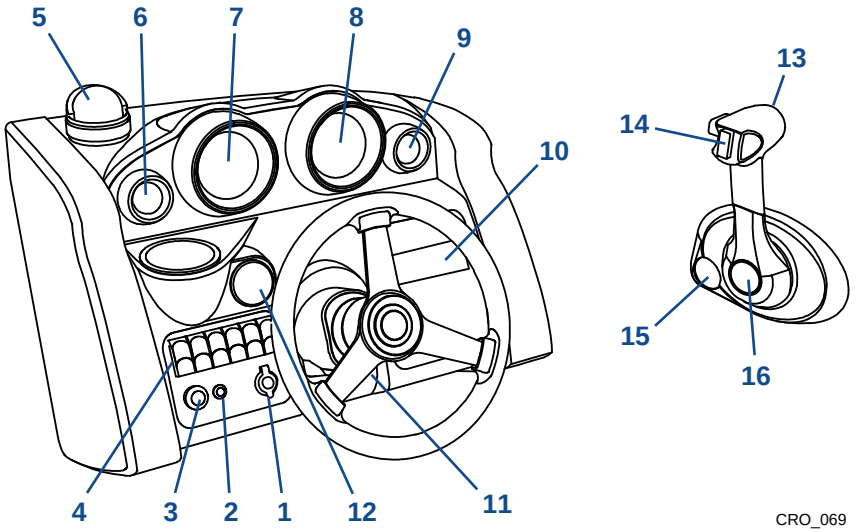


Figure 10-1: 19XS/205SS

1. 12V Receptacle
2. Ignition Breaker
3. Ignition Switch
4. Switch Panel – Nav/Anchor Light, Bilge Pump, Courtesy Lt/Wiper, Bilge Blower, Accessory
5. Compass
6. Depth Gauge
7. Speedo/Multi Gauge
8. Tachometer/Multi Gauge
9. Trim Gauge
10. Stereo
11. Steering Wheel Tilt Lever
12. OBD-M Light
13. Throttle/Shift Control
14. Tilt/Trailer Switch
15. Emergency Stop Switch w/Lanyard
16. Neutral Detent

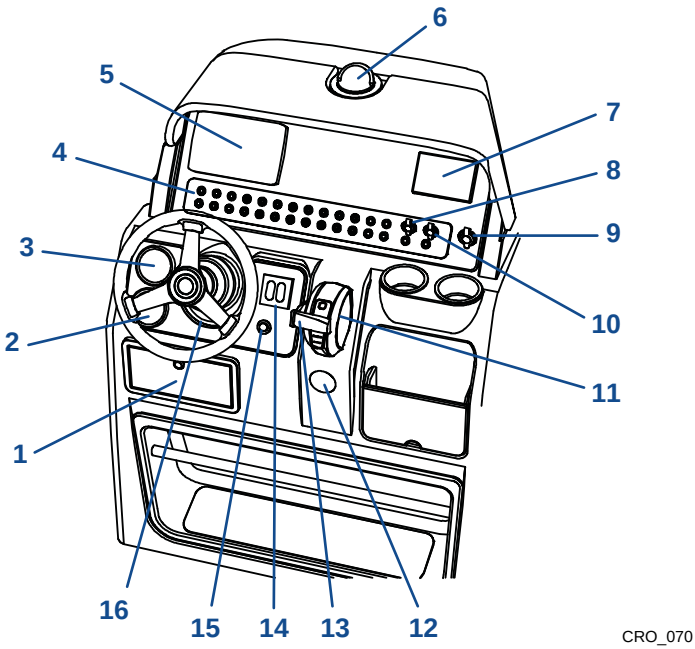


Figure 10-2: FINSEEKER 200CC

1. Glove Box
2. Tachometer
3. Speedometer
4. Switches/Breakers
5. Multifunction Display (optional on some models)
6. Compass
7. Stereo
8. USB Port
9. Aux/USB Port
10. 12V Receptacle
11. Throttle/Shift Control
12. Emergency Stop Switch w/Lanyard
13. Trim Switch
14. Trim Tab Switches (optional)
15. Ignition Switch
16. Tilt Helm

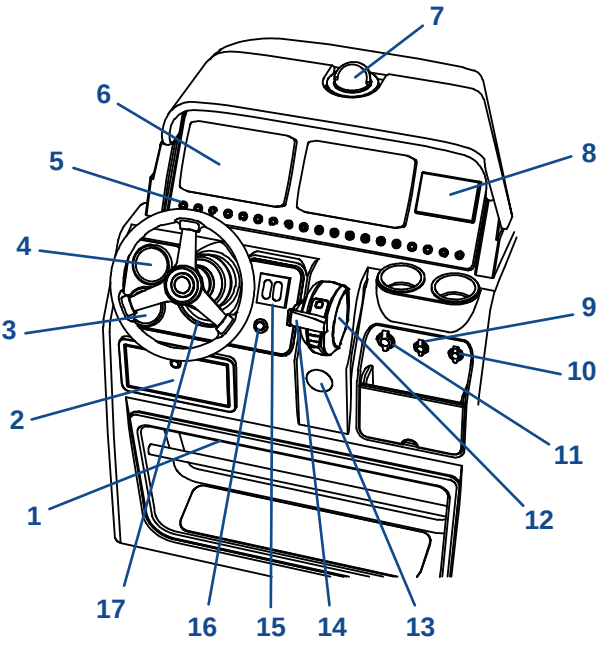


Figure 10-3: FINSEEKER 220CC/230CC

1. Breaker Panel
2. Glove Box
3. Tachometer
4. Speedometer
5. Switches
6. Multifunction Display (optional on some models)
7. Compass
8. Stereo
9. USB Port
10. 12V Receptacle
11. Aux/USB Port
12. Throttle/Shift Control
13. Emergency Stop Switch w/Lanyard
14. Trim Switch
15. Trim Tab Switches (optional)
16. Ignition Switch
17. Tilt Helm

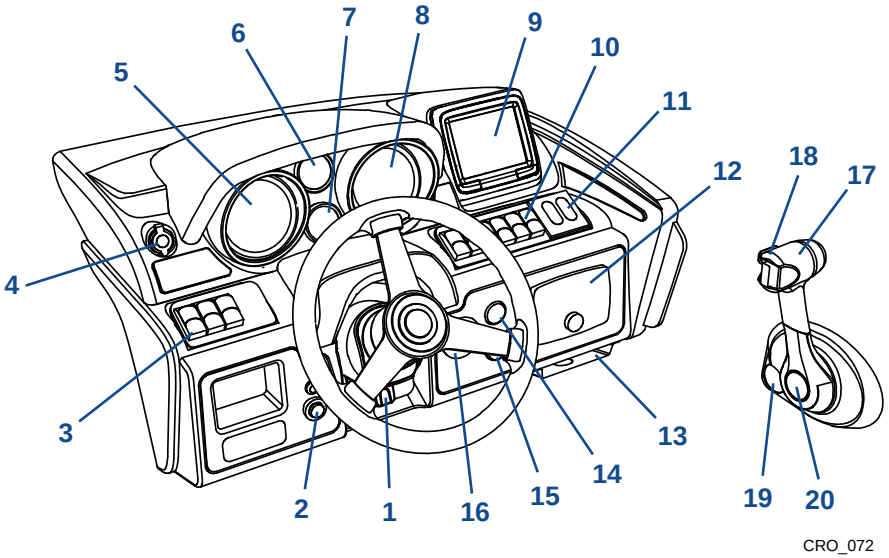


Figure 10-4: 215SS/225SS/235SS/E225/E235/E205XS/E215XS/E235XS

1. Steering Wheel Tilt Lever
2. Ignition Switch/Breaker
3. Switch Panel – Horn, Blower, Navigation/Anchor
4. 12V Receptacle
5. Speedometer/Voltage/Fuel
6. Depth Sounder
7. Trim Gauge
8. Tachometer/Oil Pressure/Water Temp (tach only on outboards)
9. Multifunction Display (optional on some models)
10. Switch Panel – Bilge Pump, Exhaust/Docking Light, Courtesy Light/Wiper, Accessory (3)
11. Switches – Trim Tabs (optional)
12. Stereo
13. Cell Phone/Device Tray
14. USB/Aux Port
15. OBD-M Light
16. Automatic Fire Extinguisher Indicator (optional)
17. Throttle/Shift Control
18. Trim/Trailer Switch
19. Emergency Stop Switch w/Lanyard
20. Throttle Only Button

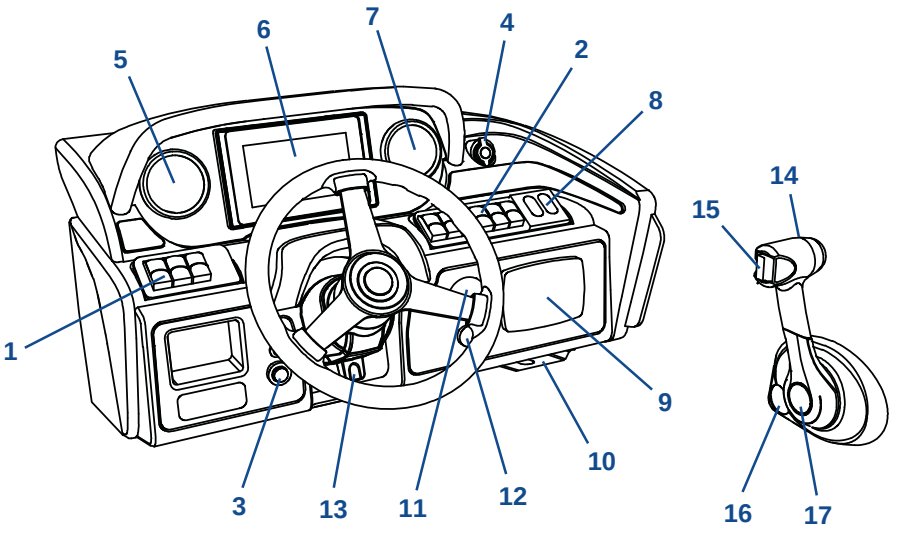


Figure 10-5: 255SS/265SS/280SS/290SS/270XSS/280XSS/290XSS/E255/E275/E285/E255XS/E275XS/E285XS

1. Switch Panel – Horn, Blower, Navigation/Anchor
2. Switch Panel – Bilge, Exhaust/Docking Light, Courtesy Light/Wiper, Accessory
3. Ignition Switch/Breaker
4. 12-Volt Accessory Port
5. Speedometer/Fuel Gauge
6. Multifunction Display
7. Tachometer/Trim Gauge
8. Trim Tab Switches (optional)
9. Stereo
10. Electronics Accessory Tray
11. Automatic Fire Extinguisher Indicator
12. OBD-M Status Light
13. Steering Wheel Tilt Lever
14. Throttle/Shift Control
15. Trim/Trailer Switch
16. Emergency Stop Switch w/Lanyard
17. Throttle Only Button

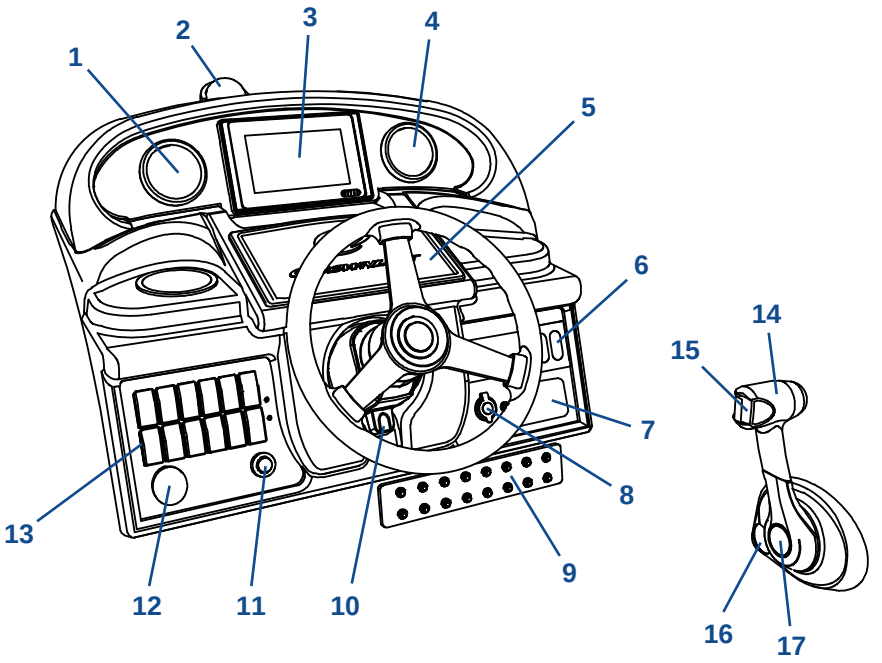


Figure 10-6: 264CR

1. Speedometer/Fuel Gauge
2. Compass
3. Multifunction Display
4. Tachometer/Trim Gauge
5. Electronics Landing
6. Trim Tab Switches
7. Stereo Remote
8. 12-Volt Accessory Port
9. Breaker Panel
10. Steering Wheel Tilt Lever
11. Ignition Switch/Breaker
12. Automatic Fire Extinguisher Indicator
13. Switch Panel – Navigation Lights, Courtesy/Docking Lights, Panel Lights, Engine Room Lights, Wiper, Horn, Exhaust, Engine Hatch, Accessory, Windlass, Bilge Pumps, Blowers
14. Throttle/Shift Control
15. Trim/Trailer Switch
16. Emergency Stop Switch w/Lanyard
17. Throttle Only Button

