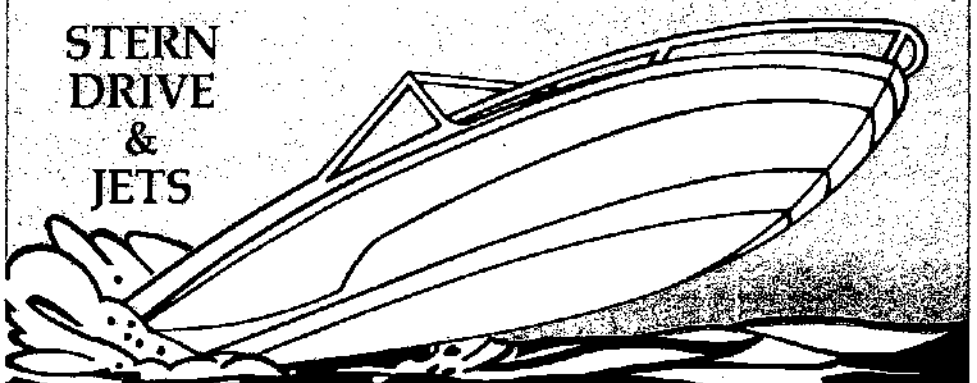
Glastron® & Carlson™

Runabout, Offshore, Cruiser & Sportboats

OWNER'S MANUAL

STERN DRIVE & JETS



OUT FRONT

U.S. COAST GUARD & B.I.A. REQUIREMENTS

GLASTRON OR GLASTRON/CARLSON HAS PROVIDED:

Navigation Lights: Depending upon the model, factory-installed running light installations comply with United States Coast Guard (U.S.C.G.) regulations for either inland or for international lighting.

Ventilation: Engine and fuel tank compartments comply with U.S.C.G. regulations & Boating Industry Associations (B.I.A.) requirements.

Fuel System: Factory-installed fuel tanks and fuel piping comply with U.S.C.G. regulations & B.I.A. requirements.

Flotation: Models up to 24' have foam flotation material installed.

Backfire Flame Control: All inboard/outboards (I/O's) comply with U.S.C.G. regulations for carburetor flame arrestors.

Capacity Plate: All models have a U.S.C.G. or B.I.A. capacity plate which indicates the safe load capacity.

Electrical System: Electrical wiring & components comply with U.S.C.G. regulations and B.I.A. requirements.

YOU MUST PROVIDE:

Personal Flotation Devices: There must be at least one U.S.C.G. approved personal flotation device aboard for each person riding in the boat and for each person skiing plus one throwable device.

Fire Extinguisher: Class A, Class I, and Class II I/O's must have a fire extinguisher on board.

Bell, Whistle or Horn: A sounding device is required by federal and state regulations on Class I (16' to less than 26' length) and Class II (26' to less than 40' length) boats.

Registration: You must properly register your boat and display the proper registration numbers as required by law.

State Laws: The state in which you operate your boat may have other equipment requirements — check the law.

YOU SHOULD PROVIDE:

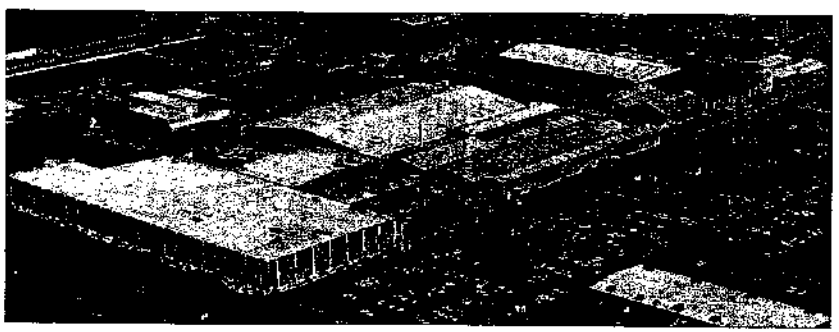
Safety Kit: Carry a safety kit that includes distress signals, flashlight, first aid kit, hand tools, spare propeller, shear pins, cotter pin, oar, anchor and a tow line.

CONGRATULATIONS!

Welcome to the Glastron® and Glastron/Carlson® fleets of satisfied owners. Your boat is designed, engineered, tested and constructed to give you the most in performance and comfort with safety.

This owner's-operator's manual will help you get the most pleasure and utility from your boat. It contains information about your equipment, operating procedures, performance, construction, safety requirements and suggestions for service and care.

EVERYONE WHO USES THIS BOAT SHOULD READ THIS MANUAL, THE ENGINE MANUAL, AND BE FAMILIAR WITH SAFETY AND CAUTION WARNINGS CONTAINED THEREIN.



GLASTRON BOAT COMPANY was founded in 1956. Recording a remarkable continuing growth, Glastron has become the world's largest manufacturer of fiberglass runabout pleasure boats under one brand name with world-wide sales through over 1,200 dealers in all states and 55 foreign countries.

The Glastron Boat Company Plant in Austin, Texas is now over 660,000 square feet with a total Austin employment of about 1,000. In 1969 Glastron acquired Carlson Boats in Anaheim, California to produce the Glastron/Carlson design high-performance fiberglass pleasure boats.

CONTENTS

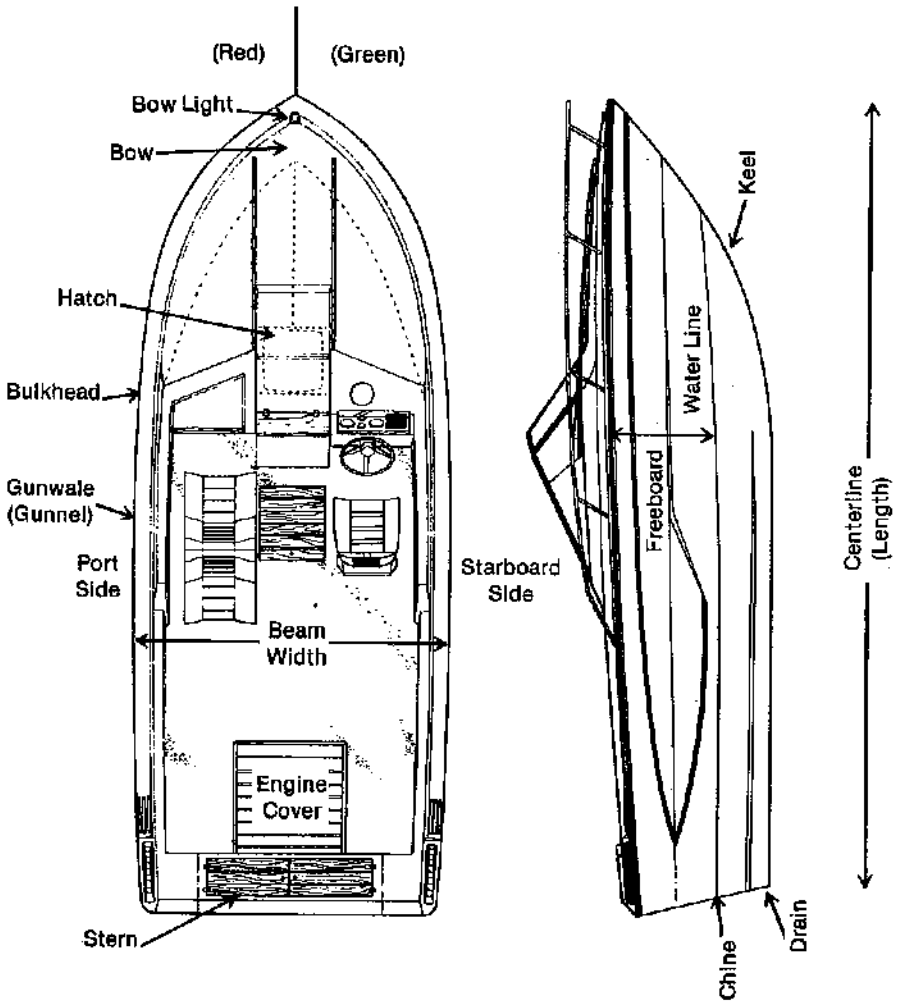
SAFETY

The purpose of the warning notices is to attempt to attract the operator's attention to possible dangers. Each deserves the operator's careful attention and understanding. Safety warnings do not by themselves eliminate any danger and the warnings they give are not substitutes for proper accident prevention measures.

NAUTICAL TERMS

INBOARD/OUTBOARD (I/O)

or STERN DRIVE



DEFINITION:

Class A Boats — Under 16′ Length (Centerline)
Class I Boats — 16′ to less than 26′ Length (Centerline)
Class II Boats — 26′ to less than 40′ Length (Centerline)

Section I: Operation

B.I.A. CAPACITY PLATE

Glastron or Glastron/Carlson does not release any model until the boat has met the most stringent of engineering tests and passed United States Coast Guard (U.S.C.G.) and Boating Industry Associations (B.I.A.) specifications and requirements. Each boat has been certified by B.I.A. to comply with safety specifications for boat capacity, navigation lights, flotation (up to 24′), steering, fuel systems, electrical systems, and engine and fuel compartment ventilation.

Your Boat is designed to meet U.S.C.G. regulations for safe loading. The maximum permissible weight capacity is clearly identified on the U.S.C.G.capacity plate. DO NOT EXCEED THESE RATINGS.

EXAMPLE: Maximum Persons Capacity (pounds).....1050
Maximum Weight Capacity (persons and gear) (pounds).....1050
Engine and Fuel Not To Exceed.....1220 pounds

BEFORE PUTTING THE BOAT IN THE WATER:

1. **CAUTION: Make sure drain plug is properly installed before you place your boat in the water.**

2. Inspect the hull for cleanliness or damage. A dirty hull lessens performance, increases drag and fuel consumption. There is a possibility that the gelcoat finish can "blister" and peel if boats are kept in the water continuously. (See "Care and Maintenance," Section III).

3. Secure all accessories and loose equipment.

4. Check that boat is properly equipped with U.S.C.G. required and approved safety equipment.

   You must have a U.S.C.G. approved personal flotation device for each person on board and for each person skiing plus one throwable device for boats over 16′. Small children and non-swimmers should be required to wear a life vest at all times. Check the condition of the flotation devices.

5. Have an approved fire extinguisher aboard.

6. If your boat is 16′ to less than 40′ in length, you must have aboard a horn or whistle. You should have one for a boat under 16′ as well.

7. **CAUTION: Check to assure an adequate fuel supply. Take every precaution. Fill portable tanks outside your boat. A half pint of gasoline is said to have the destructive power of five sticks of dynamite under certain conditions. You are dealing with several gallons of gasoline when refueling. See. p. 18 for safe refueling procedures.**

8. Lighting: Check for proper operation.

9. Propeller and Lower Unit: Check for nicks or cracks in the propeller and the general condition of your lower unit.

LAUNCHING: See TRAILERING, Pages 35-36.

