FOUR WINNS®
BOATING MADE EASY™

Vista®

Owner's Manual

PREFACE

This manual will acquaint you with the use and maintenance of your new Four Winns® boat. This 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 means used to increase the visibility of these important messages. Also included in your owner's packet is the "Boating Basics, A Guide to Responsible Boating". This publication covers the boating basics and should be read along with your Four Winns Owners 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 models. When appropriate, please 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 manufacturer of this equipment. All information available at the time of manufacture has been included with your owner's packet.

Read this entire 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 the dealer for service or other assistance. If you find it necessary to contact Four Winns directly, please refer to the address information 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 the 348 Vista®. **It should be noted that this manual is also applicable to all prior 338 Vista® models as well.** Please record the serial number below.

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
925 Frisbie Street
Cadillac, Michigan 49601
231-775-1343
231-779-2345(FAX)
E-Mail Address: boating@fourwinns.com

SAFETY WARNINGS

This manual contains instructions critical to the safety of those aboard or the longevity of the equipment. **Pay close attention to all safety warnings.** The following safety warnings and instructions are used throughout the manual and at selected locations on your boat.

DANGER

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

WARNING

This safety symbol and this signal word indicate a potentially hazardous situation which, if not avoided, CAN result in severe injury or death.

CAUTION

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

NOTICE

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

YOU are responsible for your own safety, as well as the safety of your passengers and fellow boaters. You should fully understand and become familiar with the operating procedures and safety precautions in this manual and any other information in the Owner's Packet before you launch the boat. Always operate your boat with consideration, courtesy, and common sense.

The warnings in this manual do not and can not address every conceivable situation. Always use common sense! If you have any questions regarding your boat or its operation, contact your dealer.

The following pages illustrate the locations of various warning labels, capacity label and other stickers on your Four Winns boat.

348 VISTA SPECIFICATIONS*

LOA (W/ SWIM PLATFORM)	**35' 7" / 10.8 M**
LOA (W/OUT SWIM PLATFORM)	**33' 5" / 10.2 M**
BEAM	**11' 9" / 3.58 M**
BRIDGE CLEARANCE W/ARCH	**9' 2" / 2.80 M**
DEAD RISE	**19°**
DRAFT	**35" / 89CM**
FUEL CAPACITY	**220 GAL / 832 L**
POTABLE WATER CAPACITY	**44 GAL/ 166 L**
HOLDING TANK WASTE	**30 GAL/ 113 L**
HOLDING TANK - GREY	**30 GAL / 114 L**
WEIGHT	**12,600 TO 13,000 LBS**
	5,710 TO 5,900 KG

***Specification measurements are approximations and subject to variance.**

NMMA YACHT LABEL AND OTHER WARNING LABEL LOCATIONS

The NMMA Yacht Label (Gas) and various warning label stickers are placed at different locations on each model for your safety. See Figures 1-5 on the following pages. Additional warnings for fuel leakage, blower operation, and other important information will be imprinted or located on the dash. Many of these stickers and labels are not required by the U.S. Coast Guard but are important to ensure the safe operation of your Four Winns® boat. In addition, the Hull Identification Number plate is permanently attached below the deck-hull joint on the starboard aft corner.

NOTICE

Not all of the warning label stickers are depicted in the following pages. Some of these stickers will be found on appliances i.e. microwave, TV/VCR, generator, shore power cord. Be sure to read and follow all manufacturer's literature and warning label(s) relating to their product(s).