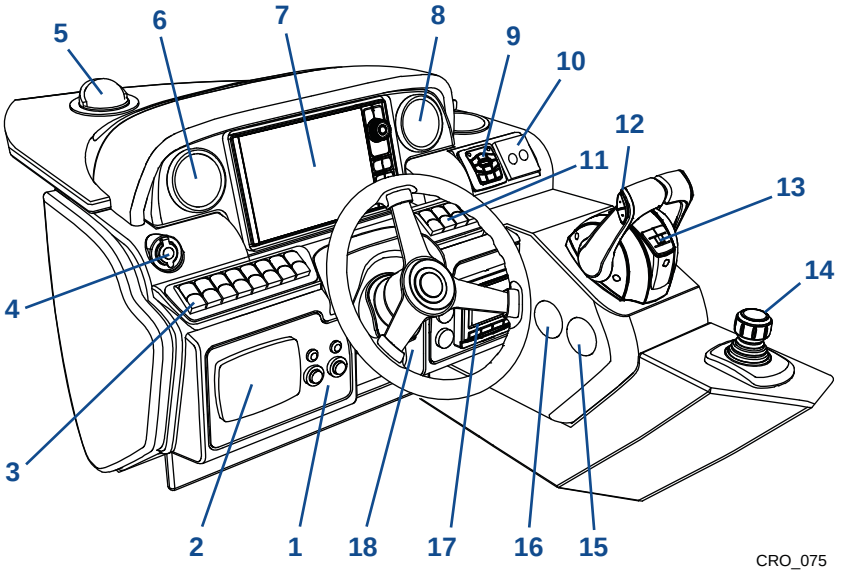


Figure 10-7: E305/E305XS

1. Ignition Switch/Breaker (1 each per engine)
2. Stereo
3. Switch Panel – Engine Hatch, Windlass, Courtesy Light, Underwater Lights/Engine Room Lights, Forward Docking Lights/Aft Docking Lights, Stereo, Amplifier, Wiper/Water Pump
4. 12-Volt Accessory Port
5. Compass (optional)
6. Gauge (Port Tachometer – Twin Engines, Speedo – Single Engine)
7. Multifunction Display
8. Gauge (Starboard Tachometer – Twin Engine, Tachometer – Single Engine)
9. Auto Glide Trim Tab Control
10. Start/Stop Buttons (some models)
11. Switch Panel – Horn, Navigation/ Anchor Lights, Bilge Pumps, Blowers
12. Trim/Trailer Switch (twin engine control shown)
13. Trailer/Throttle Only/Controller Switches (twin engine control shown)
14. Joystick Maneuvering Control (only available on twin engine-equipped boats)
15. Emergency Stop Switch w/Lanyard
16. Automatic Fire Extinguisher Indicator
17. Engine Monitor
18. Steering Wheel Tilt Lever

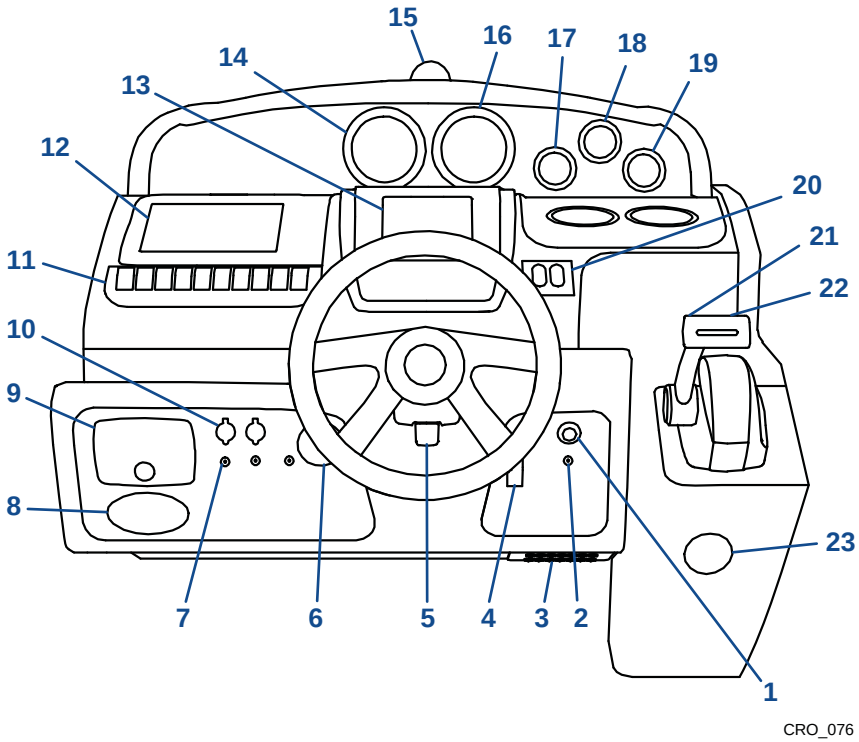


Figure 10-8: 294CR Single

1. Ignition Switch
2. Ignition Breaker
3. Helm Breaker Panel
4. Blower Switch
5. Steering Wheel Tilt Lever
6. Automatic Fire Extinguisher Indicator
7. 12V Receptacle Breaker
8. Spotlight Remote (optional)
9. Stereo Remote
10. 12V Receptacle
11. Switch Panel – Battery Parallel, Engine Hatch, Windlass, Wiper, Engine Light, Overhead Light, Courtesy Light, Bilge Pump, Nav/Anchor Light, Horn
12. Multifunction Display (optional)
13. Vessel View (optional on some models)
14. Speedometer
15. Compass
16. Tachometer
17. Fuel
18. Depth
19. Trim
20. Trim Tab Switches/Indicators
21. Trim/Trailer Switch
22. Throttle/Shift Controller
23. Emergency Stop Switch w/Lanyard

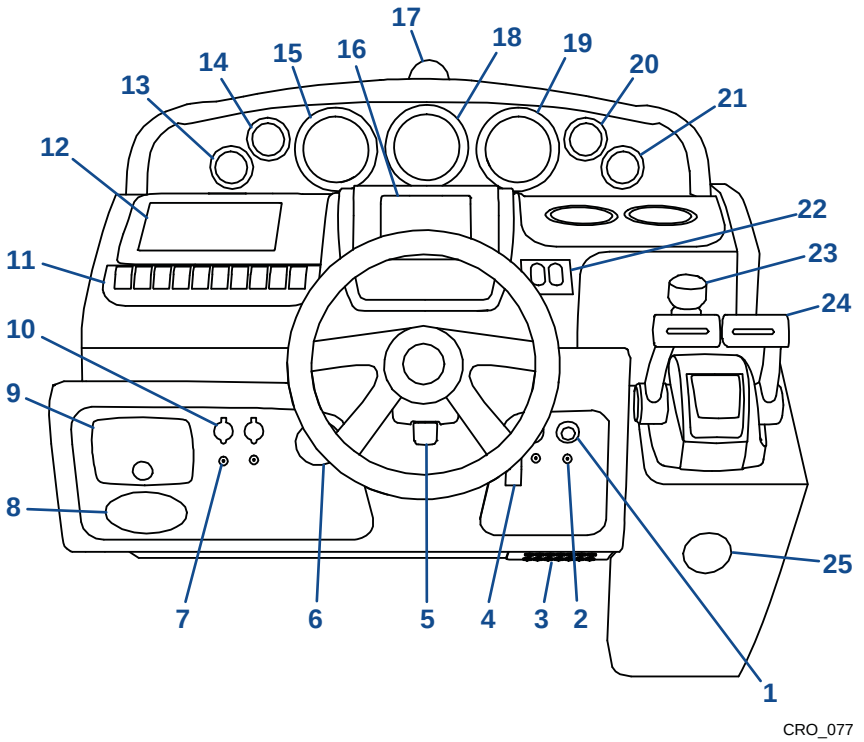


Figure 10-9: 294CR Twin/350SY

1. Ignition Switch
2. Ignition Breaker
3. Helm Breaker Panel
4. Blower Switch
5. Steering Wheel Tilt Lever
6. Automatic Fire Extinguisher Indicator
7. 12V Receptacle Breaker
8. Spotlight Remote (optional)
9. Stereo Remote
10. 12V Receptacle
11. Switch Panel – Battery Parallel, Engine Hatch, Windlass, Wiper, Engine Light, Overhead Light, Courtesy Light, Bilge Pump, Nav/Anchor Light, Horn
12. Multifunction Display (optional)
13. Vessel View (optional on some models)
14. Fuel
15. Depth
16. Tachometer – Port Engine
17. Compass
18. Speedometer
19. Tachometer – Stbd Engine
20. Trim – Port Engine
21. Trim – Stbd Engine
22. Trim Tab Switches/Indicators
23. Joystick (optional)
24. Throttle/Shift Controller
25. Emergency Stop Switch w/Lanyard

SHIFT AND THROTTLE CONTROLS

Knowing how to operate the shift and throttle controls of the boat is essential for safe and proper operation.

The following basic and typical information may not apply to your specific shift control. See the *Engine Operator's Manual* or control manufacturer's instructions for information on your throttle and shift control operation, adjustment and maintenance.

Single-Lever Controls – Single or Twin Engine

Single-lever controls operate both the gear shift and the throttle for one engine with one control lever. Single-lever controls can be used on single- or twin-engine boats.

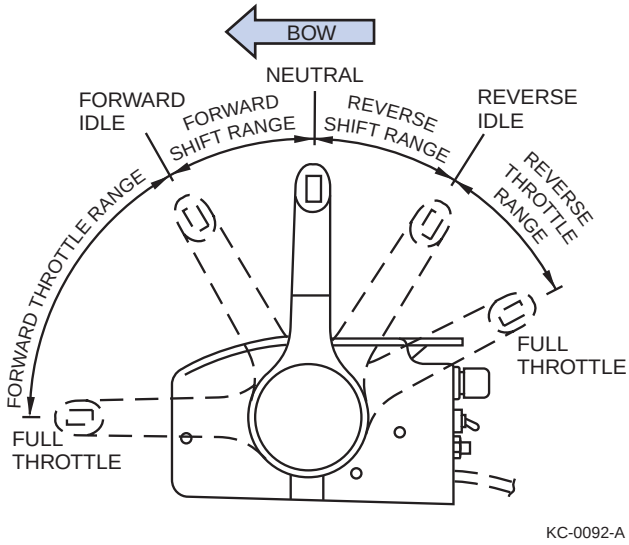


Figure 10-10: Single-Lever Controls

NEUTRAL – The lever is detented in the NEUTRAL position (center of travel) for starting; the neutral safety switch allows starting in this position only. For engine warm-up, a separate lever or button on the control is used to disengage the shift cable and allow the throttle to advance only while the transmission remains in NEUTRAL.

FORWARD – Release the detent lock to allow shifting to the FORWARD position. Moving the lever into the first 15 degrees of travel (toward the bow or up) positions the control in the FORWARD detent IDLE position. Advancing the lever beyond 15 degrees allows throttle increase in FORWARD.

REVERSE – Release the detent lock to allow shifting to the REVERSE position. Moving the lever into the first 15 degrees of travel (toward the stern or down) positions the control in the REVERSE detent idle position. Advancing the lever beyond 15 degrees allows throttle increase in REVERSE.

Twin-engine boats with single-lever controls have two levers: a left lever for port engine control and a right lever for the starboard engine. Two levers enable you to operate one engine in FORWARD and the other in REVERSE for easier maneuvering in tight quarters.

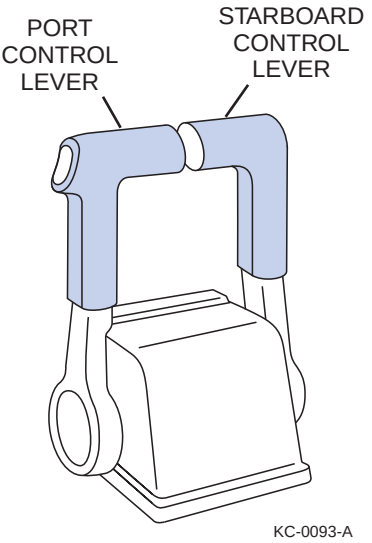


Figure 10-11: Twin-Engine Boats with Single-Lever Controls

NEUTRAL – The lever is detented in the NEUTRAL position (center of travel) for starting; the neutral safety switch allows starting in this position only. For engine warm-up, a separate lever or button on the control is used to disengage the shift cable and allow the throttle to advance only while the transmission remains in NEUTRAL.

FORWARD – Release the detent lock to allow shifting to the FORWARD position. Moving the lever into the first 15 degrees of travel (toward the bow or up) positions the control in the FORWARD detent IDLE position. Advancing the lever beyond 15 degrees allows throttle increase in FORWARD.

REVERSE – Release the detent lock to allow shifting to the REVERSE position. Moving the lever into the first 15 degrees of travel (toward the stern or down) positions the control in the REVERSE detent idle position. Advancing the lever beyond 15 degrees allows throttle increase in REVERSE.