BEFORE START:

1. The engine and fuel compartments must be properly ventilated and free from evidence of fuel leaks. Raise engine cover and look for fuel puddles and sniff for fumes. Run blower for at least 5 minutes prior to starting.
2. Check battery to make sure it is not standing in water, that battery cables are properly connected and that water in battery is at a safe level. By turning the key to "on" position the voltmeter will indicate the condition of your battery. (See p. 25 for voltmeter information).
3. Check steering cable and fittings for secure operation and proper lubrication.
4. Check that the bilge is clean, dry and free of oil, water and loose objects.
5. Check oil level and that oil is clean. Since marine engines are operated at continuous rpm's (usually higher than automotive engines) we advise that you check your engine manual for recommendation on oil specifications and oil changes.
6. Check freeze plug, drains closed.
7. Secure boat to ramp or dock before starting.
8. Make sure drive unit and propeller are free, have adequate clearance from underwater objects and that the stern area of the boat is clear before starting.

STARTING: (See your Engine Operating Manual)

1. Place control lever in neutral position. (Refer to engine manual for cold starting.)
2. Turn key to Start.
3. Check voltmeter for proper charging.
4. Check oil pressure to assure safe operation.
5. Allow the motor to warm up before operation. Check water temperature gauge for overheating.

OPERATION — UNDERWAY: (See Developing Boating Skills, Page 9)

1. Test steering for proper operation as you move slowly away from dock.
2. **WARNING: Do not operate boat with stern curtain closed as the curtain will prevent proper cockpit ventilation of fuel or engine fumes.**
3. Keep speed under control at all times. Respect the rights of others. Be courteous.
4. Trim boat by weight distribution. For best rpm configuration see your Engine Owner's Manual.
5. Drive "defensively" as you should your car.
6. Remember — the privilege to use public water carries with it an obligation to helm your boat in a safe and courteous manner.
7. Operate boat underway with operator sitting securely in driver's seat.

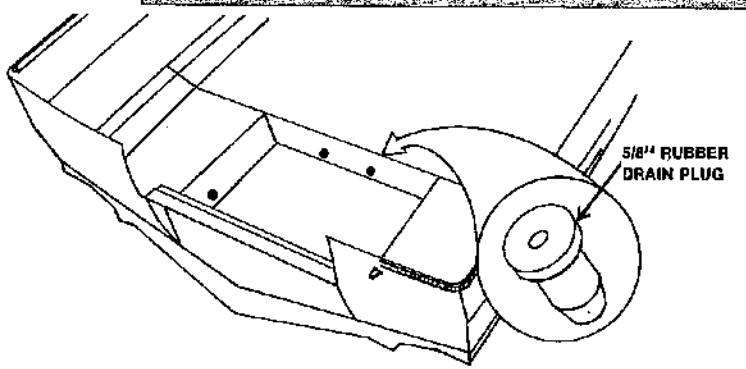
DOCKING: (See Basic Fundamentals of Operation, Page 7)

1. Approach the dock or beaching area with adequate speed to control boat with steering but slow enough to immediately stop the boat with reverse throttle if necessary.
2. After docking, turn off ignition and tilt the lower unit for trailering.
3. Remove and secure ignition key.
4. Secure boat equipment.

CAUTION:

The double bottom of some Glastron Inboard/Outboard boats are sealed to prevent accumulation of water. It is possible for water to get into this area through condensation or seepage. This accumulation could adversely affect the boat's handling characteristics.

One or more drain plugs or rubber stoppers may be located in the forward bulkhead of the engine sump. Should be removed periodically to allow excess water to drain. REPLACE STOPPERS AND/OR PLUGS WHEN WATER HAS DRAINED.



BASIC FUNDAMENTALS OF OPERATION

STOPPING:

Your Glastron or Glastron/Carlson is no more difficult to operate than your automobile, but it is different.

Your boat will slow down when the throttle is retarded to idle in a varying length of time depending on forward or reverse speed, boat load and the effects of wind, waves, tide and current.

It will slow more quickly when headed directly into the wind, waves or current than when it is running with these forces on the stern. For maximum braking action, shifting to reverse and advancing throttle will provide maximum deceleration. (Normally used for docking at slow speeds.)

The judgment of distance and momentum on the water may be a new experience for you and often is deceptive to an inexperienced boat operator.

The ability to estimate distance on the water, to judge the stopping distance of your boat at varying speeds in different water conditions can only be learned with experience.

Make sure each person who operates your boat is trained in all facets of boating and boat handling.

STEERING:

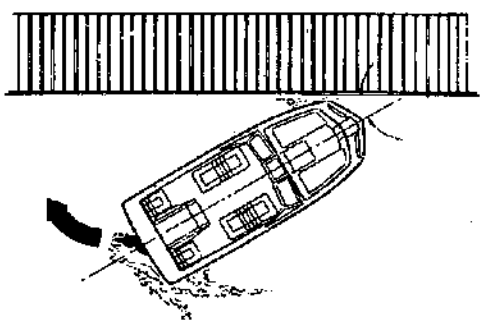
Steering response of an automobile and a boat are markedly different. The front wheels of an automobile turn in the direction that the steering wheel is turned and the rear wheels follow in the track of the front wheels.

Not so with your boat! When you turn the steering wheel of a boat, the stern, rather than the bow, reacts first. Turn the wheel to the right, the stern swings to the left. Turn the wheel to the left and the stern will swing to the right.

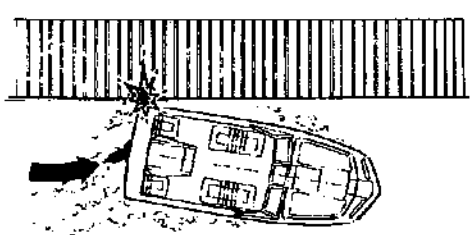
The thrust of the propeller from the stern plus the resistance of the water built up on the outside of the turn will cause the bow to deflect in the direction of the turn.

In a turn away from an object your boat's stern is directed toward the object. If you remember this, you will have mastered the most important single principal of boat helmsmanship.

NOTE: At extremely slow (or "no-wake") speeds, stern drive boats tend to "wander" rather than steer firmly in a straight line. This tendency to "wander" is generally dealt with by making small, continuous steering corrections.



Proper handling.



Improper handling.

BOAT HANDLING AT THE DOCK

Make use of the natural directional characteristics of your boat. A handling trick that will prove invaluable in docking a boat is to proceed at a slow speed to the docking location. Make your approach at a 30° to 45° angle, either starboard or port side. Just before the bow touches the dock, shift to neutral, turn the steering wheel over toward the dock, then shift into reverse. A short quick move of the throttle will then permit the motor to draw the stern of the boat to the dock.

TWIN ENGINE MANEUVERING

The maneuverability is greater with twin engines. With one engine in reverse and the other in forward you are able to make in place turns without the use of the wheel. Turns may be made in either direction by simply switching the opposing port and starboard engines to reverse or forward. A little practice in open water with varied throttle settings will give you a better understanding of the capabilities of twin engines and help you in controlling larger boats.

DEVELOPMENT OF BOATING SKILLS

Development of boating skill will depend on practice, study and observation. The skillful boat operator will learn to sense when in the interest of safety a change of speed or course is necessary. He will gradually gain an instinctive touch in protecting his boat from strain, stress and avoid possible hazaroud situations.

Weather Forecasts

Until you are capable of knowledgeable weather forecasting, get in the habit of checking your local newspaper, radio and T.V. broadcasts, consulting operators of local marinas or placing a call to the nearest Coast Guard Station or airfield to get up-to-date information on marine weather forecasts. REMEMBER WEATHER CAN CHANGE RAPIDLY.

Small Craft Warnings

If small craft warnings are broadcast for the boating area, or if storm warning signals are displayed, don't go boating just because the sky seems clear. Learn to respect the weather and its consequences. DON'T TAKE CHANCES IN MARGINAL WEATHER.

Water Surfaces Give Clues To Depth

Make it a practice to study the water ahead. Deeper water is usually darker in color and shallow water is lighter.

Ripples will build up more easily in a light breeze on water flowing over shallows than it will in deep water. Usually, disturbed water marks the location of underwater obstacles.

In navigable rivers, deeper water will be found on the outside of bends. At curved sections, mud and sand bars are more likely to build up on the inside curves.

Charts

When the boatman leaves areas marked with buoys and cruises into unfamiliar areas, a chart is a necessity. A chart is a mariner's road map. It can help you reach a destination without jeopardizing your boat and passengers.

Night Operation

At night, you must forego certain pleasure boating activities that are commonplace by day — waterskiing and skin diving in particular — in the interest of safety.

If your passengers decide to swim, take a personal inventory from time to time. Use the "buddy system" with passengers paired off, each responsible for the other. Don't let swimmers stray too far.

CAUTION: Swim only in known waters, when the engine is shut off and the boat is securely anchored. Keep one person, who understands the operation of the boat, on boat at all times.

It is good practice to tell some responsible person where you are going and when you expect to return (both night and day).

BASIC RULES

Knowing the "Rules of the Road" is a legal requirement of all boatmen (see back cover). "Rules" are a combination of common sense principles blended with courtesy. Courtesy involves a recognition of the other fellow's rights, comfort and safety.

Speed limit signs are usually found at or near boat anchorage or swimming areas.

You are expected to keep clear of boatmen engaged in fishing or swimming.

Avoiding persons engaged in water skiing or scuba diving is of prime importance.

The privilege to use public waters carriers with it an obligation to operate your boat in a safe and courteous manner.

Here are some basic rules to remember in the proper operation of a boat.

1. Keep your speed under control. Don't show off. Respect the rights of others afloat and on shore. Slow down when it's a matter of courtesy.
2. You should usually cross a large wave at a 45° angle.
3. Slow down immediately when caught in a squall or heavy waves. Maintain enough power to head the boat into or at a slight angle to the wind and waves.
4. Consult your Glastron dealer and talk with other experienced boatmen on special problems in handling your boat.
5. A cardinal principle of boating requires that you be ready at all times to render assistance to other craft in need of aid.
6. If caught in abnormal weather conditions, stay calm, avoid unnecessary passenger movement and stay low in the boat while seeking shelter.

CAUTION: Every boat operator is responsible for his wake and any damage it might cause.

CAUTION: You wouldn't drive your automobile at excessive speeds perpendicular to ruts in a corn field. Neither should you drive your boat at excessive speeds over rough water. To do so is considered abuse of the product and can cause premature structural failure. Speeds that permit personal comfort for you and your passengers is generally a safe cruising speed.

It is recommended that you take advantage of materials and publications available as follows:

U.S. Power Squadron free boating classes.

U.S. Coast Guard publications.

UNITED STATES POWER SQUADRON (U.S.P.S.)

All boatmen are invited to take advantage of the free boating classes conducted by the U.S.P.S. Individuals who have successfully completed the boating course are invited to membership in a local squadron and may take further courses in Seamanship, Advanced Piloting, Junior Navigation, Marine Electronics, Engine Maintenance, Sail and Weather. Courses are taught by volunteer instructors in formal classroom sessions. Call 800-243-600 Toll Free, for information on the nearest U.S. Power Squadron. (800-882-6500 in Connecticut).

U.S. COAST GUARD PUBLICATIONS

You are invited to write to the U.S. Coast Guard for information relative to boating safety. It is suggested that you indicate your particular interest in:

— Taking a safe boating/seamanship course
— Applying for home study "Skipper's Course"
— Information on Federal equipment requirements
— General safe boating literature
— Learning more about the Coast Guard Auxiliary.

