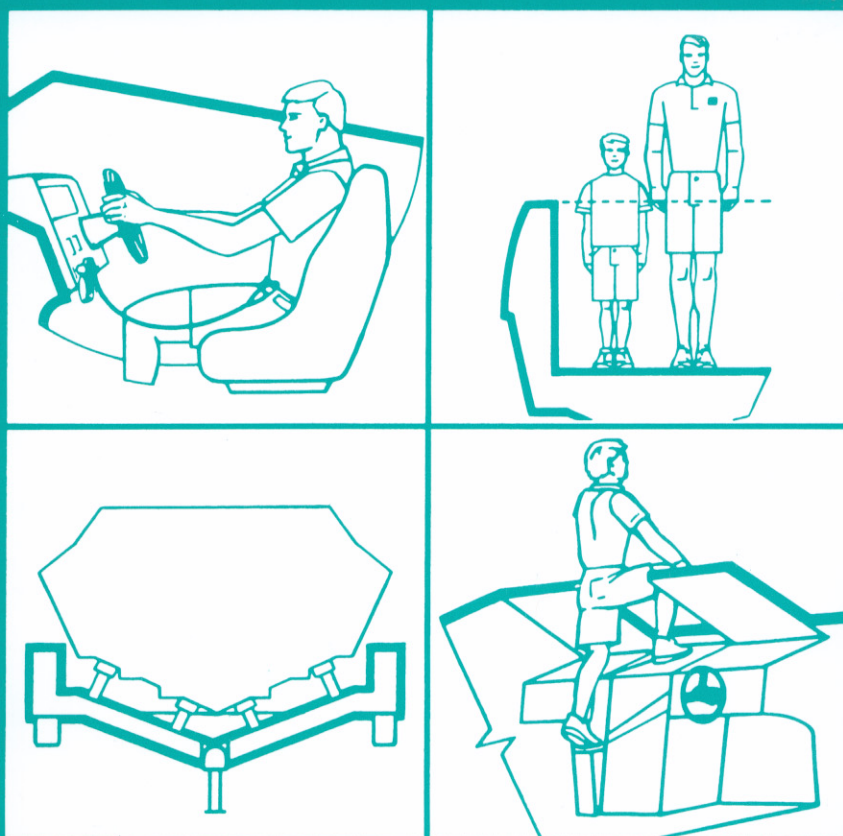


# FOUR WINNS



## CRUISER OWNERS MANUAL

PART #090-2308



# PREFACE

This manual will acquaint you with the use and maintenance of your new Four Winns boat. The manual also provides special information critical to the safety of the passengers, and longevity of the equipment. The information on the following page lists the conventions used to increase the visibility of these important messages. Also included with this manual is the "Boating Basics, Blueprint for Safe Boating" published by the National Marine Manufacturers Association. This publication covers all the boating basics and should be read along with Four Winns manual before operating your boat. Review this information in detail.

Four Winns continually strives to improve its products. Unit specifications, including standard and optional equipment are constantly being modified. Equipment availability is also subject to change. The most current and accurate information available at the time of publication is included in this manual. Some variation in equipment, description, location, and details can result.

The information in this manual focuses upon the equipment designed and manufactured by Four Winns on specific cruiser models. Utilize the information pertinent to your specific boat model. Equipment such as engines, and other accessories are manufactured by others. The information provided in this manual is intended to be used in conjunction with the information provided by the manufacturers. All information available at the time of manufacture has been included with this manual.

Read this manual carefully before operating your new boat. Many instructions may require direct performance of the activity to fully understand the correct method. If you choose to read this manual at home, remember to take it to the boat with you.

Your Four Winns dealer knows your boat best and is interested in your complete satisfaction. Return to him for service or other assistance. If you find it necessary to contact Four Winns directly, please write the office listed below. Be sure to include the boat model, serial number, your daytime telephone number, and specifics of the information desired.

This manual has been specifically developed for cruiser models over 24 feet. Please record the model and serial number information below.

**Model**

**Serial Number**

\_\_\_\_\_

\_\_\_\_\_

This manual should be considered part of the boat. Should you sell the boat, pass this manual on to the new owner. Take special care of this manual. Certain information in this manual may not be available in a replacement manual.

Thank you for joining the Four Winns family. We appreciate your purchase and welcome the opportunity to demonstrate our commitment to you.

**Four Winns Customer Service Department  
4 Winn Way  
Cadillac, Michigan 49601  
616-775-1343**

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# WARNING CONVENTIONS

This manual contains instructions critical to the safety of those aboard or the longevity of the equipment. The conventions below have been adopted to increase the visibility of this information throughout the manual.



This is used to indicate the presence of a hazard which **WILL** cause **SEVERE** injury or death if the warning is ignored.



This is used to indicate the presence of a hazard which **CAN** cause **SEVERE** injury or death if the warning is ignored.



This is used to indicate the presence of a hazard which **WILL** or **CAN** cause **MINOR** personal injury or property damage if the warning is ignored.

## NOTICE

This is used to notify people of installation, operation, or maintenance information which is important but not hazard-related.



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# WARRANTY AND SERVICE

## A - 1 FOUR WINNS WARRANTY POLICY

The Four Winns Winning Edge™ Owner Protection Plan, provides the new Four Winns purchaser with one of the most comprehensive corporate commitments in the marine industry today. The Four Winns Owner Protection Plan, included later in this section, defines the warranty coverage on all units manufactured by Four Winns, Inc. It thoroughly describes the warranty policies and those procedures to be followed to obtain warranty coverage. Review the Four Winns Owner Protection Plan and limited warranty statements carefully.

Engines, drive systems, and generators are warranted and serviced by their respective manufacturers. These companies have service support to handle problems as efficiently as possible. Your Four Winns dealer can coordinate these services on your behalf.

## A - 2 HULL STRUCTURE WARRANTY

Each unit manufactured by Four Winns is encompassed by a separate warranty providing specific coverage on the hull structure. The Four Winns Owner Protection Plan thoroughly describes this coverage.

## A - 3 WARRANTY REGISTRATION

A Four Winns Warranty Registration Card is attached to the Four Winns Owner Protection Plan statement. Your Four Winns Dealer is responsible for completing and mailing the warranty card at the time of purchase. This is the sole basis for establishing proof of ownership of the boat and trailer and corresponding warranty validation. Registration of the boat and engines with the manufacturer is required by the Federal Boat Safety Act of 1971.

Other equipment manufacturers also require that their products be registered with the respective companies. These warranty registration cards are provided with this manual.

## A - 4 TRANSFER OF WARRANTY

Four Winns confidence in the product and our warranty commitments can extend long after the original purchaser may choose to move on to a new boat. Four Winns Limited Warranty coverage and Extended Protection Plan, when applicable, are transferable to successive owners of the boat. Registration of the second or successive owners is required. The Four Winns Owner Protection Plan thoroughly describes the action required to transfer warranty coverage.

## A - 5 PRE-OWNED UNIT REGISTRATION

Section A-4 Transfer of Warranty discussed the need to properly register the purchase of a pre-owned boat with Four Winns to transfer applicable warranty coverage.

Purchasers of all Pre-Owned Four Winns cruisers are encouraged to register ownership with Four Winns. Receipt of this information can be of significant assistance should you, or a later owner, wish to document the vessel with the U.S. Coast Guard, or if Four Winns should encounter the need to contact the current owner.

To register ownership of a "Pre-Owned Four Winns boat," provide Four Winns with your name, address, daytime phone number, purchase date, and hull serial number of the boat purchased.

For your convenience, a blue Pre-Owned Four Winns Boat/Trailer Registration Card is included at the with this manual. Simply complete this card, or provide the information listed above in a letter to the Four Winns Customer Service Department. If you wish to transfer warranty or an extended service plan coverage, be sure to include a check to cover the necessary fees.

The hull serial number is embossed into the starboard side of the transom. The trailer serial number is imprinted on an identification plate affixed to the trailer frame.



Registration of a Pre-Owned Four Winns boat does not extend or in any way affect or modify the specific terms of the Four Winns 'Winning Edge' Owner Protection Plan or Limited Warranties.

We provide this service to the purchasers of Pre-Owned Four Winns boats in the interest of better boating. Four Winns, Inc. welcomes every purchaser of a Four Winns boat, new or used, to our family.

#### **A - 6 INSURANCE COVERAGE**

One of your responsibilities as a new boat owner is to acquire proper insurance protection. Insurance should include comprehensive, and general liability coverage appropriate to your financial needs. Your Four Winns dealer can answer any questions you may have insurance protection.

#### **A - 7 SERIAL NUMBER RECORD**

The manufacturer, model, and serial number of major components are recorded during the assembly of each Four Winns cruiser. Two copies of this completed form are included with this manual. One copy should be removed and kept by the dealer in his records. This can assist the dealer in processing warranty claims, or obtaining necessary information. The second copy should be kept in this owners manual.

#### **A - 8 PRE-DELIVERY SERVICE**

Four Winns Inc. makes every effort so your boat is in as near to 'turn key' condition upon delivery to the dealer as possible. The process of transporting and handling the boat necessitates certain inspections and adjustments prior to delivery to you. Also, various aspects of operation must be checked and adjusted immediately prior to final delivery and use, while the boat is in the water.

The selling Four Winns dealer must perform this thorough review of the boat and its numerous systems during the commissioning or "dealer pre-delivery service" of the craft.

A Four Winns Cruiser Pre-Delivery Service Record form is provided in this section. This form lists the many items encompassed by the pre-delivery

service previously described. The Four Winns Pre-Delivery Service Record is a four-part form. The dealer is to check off the items as they are completed, and complete the form as indicated providing specific performance related information appropriately.

Your Four Winns dealer will sign the Cruiser Pre-Delivery Service Record upon completion of the work. You will be asked to sign this form upon accepting delivery of the boat. Both you and your dealer are to retain one copy of the completed Four Winns Pre-Delivery Service Record. The other two copies are to be mailed to the Four Winns Customer Service Department.

#### **A - 9 REPLACEMENT PARTS**

Four Winns dealers are equipped with a Four Winns Parts Manual that details the components of each model and their appropriate part numbers. Many Four Winns dealers inventory common replacement components.

In addition Four Winns, Inc. maintains specific records on the components used in the manufacture of each unit and makes a concerted effort to maintain components specifically to fill replacement part needs.

The Four Winns dealer from whom you purchased your boat is in the best position to meet your needs. If he does not have the needed item, he has the capability, through direct facsimile contact with the Four Winns Customer Service Department, to obtain it quickly. Four Winns will only sell replacement parts to established Four Winns dealers. If you relocate and cannot find a Four Winns dealer close to you, contact the Four Winns Customer Service Department for information on how you can obtain necessary items.

#### **A - 10 CUSTOMER SATISFACTION SURVEY**

Four Winns, in association with Outboard Marine Corporation, participate in an on-going market study of the purchasers of our products. Our concern and desire for your complete satisfaction is genuine. Should you receive such a survey, please take the few minutes necessary and respond frankly and honestly. Each dealer, the



product, and our customer support services are rated based upon the responses received.

#### **A - 11 WINN GEAR**

Show your colors! Four Winns offers a complete line of sports clothing designed to complement your new cruiser purchase. Your Four Winns dealer has a complete catalog and pricing.



# IMPORTANT OPERATING INSTRUCTIONS

Caution is needed when operating or starting inboard engines or generators on Four Winns Cruisers equipped with hydro-lift mufflers. Water can accumulate in the muffler if engine fails to start. Prolonged cranking of the starter will pump water into the muffler system. Each additional attempt to start (that fails) places more water into the exhaust, and will back up into the manifold and flow into the cylinders.

If the starter does not crank over the engine (after continued attempts have failed), there may be water backed into a cylinder. This condition may be mistaken as a dead battery and **immediate action is necessary to prevent engine damage.**

If the inboard engine or generator is hard starting, Four Winns recommends removing the drain plug in the muffler to allow water to drain and have engine tuned up or repaired as soon as possible. Once the engine is started, reinstall the drain plug.



**DO NOT** leave boat unattended with plug removed. Water may enter boat from overboard.

To locate the drain plug or muffler, refer to the locator drawings at the end of Section O on Operations or talk to your Four Winns dealer. If the engine or generator does take on water, **it is very important that immediate action is taken to prevent engine damage.** Contact your Four Winns or OMC dealer for assistance.

# ENGINE AND DRIVE SYSTEMS

## B - 1 GENERAL

### **WARNING**

DO NOT attempt to service any engine or drive component without being totally familiar with the safe and proper service procedures. Certain moving parts are exposed and can prove dangerous to one unfamiliar with the operation and function of the equipment.

Four Winns, Inc. does not manufacture engines or drives. Because of the technical nature of the engine and drive systems, all manufacturers of these items require that warranty and service problems be taken directly to an authorized dealer for resolution. The Four Winns dealer from whom you purchased your boat, will handle all warranty and service matters with the engine manufacturer for you.

In compliance with the Federal Boat Safety Act of 1971 all engine manufacturers require their products to be registered. A registration card is furnished with each new engine. When selling a Four Winns boat, the dealer, along with the purchaser, should complete the information requested on these cards and return them to the respective engine manufacturers. Engine registration cards are provided with the engine and will usually be found with the boat literature.

Each manufacturer of the various marine power components provides an owners information manual with their product. This publication is included with this manual. It is important that you read the manual(s) carefully and become completely familiar with proper care and operation of the engine and drive system. Be sure to read the section on winterization. Replacement costs associated with frozen engine blocks, drive systems and other components are quite substantial.

Also review the other sections in this manual, especially Sections F on Fuel Systems, and Section C on Control Systems.

## B - 2 ENGINE EXHAUST

### A. Carbon Monoxide

The carbon monoxide in exhaust fumes can be hazardous. It is important for you and your passengers to be aware of the potential safety hazard created by exhaust fumes. Familiarize yourself with the symptoms of individuals overcome by carbon monoxide, and most importantly, ways you can protect yourself and your guests.

### **WARNING**

DO NOT inhale exhaust fumes! Exhaust contains carbon monoxide which is colorless and odorless. Carbon monoxide is a dangerous gas that is potentially lethal.

Persons overcome by carbon monoxide may exhibit the following symptoms:

- a. Watering and itchy eyes
- b. Flushed appearance
- c. Throbbing temples
- d. Inattentiveness
- e. Inability to think coherently
- f. Ringing in the ears
- g. Tightness across the chest
- h. Headache
- i. Drowsiness
- j. Incoherence
- k. Nausea
- l. Dizziness
- m. Fatigue
- n. Vomiting
- o. Collapse
- p. Convulsions

**IF YOU THINK EXHAUST FUMES ARE ENTERING YOUR BOAT, DETERMINE THE CAUSE AND HAVE IT CORRECTED IMMEDIATELY!**

The following suggestions can help prevent exhaust fumes from entering the boat:

1. DO NOT allow the boat to remain stationary with the engines running for an extended period of time.



2. Use extreme caution while operating the engines in confined areas such as enclosed slips, congested piers, or in any area where the exhaust outlets are facing or near a bulkhead or wall structure of any kind. Operation under such conditions could easily lead to exhaust gasses (carbon monoxide) entering even though you may have all the hatches, windows, doors and portholes closed.
3. Never operate your generator while the boat is moored against any other boat, dock or wall structure that is against or near the exhaust outlet. Again, operation under such conditions could easily lead to exhaust gasses (carbon monoxide) entering your boat or the boat to which you are moored, even though you may have all the hatches, windows, doors, and portholes closed.
4. Under certain conditions, exhaust gases can enter the boat through the sink drains. Each sink drain has a water trap installed to help prevent this. To be effective, the sink drains must have water in them. Normal use of the sinks will provide the water needed for this to occur.
5. Persons sleeping can be easily overcome by carbon monoxide because they are unaware of its presence. Sleeping while the engines or generator are running is not recommended. If persons are sleeping aboard while underway, or while the generator is running, those awake should monitor for carbon monoxide accumulation in the cabin; especially the sleeping areas. Open forward facing windows or deck hatches to provide fresh air ventilation. Keep hatches, windows, and doorways that face aft or towards the exhaust discharge closed.

 **WARNING**

NEVER operate the propulsion engine(s) or generator while everyone on-board is sleeping. Fatal carbon monoxide poisoning can occur.

6. If possible, ventilate your cabin while underway. Open a forward hatch, porthole, or window to allow air to travel through the cabin. Be very careful of operating the boat with the cabin door or other windows, hatches, or

portholes that face aft, open. The natural vacuum created during operation may allow exhaust gasses to be drawn into the cabin.

**NOTICE**

Current deck hatches are designed to allow ventilation when locked in a partially open position.

7. Inspect the engine exhaust system frequently for water and exhaust gas leakage, hose deterioration, and loose hose clamps. See Section O General Maintenance for additional information.
8. Have a competent marine engine service technician inspect your exhaust system whenever your boat is in for service, or if you notice a change in the sound of your engines.

For additional information, refer to Section H-4 Carbon Monoxide.

**B. Carbon Monoxide Monitor**

A carbon monoxide (CO) monitor will sound an alert should carbon monoxide reach an unsafe level in the cabin of your Four Winns boat. The CO Monitor is available on all models and is usually located on the cabin wall. If a CO monitor is installed, refer to the manufacturer's literature included with this manual.

**B - 3 DRIVE SYSTEMS**

**A. Stern (I/O) Drives**

A stern drive or inboard/outboard propulsion system has a piston engine equipped with special marine components mounted near the transom and coupled to an external outdrive-type transmission unit. Shifting is performed within the outdrive gear case. This type of system is depicted in Figure B1.

Consult the Engine Owners Manual provided with this manual for additional operation and maintenance information.



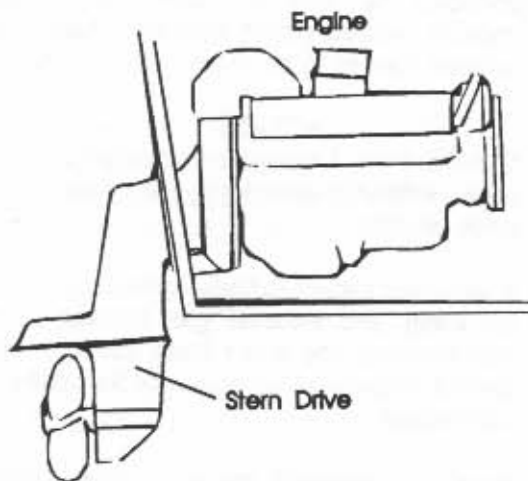


Figure B1: Stern Drive

## B. Inboard Drives

On Inboard and V-drive propulsion systems, all shifting and gearing components are installed inside of the hull, only the propeller shafts and associated equipment are under water.

Boats equipped with this system have the engine mounted approximately ten feet forward of the transom with the output shaft of the engine facing aft. A transmission which performs desired shifting functions is directly coupled to engine. The prop shaft extends through the hull and connects the transmission output coupling with the propeller.

Some inboard transmissions have built-in reduction gearing. This gearing reduces the speed of the propeller in relation to the engine speed and increases propulsion system efficiencies. See Figure B2.

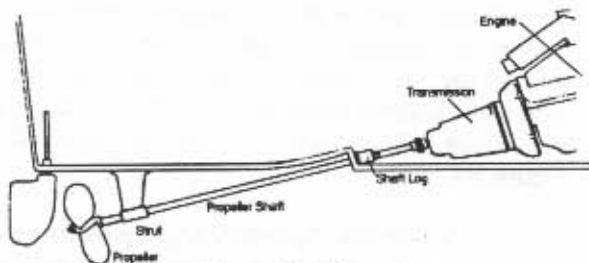


Figure B2: Inboard

## C. Inboard V-drives

The V-drive system has the engine mounted in the extreme stern of the boat with the output shaft fac-

ing forward. A transmission which performs shifting functions is mounted directly onto the engine. A v-drive reduction gearbox is then mounted directly to the transmission. The prop shaft is then connected to the v-drive output coupling. See Figure B3.

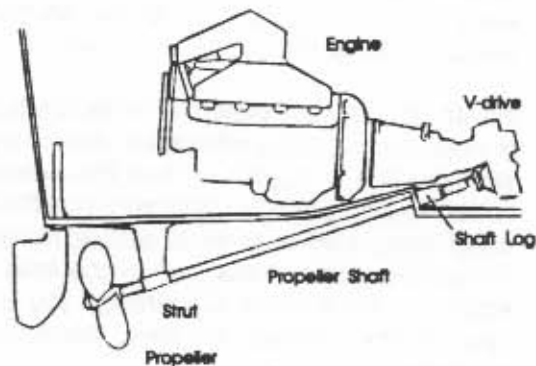


Figure B3: V-drive

### NOTICE

Always return the engine throttle lever to the extreme low speed position before shifting. NEVER shift the unit while engine speed is above 1000 rpm.

## B - 4 UNDERWATER EQUIPMENT (Inboards)

### WARNING

Running aground or striking a water borne object is to be avoided. Serious damage to the stern drive or inboard underwater gear can result. A boat so damaged can take on water. In the event of such an occurrence, proceed at low speed to the nearest service facility and have an immediate inspection made of the prop shafts and struts before further use of the craft. Keep all life saving devices at hand while driving to a dock area. If the boat cannot be immediately removed from the water, thoroughly inspect the bilge area for leaks so that the boat does not sink while moored.

### A. Shaft Log

The shaft log allows the propeller shaft to extend and rotate through the hull with only limited water

leakage occurring. Periodic inspection of the shaft log and packing nut is required. See Figure B4.

**WARNING**

To prevent personal injury, keep away from the propulsion machinery during its operation or whenever the boat is in motion. Movement of water past a propeller can cause the propeller, propeller shaft, and other propulsion machinery to rotate even if that equipment is not being operated intentionally.

Both shaft log packing nuts utilize right hand thread rotation regardless of the engine or propeller shaft rotation.

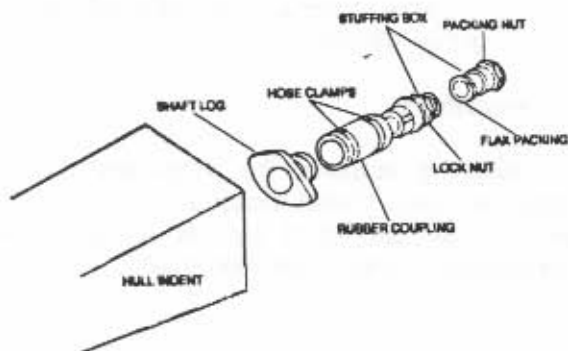


Figure B4: Shaft Log

The packing nut should be tightened only enough to prevent water leakage when the shaft is not rotating. Minor dripping may occur and is not abnormal during operation. After tightening the packing nuts, operate the boat at slow speeds for ten or fifteen minutes and re-check the packing nuts to be sure they are not hot; if so, loosen slightly. If leakage cannot be corrected without experiencing excessive heat generation, repacking is necessary. When repacking, use only flax or teflon packing. Graphite packing may cause corrosion in salt water.

**WARNING**

To prevent water from entering into the boat, always be sure the lock nuts are tightened securely to prevent the packing nuts from loosening. DO NOT attempt to tighten the lock nuts without the proper e-

quipment to hold the packing nut stationary.

Proper performance of the shaft log is directly dependent upon correct propeller shaft alignment. Repeated shaft log leakage, packing nut(s) becoming loose, premature packing failure, shaft log assembly damage, and many other related problems are most always the result of misalignment. Propeller damage, a bent strut or shaft, or abnormal wear, settling, etc., are common reasons for misalignment. Therefore, periodically have the shaft alignment checked and have adjustments made when necessary.

### B. Strut

The strut secures the lower end of the propeller shaft. Seasonal inspection of each strut should be made to insure no damage has incurred and the strut bearing is not worn excessively.

When the boat is removed from the water for winterization or general maintenance, apply a light water proof grease to the strut bearing (rubber sleeve in the strut) and the shaft where it penetrates the strut bearing. This will keep the strut bearing from drying out. Replace the strut bearing should it become worn or cracked.

### C. Propeller Shaft

**NOTICE**

When lifting the boat, always position the lifting straps at the corresponding "sling" labels. Lifting the boat with lifting straps over the prop shafts will cause the shafts to become bent.

The prop shafts of all inboard and v-drive boats are aligned and coupled at the factory. Prop shaft alignment should be checked by your dealer during pre-delivery service. Shaft alignment should be checked again forty-eight hours after initial commissioning. Periodic checks of shaft alignments, and engine v-drive mounting bolts should be made; especially if noise or vibration occurs.

**NOTICE**

Excessive vibration, abnormal shaft log wear, or broken propeller shaft coupling bolts are an indication of misalignment. Misalignment can also cause severe dam-

age to shaft logs, struts, shafts and the engine transmission or v-drive. Realignment should only be performed by a qualified service person. The following procedures are provided so a boat owner can determine if service work is required.

The propeller shaft coupling and engine/v-drive output flange coupling must be aligned to within 0.003 inches. Always be sure the prop shaft is centered in the strut bearing and shaft log before alignment adjustments are made. Refer to Figure B5.

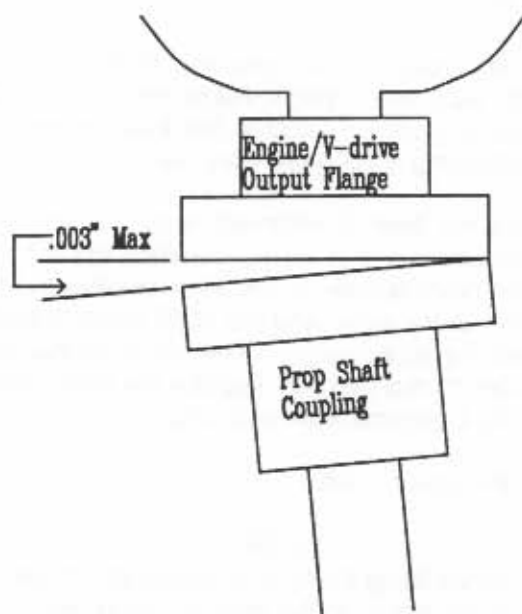


Figure B5: Coupling Alignment

To check alignment:

1. Remove the bolts that secure the prop shaft flanges.
2. Separate the prop shaft flanges approximately  $1/32$ ". DO NOT separate the flanges beyond this or the male and female pilot rings of flanges will disengage. Insert a .010 feeler gauge and close the flange faces until the gauge fits snugly.
3. Next, insert the feeler gauge at the top, bottom, and both sides between flanges. If it is exceptionally loose in any area, try inserting a larger feeler gauge until you determine the amount of variance; then proceed to step 4.

4. While holding the v-drive output flange, turn the prop shaft  $1/4$  turn and repeat procedure 3 above until all four positions have been checked. Repeat step 4 two more times.
  - a. A straight shaft in proper alignment will not allow the insertion of a feeler gauge which exceeds .013 inch at any of the 4 positions; regardless of prop shaft rotation.
  - b. If the gap moves as the flange is rotated, the flange or prop shaft is bent.
  - c. If a larger feeler gauge is inserted between the flanges, and the gap remains at the same position, regardless of flange rotational position, the engine assembly must be realigned. At this point, contact a Four Winns dealer.

#### D. Propellers

For shipping reasons, the propellers are not factory installed. Initial installation of the propellers will be performed by the dealer during pre-delivery service. See Figure B6.

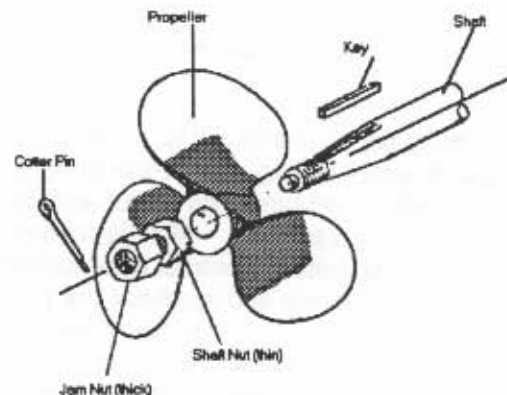


Figure B6: Prop Installation

#### NOTICE

Should it be necessary to change propellers, always use an appropriate propeller removal tool or "Prop Puller." DO NOT attempt removal using a hammer. Damage to the propeller or propeller shaft can result.

Always check shaft rotation before propeller installation. A right hand rotation propeller must be installed on the prop shaft connected to a starboard engine. Similarly, a left hand prop must be connected to the port engine shaft.

Be sure the propellers are of the correct blade configuration, diameter, pitch, and shaft size to assure good performance.

## B - 5 ENGINE COOLING SYSTEMS

All marine engines use surface water as a cooling medium. The cooling water employed enters the system through a water intake and is relinquished through the exhaust manifold system.

Inboards utilize a thru-hull water intake scoop. This type of intake has an external strainer. Be sure this strainer is kept free of mud, weeds and other debris. Some boating areas require that additional strainers or water intake filters be installed. Reference Section M-3 Equipment Installation, in this manual for installation instructions and consult your Four Winns dealer regarding any special equipment that may be required.

A gate valve or seacock is provided at the intake scoop previously described. Be sure this valve is in the open or closed position dependent upon the desired flow of cooling water.



### WARNING

Should an engine intake or an exhaust or cooling hose rupture, turn the engine off and close the seacock immediately. Proceed under tow if necessary, to a service facility for appropriate repairs; maintain a close visual watch on the problem hose and also on the bilge water level.

Inboard boats utilize exhaust hose to relinquish cooling water. A periodic inspection of the hose, muffler and related parts should be made to insure that leaks or heat deterioration have not resulted. Replace them as necessary.

Installation of "Fresh Water Cooling" provides adequate engine cooling without exposing the internal engine cooling system to the detrimental

effects of surface water. This option is recommended when the boat will be operated in salt, highly polluted or silt-laden water. Ask your Four Winns dealer for recommendations regarding the necessity of fresh water cooling in your boating area. The Engine Owners Manual provides additional information regarding service and maintenance of this equipment.

## B - 6 ENGINE FLUSHING

The engine flush out option is offered on all stern drive models. The engine flushing kits attach permanently to the engine. A fresh water supply can be connected to the engine with the boat in the water. It is not intended for use with the boat out of the water. This option is useful to flush the engine cooling system of unwanted salt residue.

The flush out kit should only be used with the boat in the water and the engine OFF. See Section O General Maintenance for flushing procedures.

## B - 7 PROPELLERS

Knowledge of the propeller is most easily gained through better understanding of the terminology used to refer to the aspects of propeller size and performance.

### A. Diameter

Diameter is twice the distance from the center of the prop shaft to the extreme tip of a propeller blade. Increasing or decreasing propeller size will have a direct bearing on the RPM's an engine will develop. This is due to the greater amount of propeller blade surface in contact with the water. See Figure B7.

### B. Pitch

Pitch is a measure of helix angle, or angle of attack, of the rotating blade. Pitch is easily understood if one imagines the propeller rotating through a semi-solid such as butter or jello. The distance the propeller will travel in one revolution is called "Pitch." Increasing or decreasing pitch will also have a direct bearing on engine RPM's because of the greater bite taken by the blade with each rotation. See Figure B7.

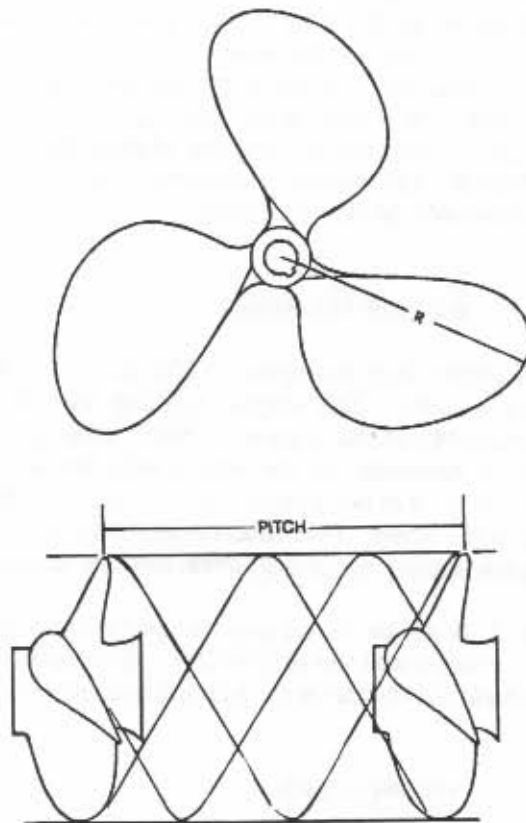


Figure B7: Propeller Pitch & Diameter

### C. Prop Slip

When traveling through water a propeller is unable to get a complete bite because of the fluidity of water. "Prop Slip" is usually expressed as a percent of the computed theoretical speed. Twenty-five to thirty-five percent prop slip is common for a cruiser type boat operating at cruising speed.

Therefore the deduction can be made that a propeller, of a certain diameter, with a 10 inch pitch, rotating at 3600 revolutions per minute, with a prop slip of 30%, would move the boat at a rate of 24 miles per hour.

Changing either diameter or pitch will have an effect on engine speed and prop slip, and in turn, directly effect the performance of a boat. The propeller(s) included with each Four Winns boat provide the best general performance based on data obtained from on-the-water testing of that model. Variations in load, operating conditions,

environment, the individual engine and hull performance may necessitate the purchase and use of another propeller(s).

Under your normal load conditions the engine(s) should turn within the maximum RPM range when at full throttle. If the engine(s) exceeds the recommended RPM, an increase in pitch or diameter is required. If the engine RPM is too low, a decrease in pitch or diameter is required.

An engine that is not developing full power and the load carried in a boat will directly effect performance of the engine. Always be sure the engine is properly tuned and load conditions are those normally experienced, before changing propellers.

For additional information on factors affecting performance, please consult your Four Winns dealer.

## B - 8 RUNNING ANGLE & POWER TRIM/TILT

Hull planing surfaces have the least amount of drag at a three to five degree angle with the water. This is the preferred running angle when boating. The running angle has a significant impact on top speed and handling. Heavy load or certain water conditions may make it difficult to achieve the optimum running angle. See Figure B8.

The running angle can be controlled through the use of power trim (stern drive's only) and trim tabs. See Section B-9 Trim Tabs, for information on the use of trim tabs.

Power trim/tilt is not applicable to inboard models. Inboard propulsion systems do not have this capability. Please see Section B-9 Trim Tabs, and Section D Steering, in this manual for additional information.

### A. Power Trim

Trim angle is how far in or out, the lower unit is positioned in relation to the bottom of the boat. The trim angle of the lower unit has a distinct affect on the running angle of the boat.

The power trim system permits control of the trim angle of the drive unit relative to the boat, at the touch of a button.

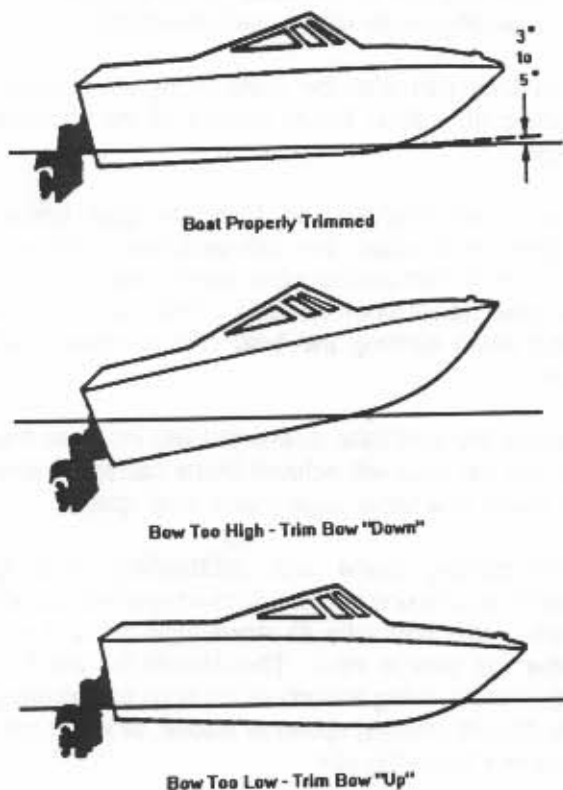


Figure B8: Running Angle

It allows the drive unit to be raised (trimmed out) for shallow water operation. Power trim also allows the operator to adjust the drive unit while underway to provide the ideal running angle for a given load and water condition. Additional information can be found in the engine owner's manual.

### B. Power Tilt

Power tilt allows the operator to raise and lower the drive unit for trailering, launching, and beaching. Additional information on power tilt can be found in the engine manufacturer's manual included with this manual.

#### NOTICE

DO NOT operate the engine with the stern drive tilted up. Severe damage to the engine drive systems can result. Consult the engine owners manual for specific information.

## B - 9 TRIM TABS

Electric/hydraulic trim tabs are optional and help provide maximum control of the hull in all water and load conditions. If used properly, trim tabs can

- Compensate for wind and load listing (level the boat side to side).
- Induce faster planing and help achieve optimum running angle (see Section B-8 Running Angle & Power Trim/Tilt)

The proper use of electric/hydraulic trim tabs require a basic understanding of trim tab operation and some practice in calm water.

The trim tab control uses two (2) momentary-type rocker switches. The trim tab switches control the attitude or position of the boat. The trim tab switches are illustrated (with boat drawings) and when depressed, indicate what will happen to the bow of the boat. See Figure B9.

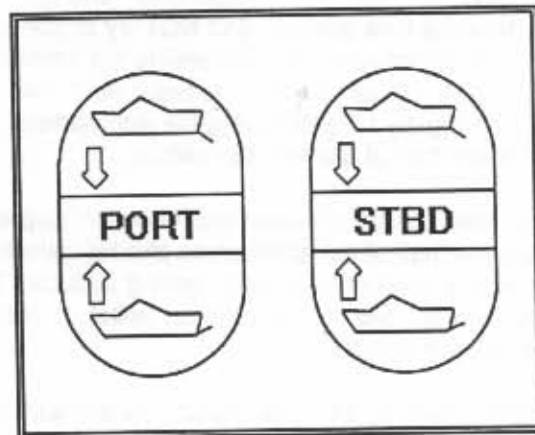


Figure B9: Trim Tab Switches

Before leaving the dock and utilizing the trim tabs, ensure the trim tabs are in the full up position. Depress both lower halves of the trim tab switches and hold (for approximately 10 seconds) until the tabs are full up.

### A. Control Listing

Wind, loading and many other factors can result in the boat tilting or leaning towards one side while running. This is called listing and can be negated using trim tabs.

Pressing the lower port trim tab switch will move the port trim tab upward. This will result in the starboard bow of the boat being allowed to rise.

Pressing the lower starboard trim tab switch will cause the starboard trim tab to move upward and will result in the port bow being allowed to rise.

Depressing the upper port trim tab switch will cause the port trim tab to move downward and will force the starboard bow downward.

Depressing the upper starboard trim tab switch will cause the starboard trim tab to move downward and will force the port bow downward.

Always establish your intended heading and attain desired cruising speed before trying to adjust running attitude (using the trim tabs).

 **WARNING**

Always press the trim tab switches in short 1/2 second bursts. If depressed too long, you can overcompensate, and potentially lose control. DO NOT try to correct the situation by depressing the other upper trim tab switch. Instead, raise the tab slightly by depressing the appropriate lower half of the trim tab switch.

After stabilization of speed and direction, depress the upper half of the appropriate trim tab switch to achieve a level side to side running attitude. Be sure to press the correct trim tab switch to obtain the desired result.

After depressing a trim tab switch, always wait and allow time for the change in trim tab position to take effect. DO NOT continue to depress the trim tab switch while awaiting trim tab reaction. By the time the effect is noted, the trim tab will move too far and thus overcompensate.

## B. Induce Planing & Controlling Trim Angle

 **CAUTION**

The use of trim tabs to attain quicker planing should not be used by inexperienced boaters. The combination of extreme inward drive position and extended

trim tabs can dangerously affect the boats handling under certain sea conditions.

Trim tabs can also be used to facilitate faster planing and allow better control of the running angle.


Before accelerating and trying to gain plane, depress both upper trim tab switches. This will cause both trim tabs to move downward and force the bow down when running. This can also be used when running the boat with a heavy load aboard.

Moving the trim tabs downward will increase the lift and the boat will achieve plane faster, or stay on plane at a lower engine and boat speed.

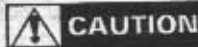
After gaining plane and establishing cruising speed, depressing both lower trim tab switches will cause both trim tabs to move upward and will allow the bow to rise. This should be used to adjust the running attitude of the boat to decrease the drag at cruising speed or above, or when running in a following sea.

When running at an engine speed that results in the boat falling off plane or causes the boat to plane inefficiently, lowering both tabs slightly (bow down) will improve the running angle and improve operating efficiency.

Optimum efficiency is obtained when operating at a 3 to 5 degree running angle. Utilizing too much "Bow Down" trim tab can reduce operating efficiency and cause substantial steering and handling difficulties. Be extremely careful when running in a following sea. The effect of trim tabs is amplified under such conditions. Steering and handling difficulties can result from improper trim tab usage, especially in a following sea. If unsure of proper trim tab positioning, raise the trim tabs to the full-up position.

 **WARNING**

When running at high engine speeds, be sure the trim tabs are in the full up position. Trim tab action should be only enough to compensate for any listing. Trim tab adjustments at high speeds are extremely critical. Be prepared to slow down should handling difficulties arise.



### CAUTION

The combination of extreme inward drive position and extended trim tabs will cause a severe bow down running angle. In certain sea conditions, this will limit the operator's control over the boat.

When running in a displacement (very slow speed) mode, better efficiency will be obtained with the trim tabs in the full-up position.

## B - 10 ENGINE INSTRUMENTATION

The helm station is equipped with a complete set of engine instruments. These instruments allow the pilot to constantly monitor the operational condition of the engine. Close observation of these instruments could save the engine from damage.

### A. Tachometer

The tachometer indicates the speed of the engine in revolutions per minute (rpm). This speed is not the boat speed or necessarily the speed of the propeller. The tachometer may not register zero with the Ignition Key in the OFF position.

#### NOTICE

Never exceed the maximum recommended operating RPM of your engine. Maintaining maximum, or close to maximum RPM for extended periods can reduce the life of the engine.

Some engines are equipped with devices that limit engine rpm in accordance with the oil pressure, or engine temperature. Refer to the engine manual for information.

### B. Speedometer

The speedometer is a water pressure sensitive unit. It has a pick-up (pitot tube) assembly mounted on the transom and a small plastic hose that connects it to speedometer gauge on the dash. The pitot tube extends below the hull. Water strikes the tube inlet and creates positive pressure. The faster the boat speed, the greater the pressure, and the higher the speed indication on the speedometer.