Control Operation Guidelines

⚠WARNING ***Control Hazard: Improperly maintained controls are hazardous and may cause sudden loss of control. Make sure all shift/throttle hardware and cables are regularly inspected and maintained. Improper maintenance may result in a loss of control.***

- Side mount throttle and shift controls have a neutral detent locking lever that must be released before shifting from NEUTRAL.
- Always use a brisk and decisive movement when shifting into or out of gear.
- Always pause in NEUTRAL before shifting from FORWARD to REVERSE, or REVERSE to FORWARD. Most throttle and shift controls have a detent position for NEUTRAL, FORWARD and REVERSE engagement positions. Engine damage may occur if you rapidly shift into gear without pausing in these detent positions or allowing the engine RPM to lower into the approved shifting range.
- When traveling at high speed, never shift into REVERSE while your boat is in FORWARD gear.
- Always keep the shift control clean and clear of obstructions.

NOTICE *All shift and throttle controls are equipped with a safety switch for start-in-gear prevention. Place the control in the NEUTRAL position before you attempt to start the engine.*

- Never attempt to shift when the engine is not running.

CONTROL SWITCHES

The following information is intended as basic and typical and may not apply to your specific application. Not all switches may be covered in this section. See the *Manufacturer's Operator's Manual* for specific information on the use and operation of switches in the boat.

Many of the electrical features and systems in the boat are equipped with a control switch and protected with breakers or fuses. Switches are designed for different applications and found in many styles and shapes. Some switches may have a lighted indicator for easy ON/OFF identification. Some switch panels contain a master power switch that controls power to all circuits.

Circuit Breaker(s)

Circuit breakers protect the labeled circuit. These circuits are protected from overload by the use of circuit breakers. In the event of an overload or short circuit, circuit breaker will trip. If a circuit continuously overloads under normal operating conditions, contact your CROWNLINE/FINSEEKER dealer immediately. Some models have individual circuits protected with a circuit breaker located next to the switch. To reset a tripped circuit breaker, switch OFF the circuit, wait about one minute for the breaker to cool, push the breaker button fully, and switch ON the circuit.

NOTE: The electrical system is designed to protect you from short circuits and overload. Any modifications to the system, such as adding electrical accessories, should be done by a qualified technician.

Ignition Switch (Key)

Operation of the ignition switch (key) will START and STOP the engine.

START - turn the ignition switch to START position; once engine is started, turn switch to RUN position.

RUN - the ignition switch in RUN position should only be used when your engine is actually running. Engine running also allows your craft's engine alternator to recharge the battery while you run your craft. If the switch is allowed to remain in the RUN position without the engine running, this will discharge your battery and increase the engine operating time on the hour meter.

OFF - the ignition switch should always be in the OFF position when the craft is not in use or power is not required.

Blower Switch

The blower switch is used on boats that use an engine within an engine compartment, such as sterndrive and inboard engines. The switch controls power ON/OFF to the engine compartment ventilation blower to remove explosive fumes from the engine and bilge areas.

You must operate the blower for a minimum of four minutes before each time the engine is started.

⚠WARNING ***Fire/Explosion Hazard: If equipped with a bilge blower switch, always operate the bilge blower for a minimum of 4 minutes prior to starting the engine. Gasoline vapors can explode, resulting in injury or death.***

Battery Switch

Battery switches are used to control battery power distribution and disconnect the batteries from the boat's electrical system. Battery switches are designed in many styles and for different applications. They generally provide battery isolation when used with multiple batteries and are used primarily as a method of quick and positive battery disconnection. Battery switches also protect against tampering, electrical fire hazards and battery drain. Keep this switch off when not using the boat or when storing it for extended periods of time.

NOTICE *Do not turn off the battery switch with the engine running; this could damage the engine's charging system.*

Consult a qualified, knowledgeable technician for proper operation of the boat's specific electrical system.

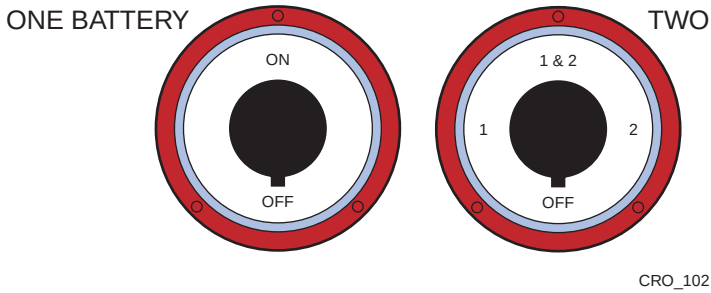


Figure 10-12: Typical Battery Switches

OFF Position – Neither of the batteries are connected to the engine's starting or charging systems. The switch should be in the OFF position when the boat is not being used to ensure that the batteries do not lose their charge. The switch should also be in the OFF position when an external battery charger is being used to charge the battery(s) to avoid possible damage to the electronic components on the engine or in the boat.

NOTICE *Do not turn the battery switch to any other position with the engine running; this could damage the engine's charging system.*

"1" Position – This is usually the main battery. Normally when the battery switch is not OFF, it should be set on 1.

“2” Position – This is usually the auxiliary, house or backup battery. This position should only be used if battery 1 has become depleted and the reserve battery is needed to start the engine.

“1+2” Position – The switch may also be labeled “both” or “combined.” This position would be used in an emergency situation where both batteries are low and power is needed from both batteries to start the engine. Once the engine has started, carefully select battery 1 or battery 2 (but not OFF) to direct all of the charging current to one battery.

NOTICE *If the battery is dead or severely undercharged, do not use the engine charging system’s alternator to bring the battery to a fully charged condition. The excessive current draw can overheat the alternator and cause it to fail. If you have a dead battery, use an external battery charger to bring the battery to a fully charged condition.*

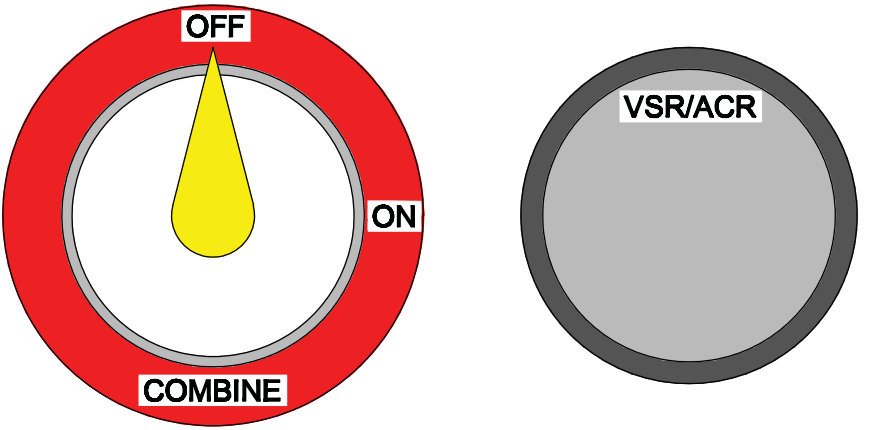


Figure 10-13: Battery Switch with VSR or ACR

When the boat is in storage or the batteries are being charged by an on-board battery charger, the battery switch should be in the OFF position. When boating, the battery switch should be in the ON position. If the main starting battery voltage is too low to crank the engine, turn the battery switch to COMBINE and then start the engine. After the engine has started, carefully return the battery switch to the ON position.

NOTICE *Do not turn the battery switch to OFF while the engine is running.*

Voltage Sensitive Relay (VSR) or Automatic Charging Relay (ACR)

Models equipped with a VSR or ACR automatically connect or isolate the batteries as needed. Under normal conditions, the main starting battery is isolated from the secondary battery or battery bank. The main starting battery is being charged when the engine is running. When the secondary battery or battery bank drops in voltage, the relay will combine the batteries while the engine is running so as to charge all batteries.

Engine Emergency Stop Switch and Lanyard

The engine emergency stop switch controls the engine ignition ON/OFF. This safety device shuts the engine off immediately and prevents the boat from becoming a runaway if the operator is accidentally thrown from the seat or away from the helm.

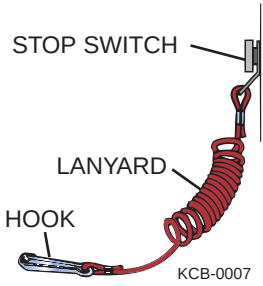


Figure 10-14: Emergency Stop Switch and Lanyard

Whenever the boat's engine is on, physically secure one end of the emergency engine stop switch lanyard to the emergency stop switch and the other to the boat operator. If the operator is thrown from the seat or moves too far from the helm, the lanyard will disconnect from the switch, activating the switch to turn off the engine.

⚠WARNING ***Control Hazard: Never remove or modify the engine emergency stop switch and/or lanyard.***

- ***Always check the switch for proper operation. With the engine running, pull the lanyard. If the engine does not stop, have the switch repaired before continuing to operate the boat. Never operate the boat if the engine emergency stop switch does not work.***
- ***Attach the engine stop switch cord lanyard to a secure place on your clothing, your arm or leg while operating.***
- ***Avoid accidentally pulling the cord lanyard during normal operation. Loss of engine power means loss of most steering control. Also, without engine power, the boat could slow rapidly. This could cause people and objects in the boat to be thrown forward.***

- ***DO NOT attach the cord lanyard to clothing that could tear loose. DO NOT route the cord lanyard where it could become entangled, preventing it from functioning.***

Neutral Start Safety Switch (Start-in-Gear Prevention)

The neutral start safety switch provides start-in-gear prevention. The switch controls power to the engine starter circuit of the ignition switch. The engine gear shift control lever must be in the NEUTRAL position to allow the ignition switch to activate the engine starter. This safety device will prevent the boat's engine from starting if the engine is in gear.

Horn Switch

The horn switch controls power ON/OFF to sound the horn.

Boarding and Courtesy Light Switches

The boarding and courtesy switches control power ON/OFF to boarding lights and cockpit courtesy lights.

Power Trim/Tilt Switch

The power trim/tilt switch controls power ON/OFF to the engine's power trim/tilt electric hydraulic pump. This switch is usually a three-position switch, with OFF in the center. If engine is equipped with power trim and tilt, this system allows you to raise and lower the lower drive unit and propeller to adjust trim (the planing, and running angle of the boat while underway).

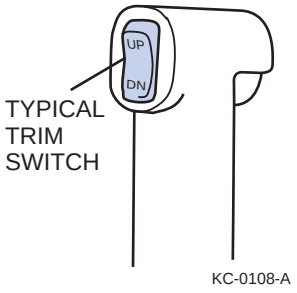


Figure 10-15: Typical Trim Switch

The tilt feature positions the lower drive unit up beyond the power trim range and is used for trailering, launching or beaching. Never use power tilt when the engine is running.

Navigation Lights Switch

The navigation lights switch controls power ON/OFF to the boat's navigation, running and anchor lights. This switch is usually a three-position switch, with OFF in the center. When the switch is in the NAV position, the red and green navigational, white stern and running lights, and console gauge lights are activated. When the switch is in the ANC position, only the white stern light is activated.

Never operate the boat between sunset and sunrise using only the stern light. Use all navigational lights when operating underway between sunset and sunrise.

Bilge Pump Switch

The bilge pump switch controls power ON/OFF to the bilge pump to remove excess water from the bilge area of the boat. Some models are equipped with an automatic bilge pump setting. Switching to AUTO when the boat is in operation will allow water to be automatically pumped out when it reaches a level that activates the float switch in the bilge area.

12-Volt Accessory Circuit Breaker

Protects the 12-volt accessory port from an overload. Refer to Circuit Breaker(s).

12-Volt Accessory Port

This 12-volt port allows you to power or charge cellular phones, video cameras, other 12-volt electronics or an MP3 player. DO NOT use any device which exceeds 10 Amps.

Accessory Switch

The accessory switch supplies switched power to your craft's accessories. When using your craft's accessories, start your engine occasionally to allow the engine alternator to recharge the battery. Otherwise, you may drain the battery and you will not have enough power to start the engine. When not in use, make sure all accessory and light switches are turned to the OFF position to eliminate battery discharge. Limit the accessory to 10 Amps.

Compass

Various factors affect the operation of the compass, such as local magnetic variation and deviation (induced needle deflection caused by metal components and the operation of electrical equipment on-board your craft). Each compass must be compensated to adjust for the specific characteristics of each craft. It is vitally important you have your compass professionally compensated before using it for marine navigation. Contact your CROWNLINE/FINSEEKER dealer regarding compass compensation.

IMPORTANT: The compass should be re-compensated when having additional electrical equipment installed on your craft.

Courtesy Light Switch

The courtesy light switch controls the ON or OFF operation mode of the courtesy lights.

Depth Sounder

The depth sounder allows you to monitor the lake, river or ocean floor. Some of the options are: shallow water, depth, keel depth and units. Refer to the manufacturer's literature for more detailed information.

Powering On and Off

Under normal operation the unit will turn on and off with the external power supply (key switch).

Manual Power Override

The manual power override allows the user to turn the unit OFF with the presence of a constant external power source (key switch on). This is especially helpful when there is not a switched external power source available to the unit, or the user wishes to turn the unit OFF to prevent interference with other sonar equipment on the vessel.

To set the Manual Override:

1. With the unit on, press and hold both the UP ▲ and DOWN ▼ buttons for 6 seconds.
2. After 6 seconds the unit will display "OFF."
3. Release the buttons and the unit will continue to display "OFF" signifying no depth readings will be displayed nor will any depth alarms be active.
4. The manual override is now set.

