Owner's Manual

Cruisers

Part # 195974

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I. General Information

We are particularly interested in maintaining only the best of customer relations. Only by having your complete confidence and satisfaction with our product and its service can we assure our continued success as manufacturers of recreational craft. We have found that continuing a pleasant and effective relationship through our dealers is equally as important as maintaining the technical excellence of our product. Your authorized dealer will cordially assist you in providing service, maintenance, selection of options, and instructions concerning the operation of your Sea Ray.

Most problems arise from misunderstandings concerning warranty and service, and can usually be solved at the dealer level.

Please have all the pertinent information such as serial numbers, model numbers, etc., when contacting your dealer.

You are entitled to all the benefits and services as contained in the warranties for your Sea Ray boat and separately warranted products. With your help we intend to see that you fully receive those benefits and services. It is important that you become familiar with the proper procedures for obtaining service and parts, in and out of warranty. Your dealer is instructed to provide you with orientation in these matters at the time of delivery, as a supplement to these instructions.

A. Owner's Responsibilities

1. Before operating your boat, it is necessary to read and fully understand this manual.

2. ***Upon reaching the specified engine break-in period, it is the owner's responsibility to return the boat to the selling dealer for inspection (Consult your dealer for rates).***

3. It is the owner's responsibility to properly maintain and service the product in accordance with the enclosed service guide.

B. Dealer's Responsibilities

1. Provide the customer with an adequate orientation in the general operation of his Sea Ray and use of its systems and components, and safety considerations concerning the use of those systems.

2. Insure that the customer receives a complete owner's packet containing warranty cards and various registrations for the Sea Ray boat and separately warranted products, and accompanying literature, including all operating, installation and maintenance instructions as required.

3. Carefully review all warranty entitlements with the customer, pointing out the importance of mailing warranty cards and registrations to various manufacturers within the required time limits. Assist the customer in properly completing these forms if he desires. Request that the customer read all the warranty information and clear up any provisions which are not understood.

4. Instruct the customer on how to obtain local service and out-of-area service on his Sea Ray and its separately warranted products during and out of warranty periods.

Limited Warranty

For a period of one year from the date of delivery to the original retail purchaser, SEA RAY BOATS warrants each Sea Ray operated under normal, non-commercial use to be free from defects caused by faulty workmanship or materials.

During this period, warranty repairs will be made without charge by the selling Sea Ray dealer at that dealer's store or service center, or at SEA RAY's option, at one of the Sea Ray manufacturing plants. Transportation costs to and from the selling Sea Ray dealer's service center or to the SEA RAY plant are the responsibility of the purchaser. All warranty repairs must be approved by an authorized SEA RAY representative.

Engines, outdrives, controls, batteries, and other equipment or accessories carrying their own individual warranties provided by their respective manufacturers are not covered by the provisions of this warranty.

This warranty does not cover boats owned by other than the original retail purchaser; windshield breakage; gelcoat crazing, fading or blistering; upholstery damage; scratches or tears; leakage around windshields, hatches and canvas; boats used for commercial or racing purposes; or boats or parts which have been altered or subjected to misuse or negligence.

The obligation of SEA RAY BOATS under this warranty shall be limited to the repair or replacement of any part which is judged defective by SEA RAY BOATS. SEA RAY BOATS WILL NOT BE LIABLE FOR HAUL OUT, LAUNCH, TOWING OR STORAGE CHARGES, INCONVENIENCE OR LOSS OF TIME OR INCOME, OR ANY OTHER SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY KIND OR NATURE. IMPLIED WARRANTIES, IF ANY, SHALL BE LIMITED TO THE DURATION OF THIS WRITTEN LIMITED WARRANTY. Some states do not allow the exclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty lasts, so the limitations and exclusions stated in this paragraph may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that may vary from state to state.

II. Your Sea Ray Boat

A. Construction:
Your Sea Ray complies with the safety standards set by the United States Coast Guard and is designed and engineered in accordance with numerous other recommended practices of the Boating Industry Association and the American Boat and Yacht Council. The black and yellow capacity plate located near the helm carries important information regarding maximum persons capacity in pounds and the maximum total weight capacity your boat is capable of carrying safely under normal conditions. Be sure to familiarize yourself with these capacities and observe them.

An index is located in the rear of this manual. Check there to find information on the electrical system, fuel system, steering system, and any of the other systems your boat may have.

B. Care:
Fiberglass
Fiberglass, although impervious to many of the hazards normally associated with wood and other boatbuilding materials, does have some maintenance requirements which are unique.

The fiberglass hull or sections, when received by the owner, consist of the molded shell and exterior gelcoat. The gelcoat is the outer surface, often colored, and presents the shiny smooth appearance which is associated with fiberglass products. In some areas this gelcoat surface is taped at the factory for styling purposes.

Wash the fiberglass regularly with clean fresh water. Wax gelcoated surfaces to maintain the lustre. In northern climates, a pre-launching waxing may suffice for the season. In southern climates, a semi-yearly application of wax will be required for adequate protection. A product which contains a polishing compound and a wax is suggested.

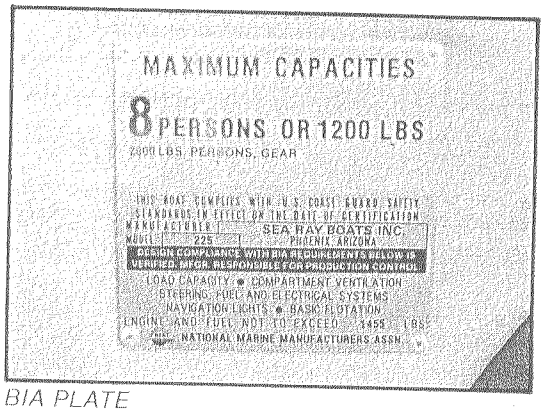
If your boat should lose some of its original lustre and cannot be restored by the above method, it should respond to hand buffing with a rubbing compound such as DuPont No. 7, or power buffing with Mirror-Glaze No. 1, then waxing.

Stains and Scratches
Gelcoat surfaces are very resistant to deep stains. Common surface stains on gelcoat may be removed with diluted household detergents provided these detergents do not contain ammonia or chlorine. ***Porcelain-cleaning powders are too abrasive and often contain chlorine and ammonia, either of which would permanently discolor the gelcoat.*** Alcohol or kerosene may be used for difficult stains but these liquids should be washed away promptly with a mild detergent and water. ***Never use acetone or any ketone solvents.***

Minor scratches, and deeper stains which do not penetrate the gelcoat, may be removed by light sanding and buffing.

Bottom Care
If your boat is to be left in salt water for any length of time, the bottom should be painted with a good anti-fouling marine bottom paint. In certain fresh water areas where algae or grass are prevalent, it may also be necessary to paint the bottom of your boat with anti-fouling paint. ***Residues and chemicals found in some waters can stain the hull bottom***: again, a coat of anti-fouling paint may be helpful. Consult your Sea Ray dealer regarding local conditions and recommendations as to bottom painting.

If your Sea Ray is used primarily for trailer boating and only left in the water for a few days at a time, bottom painting is usually not necessary. But remember to scrub the bottom of your boat after each use to prevent a build-up of marine growth. If possible, try to clean the boat immediately after hauling it out of the water. Marine growth is a lot easier to remove while it is still wet than if it is allowed to dry and harden.



BIA PLATE

Hardware

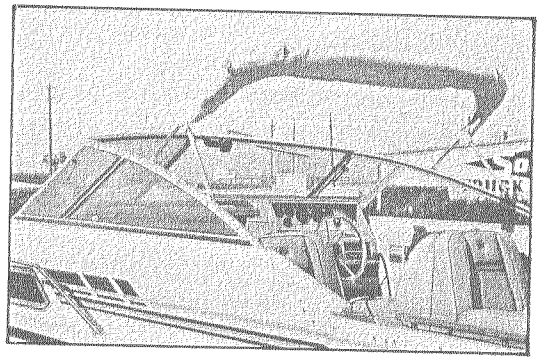
Automotive chrome and metal cleaners can be used to restore the gloss to the metal hardware on your new Sea Ray. A frequent application of paste wax helps seal the pores in the metal to prevent oxidation and pitting. In addition all metal fittings, including dash panel, instruments, railings and hardware, should be sprayed with a rust inhibitor similar to WD-40 every three months when exposed to salt water and annually in fresh water. If not maintained on a regular basis, stainless steel railings and fittings will discolor.

Teak

Teak is a low maintenance wood which is most beautiful in its natural state. ***Never varnish teak***. Teak is rich in natural oils which give it the deep coloring. As the oils evaporate, the teak will get lighter in color and the surface will become rough. To keep teak looking fresh, it should be treated with teak oil at least twice a year (more often if exposure is severe). If the teak is in particularly bad condition, the teak oil should be rubbed in after using 220 grit wet and dry sand paper.

Windshields and Windows

Safety glass is used in Sea Ray windshields. No special cleaning agents are required, but remember that ***safety glass will scratch so don't use any abrasive cleaners or metal scrapers on your windshield***.



Convertible Tops and Curtains

Your convertible top and vinyl curtains may be cleaned with a good vinyl cleaner or detergent. ***Never fold or stow any tops or curtains when dirty or wet*** — the abrasive effect will cause premature wear. Special care should be taken of the transparent curtains. To prevent scratching, use only fresh water and ***never wipe with anything but a soft and completely dirt-free cloth***. When stowing the transparent curtains, it is recommended to roll them up in a towel or tissue to prevent them from sticking together in hot areas rather than folding flat. This prevents creases or cracks from forming.

Interior

CAUTION: Cleaning the vinyl products with anything other than mild soap and water may result in removal of mildew inhibitors or damage of the product.

The vinyl upholstery may be cleaned with a mild soap solution. ***Never use bleaches or solvents*** — they can permanently damage the upholstery.

The floor carpeting in your Sea Ray will not stain, discolor, or soak up water with proper maintenance. It can be cleaned by washing and hosing down. An occasional vacuuming will remove any residual sand or dirt.

Bilge

Over a period of time the bilge may accumulate dirt. Bilge cleaners are available which will loosen this grime and allow it to be drained into a proper receptacle. Check with your dealer or at any marine supply house.

C. Winterizing

When boating season is over, follow these suggestions to protect your boat through the winter:

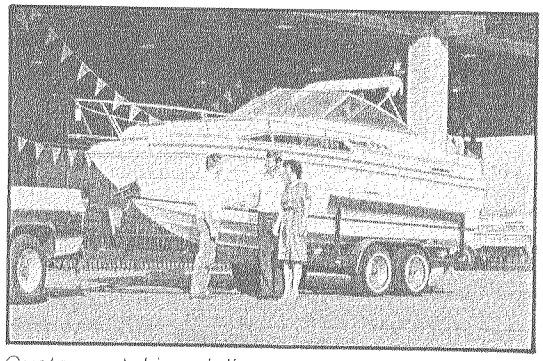
1. Drain and winterize your engine. ***Refer to the engine manufacturer's owner's manual for procedures for winterizing your engine.*** Be sure ALL water drain plugs are removed from the engine and stern drive.
2. Clean your boat thoroughly inside and out. If the hull has any growth or residue on the bottom, clean it.
3. Remove the stern drain plug so that any water in the boat can drain out. Operate the bilge pump for a few minutes. This removes all water from the bilge pump system.
4. If your boat is stored for the winter with fuel in the fuel tank, be sure to add a preservative such as Stabil to the fuel. A full fuel tank also prevents condensation and water accumulation in the fuel.
5. If your boat is stored on a trailer, make certain that the hull is resting properly on the trailer bunks. Raise the bow of the boat higher than the stern so that any moisture that accumulates from condensation can drain out of the boat. Release the hold down straps so that your boat will not be held in a stressed position throughout the winter.
6. Block the trailer tires off the ground. Repack the trailer wheel bearings with heavy duty marine grease.
7. Cover your boat as completely as possible for winter storage.

Note: For additional winterizing instructions, refer to your Marine Engine Owners Manual.

III. Placing Your New Boat into Service

A. Making Delivery and General Preparation

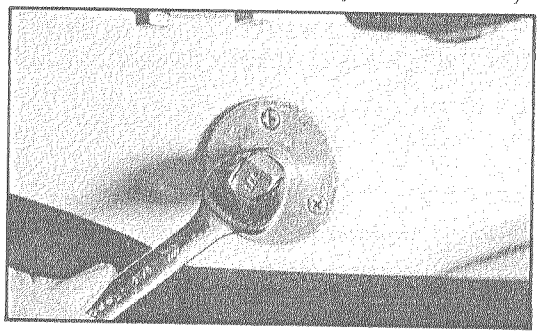
Your Sea Ray is a product which has undergone a series of rigid inspections by highly qualified factory personnel throughout the manufacturing process. Our final factory check by quality control inspectors before shipment to the dealer is not the last one before you take a delivery. Your dealer has been trained to perform additional pre-delivery inspections and systems checks, condition and service your Sea Ray, and assist you in understanding and completing warranty registration forms.



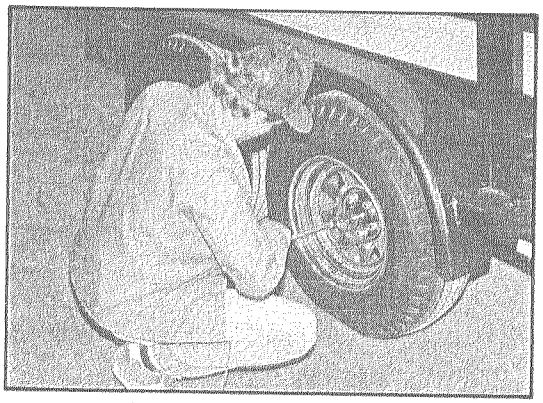
Customer taking delivery

In addition to the usual inspection and servicing of the boat, we recommend that special emphasis be given the following to prevent unnecessary inconvenience.:

1. ***Make certain the hull drain plug is in place before launching (this requires a wrench).***



2. Install Propeller (Consult engine manufacturer's manual)
3. Check all wiring for loose connections. Ask dealer to show you location of the central electrical panels and the proper operation of switches and equipment installed.
4. Before taking on any fuel, inspect all fuel line fittings and connections to be certain none of them are loose and/or unattached. Check overflow vent connections. Fill fuel tank. Inspect the entire system thoroughly for leaks.
5. Examine the complete exhaust system. All connections, including any exhaust hose clamps, and engine drain plugs, must be in place and properly tightened. Recheck with engine running, after launching, and within a few minutes after the engine is first started.



Make certain that wheel bearings are sufficiently packed and that all lug nuts are secure.

B. Trailering and Launching

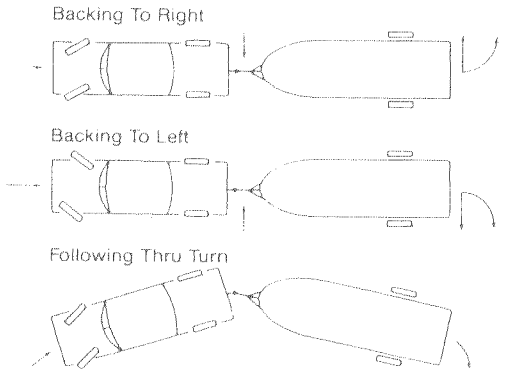
If you trailer your new Sea Ray, there are some things you will want to remember to extend the life of your boat and your trailer.

1. Make certain that your trailer is adjusted to fit your boat. The trailer bunks and rollers should be adjusted so that the majority of the weight of your boat is supported at the keel and transom. Avoid a situation where the boat is being supported at only one or two points — this may damage the hull bottom.
2. Make certain that your trailer is adjusted so that you have the correct weight on your trailer hitch. For specific recommendations, consult your Sea Ray dealer. Too much or too little weight may cause trailer sway.
3. When trailering your boat, it is recommended that you secure the boat to the trailer by tie downs.
4. Some trailer tires require more air pressure than automobile tires. Check your trailer owners' manual for recommended pressures. Under-inflated tires can lead to blow outs, trailer sway or rapid tire wear.
5. At least once a year you should clean and repack your trailer wheel bearings with waterproof marine grease. A service station can do this. Trailer wheel bearing lubrication is important because of the repeated immersion in water during launching. This is especially important in salt water areas, where more frequent repacking may be required. Carry a spare tire for your trailer and tools for changing tires or for other minor repairs or adjustments.
6. Make certain that your trailer is equipped with safety chains and that you attach them when trailering your boat.
7. Speed limits for cars towing trailers are often lower than posted on highway signs. Make certain you know what the legal speed limit is. If in doubt, check with your local or state police.
8. Before starting on a trip check the following:
   a) Make certain hitch coupler and safety chains are secure and trailer ball is tight.
   b) Turn on car lights and make certain that your trailer lights, turn signals, and brake lights are working.
   c) Secure convertible top cover for travel. Stow loose gear so that it will not slide around or be blown out of your boat. ***Do not trailer your boat with your convertible top and curtains up.***

How to Back Up a Trailer

We will attempt to show you how it is done in pictures. Practice makes perfect however, so we suggest practicing in an empty parking lot.

