GENERAL INFORMATION 1

ABOUT THIS MANUAL

More and more people are joining the ranks of boat owners who find enjoyment in the leisure activity of boating and fishing. For this reaso this manual is written for the first-time boat owner or operator. Even i you are an experienced boater, you will still find much valuable infor- mation regarding the safe operation and maintenance of your boat, motor and trailer.

For your own safety and the safety of others, take the time to read this entire manual before you take the boat out for the first time. Use it as a guide to familiarize yourself with its systems and components. The information in this manual will help you with its oper ation and maintenance. The suppliers of more complex components, such as engines, pumps, and electronics, supply their own manuals. They are included in your Owner's Packet. The suppliers of these prod- ucts maintain their own manufacturers' warranties and service facilities One of the first orders of business should be to fill out each warranty card and mail it back to the manufacturer to register your ownership.

Make sure you read and understand the safety, emergency, and opera ing procedures in this manual and pass this information along to your family and passengers. Pay close attention to safety warnings. Remember that along with the freedom and fun of boating and fishing comes the responsibility for the safety of your passengers, other boaters, and the environment which we all share.

This manual is part of your boat's equipment. Always keep it on board If you transfer ownership of the boat to someone else, give this manua to the new owner. In some cases, this manual provides general infor- mation; more specific information is available in the original equipmer manufacturer (OEM) manuals. This owner's manual does not supersed or change any of the original manufacturers' specifications, operation or maintenance instructions. If the information in this manual conflicts with that in the OEM manuals, the OEM manuals take precedence.

Note: This manual may include information about systems and equip ment not provided on your boat. Check with your dealer if you have any questions.

YOU AND YOUR NEW BOAT

If you are new to boating, you may not be familiar with some commo boating terms. Figure 1-1 lists some of these terms and identifies thei meaning in relation to a typical boat.

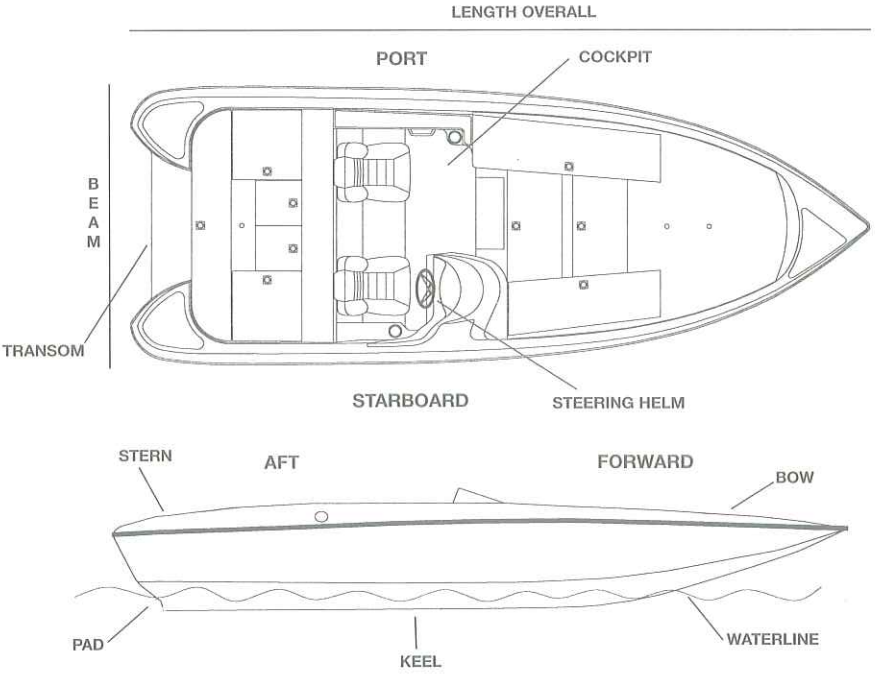


FIGURE 1-1 TERMINOLOGY

CERTIFICATION

All Stratos/Javelin boats have National Marine Manufacturers Association (NMMA) certification. NMMA certification means that the boat complies with applicable federal regulations set forth by the U.S. Coast Guard. This certification covers the following boat components:

- Engines
- Electrical Systems
- Navigation Lights
- Flotation
- Fuel Systems
- Mechanical Systems
- Load Capacity

Construction of the hull begins with multiple layers of hand-laid fiberglass, bonded with polyester resin, providing a tough, seaworthy hull. The floor and stringers are fiberglass encapsulated for strength and permanence. Rigid cell urethane foam fills strategic spaces between stringers and floor.

WARRANTY

The Limited Warranty for your Stratos/Javelin boat is at the end of this chapter. Please read it carefully. The warranty becomes effective upon the date of purchase, but the warranty registration card must be com-

sale in order to obtain any warranty coverage. When you sign the warranty registration card, you are telling us that you understand the warranty's terms and conditions. Stratos/Javelin Boats provides no other warranty for your boat. If you have any questions, please discuss them with your dealer or get in touch with our Customer Service Departmen Failure to follow warranty instructions will void your warranty.

Your dealer will properly fill out the warranty registration card for you signature. **Make sure your dealer has mailed the card to us to validate the warranty.** A hull identification number is located on the starboard side of the boat's transom. Use this number for registration and to identify your boat for warranty service. A vehicle identification number is located at the portside of the trailer frame.

The Federal Boat Safety Act of 1971 requires that all boat manufacturers notify first time owners if any defect "which creates a substantial risk of personal injury to the public" is discovered. In order for us to comply with the law, if it becomes necessary, it is essential that your completed warranty registration card with your name, address, and th boat serial number be completed and mailed to our Customer Service Department.

If you do not complete and return the warranty registration card, Stratos/Javelin Boats will not be able to notify you as the Federal Boa Safety Act requires. Failure to return the card means that you waive any right to notification and/or repair at Stratos/Javelin Boats' expens of any unsafe condition for which notification and/or repair would be required by Federal Boating Laws.

SERVICE

If you have a problem with your new boat as a result of workmanship o materials, we want to correct it and get it back in service as quickly as possible. Contact the Stratos/Javelin Boats dealer from whom you purchased the boat. An authorized dealer must process all warranty repairs If the dealer fails to remedy the cause of the problem, contact us within 30 days. **It is your responsibility to deliver the boat to the dealer for repair.**

Information about service, replacement parts, or additional equipment is available from your dealer or Stratos/Javelin Boats. You can get in touch with us directly at:

Stratos/Javelin Boats
880 Butler Road
Murfreesboro, Tennessee 37127
Phone: (615) 895-5190

RESPONSIBILITIES

Boat Owner

You should inspect the boat at the time of delivery to verify that all systems and components are operating safely and acceptably. We recommend that you refer to the engine warranty certificate for initial inspection and service requirements. Be sure to review the pre-delivery checklist for the boat and engine with your dealer when you take delivery.

Your dealer will also record all important information about your boat and its major components on the **Boat Data Sheet**. (You will find the Boat Data Sheet at the end of this chapter.) After all the data has been entered, make a photocopy and store at home or another safe place.

You are responsible for following proper procedures during the break-in period. Check with your dealer if you have any questions. You should also schedule the 20-hour checkup with your dealer. At the 20-hour checkup, your dealer should perform an engine check according to recommended procedures as stated by the engine manufacturer in the engine owner's manual.

The operator is also responsible for complying with the following procedures and operational requirements:

- Registering the boat with the appropriate jurisdiction.
- Safety training of passengers and crew.
- Ensuring the boat's continued safe operation through proper maintenance and repair.
- Obtaining adequate insurance coverage.
- Following safe operating practices at all times.
- Learning the Rules of the Road.
- Developing an understanding of boat systems.
- Operating and maintaining all equipment in compliance with the manufacturer's instructions.
- Avoiding the use of drugs and alcohol.
- Complying with environmental regulations.

Along with boating comes the responsibility of complying with environmental regulations. Please think about the future of our waterways oceans, and marine life while you're out enjoying them – and take all necessary measures to help protect our natural habitats. Keeping our waterways and marine habitats free from debris, and showing consideration for the creatures who thrive in these environments are some ways you can help assure the pleasure of boating for years to come.

Dealer

Your dealer will inspect your boat when you take delivery to make sure is in flawless condition and that all components are working properly. Your dealer will discuss the terms of all warranties and emphasize the importance of registering each warranty with the manufacturer. He will also explain the proper procedures for obtaining warranty service. If requested, he will instruct you in the operation of the boat and its systems and components.

ADDITIONAL INFORMATION

Maintenance and Repair

Proper maintenance and repair are critical to your continued enjoymen of and the safe use of your boat. Your dealer is always ready to help you. There are areas that you, the owner, cannot service because of today's complex technology. Your dealer has access to factory trained specialists, when they are needed, for such equipment as engines and trailers. You can handle basic servicing such as checking engine oil levels and inspecting the condition of hoses, sea cocks, bilge pumps, and electrical connections, but all other maintenance and repair should be performed by properly trained and qualified technicians.

We suggest you develop a routine maintenance plan for the engine and trolling motor to assure that they remain in first-rate condition an continue to operate properly. Follow the maintenance and service schedule recommended by the manufacturer. Cleaning and waxing th hull and deck regularly will keep your boat looking like new.

Boating Education

It is highly recommended that the boat operator and a standby operator enroll in a boating safety course. Such organizations as the U.S. Power Squadron, United States Coast Guard Auxiliary, and the American Red Cross sponsor educational programs. Chapter 3 has general information about such courses. See your Stratos/Javelin Boats dealer about special courses available in your area.

There are many good boating publications that have helpful information. Pamphlets prepared by the Coast Guard explain "Rules of the Road," signal lights, buoys, safety, international and inland regulations, and other information beyond the scope of this manual. Check Chapter 3 for a partial listing. You can contact the local U.S. Coast Guard Unit or call the Coast Guard Boating Safety Hotline at 1-800-368-5647.Your dealer will also have information about your area and what other boaters are doing, such as club memberships and other activities.

BOATING LAWS AND REGULATIONS

The U.S. Coast Guard is the authority of the waterways; it is there to help the boating public. State boating regulations are enforced by local authorities. You are subject to marine traffic laws and "Rules of the Road" for both federal and state waterways. You must stop if signaled to do so by enforcement officers, and permit them to board if asked.

Some states and localities have specific local trailer specifications and local legal limits on speed and noise. It is your responsibility to be aware of these laws and to ensure that your boat and trailer comply. Check with your dealer and consult with the local Marine Patrol or local Coast Guard office about any local requirements.

Registration

Federal and state laws require that every boat equipped with propulsion machinery of any type be registered in the state in which it is principally used. In a few jurisdictions, the Coast Guard retains registration authority. Registration numbers and validation stickers must be displayed on the boat according to regulations, and the registration certificate must be carried on board when the boat is in use. Some states require additional registration when an out of state boat is used within their boundaries. Your dealer will either supply registration forms or tell you where they may be obtained.

Insurance

In most states, the boat owner is legally responsible for damages or injuries he or she causes, even if someone else is operating the boat at the time of the accident. Common sense dictates that you carry adequate personal liability and property damage insurance, just as you would on an automobile. You should also protect your investment by insuring the boat against physical damage or theft.

Accident Reporting

After an accident, the operator of the boat is responsible for filing a

for accidents involving loss of life, injury, or damage over $500. Ask your insurance agent for more information. If you are involved in an accident, check with your local authorities for reporting requirements.

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

Discharge of Oil

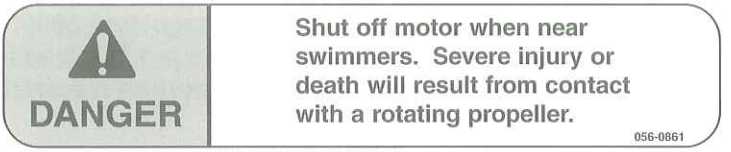
The Federal Water Pollution Control Act prohibits the discharge of oil or oily waste into or upon navigable waters of the United States or the waters of the contiguous zone if such discharge causes a film or sheen upon, or a discoloration of, the surface of the water or causes sludge or an emulsion beneath the surface of the water. Violators are subject to a maximum penalty of $25,000.