Address your inquiry to the Coast Guard Office nearest you.

Contact the Director of Auxiliary nearest you

1st Coast Guard District
150 Causeway Street
Boston, Massachusetts 02114
(617) 223-3607

2nd Coast Guard District (NR)
Ft. Snelling, Fed Bldg, Rm 668
St. Paul, Minnesota 55111
(612) 725-3414

2nd Coast Guard District (SR)
110 — 9th Ave., S. Rm A-938
Nashville, Tennessee 37203
(615) 749-5724

2nd Coast Guard District (ER)
4016A, Federal Bldg.
550 Main Street
Cincinnati, Ohio 45202
(513) 684-2811

2nd Coast Guard District (WR)
210 North — 12th St., Rm 545
St. Louis, Missouri 63101
(314) 425-4618

3rd Coast Guard District (NR)
Bldg. 104, Governors Island
New York, New York 10004
(212) 264-4905

3rd Coast Guard District (SR)
Coast Guard Base Gloucester
King & Cumberland Streets
Gloucester City, New Jersey 08030
(609) 456-7812

5th Coast Guard District
741 Crowford Street
Portsmouth, Virginia 23705
(804) 393-9611 Ext. 207

7th Coast Guard District
51 S.W. First Avenue, Rm 1231
Miami, Florida 33130
(305) 350-5697

8th Coast Guard District
Hale Boggs Fed. Bldg., Room 1115
New Orleans, Louisiana 70130
(504) 589-6629

9th Coast Guard District (ER)
New Federal Bldg.
801 Rockwell Ave., Rm 305
Cleveland, Ohio 44114
(216) 522-3966

9th Coast Guard District (CR)
P. O. Box 480, Castle Station
Warren and E. Genesee Streets
Saginaw, Michigan 48606
(517) 793-2340 Ext. 436

9th Coast Guard District (WR)
2420 S. Lincoln Memorial Drive
Milwaukee, Wisconsin 53207
(414) 224-3198

11th Coast Guard District
Union Bank Building
400 Oceangate Blvd.
Long Beach, California 90822
(213) 590-2218

12th Coast Guard District
630 Sansome Street
San Francisco, California 94126
(415) 556-5310

13th Coast Guard District
Federal Office Building
915 — Second Avenue
Seattle, Washington 98174
(206) 442-7390

14th Coast Guard District
677 Ala Moana Boulevard
Honolulu, Hawaii 96813
(808) 546-5575

17th Coast Guard District
P.O. Box 3-5000
Juneau, Alaska 99801
(907) 586-7315

ACCESSORY EQUIPMENT REQUIRED

No boat should be operated without all required items of accessory equipment. The U.S. Coast Guard requires that each boat, depending upon size, carry certain approved safety accessories. Other law enforcement agencies — state, county or municipal — impose similar equipment requirements that do not fall under Coast Guard jurisdiction.

Your boat is rated Class A if under 16' in length and as Class I if 16' to less than 26' in length and Class II if 26' to less than 40' in length.

FIRE EXTINGUISHERS

Class A and Class I and II boats including all inboard/outboards must carry at least one portable fire extinguisher. This can be either:

Class A & I

a. Two pound dry chemical extinguisher
b. Four pound carbon dioxide extinguisher
c. 1¼ gallon foam extinguisher

Class II

a. 2 each 2 pound dry chemical extinguisher
b. 1 each 16 pound carbon dioxide extinguisher
c. 1 each 2½ gallon foam extinguisher

WARNING: Vaporizing liquid extinguishers such as carbon tetrachlorides or chlorobromomethane are not permitted because of the danger of toxic fumes.

PERSONAL FLOTATION DEVICE

All boats must be equipped with a U.S.C.G. approved personal flotation device for each person on board and for each person skiing and one throwable device for boats 16' in length and over.

CAUTION: Small children and non-swimmers should be required to wear them at all times. All persons aboard should have a flotation device readily available when there is a threat of a storm or when navigating on dangerously rough water.

NOTE: All personal flotation devices must be tagged or marked with a U.S. Coast Guard approval number.

SOUND SIGNALING DEVICE

All Class I boats must carry on board a hand, mouth or power operated horn or whistle. These are recommended for Class A boats also.

All Class II boats must carry; on board a hand or power operated horn or whistle. It is also a requirement that a bell be on board.

Signal devices should be used only when changing course in confined areas, to promote safe passing, to warn other craft of your proximity in fog or as a signal to operators of docks or drawbridges.

LIGHTS

Depending upon the model, Glastron and Glastron/Carlson boats come equipped with navigation lights for either International or Inland lighting rules as required by the U.S. Coast Guard.

Under inland rules a boat is required to show a combination red and green light forward when underway from sunset to sunrise. This combination light must be visible from a distance of one mile. A white light visible 360° for two miles must be displayed aft. This white light must be displayed when anchored or while rowing at night.

NOTE: The above regulations are duplicated by many state boating laws specifying required equipment for state and local waters not under federal jurisdiction.

Some local laws require additional equipment. It is important that you obtain a copy of local laws.

RECOMMENDED ADDITIONAL GEAR

Important both to safety and convenience are the following items:

Basic Gear

Suitable anchor and anchor line
Two lines
2 lightweight fenders
2 mooring lines
Flashlight
Spare fuses
First aid kit
Sunburn lotion
Portable searchlight
Flares
Bilge pump and bailer
Extra drain plug
Oar or paddle
Boat hook

Navigation Gear

Compass
Parallel rulers
Dividers
Charts of the area

Basic Tools

Spark plug wrench
Screwdriver
Pliers
Adjustable wrench
Knife
Hammer
Roll of soft wire
Electrician's tape

Extended Cruising

Fuses, coil, spare battery
Spare propeller
Propeller nut
Lock washer
Shear pins (if applicable)
Spare light bulbs
Spark plugs

Check with your dealer and other boatmen for advice on additional equipment

NOTE: For additional information relative to safe operation, see Section II: "Systems," and your Engine and/or accessory Owner's Manuals.

THE INBOARD/OUTBOARD (I/O)

The Inboard/Outboard (I/O) is often referred to as a "stern drive" or "outdrive." It contains the advantages of both the true outboard and the true inboard.

There is no defined limit to the size boat that can accommodate an I/O but 16 feet is usually the lower boundary due to weight/horsepower ratio. Boats up to 45 feet in length are manufactured with I/O power units.

ADVANTAGES OF AN I/O

1. Four cycle engines use less fuel than comparable horsepower outboards and do not require mixing of gas and oil.
2. The engine can be serviced from the cockpit.

CAUTION: If an underwater object is struck, stop and examine stern drive, propeller and steering for damage before proceeding.

MAINTENANCE

Closely follow the recommendations found in the Engine Owner's Manual relative to lubrication points, oil changes, winter storage, and tune up. For emphasis, several points here supplement the manual.

1. Do not leave the outdrive unit in the water (particularly salt water) all season.
2. In salt water the outdrive is subject to the ravages of electrolysis.

CAUTION: The lower unit should be hosed off and the engine should be flushed out with fresh water after use in salt water.

3. When lubricating the outdrive unit, it is important that no fittings are overlooked. Use only the type lubricant specified by the manufacturer.

WARNING: Your engine is cooled by water circulating through when running. Make sure that the water is drained when there is a danger of a freeze. Remember to close drain cocks prior to operation.

NOTICE: See "Warranty" section for engine warranty information.

CHECK POINTS FOR PEAK PERFORMANCE

Your Glastron or Glastron/Carlson Hull design was carefully designed and tested to assure that it would perform properly with recommended power. It will, but only with some help from you.

Angle of Motor Adjustment Important

Inboard/outboard drive units are equipped with a means to alter the angle of drive unit. The same boat under different load conditions may call for a varied drive angle; that is, the relation of propeller thrust to the planing surface of the hull's bottom.

Often the drive unit angle setting that will offer the highest speed under light load conditions will be that setting just short of the porpoising point. This setting, however, may be unsuitable to heavy load conditions or when pulling water skiers. The latter situation may call for a reduced angle.

INCORRECT
Causes boat to "plow"

INCORRECT
Causes boat to "squat" or porpoise

CORRECT
Gives maximum performance

INCORRECT
Overload forward
Causes boat to "plow"

INCORRECT
Overload aft
Causes boat to "squat"

CORRECT
Gives maximum performance

(Optional) Boat Levelers

On Glastron Cruisers we highly recommend the installation of hydraulically operated optional boat levelers.

These boat levelers can help maintain a level attitude while attaining a planing attitude and while underway. See the instructions which come with this optional accessory.

Propeller Torque And Its Correction

Some of the more powerful motors create a considerable torque effect; that is, a twisting motion causing the boat to ride with one sheer lower than the other. This twisting reaction is caused by the direction of propeller rotation lifting one side of

the boat. This causes an uneven drag, so that a boat's bow may tend to fall off in one direction or the other from the intended course given by the wheel.

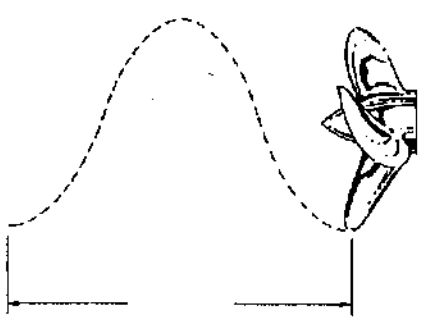
Good hull design offsets this tendency in Glastrons, but some torque action may occur when maximum or close to maximum rated horsepower is applied. Any slight torque may be offset by shifting passenger or gear weight laterally to the high side of the boat.

Don't feel that the need to change fore and aft or lateral trim is an inherent weakness in hull design. It is not. In fact, motor manufacturers incorporated the transom angle adjustment feature because they realized that their power plants would be applied to relatively light-weight boats in which loads might vary considerably from trip to trip. A change in engine thrust angle will cause a change in torque characteristics and most I/O's are equipped with an adjustable "tab" for correcting steering torque. This tab is located on the lower side of the cavitation plate aft of the propeller. If the boat tends to turn to port when properly trimed and running straight (on smooth water and no beam wind), move the trim tab slightly to port. Move the tab slightly to the right if the boat tends to turn to starboard.

Basic Propeller Characteristics

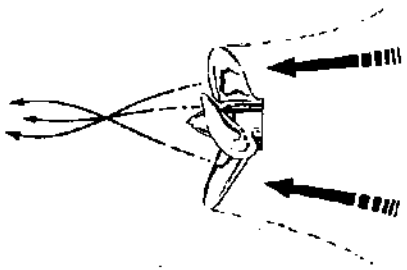
Propellers have two basic characteristics: diameter and pitch. Diameter is that distance measured across the propeller hub line from the outer edge of the 360° arc made by the propeller's blades during a single rotation. Pitch is the angle of the blades from a flat plane, expressed in inches in terms of the propeller's theoretical advance through the water in one complete rotation.

For example, a propeller with a 12 inch pitch, when rotated 360° would, theoretically, advance 12 inches through the water. Actually, no propeller applied to any boat is 100% efficient. No 12-inch pitch blade will, in a single rotation, advance a boat 12 inches. This variance is referred to as slippage.

