PRINCECRAFT®

The More You Know *The Better We Look*

CONGRATULATIONS...

You are now the proud owner of a boat manufactured by Princecraft Boats Inc., a subsidiary of BRUNSWICK INTERNATIONAL LIMITED.

Your admiration and respect for your new Princecraft boat will be enhanced if you follow the recommendations in this Owner's Manual. Other handbooks and written directions pertaining to the operation of your boat can be found in the owner's packet. They will help guide you toward years of enjoyable boating if you will take the time to read this material.

This manual has been compiled to help you operate your craft with safety and pleasure. It contains details of the craft, the equipment supplied or fitted, its systems, and information on its operation and maintenance. Please read it carefully and familiarize yourself with the craft before using it.

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

PLEASE KEEP THIS MANUAL IN A SECURE PLACE, AND HAND IT OVER TO THE NEW OWNER IF YOU SELL THE CRAFT.

Because of our policy of continuous product improvement, the illustrations used in this manual may not be the same as your boat and are intended as representative reference views. Some controls, indicators, or information may be optional and not included on your boat. For a complete list of standard and optional features and equipment, consult your local Princecraft dealer.

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 reason, this manual is written for the first-time boat owner or operator. Even if you are an experienced boater, you will still find much valuable information 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 operation and maintenance. In addition, you can consult your local Princecraft dealer for product use and instruction. 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 products 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 operating 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 manual to the new owner. In some cases, this manual provides general information; more specific information is available in the original equipment manufacturer (OEM) manuals. This Owner's Manual does not supersede 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 equipment not provided on your boat. This manual contains information about pontoon boats, deck boats, and fishing boats. Some information pertains only to some models and may not apply to 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 common boating terms. Figure 1-1 lists some of these terms and identifies their meaning in relation to a typical boat.

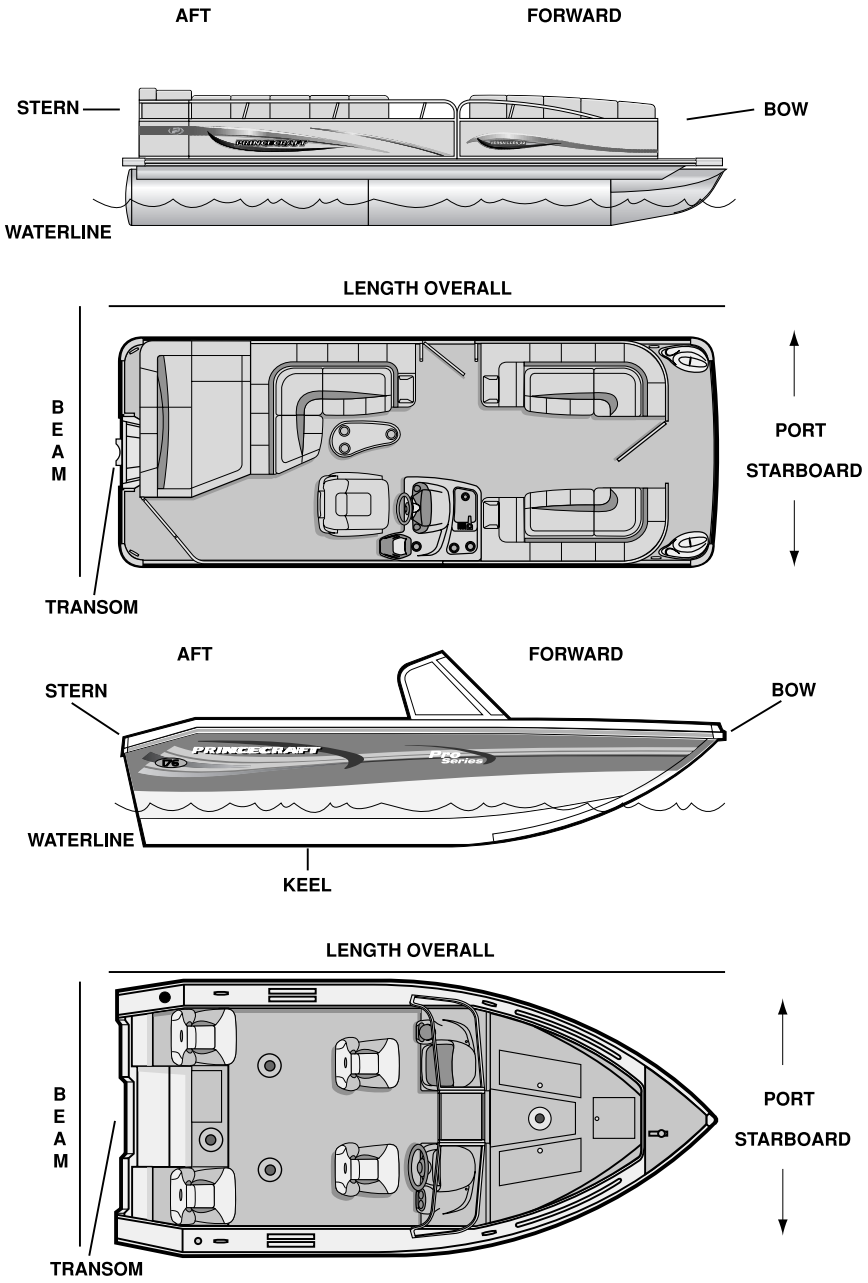


FIGURE 1-1 TERMINOLOGY

WARRANTY

The Express Limited Warranty for your Princecraft boat can be found in your Owner's Packet. Please read it carefully. The warranty becomes effective upon the date of purchase, but the warranty registration card must be completed, signed, and returned to Princecraft Boats Inc. within 30 days of sale in order to obtain any warranty coverage. Princecraft 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 Department. Failure to follow warranty instructions will void your warranty.

Your dealer will properly fill out the warranty registration card for your signature. **Make sure your dealer has mailed the card to us to validate the warranty.** On most boats, the hull identification number is located on the starboard side of the boat's transom. On pontoon boats, the hull identification number is found near the stern end of the port side pontoon. 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.

In some countries, it is required 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 the boat serial number be completed and mailed to our Customer Service Department.

If you do not complete and return the warranty registration card, Princecraft will not be able to notify you as required. Failure to return the card means that you waive any right to notification and/or repair at Princecraft's expense of any unsafe condition for which notification and/or repair would be required.

MANUFACTURER'S RECOMMENDATIONS

Boats

1. Make sure you read the capacity plate and never exceed the persons, horsepower and maximum capacities of the boat, canoe, pontoon boat, or deck boat. (See section 1.8 to 1.11 for warning labels)
2. When transporting, the boat should be properly supported by the trailer; bunk type trailer with long straight longitudinal bunkers extending past the transom of the boat provide most uniform support and are definitely recommended; trailer using rollers as the principal means of support are not recommended; the boat should be firmly secured to the trailer so that it cannot shift; trailer transom supports must be used where motors are transported on the boat.

3. Use common sense afloat; when encountering rough water or any adverse condition, adjust your speed to the safe speed you have predetermined; remember, waves are not soft and even a large ship slows down when the going is rough.
4. Never use metal base antifouling compounds on your aluminium boat, canoe, pontoon boat, or deck boat; antifouling compounds containing copper, mercury, arsenic or lead are not recommended; organotin based antifouling paints such as tribytylin oxides are recommended by the Aluminium Association for antifouling protection in salt and brackish water; do not place steel, brass, bronze or copper fitting in direct contact with aluminium hulls; separate with gaskets or brushing of micarta or other plastics to prevent electrolytic action.
5. Our boat hulls are constructed of corrosion resistant Marine Aluminium Alloy 5052-H36; after repeated use in salt water, check occasionally for signs of pitting or excessive corrosion which are indicators of possible electrolytic action; always rinse with fresh water after removing from salt or brackish water, an occasional application of wax will bring back the lustre.

Trailers:

1. Before each use:
   - check the lights;
   - check the air pressure in each tire;
   - make sure the bolts on each wheel are tightened properly;
   - make sure there is sufficient grease on the ball bearing.
2. Maintenance required every 3200 Km (2000 Miles), after each heavy use and before seasonal storage and or non-use for a period of more than 30 days:
   - remove the wheels and ball bearings and check the seals behind the ball bearings; if everything is in perfect condition, re-grease and proceed with re-assembly of the ball bearings and wheels;
   - carry out a visual inspection of the leaf springs and the coupler and retighten all bolts in the suspension and coupler.
3. Your trailer has been designed to carry the load stated on the label (see section 1.8 to 1.11); you should avoid transporting loads exceeding this capacity; overloading your boat could also damage the bottom of your boat.
4. Trailering on inadequate roads or paths could damage your trailer and boat.

We hope that you never have to use neither your boat nor trailer warranty card; however, if you do develop a problem with your boat or trailer, please contact your selling dealer.

SERVICE

If you have a problem with your new boat as a result of workmanship or materials, we want to correct it and get it back in service as quickly as possible. Contact the Princecraft 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 Princecraft. You can get in touch with us directly at:

Princecraft Boats Inc.
725, rue St-Henri
Princeville (Québec) G6L 5C2
Telephone: (819) 364-5581
Fax: (819) 364-5821

Princecraft U.S.
2600 Sea Ray Blvd. Building # 2
Knoxville, TN 37914
Telephone: (866) 774-6232
Fax: (865) 971-6456

Website: www.princecraft.com
E-mail address: service@princecraft.com

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. On stern-drive models, 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:

- Obtaining adequate insurance coverage.
- 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.
- 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 should inspect your boat when you take delivery to make sure it is in good condition and that all components are working properly. A copy of the checklist is at the end of this section. Your dealer should discuss the terms of all warranties and emphasize the importance of registering each warranty with the manufacturer. He should 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 enjoyment 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 and continue to operate properly. Follow the maintenance and service schedule recommended by the manufacturer. Cleaning and waxing the 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 Canadian Power and Sail Squadron (1-888-277-2628), United States Coast Guard Auxiliary, and the Red Cross sponsor educational programs. See your Princecraft dealer about special courses available in your area.

Learn how to operate your boat safely. This book is not intended to teach you everything you need to know. There are many good boating publications that have helpful information. Pamphlets prepared by the Canadian and U.S. Coast Guard explain "Rules of the Road," signal lights, buoys, safety, international and inland regulations, and other information beyond the scope of this manual. You can contact the U.S. Coast Guard Boating Safety Hotline at 1-800-368-5647. Contact the Canadian Coast Guard at 1-800-267-6687.

BOATING LAWS AND REGULATIONS

You are subject to marine traffic laws and "Rules of the Road" for all waterways. You must stop if signaled to do so by enforcement officers, and permit them to board if asked.

Some regions have specific trailer regulations and 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

Register your boat in the area where it is used most frequently. Contact

boating authorities for requirements. Your dealer may either supply registration forms or tell you where they may be obtained.

Insurance

Generally 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 consider protecting 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 report with the appropriate authorities. Reports are generally necessary for accidents involving loss of life, injury, or in some cases when the damage amount exceeds a specified amount. 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.

Discharge of Oil

Regulations prohibit the discharge of fuel, oil, or oily waste into or upon navigable waters, 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.

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. 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. Be sure to read and adhere to all hazard warnings. (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 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.

Couper le contact au moteur lorsque près des baigneurs. Le contact avec l'hélice causera des blessures graves ou la mort.

PT#056-0861

DANGER

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

Ne jamais approcher ou utiliser l'échelle quand le moteur fonctionne. Le contact avec l'hélice en mouvement causera des blessures graves ou la mort.

PT#056-0862

WARNING/AVERTISSEMENT

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.

Cet espace n'est pas ventilé. Les vapeurs d'essence sont explosives et inflammables. Pour éviter des blessures graves ou la mort, ne pas entreposer d'essence ou de liquides inflammables ici.

PT#056-0864

WARNING/AVERTISSEMENT

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

Les fuites d'essence sont explosives et inflammables. Pour éviter des blessures graves ou la mort vérifier le système d'essence pour déceler des fuites au moins une fois par année.

PT#056-0865

WARNING/AVERTISSEMENT

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

Ne pas utiliser le mât de remorquage pour skieur pour tirer un parachute. Le mât peut sortir de son attache pouvant causer des blessures graves ou la mort.

PT#056-0871

WARNING/AVERTISSEMENT

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.

LES GAZ D'ÉCHAPPEMENT DES MOTEURS CONTIENNENT DU MONOXIDE DE CARBONE. LES EMBARCATIONS AVEC LES TOITS DE TOILE INSTALLÉS SONT PLUS SUJETTES À ACCUMULER DES GAZ D'ÉCHAPPEMENT. POUR ÉVITER DE SUBIR DES DOMMAGES AU CERVEAU OU LA MORT PAR LE MONOXIDE DE CARBONE, BIEN VENTILER L'INTÉRIEUR. LES SIGNES D'UNE EXPOSITION SONT LA NAUSÉE, L'ÉTOURDISSEMENT ET LA SOMNOLENCE. VOIR LE MANUEL DU PROPRIÉTAIRE POUR PLUS DE DÉTAILS. SI UN CHAUFFAGE CATALYTIQUE EST UTILISÉ, PRÉVOIR UNE VENTILATION. NE PAS UTILISER UN CHAUFFAGE CATALYTIQUE PENDANT LE SOMMEIL.

PT#056-0867

⚠ WARNING/AVERTISSEMENT

Prevent falls overboard. Do not occupy upper deck while underway.

Prévenez les chutes par-dessus bord, ne pas utiliser le pont supérieur quand l'embarcation est en mouvement.

PT#056-0874

⚠ WARNING/AVERTISSEMENT

BEFORE STARTING ENGINE

EQUIPEMENT

- **drain plug - secured ?**
- **moveable 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, raised seats, or edges of boat !**
- **operator's vision - unobstructed ?**
- **weather conditions - safe to go out ?**
- **passengers - aware of emergency procedures ?**

AVANT LE DÉMARRAGE DU MOTEUR

EQUIPEMENT

- ***bouchon de vidange - bien installé ?***
- ***siège amovible - sécurisé ?***
- ***ceinture de sauvetage - une par personne ?***
- ***autres items de sécurité - à bord ?***

PROCÉDURES

- ***coupe-circuit d'urgence - cordon attache ?***
- ***tous les occupants assis dans l'embarcation ? jamais sur des dossiers ou sur le rebord !***
- ***champ de vision du pilote - sans obstruction ?***
- ***conditions météo - sécuritaire pour naviguer ?***
- ***passagers - familiers avec les procédures d'urgence ?***

PT#056-0869

⚠ WARNING/AVERTISSEMENT

Do not use cooking appliance inside camper enclosure. Heat may ignite camper material.

Ne pas utiliser l'appareil de cuisson à l'intérieur du toit campeur. Le matériel du toit peut s'enflammer sous l'effet de la chaleur.

PNA.000501

⚠ WARNING/AVERTISSEMENT

DO NOT EXCEED 5 M.P.H. (8 KM/H) WHEN BOLSTER IS UP

NE PAS DÉPASSER 5 M.P.H. (8 KM/H) LORSQUE LE COUSSIN EST SOULEVÉ

050400

⚠ DANGER ⚠

Avoid serious injury or death from carbon monoxide.

Exaust fumes from engines contain carbon monoxide gas and may collect in enclosed areas.

Keep cockpit well ventilated, do not use canvas, side curtains without proper ventilation.

Co sickness symptoms include headache, nausea and dizziness. Do not mistake for seasickness.

See owners manual for additional information.

Éviter des blessures graves ou la mort par le monoxyde de carbone.

Les gaz d'échappement des moteurs contiennent du monoxyde de carbone qui peuvent s'accumuler dans des endroits mal ventilés.

Bien ventiler l'habitacle et ne pas utiliser les toits de toile ou rideaux sans une ventilation adéquate.

Les signes d'une exposition sont la nausée, l'étourdissement et la somnolence. Ne pas confondre avec le mal de mer.

Voir le manuel du propriétaire pour plus de détails.

050410

WARNING/AVERTISSEMENT

Gasoline vapors can explode resulting in injury or death.
BEFORE STARTING ENGINE
- **Check engine compartment bilge gasoline or vapors, and**
- **operate blower for four minutes, and**
- **verify blower operation.**

Run blower when vessel is operating below cruising speed.