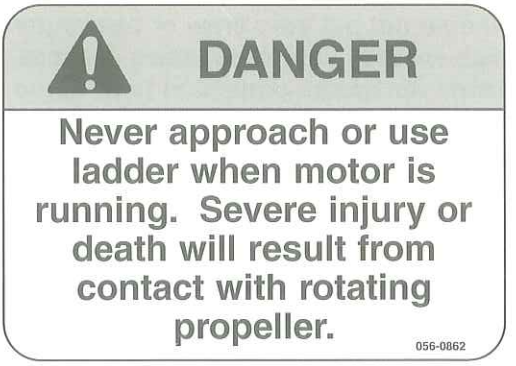
Disposal of Plastics & Other Garbage

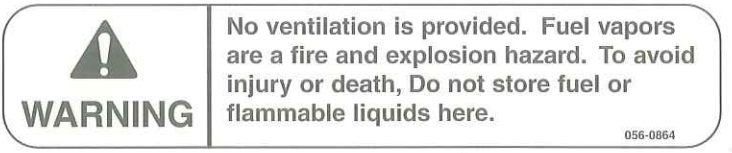
Plastic refuse dumped in the water can kill fish and marine wildlife and can foul boat propellers and cooling water intakes. Other forms of waterborne garbage can litter our beaches and make people sick. U.S. Coast Guard regulations prohibit the dumping of plastic refuse or other garbage mixed with plastic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

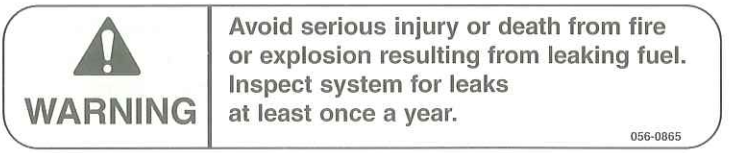
HAZARD COMMUNICATION LABELS

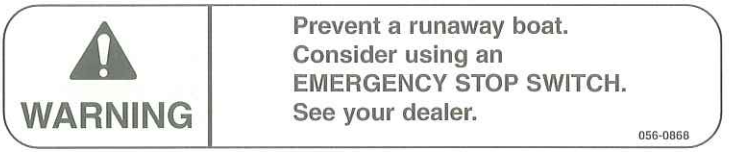
Some or all of the hazard communication labels shown on the following pages can be found in various locations on your boat or trailer. (Labels are not necessarily to size or scale.) The appropriate labels are determined by the standard and optional equipment actually installed upon delivery. Check with your dealer to find out what labels your boat or trailer should have. If any label is missing, ask your dealer for a replacement.

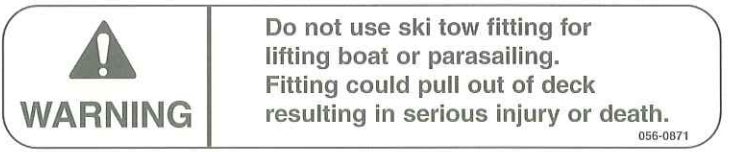

DANGER
Shut off motor when near swimmers. Severe injury or death will result from contact with a rotating propeller.
056-0861


DANGER
Never approach or use ladder when motor is running. Severe injury or death will result from contact with rotating propeller.
056-0862


WARNING
No ventilation is provided. Fuel vapors are a fire and explosion hazard. To avoid injury or death, Do not store fuel or flammable liquids here.
056-0864


WARNING
Avoid serious injury or death from fire or explosion resulting from leaking fuel. Inspect system for leaks at least once a year.
056-0865


WARNING
Prevent a runaway boat. Consider using an EMERGENCY STOP SWITCH. See your dealer.
056-0868


WARNING
Do not use ski tow fitting for lifting boat or parasailing. Fitting could pull out of deck resulting in serious injury or death.
056-0871

WARNING

Exhaust fumes from engines contain carbon monoxide. Boats with canvas deployed are more likely to collect exhaust fumes. Avoid brain damage or death from carbon monoxide. Keep cockpit and cabin areas well ventilated. Signs of exposure include nausea, dizziness, and drowsiness. See boat owner's manual for more details. If using a catalytic heater, provide ventilation. Do not use catalytic heater while sleeping.

056-0867

WARNING

BEFORE STARTING ENGINE

EQUIPMENT
DRAIN PLUG - Secured?
MOVABLE SEATS - Secured?
LIFE JACKET - one for each person?
OTHER EMERGENCY GEAR - on board?
PROCEDURES
EMERGENCY STOP SWITCH - tether hooked up?
EVERYBODY - seated in boat? NEVER on seatbacks, or edges of boat!
WEATHER CONDITIONS - safe to go out?
PASSENGERS - aware of EMERGENCY procedures?

056-0869

WARNING

Avoid serious injury.
Do not occupy platform above trolling speed. Make sure latches are closed securely.

056-0872

NOTICE!

TONGUE WEIGHT

THIS BOAT HAS BEEN DESIGNED FOR AN 18 INCH COUPLER HEIGHT ABOVE THE GROUND (+/- 1 1/2 INCHES.) ADJUST YOUR BALL HEIGHT TO MAINTAIN PROPER TONGUE WEIGHT.

BEFORE TOWING

* SECURE HITCH BALL AND COUPLER
* CROSS AND FASTEN SAFETY CHAINS / CABLES
* SECURE WINCH STRAP TO BOW
* INSTALL REAR TIE-DOWN STRAPS

OWNER'S RESPONSIBILITY

TIGHTEN WHEEL LUG NUTS
SERVICE HUBS AND BEARINGS
TIGHTEN ALL BOLTS AND SCREWS
INFLATE TIRES TO PROPER PRESSURE PRINTED ON SIDEWALL

WARNING

BEFORE TOWING,
ALWAYS
INSTALL A PIN OR LOCK INTO COUPLER TO ENSURE THAT LATCH CANNOT OPEN AND COUPLER CANNOT COME OFF BALL.

BEFORE USE, PUSH UP ON TAB TO ASSURE BRAKES ARE RELEASED

LIMITED WARRANTY
2001 OR NEWER MODELS

Stratos/Javelin Boats extends this limited warranty on each Stratos®/Javelin® boat it manufactures and sells ("boats") pursuant t the following terms.

WARRANTY COVERAGE

Stratos/Javelin will repair any warranted items found defective in factory materials or workmanship subject to the time limitations set forth below. This warranty shall commence upon the date of original retail purchase by the owner ("Owner") and applies only to new boats sold through authorized Stratos/Javelin boat dealers. Stratos/Javelin's obli ation under this warranty is strictly and exclusively limited to the repa or the replacement of defective warranted items and Stratos/Javelin does not assume or authorize anyone to assume for them any other obligations. No claims for breach of warranty shall be cause for cance lation or rescission of contract of sale of the Stratos/Javelin product. The balance of the factory warranty is transferable to the subsequent owners of the boat through an authorized Stratos/Javelin dealer, for a one-hundred dollar charge. For this warranty to take effect, the transferring dealer and subsequent owner will be required to complete a Transfer of Warranty Form to be returned to Stratos/Javelin accompanied by the necessary payment. The Transfer of Warranty Form must be received by Stratos/Javelin within 60 days of purchase by the subsequent owner with proof of purchase.

Note: Return of the warranty registration card or transfer form is a condition precedent to this warranty.

I. Items Warranted by Stratos/Javelin:

A. One (1) year:
   1. View display unit
B. Three (3) years:
   1. Navigation light fixtures, deck hardware, and fuel tanks.
   2. Hoses, clamps, and fittings.
C. Five (5) Years:
   1. Decals.
   2. Rule pumps.
   3. Upholstery.
   4. Trailer Paint.
   5. Stratos/Javelin trailer frames.
D. Ten (10) years:
   1. Hull only, stringers and transom.

II. Items Not Warranted by Stratos/Javelin:

1. Windshield breakage.
2. Gel coat cracks.
3. Gel coat crazing, stars, fading, chalking, or changing in color.
4. Water blisters.
5. Engine controls and propellers.
6. Engine and accessory removal, derigging or rigging by dealer.
7. Damage to the boat caused by accident, misuse, abuse, or negligence. A boat powered or loaded in excess of maximum limits as stated on the U.S. Coast Guard capacity plate in each boat is misuse. Use of the boat for racing or engaging in a contest of speed or endurance of any type is considered misuse.
8. Any modifications to the boat or its systems, other than those authorized by Stratos/Javelin.
9. Damage caused by failure to perform periodic maintenance in accordance with Stratos/Javelin recommendations.
10. Cosmetic damage, including but not limited to, gel coat cracks, gel coat crazing, stars, fading, chalking, or changing in color resulting from dealer or customer misuse, abuse, or neglect.
11. Damage caused by the improper mating of a boat to a trailer, or failure to use proper boat tie downs or lower unit support devices when trailering boat.
12. The expense of returning boat to an authorized Stratos/Javelin dealer or to Stratos/Javelin for warranty service and the expense of returning same to owner or Stratos/Javelin dealer.
13. Damage to transom or splashwell resulting from the use of jackplates, other than those specified or offered by Stratos/Javelin.
14. Light bulbs used in navigation fixtures or gauges.
15. Upholstery damage due to sun exposure, cuts, neglect, chemical spills, and normal wear and tear.

Note: It is the Owner's responsibility to provide transportation of the boat both to the service location and its return after repairs are completed. The service location shall be determined by Stratos/Javelin.

III. The following items are warranted by their respective manufacturers and are Not Warranted by Stratos/Javelin.

1. Engine, trolling motor - call OMC (847) 689-5630
2. Engine controls and wiring harness - call OMC (847) 689-5630
3. Batteries - call Interstate (800) 272-6548

IV. The following items are warranted by their respective manufacturers for (2) years and are Not Warranted by Stratos/Javelin.

1. Boat wiring harness and switches - call B & H (901) 837-1111
2. Radios - call Pro Spec or JVC (800) 394-1914
3. Battery Charger - Guest Chargers - Call (203) 235-4421

V. The following items are warranted by their respective manufacturer for (3) years when factory supplied or installed and are Not Warranted by Stratos/Javelin:

1. Mechanical depthfinder - call Lowrance (800) 324-4738
2. All instrumentation - call Teleflex (800) 281-7543
3. Hydraulic or mechanical steering head and cables - call Teleflex Hyd. (604) 270-6899 Mech. (610) 495-7011
4. Tires - see respective warranty of manufacturer.

VI. The following items are warranted by their respective manufacturer for (5) years when factory supplied or installed and are Not Warranted by Stratos/Javelin:

1. Depthfinders - call Zercom (800) 747-9329
2. Carpet - call Sparta (800) 863-4747
3. Trailer jack and winch - Fulton Performance Products - call (715) 693-1700
4. Battery charger - Charging Systems, Inc. - call (800) 742-27405
5. Depthfinders - call Lowrance (800) 324-4738
6. Steel or aluminum wheels - call Jet Star (800) 731-8473
7. Axles assembly- call UFP (800) 854-1905

Procedure for Warranty Repairs:

1. The boat must be returned to the selling dealer, who has the primary responsibility to perform warranty repairs. In the event the selling dealer has ceased to do business, or you are traveling or your address changes, any authorized dealer may perform warranty work. All inquiries regarding warranty matters should be addresse to your local authorized Stratos/Javelin dealer.
2. You must present your registration card or original sales receipt to the dealer to verify that the boat is still under warranty and that you own it.
3. The authorized Stratos/Javelin dealer will examine the boat to determine if a warrantable problem exists. If a warrantable problem exists, Stratos/Javelin, at its option, will authorize repair or replacement of all parts that, in its opinion, failed due to warrantable causes. All repairs performed outside the Stratos/Javelin factory must be authorized by Stratos/Javelin prior to all work being performed.
4. You must sign a warranty form to assure Stratos/Javelin that the warranty work has been performed to your satisfaction.
5. All warranty repairs and communications must be handled throug an authorized Stratos/Javelin dealer.
6. Due to Stratos/Javelin being a manufacturer, we are not set up for retail business. Therefore any boat returning to the factory must have prior authorization and all necessary paperwork to gain entrance through security.

LIMITATIONS AND EXCLUSIONS:

ALL IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED TO THE DURATION OF THIS EXPRESS WRITTEN LIMITED WARRANTY AND ARE DISCLAIMED AFTER THE EXPRESS WRITTEN LIMITED WARRANTY EXPIRES. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF IMPLIED WARRANTIES, SO THE FOREGOING MAY NOT APPLY TO YOU. STRATOS/JAVELIN SHALL NOT BE RESPONSIBLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY SORT OR NATURE, INCLUDING BUT NOT LIMITED TO PERSONAL INJURY, PROPERTY DAMAGE, LOSS OF USE, TIME, OR INCOME. SOME STATES DO NOT ALLOW THE EXCLUSION OF DAMAGES, SO THE FOREGOING MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS; YOU MAY HAVE OTHER RIGHTS THAT VARY FROM STATE TO STATE.

Stratos/Javelin reserves the right to change or improve the design of any boat without obligation to modify any boat previously manufactured. This warranty constitutes the entire agreement between Stratos/Javelin and owner. Stratos/Javelin does not assure or authorize any person other than its corporate officers to assure any other obligation on its behalf.

TRAILERING 4

A correctly selected trailer supports the boat properly, makes towing safer, and makes loading and unloading easier. Improper trailering can cause serious traffic accidents and is one of the major causes of boat damage. The warranty does not cover damage of this type. Familiarize yourself with proper towing procedures before towing your boat on the road.

IMPORTANT: Your boat's trailer was specifically designed to properly transport your boat. Do not use any other trailer with your boat. Your dealer can help you with the proper tow vehicle connections. Check with the state Department of Motor Vehicles for registration and licensing regulations in your state. Some states require that boat trailers be registered and licensed. Some states also have brake requirements of which you should be aware.

⚠WARNING

Overloading trailer can lead to frame or component failure or loss of tow vehicle control. To prevent accidents and injury, total weight of trailer, boat, and gear must not exceed trailer weight rating.

GROSS VEHICLE WEIGHT RATING

The trailer should be able to accommodate the weight of the boat, engine, full fuel tank, and any other equipment that will normally be carried. Check the certification label on the frame of the trailer for the gross vehicle weight rating (GVWR). The total weight of your boat, engine, fuel, gear, and trailer should not exceed the GVWR.

WEIGHT DISTRIBUTION

If your towing vehicle is equipped with a weight distribution hitch, it must be capable of handling the GVWR. The weight on the trailer should be evenly distributed. If too much weight rests on the hitch, the front end of the vehicle will sway or oversteer. Insufficient tongue weight will cause the trailer to fishtail. In either case, the vehicle will be hard to handle and could become uncontrollable at high speeds.