1. Turn the front wheels of the car the opposite direction from which you want the trailer to go.



2. Once turn is started, follow the trailer as you would normally backing the car.

3. When rounding turns on highways or streets, do not cut corners.
4. Equip your vehicle with a right hand mirror — a real benefit when passing and parking.

NOTE: ***When backing, be sure to have a lookout — your visibility may be severely impaired.***

Launching

Your Sea Ray can be safely launched with a crane and hoist. The boat may be lifted by means of slings under the hull, or by attaching hooks through the stainless-steel bow and stern eyes. In either case, however, be sure to use spreader bars to prevent undue stress on the hull.

Loading

The capacity plate attached to a boat states the maximum persons capacity in pounds and the maximum weight capacity for persons, motor, and gear in pounds that the boat will handle safely under normal conditions.

These load capacity ratings are computed from a rather complex formula determined by the U.S. Coast Guard.

Overloading is a very significant cause of accidents in boating. Improper loading can be equally as hazardous.

The number of seats in a boat is *not* an indication of the number of persons it can carry safely.

The performance of a boat is affected by the amount and distribution of the load it is carrying.

When loading a boat, step or climb into the cockpit. Never jump into a boat.

Have someone on the dock pass the gear aboard. Secure all gear firmly so that it will not shift or interfere with the operation of the boat. Place heavy gear in the boat so that the load is balanced and will not affect the trim of the boat.

Have the passengers board one at a time and seat them so as to maintain an even trim of the boat from port to starboard and forward to aft.

Do not exceed the load capacity rating as stated on the U.S. Coast Guard Capacity information plate.

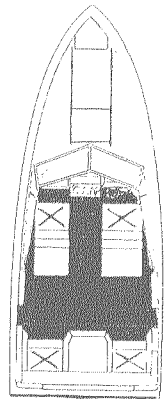
Do not allow passengers to ride on the bow of a boat with feet hanging over the side.

Do not allow several passengers to ride in the open bow of small boats causing the bow to "plow".

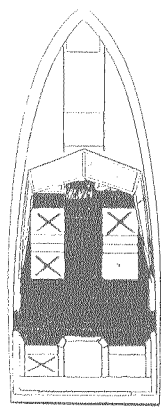
Do not allow passengers to ride sitting on the stern or gunnels of the boat. Falling from moving boats is a major cause of boating accidents.

Remember that the presence of the capacity plate does not relieve the boatsman from the responsibility of using common sense or sound judgment. Rough water and adverse weather conditions will reduce the capacity of the boat. Advance knowledge of weather forecasts and water conditions are recommended.

Overloading is a violation of Coast Guard regulations.



Proper Load Distribution (one of several)



Improper Load Distribution (one of several)

OVERLOADING AND IMPROPER DISTRIBUTION OF WEIGHT ARE SIGNIFICANT CAUSES OF ACCIDENTS. CAPACITY PLATES INDICATE MAXIMUM LOADS UNDER NORMAL CONDITIONS. GIVE YOURSELF AN EXTRA MARGIN OF SAFETY IN ROUGH WATER.

C. Boat Handling and Rules of the Road

It is beyond the scope of this manual to offer a complete course in seamanship. This section will provide basic instructions in small boat handling plus recommended safety precautions. Complete courses covering all phases of boating are offered by both the United States Coast Guard and United States Power Squadron. Different courses are available for novice as well as experienced boaters, and in general the instruction is free with the only charges being for books and materials used. Additionally, many states have their own boating education programs — check with your Sea Ray dealer for details.

III

Basic Maneuvering

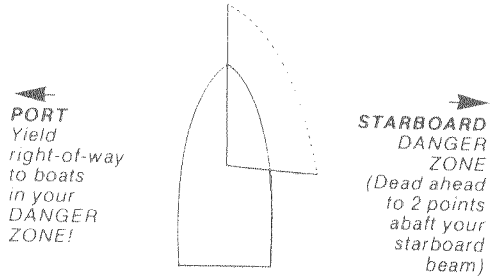
Remember that all boats steer by the stern (the feeling is much like steering your automobile in reverse). For example, when you turn the steering wheel to the left, the stern of the boat will swing to the *right* as the boat goes into a left turn. This is especially important to keep in mind when docking and operating in close quarters with other boats.

There are no brakes on a boat. Stopping is accomplished by allowing the boat to slow down (under 5 m.p.h.) and then putting the engine in reverse. Gently increasing reverse power will allow you to stop the boat in a very short distance. A boat does not respond to steering in reverse nearly as well as it does when going forward, so don't rely on being able to accomplish tight turning maneuvers when backing up.

Skillful docking maneuvers can be learned quite easily with a little practice. Get to know the "feel" of your new Sea Ray at low speeds, and then practice docking a few times at a vacant pier before attempting to pull into your local marina on a crowded afternoon.

Whenever possible, approach a dock *against* the wind or current — whichever is greater. Approach slowly at a slight angle, and just before the bow touches the pier, turn the steering wheel into the pier, shift into reverse, and give a short burst of power. This will swing the stern in and bring the boat to a stop parallel to the pier. Remember to have your dock lines handy so that bow and stern can be properly tied as soon as the boat comes to a stop and the engine is shut down.

There are two basic procedures for pulling away from a pier depending on wind and current conditions. If the wind or current is *incoming* and holding your boat against the pier, push the stern out as far as possible by hand and slowly back out turning the steering wheel away from the pier so that the propeller will pull the stern out. When well clear of the pier and other boats, shift into forward and proceed slowly ahead. If the wind or current is going *away* from the pier, push the boat away, and when it is clear of the pier and other boats, proceed ahead slowly in forward gear. Don't attempt to turn away too sharply — remember that your boat steers from the stern and too sharp a turn can swing the stern back into the pier or other boats.



REMEMBER THESE RULES

1. **OVERTAKING-PASSING: Boat being passed has the right-of-way. KEEP CLEAR.**
2. **MEETING HEAD-ON: Keep to the right.**
3. **CROSSING: Boat on right has the right-of-way. Slow down and permit him to pass.**

WHISTLE SIGNALS

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

Boat Trim

The riding attitude of your Sea Ray is important in that it affects performance and passenger comfort. If you will consider both lateral and longitudinal trim, there is much you can do to improve the ride of your boat.

Proper lateral trim is mainly a function of weight distribution within your boat. As batteries, gear and passengers are added, any significant lateral weight imbalance will cause your boat to list to one side or the other when at rest, at idle, and probably up through cruising speeds. If this situation occurs, it can be corrected by transferring weight from one side of your boat to the other.

Engine torque and wind direction may also affect lateral trim. All boats tend to lean into the wind when underway. You can compensate for this by switching passenger weight around or selecting a better heading. Make certain that the trim tab on your stern drive is properly adjusted. If it is not, you will experience steering torque *and a* list when underway. Your engine owner's manual covers how this adjustment can be made.

Longitudinal trim is affected by weight distribution and by the angle of the stern drive cavitation plate in relation to the bottom of your boat. Too much gear and passenger weight too far aft will result in a bow high attitude and slow planing. As previously mentioned, your engine is equipped with MerCruiser Power Trim or OMC SelecTrim. A little experimenting will allow you to find the setting which achieves the best running attitude in any given set of conditions.

Rules of the Road

The most basic rule to remember is when two boats are approaching at an angle (from dead ahead to two points aft of the starboard beam) the boat on the starboard (right) has the right of way. The boat on the port (left) is required to alter course or speed. If two boats are approaching each other from dead ahead, both should swing slightly starboard and pass port to port. When overtaking another boat from the stern, you may pass on either side, but keep well clear since that boat has the right of way. The law requires you to give way to all boats under sail. Probably the best rule of the road is to use common sense and courtesy. Operate your boat cautiously and defensively. In a crowded harbor or river don't presume all boaters to be totally observant of the strict rules. Be courteous and yield to boats under sail, boats pulling water skiers, boats trolling, and other boats less maneuverable than yours. ***Watch your wake — you are legally responsible for damage caused by the wake of your boat!***

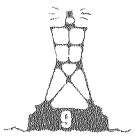
Types of Buoys

Channels and rivers are often marked with buoys as an aid to navigation. When entering a channel, the red even-numbered buoys mark the right-hand side of the channel. The black odd-numbered buoys mark the left side. An easy way to remember on which side to pass these buoys is to memorize this phrase: "Red - Right - Returning" (*Red* buoy on your *Right* when *Returning* to or entering a channel). Black and white vertically striped buoys are mid-channel markers and may be passed on either side.

CHANNEL BUOY GUIDE

Entering port or going upstream

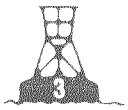
PORT SIDE
Color: Black
odd numbers



Lighted

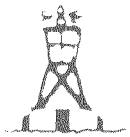
Can Spar

Unlighted Bell

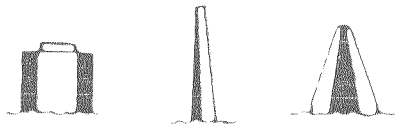


Unlighted Whistle

MID-CHANNEL
Color: Black & White
no numbers



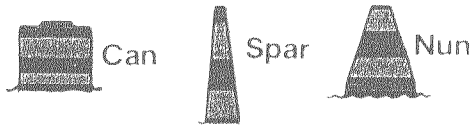
Lighted



Can Spar Nun

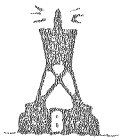
JUNCTION

Red and Black
Lighted



Can Spar Nun

STARBOARD
Color: Red
even numbers



Lighted

Spar Nun

Unlighted Bell

Unlighted Whistle

IV. Operating Instructions

A. General Familiarization

An important part of your understanding of your Sea Ray and how to operate it is the indoctrination you receive from your Sea Ray dealer at the time you take delivery. During this session, operation of the engine and all components and systems are covered. If some further question occurs to you as you read this manual, jot it down and check back with your dealer. If he doesn't have an answer, he will get it for you.

The Marine Engine

This manual does not dwell on the engine in detail. Necessary information concerning your engine is in the Engine Operator's Manual. It will be found in the Owner's Information Envelope and you are urged to familiarize yourself with it. The life and performance you receive from your engine depends greatly upon the way it is cared for. Adherence to a good maintenance schedule will result in many hours of pleasurable boating. Your engine is the finest obtainable — take good care of it.

Watch the oil level. Change oil as recommended and use only approved lubricants.

If the engine misfires, loses RPM or is hard to start, locate the cause and correct it. Continued operation may cause damage.

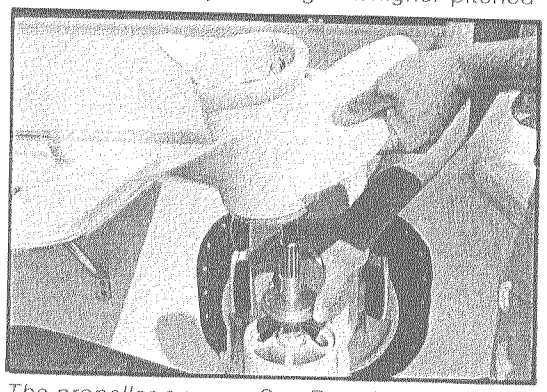
Do not tolerate a spark knock, detonation or "pinging". It may be evidence of too lean a mixture, improper fuel, or an improperly adjusted ignition system. Burned valves, abnormal wear of piston rings, pistons, and bearings, and even destruction of the piston heads may result if this condition is permitted to continue.

Erratic operation of an engine and hard starting, sometimes blamed on distributor, coil, carburetor and other expensive items, may be due to an often overlooked but simple cause —high tension cables in poor condition. Spark plug and coil wires (the engine ignition wiring harness) more than a year old and subject to the high temperature and humidity conditions inherent in a boat, may develop leakage sufficient to affect the engine performance. In any case, cables more than two years old should be replaced.

Do not replace original spark plugs with other types having different temperature characteristics or length without first consulting your Sea Ray dealer.

Propellers

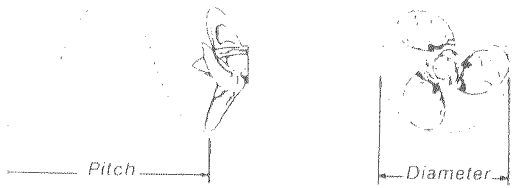
Your Sea Ray has been equipped with the propeller which our tests have shown to be the best suited for general use under normal conditions and load. In some situations you may wish to change propellers to give your boat slightly different performance characteristics. In general, changing to a *lower* pitched propeller will increase acceleration and load-pulling ability, but with a slight decrease in top speed. Conversely, moving to a *higher* pitched



The propeller on your Sea Ray should be periodically removed and the shaft and splines greased to prevent the propeller from freezing up on the shaft.

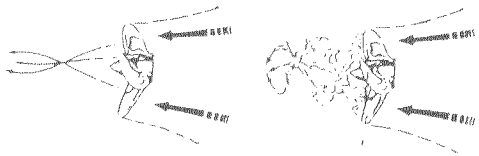
ropeller will attain higher top speed with a ight load, but will sacrifice acceleration and ower. Your particular requirements should be iscussed with your Sea Ray dealer. ***Under no ircumstances use a propeller which allows he engine to operate at higher than recom-nended RPM's.***

asic Propeller Characteristics:
ropellers have two basic characteristics: iameter and pitch. Diameter is that distance neasured across the propeller hub line from he outer edge of the 360° that is made by the ropeller's blades during a single rotation. itch is the angle of the blades from a flat lane, expressed in inches in terms of the pro-eller's theoretical advance through the water one complete rotation.



or example, a propeller with a 12-inch pitch, hen rotated 360° would, theoretically, dvance 12 inches through the water. Actually, o propeller applied to any boat is 100% effi-ient. No 12-inch pitch blade will, in a single otation, advance a boat 12 inches. This var-nce is referred to as slippage.

entilation, Its Causes and Corrections:
/hile often called cavitation, ventilation is ally a different effect. At times when a boat nters or leaves a sharp turn, the propeller eems to slip and lose thrust and the engine ay overspeed. This problem is normally



caused by air or aerated water entering the propeller (a damaged propeller can also cause ventilation). The correction can usually be accomplished by one or more of the following:

1. Replace the damaged or incorrect propeller with the recommended one.
2. Set the outdrive at a lesser trim angle (trim the unit inward).
3. Try a cupped propeller, if not so equipped.

Cavitation, Its Causes and Corrections:
Cavitation is a phenomenon that occurs in all propeller-driven craft under certain conditions.

The surfaces of propeller blades are not perfectly flat, and, as water is drawn through the blades to be discharged aft into the propeller's slip stream, the water flowing over the curved surface of the blade encounters areas of greater and lesser pressure.

In those areas of reduced pressure air bubbles are formed. When they move out of the low pressure area these bubbles collapse. If they collapse while in contact with an object such as part of the propeller blade or the trim tab, the bubbles create such high localized forces that they erode the surface of the object. In the case of the propeller such damage is sometimes called a "burn." It may be caused by an irregularity in the propeller's leading edge, and it should be corrected by reconditioning the prop or replacement.

Cavitation is a normal occurrence in modern sport boats, and prop inspection should be part of routine maintenance.

Propeller Torque and Its Correction:
Some of the more powerful motors create a considerable torque effect; that is, a twisting motion causing the boat to ride with one sheer lower than the other. This twisting reaction is caused by the direction of propeller rotation lifting one side of the boat. This causes an uneven drag, so that a boat's bow may tend to fall off in one direction or the other from the intended course given by the wheel.

Good hull design offsets a majority of this tendency in Sea Ray Boats, but some torque action may occur when maximum or close to maximum rated horsepower is applied. Any slight torque may be offset by shifting passenger or gear weight laterally to the high side of the boat. Hydraulic Trim tab adjustments will also change the ride attitude.

Replace Damaged Propellers:
Badly damaged propellers should be replaced. Those that are chipped, bent, or merely knocked out of shape can be reconditioned by your marine dealer. If damaged beyond repair, replace the malfunctioning propeller with a new one.

Propellers should be free from nicks, excessive pitting, and any distortions that alter the propellers from their original design.

When doing extensive cruising, it is always advisable to carry an extra propeller aboard.

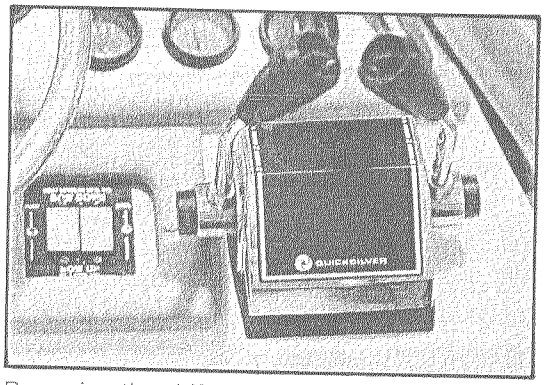
Operating your boat with a damaged propeller will reduce its top speed, may introduce undesirable handling characteristics, and will definitely increase fuel consumption.