Les vapeurs d'essence peuvent exploser causant des blessures graves ou la mort.
AVANT LE DÉMARRAGE DU MOTEUR
- ***Vérifier le compartiment à moteur pour détecter s'il y a présence d'essence ou de vapeur d'essence, et***
- ***actionner le ventilateur pendant 4 minutes, et***
- ***vérifier l'opération du ventilateur.***

Actionner le ventilateur quand l'embarcation navigue à vitesse réduite.

PT#056-0863

WARNING/AVERTISSEMENT

Avoid personal injury secure seat fully into track and latch before use.

Pour éviter des blessures personnelles graves. Fixer solidement le siège dans la glissière et immobiliser le avec l'attache avant de l'utiliser.

PNA 990929

WARNING/AVERTISSEMENT

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

Evitez des blessures graves,ne pas utiliser la plate-forme à une vitesse supérieure à celle de la pêche à la traîne. Assurez-vous que les compartiments sont bien fermés.

PT#056-0872

WARNING/AVERTISSEMENT

Prevent falls overboard or in boat. Do not use swivel seat(s) above trolling speed.

Prevenez les chutes par dessus bord ou à l'intérieur de l'embarcation. Ne pas utiliser le(s) siège(s) pivotant(s) à une vitesse supérieure à celle de la pêche à la traîne.

PNA 000601

WARNING AVERTISSEMENT

Prevent falls overboard, close, latch, and stay inside gate(s) while underway.
Prévenez les chutes par-dessus bord. fermez les portes et demeurez à l'intérieur des clôtures quand l'embarcation est en mouvement.

PT#056-0873

HOW TO READ YOUR HULL I.D. PLATE

Your I.D. plate is located on the outboard side of the starboard transom, above the waterline, or on the port side pontoon near the stern end. The hull I.D. (serial number) should be included in any inquiries or when ordering parts. The Coast Guard requires that your H.I.D. be permanently affixed on the starboard transom of the boat.

Q	J	T	6	5	0	0	6	E	1	0	2

BOAT AND TRAILER DATA

Owner _____

Date Purchased_____

Address_____

Dealer _____

Phone _____

Address_____

Boat Model_____

Serial Number_____

Motor_____

Serial Number_____

Outdrive Serial Number (for inboard) _____

Trailer_____

Serial Number_____

Other _____

_____

SAFETY 2

SAFE BOATING CHECKLIST

Boating safety and the safety of your passengers is YOUR responsibility.

- ☐ Observe the instructions on all safety labels. They are there to assure that you have a safe and enjoyable outing.
- ☐ Never operate a boat while under the influence of drugs or alcohol. Allow only qualified drivers to operate your boat.
- ☐ At least one passenger should be able to operate the boat in case the operator is unexpectedly unable to do so.
- ☐ Don't overload the boat. Heavy seas reduce capacity. A weight capacity plate is not an excuse for failure to use common sense or rational judgment.
- ☐ Always use the lanyard stop switch when operating the boat and ensure that all passengers are familiar with its use.
- ☐ Regularly inspect the boat, the hull, engine, safety equipment, and all other boating gear and keep them in safe operating condition.
- ☐ Be sure you have the minimum required safety equipment and any additional gear needed for your cruise.
- ☐ Check that all lifesaving equipment, including fire extinguisher, is in safe operating condition and in easily accessible locations. Show all passengers where this equipment is, and make sure they know how to use it.
- ☐ Be very careful while fueling. Know the capacity of the fuel tank. Avoid fueling at night except under well-lit conditions. Gas spills are unnoticeable in the dark. Extinguish all open flames when fueling.
- ☐ Each time you fill up, be sure the engine compartment is free of gasoline vapors, and inspect fuel lines for leaks and hose deterioration.
- ☐ Keep enough fuel on board for the planned trip. Allow for changes due to adverse weather or other delays. Use 1/3 of the fuel to reach your destination, use 1/3 to return, and keep 1/3 in reserve.
- ☐ Keep an eye on the weather. Check local weather broadcasts before departure. Be alert to changing conditions.
- ☐ Always keep accurate up-to-date charts of the boating area on board. Before getting underway, check water conditions in the planned boating area.
- ☐ Before departure, file a Float Plan with a responsible person ashore.
- ☐ Always operate your boat with consideration, courtesy, and common sense.

YOU are responsible for your own safety, as well as the safety of your passengers and your fellow boaters. You should fully understand and become familiar with the operating procedures and safety precautions in this manual and the other information in the Owner's Packet before you launch the boat. Before leaving on a cruise, whether for an hour or several days, go through the Safety Checklist on page 2-1. Always operate your boat with consideration, courtesy, and common sense.

HAZARD STATEMENTS

As you read your Owner's Manual, please note the hazard warnings which alert you to safety precautions related to unsafe conditions or operating procedures. We have included these warnings because we are concerned about your safety and the safety of your passengers.

The safety alert symbol is recognized around the world. In this manual, it means read this information carefully! Be sure you understand the consequences of a hazard and how to avoid them. *Failure to follow the recommendations in a hazard communication statement may result in property damage, personal injury, or death.*

People often refer to a hazard statement as a warning in a general sense. This manual uses three kinds of "warnings" depending on the likely effect of a hazard (minor injury, severe injury, death).

⚠CAUTION

The safety symbol and this signal word indicate a potentially hazardous situation which, if not avoided, may result in minor or moderate personal injury or moderate property damage. It may also be used to alert against unsafe practices.

⚠WARNING

The safety symbol and this signal word indicate a potentially hazardous situation which, if not avoided, COULD result in severe injury, death or substantial property damage.

⚠DANGER

The safety symbol and this signal word indicate an imminently hazardous situation, which, if not avoided, WILL result in severe personal injury or death.

The warnings in this manual do not and cannot address every conceivable situation. Always use common sense! If a procedure, method, tool, or part is not specifically recommended, you must satisfy yourself that it is safe for you and others and that your boat will not be damaged or made unsafe as a result of your decision.

ADVISORY STATEMENTS

Advisory statements alert you to conditions that affect equipment operation, maintenance, and servicing practices.

An **IMPORTANT** statement indicates a procedure intended to prevent damage to equipment or associated components.

A **Note** statement is a general advisory statement relating to equipment operation and maintenance procedures.

SAFETY EQUIPMENT

As the owner of the boat, you are responsible for assuring that all required safety equipment is aboard. You should also consider supplying additional equipment as needed for your safety and that of your passengers. Check state and local regulations for information about required safety equipment. The following information is general and not meant to cover all safety equipment.

Required Safety Equipment

While most required safety equipment has been provided on your boat, it is your responsibility to properly equip your boat. Check with your dealer or with boating authorities to determine equipment needed.

Personal Flotation Devices (PFDs)

Federal regulations require that you have at least one Coast Guard approved personal flotation device (PFD) for each person in a recreational boat. You may not use your boat unless all PFDs are in serviceable condition, readily accessible, legibly marked with the Coast Guard approval number, and of an appropriate size (within the weight range and chest size marked on the PFD) for each person on board. Personal flotation devices must be fit to the people wearing them.

A PFD provides buoyancy to help keep your head above the water and to help you remain in a satisfactory position while in the water. Body weight and age should be considered when selecting a PFD. The buoyancy provided by the PFD should support your weight in water. The size of the PFD should be appropriate for the wearer. Body weight or chest

size are common methods used to size PFDs. It is your responsibility to ensure that you have the proper number and types of PFD's on board and that your passengers know where they are and how to use them.

Personal Flotation Device Pointers

The purpose of a PFD is to help save your life. If you want it to support you when you are in the water, it needs to fit, float, and be in good condition.

- Try the PFD on and adjust it until it fits comfortably in and out of the water. Mark your PFD if you are the only wearer.
- To make sure the PFD works, wear it in the water. This will show you how it works and give you confidence when you use it.
- Teach children how to put a PFD on and allow them to try it in the water. That way, they know what the PFD is for and how it works. They will feel more comfortable with it if they suddenly find themselves in the water.
- If the PFD is wet, allow it to dry thoroughly before storing it. Do not dry it in front of a radiator or heater. Store it in a well-ventilated area.
- Keep PFDs away from sharp objects which can tear the fabric or puncture the flotation pads.
- For their own safety and the safety of others, all non-swimmers, poor swimmers, and small children should wear PFD's at all times, whether the boat is stationary or moving.
- Check the PFD frequently to make sure that it is not torn, that flotation pads have no leaks, and that all seams and joints are securely sewn.
- If a PFD contains kapok, the kapok fibers may become waterlogged and lose their buoyancy after the vinyl inserts are punctured. If the kapok becomes hard or if it is soaked with water, replace it. It may not work when you need it.

Hypothermia

Hypothermia, the loss of body heat to the water, is a significant cause of deaths in boating accidents. After an individual has succumbed to hypothermia, he or she will lose consciousness and then drown.

PFD's can increase survival time because of the insulation they provide. Naturally, the warmer the water, the less insulation one will require. When operating in cold water (below 40°F) consideration should be given to using a coat or jacket style PFD as they cover more of the body than the vest style PFD's.

Some points to remember about hypothermia protection:

1. While afloat in the water, do not attempt to swim unless it is to reach a nearby craft, fellow survivor, or a floating object on which

you can lean or climb. Unnecessary swimming increases the rate of body heat loss. In cold water drownproof methods that require putting your head in the water are not recommended. Keep your head out of the water. This will greatly lessen heat loss and increase your survival time.

2. Keep a positive attitude about your survival and rescue. This will improve your chances of extending your survival time until rescue. Your will-to-live does make a difference!

3. If there is more than one person in the water, huddling is recommended while waiting to be rescued. This action tends to reduce the rate of heat loss and thus increase the survival time.

4. Always wear your PFD. It won't help you fight off the effects of hypothermia if you don't have it on when you go into the water.

Fire Extinguishers

As the owner of the boat, you are responsible for supplying a fire extinguisher.

Hand-held portable fire extinguishers should be mounted in readily accessible locations away from the engine compartment. All persons aboard should know the location and proper operation of the fire extinguisher(s).

⚠WARNING

Fire! In case of fire, do not open engine compartment. Turn off engine. Discharge repetitively small amounts of the extinguishing compound on the fire until the fire dies. Do not discharge the entire contents of the fire extinguisher at the same time, or you may run out of extinguishing compound.

Note: Don't test fire extinguishers by squirting small amounts of the extinguishing compound. The extinguisher might not work when you really need it!

Sound Signalling Devices

Note: No single signaling device is appropriate for all purposes. Consider keeping various types of equipment on board.

Boat operators are required to carry a hand, mouth, or power operated horn or whistle. It must produce a blast of two-second duration and audible at a distance of at least one-half (1/2) mile.

Following are standard whistle signals:

- One Prolonged Blast — Warning signal
- One Short Blast — Pass on my port side
- Two Short Blasts — Pass on my starboard side
- Three Short Blasts — Engines in reverse
- Five or More Blasts — Danger signal

Navigation Lights

Navigation lights are intended to keep other vessels informed of your presence and course. If you are out on the water between sunset and sunrise, you are required to display appropriate navigation lights.

The Pilot Rules prohibit the display of any light not required by law which would in any way interfere with the prescribed navigation lights. At night, extraneous lights can confuse the pilots of other vessels, and can interfere with your own night vision.

ADDITIONAL RECOMMENDED EQUIPMENT

It is recommended that you acquire additional equipment for safe, enjoyable cruising. This list, which is not all-inclusive, includes items you should consider acquiring.

BASIC GEAR

Flashlight	Mooring lines	Compass
Oar or paddle	Distress signals	First aid kit
Dock fenders	VHF radio	EPIRB
Boat hook	Extra warm clothing	Charts
Suntan lotion	Tow line	
Second anchor and line	Dewatering device (pump or bailer)	
Emergency supply of drinking water and food		

TOOLS

Spark plug wrench	Hammer	Screwdrivers
Jackknife	Pliers	Electrician's tape
Adjustable wrench	Lubricating oil	Prop wrench
Duct tape		

SPARE PARTS

Extra bulbs	Spare propeller	Extra fuses
Extra drain plug	Spark plugs	Spare wire
Extra prop nut/washer		

CARBON MONOXIDE AND BOATING

⚠WARNING

Carbon Monoxide! Carbon monoxide can be harmful or fatal if inhaled. Keep exhaust outlets clear of blockage. Provide adequate ventilation. Open canvas enclosures to ensure adequate ventilation. Avoid operating the boat for extended periods of time at idle speed, and be sensitive to weather conditions that may prevent CO from dissipating into the air when the canvas is completely enclosed. Do not tow skier or people in a tube at low speed or idle.

Burning a material containing carbon produces carbon monoxide (CO), an odorless and colorless gas. Because CO weighs approximately the same as air, it can spread throughout an enclosed space unnoticed because you cannot see it or smell it. Any device used to burn carbon based materials on a boat can be a source of CO. Common sources of carbon monoxide include internal combustion engines.

Carbon monoxide reacts with the blood to reduce the ability of the blood to carry oxygen. The reduced oxygen supply to body tissues results in death of the tissue. Prolonged exposure can cause brain damage or death. In high concentrations, CO can be fatal within minutes. The effects of CO in lower concentrations are cumulative and can be just as lethal over long periods of time.

Symptoms of CO poisoning include: itchy and watering eyes, flushed appearance, throbbing temples, inability to think coherently, ringing in the ears, tightness across the chest, headaches, drowsiness, nausea, dizziness, fatigue, vomiting, collapse, and convulsions. **Carbon monoxide poisoning is often confused with seasickness.** If any of these symptoms are evident, begin treatment immediately. Prompt action can make the difference between life and death.

- Evacuate the area and move the victim to fresh air.
- Administer oxygen if available and get medical help.
- Open all canvas enclosures to ventilate the area.
- Investigate the source of CO and take immediate corrective action. Be especially aware of sources adjacent to the boat.

Carbon Monoxide Accumulation

Following are examples of possible situations where carbon monoxide may accumulate within your boat while docked, anchored, or underway. Become familiar with these examples and their precautions to prevent DANGEROUS accidents.

⚠WARNING

Exhaust Fumes! Generator or hull exhaust from other vessels while either docked or anchored can emit poisonous carbon monoxide gas and cause excessive accumulation within cabin and cockpit areas. See Figure 2-6. Be alert for generator exhaust from other vessels alongside.

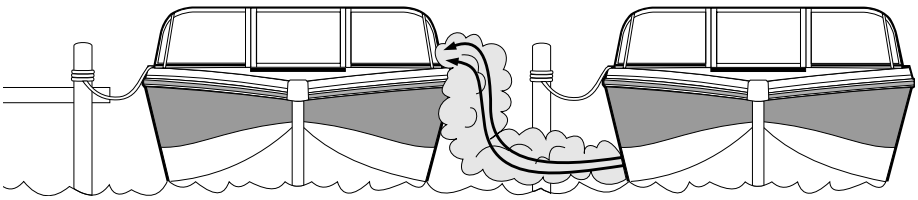


FIGURE 2-6 VESSEL ALONGSIDE

⚠WARNING

Backdrafting! Under certain conditions, moving air currents can direct poisonous carbon monoxide fumes into boat (Figure 2-7). These fumes can accumulate to dangerous levels without proper airflow. Provide adequate ventilation, redistribute the load or bring boat out of high bow angle.

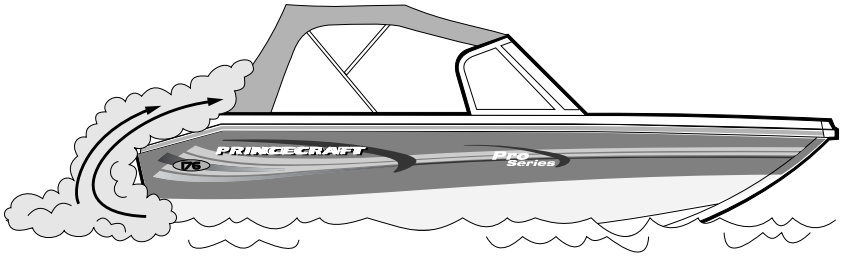


FIGURE 2-7 WHILE UNDERWAY (BACKDRAFTING)

While underway, CO concentrations can increase by backdrafting or "the station wagon effect." Backdrafting is caused by factors such as relative wind direction, speed, or the bow being too high. To prevent this, open canvas whenever possible to provide positive airflow through the hull.

⚠WARNING

Slow Speed Towing! Running at slow speed or idle can cause excessive accumulation of poisonous carbon monoxide gas at the back of the boat. Do not tow skier or people in a tube at low speed or idle.