State regulations usually require that trailers above a specified weight rating be equipped with brakes. Requirements vary; check with your dealer for additional information.

HITCH

⚠WARNING

Overloading can cause hitch failure, leading to injury-causing accidents. Total weight of the loaded trailer must not exceed capacity marker on hitch of tow vehicle.

Hitches are divided into classes that specify the gross trailer weight and maximum tongue weight for each class. Always use a hitch with the same class number as the trailer. Most boat trailers connect to a ball hitch that is bolted or welded to the towing vehicle. Be certain that the tow vehicle is equipped with a hitch capable of handling the GVWR. The two basic types of trailer hitches are a weight-carrying hitch, which is adequate for some of the smaller models, and a weight-distributing hitch for heavier models.

The trailer hitch coupler must match the size of the hitch ball. The correct ball diameter is marked on the trailer coupler. When it is latched, the coupler should fit snugly on the ball.

SAFETY CHAINS OR CABLES

Safety chains or cables provide added insurance that an unhitched trailer will not become completely separated from the towing vehicle while it is being towed. Crisscross the chains or cables under the trailer tongue to prevent the tongue from dropping to the road if the trailer separates from the hitch ball (Figure 4-1). Safety chain or cables should have a minimum breaking strength equal to the upper limit of the GVWR.

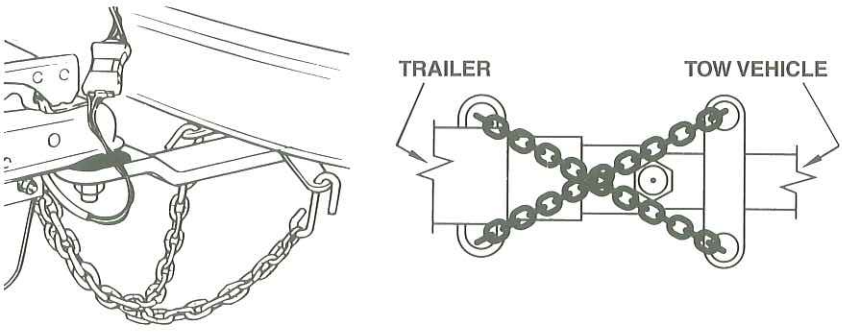


FIGURE 4-1 SAFETY CHAINS

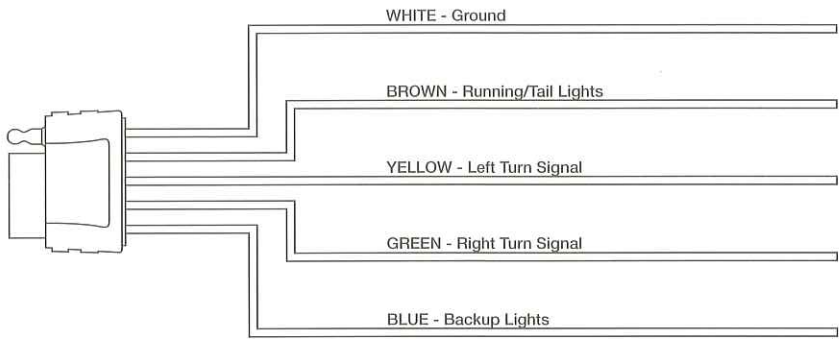
BRAKES

⚠WARNING

Property Damage! Personal Injury! Failure to use brakes when required can result in an injury-causing accident. Observe conditions carefully and be prepared to stop. Maintain brakes properly to assure they are in good working order.

Your boat trailer may be equipped with surge brakes. Trailer brakes help relieve stress on the tow vehicle by transferring some of the brak ing action to the trailer wheels. As the towing vehicle slows and decel erates, the momentum of the trailer applies pressure through linkage to the trailer's master cylinder mounted on the tongue near the cou- pler. This hydraulic pressure is transmitted through the brake lines to the wheel brake assemblies to assist with slowing or stopping the veh cle and the trailer. A shock absorber assures smooth and even opera- tion of the brakes by preventing intermittent application of the brakes.

Some trailers are equipped with disc brakes. The wiring harness for these trailers incorporate a 5 connector plug. The tow vehicle wiring harness plug must be wired as shown to release the disc brakes when backing.



TURNING WHILE TOWING A TRAILER

When you are towing a trailer, be aware that the trailer will track in a tighter turn than the tow vehicle (Figure 4-2). When making a turn, be careful that the trailer does not strike another vehicle or object. Turns made when you are towing a trailer should be made at appropriate speeds.

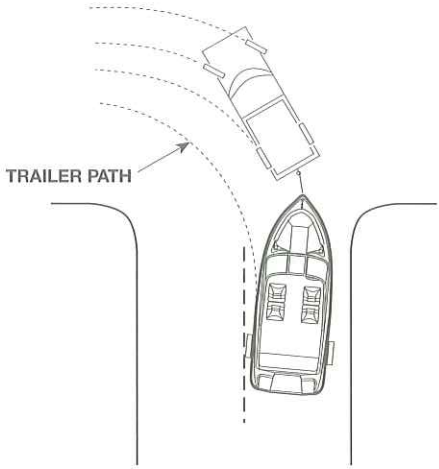


FIGURE 4-2 TURNING WITH TRAILER

BACKING A TRAILER

Practice backing with a trailer *before* you get into a confined launch site. Get accustomed to using the trailer in an open area. Take someone with you who knows how to back a trailer. Backing a trailer works the opposite of backing a car. If the trailer needs to travel to the right, turn the steering wheel to the left and vice versa (Figure 4-3). Do not turn the wheel too far or oversteer. Turn the wheel gradually until you get the feel of safe backing.

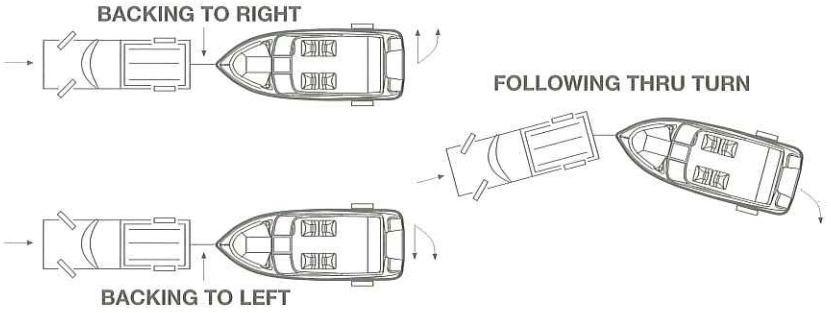


FIGURE 4-3 BACKING A TRAILER

LAUNCHING GUIDELINES

Before launching your boat, stay to one side and watch a couple of launchings to notice any problems on the ramp and the effects of the wind and the current on launching.

It's a common courtesy to prepare the boat for launching away from the ramp. This includes removing tie-downs, securing loose gear, loading personal gear, and making sure drain plugs are installed.

Have an individual at the launch ramp give you directions. Back slowly down the ramp. Always remember to launch the boat at a right angle to the shoreline. If launching from a trailer, tilt the outdrive up to avoid damage.

When the boat's transom is in several inches of water, stop the towing vehicle. If the vehicle has a manual transmission, leave it in gear. If it has an automatic transmission, shift to PARK. Turn off the engine and set the parking brake. Place blocks behind the vehicle's back wheels.

Do not detach the winch cable from the bow eye until a mooring line has been secured to one of the boat's cleats. Otherwise, the boat could slide off the trailer and float away. Attach one line to the bow and one line to the stern to help control the boat. See the mooring information in Chapter 8 for suggested securing procedures.

After moving the boat down and off the trailer into the water, secure it to the dock or have someone hold mooring lines. Then lower the outdrive all the way into the water.

Pull the towing vehicle away from the launch ramp. Park only in designated areas. When parking, be sure the towing vehicle and trailer do not block other boaters from approaching the launch ramp or hinder their ability to maneuver a boat and trailer when launching.

LOADING YOUR BOAT ON THE TRAILER

Loading your boat is similar to launching except loading is done in reverse.

1. Back the trailer into the water.
2. When the trailer is in enough water so the boat will "float on" the trailer bunks:
    - STOP the towing vehicle.
    - Leave manual transmission in gear or place automatic transmission in park.
    - Place blocks behind the vehicle's back wheels.
    - Turn off the engine.
    - Set the parking brake.

3. Tilt the boat's drive up to the high tilt position to avoid damage while loading.

4. Pull boat up onto trailer and secure safety chain.

5. After securing the boat to the trailer, start engine on towing vehicle and pull trailer out of water to boat securing area. (If blocks are connected with a rope to the trailer tongue, you will not need to remove them before pulling trailer out.)

6. Open the drain plug to allow bilge to drain. Keep plug open to prevent accumulation of water in bilge. Be sure to close drain plug before next boat usage, to prevent flooding.

7. Use tie-downs to secure boat on trailer. Use stern tie-downs to prevent the boat from shifting.

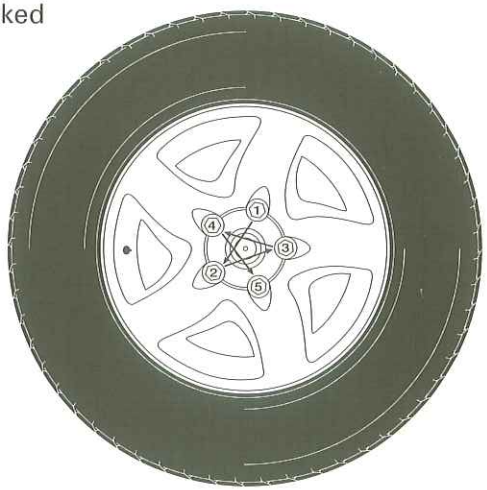
8. Wipe hull down to prevent water spots and keep hull clean.

9. Make sure all cargo, lids, and canvas are secure or tied down before trailering on the road. Place loose gear in towing vehicle.

10. Reconnect trailer lights. Check that lights are working.

11. Check tires for proper inflation (check tire rating on sidewall). Under-inflated tires heat up rapidly and may blow-out or cause uncontrolled swaying.

12. All lug nuts must be checked and retorqued to 75-85 foot lbs. after 25 miles, again after 100 miles, and periodically thereafter. Lug nuts must be tightened in a star criss-cross pattern (see illustration) to insure uniform pressure and alignment. Apply torque evenly by repeating star pattern until desired torque is reached.



13. Be sure the coupler is secured to the trailer hitch and safety chains or cables are attached.

14. Check the brakes for proper operation prior to departure. See Owner's Manual for brakes or trailer for complete instructions.

15. Check the springs and under carriage for loose parts.

16. Carry a spare tire for both the trailer and towing vehicle. On extended trips, carry spare wheel bearings, seals, and races. Be sure and carry the proper tools to complete the repairs.

17. When traveling, check the wheel hubs during stops at gas stations, restaurants, or other places. If the hub feels abnormally hot, the bearing should be inspected before continuing the trip

Note: All trailers used in salt or brackish waters must be rinsed off completely with fresh water immediately after use, to prevent rust and corrosion. Failure to rinse the trailer could cause cosmetic trailer damage that is not covered by your warranty.

WHEEL BEARINGS

The best protection you can give to your wheel bearings is to always keep the hubs fully lubricated. Periodically add fresh grease to the trailer hubs with a water resistant wheel bearing grease. Fill the hubs with grease to the manufacturer's specifications, as detailed in the Trailer Buddy® owner's manual.

ELECTRICAL SYSTEM 5

This section of the manual includes information about your boat's electrical system. Your boat is designed with a safe electrical system to protect you from hazardous shocks and was checked carefully before it was shipped to your dealer. To protect yourself from electric shock, always have a qualified technician make any modifications to the system. If you have questions, see your dealer for more information.

12-VOLT DC BOAT SYSTEM

The 12-Volt D.C. electrical system is a 12-Volt, 2-wire, negative ground type. The hot wire is positive, feeding the lights and appliances for instance, and the negative return is by an insulated wire to the negative terminal of the battery.

12/24-VOLT TROLLING MOTOR SYSTEM

The 12/24-Volt D.C. electrical system is a 12 or 24-Volt, 3 wire, negative ground type. One hot wire is 12-Volt. The other hot wires are positive, feeding the trolling motor, and the negative return is by an insulated wire to the negative terminal of the batteries.

24-VOLT TROLLING MOTOR SYSTEM

The 24-Volt D.C. electrical system is a 24-Volt, 2-wire, negative ground type. The hot wire is 24-Volt, feeding the trolling motor, and the negativ return is by an insulated wire to the negative terminal of the batteries.

IMPORTANT: Turning the ignition switch off does not cut off power t all components. Powered components, such as the stereo, can draw down the battery if they are left on for an extended period without run ning the engine. A power switch, which can shut off these components, is standard on some models.

The electrical system is wired at the factory to handle factory-installed electrical equipment. It is recommended that you have your dealer install any additional equipment. An error in wiring the electrical circuit can cause a fire or damage electrical system components. Have your dealer repair the electrical system and install additional equipment.

⚠WARNING

Fire or Explosion Hazard! Electrical system parts are designed and manufactured to comply with U.S. Coast Guard requirements to minimize risks of fire or explosion. **Never substitute automotive parts for marine parts.** Automotive parts do not provide the necessary ignition spark protection.