A damaged propeller may also create unpleasant vibrations leading to an increased sound level. These excessive vibrations will hasten wear to rotating and reciprocating engine components, and may cause costly damage.

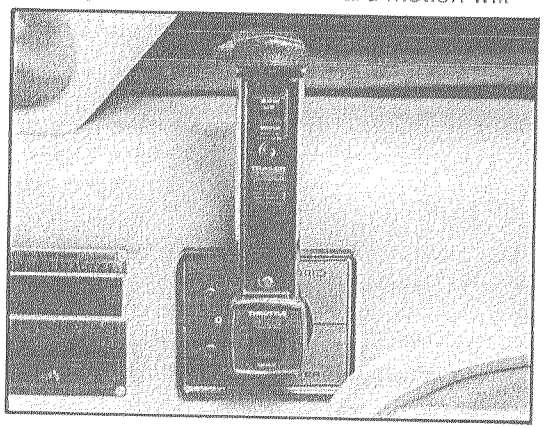
IV

IV

Shift and Throttle Controls and Steering
The single lever control on your Sea Ray activates both the shifting mechanism and the throttle advance. The control must be in the neutral position to start your engine. Moving the lever forward engages the forward gear and then the throttle advance. To reverse power, bring the control lever back to the neutral position, then move it further back to engage the reverse gear and increase reverse thrust.

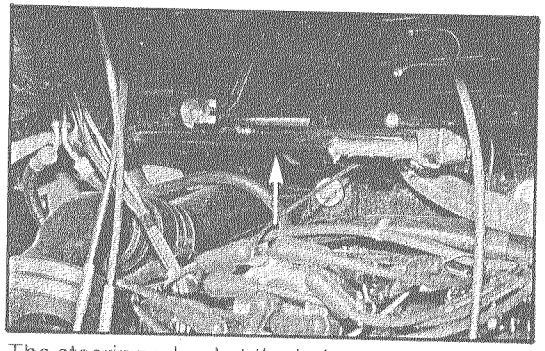


Reversing the shift mechanism will act as a "braking action" when maneuvering the boat at low speeds. Care should be taken in using reverse throttle for "braking action" as sudden slowing of the boat from forward motion will create a following wake which may rise above the swim platform. All propellers are designed to provide maximum forward thrust, so that the reverse thrust of the propeller will not be as efficient.



Controls vary slightly depending on the particular Sea Ray model and engine combination.

Steering System:
The standard power steering used in all Sea Ray I/O boats is a mechanical system with enclosed cable.



The steering wheel at the helm position is connected to the stern drive by cable. The cable connections at the helm and at the outdrive should be inspected and tightened at least twice a year. ***A loose connection can result in sudden loss of steering and control.***

All mechanical steering systems require periodic maintenance to be trouble-free and safe. Regular checks of the complete system, whichever system your boat may have, is essential.

Push-pull cable steering should be checked for proper lubrication of the cable, proper alignment, with no binding or looseness, and no interference in the system. Cable and attachments to the stern drive should be checked for wear, rust, or corrosion on a regular basis and be properly lubricated. Check the anchor post at the aft end of the cable to be sure it is secure and free from rust and corrosion.

Power steering must have lubrication and maintenance inspection at regular intervals as specified: under normal service — every 50 hours of operation or 60 days, whichever comes first. Under severe service — every 25 hours of operation or 30 days, whichever comes first.

Note: Operation in salt water is considered "severe service."

Lubricate the control valve through the grease fitting with multi-purpose lubricant until grease appears around the rubber boot.

Coat power steering output shaft and exposed steering cable end with special lubricant. See engine manufacturer's manual.

Lubricate cable end guide pivot point with SAE 30W engine oil.

Check power steering fluid level and add type "A" automatic transmission fluid as required to bring level up to "full" mark on the dipstick which is attached to the fill cap.

Inspect all hydraulic lines and hoses as part of routine maintenance for leaks. Be certain that lines and hoses are free from friction and extreme heat and adjoining parts. Tighten fittings and clamps as needed.

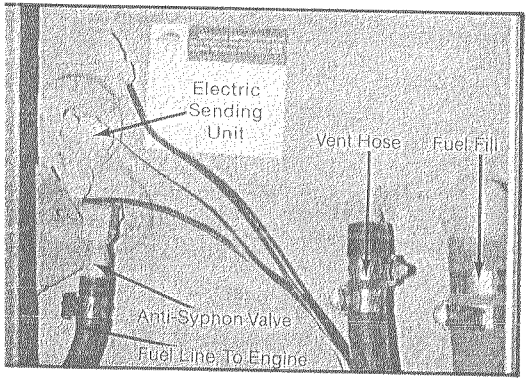
Check all bolts for tightness on a regular basis.

Check pump pulley drive belt often for wear and proper tension. Overtight belts may cause bearing failure. Loss of the belt compounds effect steering severely.

Sea Ray recommends that all repairs and/or replacements to steering systems be made only by qualified dealers authorized by the manufacturer of the steering system of your boat.

Caution: Boat steering is not self centering. Steering is affected by engine and propeller torque, trim tab setting, wave and current action, and the speed of the hull through the water. Constant attention and control of the direction of the boat is required for safe operation.

Fuel Systems:
The fuel system in your Sea Ray boat is designed to provide the aspect of safety in the prevention of fire and explosion, and to provide a continuous flow of clean fuel to the engine.



The system is designed and built to conform to, or exceed, all standards set by the U.S. Coast Guard at time of manufacture.

It is most important that you check and maintain your fuel system at frequent intervals. The entire system must be kept liquid and vapor tight within the hull interior.

(A half tea cup of gasoline can create enough explosive vapor to totally destroy a large boat.)

The fuel tank installed in your Sea Ray boat is baffled aluminum. Inspection plates or hatches are located over the fittings on top of the tank. The tank is equipped with an anti-syphon valve to prevent fuel from filling the bilge due to a broken line.

Occasionally, contaminated fuel will cause the check valve to malfunction.

In emergency situations, the check valve may be removed if the engine is not getting fuel.

Do not attempt to repair the valve — replace it with a new one. During winter storage or in the case of contaminated fuel a fuel conditioner is recommended.

Check all hoses and connections for leakage and tightness of fittings each time the boat is fueled and before each use.

Keep your tank filled when the boat is not in use to prevent condensation in the tank.

Keep the bilge and engine compartment area clean and well ventilated. Do not keep oily rags or flammable materials anywhere on the boat.

Have your dealer inspect your entire fuel system on a regular basis (at least once a year) including all components that are hidden from view. Replace all deteriorated hoses and corroded clamps, connections and fittings. Never repair a leaking fuel tank. Have it replaced with a new tank.

SAFETY WARNING
Fuel Recommendations

Alcohol and Methanol in gasoline can deteriorate fuel system components. If alcohol free gasoline is not available use gasoline which contains the least alcohol. We do not recommend using gas which contains methanol.

Electrical System
D.C. Electrical System (12 volt)
The direct current (D.C.) electrical system derives its power from the battery, which is kept charged by an engine-driven alternator. The battery charge is indicated by the voltmeter. The batteries supply power through a central fuse or circuit breaker panel to various items such as navigation lights, instruments and accessories.

The negative terminal is attached to the grounding stud of the propulsion engine. (Also connected to the negative battery terminal is a common bonding system connecting together all the underwater gear, gas tanks and gas fill plates.) This is, of course, known as a "negative ground system" and is the approved system for marine D.C. electrical systems.

If any additional D.C. items are added to the boat's electrical system, they must be adaptable to the negative ground D.C. system.

When installing additional equipment, it will be necessary to stipulate that its current supply be taken from the central distribution panel. If additional fusing is required, it should be added in that area. Do not allow any power feeds for accessory equipment to be taken from the voltmeter terminals.

Enlist the aid of your dealer for a careful analysis of D.C. power needs on your boat.

Battery Maintenance
Under the cap of each cell there may be a grid to prevent foreign matter from falling into the cells. The water level of each cell should be about ½" above that grid. This leaves a large space above the cell to take care of the electrolyte expansion during charging, so that none will be forced through the vent in the cell cap. (Certain batteries may not be equipped with filler caps.)

Any spilled acid on batteries, battery boxes or other parts should be neutralized and cleaned up with baking soda in warm water. The terminals and clamp bolt nuts may be cleaned in the same manner. The battery manufacturer recommends that the terminal and the battery tops be coated with Dow Corning Compound #3 or an equivalent as a corrosion preventative.

The specific gravity of the electrolyte is 1.260 full charge. A hydrometer with temperature reading and correction factor combination should be used to test each cell.

Do not test batteries right after adding water.

To accurately test the batteries, the charging devices must be turned off for at least 20 minutes.

The average charge at different specific gravity readings will be:

Full Charge • Specific Gravity 1.260
¾ Charge • Specific Gravity 1.220
½ Charge • Specific Gravity 1.190

In freezing weather, discharged batteries will freeze and damage their containers. We recommend that all batteries should be kept at a 1.230 specific gravity reading in freezing weather.

The freezing points are:

Specific Gravity	Freezing Point
1.260 Full Charge	-70° F
1.230	-40° F
1.200	-18° F
1.170	0° F
1.125	+14° F)above
1.100	+20° F)zero

When adding water to battery cells in freezing weather, be sure to recharge sufficiently to thoroughly mix with electrolyte to prevent freezing.

Batteries in storage or idle for months at a time should be kept under trickle charge or should be fully charged once a month.

A battery that has its electrolyte under 1.230 for long periods will have internal chemical damage due to standing in a discharged condition.

Caution: A battery will explode if a flame or spark ignites the free hydrogen given off by the battery during charging. For this reason, never use an open flame in the battery storage area. Also, avoid striking sparks at terminals. Be sure battery covers are always installed to prevent shorting by any other means. Always recheck battery terminals for tightness and never disconnect under load.

Trouble Shooting
Before installing a battery, clean the terminal posts with a wire brush or steel wool and then attach the cables. After cable clamps are tightened down, smear posts and clamps with petroleum jelly or grease to exclude air and acid. Do not apply grease before attaching and tightening terminal clamps. Examine all wiring.

A very low battery — less than 9 volts rather than the normal 12 volts — may not actuate the voltage regulator even though it might start the engine. Consequently, the alternator cannot deliver a charge to the battery and it will be necessary to have it recharged ashore.

Caution: Always disconnect the "positive" battery cable before doing any work on the engine electrical or alternator wiring, to prevent sparking or damage to the alternator.

Switches
Switches for the navigation lights, cockpit and cabin lights, bilge pump, bilge blower, horn, and other accessories are located at the helm position. Each switch is individually fused.

Navigation Lights. Navigation lights must be displayed while underway from sunset to sunrise. The term "underway" denotes not at anchor or dock. Trolling or drifting with power off is considered underway, and normal running lights must be used. At anchor, in open water, a 32 point white anchor light must be displayed.

The navigation lights are operated by the three-position toggle switch on the helm switch panel. The center position of this switch is the off position. The two outside positions are for running lights and anchor light.

12 V Cockpit Lights
These lights will run only on battery power. The cover lenses pop off for access to the bulb. These operate on the switch marked "cockpit lights".

Ignition Switch. The ignition switch on your boat has three positions — "off", "on", and "start". The start position is spring loaded and the key should be held in this position until the engine starts. After the engine starts, release the key and it will return to the on position. Always turn the key to the off position when the engine is not running to prevent discharging the battery. ***Do not operate the engine starter motor for more than 15 seconds at one time as the motor will overheat.***

Instrumentation

The various instruments located at the helm position of your Sea Ray are there for your safety and convenience. Form the habit of looking at them frequently, especially when first starting the engine and during warmup.

Oil Pressure Gauge. This is a most important instrument. Very little serious trouble can occur inside an engine without it showing up on the oil pressure gauge. Generally readings of 10 to 15 pounds pressure at idle and/or 15 to 25 pounds pressure at cruise are satisfactory. Your engine owner's manual is more specific on this subject. ***If a complete loss of oil pressure occurs, shut off the engine at once.***

Water Temperature Gauge.
The water temperature gauge indicates the temperature of the cooling water circulating inside the engine. Your engine is equipped with a thermostat so that a predetermined engine temperature should be reached soon after starting the engine and maintained thereafter while the engine is running. Temperatures of 150 to 170° F. are in the normal operating range. ***If the temperature approaches the red zone on your gauge,*** **shut down the engine at once**

Fuel Gauge.
The fuel gauge indicates the fuel level in your fuel tank. The most accurate reading of the fuel gauge is at idle speeds when your boat is in an approximately level position. At slow plane when your boat is in a bow up position, the gauge will read inaccurately (on the low side) because the fuel in the tank travels to the rear of the tank and away from the fuel tank sending unit.

Since boats are subject to considerably more stress than automobiles due to rough water conditions, the fuel gauge may not provide accurate readings at all times even at idle speeds. Become familiar with your engine's hourly fuel consumption at various speeds and use this along with your running time as a backup check against the reading on your fuel gauge.

Speedometer. (Optional)
The speedometer indicates the speed of your boat in miles per hour. It operates by transferring the water pressure at the pitot tube mounted on the transom to the gauge. To insure an accurate reading, make sure that the pitot tube is in the down position and its opening is not clogged.

Maintenance

1. A clogged water pickup will render the speedometer inoperative. Clean with a piece of wire or blow out with compressed air. Before blowing out with compressed air, disconnect speedometer tubing from pitot tube or bayonet fitting.
2. Drain the system of water completely before storage. Remove tubing from speedometer fitting and blow thru tubing to remove water.

Tachometer
The tachometer indicates the RPM's at which your engine is running. Your engine owner's manual states the maximum full throttle RPM at which the engine should operate. This should not be exceeded. The tachometer should also be used to determine the most comfortable and economical crusing RPM. Generally, an RPM range of 2800 - 3100 RPM will give you the best range and most comfortable ride in calm seas. In rough seas, a lower RPM will give you the most comfortable ride.

Voltmeter.
The primary function of the voltmeter is to indicate battery voltage.

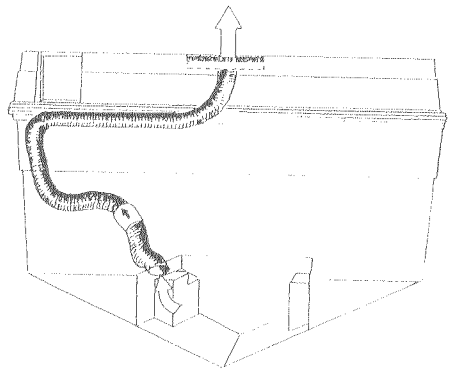
Trim Gauge.
On boats equipped with Mer-Cruiser Power Trim or OMC SelecTrim engines, you may have a trim gauge which indicates the angle of the stern drive cavitation plate in relation to the bottom of your boat. When the stern drive is trimmed "in" or "down", the bow of your boat is being forced down. It is recommended that the trim be in a full "in" position when accelerating from idle to plane. This will result in faster planing and less bow rise. Once on plane, the stern drive can be trimmed "up" or "out". This will raise the bow of the boat and increase speed. You will need to experiment a bit to determine the trim position you prefer under various conditions. If you trim the outdrive out too far while on plane, you may encounter propeller ventilation. This is evidenced by a sudden increase in RPM's and should be avoided. Should ventilation occur, reduce your engine RPM's and trim the outdrive in until it stops. If the outdrive is trimmed in too far when on plane, you may have a rooster tail or excessive spray around the transom. This can be corrected by trimming the outdrive out slightly.

IV

Bilge Blower

Your Sea Ray has a ventilation system that ventilates the engine compartment when your boat is underway. In addition, your boat is equipped with an electric bilge blower to provide forced ventilation of the engine compartment before starting the engine and when operating below crusing speeds. The bilge blower is located in the engine compartment near the transom.

Caution: Use of the bilge blower should never take the place of checking the bilge visually and "smelling" for fumes.



Caution: DO NOT operate blower while refueling.

Operation

The bilge blower is operated by a two-position fused switch located on the helm switch panel. ***Operate the blower a minimum of four minutes and check the engine compartment for fumes before starting the engine.***

Maintenance

Your bilge blower should be checked periodically to insure that the hoses are securely fastened to the blower. Check for corrosion of wires and make sure 12v. wires are secured in place.

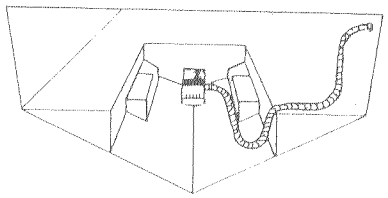
Trouble Shooting

If your bilge blower fails to operate:

1. Check the fuse at the helm switch panel.
2. Check to see if the blower hose is fastened to the blower.

Bilge Pump

Your Sea Ray is equipped with two Bilge Pumps. One is located underneath the engine. It is removable for cleaning, winterizing or replacement.