If the pick-up becomes clogged, the speedometer will not register. Clean the opening with a piece of wire or disconnect the tubing and blow out the pick-up with compressed air.

When winterizing the boat, the speedometer tubing must be drained of water. Disconnect the speedometer hose at the pick-up assembly and at the gauge and blow through the tubing to remove the water.

Speedometers are not precision instruments. The indications are relative and should never be used for navigational purposes or similar critical situations.

#### NOTICE

DO NOT rely on the speedometer when trying to achieve a "NO WAKE" condition in a harbor or other enclosed waterway. ALWAYS reduce throttle! Speedometers are not effective at measuring low operational speeds. You are responsible for damage caused by the wake of your boat.

Some Four Winns Cruiser models are not equipped with speedometers.

### C. Temperature Gauge

The temperature gauge monitors the cooling system of the engine. A sudden increase in the temperature could be a signal of a blocked cooling passage or a water pump malfunction.

#### NOTICE

Operation of an overheated engine can result in engine seizure. If an unusually high temperature reading occurs, shut the engine off immediately.

### D. Oil Pressure Gauge

The Oil Pressure Gauge indicates the pressure in the engine lubrication system. A drop in oil pressure is a possible indication of oil pump or leakage problems.

#### NOTICE

Operation of an engine with abnormally low oil pressure can lead to engine damage and possible seizure. Have the en-



gine serviced immediately upon a reduced oil pressure indication.

### E. Voltmeter

The voltmeter monitors battery condition and thus alternator performance. See Section E Electrical Systems for additional information on voltmeter operation.

### F. Fuel Gauge

The Fuel Gauge displays the level of fuel that is present in the fuel tank(s). The fuel gauge(s) will operate when the battery selector switch is on (1, 2, or All) and the ignition switch supplying power to the fuel gauge is in the RUN position. Refer to Section E Electrical Systems, for additional information on battery switch operation.

Due to the mechanical nature of the fuel sender, variations in readings during various speeds of operation may occur. This system is merely a relative indication of the available fuel supply and not a calibrated instrument. Relative adjustments can be made by bending the fuel sender float arm.

#### NOTICE

Use only clean, dry fuel of the type and grade recommended by the engine manufacturer. The use of incorrect or contaminated fuel can cause engine malfunction and serious damage.

### G. Power Trim Gauge

Boats equipped with Stern Drives also have a "Power Trim Gauge." This gauge provides a visual indication of the inward-outward (trim angle) position of the outdrive.

### H. Ignition Switch

The ignition switch has three positions: OFF, RUN, and START. The START position is spring loaded and the key should be held in this position until the engine starts. The key will return to the RUN position once released. Always turn the key to the OFF position when the engine is not running. This will prevent discharging of the battery(s). Additional information on ignition switch operation is covered in Section Q Operation, of this manual.

### I. Emergency Ignition Shut-Off

The emergency ignition shut-off switch is provided on most models. If equipped, the switch has a lanyard (cord) attached to a clip which must be in position for the engine(s) to run. The helmsman can attach the cord to a belt loop, life jacket, etc. If the clip is not in position, the starter and other systems will still operate but the engine will not start. Should the operator be thrown from the helm position, the lanyard will pull the clip from the switch and shut off the engine(s). See Figure B10.

#### NOTICE

DO NOT attach the lanyard to clothing that will tear away before the lanyard is pulled from the switch to stop the engine.

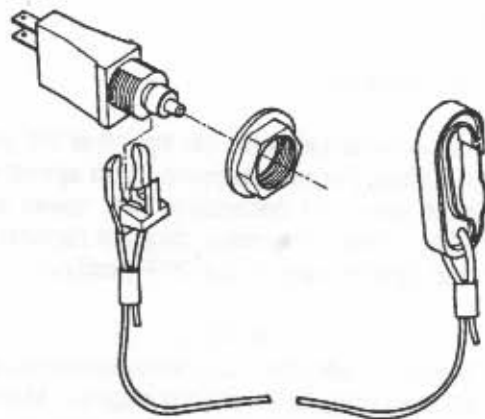


Figure B10: Emergency Stop Switch

If the clip is not in position, the starter and other systems will still operate **but the engine will not start**. Should the boat operator be thrown from the helm position, the lanyard will pull the clip from the switch, shut off the engine and prevent the boat from becoming a runaway.

The emergency stop switch can only be effective when in good working condition. Observe the following:

1. Lanyard must always be free of entanglements that could hinder its operation.

2. Once a month, check the switch for proper operation. With engine running, pull lanyard. If the engine does not stop, see your Four Winns dealer.

In an emergency situation, any occupant of the boat can restart the engine. Just press in and hold the emergency stop switch button, then follow normal starting procedures. When the button is released, the engine will stop.



#### **CAUTION**

Avoid knocking or pulling the clip or lanyard from the switch during regular boating operation. Occupants may be thrown forward or possible engine damage may occur by the sudden loss of engine power.

#### **J. Alarm Systems**

Engine alarm systems are installed on some models with specific types of engines. The alarm is an audible alarm that is mounted in the helm area; it is actuated by engine water temperature and engine oil pressure senders. The alarm will sound in the event of low engine oil pressure or high engine coolant temperature.

The engine alarm will sound during engine start-up, or whenever the ignition switch is positioned to ON and the engine is not operating. The alarm sounds under these conditions because engine oil pressure is low; the alarm will cease to sound as soon as engine oil pressure rises to the proper level.

#### **NOTICE**

The engine alarm system installed in Four Winns boats monitors only engine water temperature and engine oil pressure. Always maintain a close visual watch on the drive(s), transmission(s), engine fluid levels, bilge water level, etc. Refer to the engine manufacturer's literature for additional information.

#### **K. Engine Synchronizer Gauge**

An engine synchronizer gauge is installed on the model 365 dash only. It is located between the tachometers on the dash. This instrument compares the electrical signals generated by the

engines and converts those signals to a visual meter indication of engine speed difference. The meter movement responds to changes in throttle position.

This instrument does not physically synchronize the engines, but only provides a visual indication so the operator can take corrective action. See Section C-2 Control Operation and the engine manufacturer's literature for additional information on throttle usage and engine synchronization.

#### **L. Engine Hour Meter**

Engine hour meters are available on all models and provide a numeric record of elapsed engine operating time. This information is important in determining scheduled maintenance intervals, ships log data, cruise information, etc. If so equipped, the hour meter will be located in the engine compartment.

The hour meter is connected to the ignition switch. Be sure the ignition switch is in the OFF position when the engine is not operating or the hour meter will record additional time.

#### **M. Instrument Maintenance**

Electrical protection for instruments and ignition circuitry is provided by a fuse or circuit breaker on the instrument panel.

Periodically, spray the ignition switch(s) with a contact cleaner. The ignition switch(s) and all instruments, controls, etc. should be protected from the weather when not in use. Four Winns offers appropriate weather covers for each model. Excessive exposure can lead to gauge and Ignition Switch difficulties.

Electronic gauges are affected by static electricity that builds-up on the glass face. Periodic washing of the gauge face with warm water and mild liquid detergent will help eliminate the static electricity problem and improve gauge accuracy.

# CONTROL SYSTEMS

## C - 1 GENERAL

Control systems permit operation of the engine's throttle and shift mechanisms. They consist of three major components; the control, and the throttle and shift cables.

Some models are equipped with single lever controls. These have one lever for each engine. This lever actuates both the throttle and shift function. Neutral is in the center or straight up position. Rotating the control forward shifts the engines into forward. Rotating the control aft shifts the engines into reverse. Moving the lever further forward or aft increases engine speed.

Other models are equipped with dual lever controls. Two levers control each engine. One lever is for the shift and one is for the throttle. Moving the shift lever forward will shift the engine transmission into forward. Moving it aft will shift the engine into reverse. Moving the throttle lever forward will increase engine speed.

Additional information on controls and their operation is discussed in Section C-2 and the engine manufacturer's information included with this manual.

## C - 2 CONTROL OPERATION

### A. Standard Engines

During the general operation of a dual engine boat, it is advantageous for both engines to be operated at the same engine speed (rpm). This reduces noise and vibration, and can increase propulsion system efficiency. Setting the throttles so the engines are running at the same rpm (synchronized) can be done by engine sounds or by an engine synchronizer gauge (as described in Section B-10). Attempting to synchronize the engines solely by using tachometer readings or control lever placement generally will not be effective. When the engines are in proper synchronization, the throttle levers may not necessarily be in the same position.

All controls provide some means of increasing the engine speed during cold starting. On single lever controls, this is usually activated by placing the shift lever in neutral and pulling it outward. This disengages the shift control mechanism and allows higher engine rpm. Refer to the control manufacturers information for additional details.

### B. Multi-port Fuel Injected Engines (EFI)

On Multi-port Fuel Injected engines, starting the engine is much easier and faster. It is not necessary to use the throttle while in neutral to cold-start the engine. Simply turn the key and allow the engine to warm up.

For additional information, refer to the section on "Starting and Operation" in the engine manufacturer's manual.

For additional information, please refer to the sections Section B-8 Trim/Tilt, Section B-9 Trim Tabs, and Section D Steering System.

## C - 3 NEUTRAL SAFETY SWITCH

Every control system has a neutral safety switch incorporated into it. This device prohibits the engine from being started while the shift lever is in any position other than the neutral position. If the engine will not start, slight movement of the shift lever may be necessary to locate the neutral position and disengage the safety cut-out switch. Control or cable adjustments are required to correct this condition should it persist. See your Four Winns dealer for necessary control and cable adjustments.

## C - 4 CONTROL SYSTEM MAINTENANCE

Periodic inspections of the control(s), cables, and all connections should be made. Signs of looseness, rust, corrosion, wear, cable jacket cracks or other deterioration require immediate system servicing. Replace all damaged components.



Generally, periodic lubrication of all moving parts and connections with a light, waterproof grease is in order. Cables can be lubricated by positioning them to their fullest extension and applying light grease to the inner cable near the jacket. Working the cables back and forth will distribute the grease in the inner cable. Re-apply the grease if necessary.

Lubrication should be performed as often as necessary to keep the system operating smoothly. Cable manufacturers such as Teleflex, OMC, and Morse often offer special tools to make cable lubrication easier.

Cable and control adjustments may become necessary. Adjustment screws in the control, on the cables and in the linkage are provided.



**WARNING**

DO NOT attempt control adjustments unless you are familiar with servicing control systems service procedures. Control misadjustment can cause loss of control.

Other lubrication, adjustment and maintenance instructions are included in the information provided by the control manufacturer.

# STEERING SYSTEMS

## D - 1 GENERAL

Four Winns boats are equipped with rotary or hydraulic-type steering systems. Tilt and power steering are features which are available on most models.

### A. Rotary Steering

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

In twin engine configurations, the pump on the starboard engine supplies power to the hydraulic assist cylinder. Additional information on steering operation can be found in Section Q-9.

### B. Tilt Steering

If equipped with tilt steering, depress the release lever with your thumb to tilt the steering wheel. Be sure to hold the top of the wheel to assist in positioning. Refer to the steering manufacturer's literature for additional information.



The tilt mechanism should not be adjusted when the boat is moving. Sudden boat movement may cause loss of balance resulting in loss of control and/or injury.



The tilt mechanism is spring loaded. Due to the variation in steering wheel offerings, the wheel may spring up rapidly when depressing the release lever. **ALWAYS KEEP ONE HAND ON THE WHEEL DURING TILT ADJUSTMENT OR INJURY MAY OCCUR.**

### C. Power Steering

Power steering is also available. It is comprised of an engine mounted pump, hoses and steering cylinder. Power steering works in conjunction with the helm and steering cable to move the transom mount tiller arm and vertical drive more smoothly.

On models with power steering, restricting movement of the steering cable will limit or stop the steering system's hydraulic assist.

#### NOTICE

**DO NOT** interfere with or restrict steering cable movement through the last 90° of bend at the engine. **DO NOT** use cable retainers, clamps or tie straps. Using one or all of these could restrict the cable movement near the engine. **DO NOT** tie wiring harnesses or other control cables to the steering cable. Make sure the deck coaming pads and bulkheads allow for steering cable movement in all positions of trim.

If the power steering system becomes inoperative, an increase in steering effort will be felt. Should this condition occur, inspect for possible cause and correct if possible. If the power steering system cannot be corrected on board, proceed at a reduced speed. The boat will be steerable, but with increased effort. Return the boat to your Four Winns or OMC dealer as soon as possible to correct the power steering system.



If equipped with power steering, check the fluid level in the reservoir periodically. Low power steering fluid levels may increase steering difficulty.



After the first two hours of running time, check the entire steering system for loose bolts, nuts and fasteners which could adversely affect steering control.



#### NOTICE

When storing equipment in the engine compartment, be sure to avoid contact with the steering cable. Cables may become kinked or damaged and may increase steering effort.

Most Four Winns boats equipped with stern drives are equipped with power steering. This is a "power assist" system and can greatly reduce steering effort required. It is not, however, a full power steering system as is used in automobiles. Some steering tension remains in the system.

On twin engine installations, only the starboard engine is equipped with a power steering hydraulic assist pump (on stern drive models). Therefore, when operating on a single engine, it is imperative to operate with the starboard engine. If only the port engine is used, hard steering will result.

#### NOTICE

DO NOT force the steering unit to either extreme. This can place undue strain on the unit and can lead to hydraulic line or seal failure.

Upon commissioning the boat, it is necessary to purge the system of air. This is performed by your Four Winns dealer during pre-delivery service. Should steering difficulty increase with time, it is possible additional bleeding of the system is required. See your Four Winns dealer for assistance. This and other adjustments on power steering units are critical and should be performed only by a qualified service technician.

If the power steering becomes inoperative, steering will be harder and more effort will be needed to steer the boat. Check for a broken or loose belt on the power steering pump. Also, low fluid levels in the power steering pump reservoir will cause hard steering. If these items are not the source of the problem, check for equipment or other items lying on or up against the steering cable at the back of the boat. The cable must be free and clear to slide back and forth. Any item blocking free movement of the cable will result in harder steering and possible damage to the steering cable. If unable to locate or correct the problem, have the steering cable inspected and lubricated by your Four Winns dealer.

It is important that the power steering fluid be maintained to the proper level. If equipped with a power steering unit, please consult the engine manual for additional information.

For additional information, refer to the steering manufacturer's literature included with this manual. Also, refer to the section on Steering in your engine manual.

#### D. Hydraulic Steering

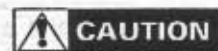
The hydraulic steering system is comprised of the helm pump and reservoir, hydraulic hoses, and the hydraulic cylinder. The helm assembly acts as a pump to move the oil through the system. In many aspects this type of steering is similar to the mechanical system. Instead of activating a cable, turning of the helm causes fluid in the hydraulic hoses to flow and activate the hydraulic cylinder causing the rudders or outdrives to turn.

#### 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 valves in the helm unit; this is normal.

#### D - 2 STEERING LOAD

A load is placed on the steering system by the outdrive, propeller torque, or water flowing past the rudder or outdrive. The steering system is designed to normalize the effort required to turn the steering wheel throughout the average operating speed range and general rudder position. This is an advantage when the boat is on plane. This can be somewhat of a disadvantage at lower speeds in that the steering effort is not reduced to a level where it can be wheeled "lock to lock" without a concentrated turning effort.



Steering effort can vary significantly with engine acceleration, steering angle, trim angle, and sea condition. Be prepared for additional steering loads at all times.



### D - 3 RUDDER

Dual engine inboard and v-drive boats have two rudders. These are coupled together at the tiller arms by a tie bar. The rudders are toed-in at the front to provide maximum stability on straight ahead runs and proper tracking through corners. Rudder alignment is pre-set at the Four Winns factory. Further alignment adjustments should not be necessary unless the rudder or steering system incurs damage. Alignment specifications are provided in Figure D1.

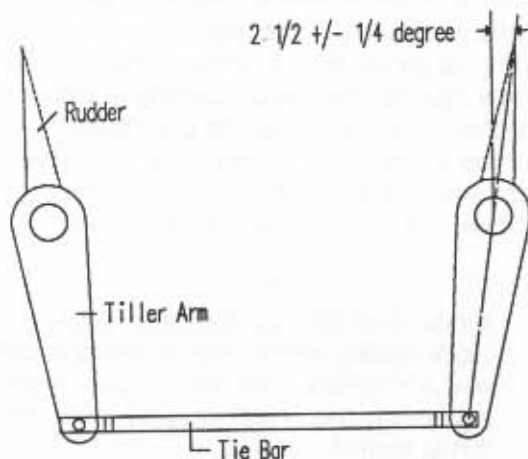


Figure D1: Dual Engine Tie Bar

### D - 4 RUDDER POSITION INDICATOR

A rudder position indicator is a device that indicates the location of the rudders or stern drives relative to the straight ahead position. Such a unit is provided on certain models and consists of a gauge on the dash and an electrical sending unit connected to a rudder tiller arm or the steering assembly.

The reading on the gauge can be adjusted by loosening the three screws securing the electrical sending unit and turning the sending unit either clockwise and counterclockwise slightly. The reading will vary accordingly.

### D - 5 PROPELLER TORQUE

The propeller rotation of a single engine installation will exert a directional force on the steering

system. This can cause the steering to be harder in one direction than the other, and is called propeller torque.

Propeller torque can also cause the boat to wander (not follow a straight line) when operated at low speeds. This condition is normal and can be corrected only by increasing engine rpm. Wind, water currents and play in steering components can cause equivalent effects.

### D - 6 AUTOPILOT

An autopilot unit is available as an option with hydraulic steering systems on some boat models. The autopilot is an automatic steering system designed to assist the operator on long voyages. Course information is entered into the autopilot computer and the system will then steer the course designated. The autopilot can be switched between manual and automatic steering control.

#### CAUTION

Autopilots are intended to assist with steerage. Under no circumstances should the boat be allowed to operate without a knowledgeable boater at the helm at all times.

#### NOTICE

Autopilots need to be programmed for the geographic area in which the boat is to be used.

The Loran option is required with the installation of the Autopilot.

Complete user instructions and information are provided in the manufacturer's manuals included with this manual.

### D - 7 STEERING SYSTEM MAINTENANCE

A periodic inspection of all steering cables, linkage and helm assemblies should be made. Signs of corrosion, cracking, loosening of fastenings, excessive wear, or deterioration should be immediately corrected. Failure to do so could lead to steering system failure and corresponding loss of control.



The helm and cable assembly should be so adjusted that the steering wheel is centered with the rudders or outdrive in the straight ahead position. There should be an equal number of turns to port and starboard from the straight ahead position. If adjustment becomes necessary, see your Four Winns dealer.

All cables, helm assemblies, and steering connections should be periodically lubricated with a light, waterproof grease or as indicated in the manufacturers information provided included with this manual.

Inboard boats should also be inspected for leakage around the rudder port packing nut(s). The packing nut(s) should be tight enough to prevent leakage, yet loose enough so excessive drag is not placed on the rudder shafts. Hard steering could otherwise result. If the leakage cannot be stopped without exerting excessive drag on the rudder shaft, repacking of the packing nut may be necessary. When repacking, use only flax or teflon packing. Graphite packing may cause corrosion in salt water and should not be used. See Figure D2 for additional information.



**WARNING**

To prevent water from entering into the boat, always be sure the lock nuts are tightened securely to prevent the packing nuts from loosening.

Hydraulic steering systems must periodically have all air purged from the system. Review the information provided by the hydraulic steering manufacturer for proper specifications and details on system service and maintenance.



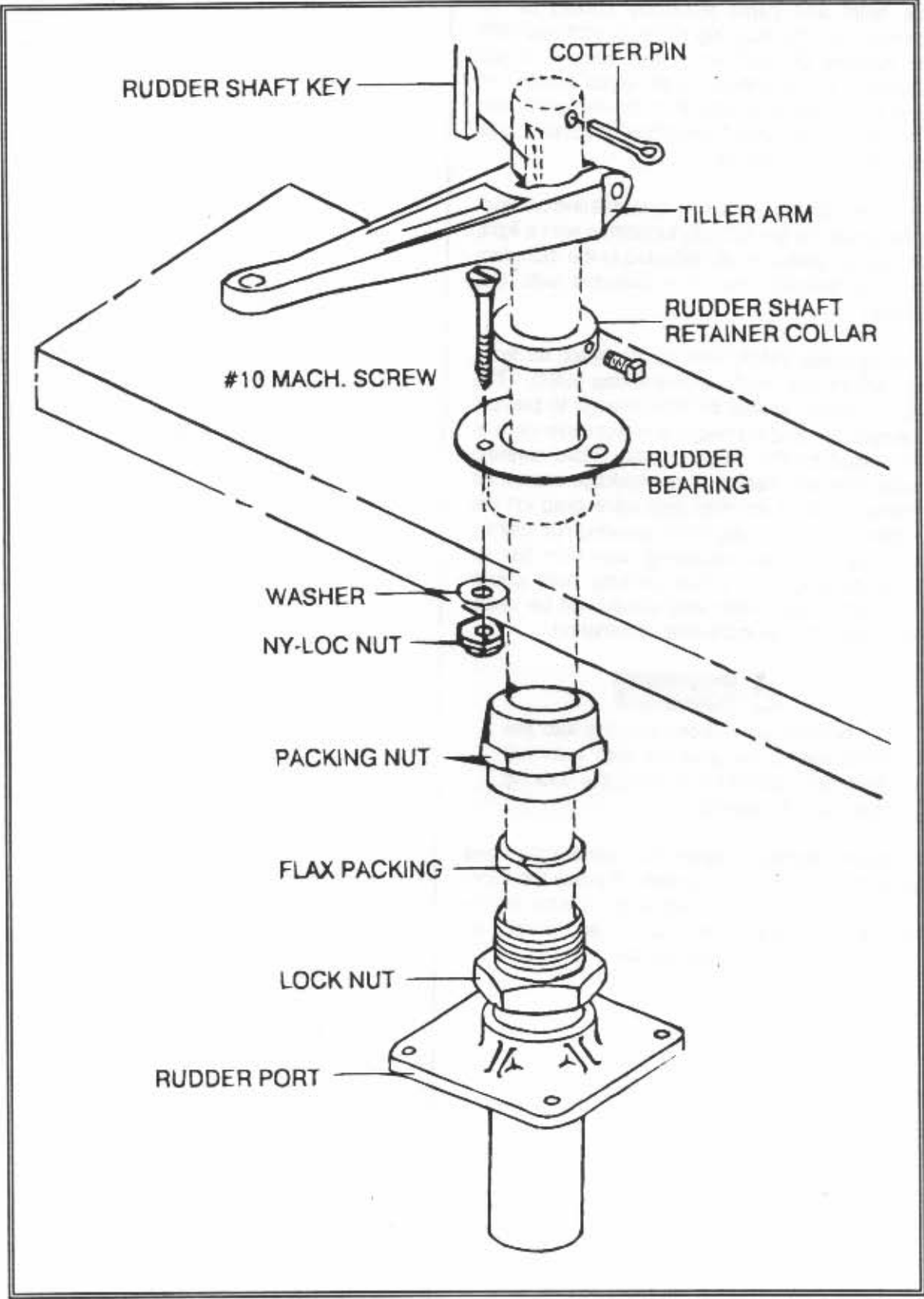


Figure D2: Rudder Assembly



# ELECTRICAL SYSTEMS

## E - 1 GENERAL

All electrical equipment on the Four Winns models operates on either 12 volt DC or 120 volt (220 volts on 50 Hertz models) AC electrical power. Dual battery systems, battery charger and dock-side power are optional on smaller cruiser models. Dual batteries and dockside power are standard equipment on larger models. Batteries will normally be installed in the port side storage compartment. Batteries may also be located below the engine compartment lid.

### WARNING

DO NOT tamper with any electrical connection, panel or harness, or attempt installation of any electrical equipment unless thoroughly familiar with the systems and are experienced in making such installations.

## E - 2 SINGLE BATTERY SYSTEM

A single battery is provided as standard equipment (12 volt DC) per Section E-1 above. The dash components are protected by fuses located in the fuse block below the dash panel. See the locator drawing at the end of Section Q Operation for the exact location of the battery.

When installing the battery, proceed as follows:

1. Connect the red (positive) cable running from the engine starter solenoid to the positive (+) battery terminal. See Figure E1.
2. Connect the black (negative) battery cable running from the engine block to the negative (-) battery terminal. A black/green stripe ten gauge wire must also be installed on the negative battery terminal. This wire connects a negative accessory terminal blocks to ground.

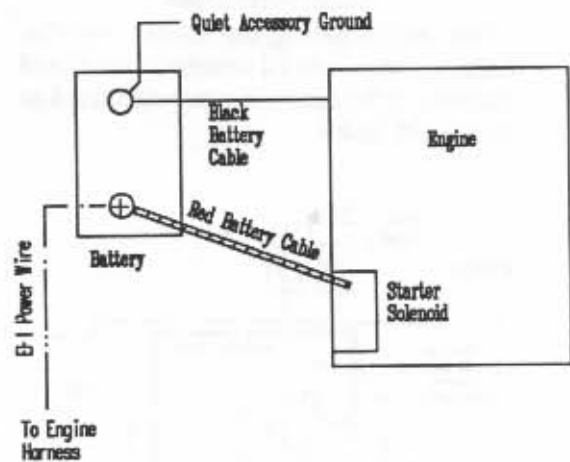
### CAUTION

When disconnecting the cables from the battery, make sure all switches are off and disconnect the black negative cable first to prevent spark.

### NOTICE

DO NOT disconnect the battery while the engine is running. Alternator and wiring damage could result.

Monitor the battery's condition regularly with the DC Voltmeter. See Section E-5 Voltmeter Use & Operation for more information.



E1: Single Engine-Single Battery Installation

## E - 3 SINGLE ENGINE - DUAL BATTERY SYSTEM

A battery selector switch is provided on single engine, dual battery installations. This allows DC power to be used from either one or both batteries. See the locator drawing at the end of Section Q Operation for the exact location of the battery selector switch.



## A. Installation

When installing dual batteries, proceed as follows:

1. Connect each of the red battery cables leading from the battery selector switch to the positive (+) terminal on each of the two batteries. See Figure E2.

### NOTICE

Be sure both cables are installed on the positive (+) battery terminals.

2. Connect the black battery cable and two black/green stripe leads (see Section E-2, 2 above) to the port negative (-) battery terminal. Install the black battery jumper cable between the batteries.



When disconnecting the cables from the battery, make sure all switches are off and disconnect the black negative cable(s) first to prevent spark.

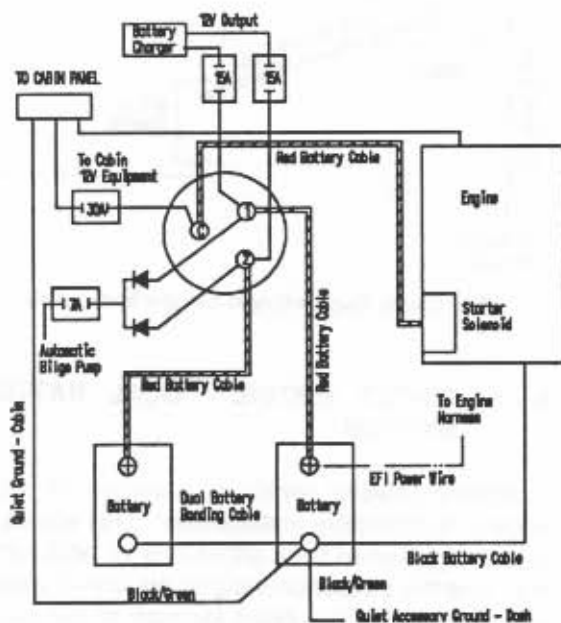


Figure E2: Single Engine-Dual Battery Installation

## B. Operation

Power to the engines and all 12 volt electrical equipment (except the automatic bilge pump) is

controlled by the battery selector switch. Separate breakers are provided on the battery selector switch panel to protect the battery charger, automatic bilge pump, cabin DC electrical panel and refrigerator.

Battery selector switch positions:

"OFF" - With the battery selector switch in the OFF position, all 12 volt power to the boat is shut off except to the automatic bilge pump. Always turn the battery selector switch to the OFF position when the boat is unattended for an extended period.

### NOTICE

DO NOT turn the battery selector switch to the OFF position while the engine is running. Alternator and wiring damage could result.

"1" - Turning the switch to position "1" will use battery #1 to power the engine(s) and 12 volt equipment. Battery #2 will be isolated and remain in reserve. Only battery #1 will be charged by the alternator.

"2" - Turning the switch to position "2" will use battery #2. Except for automatic bilge pumps, battery #1 is isolated and remains in reserve. Only battery #2 will be charged by the alternator.

"ALL" - With the battery selector switch in the ALL position, the batteries are connected in parallel. Both batteries will be used by the engine and all 12 volt equipment. Both batteries will be charged by the alternator.

The use of one battery at a time is recommended. Use one battery at a time by positioning the battery selector switch to either the #1 or #2 position.

Avoid using the ALL position. Use the ALL position only when a single battery is not capable of starting the engine.

Alternate battery usage increases battery longevity. Use battery #1 for the first day of a cruise and switch to battery #2 on the second day.

Position the battery selector switch to the battery that has sufficient power to start the engine. After



the engine is running, turn the battery selector switch to the battery that has the lowest charge. This will allow the alternator to charge the low battery. Utilizing the battery selector switch in this manner (instead of using the ALL position) will supply a greater charge to the battery.

**FOR EXAMPLE:** If battery #1 is fully charged and battery #2 is in need of a charge, use battery #1 to start the engine. After the engine is running and warmed-up, turn the battery selector switch to the #2 position. This will permit the alternator to charge the low, #2 battery.

Monitor the battery condition regularly with the DC Voltmeter. See Section E-5 Voltmeter Use & Operation for more information.

### C. Battery Charger

The batteries in a dual battery system may be charged by a battery charger/converter when the boat is connected to dockside power. The BATTERY CHARGER 1 & 2 circuit breakers on the battery selector switch panel protect the DC system during charger operation.

Additional information on the battery charger can be found in Section E-8b 120 Volt AC Equipment in this manual and refer to the manufacturer's literature included with this manual.

## E - 4 DUAL ENGINE - DUAL BATTERY SYSTEM

Two battery selector switches are provided on dual engine, dual battery installations. This allows DC power to be used from either one or both batteries. See the locator drawing at the end of Section Q Operation for the exact location of the battery selector switches.

### A. Installation

Installation of cables is the same as the section on Single Engine-Dual Battery System above except the ground cables. An additional black cable is connected to the other engine. Refer to Figure E3.

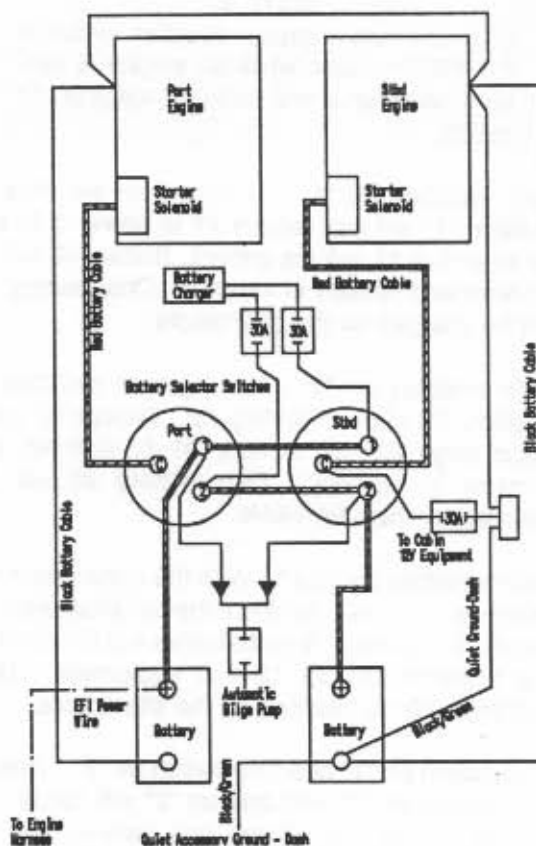


Figure E3: Dual Engine-Dual Battery Installation

### B. Operation

Power to the engines and all 12 volt electrical equipment (except the automatic bilge pump) is controlled by the battery selector switch. Separate breakers are provided on the battery selector switch panel to protect the battery charger, automatic bilge pump, cabin DC electrical panel and refrigerator.

With two battery selector switch positions it is important to fully understand the possible combinations.

Battery selector switch positions:

Both switches "OFF" - With the battery selector switch in the OFF position, all 12 volt power to the boat is shut off except to the automatic bilge pump. Always turn the battery selector switches to the OFF position when the boat is unattended for an extended period.

### NOTICE

DO NOT turn a battery selector switch to the OFF position while an engine is running. Alternator and wiring damage could result.

Both switches on "1" - Turning both switches to position "1" will use battery #1 to power both engines and all 12 volt equipment. Battery #2 will be isolated and remain in reserve. Only battery #1 will be charged by the alternators.

Both switches on "2" - Turning both switches to position "2" will use battery #2. Except for automatic bilge pumps, battery #1 is isolated and remains in reserve. Only battery #2 will be charged by the alternators.

Both switches on "ALL" - With the battery selector switches in the ALL position, the batteries are connected in parallel. Both batteries will be used by the engines and all 12 volt equipment. Both batteries will be charged by the alternators.

One switch on "1" and One switch on "2" - Turning one switch on "1" and one on "2" will cause one engine to use and charge one battery, and the other engine to use and charge the other battery. The position of the selector switch controlling power to the 12 volt electrical panel will determine which battery will be used by the electrical accessories.

One switch on "1" or "2" and One switch on "ALL" - Using the battery selector switches positioned in this manner is not recommended. Proper control of battery usage and charging operations cannot be maintained.

The use of one battery at a time is recommended. Use one battery at a time by positioning the battery selector switches to either the #1 or #2 position.

### NOTICE

Start one engine, and then the other. Attempting to start both engines by turning both ignition keys simultaneously may damage electrical components and is not recommended.

Avoid using the ALL position. Use the ALL position only when a single battery is not capable of starting the engine(s).

Alternate battery usage increases battery longevity. Use battery #1 for the first day of a cruise and switch to battery #2 on the second day.

Position the battery selector switches to the battery that has sufficient power to start the engines. After the engines are running, turn the battery selector switches, one at a time, to the battery position that has the lowest charge. This will allow the alternators to charge the low battery. Utilizing the battery selector switches in this manner (instead of using the ALL position) will supply a greater charge to the battery.

FOR EXAMPLE: If battery #1 is fully charged and battery #2 is in need of a charge, use battery #1 to start the engines. After both engines have started and are running and warmed-up, turn one battery selector switch to the #2 position. Then, turn the other battery selector switch to the #2 position. This will permit both alternators to charge the low, #2 battery.

Monitor the batteries' condition regularly with the DC Voltmeter. See Section E-5 Voltmeter Use & Operation for more information.

### C. Battery Charger

The batteries in a dual battery system may be charged by a battery charger/converter when the boat is connected to dockside power. The BATTERY CHARGER 1 & 2 circuit breakers on the battery selector switch panel protect the DC system during charger operation.

Additional information on the battery charger can be found in Section E-8b 120 Volt AC Equipment in this manual and refer to the manufacturer's literature included with this manual.

## E - 5 VOLTMETER USE & OPERATION

A DC Voltmeter is provided on the main electrical panel in the galley to monitor the condition of the batteries.



To test the battery, depress the DC VOLTMETER switch. When two batteries are installed, set the battery selector switch on #1 or #2 to test the appropriate battery.

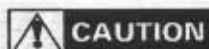
When the voltage is tested during engine or battery charger/converter operation, the voltage of the respective battery, plus any electrical charges supplied to it, will be indicated on the voltmeter. It is common to have a 14 Volt reading when the engines are running.

## E - 6 12 VOLT ELECTRICAL EQUIPMENT

### A. Helm Equipment

Equipment on the helm is protected by the HELM MAIN circuit breaker at the cabin electrical center on the Model 365. Other cruiser models are protected by a breaker on the cabin DC panel.

The ignition, DC outlet, and panel switches are protected by a separate circuit breaker panel located below the dash, behind the access door. Descriptions of individual switches are below.



#### CAUTION

To prevent electrical problems, use only replacement fuses or breakers that are of equal rating to the originals.

**Horn** - To sound the horn, push the HORN button.

**Bilge Blower** - The BLOWER switch is used to activate the bilge blower. The bilge blower is used to remove any gas vapors that may have accumulated in the bilge or engine areas.



#### WARNING

Be sure to operate the bilge blower for at least four (4) minutes before starting an engine or generator, or whenever operating the engine(s) at idle speed. Check the bilge blower output before each use. Refer to Section H-1 Engine Compartment Ventilation for more information.

**Aft Bilge Pump** - The PUMP switch is used to manually activate the bilge pump in the engine compartment. The bilge pump is used to remove

water from the bilge (bottom of the hull) area of the boat by pumping that water overboard. The aft bilge pump is equipped with an automatic bilge switch and will operate whenever bilge water rises to a level that will cause the float to move upward.

This automatic bilge pump is active even if the battery selector switch is in the OFF position or if no battery selector switch is installed. The automatic bilge pump circuitry is connected directly to the batteries.

When leaving your boat unattended for an extended period, check the charge on the battery(s) periodically. Also check the water level in the bilge and make sure the float switch is functional.

If the automatic bilge pump must be disabled, disconnect the wiring plug near the bilge pump.

**Navigation & Anchor Lights** - Moving the NAV/ANC LTS switch towards the NAV position activates the bow lights and the all-around light or both portions of the mast light (on boats with radar arches). Move the switch to the ANC position to activate the all-around light or both the fore and aft portion of the mast light. The center switch position is OFF.

**Cockpit Lights** - The CKPT LTS switch is used to activate the cockpit (courtesy) lights.

**Instrument Lights** - The INST LTS switch is used to activate the instrument lights on the dash.

**Arch Lights** - The ARCH LTS switch is used to activate the arch light.

**Wipers** - The WIPERS switch activates the windshield wiper(s). Moving the switch upwards will activate the starboard wiper. Moving the switch downwards will activate both wipers. The center switch position is OFF.

**Trim Tabs** - If the boat is equipped with electric-hydraulic trim tabs, the trim tabs are controlled by the TRIM TAB switches. Refer to Section B-9 Trim Tabs for more information.

**Windlass** - The WINDLASS switch activates the windlass.



Halon - A sensor is incorporated into the halon system and will automatically activate in the event of fire. A light on the helm indicates normal and proper operation. When the halon system activates, the indicator light will go out and the blower becomes inoperative. This is done to prevent the blower from removing the halon gas from the engine compartment during discharge.

If the halon system is activated, the blower automatically shuts off and cannot be turned on until the fire extinguisher is recharged or bypass wiring plug is installed as below.

A wiring plug to bypass the blower shut-down circuitry in the halon system is provided. The plug is located above the halon fire extinguisher in the engine compartment.

Accessories - Accessory equipment such as the spotlight and marine radio have separate controls and are wired to the fuse block below the dash.

### B. Installation of Additional 12 Volt Equipment

Additional circuit breakers for accessories are provided behind the dash panel door. Non-factory installed 12 volt accessory equipment can be connected to the "ACC" switches on the dash. Accessory equipment can also be wired to the "ACC" circuit breaker switches on the DC panel.



#### CAUTION

Be sure to provide proper fuse or circuit breaker protection for all 12 volt equipment that is installed. DO NOT overload the accessory circuitry by installing too much additional 12 volt equipment.

### C. Interior Equipment

The 30 amp circuit breaker located on the battery selector switch controls power to the 12 volt cabin panel.

If the boat is not equipped with a battery selector switch, a 30 amp fuse is installed on an "ACC" (accessory) terminal on the helm fuse block to protect the cabin panel.

DC Voltmeter - The DC voltmeter will register the amount of voltage available at the batteries. Place

both battery selector switches on #1 or #2 and depress the voltmeter switch to activate the voltmeter. See Section E-5 Voltmeter Use & Operation.

Forward Bilge Pump - The forward bilge compartment has an automatic bilge pump. It can also be activated manually by the FWD PUMP breaker switch. When the water entering the forward bilge cavity from the shower and sink reaches a certain level, it is pumped overboard.

Shower Sump Pump - A sump pump is used to discharge water from the shower and sink drains overboard. The sump pump has a float switch which will activate the pump when the water level rises in the sump. This pump is protected by the SHOWER circuit breaker on the 12 volt cabin panel. The switch must be in the ON position for the sump pump to operate.

If the boat is equipped with a grey water system, the water from the shower and sinks is pumped into a holding tank instead of overboard.

A grey water/fresh water level monitor is included with the grey water option and is then installed in the head. It will monitor the level of both the grey water and fresh water tanks. The monitor is protected by the GREY WATER circuit breaker. Tank levels can also be determined visually. Refer to the plumbing drawings at the end of Section G and the locator drawings in Section O for more information.

Pressure Water - A pressure water pump delivers water to the faucets, shower, transom washdown, and throughout the water distribution system. The pressure water pump will operate automatically as long as the POTABLE OR FRESH WATER circuit breaker and switch are on. Turn the POTABLE OR FRESH WATER switch OFF when the water tank becomes empty, or when water will not be required for an extended period. Visual inspection is generally necessary to check the water level in the tank.

Stereo - The stereo has a separate switch on the unit and is protected by a circuit breaker labeled STEREO on the 12 volt cabin panel. A separate in-line fuse is provided in the wiring behind the stereo unit. To replace the fuse, remove the

screws securing the stereo and DC panels to gain access to the wiring.

**CO Monitor** - The CO monitor has a separate switch and is protected by a circuit breaker labeled CO MONITOR on the 12 volt cabin panel.

**Overhead Lights** - To turn the overhead lights on, activate the OVERHEAD LTS switch on the 12 volt cabin panel.

**V-berth Lights** - To turn on the v-berth lights, activate the V-BERTH LTS switch on the main 12 volt cabin panel.

**Mid Cabin Lights** - To turn on the mid-cabin lights, activate the CABIN LTS switch on the 12 volt cabin panel.

**Indirect Lights** - To turn on the cabin steps light, activate the INDIRECT LTS switch on the 12 volt cabin panel.

**Head Compartment Blower** - A blower is installed on some models in the head compartment and has a separate switch. It is wired to the OVERHEAD LTS circuitry.