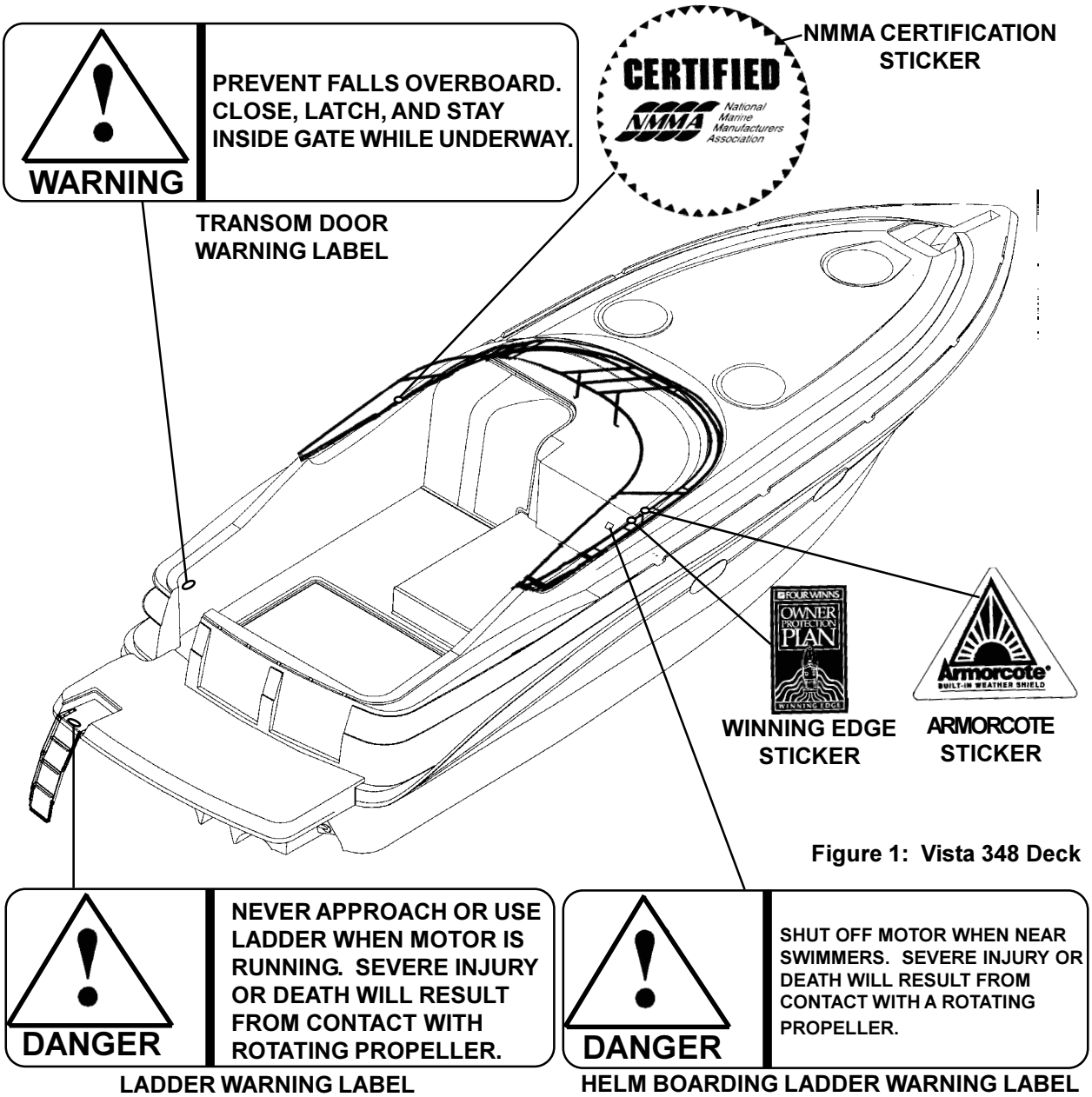


Figure 1: Vista 348 Deck

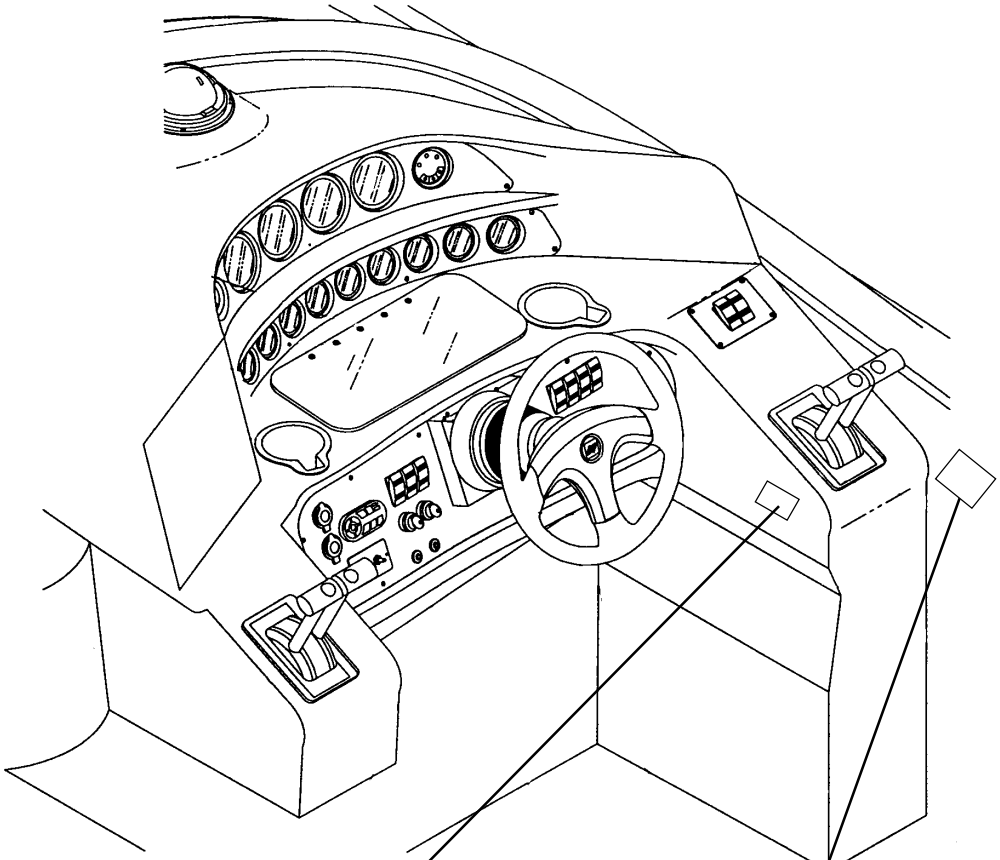


Figure 2: HELM STATION

NMMA

YACHT CERTIFICATION

DESIGN COMPLIANCE WITH NMMA REQUIREMENTS IN EFFECT ON THE DATE OF CERTIFICATION IS VERIFIED. MANUFACTURER RESPONSIBLE FOR PRODUCTION CONTROL

NATIONAL MARINE MANUFACTURERS ASSOCIATION

THIS BOAT COMPLIES WITH U.S. COAST GUARD SAFETY STANDARDS IN EFFECT ON THE DATE OF CERTIFICATION

FOUR WINNS, CADILLAC, MI

NMMA YACHT LABEL

WARNING

BEFORE STARTING ENGINE:

EQUIPMENT

DRAIN PLUG - SECURED?
MOVEABLE SEATS - SECURED?
LIFE JACKET - ONE FOR EACH PERSON?
OTHER EMERGENCY GEAR - ON BOARD?

PROCEDURES

EMERGENCY STOP SWITCH - TETHER HOOKED UP?
EVERYBODY - SEATED IN BOAT? **NEVER** ON SEATBACKS, RAISED SEATS, OR EDGES OF BOAT!
OPERATOR'S VISION - UNOBSTRUCTED?
WEATHER CONDITIONS - SAFE TO GO OUT?
PASSENGERS - AWARE OF **EMERGENCY** PROCEDURES?