Operation

Should water accumulate in your boat, it will drain to the sump underneath the engine. Use your bilge pump to pump it overboard.

Most Sea Ray Cruiser models have an automatic bilge pump switch. This switch is wired directly to the battery with a fuse separating the two. The pump comes on when there is enough water in the bilge to lift the float to its highest position. The pump also has a manual overide "on-off" fused switch located on the helm switch panel.

Caution: The pump motor is water-cooled, so never run it "dry" for any length of time.

Maintenance

Your bilge pumps should be checked and cleaned periodically to insure that the pump is operating at its maximum flow.

1. Remove pump from sump under engine. Do not disconnect wiring or discharge hose.
2. Disassemble (Two tabs secure the halves together.)
3. Clean the strainer slots at the bottom of the strainer base and the small slot at the top of the cylindrical motor well.
4. Reassemble.

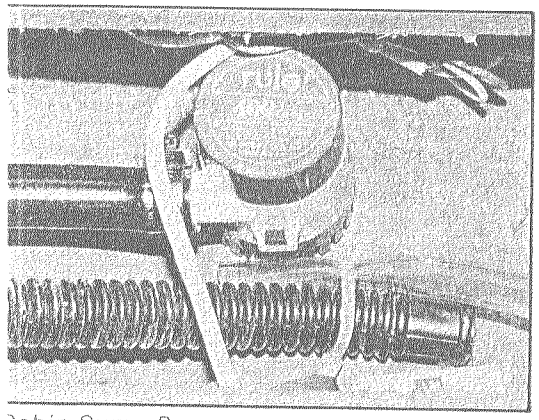
Trouble Shooting

If the water does not come out of the discharge hose

1. Check the fuse at the switch panel.
2. Check the fuse between the automatic switch and battery.
3. Remove the power module to see if the impeller rotates with the power on.
4. Remove any debris that may have accumulated in the white nozzle section or strainer base.
5. Check hose and connection on hull side for debris and proper connections.

Cabin Sump Pump

Your Sea Ray family cruiser is equipped with a cabin sump pump which is located on the cabin floor underneath the forward cabin step. It is easily removable for cleaning, winterizing or replacement. Access to this pump on some models would require the removal of the forward portion of the cabin step.



Cabin Sump Pump

Operation

Should water accumulate in the forward cabin of your boat, it will drain to the sump underneath the cabin step. Use your cabin sump pump to pump it overboard. The pump is activated by an "on-off" fused switch located on the helm switch panel. The switch is marked cabin pump"

CAUTION: The pump motor is water cooled, *do never run it "dry" for any length of time.*

Maintenance

Your cabin sump pump should be checked and cleaned periodically to insure that the pump is operating at its maximum flow.

1. Disassemble.
2. Clean the strainer slots at the bottom of the strainer base. Check for and remove any debris wedged between impeller and motor case.
3. Reassemble.

Trouble Shooting

1. Check the fuse at the switch panel
2. Remove the power modual to see if the impeller rotates with the power on.
3. Remove any debris that would impair the rotation of the impeller.

Canvas

To put your convertible top up, snap the top to the windshield and then lay the top back so that it is in the up position. The rear hold down straps may then be easily clipped in place by pulling the rear bow down with one hand and attaching the strap with the other. (Side and aft curtains should be zippered in place first and then snapped.)

There is considerable adjustment that can be made in the fit of the top by tightening or loosening the bow support straps and rear hold down straps. If you attempt such adjustment, please bear in mind that it will also affect the fit of the side and aft curtains and especially their snap locations.

Your convertible top and aft curtain are constructed of a fabric backed vinyl. In cold weather this material tends to stiffen and shrink a bit which will make your canvas more difficult to handle than in summer months.

The convertible top, side curtains, and aft cover on your Sea Ray should always be dry before folding and storing. This will prevent possible mildew. ***Do not trailer your boat at highway speeds with the top and curtains up since this can result in torn fabrics or broken snaps.***

Safety Precautions Prior to Starting Engine

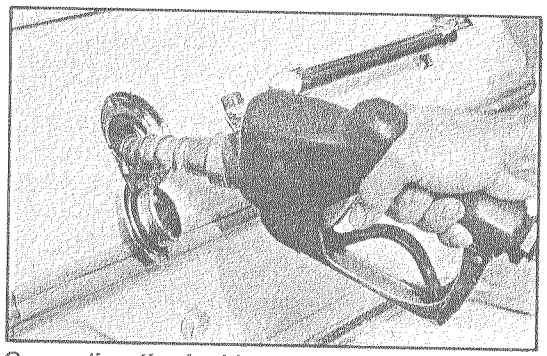
Drain Plug:

All Sea Rays are fitted with a brass garboard drain plug. This is a threaded plug which is installed through the outside of the transom. We recommend that you remove the drain plug when trailering or storing your boat. ***MAKE SURE YOU REPLACE THE DRAIN PLUG BEFORE LAUNCHING.***

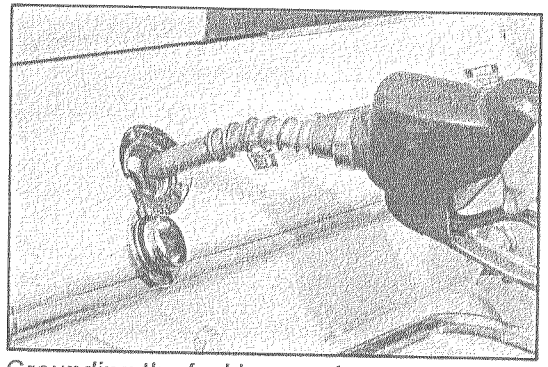
Fueling Precautions

Before fueling, close all ports, windows, hatches, engine boxes, and doors. Do not operate engine, or electrical equipment while fueling. Do not operate bilge blower while fueling. Avoid smoking.

Always ground the fueling hose nozzle by holding it against the fill pipe before any fuel is pumped. Sparks of static electricity can occur if this precaution is not taken.



Grounding the fuel hose — proper



Grounding the fuel hose — improper

Do not overfill fuel tanks. Avoid waste by allowing room for fuel expansion due to temperature change. Fuel pumped from cool underground tanks can expand from 2 to 6 percent. However, tanks should be kept as full as practical to minimize condensation and accumulation of moisture in the fuel system.

After taking on fuel, and before starting engine(s):

1. ***Open windows, hatches, engine compartments, and doors, and ventilate all enclosed spaces***;
2. ***Operate bilge blower at least four minutes — but do not depend on the blower to eliminate fumes***:
3. ***Always check bilge by visual inspection and smell. Leave engine hatches and engine boxes open until after the engine has started and run for some time.***

The tank fill pipe is of sufficient size to assure easy and safe filling. The fill pipe cap is located on deck with provision that any overflow will drain overboard and not into the boat.

Your boat is equipped with a fuel tank vent. This type of vent serves a dual purpose of pressure or vacuum release and safety overflow. The through-hull vent fitting is also a flame arrester. Keep the screen in this vent fitting clean. Replace screen immediately if damaged or displaced. The fuel pickup at the (gasoline tank) has an anti-siphon device for safety in case of line failure.

Fuel lines, tank, filters, and engine fuel system components should be checked at the start of each season and periodically thereafter, particularly after any work has been done aboard the boat which might have affected any part of the system. Be certain that all are in proper condition and that the entire system is fuel tight. Only a qualified marine mechanic should be allowed to work on the fuel system. Damage can be done to fuel system components by inexperienced or indiscriminate tightening of connections, including flexible fuel line sections.

Caution: Never start an engine until you are certain that gasoline fumes are not present in the engine compartment or elsewhere in the bilge of the boat.

Check the engine oil level. The oil "dip sticks" are marked to indicate both high and low levels. Always fill to the high mark, but not over.

Starting Your Engine

1. To facilitate starting when engine is cold, disengage shift control and move throttle lever back and forth 3 or 4 times while starter is operating. This will actuate the carburetor accelerator pump and feed more fuel to the engine for starting. ***DO NOT move throttle lever back and forth if engine is hot, as this will cause flooding.***
2. Turn ignition key clockwise to "Start" position. As soon as engine starts, release key and allow switch to return to "Run" position.

Important: Do not continue to operate starter for more than 15 seconds without pausing to allow starter motor to cool off for 2 minutes. This also will allow battery to recover between starting attempts.

3. Check engine RPM on tachometer as soon as engine starts. Do not allow RPM to exceed 1500. Move neutral throttle lever down to decrease RPM.

Caution: Do not race engine before turning ignition key off nor turn key off with engine running above idle. This could cause water to be drawn into engine via the exhaust system and result in internal damage.

After Starting Engine

After the engine is running, these few rules will assure you that the engine is functioning properly:

1. Check the oil pressure indicator for normal reading.
2. Check for proper water circulation. The temperature gauge should show normal after a few minutes. ***REFER TO ENGINE OWNER'S MANUAL FOR CORRECT TEMPERATURE.***
3. Make a visual inspection for any leaks related to fuel, exhaust, oil or water lines and correct as necessary. All engines and electrical equipment (motors) should be shut off if fuel leaks are found.
4. Water test the boat after properly warming up the engine. Drive at top speed for only a moment, if you are in open waters and conditions permit such practice, to note maximum RPM developed and general operation of the boat, its instruments and the engine. Follow detailed instructions on "Engine Break-In" in the Engine Operator's Manual.

FOR DETAILED INFORMATION ON YOUR NEW ENGINE, REFER TO THE ENGINE OPERATOR'S MANUAL.

It is good safety practice and we recommend that all numbered precautions in the above paragraphs be observed each time the engine is started after a period of non-use. It is best that *you* check items on which the safety of your boat and the personnel aboard depends, rather than entrust this to others.

Boat Performance

Boat speeds are affected by a great many factors. Some such as temperature and altitude, you can't do anything about. You can affect other factors. They are:

1. Loading: Take with you only the necessary equipment. As you add weight to your boat it slows down. Keep weight low in the boat and evenly distributed.
2. Propeller: Keep it in good repair and the correct pitch for your particular situation. The factory standard equipment propeller may not be the best one for your particular boat and load conditions. The engine should be able to come up to it's rated r.p.m. on a normally loaded boat. If the engine r.p.m. at full throttle is less than the maximum rated, try a prop of less pitch. If the engine r.p.m. exceeds the maximum rated, try a prop of greater pitch. A slightly bent or nicked propeller will adversely affect the performance of your boat.
3. Weeds, barnacles and other growth: Keep your boat bottom clean. When your boat starts "growing grass" it will slow down greatly, even to the point it will not plane. Anti-fouling paint that does not contain mercury or copper is recommended. Base materials, such as copper, will accelerate electrolysis and possibly damage underwater gear. Marine growth varies from one area to another so it's best to consult your dealer for the best bottom paint for your particular area.

ADDITIONAL SYSTEMS

A.C. ELECTRICAL SYSTEM

The systems control panel allows you to monitor and operate all 110-volt A.C. electrical systems on board. The 110-volt system is controlled by all of the black circuit breakers. The actual amount of voltage can be monitored by the A.C. volt meter located on the panel. The dockside line will supply a maximum of 30 amp service to the panel. When operating 110-volt accessories make certain that you do not overload the electrical panel or the main breaker. To operate any 110-volt accessory, the main circuit breaker and the individual breaker must be turned on.

CAUTION: The total usage of options will depend on the power source available.

When operating off the generator, the power selector switch must be set to the generator position. The A.C. volt meter indicates the line voltage of shore power or the A.C. generator.

CAUTION: Never operate shore power or generator at less than 105 volts.

The wiring for 115-volt, 60-cycle A.C. systems installed on SEA RAY boats consists of three color-coded wires. The black wire is the "Hot" feed, the white wire is the common, and the green wire is ground. All distribution fuses and switches for A.C. equipment are installed in the "hot" wire (black). The enclosures of A.C. devices, fuse box, switch box and outlet boxes are connected with the green ground wire.

As factory-installed, a circuit breaker is placed in both the white neutral feed and the black hot feed wires from shore power inlet. This fuses the feed, in case the shore connection plug is accidentally reversed. This breaker could trip under shore power surge or inadequate voltage. The green conductor of the shore power cord is connected to the ground bus bar in the breaker box.

The dockside power panel is equipped with a red warning light to indicate reversed polarity. Should this light come on when attempting to receive shore power, one should check the incoming power for reverse polarity, using a circuit tester. Notify the marina if you suspect the incoming power source is faulty. If the incoming power is proper, have the boat's AC system inspected by a qualified serviceman.

The hull receptacle and plug have three prongs and the normal shore power cable for this 110-volt A.C. system contains three color-coded wires: white, black and green. We suggest a yellow or white plastic (not rubber) jacket for shore cables so that decks and hull sides will not be stained.

Motorized equipment such as refrigerators and air conditioners should never be operated when the line voltage is below 105 volts. To do so may result in burned-out motors. Resistance loads such as lamps, stove, heaters and rectifiers may be used at lower voltages but not at peak efficiency.

Ground-Fault Interrupter Outlet

There is an outlet on your boat — in the galley or in the head. It is equipped with a test and reset switch in the center of the faceplate. All of the 110-volt 15 amp galley and cabin outlets and 110-volt lighting are protected through this outlet, except the stove outlet.

This receptacle employs a ground-fault circuit interrupter to provide protection against the hazards of ground-fault currents that can cause loss of life. Ground-fault current flows through a person who is using an appliance with faulty insulation and at the same time, is in contact with an electrical ground such as a plumbing fixture, wet floor or earth.

If, for example, the electric razor you are using gets wet, the breaker will automatically trip to avoid electrical shock. To reset, push the switch marked "reset." This outlet should be checked periodically by pushing the test button on the outlet itself. When this is done, there should be no 110-volt power in the outlets or 110-volt lights.

The ground-fault receptacle will not protect against short circuits or overloads. The circuit breaker or fuse in the electrical panel which supplies power to the circuit provides that protection.

CAUTION: Even with the protection of the GFI outlet, an electrical shock may occur, but such shock will be of less than normally dangerous duration. Persons with acute heart problems or other conditions which may make that person particularly susceptible to electrical shock may still be seriously injured. The outlet also does not protect against overloads of circuits.

Testing
Push yellow "TEST" button. Red "RESET" button will pop out, exposing the word "TRIP". Power is now OFF at all outlets protected by the INTERRUPTER. This indicates that the device is functioning properly.

If "TRIP" DOES NOT SHOW WHEN TESTED, DO NOT USE ANY OUTLET ON THIS CIRCUIT. RE-CHECK TO MAKE SURE INSTALLATION IS DONE CORRECTLY. To restore power, push red "RESET" button back in.

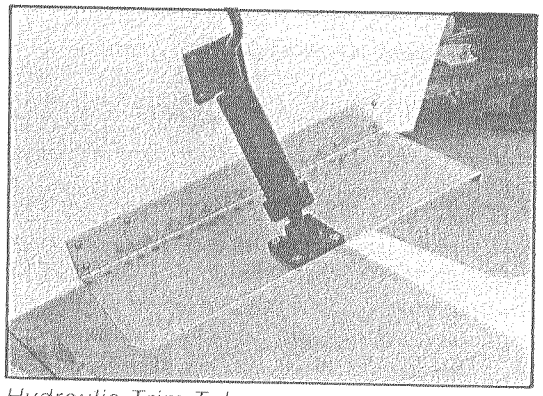
WINDSHIELD WIPER

The wiper motor supplied with your Sea Ray is the finest obtainable. All good equipment, however, requires some maintenance. Do not increase the size of the wiper blade. The manufacturer has engineered the motor for that exact load. If the wiper does not operate:

1. Check fuse
2. Check switch
3. Check that wiper arm is securely attached to motor.

ELECTRIC HYDRAULIC TRIM TABS

Your Sea Ray Family Cruiser may be equipped with optional electric hydraulic boat levelers. These are installed on the transom of your boat and are operated by switches located at the helm. Proper use of your boat levelers will allow you more positive control of both lateral and longitudinal trim.



Hydraulic Trim Tab

The riding attitude of your Sea Ray Family Cruiser is important in that it affects performance and passenger comfort. If you will consider both lateral and longitudinal trim, there is much you can do to improve the ride of your boat.

Proper lateral trim is mainly a function of weight distribution within your boat. As batteries, gear and passengers are added, any significant lateral weight imbalance will cause your boat to list to one side or the other when at rest, at idle, and probably up through cruising speeds.

The two trim planes on the transom of your Sea Ray Family Cruiser boat work like ailerons on an airplane and can be used to trim the list of your boat that may be caused by improper storage of gear, too many people on one side, or strong cross wind.

Longitudinal trim is affected by weight distribution and by the angle of the stern drive cavitation plate in relation to the bottom of your boat. Too much gear and passenger weight too far aft will result in a bow high attitude and slow planing.

Operation
For longitudinal trim adjustments: To bring the bow of your boat down, depress the "bow down" portion of the switches. To raise the bow of your boat, depress the "bow up" portion of the switches.