## E - 7 120 (220) VOLT ELECTRICAL SYSTEM

The boat may be equipped with 30 amp, 120 volt, 60 Hertz (or 15 amp, 220 volt, 50 Hertz) AC electrical wiring. When the boat is connected to a shore power outlet, the AC system supplies electrical power to items such as the refrigerator, battery charger, receptacles, and air conditioner.

The dockside system uses three-wire, color-coded circuitry. The black or hot wire is the ungrounded current carrying conductor. The white or neutral wire is the grounded current carrying conductor. The green wire, referred to as the "equipment ground," is a grounded conductor, and under normal conditions is not a current carrying wire. The neutral wires are connected together at a buss bar. The equipment grounds are similarly connected together at another buss bar. Each hot wire is connected to, and protected by, a circuit breaker in the distribution box.

The distribution box houses the system circuit breakers. The standard dockside system has a

main circuit breaker which protects the overall distribution network. The MAIN circuit breaker protects both the hot and neutral input leads. This breaker is sensitive. The resulting power surge which occurs when connecting the shore power cord may cause the MAIN breaker to trip. To avoid this power spike, turn off the MAIN breaker before plugging in the shore power cord. Securely connect the power inlet of the boat and the shore power receptacle. If the connection is broken and later re-secured, the circuit breaker may trip. Connections must be secure for uninterrupted dockside service.

## E - 8 DOCKSIDE OPERATION

### WARNING

If any abnormalities appear during dockside operation, DISCONNECT the system immediately to prevent electric shock hazards! Have the boat's electrical system and the shoreside receptacles checked as soon as possible.

### A. Shore Power Connections

#### WARNING

To prevent electric shock hazards, use only equipment with approved three wire electrical plug connections. Be sure each item being used has been tested and is free of electrical shorts and ground faults.

Fifty foot, ten gauge, three wire, shore power cords are provided with dockside wiring. The shore power cords on 60 Hertz systems have 30 amp twistlock type connectors. This connector is approved by National Marine Manufacturers Association and the American Boat and Yacht Council.

Some marinas are not equipped with approved twistlock type receptacles. An adaptor is available from Four Winns which converts the twistlock shore plug to a three wire grounded household type plug. Use only an approved adaptor when an adaptor is necessary.





### WARNING

DO NOT use a two-wire adaptor to connect to a three-wire system. These adaptors do not provide adequate grounding.

Shore power connection procedure is as follows:

1. Turn off the boat's main breaker switch before connecting or disconnecting the shore power cable.
2. Connect shore power cable at the boat first, then connect it to dockside shore power outlet.

### NOTICE

Always connect the cord to the power inlet receptacle of the boat before making connections to the shore power source.

3. Check for reversed polarity. If the reversed polarity light is activated, immediately disconnect the shore power cord. See Section E-8c Reverse Polarity Indicator.
4. To disconnect shore power, turn off the main breaker switch on the AC electrical panel and disconnect the power cord from the shore power dockside receptacle first. Then, disconnect the cord from the boat.

### NOTICE

Always disconnect the shore power cord from the dockside first before disconnecting from the boat.

## B. 120 Volt AC Equipment

All 12 volt equipment is isolated from the 120 volt AC system (except the refrigerator which is dual voltage). Appropriately labeled circuit breakers protect the refrigerator, microwave, charger, receptacles, and electric water heater. The receptacles can be used for 120 volt (220 volts on 50 Hertz models) household appliances.

The battery charger is controlled by a circuit breaker on the AC electrical panel in the cabin. With dockside power connected and the BATTERY CHARGER circuit breaker on, the charger will convert 120 volt AC power to 12 volt DC power.

Always use battery selector switch position "1" or "2" when AC power is supplied to the battery charger.

### NOTICE

If a 120 (220) volt battery charger is used, be sure the neutral lead of the charger is isolated from the ground or bonding circuit. Be sure the battery charger is of the type which properly senses battery requirements and does not overcharge or cause the electrolyte to boil.

The RANGE circuit breaker must be activated to supply power to the electric stove. The MICROWAVE breaker must be on to supply power to the microwave receptacle. Refer to Section I-1 Galley Equipment in this manual for more information.

The REFRIGERATOR circuit breaker must be on to operate on 120 voltage. If this breaker is off, the refrigerator will automatically operate on the 12 volt system. This can deplete the battery. Excessive drain on the battery may cause irreparable battery damage. The refrigerator will automatically operate on 120 volts when provided. Refer to Section I-1 Galley Equipment in this manual for more information.

The WATER HEATER circuit breaker supplies power to the water heater. Refer to Section G-2c Water Heating Systems in this manual for more information.

### NOTICE

DO NOT supply electrical power to an empty water heater. Activate the POTABLE WATER circuit breaker and switch to start the water pump and prime the system. Be sure there is adequate water in the system before turning on the water heater. Failure to comply will result in damage to the heater element.

The AIR CONDITIONER circuit breaker supplies power to the air conditioner. Dual Dockside is installed on Four Winns models with this option. Refer to Section I-6 Air Conditioning in this manual for more information.

The ICEMAKER circuit breaker supplies power to the icemaker on cruiser models.

The OUTLET circuit breakers supply power to all receptacles except the microwave and refrigerator receptacle.

Most receptacle circuits are capable of handling 15 amperes. Below is a list of equipment and the electrical currents usually required to operate these items. For 220 volt, 50 Hertz models, divide all of the current ratings below by 2. Usually, the power requirement is specified on the electrical item. This is only an approximation of the electric current usage normally experienced.

Table 1: Electrical Equipment

EQUIPMENT	ELECTRICAL LOADS
Air Conditioners	See motor load plate
Battery Chargers	Up to 800 watts (7.3 amps)
Blankets (Electric)	50 to 200 watts (2 amps)
Coffee Makers	550 to 700 watts (6.3 amps)
Electrical Drills	See motor load plate
Fans	25 to 75 watts (0.7 amps)
Fry Pan	1350 watts (12.3 amps)
Heater	1500 watts (13.7 amps)
Lights	Wattage as marked
Television	1500 watts (10.5 amps)
Vacuum Cleaners	See motor load plate

### C. Reverse Polarity Indicator

Improper grounds or reversed polarity at shore power are a source of serious electrical hazard. The reverse polarity light will indicate if a problem exists at the 120 AC electrical system shore connection.



#### WARNING

ALWAYS check the Reverse Polarity Indicator Light in the AC distribution panel immediately upon connecting the shore power cord and turning on the AC MAIN circuit breaker. If the light is on, a problem with a reversed electrical connection exists. Turn the AC MAIN circuit breaker off and disconnect the shore power cord

immediately. Notify the marina and have the dock's shore power connection inspected.

The Reverse Polarity Indicator Light can be tested to verify proper operation by pressing the REVERSE POLARITY INDICATOR switch at any time after shore power connection and turning on the AC MAIN circuit breaker on the 120 volt AC electrical panel. The light should activate upon pressing the switch. This is normal and does not indicate a reverse polarity condition. It only indicates that the light works properly.

Under proper operating conditions, the Reverse Polarity Indicator Light will not be on.

#### NOTICE

Some marina shore power systems may be improperly grounded to retard electrolysis (see Section E-11 Electrolysis & Corrosion). Before using any 120 volt equipment, make sure the reverse polarity light does not come on when tested.

### D. Ground Fault Current Interrupters (GFCI)

The Ground Fault Current Interrupter (GFCI) is a device which protects against hazardous electrical shock from improper ground. An appliance electrical cord with worn insulation or damp equipment may have stray current which will run through electrical grounds. Stray current as above will result in an electrical shock.

One GFCI receptacle will protect all of the receptacles on the circuit. A GFCI may be used as a receptacle as well as an interrupter.

To test:

Push the black test button and the red reset button should pop out from the inner surface. The receptacle and the circuit are now off.

Push the reset button in until it clicks to reset it. If it does not reset, there is either a short in the circuit or the equipment being used, or a ground fault in the equipment. Unplug all appliances and reset the GFCI. One at a time, plug the equipment back in and turn it on. The item that causes the GFCI to trip is the problem item and should not be used.

## E - 9 GENERATOR OPTION

An optional generator is available on cruiser models to provide 120 Volt (220V) AC power when the boat is away from the dock. The generator can be operated while running at or below cruising speed. The generator should not be operated when the boat is being run at high speeds. Insufficient cooling water may be available due to the speed.

A generator factory installed by Four Winns is capable of providing sufficient power for most electrical needs including cooking, refrigeration, and air conditioning. It is possible to overload the generator by trying to operate too much equipment at one time. The circuit breaker that protects the output circuits on the generator set will trip should that occur. This can be avoided by keeping a watchful eye on the AC ammeter. Limit power usage so the ammeter remains below the rated output of the generator. See the generator manufacturer's information for specifications and additional details.

A generator installation includes an additional battery. This battery is specifically for the generator and is isolated from the remainder of the 12 Volt electrical system. This battery is directly wired to the generator on most Four Winns models. The model 365 has a battery selector switch provided. Position the switch to the ON or "1" position before trying to use the generator. See Figure E4.

When a generator is installed, an AC power shore-line transfer switch is installed in the Electrical Center (see Figure E5). If you wish to use dock-side power, be sure the generator is off, turn the switch to the Shore Power position and connect the shore power cords as explained in Section E-8a. If you wish to use generator power,

1. Be sure the shore power cord(s) are disconnected.
2. Slide the selector to the Generator position.
3. Check the bilge for fumes, and operate the Generator blower for at least 4 minutes.
4. Turn the generator battery selector switch (model 365 only) to the ON or "1" position.

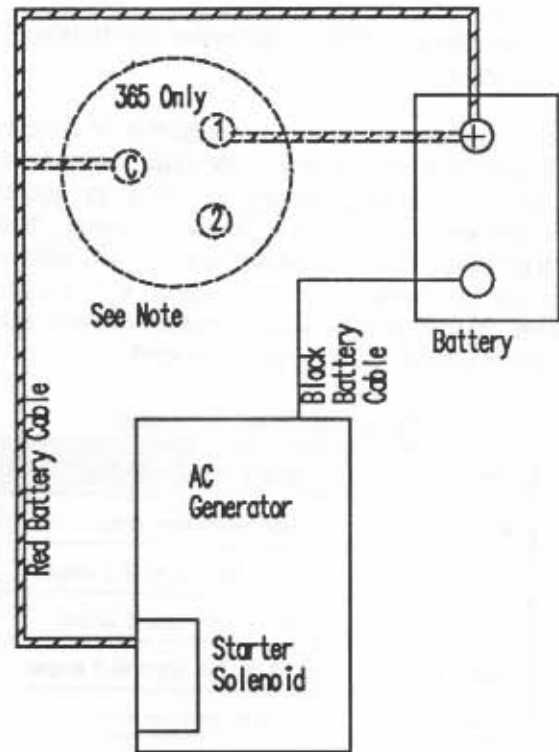


Figure E4: Generator Battery Installation

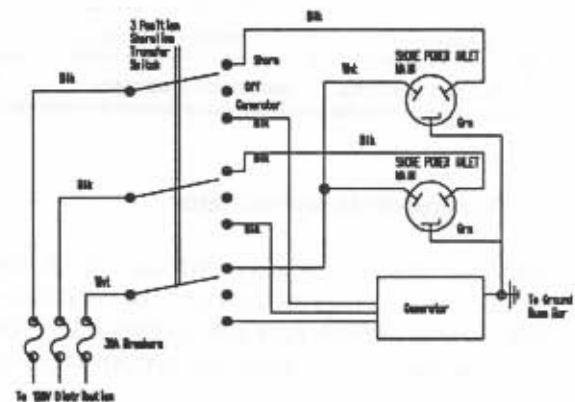


Figure E5: Shoreline Transfer Switch

5. Start the generator using the remote generator start switch on the dockside panel.



### NOTICE

DO NOT position the switch to the "2" position. Never turn the battery selector switch to the OFF position when the generator is running.

If a generator is installed, periodic generator maintenance as outlined in the generator owners manual is necessary. Refer to the manufacturer's literature for more information.

## E - 10 ELECTRICAL SYSTEM MAINTENANCE

### A. Battery Maintenance

Be sure to keep the batteries charged. Also, keep the batteries clean, especially the terminals and connection lugs. Be sure the batteries are fastened securely while in use.

Replenish a battery indicating a low charge. Determine the reason for the discharge. Lack of battery usage is as detrimental to battery longevity as is over-use. Alternating battery usage is important. Refer to the battery manufacturer's instructions included with your battery.

### B. Electrical Wiring Maintenance

Periodically, inspect all wiring for nicks, chaffing, embrittlement, improper support, etc. Examine the shore power cord closely for insulation cracks and corrosion in the electrical devices. Spraying the receptacles and electrical connections with an electrical connection cleaner will reduce corrosion and improve electrical continuity.



### WARNING

DO NOT allow corrosion to build up on connections. Shorts or ground faults can result.

The entire 120 (220) volt circuitry, especially the shore power cord, should be seasonally tested for proper continuity by an experienced marine electrician. This will help detect any short, open wire, or ground fault. Also, check the polarity indicator system for proper operation.



### WARNING

120 (220) volt AC electrical power can be dangerous. DO NOT attempt to service a system unless you are familiar with, and experienced in, performing such service.

## E - 11 STRAY CURRENT CORROSION

### A. General

Electrically induced underwater corrosion occasionally affect boats and their related components. This is referred to as "Stray Current Corrosion" and appears as surface pitting or deterioration. Stray current corrosion is the decomposition of chemical compounds by electric current.

Stray current corrosion can be caused by the polarity of the dockside wiring system of the boat being reversed from the power source (reversed polarity) or surrounding boats, an improperly wired battery installation, other boats that are in close proximity that have electrical power leakages, or any other source close to the boat that has electrical power leakage into the water. Stern drive units are especially vulnerable to stray current corrosion.

Periodically inspect the drive components and thru-hull fittings to determine if stray current corrosion damage exists. If corrosion damage is found, determine and correct the cause of stray current to prevent further damage. Consult an experienced marine electrician or contact your Four Winns dealer for assistance.

The use of some shore power battery chargers, while the boat is in the water and the battery is connected to the system, can cause stray current corrosion. Have an experienced marine electrician review any battery charger installation to ensure a stray current corrosion problem will not develop. An improper battery connection is a common cause of stray current corrosion.

### NOTICE

Use only "Coast Guard" approved battery chargers. Consult your Four Winns dealer for his recommendations.



Corrosion is usually more prevalent in polluted or salt water than in clean water. It is also more likely to occur when dockage is in an area with steel piers, large metal boats, or where shore power is in use.

### **B. Galvanic Corrosion**

Galvanic corrosion results from a potential electrical difference existing between dissimilar metals immersed in a conductive solution (e.g., salt water). If these metals touch or are otherwise electrically connected, this potential difference produces an electron flow between them. The attack on the more active metal is usually increased and the attack on the less active metal is decreased, as compared to when these metals are not touching.

### **C. Corrosion Prevention**

Anti-corrosion anodes are attached to the bottom of the gimbal housing to prevent corrosion to your stern drive and underwater parts. These anodes will be slowly eroded away by galvanic action and require periodic inspection. Please refer to the section on "Anti-Corrosion Anodes" in your engine manufacturer's manual for additional information.



## BE CAUTIOUS WHEN USING GASOLINE THAT CONTAINS ALCOHOL



### CAUTION

To conform to Federal Air Quality Standards, the petroleum industry reduced the amount of tetraethyl lead in gasoline. Alcohol is being blended with gasoline to help restore the octane rating lost when the lead was removed. While blending alcohol with gasoline increases the octane level of the fuel, it can also create certain safety and performance related problems for boaters.

### PROBLEMS THAT MAY BE EXPERIENCED WHEN USING BLENDED GASOLINE

- A. Premature deterioration of fuel system components**  
Alcohol will attack rubber fuel hoses, fuel tanks, fuel filters, fuel pumps and rubber gaskets. This deterioration will lead to fuel system leakage.
- B. Phase separation of fuel**  
Water that accumulates in the tank through contamination or condensation will be absorbed by the alcohol. This water-heavy alcohol will settle at the bottom of the tank. This phase separation will lead to fuel tank corrosion. This may also result in a lean mixture to the carburetor and cause engine stalling or possible engine damage.

The use of alcohol additives in gasoline has become more wide-spread. Regulations on public notification of the existence of additives is currently controlled by the Environmental Protection Agency (EPA). Some states do require that gasoline pumps display information on additives (especially alcohol). If alcohol content is not posted, ask and avoid using fuel containing alcohol if possible.

### ASSUME BLENDED GASOLINE IS BEING USED AND FOLLOW THESE RECOMMENDATIONS

- A. Inspect fuel hoses often**  
A deteriorated hose containing alcohol blended gasoline will normally be soft and swollen. A deteriorating hose containing no fuel will normally be hard and brittle. In both cases the hose should be replaced.
- B. Ventilate the engine compartment before starting engines**  
Operate the engine compartment blower for four (4) minutes. Then, prior to starting the engines, check the bilge area for the scent of gasoline fumes; DO NOT start the engines if the odor of gasoline is detected.
- C. Frequently inspect the fuel system fittings**  
Check the fuel tanks, pumps and filters for signs of corrosion. Visually inspect for deteriorating metal fittings at the fuel hose connections.



### WARNING

Fuel leaks in hoses or at fittings are a fire hazard. If areas are found within the fuel system that appear questionable, have a qualified marine technician inspect the system. A thorough fuel system examination should be made by an experienced marine technician at least once a year.



# FUEL SYSTEMS

## F - 1 GASOLINE FUEL SYSTEMS

Gasoline fuel systems used in Four Winns boats are designed to meet or exceed the requirements of the U.S. Coast Guard, the National Marine Manufacturers Association, and the American Boat and Yacht Council in effect at the time of manufacture.

### NOTICE

Use only clean, dry fuel of the type and grade recommended by the engine manufacturer. The use of incorrect or contaminated fuel can cause engine malfunction and serious damage.

Tanks on models with a single fuel tank are located below the mid-cabin floor. Tanks on models equipped with dual fuel tanks are located below the cockpit floor on the port and starboard sides, usually forward of the engines. Refer to Table I below for fuel tank capacities by model.

Table I: Fuel Tank Capacities

Model	Tank Capacities	Total
245	Sgl. - 75 gal.	75 gal.
265	Sgl. - 85 gal.	85 gal.
275	Sgl. - 112 gal.	112 gal.
285	Dual - 70 gal.	140 gal.
315	Dual - 90 gal.	180 gal.
325	Dual - 90 gal.	180 gal.
365	Dual - 150 gal.	300 gal.

### A. System Testing

All gasoline fuel systems have been factory inspected and pressure tested in accordance with regulations in effect at the time of manufacture. Additionally, each fuel tank must pass rigid tests and inspections performed by the fuel tank manufacturer.

Prior to taking delivery, it is important that a full inspection be made of the entire fuel system by the selling dealer. An entry on the Four Winns Pre-Delivery Service Record will attest to the dealer's performance of this service.

### B. Fuel Fills

Fuel fill deck plates are located either on the aft deck or side decks, and are marked FUEL, GAS, or DIESEL. Be sure to utilize the proper type and grade fuel. See Section F-3 for additional information.

### WARNING

DO NOT confuse FUEL deck fill plate with WATER or WASTE deck plates. Deck fill plates are labeled according to the intended use.

The o-ring seals on the fuel fill cap assist in sealing when closed. A missing or damaged o-ring can allow water on the surrounding surfaces to run into the tank.

Periodically inspect the cap and the fuel deck plate. The O-ring seal, if so equipped, should be inspected for cracks or damage and replaced as necessary. Lubricating with a light, water-proof oil or grease is recommended and can extend the o-ring's longevity.

### C. Fuel Vents

Each fuel tank is vented overboard. While the tank is being filled, the air displaced by the fuel escapes through the vent. When the tank is almost full, fuel will be ejected from the fuel vent.

### WARNING

DO NOT overfill or overflow the tank, or allow fuel spills into the hull or bilge.

After fueling, replace the fill cap(s), and wash the areas around the fuel fill plate and below the fuel vent(s). Residual fuel left on the deck and hull

sides can be dangerous, and will yellow the fiberglass.

Periodically, remove the caps from the fuel vent(s), clean the vent of any dirt, wax, etc. Be sure the caps are replaced securely after cleaning. The vents are designed to keep insects and foreign matter from contaminating the fuel and fuel system.

#### D. Anti-Syphon Valves (Except Diesels)

Fuel withdrawal lines are equipped with anti-syphon valves where the lines attach to the fuel tanks. These valves prevent gasoline from syphoning out of the fuel tank(s) should a line rupture. See Figure F1 for anti-syphon location.

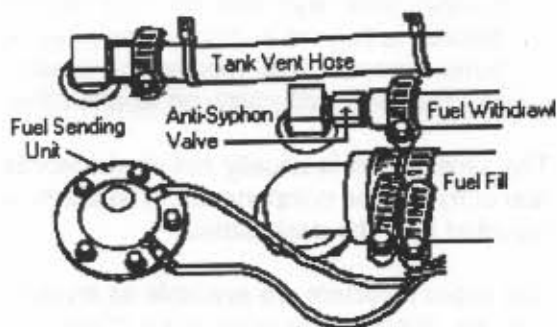


Figure F1: Fuel Tank Fittings

#### CAUTION

DO NOT remove the anti-syphon valve(s) from the system. Should the valves become clogged, clean and re-install or replace.

#### CAUTION

The fuel withdrawals are positioned in the fuel tanks to achieve optimum fuel usage, and fuel line routing. At certain speeds and hull trim angles, the fuel supply at the withdrawal tank location can increase or decrease accordingly. Be extremely careful when attempting to operate the boat on a minimum amount of fuel. Though some fuel may be in the tank(s), the relative trim angle of the boat may cause the fuel to flow away from the withdrawal(s).

#### NOTICE

In most Four Winns models, access to the anti-syphon valve and fuel sender is by lifting the engine hatch.

#### E. Fuel Selector Valves

All boats equipped with multiple gasoline fuel tanks are equipped with a fuel selector valve assembly. These valves control fuel flow from the port and starboard tanks. Access is gained through the engine hatch on all models.

The boat is set up so that each engine may run on one or both tanks. If a generator is installed, an additional valve is installed to control fuel to the generator. Also, a check valve is installed where the fuel line to the generator connects to the manifold.

Each fuel selector valve has an ON and OFF position. The valve lever is labelled appropriately. The OFF position shuts off the fuel flow. Be sure the valves are in the fully open or fully closed position.

Refer to Figure F2. The port fuel selector valve (A) controls the fuel flow from the port tank. The starboard valve (B) controls the fuel flow from the starboard tank. The center valve (C) allows fuel flow from both tanks.

When there is sufficient fuel in both tanks, position the valve for the port tank (A) to the ON position and the valve for the starboard tank (B) to the ON position. The center valve (C) should then be in the OFF position. This will result in the port engine drawing from the port tank and the starboard engine drawing from the starboard tank. This is the normal method of operation.

If one tank has significantly more fuel than the other, position the valve for the tank having the most fuel to the ON position. Position the valve for the tank having the least fuel to the OFF position. In this case, the center valve (C) must be in the ON position. These valve settings will result in both engines drawing fuel only from the tank that has the greatest amount of fuel. After the fuel level in both tanks is approximately even, return the valves to the positions discussed in the paragraph above.



Position the fuel selector valves to use fuel from the fuel tanks to achieve the best static balance and fuel weight distribution.

#### NOTICE

Be sure the fuel tank(s) being used has sufficient fuel. If one tank is full and one tank is empty (or near empty), and the fuel selector valves are positioned so all three are in the ON position, the engines can draw air from the tank that is near empty. This will result in engine stalling or failing to start.

#### NOTICE

Operating the boat with all fuel valves (A, B, & C) set to the ON position is NOT recommended. Due to the different lengths of fuel lines, variations in fuel pumps, etc., fuel will not be drawn from the tanks evenly.

### F. Fuel Gauge

The fuel gauge(s) indicate the amount of fuel in the corresponding tanks. See Section B-10f Fuel Gauge for additional information on fuel gauge use.

### G. Fuel Filters

Fuel filters are installed on each engine. Filters should be cleaned frequently to assure an adequate supply of clean, dry fuel to the engine(s). Refer to the engine manufacturer's manual for additional information.

### H. Use and Maintenance



DO NOT let the odor of gasoline go unchecked. If the odor of gasoline is noted, shut off all engines, electrical and heat generating equipment. Investigate and correct the situation immediately! Have all passengers put on personal flotation devices and keep fire extinguisher at hand until the situation is resolved.

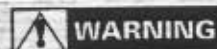
Periodically inspect all connections for leakage and all hoses for damage or deterioration. Replace as necessary.



To help guard against damage, avoid the storage or handling of gear near the fuel lines, fittings and tanks.

### I. Gas Vapor Detector

A properly installed gas vapor detector or "sniffer" can be a valuable safety device. The Gas Vapor Detector will monitor the engine compartment and notify the operator of an accumulation of gasoline vapors. The operator must take immediate action upon warning to avoid the possibility of an explosion.



Always personally inspect the engine compartment and sniff for fuel vapors before starting the engine. Remember, a fume detector is a mechanical device. DO NOT rely exclusively on its operation.

The sensing unit is usually mounted towards the rear of the engine compartment. The alarm unit is mounted near the dash panel.

Gas vapor detectors are available as an option or can be installed by your Four Winns dealer. Information on the gas vapor detector is included at the end of this section if your boat is so equipped.

## F - 2 DIESEL FUEL SYSTEMS

Proper diesel engine operation requires clean, dry diesel fuel. Improper marina fuel storage techniques, limited boat usage, etc. can cause fuel to become contaminated. Four Winns installs water separating units in the fuel system to help protect the fuel supply from contamination.

The use of poor grade fuel, especially in hot humid weather can produce an algae in the fuel tank. Four Winns recommends using a fuel conditioner to help eliminate algae growth and moisture contamination. It is always a good idea to use the highest quality fuel available.

If the tank(s) become contaminated, Four Winns recommends having qualified marine technicians

service your boat. Contact your Four Winns dealer for assistance.



To prevent possible injury or damage to your boat, **DO NOT** drain fuel into the bilge. This could lead to fire.

#### NOTICE

**DO NOT** allow the boat to sit unused for an extended period of time with the fuel tank(s) less than full. Changes in temperature and weather conditions could cause condensation to accumulate within the tanks.

Water separators should be drained and replaced as necessary. Refer to the engine manufacturer's manual for additional instructions.

Anti-syphon valves are not provided with diesel engine installations. The use of these valves is not recommended in diesel fuel applications.

#### NOTICE

Clean fuel filters regularly.

### F - 3 FUELING INSTRUCTIONS

1. Avoid fueling at night except in emergencies.
2. When moored at fueling pier:
  - a. Do not smoke, strike matches, or throw switches.
  - b. Stop all engines, motors, fans, and devices that could produce sparks.
  - c. Put out all lights and galley fires.
  - d. Position the Battery Selector Switches to OFF (if boat is so equipped).
3. Before starting to fuel:
  - a. Ensure that boat is moored securely.
  - b. Close all ports, windows, doors and hatches.
4. During fueling:

Keep the fill nozzle in contact with the metal fuel opening at all times to guard against possible static spark.
5. After fueling:
  - a. Replace all fill caps securely.
  - b. Wipe up any spilled fuel.
  - c. Open all ports, windows, doors and hatches.
  - d. Run Bilge Blower for four (4) minutes before activating equipment.
  - e. Determine that there is no odor of gasoline in the engine compartment or below decks before starting machinery, turning on lights or lighting fires.
  - f. Be prepared to cast off moorings as soon as engines are started.

- c. Be sure the proper type of grade of fuel as recommended by your Engine Owners Manual is used.
- d. Determine how much additional fuel is required to avoid overflow.
- e. If boat is equipped with dual tanks, instruct fuel handler which fuel fill deck plate to use, and quantity of additional fuel required for each tank.



**DO NOT** overflow the tank or allow fuel spills into the hull or bilges. Visually monitor the fuel vent located on either the transom or side(s) of the hull. When the tank is full, fuel will flow from the fuel vent.



# WATER AND WASTE SYSTEMS

## G - 1 GENERAL

All Four Winns Cruiser models are equipped with a fresh water supply system. This system consists of a water supply tank, water distribution lines and a distribution pump. The water fill deck plate for the fresh water system is located on the deck. Always fill the tank slowly.

The approximate location of the water fill for each model is listed below in Table I.

**Table I: Water Fill Location**

MODEL	DECK WATER FILL LOCATION
245	Stbd, Aft of Cabin Window
265	Fwd., Aft of Anchor Locker
275	Stbd, Below Cabin Window
285	Stbd, Fwd. of Cabin Window
315	Stbd, Near Helm/Controls
325	Stbd, Near Helm/Controls
365	Port, Fwd. of Cabin Window

### CAUTION

The water deck plate is appropriately labeled. **DO NOT** fill the system with anything other than water. Should the system become contaminated with fuel or other toxic solution, component replacement may be necessary.

The water tank is equipped with an overboard vent. Maintain a close visual watch on the overboard vent while filling the water tank. Always fill the tank slowly. When the tank is almost full, water will spurt out of the vent.

### NOTICE

When filling the tank, never seal the hose to the deck plate. The tank would become pressurized and could rupture.

Table II below lists the capacity and location of water supply tanks.

**Table II: Water Tank Capacities**

MODEL	TANK CAPACITY	LOCATION
245	17 gal.	Stbd Engine Compartment
265	21 gal.	Below V-berth Floor
275	38 gal.	Below V-Berth Floor
285	29 gal.	Below Mid-Cabin Floor
315	39 gal.	Below V-berth
325	39 gal.	Below V-Berth
365	98 gal.	Below Dinette Floor

### NOTICE

**DO NOT** overfill the water tank. Tank damage may result. Water capacity and tank location may vary due to other equipment that may be installed on the boat.

The materials from which the components of the water system are made may give the water supply a peculiar taste, especially when new. This condition is normal and can be reduced somewhat through the use of a water filter; such as that produced by Ametek Inc. Also, chemicals such as Sudbury's Aqua-Fresh and Pettibone's Aquabon are effective. The taste will completely dissipate in time.

### WARNING

The fresh (potable) water system should be disinfected prior to initial use.

The water system should be disinfected before first use and at the beginning of each season. The following information is a general guide to disinfecting the fresh water system.

1. Flush the boat's water system thoroughly with fresh water. Make sure all anti-freeze is removed from the system.



2. The water system should be drained completely.
3. To disinfect the water system, use one gallon of water and 1/4 cup of Clorox or Purex household bleach (5% sodium hypochlorite solution). This is recommended for each 15 gallons of tank capacity.
4. Allow to stand for three (3) hours. If time is a factor, greater concentrations of chlorine solution will be needed to disinfect the water system.
5. Drain the system.
6. Flush the system thoroughly with fresh water.
7. Fill the system with fresh water.

To remove excessive chlorine taste or odor which might remain in the system, prepare a solution of one quart vinegar to five gallons water and allow this solution to agitate in the tank for several days during boating. Then drain tank and refill with fresh water.

All drains are equipped with traps, and the water will drain slowly. If the system is not operating properly, have it checked by your authorized Four Winns dealer.

## G - 2 PRESSURIZED WATER SYSTEM

The water pump is an automatic, on-off, self-priming pump that can service several outlets at once. The pump will build up water pressure and will turn off when it reaches 35 psi. It will generate 20 psi with the faucets open.

Water pump locations for each model are listed in Table III.

Refer to the drawings at the end of this section for additional information.

### A. Priming The System

After filling the water tank, open all faucets partially. Then, activate the water pump circuit breaker on the cabin panel to supply the system with water. Let the pump run until water comes out of

Table III: Water Pump Location

MODEL	WATER PUMP LOCATION
245	Under Access Lid, Aft Cabin
265	Under Access Lid, Stbd Seat Cushion
275	Under V-Berth Compartment
285	Under Bottom Cabin Step
315	Under V-berth Compartment
325	Under V-berth Compartment
365	Under Galley Unit

all faucets, the shower, transom washdown, cockpit sink and head faucets.

After all the air has been purged from the system and a steady flow of water is coming from each outlet, turn off the faucets one by one. Begin with the cold water faucets and continue until all faucets are shut off. As the pressure builds, the pump will automatically shut off at 35 psi. Refer to Section E on Electrical Systems and the manufacturer's information included with this manual for additional information.

### B. System Operation

When properly primed and activated, the pressurized water system can be used in the same manner as the water system in a home. An automatic pressure sensor in the water pump keeps the system pressurized. Simply turn on the faucet and water will be delivered. If the system has been recently filled, or has not been used for an extended period of time, air bubbles may accumulate at the pump. If this should happen, re-priming may be necessary.

To obtain the most consistent mixture of hot and cold water, turn the cold water on full, then mix in hot water until the desired temperature is obtained. If water pump cycling occurs, some minor variations in water temperature can be expected.

Whenever the boat will be left unattended for an extended period, the water pump switch should be turned to the OFF position. This switch should also be turned OFF whenever the water tank is to remain empty for an extended period of time.

### C. Water Heating Systems

The water heaters used on cruiser models have six or eleven gallon capacities. They are generally located in the engine compartment.

#### NOTICE

Water heater capacity and location may vary due to the installation of optional equipment.

The water heater utilizes 120 volt (220 volt on 50 Hertz models) power. The water heater breaker switch is located on the cabin 120 Volt AC panel.

#### NOTICE

DO NOT supply 120 volt power to an empty water heater. Damage to the heater will result. The water system must be filled and primed before attempting to use the water heater.

A water heater that incorporates a heat exchanger is available on some models. A heat exchanger allows the engine coolant to heat a portion of the fresh water supply while the engines are operating. This option will provide hot water at times when 120 volt power is not available. Additional information on heat exchangers is covered in the engine and hot water heater manufacturers' manuals. Please refer to Section E on Electrical Systems for additional information.

### D. Using The Shower

The head sink faucet has a shower attachment on all models except the model 365. The shower fixture on the 365 is mounted on the wall and has separate hot and cold water mixing valves to regulate the water flow.

On all other models, the shower hose attaches to the fitting on the sink faucet. Turn on the faucets to desired temperature, lift the hose (while attached), move the lever on the shower head, and the shower is operational.



#### CAUTION

The water temperature can vary during shower use as the pressure pump cycles on and off. For greatest consistency, turn the cold water on full, then mix in hot

water until the desired temperature is obtained.

When using the shower, draw the shower curtains (when provided) before using the shower. Damage to the finish can result if surrounding walls and flooring are allowed to become excessively wet. Thoroughly dry these areas after showering.

A shower sump pump is incorporated into the drain system of the shower in most models. If a sump pump is not present, the shower drains into a sealed forward bilge cavity under the aft cabin access lid.

Immediately prior to using, the shower pump must be in an operational state. To activate the shower sump pump, place the shower sump (or forward bilge pump) circuit breaker in the ON position. The shower pump will automatically start as soon as the water in the sump reaches a level that will cause the float on the sump switch to rise.

After showering, let the water flow for a period of time to flush the pump of soap residue.

If water flow from the shower head appears to be restricted, it may be due to sediment accumulating at the shower head. If necessary, remove the head and clean the discharge holes with a fine wire.

Periodically check the sump pump screen for clogs to prevent drainage problems from occurring in the shower drain. Refer to the manufacturer's literature included with this manual for more information.

### G - 3 GREY WATER SYSTEM

The grey water system is optional on all Four Winns cruiser models. Water from the galley sink, head sink, and shower will drain into a sump and be pumped to a holding tank. A pump-out fitting labeled WASTE but designated for grey water is provided on the deck.

#### NOTICE

Certain geographical areas have restrictions on grey water being pumped or drained overboard. Be sure to check all



local, state and federal laws in the boating area.

On the some models, a grey water/fresh water level indicator is provided with this option.

Refer to the manufacturer's literature included with this manual for additional information.

Refer to the locator drawing at the end of Section Q Operation for location of the grey water tank.

### G - 4 SHORE WATER CONNECTION

Shore water connection is standard on all cruiser models. This feature allows the direct connection of a shoreside water supply to the boat's water system to provide a constant supply of fresh water without the need to constantly re-fill the water supply tank. This minimizes pressure pump operation thus extending the life span of the pump.

Dockside shore water pressure can vary dramatically. Excess pressure could damage the boats water system so the shore connection also regulates the water pressure to a maximum of 35 psi.

The female inlet deck fitting is near the transom or is located on the starboard deck forward of the cabin window.

To use shore water, connect a hose from the shore water faucet to the shore water fitting on the boat and turn on the shore water. The water system of the boat will then be pressurized if the system was previously primed.

While connected to shore water, the water system pressure pump will not function, and the water in the water storage tank of the boat will not be utilized.

#### NOTICE

Always remember to disconnect the shore water supply hose before leaving the dock.

#### NOTICE

Always turn off the shore water whenever the boat is left unattended. If a major water leak did occur and went undetected the boat could fill with water and sink.

DO NOT alter or repair the pressurized water system or shore water connection without having proper knowledge of the system. Damage to the water system can occur.

See Section G1 for general water system information and instructions on filling the water tank. The water tank will not be filled while connected to shore water.

### G - 5 SPA

The model 365 has an optional spa available. A cold water line runs to the spa from the water system. See Figure G4 at the end of this section. When filling the spa, approximately 65 to 80 gallons will be needed.

Four Winns recommends using the shore water connection to fill the spa to prevent depletion of the water tank. Fill the spa allowing a minimum of 3 inches below the full level for each person using the spa. The water will rise as each person enters the spa.

The water in the spa will be heated when the water circulating pump and spa heater are active. During operation, the water leaves the spa, enters the pump, is pumped through the spa water heater, and re-enters the spa.

#### A. Operation of Spa

1. Connect the boat to the shore water supply. Be sure the water system is properly primed.



DO NOT operate the boat with water in the spa. Handling difficulties or physical damage to the interior can result.

2. Locate the shut-off valve under the front access panel and turn it on to allow water to be

pumped into the spa. When the spa is filled, turn the water supply valve off.

#### NOTICE

DO NOT leave boat unattended when filling the spa with water. The water supply must be shut off manually.

3. Activate the 120 Volt AC Spa Circuit Breaker.
4. The diverter valve under the starboard access panel on top of the spa should be set to allow recirculation. Only turn the valve to the overboard setting when draining. This would send the water out the thru-hull fitting.
5. The panel on the port side controls the recirculation pump and the aerator. The pump recirculates the water. The pump switch also activates the spa water heater.

The aerator regulates the mixture of air and water being supplied to the jets. The OFF position on the aerator does not allow any air to mix with the water.

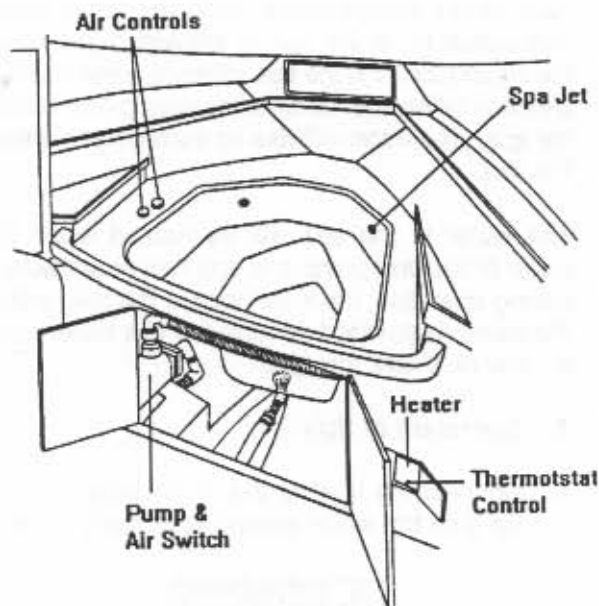


Figure G1: Spa

#### NOTICE

The spa pump must be ON for heating to occur. Make sure the diverter valve is set to divert water for recirculation.

DO NOT operate the pump without water in the spa. The spa's heater will overheat and damage will occur.

6. The spa water heater is located behind the front access panel. To set the water temperature, adjust the heater control clockwise to increase temperature and counterclockwise to reduce temperature. The water used to fill the spa will be cold. The water will take approximately two to six hours to heat.

#### NOTICE

Open a hatch, window, or cabin door when using the spa to provide ventilation in the cabin area. Excessive moisture in the air from spa use must be avoided or interior damage may result.

#### NOTICE

The spa water heater has a limit switch to prevent overheating. If the heater shuts off, push the limit reset button on the back of the unit.

### B. Draining the Spa

1. To drain the spa, make sure the water supply valve on the front panel is in the OFF position.
2. Turn the diverter valve on the starboard side to the OVERBOARD position.
3. Turn the spa water pump ON and the spa will drain in approximately 15 to 20 seconds. The water will be pumped overboard in a steady jet-like flow. When the spa is completely drained, turn the spa water pump OFF.

#### NOTICE

DO NOT allow the spa pump to run dry. Turn the spa pump OFF as soon as all water has been pumped overboard.

4. After pumping the spa water overboard, wipe up residual water remaining in the spa with a sponge or towel. Allowing residual water to remain in the spa can cause odors or mildew to occur.

Winterizing instructions are covered in Section G-8 in this manual. Also, refer to the manufacturer's literature included with this manual.



## G - 6 TRANSOM WASHDOWN

The transom washdown option is available on most Four Winns models. The washdown unit is usually located on the port or starboard side of the transom and has its own protective panel. The water supply system can be used for showering or washdown purposes at the transom. See Figure G2.

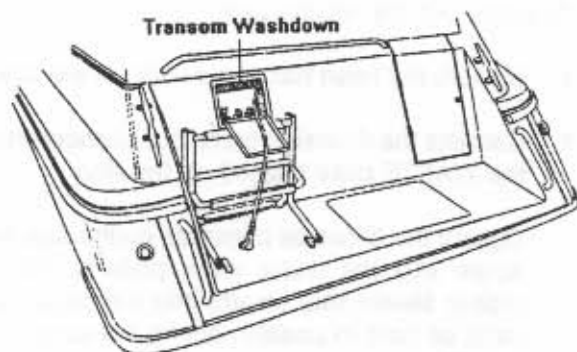


Figure G2: Transom Washdown

As long as there is water pressure, the faucets will operate the shower. A separate washdown is also included for garden hose hook-up.

Fresh water tank capacity is limited. Connect the boat to shore water before using large amounts of water as required when washing the boat down.

## G - 7 HEADS

The various anti-pollution laws presently in effect have necessitated the use and availability of a wide variety of heads. The heads that have been factory installed in Four Winns boats have been chosen to provide reasonable longevity and reliable service, at a realistic cost.