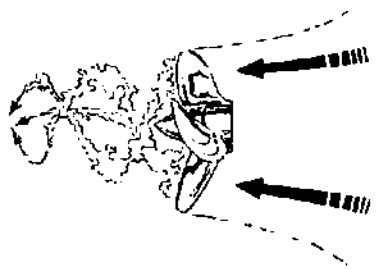


Pitch

Diameter



Optimum Performance



Cavitation

Cavitation, Its Causes and Corrections

At times when a boat enters or leaves a sharp turn, the propeller seems to slip and lose thrust and the engine may overspeed. This problem is normally caused by air or aerated water entering the propeller (a damaged propeller can also cause cavitation). The correction can usually be accomplished by one or more of the following:

a. Replace the damaged or incorrect propeller with the recommend one.
b. Set the outdrive at a lesser trim angle (trim the unit inward
c. Try a cupped propeller.

Replace Damaged Propellers

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

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

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

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

CAUTION: Persons in the water can be seriously injured if struck by a rotating propeller. Operate motor only when operator is seated securely at controls. Turn off motor when swimmers are entering/leaving boat from/to water.

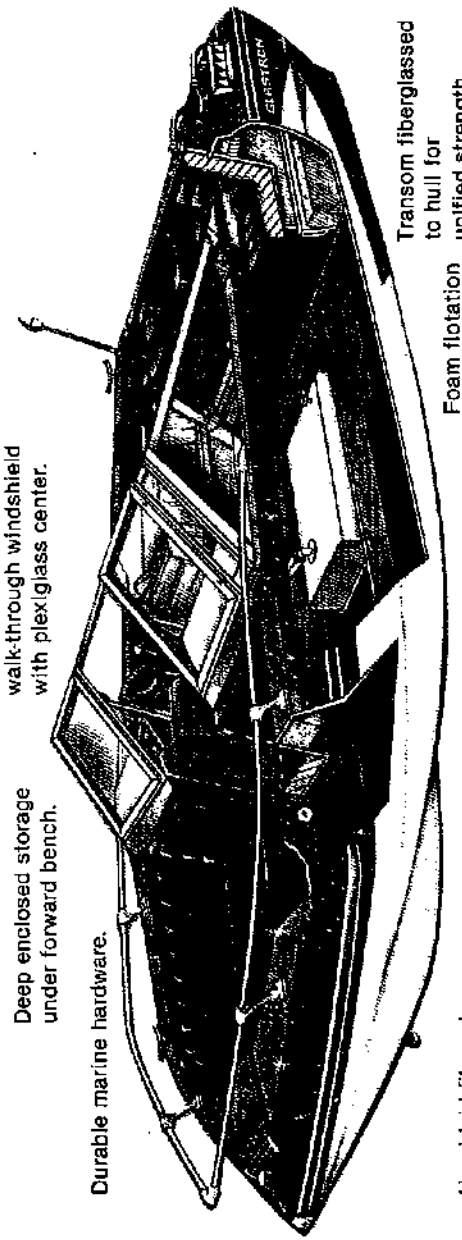
Engine and Drive Unit Maintenance

(Please refer to your Engine Owner's Manual)

Fuel System Maintenance (see page 21)
Steering System Maintenance (see page 23)

CUT-A-WAY OF A TYPICAL I/O
GLASTRON FROM THE INSIDE OUT.

WARRANTY: *All Glastron warranties are limited warranties within the meaning of Title I of the Federal Trade Commission Improvement Act. See specification sheet for full warranty statement.*



Swingout tempered glass walk-through windshield with plexiglass center.

Deep enclosed storage under forward bench.

Durable marine hardware.

Transom fiberglassed to hull for unified strength.

Foam flotation up to 24'.

Multi-tested fuel system.

Stringers encapsulated in fiberglass and bonded to hull.

Hand laid fiber glass construction with Super NPG gelcoat finish.

B.I.A. Certification: Certified by the Boating Industry Association to meet or exceed Coast Guard and Industry standards set for fuel systems, compartment ventilation, steering, lighting load capacity, flotation and outboard horsepower limitations.

GLASTRON AND GLASTRON/CARLSON JET

Basically, the Glastron or Glastron/Carlson Jet is a high performance water pump. Water is drawn in through the intake located on the bottom of the boat. The impeller, driven by the engine, increases the velocity of the water, and discharges it through the nozzle at a much higher velocity. It is the reaction to the velocity of this mass of water being discharged by the pump which drives the boat.

The Jet will handle differently from most other boats. Both power and steering are accomplished by a high-velocity stream of water leaving the jet, instead of a conventional propeller and rudder. This means that when there is no power, there is no steering.

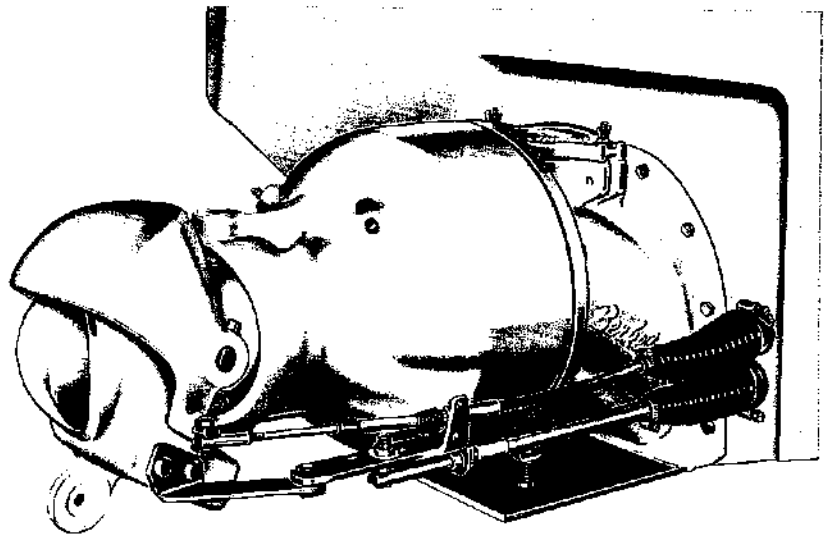
In a turn, you can increase power and your turn will tighten, cut power and you will glide in a straight line. This can be paraphrased by saying "Strong power, strong turn; no power, no turn."

NOTE: To assist in steering, Glastron and Glastron/Carlson have provided a detachable rudder on all jet boats. With this small rudder you will be able to retain some directional control with little or no power.

CAUTION: Stopping is accomplished by shifting into reverse, and can be done at any speed with no mechanical danger. However, use common sense: shifting at high speed is similar to jamming your automobile brakes at high speed. Passengers are likely to be injured by the abrupt stop.

CAUTION: Even though your jet inlake has a strainer, it can still pick up small sticks, plastic bags, and ski ropes. Most of these will pass right on through, but a rope will foul on the impeller and have to be removed manually. Keep the pump intake in the water because the cooling water for engine is supplied by propulsion pump. Running pump in mud or sand can stop up the cooling system. Don't stop it up with mud or sand. If in doubt, shove your boat into deeper water before operation.

Operation where sand is present in the water will slowly wear the jet components with a resulting drop in performance when clearance at the wear ring becomes excessive. The wear ring can be replaced relatively inexpensively. After operation of your jet in salt water, the unit should be rinsed with fresh water. We do not recommend leaving the jet in sea water for a long period of time unless special precautions and extra maintenance can be provided.
The engine is installed very low in the bilge of your boat in order to connect the pump shaft directly. It is possible to submerge and damage the electric starter if the bilge becomes flooded. Always check your bilge to assure it is free of water before operation.



BERKELEY 12 JE JET DRIVE

Berkeley 12 JE jetdrive used in all Glastron and Carlson jet boats. For instructions and detailed information on this unit consult the Berkeley instruction Manual which should be included with every new jet boat. If you do not have a manual, please write or phone the manufacturer: Berkeley Pump Company, P.O. Box 2007, Berkeley, California 94702, Phone (415) 843-9400. **If any communication with Berkeley, Glastron or Glastron/Carlson, you should always state model and serial number of boat, engine and jetdrive to speed an appropriate reply.**

Section II: Systems

FUEL SYSTEM

(See Illustration Next Page)

Fuel for your I/O is placed and stored in permanently installed fuel tanks located either in the bow, beneath the floor or under the seat.

All factory installed fuel systems are in compliance with U.S. Coast Guard regulations and B.I.A. certification requirements. These standards cover parts and equipment used and correct procedures for installation. Compartment ventilation complies with the requirements of the U.S. Coast Guard and B.I.A.

NOTES:

1. **Caution:** All I/O's are equipped with a bilge blower. Be sure to run bilge blower at least five minutes before starting, during the engine starting operation, and when operating below cruising speed. If the boat has been idle, visually inspect the engine compartment and bilge area and "sniff" the compartment to be sure there are no fuel vapors present.

FUEL TANKS

It is important to keep the tanks full when stored to prevent condensation which can cause corrosion in the tank. Condensation will also preclude proper engine operation.

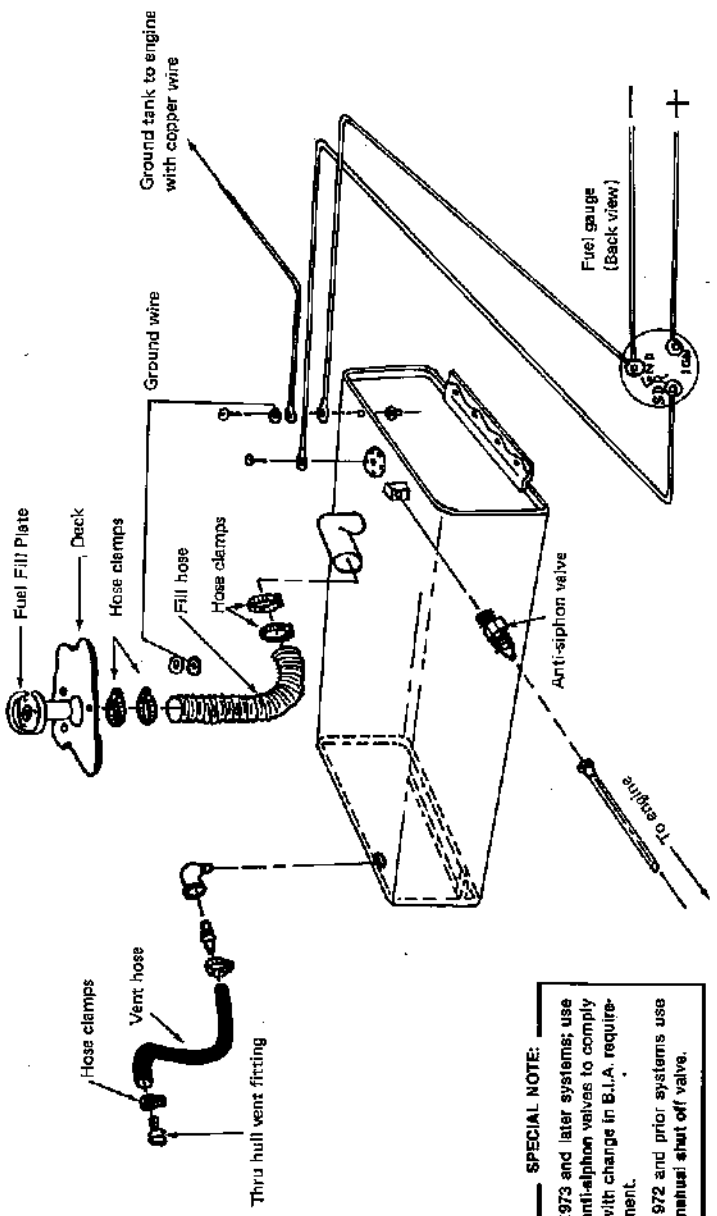
NOTE: It is advisable to have your dealer check all fuel connections, fittings, resilience of neoprene hoses and fuel tanks for corrosion, leaks and tightness at least once each year.