For lateral trim adjustments: If your boat is listing to one side when underway, depress the "bow down" portion of the switch on the opposite side to level it up.

Until you become used to the operation of the boat levelers and their effect on the trim of your boat, it is suggested that you operate the switches in "half second bursts." Reaction to tab adjustments is not immediate and it will take a few seconds for you to notice the change in the running attitude of your boat.

In heavy following seas, or when running an inlet, best maneuverability is obtained with a bow-high attitude. To be sure the planes are full up in the zero position, push the up buttons for several seconds. You will then have the seaworthiness that Sea Ray Family Cruisers has designed into the hull for your safety.

CAUTION: When run wide open most boats do not require any trim unless loaded. Do not overtrim as the bow may dig and the boat veer. It is possible to lose rudder control with the bow trimmed all the way in the down position.

Stay clear of tabs and hinges when operating them.

Do not use tabs as a loading platform: injury may occur from slipping on the edges of the tab.

When boat is at dockside, it is recommended to retract tabs.

During extended periods storage tabs should be left partially down to prevent seals from drying — see boat leveler manual.

If your boat is equipped with Mercruiser power trim or OMC SelecTrim, please remember that longitudinal trim is also affected by the trim of the sterndrive. Again, you will need to experiment a bit to determine how to get the best results from each trim system.

Maintenance:
The hydraulic pump which activates the trim tabs is mounted on the inside of the transom of your boat. The fluid level in the pump reservoir should be checked periodically by removing the small rubber stopper from the pump reservoir. If the fluid level is low, fill with clear Type A transmission oil

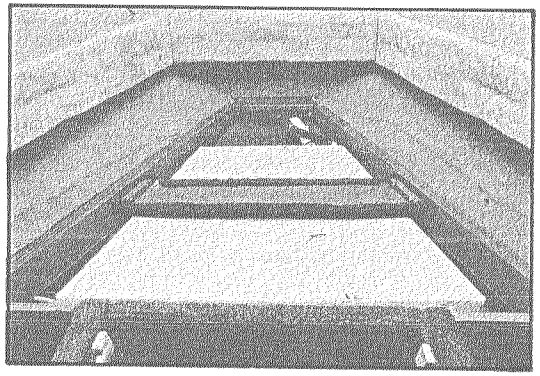
CAUTION: Keep hydraulic oil away from eyes or mouth. Disconnect power to unit while servicing so no shorts may occur.

Painting of Tabs
In order to keep growth from cylinders and tabs, we recommend you see your local marine paint supplier for proper primer and anti-fouling paint.

CAUTION: Do not paint cylinder rams.

Fresh Water System
Your Sea Ray Family Cruiser may be equipped with a pressurized fresh water system. This system is comprised of several component parts; fresh water tank, water filter, pressure pump and water faucets. In addition, you may have an optional water heater and/or shower assembly.

Operation
Theory — This system is designed to supply fresh water to the faucets and water heater automatically by the self-priming water pump. When the system's water pressure drops, (which would occur when opening one of the faucets) the water pump will automatically be activated to pump water until the pressure builds to the appropriate level. When the pressure reaches this level, the pump will automatically turn off.



Fresh Water Holding Tank

To operate:

A. Fill fresh water tank at water deck plate. CAUTION: Fill the tank only from sources known to provide pure drinking water.

To assure complete sanitation of your potable water system, it is recommended that the following procedures be used. This applies if it is a new system, one that has not been used for a period of time, or one that may have become contaminated.

1. Prepare a chlorine solution using one gallon of water and ¼ cup of Chlorox or Purex household bleach (5% sodium hypochlorite solution). With tank empty, pour chlorine solution into tank. Use one gallon of solution for each 15 gallons of tank capacity.

2. Complete filling of tank with fresh water. Open each faucet and drain cock until all air has been released and entire system is filled.

3. Allow to stand for three hours.

4. Drain and flush with potable fresh water. (IMPORTANT)

5. To remove excessive chlorine taste or odor which might remain, prepare a solution of one quart vinegar to five gallons of water and allow this solution to agitate in tank for several days by vehicle motion.

6. Drain tank and again flush with potable water. (IMPORTANT)

The above recommendations conform to Section 10.8 in the A119.2 code covering electrical, plumbing and heating of a recreational vehicle. The solution is approved and recommended by competent health officials.

B Turn on "Water System" switch located on helm switch panel. Pump should immediately be activated. Open all faucets to bleed the system of air.

NOTE: Allow a short period of time for pump to fill water lines and water heater tank. When pump turns off, you may want to add additional water to the water tank.

CAUTION: Turn switch off when tank is empty or when water system is not in use.

Trouble Shooting

Motor does not operate — Is the battery charge too low? Are the wires disconnected? Is the switch in the "on" position? Is the fuse good? Is the pump head frozen? If so, place a lamp bulb near the pump to thaw.

Pump runs but water does not appear — Is there water in the tank? Are there kinks in the hose? Is air leaking into the inlet hose or fittings? Is the inlet line clogged? To check remove the outlet hose and try again. If water flows the problem is further on in the system.

Motor runs but water sputters — This indicates air is getting into the lines. Check hose and clamps on the input side of the pump. Restart and allow air to clear from the lines and hot water tank.

Pump cycles (rapid on/off) — Cycling of the pump is normal if the flow of water is restricted to less than the flow capacity of the pump. For example, a faucet partially opened. Under these conditions the pump will cycle on and off in a rhythmic interval.

Abnormal cycling — If the pump cycles on and off when all faucets are closed, something is wrong. Most likely there is a leak somewhere. Check faucets for dripping. Correct any leak no matter how small.

If no leak can be detected, shut off the pump. Remove the output line. Insert a cap or plug in the open end. You can make a plug from a barb fitting with a cap tightly screwed on the threads.

If a threaded fitting, use a cap or plug. Either way — there must be **no** leak. Turn the pump switch on. The pump should come on, run a few seconds and shut off. If the pump remains off the problem is **not** the pump. The problem is in the system. If however, the pump goes on and off there may be a problem in the pump. There may be an internal pump leak which allows water to escape from the high pressure area back into the low pressure inlet area causing the pump to cycle. This may be caused by a valve held open by a foreign particle or by a crack in the casting.

Pump does not shut off — The water system switch may be used for temporary control of the pump. A low battery may be the cause. Voltage should be 10¼ volts or more to the pump. Low voltage may provide energy enough for the motor to run but not enough for it to reach shut off pressure. Also the switch mechanism may be stuck. Try tapping the switch cap on the end of the pump with the handle of a screwdriver.

If you are unable to isolate the problem, contact Shurflo via one of their toll free numbers (1-800-854-3218) and request the name of the nearest Shurflo service centers for professional help.

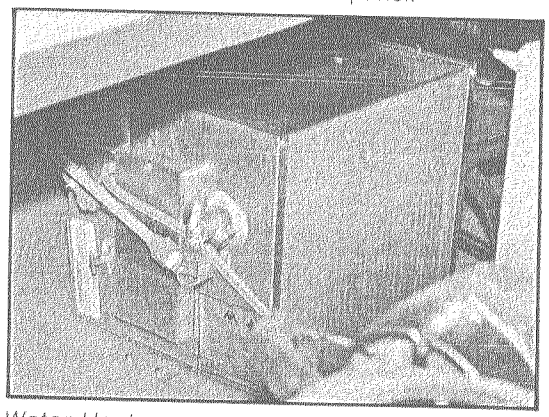
Reduction in water flow — Disassemble water filter, remove any particles which would restrict water flow.

Water doesn't get hot — For water to heat, the engine must be running or 110v. power must be supplied to the water heater. Check to see that water heater switch, located in master breaker panel, has been turned on.

Water Filter — It is essential that a filter be used in the pump input line to prevent particles from entering the pump head. This filter is located between the water tank and pump. A reduction in the amount of water being pumped may be due to a collection of particles in the filter. Periodically disassembly the water filter and remove any particles that might restrict water flow.

WATER HEATER OPERATION

110 Volt Heating — The electric switch is located in the master breaker panel.



Water Heater

CAUTION: Before turning the switch on, be sure heater tank is filled with water. An empty tank will burn out the heating element. The electric heating element is a long-life immersion type 110v.-1250w. size. The 6-gallon supply tank has a recovery rate of 13 gallons per hour (40° rise). The water heater is equipped with a thermostat to allow desired temperature settings. A built-in high limit

safety switch automatically turns the electricity off when the temperature rises above pre-set limits.

WATER SYSTEM MAINTENANCE

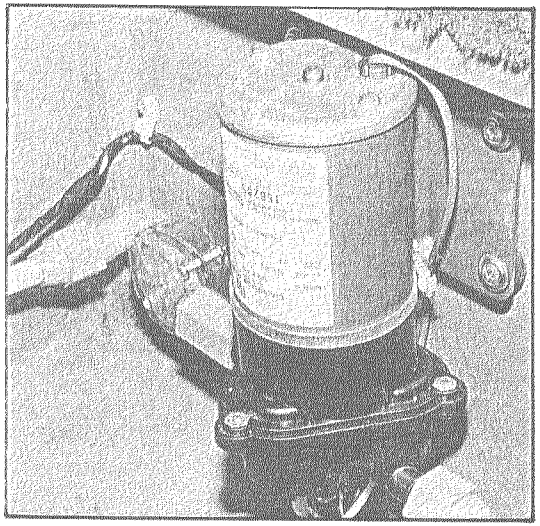
Water Tank — You may want to periodically drain and flush-out your water tank. Refer to procedure listed under "To Operate".

Winterizing

Satisfactory winterizing requires draining the water from the entire water system.

Water Tank — Open a faucet and allow the pump to pump the tank dry.

Water Pump — Remove the outlet hose on the pump. Turn the pump on, allowing it to pump out any remaining water — about a cupful. A towel or rag can be used to catch this water. Should you wish to blow the lines out with air, apply the air nozzle to the system where the outlet hose has been removed. Be sure all valves are open.

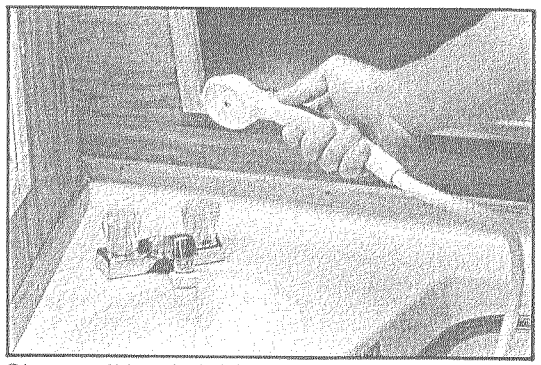


Water Pump System

Water Heater — Drain the water heater tank by opening the petcock at the cold water inlet. Remove all hoses and blow the lines out with air.

SHOWER OPERATION

Snap on hose by push/pull movement of release/coupler ring on Hose Coupler. To remove hose, repeat push/pull movement and snap hose off faucet.



Shower (Hand Held)

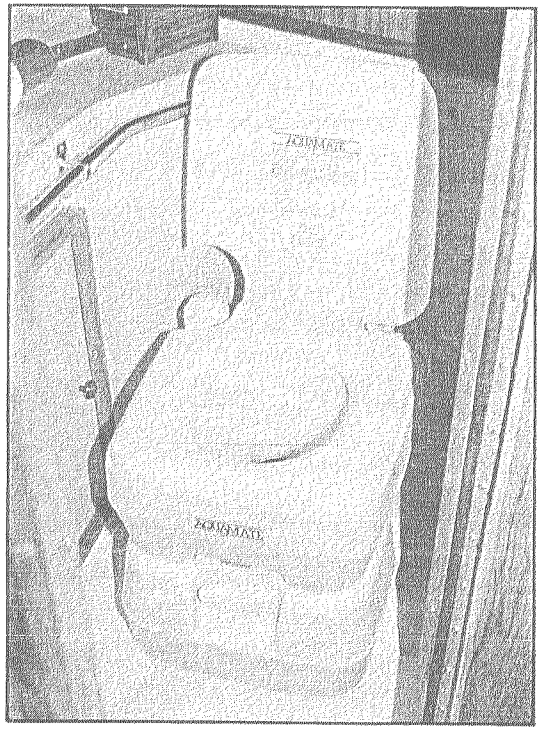
The push button hand showers are designed to allow a slight trickle of water in the off position, a feature which serves as a relief to eliminate back pressure build-up and to alert the bather that the shower water is on.

The shower is equipped with an automatic shower sump pump. It is important to keep the shower drain clean. Hair can cause the shower pump to become jammed. After using the shower, it is advisable to run about a gallon of clean water through the shower drain to clean out soap residue from the shower sump and pump. (Some models are equipped with a manual override sump pump switch near the shower)

NOTE: After use and unit is detached, drain hose over sink to remove water prior to storage.

HEAD

Your Sea Ray Family Cruiser may be equipped with a portable or permanently installed head. The portable head, which has an easy to handle waste storage tank mounted underneath the fresh water storage tank, can be disposed at any dumping site. The head, when permanently installed, would require discharge at a dockside pump-out station.



Portable Head

Operation Preparation

1. Disengage the top section (fresh water tank) by pulling upper clasp handle out (see Fig. A). Lift the fresh water tank from the waste holding tank and set it down with the handle and cap facing upward.

IV

2. Remove cap and fill the tank with fresh water to the 10 liter mark (2.6 gallons) on underside of tank (see Fig. B). DO NOT POUR WASTE HOLDING TANK DEODORANT INTO THE FRESH WATER TANK. Replace the cap and tighten securely.

3. To add a holding tank deodorant to the waste holding tank, first pull waste valve handle straight out (see Fig. C). Add chemical directly into the waste holding tank (see Fig. D).

CAUTION: Never pour an odor control chemical into the bowl with the waste valve handle closed. Under certain conditions, pressure build-up could result in the contents of the bowl blowing back when flushing. Before each use, always check the pressure build-up by pulling out waste valve handle with the seat cover closed.

To Flush

1. Depending on personal preference, you may wish to add water to the bowl before each use. To add water, simply press the flushing bellows one or more times.
2. To flush after use, first close seat cover. Pull waste valve handle, located at front of unit, straight out. Press down firmly on the flushing bellows one or more times. Waste and water will be rinsed into the hold tank.
3. To close the holding tank after flushing, push the waste valve handle in all the way. This will insure a positive seal.

To Empty Waste Holding Tank
For Portable Application:

1. Make sure waste valve handle is in closed position.
2. Pull upper clasp handle out and lift upper water supply tank from waste holding tank.
3. Separate waste holding tank from mounting base by removing two tie-down screws located on sides of tank.
4. Carry unit to permanent toilet facility. Position waste holding tank with carrying handle and cap facing upward. Remove cap.
5. Carefully empty contents into the permanent toilet facility.
6. Rinse the waste holding tank and recharge with holding tank deodorant.
7. Replace waste holding tank cap and reassemble unit.

For Permanent Application:

The waste holding tank of the head is ready to be emptied when the contents approach the level of the holding tank valve. Connect pump-out station evacuation hose to deck fitting and evacuate tank. While still connected to pump-out station discharge hose, you may wish to rinse the holding tank using a cleaner diluted with several gallons of fresh water. Be sure to evacuate rinsing solution before disconnecting the pump-out station evacuation hose.

Storage

Empty fresh water tank and waste holding tank. Rinse out holding tanks using a solution of one cup (237 cc) of bleach (5% solution) per gallon (3.8 liters) of water.

Maintenance

To clean head, use a non-abrasive, noncaustic cleaner.

Lid and seat detach easily for cleaning.

Aside from simple cleaning, the head requires no routine maintenance. If, after extended use, holding tank valve begins to stick, merely apply a light film of silicone lubricant to the blade.

Winterizing

For cold weather use, add non-toxic antifreeze to the fresh water tank to protect against freezing. Used according to instructions, this will protect fresh water supply and waste holding tank contents in sub-freezing temperatures.

CAUTION: Never use automotive type antifreeze.

ALCOHOL STOVE

Your Sea Ray Family Cruiser galley may feature an alcohol stove. Before attempting to operate your stove, please read these instructions carefully and become thoroughly familiar with the various parts and how they operate.

Theory of Operation

The burners use alcohol vapor for fuel. This gaseous fuel is produced by boiling liquid alcohol in the base of the burner by diverting some of the heat from the flame through the burner body.

In order to start a cold burner, it must first be heated above 180° F in order to produce the required vapor. This is usually done by burning a small amount (about ¼ oz.) of liquid alcohol in a special priming cup under the base of the burner. As the burner heats up, the liquid alcohol trapped in the burner boils, causing a flame to appear at the burner cap. If the priming cup is too full, the rising temperature also causes the priming alcohol to boil which produces a relatively high flame around the burner before it boils away. These conditions, usually termed "flare-up" are a natural consequence of the priming process and are usually not serious. A little practice will show

the correct amount of alcohol necessary to produce the required temperature. Too much alcohol will produce "flare-up" and too little will not bring the burner to a high enough temperature. A hot burner will produce a hissing sound when turned on. A cold burner will be silent or produce a squirting sound, and liquid alcohol will flow down into the priming cup. After priming, the burner must be lit before it cools off, or re-priming will be necessary.