To remove the Manual Override:

1. Press and release any button (either UP or DOWN).
2. The Manual Override is now off. The unit will operate as normal and will power on and off with the application of the external power source.

NOTE: If the external power source is removed from the unit while in the manual override or "OFF" mode, the unit will automatically turn on when the external power is again applied. To reengage manual power override, follow steps 1 through 4 above.

Operating the Display

The display's auto-ranging, auto-sensitivity features mean that you never have to worry about adjustments. Simply turn the power on, and you are ready to go. The display emits sound signals that travel through water, and then calculates the amount of time that elapsed while the signal traveled down to the bottom and returned back to the transducer. This time is calculated by the unit and displayed as a depth reading.

Extremely dirty water, very soft bottom, high speeds, deep water, or a combination of the above may result in incomplete or inaccurate readings. Under these conditions variable readings or "- - -" ***(Figure 10-16)*** will be displayed.

Figure 10-16: Incomplete or Inaccurate Reading on Display

IMPORTANT: All user selected settings will be retained when the power is turned off; therefore, they will not need to be reset when the power is turned back on.

Setting the Units of Measure

The UNITS of measure for depth readout and alarm functions can be set in four easy steps. The two settings available are Feet (FT) and Meters (M).

To set the units:

1. Press and hold the "UP" and "DOWN" keys at the same time for 5 seconds until the units indicator (FT or M) blinks ***(Figure 10-17)***.

Figure 10-17: Setting the Display's Units of Measure

2. To set the units to FEET press the "UP" key. "FT" will flash on the Display.
3. To set the units to METERS press the "DOWN" key. "M" will flash on the Display.
4. The display will return to the normal operation mode automatically after 5 seconds.

Setting the Shallow Water Alarm

The shallow alarm function can be set for depths ranging from 3 to 200 feet and triggers an alarm when the depth is less than the setting.

To set the SHALLOW ALARM (upper alarm):

1. Press the “UP” key located on the front of the display ***(Figure 10-18)***. The current alarm setting will be displayed on the display. “000” is the default setting.

Figure 10-18: Setting the Display’s Shallow Water Alarm

2. Pressing the “UP” key will increase the selected value. Pressing the “DOWN” key will reduce the value. Pressing and releasing the key will change the value in 1-foot increments per second. Holding down the key will change the value in 9-foot increments per second.
3. After your selection is made, the display will return to normal operation after 5 seconds.
4. The “” and “▲” icons will now be present.

When triggered, the alarm sounds an audible “alarm” for 10 seconds while flashing the warning LED and the “” and “▲” icons on the display. After 10 seconds the audible alarm mutes and the warning LED and the “” and “▲” icons continue to blink until the depth increases, or the alarm is reset. To reset the alarm repeat steps 1 through 4.

Setting the Deep Water Alarm

The DEEP alarm function can be set for depths ranging from 3 to 200 feet and triggers an alarm when the depth is more than the setting.

To set the DEEP ALARM (lower alarm):

1. Press the “DOWN” key located on the front of the display ***(Figure 10-19)***. The current alarm setting will be displayed on the display. “000” is the default setting.

Figure 10-19: Setting the Display’s Deep Water Alarm

2. Pressing the “UP” key will increase the selected value. Pressing the “DOWN” key will reduce the value. Pressing and releasing the key will change the value in 1-foot increments per second. Holding down the key will change the value in 9-foot increments per second.
3. After your selection is made, the display will return to normal operation after 5 seconds.
4. The “” and “▼” icons will now be present.

When triggered, the alarm sounds an audible “alarm” for 10 seconds while flashing the warning LED and the “” and “▼” icons on the display. After 10 seconds the audible alarm mutes and the warning LED and the “” and “▼” icons continue to blink until the depth increases, or the alarm is reset. To reset the alarm repeat steps 1 through 4.

Setting the Keel Offset

The Keel Offset feature is used to adjust the depth readings shown by the display to compensate for the depth of the water required for your vessel to operate safely.

For Example: If your boat’s draft is 3 feet, the Keel Offset feature should be set to 3 feet. The display will then subtract 3 feet from the actual depth reading, and display this figure as the depth. If the water depth is 5 feet and the Keel Offset is set to 3 feet, the depth will be displayed as 2 feet, indicating to the operator that there is 2 feet of safe operating water.

The maximum Keel Offset setting is 20 FT (6.1 M), settable in 0.1 (1/10th) foot or meter increments. The display will read “- - -” when a negative value occurs due to the Keel Offset Subtraction.

To set the KEEL OFFSET:

1. Press and hold the “UP” and “DOWN” keys at the same time for 3 seconds. When “K/O” begins flashing in the upper left hand corner of the display, release the keys ***(Figure 10-20)***.

Figure 10-20: Setting the Display’s Keel Offset

2. Press the “UP” key to increase the Keel Offset value. Press the “DOWN” key to reduce the value.
3. The display will return to the normal operation mode after five seconds if no keys are pressed.
4. “K/O” will remain illuminated in the top left hand corner indicating that the depth readings are adjusted to the Keel Offset setting.

⚠WARNING ***If you are unsure of the Draft of your vessel, please consult with the vessel's manufacturer before setting the Keel Offset. An improper Keel Offset setting can cause accidentally grounding of the vessel and may cause severe damage to the vessel and its passengers.***

Docking Lights Switch

The docking lights switch controls the ON or OFF operation mode of the docking lights.

Drive Unit Trim Switch

The drive unit trim switch activates the power trim feature of the engine. Push and hold the switch UP or DOWN until the drive unit is at the desired angle. Use this switch in combination with the trim gauge to monitor the optimum performance location for the load.

Engine Hatch Switch

⚠WARNING ***An engine guard which is not in place or in contact with any moving parts can cause death or serious personal injury. The engine box cover is a machinery guard. DO NOT operate your boat without the cover closed and in place unless you are performing a check or maintenance. Keep your hands, clothing, hair and any other body parts away from any moving parts.***

The engine hatch switch controls the UP or DOWN operation of the engine hatch. DO NOT continue to operate the switch when the engine hatch is closed or fully open. Damage to the system will occur. Lower the hatch support when the hatch is opened. Be sure to return the support to its stowed position before lowering the hatch.

Engine Room Lights Switch

The engine room light switch controls the ON or OFF operation mode of the engine room lights.

Engine Temperature Gauge

The engine temperature gauge monitors the cooling system of the engine. A sudden increase in the temperature could indicate a blocked cooling passage or a water pump malfunction. Always check the gauge immediately after starting the engine.

Marine engines draw external water and circulate it through the heat exchanger on the engine, then pump it overboard through the exhaust system. If the temperature gauge is high, STOP the engine immediately. Refer to your *Engine Operation and Maintenance Manual* for instructions and corrective action.

Exhaust Switch

The exhaust switch controls the operation mode of the optional exhaust system.

Fire Extinguisher System Monitor

The fire extinguisher system monitor has an indicator lamp to indicate fire extinguisher system status. The lamp should glow when the ignition switch is in the ON position, indicating a charged system. Should the system discharge, the lamp will not glow. Refer to the manufacturer's literature.

Fuel Gauge

The fuel gauge shows the level of fuel present in the fuel tank. The ignition switch must be ON when checking the fuel level. There will be a more accurate reading when the craft is level. At normal speeds, the fuel gauge will usually read higher due to the angle of the bow.

Because fuel gauge readings are approximate, you should use the One-Third Rule. One-third of your total fuel should be used to travel to your destination and one-third to return. The remaining one-third is reserved for emergencies.

Horn Switch

The horn switch is a momentary button to control the horn. The horn will sound as long as the switch is pressed.

Ignition Switch Breaker

The ignition switch breaker protects the ignition switch from an overload. Refer to Circuit Breaker(s).

MP3 Port

The MP3 port allows you to connect your MP3 player to the craft's stereo system.

Navigational/Anchor Light Switch

This three-position switch controls the ON or OFF operation mode of the navigational lights and anchor light. The FORWARD position operates the navigational lights. The AFT position operates the anchor light only, for mooring. Middle position is the OFF position.

The law requires the bow light(s) and the 360 degree light (located near the stern) to be ON while running the boat after sunset or before dawn.

⚠WARNING ***Blocking navigational lights can cause death or serious personal injury. DO NOT block the navigational lights.***

Neutral Detent Button

The neutral detent button allows the throttle to be advanced without shifting the transmission. Refer to the manufacturer's literature for more detailed information.

Oil Pressure Gauge

The oil pressure gauge can be used as an early indicator of a potential engine problem. It provides an indication of the pressure in the engine lubrication system. A preset valve in the oil pump controls the maximum oil pressure. A drop in oil pressure is a possible indication of oil pump or leakage problems, low oil level or high engine temperature.

NOTE: If a complete loss of oil pressure occurs, STOP the engine immediately. Serious damage will occur if the engine continues to run after loss of oil pressure.

Power Trim Gauge

The power trim gauge provides a visual indication of the inward-outward position of the engine's outdrive.

Power Trim Switch

This switch will maximize the performance and ride of the craft. When combined with optional trim tabs, the ride can achieve better performance.

Speedometer

The speedometer registers forward speed in miles per hour (MPH). You can also use the speedometer to monitor fuel consumption and your propeller's performance.

Spotlight Switch

The spotlight switch controls the ON or OFF operation mode of the spotlight. It also activates the remote control for side-to-side and up-and-down positioning. Refer to the manufacturer's literature for more detailed information.

Steering Wheel Tilt

The steering wheel tilt lever adjusts the wheel angle to a more comfortable position for the operator. DO NOT adjust the tilt angle when the craft is moving.

Stereo

Refer to the manufacturer's literature for more detailed information.

Stereo Remote

The stereo remote allows the stereo to be controlled from that positon.

Tachometer

The tachometer gauge indicates the speed of the engine in revolutions per minute (RPM). This speed is not the craft speed or necessarily the speed of the propeller. The tachometer may not return to zero with the ignition key in the OFF position, but will return to zero when the ignition switch is turned ON.

Trim Tab Controls

Push the trim tab rocker switches in half-second bursts. Holding the rockers down too long will over-trim the boat.

The trim tab switches are used to correct the trim of your boat while you are underway.

- The right switch controls the left tab.
- The left switch controls the right tab.

Voltage Gauge

The voltage gauge monitors battery condition and alternator performance. Under normal engine running conditions (1000 RPM or higher), the voltage will range between 12.0 to 15.5 volts when the alternator is charging. The batteries are fully charged if the voltage gauge reading is high when the engine is not running and the ignition key or switch is ON.

Significantly higher or lower readings show a battery problem, alternator malfunction or heavy drain on the battery. An oscillating reading shows a loose wiring connection or loose belts. Displayed low voltage readings after stopping engine shows a bad battery or large battery load.

Wash-Down Pump Switch

The wash-down pump switch controls the ON or OFF operation mode of the wash-down shower pump. To prevent damage to the pump, make sure both the seacock and the shower wand, or spigot, is open before turning ON the system.

Windlass Switch

The windlass switch controls the UP or DOWN operation mode of the windlass. Refer to the manufacturer’s literature for more detailed information.

Windshield Wiper Switch

The windshield wiper switch controls the ON or OFF operation mode of the windshield wiper.

USB Port

This port allows cell phones and other electronic devices to be charged via a USB-to-device cord.

Push-Button Switches (Some FINSEEKER Models)

Push-button helm switches, as used on some FINSEEKER models, have these characteristics:

- No backlighting - battery switch is in the OFF position
- Blue backlighting - battery switch is in the ON position (horn switch will be red)
- Red backlighting - helm switch is in the ON position (horn is always red when battery switch is 'on')
  - Navigation/Anchor light switch - red indicates the ANCHOR position
  - Navigation/Anchor light switch - green indicates the NAVIGATION position
  - Navigation/Anchor light switch - blue indicates the OFF position

Fish Box Macerator

Some in-floor fish boxes are equipped with macerators. The purpose of the macerator is to grind up fish scales to keep the drain lines from becoming blocked. The switch for the macerator is in the gunwale above the fish box.

Inverter and Grill

Boats equipped with a cockpit grill and no shore power will have an inverter under the port/aft cockpit cushion. There is a remote switch for the inverter mounted in the wet bar. The inverter changes the 12V DC electrical current coming from the deep-cycle batteries into 120V AC current which powers the grill. The grill and inverter are protected by ground fault circuit interrupter (GFCI) devices.

High-Water Alarm

All boats with accommodation spaces (cabin boats) are equipped with a high water alarm. The sensor is in the engine compartment and will trip the audible alarm, mounted in the cabin, if the bilge water exceeds expected levels.

Pre-Wired Battery Chargers

Pre-wired battery chargers are installed on some models that do not have shore power. These chargers are designed to be used when the boat is on a trailer, boat lift, or dry dock. They should not be used while the boat is in the water since the metallic boat components in the water will be susceptible to galvanic corrosion.

NOTES

The boat may feature a variety of specialized systems and components. The following basic and typical information may not apply to your specific application. This section may not cover all systems or components on the boat. See the *Engine Operator's Manual* or the equipment manufacturer's information for maintenance procedures.

Maintenance procedures may require special knowledge and equipment. Always consult the boat dealer for assistance in performing service, maintenance or modifications to the boat.