REFUELING

1. Exercise care in refueling your boat. Make sure the gas pump hose nozzle is in contact with the rim of the fill tank opening while refueling to prevent generating a spark of static electricity.
2. Close all hatches, windows and doors before refueling and allow no smoking.
3. After refueling make sure before starting that fuel has not overflowed into the bilge or engine compartment.
4. Any portable tanks should be removed from the boat for refueling.

WARNING: Before starting the engine open the motor cover and visually check for leaking fuel or excessive fuel vapors (this is particularly important after refueling or if the boat has been at dock idle for any period of time). If a fuel leak is discovered, immediate measures should be taken to correct the source. Do not attempt to repair a leaking tank — have it replaced with a new tank. It is good practice to leave the motor cover open while starting the engine after determining that no fuel leak or fuel vapor exists.

TYPICAL I/O FUEL SYSTEM



WARNING: If your boat has a top installed you are warned NOT to operate your boat with the stern curtain closed. The cockpit MUST be open for legal engine and fuel compartment ventilation. You can be cited for a violation of boating safety laws if your boat is operated with the stern curtain closed.

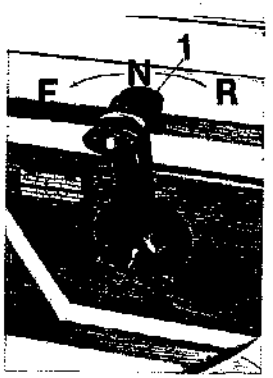
MECHANICAL STEERING SYSTEMS

CAUTION: Mechanical steering systems require service to be safe and relatively trouble free. It is essential to periodically inspect the complete steering system. The engine attachment at the aft end of the cable must be checked for wear and to be sure all fittings are secure and parts are free from rust and corrosion.

IMPORTANT: Cable should be tight and properly aligned. Check for binding, looseness, corrosion, and/or interference in the system. Proper lubrication of all working parts is essential, particularly moving parts connected to the stern drive.

NOTE: You should have your dealer inspect your steering system every year.

THROTTLE & GEARSHIFT CONTROL LEVER



Single Engine Mounting Installation

1 = Control lever
2 = Disengaging device
N = Neutral
F = Forward
R = Reverse
See Engine Manual for twin control usage.

Cold Starting:

When starting a cold engine is is usually a good idea to move the throttle control from neutral to full throttle and back to neutral at least once, sometimes twice.

This allows the accelerator pump inside the carburetor to squirt some gasoline into intake manifold so the engine will have a fuel-rich mixture for starting.

Warm Starting:

When starting a warm engine or one that has become "flooded" by the induction of too much gasoline, you should crank the engine with the throttle partially open.

Each Glastron inboard/outboard boat is equipped with a neutral safety switch. This switch will not allow the engine to start in any position except neutral unless the shift disengaging mechanism is actuated to allow for cold start. If your engine will start in gear the neutral safety switch is not working properly and you should see your Glastron dealer immediately.

ELECTRICAL SYSTEMS

Glastron and Glastron/Carlson Inboard/outboards are provided with direct current 12 volt electrical systems. The instrument panels have keyed plugs which can be used to disconnect the panel from the rest of the system for ease of service.

All wiring is color-coded for ease of tracing in trouble shooting. I/O electric system schematic shown on page 24 is representative of the wiring for various instruments and components.

A voltmeter is provided rather than an ammeter. This enables the operator to immediately determine the condition of the battery as well as provide the voltage charge indication while running.

CAUTION: Critical circuits are protected by a fuse or circuit breaker system. Replacement fuse size is noted on your fuse holder for easy reference. Be sure and replace with the same amperage fuse. A separate fused circuit directly from battery should be added to supply accessory loads.

CAUTION: An error in rewiring or circuiting can cause damage to the alternator, regulator and/or other expensive components. It is recommended that installation of additional instruments or service repairs be accomplished by your dealer or a qualified service representative.

Instrument Panel

Switches may be provided for such equipment as lights, horn, bilge pump, and other accessories if installed. Typical instruments may be as follows:

Speedometer

The speedometer operates by water pressure obtained through a pitot pick-up mounted on the transom. If it ceases to function, check hole in pitot pick-up for trash. The pitot pick-up will flip up if it hits a submerged object or if bumped when trailering. A good time to insure that the pitot pick-up is in the "down" or working position is just prior to putting the boat in the water.

Oil Pressure

The oil pressure gauge should indicate steady pressure while engine is running. Any deviation from normal pressure or an indication of erratic pressure is a warning to check the oil level or the oil system. Each time the boat is operated check engine oil level and at intermittent times during operation, you should check this gauge. Check your engine manual for the normal pressure for your particular engine. Some stern drive models will have an oil pressure light instead.

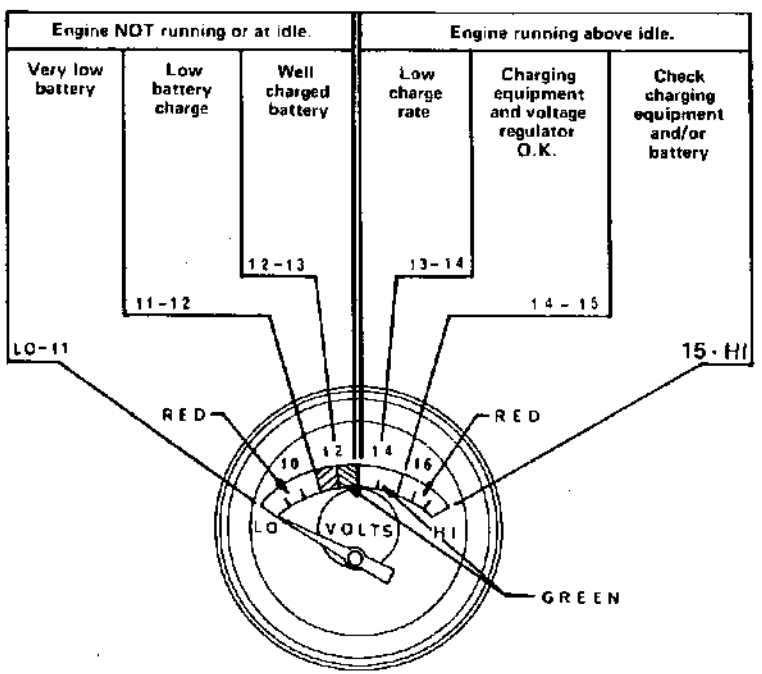
Water Temperature Gauge

Observation of this gauge is especially critical during break-in. Your engine is equipped with a thermostat to regulate water temperature and keep it within a specific range best suited for the intended use. Periodic checks of this gauge during operation are a must to prevent overheating due to, for example, a clogged or restricted water passage. The gauge should be checked frequently during the first ten hours of operation and at lesser intervals after break-in. During warm-up observe the gauge periodically until temperature stabilizes within the specified operation range thus indicating that the thermostat has opened and the total cooling system is operating properly. Some stern drive models will have an engine temperature light instead.

Voltmeter

The voltmeter indicates the condition of the battery and voltage regulator and the charging state of the alternator. The charging circuit of the electrical system is, as with all other systems, intended to operate within a certain range which is indicated on the face of the voltmeter. The diagram below reflects the various readings possible with the engine not running, idling, and running above idle. Some cruiser models will only have one voltmeter and a switch for checking twin engine battery conditions.

VOLTMETER READOUT



Tachometer

The tachometer indicates the revolutions per minute (rpm) of your engine and is most useful in assuring that you are getting peak performance. It is electrically operated. While a tachometer normally presents good steady readings, a good shop tachometer can provide a more accurate calibration of tuning and checking exact engine performance. It may be desirable to calibrate your boat tachometer against a shop tachometer for high or low readings. Any significant decrease in maximum engine speed caused by a loss of power will be readily apparent on the tachometer. See your Engine Owner's manual for instruction for using the tachometer.

Electric Fuel Gauge

Fuel gauges will be found on most built-in fuel tanks. The gauge is operated by a sender unit which is in the tank itself. Note that your fuel system is grounded in two places for safety.

Engine Hour Meter

An engine hour meter is a most valuable instrument used to record actual hours of operation to provide a guide for service and maintenance.

Ignition Switch

Ignition switches are three position, off-on-start. Most models have the ignition switch located on the left side of the instrument panel so that you may start the engine with your left hand while operating the throttle with your right hand.

Battery Crossover System

Purpose: The system allows for installation of up to three batteries. These batteries are normally isolated from each other. However, the engaging of the solenoids by the "auxiliary battery Switch" (located on the switch panel at the dash and is labeled Aux. Batt.) unites these batteries. This enables the operator to draw from all available battery power for use in starting any engine in the system. Once the engine is started, release the auxiliary battery switch and allow the engine charging system to recharge the low battery.

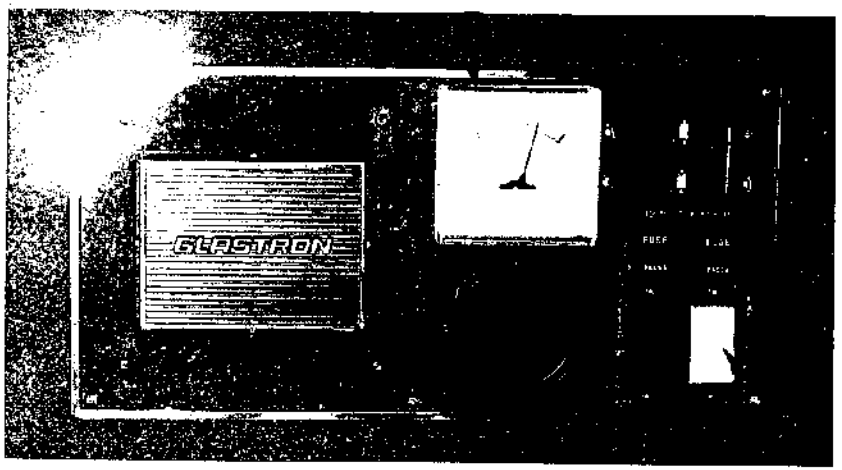
Battery Installation for Battery Crossover System:

Single engine only - attach engine battery to cable marked-"primary engine battery". Attach any auxiliary batteries to either of the other two battery leads.

Twin Engine - Attach a battery to the battery cable marked - "Primary engine battery" and a battery to the cable marked - "Secondary engine battery". Connect auxiliary battery to the battery cable marked "Generator Battery".

Single Engine with Generator - Attach a battery to the battery cable marked "primary engine battery". Attach a battery to the cable marked "Generator battery". Connect auxiliary battery to the battery cable marked "Secondary engine battery."