Refer to the manufacturers literature included with this manual.

### A. Manually Operated Head

A manually operated head is equipped with either an integral or separate waste holding tank.

On smaller cruiser models, a portable head is used which has separate water and waste tanks

built into the unit. If equipped with the pump out option, the waste can be removed from the tank at a pumping station. A deck plate fitting labeled WASTE, is provided for this purpose.

With a manual head installation, a separate waste tank is standard equipment. The waste holding tank has a 15 gallon capacity and is located in the engine compartment.

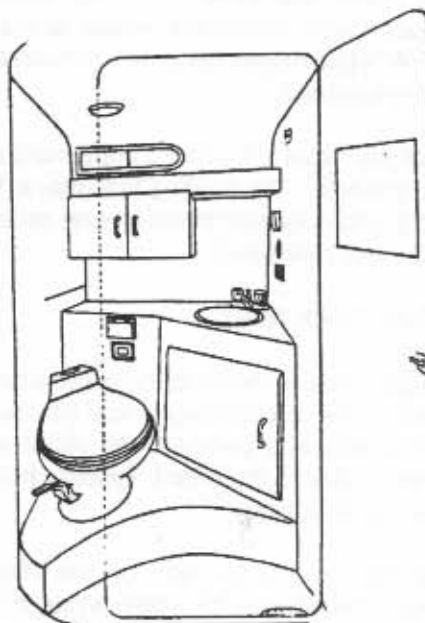


Figure G3: Typical Head Compartment

This type of head obtains rinse water from the fresh water supply tank. The fresh water tank must have water before the heads will operate.

1. Move the wet/dry bowl selector to WET BOWL position. Pump the handle up and down a few times to add some water to the bowl.
2. To flush, make sure selector is in the WET BOWL position and pump the handle until the bowl is thoroughly rinsed and evacuated.
3. After flushing, move selector to DRY BOWL position and pump handle until about one cup of water remains in the bottom of the bowl.

Leave wet/dry bowl selector in DRY BOWL position when not in use.





See the appropriate manufacturer's information included with this manual.

## B. Electric Head

This head is the same as the manually operated head except that an electric motor is provided to perform the pumping action. The toilet is flushed by turning the control knob. The control knob is spring loaded and will return to the OFF position. Water rinses the bowl while the waste pump macerates and pumps the waste to the holding tank. A typical flush cycle is completed in less than ten seconds.

The electric head is standard equipment on larger cruiser models. The holding tank has a 15 gallon capacity and is located in the engine compartment or under the cabin floor.

## C. Vacu-Flush Head

The Vacu-Flush Head system operates on vacuum created by the electro-mechanical devices provided. The waste is pumped into either a holding tank or a SanX treatment system (usually for overboard discharge).

To operate this system, turn ON the Water Pump Breaker, and be sure the water system has been primed. Turn ON the 12 Volt Head System Breaker located on the main cabin panel. Refer to the manufacturer's instructions included with this manual for detailed operating information.

## D. Holding Tank Level Indicator

If the boat is equipped with a remote waste holding tank system, a SanX Level Monitor System is provided. This panel is on the vanity in the head compartment.

This system provides sensors in the holding tank to indicate when the waste reaches a significantly high level, and again when it reaches the tank capacity.

When the waste tank becomes approximately 3/4 full the YELLOW indicator light on the control panel will be activated. The tank should be pumped at this time. If you do not pump the tank, a RED indicator light will come on when the tank becomes completely full. If the tank is empty the

control panel indicators will be inactive. The manufacturer's information is included with this manual if your boat is so equipped.

## E. Dockside Pump-Out

Waste can be removed from the holding tank by taking the boat to a dockside waste pumping station. Most marina fueling facilities provide such services.

To pump out the holding tank:

1. Be sure the head has some water in the bowl.
2. Connect the dockside pump out connection to the WASTE plate located on the deck.

Usually the dockside pump out connection will screw into the waste deck plate or has a rubber sleeve that inserts into the plate and must be held in position during the pump out operation.

3. Have the pumping station operator activate the pumping equipment. The waste will be drawn from the holding tank and into the pumping stations disposal tank.
4. Remove the pump out connection from the deck plate. Add at least 5 gallons (1 gallon on portable units) of clean water to the holding tank through the waste deck fitting using a dockside water hose.
5. Repeat steps 2 & 3 above to pump out the water used in 4 to flush the holding tank.
6. Add waste holding tank treatment chemical available from the dockside pumping station operator to the head bowl. Flush at least twice.



### CAUTION

Be careful when handling and storing treatment chemicals. Not only are they toxic, but they will also stain and damage surrounding surface.



## F. Overboard Waste Disposal

Some boats are specifically ordered with equipment for operating in waters where the discharge of waste into the water is permitted. These boats are equipped with equipment to pump the waste through a valve in the hull into the water. See Figure G5.

Discharging waste overboard is illegal in most U.S. waters today. Discharge is limited to certain coastal waters, a designated distance off-shore. Check with your local boating regulations before proceeding with any discharge activities.

To operate the overboard discharge system:

1. The discharge valve is located in the engine compartment. To open, turn the valve so that the handle is parallel to the flow of the valve.

The waste deck plate cover must be tightened securely for the overboard discharge system to operate.

2. Turn ON the Waste Pump Breaker located on the main cabin panel. Allow the pump to run until the storage tank is empty. The sound of the pump's motor load and speed will change when the tank becomes empty.
3. Turn Waste Pump Breaker OFF.
4. Turn the discharge valve handle to the closed position, and secure it.

The thru hull valve must be closed to prevent water from being forced back into the system.

Some local regulations require overboard discharge systems be physically secured in a closed position during use of the boat in waters designated as 'no discharge' areas. Check with local boating regulations. Refer to the manufacturer's literature for additional information.

## G - 8 SYSTEM MAINTENANCE

Information supplied with water and waste system components by the equipment manufacturers is

included with this manual. Refer to this literature for additional operation and service information.

Be sure the batteries in the boat are properly charged. Operating the pressure pump from a battery with a low charge will result in pump cycling. This could lead to premature pump failure. This can also lead to premature damage of the tank monitor system, electric head or Vacu-Flush equipment.



### WARNING

The decomposition of waste produces a colorless, odorless gas, methane, that is lighter than air, combustible, and extremely lethal. Always provide sufficient ventilation when effecting repairs to the waste system and allow no odor from the waste system to go un-resolved.

## A. Clean Vents and Screens

Periodically remove the vent caps and check the water tank vent(s). Clean the thru-hull vent fitting(s) of any dirt, wax, plastic particles, etc. Always replace the caps after cleaning.

### NOTICE

Failure to keep the water tank vent fittings clean will cause excessive pressure build-up within the tank during filling. This can cause water tank damage.

Periodically remove the filter screens from the faucet discharge spouts and shower head. Remove the accumulation of sediment from the screens. If necessary, clean out the holes using a fine wire. A build-up of debris in the faucet filter screens can create enough restriction to cause the pump to cycle on and off.

Check the in-line water filter/screen for sediment and blockage. It is located between the water tank and the pressure water pump. If obstructed, remove from the water line and either clean or replace the part.

Inspect and clean the shower sump compartment every 30 days. Some water will always be in the compartment. Sediment and other debris will build-up and affect the automatic bilge switch and pump operation. Remove the pump's cover and



clean the screen. The screen will become blocked and the pump will not operate properly. To clean the compartment, use baking soda and a fine wire brush to remove dirt and other debris. This will also serve to disinfect the area. Also, check the automatic bilge switch for proper operation. Refer to the manufacturer's literature for additional information on maintenance and to the locator drawing at the end of Section Q for sump location.

## B. Winterizing the Water System

Winter lay-up service procedures should include a thorough draining of the water system. Disconnect all accessible fittings. Blow out all lines. Be sure the hot water heater, spa, ice maker, water tank, waste tank, transom washdown, pumps and lines are completely dry. Leave all faucets open. Freezing water can cause severe damage to all water system components.

### NOTICE

Always winterize the fresh water system prior to winterization of the hull drainage (bilge pump) system.

Draining the system as mentioned can be very tedious and an incomplete job can result in expensive repairs. The use of non-toxic anti-freeze (such as R.V. anti-freeze) designed for fresh water systems considerably reduces the work necessary and is a more positive means of winterizing the system. Follow the directions included with the anti-freeze solution.

To winterize:

1. Turn on the water pump and drain the water tank by opening a faucet (the pump will run faster when it is empty). The water tanks on some models can be drained by removing withdrawal hose from the tank and allowing water to drain into the bilge.

### NOTICE

Be sure the circuit breaker for the water heater in 120 Volt AC panel is in the OFF position. The water heater will be damaged by supplying electrical power to an empty water heater.

DO NOT run the water pump without water in the system. Pump damage can

result. Be watchful and turn the pump off as soon as the tank becomes empty.

2. Add 15 gallons of R.V. anti-freeze to the water tank (20 gallons on model 365).

The hot water heater will require approximately five gallons of anti-freeze (ten gallons on model 365) before the hot water lines will have anti-freeze running through them. The cold water faucet should be turned OFF at some point to test for anti-freeze in the hot water line.

3. Turn ON all faucets (both hot and cold) until undiluted antifreeze is seen. Make sure the transom washdown, cockpit faucet, toilet, and spa water supply line have anti-freeze coming out.
4. Activate the shower sump pump and pour approximately 1 quart of non-toxic antifreeze down the shower drain. The shower sump will discharge some of the anti-freeze overboard.



### DANGER

Use only non-toxic anti-freeze solutions such as R.V. anti-freeze. DO NOT use ethylene glycol solutions; the type that is used in engine coolant systems. These are toxic.

### NOTICE

Be sure to wipe up any anti-freeze that has been spilled on the fiberglass shower surfaces.

## C. Winterizing the Spa

The spa should have been drained before removing the boat from the water. Due to the complexity of the spa installation and the expense of the spa equipment, winterizing the spa by draining is not recommended. Use non-toxic anti-freeze when winterizing the spa.



 **DANGER**

Use only non-toxic anti-freeze solutions such as R.V. anti-freeze. DO NOT use ethylene glycol solutions; the type that is used in engine coolant systems. These are toxic.

When winterizing the complete water system with anti-freeze, open the spa water supply valve to allow several gallons of anti-freeze into the spa. Turn the diverter valve to the overboard position and turn the recirculating pump ON. When anti-freeze exits the thru-hull fitting, turn OFF the recirculating pump and the spa's water supply valve.

**NOTICE**

Make sure the diverter valve under the access plate is set to the overboard position or water coming from the jets may spray throughout the cabin. This can stain the surrounding upholstery and carpet. As a pre-caution, place the lid on the spa.

To winterize the aerator using non-toxic anti-freeze, attach a funnel to a water jet on one end, plug the middle jet, and add anti-freeze until it exits the other end. The aerator should be winterized only after the spa winterization is completed.

**D. Winterizing the Waste System**

To winterize the waste holding tank, flush the tank with soap, water and a deodorizer (e.g., Lysol Liquid). Empty the tank and pour two (2) gallons (4 gallons if equipped with overboard discharge) of R.V. anti-freeze into the bowl and flush.

If the boat is equipped with overboard discharge capabilities, follow the normal procedures in Section G-7f above. Run the discharge pump only long enough until the anti-freeze solution is being pumped overboard.

If the boat is equipped with a Vacu-flush system, refer to the manufacturer's instructions for winterization procedures.

For additional information, refer to the manufacturer's manuals included with this manual. Also, see Section O on Maintenance.

**NOTICE**

The instructions listed in this section provide a working knowledge to winterize the water and waste systems. However, to prevent possible damage to components in your boat, Four Winns recommends having the boat winterized by your Four Winns dealer.

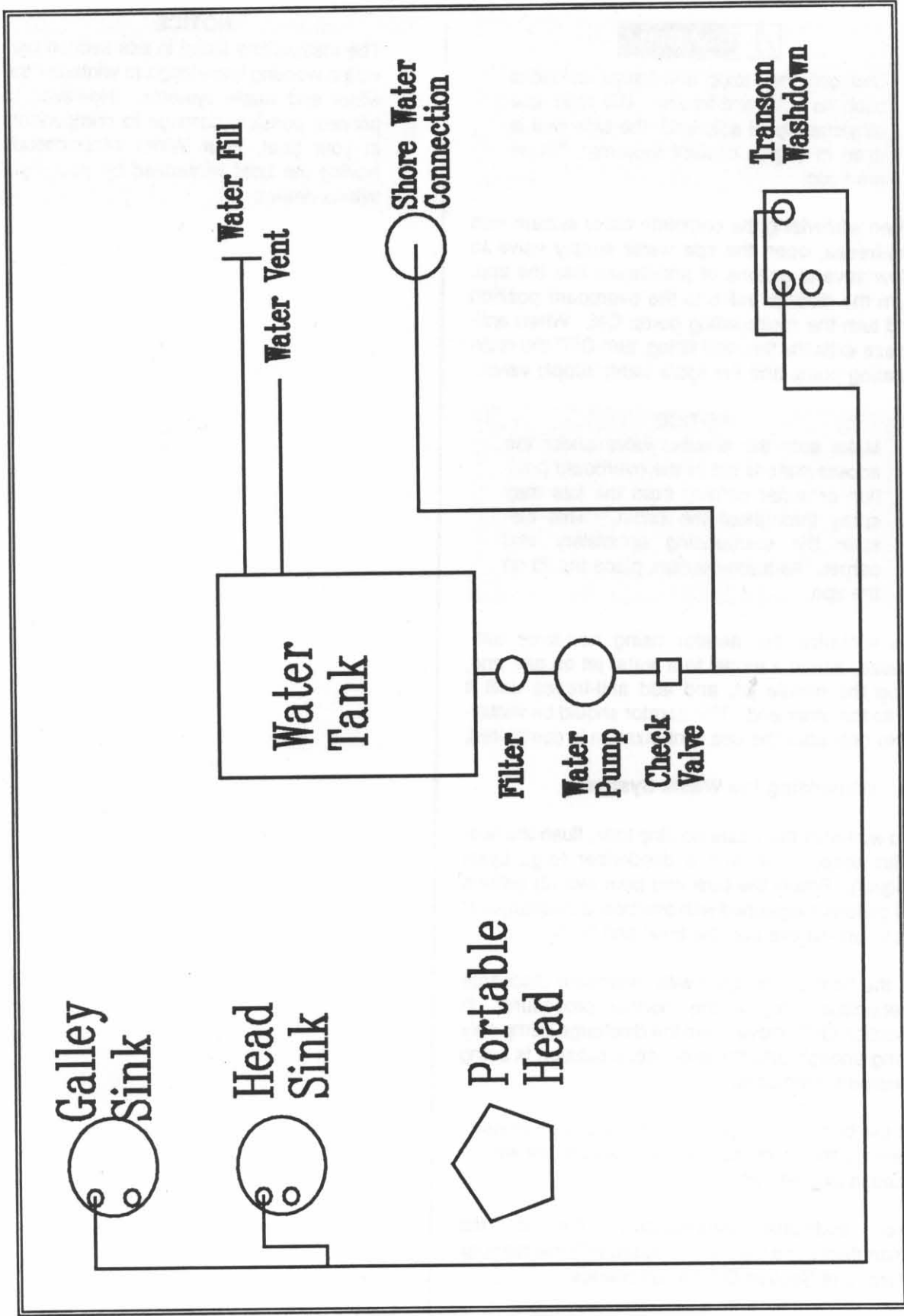


Figure G4: 245, 265 & 275 Cold Water System

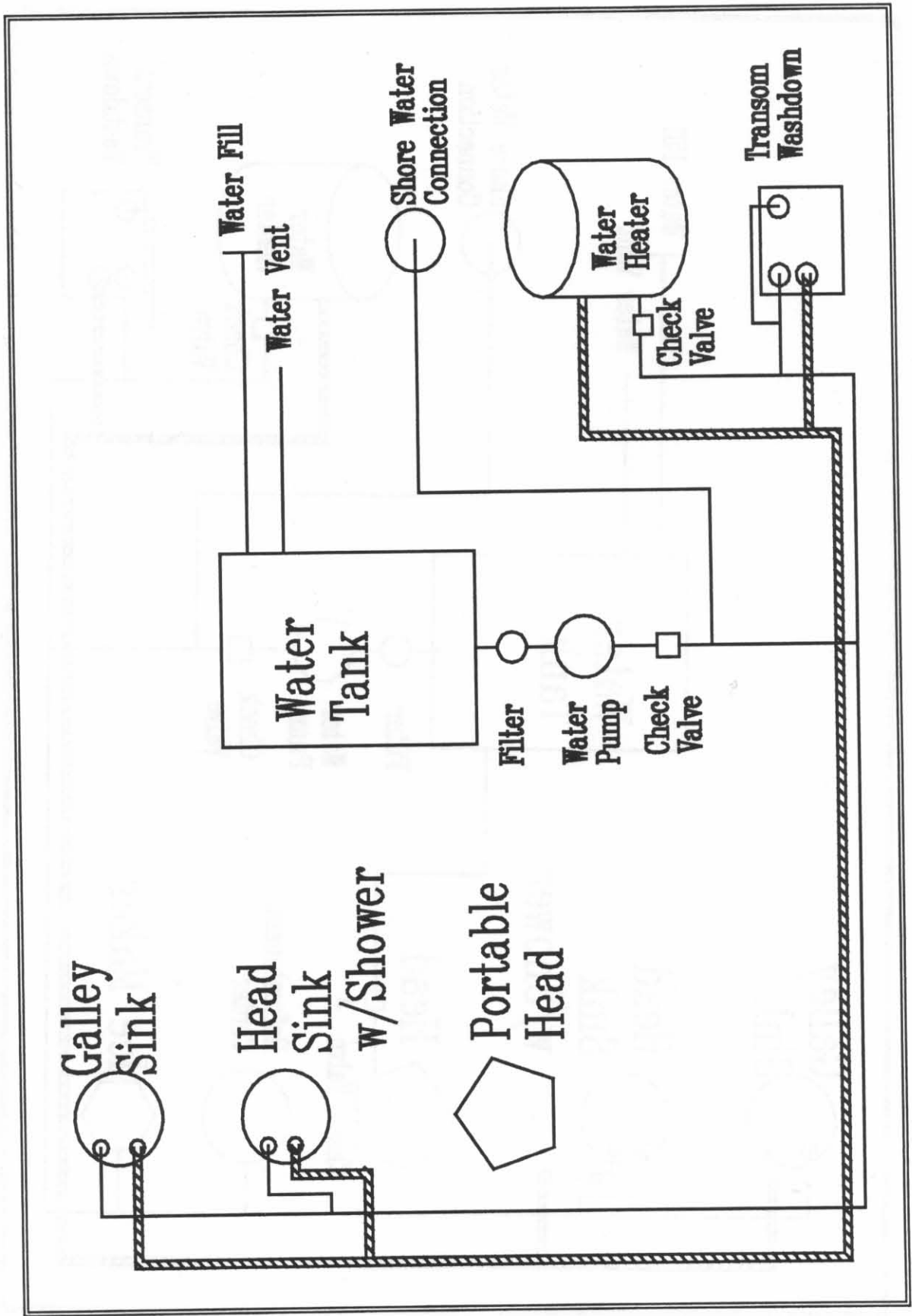


Figure G5: 245, 265 & 275 Hot Water System

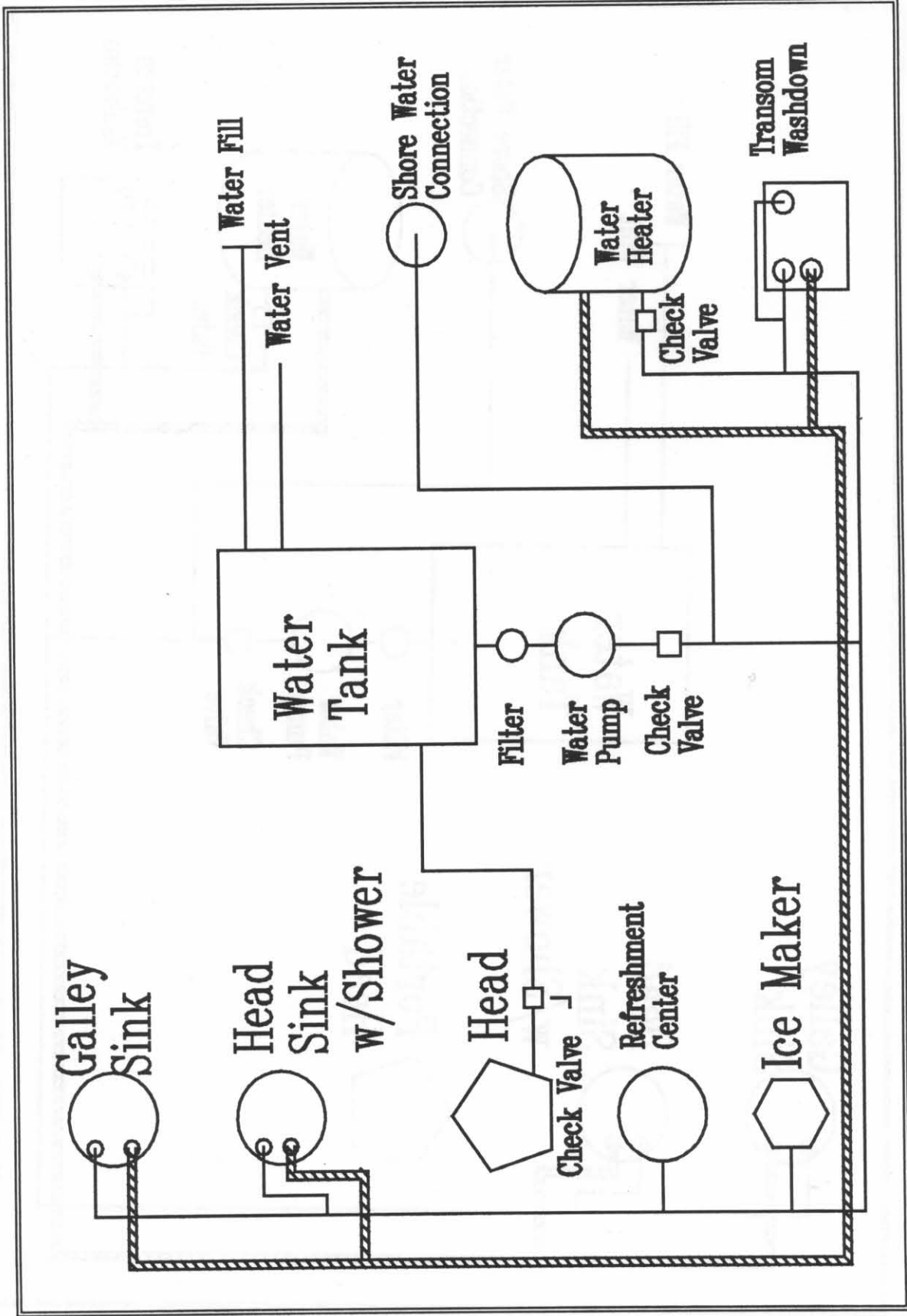


Figure G6: 285, 315 & 325 Water System Diagram

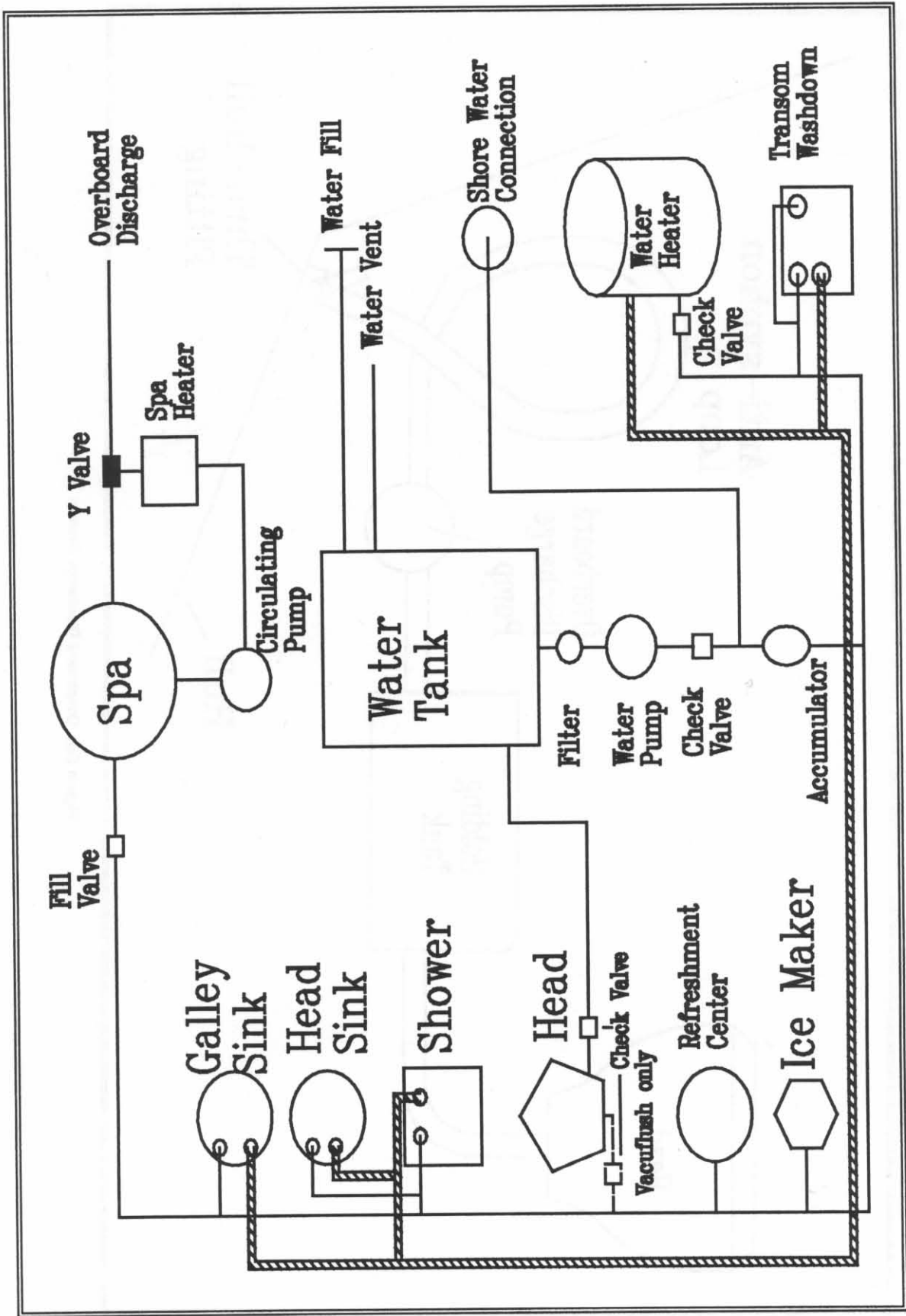


Figure G7: 365 Water System



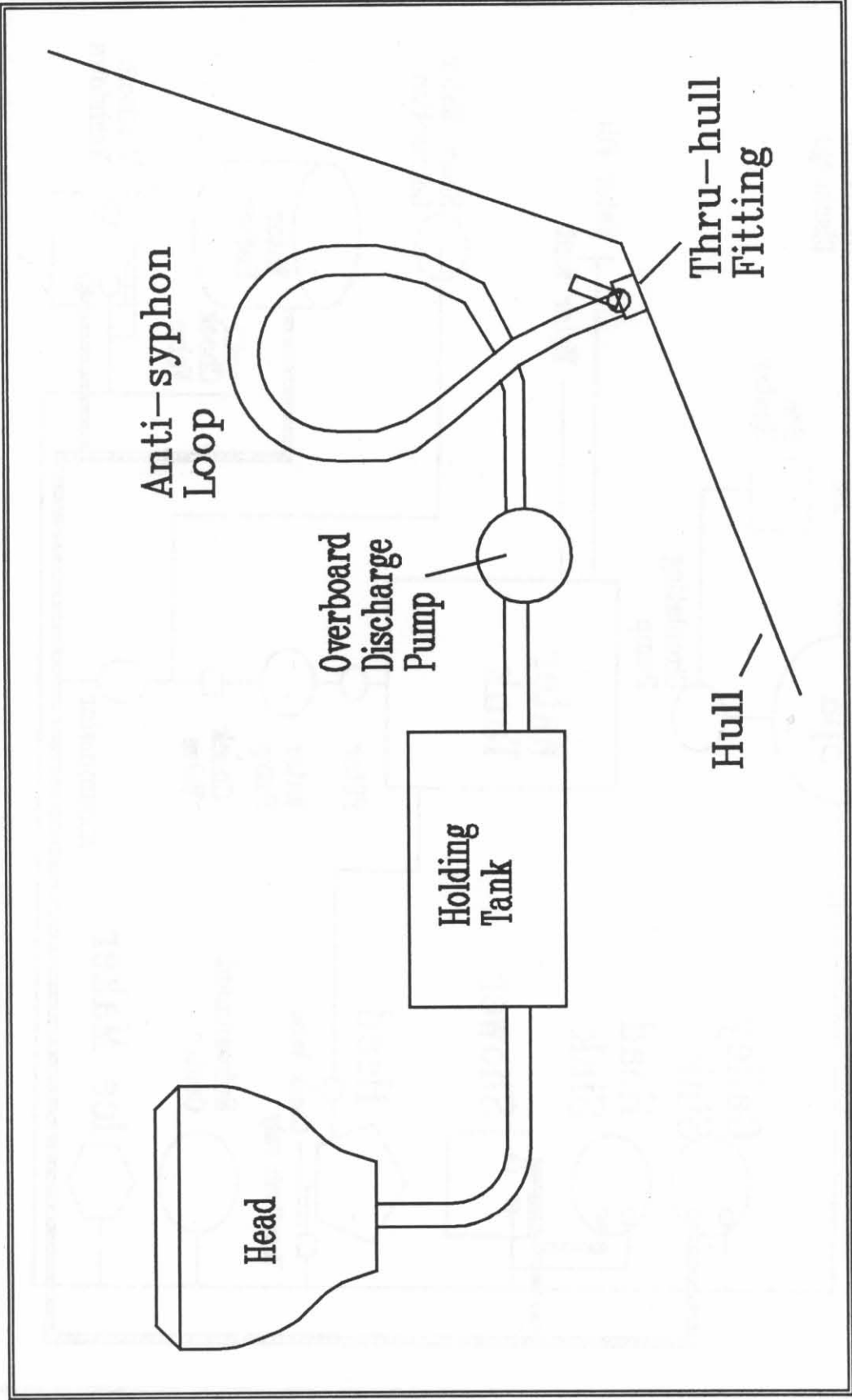


Figure G8: Overboard Discharge System

# VENTILATION AND DRAINAGE SYSTEMS

## H - 1 ENGINE COMPARTMENT VENTILATION

All Four Winns cruisers are equipped with engine compartment ventilation. This system is designed to meet or exceed the requirements (in effect at the time of manufacture) of the U.S. Coast Guard, the National Marine Manufacturers Association, and the American Boat and Yacht Council.

### A. Gravity Ventilation System

This system includes air intake and exhaust components. The exhaust ducting reaches to the lower bilge area. This provides adequate air movement while underway and during bilge blower operation.

### B. Forced Air Ventilation

All Four Winns cruisers are equipped with an electric bilge blower. The bilge blower provides the ventilation required prior to starting the engines and while at idle. See Section E Electrical Systems for blower operation instructions.

#### WARNING

Before starting the engine(s) or generator, operate the engine compartment bilge blower for four (4) minutes. Then check the engine compartment for gasoline vapors. ALWAYS operate the bilge blower while the engines are at idle or the generator is in use. Failure to comply could cause explosion and thereby inflict serious injury.

#### WARNING

Fumes can come from batteries while charging. A concentration of hydrogen fumes can be explosive under the right conditions.

#### NOTICE

The Gas Vapor Detector is a monitor to alert the operator of an accumulation of gasoline fumes in the engine compartment. For more information, see Section

F-1i on the Gas Vapor Detector in this manual.

## C. Engine Ventilation System Maintenance

Periodic inspection and cleaning of the ventilation ducts is necessary to ensure adequate air circulation. A build-up of leaves, twigs, or other debris can severely reduce ventilation. Be sure bilge water does not accumulate to a level that would obstruct the ventilation ducts.

Blower operation can be tested by placing a hand over the vents. DO NOT rely on the sound of the blower. Be sure a substantial amount of air is being exhausted by the bilge blower. Check the bilge blower system often, preferably before each cruise.

Should blower noise and vibration be excessive, loosening the bilge blower mounting screws and then tightening evenly usually reduces noise considerably.

## H - 2 CABIN VENTILATION

Certain cabin side windows on Four Winns boats are designed to slide open to provide adequate cabin ventilation and will have screens provided. Some boats have porthole hatches installed on the hull sides, or in the mid-cabin berth area.

#### WARNING

Failure to properly ventilate the boat while the engines or generator are operating may permit carbon monoxide to accumulate inside of the cabin. Refer to Section B-2 Engine Exhaust and Section H-4 Carbon Monoxide for additional information.

Screens for the forward deck hatches are available for all Four Winns boats. The screens are removable and most are attached by velcro to the hatch or headliner.



### NOTICE

DO NOT close the fore deck hatch with the hatch screen in place. Damage to the screen can result. Be sure deck hatches are secured while underway. Damage to the hatch may result.

In time, the color on certain plastic deck hatch and port hole assemblies may fade or become weathered. The surface oils in the plastic are removed due to exposure. This is normal. The deep, rich color can easily be restored by periodic applications of mineral oil or silicone lubricant.

## H - 3 HULL DRAINAGE SYSTEMS

### A. Transom Drain

A transom drain with plug is provided in the engine compartment to allow water drainage. When boat is out of the water, the boat and cradle should be positioned so any bilge water accumulation during dry storage will flow towards the transom.



### CAUTION

Be sure the drain plug is securely in place prior to launching the boat. Upon shipment of the boat, the drain plug is usually taped to the steering wheel.

### B. Bilge Pumps

Bilge pumps are provided in the bottom of the hull to remove miscellaneous water accumulations that might occur during normal boating or weather conditions. The bilge pumps are controlled by the Bilge Pump Switches on the helm control panel (see Section E for a detailed description of the bilge pump switches and the locator drawing in Section Q Operation for exact location of the bilge pumps).

Some bilge pumps are equipped with automatic switches to control pump operation. As the water level rises, the automatic float switch will activate the pump. A separate circuit breaker is provided to supply power directly from the battery(s) regardless of battery selector switch position.

### NOTICE

While at rest, any bilge water accumulation may flow forward. Therefore, operate the bilge pump(s) shortly after getting underway and while the boat is at a substantial running angle. DO NOT allow bilge water to accumulate. Damage to the engine or other components may result.

When leaving the boat unattended for long periods of time or during excessive rain storms, it is a good idea to check on the boat for excessive water accumulation. Be sure the bilge pump and automatic float switch (if equipped) are operating properly. The operating time of the bilge pump will be limited to the battery capacity.

Periodically, clean the bilge pump strainers. DO NOT allow dirt and debris to clog the bilge pump intakes. Check operation of the bilge pump float switch often to ensure movement of the switch is not restricted by debris, portions of the hull, etc.

Wipe up any oil accumulation in the bilge prior to activation of the bilge pump(s). Pumping oil overboard will pollute the water, and is subject to fine.

After winterization of the fresh water systems, be sure the bilge area, bilge pumps and associated hoses are thoroughly dry. Damage to the hull, bilge pumps and other equipment could occur if water is allowed to freeze in the bilge.

Refer to the manufacturers literature included with this manual for additional information.

### C. Bilge Compartment Drainage

Certain bulkhead areas of Four Winns boats are sealed in accordance with U.S. Coast Guard regulations effective at the date of manufacture. Drainage is provided and water can be removed with the bilge pump(s).

### D. Cockpit Drainage

Most models incorporate a fiberglass self bailing cockpit. This feature minimizes water entry to the bilge or engine compartment areas by providing means for water to be drained overboard.



Periodically open all engine hatches and clean the aft bilge compartment. Be sure the drains, tubes and fittings are clean and free of leaves, dirt, or other debris.

## H - 4 CARBON MONOXIDE

Carbon monoxide accumulation is affected by vessel geometry; hatch, window and door openings; ventilation openings; proximity to other structures; wind direction; vessel speed; and a multitude of other variables. The technical information included in this section is to inform the boat owner of possible cause and effects of carbon monoxide. This information has been reprinted with permission from the American Boat and Yacht Council's (ABYC) technical information report: "Educational Information About Carbon Monoxide". This information pertains to all boats manufactured by Four Winns.

### NOTICE

The boat owner should be aware that other factors may contribute to carbon monoxide accumulation. The most common ones are listed in this section. If a person is exhibiting carbon monoxide-type symptoms (Refer to Section F Symptoms), be sure to take the necessary precautions as prescribed later in this section.

### NOTICE

Boats fueled by diesel have limited carbon monoxide present in the exhaust in comparison to gasoline engine exhaust. However, the boat owner should still be aware of the causes and effects of carbon monoxide which may occur in different boating situations.

### A. Definition of Carbon Monoxide

1. **Carbon Monoxide:** Carbon Monoxide (CO) is a gas formed by the combination of one molecule of carbon and one molecule of oxygen. Chemists refer to it as CO, its chemical formula, "C" for carbon and "O" for oxygen.
2. **COHb:** Carboxyhemoglobin is the molecule formed when Carbon Monoxide combines with blood instead of oxygen.

### B. Properties and Characteristics of Carbon Monoxide

1. Carbon Monoxide is a colorless, odorless and tasteless gas.
2. Its weight is about the same as air so it cannot be expected to rise or fall like some other gases, but will distribute itself throughout the space.

### NOTICE

DO NOT rely on the use of smell or sight of other gases to detect CO, because it diffuses in the air much more rapidly than easily detectable (visible and smellable) gases.

### C. What Makes Carbon Monoxide

Any time a material containing carbon burns such as gasoline, natural gas, oil, propane, coal, or wood, CO is produced.

Common sources of carbon monoxide are:

1. Internal combustion engines.
2. Open flame devices such as:
  - a. Cooking ranges
  - b. Central heating plants
  - c. Space heaters
  - d. Water heaters
  - e. Fireplaces
  - f. Charcoal grills

### D. How a Person Is Affected by Carbon Monoxide

Carbon monoxide is absorbed by the lungs and reacts with blood hemoglobin to form carboxyhemoglobin, which reduces the oxygen carrying capacity of the blood. The result is a lack of oxygen for the tissues with the subsequent tissue death and, if prolonged, death of the individual.

### E. Effects of Carbon Monoxide

Carbon monoxide in high concentrations can be fatal in a matter of minutes. Lower concentrations must not be ignored because the effects of expo-



sure to CO are cumulative and can be just as lethal.

Certain health related problems and age will increase the effects of CO. People who smoke or are exposed to high concentrations of cigarette smoke, consume alcohol or have lung disorders or heart problems, are particularly susceptible to an increase in the effects from CO. However, all occupants' health should be considered. Physical exertion accelerates the rate at which the blood absorbs CO.

### F. Symptoms

One or more of the following symptoms can signal the adverse effect of CO accumulation:

1. Watering and itchy eyes
2. Flushed appearance
3. Throbbing temples
4. Inattentiveness
5. Inability to think coherently
6. Ringing in the ears
7. Tightness across the chest
8. Headache
9. Drowsiness
10. Incoherence
11. Nausea
12. Dizziness
13. Fatigue
14. Vomiting
15. Collapse
16. Convulsions

#### NOTICE

The order of the above list is generally the sequence of appearance of symptoms. However, the order of appearance may change for different people.

#### NOTICE

The symptoms of Carbon monoxide poisoning may easily be mistaken for seasickness.

### G. Treatment (Evacuate, Ventilate, Investigate, Take Corrective Action)

1. Move the person to fresh air.
2. Administer oxygen if available.

3. Contact Medical help.
4. If the victim is not breathing, perform artificial respiration per approved CPR procedures until medical help arrives and takes over.

#### NOTICE

Prompt action can make the difference between life and death.

5. Ventilate area.
6. Investigate source of CO and take corrective action.

### H. Inspection

Look and listen for leaks in the exhaust systems of both the generator and propulsion engine(s). Look for discoloration around joints in the system (water leaks, carbon, stains, etc.).

1. Make sure all exhaust clamps are in place and secured.
2. Make sure ventilation systems work and are not obstructed or restricted.
3. Make sure gaps around the engine room plumbing and cableways and exhaust system doors, hatches, and access panels are minimized to reduce the opportunity for CO to enter the accommodation spaces(s).

### I. Operation

Cold Start vs. Warm Start: CO production is greater while the combustion chamber surfaces and gas passages are cold versus when they are warm. A boat operator should:

1. Pay attention to ventilating the boat,
2. Orient the boat so it will allow the maximum dissipation of CO,
3. Minimize the time spent on getting underway.

### J. Boathouses, Sea Walls and Other Boats

A boat operator should be aware that dangerous concentrations of CO can accumulate when a boat, generator or other engine operated device is



operated while the boat is moored in a confined area such as:

1. Boathouses,
2. Proximity to sea walls, or
3. Proximity to other boats.

Orient the boat for maximum dissipation of the exhaust or DO NOT run the boat or boat equipment for extended periods under these conditions. See Figure H1.



**FIGURE H1: THE EFFECT OF SEA WALLS AND OTHER CONFINED SPACES.**

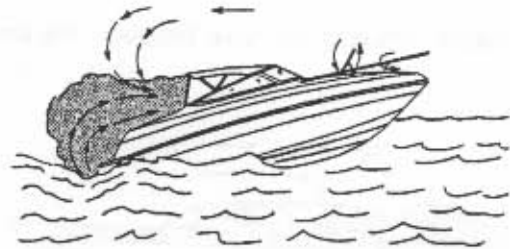
A boat operator should be aware that carbon monoxide is emitted from any boat's exhaust. The operation, mooring, and anchoring in an area containing other boats may be in an atmosphere containing CO not of the operator's making. An operator likewise needs to be aware of the effect of his actions on other boats. Of prime concern is the operation of an auxiliary generator with boats moored along side each other. Be aware of the effect your exhaust may have on other vessels and be aware that the operation of other vessel's equipment may affect the carbon monoxide concentration on your vessel. See Figure H2.