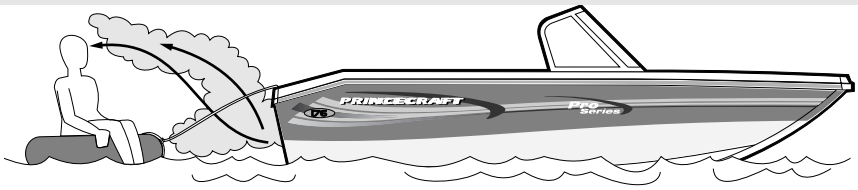


FIGURE 2-8 SLOW SPEED TOWING

Engine exhaust from your boat when operating at slow speed or idle can cause excessive CO concentration that can be harmful to people being towed too close to the boat or standing on the swim platform. Do not tow people at slow speed and do not allow anyone near the back of the boat or the swim platform while running at slow speed or idle.

⚠WARNING

Exhaust Fumes! Hull exhaust from your boat can cause excessive accumulation of poisonous carbon monoxide gas within cockpit area when using protective weather coverings while underway (Figure 2-7) or while stationary. Provide adequate ventilation when the canvas top, side curtains, and/or back curtains are in their closed protective positions.

⚠WARNING

Exhaust Fumes! Hull exhaust outlets near a pier, dock, seawall, or outlets blocked by any other means can cause excessive accumulation of poisonous carbon monoxide gas within cockpit area (Figure 2-9).

Boat houses, seawalls, and other boats in close proximity or confined areas can contribute to increased CO levels. *Operators must be aware that operation, mooring, and anchoring in an area with other boats puts them in jeopardy of CO accumulation from other sources. Likewise, a boat operator must be aware of how exhaust from his boat will affect others.* Operation of the engines while moored may cause CO accumulation in your boat and those around you.

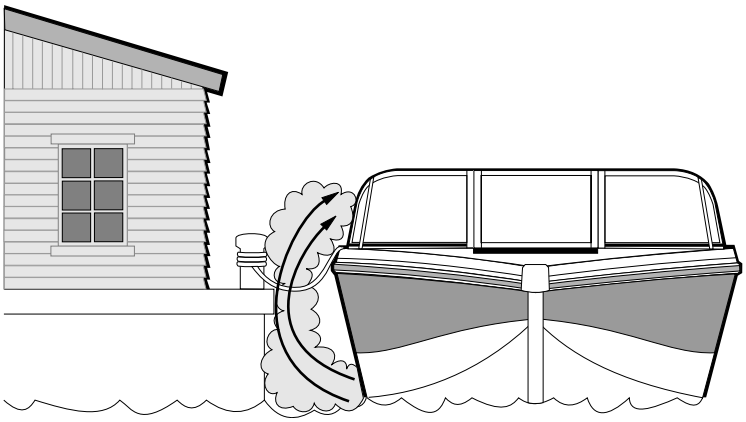


FIGURE 2-9 CONFINED AREAS

⚠WARNING

Exhaust Fumes! Engine exhaust from your boat when operating at slow speed or stopped in the water can cause excessive accumulation of poisonous carbon monoxide within cockpit area. Tail wind can increase accumulation. Provide adequate ventilation or slightly increase speed if possible.

Installing rear canvas while underway increases the chance of CO accumulation in your boat. Be sure to provide adequate ventilation. If the windshield has vents, open them before getting underway to increase positive air flow and decrease the chances of CO accumulation.

Even with the best boat design and construction, CO may still accumulate in enclosed areas under certain conditions. Continually observe passengers for symptoms of CO poisoning.

CO Detector

It is strongly recommended that you have a marine grade approved CO detector installed in boats with canvas enclosures. Monitors are available from your dealer. Monitors should be professionally installed and calibrated.

Note: A CO detector is not a gas fuel vapor detector. Gas fuel vapor detectors do not monitor the buildup of carbon monoxide in an enclosed area.

LANYARD STOP SWITCH

This safety device automatically stops the engine if the lanyard is attached to the operator and the operator falls from the control station. Refer to the engine manual for detailed information about using this switch.

The stop switch (Figure 2-10) incorporates a shutoff switch, switch clip, lanyard, and lanyard clip. The lanyard clip must be securely attached to the operator's PFD, clothing, arm, or leg. Be sure to attach the lanyard to a place where it is free of obstructions and to something that will move with the operator if he or she leaves the helm station. If the engine shuts down because this switch was activated, the clip may have to be reinstalled and the interrupter switch has to be set to run (or upper) position

⚠WARNING

Keep lanyard stop switch free from obstructions that could interfere with its operation. Do not modify or remove lanyard stop switch or bypass its safety features. The proper use of the lanyard stop switch can prevent a runaway boat situation which can cause severe personal injury or death.

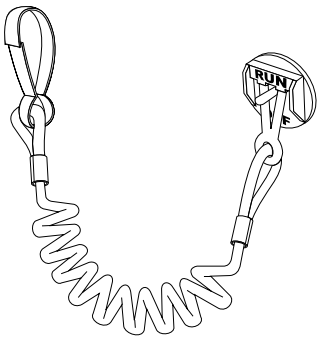


FIGURE 2-10 TYPICAL IGNITION INTERRUPTER (STOP SWITCH) WITH LANYARD

SAFE BOATING PRACTICES

YOU are responsible for your own safety, the safety of your passengers, and the safety of fellow boaters.

Drugs and Alcohol

⚠WARNING

Alcohol consumption and boating do not mix! Operating under the influence endangers the lives of your passengers and other boaters. Laws prohibit operating a boat under the influence of alcohol or drugs.

Do not use drugs or drink alcohol while operating a boat. Like driving a car, driving a boat, requires sober, attentive care. Operating a boat while intoxicated or under the influence of drugs is not only dangerous, but also illegal. These laws are vigorously enforced. The use of drugs and alcohol, singly or in combination, decreases reaction time, impedes judgment, impairs vision, and inhibits your ability to safely operate a boat.

Safe Operation

Safe operation means that you do not misuse your boat nor do you allow your passengers to do so. Safe operation means using good judgment at all times. It includes, without limitation, the following actions:

- Load the boat within the limits listed on the capacity plate. Balance loads bow to stern and port to starboard.
- Maintain boat speed at or below the local legal limit. Avoid excessive speed or speeds not appropriate for operating conditions.

- Do not use the boat in weather or sea conditions beyond the skill or experience of the operator or the comfortable capability of the boat or passengers.
- Be sure at least one other passenger is familiar with the operation and safety aspects of the boat in case of an emergency.
- Make sure that passengers and gear do not obstruct the operator's view or ability to move.
- Do not exceed the maximum engine power rating stated on the certification plate attached to the boat.
- Observe all safety signs and warnings both inside the boat and in the immediate boating area.

Passenger Safety

Before getting underway, show all passengers where emergency and safety equipment is stowed, and explain how to use it. Everyone aboard should wear rubber-soled shoes which resist slipping on wet surfaces. While underway, passengers should remain seated inside the deck rails. Don't allow passengers to drag their feet or hands in the water. Always use handholds and other safety hardware to prevent falls. All non-swimmers, poor swimmers, and small children should wear PFD's at all times.

Propeller

⚠ DANGER

Personal Injury! Do not allow anyone near a propeller, even when the engine is off. Propeller blades can be sharp and can continue to turn even after the engine is shut off. Do not allow anyone near the propeller when the throttle is in the neutral position. Contact with propeller will result in serious injury or death.

First Aid

As a boat operator, you should be familiar with basic first aid procedures that may be needed while you are far from help. Fish hook accidents or minor cuts and abrasions may be the most serious mishaps on board a boat, but you should also learn the proper procedures and be ready to deal with the truly serious problems like excessive bleeding, hypothermia, and burns. First aid literature and courses are available through most Red Cross chapters.

Operation By Minors

Minors should always be supervised by an adult whenever operating a boat. Some regions also have laws regarding the minimum age and

licensing requirements of minors. Be sure to contact the local boating authorities for information.

Rules of the Road

As a responsible boater, you will comply with the "Rules of the Road," the marine traffic laws. Navigating a boat is much the same as driving an automobile. Operating either one responsibly means complying with a set of rules intended to prevent accidents. Just as you assume other car drivers know what they are doing, other boaters assume you know what you are doing.

Safe Boating Courses

You will need to learn how to operate your boat safely. Your dealer can advise you of boating safety courses held in your area. You can also contact the Canadian Power Squadron at 1-888-277-2628, or the Boat/U.S. Foundation at 1-888-336-2628 for more information. It is your responsibility to gain knowledge and experience in skills such as:

- Navigation
- Seamanship and boathandling
- Rules of the Road, international-inland
- Weather prediction
- Safety at sea
- Survival in bad weather
- Respect for others on the water
- First aid
- Radio communication
- Distress signals
- Pollution controls

WATER SPORTS

⚠ DANGER

Personal Injury! Your boat is not designed for and should not be used for pulling parasails, kites, gliders, or any device which can become airborne. Use boat only for appropriate water sports.

Water skiing, wakeboarding, kneeboarding, or riding a towed, inflatable apparatus are some of the more popular water sports. Taking part in any water sport requires increased safety awareness by the participant and the boat operator. If you have never pulled someone behind your boat before, it is a good idea to spend some hours as an observer, working with and learning from an experienced driver. It is also important to be aware of the skill and experience of the person being pulled. Always have a second person on board to observe the person in the water so the driver can concentrate on operating the boat.

Everyone participating in a water sport should observe these guidelines:

1. Allow only capable swimmers to take part in any water sport.

2. Always wear a personal flotation device (PFD). Wearing a properly designed PFD helps a stunned and unconscious person stay afloat.

3. Be considerate to others you share the water with.

4. Always participate in water sports in safe areas. Stay away from other boats, beaches, restricted areas, swimmers, and heavily travelled waterways.

5. Have a second person aboard to observe the person being pulled and inform the driver about that individual's hand signals (Figure 2-12). The driver must give full attention to operating the boat and the waters ahead.

6. Give immediate attention to an individual who has fallen. He or she is vulnerable in the water alone and may not be seen by other boaters. Be careful not to swamp the boat while taking a person on board.

7. Approach a person from the lee side (the opposite direction of the wind). Stop the motor before coming close to the person.

8. Do not drive the boat directly behind a water sport enthusiast that is being towed by an other boat. At 25 Miles per hour, the boat will overtake a fallen individual who has 200 feet in front in about 5 seconds.

9. Do not allow anyone near the propeller(s), even when the engine is off. Propeller blades can be sharp and can continue to turn even after the engine is off.

10. Do not tow people at slow speed and do not allow people near or around the rear of the boat even when the boat is running at slow speed or idle.

11. Stay at least 150 feet away from areas marked by a diver down float (Figure 2-10).

12. Turn off the engine and anchor before swimming.

13. Swim only in areas designated as safe for swimming. These are usually marked with a swim area buoy (Figure 2-11). Do not swim alone or at night.

14. Do not practice water sports between sunset and sunrise. It is illegal in most areas.

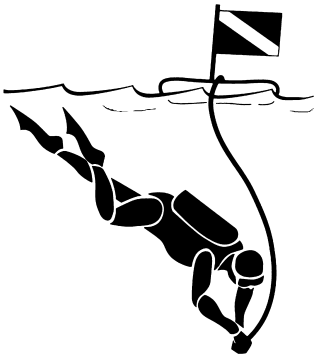


FIGURE 2-11 DIVER DOWN FLOAT

FIGURE 2-12 SWIM AREA BUOY

For more information about water skiing, please contact the American Water Ski Association, 799 Overlook Drive, Winter Haven, FL 33884 (1-800-533-2972). In Canada, contact Water Ski Canada, 2197 Riverside Drive, Ottawa, Ontario (1-613-526-0685).

⚠ DANGER

Rotating Propeller! Rotating propeller can cut or sever, causing serious injury or death. Switch engine off before skiers enter the water and before taking skiers aboard. Do not leave engine running in neutral. Accidentally engaging shift can seriously injure skier.

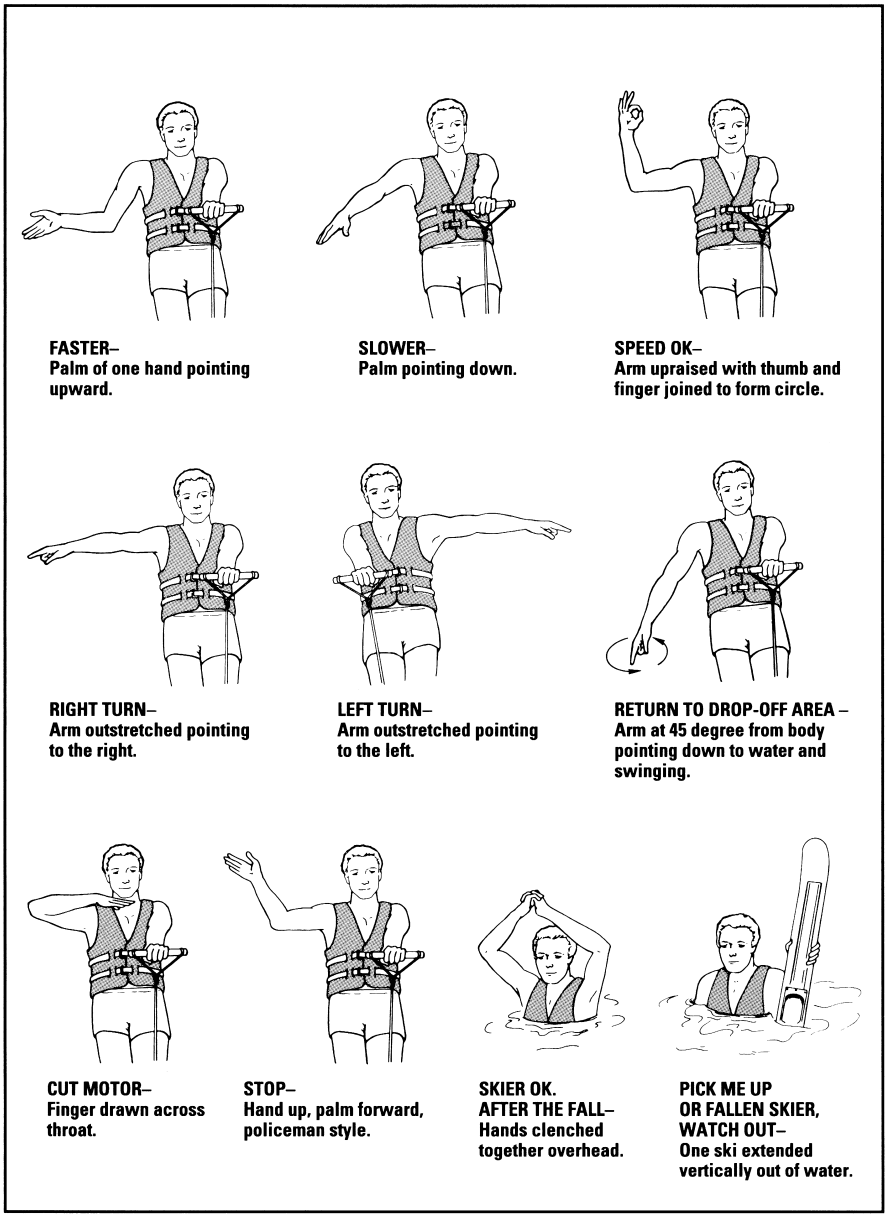


FIGURE 2-13 WATER SPORT SIGNALS

OWNER'S LOGS AND RECORDS

At the end of this chapter are several forms which you will find very helpful.

The **Float Plan** provides a record of your destination, departure and return times, boat description, passenger list, and other information about the trip you have planned. At the bottom of the form is space for listing emergency telephone numbers in case your return is delayed past the expected time. It also has space for indicating information about the person filing this report. Leave the completed form ashore with a responsible person. We recommend you make several copies of this form each boating season to assure an ample supply.

The **Fuel Log** is a handy way to record information covering engine hours, fuel consumption, miles traveled, as well as RPM (revolutions per minutes), average mph (miles per hour), and gph (gallons per hour).

The **Service/Maintenance Log** provides a record of maintenance work completed, the date of completion, and the engine hour reading. This log also helps you identify the frequency of routine maintenance work, such as engine oil changes. If you should decide to sell your boat, it demonstrates to prospective buyers that you have done a good job of taking care of it.