Fuel: The burners are designed to use 95% **denatured ethyl alcohol**, which is commerically available as stove fuel or denatured alcohol shellac thinner. Satisfactory operation is also obtained with 95% isopropyl alcohol containing less than .003% by weight non-volatile material.

CAUTION: *Do not use wood alcohol (methanol) or rubbing alcohol as they will not burn satisfactorily and burner will become clogged.*

To Fill: Turn all burners OFF. Allow stove to cool. Eliminate any potential source of ignition for alcohol vapor or liquid anywhere in boat. Slowly loosen fill cap ½-1 turn. Allow pressure to escape, then remove fill cap. Fill tank ¾ full of approved stove alcohol fuel. Tank holds ¾ quart. *Never fill directly from large container.* Replace fill cap. *DO NOT use any other type of cap,* as cap includes a pressure relief valve. Wipe up any spills and wash cloth in water to remove alcohol. Check that burner controls are OFF (As far RIGHT as they will go).

To Start: Pump 20 or more times to pressurize fuel tank. Pump is located at front of stove.

To Operate: Each burner is operated by a control knob. Burner is closed when the control knob is turned to extreme right (clockwise).

Burners must be preheated to produce vaporized alcohol. Carefully pour alcohol into the priming ring at the base of the burner. Fill ring to ¾ full. *Do not overfill ring.* Ignite priming alcohol. When the allcohol is almost consumed, turn the control valve to open (counter clockwise). Preheating flame should ignite the burner; if not, use a match to ignite.

DO NOT PUT COOKING UTENSILS ON STOVE UNTIL BURNERS ARE FUNCTIONING PROPERLY.

CAUTION: FLARE-UP may occur during preheating and particularly if burner valve is opened before preheating is completed. Follow starting instructions very carefully, If flare-up occurs, shut off burner and re-start as per instructions "To Operate."

CAUTION: Use water on alcohol fires. Use Class B Fire Extinguisher on grease fires. Always make certain that the stove is securely locked in place before operating your boat. Do not operate the stove when your boat is underway or in rough water conditions.

Operation
Maintenance — Troubleshooting

When properly vaporized, all fuels tend to burn with a bright blue flame without smoke and very little odor. Improper vaporization tends to produce yellow, smokey flames and a strong odor.

In all cases, the vaporized fuel is sprayed into an open space before striking a burner plate or burner top. Here it is mixed with air to become a combustible mixture which burns efficiently. Any factors that tend to change this mixture will produce abnormal operation. Incorrect pressure, type of fuel, preheating, nipple or fuel flow will cause this. In addition, changes, disturbances in the flow of the fuel/air mixture due to damaged tubes, dirt or clogging can disrupt the burning pattern.

For additional information refer to the stove manufacturer's owner's manual, provided in your packet.

General Information: Keep priming rings and upper parts of burners free of dirt with occasional cleaning with a stiff brush. Excessive dirt causes yellow flame. A yellow flame should only occur when burners are first lit, then it should turn blue.

1. To obtain maximum performance from your new stove, it is extremely important that you use a quality grade denatured alcohol, free from impurities.
2. If you find a small flame where the control stem enters the burner, tighten the nut slightly until flame no longer appears.
3. Should you notice alcohol in or around the pump, the check valve located in the bottom of the pump barrel leaks and must be replaced.
4. If the pump bounces back when you try to pump, the check valve is stuck and should be replaced.
5. If you pump and get little or no pressure in the tank, the pump leather or U-cup (depending on age of your stove) needs replacing or oiling.
6. If your stove lights up but goes out after a while, your filler cap leaks or you did not pump enough.

7. If no alcohol comes through the burner when you attempt to prime, you have no pressure in the tank or a filter clogged by dirty alcohol. The filter seldom clogs but when it does your stove must be serviced by trained personnel.

8. If you order spare parts please give stove Model and Serial number to make sure the correct parts are shipped.

COMBINATION ALCOHOL-ELECTRIC STOVE

Your Sea Ray Family Cruiser may feature a Combination Alcohol-Electric Stove. Before attempting to operate your stove, please read the instructions supplied by the stove manufacturer carefully. The instructions can be found in your owners packet. Become thoroughly familiar with the various parts and how they operate.

LP Gas Systems

Sea Ray does not install LP (Liquefied Petroleum — often called "propane" or "butane") gas systems.

In general, it may be said that the LP gas system and equipment as offered for house and travel trailer or mobile home use is not acceptable or approved for boat installation.

REFRIGERATOR

Your Sea Ray Family Cruiser may be equipped with an optional Electric Refrigerator. This refrigerator offers you the convenience of having cold foods and beverages while at dockside or while underway.

Operation

Refrigerating temperature can be controlled by means of the thermostat dial, which also serves as the the "ON-OFF" switch. Turn the dial clockwise from "OFF" and your refrigerator is switched "ON" just before the dial reaches the "1" position.

The interior temperature drops as the dial position is changed from "1" to "5". In this way, interior temperatures can be regulated freely within the range of 45° to 32°F at the storage compartment. To switch off your refrigerator, turn the dial counterclockwise of "OFF". The dial does not turn clockwise beyond "5". For efficient operation, regulate the temperature according to the types of foods stored.

Turn the thermostat knob to "1" to shut down the refrigerator for a day or two. For a longer period, set the thermostat knob to "OFF" and remove the plug from its socket.

When not in use the refrigerator should be emptied, cleaned and dried, and the door left ajar.

NOTE: Built-in relay switches automatically to correct power supply.

A. Suppose the refrigerator is operating on 117 volt A.C. (at home, trailer park, shore-power connection on boat dock, etc.) and then the power source is disconnected by switches or by pulling the plug, the relay automatically switches the refrigerator over to the 12 volt D.C. power source and continues to operate the compressor, providing, of course, the leads are connected to the battery.

B. If the refrigerator is installed in a trailer or boat and operating normally on a 12 volt battery, then when 117 volt A.C. power is available at home, campsites, boat docks, etc., by just plugging in the A.C. power cord the relay switches the compressor over to A.C. operation. This will save on power consumption and keep your battery in good condition.

Ice Making

Fill the ice-tray with water to within ¼ inch from the top and place in the freezing compartment. When ice has formed the ice-tray can be released from the compartment simply by lifting one corner. Then remove the ice by first pouring water on the underside of the tray. Individual pieces of ice can be extracted by flexing the divider.

Defrosting

Set the thermostat dial to "OFF". When frost is melted, wipe the compartment plates with a soft, dry cloth. The best suggestion is to set the dial to "1" before you retire for the night. The frost will be gone the next morning.

CAUTION: Safety Latch — The safety latch should be in place to secure the door in case contents of box shift against it when the boat rocks.

Maintenance

Cleaning Box and Door: Wipe with a soft, dry cloth. To remove dirt, use a cloth moistened by a warm neutral detergent solution. Never use hot water. After cleaning, wipe with a dry cloth.

Gasket (door cushion): Wipe away dirt with a soft cloth moistened by a neutral detergent. Do not soak the cloth excessively. If water gets inside, the insulating effect may become temporarily impaired.

Attachments: Wash all attachments in soapsuds. Rinse and wipe clean with a dry cloth.

CAUTION: Never use a brush, powder soap, cleanser, acid, benziene, gasoline or thinner. These tend to leave scratches on the coating.

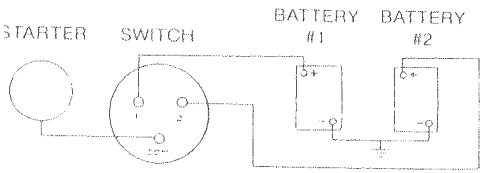
Caution
In order to avoid an excessive drain of your battery, it is advisable to keep the thermostat setting at the #3 setting position when ambient temperatures are in the 70° to 90° F. When frozen food is stored in the freezing compartment, advisable thermostat setting is the #5 setting at the same temperature conditions.

Maintenance of Battery is Important
If the charge of your battery is not sufficient a decline in the cooling performance of your refrigerator can be expected. If 110 V, 60 hertz, electric power supply is available, A.C. operation is recommended to keep your battery in good condition. A.C. power is AUTOMATICALLY applied, if your boat's 110 volt electric system is connected to the 110 V shore power supply.

Never employ "quick charge" to your battery unless thermostat has been turned to "Off".

Never use a commercial 12 volt D.C. to 117 volt A.C., 60 hertz inverter or converter for operating your refrigerator on A.C., since these devices do not hold the required constant frequency.

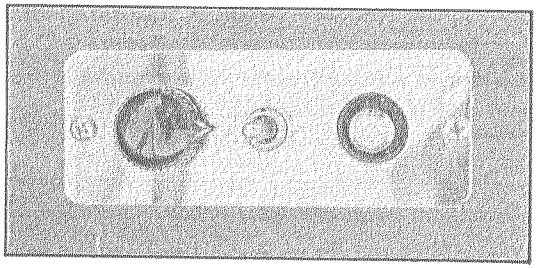
DUAL BATTERY HOOKUP
The *Wiring Diagram shown below* is recommended for *dual battery hookup.*



CAUTION: Any switches, leadwires or other electrical equipment should not be common with wiring between your refrigerator and battery, because this equipment often generates high voltage pulses and can cause transistor effects in the inverter.

Sea Ray Boats

SEARCHLIGHT
Your Sea Ray Family Cruiser may be equipped with an optional remote searchlight. The searchlight is mounted on the bow as far forward as possible in order to eliminate glare from the deck of your boat. The control panel is located at the helm.



CAUTION: Although a searchlight is used for night navigation, never operate your boat at a speed faster than circumstances would allow.

Operation
A. Lightswitch — Spot/Off/Flood switch positions.
B. Directional Switch — Move it up or down, left or right, and the light will move in the same direction.
C. Variable Speed Control — Turn the knob for fast or slow movement of the light head.

NOTE: When searchlight is not in operation, we recommend facing the light aft to protect the bulb from flying objects.

Maintenance
Bulb Replacement — Loosen screw and remove bulb retaining ring. Disconnect wires from faulty bulb. Connect wires to new bulb as shown below. Install bulb and fasten with bulb retaining ring.

Trouble Shooting
No illumination of bulb — Check for blown fuse located behind spotlight switch. Check for 12v. power to bulb if power is supplied, replace defective bulb.

No movement of light head — Check for blown fuse located behind spotlight switch. Check for 12v. power being discharged *from* switch. If 12v. power is supplied to switch but not discharged from switch, the switch is defective and must be replaced.

Dual filament bulb works in reverse (up is spot, down is flood) — Disconnect orange and gray wires. Reconnect as follows: (Orange from light) to (Gray from switch), (Gray from light) to (Orange from switch).

Control lever works in reverse in horizontal direction only (left is right and right is left) — Disconnect Yellow and Blue wires. Reconnect as follows: (Yellow from light) to (Blue from switch), (Blue from light) to (Yellow from switch).

Control lever works in reverse in vertical direction only (up is down, down is up) — Disconnect Green and Violet wires. Reconnect as follows: (Green from light) to (Violet from switch), (Violet from light) to Green from switch).

Light moves in only three of the four possible directions: One Horizontal direction is inoperative — Reverse connection as in Step 3. If opposite horizontal motion becomes inoperative, replace the switch. If problem persists, return light for service.*

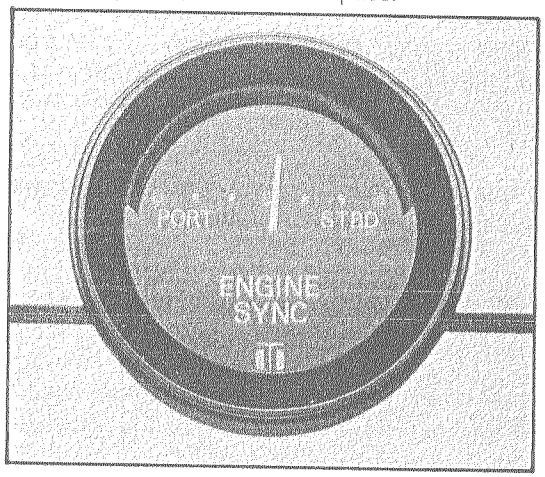
One vertical motion is inoperative — Reverse connections as in Step 4. If opposite vertical motion becomes inoperative, replace the switch. If problem persists, return light for service.*

*Return light for service at the factory, ITT Jabsco Products, 501 W. Liberty St., Springfield, Ohio 45501 (1-513-325-8701)

ENGINE SYNCHRONIZER

How It Works

The Engine Synchronizer is an electrical pulse integrator. The synchronizer for gasoline engines takes the pulse from the ignition system. The needle will lean to the faster engine with optimum R.P.M. alignment reached when the needle is centered. Accuracy is 100%. It does not interfere with the operation of the ignition system, radio or compass.



GAS VAPOR DETECTOR

Operation

Move the control switch on the indicating head from "off" to "on". The blue lamp will light and remain lighted for approximately one minute. (This is a built-in delay to insure that the sensor has reached proper operating temperature.) At the conclusion of this one-minute period, the circuit shifts automatically to the active mode and if the atmosphere in the vicinity of the sensor is clear, the green lamp will light. If a dangerous condition exists, the amber lamp will light and the audible alarm will sound. If the condition approaches explosive, the red lamp will light and the audible warning sound will become more intense.

After the unit is in operation, the circuit may be tested at any time by rotating the control switch to "test". When this is done, the red lamp will light and the alarm will sound. After a few seconds, the amber lamp will light and the alarm will stop, indicating that all circuits are satisfactorily operating and that a safe condition exists. Should the atmosphere be unsafe during the test procedure, the red or amber lamp will remain lighted and the horn will continue to sound. The control switch may be left in the "test" position or returned to the "on" position, but monitoring continues in either case.

MARINE COMPASS

The magnetic marine compass is a sensitive and very useful instrument. It requires little or no attention once it is installed and properly adjusted.

Operation

Some basic knowledge of this instrument is helpful in understanding its operation. It can be deflected and its usefulness impaired by other instruments or objects containing iron, magnets or electric current-carrying wires in its vicinity. A newly installed compass must be adjusted to compensate for these influences if it is necessary that they remain in proximity to it.

The compensating, or adjusting, should be done by a well qualified compass adjuster. It is seldom that a compass can be corrected to zero deviation on all headings, so he will provide you with a deviation card or chart showing the correction to be applied when laying out a compass course or making your navigational calculations.

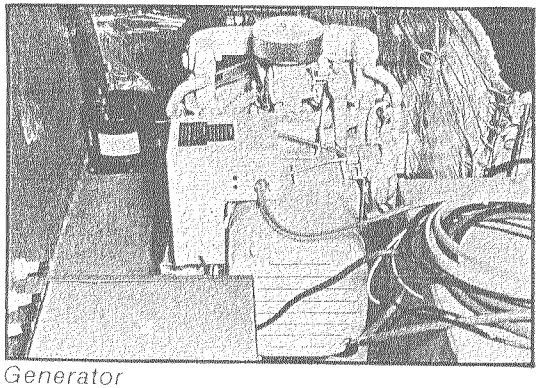
After your compass is adjusted, do not permit items which might affect it to be placed near it, even temporarily. It must be readjusted if any influencing item for which it has been compensated is removed, relocated or added in its vicinity.

Care and Maintenance

The compass dome should be cleaned with care to avoid scratching. A soft cloth moistened with water is recommended. Avoid the use of any abrasive or strong cleaning solutions as these may be harmful to the surface. Any good grade of paste wax can be applied to the dome so as to retain its luster and optical clarity.

GENERATOR

Your Sea Ray family cruiser may be equipped with an optional Generator. An on-board generator is designed to supply your boat with 110 volt power while underway or at dockside, when shore power is not available. The generator is supplied with fuel from your boat's main fuel tank. It receives 12 volt power from a battery separate from your boat's main battery system. The generator is cooled by sea water collected from a thru hull inlet located near the keel. A shut-off valve and sea strainer are located in the bilge between thru-hull inlet and generator. This valve must be open when operating generator. The generator is cooled as sea water circulates through the block and is then discharged overboard at exhaust thru-



Generator

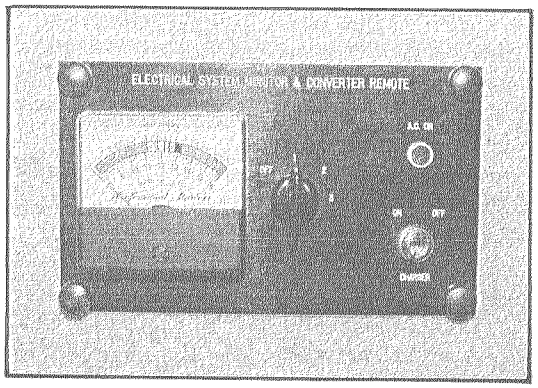
hull located above the waterline. For detailed information on your generator, refer to the manufacturers owners manual supplied with the unit.