EQUIPMENT AND PROCEDURES CHECKLIST LABEL

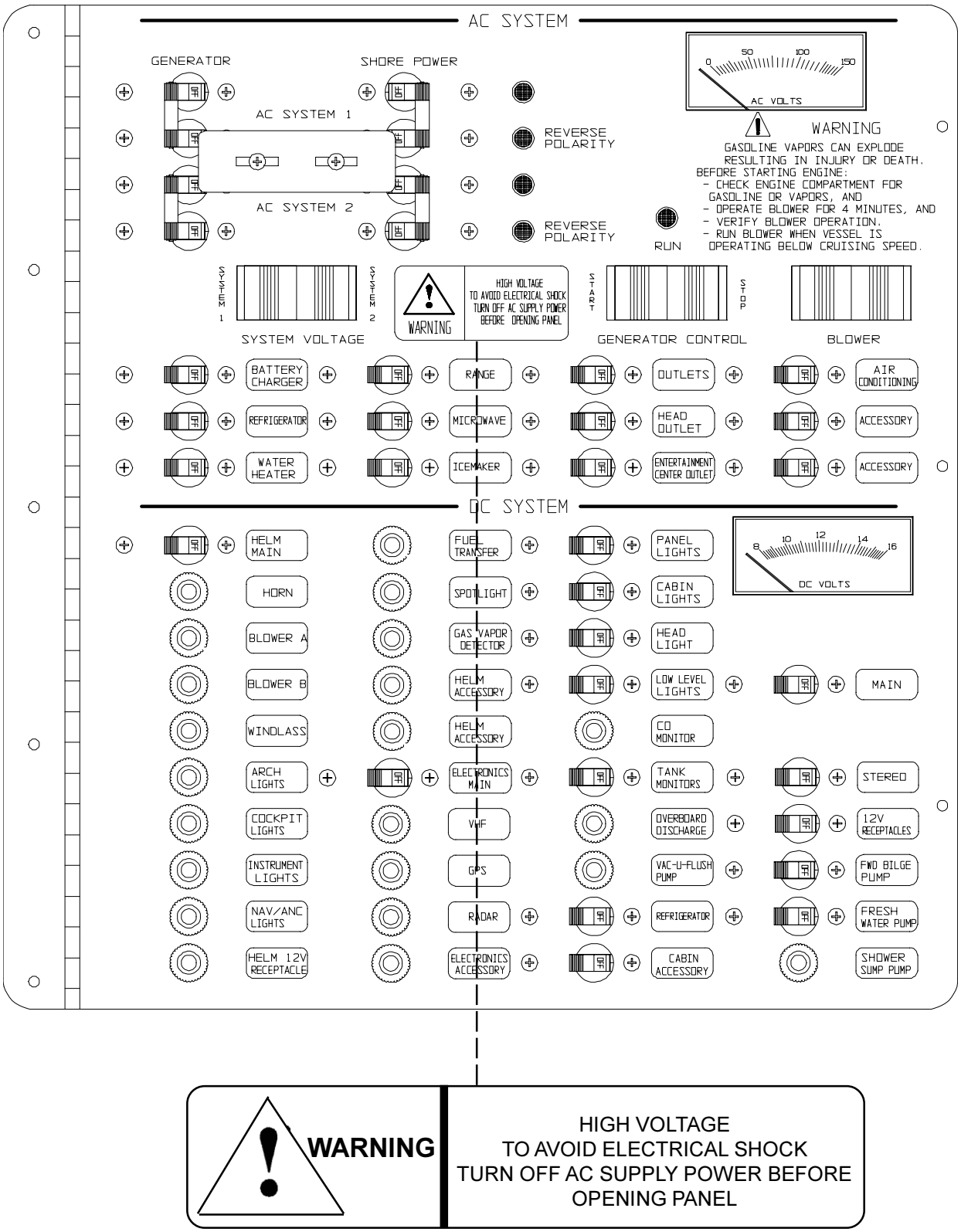
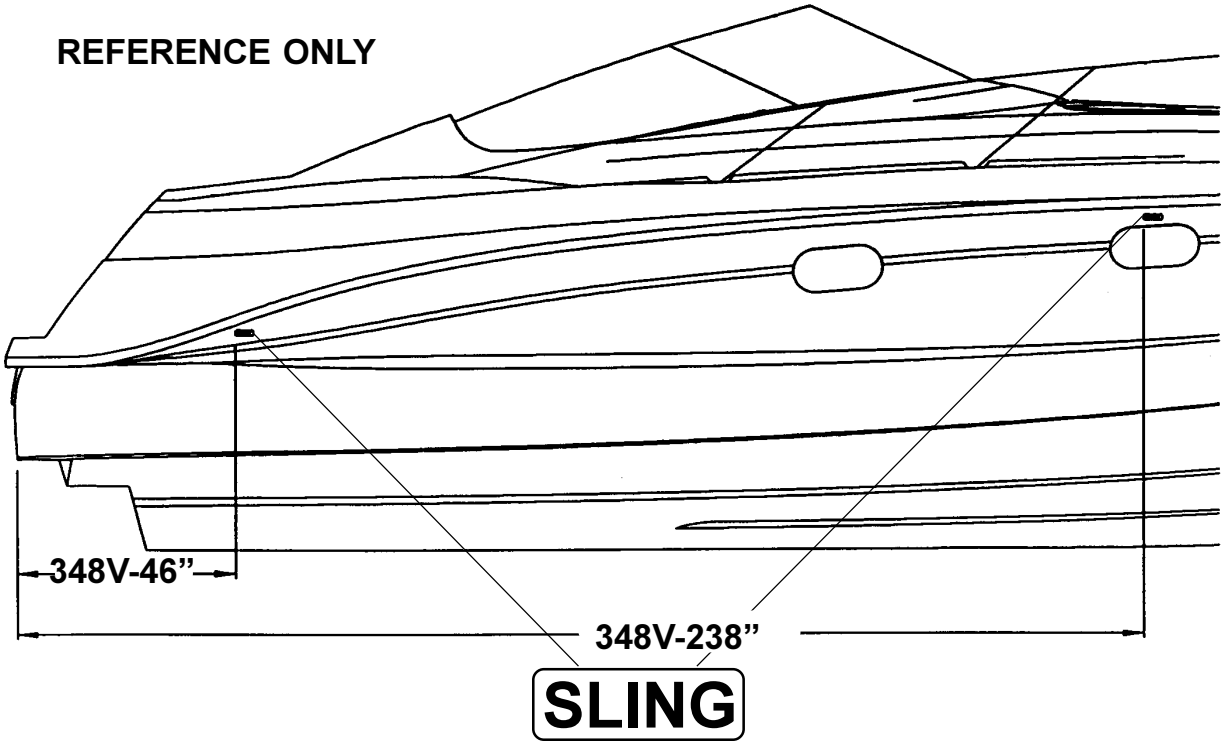