Neglect of maintenance and unauthorized service work is not recommended and may void your warranty. Refer to the *Engine and Equipment Manufacturer's* maintenance schedules and requirements, and keep a detailed log of the procedures and dates completed. Always consult the boat dealer for assistance with periodic maintenance.

Before performing any general care and maintenance procedures within this section, review ***Safety in Section 2***.

SAFETY EQUIPMENT

Periodically check the safety equipment for damage, general condition and operation when applicable. Always replace safety equipment that is in question or in need of repair:

- Fire extinguisher
- Life jackets
- Visual distress signaling devices
- Audible signaling devices
- Navigational lights
- Emergency radios or Emergency Position Indicating Radio Beacon (EPIRB)
- First aid kit
- Batteries in electronic devices

BOATING EQUIPMENT

Periodically check the general equipment on board for damage, general condition and operation when applicable. Always replace equipment that is in question or in need of repair.

- Anchors and anchor lines
- Boat hook
- Dock fenders
- Foul weather gear/clothing
- Mooring lines
- Oars/paddles
- Tool kit
- Tow line

CORROSION PROTECTION

Galvanic Corrosion

Galvanic corrosion (electrolysis) is the deterioration of metals from the effects of electrolytic action. When two dissimilar metals are immersed in a conductive fluid such as salt water, an electric current is produced, much like a battery. As current flows between the two metals, the softer, or sacrificial, metal deteriorates.

If you operate in salt, polluted or brackish waters, the boat should be equipped with a transom-mounted sacrificial anode to prevent corrosion damage to other metal parts of your boat that are in contact with the water. The anodes are self-sacrificing and are slowly eroded by electrolytic action. These anodes are important and require periodic inspection for deterioration. Replace the anode when it is less than 50% of its original size.

Most engines are equipped with one or more anodes that require periodic inspection. See the *Engine Operator's Manual* for maintenance procedures.

Electronic cathode systems are designed to reduce the effects of electrolysis. Electronic cathode systems emit an electrical low-current charge into the water near the metal components' neutralizing electrolytic action.

NOTICE *Do not paint or coat sacrificial anodes or cathodes with any substance. Once covered, they do not provide protection from galvanic corrosion. Replace anodes if they have deteriorated 50% or more.*

Saltwater Corrosion

Any boat exposed to salt water can be affected by the salt. However, to minimize the effects of salt water on aluminum boats, consider the following preparation and maintenance.

If you plan to use your boat in salt water, all portions of the boat that will be submerged should be painted with an approved aluminum anti-fouling paint. This service is provided by your dealer or by someone recommended by your dealer. There is an extra charge for this service.

If you trailer your boat and use it in salt water, be sure that the bottom of the boat has a barrier between it and the bunks. If anti-fouling paint is not used, salt water trapped in the trailer bunks can cause corrosion at the point where the trailer bunk meets the hull.

In some cases you may need to have sacrificial anodes added to your boat to prevent electrolysis. Ask your dealer whether he recommends adding anodes. There is an extra charge for this service.

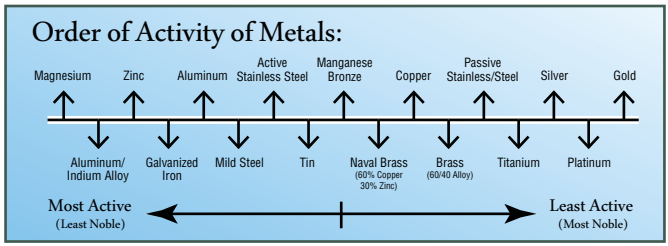
Maintenance

Removing saltwater deposits from the boat as quickly as possible is the key to keeping saltwater corrosion in check.

- Rinse the boat hull and deck with fresh water and wash immediately after using the boat in salt water. Allow the boat to dry before covering it with the mooring or seat covers.
- If you trailer your boat you MUST flush the salt water from in between the bunks and the pontoons. This does not prevent corrosion but only mitigates it if no anti-fouling paint is applied.
- You should repair paint chips and scratches when you start to notice bare metal showing.
- Cover your boat WHEN DRY with seat covers or a mooring cover to keep salt and weather off of your boat. Since most saltwater areas are very humid it is imperative that the boat be dry before it is covered. If you cover it wet you will see mildew develop.
- A yearly inspection for corrosion or deterioration of the electrical connections is recommended.
- If the boat is used primarily in salt water, wax the hull monthly and apply corrosion inhibitor to all hardware.
- Flushing the engine cooling system is recommended when the engine has been used in salt, polluted or brackish waters. Flush the entire engine cooling system with fresh water for at least 5 minutes after use in these waters. See the *Engine Operator's Manual* for the flushing procedure. Consult the boat dealer for suitable flushing equipment.

Sacrificial Anodes

Anodes (sometimes called "zincs") are used to protect hardware exposed to the water. Since galvanic corrosion attacks the least "noble" metals first, less noble metal anodes are used to purposefully "sacrifice" themselves, thereby protecting the more noble metals of the drives, propeller, tabs, boarding platform and other metal items below the waterline (such as underwater gear).



KC-6009

Figure 11-1: Sacrificial Anodes

Anodes may be installed on the boat transom and/or bottom at the factory. Additional anodes may be installed on the underwater gear as well as any metal components exposed to raw water, such as heat exchangers and water cooling jackets. Anodes are made in three different metals which must be matched to the water type and local conditions. Most boats are equipped from the factory with zinc anodes on the recommendation from engine and drive manufacturers. The anodes that are installed on the trim tabs are typically zinc and are isolated from the boat bonding system.

Selection, monitoring and replacement of the anodes on the transom, drives, trim tabs, boarding platform supports and other underwater gear is the customer's maintenance responsibility. Any damage done because of lack of maintenance will not be covered under warranty.

WATER TYPE	ANODE MATERIAL	REPLACE AT
Salt water	Zinc	40% decomposition
Brackish water	Aluminum	50% decomposition
Fresh water (clean)	Aluminum/magnesium alloy	50% decomposition
Fresh water (polluted)	Magnesium	40% decomposition

NOTICE *To be effective, anodes must be bare metal. If the boat is dry-docked more than 24 hours, sand the anodes to clean oxidation from the surface.*

- *Zinc and aluminum anodes left in fresh water or zinc anodes used in brackish water will become covered with white oxide which effectively stops the sacrificial process and exposes the underwater gear to damage.*
- *Do not paint sacrificial anodes. Bottom paints/sealants on anodes will block the sacrificial process and expose the underwater gear to damage.*
- *Depending on local conditions, some anodes can deteriorate very quickly and must be closely monitored. See the boat dealer for recommendations.*

Because of the vital function that anodes play in the protection of underwater gear, replace anodes at the recommended level of decomposition, or annually, with the correct type. Boats stored in salt water will normally need to have the anodes replaced every 6 months to one year. Anodes requiring replacement more frequently may indicate a stray current problem within the boat or at the slip or marina.

Anodes that do not need to be replaced after one year may not be providing the proper protection. Loose or low-quality anodes could be the problem. There could also be a problem in the bonding system or the wrong anode material is being used.

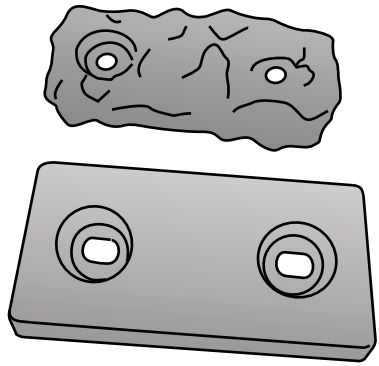


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Figure 11-2

The boater/customer has the responsibility in maintaining and ensuring that the proper anodes are installed for the area (water) in which the boat will be used. See the boat dealer about changing material or adding additional anodes.

Hardware, Fasteners and Fittings

Check all fasteners, fittings, hinges, latches, rails and cleats for corrosion and tightness. Repair or replace any items that need attention. Never use automotive replacement parts when replacing marine parts.

Periodically clean all hardware with approved marine cleaners or mild soap and water. Never use abrasive cleaners or materials; they will scratch the polish and protective coatings on the hardware and cause the hardware to corrode. Applying a coating of marine-grade wax can help maintain the original shine of the hardware and help prevent corrosion.

Stainless Steel and Chrome Hardware

Stainless steel and chrome will normally oxidize over time, especially in marine environments. Cleaning and preventive maintenance of stainless steel and chrome hardware are crucial in maintaining appearance and functionality. If the hardware is left unattended, it can corrode, causing the hardware to appear unsightly and cause structural integrity problems.

Wash the stainless steel and chrome hardware with mild soap and water after operating the boat in corrosive environments such as salt water.

Remove rust or corrosion promptly by cleaning the hardware using a high-quality stainless steel, chrome cleaner or conditioner. Do not use any abrasive materials such as steel wool or sandpaper to clean the hardware. Do not use acids or bleach or any cleaners not intended for stainless steel or chrome, such as glass, tile or

counter cleaners, as these types of cleaners can cause permanent damage. Always test a cleaner in an inconspicuous area first before applying to the complete surface.

After cleaning, protect the surface of the hardware by using a high-quality boat, automotive, stainless steel or chrome protectant or wax.

Aluminum Hardware

Periodically wash aluminum hardware with soap and water to keep it clean. If the boat is used in salt water or polluted water, wash aluminum hardware with soap and water after each use. Salt water allowed to remain on aluminum will penetrate the metal and corrode the aluminum.

It is recommended to frequently clean and coat all aluminum hardware with a metal protectant made for aluminum to protect against pitting and corrosion caused by the harsh effects of salt water. Choose an appropriate cleaner specific to your needs, as special cleaners are available for different types of aluminum hardware such as anodized, powder coated and polished.

Most stains can be removed from aluminum with a metal polish or fine polishing compound. To minimize corrosion, use a caulking compound or Teflon-based sealer to isolate hardware and fasteners mounted to aluminum fabrications. With proper care, aluminum hardware can provide many years of service.

ELECTRICAL SYSTEM

Before performing any work on the electrical system or the battery, review ***Safety in Section 2***.

Batteries

⚠WARNING ***Electrical Shock Hazard: Always disconnect the batteries before performing maintenance on the DC electrical system. Electrical shock may occur if the batteries are not disconnected during maintenance on the DC electrical system.***

⚠WARNING ***Personal Injury Hazard: Always wear gloves and protective eyewear when working on and around the batteries. The batteries contain an acid called electrolyte. Avoid causing damage that could spill electrolyte into the bilge when servicing the batteries. Avoid getting salt water in or on the battery. Either condition can create a poisonous gas that is harmful if inhaled. Always disconnect the batteries before cleaning.***

⚠CAUTION ***Personal Injury Hazard: Never allow a tool to bridge across the battery terminals. Injury can result if the terminals are accidentally bridged with a tool or other conductor.***

Today's boats can be loaded with electronics that all run off the boat's battery. Because of this, many boats will have two or more batteries: one for starting and running the engine, and one for electronics, commonly referred to as the house battery. One advantage is that the starting battery will not be drawn down when using electronics with the engine off, such as with a stereo. Another advantage is if the starting battery has lost capacity because of age, the battery switch has a 1+2 (Both) position that parallels both batteries for emergency starting. See the Blower Switch section of this manual for more information.

Marine batteries generally come in two types: starting and deep-cycle. Starting batteries are similar to car batteries, can supply lots of current for a short period of time and are used for starting the engine. Starting batteries should be recharged almost immediately and do not tolerate deep discharges. Deep-cycle batteries are designed for repeated discharging and recharging cycles without damage. They are used as the house battery on boats with higher DC power requirements.

All batteries have one thing in common — they run for a while, need recharging and require an eventual replacement as the capacity fades. Most marine batteries are sealed and require no maintenance other than keeping them at a full state of charge and diligently cleaning corrosion from the terminals. To maintain long life, deep-cycle batteries should not be discharged more than 50% before they are recharged.

Most marine batteries are flooded, sealed lead-acid, but there are several different battery types/chemistries that could be used. You must use caution when charging or replacing the batteries; replace batteries with the exact same type, group and capacity. If your boat is not equipped with an onboard battery charger, use a smart charger suitable to your battery type/chemistry.

⚠CAUTION ***Burst Hazard: Never use an automotive type (lead-acid) battery charger to charge a gel cell type battery. Doing so will cause damage to both the charger and battery and can cause the battery to burst. Use a battery charger specifically designed to charge gel cell type batteries.***

Always turn off the battery switch (if equipped) or disconnect the negative battery cable before servicing the electrical system.

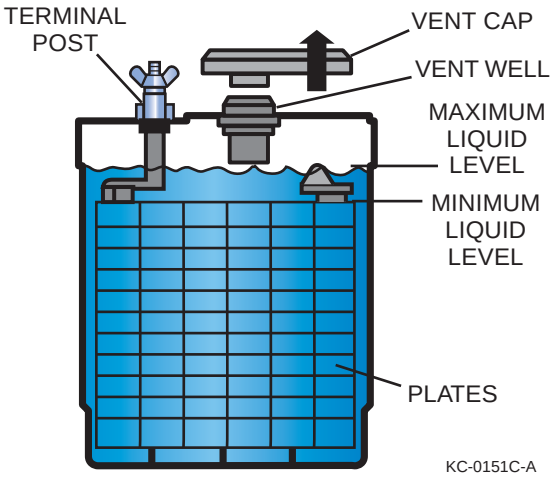

Figure 11-3: Lead-Acid (Wet Cell) Battery

When you install a battery:

- Make sure the battery terminals are clean.
- Be certain to use correct polarity when you connect the battery cables to the battery.
- Make sure the cable connections are tight.
- Always shut down the engine before removing or attaching battery cables and never run the engine with the battery cables disconnected.
- Always remove the negative (-) cable first. Always attach the negative (-) cable last.