**FIGURE H2: THE EFFECT OF BOATS MOORED ALONG SIDE.**

### K. Backdrafting (Station Wagon Effect)

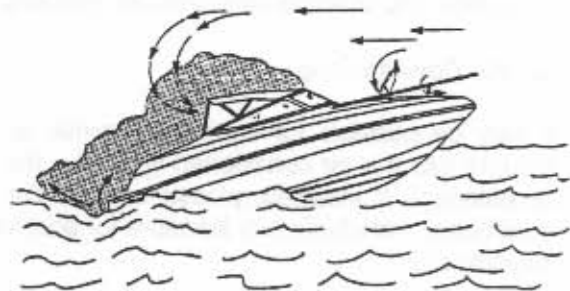
Backdrafting or the "station wagon effect" is caused by air movement over or around a boat creating a low pressure area of suction area around the stern which can increase CO level on the boat. Backdrafting can be affected by relative wind direction, boat speed, and boat trim angle. See Figure H3 Backdrafting - Airflows Over Boat and Behind Transom".



**FIGURE H3: BACKDRAFTING - AIRFLOWS OVER BOAT AND BEHIND TRANSOM.**

Under certain speed and operating conditions the low pressure area may form in other regions and permit carbon monoxide to enter the hull through openings that are not on the back of the vessel. Boat factors which may affect CO concentration:

1. Inefficient trim angle. See Figure H4.



**FIGURE H4: INEFFICIENT TRIM ANGLES.**

2. Excessive or unequally distributed weight.
3. Canvas Configurations - Under various conditions, adding or removing canvas may raise or lower CO levels. See Figures H3, H5 & H6.



- Opening and closing ports, hatches, doors, and windows may raise or lower CO levels on board a boat. See Figures H5 and H6.



FIGURE H5: DESIRED AIR FLOW THROUGH THE BOAT.



FIGURE H6: THE EFFECT OF CANVAS CONFIGURATIONS.

#### L. Cabin Appliances

Boats having fuel burning appliances in accommodation areas should be provided with adequate ventilation and maintained to function properly.

#### M. Air Conditioning

It may be possible for carbon monoxide to be brought into the air conditioned space by the air conditioner. If installed, please refer to the air conditioner manufacturer's literature for additional information.

#### N. Ventilation of Accommodation Spaces

Accommodation spaces need to be ventilated to introduce fresh air into the spaces. Ventilation method; e.g. windows, hatches, doors, and blowers; used to accomplish this may, under certain conditions, bring hazardous levels of CO into the accommodation spaces. Care should be taken to be aware of all prevailing conditions when using these ventilating methods.

#### O. Altitude and Sea Conditions

Changes in altitude greater than 5,000 feet contribute to inefficient engine performance and may require adjustments to the ignition systems, fuel systems, or changing the propeller's size.

- Failure to make adjustments to ignition systems, fuel systems, and propeller size may cause an increase in CO production.
- Heavy sea conditions tend to load engines resulting in reduced performance and thereby increasing their CO production.

#### P. Portable Generator Sets

Gasoline powered portable generator are available in the marine market place and is not an option available through Four Winns. The portable generator will produce CO. These sets discharge their exhaust products in locations which can lead to an increase in the accumulation of carbon monoxide in the accommodation space. This equipment is not recommended for use on Four Winns boats.

#### Q. Maintenance - Engine Performance

Efficient engine performance is vital to minimizing CO production. The following items are those considered to have the greatest effect on increased CO production:

- Fuel Systems - Fuel that is contaminated, stale or incorrect octane number.
  - Dirty or clogged flame arrester.
  - Malfunctioning automatic choke plate or faulty adjustment of manual choke plate.
  - Worn float needle valve and seat.
  - High float level.
  - Incorrect idle mixture adjustment.
  - Dirty or worn injectors.
- Ignition System



- a. Fouled or worn spark plugs.
  - b. Worn points or incorrect gap on points.
  - c. Shorted or opened circuit high tension spark plug cables.
  - d. Incorrect ignition timing.
4. General
- a. Worn piston rings and valves.
  - b. Engine temperature - Cold running engines increase CO production. Engine cooling water system design and selection of thermostat(s) are primary considerations affecting engine operating temperature. Generally, an engine produces less CO if it operates at a relatively high temperature within manufacturer's specifications.
  - c. Exhaust Back-Pressure - Certain alterations to the exhaust system may increase engine exhaust back pressure and CO production.
  - d. Restricted engine room or compartment ventilation.

#### R. Maintenance - External Conditions

External conditions that contribute to inefficient engine performance are:

1. Fouled hull bottom.
2. Damaged and fouled running gear (propeller and trim tabs).
3. Incorrect selection of propeller size.

#### S. CO Detection Systems

Carbon Monoxide (CO) Detectors are optional equipment on the Sundowner models only. This may also be installed by your Four Winns dealer.

#### NOTICE

For information on CO Detection Systems, see American Boat and Yacht Council (ABYC Manual) Section A-24, "Carbon Monoxide Detectors".

Even with the best of boat design and construction plus utmost care in inspection, operation, and maintenance, hazardous levels of CO may still be present in accommodation spaces under certain conditions. Continuing observation of passengers for symptoms of CO intoxication can be supplemented by an alarm type CO detection device in the accommodation space.

Current CO detector technology can be broken down into three major categories: single-point, multi-point, and fully-integrated; the difference being the degree to which each type of unit considers exposure time.

1. Single-point Detection: The single-point detector will sound the alarm whenever the detector senses that a single pre-set PPM (Parts Per Million) level of CO has been exceeded.
2. Multi-point Detection: The multi-point detector alarm will sound at a number of selected CO levels. The multi-point detector may include several different measuring time periods with their corresponding different PPM CO level alarm settings.
3. Fully-integrated Detection: The fully-integrated detector will sound an alarm to any combination of PPM CO level and exposure time that would cause a health hazard.

Detection devices should meet the requirements of ABYC A-24 "Carbon Monoxide Detection Systems on Boats".





# INTERIOR EQUIPMENT

## I - 1 GALLEY EQUIPMENT

### CAUTION

Care must be exercised while around stoves and other appliances. Keep children away from burners.

### A. Alcohol Stove

Alcohol stoves are available on smaller cruiser models. If equipped, see the manufacturer's literature included with this manual.

### WARNING

Be careful while lighting and operating your alcohol stove. Flare-up during ignition can result. Use denatured alcohol only.

### WARNING

To prevent skin burns, be sure the stove is off before closing the lid. Be sure the stove cools totally before storing.

### B. Electric Stove

Electric stoves are standard on larger cruiser models. The stoves will be equipped with either a single or dual burners. A circuit breaker is provided in the 120 Volt AC cabin electrical panel. If equipped, refer to the Section E and the manufacturer's literature included with this manual. See Figures I1 and I2 for stove and other appliance locations.

### C. Microwave Oven

A microwave oven is available as an option on all models. A circuit breaker is provided in the 120 Volt AC cabin electrical panel. If equipped, refer to the manufacturer's literature provided with this manual.

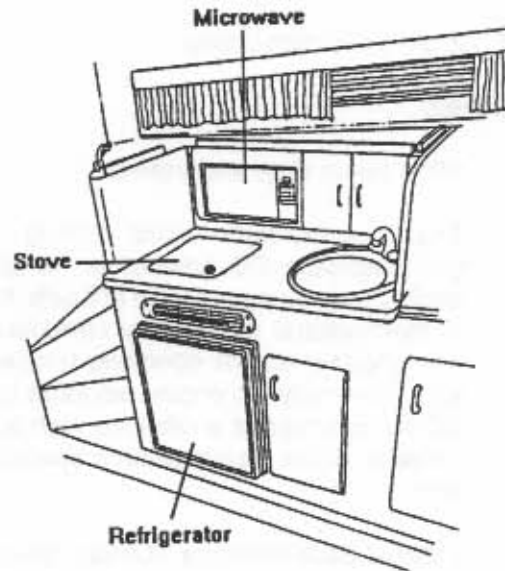


Figure I1: Typical Galley

### D. Galley Blender

The flush-mounted galley blender is available as an option only on the model 365. The power unit is mounted below the galley surface. A circuit breaker is provided in the 120 Volt AC cabin electrical panel. Additional food processing attachments may be ordered from the manufacturer. If equipped, refer to Section E and the manufacturer's literature included with this manual.

### E. Coffee Maker

Coffee Makers are optional on the model 365 only. A circuit breaker is provided in the 120 Volt AC cabin electrical panel. If equipped, refer to Section E and the manufacturer's literature included with this manual.

## I - 2 ICE BOX

The ice box is standard on smaller cruiser models. The ice box functions similar to a portable cooler. Adding ice (preferably block ice) will keep food

cold for a long period of time. The excess water from the melting ice will drain overboard.

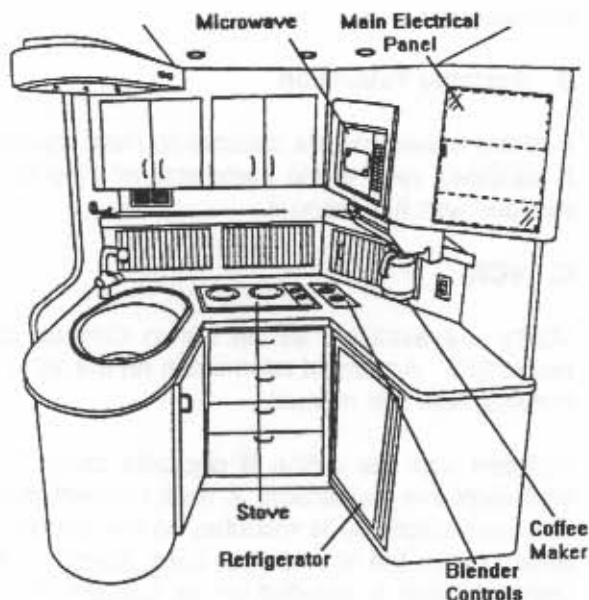


Figure 12: Model 365 Galley

### 1 - 3 REFRIGERATOR

Dual voltage refrigerators are standard equipment on most models. The refrigerator will operate on 120 volt (220 volts on 50 Hertz models) AC power while the boat is connected to dockside power. The refrigerator will automatically transfer to 12 volt operation when dockside power is not available.

Though the refrigerator operates on both voltages, it is much more efficient on 120 volt (220 volt on 50 Hertz models) power. The refrigerator will cool more slowly on 12 volt power. Making ice cubes may be difficult on a warm day unless the unit is operated first on 120 volts to reduce the temperature. Whenever possible, use 120 volt power to initially cool the refrigerator.

Care should be exercised while operating the refrigerator on the 12 volt system. The refrigerator requires a substantial amount of current. Excessive current draw can severely drain a battery through extended use. When a refrigerator is installed, dual batteries and a battery selector switch are recommended.

A magnetic catch is used on certain refrigerators. This latch must be properly adjusted to obtain adequate sealing of the door when closed. Also, make sure retaining pin is in place to secure refrigerator door.

#### NOTICE

Before installing a shore power battery charger, refer to Section E on Electrical Systems and the refrigerator owner's manual. Damage to the refrigerator may occur from improper installation.

### 1 - 4 ICEMAKER

The icemaker is available as an option on most models. The icemaker is mounted in the cockpit. See Figure 13.

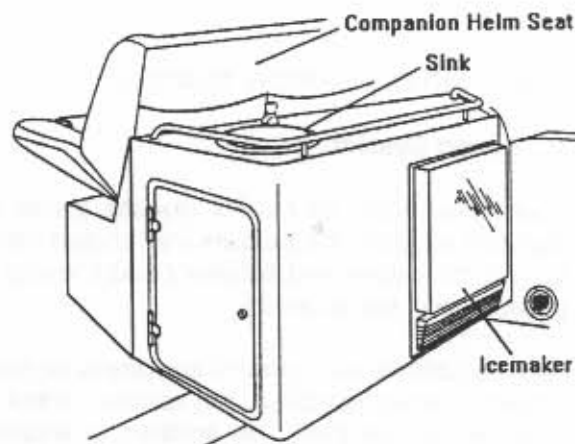


Figure 13: Icemaker & Cockpit Sink

Remember, the icemaker operates on 120 volt (220 volt on 50 Hertz models) AC power. The icemaker will only operate when plugged into dockside power or when the generator is running. The icemaker is controlled by the Icemaker Circuit Breaker on the main cabin electrical panel. Refer to Section E on Electrical Systems for more information.

To operate, make sure the unit is plugged in and the main water supply is on. Turn on the switch located behind the front grill. The first ice cubes may take approximately 45 minutes to be made.

To winterize, unplug the unit and follow the normal cleaning and maintenance instructions included in



the manufacturer's manual to drain the system. For instructions on winterizing with anti-freeze, refer to Section G-8 on Water System Maintenance in this manual.

**CAUTION**

Thoroughly flush the water supply lines and system prior to initial use, and at least once each season. This will remove any additives and possible contaminants present in the system.

The materials from which the components of the water system are made may give the water supply a peculiar taste, especially when new. This condition is normal and can be reduced substantially by adding a water filter to the system such as one produced by Ametek, Inc. The taste will completely dissipate in time.

**I - 5 ENTERTAINMENT CENTER**

**A. Stereo System**

Four Winns offers an AM/FM cassette stereo as standard equipment. Speakers are installed within the interior cabins and exterior cockpit areas to provide good sound quality.

Remote controls are standard equipment on most models. When equipped, the remote control is mounted on the dash. In addition, a wireless remote may be available on the 365.

Stereos include programming options. With the push of a button, the stereo will automatically program radio stations. The strongest signals will be picked up but will not necessarily be in order. If equipped with the Clarion stereo, up to 18 stations can be programmed. To determine how to program, refer to the stereo literature included with your owner's packet.

On the model 365, a switch is provided to allow the television sound to run through the stereo speakers. The switch must be in the "T.V. Speaker" position for this to occur.

On 1993 models, the stereo does not need to be "ON" for the television sound to be heard through the speakers. In addition, the cabin and cockpit

speakers are separate. If the stereo and television are "ON", the cockpit speakers will carry the stereo sound only (with the switch in the "T.V. Speaker" position).

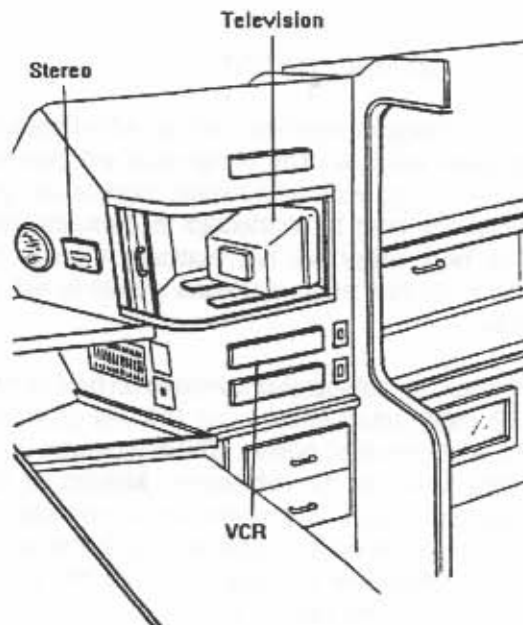
**B. Portable Television**

Portable televisions are optional on most models. If equipped, refer to the manufacturer's literature included with this manual.

**C. VCR**

VCR's are available as an option only on the model 365. Additional information on the VCR is included with this manual.

Included with this option is dockside cable T.V. and telephone connection. A deck connection for T.V. and telephone is mounted on the starboard deck next to the shorepower deck fittings. The telephone jack is installed on the forward side of the entertainment center (phone not included).



**Figure 4: Entertainment Center**



## D. Power Antenna

The power antenna is an omni-directional T.V. - F.M. antenna and is available as an option on some of the models. The antenna is mounted on the radar arch and is activated by a circuit breaker located on the main cabin panel. If equipped, refer to the manufacturer's literature included with this manual.

## I - 6 AIR CONDITIONING

Air conditioning is available on most models and this unit operates on 120 volt (220 volt on 50 hertz models) AC power. Dual dockside is required with air conditioning. Be sure the appropriate shore power cord is connected or generator running whenever the air conditioning is to be used.

The Air Conditioning breaker must be turned on to activate the air conditioning unit(s). Depending upon humidity, the air conditioner will condense 5 to 15 gallons of water a day and this water drains into the sump pump. Make sure the Sump Pump Breaker (or Forward Bilge) is in the ON position for proper drainage.

Air conditioner vents are located throughout the cabin to provide good air circulation. Some models may have a vent in the head for additional air circulation. The vents are adjustable to change air flow direction and can be closed. Refer to Table I for air conditioner locations and output in BTU's for each model.

The air conditioning controls are located in various areas of the boat and can be affected by installation of options. See Table II for approximate location of the controls.

### NOTICE

Most air conditioners utilize surface water as the cooling medium. Prior to using the air conditioning, the boat must be in the water and the seacock to the air conditioning water intake must be in the open position. The air conditioning seacock for water intake is in the engine compartment or below the aft cabin access panel. Operating air conditioners without proper cooling water will cause damage to the air conditioning system.

Table I: Air Conditioner Location

MODEL	# BTU'S	UNIT LOCATION
245		Not Available
265	7,000	Under Cabin Steps
275	7,000	Port Mid Cabin
285	9,000	Under V-berth
315	12,000	Under V-berth
325	12,000	Under V-berth
365	6,000 16,000	Under Galley & Stbd Mid Cabin

Air conditioners utilized in Four Winns boats are equipped with reverse cycle heat. Thus, some heat effect can be derived from the unit. The amount of heat that can be obtained is limited by the temperature of the raw cooling water pumped through the system. When the water temperature drops to 40 degrees Fahrenheit, the output is about 50% of the maximum. At 36 degrees Fahrenheit, the output is very low. During cold conditions, an alternate or supplemental heating system should be used.

Table II: A/C Control Location

MODEL	CONTROL LOCATION
265	Galley, Above Sink
275	Aft Cabin, Port Front
285	Aft of Head, Port Side
315	Starboard Closet, Aft of V-berth
325	Starboard Closet, Aft of V-berth
365	Starboard Closet, Aft of V-berth & Aft Cabin Starboard Side Wall

Clean the sea water strainer often. Also, clean the return air filter screens, located behind the louvered doors and grills, at least once a month. Please refer to the locator drawing at the end of Section Q Operation for location of the sea water strainer and other equipment.

To winterize, refer to the manufacturer's literature included with this manual.



# EXTERIOR AND SAFETY EQUIPMENT

## J - 1 RAILS & DECK HARDWARE

Hand rails have been installed to provide security for passengers in the cockpit. Limiting passenger movement while underway is recommended. All those on board should be safely seated whenever possible. Additional care must be taken when in rough seas or foul weather. Access to the foredeck should be through the foredeck hatch when running in adverse conditions.

The rail system and hardware fittings have been selected and installed to perform specific functions. Fenders or mooring lines should not be secured to the rails or stanchions. Be certain that a clear lead exists when running dock lines or an anchor line. A line inadvertently threaded around a stanchion or over the rail could cause damage.

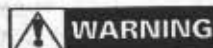
The majority of the hardware installed is made of stainless steel. Regardless of the type of hardware used, periodic maintenance is necessary.

Cleaning the hardware with a non-abrasive cleaner will help keep the original shine and beauty. Stainless steel hardware, while quite durable, can become superficially rusted. This can be controlled by cleaning the fittings and applying a coat of wax. Any future rusting can be easily removed by polishing and re-waxing.

### NOTICE

All fittings must be periodically inspected for loosening, wear, and damage. Problems should be corrected immediately!

The cleats that have been installed are specifically designed and are intended to be used as mooring cleats. Their purpose is for securing the vessel to a dock, pier, mooring, or anchor.



### WARNING

Four Winns Boats are not equipped with any hardware designed for towing purposes. The mooring cleats that are installed on the boat are not to be used for towing another vessel or having the boat towed. Refer to Section Q Operation for addition-

al precautions regarding grounding and towing.

## J - 2 TRANSOM DOOR

Transom doors are provided on all models. The transom door allows access from the swim platform to the cockpit. A slide bolt is used to secure the transom door.



### WARNING

To prevent a possible man overboard situation, make sure the transom door is secure before each cruise.

The transom door will be comprised of star board, fiberglass, or aluminum. The fiberglass and aluminum transom doors will include a storage compartment and plexiglass insert.



### CAUTION

DO NOT sit on or lean against the transom door. This is unsafe and may damage the hinges and door.

### NOTICE

The transom door plexiglass insert has a plastic catch. Before closing the transom door, make sure the insert is secure or it may become damaged.

## J - 3 COMPANIONWAY DOOR

The companionway door is comprised of plexiglass on all models. Smaller cruiser model companionways consist of a lid and bi-fold doors or sometimes referred to as a bell hatch. A strap or velcro snap is provided to secure the door in the open position. See Figure J1.

### NOTICE

The door must be closed before sliding the hatch or hatch damage may occur.

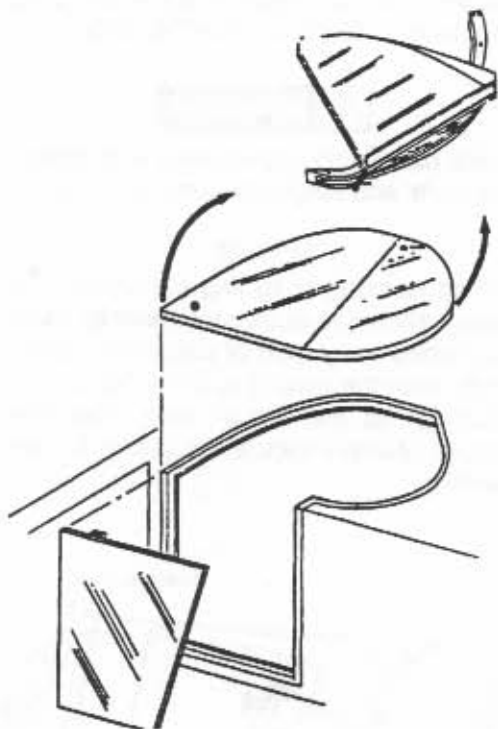


Figure J1: Bell Hatch

The larger models have a one-piece sliding companionway door on a track. See Figure J2. A drop pin secures the door in the open position.

**NOTICE**

To prevent damage to the companionway track, the companionway door and hatch must be moved slowly and carefully during use.

Locks are provided to secure the cabin. Plexiglass will break. Always secure the hatch and door before operating the boat.

**J - 4 WINDOWS**

**A. Windshields and Cabin Windows**

The windshield and cabin windows on all Four Winns boats consist of tempered safety glass or plexiglass. The windshield frame is aluminum.

A walk-thru option is available on one of the models. A step is provided between the companionway and helm station to allow easy access through the walk-thru windshield opening.

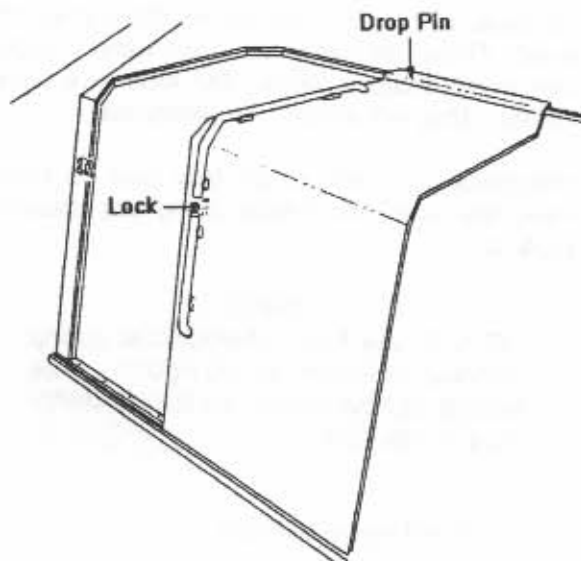


Figure J2: Sliding Companionway Door

**WARNING**

DO NOT use walk-thru during bad weather or on rough seas. Make sure deck hatch is closed when using walk-thru to prevent injury.

**NOTICE**

Make sure walk-thru is closed and secured when boating. Damage to the windshield will otherwise result.

Windshields of tempered glass can be cleaned with automotive glass cleaners or dishwashing soap and water. See the following section for information on the care of plexiglass.

Aluminum can be cleaned with similar products or with non-abrasive cleaners such as Fantastic.

**NOTICE**

Read the label before using any product. DO NOT use abrasive cleaners.

**B. Plexiglass**

Plexiglass is used for port holes, companionway assemblies, sliding storage doors, electrical panel doors, cabinets, and some windshield, or cabin windows. Plexiglass will scratch easily and must be handled with care.

To clean, wash gently with dishwashing soap and water. Rinse thoroughly with clean water. To dry, use a soft chamois cloth. DO NOT use paper towels. They will scratch the plexiglass.

Plexiglass or plastic polish may also be used. Read the label first before using any cleaning product.

#### NOTICE

DO NOT use harsh chemicals or strong cleaning solutions on plexiglass. The surface can be etched, scratched, disfigured, or clouded.

### J - 5 FOREDECK HATCH

Foredeck hatches consisting of plastic (or plexiglass) are provided on all Cruiser models. The hatch is supported by one arm and can be secured in a partially open position for ventilation (on current models only). Hatch screens are optional on all models.

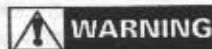
#### NOTICE

DO NOT close the foredeck hatch with the hatch screen in place. Damage to the screen can result. Be sure deck hatches are secured while underway. Damage to the hatch may result.

### J - 6 SWIM PLATFORM

Four Winns provides an integrated fiberglass swim platform on all models. For better footing, a non-skid surface is provided. The ladder and hand rails are located for easy access when boarding. See Figure J3.

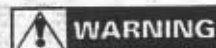
Teak swim platform inserts are optional on most models and can be installed by your Four Winns dealer. The teak platform inserts improve footing and accent the stern of the boat. For information on maintaining teak, refer to Section N-1 on Teak care & maintenance in this manual.



#### WARNING

To prevent personal injury, DO NOT use the boarding ladder or swim platform while the engines are operating or the boat is in

motion. Engines must be off when using the swim platform or boarding ladder.



#### WARNING

Keep hands and fingers away from ladder supports and hinges to prevent injury.

#### NOTICE

When lowering or raising the ladder, the stern drives (on applicable models) must be turned away (port or starboard depending upon the model) to clear the ladder. Damage to the ladder may otherwise result. Always secure the ladder before boating.

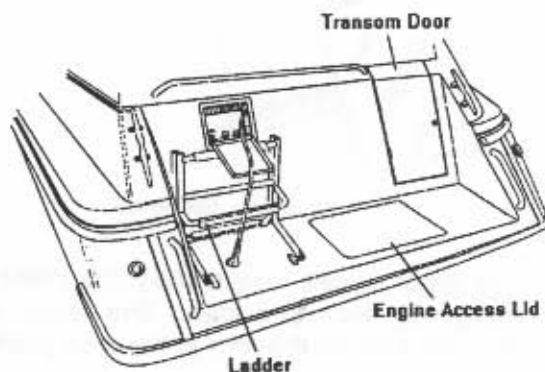


Figure J3: Transom Door & Engine Access Lid

### J - 7 COCKPIT STORAGE

Storage compartments are provided throughout the cockpit area. Batteries are stored behind a folding-style door used on the model 365. See Figure J4.

Plexiglass sliders are installed in some models. Several types of plexiglass (white and smoked color) doors are used in the cockpit. Doors with latches are also common in most models. These have roller-type catches for easy opening and closing. Storage space or shelves behind the doors are easily accessible. Refer to Figure J5.

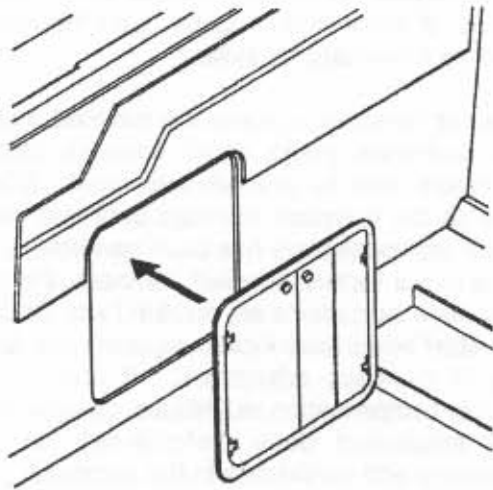


Figure J4: Battery Storage Compartment

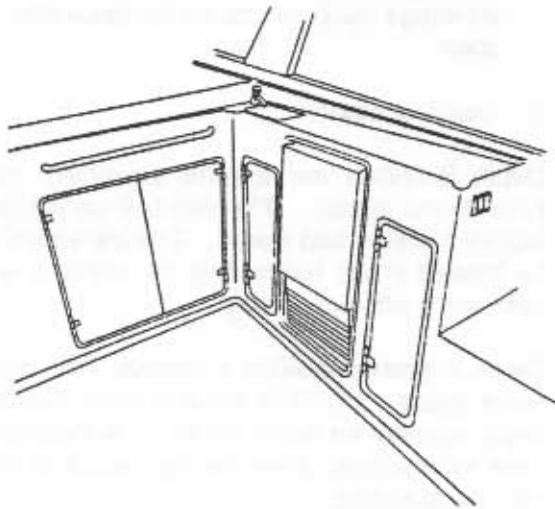


Figure J5: Storage Compartment Doors

## J - 8 STORAGE LOCKERS

Fiberglass storage lockers are also provided on some models. On the model 365, bumpers can be stored in the lockers on the forward deck. Optional storage lockers can be installed at the transom. See Figure J6.

In addition, a fiberglass lid on the swim platform provides storage and access to the engine compartment on inboard models. Refer to Figure J3 on the previous page.

Most storage lockers are latched closed. To open, lift the handle and turn. The latches are flush mounted to prevent injury or accidental opening while underway.

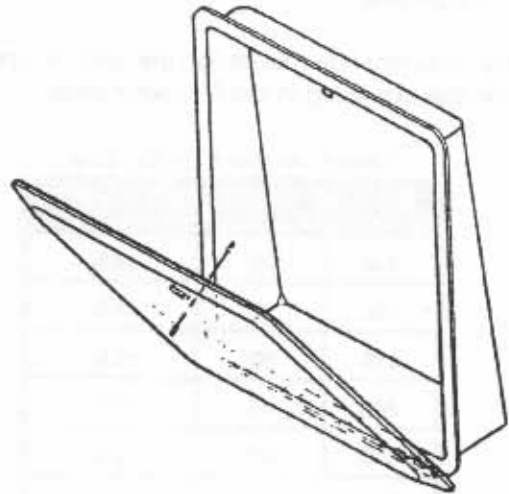


Figure J6: Storage Locker Option

## J - 9 BOW PULPIT

The Four Winns bow pulpit is designed to be functional while anchoring. Most "Danforth" style anchors can be stored on the platform. See Figure J7 below.

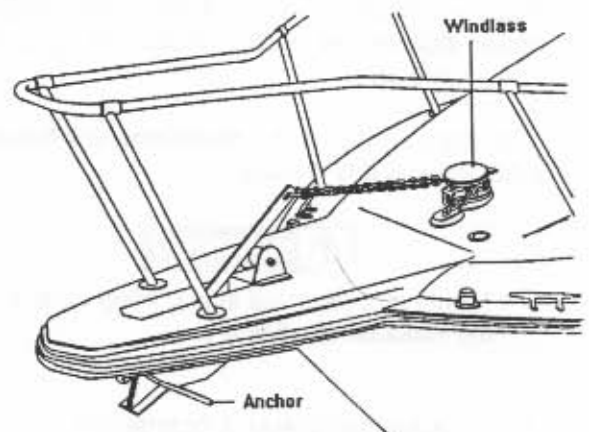


Figure J7: Bow Pulpit





# UPHOLSTERY

## K - 1 INTERIOR SEATING

### A. Cabin Tables

Table bases are "flush" mounted for convenience. Table legs are removable for easy storage. Rotating the leg while lifting will ease the removal. The tables are usually stored in the mid-cabin.

Some tables are used for both the dinette and cockpit area. A small cocktail table accommodates ease of passenger movement through the cabin and can be used in the cockpit. A larger dinette table top may be barrel bolted to the cocktail table (on some models).

### B. V-berth Filler Cushions

Four Winns provides a filler cushion for the v-berth area. This filler cushion drops into place or is supported by cross support(s). Additional berth area is created with the use of the filler cushion. When removed, accessibility to surrounding compartments is usually good. See Figure K1.

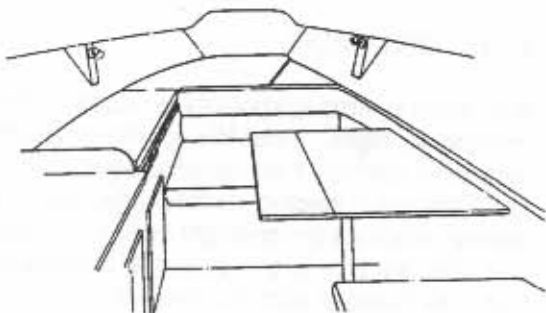


Figure K1: Typical V-Berth



To prevent personal injury, be sure the v-berth filler cushion is securely installed before use.

Storage is provided under the v-berth on most models. These areas are easily accessible under the cushions or under carpeted panels.

### C. Dinette and Mid-Cabin Berths

Dinettes and mid cabin berths are provided on most models. These areas can usually be converted into large sleeping areas by the use of filler cushion(s). Cross supports or cabin table (on certain models) will be used to support filler cushions. See Figures K2 & K3.

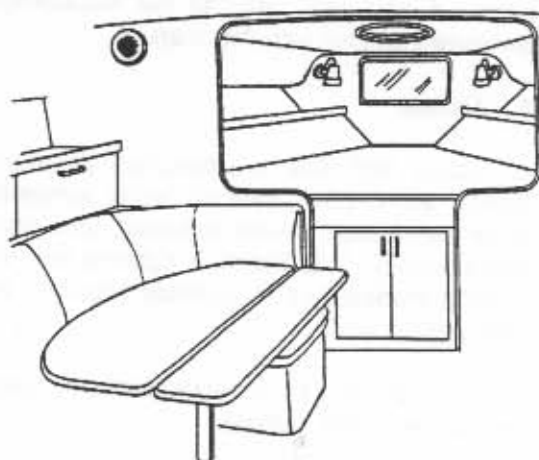


Figure K2: Dinette Seating/Berth

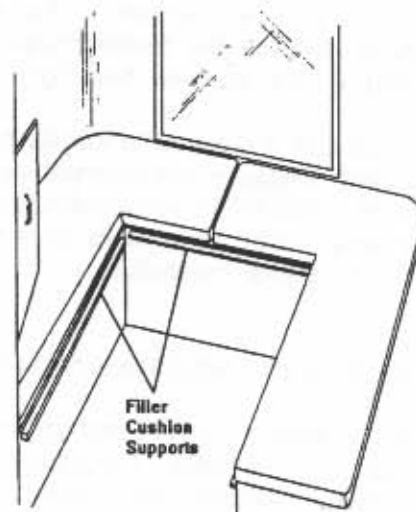


Figure K3: Mid Cabin Berth

**CAUTION**

To prevent personal injury, be sure the dinette or mid cabin filler cushion(s) are secure before use.

Storage is provided below the dinette cushions. Also, access lids are installed below mid cabin cushions on certain models for servicing plumbing and other equipment.

## K - 2 EXTERIOR SEATING

### A. Bucket Seat

The bucket seat or captain's chair has lumbar supports and will swivel. To swivel, locate the knob below the seat and loosen by turning counterclockwise. Then lift on the chair before rotating. In addition, **DO NOT USE FORCE** to rotate the chair. To prevent upholstery damage, be sure the seat is not hitting the coaming pad or any other objects before adjusting. See Figures K3 & K4.



Figure K4: Bucket Seat

The bucket seat is adjustable. Lift the lever below the seat and slide the seat forward or aft to the

desired position. The seat will adjust a total of six (6) inches.

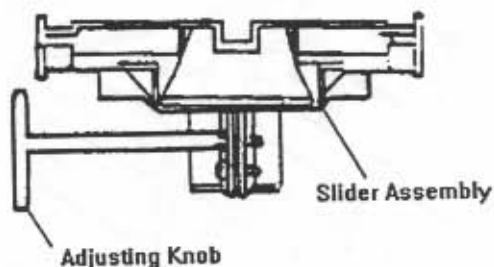


Figure K5: Bucket Seat Base

**WARNING**

**DO NOT** sit on the backrest portion of any cockpit seat. The helmsman could lose control of the boat or passengers could be thrown from the boat. The seat could also be damaged if excessive force is applied.

### B. Companion Helm Seat

Companion helm seats are available on most models. Three different types are available. On the smaller cruisers, the companion (or convertible) helm seat's backrest can be adjusted forward or aft. This allows seating in either the forward or aft position. Storage is provided below the cushions. See Figure K6.

To slide the seat forward or back, a tee-handle is located between the seat base and coaming pad. Turn the handle to loosen, and slide the seat to the desired position.

**CAUTION**

To prevent injury, be sure to tighten the tee-handle back down after adjustment.

On the larger models, the companion helm seat is built into the cockpit galley (wet bar assembly). A mechanical slider is mounted under the seat. To adjust, lift the lever below the seat and slide the seat forward or aft to the desired position (approximately six inches of adjustment). See Figure K7.

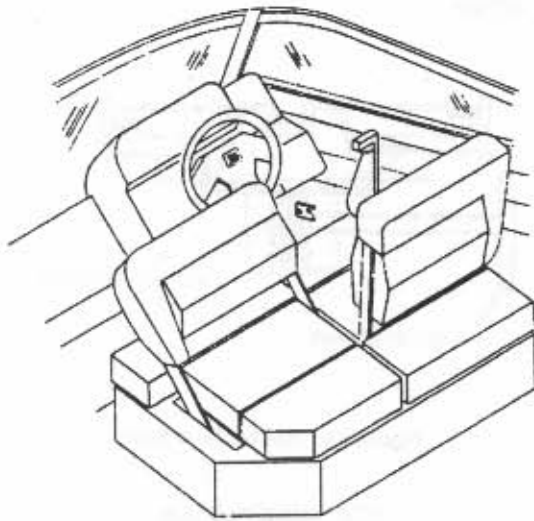


Figure K6: Convertible Helm Seat

A companion helm seat can also be installed on the port side of the cockpit. This seat can be rotated 180°. To rotate, push the lever below the seat downward and turn the seat.

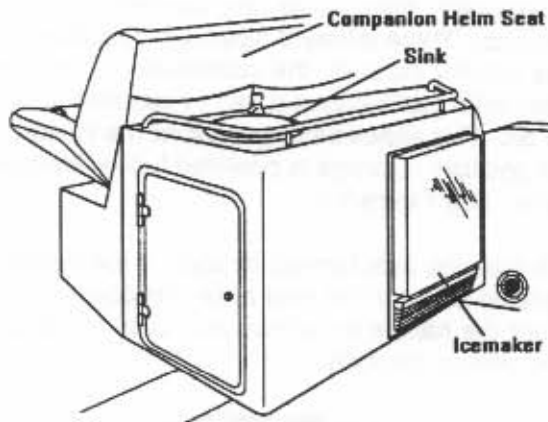


Figure K7: Companion Helm Seat/Wet Bar Assy.

Storage is provided behind the plexi-glass doors under the companion helm seats.

### C. L-Shaped Lounge

L-Shaped Lounge seating is available on some models and will rotate 180°. To rotate, push the lever below the seat downward and turn the seat. See Figure K8.

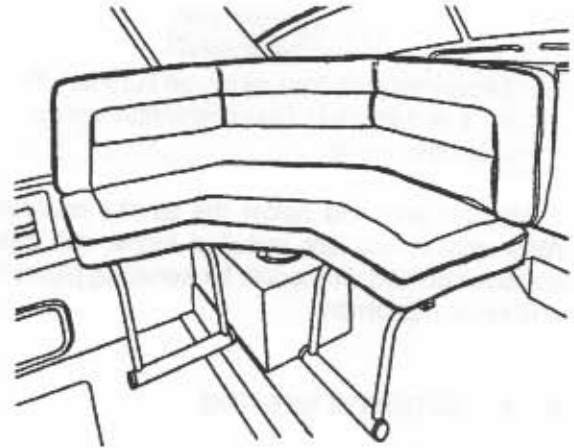


Figure K8: L-Shaped Lounge

Storage is provided under the lounge on some models. This area is easily accessible by removing the vinyl (snapped) curtain.

### ⚠ WARNING

DO NOT sit on the backrest portion of any cockpit seat. The helmsman could lose control of the boat or passengers could be thrown from the boat. The seat could also be damaged if excessive force is applied.

### D. Stern Lounge

The stern lounge includes support legs or fiberglass base. The seating arrangement continues around the back of the boat to create more usable seating area. Fill-in cushions are also available to extend the cushion or seating area on certain models. Refer to Figure K9.

On some models, the center or main seat cushion folds up against the transom to allow for more floor space. Some cushions can be removed. Make sure legs are vertical and locked before using the seat. Refer to Figure K10.

When storing the seat up against the transom, be sure the legs are folded and secured to prevent damage to the seat. Nylon straps, slide bolts, or hooks are provided to secure the seat in the stored position.

 **WARNING**

To prevent a possible man overboard situation, NEVER stand on, or try to utilize the bow pulpit in any way while the boat is underway.

The recommended sizes for the anchor and anchor line are listed in the following table.

**Table 1: Anchor & Anchor Line**

Model	Line Size	Anchor Size
245	1/2"	13 lb.
265	1/2"	13 lb.
275	1/2"	16 lb.
285	1/2"	13 lb.
315	1/2"	13 lb.
325	1/2"	13 lb.
365	5/8"	26 lb.

## J - 10 WINDLASS

A windlass is an electrically controlled winch mechanism for retrieving the anchor. The mechanical winch portion is mounted on foredeck. The windlass can be controlled by the electrical switches mounted on the helm. The windlass option includes an anchor, chain and nylon line. See Figure J8.

If equipped, refer to the manufacturer's literature included with this manual.

 **WARNING**

To prevent personal injury, keep clear of the windlass at all times.

## J - 11 NAVIGATIONAL EQUIPMENT

### A. Compass

A compass is optional on all Four Winns models. It is a valuable piece of equipment when operating offshore, in unfamiliar waters, or in adverse weath-

er conditions. The safety of those aboard the boat could, at some time, depend upon the compass and your navigational skills.