FIGURE 3: HIGH VOLTAGE WARNING LABEL

Figure 4: SLING LOCATION LABEL



CAUTION

Ensure slings are in proper location as indicated by the sling label location. **Failure to do so may result in permanent hull structure damage and will invalidate the hull structure warranty.**

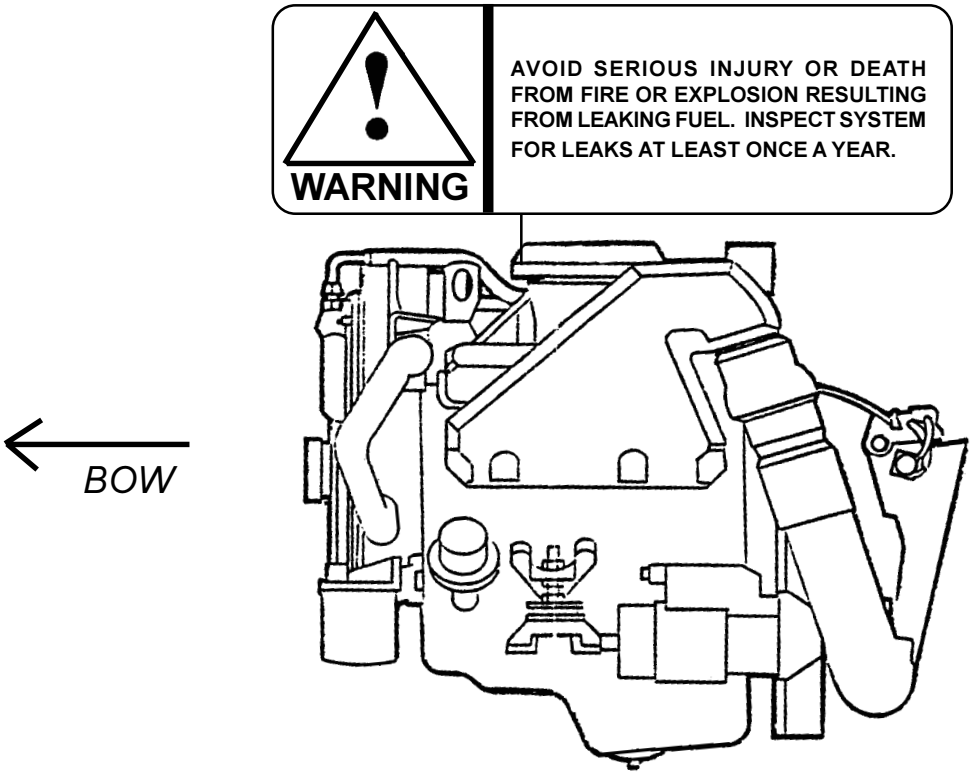


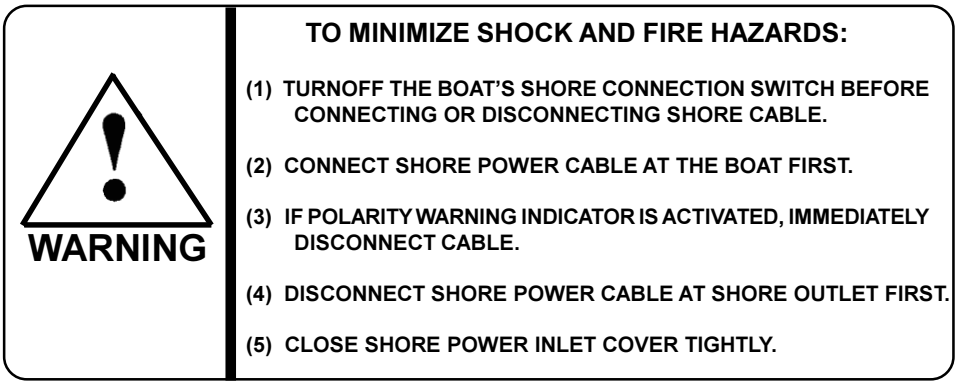
Figure 5: LEAKING FUEL WARNING LABEL LOCATION