AIR CONDITIONING/HEATING SYSTEM

Your Sea Ray family cruiser may be equipped with an optional air conditioning/heating unit. When supplied with 110v. power, this system will control the cabin temperature of your boat. The air conditioning/heating system is controlled from a switch panel located in the cabin of your boat. This switch panel consists of three control knobs, system switch, fan speed control, and thermostat. The air conditioner is cooled by sea water collected from a thru-hull inlet located near the keel. A shut-off valve and sea strainer are located in the bilge between thru-hull inlet and air conditioner. This valve must be open when operating the air conditioner. For detailed information on your air conditioning/heating system, refer to the manufacturers owners manual supplied with the unit.

A.C.-D.C. CONVERTER

Your Sea Ray family cruiser may be equipped with an optional A.C.-D.C. Converter. This converter is a fully automatic solid state unit designed to convert shore power or on board generator current (110 volt A.C.) to 12 volt D.C. current for re-charging your 12 volt battery system. When your boat is not in use, the use of a converter provides confidence that your battery system will be fully charged and ready for use when you are.



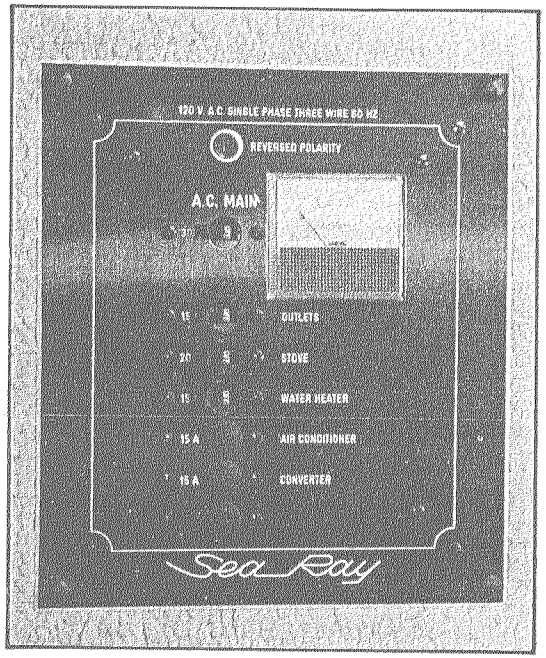
Operation

For further information, refer to separate instructions supplied with the converter.

Operation

Energizing 110v.-120v. A.C. System —

1. Turn the main breaker and all branch circuit breakers off at the main breaker panel.
2. Plug the shore power cord into your boat receptacle *FIRST* and then into the dock receptacle.
3. Observe the polarity light on the main panel. The polarity light will alert you to a reversed polarity condition in the dockside wiring on shore. If the red polarity light is *not on*, dock polarity is safe to use. Caution: If red polarity light is *on*, the dock polarity is wrong and your A.C. power system cannot be energized. If this condition occurs, the main circuit breaker will trip and the light will activate. Disconnect the shore power cord at the dock receptacle and then report the problem to the dockmaster. *Do not* reconnect the shore power cord until the problem has been corrected. The light will remain on until the condition is repaired.
4. Turn on the main breaker and branch circuit breakers and your A.C. system is energized and ready for use.



Shut-down of A.C. System —

1. Turn the main breaker and all branch circuit breakers off at the main breaker panel.
2. Disconnect shore power cord at dock.
3. Disconnect shore power cord at your boat.

NOTE: During electrical storms and power surges, the main breaker can be tripped in the A.C. system. This protects all A.C. components and appliances from damage. This breaker should be checked after storms and surges.

V. Safety Procedures

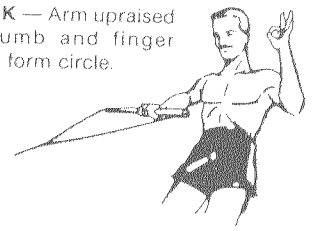
A. Passenger Safety

As a skipper, it is up to you to look out for the safety of your passengers. As noted, the Coast Guard requires you to have one approved flotation device for each passenger aboard. Make sure that all children and non-swimmers actually *wear* jackets while boating. Request that your guests wear soft-soled, non-skid deck shoes. Hard-soled shoes are slippery and can result in a fall. Always see that your passengers are properly seated while underway. **Never *allow passengers to sit on the fore deck, gunwale, or on top of seat backs while the boat is in motion.*** Instruct at least one passenger on the proper operation of your Sea Ray just in case something should happen to *you*.

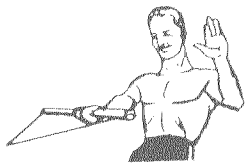
B. Swimming & Waterskiing — Diving

These pastimes are three of the greatest joys connected with boating, but they also represent a potential danger if performed carelessly around a boat.

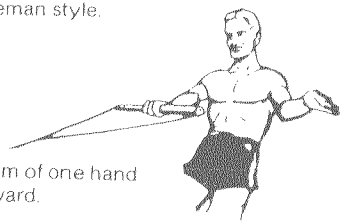
When skiing, always have two people in the boat — one to concentrate on operating the boat and watching the water ahead: the other to keep an eye on the skier. Some states require the observer to be at least 12 years old (it's the law). Insist that all skiers wear a U.S.C.G.A. properly fitting ski vest. Always keep your boat a safe distance from bathing beaches and areas in which skin divers may be operating. ***A spinning propeller is extremely dangerous.*** *Always* turn off the engine when taking swimmers or skiers aboard, or when putting them overboard.



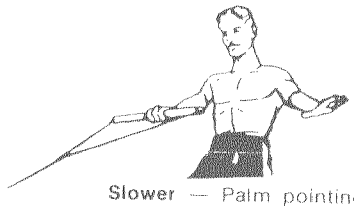
Speed OK — Arm upraised with thumb and finger joined to form circle.



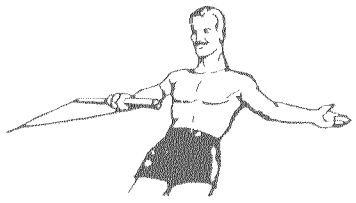
Stop — Hand up, palm forward, policeman style.



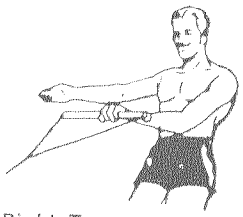
Faster — Palm of one hand pointing upward.



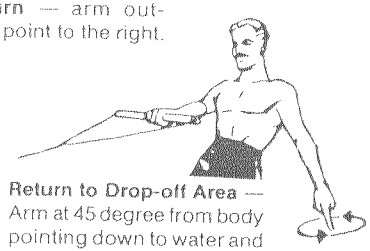
Slower — Palm pointing down.



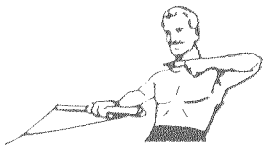
Left Turn — Arm outstretched point to the left.



Right Turn — arm outstretched point to the right.

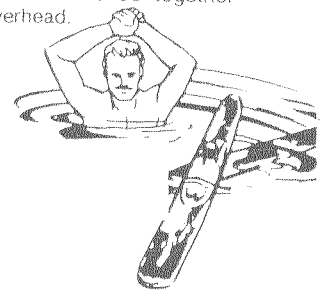


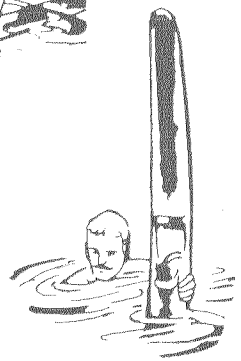
Return to Drop-off Area — Arm at 45 degree from body pointing down to water and swinging.



Cut Motor — Finger drawn across throat.

Skier OK After the Fall — Hands clenched together overhead.





Pick Me Up or Fallen Skier, Watch Out — One ski extended vertically out of water.

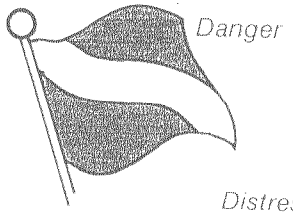
Water Skiing:
The following guides will do much to reduce the hazards while water skiing.

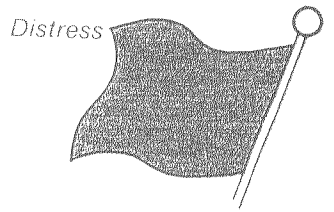
1. Water ski only in safe areas, away from other boats and swimmers, out of channels, and in water free of underwater obstructions.
2. Do not allow anyone who cannot swim to water ski.
3. Be sure that the skier is wearing a proper U.S.C.G.A. flotation device. A properly designed ski vest is intended to keep a stunned or unconscious person afloat.
4. Always carry a second person on board to observe the skier so that full attention may be given to your operation of the boat and the waters ahead.
5. Approach a skier in the water from the starboard side, and be certain to stop your motor before coming in close proximity to the skier.
6. Give immediate attention to a fallen skier.

To the left you will find a set of hand signals recommended by the A.W.S.A. (American Water Skiing Association). Skier, observer and boat operator should all know and understand these simple signals from the skier.

Diving:
Respect These Flags
Danger (Red)
The SPORT DIVERS FLAG indicates a diver in the water. You should keep a *minimum* of 30 yards between your boat and this flag. "A life is worth more than a few feet of water."

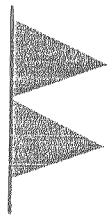
Distress (Orange)
The DISTRESS FLAG indicates a boat or passenger in serious trouble. When seeing it, you should respond and render any assistance possible. Remember — it could be *your* boat displaying this flag.





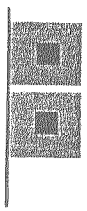
Storms/Rough Weather
A wise boatman keeps a sharp eye out for impending storms or high winds. When a storm is detected approaching, head for the nearest shelter and wait it out. If you are unfortunate enough to be caught in open water during a storm, have everybody put on life jackets and sit low in the boat. Keep the bow headed into the waves with enough power to maintain slow headway.

RED FLAG — Small craft (winds to 33 knots)



2 RED FLAGS — Gale (up to 47 knots)

SQUARE RED FLAG — BLACK BOX —(Storm)

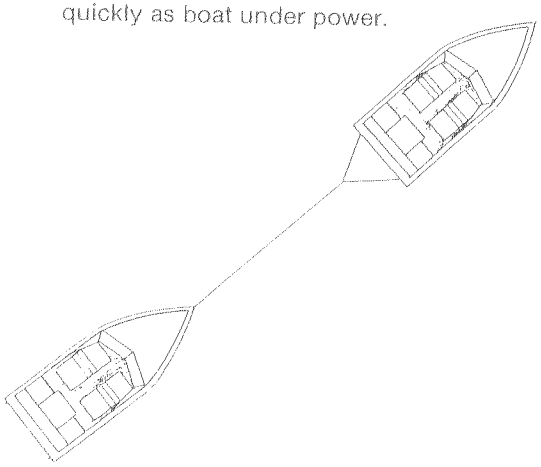


2 SQUARE RED FLAGS BLACK BOX — (Hurricane)

V

Towing a Distressed Vessel

1. **Tow with line of suitable diameter and tensile strength.**
2. **Fasten line to bow eye or stern eyes. Do not *fasten to cleats or rails.***
3. Tow at very slow speed.
4. Always be cautious of "Back-lash" should tow line snap while underway. (Flexible line is not recommended)
5. Keep ample distance between the two boats as towed boat will not slow as quickly as boat under power.



Boating Safety Courses

Your local Coast Guard Auxiliary or Power Squadron generally puts on a Safe Boating Class several times a year. They are very comprehensive and generally of minimal cost to you. Call your local US Coast Guard Auxiliary or Power Squadron Flotilla for the time and place of the next class.

C. Regulations — Safety Procedures and Safety Equipment

Government Regulations

The Coast Guard is an ever-present help to the boating public. Its boating regulations prescribe minimum standards of safety and you should equip your Sea Ray so that it complies with these regulations.

Safety Procedure and Equipment

The safety equipment you own and the procedures you follow depend solely on you, the boat owner. Many safety features have been incorporated in your Sea Ray but more can be added as needed to meet your particular requirements.

Signal flares should be carried by boats going offshore.

The Coast Guard regulations, however, make it obligatory to carry certain items of equipment. These vary with the size of vessel and are detailed below:

A. An approved hand held fire extinguisher.
B. At least one Coast Guard approved, personal flotation device for each person aboard (life jackets).
C. At least one approved throwable device (ring buoy or buoyant cushion).
D. One hand, mouth, or power-operated whistle or horn, audible for at least one mile.

In addition, it is recommended that you carry an anchor, anchor line, tie-up lines, fenders, first aid kit, waterproof flashlight, distress flares, spare fuses and electrical tape.

Fueling Practices and Procedures

Gasoline fumes aboard a boat can be extremely dangerous. To minimize the chances of an unfortunate accident, observe the following safety precautions:

1. Before taking on fuel:
   Turn off the engine.
   Shut off all electrical systems.
   Extinguish galley stove burners.
   Extinguish cigarettes, other tobacco, and matches.
   Close all hatches and cabin door.
2. During fueling:
   Keep hose nozzle in contact with the fill pipe. (This provides a ground against a static spark.) Fill the tank slowly to avoid any spillage.
3. After fueling:
   Wash any spilled fuel off deck and hull with fresh water.
   Open doors and hatches.
   Open engine cover and sniff for any fumes. ***OPERATE BILGE BLOWER FOR AT LEAST FOUR MINUTES BEFORE STARTING ENGINE. IF ANY GASOLINE FUMES ARE DETECTED, DO NOT ATTEMPT TO START ENGINE.***

Think of yourself and others.

For your personal safety and that of your passengers and other boaters, please note the following recommendations:

Boats should not be operated by inexperienced persons until complete instructions in the use of all instruments and controls, handling characteristics at all speeds and water conditions, and driver check-out is completed under the supervision of a qualified person.

Passengers should be made aware of the possibility of being thrown to the deck, or even from the boat, if they are not carefully seated while the boat is being run.

Be especially careful in the proximity of other boats, pilings, underwater obstructions, sea walls, or other obstacles.

More frequent checks and preventive maintenance are required for high performance boats. Mechanical failure at high speeds may cause very serious consequences to persons and property.

Remember that the person in control of the boat is responsible for his own acts of negligence, carelessness, irresponsible operation or damage caused by his wake.

The following guidelines should always be followed:

Do not "show off" in tight areas or around docks.

Every experienced boatman knows that danger can attend high speed boating if trouble signs and prudent operation are ignored.

Every experienced skipper knows that choppy water demands slower speeds.

And he knows that vigilant maintenance is essential to safety in operation.

Maximum throttle should be used for very brief periods only — damage to structure and engine may result with prolonged operation.

Be certain atmospheric conditions assure clear visibility and straight runs at least one mile ahead.

Be sure that there is no possibility of other boats coming into your course from the sides.

The operator is responsible for the safety of his passengers.
Do not let passengers stand up.

Avoid sharp turns at high speed; keep one hand on the throttle at all times ready to reduce speed.

Speed According to Boat Traffic.

Modify speed in keeping with weather and sea conditions.

Modify speed depending upon debris.

Always throttle back whenever boat leaves the water to prevent over revving of the engine and undue stress on the outdrive unit when boat re-enters the water. You will damage your engine if the propeller leaves the water without an instant reduction of R.P.M.

Some Things to Check:

Achieving good performance requires regular and above average attention to hull, engine, mechanical and electrical equipment.

The bottom must be clean and smooth and checked regularly.
Passengers load and trim should be adjusted for best performance.

The propeller must match the boat and engine and be in perfect balance and condition.

Engines must be expertly tuned for maximum power output. Consult the Engine Operator's Manual and your servicing dealer for details.

Safety Review
As a boat owner, you have the responsibility for the safety of all occupants of your boat. To protect yourself, your passengers, and other boaters, follow these suggestions for safety:

1. Be careful with gasoline and gasoline fumes. ***Gas in the bilge is very dangerous.*** Use care when refueling. If gasoline is spilled inside your boat, clean it up immediately. Make certain there are no fumes in your boat before starting the engine.
2. Check all gas lines and connections periodically. Open the engine compartment and "sniff" for fumes before starting your engine.
3. Periodically check your fire extinguisher, life preservers and other safety equipment to make certain they are in good condition. Make certain that there is a U.S. Coast Guard approved life preserver for each person aboard plus one approved throwable device for man overboard protection. ***Children and non-swimmers should wear life preservers at all times.***
4. Keep an alert lookout for swimmers, divers, skiers and other boats. Be extra cautious at night or in inclement weather.
5. Watch the weather. Be especially watchful for strong winds or electrical storms. Small craft storm signals are for your information and safety. Learn them and be guided accordingly.
6. Instruct at least one of your passengers in the basic fundamentals of the handling of your boat in case you are disabled or fall overboard.
7. Turn off your engine when taking swimmers or skiers aboard or when putting them overboard. ***Never permit use of the transom swim platform while your engine is running.***

8. Do not overload or improperly load your boat. ***Don't permit passengers to ride on parts of your boat not designed for such use.***
9. Know your fuel tank capacity and your engine's hourly fuel consumption. Compute your fuel usage and use this as a backup check against the reading of your fuel gauge.
10. Watch your wake. It might capsize a smaller boat or do considerable damage to boats or property along the shore.
11. Obey the rules of the road. Neglect of this is the greatest single cause of collisions.
12. Watch your footing when on board or boarding. Require that good boat shoes be worn by your passengers to avoid the possibility of slipping.
13. Know the meaning of the buoys. Never moor to one. It is a federal offense.
14. If uncertain as to the depth of the water ahead, proceed with caution. In rough water — slow down — keep the bow headed into the waves with enough power to maintain headway.
15. Check and tighten shift and throttle and steering cable connections at least twice a year. A loose connection can result in sudden loss of steering and control.
16. Water ski in areas that are clear of other boats and always have an observer in your boat to maintain a proper look out.