If you do add additional equipment, it must be adaptable to the negative ground system. When installing additional equipment, be sure to take the power supply from the circuit breaker panel. If additional circuit protection is required, it must be added at the fuse block at the helm console. Be sure to protect all electrical components from rain, water, or sea spray.

Note: Power feeds for accessory equipment must NOT be taken from the voltmeter terminals. Consult with your dealer for additional DC power needs.

BATTERY

⚠WARNING

Poison! Sulfuric acid in batteries can cause severe burns. Avoid contact with skin, eyes, or clothing. Wear goggles, rubber gloves, and protective apron when working with batteries. In case of skin contact, flush with water at least 15 minutes. If swallowed, drink large quantities of water or milk. Follow with Milk of Magnesia, beaten egg, or vegetable oil. Get medical attention immediately.

⚠WARNING

Fire or Explosion Hazard! Only qualified personnel should install batteries and perform electrical system maintenance. Do not expose batteries to open flame or sparks. Do not smoke near batteries.

Your dealer has installed a battery or batteries which supply power to the DC electrical system. Marine batteries provide high reserve capacity plus cold cranking performance. When the engine is running, the battery is charged automatically.

Batteries produce hydrogen and oxygen gases when being charged. These explosive gases escape through the vent/fill caps and may form

an explosive atmosphere around the battery if ventilation is poor. This gas may remain around the battery for several hours after charging. Sparks or flames can ignite the gas and cause an explosion.

Note: Never disconnect the battery cables while the engine is running. Doing so can damage the electrical system.

WIRING SCHEMATIC

An electrical wiring schematic for your boat is included in your Owner's Packet.

AC/DC BATTERY CHARGER

Your boat may have a battery charging system which operates off 120 volt AC power from shore. Turn the charger on whenever your boat is connected to shore power to keep batteries fully charged. The chargin system is fully automatic and permanently wired into the 12-volt DC system. If the monitored battery level drops under the full charge range, the charger automatically turns ON and restores the battery to FULL charge status.

BATTERY CHARGING

The engine alternator will recharge the engine battery when the engine is running. On some models a voltage regulator controls the rate of charge by sensing battery voltage and increases or decreases alternato output accordingly. If your boat is equipped with a battery charger, please refer to battery charger owner's manual for detailed instructions

⚠WARNING

To prevent personal injury, do not attempt to start your engine with jumper cables. The use of jumper cables could create dangerous sparks, which could cause the battery's hydrogen vapors or gasoline fumes to explode.

OVERLOAD PROTECTION

The engine is equipped with a fuse or circuit breaker to protect the engine wiring harness and instrumentation power leads. If an electrica overload occurs, a circuit will "open" and interrupt current flow when the current draw exceeds the rated amperage. Refer to your engine manual for breaker location, resetting procedure, or for fuse rating an replacement procedure.

TRANSDUCER MOUNTING (DEALER OR CUSTOMER INSTALLED)

For optimum boat performance, we recommend that a transducer be glassed or epoxied into the hull so that the signal is shot through the hull. A space is provided for the transducer in the bilge area. If a hull-mounted transducer is used, take care to mount the transducer as far from the prop as possible to prevent disturbance of the flow of water to the propeller.

TROLLING MOTOR

All of our Bass boats have a heavy-duty trolling motor receptacle located at the bow of the boat. This receptacle is to be used only when the trolling motor is in use. Running from the receptacle is a heavy-duty copper wire harness that extends back to your batteries. This extra-heavy wire assures you of maximum thrust and longer battery life. All of our boats feature an electrical device that protects this harness, which is located near the trolling motor batteries.

Note: To prevent equipment damage and possible injury, always connect the trolling motor and batteries by using the factory supplied wiring.

Mounting Trolling Motor

The front deck of your boat has been reinforced to withstand the maximum thrust put out by today's heavy-duty trolling motors. Follow manufacturer's directions when mounting trolling motor bracket. Always use washers on the underside of the deck when bolting on a trolling motor, and use all available bolt holes for maximum strength.

Detachable Trolling Motor Mount

Some models are equipped with a device that allows removal of the trolling motor. Please refer to the owner's manual for proper mounting and securing instructions.

ENGINE ALARM SYSTEM

Some engines are equipped with an audible warning alarm. An alarm (located under the dash) will sound if any one of the following occur in either engine: 1) cooling system water temperature too high, 2) VRO tank oil supply low. If alarm sounds, quickly observe gauges for an abnormal reading, then stop engine immediately. If all gauges read normal, then refer to your engine manual to aid in finding and correcting the problem.

If the cause for the alarm cannot be found, consult your dealer. To prevent possible damage to an engine, do not restart engine until the cause for the warning has been found and corrected. In an emergency situation, continue at low speed.

Note: Refer to engine owner's manual for additional information.

CORROSION

Corrosion of metal parts, especially those exposed to brackish water, is common for boats. Corrosion can be caused by stray electric currents from shorepower installations, improperly grounded A.C. lines and circuits, and poorly insulated D.C. powered equipment from boats moored nearby.

Corrosion is accelerated when electric current is present. For example, in the following list, aluminum is less noble than copper. This means the aluminum will corrode faster than copper if the two are submerged in seawater.

Sacrificial Zinc Anode System

This system, used to reduce corrosion on underwater metal parts, is the attachment of zinc castings to the parts in need of protection. Zinc which is an active metal in the galvanic series, is attacked by corrosion while a nobler metal, such as a bronze fitting, is protected.

Periodic replacement of zinc anode components is considered normal maintenance.

NOTICE
DO NOT PAINT ZINC ANODES

Galvanic Series of Metals

The metals in the chart (on the next page) range from the Least Noble (Anode Active) to the Most Noble (Cathode Passive). Combinations of any of them will show you what to expect relative to Active and Passive Corrosion.

This information is important to know when adding or replacing hull fittings: use metals that are close to each other in the galvanic series. The best way to avoid corrosion is to use genuine OMC replacement parts. When adding accessories not supplied by us, consult your dealer regarding selection and proper installation.

Least Noble (Anode-Active)

1. Zinc
2. Galvanized steel or galvanized iron
3. Aluminum
4. Cadmium
5. Mild steel
6. Wrought iron
7. Cast Iron
8. Ni-Resist
9. Lead
10. Tin
11. Manganese bronze
12. Naval brass (60% copper-39% zinc)
13. Nickel (active)
14. Yellow brass (65% copper-15% zinc)
15. Admiralty brass
16. Aluminum bronze
17. Red brass (85% copper-35% zinc)
18. Copper
19. Silicon bronze
20. Nickel (passive)
21. Hastelloy C

Most Noble (Cathode-Passive)

TROUBLESHOOTING

⚠CAUTION

Electric Shock! Equipment Damage! Disconnect battery cables before performing all inspections, checks, and repairs to avoid possible personal injury and damage to equipment.

DC Electrical System

Problem	Cause	Solution
No power to 12-V equipment	Battery power switch OFF	Turn switch ON
	Weak or dead battery	Recharge battery
Battery not charging (engine running)	Engine alternator malfunction	See dealer
Battery not holding a charge	Bad battery	Replace battery
12-V device not working	Circuit breaker for device is OFF	Reset breaker to ON
	Weak or dead battery	Charge battery
	Faulty electrical connection	Check 12-V connections. Tighten or repair as needed

BOAT SYSTEMS & EQUIPMENT 6

This chapter discusses major systems or components on your boat. Information about boat controls is in Chapter 7. Equipment discussed in this chapter is standard or optional on some models and not available on others. See your dealer for more information.

ENGINES

Your boat may be available with a range of engine options. In your Owner's Packet is an owner's manual for the engine. Refer to that manual for information about engine care and maintenance.

Keep your engine well tuned to decrease exhaust hydrocarbon emissions that pollute the air and water.

Your dealer employs factory trained technicians certified to service the engine. If you choose to do so, you can handle basic servicing such as checking engine oil. But with today's ever-advancing engine technology, these technicians have the tools and the expertise required for efficient and safe engine service.

⚠WARNING

Do not attempt to maintain or adjust an engine while it is running. Failure to shut off the engine for maintenance or adjustment can result in serious injury or death.

FUEL SYSTEM

The fuel system is designed to prevent fire and explosion and to provide a continuous flow of clean fuel to the engine. It meets or exceeds the Federal requirements of the U.S. Coast Guard at the time of manufacture. The system is also certified by the National Marine Manufacturers Association (NMMA). Every fuel tank must pass rigid tests and inspections by the tank manufacturer.

Before you take delivery, check that your dealer has completed a full inspection of the entire fuel system. You should also inspect the entire system at least once a year.

⚠WARNING

Fire and Explosion Hazard! Leaking gasoline and fuel vapors can burst into flames or explode. Inspect fuel system regularly for leaks, deterioration, and corrosion. Replace defective parts before starting engine.

- Gas Deck Fill: Your boat has an internal gas tank equipped with a deck fill plate labeled GAS or GASOLINE. Be sure to use the proper grade fuel as specified in the engine owner's manual. See Chapter 9 for fueling instructions and recommendations.

- Gas Tank Vent: As the engine draws down fuel in the tank, air enters the tank through the vent to prevent a vacuum from forming inside the tank. While you are filling the tank, gasoline entering the tank pushes air in the tank out through the vent. Be careful when filling the tank, otherwise gas will be ejected through the vent when the tank is full or nearly full.

- Valves: Fuel pickup lines for the engine have either a shutoff valve or an anti-siphon feature at the point where the line attaches to the fuel tank. The anti-siphon valve automatically prevents gasoline from siphoning out of the tank if the fuel line separates. The manual shut-off valve can be used to shut off the fuel supply in case of an emergency such as a break in the fuel line. The valve is under an inspection plate in the cockpit sole or in the engine compartment.

- Fuel Tank: The internal fuel tank fittings are accessible through the engine compartment or under removable deck plates. The tank is equipped with a gas fill line, gas vent line, sending unit, and engine fuel pickup.

⚠WARNING

Fire or Explosion Hazard! Ignition and fuel system parts are designed and manufactured to comply with U.S. Coast Guard requirements to minimize risks of fire or explosion. **Never substitute automotive parts for marine parts.** Automotive parts do not provide the necessary ignition spark protection.

PROPELLER

The selection of the correct propeller and its condition are the most important items for peak boat performance. The propeller's diameter and pitch have been matched to the engine for trouble free operation

and maximum performance (Figure 6-1). See your engine owner's manual for propeller removal and replacement procedures.

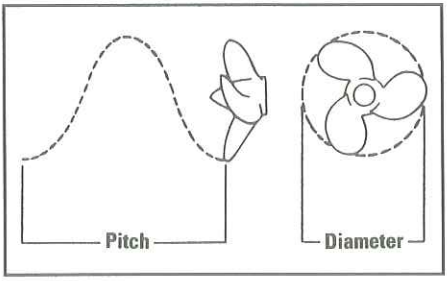


FIGURE 6-1 PROPELLER MEASUREMENTS

All models should be "propped" to be in the upper half of the maximum RPM range with the boat lightly loaded and the outboard trimmed up to maximum. This configuration allows the engine to operate within the recommended RPM range with a heavy load.

If fuel consumption is higher than normal or the handling characteristics have changed, the propeller may be damaged. A damaged or unbalanced propeller can cause excessive vibration or increased noise. If you notice either condition, stop the engine and check the propeller for nicks, cracks, pitting, distortion, or other damage.

Note: Never run with a damaged propeller. You can damage the engine or drive unit. Keep a spare propeller on board. You can continue your excursion without spoiling your day.

If the propeller is damaged, change it. Detailed procedures are in the engine manual. Otherwise, return to port slowly to prevent further drive and engine damage from an out-of-balance condition. Watch the temperature gauge to make sure the engine does not overheat.

Cavitation

Cavitation is the formation of air bubbles along the surface of the propeller. Typical causes of cavitation are a damaged propeller, the outboard trimmed out too far, or a hull projection in front of the engine. Recondition or replace damaged propellers.

Ventilation

Ventilation is the formation of a void around the propeller, usually on entering or leaving a sharp turn (Figure 6-2). Without water to turn in, the propeller runs free and the boat nearly stops moving forward until the propeller finds water to turn in again. When ventilation occurs

throttle back immediately. If ventilation continues when you resume speed, you may have to adjust engine trim or the load.

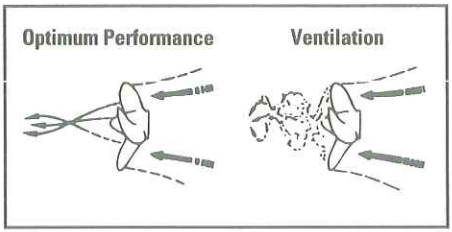


FIGURE 6-2 PROPELLER VENTILATION

STEERING SYSTEM

Your boat is equipped with either a hydraulic steering system or a mechanical cable system that is equipped with a no-feedback feature. The hydraulic steering system is comprised of the helm pump and reservoir, hydraulic hoses, and the hydraulic cylinder. The helm assembly acts as a pump to move the oil through the system. In many respects this type of steering is similar to the mechanical system. Instead of activating a cable, turning of the helm causes fluid in the hydraulic hoses to flow and activate the hydraulic cylinder to turn the outboard motor.