FLOAT PLAN

Copy next page and fill out the copy before going boating. Leave the completed copy with a reliable person who can be depended upon to notify the Coast Guard, or other rescue organization, should you not return as scheduled.

FLOAT PLAN

Name_____ Telephone _____

Description of Boat: _____Type _____ Color _____ Trim _____

Registration Number_____

Length _____ Name_____ Make _____

Hull Identification Number _____

Other Info. _____

Persons Aboard: **Name** **Age** **Address** **Telephone**

_____

_____

_____

Engine Type:_____ HP _____

No. of Engines: _____ Fuel Capacity:_____

Survival Equipment:

PFDs _____ Flares _____ Mirror_____

Smoke Signals_____ Flashlight_____ Food _____

Paddles _____ Water_____ Anchor _____

Raft or Dinghy _____ EPIRB _____ Sea Anchor_____

Navigation Equipment

Compass _____ Loran _____ GPS_____Radar_____

Radio: Yes_____ No_____ Type_____ Freq _____

Phone: Yes_____ No_____ Phone No. _____

Destination _____ Est. Time of Arrival _____

Expect to Return By_____

Auto Type _____ License No. _____

Where _____

If not returned by _____ call the Coast Guard, or_____.
(Local Marine Authority)

Coast Guard Telephone Number: _____

Local Marine Authority Telephone Number: _____

FUEL LOG

DATE	HOURS RUN	FUEL (GAL)	RANGE (MI)	RPM	MPH	GPH

SERVICE/MAINTENANCE LOG

DATE	HOUR METER READING	SERVICE/REPAIRS PERFORMED

TRAILERING 3

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 local authorities for registration and licensing regulations in your area. Your boat trailer has to be registered and licensed. Some regions 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 and the boat should be level. 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.

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. The height of the vehicle hitch must also match the recommended trailer hitch height. (see trailer specifications sticker for recommended height)

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 3-1). Safety chain or cables should have a minimum breaking strength equal to the upper limit of the GVWR.

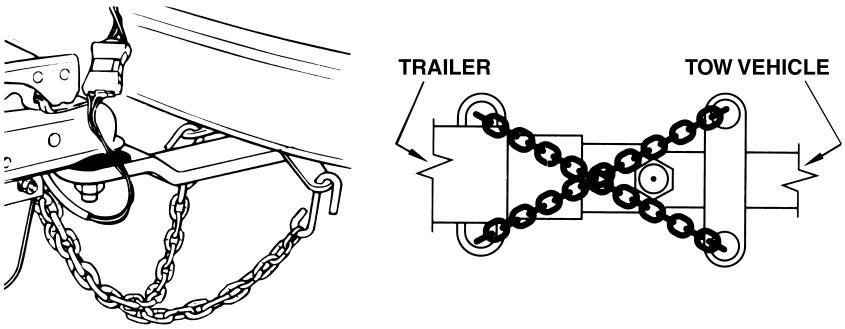


FIGURE 3-1 SAFETY CHAINS

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 braking action to the trailer wheels. As the towing vehicle slows and decelerates, the momentum of the trailer applies pressure through linkage to the trailer's master cylinder mounted on the tongue near the coupler. This hydraulic pressure is transmitted through the brake lines to the wheel brake assemblies to assist with slowing or stopping the vehicle and the trailer. A shock absorber assures smooth and even operation of the brakes by preventing intermittent application of the brakes.

Some trailers are equipped with disc brakes. The wiring harness for these trailers incorporate 7 connector plugs (Figure 3-2). The tow vehicle wiring harness plug must be wired properly to release the disc brakes when backing. See your dealer for proper wiring set-up.

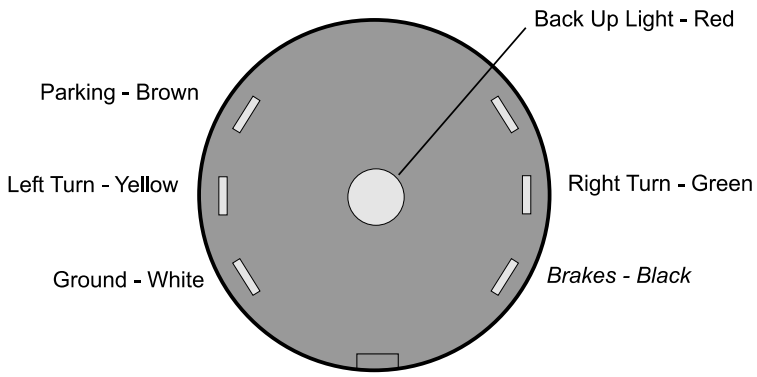


FIGURE 3-2 DISC BRAKE PLUG

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 3-3). 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.

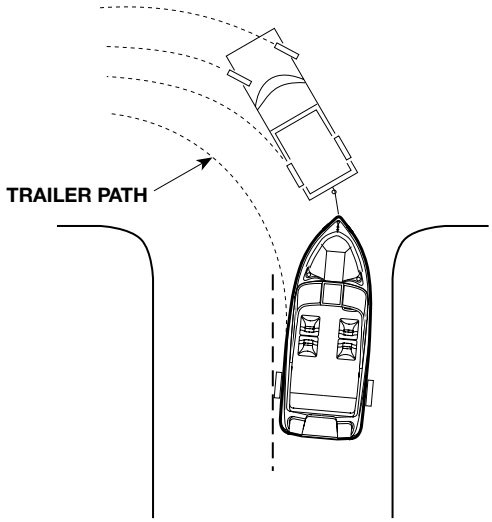


FIGURE 3-3 TURNING WITH TRAILER

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 3-4). Do not turn the wheel too far or oversteer. Turn the wheel gradually until you get the feel of safe backing.

Some trailers are equipped with disc brakes. In order to be able to back up the trailer, the tongue back-up pin (Figure 3-5) must be installed. Refer to your Trailer Owner's Manual for additional information.

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.

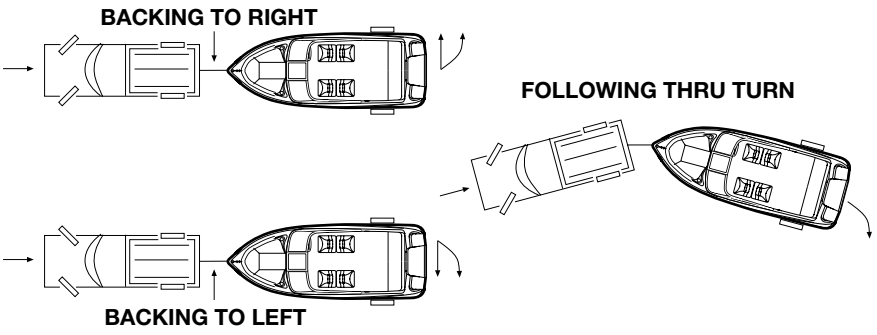


FIGURE 3-4 BACKING A TRAILER

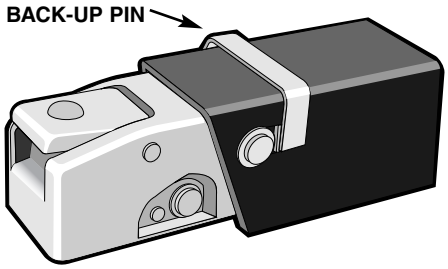


FIGURE 3-5 BACK-UP PIN

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. When 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 7 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.
    - Turn off the engine.
    - Set the parking brake.
    - Place blocks behind the vehicle's back wheels.
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. On all boats except pontoon boats, 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. If your trailer is equipped with a transom saver motor support bar, make sure it is well attached to your motor before you go.

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

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

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

12. Check tires for proper inflation (check tire rating on sidewall). Under-inflated tires heat up rapidly and may blow-out or cause uncontrolled swaying. Also, make sure lug nuts are tight.

13. Before use and after the first 100 miles, torque the lugnuts to 90-95 foot lbs. Lug nuts must be tightened in a star criss-cross pattern (Figure 3-6) to ensure uniform pressure and alignment. Apply torque evenly be repeating star pattern until desired torque is reached.

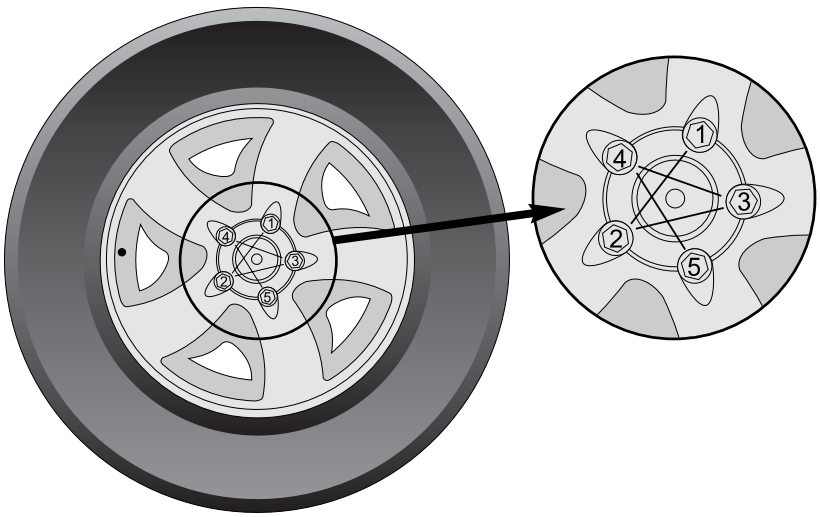


FIGURE 3-6

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

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

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

17. 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.

18. 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 bearing buddy hubs with a water resistant wheel bearing grease. Fill the hubs with grease to the manufacturer's specifications, as detailed in the trailer owner's manual.

ELECTRICAL SYSTEM 4

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-VOLT TROLLING MOTOR SYSTEM

The 12-Volt D.C. electrical system is a 12-Volt, 2-wire, negative ground type. The hot wire is positive, feeding trolling motor and light (if so equipped), and the negative return is by insulated wire to the negative terminal of the battery. (See Bow Panel Installation Sheet in your owner's package for wiring diagram.)

The 12-Volt plug is located on the bow of your boat (Figures 4-1 and 4-2).

FIGURE 4-1
12- VOLT "MARLAN" STYLE PLUG

FIGURE 4-2
12- VOLT "ECONO" BOW TROLLING PANEL

12/24-VOLT TROLLING MOTOR SYSTEM

The 12 or 24-Volt electrical system is a 12 or 24-Volt, depending on selection, negative ground type. Each hot wire is 12-Volt, feeding the trolling motor, and the negative return is by two insulated wires to the negative terminal of the batteries. (See Bow Panel Installation Sheet in your owner's package for wiring diagram.)

The 12/24-Volt plug is located on the bow of your boat (Figures 4-3 and 4-4).

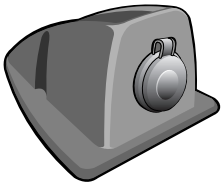


FIGURE 4-3
24 VOLT RECEPTACLE

FIGURE 4-4
12-24 VOLT BOW TROLLING PANEL

12/24-VOLT BOAT BOW TROLLING MOTOR PANEL UTILIZATION

The 12/24-Volt boat bow trolling motor panel comes equipped with a Marinco type receptacle, a Voltmeter, a Tilt switch, and a Battery Check switch.

The Marinco™ receptacle allows you to quickly plug and unplug your trolling motor. (See Bow Panel Installation Sheet in your Owner's Package for wiring diagram)

The Tilt switch is a two position switch. The upper position enables you to drive the back motor or stern drive out of the water for better trolling performance of your electric trolling motor. The lower position enables you to drive down the back motor or stern drive into the water for driving your boat.

The Voltmeter indicates you the remaining voltage in either battery. The Voltmeter is activated by a two position switch. The upper position gives you the remaining voltage of the first battery, and the lower position provides you with the remaining voltage of the second battery.

12/24/36-VOLT TROLLING MOTOR SYSTEM

The 12, 24 or 36-Volt electrical system is a 12, 24 or 36-Volt, depending on selection, negative ground type. Each hot wire is 12-Volt, feeding the trolling motor, and the negative return is by three insulated wires to the terminal of the batteries. (See Bow Panel Installation Sheet in your Owner's Package for wiring diagram)

12/24/36-VOLT BOAT BOW TROLLING MOTOR PANEL UTILIZATION

The 12/24/36-Volt boat bow trolling motor panel comes equipped with a Tilt switch, a Marinco type receptacle , a Battery Power Level gauge, a Battery Power Level Check switch, and a Battery Selector switch.

FIGURE 4-5 12-24-36 VOLT BOW TROLLING PANEL

The Marinco receptacle allows you to quickly plug and unplug your trolling motor. (See Bow Panel Installation Sheet in your Owner's Package for wiring diagram)

The Tilt switch is a two position switch. The upper position enables you to drive the back motor or stern drive out of the water for better trolling performance of your electric trolling motor. The lower position enables you to drive down the back motor or stern drive into the water for driving your boat.

The Battery Power Level gauge enables you with the remaining voltage, in percent, of the selected battery. It is activated by the Test switch and the Battery Selector switch. In order to know the remaining voltage of a battery, set the Battery Selector switch to the desire battery and press and hold the Test switch, the remaining voltage will be indicated in the Battery Power Level gauge.

IMPORTANT: Turning the ignition switch off does not cut off power to all components. Powered components, can draw down the battery if they are left on for an extended period without running the engine. It is recommended that you unplug any components, such as the trolling motor, to avoid battery drainage.

IMPORTANT: 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 circuits 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 minimize risks of fire or explosion. **Never substitute automotive parts for marine parts.** Automotive parts do not provide the necessary ignition spark protection.

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.

AC/DC BATTERY CHARGER

Your boat may have a battery charging system which operates off 120-volt AC power from shore. This battery charger, if so installed on your boat, is designed only to charge the deep cycle battery that is used for your electric trolling motor. Turn the charger on whenever your boat is connected to shore power to keep batteries fully charged. The charging 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.

IMPORTANT: Before plugging in battery charger, make sure all trolling motors are unplugged. Failure to do so could damage trolling motor.

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 alternator output accordingly.

⚠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. To avoid any risk of explosion due to hydrogen vapors when charging a battery, always leave the cover of the battery compartment open.

OVERLOAD PROTECTION

The engine is equipped with a fuse or circuit breaker to protect the engine wiring harness and instrumentation power leads. If an electrical 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 and replacement procedure.

TROLLING MOTOR

Some Princecraft 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 heavy-duty 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 will sound if any one of the following occur in either engine: 1) cooling system water temperature too high, 2) tank oil supply low. If alarm sounds, quickly observe gauges for an abnormal reading, then stop engine immediately. You can also refer to your digital message center if your boat is so equipped. 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 (next page), 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 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 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)

RADIO CASSETTE/CD PLAYER

We recommend the radio switch be turned off while the boat is not being used to avoid battery drainage. (See section 6 for switches)

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	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
	Device is not connected	Verify all wires are connected

BOAT EQUIPMENT 5

This chapter discusses major systems or components on your boat. Information about boat controls is in Chapter 6. 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.

Affixed to your boat is a capacity plate that states the maximum size engine that can be used on your boat. Do not overpower your boat.

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 applicable requirements of the U.S. Coast Guard at the time of manufacture. The system is also certified by the National Marine Manufacturers Association (NMMA) and the Canadian D.O.T. 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: If your boat has a built in gas tank, it is 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.

- 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 and Canadian D.O. T. 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 5-1). See your engine Owner's Manual for propeller removal and replacement procedures.

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.

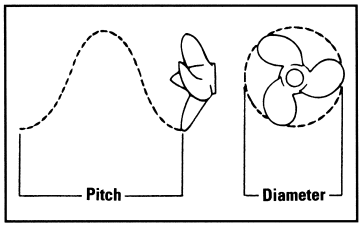


FIGURE 5-1 PROPELLER MEASUREMENTS

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 5-2). 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.

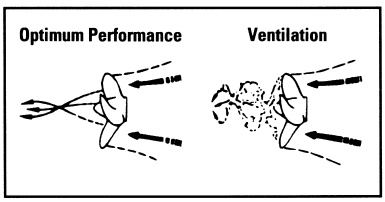


FIGURE 5-2 PROPELLER VENTILATION

STEERING SYSTEM

Note: The following information refers to the steering system on boats with a helm station. If your boat is not so equipped, see your engine Owner's Manual for information on tiller steering.