ADDITIONAL WARNING LABELS

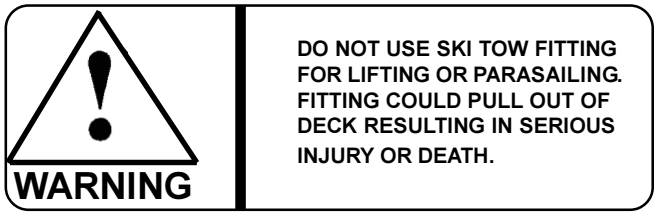
DISCHARGE OF OIL PROHIBITED

THE FEDERAL WATER POLLUTION CONTROL ACT PROHIBITS THE DISCHARGE OF OIL OR OILY WASTE INTO OR UPON THE NAVIGABLE WATERS OF THE UNITED STATES, OR THE WATERS OF THE CONTIGUOUS ZONE, OR WHICH MAY EFFECT NATURAL RESOURCES BELONGING TO, APPERTAINING TO, OR UNDER THE EXCLUSIVE MANAGEMENT AUTHORITY OF THE UNITED STATES, IF SUCH DISCHARGE CAUSES A FILM OR DISCOLORATION OF THE SURFACE OF THE WATER OR CAUSES A SLUDGE OR EMULSION BENEATH THE SURFACE OF THE WATER. VIOLATORS ARE SUBJECT TO SUBSTANTIAL CIVIL PENALTIES AND/OR CRIMINAL SANCTIONS INCLUDING FINES AND IMPRISONMENT.