NOTICE

If equipped with the hydraulic system, a slight clicking sound may be heard as the wheel is turned. This sound is the opening and closing of the valves in the helm unit; this is normal.

In the mechanized system, a rotary drum or rack and pinion assembly is mounted under the dash behind the steering wheel with a one-piece cable running through the boat to the engine. At the transom, the cable turns and is connected to the engine or outdrive.

It is important that you get the "feel" of your boat's steering system. Turn the steering wheel from full left to full right, and make sure the motor steering arm is turning accordingly. The system should operate freely and smoothly. The cable end and its fittings should be kept clear of fuel line, control cables, electrical wiring, or onboard gear when the motor is moved through its full steering cycle in both running and full tilt positions.

All fittings and cables should be inspected for corrosion or damage and replaced if necessary. Check for the presence of the original self-locking nuts that are used to fasten the "steering link rod" or "drag

link" between the steering cable(s) and the engine. These nuts must never be replaced by common or non-self-locking nuts, which can vibrate off. Also, the steering wheel should be inspected for looseness and tightened, if necessary. Replace the steering wheel if there are any cracks around hub or base of spokes.

Steering or propeller torque can be present in any drive system. In some systems, it is more noticeable than in others.

Note: See Steering Manufacturer's recommendations for cleaning, lubrication, and maintenance of the steering system.

Note: The steering system should be inspected by a qualified mechanic at regular service intervals.

For additional information refer to the "Getting Underway" section of this manual.

⚠WARNING

Steering effort can vary significantly with engine acceleration, steering angle, trim angle, and sea condition. Whenever possible, it is best to trim your outboard to generate minimum steering effort. Under all circumstances, the boat operator should keep at least one hand on the steering wheel.

LIVEWELL SYSTEM

The livewell system on your boat is designed to supply the water and oxygen needed for the survival of your catch. We encourage the careful handling and livewell maintenance of all fish that you catch, and ask that you consider the live release of any fish that you do not care to eat or mount as a trophy.

The livewell system has a fresh water supply pump as well as a pump to recirculate the water in the livewell. Your boat is equipped with one of the following types of livewell systems:

Remote Drain Shut-Off Livewell Control System

This system is equipped with a separate fresh water supply pump and recirculating pump for each livewell. A remote cable operated drain control valve is provided for each livewell for water retention and livewell draining. The valve control actuator is labeled "OPEN" and "CLOSED."

The "OPEN" position is primarily used to drain the livewell after all aerator pumps have been turned off. The "CLOSED" position is used to seal the livewell drain in order to maintain a full livewell. By putting the control actuator in the "CLOSED" position prior to launching, it can also be used to prevent water from entering the livewell through the drain.

Once the first fish is caught, select the port or starboard livewell and insure that the corresponding valve control cable is in the "CLOSED" position. Next, turn on the appropriate fresh water supply pump to fill the livewell and after the livewell is approximately 1/3 full, turn on the recirculating pump. After the livewell is filled, the fresh water supply pump may be left on while off-plane, but must be turned off prior to running on-plane to the next fishing spot. The recirculating pump, however, should be left on.

When fishing several locations during the day, the fresh water aerator pump should be run while off-plane to maintain a full livewell by replenishing any water lost through the overflow while running from spot to spot. This also freshens the livewell water and forces any used ammonia-laden water out the overflow.

In summary, place the actuator in the "CLOSED" position when filling the livewell and leave in this position when livewell is in use. Place the actuator in the "OPEN" position to drain the livewell and then return to the "CLOSED" position to prevent water from entering until desired.

Automatic Livewell Control System

This system features a three position automatic livewell control valve. The automatic control valve provides many automatic operating features to ensure your livewell stays full, oxygenated, and freshened to keep your catch healthy while you concentrate on fishing. Using the control valve you can operate this system in the "AUTO," "RECIRCULATE," or 'EMPTY" modes.

AUTO

Once the first fish is caught, simply place the rotary actuator in the "AUTO" position and turn on the aerator pump. With the boat off-plane, fresh water will be constantly blended with recirculated livewell water. This ensures a properly filled and freshened livewell at all times and that any ammonia laden used water is expelled through the overflow.

When the boat is placed on-plane, the control valve will automatically close the transom port to prevent water loss and the aerator pump is automatically diverted to closed recirculation duty. When the next fishing spot is reached and the boat is brought off-plane, the control valve

automatically opens the transom port when the pump runs to again allow fresh oxygenated water to be added to the livewell. Therefore, any water that was lost through the overflow while running from spot to spot is automatically made up without any operator assistance.

RECIRCULATE

The "RECIRC" position is for those rare occasions when outside water may not be desirable. This may include refueling stops at dockside, and when using a livewell additive shortly before a tournament weigh in. By placing the rotary actuator in the "RECIRC" position, outside water is prevented from entering while the control valve continues to allow the pump to recirculate and aerate the livewell. When outside water conditions improve, return to the "AUTO" position. This positio also may be used when trailering or making extremely long runs.

EMPTY

The "EMPTY" position is, of course, used for draining the livewell. After emptying, the valve control actuator can be placed in the "RECIRC" position to prevent water from entering the drain during the next launch.

In summary, place the actuator in the "AUTO" position when you hav fish, "EMPTY" or "RECIRC" when you don't, and "RECIRC" when in bad water or trailering fish.

Livewell Pump-Out System

Some models can be equipped with an optional livewell pump-out sys tem. This system is primarily used by the tournament angler who wishes to rapidly lower the livewell water level at weigh-in to aid in th removal of fish from the livewell. This system features a selector valv and control actuator for each livewell.

The system is normally operated in the "RECIRC" mode. Switch to the "PUMP-OUT" mode when you wish to lower the livewell water level.

To use the pump-out feature, (1) turn off the fresh water supply pump (2) insure that the livewell control valve is "CLOSED," (3) turn on the recirculating pump, and (4) move the pump-out control to the "PUMP OUT" position. Once the water level has been lowered to the desired level, return the control to the "RECIRC" position to continue aeration while the fish are removed. Once all fish have been removed, turn off the recirculating pump.

Note: If your livewell system is equipped with the recirculating fea-

General Livewell Plumbing Information

The plumbing system for your livewell consists of several pumps, hoses, fittings, and clamps. A schematic diagram of the system can be found in your Owner's Packet.

All hoses are heavy-duty and are reinforced for years of service. All hardware, clamps, screws, and valve control cables are stainless steel. Through-hull fittings are constructed of PVC, sealed with marine sealant, and have a retaining nut to prevent leaks. While the plumbing system is designed to be leak free, it is the owner's responsibility to frequently check the system's components for leaks, cracks, and worn components. In the event a leak should develop, contact your dealer immediately.

BILGE

The deepest part of the hull, under the floor, is the bilge. Water may accumulate in the aft portion of the bilge. Be sure to keep the bilge area free of debris so that water can drain through the stringers and bulkheads to the bilge pump area. It is normal to have a small amount of water in the bilge. If you should notice fuel or oil in the bilge, check for leaks and correct immediately. Do not pump fuel or oil overboard, as this act of pollution is a violation of federal law. Clean up fuel and oil and properly dispose of on shore. Oil stains can be removed by using a bilge cleaner available from your dealer. Do not use flammable solvents to clean the bilge.

BILGE PUMP

You boat is equipped with an electric bilge pump, and may have an automatic float switch. Rising water activates a float switch to start the bilge pump. When the water is pumped out, the pump shuts off automatically.

Note: Electrically operated bilge pumps can fail. There is no substitute for checking the bilge frequently, especially during periods of heavy rain, high seas, or storm conditions.

If for some reason the pump fails to start, check the fuse and wiring connections. If the pump motor runs but no water is discharged, it may be clogged. Keep the area around the switch and the pump free of debris. If there is no visible debris clogging the pump or blocking the float switch and water is still not being removed, inspect the discharge hose for kinks or obstruction.

If oil is spilled in the bilge, do not run the pump. Keep the oil from spreading in the bilge and properly dispose of the oil on shore. Your

dealer can help you select products you can use to soak up the oil and give you advice about methods of disposal.

The bilge pumps on some models may not have automatic float switches. You must check the water level in the bilge and, if necessary operate the pump manually using the on-off switch at the helm. Check with your dealer if you have any questions.

TROUBLESHOOTING

Following are basic troubleshooting procedures. Always refer to the manufacturer's manual for detailed troubleshooting information.

Engine

Engine troubleshooting procedures are in the engine owner's manual. These guides may recommend specific procedures for checking engin problems. Your dealer has the expertise, tools, and training for performing engine maintenance or repairs. If you do not know how to complete a procedure or if you do not have the proper tools and parts do not attempt to perform the maintenance or repairs. A "quick fix" may cost you more over the long run.

Note: Always check the engine manual before attempting to adjust or repair anything on the engine. You will find it to be time well spent.

Fuel System

Problem	Cause	Solution
Fuel overflows at fill plate (tank not full)	Fill or vent line blocked	Check lines. Clear obstruction from line or straighten line if kinked.
Water or moisture in fuel tank	Cap on deck fuel fill plate not tight	Check cap; tighten.
	Condensation forming on walls of partially filled tank	Add fuel drying product to fuel supply. See your dealer for recommendations.
	Poor quality fuel from marina tanks	Add fuel drying product to fuel supply. See your dealer for recommendations.

Propeller

Problem	Cause	Solution
Excessive vibration	Material obstructing propeller	Remove material from propeller, shaft, or rudder by reversing engine. If necessary, ***stop engine*** and cut or pull away.
	Bent prop	Inspect propeller. Replace propeller if necessary. If vibration continues, see dealer for service.
	Loose engine mounting bolts	Check bolts. Tighten as needed.
Poor performance	Material wrapped around propeller	Remove material from propeller, shaft, or rudder by reversing engine. If necessary, ***stop engine*** and cut or pull away.
	Damaged propeller	Replace propeller.
	Wrong propeller in use	Replace propeller.
	Marine growth on hull bottom	Clean hull bottom.

HELM INSTRUMENTS

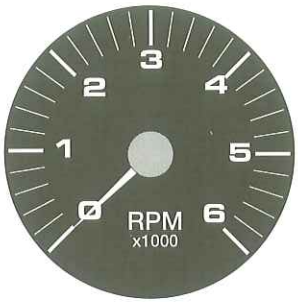
The instruments at the helm tell you what is going on inside the engine. Whenever an engine is running, check the instruments frequently for unusual readings. If a gauge shows a substantial variation from its normal reading, don't take chances. Check for the cause immediately.

When you take delivery, ask your dealer about the normal readings of the gauges. This provides a reference point for the life of the engine. Keep in mind that the reading on some gauges may fluctuate.

Note: Your boat may not have all the instruments discussed in this section. The ranges of the gauges may also vary from the readings listed.

Tachometer

The tachometer shows engine rotation speed in revolutions per minute (RPMs) under all engine operating conditions. Engine speed is different from boat speed. Weather conditions, boat load, and other factors determine boat speed at a given engine RPM. Consult with your dealer if you require additional information. Do not exceed engine manufacturer's recommendations for maximum RPM.



TACHOMETER

Speedometer

The speedometer measures boat speed in miles per hour (MPH). Boat speed is different from engine speed (RPMs). The accuracy of this instrument depends on the placement and cleanliness of the pickup tube. Some boats may be equipped with a remote pickup tube which may be tilted up for trailering to prevent damage. It may also be tilted up during operation in shallow water to prevent damage or clogging the tube with sand or silt. It should be tilted down while underway.

SPEEDOMETER

Fuel Gauge

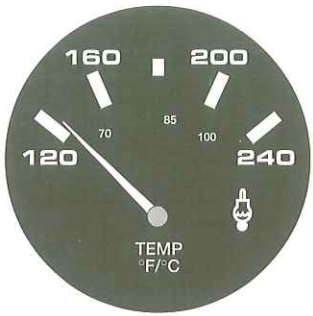
The fuel gauge displays the approximate amount of fuel in the fuel tank(s). The most accurate reading of the gauge is at idle speed and when the boat is level. While running, the fuel gauge usually reads fuller than the actual level because the bow is higher. Since gauge readings are approximate, it is best to compare them to the hours of use versus known fuel consumption or gallons per hour (gph).

FUEL GAUGE

Note: A good way to manage the fuel supply is the one-third rule. Use one-third of the fuel to travel to your destination, use one-third to return, and keep one-third in reserve for emergencies.

Temperature Gauge

This gauge measures the temperature of the engine cooling system. Check the gauge regularly while the engine is warming up. Marine engines draw sea water, circulate it through the engine, and expel it overboard through the exhaust system. If the temperature gauge shows that the engine is hot, stop the engine immediately and check the cooling system. Refer to the engine owner's manual for instructions and corrective action.



TEMPERATURE GAUGE

Power Trim Gauge

The power trim gauge shows the relative position of the outboard unit. Read the gauge carefully, as it does not show position of unit in the degrees. Proper trim should be indicated by bow attitude and engine RPM. For more information see the engine owner's manual.