Your boat is equipped with either a hydraulic steering system or a mechanical cable system with in some cases a no-feedback system. 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.

If your boat is powered by an inboard engine, it comes equipped with a power steering system. The power steering system is very similar to the hydraulic steering system. The only difference is that with the power steering system, when turning the steering wheel, the power steering pump will be circulating the fluid in the hydraulic system to turn the sterndrive.

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. With the no-feedback system it is normal to feel a certain restriction when you turn the steering wheel.

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.

To fill the livewell, first install the overflow pipe in the drain fitting inside the livewell. Open the flow adjustment knob in the livewell by turning it counter-clockwise. You can fill the livewell when the boat is in the water and is stopped or moving at less than cruising speed. Turn on the switch to start the livewell filling pump. (See section 6 for switches.) The water will rise in the livewell until it reaches the top of the overflow pipe. Use the flow adjustment knob to control the aerator spray.

Turn off the livewell filling pump once the livewell is full. Occasional use of the pump will keep the water fresh. Running the pump continuously may drain your boat's battery. Some livewell systems come equipped with a two position switch that controls the oxygenation of the livewell water. Place the livewell switch in ''MAN'' position for a continuous oxygenation or ''AUTO'' position for

intermittent oxygenation. (See the Livewell: Filing-Up sheet in your Owner's Package for more information.)

To drain the livewell, stop the pump and remove the overflow pipe.

Some livewell systems are equipped with a second pump that will recirculate the water in the livewell. A three position switch controls both the livewell filling pump and the recirculating pump. Use the recirculating pump when in brakish water, while running at cruising speed, or while your boat is on the trailer and you want to keep your catch alive.

PRO FLO™ PLUS LIVEWELL SYSTEM

The Pro Flo™ Plus livewell system is available on select models. This system is equipped with a remote control livewell drain. (See section 6 for switches and the "Livewell filling up sheet" in your owner's package for more information).

To fill the livewell, place the remote control in the "Closed" position. Start the livewell filling pump using the three position livewell switch. Place the switch in "MAN" (manual) position. Turn off the livewell pump when the livewell is full.

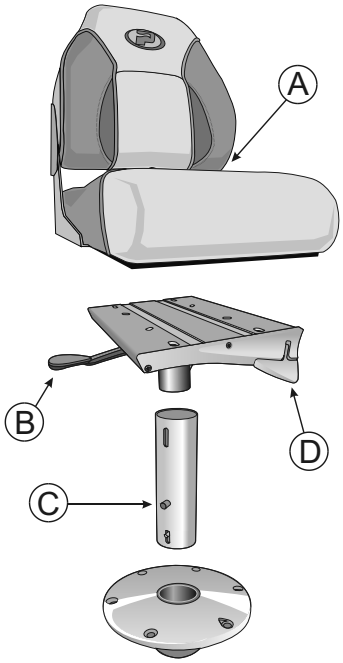
To oxygenate the livewell, place the remote control in the "Closed" position. Turn on the oxygenation pump using the three (3) position livewell switch. Place the switch in the "Auto" (automatic timer) position for intermittent oxygenation, if so equipped. This system allows continuous recirculation while running, docked or trailering.

To drain the livewell, Turn off the pump and place the remote control in the "Open" position. When the livewell is empty, place the remote control in the "Closed" position to prevent water entering the livewell.

General Livewell Plumbing Information

The plumbing system for your livewell consists of several pumps, hoses, fittings, and clamps. 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.

SEAT SETTINGS



Your boat comes equipped with different models of pedestal seats. The instructions below will help you adjust your seats for better comfort or diverse usage. Your seat may not be equipped with all the adjustments mentioned below.

1. If your seat is folded, press the button (A) located on the left hand side of the seat base to open it.

2. To remove the seat from the seat post, lift up the swivel (B) located on the right hand side underneath the seat base and pull.

3. To remove the seat post from the floor base, press the locking device (C) located at the bottom of the seat post, twist the seat post and pull it up.

4. To turn your seat around, lift up the swivel (B) located on the right hand side underneath the seat base and move your seat clockwise or counter clockwise. Keep in mind that if your seat is not on its initial position, the locking device is not locked in.

5. To slide your seat forward or backward, lift up the swivel (D) located on the front part underneath your seat base and push or pull your seat.

6. To incline the back of your captain seat, if your boat is so equipped, lift up the swivel located on the left hand side of the seat base.

Note: For security purposes and for better driving visibility, we strongly recommend you remove the seat post and to fold down all bow seats when cruising above idle speed.

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

Your boat may be 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. Most models of bilge pumps are equipped with an easy removal pump system that allows you to pull out the pump for easy inspection and servicing. Inspect the bilge pump system on a regular basis and clean it if necessary.

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.

SHOWER

Your boat may be equipped with a stern shower. Before using the shower, fill the potable water tank through the filling cap. Turn the shower water pump on using the on-off switch located in the shower cabinet. A red light appears when the pump is running. Activate the shower using the shower head valve. When finished using the shower, shut off the pump using the on-off switch. To prevent battery shortage, the shower pump must be turned off whenever it is not in use (red

light must be off).

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 engine 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.

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.

Fuel System

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.

INSTRUMENTS AND CONTROLS 6

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.

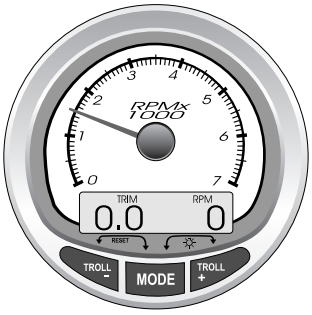
Note: Your boat may not have all the instruments discussed in this section. The ranges of the gauges may also vary from the readings listed.

MERCURY® SMARTCRAFT™

Some models come equipped with Mercury® SmartCraft™ digital pilot gauges. Two digital gauges are available, a tachometer and a speedometer. Each gauge will power up when the ignition is turned on. Gauges will stay on as long as the ignition is on. Each Mercury® SmartCraft™ pilot gauge is also equipped with a digital message centre. When a problem is detected with the engine, the warning display screens will alert the operator to the potential problem. We suggest you carefully read the SmartCraft™ Operation Manual provided with your Owner's Package to get the best performance from the SmartCraft™ pilot gauges.

SmartCraft™ Tachometer

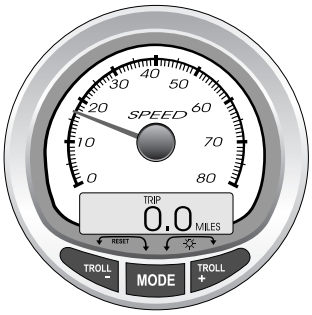
Depending on engine type, the Tachometer Digital Display Screen provides the following engine information: engine break-in, engine temperature, oil Psi, trim, RPM, water pressure, battery voltage, engine hours, fuel flow, fuel used and depth. Note: the depth sounder is not to be used for navigation or as device to avoid grounding which may result in boat damage or personal injury.



TACHOMETER

SmartCraft™ Speedometer

Depending on engine type, the Speedometer Digital Display Screen provides the following engine information: speed, fuel used, clock-air/sea temperature, Inst. And Ave. Fuel economy, trip odometer, fuel tank level, oil tank level, trim and RPM synchronizer, fuel range, fuel economy.



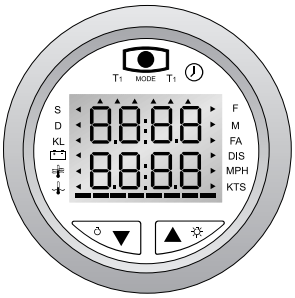
SPEEDOMETER

FARIA®

Certain type of boats are equipped with Faria® Pilot System™ technology that includes two different digital gauges: Pilot TM 1 and Pilot TM 2. The Faria® Pilot System™ is a multifunctional instrument designed to give two simultaneous readouts of several different and independent functions on an upper and lower LCD display. The Faria® Pilot System™ provide the boat operator with important navigating and engine information, therefore, we suggest you to take a look at your gauge frequently when you are operating your boat. Before using your Faria® Pilot System™, the reading of the literature provided with the Owner's Package is strongly recommended.

Pilot TM 1

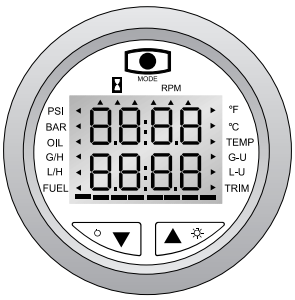
The Pilot-Digital Multifunction Speedometer digitally displays a speedometer, depth sounder, clock, trip log, water temperature, bait well temperature and dual timers. Note: the depth sounder is not to be used for navigation or as device to avoid grounding which may result in boat damage or personal injury.



SPEEDOMETER

Pilot TM 2

The Pilot-Digital Multifunction Tachometer digitally displays a tachometer, fuel remaining, fuel flow, hourmeter, total and trip fuel log, trim gauge, engine temperature and oil pressure.



TACHOMETER

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

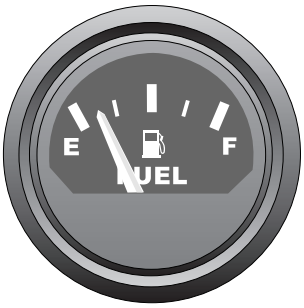
Speedometer

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).

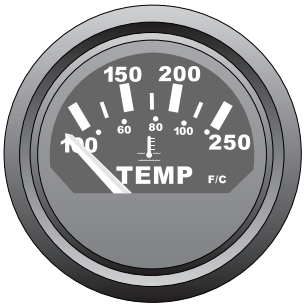


FUEL GAUGE

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

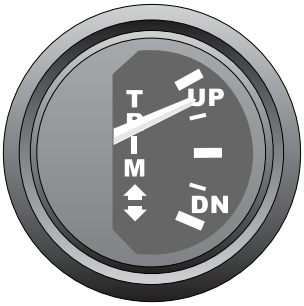
This gauge measures the temperature of the engine cooling system. Check the gauge regularly while the engine is warming up. Marine engines draw sea water, circulate it through the engine, and expel it overboard through the exhaust system. If the temperature gauge shows that the engine is hot, stop the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



TEMPERATURE GAUGE

Power Trim Gauge

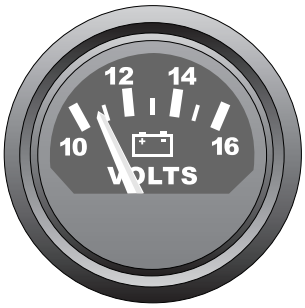
The power trim gauge shows the relative position of the outboard unit. Read the gauge carefully, as it does not show position of unit in the degrees. Proper trim should be indicated by bow attitude and engine RPM. For more information see the engine Owner's Manual.



POWER TRIM GAUGE

Voltmeter

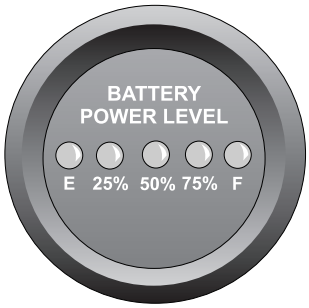
The voltmeter measures the condition of the main or cranking battery in volts DC. Normal operating voltage when the engine is running at 1000 RPM or higher is between 12 and 15 volts. If your battery is fully charged, the voltmeter should in the the 11.5 or 12.5 volt range when the ignition is on and the engine is not running. Check your battery and charging system if the voltmeter reads below these normal ratings. An oscillating voltmeter reading may indicate loose belts or loose electrical connections.



VOLTMETER

Trolling Motor Battery Power Level Gauge

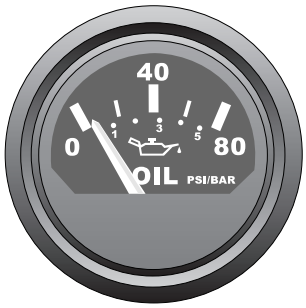
The battery power level gauge located on the bow panel of some type of boat provides you the remaining voltage of the trolling motor deep cycle battery. Check the gauge on a regular basis when you are using your trolling motor. If the battery voltage is low and your boat is equipped with a battery charger, turn the charger on whenever your boat is connected to shore power. Otherwise, remove your battery from the compartment and charge it with a battery charger. Note: the alternator of your boat does not charge the trolling motor battery.



TROLLING MOTOR BATTERY POWER LEVEL GAUGE

Oil Pressure gauge

The Oil pressure gauge provides you with the pressure, in BAR or PSI, of the engine oil. If you see any irregularity with the pressure level of your boat engine, refer to your engine owner's manual.



OIL PRESSURE GAUGE

Depth Sounder and Fish Finder (not shown)

Some boats are equipped with a fish finder that helps you to locate fish and provides the depth of water. The fish finder should not be used as a navigation device. We strongly recommend you to read the Installation and Operation Instructions manual provided with your boat literature for a good understanding and a maximum use of your fish finder.

ENGINE THROTTLE/SHIFT CONTROL

Note: See your engine Owner's Manual for operating information for tiller mounted engine controls.

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 6-1 shows a typical control.

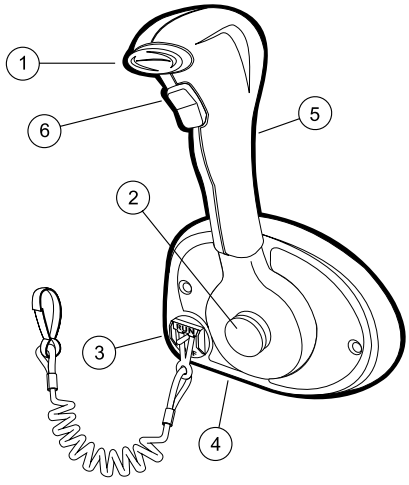


FIGURE 6-1 TYPICAL THROTTLE SHIFT CONTROL

1. **Neutral Lock Button-**Prevent accidental shift and throttle engagement. Neutral lock button must be pushed IN to move the control handle out of NEUTRAL.

2. **Throttle Only Button-**Allows engine throttle advancement without shifting the engine. This is done by disengaging the shift mechanism from the control handle. The throttle only button can be depressed only when the remote control handle is in the NEUTRAL position, and should only be used to assist in starting the engine.

3. **Lanyard Stop Switch-**Turns the ignition OFF whenever the operator (when attached to the lanyard) moves far enough away from the operator's position to activate the switch.

4. **Control Handle Throttle Friction Screw-** This screw, (located behind the bezel cover), can be adjusted to increase or decrease the tension on the control handle. This will help prevent slipping of the remote control handle. Turn screw clockwise to increase the tension and counterclockwise to decrease tension. Adjust to tension desired.

5. **Control Handle-**Operation of the shift and throttle are controlled by the movement of the control handle. Push the control handle

forward from NEUTRAL with a quick firm motion to the first detent for FORWARD gear. Continue pushing forward to increase speed. Pull the control handle back from NEUTRAL with a quick firm motion to the first detent for REVERSE gear and continue pushing back to increase speed.

6. **Trim Tilt Button (if equipped)-** 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. Some controls can also be equipped with a trim/tilt switch. This switch works like the trim switch. The only difference being that pressing the switch in the UP position, moves the stern unit near water level. And by applying a stronger pressure on the switch in the UP position will raises the sterndrive to a upper position suitable for trailering, beaching or launching.

For more information, please review your engine owner's manual.

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 ranges.

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.

SWITCHES

Note: Not all models will have all switches.

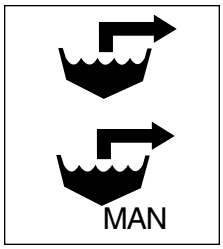
Pro-Flow™ Plus

The Pro Flo™ Plus remote control switch (Figure 6-2) can be used to fill, oxygenate and drain the livewell. To fill the livewell, place the remote control in the "Closed" position. Start the livewell filling pump using the three position livewell switch. Place the switch in "MAN" (manual) position. Turn off the livewell pump once the livewell is full. To oxygenate the livewell, place the remote control in the "Closed" position. Turn on the oxygenation pump using the three (3) positions livewell switch. Place the switch in the "Auto" (automatic timer) position for intermittent oxygenation, if so equipped. This system allows continuous recirculation while running, docked or trailering. To drain the livewell, turn off the pump and place the remote control in the "Open" position. When the livewell is empty, place the remote control in the "Closed" position to prevent water entering the livewell.