After all personal equipment is installed, including all electronics (radio, depth sounder, etc.), the compass must be properly calibrated. DO NOT rely on the compass readings until initial adjustment (compensation) has been performed. If the boat has a factory installed compass, the manufacturer's instructions are provided with this manual. Most areas have local companies that specialize in compass adjustment. If unsure of the proper compensation techniques, consider having the adjustment done professionally to insure accuracy and confidence in the compass.

### NOTICE

During use, keep all extraneous metal objects away from the compass. The close proximity of metal objects (e.g., beverage cans) can cause compass deviation.

### B. Depth Sounder

Depth Sounders are optional equipment on all Four Winns models. The thru-hull transducer is factory installed and tested. This transducer will be located in the hull to limit the effect of water turbulence while underway.

Depth sounders provide a relative indication of water depth. DO NOT depend solely upon the depth sounder for water depth. It is important to have navigational charts of the waters in which you are operating.

### C. Ship to Shore VHF Radio

A VHF radio is optional equipment on all Four Winns models. It provides reliable communication between vessels, and from ship to public or private shore stations. It also provides a weather band.

The VHF radio, and microphone is usually mounted on the helm. If equipped, additional information is included in the manufacturer's literature included with this manual.

## D. Loran

A Loran is an electronic system through which a navigator can determine his position regardless of weather. It receives high frequency radio signals generated from established points to generate coordinate readings on the display. These readings can then be triangulated on a NOAA navigational Loran coordinate chart to determine the vessel's exact position.

Factory installed Loran system is optional only on the inboard models. It is normally mounted at the helm. If equipped, refer to the manufacturer's literature included with this manual.

## E. Tridata

A Tridata unit has a combined informational display which gives data on water temperature, water depth, boat speed, distance, and length of time traveled. The Tridata is optional only on the inboard models and is normally mounted in the instrument panel.

If equipped, refer to the manufacturer's literature included with this manual.

## F. Radar and Radar Arch

Radar is optional only on the model 365. Radar equipment allows the user to determine locations of objects or other vessels in the area. If equipped, refer to the manufacturer's literature included with this manual. See Figure J8.

The radar arch is required for installation of Radar equipment. Because of the complexity of installation and variations in windshields, canvas, and other components, Four Winns does not recommend after-market installation.

## J - 12 FIRE EXTINGUISHER SYSTEM

A self-contained, Halon fire extinguisher system is available on all models. The equipment utilized has been so chosen, and located, to provide sufficient volume and coverage of the entire engine compartment. While the Halon system ensures excellent overall bilge fire protection, it does not eliminate the U.S.C.G. requirement for hand-held fire extinguishers. If equipped, refer to

the manufacturer's literature included with this manual.

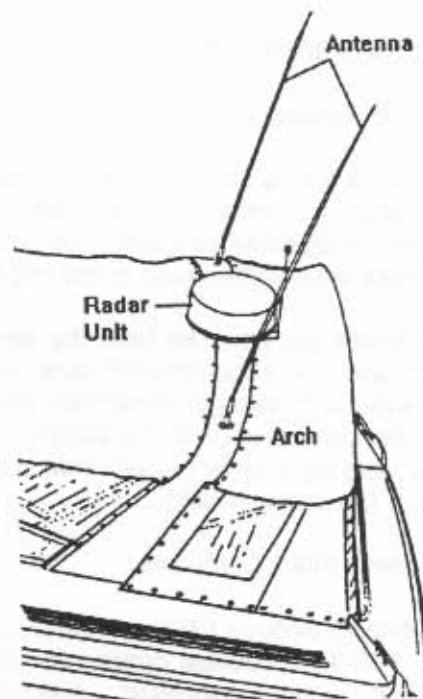


Figure J8: Arch & Other Options

## J - 13 SPOTLIGHT

A properly operating spotlight is essential for safe cruising at night. Four Winns offers electrically controlled spotlights as optional equipment. The spotlights use electric motors and helm switch controls to direct the spotlight beam. If equipped, see Section E and the spotlight manufacturer's literature included with this manual.

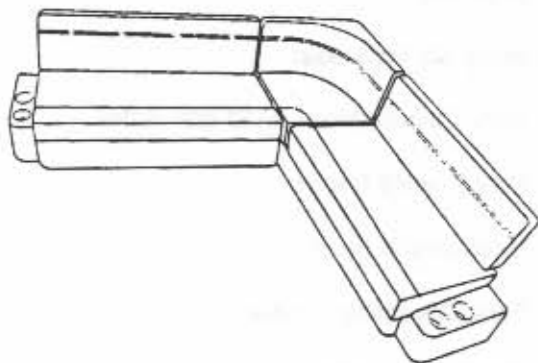


Figure K9: Stern Lounge With Fiberglass Base

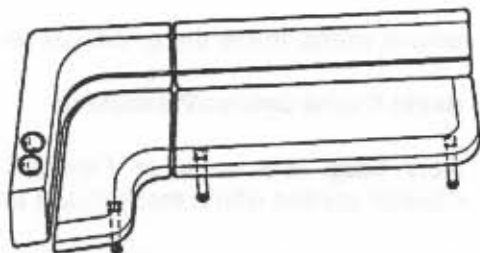


Figure K10: Folding Stern Seat

### E. Cockpit Tables

Cockpit table installations are optional on all models. Table bases are "flush" mounted for convenience. For use, install the table leg into the base and set the cockpit table in place.

## K - 3 INTERIOR UPHOLSTERY CARE

### A. Cleaning Interior Fabric

The fabric used in the cabin should be treated the same as upholstery in your home. Periodic vacuuming and shampooing will keep the upholstery clean and odor free. Spraying the upholstery with Lysol Spray Disinfectant will help retard mildew.

#### Cleaning Kit Includes:

- Westley's Clear Magic  
(to order, call 1-800-545-0982)

- Lendow Glass Cleaner  
(to order, call 313-777-2236)
- Lift-off Spot Remover  
(to order, call 216-881-4070)
- Clean, white towels
- Clothes shaver
- Air hose (if available)

To remove stains, please refer to the following list for recommended cleaners.

#### 1. Basic Stains/Ink/Grease/Pencil/Dirt:

Westley's Clear Magic

#### 2. Adhesives/Teak Oil/Gum/Tar:

Lift-Off Spot Remover

#### 3. Water Stains:

- While fabric is still wet, use an air hose and nozzle to go over the wet area. This will force the stain into the back of the fabric.
- For water stains that have dried, spray Lendow Glass Cleaner over the stained area. Let the foam dissipate, then rub the area with a clean towel. Repeat.

#### 4. Tough Stains/Set Water Stains:

- Always try the Lendow Glass Cleaner method first!
- Spray Westley's Clear Magic on the area, going two (2) inches around the stain or if possible, bring wetness to a break point, such as a bulkhead, etc. Spray water on the same area as directed on the bottle.
- Let set approximately five (5) minutes.
- Rub the area with a clean towel, rotating the towel as the stain is removed. As you rub, go a little beyond the wetness with the towel, flaring the edges.



- e. Allow to dry or blow complete area with air hose.
- f. Repeat if necessary or try the Lendow cleaner.
- g. After the stain is removed, use a clothes shaver to remove fuzzies.

## B. Interior Carpets

Four Winns Cruisers use a high quality interior grade carpeting. Vacuuming and occasional rug shampooing are recommended for extended life and appearance.

## C. Draperies

After a season or more use and exposure, you may wish to remove the draperies. Dry cleaning is recommended. Most draperies can be taken down after removing the screw from the end of the curtain track.

This screw may not be accessible on some models. Should this be the case, remove the screws securing the end of the track. The track is flexible and can be lowered to remove the end screws.

## D. Blinds

Some boat models are equipped with mini-blinds. The blinds can be taken down by removing the end screws and pulling the tabs that hold the blind in place.

## K - 4 EXTERIOR UPHOLSTERY CARE

### A. Cleaning Vinyl

The vinyl material used on the exterior upholstery can be easily cleaned using mild detergent and water. Be sure to thoroughly rinse the seats after washing to remove all soap film. Periodic spraying of the seats with Lysol Spray Disinfectant will help retard mildew.

#### NOTICE

DO NOT apply vinyl protectants such as Armorall. The manufacturer does not recommend this product because it re-

moves the oils present in vinyl that keeps vinyl soft.

### Cleaning Kit Includes:

- Ivory Dishwashing Liquid and water
- Clean, white towels
- Medium-soft brush
- Fantastik Spray Cleaner
- Denatured Alcohol
- 3M Citrus Cleaner (to order, call 404-447-7132)
- Ammonia and hydrogen peroxide

To remove stains, follow the guidelines below.

#### 1. Basic Stains/Grease/Pencil/Dirt:

Ivory Soap and water or Fantastik Spray Cleaner applied with a medium-soft brush.

#### 2. Tough Stains/Adhesive/Teak Oil/Rust:

3M Citrus Cleaner; rinse with soap and water.

#### NOTICE

To prevent possible damage to the vinyl, rinse with soap and water after applying the 3M Citrus Cleaner.

#### 3. Ink:

Denatured alcohol.

#### 4. Mildew Stains:

To kill bacteria creating the mildew, vigorously brush the stained area with a 4-to-1 mixture of water and ammonia; rinse with water.

#### 5. Tough Mildew Stains:

Apply a mixture of one (1) teaspoon ammonia, one-fourth (1/4) cup of hydrogen peroxide, and three-fourths (3/4) cup of distilled water; rinse with water.



**NOTICE**  
ALWAYS CLEAN STAINS IMMEDIATELY!  
DO NOT use 409 Cleaner or Armorall on vinyl.

**NOTICE**  
All cleaning methods must be followed by a thorough rinse with water.

Certain household cleaners, powdered abrasives, steel wool and industrial cleaners can cause damage and discoloration and are not recommended. Dry cleaning fluids and lacquer solvent should not be used as they will remove the printed pattern and gloss. Waxes should be used with caution. May contain dyes or solvents that can permanently damage the protective coating.

Additional cleaning information is provided by the manufacturer and is included with this manual.

Four Winns offers a variety of optional weather covers for protection of the boat and associated equipment. Continued exposure can damage the upholstery and seating. The seating can become thoroughly saturated with water if not adequately protected. Refer to Section L-6 on Weather Covers for more information.

**NOTICE**  
The appearance and longevity of the exterior upholstery will be affected by water saturation. Protect these items appropriately.

## B. Exterior Carpets

The removable exterior grade carpeting may be periodically washed with mild laundry soaps or shampooed, dried and reinstalled. DO NOT dry carpeting in an automatic dryer.

## K - 5 REPLACEMENT UPHOLSTERY

Should upholstery become severely soiled, torn, or in some manner damaged, replacement upholstery cushions and certain jackets are available. However, the original vinyl or fabric patterns may not be available.

Replacement upholstery can be obtained by providing the part number (if available), cushion

description, boat serial number, upholstery color, and whether a jacket or complete cushion is needed. Please contact your Four Winns dealer for assistance.





# WEATHER COVERS

## L - 1 GENERAL INFORMATION

Weather covers for the cockpit areas are available on all Four Winns models. Suntops, side and aft curtains, campers, and cockpit covers are available on most models. Four Winns covers are designed and intended to provide protection of the cockpit seating areas.

Four Winns utilizes 100% acrylic Sunbrella material. During the manufacture of the weather covers, the smallest possible needle and highest quality UV stabilized, bonded polyester thread is used in the stitching.



### WARNING

Never use any form of open flame cooking device in any area fully enclosed or near Sunbrella covers. This material is flammable.

The weather cover is water repellant but not water proof. During a hard rain, you may notice a light mist permeating through a weather cover. This is normal. If the seams leak, they can be sprayed with Scotchguard or similar water repellent. Keep objects from contacting the inside of the cover. Leakage may occur at point of contact.

Weather covers must be installed "snug" to prevent sags in the Sunbrella when installed. The Sunbrella material relies on swelling to seal itself. If taut or overly tight, the material will not seal and may tear.

### NOTICE

Periodically check weather covers for accumulation of water. Damage to the bow assemblies may otherwise result. Make sure cover is snug to avoid puddling of water.

After use, the top canvas should be rolled up into the boot (if supplied) and secured.

### NOTICE

NEVER fold or store a wet weather cover. This can lead to mildew or shrinkage.

Roll rather than fold the enclosure curtains. Sharp folds increase the chance of cracking the clear vinyl.

### NOTICE

DO NOT use the weather covers during outdoor winter storage. The weight of the snow or heavy rain can cause severe damage to the material or top structure. Refer to L-3 Winter Storage in this manual for more information.

When snapping covers to the boat, apply direct downward pressure on the snap. When unsnapping, rotate the snap and cover upward at each snap location.

### NOTICE

Remove snaps one at a time to prevent damage. DO NOT rip off or pull the weather cover as a whole; acrylic material may tear at snaps.

## A. Suntop

The Suntop covers the forward cockpit area and is stored on most models in a free-standing position, up against the radar arch or stored within the cabin. A boot is usually provided to protect the canvas from damage. See Figure L1.

To install:

1. Remove the canvas boot and unroll the suntop.
2. Snap the forward edge of the suntop to the windshield. Windshield snaps will slide to adjust to the canvas.

### NOTICE

When an arch is installed, the aft edge of the suntop will attach to the forward edge of the arch.

3. Adjust the secondary bow to support the canvas and attach the nylon strap to the strap eye located on the deck. The strap can be adjusted for tautness.

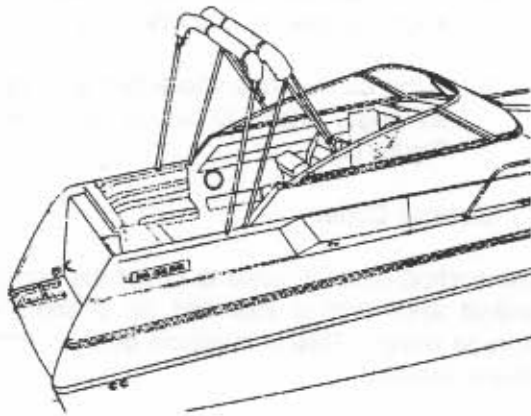


Figure L1: Suntop Storage Without Arch

**NOTICE**

On some models, couplers are included with the extensions to allow for vertical adjustment. Horizontal adjustments can be made with the buckle located on the nylon strap and by sliding the secondary bow(s) up or down along the main bow.

**B. Side Curtains**

The side curtains are used to enclose the area between the windshield wings and canvas. Each curtain will zip to the underside of the suntop and snap to the windshield wings. Windshield snaps will slide to adjust to the curtain.

**NOTICE**

**DO NOT FOLD THE SIDE CURTAINS!** Damage may result. Always roll the side curtains up to prevent damage to the isinglass.

**C. Aft Curtain**

The aft curtain encloses the remaining cockpit area when the suntop is installed. The aft curtain is part of the full canvas option (which includes the suntop and side curtains). The aft curtain attaches to the suntop and stern of the boat. If an arch is installed, the aft curtain attaches to the back side of the arch. See Figure L2.

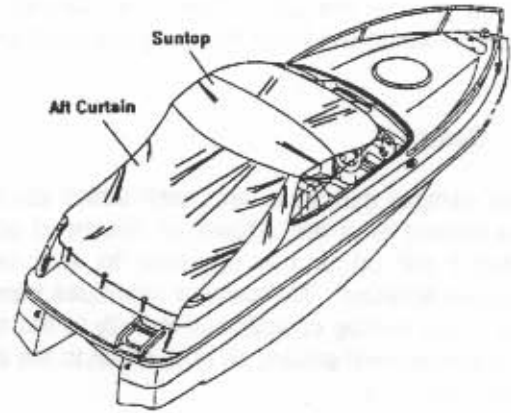


Figure L2: Full Canvas Option

To install:

1. Attach the aft curtain to the zipper provided on the rear portion of the suntop. If an arch is installed, attach to the rear zipper on the arch.

**NOTICE**

On most models, the zipper can be removed from the arch. A bead is sewn into the zipper slide within a track. The track is silicone permanently into the arch frame.

2. Secure the rear corners.
  - a. If the canvas has snaps along the aft edge, secure the corners.
  - b. If the canvas has shock cords along the aft edge, attach to knobs as shown in Figure L3.

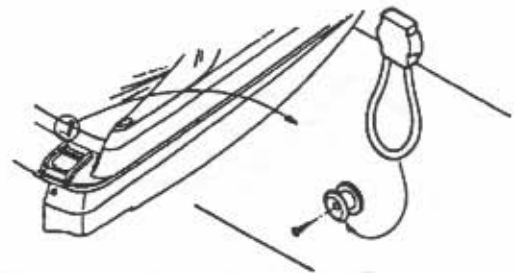


Figure L3: Shock Cords

3. Finish snapping canvas to deck.



When storing the aft curtain, fold canvas in a manner which will keep the isinglass from creasing.

#### D. Camper

The camper canvas is an option which encloses the cockpit area and allows for overhead space. Covers roll up or are removed to expose the window screens. The canvas continues from the top of the suntop or arch horizontally to the stern. The camper will square off and attach to the stern. See Figure L4.

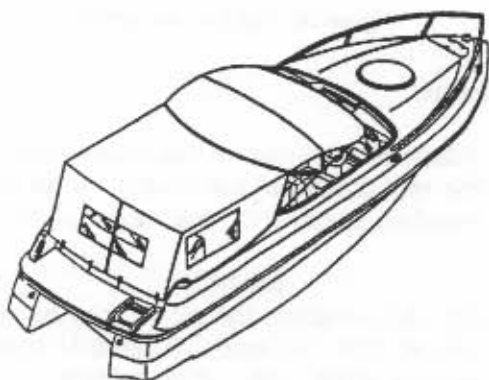


Figure L4: Camper Canvas Option

To install:

1. Install suntop and side curtains as previously instructed above.
2. Attach camper bows to deck hinge. Unroll canvas and attach forward edge of canvas to suntop zipper. If an arch is installed, attach or zip camper top to the arch. Refer to Figure L5.

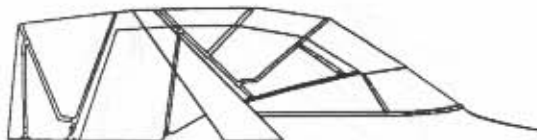


Figure L5: Side View of Typical Camper Installation

3. Adjust bows and attach straps to strap eyes.
4. Secure the rear corners.

- a. If the canvas has snaps along the aft edge, secure the corners.
- b. If the canvas has shock cords along the aft edge, attach to knobs as shown in Figure L3.

#### E. Cockpit Cover

The cockpit cover is used to cover the complete cockpit area and is intended as a short term storage cover. This is available only on smaller cruiser models.

To install:

1. Snap the forward edge of the cockpit cover to the windshield. Windshield snaps will slide to adjust to the canvas.
2. Secure the rear corners.
  - a. If the canvas has snaps along the aft edge, secure the corners.
  - b. If the canvas has shock cords along the aft edge, attach to knobs as shown in Figure L3.
3. Snap the cockpit cover sides and rear (if applicable) to the deck.

#### F. Mooring Cover

Mooring covers are intended for longer term storage and spread over the entire boat. They are available as an option on smaller models only. If used in areas with snow accumulation, be sure to support the canvas adequately and inspect frequently for snow loads or damage will occur. Refer to L-4 Winter Storage for additional information.

To install:

1. Spread mooring cover over entire boat.
2. Install adjustable poles in the rear cockpit. Be sure there are no pockets in the canvas.
3. Tie off at the transom.

4. Nylon loops are provided for attaching rope or bungee cords to the trailer or from side to side (under the boat).

## L - 2 TRAILERING

High winds encountered during trailering your boat can severely damage most weather covers. If an extended trip at highway speeds is planned, the top and other weather covers should be in the down position or removed entirely. This will prevent damage and loss.

## L - 3 WINTER STORAGE

The boat must be properly protected during winter dry dock storage. A winter storage cover is advisable. Many marine dealers offer shrinkwrap enclosures for outdoor storage. See a Four Winns dealer for information on the availability of winter storage covers or other alternatives for storage.

When storing outdoors, make sure the supporting framework keeps the weight of the snow and rain from accumulating on the storage cover. Proper ventilation must also be provided or dry rot and mildew will occur. See Section O General Maintenance for additional winter storage information.

## L - 4 MAINTENANCE

Moisture, dirt, chemicals from industrial fallout, heat, ultraviolet rays and in some cases, salt water are factors which affect the longevity of acrylic covers.

1. Moisture can cause shrinkage and mildew. Allow the cover to dry thoroughly before disassembling tops. Keep it clean and well ventilated to prevent mildew. Spraying the weather cover with Lysol Disinfectant or similar product will help prevent mildew.
2. Dirt creates a starting point for mildew when moisture is present. Clean the top with a sponge or soft scrub brush and mild detergent when the cover is installed. Make sure cover is snug to help prevent shrinkage.

3. Chemicals cause decay if allowed to accumulate for long periods of time. Keep the cover clean to prevent decay.
4. Heat can cause cracks in vinyl components and stiffening of fabric when enclosed in plastic or polyethylene. DO NOT store the weather cover in polyethylene under direct sunlight or high temperature situations.
5. Ultraviolet degradation may occur under prolonged exposure to direct sunlight. Store the top in the boot when not in use.
6. Salt water can corrode brass, aluminum, or stainless steel fittings and fasteners. Keep fittings clean, lubricated, and waxed to prevent corrosion.

Clear vinyl curtains and windows demand extra care to prevent scratching. DO NOT use cloth or chamois skin. Dirt or grit in the cloth will scratch the vinyl window. Hose clean water onto vinyl to rinse off salt, dirt, or grime.

### NOTICE

DO NOT use hot water. DO NOT dry in an automatic dryer. DO NOT dry clean or steam press.

Leakage after cleaning may be the result of insufficient rinsing. Re-rinse. If leakage continues, apply a coat of silicone air drying water repellent, such as Scotchguard.

See your Four Winns dealer for additional information on weather covers.

## L - 5 CARBON MONOXIDE

When the boat is underway, a natural vacuum may exist with the right wind and sea conditions to draw the exhaust gases (which includes carbon monoxide) into the boat. When the camper or side curtains are installed, this compounds the possibility of this occurring. Carbon monoxide may also be present when mooring or near sea walls. For more information, refer to Section H-4 Carbon Monoxide in this manual.

The carbon monoxide in exhaust fumes can be hazardous. It is important for you and your pas-



sengers to be aware of the potential safety hazard created by exhaust fumes. Familiarize yourself with the symptoms of individuals overcome by carbon monoxide, and most importantly, ways you can protect yourself and your guests.



**WARNING**

**DO NOT inhale exhaust fumes!** Exhaust contains carbon monoxide which is colorless and odorless. Carbon monoxide is a dangerous gas that is potentially lethal.



# FIBERGLASS AND HULL INFORMATION

## M - 1 HULL DESIGN INFORMATION

Four Winns boats are designed using the sound engineering and mathematical principles of hydrostatics, hydrodynamics, structure, and strength of materials. The materials utilized provide optimum strength at the lightest possible weight. The exact fiberglass laminate schedule and construction techniques of each part is determined in accordance with the strength and rigidity required.

### A. Stable-Vee Hull Design

On the new Horizon and Sundowner models, Four Winns has applied for a patent on its **Stable-Vee** hull design. This design is now being extended to larger models. Pods on either side of the outdrive extend the running surface beyond the transom. These pods, plus the unique distribution of deadrise from transom to bow, allows Four Winns to place more hull in the water than deep-vee designs of similar length and beam. This results in better boat handling whether on plane, during turns, or at rest.

### B. Deep V-Hull Design

Four Winns utilizes a variable deadrise, deep V-hull construction on all other models. The sharp "V" of the hull at the stern will cut the water cleanly to soften the ride in rough water. The strakes in the hull are designed to provide additional lift for easier planing, more stability and to help soften the ride. Four Winns hull designs optimize speed, performance, and handling characteristics.

## M - 2 FIBERGLASS CONSTRUCTION

The fiberglass components of Four Winns boats are of the finest quality materials, workmanship and construction techniques available. This ensures the structural integrity to provide years of boating enjoyment with minimal maintenance.

The construction of a Four Winns hull begins with the application of gel coat to the mold. The gel coat is approximately 20 mils thick. A coat of resin and chopped fiberglass is then sprayed into

the hull and carefully hand rolled until it is securely affixed to the gel coat.

A number of fiberglass layers and woven roving are applied to the above laminate. Each layer is hand laid and hand rolled. The keel and chine areas have fiberglass woven roving overlapped in these areas to provide additional strength. Some models utilize encapsulated end-grain balsa core or coremat laminates to achieve additional rigidity. Others utilize additional laminations of woven roving to maintain strength and rigidity.

The hull support stringers are located using special tools, and are fiberglassed into place. This ensures a strong, rigid hull, permanently formed into a solid assembly, free of distortions.

Fiberglass cockpit liners, seat bases, v-berths, and bow pulpits are constructed similar to the hull. Balsa core or coremat laminations are utilized when necessary.

In addition to a thorough visual inspection of each fiberglass component, samples are measured using special equipment, for fiberglass reinforcement to resin ratio, laminate configuration, weight and thickness. By these procedures Four Winns ensures proper composition.

## M - 3 EQUIPMENT INSTALLATION

Many boats are used for specific purposes or under conditions which require the addition of special equipment to the hull, deck or cabin areas. Special care must be taken during the installation of any equipment to a fiberglass component. A polysulfide or butyl based sealant should be used to seal installations below the water line. Silicone "marine" seal or similar bedding compound should be used elsewhere.

### NOTICE

**DO NOT** install any item onto or through the hull without adequately sealing the hull area penetrated by the installed item or related fasteners. Improper installations could cause leakage or allow water ab-



## M - 5 FIBERGLASS REPAIRS

Fiberglass is one of the most durable, strong, and forgiving construction materials afloat. It is resilient and normal repairs can be made without affecting the strength or structural integrity of the boat.

### WARNING

Striking docks, other boats, or submerged objects could create a very hazardous situation or severely damage the fiberglass. In the event an object is struck below or near the waterline, proceed directly and cautiously to the nearest service facility and remove the boat from the water. Closely inspect the hull for damage. If the outer fiberglass laminate was penetrated, repairs must be made prior to re-launch.

Occasionally, blisters, crazing, scratches, or damage to the fiberglass can occur. Repairs may be necessary to correct the problem.

### A. Scratches

Scratches occur during normal use. Below is a step by step procedure to repair scratches.

1. Clean area with soap and water.
2. Apply a fine rubbing compound and buff.
3. Wax.

If this does not work, clean the area and sand lightly with 400 to 600 wet or dry sandpaper and follow with rubbing compound and wax.

### B. Gouges & Cracks

Stress cracks and crazing are the appearance of hairline cracks in the gel coat surface. When present, these problems usually occur in the gel coat finish or the outer "skin" coat fiberglass laminate. The appearance of these cracks do not pose a threat to the structural integrity of the boat. In most cases, they are cosmetic and can be treated.

Cosmetic surface damage can be repaired as follows:

1. Sand the surrounding area with medium or fine grit sandpaper. Clean all marine growth, dirt, anti-fouling paint, etc. from the immediate area. DO NOT excessively scratch or gouge the surrounding area.
2. Use a hard, pointed tool to open the gel crack. Take care not to damage the surrounding gel coat.
3. Sand the crack or gouge so the edges are smooth and will allow proper "feathering" of the area.
4. Clean the area thoroughly. Make sure the area is dry before proceeding.

### NOTICE

Be sure the structure and the ambient temperature are above 60 degrees F (15 degrees C) and the relative humidity below 70% immediately before, during, and after the repair.

5. If the nick or gouge is deep and penetrates through the gel coat, fill the area with fiberglass patching paste. Follow the directions on the can when mixing the paste with the catalyst.
6. After the gouge is filled and has dried, sand the patched area. Begin by using medium-fine grade sandpaper. Progressively use finer grade sandpaper until the surface is very smooth. If necessary, add filler and then sand the surface again.
7. Apply two or three light coats of matching fiberglass gel coat to the repaired area. Enough gel coat should be used so that the entire area is covered.

The gel coat used on Four Winns boats is available through servicing Four Winns dealers. Due to color variations and fading, matching the color of the gel coat may be difficult. Occasionally, tinting of the gel may be necessary.



The gel coat must be catalyzed using up to 2% MEK Peroxide which can be purchased at a supplier handling fiberglass reinforced products. Contact your Four Winns dealer for assistance.

8. After ample drying time, sand the area using very fine wet/dry sandpaper. If the appearance of the area is still not satisfactory, repeat steps 2 through 4 as necessary.
9. If above the waterline, polish the area using a fiberglass rubbing compound and then wax. If the repaired area is below the waterline, the area should be primed and painted in accordance with the anti-fouling paint manufacturer's instructions.

Gel coat, like paint, will change colors with time and exposure to sunlight (ultraviolet). For this reason, "matching" gel coat obtained from Four Winns may not match the gel color of a boat that has been exposed. However, this is the closest match commercially available. A fiberglass technician can tint the gel to be used in the repair to provide a closer color match.

More severe fiberglass damage, especially when structural, requires the expertise of an experienced fiberglass repair technician. See your Four Winns dealer for assistance.

#### **NOTICE**

Improper repair techniques can lead to further fiberglass component damage.

### **C. Osmotic Blistering**

Osmotic blistering or "boat pox" is an unfortunate but not uncommon occurrence in fiberglass boats. Fiberglass is water retardant, not waterproof. When a boat is left in the water for a period of time, the fiberglass will absorb water. It is a natural process that can not be eliminated in production methods or material selection and usage. However, there are ways to control and possibly prevent blisters (see Section M-6). If you do encounter blisters, be assured that the blisters are merely cosmetic. They do not indicate a defect in the boat structure or lamination. Four Winns, along with most boat manufacturers,

regard gel blisters as a standard maintenance item.

The repair procedure for gel coat blisters is similar to the procedures outlined in the previous section on cracks and gouges. There is an exception however, in that the hull must dry out for several days or possibly weeks before repairs can proceed.

To determine if the hull has dried sufficiently, tape one square foot of household plastic wrap securely to the hull bottom. Make sure all edges are sealed and let it stand for twenty-four hours. If condensation has accumulated under the plastic, the hull is still "wet" and must be allowed to dry longer before repairing.

When the repair is completed, an application of an epoxy barrier coat should be considered. This will help prevent the possibility of reoccurrence of blisters. Your Four Winns dealer or local ship store will have information on barrier coat products.

## **M - 6 ANTI-FOULING PAINT**

Four Winns recommends anti-fouling or bottom paint for boats which will be kept in the water for extended periods of time. Anti-fouling paint reacts with water to retard the growth of algae, barnacles and other marine growth on the hull. In addition to marine growth, it offers protection against excessive water pollution.

Anti-fouling paint begins reaction upon contact with water. After a season's use or sooner under certain conditions, the anti-fouling paint may appear to be dissolving. This is due to the paint's chemical emission that in turn retards marine growth. When this occurs, refinishing is in order.

Four Winns recommends re-application of the anti-fouling paint seasonally. The effectiveness of the paint will be drastically reduced if used longer. Though Four Winns has found the anti-fouling paints used to provide good marine growth protection in most water, other paints may be more effective in certain water conditions. See a Four Winns dealer for recommendations on anti-fouling paint use in your area.





### NOTICE

During surface preparation, the hull should be sanded only enough to remove any foreign matter, and loose paint. DO NOT sand deeply into the gel coat, fiberglass cosmetic problems could later result. After sanding, the surface should be wiped with a rag treated with a cleaner recommended by the anti-fouling paint manufacturer. The surface must be clean and slightly rough to ensure paint adhesion.

Prior to application of the anti-fouling paint, the boat owner may consider coating the hull bottom with an epoxy coating. Four Winns recommends this procedure as a preventive and effective means of controlling osmotic blistering. Most major anti-fouling paint manufacturers also supply a line of epoxy undercoatings. Consult your Four Winns dealer or local ship store for their recommendations.

## M - 7 HULL SUPPORT

Proper support of the hull while it is out of the water is imperative. Due to the design complexities, Four Winns does not recommend trailers or storage cradles be home-made. The boat is a valuable piece of equipment. DO NOT risk permanent damage to the hull structure in an attempt to save the cost of an adequate support. Improper support can lead to serious and permanent hull deformation.

### NOTICE

When attempting to raise the hull, never allow one end of the boat to rise first, while letting the opposite rest momentarily on the outdrives or underwater gear. Serious damage to these components could result. DO NOT place lifting straps on underwater gear. Be sure the strap is against the hull surface only.

A trailer, or storage cradle designed for a larger or smaller boat will not provide proper support for the hull. This could lead to hull deformation and thus serious performance deficiencies.

Always lift the hull using proper lifting straps, at the designated "sling" locations. The only excep-

tion to using the designated "sling" marker locations, is when utilizing a lifting machine which has a single lift cable. On certain models, the center of gravity may be aft of mid-ship, due to the engine/drive installation. To compensate for this, some trial-and-error replacement of the lifting straps may be required to lift the boat "level" with the surface. Always use a spreader bar or other lifting equipment that will prevent excessive force from being applied at the gunwale area.

Four Winns trailers are available for the smaller cruiser models only. Four Winns, Inc. does not recommend or provide trailers for wide beam Cruiser models. Because of shipping regulations on "wide beam" models, all transportation (by road) should be performed by professional haulers.

sorption and thus cause serious hull damage.

Any equipment which will be subjected to cyclic loading or significant force should be through-bolted to a fiberglass component. A butt block or backing plate should be used to strengthen any area onto which an item will be mounted.

#### NOTICE

Always pre-drill fastening holes with a proper size bit. Pre-drilling will help prevent the fiberglass from splintering and thus causing unsightly damage. Also, counter sink holes to prevent the gel coat from chipping.

### M - 4 FIBERGLASS CARE & MAINTENANCE

Fiberglass is affected by weathering processes and requires maintenance on a periodic basis to help maintain the beauty and shine. The effects upon the gel coat will be dependent upon boating conditions, storage, type of use, and the care given to the boat during the boating season.

#### A. General Maintenance

For fresh water use, the boat should be washed once or twice a month. When using in a salt water environment, considerable more care will be necessary. Be careful when selecting a cleaning agent. Dishwashing detergents are usually gentle and are recommended for cleaning gel coat. Cleaning products such as Ivory or Dawn dishwashing liquid can be safely used. Always read the label before using any product.

#### NOTICE

DO NOT use acetone, paint thinner, solvents, or strong alkaline based detergents, nor cleaners with a "gritty" and abrasive texture. Avoid products which contain sodium phosphate. Common examples of these types of household cleaning agents are: Tide, Oxydol, Janitor-in-a-Drum, Fantastic, Clorox, etc. Always read the label before using an agent.

There are several products available which are specifically designed to clean fiberglass exterior finishes. Many companies like Johnson & John-

son, Turtle Wax, etc. manufacture cleaning fluids mild enough to clean without stripping the wax.

#### NOTICE

Treading on a soiled fiberglass surface can severely scratch and mar the finish. Keep the fiberglass as clean as possible.

When cleaning non-skid areas, DO NOT attempt to use a wire brush or sandpaper because this will remove the non-skid gel.

Apply wax once a month to maintain gel coat lustre and prevent fading or chalking. Read the label before using any product. Make sure product is applicable to fiberglass. Consult a Four Winns dealer for his recommendations.



#### CAUTION

Waxing decks, cockpit floors or other areas on which one walks is not recommended. Waxing will produce a very slippery surface, especially when wet. Wax may also build-up in the non-skid surfaces. Be sure all persons wear deck shoes while aboard the boat. Footing will be improved and feet will be protected from accidental cuts and bruises.

#### NOTICE

DO NOT use any carnauba based wax. The gel coat will be permanently discolored.

A darkening or discoloration of the non-skid surfaces can sometimes occur as a result of wax buildup. Exposure to the sun and elements can turn the wax darker, or occasionally can cause it to become flaky or powdery. To remove, use fine rubbing compound and a low RPM buffer (1200 to 2000 RPM). Apply light pressure and keep the buffer moving at all times to prevent heat build up. Read the directions before using any equipment.

#### B. Weathering Effects on Gel Coat

Weathering occurs from direct sunlight, water, chemicals, and dust. Some of the terms below describe the changes that can occur to the gel coat surface.



Chalking is when the gel coat top surface is broken down into an extremely fine powder. When this happens, the color whitens. The chalk is present on the surface only.

Fading is the uniform change in color. This happens when the actual pigments have changed color, especially from excessive chalking, or when the gel coat has either been stained or bleached by something.

Yellowing is gel coat which has a yellow cast and streaking usually deals with a stain or contact with another surface.

Gloss refers to the shine of the surface. This can change from sanding action, chalk, residues, or exposure.

Blistering refers to a condition in which the unprotected gel coat surface below the waterline has absorbed water and formed bubbles. See Section M-5 for additional information.

Follow the instructions below for boats that have weathered and chalked.

1. Wash.
2. Wax. If this does not work, then use a fine rubbing compound. If this does not work use 400 or 600 wet or dry sandpaper, followed by fine rubbing compound and wax.

When using wax or fine rubbing compounds, make sure to read the label and follow the directions. Some helpful tips are listed below.

1. Avoid working in direct sunlight. This dries out the wax or compound, and can stain the surface.
2. Use clean pads or cloths to apply a thin coating of wax or rubbing compound to a small area such as three feet by three feet. Remove any excess, and then rub the area with a buffing pad, or power buffer. Apply pressure only as necessary to restore the surface finish. Applying too much pressure or buffing in one place too long can permanently damage the surface.

3. After applying compound, always follow with waxing.

#### NOTICE

If using a power buffer, use a low RPM buffer with light pressure. Keep the pad wet and the buffer moving at all times to prevent heat build up.

#### NOTICE

When sanding, DO NOT use a power or belt sander to prevent gouges, uneven areas, or other damage. For best results, block sand the gel coat.

### C. Stains

Stains can appear anywhere on the exterior of the boat and may be a result of contact with tar, plant sap, leaves, rust from metal fittings, and other materials. Surface stains may be removed with dishwashing soap, mild cleansers, or some household detergents. DO NOT use chlorine or ammonia products. These products can affect the color of gel coat. Commercial car washes use strong cleaners and should be avoided.

To remove stains, refer to the procedures below.

1. Wash area with dishwashing soap.
2. Begin with a small area such as three feet by three feet and apply a mild cleanser.
3. Rinse with clean water.
4. Follow with compound and waxing as outlined in procedure above.

If the stain is not removed by the dishwashing soap or mild cleanser, then the next procedure is to use either denatured or rubbing alcohol. If this does not work, consult your Four Winns dealer for professional assistance.

#### NOTICE

DO NOT use acetone, ketone, or other solvents to remove stains. These chemicals are flammable and may damage the gel coat.



# WOODWORK AND COMPOSITES

## N - 1 TEAK

Solid teakwood is being used on the platforms as an insert on most models. This wood gives a rich warm appearance with minimal maintenance. Under normal conditions, teak is resistant to rot and will not structurally deteriorate. Exposure to the sun and elements will only cause the wood to turn grayish white. Teak can be restored to its original appearance with minimal care using teak care products that are commercially available.

For a natural teakwood appearance, Wattco Teakwood Oil or Prelude Marine Oil Finish is recommended. When proper application procedures are followed, these dressings can provide a long lasting, protective coating. Many other fine teakwood finishing materials are available. Check with a Four Winns dealer for recommendations on materials commonly used in the immediate area.

To maintain teak, follow directions below.

1. Extended exposure will cause the grain of the wood to rise. The teak will feel and appear rough. Should this occur, lightly sand teak using a hand sanding block and medium grit sandpaper. Sand the wood only enough to smooth the surface.
2. Liberally apply a teakwood dressing. This will replenish the lost teak oil. Repeat the application in a few days.
3. Periodically apply teakwood dressing to keep the wood dark and rich in appearance. DO NOT varnish or paint the teak. The oil emitted by the teakwood will cause the varnish or paint to peel.

Once the teak becomes excessively gray (weathered) more complex cleaning or bleaching is necessary to restore it. Many teak restoration products are available from any Four Winns dealer. Consult your Four Winns dealer for his recommendations.

## N - 2 HIGH-PRESSURE LAMINATE CARE

Many interior counter tops, table tops, head door, closet door and drawer fronts consist of a high pressure laminate, "formica" like material. The formica has a "matte texture" finish and can be cleaned with dish washing soap and water or other cleaning solutions such as Fantastic. Always read the label before using any product.

### NOTICE

DO NOT use abrasive cleaners or solvents on formica. DO NOT use Soft - Scrub soap or similar cleaning products; they will scratch the surface and remove the shine.

## N - 3 ASH

Four Winns utilizes ash trim for most of the cruiser model interiors. The wood is prepared with a light stain followed by a polyurethane finish. To clean, a damp cloth will usually suffice. Care should be similar for ash as it is for fine, household furniture.

## N - 4 STAR BOARD

Star board is a high density polyethylene (plastic) and is very durable and fade resistant. Star board requires little maintenance, and is being used in place of wood in many areas of the boat. It is currently being used for trim, step pads, hand rails, and seat supports.

To clean star board, use a solvent-free, non-abrasive cleaner such as mild dishwashing soap or Fantastic. Read the label before using any cleaning product.

### NOTICE

Star board will stain when exposed to certain oils or chemicals. Always wipe up any spills immediately.



# GENERAL MAINTENANCE

## O - 1 WINTERIZATION

### A. Prior to Lifting for Winter Layup

1. Pump out the head (dockside discharge), and be sure the holding tank is empty. Flush the head holding tank with soap, water and a deodorizer (e.g., Lysol Liquid). Add more water if necessary. Have the cleaning solution pumped out.
2. Have the fuel tank(s) either completely full or completely empty. See the "Engine Owner's Manual" for recommendations. Also, check with the dry dock operators for recommendations. If winter storing with a full fuel tank, gasoline winterizer such as OMC 2+4™ Fuel Conditioner will reduce varnishing, condensation, etc.

#### NOTICE

If the fuel has been treated with winterizer, run engines for ten minutes to make sure the treated fuel is present in all lines and parts of the engine.

3. Drain water from the fresh water system and the hot water heater.
4. Winterize the engine and drive systems as recommended in the "Engine Owner's Manual" and V-drive Manual. Portions of this winterization procedure may require that the boat be lifted.

#### NOTICE

Make sure all fiberglass muffler exhaust components are drained and/or disconnected. A drain plug is installed on the muffler cannister for drainage purposes. See Figure O1.

5. Disconnect the prop shaft couplings (inboard and V-drives). Lift the boat only at the designated "sling" labels. See Section M-7 Hull Support in this manual for additional details.