Twin Engines with Generator - Attach a battery to the battery cable marked "primary engine battery". Attach a battery to the battery cable marked "secondary engine battery". Attach battery to the battery cable marked "Generator Battery".



Standard Switch Panel

(1) 110 AC voltmeter, optional (2) 12 Volt master switch (3) Water pressure demand switch (fixed) (4) Cabin light Hi Lo switch (fixed)

12 VDC Master Switch

This switch disconnects power between the battery (batteries) and the ignition switch (switches). This switch should not be turned off while the engine is running. It does not disconnect the battery power supplied to the power converter. Therefore, those components powered by the converter will still operate with the 12 VDC master switch in the "off" position.

12V-Amperage Draws

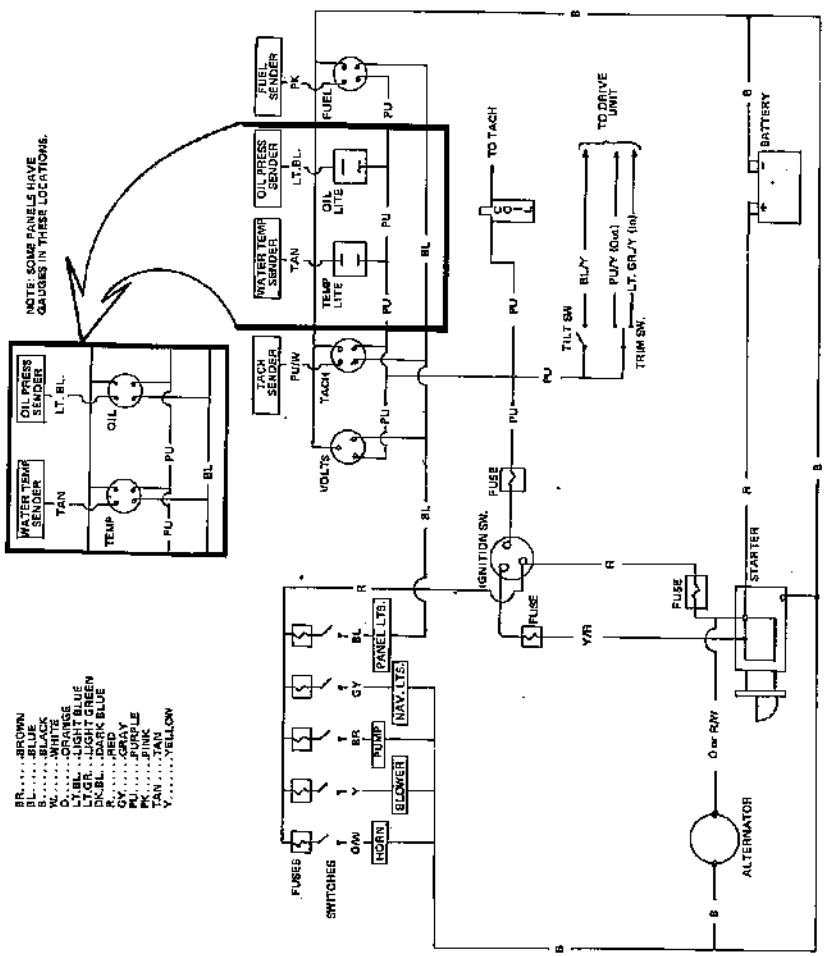
1. Windshield wiper 7 amperes
2. Horn 3.5 amperes
3. Blower 4.5 amperes
4. Bilge pump (Lg) 6 amperes
5. Fresh water pump 5.5 amperes
6. Galley, head, engine compartment, aft bunk, aft deck, and forward cabin lights. 1 ampere (ea.)
7. Overhead cabin light system
   - A. "Dim" position 4 amperes
   - B. "Full" position 15 amperes
8. Refrigerator 5 amperes
9. Levellers 15 amperes
10. Spot light 6.5 amperes
11. Navigation and Anchor lights 2 amperes (total)
12. Shower pump 2 amperes
13. Bilge pump (SM.) 2 amperes

ACCESSORY SYSTEMS

Alcohol Stove

The alcohol stove supplied in some cruiser models is the finest available. Read carefully and follow the operating instructions supplied with the stove. Use only blue stove alcohol labeled specifically for marine stove use. Do not operate stove while underway.

TYPICAL I/O ELECTRICAL SYSTEM



To fill: Unscrew filler cap. Fill tank with denatured ethyl alcohol using a funnel. Replace cap. Filler cap is equipped with a safety valve and must not be replaced by any other type cap.

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

To operate: Burners must be preheated to produce vaporized alcohol. Slowly open (counter clockwise) one burner at a time to allow alcohol to flow into priming cup below the burner body. Fill priming cup ¾ full (about ¼ ounce). Shut off burner (clockwise) and ignite priming alcohol. When this alcohol is fully consumed, turn control wheel toward open position and light burner.

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

CAUTION:
Flare-up may occur during preheating and particularly if burner valve is opened before preheating is completed. Follow starting instructions very carefully. If flare-up occurs, shut off burner and restart as per instructions.

To shut off burner: Turn control wheel to extreme right. Release pressure in tank by loosening filler cap.

To clean burner nozzle: Turn control wheel to extreme left position. This will automatically clean deposits from nozzle. Then return to extreme right.

Other Options

Marine Heads, Optional Power plant: (Special Switch Panel Included), Air Conditioner and Boat Levelers.

Refrigerator

12 VDC - 110 VAC Refrigerator in some models.

These small refrigerators run on 110 volts just like your refrigerator at home when you are plugged into dockside power. When you disconnect dockside, the refrigerator automatically switches over to cooling using the ship's battery for power. These refrigerators use considerable 12 VDC current especially if you try to cool down a lot of food and drink. We recommend you initially cool the refrigerator by plugging into 110 and bringing the box and contents down to desired temperature and then maintain the temperature with power supplied by the battery.

110V DOCKSIDE POWER SYSTEM

General Information

System is 120VAC, single phase, 60 cycle, 3 wire, 30 amperes.

Shore Power Cable

The cord has standard 30 amp marine connections at each end. If it is necessary

to plug this connection into any other configuration (15 amp, 20 amp, two 15 amps, etc.) an adapter will be necessary.

Voltmeter

Purpose: To insure that sufficient voltage is being supplied to the 120VAC system. Some electrical components operate inefficiently or may become damaged as a result of low voltage.

Proper Use: Place the main circuit breaker in the power converter in the "off" position. Complete the boat to shore power connection. If sufficient voltage is being received, switch the breaker to the "on" position and allow current to flow to the rest of the system. Occasional monitoring of the voltmeter will insure that the voltage does not drop too low. See photo, "Dockside Power Converter".

Ground Fault Circuit Interrupter (GFCI) Breaker

This is a dual purpose designed to break the circuit when loaded beyond 30 amperes or whenever a ground fault is sensed.

Ground faults result when a faulty electrical component allows leakage to ground. Ground faults become hazardous when a unintended ground return path becomes established. This ground return path could be through: (1) The normal electrical components (equipment ground for instance); (2) conductive material other than in the electrical system ground (metal, water, plumbing, pipes, etc.); (3) a person; (4) a combination of these ground return paths.

Ground fault leakage current of much lower levels than needed to trip conventional circuit breakers can be hazardous causing fires, injuries, or death.

The following table indicates the effect that short duration low levels 60 Hertz ground faults could have on an average healthy adult.

0.7 milliamps - perception current (women)
1.1 milliamps - perception current (men)
5.0 milliamps - groung fault breaker trip level
10.5 milliamps - "Let-Go" current (women)
16.0 milliamps - "Let-Go" current (men)
50.0 milliamps - fibrillation and death

The test button on the GFCI breaker allows for frequent testing to insure that the system is working property.

Grounding Conductor

As stated before, this is a three wire system. It contains an ungrounded conductor (hot lead), a grounded conductor (ground lead), and a grounding lead (safety or equipment ground). The purpose of the grounding conductor is to send any fault current to ground. Additionally, to protect against a poor ground connection on shore, the grounding conductor is grounded through the engine.

Power Converter

The power converter performs a dual function. It serves both as the 120VAC distribution panel (containing a main and all branch circuit breakers) and converts 120VAC to 12VDC. This 12VDC power is used to operate the pressurized water system pump, the overhead cabin light panel, the head light and galley light. The converter automatically switches off 12VDC power from the battery and supplies converted power to these functions whenever 120VAC power is supplied to the converter.

Automatic Battery Charger

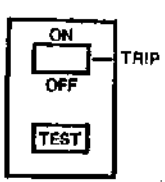
The converter is also equipped with a battery charger which charges the starboard engine battery (this is the battery from which all boat 12VDC functions derive their power). The charger reads the battery charge and will charge at a rate of up to 9 amperes. When the battery is fully charged, the charger shuts itself off.

120V Amperage Draws

Stove	15 amperes	Air Conditioning	15 amperes
Refrigerator	1 ampere	Power Converter	3 amperes
Hot Water Heater	12 amperes	Microwave Oven	15 amperes

TEST REMINDER FOR (W) GFCB®
Ground Fault Circuit Breaker

Installer: Place this test reminder card in a conspicuous location to remind the building occupants to test the ground fault circuit breaker monthly.
Owner: For maximum protection against electrical shock hazard, operate test circuit on the unit at least once a month. Keep these testing instructions in a conspicuous place and record test date each month.

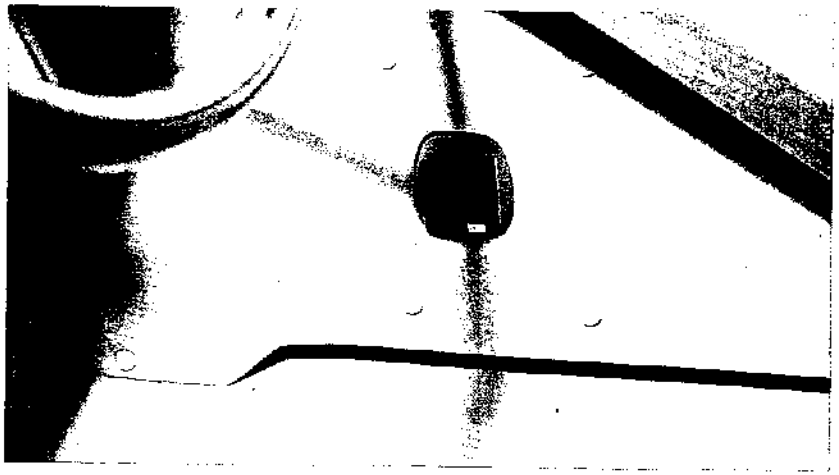


Testing Instructions

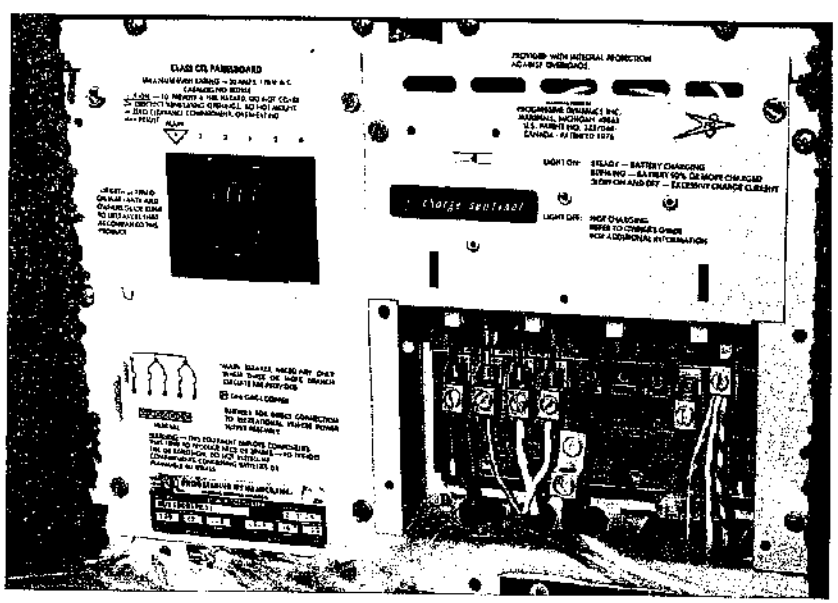
Notice: This panel is equipped with one or more ground fault circuit breakers. When properly installed in accordance with installation instructions each unit provides overload and short circuit protection for the circuit controlled and in addition provides optimum protection for people from line to ground fault hazards. This device does not provide protection against the shock hazard of user contact with two or more circuit conductors.
Owner Instructions: To verify operation—test the device monthly by
1. Insuring that panel is energized.
2. Insuring breaker is in "ON" position
3. Pressing "TEST" button; handle must trip to center position. If not, call electrician for correction.
4. Resetting breaker by moving handle to "OFF" then "ON".
5. Recording test date on a chart.