POWER TRIM GAUGE

V.I.E.W. SYSTEM

Some models are equipped with the V.I.E.W. system. The V.I.E.W. System consists of a solid state micro-computer that will display a variety of functions for the serious fisherman on a dash-mounted display panel. This panel will display:

1. Time (resetable)
2. Magnetic Heading
3. Speed
4. Engine RPM
5. Engine Total Hours
6. Livewell Temperature
7. Outside Air Temperature
8. Oil Tank Level
9. Barometric Pressure
10. Battery Voltages
11. Tournament Timers x 3 (2-day count up, 1 count down
12. Neutral Safety Indicator
13. Livewell Aerator Indicator
14. Livewell Recirculate Indicator
15. Low Battery Warning Indicator
16. Engine Warning Indicator

The V.I.E.W. System is powered through the ignition switch. Operating instructions for the system are included in your Owner's Packet.

ENGINE THROTTLE/SHIFT CONTROL

The engine owner's manual included with your Owner's Packet has detailed information about the throttle/shift control installed on your boat. The control serves two purposes: (1) it regulates the engine speed and (2) it acts as a gear shift lever to control the rotation of the propeller. When the handle is in the center, the gearshift is in neutral. As you move the handle forward and backward, you should feel the handle drop into a detent when the handle moves into the NEUTRAL position. The engine will not start unless the control is in NEUTRAL. Figure 7-1 shows a typical control.

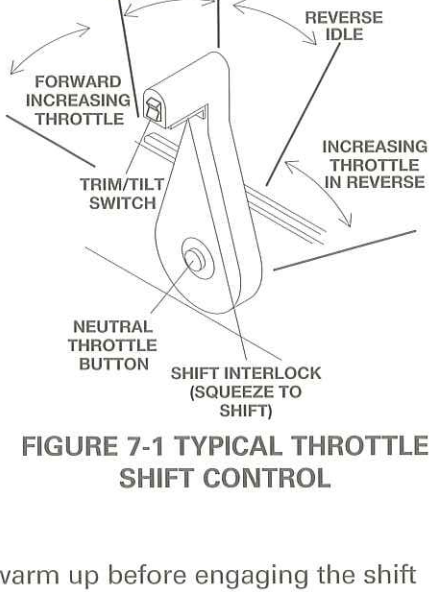


FIGURE 7-1 TYPICAL THROTTLE SHIFT CONTROL

IMPORTANT: Allow the engine to warm up before engaging the shift control. Monitor all instruments while engine is idling during warmup. See the engine manufacturer's specifications for proper operating range

Some controls have an engine warmup button near the base. Pressing the warmup button allows the transmission to remain in neutral while

the operator advances the throttle for warming up the engine. Allow the engine to warm up before engaging the shift control.

Moving the throttle forward or backward increases engine speed and increases boat speed if the engine is in either forward or reverse gear. The further the throttle is moved, the faster the engine runs.

The throttle control also acts as the gear shift lever to control forward or astern movement of the boat. Moving the throttle forward from the neutral position engages the shifting mechanism, causing the boat to move forward. Continuing the forward movement of the throttle increases engine RPM and causes the boat to move forward faster.

Moving the throttle backward from the neutral position causes the boat to move backward. Continuing the backward movement increases the engine RPM. Continued aft movement causes the boat to move backward faster. *Rapid acceleration in reverse can cause a wake that could rise above the transom and flood the boat.*

When maneuvering at low speeds, reversing the direction of propeller rotation causes a braking action which helps stop the boat.

Note: When reversing direction at an engine speed over 1000 RPM, hesitate in neutral enough to let the propeller slow its turning to avoid damage to the shifting mechanism.

Some controls may have a trim control switch which you can use to adjust the position of the outboard. Pressing the switch in the UP position moves the outboard out and away from the transom. Pressing the switch in the DOWN position, moves the outboard in closer to the transom. The switch returns to its center neutral position when released.

Note: Some models may be equipped with trim control switches on the steering wheel.

FOOT CONTROL THROTTLE

Some models may be equipped with a foot control throttle. Once the engine throttle/shift control has been used to put the boat in gear, the foot control throttle can be used to accelerate. This will enable the operator to keep both hands on the steering wheel as the boat's speed increases.

When placing your foot on the pedal of the foot throttle, rest your heel in the heel rest at the bottom of the pedal. This serves two purposes. Placing your foot on the pedal with the heel in the heel rest or "cradle" provides the most comfort from fatigue. More importantly, having your

heel on the pedal will allow you to return the pedal to idle in the unlikely event of a return spring failure, thus maintaining throttle control.

As with any newly installed accessory or accessory that is unfamiliar to the operator, operate the unit slowly and cautiously until familiarity is gained with the unit. After initial use, recheck the integrity of the connections as described in "Making Final Checks".

Note: Complete operating instructions can be found in your Owner's Packet.

SWITCHES

Note: Not all models will have all switches.

Bilge Pump

The two position switch will turn the bilge pump on or off. The three position switch (on/off/auto) is used with the bilge automatic float switch, which will turn on the bilge pump automatically when the water reaches a pre-set level.

Power Master

This switch must be on in order for other switches and equipment to function.

Courtesy Lights

This switch operates illumination lighting for the console and bow panel, and on some models rod locker lighting.

Navigation Lights

This switch operates running lights on bow and stern.

Acc.

This spare switch is provided as a control switch for any aftermarket equipment that may be added to the boat.

Horn

This switch operates the boat's horn.

Aerator

This switch controls the livewell aerator pumping new water into the livewell. The two position switch turns the aerator on or off. The three position switch allows you to run the aerator in the automatic mode (cycles on and off automatically), in addition to full time on or off.

Recirc

This switch activates a pump that will recirculate the water already in the livewell to increase the water's oxygen content. This switch can be used any time there is water in the livewell, even while the boat is on the trailer.

Note: All switches should be in the off position when not in use. Bilge and livewell system pumps can be damaged if allowed to run dry.

FRONT BOW PANEL

The front bow panel on your boat has several switches, which include outboard tilt switch, navigation lights, and courtesy lights. These switches work in the same manner as in the console and should be turned off while not in use.

SKIPPER'S CHECKLIST

Go through this checklist before starting your trip.

- ☐ Will the weather be favorable? Did you get a current weather report?
- ☐ Is there a suitable operator? Is operator impaired from drug or alcohol use?
- ☐ If the boat has been out of the water, have hull drain plugs been installed?
- ☐ Are the hull and propeller free of damage, excessive dirt, and marine growth?
- ☐ Are electrical system and navigation lights working?
- ☐ Is battery fully charged? Are connections clean and tight?
- ☐ Have you checked engine compartment for fuel odors?
- ☐ Have you checked engine(s) for leaks or signs of deterioration? Are fluid levels OK?
- ☐ Have you checked fuel system for odors, leaks, and deterioration?
- ☐ Does the steering system work smoothly? Are all components tight?
- ☐ Is the bilge pump OK? Have you pumped all water possible out of the bilge?
- ☐ Is all required safety equipment on board? Does it work? Is there one PFD for each passenger? Is safety equipment easily accessible
- ☐ Do passengers and crew know what to do in an emergency? Do they know how to use safety equipment?
- ☐ Does the horn work?
- ☐ Is the lanyard safety switch working?
- ☐ Is other needed equipment on board, such as mooring lines, anchor and line, tool kit, first aid kit, etc.?
- ☐ Do you have enough fuel for your trip? Fuel tanks should be filled to slightly less than capacity. Allow space for fuel expansion.
- ☐ Do you have navigation charts and equipment on board? Are you familiar with area where you will be boating?
- ☐ Have you filed a float plan with a responsible party ashore?
- ☐ Do you have an emergency supply of food and water?
- ☐ Are all required documents on board?
- ☐ Are all passengers properly seated?
- ☐ Is the boat overloaded or underpowered (compared with capacity plate)?
- ☐ Are there any persons or debris near the propeller?
- ☐ Are the pedestal seats lowered from the fishing positions and stored so as not to interfere with visibility?

- ☐ Are all articles of clothing, fishing tackle, etc. stored and situated so that they will not be blown out of the boat or strike a passenger?
- ☐ Is the trolling motor folded up and resting securely on its mounting bracket and secured with the strap or latching mechanism supplied with the trolling motor?

After the boat is in the water and secured to the dock, go through the Skipper's Checklist before starting your cruise.

FUELING

⚠WARNING

Fire and Explosion Hazard! Gasoline leaking from any part of fuel system can burst into flames or explode, causing death or serious injury. Inspect entire fuel system carefully at regular intervals and after storage. Check all components for leakage, softening, hardening, swelling, or corrosion. Replace any component showing signs of deterioration before starting the engine.

Because gasoline fumes are heavier than air, they migrate to the lowest part of the boat. Fumes can accumulate in the bilge and, if conditions are right, in the cockpit. These areas must be thoroughly ventilated before starting an engine.

Note: If 1/2 pint of gasoline explodes, it has the same power as 15 sticks of dynamite.

Although alcohol boosts the octane level of gasoline, it also attacks the rubber fuel distribution lines and even metal fuel system components. Alcohol permeates most fuel hoses and other components such as fuel pump, gaskets, and seals, and can also contribute to fuel system contamination.

The fuel hoses are alcohol-resistant as are the materials used by the engine manufacturers. If only fuel containing alcohol is available, or the presence of alcohol is unknown, you must perform more frequent inspections for leaks and abnormalities. Any sign of leakage or deterioration requires immediate attention. Refer to the engine manufacturer's recommendations on fuel type and octane ratings.

Preliminary Steps

- Safely secure the boat to the dock.
- Close all compartment lids to prevent accumulation of fuel vapors.
- Make sure that a fire extinguisher is readily available.

Pumping Fuel

⚠WARNING

Fire and Explosion Hazard! Do not smoke. Extinguish all open flames. Stop engines. Do not use electrical switches and other devices that could cause a spark or flame. Close all openings.

IMPORTANT: Follow engine manufacturer's recommendations for types of fuel and oil. Use of improper products can damage the engine and void the warranty.

1. Be sure to fuel in a well-lit area. It's hard to see gasoline spills if lighting is poor or in the dark.

2. Remove the gas fill cover.

3. Insert the fuel supply nozzle, keeping it in contact with the fuel fill plate to guard against static-produced sparks.

4. Stand away from the fuel tank vent and gas fill during fueling. Fuel may splash back, irritate eyes, and/or create a fire hazard.

5. Avoid spilling gasoline. It can harm the environment. Wipe up any excess fuel immediately.

6. After pumping approximately 10 gallons of fuel into the fuel tank, inspect the engine and fuel tank area for any signs of leakage. If no leaks or other problems are detected, resume fueling.

7. Allow space at the top of the tank for thermal expansion.

Note: You may not be able to fill the tank to 100% of its dry-rated capacity. The boat's floating attitude, which affects the position of the fuel tank and its vent, may limit the amount of fuel the tank will hold. fuel flows out the tank vent, stop fueling immediately. The tank is as full as possible under current conditions.

8. If fuel cannot be pumped in at a reasonable rate, check for fuel ven blockage or a kink in the line.

After Fueling

1. Replace the gas fill cover. Use rags to wipe up any fuel spilled and dispose of them properly on shore.

2. Open the fuel compartment lid. Check for fuel odors and visible fuel leakage. *If you note any indication of odor or leakage, investigate the cause and correct the problem before starting an engine. Do not operate any electrical switch until problem is corrected. A spark from an electrical device could set off an explosion!*

LOADING PASSENGERS AND GEAR

⚠WARNING

Overloading and improper distribution of weight are significant causes of accidents. Do not exceed maximum load stated on capacity plate. For safety, carry a lighter load in rough waters. Distribute the load evenly. Keep the load low.

Affixed to your boat is a capacity rating plate showing the boat's maximum load capacity under normal conditions. This plate shows the maximum weight capacity for persons and for gear. The U.S. Coast Guard determines these load capacity ratings. Your boat's capacity plates are also certified by the National Marine Manufacturer's Association (NMMA). Overloading is a violation of Coast Guard regulations!

Note: The operator is responsible for using sound judgment when loading the boat. Turbulent waters and adverse weather conditions reduce the maximum load capacity. Carrying the maximum load stated on the capacity plate can be dangerous.

When you are loading gear, have someone on the dock pass gear aboard instead of stepping into and out of the boat. Secure all gear firmly so it doesn't shift or interfere with boat operation. When boarding, passengers should step into the boat one at a time, not jump. Passengers not helping load gear should be seated during loading to maintain an even trim. Position passengers and gear so that the load is balanced (Figure 8-1). Do not use swivel seats above trolling speed. Secure unoccupied seats. Observe warnings on seat pedestals.

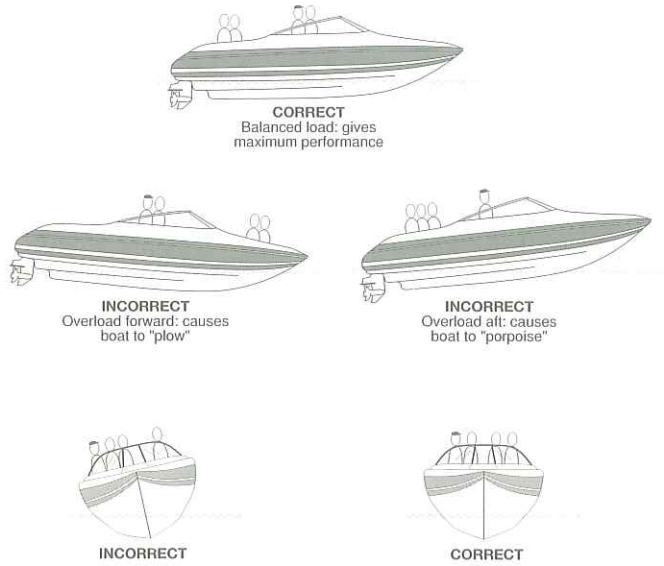


FIGURE 8-1 LOADING PASSENGERS

STARTING PROCEDURES

Note: The engine manual included with your Owner's Packet has detailed starting instructions. The following information is merely a guide and does not explain all starting procedures in detail.