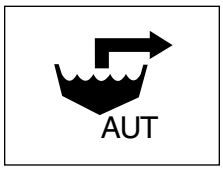
FIGURE 6-2
PRO-FLOW™ PLUS REMOTE

Bilge Pumps (not available on pontoon boats)

Your boat may be equipped with a manual bilge pump. Deckboat models may have an additional automatic bilge pump.



The manual bilge pump switch can be used to turn the pump on or off. Only run the pump until it no longer expels water, do not run it dry.

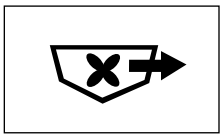


The automatic bilge pump switch can be used to turn on the pump, instead of waiting for the automatic float switch in the bilge to activate the pump. Be sure to return the switch to the automatic mode when the pump no longer expels water. As long as the battery has a charge and the switch is in the automatic mode, the pump will turn on whenever bilge water activates the float switch.

Bilge Blower (Stern drive models only)

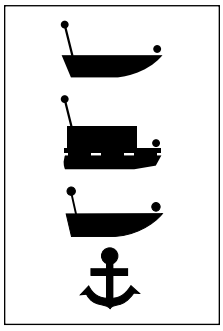
⚠WARNING

Explosion Hazard! Gasoline vapors are explosive. Operate bilge blower for at least four minutes before starting engine to eliminate gasoline fumes in the bilge. Listen to the blower in the engine compartment to verify it is operating. Check engine compartment for fumes or gasoline leaks before starting engine. Do not start engine if gasoline or fumes are present.



Use the bilge blower switch to force gasoline fumes out of the engine compartment before starting the engine. Run the blower at least four minutes prior to starting the engine, and whenever the boat is operated at less than cruising speed. Do not operate the blower while fueling the boat. Keep all engine compartment vents free of obstructions to ensure proper ventilation.

Navigation Lights

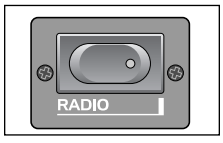


This three-position switch activates the bow and stern running navigation lights. This switch also can be used to turn on only the white stern light while anchored.

Horn

This momentary switch activates the boat's horn. Push or turn the switch and hold it to sound the horn. Release the switch to silence the horn.

Radio



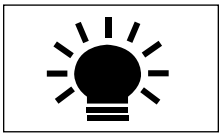
The radio switch gives power to your radio. Pressing the switch on the green button will give power to the radio. To avoid battery drainage, we recommend turning the switch off while you are not using the radio.

Accessory

This switch can be used to control any aftermarket equipment that may be added to the boat.

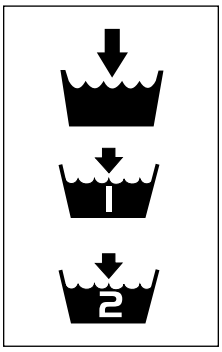
Courtesy Light

This switch activates the boat's courtesy lights. The three-position version of this switch also controls the boat's interior lights.

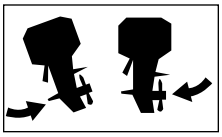


Livewell Filling Pump

This switch controls the livewell filling pump, and may be combined with the livewell recirculating pump switch.



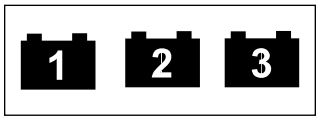
Outboard Tilt/Trim



Use this switch to tilt the outboard motor when in shallow water. Push and hold the switch until the motor is tilted to the desired position, and then release the switch. In the case of a sterndrive unit, the switch is also equipped with a trim function that is activated by a double clicking up on the switch. This allows you to raise the sterndrive out of the water.

Battery Check Switch

This switch enables you to check the remaining voltage in either battery. Push and hold the switch to either the number one, number two or number three position and read the voltage on the nearby voltmeter.



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.

Circuit Breakers and Fuses

Your boat's electric circuits may be equipped with breakers and/or fuses, depending on boat model. The following table lists circuit breakers and fuses that may be found on your boat. Be sure to use the same size breaker or fuse if replacement is needed.

Switch	Fuse AMP	Fuse Type
Horn	10	AGC
Accessory	15	AGC
Navigation Lights	5	AGC
Courtesy Lights	5	AGC
Bilge Pump	2	AGC
Livewell Filling & Oxygenating System	2	AGC
Large Capacity Bilge Pump	4	AGC
Blower	4	AGC
Docking Lights	10	AGC
12V Receptacle	15	ATC
Radio	15	ATC
Main Harness	20 or 30	ATC

ATC: Automobile type fuse
AGC: Glass type fuse

COLOR CODE FOR DASH PANEL WIRING

Color	Color Code	Description
Red	R	Main power feed
Black	B	Ground
Grey	G	Rear navigation light
Grey/White	G/W	Front navigation light
Pink	P	Fuel level gauge
Dark Green	DG	Bonding System
Brown	C	Bilge Pump
Brown/Orange	C/O	Front livewell filling system
Brown/Red	C/R	Rear livewell filling system
Brown/White	C/W	Front livewell oxygenator
Brown/Yellow	C/Y	Rear livewell oxygenator
Blue/White	DB/W	Courtesy light
Dark blue	DB	Interior Light
Orange/White	O/W	Horn
Red/White	R/W	Sonar
Red/Yellow	R/Y	Radio
Yellow	Y	Blower I/O
Grey	G	Tachometer
Tan	T	Water temperature gauge
Light Blue	LB	Oil pressure gauge
Yellow/Red	Y/R	Starting circuit
Violet	V	Instrumentation power feed
Orange	O	Accessory
Light Green	LG	Wiper
Green/Yellow	LG/Y	Accessory
Red/Brown	R/C	Automatic bilge pump sensor
Brown/White	C/W	Trim gauge
Brown/Black	C/B	Automatic bilge pump
Blue/Red	DB/R	Docking lights (Vacanza)
Red/Grey	R/G	12 Volts Receptacle

GETTING UNDERWAY 7

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. Turn off all cellular phones and pagers.

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. When using a portable gas tank insert the fuel supply nozzle, putting it in contact with the fill pipe before the flow of fuel is begun, and this contact should be maintained continuously until fuel flow has stopped. There is a serious hazard posed by static discharge unless this practice is observed.

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

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

7. 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.

8. 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. If fuel flows out the tank vent, stop fueling immediately. The tank is as full as possible under current conditions.

9. If fuel cannot be pumped in at a reasonable rate, check for fuel vent 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 most boats 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. Do not overload your boat. Overloading can cause the boat to become difficult to control and could be the cause of an accident.

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 in such conditions 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 7-1). Do not occupy platform above trolling speeds.

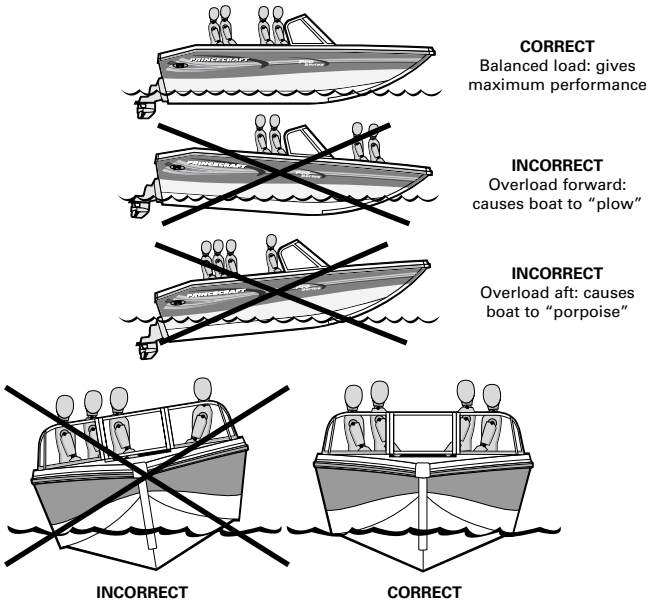


FIGURE 7-1 LOADING PASSENGERS

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. On sterndrive models, run bilge blower for at least four minutes before starting the engine.

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

6. 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, if so equipped.

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.

⚠WARNING

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

6. 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.*

7. Before leaving the dock, be sure that the lanyard switch is working properly and is attached to the boat operator.

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.

Note: If your boat is not equipped with a helm station, see engine Owner's Manual for information on tiller steering.

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. Do not occupy fishing platforms above 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 same area.

ACCELERATION

⚠WARNING

Poor Visibility! While accelerating, bow rises and obstructs forward vision. Before accelerating, be sure path is clear.

⚠WARNING

Always look behind you and to both sides of the boat before accelerating to plane. Tell your passengers of your intentions to allow them to make adjustment to their balance or positions.

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 7-2). 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.

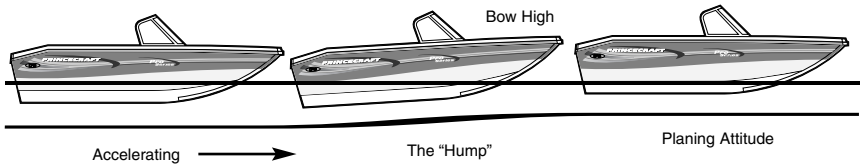


FIGURE 7-2 PLANING

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.

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 and does not apply to pontoon boats. 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 (Figure 7-3 (A)).

3. If the bow is too high, the boat tends to "porpoise" (Figure 7-3 (B)) 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.

4. In the case of low or heavy bow attitude, the boat tends to "plow" (Figure 7-3 (C)). The outboard is trimmed too far down (in). Trim the outboard up (out) to correct this situation.

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 this problem.

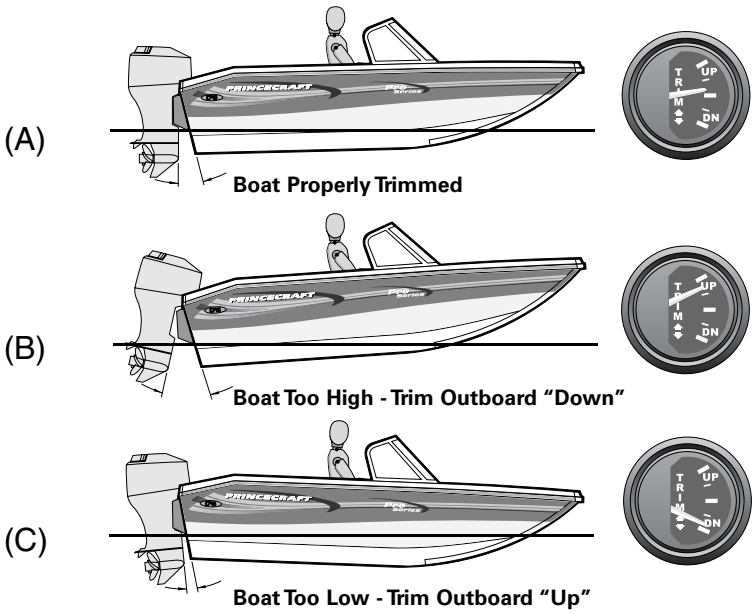


FIGURE 7-3 TRIMMING THE BOAT OUTDRIVE

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 hand. 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.

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 boat is equipped with power steering or with an hydraulic system, the steering forces are partially controlled by the power steering or the hydraulic system. You will feel minimal outside steering forces while the power steering system is working properly. If your boat is also equipped with a No Feedback system you will feel minimal steering forces only when changing direction. If the power steering, the hydraulic system or the no feedback 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 7-4). 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).

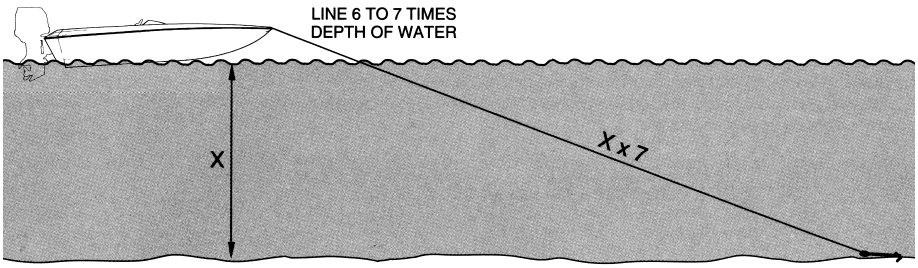


FIGURE 7-4 WEIGHING ANCHOR

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 in case the boat's attitude should shift suddenly. Additionally, inspect the anchor and anchor line prior to use, and replace if damaged or worn.

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 cleat. 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 it 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 wind 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 line 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 toward 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 7-5). 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.

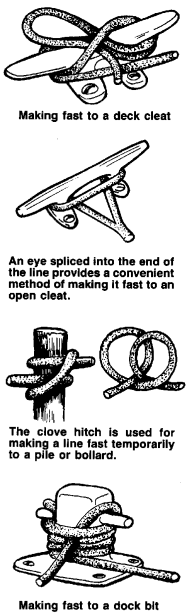


FIGURE 7-5 MOORING LINE TIES

The mooring lines you use most often are the bow line, the stern line, and spring lines as shown on Figure 7-6. 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.

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 moor-

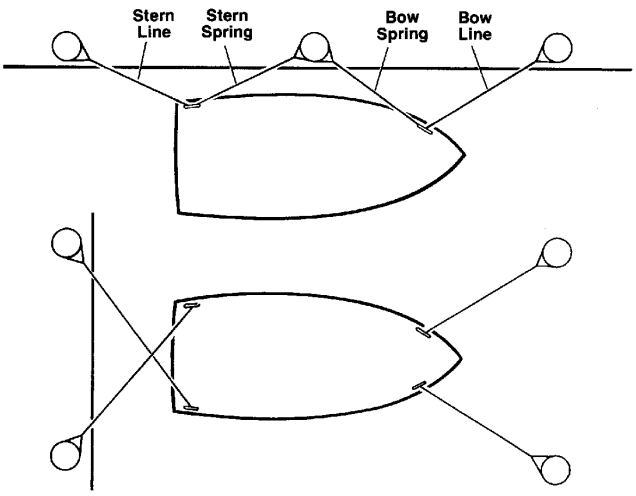


FIGURE 7-6 MOORING LINES

ing 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. When 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 course 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 air cools, it loses its ability to hold moisture and fog will develop when the air temperature drops to the dewpoint temperature. Dewpoint temperature depends on the amount of humidity in the air. You should be aware that fog can form quickly as the air temperature drops, especially 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 overheat 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 familiar 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 all 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 OVER-BOARD."
- Throw a Type IV throwable 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 Coast Guard 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 operation of the fire extinguishers.

Most fires are caused by electrical problems or careless fueling practices. A fire is a serious emergency. You must work quickly to implement 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 engine compartment. This feeds oxygen to the fire and may cause it to flare up. Try to put the fire out using a fire extinguisher, shooting through the fire port located on the front of the compartment.

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 contact 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 to 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.

CARING FOR YOUR BOAT 8

Proper care and maintenance preserves the value of your investment. This chapter explains how to keep your boat looking like new as the years go by.

⚠WARNING

Fire Hazard! Spontaneous combustion can ignite rags wetted with acetone, cleaning fluids, fuel, or other solvents. Never store wetted rags on board. Dispose of them properly on shore.

Use cleaning agents sparingly. Never discharge cleaning solutions into the waterways. Do not use products containing phosphates, chlorine, solvents, or nonbiodegradable or petroleum based products.

Your new boat is designed to provide you with years of enjoyment and satisfaction. In order to maintain the sharp, new appearance of your boat, we recommend the use of a high quality marine surface care product. Washing and waxing a new boat is simple, and it will make ongoing maintenance much easier.

ALUMINUM SURFACES

Salt Water Information

Princecraft's aluminium boat hulls are made of high quality 5052-H36 Marine Aluminium recommended for salt-water use by the Aluminium Association. However, care must be taken in both salt water and fresh water to avoid creating electrolytic action. Do not place brass, bronze, or copper fittings in direct contact with the aluminium. A thorough fresh water bath after every use is recommended by Princecraft and will prolong the life of your boat.

Cleaning

Treat natural aluminum portions of most aluminum boats with a clear protective coating to reduce natural oxidation. Rinse occasionally with clear water or mild detergent to keep those portions of the boat clean. On painted aluminum surfaces, use water and mild detergent for cleaning and protect the surface with a liquid cleaner or wax. Do not use harsh chemicals or abrasives.