110 Volt Dockside Power

A ground fault circuit breaker is a built in safety feature of the 110 power.



110 Dockside Power Converter



Section III: Maintenance and Service

CARE AND MAINTENANCE

FIBERGLASS CONSTRUCTION

Glastron and Glastron/Carlson hulls are constructed of handworked laminates of fiberglass reinforced polyester. While hand laminating is the most expensive type of fiberglass construction, we feel that it is essential to guarantee uniform construction and the best possible strength to weight ratio for your boat.

Glass fibers reinforce polyester resin much like steel reinforcing rods in concrete. These fibers are manufactured in three basic forms. Fiberglass cloth is much like the material in a shirt, enlarged several times. Fiberglass mat is a random chop material. Woven roving is a thickly woven high impact resistant material.

Your boat is manufactured using a combination of these three reinforcement materials. The exterior of your boat is gelcoat. Even though gelcoat is the finish on the outside of the boat, it is the first material applied to the mold in the manufacturing process.

The gelcoat material used is the best and most advanced that research and industry has to offer. However, it is possible that boats which are stored in the water continuously can develop small blisters in the gelcoat. If you plan to store your boat in the water, "Blisters" formed in the gelcoat will not affect the strength of your hull.

Water blistering is a common characteristic of the gelcoat surface of fiberglass laminates continuously exposed to water and will not affect the strength of your hull. Hull surface maintenance can be reduced by storing your boat out of the water or paint your hull with antifouling paint.

Small hair line cracks called gelcoat crazing may occur occasionally in the gelcoat surface at points of impact or points of high stress. Since the gelcoat is not a structural part of your boat, this will in no way affect the performance, strength or quality.

Repair

Fiberglass, as tough as it is, can be scratched, scarred or even penetrated by hard contact with sharp objects such as spikes or jagged rocks.

Touching up scratches or blemishes is easy to do. Your dealer carries a gelcoat kit, color matched to your boat. Full instructions are included with each kit. If your dealer is temporarily out of the kits he can get one for you through his regional distributor. Dealers also carry larger repair kits which include all three types of fiberglass, resin and full instructions for repair.

MAINTAINING HULL FINISH

We recommend that you give your boat a coat of wax and keep the hull clean at all times. A waxed boat is easier to clean and the wax serves as a protective coating to your hardware and gelcoat finishes.

Wash your boat regularly with fresh water after use in salt water. Salt crystals will not damage your gelcoat finish but can dull the appearance. Should dirt or salt build up in the grooves or molded-in-non-skid surfaces, they can be removed with soap, water and a good brush.

Your owner's packet has an information card recommending a Carnauba boat wax. Carnauba boat wax is a durable wax especially designed for fiberglass boats. It contains cleaners to polish gelcoat which may have become dull in appearance. We also recommend the use of Carnauba wax on your hardware.

Keep Planing Surface Clean

If left in the water continually, (particularly in salt water) hulls are subject to many types of marine growth. These growths add weight, reduce maximum speed, increase fuel consumption and in general limit the operating efficiency of your hull.

Ask your dealer to recommend an antifouling paint which is best for your area.

A good wax coating on a hull that does not have antifouling paint can make cleaning a much easier task.

We recommend that you coat your vinyl upholstery with a good grade upholstery wax. These waxes will also serve as a cleaner for soiled areas on your vinyl. The use of harsh detergents can eventually damage the threads on your vinyl upholstery parts.

The information relative to boat wax in your owner's packet also recommends a good vinyl and leather protective wax.

Remember, when a prospective buyer looks at a used boat, he always notes the condition of the seats, vinyl and hardware as well as the finish of the hull. Keeping your boat in good condition will keep the value at its peak.

CANVAS MAINTENANCE

Keeping your top clean, dry and properly stored will greatly extend the life of your boat's canvas. The proper care and maintenance procedures are listed below.

1. Moisture — Moisture will cause some shrinkage during the first few months of use, which is normal. Always allow your top to dry while installed on your boat. Storing it wet will cause your top to mold and mildew.
2. Keep Canvas Clean — Dirt and industrial fallout can initiate deterioration of your top especially if moisture is present. Clean your canvas periodically with a mild detergent and water. Harsh chemicals will remove your top's protective coating.
3. Store Canvas Top and Accessory Curtains in a Dry Area — Using your canvas as a boat cover will shorten its life. Your soft top may be stored inside the protective boot; however, both should be dry before enclosing the top in the boot. Notice - Canvas should be stowed during trailering. Damage will occur otherwise.

Section IV: Trailering

TRAILERS AND BOAT TRAILING

With a modern easy-to-launch-and-load trailer, you don't need access to private water frontage or an unlimited budget to spend on mooring facilities in order to enjoy sports afloat. You can store your Glastron in your garage or back yard.

Choose Your Trailer With Care

We strongly recommend that you don't try to shave your boating budget by buying the cheapest trailer available. Trailer builders are constantly improving their products — using better metals, wheels, bearings — and standardizing on many components to relieve spare parts problems. But remember that a breakdown hundreds of miles from home may prove expensive. A trailer that is not properly mated to your boat and motor can cause distortion or damage to the hull that may detract from its performance and prove expensive to correct.

CAUTION: Buy only a trailer that is tagged with a specific maximum load capacity. This is a static load and represents the maximum number of pounds the trailer is designed to support at rest. This load capacity includes the weight of the boat, motor and accessory gear. Don't exceed it.

Don't merely guess at the weight. Drive an unloaded trailer to a railway, freight or lumber yard platform scale. Weigh the trailer. Then load boat and gear — be sure to fill the boat's fuel tanks — and weigh again.

NOTICE: A copy of the latest Digest of State Boat Trailer Laws may be obtained free by writing the Boating Industry Associations, 401 N. Michigan Avenue, Chicago, Illinois 60611. This complete report will tell which states require licenses, fees involved and where to apply, trailer lighting requirements, safety chain and brake requirements, maximum trailer speeds and other miscellaneous laws that may affect your trailering.

NOTICE: Canvas should be stowed during trailering. Damage will occur to the canvas otherwise.

Trailer Balance Important

Sway in boat trailers is usually caused by a tail heavy load. Smooth trailing calls for a 60-75 pound minimum downward pressure on the tongue. If your trailer sways, shift movable gear in the boat forward.

Sway may also be caused by an overly heavy load in the towing car. Helper springs will keep the rear of the automobile higher by compensating for added gear and trailer tongue weight.

Non-adjustable metal helper springs will prevent the towing car rear from dipping. Pneumatic "air-lift" springs offer the added advantage of flexibility of support to meet varying load requirements, and when deflated will prevent rough rides when your automobile is not being used for towing.

How To Rig And Maintain Your Trailer

All modern boat trailers are fitted with adjustable supporting rollers and/or bunk pads. For the protection of your boat, be certain these supports conform to the hull's design. To maintain the running lines of your boat, the bunks should run longitudinally and completely support the transom. The bunks must conform to the contour of the bottom of the boat. Once adjusted, you need not alter them.

Tie-downs should be drawn snugly so that on rough roads the boat and its gear load remain in constant contact with trailer bed and hull supports. We recommend carrying one extra mounted and inflated tire. Inflate trailer tires to recommended pressures, which are usually double or more than that recommended for automobile tire pressures.

Trailer wheel bearings should be checked often. After launching, particularly from a sandy beach or in salt water areas, flush the wheel hubs and underbody of the trailer with fresh water.

For safety, install side view mirrors on your car, since the loaded trailer may obscure your vision in the regular rear view mirror. Auto supply stores and marine dealers carry telescoping side view mirrors that may be extended when trailering.

Tips On Boat Launching

With a present day trailer fitted with some form of tilt bed, heavy duty geared retrieving winch and rollers supports, you will find that handling larger boats has been made easier. However, since many launching ramps are rather steep, we would suggest that you carry a set of wheel chocks in your boat or towing car. Don't depend on finding stones, bricks or blocks of wood at the launching ramp.

A pair of wedge shaped wood sections fitted with a short length of chain or a lanyard will eliminate the need to crawl under the car to pull the chocks free.

Storing Your Boat On A Trailer

There is no one right way to store a boat. Water offers the perfect cradling to prevent boat distortions but mooring afloat has the drawback of exposure. When mooring at home, with the boat on the trailer, keep your rig in a protected location, shaded and preferably under cover. Remove wet gear from the boat. Loosen tie-down lines. Be certain that the trailer bed offers a good support at the transom.

CAUTION: Protect boat from corrosive elements or salt atmosphere and periodically wash down boat.

If the boat is stored outdoors where rain may drop onto the unprotected boat or under the boat cover, raise the tongue of the trailer so that the keel line of the boat is higher forward than aft. Be sure the drain plug has been removed from the transom.

Remember that interior vinyls, even though very durable, can be damaged by exposure to extreme weather conditions.

Glass windshields should be shielded. Stray baseballs and stones have an infallible way of finding them. Plexiglass shields should be flushed with fresh water, and soap, dried with a chamois and covered from direct sunlight. For off-season trailer storage, jack the trailer axles so the wheels are free of the ground, then put cement block sor some other chocking material under the trailer axle so the wheels don't rest in the mud, damp grass, snow or ice.

Use A Sturdy Frame Hitch

We strongly recommend, even for short distance trailering, that you fit the towing car with a frame-type hitch, bolted or welded securely to your car's frame.

CAUTION: Check the ball hitch for secure latching before towing trailer from parked position.

Many modern automobiles are built with very lightweight frame materials. Consult your marine dealer or local mechanic and follow his advice if he recommends having additional stressing metal added for greater security. While not required in all states, it is a good practice to have a heavy duty safety chain on your trailer, capable of withstanding loads of three times the gross weight of the trailer.