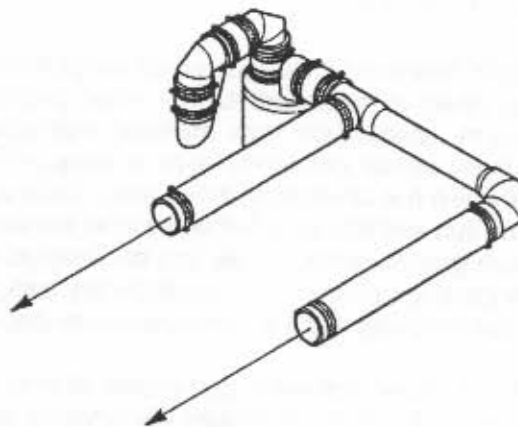


Figure O1: Muffler Installation

### B. After Lifting

1. Remove the drain plug.
2. Thoroughly wash the fiberglass exterior, especially the hull bottom. Remove as much marine growth as possible.
3. Lower boat onto cradle properly or place boat on trailer. Be sure boat is adequately supported. The boat should be raised slightly under the forward supports or trailer tongue to improve drainage to the transom drain.
4. Be sure all the water is completely drained from the fresh water system. Disconnect all hoses, check valves, etc. and blow all the water from the system using very low air pressure. The use of non-toxic, fresh water system anti-freeze is recommended as an alternative to disassembling the water system. Refer to Section G-8 System Maintenance in this manual for information on winterizing the water system.
5. Winterize the head as recommended by the head manufacturer. If the boat is equipped with a holding tank, mix some anti-freeze solution and pour it into the head. Transfer some of the anti-freeze to the holding tank by flushing the head. Also, refer to Section G-8



System Maintenance for additional information.

6. Drain or winterize the air conditioning and generator systems. Follow the appropriate manufacturer's directions. Be sure all water intake filters are drained thoroughly.
7. Ensure that all water is removed from the sump pump, bilge pumps and bilge pump lines. Dry the hull bilge, and self-bailing cockpit drain troughs. Water freezing in these areas could cause damage. See Section H-3 Hull Drainage Systems.
8. Remove the battery(s) and store in a cool place. Clean the battery using clear, clean water. Be sure the battery has sufficient water and clean terminals. Keep the battery charged throughout the storage period. DO NOT store the battery on a concrete floor or other damp or conductive surface.
9. Drain the alcohol out of the stove (if applicable) and store alcohol in a cool, dry place away from heat or spark.
10. Clean the boat interior thoroughly. Vacuum carpets, and dry clean drapes and upholstery jackets as necessary.
11. Scrub the hull bottom and wash exterior fiberglass components, wax lightly.
12. Clean exterior upholstery with mild soap and water, rinse, and dry thoroughly.
13. Remove all oxidation from exterior hardware and apply a light film of moisture - displacing lubricant.

### C. Prior to Winter Storage

1. Remove as many cushions as possible. Remove storage lids or hatches. Open as many locker doors, as possible. Open the ice box or refrigerator door. Leave these areas open to improve ventilation.
2. Spray the weather covers and the boat upholstery with Lysol Spray Disinfectant. Enclosed areas such as the refrigerator, shower basin,

storage locker areas, etc. should also be sprayed with Lysol disinfectant.

3. Place small dishes of rodent poison such as D-Con in a number of areas around the boat. Be sure dishes are placed near the head and the engines, as rodents will destroy water intake and discharge hoses.
4. If the boat will be in outside storage, properly support a storage cover and secure it over the boat. DO NOT secure the cover tightly to the boat. This does not allow adequate ventilation and can lead to dry rot. DO NOT store the boat in a damp storage enclosure. Excessive dampness can cause electrical problems, corrosion, and dry rot.
5. DO NOT use the suntop or camper top as a winter storage cover. The life of these covers may be significantly shortened if exposed to harsh weather elements for long periods.



#### WARNING

Placing an electric or fuel burning heating unit in the bilge of the boat during cold weather could cause fire or explosion and is not recommended.

### O - 2 ENGINE FLUSH OUT

The optional engine flush out should be used to clean the engine of unwanted salt, mud, sludge, etc. which may have accumulated in the engine cooling system. Before winterizing the engine, flush out the system for at least five minutes.



#### CAUTION

Make sure that no section of flush hoses are in contact with moving or hot engine parts or abrasive surfaces such as screw threads, sharp edges, etc., which could damage the hoses. Damage to the hoses could cause leaks and possible flooding of the engine compartment. Periodically check hoses for abrasions.



**NOTICE**

The flush out kit should only be used with the boat in the water and the engine OFF.

**NOTICE**

Flush out kits are not available on engines with hydro lift mufflers.

To flush out the engine, follow the instructions below.

1. Do not run engine during flushing procedure.
2. Remove cap from coupling and attach swivel connector.
3. Attach water supply hose to swivel connector.
4. Turn water on and allow water to flush the engine and exhaust manifold for five to ten minutes.
5. Turn water off. Disconnect hose; replace and tighten cap securely.



**CAUTION**

Reinstall cap onto coupler after flushing. Flooding of the engine compartment will occur if the cap is not installed and tightened.

**O - 3 GENERAL MAINTENANCE SCHEDULE**

\* Or As Required

SERVICE	At Launch and First Operation*	25 Hour Check each Season*	Bi-Seasonally or Every 6 Months or Every 100 Hours*	Seasonally or Every 12 Months or Every 200 Hours*
<b>Engine and Drive Systems</b>	Refer to Section B			
Engine Maintenance	As Recommended by the Manufacturer			
Inspect Water Intake Connections and Hoses	■	■	■	
Inspect Water Intake Strainers	■	■	■	
Inspect Exhaust System Hoses and Connections	■	■	■	



SERVICE	At Launch and First Operation*	25 Hour Check each Season*	Bi-Seasonally or Every 6 Months or Every 100 Hours*	Seasonally or Every 12 Months or Every 200 Hours*
Check Prop Shaft for Trueness				■
Check Strut Bearing				■
Check Propellers				■
Check Rudder Alignment				■
Check All Thru-Hull Fittings	■			■
Shaft Log Packing Nut Inspection	■	■	■	
Check Prop Shaft Alignment	■ and 48 hrs after launch	■	■	
Test Emergency Shut-Off Switch	■		■	
Gauge Cleaning			■	■
<b>Control Systems</b>		Refer to Section C		
Throttle and Shift Adjustment		■		■
Neutral Safety Switch Test				■
Cable and Control Lubrication				■
<b>Steering Systems</b>		Refer to Section D		
Linkage and Connection Inspection			■	■
Rudder Indicator Adjustment			■	■
Stern Drive Torque Tab Adjustment				■
Power Steering Service	As Recommended by the Manufacturer			
Steering Adjustments				■
Steering System Lubrication				■
Rudder Packing Nut Inspection	■	■	■	■
<b>Electrical Systems</b>		Refer to Section E		
Inspect Battery Connections			■	■
Check Battery Water		■	■	■
Battery Cable Inspection				■
12 V. Electrical Equipment Operation		■		■
12 V. Wiring and Connection Inspection				■
120 V. Electrical Equipment Operation		■		■
120 V. Wiring Inspection				■
120 V. System Continuity Test				■





SERVICE	At Launch and First Operation*	25 Hour Check each Season*	Bi-Seasonally or Every 6 Months or Every 100 Hours*	Seasonally or Every 12 Months or Every 200 Hours*
Shore Power Cord and Adaptor Inspection			■	■
Polarity Buzzer Operation				■
Receptacle and Connection Inspection			■	■
Generator Maintenance	As Recommended by the Manufacturer			
Inspect Generator Water Intake and Exhaust	■	■	■	■
<b>Fuel Systems</b>	Refer to Section F			
Inspection for Leaks		■	■	■
Fuel Sender Inspection				■
Fuel Filter Inspection		■	■	■
Tank Inspection				■
<b>Fresh Water Systems</b>	Refer to Section G			
Flush Water System				■
Water Tank Inspection				■
System Inspection		■		■
<b>Ventilation and Drainage</b>	Refer to Section H			
Blower Operation		■	■	■
Blower Vent System Cleaning			■	■
Bilge Pump Operation and Cleaning		■	■	■
Check Transom Drain Plug	■		■	■
Sliding Side and Mid Cabin Window Operation				■
<b>Interior Equipment</b>	Refer to Section I			
Head Maintenance	As Recommended by the Manufacturer			
Thru-Hull Fitting Inspection	■	■	■	■
Ice Box and Refrigerator Cleaning				■
Icemaker	As Recommended by the Manufacturer			
Stove Fuel System		■		■
Stove Maintenance	As Recommended by the Manufacturer			
Stereo Head Cleaning and Demagnetizing				■
Cabin Window and Hatch Screen Cleaning				■



SERVICE	At Launch and First Operation*	25 Hour Check each Season*	Bi-Seasonally or Every 6 Months or Every 100 Hours*	Seasonally or Every 12 Months or Every 200 Hours*
<b>Exterior Equipment</b>		Refer to Section J		
Clean Spotlight			■	■
Check Compass for Magnetic Deviation				■
Check Trim Tab Fluid Level		■	■	■
Check Trim Tab System for Leakage				■
<b>Upholstery</b>		Refer to Section K		
Clean Upholstery				■
Spray Upholstery with Lysol				■
Check Convertible Seat Hinges and Swivels				■
<b>Weather Covers</b>		Refer to Section L		
Wash Weather Covers				■
Spray Weather Covers with Lysol				■
<b>Fiberglass Components and Hull</b>		Refer to Section M		
Check all fastenings securing rails, seats, etc.				■
Clean Fiberglass Thoroughly			■	■
Wax Hull Sides and All Non-tread Areas				■
Inspect Fiberglass Areas for Damage				■
Perform Minor Touch-up Repairs				■
Sand Hull and Re-apply Anti-fouling Paint				■
<b>Woodwork Care and Maintenance</b>		Refer to Section N		
Apply Teak Care Products		As Needed		
Clean Ash Trim and Tables				■
<b>Trailers</b>		Refer to Section P		
Wax Trailer		■	■	■
Lubricate Trailer Jack		■	■	■
Lubricate Trailer Coupler			■	
Lubricate Trailer Winch		■	■	■
Inspect Trailer Brakes			■	
Lubricate Bearings		■	■	



# TRAILER INFORMATION

## P - 1 GENERAL TRAILER INFORMATION

The trailer must properly "match" the boat's weight and hull design. Four Winns trailers are designed specifically for each boat model. This will prevent any problems related to trailer capacity or improper support. Four Winns trailers meet or exceed the National Marine Manufacturers Association's trailer requirements.

Four Winns, Inc., manufactures bunk type trailers. The bunks are located specifically for Four Winns boats and adequately support all parts of the boat. It is a "drive-on" type trailer which means winching the boat from the water is not necessary.

### NOTICE

When winching the boat onto the trailer, be sure the bunks are wet to prevent damage to the boat or trailer. DO NOT attempt to winch the boat forward when out of the water. Damage to the winch stand/assembly or tongue could occur.

Four Winns offers both painted and galvanized trailers. The painted trailer is intended to be used in fresh water and the galvanized trailer in salt/brackish water.

### A. Regulations

Federal law requires that the trailer and tire registration information be compiled and recorded. The Four Winns boat registration card includes trailer registration information. A trailer tire warranty card provided with this manual, is to be filled out and returned to the tire manufacturer.

Laws covering such items as trailer brakes, lights, safety chains, etc., will vary from state to state. Please contact the motor vehicle department in your state for additional information.

### B. Load Carrying Capacity

The certification label shows the maximum load-carrying capacity and is located on the port forward side of the trailer. The Gross Vehicle Weight Rating (GVWR) is the load-carrying capacity plus

the weight of the trailer itself. DO NOT exceed the GVWR rating for the trailer.

If selecting a trailer from another manufacturer, check the load-carrying capacity. A trailer with a load-carrying capacity that is too low will be unsafe on the highway and could cause sudden failure of critical trailer components or abnormal tire wear. A trailer with too high of a load-carrying capacity that is sprung for heavy loads can damage a lighter boat.

### NOTICE

DO NOT overload your trailer by placing camping gear or other heavy equipment in the boat. DO NOT exceed the GVWR rating. Damage to the hitch, coupler, or trailer may occur.

Improper weight distribution can place excessive strain on the towing vehicle and trailer. It can also cause the trailer to "fishtail" (sway side to side). Be sure gear and other items are distributed evenly in the boat.

### C. Hitches

The load-carrying capacity of trailer hitches will vary between manufacturers and must equal or exceed the GVWR. Four Winns trailers use surge brake systems and require a fixed hitch. Refer to Section P-2g Surge Brakes for more information.

Before hitching the trailer to the vehicle, make sure the proper size hitch ball is installed to match the coupler. Please refer to the coupler or actuator on the trailer for ball size. Four Winns trailers require 2 5/16" hitch ball. Refer to Section P-3 Operation for additional information on hitches. Also, consult your Four Winns dealer for his recommendation before purchasing a trailer hitch for your towing vehicle.



### WARNING

To help guard against a sudden failure while in use, DO NOT use a worn hitch ball. Replace all worn or damaged parts.

## P - 2 TRAILER COMPONENTS

### A. Bunk Supports

All bunk boards are made of pressure treated wood. This wood is rot resistant. All boards are covered with a high quality exterior grade carpet to protect the boat from damage during normal use.

Bunk supports run parallel to the keel and support the hull, extending beyond the transom. See Figure P1.

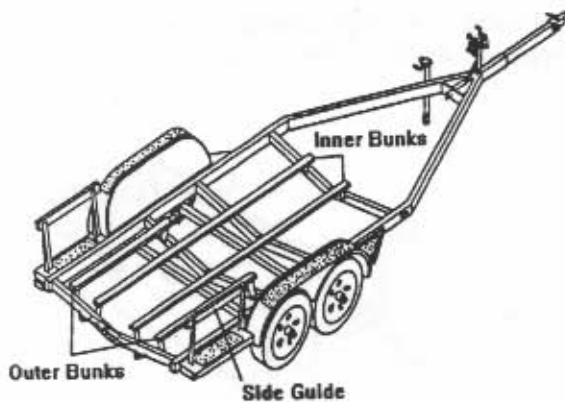


Figure P1: Trailer Bunks

Outer bunk supports provide stability for the boat. The inside bunks are the main weight bearing members. Side guide-on supports help to keep the boat straight while driving the boat onto the trailer. Keeping the tie-downs tightly fastened will prevent the boat from bouncing against the bunk supports.

#### NOTICE

Improper trailer set-up can cause hull damage.

### B. Tongue

The trailer tongue can be removed during storage of the boat and trailer. The tongue slides into the trailer frame and two clevis pins with hair pin cotters are installed to secure the tongue in place. See Figure P2.

#### CAUTION

Make sure the trailer tongue is secure before hitching to the towing vehicle.

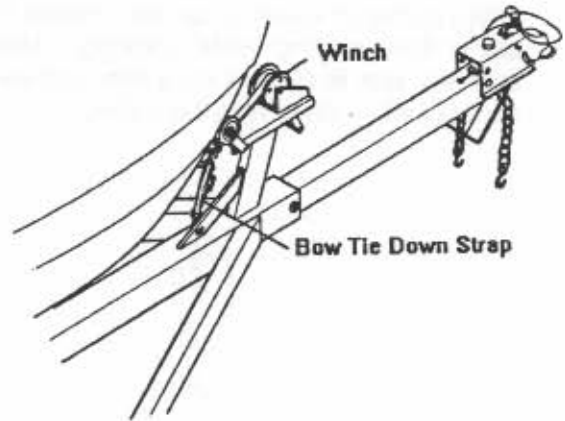


Figure P2: Trailer Tongue Assembly

Four Winns trailers are designed with tongue weights between 5% and 10% of the total weight of the boat, fuel, gear and trailer. If the downward weight on the coupling ball does not fall within this range, coupler failure and towing instability may occur. If using another manufacturer's trailer, have the dealer check the tongue weight before trailering.

#### NOTICE

DO NOT use a bent or damaged tongue or coupler. Replacement parts may be ordered through a Four Winns dealer.

### C. Swivel Jack

The jack is designed to lift, lower and support the tongues of the trailers when not connected to the towing vehicle. Before unhitching the trailer, use the following guidelines when setting up the jack.

1. Pull on the lock pin. See Figure P3.
2. Swivel jack to the vertical position.
3. Release the lock pin and make sure the pin fully engages the attached tongue bracket.



**CAUTION**

Be sure dirt, sand, ice, etc., does not obstruct the proper seating of the lock pin.

- When raising or lowering the jack, prevent the caster from rotating while cranking. Make sure the jack is planted on a firm and level surface before unhitching the trailer.

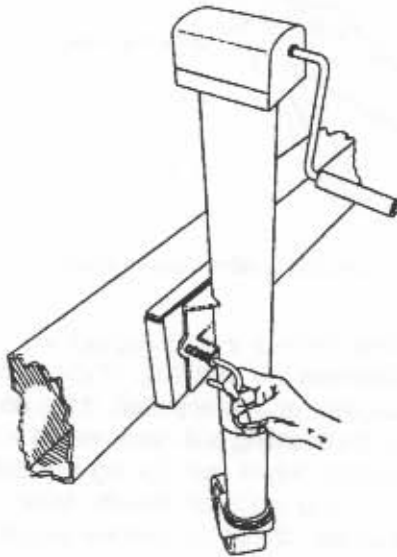


Figure P3: Swivel Jack

**WARNING**

To prevent personal injury or damage to the boat and trailer, observe the following:

- NEVER pull on the lock pin when any trailer weight is on the trailer jack.
- DO NOT move the trailer when resting on the swivel jack. Use towing vehicle to move the boat and trailer.
- Keep body and feet clear of trailer tongue when raising or lowering jack.

Always remember to swivel jack to the horizontal position before towing the trailer. Damage to the caster and jack may result.

The swivel jack provided on the Four Winns trailer can be removed from the trailer to allow for maintenance or repairs. Follow the manufacturer's recommendations provided with this manual.

**D. Surge Brakes**

Brakes are available on all trailers manufactured by Four Winns, Inc. Surge brakes operate automatically when the tow vehicle's brakes are applied. When the tow vehicle slows down or stops, the forward momentum or "surge" of the trailer against the hitch ball applies pressure to a master cylinder in the trailer coupler. This pressure activates the trailer brakes through the brake's hydraulic system. See Figures P4.

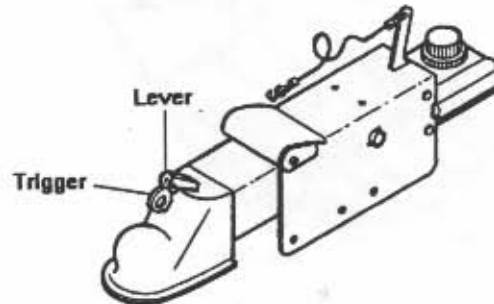


Figure P4: Surge Brake Actuator & Coupling Assembly

On the Surge Brake Actuator and Coupling Assembly shown in Figure P5, lift the release handle to unlock the coupler. The optional locking pin or a padlock may be inserted in the locking lever hole to secure the trailer. Refer to Section P-3 Operation for additional information on couplers and hitching to the tow vehicle.

**NOTICE**

Anti-sway devices as used on recreational vehicles (RV's) are not applicable to surge brake systems and should not be used on Four Winns trailers.

DO NOT use a trailer hitch with moving parts. The brakes could activate when traveling downhill. Always use a fixed hitch.

If the brakes are wet from loading, travel at a slow speed and apply the brakes on your towing vehicle several times to "dry" out the trailer brakes.



For maintenance and other information, refer to the manufacturer's literature included with this manual.

### E. Winch

Winch operating instructions are listed below.

To release the winch, place the ratchet in the REVERSE or NEUTRAL position. The winch handle may spin when pulling on the winch line.

#### CAUTION

A clicking sound will be heard when the winch is properly engaged. If a clicking sound is not heard, DO NOT release the handle. Handle may spin backwards. Lower the load into a safe position before releasing the handle.

#### CAUTION

To prevent personal injury, observe the following:

- A spinning winch handle can cause injury. Be sure the area is clear.
- DO NOT release the handle when the ratchet is disengaged. Be sure the ratchet is engaged or no load is on the winch before releasing the handle.
- Always inspect the winch line and hook before each use. NEVER use line that is worn or frayed. NEVER let anyone stand in or behind a boat while pulling with the winch.

To rewind the winch, ALWAYS engage the ratchet first. Turn the handle in the appropriate direction to rewind the line.

Refer to the manufacturer's literature included with this manual for more information on winch operation.

### F. Wheels

Trailer wheel rims are available in three types of finishes: white, aluminum and galvanized. The

white, powder coat finish is standard. Aluminum rims (Mags) have become available just recently and are optional on Four Winns trailers. Galvanized trailers are equipped with matching galvanized rims. Refer to P5.

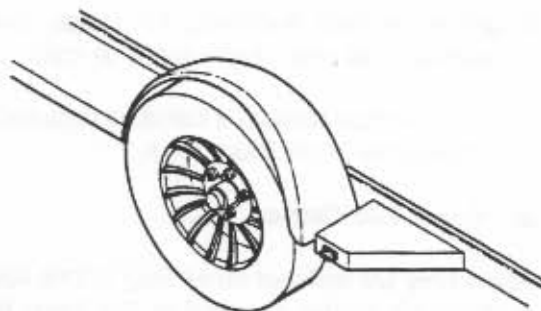


Figure P5: Mag Wheel

The tires installed on Four Winns trailers meet the trailer load requirements for each model. Before tralling, make sure the tires are inflated according to the manufacturer's recommendation. Tire pressure information is noted on the tire and on the manufacturer's literature.

Lug nuts must be checked for proper tightness after the first 50 miles and periodically thereafter. Lug nuts should be torqued to 85 foot pounds on white, galvanized, and aluminum wheels.

Mag wheels include a locking-type nut to help deter theft. This nut requires a special key or socket to remove. The socket will be included with your trailer when mag wheels are ordered. Refer to Figure P6.

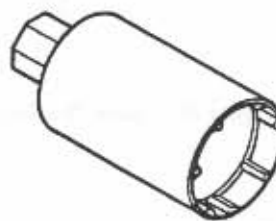


Figure P6: Mag Wheel Key (Socket)



### NOTICE

DO NOT use an air wrench or other power equipment to install lug nuts on aluminum (Mag) wheels. Damage to the wheel may result. Lug nuts should be torqued to 85 foot pounds.

Examine the tires frequently for snags, bulges, excessive tread wear, separations or cuts.

Refer to the manufacturer's literature included with this manual for more information.

### G. Spare Tire Carrier

Spare tires are optional on all Four Winns trailers. A spare tire carrier is bolted to the trailer frame and is available in painted or galvanized finish. Refer to Figure P7. A spare tire carrier and wheel can be ordered from your Four Winns dealer.

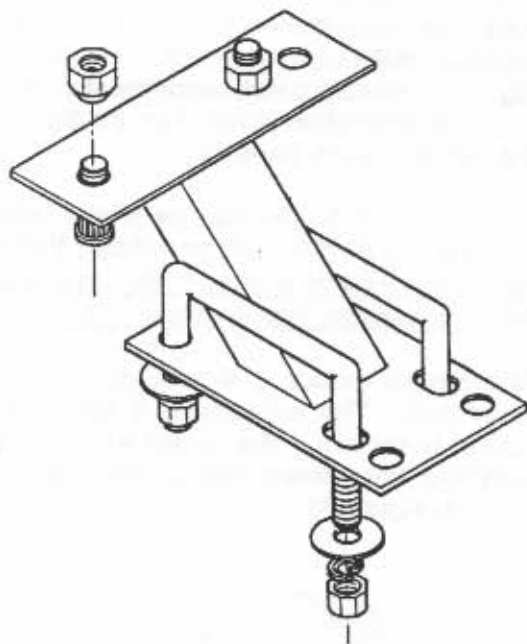


Figure P7: Spare Tire Carrier

### H. Lights

Four Winns trailers are equipped with taillights, brake lights, turning signals, and clearance lights.

Consult your dealer for state trailer regulations concerning lighting and other optional equipment.

### I. Tie-downs

The boat should be secured to the trailer by tie-downs to prevent damage to the hull. The boat may shift or bounce against the bunks or hull supports if not secured. It may also slide or fall off the trailer while being towed.

There are two types of tie-downs being used:

1. Bow Tie-downs: A bow stop to hold the front of your boat in place is located on the winch stand. It should be positioned so that the winch line pulls straight and is parallel to the trailer frame. A separate tie-down should then be attached to hold the boat. See Figure P8.

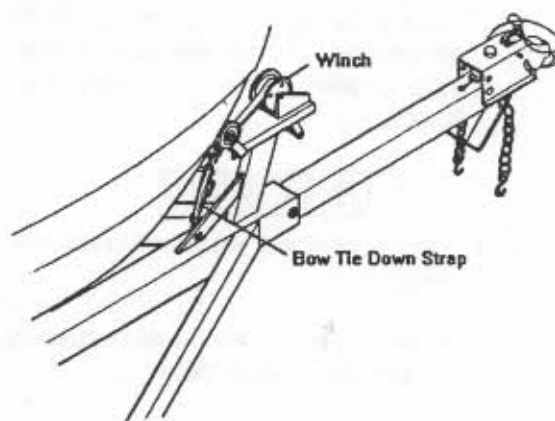
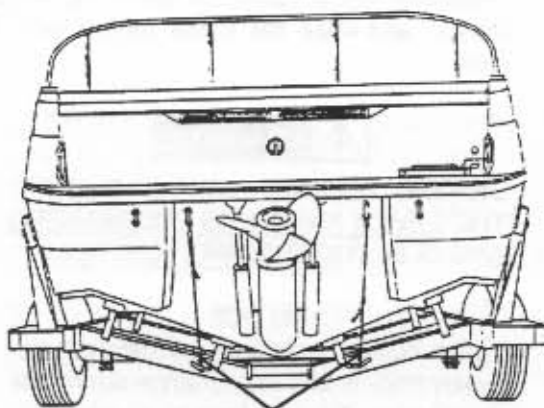


Figure P8: Bow Tie Down Strap

### NOTICE

DO NOT rely on the winch cable (or line) alone to hold the bow of the boat against the bow stop. A bow tie-down is provided with the Four Winns trailer.

2. Rear Tie-downs: It is very important that the transom is resting securely on the bunk supports at the rear of the trailer. Rear tie-downs are provided to secure the boat to the trailer. Tighten the tie-downs to prevent the boat from moving. See Figure P9.



Rear Tie Down Straps

Figure P9: Rear Tie Down Straps

### P - 3 OPERATION

#### A. Hitching Trailer

Before towing, the trailer must be properly hitched to the tow vehicle.

1. Position actuator ball socket above ball hitch.
2. Hold release handle in open position. See Figure P4.
3. Lower trailer tongue until ball is seated or rests in ball socket.
4. Close release handle.

The release handle will close freely with finger pressure when ball is properly seated in socket. If the handle does not close freely, do not tow trailer. DO NOT force handle into closed position. Inspect actuator for bent parts or cause of improper operation.

#### NOTICE

Keep the coupler clean and lubricated to prevent damage to the coupler.

5. Make sure the actuator is secure. If unsure, extend the trailer tongue jack to the ground and lift (with the jack) the car and trailer combination approximately 2" to 4". If the ball

does not disengage and remains secured, the actuator is latched properly.

#### NOTICE

To prevent back injury, DO NOT PHYSICALLY LIFT the trailer tongue when loaded.

6. Insert padlock or bolt through lock hole to protect from theft.
7. Connect breakaway cable solidly to bumper or frame of tow vehicle and should be as near to center as possible. The cable should hang clear of trailer tongue and be long enough to permit short radius turns without pulling breakaway cable forward.
8. Make sure breakaway cable is in released position with indicator bead touching or resting against cable spring stop. See Figure P10.

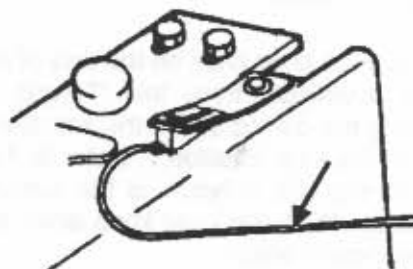


Figure P10: Breakaway Cable

#### CAUTION

DO NOT use breakaway cable as a parking brake.

9. Safety chains are provided and must be used. Cross the safety chains under the coupling and attach to the towing vehicle's frame or bumper. Always allow slack for turns.

#### WARNING

To reduce the risk of breakaway accidents, be sure coupler is seated and safety chains crisscrossed before trailering.

10. Retract jack fully and place in trailering or horizontal position.





11. Check for proper tow vehicle-trailer hook-up. The tow vehicle and trailer should be level with a positive tongue load. Four Winns trailers are designed with tongue weights between 5% and 10% of the total weight of the boat, fuel, gear and trailer. The trailer should be close to level. If unsure of tongue load and trailer position, consult your Four Winns dealer before proceeding.

Be sure to read the manufacturer's literature included with this manual before towing your Four Winns boat and trailer.

### B. Backing Up

Follow the steps listed above for hitching the trailer before backing up.

1. Before backing up a slope or through soft ground, pull the trailer forward slightly to assure the actuator socket is in the fully forward position.
2. Move the lever knob on the side of the actuator downward from the "Towing Position" along the curved slot in the actuator frame to the "Back-up Position". Refer to Figure P5. The slot has a notch at the bottom of its travel. Push the lever knob down to engage the locking notch.
3. Back the trailer up.



Avoid sharp turns. This could bend, create extreme stress or fracture either the actuator or trailer tongue.

### NOTICE

Be sure to check for obstacles or persons behind the trailer before backing up. Also, adjust your mirrors for clear view of the area behind the trailer.

4. If the trailer is to be uncoupled from the tow vehicle after backing with the lever knob engaged, block all trailer wheels and pull forward slightly to take strain off the actuator.

Uncouple the actuator by lifting the release handle and raise the trailer tongue with the jack.



**BEFORE TOWING, ALWAYS ENSURE THE LEVER KNOB HAS DISENGAGED AND IS IN THE "TOWING POSITION".**

### NOTICE

Trailer components may be different between models and may change during the model year. Be sure to read all manufacturer's literature supplied with your Four Winns trailer.

## P - 4 TRAILERING

### A. Checklist

Before trailering, the trailer should be inspected for the following:

1. Check tires for proper inflation. Under-inflated tires heat up rapidly and may blow-out or cause uncontrolled swaying. Also, make sure lug nuts are tight.
2. Be sure the coupler is secured to the trailer hitch and safety chains are attached.
3. Be sure trailer taillights and turning signals are operational.
4. Check the brakes for proper operation prior to departure.
5. Check lug nuts for proper tightness.
6. Check tie-downs and make sure boat is secured to the trailer.
7. Check the springs and under carriage for loose parts.
8. Before towing, close and secure all hatches, doors, and windows. Securely store all equipment and canvas. Installed tops, side curtains, and aft curtains can be damaged while towing.



9. 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.



**WARNING**

To avoid bearing failure and possible wheel loss, keep wheel bearings properly lubricated. Inspect the wheel bearings periodically and check for damage.

10. Before trailering, inspect the bearings for wear and adequate lubrication. 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.

**B. Tactics**

**NOTICE**

Be sure to check the towing vehicle manufacturer's literature for recommendations on towing.

1. Install outside rear view mirrors on both sides of the towing vehicle to improve vision. Check the rear view mirrors at frequent intervals to be sure trailer and boat are riding smoothly.
2. Allow at least one car and trailer length between vehicles for each 10 mph. DO NOT tailgate.
3. Use low gear (on manual transmissions) when traveling up steep hills or over sand, gravel, or dirt roads.
4. Use care if shifting to a lower gear while traveling downhill. This could activate the trailer's surge brakes for the duration of the downhill run and cause overheating. Extended overheating could result in complete loss of the trailer brakes.

To help prevent overheating, slow down while approaching the crest of a hill and maintain a slow, controlled downhill speed. Apply brakes in short intervals to allow time between braking for the brakes to cool off.

5. When rounding turns on highways or streets, DO NOT cut corners. Also, travel slowly over railroad tracks.
6. If the trailer begins to "fishtail" when accelerating, reduce speed until it ceases. If the trailer "fishtails" again during acceleration, stop to investigate the cause of the problem. Check for improper trailer load and uneven weight distribution inside the boat. Check the winch line and tie-downs. Also check the tires for proper inflation or damage. If necessary, redistribute the load before continuing.

**NOTICE**

Before backing the trailer into the water, disconnect the trailer light plug from the towing vehicle. This will greatly reduce the likelihood of blowing out trailer lights or fuses on the towing vehicle, and give extra time for the hubs to cool down. Be sure to carry extra fuses for the towing vehicle.

For additional information on trailering, refer to the Boating Basics manual included with this manual.

**P - 5 MAINTENANCE**

**A. Care of Exterior Finish**

When using the trailer, keep in mind the paint can scratch and become marred during normal use. Paint touch up kits can be ordered from Four Winns Customer Service department. Contact a Four Winns dealer for assistance.

Some maintenance is required to maintain the finish and minimize rusting. The trailer should be washed and rinsed with clean water immediately after each use. On galvanized trailers, rinse only with clean water. Depending upon use, waxing is recommended twice a year. Use paste wax designed for enamel paint.

**B. Bunks**

The bunks should be replaced if they are cracked, warped, or evidence of dry-rot is found. The replacement boards should be treated lumber of the same length and width.

**CAUTION**

DO NOT burn damaged or broken bunks. Toxic fumes will be released. Dispose of bunks properly.

**C. Swivel Jack**

Keep the swivel jack clean of dirt, tar, and mud. Lubricate every six months. The swivel jack's inner ram should be lubricated with SAE 30 weight oil. The top cover may be removed to lubricate the gears with wheel bearing grease.

Replace all worn and damaged parts. ALWAYS use the manufacturer's replacement parts. Replacement parts may be ordered through your Four Winns dealer.

For more information on maintenance, refer to the manufacturer's literature included with this manual.

**D. Brake Actuator & Coupling Assembly**

When storing or parking your trailer, keep the brake actuator and coupling assembly (coupler) off the ground to prevent dirt build-up in the ball socket. Keep the coupler clean of dirt, tar, and mud. Lubricate the coupler with SAE 30 weight oil every six months or as often as necessary. Replace any worn or defective parts. If the coupler is damaged, contact your Four Winns dealer for replacement parts. DO NOT use a damaged or bent coupler assembly.

For more information on maintenance, refer to the manufacturer's literature included with this manual.

**NOTICE**

The trailer should be set up at a slight angle to allow for water to drain aft in the boat.

**E. Winch**

The winch should be kept clean of dirt, ice, paint, etc., and the spur gears should have a film of grease on them at all times. Apply several drops of SAE 30 weight oil to the ratchet pawl mechanism, bushings and pinion shaft threads twice per season.

Replace any worn or damaged parts. For more information on maintenance, refer to the manufacturer's literature provided with this manual.

**F. Wheels**

Some maintenance is required to maintain the finish and retard rusting of painted rims. The wheels should be cleaned with dishwashing soap and water and rinsed with clean water immediately after each use. Waxing is recommended three to four times each year.

Aluminum wheel rims may be cleaned with dishwashing soap and water. However, cleaning products specifically for aluminum are available and can be used. Cleaners may be obtained from Four Winns dealers and your local auto parts stores. The Mag wheel manufacturer recommends a product by Priority One called "Pro-Long Aluminum/Chrome Wheel Protectant". Galvanized rims should be rinsed only with clean water immediately after each use.

**NOTICE**

ALWAYS read the manufacturer's instructions on the label before using any product.

**G. Brakes**

Keep the actuator clean of dirt, tar, and mud. The actuator and internal parts should be lubricated at all times with SAE 30 weight oil. The hitch ball may be lubricated with automotive grease or lubricant made for hitch balls.

Periodically inspect the brake system for leaks. Check all hoses for cuts or wear. Replace all defective hoses. The master cylinder should be filled within 1/2 inch from the top of the reservoir. At the beginning of each year, inspect the brakes for excessive wear, replacing linings if necessary.

For more information on maintenance, refer to the manufacturer's literature included with this manual.

**H. Bearings**

Wheel bearings and seals should be inspected at the same time as brakes. Replace any worn or defective parts. Grease bearings and seals at this time and at the end of the boating season. Lube



Bearing Protectors should be greased three to four times a year. A grease fitting is provided.

**NOTICE**

Most bearing failures are due to improper maintenance. Be sure to inspect bearings and seals as noted and refer to Section O Maintenance in this manual.

**I. Lights**

Inspect wiring for cuts or bare wire which could cause electrical shorts. Repair or replace defective wiring. Replace cracked or damaged lens and always carry spare bulbs. Replacement parts may be ordered through a Four Winns dealer.

**J. Tie-downs**

Replace frayed or damaged tie-downs. Periodically, lubricate the ratchet mechanism with a fine oil or silicone spray. Replacement parts may be ordered through a Four Winns dealer.



# OPERATION

## Q - 1 GENERAL

Before starting the boat, become familiar with all of the various systems and related operations. Be sure all necessary safety equipment is on-board. Know the "Rules of the Road". Have an experienced pilot brief you on the general operation of your new boat. Perform a "Pre-Cruise Systems Check".

## Q - 2 COMPONENT SYSTEMS

Before you can really enjoy your boat, a thorough understanding of its systems and their operation is essential. This manual and the associated manufacturers information are provided to enhance your knowledge of the boat. Read this information carefully.

After becoming familiar with the boat and its systems, re-read this manual. Maintenance and service tips are included to help keep the boat in like-new condition.

## Q - 3 SAFETY EQUIPMENT

Besides the equipment installed on the boat by Four Winns, Inc., certain other equipment is required for passenger safety. A brochure listing the Federal equipment requirements is included with this manual. Remember that these laws are for your protection and are minimum requirements. Check your local and state regulations, also.

Items like a sea anchor, working anchor, extra dock lines, flare pistol, a line permanently secured to your ring buoy, etc. could at some time save your passengers lives, or save your boat from damage.

The Coast Guard Auxiliary offers a "Courtesy Examination." This inspection will confirm the boat is equipped with all of the necessary safety equipment.

## Q - 4 PASSENGER SAFETY

You are responsible for the safety of your passengers as well as for their behavior while aboard. Make sure:

1. Each passenger is properly instructed in Personal Flotation Device (PFD) use and keeps one within reach in case of emergency. Children should wear a PFD at all times when underway.
2. Passengers do not sit on gunwales, open decks, elevated pedestal seats or on seat backs when the boat is underway. This could cause them to be thrown overboard during a sudden maneuver.
3. At least one other person knows how to operate the boat in case of an emergency.

## Q - 5 RULES OF THE ROAD

As in driving an automobile, there are a few rules that must be known if safe boating operation is to be maintained. The Coast Guard, Coast Guard Auxiliary, Department of Natural Resources or your local boat club sponsor courses in boat handling, including rules of the road. Such courses are strongly recommended. Books on this subject are also available from local libraries.

## Q - 6 LIGHTNING

When boating, it is important to be aware of the weather around you. When the weather changes for the worse, DO NOT jeopardize your safety by trying to "ride out the storm". If possible, return to safe harbor and dock your vessel immediately.

If caught in a storm, seek shelter inside the cabin and wait for the storm to pass. With open bow models, suntops and campers will provide some protection, but should not be relied on if you are able to return to shore. Exercise care when high winds are present!

**WARNING**

DO NOT swim or dangle legs or arms into the water during a lightning storm. Stay out of the water!

Lightning will seek a ground when it strikes. Avoid contact with metal parts such as bow rails, control handle, or windshield.

**Q - 7 DRINKING AND DRIVING**

Please keep in mind that along with the fun of boating comes responsibility. As the owner or operator of a pleasure boat, you are obligated (morally and legally) to use good judgement while underway in providing for the safety and well-being of your passengers and other boaters around you.

A common and flagrant violation of good judgement by mariners involves the use of alcohol or drugs. Each year, about half of all accidents involving fatalities involve the use of alcohol or drugs.

Laws enacted in 1984 make it a federal offense to operate a boat while intoxicated. Criminal penalties may include the termination of operating privileges for up to one year. Many states have passed similar laws.

Alcohol or drugs have an inhibiting effect on the judgement and reaction time of the helmsmen. Heed the advice of experts and statisticians...DO NOT drink or use drugs when operating a boat. NEVER allow an obviously intoxicated person to take the helm.

Have fun in your Four Winns boat but also, have the good sense to be mentally alert and physically capable of operating the boat in a safe manner.

**Q - 8 PRE-CRUISE SYSTEM CHECK**

Before leaving the dock, the following items should be checked:

**A. Before Starting The Engine**

1. Check the weather forecast. Determine if the cruise planned can be made safely.
2. Check the bilge water level and bilge pump operation. Check the engine and drive fluid levels. Look for other signs of potential problems. Check for the scent of fuel fumes.
3. Set the Battery Selector Switch to the desired position. See Section E Electrical Equipment.
4. Activate the Bilge Blower. Check the blower output.
5. Be sure all necessary safety equipment is on-board and operative. This includes items such as the running lights, horn, spotlight, life saving devices, etc.
6. Be sure the dockside shore power cord is disconnected.
7. Be sure the dockside water supply line is disconnected.
8. Ensure an adequate amount of fuel is on board.
9. Be sure you have sufficient water and other provisions on board for the cruise planned.
10. Leave a written message listing details of the planned cruise with a close friend ashore.

**B. After Starting The Engine**

1. Visibly check the engine to be sure there are no apparent water or oil leaks.
2. Check the gauges. Make sure the oil pressure, water temperature, voltmeter, etc. are reading normally.
3. Have a safe cruise and enjoy yourself.

## Q - 9 ENGINE OPERATIONAL PROCEDURES

### A. Before Starting

1. Check the engine compartment for water, gas, and/or oil leaks of any kind. Keep the bilge in a clean condition to prevent blower and bilge pump damage, and fire hazards.
2. Check the fluid levels of the engine oil and power steering system daily. Fill oil or steering fluid as required by the indications on the dip sticks. Use an SAE 30 motor oil (refer to engine manual for manufacturer's recommendations). **DO NOT USE MULTIGRADE OIL.** Power steering, power trim, and trim tabs use automatic transmission fluid. Check the fluid levels in the vertical drive units or transmission as often as practical.
3. Start and operate the bilge blower system for at least four (4) minutes before start-up.
4. Lower the vertical outdrive units (on applicable models) making sure the water intakes are under the water.
5. Attach the lanyard to the emergency ignition cut-off switch (on applicable models). Engine will crank but will not start if lanyard is not in place. Attach the other end of the lanyard to a secure place on your clothing.