Check the battery frequently for signs of corrosion. If corrosion is evident, clean the terminal posts with a baking soda and water solution and a wire brush. Disconnect the battery terminals before cleaning.

WARNING ***Burn Hazard: Lead-acid battery fluid can cause severe burns.***

Check the fluid levels in the cells.

NOTICE *Some batteries are sealed and cannot be filled. A level of approximately 1/4 to 1/2 in. (6 to 13 mm) above the plates is sufficient. If needed, fill with distilled water; do not overfill.*

During extended periods of non-use, batteries will self-discharge and should be recharged. Before recharging, disconnect the battery terminals and remove the battery from the boat. Recharge the battery according to the directions enclosed with the battery and battery charger. When installing the battery in the boat, make sure the battery is secured in the battery box, the terminals are tight and all protective covers are in place.

⚠WARNING ***Fire/Explosion Hazard: Hydrogen gases produced by a lead-acid battery while it is charging, or the engine is running, can cause a fire and/or an explosion.***

Circuit Breakers and Fuses

Never exceed the recommended fuse sizes or bypass a fuse in a circuit. Always install the proper (type and rating) fuses whenever replacing or changing fuses. Continuous fuse/breaker failures indicate a severe problem and require immediate attention.

⚠WARNING ***Fire Hazard: Never reset a circuit breaker that has been automatically tripped or replace a fuse that has blown without first identifying and correcting the cause of the problem. Failure to correct the cause may result in a fire hazard.***

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Figure 11-4: Typical Breaker/Fuse Panel

Some applications use circuit breaker switches to provide individual circuit protection with the ability to manually reset the breaker switch.

To reset a tripped circuit breaker, move the breaker switch to OFF. Identify and correct any problems with the circuit and unplug all loads connected to it. Wait a minimum of one minute for the breaker switch to cool and then push the breaker switch to ON. Turn the breaker switch to OFF immediately if it trips, and consult qualified personnel.

To replace a fuse, locate the fuse block and the failed fuse. Carefully remove the fuse without touching other fuses or wires. When possible, use a fuse removal/ installation tool. Some accessories have in-line fuses accessible inside the helm or near the battery.

⚠WARNING ***Fire Hazard: DO NOT exceed the recommended fuse sizes or bypass the fuse safeguard. Always install the proper (type and rating) fuses whenever replacing or changing fuses.***

NOTICE *A boat's electrical system is designed to protect you from electrocution, short circuits and overloads. Have a qualified electrician perform any modifications to the system such as adding electrical accessories. Some installed accessories, such as stereos, have an additional fuse located in-line with the positive lead. Other accessories may use in-line fuses near the battery.*

ALCOHOL STOVES

Carefully read and follow the stove manufacturer's operating and maintenance procedures:

- Use only denatured alcohol labeled specifically for marine use.
- Never operate the stove while underway.
- Never fill the stove near an open flame or hot object.
- Wipe up any spilled alcohol prior to lighting the stove.

BILGE

A boat's bilge area accumulates oil and greasy dirt over a period of time and should be cleaned periodically. Consult the boat dealer for recommendations on special bilge cleaning products and procedures.

BILGE PUMP

Periodically check the bilge pump(s) inlet screens and hoses for obstructions and debris. Foreign materials can clog the screen and hoses or become lodged in the bilge pump impeller, which can cause the pump to malfunction. Periodically check the operation of the bilge pump and float switch, if equipped. Inspect all wiring, clamps and hoses for tightness on a regular basis.

DETECTORS

Inspect fire, gas vapor and CO detectors periodically for proper operation. See the manufacturer's information for periodic testing procedures.

FRESHWATER SYSTEM

Perform the following maintenance monthly to help keep the freshwater system clean and sanitary.

- Drain the freshwater tank completely using all faucets, showers, etc. Refill tank with at least 20 gallons of clean, fresh water and drain again.
- Clean freshwater pump inlet filter screen, if equipped.
- Replace freshwater system filter(s), if equipped.
- Clean city water inlet strainer, if equipped.
- Flush city water system using all faucets and showers.

If water in the tank has stagnated and you suspect that the freshwater system may be contaminated, sanitize the system.

To sanitize:

- Drain the freshwater tank completely using all faucets and showers.
- Mix a solution of 1/4 cup household bleach to one gallon of water for every 15 gallons of tank capacity. Pour the solution into the freshwater tank.
- Fill the tank with clean, fresh water.
- Turn freshwater pump on and bleed air from all faucets, showers, etc.
- After approximately three hours, drain the system completely.
- Flush the system with one full tank of water.
- Fill tank with clean, fresh drinking water.

If you can smell or taste bleach in the water:

- Drain the system completely.
- Mix a solution of one quart of white vinegar to five gallons of water. Pour the solution into the freshwater tank.
- Allow the solution to remain in the tank until you have logged approximately one hour of cruising time. Boat motion will move the vinegar/water solution around to help clean the tank.
- Allow the solution to remain in the tank for at least one week.
- Drain the freshwater system completely.
- Flush the system with one full tank of water.
- Fill the tank with clean, fresh drinking water.

ENGINE

The manufacturer of the boat's engine(s) will provide a separate maintenance procedure. See the *Engine Operator's Manual* for specific information on maintenance procedures.

FUEL SYSTEM

⚠WARNING ***Fire/Explosion Hazard: Gasoline is extremely flammable and highly explosive under certain conditions.***

Be sure to check the fuel hoses and connectors for leaking and deterioration before fueling and on a monthly basis.

Fuel vents are normally located in the deck in the same general area as the fuel fills. Periodically check that the fuel fills and vent lines are free of obstructions and kinks.

Check and/or replace the fuel filter periodically or clean as needed. Check fuel lines, vent hoses and drain hoses frequently for leaks. Replace any worn or cracked hoses.

Tightening a fitting or clamp may correct a fuel leak. If the leak continues, however, replace the line, fitting or hose immediately to prevent a build-up of fluids or gases.

Use fuel system parts certified for marine use only. Never use automotive parts in marine applications.

HEAD AND WASTE CONTAINMENT SYSTEM

Head (Marine Toilet)

Periodic maintenance guidelines:

- Use a non-abrasive cleaner for the bowl.
- A light coating of a general-purpose marine lubricant on the pump rods and slides will reduce friction of moving parts.
- Use recommended deodorant and lubricant for the internal parts of the head.
- Always flush the head completely to clear any waste from the bowl and/or lines to the waste tank. This can prevent odor and waste buildup in the lines. To reduce odors, pour and keep some fresh water in the bowl after flushing.

Waste Holding Tank

If the boat has an optional waste holding tank installed, various chemicals are available to control odors and help break down solids. Consult your local marine dealer for product suggestions. After the holding tank is emptied, fill the tank with fresh water and pump it out again to rinse.

NOTICE *The discharge of any type of debris or waste, including, but not limited to, food, trash, garbage, oil, fuel, liquids and human waste, is highly restricted, if not unlawful, in most waterways. Never discharge anything into the water.*

RAW WATER SYSTEM

Periodic maintenance guidelines:

- Lubricate and operate all seacocks, checking for proper operation.
- Inspect, clean or replace strainers as necessary.
- Check for leakage at all hull fittings, lines, connections, valves, etc.
- Check all raw water-related pumps, controls and appliances for proper operation.
- Clean and flush all lines and systems with clean, fresh water and approved cleaners.

STEERING SYSTEM

⚠WARNING ***Control Hazard: Improper maintenance of steering system is hazardous and can cause death or serious injury from sudden loss of control. Ensure all steering hardware, cables and grease fittings are regularly inspected and maintained. If any steering problems are noticed, do not operate the boat and contact your dealer immediately for service assistance.***

Inspect and maintain the boat's steering system regularly. Frequently check the hardware at the helm, engine or rudder end for tightness. See the *Engine Operator's Manual* or the steering manufacturer's information for the appropriate torques.

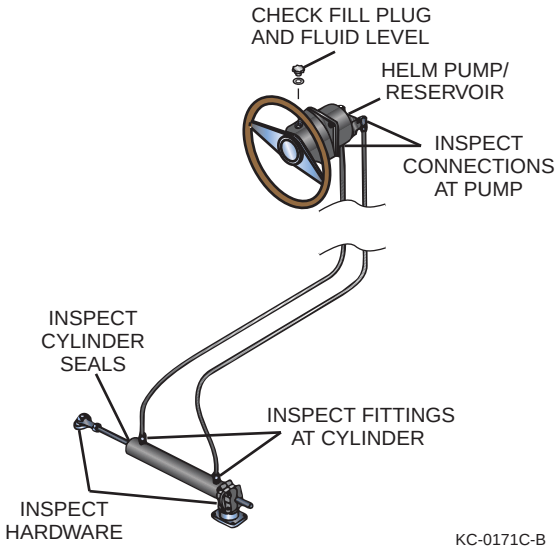

Figure 11-5: Typical Hydraulic Steering System

Make sure hydraulic hoses are tight and leak-free. Check cylinder seals for dampness, which indicates leaking. Check the fluid reservoir monthly and top off if necessary. See the steering system manufacturer's information for more details.

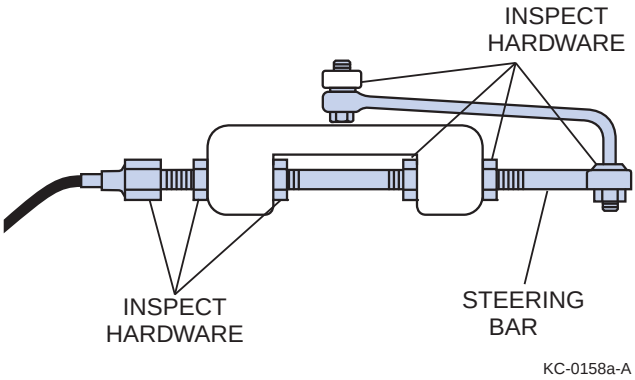

Figure 11-6: Typical Mechanical Outboard Engine Steering Link

TRIM TABS

Periodically inspect the trim tabs for damage and leaks. Check the hydraulic pump fluid level periodically and fill with the recommended fluid.

GENERAL MAINTENANCE AND CLEANING

⚠WARNING ***Asphyxiation Hazard: Do not mix cleaning agents together; toxic vapors may be released. Read and follow safety-related precautions found on the product labels.***

Marine Growth

If accelerated marine growth is a problem in your area, an antifouling bottom paint may be necessary to slow growth and prevent gelcoat damage. Before selecting a bottom paint, talk to the boat dealer to determine which product works best in your area. Many local variables can affect the selection of paint. Be sure to follow the paint manufacturer's directions exactly.

Hull

When washing the boat, use a mild detergent with a warm water solution. Never use any kind of alkaline cleaners such as Tri-Sodium Phosphate (TSP), abrasive cleaners, solvents, ammonia or chlorine to clean gelcoat surfaces, as these will damage the gelcoat surface. Special cleaners are available from the boat dealer to remove marine growth and algae from the hull.

Wax gelcoat surfaces at least twice a season. Special marine gelcoat waxes are available from the boat dealer to prevent color fade and dirt adhesion. If the gelcoat has oxidized, chalked, dulled or faded from lack of proper maintenance, buffing may be necessary to bring back the shiny appearance. Hand buffing with #7 rubbing compound or power buffing with glazing compound #1 will quickly restore the surface; however, always seek certified assistance before attempting to restore your boat's finish.

Upholstery

Regular washing with mild detergent and warm water or non-solvent type automotive vinyl cleaner is sufficient to keep the cushions, canopy top and other vinyl coverings in good condition. Keep the cushions from becoming soaked and dry off thoroughly after washing to prevent mildew accumulation after the boat is covered. Position the cushions up in the boat when covered to allow air circulation and spray with mildew repellent.

For tough stains on vinyl such as adhesive and rust, use a citrus cleaner followed by a mild detergent and warm water. For ink stains, apply denatured alcohol and wipe off. Note that some products such as suntan lotion, shoe polish and wet leaves may stain permanently.

Although not always convenient, minimizing the boat's contact with damaging ultraviolet (UV) rays and storing removable seats and canopies indoors when not in use will increase the longevity of vinyl upholstery.

NOTICE *Certain automotive, household and industrial cleaners can cause further damage and discoloration. Be cautious when using solvents and dry-cleaning fluids, or products that contain dyes such as waxes. Whenever cleaning stubborn stains, test the treatment in an unseen area first. Use the following stain treatments with discretion. Between steps, be sure to rinse thoroughly with plenty of clean water and allow to dry.*

Interior Fabric

Clean interior fabrics with cleaner approved for use with your boat's fabrics. Using inappropriate cleaners can permanently damage fabrics. Always follow the cleaner's manufacturer's instructions carefully. Always test cleaners in an unseen area first.

⚠WARNING ***Toxic Fumes Hazard: Dry cleaners require adequate ventilation during use. Open all hatches and windows before application.***

Soft cleansers or soap and water will remove most marks or stains on wallpaper. Lightly rub the mark or stain with a sponge or soft cloth and dry with a clean cloth.