On Board Tool Chest

Whether you are doing some extended cruising or just enjoying a lazy day at the lake, minor repairs can easily be made without spoiling the day.

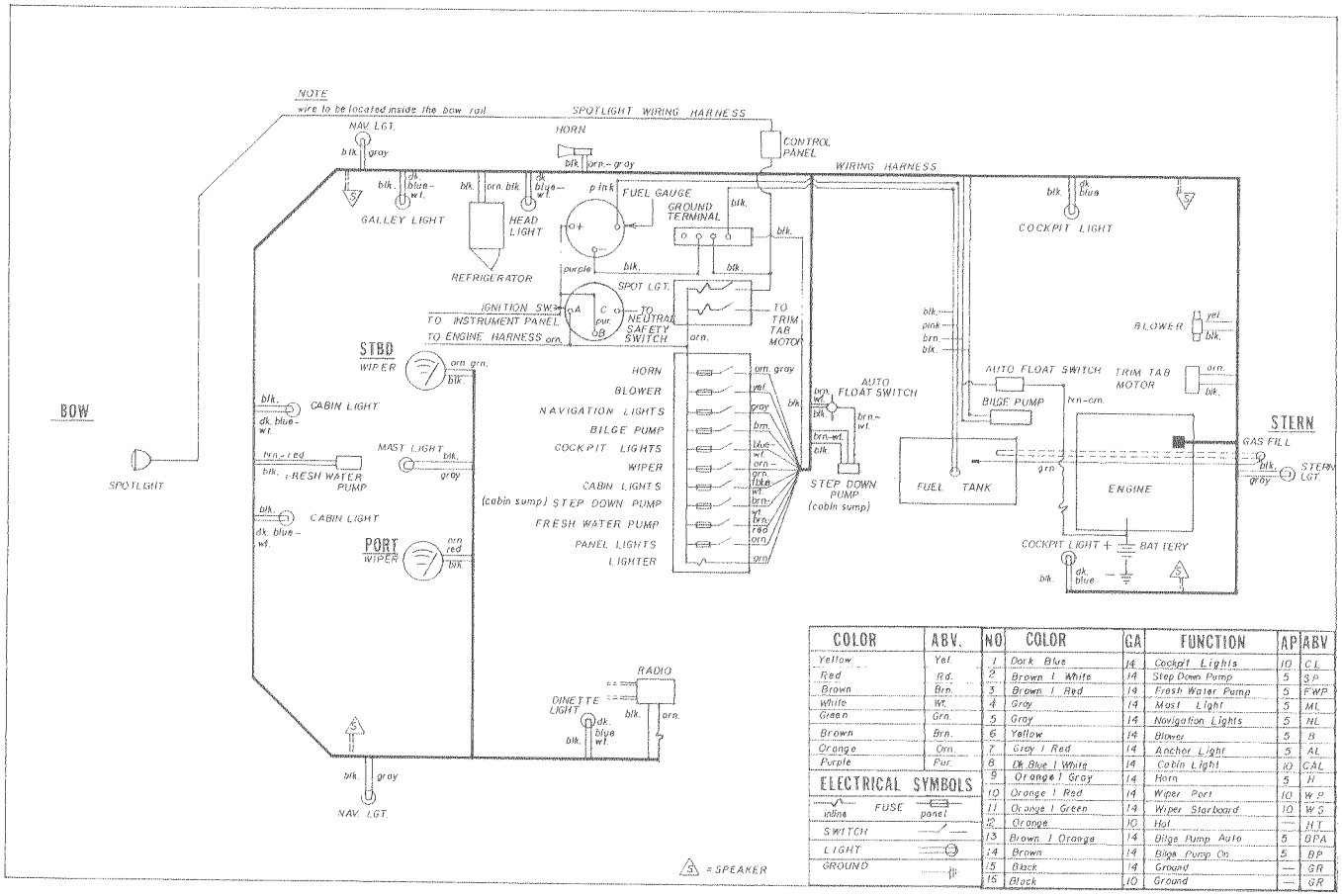
Suggested Tools:
Screwdriver set, slotted and phillips head
Hacksaw
Allen wrenches
Hammer
Jacknife
Ratchet, sockets and extension
Feeler gauges
Visegrip pliers, regular pliers
Combination box and end wrenches
Flashlight
Lubricating oil
Battery jumper cables
Water pump pliers

Suggested Spare Parts:
Set of spark plugs
Alternator belt and or water pump belt
Anti-Syphon Valve
Distributor cap
Breaker points
Condensors
Gear lubricant
WD-40
Navigation light bulbs number GE-90
Dome Lights number GE-1141
Propeller nut and washers
Spare propeller
Fuses number
AGC/3AG
2, 3, 5, 10, 15, and 20

Other Suggested Items:
Electrical tape
Friction tape
Hose clamps
Assorted screws, bolts, nuts, and washers
Penetrating oil
Water proof matches

VI. Technical Data

Wiring Diagrams



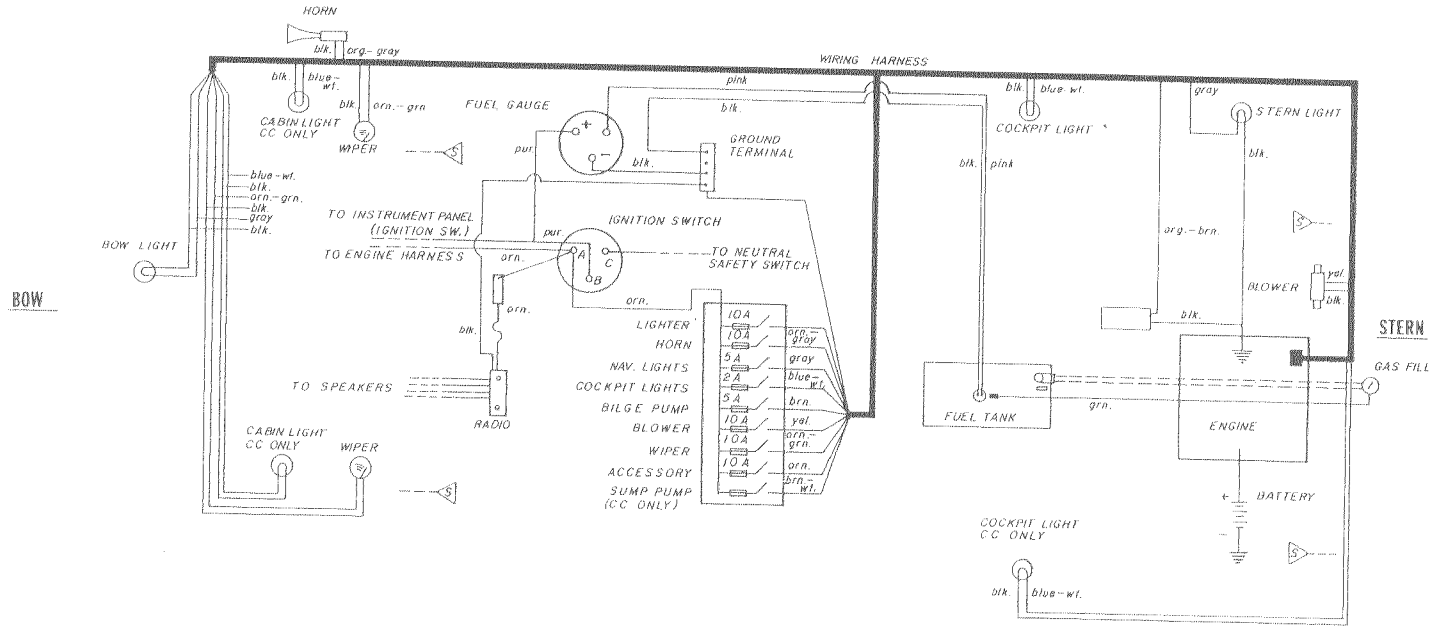
COLOR	ABV.
Yellow	Yel.
Red	Rd.
Brown	Brn.
White	Wt.
Green	Grn.
Brown	Brn.
Orange	Orn.
Purple	Pur.

ELECTRICAL SYMBOLS

FUSE (inline, panel)
SWITCH
LIGHT
GROUND

NO	COLOR	GA	FUNCTION	AP	ABV
1	Dark Blue	14	Cockpit Lights	10	CL
2	Brown / White	14	Step Down Pump	5	SP
3	Brown / Red	14	Fresh Water Pump	5	FWP
4	Gray	14	Mast Light	5	ML
5	Gray	14	Navigation Lights	5	NL
6	Yellow	14	Blower	5	B
7	Gray / Red	14	Anchor Light	5	AL
8	Dk Blue / White	14	Cabin Light	10	CAL
9	Orange / Gray	14	Horn	5	H
10	Orange / Red	14	Wiper Port	10	W P
11	Orange / Green	14	Wiper Starboard	10	W S
12	Orange	10	Hot	—	HT
13	Brown / Orange	14	Bilge Pump Auto	5	BPA
14	Brown	14	Bilge Pump On	5	BP
15	Black	14	Ground	—	GR
16	Black	10	Ground	—	GR

225 Thru 270 Sundancer Series



210 Cuddy Cruiser

Launching Record

Dealer _____

Owner _____

Boat Length & Model _____

_____

Operation before Launching — Check if OK

1. Propeller . . . . . ☐
2. Shaft turns free . . . . . ☐
3. Thru-hull fittings . . . . . ☐
4. Drain plug tight . . . . . ☐
5. Bottom clean and paint . . . . . ☐
6. Hull sides clean and finish . . . . . ☐
7. Bright work clean and finish . . . . . ☐
8. Decks clean and finish . . . . . ☐
9. Interior finish . . . . . ☐
10. Upholstery clean . . . . . ☐
11. Bilge cleaned . . . . . ☐

With Boat In Water

12. No water leaks at stern drive . . . . . ☐
13. No water leaks at thru hull fittings . . ☐
14. Hose tested for windshield leaks . . . ☐
15. Make sure negative terminal of battery is wired to ground stud on propulsion engine . . . . . ☐
16. All electrical equipment operated ok including: horn ☐ running lights ☐ bilge pump ☐ bilge blower ☐ w/wiper . . . . . ☐
17. With fuel tanks full, no fuel leaks at fill pipe, over-flow vent, or at any fuel line connections . . . . . ☐

Operation Before Starting Engine (See Engine Operator's Manual) — Check if OK

18. Distributor lubricated . . . . . ☐
19. Distributor points adjusted . . . . . ☐
20. Ignition wires in correct firing order . . . . . ☐
21. Spark plugs and coil . . . . . ☐
22. Alternator, regulator, starting motor wired correctly, connections tight . . . . . ☐
23. Throttle control and cable travel . . . . ☐
24. Shift control and cable travel . . . . . ☐
25. Crankcase oil level at FULL mark . . . ☐
26. Power Steering Pump . . . . . ☐

Starting Engines

27. Oil pressure . . . . . ☐
28. No fuel leaks in fuel lines, at fittings, at fuel filter, fuel pump, carburetor . . . . . ☐
29. No engine water leaks . . . . . ☐
30. No engine oil leaks . . . . . ☐
31. Ignition timing checked with timing light, with idling speed at 500 RPM . . . . . ☐
32. Valve tappets adjusted . . . . . ☐
33. Idling speed set at 500 to 700 RPM . . . . . ☐
34. Reverse gear shifts thru all positions and is in proper adjustment . . . . . ☐

Water Test Boat — Check if OK

35. Boat performance . . . . . ☐
36. Engine performance . . . . . ☐
37. Instruments register properly . . . . . ☐
38. Top RPM wide-open throttle for one minute after warm-up . . . . . ☐

Final Check

39. All accessory equipment operated ok . . . . . ☐
40. All loose equipment on boat . . . . . ☐
41. All boat, engine, accessory literature ready for new owner . . . . . ☐

Inspection Completed

BY: _____

DATE _____

LOCATION _____

VI

Useful Service Information

Owner _____

Home Port _____

Boat Name _____

Registration Number _____ State _____

Hull Number _____

Warranty Registration Date _____

Engine Make and Model _____ H.P. _____

Engine Serial Number _____

_____

Drive Serial Number _____

_____

Propeller Size _____ Dia. _____"

Propeller Pitch _____" Part # _____

Part Number _____

Fuel Capacity _____

Key Number, Ignition _____ _____

Key Number, Door _____ _____

Radio Call Letters _____

Selling Dealer _____

City and State _____

Length _____

Beam _____

Draft _____

Vertical Clearance _____

Estimated Weight _____

Battery Voltage _____

Trailer Make _____ Model _____

Serial Number _____ GVW _____

Insurance Company _____

Policy Number _____

Phone Number _____

Hull Color _____

Deck Color _____

Interior Color _____

Notes _____

Service Guide

VI

*REFER TO ENGINE OPERATOR'S MANUAL FOR DETAILS	After 1st 20 Hrs. of Operation	Every 50 Hours of Operation	Every 100 Hours of Operation	Once Each Year	
Change Engine Oil	•	•		•	*
Replace Oil Filter	•	•		•	*
Clean Alternator External Screen*			•	•	*
Clean Flame Arrester	•		•		*
Clean Crankcase Ventilating System	•		•		*
Check Water Pump & Alternator Belts for Tension	•	•			*
Change Water Separating Fuel Filter	•			•	*
Check Fuel System Lines & Connections for Leaks	•	•			*
Replace Carburetor Fuel Inlet Filter	•				*
Check Condition of Spark Plugs				•	*
Check Battery Electrolyte Level	•	•			*
Check All Electrical Connections	•			•	*
Check Cooling System Hoses & Connections for Leaks	•		•		*
Tighten Engine Mount Fasteners	•			•	*
Lubricate Throttle & Shift Linkage Pivot Points				•	*
Check for Loose, Damaged or Missing Parts	•		•	•	*
Inspect Propeller for Possible Damage		•			*
Inspect Zinc Anodes, Replace When Necessary	•			•	*
Check Fuel Pump Sight Glass for Leaking Diaphragm		•			*
Check Exhaust System for Leaks	•		•		*
Inspect the Fresh Water Pump & System	•		•		*

Upon reaching the specified engine break-in period, an inspection should be performed by the selling dealer at local rates and paid for by the owner. After the normal break-in check-up, your Sea Ray should be taken to the selling dealer every 6 months or 100 hours of operation — or at least once a year for lube change, tune up, etc.
The inspection and service schedule above is based on average operating conditions. Under severe operating conditions, intervals should be shortened.

VI

Nautical Terms

abeam — object 90 degrees to center line on either side of boat

abaft — a point on a boat that is aft of another

aft — toward the rear or stern of the boat

beam — the greatest width of a boat

bilge — the lower interior area of the hull

bow — the fore part of a boat

bulkhead — vertical partition in a boat

chine — meeting juncture of topside and bottom of boat

chock — deck fitting, used as guides for mooring or anchor lines

cleat — deck fitting with arms or horns on which lines may be made fast

deck — upper structure which covers the hull

draft — depth of water required to float boat

fathom — six feet

freeboard — height of topside from water line to the deck

gunwale (or gunnel) — meeting junction of hull and deck

hatch — an opening in deck to provide access below

head — a toilet or toilet area in a boat

headroom — vertical distance between the deck and cabin or canopy top

helm — steering consol

hull — the basic part of a boat, a watertight vessel that provides buoyancy to float the weight of the craft and its load

keel — the major longitudinal member of a hull — the lowest external portion of a boat

knot — unit of speed in nautical miles per hours

lee — the side that is sheltered from the wind

port — term designating left side of the boat

scupper — holes permitting water to drain overboard from deck or cockpit

sheer — curve or sweep of the deck as viewed from the side

starboard — lateral direction term designating right side of the boat

stern — the aft end of a boat

stern drive — inboard/outboard unit (I/O)

stringer — longitudinal members fastened inside the hull for additional structural strength

transom — vertical part of stern

wake — disturbed water that a boat leaves behind as a result of the foreward motion

windward — toward the direction from which the wind is blowing