Remove stains or light corrosion with a good metal polish. Buff with a fine rubbing compound only if necessary. Remove algae, scum, or other marine growth while they are still wet. They will be much harder to remove if they have had a chance to dry out.

Corrosion

Modern boatbuilding techniques minimize corrosion problems on aluminum models; nevertheless, corrosion can occur when dissimilar metals come in contact and are wetted by contaminated water. In general, saltier water leads to faster corrosion. To minimize this problem, use a quality caulking compound when mounting non-aluminum fixtures or hardware to aluminum. Never use an aluminum boat as the ground wire for an electrical circuit. Electrical equipment should be completely insulated from the vessel to eliminate electrolysis and corrosion.

If your boat is in daily contact with salt water, remove it from the water every three months and rinse inside and out with fresh water.

Repairs

Knock out minor dents with a rubber mallet or use automotive body tools. Have your dealer or an experienced body mechanic repair punctures, skin fractures, loose rivets, and bent or broken reinforcing members (ribs).

Loose Rivets

Clean head around rivets with a wire brush. Flow on a marine sealer around the head for a temporary repair. To retighten, use a steel hammer and a bucking tool (steel block) shaped to fit the head of the rivet. Place bucking tool against rivet head and strike flattened end of rivet inside hull with a steel hammer.

Broken Rivets

Drill out the remaining part of the rivet using a drill bit slightly smaller than the original rivet. Install a solid aluminum rivet. (For a temporary repair, dip a stainless steel sheet metal screw in sealer and insert.)

Pop Rivets

Pop rivets are used to fasten floors, castings, and other trim. Remove by inserting a small punch through the center hole and tapping out the core. Once the core is removed, drill out the rest of the rivet and install a new pop rivet. If pop riveting equipment is not available, you can install a stainless steel sheet metal screw instead.

IMPORTANT: Do not use pop rivets where a watertight seal or a structural fastener is needed.

Cracked Aluminum

Ask your dealer for advice on patching cracked aluminum. Aluminum must be of similar thickness and alloy.

Hull Bottom Maintenance

If a film of algae or scum builds up on the bottom of your boat, it will be easier to remove if it is not allowed to dry out. Use a fine grade of steel wool if the buildup does not come free with a thorough scrubbing. If your boat will remain in the water for more than three months, check with your dealer about the best bottom coating to use for preventing algae or scum buildup.

CLEAR PLASTIC AND PLEXIGLASS

Meguiar's Mirror Glaze Clear Plastic Polish (No. 18)

- Spray on Cleaner.
- Wipe dry with a clean soft cloth to restore optic clarity.

Meguiar's products are available at your Princecraft dealer. For questions concerning the proper use of Meguiar's products follow the instructions or call 1-800-347-5700.

ANTIFOULING BOTTOM PAINT

If your boat will be in the water or docked for extended periods of time, it is recommended to have your dealer apply antifouling bottom paint. Your dealer can choose a paint that will help prevent the development of marine growth. You must use a good quality anti-fouling paint that **does not** contain copper, tin or any other material that could conduct electric current. This paint is designed to slowly dissolve, preventing marine growth. **Do not paint the engine drive surfaces. See your motor operation and maintenance manual for motor and drive exterior care.** Your boat's hull bottom may need to be repainted at the beginning of the next boating season.

PONTOONS

If a rock, log, or other obstacle punctures a pontoon, the pontoon will not fill completely with water. A bulkhead system inside the pontoon contains the water in confined areas. If water enters a portion of the pontoon, the boat will list, but it will not sink. Contact your dealer for pontoon repairs. Do not attempt to repair the pontoon yourself, as this requires technical knowledge and training.

WINDSHIELDS

Some windshields are made of tempered safety glass. Salt and brackish water can etch safety glass. Clean glass with soap and water and a commercial glass cleaner. Flush with plenty of clean water.

Low profile windshields are plastic. Wash plexiglass and plastic with clear water. Ask your dealer to recommend a solvent for removing oil and grease from these surfaces. After cleaning, use a plastic window cleaner and non-abrasive polish.

Vibration may loosen windshield fasteners and braces during normal use. Tighten all loose fasteners, clamps, and fittings.

IMPORTANT: Never use acetone, benzene, carbon tetrachloride, lacquer thinner, or similar type solvents. They penetrate the glass surfaces and cause hazing which obstructs visibility. Do not wipe dirt from a dry windshield.

BILGE

Your bilge accumulates oil and greasy dirt over a period of time and should be cleaned out. Also most models of bilge pumps are equipped with an easy removal pump system for easy inspection and servicing. Inspect the bilge pump system on a regular basis and clean it if necessary. Usually, ordinary soap and water does not remove the accumulation, and something stronger is necessary. Consult your dealer for his recommendations.

HOSES

Fuel lines, vent hoses, and drain hoses should be checked frequently for leaks. If this is occurring around the fitting, then tightening of the hose clamps may be all that is necessary. However, if the leak continues, replacement of the hose should be done immediately to prevent a build-up of fluids or gases. Surface cracking on the hoses indicates wear and replacement is recommended. Use only fuel system parts certified for marine use. Do not substitute automotive parts. Their design is not suitable for marine use.

ELECTRICAL

Your boat is equipped with marine 12-volt batteries. A non-metallic tray is provided to help contain spills and prevent corrosion.

Check your battery terminals frequently for corrosion. Clean terminals with a baking soda and water solution and a wire brush. Also, check the fluid levels in the cells. Usually, a level approximately 1/4 to 1/2 inch above the plates is sufficient. If needed, fill with distilled water. However, some batteries are sealed, and this process is not necessary. Also, read directions when applicable.

If you operate your boat infrequently, you may want to charge your battery occasionally. To recharge, remove the battery from the boat and remove the battery caps (when applicable). Recharge the battery according to the directions enclosed with your battery charger.

Note: Your boat might be equipped with an optional battery charger, remember that this battery charger is installed to charge your trolling motor deep cycle battery only. It is not designed to charge the engine battery.

LIVEWELL SYSTEM

Check the livewell system often to assure that it is free of leaks. Hose connections should be tight and through hull fittings should be water tight. Clean livewells periodically with fresh water only, do not use cleaning agents, as they can harm fish later added to the livewell.

VINYL

The vinyl we use is able to withstand scuffing, cracking, peeling, hard use, and soiling. In general, most household soil can be easily cleaned with warm soapy water and several clear rinses. Moderate scrubbing with a medium bristle brush will help to loosen the soiling agent from the depressions of embossed surfaces. Certain commercially available products clean routine household spills from vinyl very effectively. **Check the label on the product to see if it is recommended for this use.** Certain household cleaners could cause damage or discoloration of the vinyl product and should be avoided. Certain stains may become permanent if they are not removed immediately. Several stains and suggestions for removal (subject to manufacturer's instructions for stain removal) are discussed below.

Ballpoint Ink

Ink spots usually stain plastic products permanently, but much of the stain may be removed by immediate wiping with rubbing alcohol.

Oil Base Paint

Turpentine will remove fresh paint. Dried paint must be sparingly moistened with a semi-solid stripper so that the softened paint can be gently scraped away.

⚠CAUTION

Paint stripper will probably remove the printed patterns on plastic surfaces.

Latex Paint

Fresh paint can be wiped off with a damp cloth. Follow the instructions for dried oil paint if the latex has dried.

Surface Mildew

Wash with a bleach solution of one tablespoon of bleach to one quart of water, then rinse several times with clear water.

Tar and Asphalt

Remove immediately. Lengthy contact will cause a permanent stain. Using a cloth dampened with kerosene or mineral spirits, rub gently from outside edge of stain to the center. This will prevent the stain from spreading. Rinse with soap and water.

Chewing Gum, Car Grease and Shoe Polish

Scrape off as much as possible (chewing gum will come off more easily if rubbed with an ice cube) and go over lightly with mineral spirits to remove the remainder. No time should be wasted in removing shoe polish, because it contains dye which can cause permanent staining. Rinse thoroughly.

Note: Powdered abrasives, steel wool, and industrial strength cleaners are not recommended. They will cause dulling of glossy surfaces. Dry cleaning fluids and lacquer solvents are not recommended because they will attack the vinyl and remove or destroy the printed patterns on the surface.

Wax should only be used on the vinyl if the manufacturer of the product recommends it. Many waxes contain dyes, and dyes will stain.

Remember: Always follow manufacturer's directions prior to using any product on your boat.

CARPETING

Your boat may be equipped with a top-quality, all-weather marine carpet. It is essentially waterproof and fade resistant. To clean, scrub with soap and water, and rinse thoroughly. Occasional vacuuming will remove imbedded dirt and grit.

If you spill gasoline or any other solvent on the carpet (including fish scents), WASH IMMEDIATELY to reduce possible damage to the carpet

fibers and rubber backing. Also, gasoline fumes are highly volatile and could cause an explosion.

HARDWARE

Most of the metal hardware on your boat consists of aluminum, chrome, brass, and stainless steel, and should be cleaned on a periodic basis. Soap and water is usually sufficient, but metal cleaners are available on the market. Your dealer may be able to recommend a product.

After a good cleaning, a coat of metal polish or paste wax will improve the luster of the hardware. In fresh water conditions, metal fittings, railings, and hardware should be sprayed annually with a rust inhibitor such as WD-40 or other fine oil, and every two or three months in saltwater conditions. Check with your dealer for his advice.

Your hardware has designated uses and, as a reminder, cleats are for mooring lines and not for towing skiers or other boats. Also, periodically check screws, bolts, and fittings for tightness, and replace broken or damaged hardware.

Your Princecraft boat may be equipped with top-quality marine grade key locks to secure your storage areas. Should your boat be subjected to use in or near salt water, care should be taken to flush the locks out thoroughly with fresh water to prevent corrosion. The addition of a rust inhibitor such as WD-40 is also recommended to prolong the lifetime of your key locks.

CANVAS

Boat canvas is subject to severe punishment. Moisture can cause canvas to shrink and can promote the formation of mildew, especially if the canvas is dirty. Temperature changes and exposure to sunlight can cause plastics to stiffen and crack. Exposure to chemicals in the air can, over time, cause plastics and fabrics to decay. Salt water can corrode metal fittings.

Canvas is water repellent; it is not waterproof. When it is raining, some leakage may occur. Keep objects from touching a canvas interior. It may begin leaking at the point of contact. If canvas begins leaking at a seam, apply a seam sealer compound or rub a stick of paraffin along the affected area. Repellence to water at the seam will also increase with time as the thread will expand after a few rains.

When installing canvas, be sure to adjust it properly. Your dealer can show you how to do this. Water pockets may form in the roof of loose canvas. The added weight of this water adds to the load on the frame

supports and can cause a broken frame. (See your canvas Installation sheet provided with your canvas top for illustration and installation.)

⚠WARNING

Canvas is not to be installed and upright under the following conditions:

- **While under motor power.** Hazardous fumes can collect inside complete canvas enclosure. Death or serious injury may result. Keep sides and aft canvas open for ventilation. Read safety information supplied with canvas.
- **While exposed to high winds.** Supporting framework may lift from mountings. Falling framework can cause injury.
- **While trailering.** Canvas and framework can be damaged. Falling framework and canvas can obstruct vision of nearby motorists and damage vehicles.

Canvas tops are designed to protect the helm seating areas from the sun. Although these tops provide ample weather protection for the helm, they are not completely weathertight like a winter storage cover.

Please review the following recommendations:

Moisture: May cause shrinkage and mildew if fabric is not properly stored. Always allow canvas to dry thoroughly while mounted before storing. Allowing canvas to dry unmounted may cause shrinkage. Make sure top is properly adjusted avoiding areas of looseness. Proper adjustment will decrease any chances of shrinkage.

Keeping top clean, well ventilated and stored properly will help avoid mildew.

Dirt: Creates a starting point for mildew when moisture is present. Cleaning periodically with a **mild natural soap** (Ivory) and water when unit is mounted on the boat will extend canvas life and provide better appearance. Cleaning can be accomplished with a sponge or soft scrub brush. Canvas should always be fully mounted and adjusted to a tight, smooth appearance before washing. Allow canvas unit to air dry thoroughly before removing or loosening any canvas.

Heat: Under certain conditions heat may cause plasticizer migration. Any vinyl coated fabric when enclosed in a polyethylene container and under direct sunlight is subject to potential migration of the vinyl plasticizers. This will result in cracks appearing on the vinyl components and have a stiffening effect on the fabric. Polyethylene

bags or tubes are meant only for protection during shipping and handling. DO NOT USE THEM FOR STORAGE.

Ultraviolet degradation: Most synthetic fabrics are U.V.R. treated to resist ultraviolet effects. The best protection, however, is to avoid long periods of storage in areas subjected to direct sunlight.

Salt water: Corrosive effects of salt water can erode brass, aluminium or stainless fittings and fasteners. Your canvas has fittings and fasteners made of these materials. These can be protected by keeping them clean, occasionally lubricating them and waxing the chromed brass or stainless fittings and tubing periodically with an appropriate wax.

In short, here are a few tips to help you protect your investment and give you years of enjoyment.:

1. Keep it clean. DO NOT use harsh cleaners. Never use any form of bleach.

2. Clear vinyl curtains and windows demand extra care to prevent scratching. Ideally, they should be washed with clear water, preferably hosed off, wiping it with your hand at the same time. Do not use a cloth or chamois skin. Any dirt or grit in the cloth may result in scratches. Clear water and a clean hand is the safest way. When storing, never fold these items, they should be rolled to prevent any cracking.

3. Under direct sunlight conditions do not allow the clear vinyl to come into contact with the framework. The framework gives off heat that will burn the clear vinyl.

4. Be sure that top is completely dry before storage.

5. Keep unit well ventilated when stored. DO NOT STORE IN PLASTIC OR POLY BAGS.

6. Keep fittings and fasteners clean and lubricated.

7. Never trailer your boat with the canvas unit mounted or expose the unit to severe winds.

8. Do not use a mooring cover as a travel cover.

The material used to produce your boat top and curtains are the finest obtainable. Reasonable care will assure you many years of service.

CARING FOR YOUR TRAILER

Paint maintenance:

1. Residues left from trailering such as tar, calcium, etc. can damage the finish and appearance of your trailer; they shall be removed

2. It is recommended that trailer be waxed at least once a year with non-abrasive wax similar to that used in the automobile industry.

3. Trailer should be washed down whenever possible after each use and should be rinsed thoroughly after use in salt water.

4. Storing for a prolonged period of time should be in a cool dry area.

5. Improper use, storage, care or overloading of trailer may void warranty.

Bearings:

Make sure all bearings are always properly lubricated using waterproof grease.

WINTERIZATION AND STORAGE 9

When cold weather has arrived or if you will be placing your boat in storage for a longer period of time, we suggest using the following guidelines to prepare it for storage. If you live in an area that does not require seasonal storage, we recommend a thorough inspection once a year.

PREPARATION FOR STORAGE

Trailer

When you are preparing the boat for winter storage, it's also a good time to check the trailer thoroughly.

Check the electrical system for wear or loose connections, and repair if necessary. Inspect tail light lenses and inspect bulbs and sockets for excessive rust and corrosion. Coat metal base of bulb with a die-electric grease or spray with WD-40.

Examine the entire trailer and running gear for signs of cracking or metal fatigue. Repair weld cracks, and tighten any loose bolts and screws. Check the frame for signs of bending or swaying due to overloading. If rust has formed on the trailer, remove it by sanding and paint the bare spots to match the trailer. Repair or replace worn or misadjusted bunks or rollers.

Inspect the winch and fastening hook for wear. Check tie-downs for fraying. Loosen or remove tie-downs. Lubricate the winch, the coupler, all rollers and pivot points. Check the safety chains for weak links, safety cables for frayed wire and faulty hooks.

Boat

Note: Remove the bilge drain plug immediately after taking the boat out of the water. After washing, raise the bow to allow as much water as possible to drain while performing other storage preparations.

If you are placing the boat in dry storage, scrape any barnacles and other growth off the hull. Scrub the hull and deck thoroughly to remove marine growth and scum. Inspect the underwater gear and propellers for excessive wear or damage. Check whether the bottom needs repainting.

Note: Clean the hull right after the boat is hauled out of the water. Marine growth and barnacles are easier to remove while they are still wet.