CAUTION: Know and comply with the state trailer laws within the area you are towing your boat. These laws vary widely from state to state.

Section V: Warranty

LIMITED WARRANTY

Glastron Boat Company (Glastron) warrants each new Glastron and Glastron/Carlson boat to the original purchaser only to be free from defects in material and workmanship under normal use or service for one (1) year from date of retail purchase from an authorized Glastron Dealer according to the following terms:

Any part of the boat manufactured by Glastron and found in the reasonable judgment of Glastron to be defective in material or workmanship will be repaired or replaced at Glastron's option by an authorized Glastron dealer without charge for parts and labor.

The boat including any defective part must be returned to an authorized Glastron dealer within the warranty period. The expense of transporting the boat to the dealer and the expense of returning the boat back to the owner will be paid for by the owner. Proof of purchase will be required by the authorized Glastron dealer to substantiate any warranty claim. In addition, all warranty work must be performed by an authorized Glastron dealer.

WARRANTY DOES NOT COVER:

This warranty does not cover any boat that has been subject to misuse, neglect, negligence, or accident, or operated for racing purposes, or operated in any way contrary to the operating or maintenance instructions as specified in the Glastron Owner's-Operator's Manual. The warranty does not cover any boat that has been altered or modified so as to adversely affect the boat's operation, performance or durability or that has been altered or modified so as to change the intended use of the boat. In addition, the warranty does not extend to repairs made necessary by normal wear, or by the use of parts or accessories which in the reasonable judgment of Glastron are either incompatible with the boat or adversely affect its operation, performance or durability.

IN ADDITION:

This warranty does not cover: (1) engines, outdrives, controls, batteries, or other equipment or accessories carrying their own individual warranties (appropriate adjustments to them provided by their respective manufacturers); (2) machinery, equipment and accessories not factory installed; (3) windshield breakage; (4) gelcoat maintenance and gelcoat crazing; (5) upholstery damage such as puncturing, or by solvents or cleaners; (6) any Glastron boat which has been overpowered or overloaded (in excess of horsepower and/or capacity as specified on capacity plate on each Glastron boat); (7) any Glastron used for commercial purposes. Upon request, Glastron may provide special written warranty for specific commercial applications.

Glastron boats contain flotation material; however, there is no boat that is unsinkable. Therefore, personal flotation devices should be carried for each passenger in accordance with U.S. Coast Guard requirements.

NO OTHER WARRANTIES MADE: LIABILITY DISCLAIMER

Repairs or replacements qualifying under this warranty will be performed by an authorized Glastron dealer following delivery of the boat to the dealer's place of business. Glastron's responsibility in respect to claims is limited to making the required repairs or replacements, and no claim of breach of warranty shall be cause for cancellation or rescission of the contract of sale of any boat.

Glastron assumes no responsibility for loss of use of the boat, loss of time, inconvenience, or other damage, consequential or otherwise, including, but not limited to, expense for gasoline, expense of returning the boat to the dealer and expense of returning the boat back to the owner, removal of the motor from a boat and reinstallation, mechanic's travel time, in-and-out-of-water charges, telephone or telegraph charges, trailering or towing charges, rental of another boat during the time warranty repairs are being performed, travel, lodging, loss or damage to personal property, or loss of revenue.

Glastron reserves the right to change or improve the design of any boat without assuming any obligation to modify any boat previously manufactured.

ALL IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE DURATION OF THE ONE (1) YEAR WARRANTY PERIOD. ACCORDINGLY, ANY SUCH IMPLIED WARRANTIES INCLUDING MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE, ARE DISCLAIMED IN THEIR ENTIRETY AFTER THE EXPIRATION OF THE ONE (1) YEAR WARRANTY PERIOD. GLASTRON'S OBLIGATION UNDER THIS WARRANTY IS STRICTLY AND EXCLUSIVELY LIMITED TO THE REPAIR OR REPLACEMENT OF DEFECTIVE PARTS, AND GLASTRON DOES NOT ASSUME OR AUTHORIZE ANYONE TO ASSUME FOR THEM ANY OTHER OBLIGATION.

Some states do not allow limitations on how long an implied warranty lasts and some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

The Warranty Validation Card must be signed by the owner and returned to Glastron within fifteen (15) days after the original purchase. Failure to sign and return the card within the prescribed time will render your warranty null and void. Nothing herein shall be interpreted, however, as limiting Glastron's obligations under the Boat Safety Act of 1971 to correct defects which violate Coast Guard Safety Standards, Regulations, or which are determined to create a substantial risk of personal injury to the public.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

This warranty applies only to boats sold in the United States and Canada.

Glastron Boat Company
9108 Reid Drive
Austin, Texas 78759

NOTE!

In keeping with Glastron's policy of continuous improvements of all products, we reserve the right to change specifications and prices without notice.

All boat manufacturers are required by Federal law to notify first time owners in the event any defect is discovered "which creates a substantial risk of personal injury to the public." Failure of the purchaser to return the boat warranty registration card will waive the right to notification of defect and repair at manufacturer's expense. In order that we can comply with the law if it becomes necessary, it is essential that your boat warranty registration card with the owner's name, address and boat serial number be completed and mailed (Federal Boat Safety Act of 1971, Subsection 15b).

WARRANTY SERVICE

To make a claim under warranty, contact the authorized Glastron dealer from whom the boat was originally purchased, or the nearest authorized Glastron dealer. Remember, your boat must be delivered to an authorized Glastron dealer within the warranty period, and all warranty work must be performed by an authorized Glastron dealer. Any repairs to be performed after the warranty period must first be approved in writing by the Glastron Service Department. Proof of purchase will be required by the Glastron dealer to substantiate any warranty claim.

INBOARD/OUTBOARD CARRY ON CHECK LIST (Keep on Board)

PRE-LAUNCH INSPECTION

1. Drain plug — Install
2. Accessory gear — secure
3. Safety equipment — aboard
4. Fuel supply — adequate
5. Oil — check oil level safe
6. Freeze plug drains — closed
7. Check running lights
8. Check propeller and lower unit

BEFORE START

1. Engine — properly ventilated
2. Bilge blower — operate at least 5 minutes
3. Fuel — check for engine and fuel compartment leaks
4. Battery — properly connected, water level safe
5. Steering cables and fittings — tight
6. Bilge — clean, dry, clear of loose objects

STARTING

1. Control lever to neutral position
2. Stern area — clear
3. Start engine, turn key to right
4. Oil pressure — check for safe pressure
5. Voltmeter — check for charge if installed
6. Allow engine to warm up — check temperature gauge for overheating.

OPERATION — (UNDER WAY)

1. Observe "Rules of the Road"
2. Steering — test for proper operation
3. Speed — only when clear and in open water
4. Trim boat for best speed/r.p.m. combination

MOORING OR TRAILERING

1. Dock boat slowly — exercise extreme care
2. Stop engine — ignition off
3. Outdrive — tilt for trailering
4. Properly stow gear for trailering or storage
5. Secure boat on trailer
6. Remove drain plug — **(See Caution, page 7).**
7. Hull — check for possible damage and cleanliness
8. Temporary or winter storage — see Engine Manual for procedures to protect engine.

Cut along dotted line. Keep aboard your boat.

WARNING AND CAUTION SUMMARIZED

CAUTION: Provide a U.S.C.G. approved personal flotation device for each person aboard and for each person skiing and one throwable for boats 16' in length and over.

CAUTION: Provide a fire extinguisher for your boat.

CAUTION: It is good practice always to start your engine with the controls in neutral and operate only when driver is seated securely at controls.

CAUTION: Fill auxiliary fuel tanks outside of the boat.

CAUTION: Install drain plug before you launch your boat.

CAUTION: CLEAR the stern area of the boat prior to start.

CAUTION: Display running lights between sunset and sunrise.

CAUTION: Every boat driver is responsible for his wake and the damage it might cause.

CAUTION: Know and comply with state trailering laws within any state you may tow your boat.

WARNING: A vaporizing liquid extinguisher, such as carbon tetrachloride is not permitted on board since these create toxic fumes.

WARNING: If fuel leak is discovered, do not operate your boat until repairs are made. Do not attempt to repair leaking fuel tank — have it replaced.

WARNING: Do not operate your boat with the stern curtain closed.

WARNING: It is extremely important to keep steering cables and fittings tight and free from corrosion at all times.

WARNING: Do not smoke while fueling boat.

WARNING: Operate bilge blower for at least 5 minutes prior to starting your engine.

WARNING: **INSTALLATION OF AN ENGINE WITH HORSEPOWER IN EXCESS OF THE MAXIMUM HORSEPOWER REFLECTED ON GLASTRON AND GLASTRON/CARLSON SPECIFICATION SHEETS FOR EACH MODEL WILL VOID THE WARRANTY ON YOUR BOAT AND MAY LEAD TO UNSAFE SPEEDS AND/OR UNSTABLE HANDLING CHARACTERISTICS.**

WARNING: The "Federal Boat Safety Act of 1971," (Public Law No. 92-75) established rules, regulations and standards which affect the operator of a power boat. Especially:

Sec. 12(c): "No persons may use a vessel in violation of this Act or regulation issued thereunder."

Sec. 34: Any person who unwillfully violates Section 12(c) of this Act or the regulations issued thereunder shall be fined not more than $1,000 for each violation or imprisoned not more than one year, or both."

We encourage you to read this law and to stay abreast of the regulations by consulting your dealer periodically or contacting the nearest U.S. Coast Guard Auxiliary Squadron.

WARNING: Check for exhaust leaks in exhaust system of all Engines periodically.

NOTES

← PORT STARBOARD →

Yield right-of-way to boats in your DANGER ZONE!

DANGER ZONE (Dead ahead to 2 points abaft your starboard beam)

REMEMBER THESE RULES

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

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WHISTLE SIGNALS

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

STORM WARNINGS

RED FLAG Small craft (winds to 38 mph)

2 RED FLAGS Gale (up to 54 mph)

SQUARE RED FLAG—BLACK BOX (whole gale)

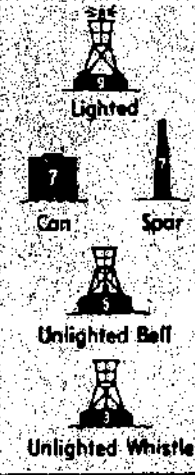
2 SQUARE RED FLAGS BLACK BOX (Hurricane)

CHANNEL BUOY GUIDE

Entering port or going upstream

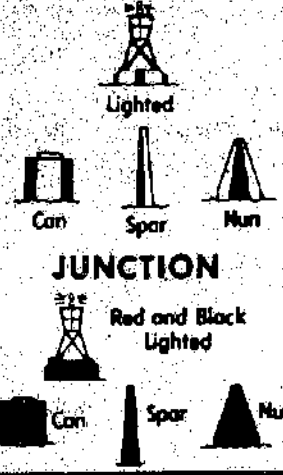
PORT SIDE

Color: Black
add numbers



MID-CHANNEL

Color: Black & White
no numbers



JUNCTION

STARBOARD

Color: Red
even numbers

USE COMMON SENSE AFLOAT