Preliminary Checks

1. If the boat is not secured to the dock, do so before starting the engine. Keep it secure until the engine is running and warmed up.

2. If the fuel system has a manual fuel valve, open it.

⚠WARNING

Fire or Explosion Hazard! Gasoline vapors are explosive. Check fuel tank compartment for fumes or gasoline leaks before starting engine. Do not start engine if gasoline or fumes are present.

3. Run the bilge pump until the flow of water stops.

4. Make sure the throttle is in the neutral position and sterndrive is lowered into water.

5. Make sure passengers seated in the bow area do not obstruct the operator's vision.

Starting Engine

1. Check the engine oil tank for proper level.

2. Pump the fuel primer bulb on the fuel line.

3. Turn the key to start the engine. Engine will not turn over if throttle is not in the neutral position.

   IMPORTANT: Do not operate starter continuously for more than 15 seconds without pausing. Starter will overheat and can be damaged. Allow at least two minutes between starting attempts so starter has time to cool.

⚠ DANGER

Carbon Monoxide Hazard! A cold engine produces more carbon monoxide than a warm engine. Provide adequate ventilation in the cockpit to prevent excessive exposure and reduce the possibility of carbon monoxide accumulation. Open all canvas and side vents to increase air movement.

4. After engine has warmed up, check water temperature gauge (if equipped) to ensure engine temperature stays within proper ranges. If temperature reading is abnormally high, stop engine immediately and inspect for cause of high reading.

5. Check steering operation. Turn steering wheel all the way in both directions, and check that outboard moves freely.

6. Turn the steering wheel full to port and starboard while observing outboard movement to check operation of the steering system.

7. With boat moored to the dock and engine idling, check for proper operation of the shifting motion by moving throttle forward, back, and then to neutral. *Leave the engine in gear for only a second or two.*

MANEUVERING

⚠ WARNING

Boat steering is not self-centering. Engine and propeller torque, wave and current action, and boat speed affect steering. Pay constant attention to steering for safe operation.

When you have finished all pre-departure checks, you are ready to leave the dock. Cast off the lines. Idle speeds work best when maneuvering. Take wind, tide, current, and other forces into account as you maneuver away from the dock. Check for other boats in the area.

IMPORTANT: Falls from moving boats are a major cause of fatal recreational boating accidents. Do not allow passengers to ride on the bow with feet hanging over the side or ride while sitting on the stern, gunwales, or seat backs. The Coast Guard considers these acts to be negligent or grossly negligent operation and prohibits them by law.

Leaving the Dock

Shift the engine into forward or reverse depending on whether you want to move the bow or the stern away from the dock first. Move the throttle lever to neutral, then push forward quickly and firmly to shift into forward gear or pull back to shift into reverse. Run the engine at a slow speed as you move away from the dock. If you move the bow out first, watch that the stern of the boat does not swing into the dock or a piling.

Note: If you are new to boating, practice maneuvering. Once away from the dock, practice docking using an imaginary dock. Practice stopping and reversing direction.

Stopping

Practice stopping maneuvers and learn early how the boat reacts. If the boat is moving forward, pull the throttle back to NEUTRAL and let it coast. Depending on speed, the distance the boat will coast until it comes to a complete stop varies. Through experience, you will be able to measure that distance more accurately.

There will be times when you must stop more quickly, but boats don't have a brake pedal. Back down on the throttle and shift into NEUTRAL. The boat will begin to slow down. When the engine is idling, shift into REVERSE and gradually increase engine speed. The boat will stop in a shorter distance.

Note: In reverse, a boat does not steer nearly as well as it does when going forward. Don't expect to accomplish tight turning maneuvers when backing up.

Steering

Boats steer by the stern. (The feeling is much like steering when you are backing up an automobile.) This means that when the boat is moving forward, the stern swings in the direction opposite to the turn. For

example, when you turn the helm wheel to port, the stern swings to starboard. This is especially important to keep in mind when docking, operating in close quarters with other boats, or when approaching a swimmer or downed skier in the water.

Once you have spent enough time practicing maneuvers and have a feel for how the boat handles, you are ready to run in open waters.

HIGH PERFORMANCE BOATS

Your boat may be capable of being operated at very high speeds. It has been equipped and rigged for safe operation, but safe operation requires:

- Driver awareness of how the boat will perform under all operating conditions.

- Driver skill in anticipating and reacting to often rapidly changing boat control conditions.

⚠WARNING

Some models are capable of speeds in excess of 45 mph. Consult your dealer for full performance capabilities of your boat. High Performance Boats should not be operated by inexperienced persons until complete instruction is accomplished under the supervision of a qualified instructor.

For the safety of boat occupants, and to prevent damage to the boat, the number of passengers, speed, and manner of boat operation must be adjusted to suit weather conditions. The boat operator is responsible for any acts of negligence or carelessness.

The boat operator is responsible for the safety of all boat occupants, and nearby boaters. Passengers should be advised of the possibility of being thrown to the deck or overboard if they are not properly seated while the boat is operated at high speeds. Swivel seats are only to be used at trolling speeds. Do not operate at high speeds near other boats, pilings, underwater obstructions, people in the water, shorelines, seawalls, or any other obstacles.

When first learning to drive a high performance boat, try to pick a day and time when the waterway is relatively clear of traffic. Driving a high performance boat requires concentration, coordination and an awareness of everything going on around the boat. You'll feel more comfortable learning to operate your boat without a lot of other boats in the

ACCELERATION

⚠WARNING

Poor Visibility! While accelerating, bow rises and obstructs forward vision. Before accelerating, be sure path is clear. Make sure passengers know you intend to accelerate.

Before bringing the boat "on-plane," check the entire area to make sure you have a clear, safe path. As you throttle up and accelerate, the boat's trim angle changes, causing the bow to ride high (Figure 8-2). This trim angle is sometimes referred to as the "hump." As the boat continues to accelerate, the boat levels out to its planing attitude. A few seconds at full throttle should get the boat over the hump and into its planing attitude; then throttle down to cruising speed. This also improves fuel efficiency.

You are responsible for any damage or injury caused by your boat's wake. Observe no wake speed zone warnings. Operate your boat with regard for the safety of other boats and people in your boating area.

Note: Visibility, handling, and performance are reduced while accelerating. It's a good idea to get "over the hump" as soon as possible.

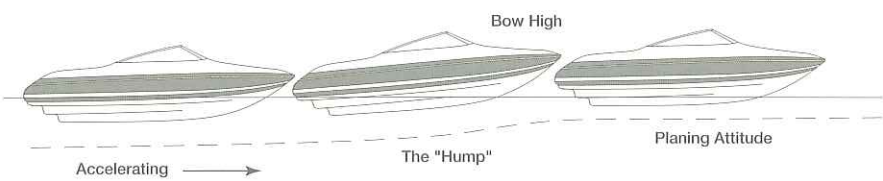


FIGURE 8-2 PLANING

POWER TRIM OPERATION

The power trim feature on your boat allows you to raise or lower the outboard motor to affect the boat's running angle while underway. While your boat is on-plane, the best performance is obtained when the boat is running at a 3° to 5° angle to the water, with the bow slightly out of the water.

Note: The following information is general. Refer to the instructions in the engine manual for more detailed information about the power trim controls.

1. The standard trim control switch is on the control lever handle.

2. The switch controls the position of the outboard. Proper trim is very important in boating. Before you accelerate, the outboard should be down.

3. In the case of low or heavy bow attitude, the boat tends to "plow" (Figure 8-3). The outboard is trimmed too far down (in). Trim the outboard up (out) to correct this situation.

4. If the bow is too high, the boat tends to "porpoise" (Figure 8-3) and the bow will bounce up and down on the water. The outboard is trimmed too far up (out). Trim down (in) to correct. The boat is trimmed correctly when it is just short of porpoising. If you are an inexperienced driver or are having difficulty correcting a porpoising condition, reduce your speed until the boat levels off.

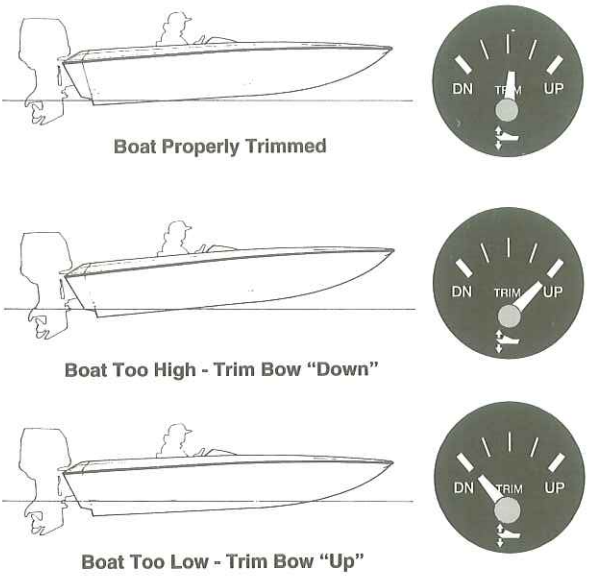


FIGURE 8-3 TRIMMING THE BOAT OUTDRIVE

5. A good practice is to get underway with the outboard trimmed all the way in. After the boat is on-plane, trim the outboard up slightly to obtain the proper bow attitude and engine speed.

6. The outboard should never be trimmed up to a point where the propeller cavitates (or slips). A rapid increase in engine RPM's is evidence of cavitation. If this occurs accidentally while running at full throttle, immediately trim the outboard down and reduce the throttle until the slipping stops. If necessary, consult your dealer for

If the prop slips at lower planing speeds, the outboard may be trimmed too far up. Immediately trim the outboard down until the prop "grabs" again to restore efficiency.

7. Trimming the outboard up lifts the boat higher in the water. It will travel faster because less hull is in the water.

⚠WARNING

Loss of Steering Control! Improper trim adjustment can result in loss of steering and can cause a serious accident.

STEERING FORCES

As the motor's propeller turns, it causes a twisting force on the motor about its steering axis. This twisting force, or torque, is felt as a force trying to twist the steering wheel out of the driver's hands. At high speed, the driver must apply a correcting force on the steering wheel when the motor is trimmed up to hold the motor's steering forces. The direction and amount of force on the wheel are affected by the height of the motor, the amount of propeller in water, the propeller type, and direction of propeller rotation.

All single installation *Johnson*® and *Evinrude*® models should use a right-hand rotation gearcase because there are more styles of high-pitch, right-hand rotation propellers available.

Turning the boat at high speed is always very touchy. Before attempting a high speed turn a common safe practice is to trim DOWN slightly. Avoid full trim DOWN position on moderate or high speed turns.

If your outboard is equipped with power steering, the steering forces are partially controlled by the power steering system. You will feel minimal outside steering forces while the power steering system is functioning properly. If the power steering system is not functioning, operate at moderate speed until it can be repaired.

ANCHORING

Note: This section includes general information about anchoring. It does not address all possible anchoring situations. It is recommended that you attend a safe boating course to learn more about anchoring.

Anchors are available in different shapes, sizes, and weights to fit different boats, uses, and conditions. The boat's size and weight governs the weight of the anchor and diameter of anchor line. Your dealer can

tell you which anchor will work best. You need an anchor line at least 6 to 7 times longer than the depth of water anchored in (Figure 8-4). For example, if you anchor in water 20 feet (6 m) deep, use an anchor line 120 to 140 feet (36 to 43 m) long (minimum).

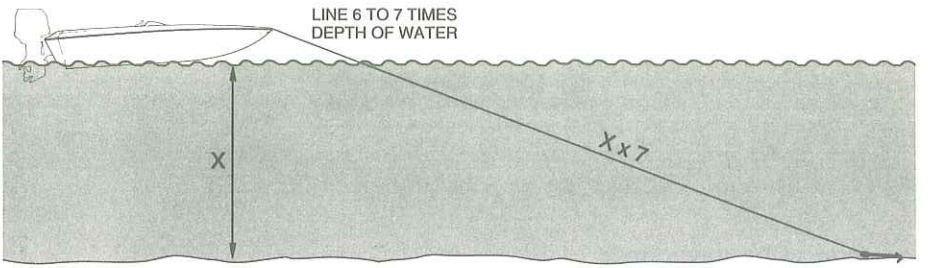


FIGURE 8-4 WEIGHING ANCHOR

If you are anchoring overnight or for extended periods, use two or more anchors set at 45° to each other. If you don't use two anchors, make certain there is enough space for the boat to swing in a full circle to prevent damage in case of shifting winds.

Note: Keep the anchor secure while underway to prevent damage or injury due in case the boat's attitude should shift suddenly.

Dropping Anchor

1. Have a crew member carefully lower the anchor. Keep slight tension on the anchor line while lowering and maintain the tension after reaching the bottom.