Canvas and Bimini Tops

In most cases, boat canvas receives more abuse than any other item on a boat. Canvas must be regularly maintained for long life and top performance. Moisture, dirt and chemicals from industrial fallout, heat, ultraviolet rays and salt water can all contribute to the deterioration of canvas. These elements can cause serious damage if left unchecked. The following guidelines will help you keep your canvas in good condition for years to come:

- Convertible tops are not designed for extended exposure to the elements as a protective cover at dockside or when the boat is in storage. Use a full, properly fitted, light-colored mooring cover for these purposes.
- If canvas gets wet during use, remove any side curtains and open the windshield to allow both sides and all seams to dry. The air circulation will allow all canvas to dry and prevent the growth of mildew. Never store wet or damp canvas.
- Occasionally set up all canvas and curtains, and hose down with fresh water to remove accumulated soot and dirt. Sweep or brush the underside of the canvas to prevent the accumulation of dirt and mildew.
- Wet canvas must be allowed to dry thoroughly before storage. Never allow canvas to dry loose since shrinkage can occur. Install and stretch all canvas fully on your boat when drying.
- Never allow the canvas to be exposed to direct sunlight for long periods of time.
- Use care when handling clear vinyl curtains and windows to prevent scratching. Never use cleaners on clear vinyl curtains and windows. Use clean water and a soft, clean cloth.
- Never fold canvas where creases can form in the material. Loosely roll canvas to prevent damage.
- Never store canvas in plastic bags. Store canvas in a dry, well-ventilated compartment.
- Outer canvas surfaces can be cleaned with a soft scrub brush and either automotive convertible top cleaners or household cleaners suitable for use on vinyl surfaces. The underside of the canvas may be periodically sprayed with a spray disinfectant to prevent mildew.
- Never store or dock the boat under trees. Tree sap is very corrosive to canvas and can also be harmful to gelcoat and vinyl interiors.
- Adjust canvas top bows to eliminate pockets in which rainwater can accumulate. The weight of accumulated water can collapse or damage the canvas top.
- Lubricate snaps and zippers regularly. Vaseline, silicone spray or paraffin are effective lubricants. Never force snaps and zippers that are stuck.
- Never trailer the boat with the convertible top in the mounted position. Dismantle, roll and securely store all canvas while trailering your boat to prevent wind damage.

Carpet

Occasional vacuuming and washing with mild detergent and warm water or household carpet cleaners will keep the carpet clean. Thoroughly wash the detergent out of the carpet with clean water. Let the carpet dry in the sun to prevent any mildew or odor caused by moisture.

To clean mildew off the carpet, first check the cleaner on a small area of carpet that is hidden to determine compatibility of cleaner and carpet. “FISH ATTRACTANTS,” which are commonly sprayed on lures and some insect repellants, will cause deterioration of the carpet backing. Spray these formulas away from the boat carpet and clean any spills promptly. DO NOT use pressure sprayers to clean boat carpet.

Windshield

A clean windshield is important. If the boat is equipped with a glass windshield, applying a nonabrasive glass cleaner with a soft cloth will remove most dirt. Clean tinted Plexiglas or plastic windshields with a mild soap solution and damp cloth only. Harsh detergents, solvents, chemicals or dry cloths used on any glass or plastic windshield will scratch the surface.

Window Channels

Nylon pile is typically used in sliding window channels. Never use any products that contain bleaching solutions to clean window channels or seals. Use only a mild detergent and water solution for cleaning. If windows stick, spray the channels with silicone spray while working the window back and forth.

FRESHWATER SYSTEM

The freshwater system provides water for drinking and bathing. The freshwater tank is filled through the freshwater fill plate located on the deck.

Sanitize the freshwater system before initial use, after winter storage, or when the system has not been used for an extended period of time. *See Sanitizing Freshwater System on page 11-18.*

Freshwater Fill/Vent Plate

The freshwater fill plate on all CROWNLINE/FINSEEKER models is labeled "WATER." Make sure the water you use is fresh and cool. DO NOT fill the freshwater tank with anything other than fresh, cool water or any sanitizing or winter storage products.

IMPORTANT: Fill the tank with fresh, cool water. Using and refilling the tank often will help keep it clean and fresh and a source of clean, fresh drinking water.

Initial Start-Up

1. Fill the freshwater tank with approximately 3 gallons of fresh water.
2. Turn freshwater breaker ON.
3. Open galley cold water faucet to allow air to escape. Close faucet when steady flow is reached.
4. Open galley hot water faucet to fill water heater, if equipped, and allow air to escape from line. Close faucet when steady flow of water is reached.
5. Bleed air from remaining faucets.
6. Fill freshwater tank to capacity.

SANITIZING FRESHWATER SYSTEM

Sanitize the freshwater system before initial use, after winter storage, or when the system has not been used for an extended period of time.

⚠CAUTION ***Notify all persons aboard that the freshwater system is being sanitized. DO NOT allow anyone to drink from the freshwater system during the sanitizing process. The following maintenance actions should be performed monthly to keep the freshwater system clean and sanitary:***

- ***Drain the freshwater tank completely using all faucets, showers and other freshwater sources. Refill tank with at least 2/3 of the capacity with clean water and drain again.***
- ***Clean freshwater filter at the pump.***
- ***Flush water system using all faucets and showers.***

If the water in the tank has not been used for an extended period of time and you suspect that the freshwater system may be contaminated, sanitize the system. To sanitize:

1. Drain the freshwater tank completely using all faucets, showers and other freshwater sources.
2. Mix a solution of 1/4 cup household bleach to 1 gallon of fresh, cool water for every 10 gallons of tank capacity. Pour the solution into the freshwater tank. Top off tank with clean, fresh, cool water.
3. Turn freshwater pump ON and bleed air from all faucets, showers and other freshwater sources.
4. After approximately three to four hours, open all faucets, beginning with faucet located farthest from the pump, to empty entire freshwater system.
5. Flush the system at every freshwater source with one full tank of fresh, cool water.
6. Fill tank with clean, fresh, cool water.

If you can smell or taste bleach in the water:

1. Drain the system completely.
2. Mix a solution of 1 quart of white vinegar to 5 gallons of water. Pour the solution into the freshwater tank.
3. Allow the solution to remain in the tank until approximately one hour of cruising time is logged. Boat motion will “slosh” the vinegar/water solution to help clean the tank.
4. Allow the solution to remain in the tank for at least one week.
5. Drain the freshwater system completely.
6. Flush the system with one full tank of water.
7. Fill the tank with clean, fresh drinking water.

Water Pump and Filter

The water pump draws water from the freshwater tank. The water is then pressurized and circulated to the faucet(s) and other freshwater sources. The water pump filter prevents foreign matter from entering pump reservoir and should be periodically inspected and cleaned.

Before servicing the system, turn the water system breaker OFF and release pressure on the system by opening all faucets. To clean the filter, remove screen and rinse with clean water. Replace filter and make sure the O-ring is seated properly when installing cover.

NOTE: Refer to the water pump instruction manual for detailed safety precautions, operation, maintenance and winterizing.

WATER HEATER

The water heater circuit breaker (15 Amp) is located on the main AC distribution panel in the cabin area. Located on the water heater is a check valve to prevent hot water from back washing into the cold water line, and a pressure-relief valve to prevent damage to the heater from over-pressure. The water heater thermostat is preset and is not adjustable.

IMPORTANT: The heating element inside the water heater will be damaged if 120-volt power is supplied to the water heater and there is an insufficient amount of water in the tank.

NOTE: Refer to the water heater instruction manual for detailed safety precautions, operation, maintenance and winterizing.

TRANSOM SHOWER

Several transom shower options are available. For operating instructions, see your dealer.

TRAILER

Periodically check the general trailer components for damage, general condition and operation when applicable. Always replace trailer components that are in question or in need of repair.

- Lights
- Electrical connectors
- Tires (condition and pressure)
- Wheel lug nuts and studs
- Wheel valve stems
- Wheel bearings
- License plate and holder
- Rollers, bunks and hardware
- General fasteners (missing, loose or corroded)
- Safety chains or straps
- Winch, winch strap and hooks
- Trailer coupler and latch
- Frame, axle and springs
- Spare tire and wheel
- Brakes and actuator assembly

The boat may be equipped with a variety of specialized systems and components. The following basic and typical information may not apply to your specific application. This section may not cover all systems or components on the boat. Consult the boat dealer for assistance.

Winterizing or storing the boat for extended periods of non-use requires special preparation to prevent boat and system damage. Without proper preparation, if the boat is not used or is stored for extended periods of time, internal parts of the engine may become corroded from lack of lubrication. If the boat is stored in freezing temperatures, water inside the bilge, engine cooling system or boat water systems may freeze and cause damage. Be sure to keep up with all annual maintenance during winterization.

Before performing any winterization and storage procedures within this section, review ***Safety in Section 2***.

WINTERIZATION AND STORAGE PREPARATION

The following procedures will help prevent damage to the boat:

- While the boat is still in the water, fill fuel tank(s) with fresh fuel and add the proper amount of fuel stabilizer/conditioner according to the engine manufacturer's recommendations. Operate the boat for at least 15 minutes to be sure that the treated fuel has reached the engine.

NOTICE *If you plan to store the boat for more than three months in either a humid environment, extreme temperatures or outdoors, "fog" the engine with a corrosion-preventing fogging oil according to the propulsion system manufacturer's recommendations. See the Engine Operator's Manual for more information.*

- Once the boat is removed from the water, remove the bilge drain plug immediately. Store the drain plug in a plastic bag and tape it to the throttle control lever for easy accessibility the next time you use the boat.
- Inspect all sacrificial corrosion protection anodes for excessive wear and replace as necessary.
- Check all thru-hull fittings and other fasteners for tightness and leakage.
- Thoroughly clean the hull, deck and interior of the boat as soon as you remove it from the water; marine growth is easier to remove when it is wet.
- Always allow all boat compartments to air dry for a couple of days to prevent mildew from trapped moisture. If you use shrink wrap, always allow for ventilation to prevent mildew from trapped moisture.
- Apply a coat of wax to the entire surface of the boat and rust inhibitor on all metal parts.
- Clean all traces of dirt, oil, grime and grease from the engine and bilge.
- After washing, raise the bow of the boat high to allow as much water as possible to drain while performing other storage preparations.
- Touch up areas where paint has been removed.

- Prepare the engine for storage according to the *Engine Operator's Manual*. Flush the engine cooling system with clean water and/or a nontoxic antifreeze mixture approved for marine use. Never exceed the maximum engine rpm for flushing recommended as stated in the manual.
- Perform all scheduled maintenance for the engine and boat equipment. See the *Engine Operator's Manual* and all equipment manufacturer's information for periodic and annual maintenance procedures.
- Turn off all electrical switches and breakers.
- Remove all batteries from the boat. Clean, fully charge and store the batteries in an area outside the boat not subject to freezing temperatures. Never store batteries close to heat, sparks or open flames.
- Clean all interior upholstery, furniture, appliances, etc.
- Pest/rodent repellents may help prevent damage to the boat during storage.

STORING ON A CRADLE OR BLOCKS

- When storing a boat on support other than the proper trailer, make sure the hull is supported properly to prevent hull damage. Most cradles are custom-built to support the boat's hull.
- Put the cradle or blocks on a hard, level surface capable of supporting the combined weight of the cradle and the boat.
- When using blocks with jack stands, always use jack stands that are rated for more than the required load, making sure they are securely positioned so they cannot move under the load. Use a minimum of three blocks to support the keel and each side of the boat where applicable. Use a minimum total of nine jacks and/or blocks.
- Position the boat to allow for adequate draining from rain or snow.
- Cover the boat to prevent the collection of rain, snow or debris. When using a cover, allow ventilation for residual moisture and condensation to escape. Never cover or plug the bilge drain hole.
- Position the lower unit drive in the DOWN position.

STORING ON A TRAILER

- Be sure the trailer supports are adjusted to properly support the boat's hull.
- Repack the trailer wheel bearings with water-resistant wheel bearing grease.
- Park the trailer and boat in a protected area with the lower unit drive in the DOWN position.
- Loosen tie-downs and winch line, but be sure the boat is resting properly on hull supports.
- Lift the trailer and place blocks under the trailer frame to relieve weight on trailer tires and springs. Position the boat to allow for adequate draining from rain or snow.

- Cover the boat to prevent the collection of rain, snow or debris. When using a cover, allow ventilation for residual moisture and condensation to escape. Never cover or plug the bilge drain hole.

RECOMMISSIONING AFTER STORAGE

- Remove blocks from under the trailer frame.
- Tighten tie-downs and the trailer winch line.
- Check tire pressure and lug nut tightness on the trailer.
- Inspect the hull for damage.
- Charge and install all batteries.
- Check the bilge blower vents for obstructions and blower operation.
- Check the bilge pump and float switch for proper operation.
- Inspect all battery and electrical wiring for loose connections and/or damage.
- Check the fuel system for leaks or damage. Verify the condition of all hoses and fuel line. Should a fuel hose need replacing, use only USCG-approved hose. Check hose labels for exact type of replacement. Be sure all hose clamps are tight.
- Check the engine and bilge for signs of nesting animals; clean as necessary.
- Check the entire engine for cracks and leaks caused by freeze damage.
- Check the condition of all hoses and clamps for tightness.
- Clean the bilge area and install the boat bilge drain plug.
- Lubricate all seacocks and check for proper operation.
- Install all drain plugs in strainers and seacocks.
- Close all drains and valves that were opened during winterization.
- Perform any annual maintenance not performed during winterization. See the *Engine Operator's Manual* and all equipment manufacturer's information for periodic and annual maintenance procedures.
- Check the engine's cooling water intake areas and screens for obstructions.
- Check and lubricate the steering system.
- Check all navigational lights.
- Check all controls, gauges, boat systems, accessories and related equipment for proper operation.
- Check all fire extinguishers for charge level.
- Inspect all safety equipment for condition and operation as applicable.
- When possible, briefly start and run the engine(s) using proper water supply equipment to check that the engine does start and there are no major operational problems.