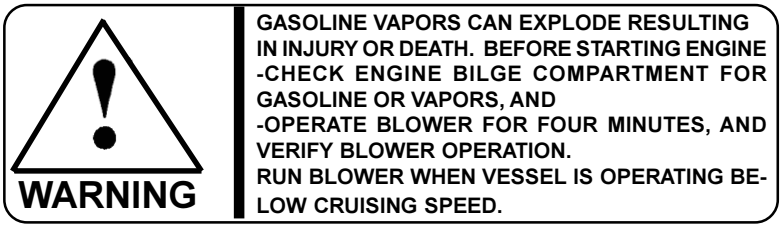
OIL DISCHARGE PLATE



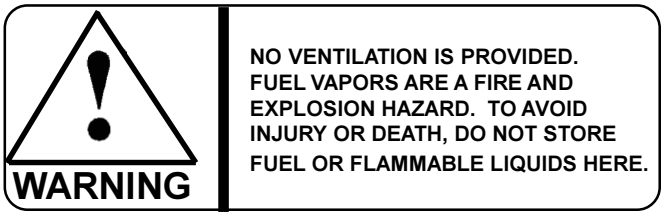
SHORE POWER WARNING



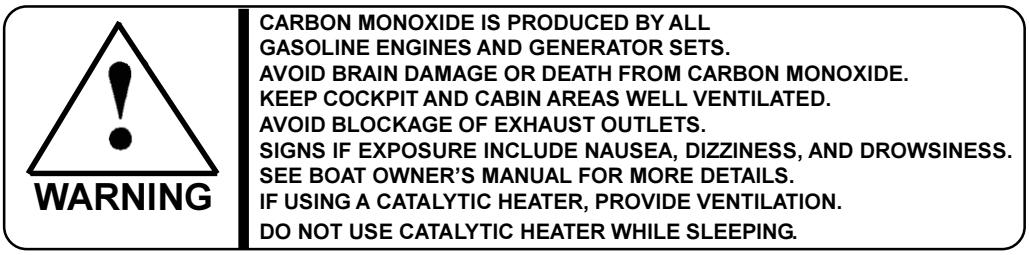
SKI TOW WARNING LABEL



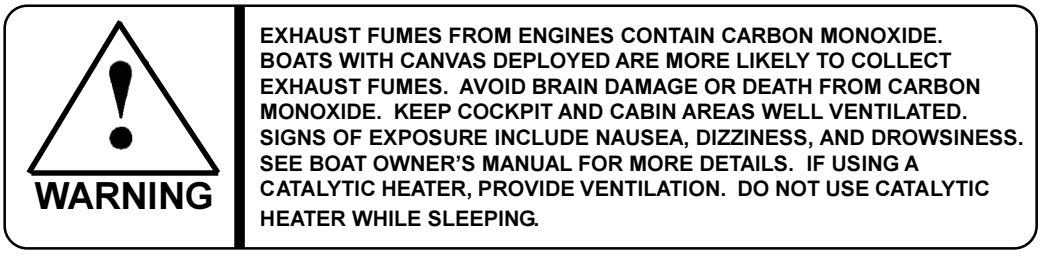
POWERED VENTILATION FOR GAS ENGINES



NO VENTILATION WARNING LABEL



CARBON MONOXIDE



CARBON MONOXIDE

TABLE OF CONTENTS

OPERATION

A - 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 operator brief you on the general operation of your new boat. Perform a "Pre--Cruise Systems Check". This manual is a part of your boat's equipment. Always keep it on board.

A - 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 included in the owner's packet. This information is provided to enhance your knowledge of the boat. Read this information carefully.

After becoming familiar with the boat and its systems, reread this manual. Maintenance and service tips are included to help keep the boat in like-new condition.

A - 3 SAFETY EQUIPMENT

Besides the equipment installed on the boat by Four Winns, L.L.C., certain other equipment is required for passenger safety. A brochure listing the Federal equipment requirements is included in the owner's packet or is available through your local U.S. Coast Guard Station. 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.

A - 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. All non-swimmers and 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.

A - 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.

A - 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!

Lightning will seek a ground when it strikes. Avoid contact with metal parts such as bow rails, control handle, or windshield.

A - 7 DRUGS AND ALCOHOL

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 and the law 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.

It is 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 boat operator and his/her passengers. 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.

A - 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. 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.

3. 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.

4. Activate the Bilge Blower. Check the blower output.

> **WARNING**
> Gasoline vapors can explode resulting in injury or death. Before starting the engine, check engine compartment bilge for gasoline or vapors. Operate blower for four minutes, and verify blower operation. ALWAYS run the blower when the vessel is operating below cruising speed.

5. Ensure an adequate amount of fuel is on board.

6. Be sure you have sufficient water and other provisions on board for the cruise planned.

7. 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.

> **WARNING**
> Always be sure to raise the anchor and ensure the chain stop is engaged prior to operating your boat. Failure to raise and secure anchor before getting underway could result in damage to boat and even severe injury or death from a rebounding anchor.

A - 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. Refer to the Table 1: "SAE Viscosity Chart" and your engine manual included in the owner's packet. DO NOT USE MULTIGRADE OIL. The hydraulic steering uses a fluid which meets Mil H5606 specifications. Please note that automatic transmission fluid (Dexron II) may be used in an emergency. Never use brake fluid. Check the fluid level of the transmission as often as practical.

IF THE LOWEST ANTICIPATED TEMPERATURE IS*	THE FOLLOWING SAE VISCOSITY OILS ARE RECOMMENDED
32° F (0° C) and above	SAE 30
0° F (-18° C) to 32° F (0° C)	SAE 20W-20
Below 0° F (-18° C)	SAE 10W
*Temperature range you expect to operate. **Note: Use only single viscosity oils**.	

Table 1: SAE Viscosity Chart

3. Start and operate the bilge blower system for at least four (4) minutes before start-up.

B. Cold Engine Start (EFI Engines)

1. Move the twin lever shifter to the neutral detent position. Place the twin lever throttle levers in the idle postion. See Figure A1. When in the neutral detent, the detent buttons will click into place. To move the levers to the desired positions after starting you simply push or pull the shifter and throttle levers. The buttons are color coded. Black buttons represent the shifter and red buttons represent the throttles.

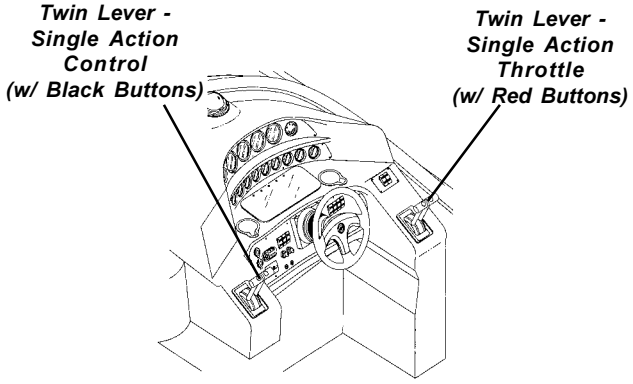


Figure A1: 348V Helm Station

2. Turn key switch to START position and hold until engine starts. DO NOT hold in START position for more than ten seconds.