2. Maneuver the boat slowly backwards until length of anchor line is 6 or 7 times the depth of the water.

IMPORTANT: Secure anchor line only to bow eye or bow cleat. Never tie anchor line to a rail, rail fitting, or other hardware not designed to support this stress. Never anchor using only a stern cleat. Waves could swamp your boat under windy conditions.

3. Fasten the anchor line around the bow eye or deck cleat. Anchor flukes should dig in and catch. Watch for anchor drag by checking shoreline landmarks at the time the anchor is dropped and one-half hour later. If the boat has drifted away from these reference marks, the anchor is dragging and must be reset.

Pulling In the Anchor

The engine should be running when you pull in anchor.

1. Slowly maneuver the boat forward to reduce tension on the line and make retrieval of the anchor line easier.

2. Pull in anchor line until the line is vertical. Pull firmly to lift the anchor's shank and free the flukes from the bottom.

If the anchor becomes stuck, attach the vertical line to the mooring clea Wave action on the bow may lift flukes from the bottom and free the anchor. If the anchor is still stuck, feed out a few feet of line and attach i to the bow cleat. Maneuver the boat slowly around the anchor, keeping the line firm. Determine the angle that will work to pull the anchor free.

RETURNING TO SHORE

Docking

Always approach the dock slowly. If possible, come in against the win or current, whichever is stronger. Approach the dock at a 30-45° angle As the boat nears the dock, slowly swing parallel to it. Tie the bow lin first; then the stern.

Note: If wind or current is moving toward the dock, move parallel to the dock further out. Let the wind or current push you in.

Use extreme caution if wind or current is from the stern. Back in towar the dock slowly at a slight angle with engine in slow reverse. Gently swing parallel. Tie stern first, then the bow. If the wind is changeable, place fenders over the side between the boat and the dock.

Mooring

After you have positioned the boat next to the dock, secure it with mooring lines to keep it in position. Mooring lines must be long enough to secure the boat in any docking situation. For example, the length of the lines for a 16-foot runabout should be at least 15 feet (4.5 m). An eye splice at the end of each line works well with bow or stern cleats (Figure 8-5). If tides are a consideration, be sure to leave slack in the lines to make up for the rise and fall of the water while the boat is docked.

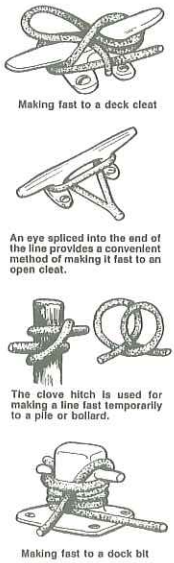


FIGURE 8-5 MOORING LINE TIES

The mooring lines you use most often are the bow line, the stern line, and spring lines as shown on Figure 8-6. Each line has a specific purpose. The bow line and the stern line secure the boat's bow and stern. The two spring lines keep the boat from moving forward or backward when you are moored alongside a dock.

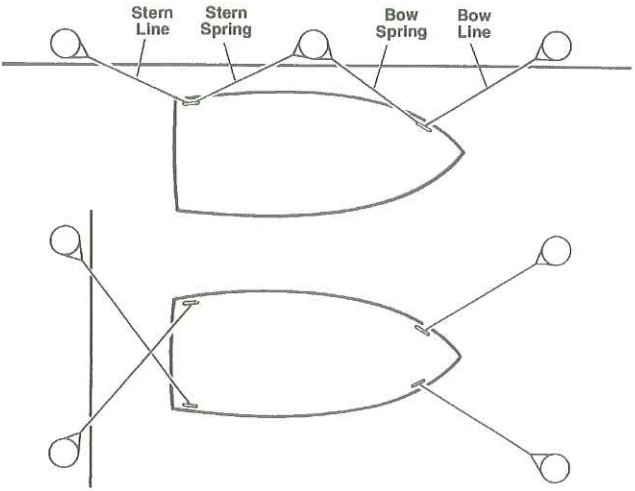


FIGURE 8-6 MOORING LINES

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

If you are mooring in a slip, bow and stern lines, port and starboard, will keep the boat in position.

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

NAVIGATION LIGHTS

Cruising at night can be very pleasurable, but it can also be dangerous Be especially careful of shallow waters and watch for submerged debris, rocks, and other obstacles in the water. Navigation lights are intended only to prevent collision, not to improve night vision. You may choose to use a spotlight, which is available from your dealer or local marine store, to aid in night navigation.

Note: It is illegal to use a spotlight as a headlight. Use it only temporarily to check the position of your boat and the surrounding area.

Your boat has one white (stern), one red (port) and one green (starboard) light. The stern light may be a removable pole light. To use the light, line up the two-prong plug in the pole with the receptacle in the base. Plug the light in, and lock it into place with lever/slide lock. Whe not in use, stow the light inside the boat for safe keeping.

Check lights for proper operation before heading out at night. You should also learn to identify the running light combinations for other vessels. We recommend that you participate in a boating safety cours to further learn about navigation lights and safe boating practices.

A three-position switch at the helm controls the anchor lights and the navigation lights. You can use it to turn on just the stern (white) light when anchored or moored or to turn on all navigation lights while underway.

HAZARDOUS CONDITIONS

Fog

When warm air is above cooler water, its temperature drops. As the a cools, it loses its ability to hold moisture and fog will develop when th air temperature drops to the dewpoint temperature. Dewpoint temper ature depends on the amount of humidity in the air. You should be aware that fog can form quickly as the air temperature drops, especial ly if the air is calm and humid. Remember the following guidelines:

- Turn on running lights.
- As fog sets in, take bearings and mark your position on the chart while continuing to log course and speed.
- Prompt all persons aboard to put on their PFD (personal flotation device).
- If your boat has depth finding equipment, take soundings to find the depth and match them to the depths shown on your charts.
- Station a person forward on the boat as a lookout.

- Reduce speed. From time to time, stop engine and listen for fog signals.
- Sound the proper horn or fog bell at proper intervals to warn other boaters.
- If there is any doubt in continuing boat movement, anchor. Listen for other fog signals while continuing to sound the proper fog horn or bell for a boat at anchor.

Storms

Storms sometimes appear without much advance notice. Although information from meteorological observation and reporting stations is available, we all know that weather forecasts aren't always accurate. Many marinas fly weather signals. You should learn to recognize these signals and monitor local weather forecasts before leaving port.

While underway, keep a watch on the horizon for signs of an approaching storm. If there are signs of bad weather, turn the radio on. Dial in a local weather station and monitor the forecast. Use the VHF radio (if provided) to check the weather channels. Everyone aboard should put on a PFD. The best precaution is to return to a safe port if there is time.

If you cannot get back to port, there is no substitute for knowing what to do. Close and secure all portals and hatches. Reduce speed as the seas build. Stow all loose gear below deck and tie down any gear required to remain on deck. Change course to one perpendicular to the storm's path; you may be able to avoid it.

Note: Coping with a storm while underway can challenge the best of operators. The information presented in a safe boating course will be very valuable in this situation.

Running Aground

Operating in shallow water can present a number of hazards. Sand bars in narrow inlets are constantly shifting, making it difficult to mark them with buoys. Sometimes waves form into breakers when they pass over sand bars. In coastal areas, tides can change water levels by as much as 30 feet. Check with local marinas or Coast Guard stations for tide tables and current charts.

If the boat runs aground, first check persons aboard for injury. Then check for damage to the boat. If the outboard strikes an underwater hazard, check for boat and outboard unit damage. If the engine vibrates excessively after striking an underwater obstruction, it may indicate a damaged propeller. If vibration is noticeable, return to port slowly to prevent further outboard damage from an out-of-balance

condition. Watch the temperature gauge to make sure you do not over heat the engine.

If the boat is not taking on any water, it may be possible to rock the boat by shifting the weight of the passengers and gear and by raising the outboard unit while reversing the engine.

If you ground the boat on a sand bar, shut down the engine and seek help from another boater or radio for help. See your dealer as soon as possible, as sand ingested in the engine cooling system can cause major engine damage. If you need to be towed, we recommend using a commercial towing service.

⚠WARNING

Deck cleats may pull free from deck. Towline broken under tension may whip about. To prevent injury, attach towline only to transom or bow towing eye. Stay clear of towline attachment points on towed and towing boats.

Warning Markers

It is a good idea to find out about hazardous areas and how they are marked by asking local authorities.

- Boaters must also recognize the flag designs which indicate that scuba divers are present and keep well clear of the area.
- Watch for swimmers. Swimming areas may not be marked, so always remain alert.
- Distress flags indicate a fellow boater is in need of assistance.
- Navigation markers serve as a means of identifying navigable routes and indicate water hazards. Boaters should become familia with navigation markers and stay within marked boundaries and clear of hazards.

REACTING TO EMERGENCIES

Note: In any emergency, the first thing all passengers must do is to put on their PFDs.

Flooding

If the boat starts taking on water, start the bilge pump immediately. Open all compartments and look for the cause of the flooding. Check al hoses and through hull fittings. If flooding occurs as a result of collision or grounding damage, call for assistance and head for shore if possible

Capsizing

If the boat capsizes, and others were on board, find them and guide them to the safety of the hull. Even if the boat is floating upside-down, stay with it. Rescuers can spot a boat hull much easier than a human head sticking out of the water. *Do not try to swim ashore; it may be further than it looks.*

Man Overboard

Think through and follow these procedures if someone in the boat falls overboard.

- Remember, every second counts, you must act fast.
- Move throttle to idle position immediately and yell "MAN OVERBOARD."
- Throw a Type IV PFD out to the person immediately. (This is why it should be readily accessible at all times. If it's not, throw out some other floating object.)
- Keep the person in the water in sight at all times. Make one passenger responsible for watching the person. Do not go into the water to help the victim. One person in the water is enough trouble, and a panicky person in the water can present a drowning hazard to rescuers.
- Circle around quickly, approaching into the wind and waves. When the person is alongside, put the engine in neutral and throw them a Type IV PFD with a line attached or extend a paddle or boat hook within his/her reach.

Collision

If a serious collision occurs, you should first check the condition of all passengers aboard, then inspect the boat to determine the extent of damage. If the boat or passengers are not in danger, prepare to assist the other vessel. If you need help and the boat has a ship-to-shore radio, first contact the U.S. Coast Guard (VHF Channel 16) or other rescue authorities immediately.

If the bow of the other boat penetrated the boat's hull, prepare to block the opening once the boats are separated. Shore up the hole with a spare PFD or bunk cushion. While blocking the hole, trim the weight of the boat (where hole exists) so that it is out of the water during repairs.

Be sure to report the accident to the proper authorities.

Fire

IMPORTANT: All persons aboard should know the location and proper

Most fires are caused by electrical problems or careless fueling practices. A fire is a serious emergency. You must work quickly to implemen safety procedures. If a fire occurs, immediately stop the engine. If it is small, try to put it out with a fire extinguisher. If the fire is in the engine compartment, turn off the bilge blower. Do not open fuel tank compartment. This feeds oxygen to the fire and may cause it to flare up.

If the fire gets out of control, execute a distress signal and call for help if equipped with a ship-to-shore radio. All persons aboard should jump overboard and swim a safe distance away from the flames.

Guidelines for fire prevention:

- Use only approved marine cooking and heating systems.
- Open flames demand constant attention.
- Keep flammable materials in approved containers in a vented locker sealed from the interior of the boat.
- Ensure ventilation systems are unobstructed.
- Remove mooring covers before starting engine.
- Check the bilge for fuel leaks.
- Extinguish smoking materials carefully.
- Use special care with flame or high temperatures around urethane foam.
- Check cleaning products for flammability.
- Ventilate when cleaning or painting.
- Disconnect electrical system from its power source before performing maintenance.
- Replace breaker or fuse with one of the same amperage.
- Electrical appliances must be within rated amperage of boat circuits. Observe the boat carefully while the electrical system is being energized.
- Allow only a qualified marine electrician to service the electrical system.

Medical Emergency

Accidents while boating can happen. Be prepared to handle these emergencies when they happen. Keeping a first aid kit and dry blankets on board can assist during these situations. It is also a good idea to conta the local Red Cross for information and training on first aid and CPR.

Propulsion Failure

Before you call for help regarding an outboard failure, it is a good idea t eliminate the possibility of simple problems. Turn off the engine and check to see that (1) there is fuel in the tank; (2) the engine cooling intakes on the outboard are not clogged; (3) props are clean and free of

weeds, netting, etc.; (4) no hoses are leaking; (5) there is oil in the engine; (6) the lanyard stop switch is connected.

Once you have checked out the possibilities listed above and find they are not the problem, call for help giving your position and a detailed description of your boat.

Control Failure

In the unlikely event of a throttle/shift failure, shut down the engine immediately. Carefully check the control connections in the engine compartment to see if they are secure. If not, try to locate the attaching hardware and reassemble. If that is not possible, try to use whatever is available such as paper clips, hair clips, tape, etc., to secure the connections. If a temporary repair is made, return to port at the slowest steerable speed and be prepared to take emergency action should the temporary repair fail also. Have your dealer make repairs before using the boat again.

Steering Failure

If a problem with the steering occurs, shut down the engine immediately. Check the connections to the outboard unit. Some boats have a push/pull cable while others have hydraulic steering. With cable connections, check the attaching hardware and tighten it if necessary. If you have hydraulic steering, have your dealer check the fluid level of the reservoir. If the steering is not operating properly, do not operate the boat and call for assistance.