Wash the deck and cockpit. Clean all metal surfaces, and apply a coat of rust inhibitor. Clean the carpet. Prepare canvas for storage. If you choose to shrink wrap your boat, be sure to provide proper ventilation to prevent condensation and mildew growth. See your dealer for additional information.

ENGINE

Refer to the engine operation and maintenance manual for detailed instructions on storing and winterization. Have your dealer or an authorized marine service dealer winterize the engine.

Fuel System

Fill the fuel tank completely to reduce condensation. Add a gasoline stabilizer solution to the fuel before storage. Follow the stabilizer manufacturer's recommended procedure.

LIVEWELL

When the boat is stored, livewells should be drained. If the boat will be stored in freezing weather, be certain to remove all water from livewells, hoses, and pumps. Failure to do so could result in component cracks and leaks.

Note: The use of compressed air hoses in all fittings and drain holes is a good way to ensure that all remaining water is removed.

SHOWER

When the boat is stored, the shower tank should be drained. If the boat will be stored in freezing weather, winterize the shower system following these steps: Start the shower pump, empty the water tank and shut off the pump. Pour potable antifreeze (non-toxic) in the water tank through the filling cap. Run the shower pump opening the shower valve until antifreeze starts to come out. Shut off the pump. Your system is ready for winter.

BATTERIES

⚠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 contact with skin, 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.

Remove the batteries. Check water level and store in a cool, dry place away from freezing temperatures. Clean the outside of the battery case, terminals, and battery clamps with a solution of baking soda and water. Do not allow baking soda solution to enter the cells. Lightly sand battery posts and clamps with fine grit emery cloth, and apply a light coat of petroleum jelly to cover the end of the battery cables.

Note: A monthly recharge or continuous trickle charge should be applied to the battery during storage.

INTERIOR CLEANING

Be sure to remove everything that can hold moisture and cause mildew. Remove all cushions, curtains, blankets, sheets, pillows, towels, and clothing from the boat for storage. If you must store cushions on board, open all zippers and lift cover away from the foam padding by placing a small plastic bowl or other round blunt object inside the cushion to allow for adequate air circulation. Where possible, seats should be stored in the down or folded out position.

PFD's and other safety equipment must be cleaned and dried. If left on board, place them where air can circulate around them.

Clean and thoroughly dry the bilge area. Remove all rags, sponges, or other cleaning materials from bilge area.

STORAGE ON TRAILER

If you are storing the boat on a trailer, make sure that the trailer supports are aligned with the structural members of the hull. Distribute the weight properly. Make sure the boat is well supported across the transom and keel. Loosen all tie-downs to relieve the stress on the hull. Position the bow to allow water to drain via the transom drain. Do not allow rain water to collect inside the boat. Put the rig on blocks or else move the trailer from time to time to prevent flat spots on the tires.

If you are not storing your pontoon boat on a trailer, support the pontoon tubes on wood blocks. Position the blocks beneath all weld seams in the pontoon tubes. Failure to properly support the pontoon tubes could lead to boat damage.

Note: If it is possible for water to accumulate on the boat covers, poke a small hole near the back of the boat cover canvas. Prepare the hole with a grommet to prevent tearing. If the boat is tilted backwards, water will run through the hole and out the bilge drain hole.

RECOMMISSIONING THE BOAT AFTER STORAGE

Follow this handy checklist to recommission your craft after storage.

NOTE: For detailed information about recommissioning, refer to the engine manual and accessory manuals in the Owner's Packet.

- ☐ Inspect the fuel system and all associated equipment for proper connections, corrosion, leaks, or other damage. Always be aware of any odor of fuel vapors.
- ☐ Charge the batteries before installing them.
- ☐ Inspect all battery wiring. Repair or replace if necessary.
- ☐ Attach the battery cables and tighten the cable clamps. After tightening, apply petroleum jelly or marine grade grease on posts and clamps to eliminate air pockets and acid build-up after clamps are tightened.
- ☐ Check bilge for signs of nesting animals and clean as necessary.
- ☐ Reinstall hull drain plug (boats) or pontoon drain plugs (pontoon boats)
- ☐ Clean the bilge area.
- ☐ Test the navigational lights and all other lighting on board.
- ☐ Inspect all wiring for fraying, wear, loose connections, and other damage.
- ☐ Inspect all switches, controls, and other related equipment for proper operation.
- ☐ Inspect all safety equipment for proper operation and physical condition.
- ☐ Launch the boat and start the engine. It may take a minute of cranking to allow the fuel system to prime. When the engine starts, keep a close watch over the gauge readings and check for leakage and abnormal noises. Keep speeds low until the engine has reached normal operating temperature. If the engine was fogged for winterization, you will see exhaust smoke for a few minutes while the fogging oil is burned off.

BOATING TERMS 10

Abaft Toward the stern.

Abeam Amidships, at a right angle to the keel.

Aboard On, in, or into a boat.

ABYC American Boat and Yacht Council, Inc., the organization that sets voluntary safety and construction standards for small craft in the USA.

Adrift Without motive power and without anchor or mooring.

Afloat On the water.

Aft Describing the after section of a vessel or things to the rear of amidships and near the stern.

Aground Touching bottom.

Amidships In the center, the center portion of a vessel.

Anchor A forging or casting shaped to grip the sea bottom and, by means of a cable or rope, hold a boat in a desired position.

Anchorage A customary, suitable, and (usually) designated harbor area in which vessels may anchor.

Astern Toward the stern. An object that is aft of a boat is said to be astern of the boat.

Athwart Across.

Aweigh Off the bottom, said of an anchor.

Aye Yes, while aboard a boat or ship. Means "I understand."

Bail (Bale) To remove water from a boat by pump or bailer.

Beacon A post or buoy placed over a shoal or bank to warn vessels. Also a signal mark on land.

Beam Imaginary line amidships at right angles to keel of vessel. Also vessel's width amidships.

Bearing The direction or point of the compass in which an object is seen.

Belay To make fast to a cleat or belaying pin; to cancel an order.

Below Beneath or under the deck. One goes below when going down into the cabin.

Bend	To fasten by means of a bend or knot.
Berth	A position, as a place to sleep or in which a vessel may be made fast; a margin of safety, as "a wide berth."
Bilge	The lower internal part of a boat's hull.
Bollard	A strong post for holding lines fast.
Bow	The forward part or front of the boat.
Breakers	Waves cresting as they reach shallow water, as at or on a beach.
Breakwater	A structure, usually stone or concrete, built to create a harbor or improve an existing one.
Bulkhead	Vertical partition in a boat.
Burdened Vessel	Former term for the vessel which must stay clear of vessels with the right-of-way.
Camber	The arch of a deck sloping downward from the center toward the sides.
Capsize	To turn over.
Cardinal Points	The four main points of a compass; north, east, south, and west.
Ceiling	The inside lining of the hull.
Certificate	Government paper, such as a boat's license.
Chart	A map of a body of water that contains piloting information.
Chine	The intersection of sides and bottom of a boat.
Cleat	A piece of wood or metal with projecting ends to which lines are made fast.
Clinker	A method of planking in which the lower edge of each strake overlaps the upper edge of the strake next below. (Also called lapstrake.)
Coaming	A raised edge, as around part or all of a cockpit, that prevents seawater from entering the boat.
Coast Guard	The federal marine law enforcement and rescue agency.
Cockpit	A well or sunken space in the afterdeck of a small boat for the use of the helmsman and crew.
Companionway	A hatch or entrance from deck to cabin.
Compass	The instrument which shows the heading of a vessel.

Cowls	Hooded openings used for ventilation.
Cradle	A frame used to support a vessel on land.
Current	The movement of the water in a horizontal direction.
Deadrise	The rise of the bottom of a midships frame from the keel to the bilge.
Deck	Any permanent covering over a compartment.
Deep-six	To discard or throw overboard.
Depth Sounder	An electronic depth-finding instrument measuring the time a sound wave takes to go from the vessel to the bottom and return, then displaying the result in feet, fathoms, or meters.
Dinghy	A small, open boat.
Displacement Hull	Type of hull that plows through the water even when more power is added.
Dock	An enclosed or nearly enclosed water area; all the port installations; a place where vessels can moor, as a pier, wharf, or floating dock.
Dolphin	A small group of piles in the water generally used for mooring or as a channel marker.
Draft	The depth of the vessel below the water line measured vertically to the lowest part of the hull.
Dunnage	Mats, boughs, pieces of wood, or other loose materials placed under or among goods carried as cargo in the hold of a ship to keep them dry and to prevent their motion and chafing; cushioning or padding used in a shipping container to protect fragile articles against shock and breakage; baggage or personal effects.
Ebb	An outgoing tide.
Estuary	An inlet or arm of the sea.
Fathom	Six feet.
Fenders	Objects placed along the side of the boat to protect the hull from damage.
Flare	The outward spread of the boat's sides from the waterline to the rail at the bow. Also, a pyrotechnic signaling device that can indicate distress.
Fore	Used to distinguish the forward part of a boat or things forward of amidships. It is the opposite of aft or after.

Forward	Toward the bow.
Frame	Ribs of the hull extending from the keel to the highest continuous deck.
Freeboard	The vertical distance measured on a boat's side from the waterline to the gunwale.
Galley	The kitchen area of a boat.
Gimbals	Swivels used to keep equipment level.
Give-Way Vessel	The one which must stay clear of vessels which have the right-of-way.
Grab Rail	A convenient grip on a cabin top or along a companion ladder.
Gunwale	The upper edge of a boat's side. (Pronounced gunnel.)
Harbor	A safe anchorage protected from most storms; may be natural or man-made, with breakwaters and jetties; a place for docking and loading.
Hatch (Lid)	An opening in a boat's deck for persons or cargo to go below.
Head	A marine toilet.
Headway	Forward motion of a vessel through the water.
Helm	The wheel or tiller by which a ship is steered.
Holding Tank	Storage tank for sewage so that it will not be pumped overboard into the water.
Hull	The body of a boat.
Hypothermia	A physical condition where the body loses heat faster than it can produce it.
Inboard	More toward the center of a vessel; inside; a motor fitted inside the boat.
Inland Rules	Rules of the road that apply to vessel operation in harbors and certain rivers, lakes, and inland waterways.
Intracoastal Waterways	(ICWs): bays, rivers, and canals along the coasts (such as Atlantic and Gulf of Mexico coasts) connected so that vessels may travel without going into the open sea.
Jetty	A structure, usually masonry, projecting out from the shore; a jetty may protect a harbor entrance.
Keel	The permanently positioned fore and aft backbone

	member of a boat's hull.
Knot	To bend a line. Also, a unit of speed equal to one nautical mile (6076.10 feet) an hour.
Launch	(1) To put a vessel into the water; (2) A small open powerboat mainly used for transportation between a vessel and shore.
Lee	The side opposite to that from which the wind blows.
Leeward	Situated on the side turned away from the wind. (Opposite of windward.)
Leeway	The amount a boat is carried sideways by the wind's force or current.
Lid (Hatch)	An opening in a boat's deck for persons or cargo to go below.
Limber Holes	Drainage holes in the bilge timbers of a vessel allowing water to run to a low point for pumping out.
List	(1) A continuous leaning to one side often caused by an imbalance in stowage or a leak into one compartment; (2) A light list is a printed listing of aids to navigation in geographical order or inclining of a vessel toward the side.
LOA	Length overall; the maximum length of a vessel's hull, excluding projecting spars or rudder.
Locker	A storage place, a closet.
Log	A record or diary of a vessel's journey.
Lubber's Line	A mark or permanent line on a compass that shows the course of the boat.
Making Way	Making progress through the water.
Marina	A place, essentially a dock area, where small recreational craft are kept; usually where floats or piers as well as service facilities are available.
MAYDAY	A radio distress call from the French m'aidez (help me); SOS in Morse Code.
Mooring	Commonly the anchor chain, buoy, pennant, etc., by which a boat is permanently anchored in one location.

Motor A source of mechanical power.

Motorboat Any watercraft 65 feet or less in length propelled by machinery, whether or not such machinery is the principal source of propulsion.

Navigation The art of conducting a ship from port to port.

Nautical Mile 6076.12 feet, or 1852 meters, an international standard; the geographical mile, the length of one minute of latitude at the equator, is 6087.20 feet.

Nun Buoy A conical, red buoy bearing an even number and marking the starboard side of a channel from seaward.

Oar A long, wooden instrument with a flat blade at one end used for propelling a boat.

Outboard (1) A propulsion unit for boats attached at the transom; includes motor, drive shaft, and propeller; fuel tank and battery may be integral or installed separately in the boat;

(2) Outside or away from a vessel's hull; opposite of inboard.

Outdrive A propulsion system for boats with an inboard motor operating an exterior drive with drive shaft, gears, and propeller; also called stern drive and inboard/outboard.

Overall Length The extreme length of a vessel, excluding spars or rigging fittings. See LOA.

Painter A rope attached to the bow of a boat for making it fast.

PFD Personal Flotation Device.

Pier A structure, usually wood or masonry, extending into the water used as a landing place for boats and ships.

Pile A vertical wooden or concrete pole driven into the bottom; may be a support for a pier or floats; also used for mooring.

Piling A structure of piles.

Pitch (1) The up and down movement as the bow and stern rise and fall due to wave action;

(2) The theoretical distance advanced by a propeller in one revolution.

Planing Hull	Type of hull that is shaped to lift out of the water at high speed and ride on the surface.
Port	The left side of a boat when you are facing the bow. Also a destination or harbor.
Privileged Vessel	Former term for the vessel with the right-of-way.
Propeller	Wheel or screw mechanism that pushes water aft to propel the boat.
Rigging	The general term for all lines (ropes) of a vessel.
Roll	The sideward motion of a boat caused by wind or waves.
Rules of the Road	The nautical traffic rules for preventing collisions on the water.
Scope	The length of the anchor rope or chain. 6 to 1 scope means that the length of the anchor rope from the boat to the anchor is 6 times the depth of the water.
Scupper	A hole allowing water to run off the deck.
Sea Anchor	A floating canvas cone held open by wire rings with an opening in the smaller end and a rope bridle at the larger end attached to a line leading to the vessel; used in storm conditions to (a) keep the bow of the boat to the wind, and (b) slow downwind drift of the boat.
Seacock	A thru-hull valve; a shutoff on a plumbing or drain pipe between the vessel's interior and the sea.
Slip	(1) A berth for a boat between two piers or floats; (2) The percentage difference between the theoretical and the actual distance that a propeller advances when turning in water under load.
Sole	The cabin or cockpit floor.
Spar Buoy	A channel marker that looks like a tall, slender pole.
Stand-On Vessel	The vessel with the right-of-way.
Starboard	The right side of a boat when you are facing the bow.
Stern	The after end or back of the boat.
Stow	To store items neatly and securely.
Strake	Planks running fore and aft on the outside of a vessel.

Taffrail The rail around a boat's stern.

Tide The alternate rise and fall of waters caused by the gravitational attraction of moon or sun.

Topsides (1) The sides of a vessel above the waterline;

(2) On deck as opposed to below deck.

Transom The transverse planking which forms the after end of a small, square-ended boat. (Outboard motors are usually attached to a transom.)

Trim To arrange weights in a vessel in such a manner as to obtain desired draft at bow and stern.

Unbend To cast off or untie.

Underway Vessel in motion, i.e. when not moored, at anchor, or aground.

USPS United States Power Squadron, a private membership organization that specializes in boating education and good boating practices.

Vessel Every kind of watercraft, other than a seaplane on the water, capable of being used as a means of transportation on water.

VHF Radio A Very High Frequency electronic communications and direction-finding system.

Wake Moving waves created by vessel motion. Track or path that a boat leaves behind it when moving across the water.

Wash The loose or broken water left behind a vessel as it moves along; the surging action of waves.

Waterline The intersection of a vessel's hull and the water's surface; the line separating the bottom paint and the topsides.

Way Movement of a vessel through the water. Technically it is underway when not at anchor, aground, or made fast to the shore. The common usage is interpreted as progress through the water. Headway when going forward and sternway when going backward.

Well Area at the rear of a boat where the motor may be located.

Wharf A structure, parallel to the shore, for docking vessels.

Wheel (1) The steering wheel;

(2) The propeller.

Whistle Signal A standard communication signal between boats to indicate change of course, danger, or other situations.

Windward Situated on the side closest to the wind. (Opposite of leeward.)

Yaw To swing or steer off course as when running with a quartering sea.