NOTICE *If fogging oil was used during winterization, the engine will emit excessive white smoke upon initial start-up. This condition is normal and will diminish once the fogging oil has been cleared through the engine.*

- Once the boat is in the water, start the engine.
- Start the engine(s) and watch the gauge readings closely, checking for leaks and abnormal noises.
- Keep speeds low for the first 15 minutes until the engine has reached normal operating temperature.
- See the *Engine Operator's Manual* and all equipment manufacturer's information for additional recommendations.

LIFTING

NOTICE *Consult the boat dealer for proper lifting instructions for the boat.*

Attempt to lift or hoist boats only if you are qualified or experienced with this procedure. This procedure requires special equipment and experience. Do not attempt to lift or hoist the boat alone; damage, personal injury or death can occur.

⚠ WARNING ***Crush Hazard: Special equipment is necessary to lift the boat and/or engine. Always use lifting equipment with sufficient capacity to lift the boat and/or engine.***

If the boat is to be removed from the water without a trailer, follow these guidelines:

- Cover lifting cables with a rubber hose or other protectors to prevent damage to the finish.
- Attach guidelines to the bow and stern to control movement.
- Use spreader bars and keep lifting pressure vertical to prevent side load damage.
- Keep the bow slightly higher than the stern to prevent engine damage.

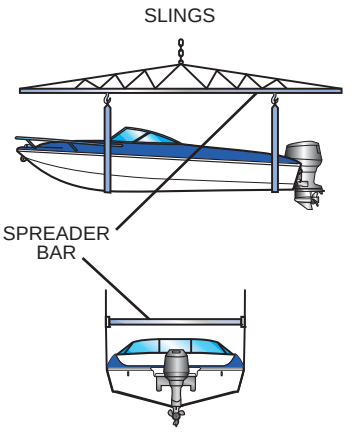

Figure 12-1: Lifting with Slings

The following information will assist you in identifying basic performance, mechanical and electrical problems. This information is intended as a general troubleshooting guide and may describe items that are not applicable to the boat.

The tachometer can be very useful when troubleshooting the boat's performance problems. A typical engine should maintain the same operating rpm throughout the useful life of the boat. When the normal operating rpm is known, that rpm should be used as a starting point when performance problems arise.

If you detect a problem with the engine, see the *Engine Operator's Manual*. If you detect an equipment or boat system problem, see the manufacturer's information for that item.

Before performing any troubleshooting procedures within this section, review ***Safety in Section 2***.

NOTICE *Certain problems may require specialized skills and tools. Always consult qualified personnel before making any repairs or modifications.*

PROBLEM	POSSIBLE CAUSES
Engine will not crank	• Engine emergency stop switch lanyard not connected • Shift/throttle control not in the NEUTRAL position • Main circuit breaker open • Battery switch is in the OFF position • Battery terminals or wiring connections corroded • Low battery voltage • Faulty ignition switch • Engine problem
Engine cranks but will not start	• No fuel in tank • Fuel tank valves closed to engine • Fuel filter clogged • Flame arrestor dirty, if equipped • Contaminated fuel • Engine problem

PROBLEM	POSSIBLE CAUSES
Poor boat performance	• Contaminated fuel • Uneven load distribution • Excessive load • Improper power trim position • Improper trim tab position • Improper propeller selection • Excessive water in bilge • Damaged or obstructed propeller • Marine growth on hull • Damaged hull • Engine system problem • Plugged flame arrestor, if equipped
Throttle/shifting control problems	• Corroded cable • Excessive bends or kinks in cable • Engine system problem
Excessive vibration	• Damaged or obstructed propeller • Bent propeller shaft • Engine system problem
Electrical problems	• Blown fuse/breaker or open circuit • Loose or corroded wiring connections • Defective switch or gauge • Weak or discharged battery • Loose shore power connection
Erratic or no speedometer reading	• Disconnected, kinked or plugged pickup tube or pitot • Speedometer gauge faulty

ABOARD:	On or in the boat.
ABYC:	American Boat and Yacht Council, Inc.
AFLOAT:	On the water.
AFT:	Toward the rear or stern of the boat.
AGROUND:	Touching bottom.
AMIDSHIP:	Center or middle of the boat.
ANCHOR:	(1) An iron casting shaped to grip the lake bottom to hold the boat. (2) The act of setting the anchor.
ASHORE:	On the shore.
ASTERN:	Toward the stern.
AUTOMATIC CHARGING RELAY (ACR):	An ACR parallels (combines) batteries during charging, and isolates them when charging has stopped and after battery voltage has fallen. An ACR is intended to keep a load from discharging both of the batteries.
AUTOMATIC IDENTIFICATION SYSTEM (AIS):	An automatic tracking system used on ships and by vessel traffic services (VTS) for identifying and locating vessels by electronically exchanging data with other nearby ships, AIS base stations, and satellites.
BAIL:	To remove water from the bottom of the boat with a pump, bucket, sponge, etc.
BAITWELL:	A miniature livewell used to store and keep live bait alive and healthy.
BEAM:	The widest point on the boat.
BEARING:	Relative position or direction of an object from the boat.
BILGE:	The lowest interior section of the boat hull.
BILGE KEELS:	The raised areas or aluminum extrusions on the bottom of a boat that parallel the keel.
BOARDING:	To enter the boat.
BOUNDARY WATERS:	A body of water between two areas of jurisdiction; i.e., a river between two states.
BOW:	The front of the boat.
BULKHEAD:	Vertical partition (wall) in a boat.
BUNKS:	Carpeted trailer hull supports.
BURDENED BOAT:	Term for the boat that must “give-way” to boats with the right-of-way.
CAPACITY PLATE:	A plate that provides maximum weight capacity and engine horsepower rating information. It is located in full view of the helm.
CAPSIZE:	To turn over.
CAST-OFF:	To unfasten mooring lines in preparation for departure.
CENTER LINE:	A lengthwise imaginary line which runs fore and aft with the boat’s keel.
CHINE:	The point on a boat where the side intersects (meets) the bottom.

CLEAT:	A deck fitting with ears to which lines are fastened.
CONSOLE:	Also called helm. The steering wheel area of the boat.
CONTROLLER AREA NETWORK (CANBUS):	A robust bus standard designed to allow microcontrollers and devices to communicate with each other in applications without a host computer.
CRANKING BATTERY:	The main battery used for engine starting and electrical circuits.
CURRENT:	Water moving in a horizontal direction.
DECK:	The open surface on the boat where the passengers walk.
DEEP-CYCLE BATTERIES:	Special long-running batteries which can be repeatedly discharged and recharged without significant loss of power.
DIGITAL SELECTIVE CALLING (DSC):	A standard for sending pre-defined digital messages via the medium frequency (MF), high frequency (HF) and very high frequency (VHF) maritime radio systems. It is a core part of the Global Maritime Distress and Safety System (GMDSS).
DOLLY WHEEL:	A rolling jack assembly at the front of the trailer used for positioning the coupler during trailer hookup.
DRAFT:	The depth of the boat below the waterline, measured vertically to the lowest part of the hull.
ELECTRONIC LEAKAGE CIRCUIT INTERRUPTER (ELCI):	Installed with or in addition to the main shore power disconnect circuit breaker(s) to offer an additional level of protection from shore power faults.
ELECTRONIC NAUTICAL CHARTS (ENCS):	Vector data sets that support all types of marine navigation.
ELECTROLYSIS:	The breakup of metals due to the effects of galvanic corrosion.
EMERGENCY POSITION INDICATING RADIO BEACONS (EPIRBS):	Safety devices carried by a vessel to alert search and rescue services and allow them to quickly locate you in the event of an emergency.
FATHOM:	Unit of depth or measure; 1 fathom equals 6 feet.
FENDERS:	Objects placed alongside the boat for cushioning. Sometimes called bumpers.
FORE:	Toward the front or bow of the boat. Opposite of aft.
FREEBOARD:	The distance from the water to the gunwale.
FUEL SENDING UNIT:	The electrical device that is mounted on the outside of a built-in fuel tank and controls the dashboard fuel gauge.

GIVE-WAY BOAT:	(1) Term for the boat that must take whatever action necessary to keep well clear of the boat with the right-of-way in meeting or crossing situations. (2) The burdened boat.
GLOBAL MARITIME DISTRESS AND SAFETY SYSTEM (GMDSS):	An internationally agreed-upon set of safety procedures, types of equipment, and communication protocols used to increase safety and make it easier to rescue distressed ships, boats and aircraft.
GLOBAL POSITIONING SYSTEM (GPS):	A global navigation satellite system that provides geolocation and time information to a GPS receiver.
GROUND FAULT CIRCUIT INTERRUPTER (GFCI):	A type of circuit breaker that measures current flow in the hot and neutral wires and immediately switches the electricity off if an imbalance of current flow is detected.
GUNWALE:	The rail or upper edge of a boat's side.
HEAD:	A marine toilet.
HELM:	The steering wheel or command area.
HULL:	The body of the boat.
HYPOTHERMIA:	A physical condition where the body loses heat faster than it can produce it.
IN-LINE FUSE:	A type of protective fuse located in the power wire of a direct current (DC) circuit usually near the battery.
KEEL:	The lowest portion of the boat; extends fore and aft along the boat's bottom.
LIFE JACKET:	A buoyant, wearable jacket that, when properly used, will support a person in the water; also see PFD.
LIST:	Leaning or tilt of a boat toward the side.
MAKING WAY:	Making progress through the water.
MARINE CHART:	Seagoing maps showing depths, buoys, navigation aids, etc.
MOORING:	An anchor, chain or similar device that holds a boat in one location.
NATIONAL MARINE ELECTRONICS ASSOCIATION (NMEA):	A U.S.-based marine electronics trade organization setting standards of communication between marine electronics.
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA):	An American scientific agency within the United States Department of Commerce that focuses on the conditions of the oceans, major waterways and the atmosphere.
NAVIGATION AID:	Recognizable objects on land or sea such as buoys, towers or lights which are used to fix position to identify safe and unsafe waters.

NMMA:	National Marine Manufacturers Association.
NO-WAKE SPEED:	The speed at which a boat travels to produce an imperceptible wake.
PFD:	A buoyant personal flotation device used to support a person in the water; also see Life Jacket.
PITOT TUBE:	See Speedometer Pickup Tube.
PLANING HULL:	A hull designed to lift, thereby reducing friction and increasing efficiency.
PORPOISE:	A condition in which the bow bounces up and down caused by trimming the engine too far out.
PORT:	(1) The left side of a boat when facing the bow. (2) A destination or harbor.
PRIVILEGED BOAT:	Term used for the boat with the right-of-way.
RIGHT-OF-WAY:	Term for the boat that has priority in meeting or crossing situations. The stand-on or privileged boat.
RULES OF THE ROAD:	Regulations for preventing collisions on the water.
SPEEDOMETER PICKUP TUBE:	Also called pitot tube. The plastic device that extends below the bottom of the boat. It connects to the speedometer with plastic flexible tubing.
SPLASHWELL:	The section of an outboard-equipped boat that is just forward of the transom.
STAND ON BOAT:	Term for the boat that must maintain course and speed in meeting or crossing situations. The privileged boat.
STARBOARD:	The right side of the boat when looking toward the bow.
STERN:	The back of the boat.
STOW:	To pack the cargo.
SURGE BRAKES:	A type of trailer braking system designed to automatically actuate when the tow vehicle's brakes are applied.
TRANSDUCER:	The unit that sends/receives signals for the depth sounder.
TRANSOM:	The transverse beam across the stern.
TRIM:	Fore to aft and side to side balance of the boat when loaded.
UNDERWAY:	Boat in motion; i.e., not moored or anchored.
USCG:	United States Coast Guard.
WAKE:	The waves that a boat leaves behind when moving through the water.
WATERWAY:	A navigable body of water.
V-PAD:	A modified vee-hull design with a small, flat area in the keel aft.
VISUAL DISTRESS SIGNAL:	A device used to signal the need for assistance such as flags, lights and flares.

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NOTES

BATTERY MAINTENANCE LIST

The boat may be equipped with any number of sensors, systems, electronics or equipment that have batteries and must be periodically checked to assure proper performance. Use this form as a handy reference for these items such as EPIRBs, handheld electronics, automatic fire extinguishers, CO detectors, etc.

ITEM	FREQUENCY	DATE CHECKED	BATTERY TYPE	REPLACEMENT DATE	NOTES

Crownline Boats / Finseeker reserves the right to change, alter and modify its finished boats, parts, specifications and prices at any time without notice. Some images in this manual may show optional equipment. The specification measurements are approximations and subject to variance.

Please boat safely! Crownline encourages you to take a Boater's Education Safety Course.