### B. Cold Engine Start

1. A cold engine will require priming by pumping the throttle. Place the throttle into the shift disengaged position and push the throttle full forward three (3) to four (4) times. This will set the choke and prime the engine. Return the throttle lever to neutral position. With the lever still in the disengaged position, push the throttle forward until resistance is felt and then move forward another 1/2 inch for fast idle position.
2. Turn the key to START position and crank to start. If the engine fails to start, repeat step #1 to reprime. **DO NOT** crank starter for more than ten (10) seconds per try or damage to the starter may occur. Steps #1 and #2 may need to be repeated two to three times.

### NOTICE

Cold engine starting procedures are different for EFI engines. Priming is not necessary. Refer to the engine owner's manual for additional information.

When the engine starts, release the key to the RUN position and adjust the throttle to about 1500 rpms. Allow the engine to warm up to at least 120 degrees before shifting into gear.

### NOTICE

**BOTH ENGINES MUST BE RUNNING** (twin engine models) during close maneuvering or at slow speeds. Water may be forced back through the underwater exhaust outlet of an engine not running and cause serious engine damage. **DO NOT** attempt to plane the boat with only one engine running except under emergency conditions. The propellers are selected for the boat with both engines in operation. This labored condition on one engine could cause extensive engine damage.

### C. Warm Engine Starting

1. Move the throttle lever to the neutral position.
2. Crank the starter until engine starts or for no more than ten (10) seconds. If the engine fails to start, disengage shift (as directed in the Control Manual) and advance until resistance is felt; then advance 1/2 inch.
3. Once the engine starts, release the key to the RUN position and quickly return throttle to the idle position.

### NOTICE

Warm engine starting procedures are different for EFI engines. Priming is not necessary. Refer to the engine owner's manual for additional information.

### D. Shifting

1. If the lever is in the shift (disengaged) position, return to the neutral detente and allow the lever to reengage shift.

## Q - 9 ENGINE OPERATIONAL PROCEDURES

### A. Before Starting

1. Check the engine compartment for water, gas, and/or oil leaks of any kind. Keep the bilge in a clean condition to prevent blower and bilge pump damage, and fire hazards.
2. Check the fluid levels of the engine oil and power steering system daily. Fill oil or steering fluid as required by the indications on the dip sticks. Use an SAE 30 motor oil (refer to engine manual for manufacturer's recommendations). **DO NOT USE MULTIGRADE OIL.** Power steering, power trim, and trim tabs use automatic transmission fluid. Check the fluid levels in the vertical drive units or transmission as often as practical.
3. Start and operate the bilge blower system for at least four (4) minutes before start-up.
4. Lower the vertical outdrive units (on applicable models) making sure the water intakes are under the water.
5. Attach the lanyard to the emergency ignition cut-off switch (on applicable models). Engine will crank but will not start if lanyard is not in place. Attach the other end of the lanyard to a secure place on your clothing.

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### NOTICE

Warm engine starting procedures are different for EFI engines. Priming is not necessary. Refer to the engine owner's manual for additional information.

### D. Shifting

1. If the lever is in the shift (disengaged) position, return to the neutral detente and allow the lever to reengage shift.



facility should check the hull and underwater gear at the first opportunity. DO NOT continue to use the boat if the condition of the hull or underwater equipment is questionable.

## Q - 11 BOATING EDUCATION

### A. Boating Courses

Boating education classes are offered throughout the country. The United States Coast Guard Auxiliary offers free courses on different topics usually during the off-season. The most popular course is the "Boating Skills & Seamanship Course," and information can be obtained by calling 1-800-336-BOAT.

The United States Power Squadron also offers free courses ranging from basic seamanship to celestial navigation. For information, contact your local Power Squadron, or write: U.S.P.S., P.O. Box 30423, Raleigh, NC 27622.

The Red Cross offers power boating and canoeing classes. Contact: Director of Water Safety, American National Red Cross, 17th & D Streets N.W., Washington, DC 20006.

The Canadian Power and Sail Squadron offers seamanship courses. Information can be obtained by calling 1-800-268-3579 (Canada only).

### B. Boating Manuals or Literature

A good source of information is the U.S. Coast Guard's home study book called "The Skipper's Course". This book may be purchased through: Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, Stock # 050-012-00159-6.

Another good source of boating information is Chapman's "Piloting, Seamanship and Small Boat Handling". Also, check the local library or bookstore for additional information on boating.

### C. Charts and Maps

U.S. nautical charts are sold throughout the country at Governmental Printing Office stores and other agents. A chart catalog is available by

writing to: National Oceanic and Atmospheric Administration, National Ocean Survey, Rockville, MD 20852.

In addition, many federal agencies publish recreational maps, including the U.S. Army Corp of Engineers, the Forest Service, the National Park Service, and the Tennessee Valley Authority.

Addresses of all state boating agencies are listed in "A Boater's Guide". For a free copy, write to: National Marine Manufacturers Association, 401 N. Michigan Avenue, Chicago, IL 60611.

## Q - 12 GLOSSARY

ABAFT - Toward the rear of a boat.

ABEAM - At right angles to the keel of the boat.

ABOARD - On the boat.

ABREAST - Side by side.

ADRIFT - Loose, not on moorings or towline.

AFT - Moving toward the stern, you are going aft.

AGROUND - Stuck fast to the bottom.

AHEAD - In a forward direction.

ALEE - Away from the direction of the wind; opposite of windward.

ALOFT - Above the deck.

AMIDSHIPS - 1. An object or area midway between the bow and stern. 2. An object or area midway between the port side and the starboard side of a vessel.

AMPERE - The standard unit used to measure the draw of an electrical current.

ANCHOR RODE OR ROPE - The line (chain) connecting a vessel to its anchor.

ANCHOR BALL - A black, circular, day signal hoisted to show that a vessel is anchored. Replaced at dusk by the anchor light.

**ASTERN** - Anywhere behind the boat, a reverse direction, opposite of ahead.

**ATHWARTSHIPS** - A line, or anything else, running perpendicular to the fore-and-aft center line of a boat.

**BATTEN** - A strip of wood or metal used to secure tarpaulin(s) in place over a hatch. To batten down means to secure for rough weather.

**BEAM** - 1. The widest distance across a boat from the outside skin on one side to the outside skin on the other. 2. A transverse structural member that stiffens and supports a portion of the deck.

**BEAM WIND** - A wind blowing against the side of the vessel, perpendicular to the long axis of the vessel.

**BILGE** - The lowest interior area of a hull, used to collect water that has entered.

**BILGE PUMP** - A pump intended for removal of spray, rainwater, and the normal accumulation of water due to seepage and spillage; not intended for damage control.

**BINNACLE** - The stand or support for a magnetic compass occasionally used to mean helm.

**BITT** - A heavy and firmly mounted piece of wood or metal used for securing lines.

**BLOCK** - A wooden or metal case enclosing one or more pulleys and having a hook, eye, or strap by which it may be attached.

**BOLLARD** - A single post (wood, metal, or concrete) on a dock, pier, or wharf used to secure a vessel's lines.

**BONDING** - The electrical connection of exposed metallic, non-current carrying components to a common point on the main engine block.

**BOW** - The front end of the boat.

**BOW LINE** - A docking line leading from the bow.

**BREAKER** - A single breaking plunging or spilling wave.

**BREAKER LINE** - The outer limit of the surf. However, all breakers may not be in a line. They can occur outside the breaker line.

**BRIDGE** - The main vessel control station

**BROACH** - The turning of a boat parallel to the waves, subjecting it to possible capsizing.

**BULKHEADS** - The interior walls of a boat.

**BULWARK** - The side of a vessel when carried above the level of the deck.

**BUOY** - An anchored float used for marking a position on the water, a hazard, or a shoal.

**CAPSIZE** - To turn over.

**CAPSTAN** - A machine that moves a cylindrical device on a shaft for the purpose of hauling up an anchor.

**CAST OFF** - To let go.

**CATAMARAN** - A twin-hulled boat, with the hulls being side-by-side.

**CHINE** - The intersection of a boat's bottom and side. If this intersection is rounded, it is a "soft" chine. If the intersection is squared off, it is a "hard" chine.

**CHOCK** - 1. A fitting or hole in a railing or deck through which a mooring or anchor line is routed. 2. A wedge used to secure an item in place.

**CIRCUIT BREAKER** - A device used to interrupt an electrical circuit when current flow exceeds a predetermined level.

**CLEAT** - A double-ended deck fitting to which lines are secured; usually anvil-shaped.

**COAMINGS** - Raised lips around cockpits or hatches used to keep water from entering

**COCKPIT** - An exposed deck area (usually aft) that is substantially lower than the adjacent deck.

**COMBER** - A wave on the point of breaking. A comber has a thin line of white water on its crest, known as "feathering."

**COMPANIONWAY** - The steps or ladder leading downward from a deck.

**COMPARTMENTS** - Rooms divided by bulkheads.

**COUNTER** - The overhang at the stern of a boat.

**CRADLE** - A framework, generally made of wood, used to support a boat when it is out of the water.

**CREST** - The top of a wave, breaker or swell.

**CUDDY** - A small sheltered cabin in a boat.

**CURRENT** - 1. The movement of water, 2. The flow of electrical charge

**DEAD AHEAD** - Directly in front of the boat.

**DEAD RECKONING** - A plot of courses steered and distances traveled through the water.

**DECK** - A permanent covering over a compartment, hull or any part thereof.

**DINGHY** - A small, open boat used for ship to shore transportation.

**DISPLACEMENT** - The weight of water displaced by the hull of a vessel.

**DISPLACEMENT HULL** - A hull that "displaces" a volume of water equal to the weight of the boat. A hull designed to run in the water rather than on top of the water. When a displacement hull moves through the water, it pushes that water out of the way. Water will then flow around the hull and fill the "hole" the boat leaves astern.

**DOCUMENTED VESSEL** - Documented yachts have been specially registered with the U.S. Coast Guard. All documented yachts must have their name and home (hailing) port marked on some conspicuous place on the hull. Numbering is not required. Advantages include legal authority to fly the yacht ensign, privilege of recording bills of sale, and other instruments of title with federal officials, and preferred status for mortgages. Documentation does not exempt the unit from any State or Federal taxes. All safety and equipment regulations still apply.

**DOLPHIN** - A group of piles driven close together and bound with wire cables into a single structure.

**DRAFT** - 1. The depth of a boat from the actual water line to the bottom of the lowest part of the boat (e.g., the propeller tip or rudder). 2. The depth of water necessary to float a boat.

**DROGUE** - Any device streamed astern to check a vessel's speed, or to keep its stern up to the waves in a following sea.

**DYE MARKER** - A brightly colored chemical that spreads when released into water; normally used to attract attention.

**EBB TIDE** - A receding tide.

**EVEN KEEL** - To be floating evenly without listing to either side.

**EXHAUST SYSTEM** - The means by which the hot engine (or generator) exhaust gases are moved from the engine to an outboard port and then released into atmosphere.

**EYE SPLICE** - A permanent loop spliced in the end of a line.

**FAST** - Said of an object that is secured to another.

**FATHOM** - Six feet.

**FENDER** - A device (usually constructed of rubber or plastic) positioned so as to absorb the impact between vessels or dock.

**FETCH** - The unobstructed distance that the wind can blow over the water to create waves.

**FLARE** - 1. Outboard curve of the hull as it comes up the side from the waterline; the reverse of tumble home. 2. A pyrotechnic device used for emergency signaling.

**FLAT** - A small deck that is built below decks, specifically to support a piece of equipment.

**FLEMISH** - To coil down a line or rope on deck in a flat, circular, concentric arrangement.

**FLOTSAM** - Floating wreckage, trash or debris.



**FLUKE** - The palm of an anchor.

**FOAM CREST** - The top of the foaming water that speeds toward the beach after a wave has broken, commonly referred to as "white water."

**FOLLOWING SEA** - A sea (waves) moving in the same direction as a vessel.

**FORE-AND-AFT** - A line, or anything else, that runs parallel to the longitudinal center line of a boat.

**FOREFOOT** - The portion of a vessel's keel that curves upward to meet the stem.

**FOREPEAK** - A compartment in the bow of a boat.

**FORWARD** - Toward the bow.

**FREEBOARD** - The minimum vertical distance from the surface of the water to the gunwale.

**FREQUENCY** - The number of crests passing a fixed point at a given time.

**FRONTS** - Where opposing warm and cold air masses meet, generally producing a band of wet, stormy weather wherever they meet.

**GALLEY** - The kitchen area of a boat.

**GALVANIC CORROSION** - A potential electrical difference exists between dissimilar metals immersed in a conductive solution (e.g., salt water). If these metals touch or are otherwise electrically connected, this potential difference produces an electron flow between them. The attack on the less corrosion resistant metal is usually increased and the attack on the more resistant metal is decreased, as compared to when these metals are not touching.

**GANGWAY** - The area of a ship's side where people board and disembark.

**GASKET** - A strip of sealing material, usually rubber, set along the edge of a water or gas tight door, port, cover or hatch.

**GELCOAT** - The thin outer layer of pigmented plastic covering a fiberglass vessel.

**GLAND** - The movable part of a stuffing box, which when tightened, compresses the packing.

**GROUND** - Electrical term meaning the electrical potential of the earth's surface, which is zero.

**GROUND SPEED** - A vessel's speed made good over the earth's surface along a course or track.

**GROUND TACKLE** - The anchor, anchor rode, and other fittings that are used to secure a vessel at anchor or dockside.

**GUNWALE** - 1. The line where the upper deck and the hull meet.  
2. The upper edge of a boat's side.

**HALYARD** - A line used to hoist a flag or pennant.

**HATCHES** - Cover on hatchways.

**HATCHWAYS** - Access ways through decks.

**HARDTOP** - A permanent cover over the cabin or cockpit.

**HAWSER** - A heavy rope or cable used for mooring or towing.

**HEAD** - A toilet or lavatory area.

**HEADING** - The direction that a vessel is going with reference to true, magnetic, or compass north.

**HEADWAY** - The forward motion of a vessel through the water.

**HEAVE TO** - To bring a vessel up in a position where it will maintain little or no headway, usually with the bow into the wind.

**HEAVY WEATHER** - Stormy weather with high seas and strong winds.

**HEEL** - To tip to one side.

**HELM** - The wheel or tiller that manually controls the boat's steering system.

**HELMSMAN** - The individual steering the vessel.



**HIGHS** - A center of pressure surrounded by lower pressure on all sides. Caused by a mass of cooler, sinking, drier air. This raises the area ground level air pressure and provides clear skies.

**HULL** - The main body of a boat.

**INBOARD** - 1. From either the port or starboard side of a boat toward the fore-and-aft centerline of a boat. 2. The dock side of a moored boat.

**INLAND RULES** - Nautical "Rules-of-the-Road" that apply in U.S. lakes, rivers, and coastal waters.

**INTERNATIONAL RULES** - Nautical "Rules-of-the-Road" that are in effect by international agreement to the high seas.

**ISOBARS** - Lines of equal air pressure that connect all the local points on a weather map. These lines are usually closed and define high or low pressure air masses.

**ISOTHERMS** - Isotherms are lines that are similar to isobars except that isotherms connect all the points that are of equal temperature.

**JETSAM** - Refuse that sinks when discharged overboard.

**KEDGE(S)** - One or more anchors set out from a grounded vessel, usually astern, to 1) keep it from being driven further aground and 2) to aid in refloating.

**KEEL** - 1. The centerline of a boat hull bottom running fore and aft, 2. The backbone of a vessel.

**KNOT** - 1. A maritime unit of speed equal to one nautical mile per hour (6076 feet). 2. A term for hitches and bends.

**LANYARD** - A short line made fast to an object to secure it.

**LATITUDE** - The measure of angular distance in degrees, minutes, and seconds, north or south of the equator.

**LAZARETTE** - Storage compartment in the deck at the stern.

**LEADLINE** - A weighted line used to take depth measurements.

**LEE** - The direction opposite that of the wind.

**LEEWARD** - Away from the wind.

**LIST** - A vessel that inclines to port or starboard.

**LORAN** - Long Range Navigation. An electronic system whereby a navigator can determine position regardless of weather.

**LONGITUDINAL** - Running lengthwise.

**LOWS** - A region of low atmospheric pressure. Hurricanes are extremely concentrated low pressure systems.

**LUBBER LINE** - A mark or line on the compass parallel to the keel indicating forward.

**MAST** - A spar that is set upright to support lighting, rigging, or sails.

**MOORING** - An arrangement for securing a boat to a mooring buoy or pier.

**NAVIGATION LIGHTS** - A set of red and green or white lights which must be shown by all vessels between dusk and dawn.

**OVERHEAD** - A ceiling or roof of a vessel.

**OVERBOARD** - Over the side of the boat.

**OUTBOARD** - 1. From the fore-and-aft centerline of a boat toward both the port and starboard sides. 2. The seaward side of a moored boat. 3. An engine that is mounted externally onto the transom of a boat.

**PAINTER** - A line to the bow of a small boat used for making fast.

**PASSAGEWAY** - A corridor or hallway aboard ship.

**PENNANT** - The line by which a boat is made fast to a mooring buoy; also pendant.

**PERSONAL FLOATATION DEVICE (PFD)** - A life preserver.



**PIER** - A loading platform that extends at an angle from the shore.

**PILASTER** - A rectangular structural support column that is an extension of the port and starboard aft cabin sides and which supports the hardtop and flybridge.

**PILING** - Support, or protection for wharves, piers, etc.

**PITCH** - 1. The vertical (up and down) motion of a bow in a seaway, about the athwartships axis. 2. The axial advance of a propeller during one complete revolution.

**PITCHPOLING** - A boat being thrown end-over-end.

**PLANING HULL** - At slow speeds, a planing hull will displace water in the same manner as a displacement hull. As speed is increased, the hull provides a lifting effect up onto the surface of the water.

**POINT** - One of 32 points of the compass that is equal to 11-1/4 degrees.

**PORT** - 1. Looking forward, the left side of a boat, 2. A harbor, 3. An opening for light or ventilation or passage of material in the side of a boat.

**PORT BEAM** - The left-center of a boat.

**PORT BOW** - Facing the bow, the front left side.

**PORT QUARTER** - Looking forward, a vessel's left rear section.

**QUARTER** - The sides of a boat aft of amidships.

**QUARTERING SEA** - Sea coming on a boat's quarter.

**RED-RIGHT-RETURNING** - A term for helmsmen that buoys and day marker are on the right when returning from seaward.

**REEF** - A shallow underwater barrier

**REEVE** - To pass a line through a block or other opening.

**RIDGES** - High pressure fingers extending out from a high.

**RODE** - The anchor line or chain.

**RUNNING LIGHTS** - Lights required to be shown on boats underway between sundown and sunup.

**RUDDER** - A vertical plate for steering a boat.

**SALON** - The main social cabin on a vessel, usually the largest area, occasionally referred to as the deckhouse.

**SCREW** - A propeller.

**SCUPPER** - A drain from the edge of a deck that discharges overboard.

**SEACOCK** - A positive action shut-off valve connected directly to the hull seawater intake and discharge piping.

**SERIES** - A group of waves which seem to travel together and at about the same speed.

**SHACKLE** - A "U" shaped connector with a pin or bolt across the open end.

**SHAFT** - The long, round member that connects the engine or transmission to the propeller.

**SHAFT LOG** - A fitting at the hull bottom where the shaft connecting an engine to its propeller penetrates the hull. A shaft log permits the shaft to rotate while simultaneously preventing water from entering the hull.

**SHEER** - The top of the hull's curvature at the deck line from the bow to the stern.

**SHEER STRAKE** - The upper edge of the hull, immediately below the deck.

**SHEET BEND** - A knot used to join tow ropes.

**SHOAL** - An area of shallow water.

**SILENCER** - A baffled chamber installed in an exhaust system to reduce the noise.

**SOLE** - Term for deck, cabin or cockpit floor



**SPAR** - A general term for booms, masts, yards etc.

**SPRING LINE** - A pivot line used in docking, undocking, or to prevent the boat from moving forward or astern while made fast to a dock.

**STARBOARD** - Looking forward, the right side of a boat

**STARBOARD BEAM** - The right-center of a boat.

**STARBOARD BOW** - When facing the bow, the front right side.

**STARBOARD QUARTER** - When looking forward, the right rear section of the boat.

**STEERAGEWAY** - The lowest speed at which a vessel can be controlled by the steering wheel.

**STEM** - The leading edge of a boat's hull.

**STERN** - The back of a boat.

**STRINGER** - A fore and aft continuous member used to provide a vessel longitudinal strength.

**STRUT** - A propeller shaft support that is below the hull.

**SUMP** - A pit or well into which water is drained.

**SUPERSTRUCTURE** - Deck houses and other structures extending above the deck.

**THWART** - A seat or brace running laterally across a boat.

**THWARTSHIPS** - At right angles to the centerline.

**TILLER** - A bar or handle for turning a boat's rudder, or motor

**TOPSIDE** - To go up to the top deck.

**TRANSOM** - The stern cross-section of a square sterned boat.

**TRANSVERSE** - Across the vessel; athwartships.

**TRIM** - Fore and aft balance of a boat.

**TROUGH** - 1. The valley that exists between waves. 2. A trough is the opposite of a ridge in that it is an elongated low-pressure area extending out from a low. A trough normally indicates unsettled weather.

**TUMBLE HOME** - The opposite of flare. The shape of the hull as it moves outboard going down from the gunwale to the waterline or chine.

**UNDERWAY** - Movement. Usually referring to a vessel proceeding forward.

**V-BOTTOM** - A hull with the bottom section in the shape of a "V."

**V DRIVE** - A drive system that has the output of the engine facing forward and coupled to a transmission. The prop shaft is then coupled to the transmission.

**WAKE** - Moving waves, track or path that a boat leaves behind it when moving across the water.

**WATER LINE** - The line of the water on the hull when the vessel is afloat.

**WATCH** - A 4 hour duty period while at sea.

**WAVES** - Waves are periodic disturbances of the sea's surface, caused by wind, seaquakes, and the gravitational pull of the moon and the sun.

**WAVE GRADIENT** - A wave's slope or angle from trough to crest with respect to the horizon.

**WAVE HEIGHT** - From the bottom of a wave's trough to the top of the crest.

**WEATHER DECK** - A deck with no overhead protection.

**WET EXHAUST** - This term refers to an exhaust system where the cooling seawater is mixed with the exhaust gases just after the riser. This mixture is then ejected through the drive or ports located in the transom or hull sides.

**WHARF** - A man-made structure bounding the edge of a dock and built along the shoreline.



**WHIPPING** - The act of wrapping the end of a piece of rope with small line, tape or plastic to prevent it from fraying.

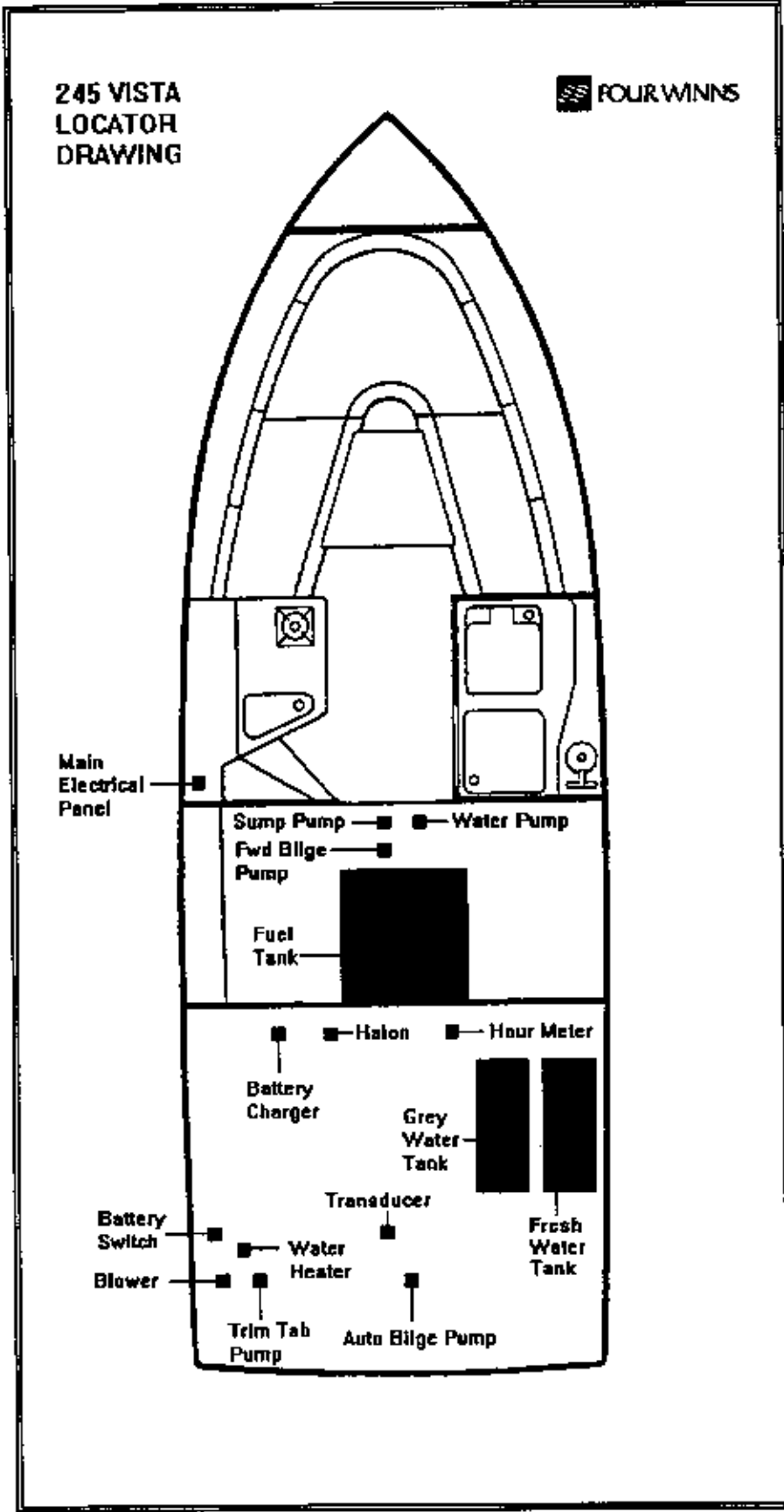
**WINDLASS** - A device used to raise and lower the anchor.

**WINDWARD** - Toward the direction from which the wind is coming.

**YAW** - 1. To swing off course, as when due to the impact of a following or quartering sea. 2. Any motion about a vertical axis.



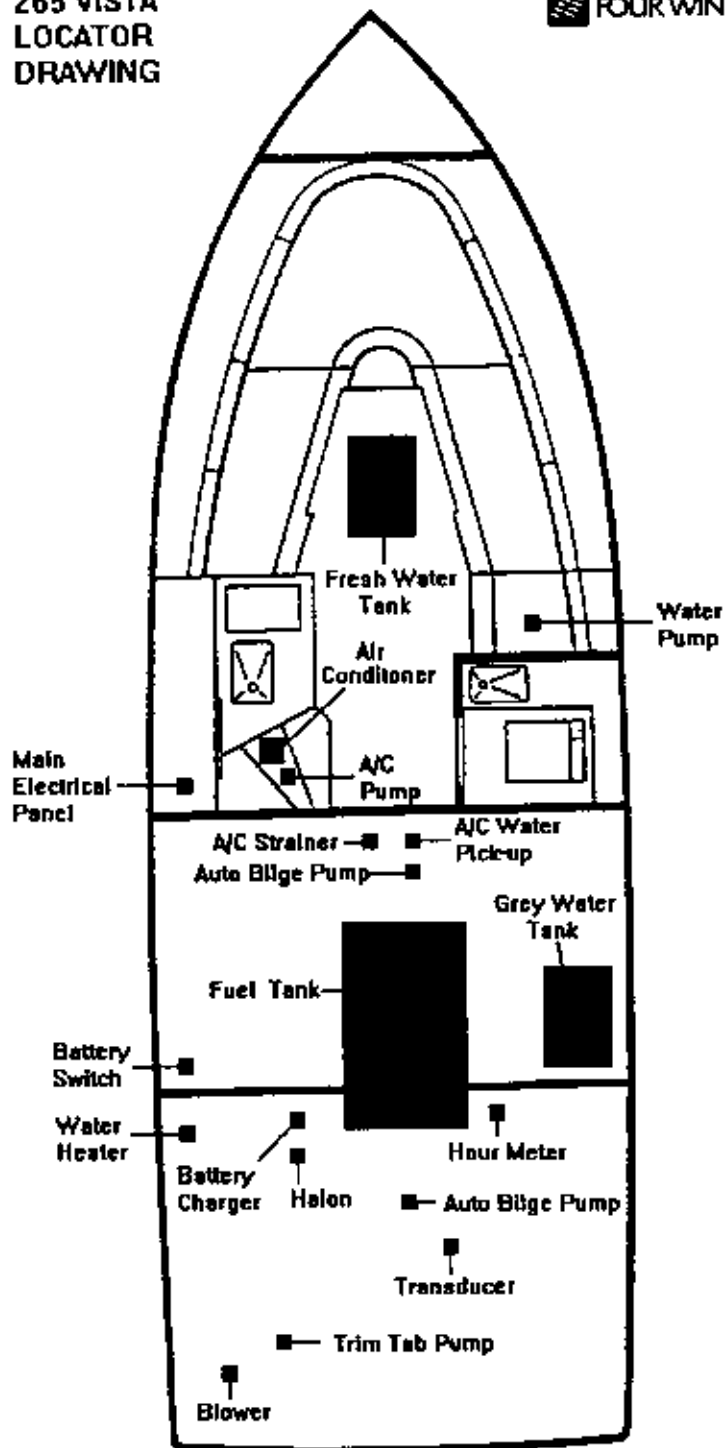
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**265 VISTA  
LOCATOR  
DRAWING**

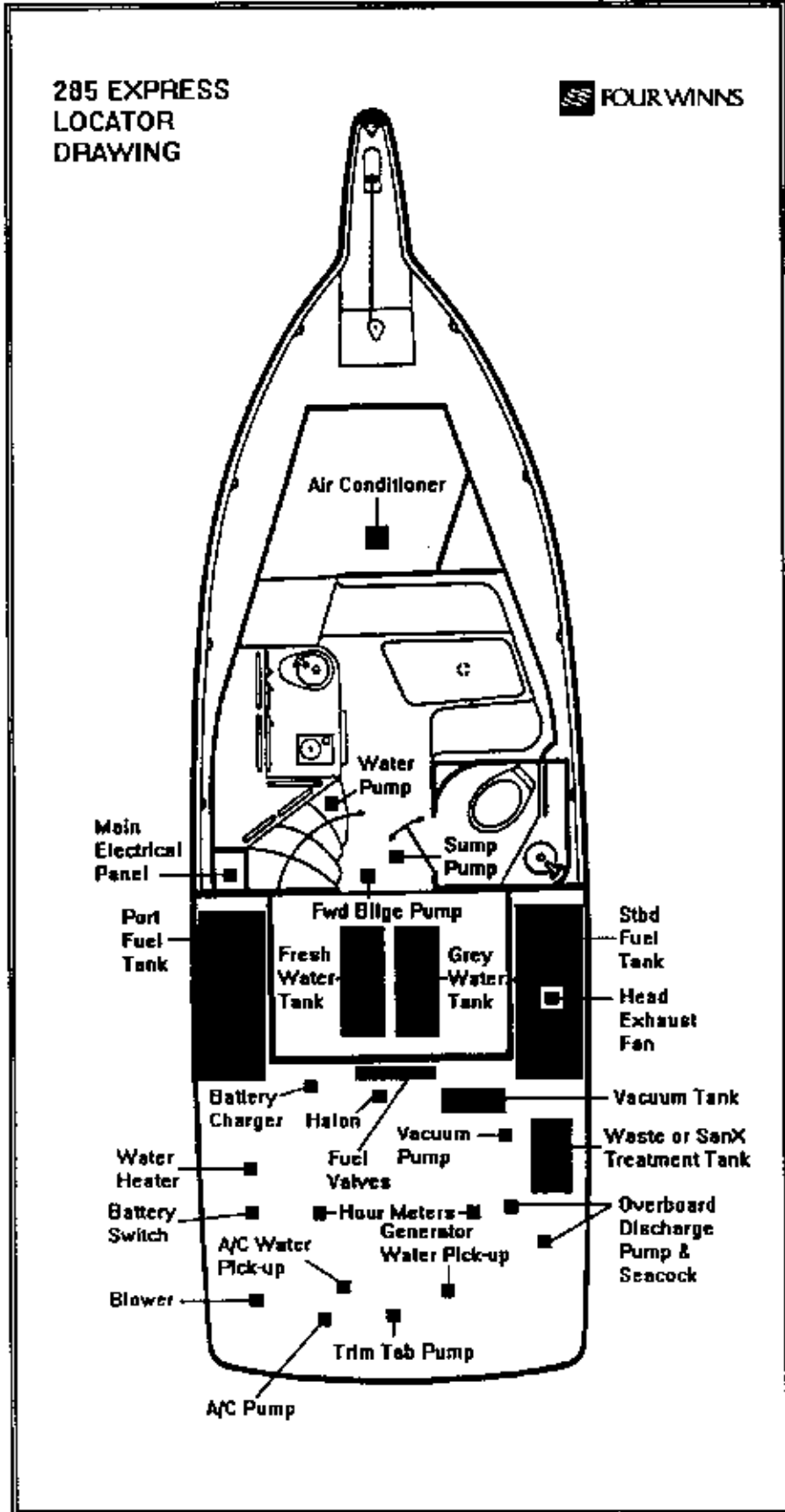
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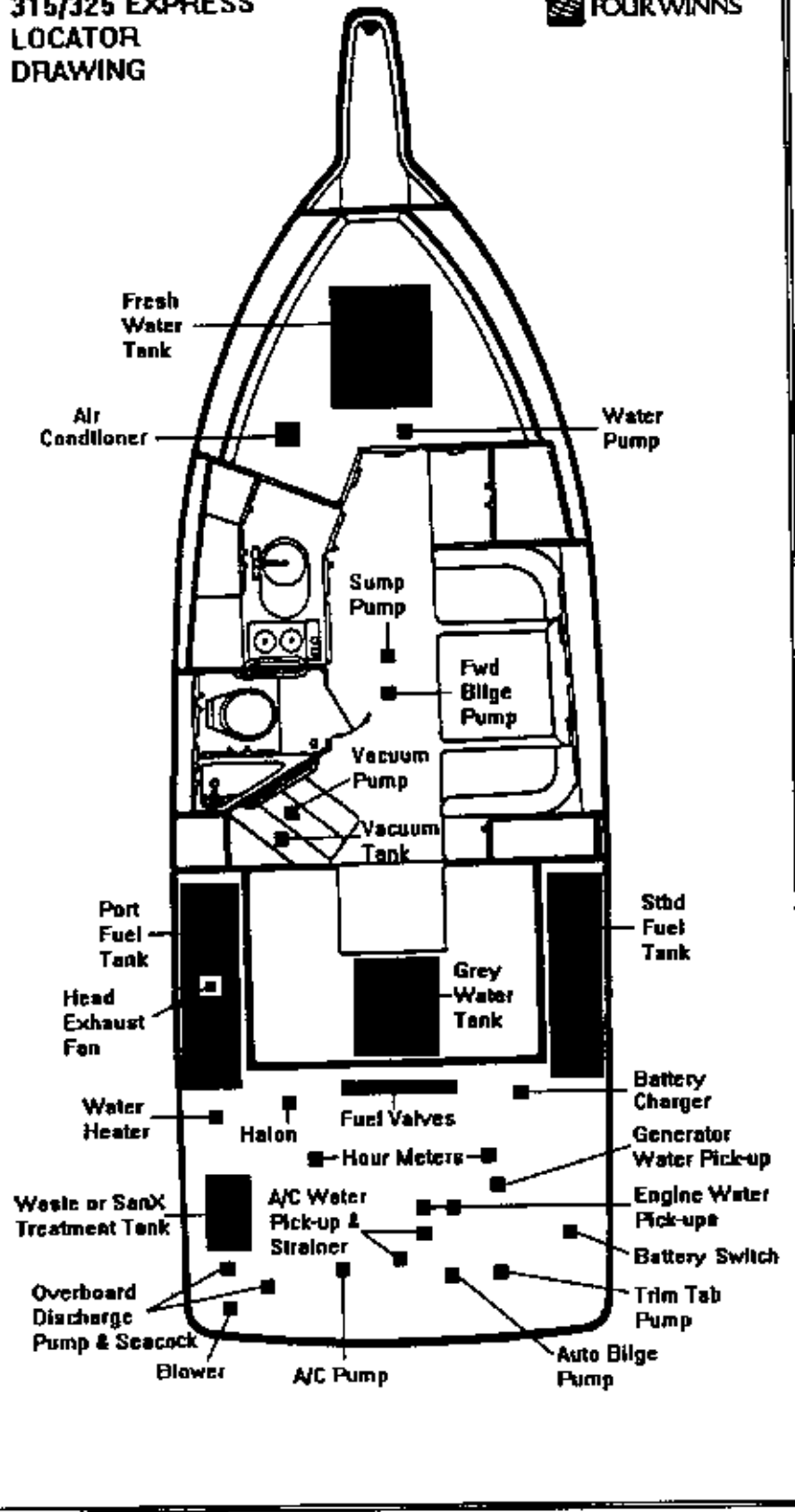
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 **FOUR WINNS**




**315/325 EXPRESS  
LOCATOR  
DRAWING**

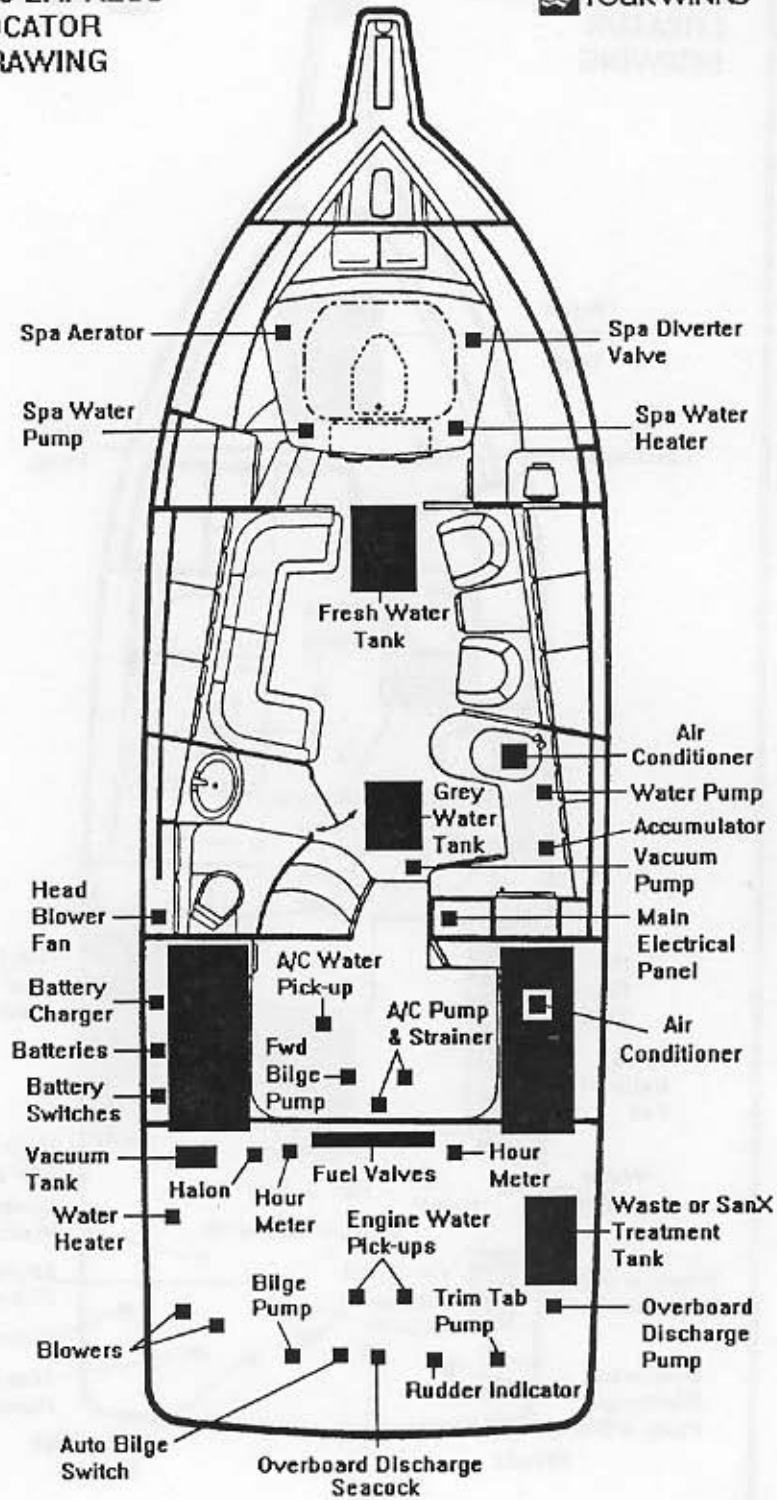
**FOUR WINNS**





**365 EXPRESS  
LOCATOR  
DRAWING**

 **FOUR WINNS**





# SERVICE INFORMATION

BOAT MODEL	
HULL IDENTIFICATION NUMBER	
ENGINE MODEL	
ENGINE SERIAL NUMBER(S)	
DRIVE MODEL	
DRIVE SERIAL NUMBER(S)	
PROPELLER DIAMETER	
PROPELLER PITCH	
PROPELLER PART NUMBER(S)	
OIL FILTER NUMBER	
BOAT COLOR	
COCKPIT UPHOLSTERY COLOR	
CABIN UPHOLSTERY COLOR	
FUEL CAPACITY	
FUEL: ESTIMATED AVG. GALLON/HR USAGE	
IGNITION KEY NUMBER(S)	
GLOVE BOX KEY NUMBER	
COMPANIONWAY KEY NUMBER	
TRAILER MODEL	
TRAILER COLOR	
TRAILER SERIAL NUMBER	
TRAILER TIRE SIZE & MANUFACTURER	
SELLING DEALER	
CITY AND STATE	
PHONE NUMBER	
MISC.	



# FOUR WINNS

A division of Recreational Boat Group Limited Partnership, an OMC company