If engine floods:

- The shifter levers remain in the neutral detent position. Move throttle levers to full throttle position.
- Turn key switch to the START position.
- Immediately move the throttle levers to the idle position when the engine starts.

NOTICE
Failure to move the throttle handle to the idle position immediately when engine starts will allow engine to "over-rev" and engine damage could result. "Over-revving" engine after off-season storage could also damage the water pump impeller. **When starting engine for the first time after off-season storage, always idle engine for one minute to allow the water pump to prime.**

3. As soon as engine starts:

   a. Release key to the ON or RUN position.

NOTICE
Priming is not necessary for EFI engines. Refer to the engine owner's manual for additional information.

C. Warm Engine Starting

1. Move shifter levers to the neutral detent position and throttle levers to the idle postion.
2. Turn key switch to START position and hold until engine starts, but DO NOT hold in start position for more than ten seconds. If engine does not start, let go momentarily, then try again.
3. As soon as engine starts, release key to the ON or RUN position.

NOTICE
NEVER turn key to START position when engine is running.

D. Shifting and Control Speed

NOTICE
If your boat is equipped with a non-OEM remote control system, ask your dealer how to properly operate it.

1. Move shifter levers to the neutral detent position and throttle levers to the idle postion. Placing the shifter levers in the neutral detent position will engage neutral start switch and allow engine to start.

CAUTION
DO NOT shift into FORWARD or REVERSE unless engine is running. Damage to the shift system could result from trying to shift without the engine running. Carefully check function of all control and engine systems before leaving the dock.

2. To go FORWARD - Briskly move the shifter levers forward. Once forward gear engagement is complete, push throttle levers forward until desired speed is achieved.

3. To go in REVERSE - Briskly move the shifter levers rearward. Once rearward gear engagement is complete, push throttle levers forward until desired speed is achieved.

WARNING
DO NOT shift from forward to reverse when the boat is planing.

NOTICE
DO NOT shift if engine speed is above 800 RPM.

4. To go from FORWARD to REVERSE, or REVERSE to FORWARD; always pause at NEUTRAL and allow engine speed to return to idle.

5. After shifting is completed, slowly push throttle levers forward until desired speed is achieved.

WARNING
Any time the boat is operated, be aware of changes in shift system operation. A sudden increase in shift effort of the shifter levers, or other abnormal operation, indicates a possible problem in the shift system. If this occurs, the following precautions must be taken:

- With engine running and boat securely tied to the dock, shift drive into forward and reverse to ensure there is gear engagement.
- When docking the boat, all docking maneuvers must be performed at slow speed. Pay special attention to other boaters. Passengers should be informed of potential problems and precautions taken.

If you suspect there is a problem, see your Mercury or Volvo Penta dealer as soon as possible for proper diagnosis and required service or adjustment. Continued operation could result in damage to the shift mechanism and loss of control.

E. Stopping Engine

1. Move shifter levers to the NEUTRAL position. Place throttle levers in idle position.

2. Turn ignition key to the OFF position.

NOTICE
DO NOT stop engine at speeds above idle or “speed up” engine while turning off ignition. Engine damage could result.

A - 10 GROUNDING AND TOWING

WARNING
If the boat should become disabled, or if assisting another craft that is disabled, great care must be taken. The stress applied to a boat during towing may become excessive. Excessive stress can damage the structure of the boat and create a safety hazard for those aboard.

Four Winns® boats are not designed nor intended to be used as a towing vessel. The mooring cleats on Four Winns® boats are not designed or intended to be used for towing purposes. These cleats are specifically designed as mooring cleats for securing the boat to a dock, pier, etc. DO NOT use these fittings for towing or attempting to free a grounded vessel.

Freeing a grounded vessel or towing a boat that is disabled requires specialized equipment and knowledge. Line failure and structural damage caused by improper towing have resulted in fatal injuries. Because of this, Four Winns strongly suggests that these activities be left to those who have the equipment and knowledge such as the U.S. Coast Guard or Sea Tow, to safely accomplish the towing task.

CAUTION

Running aground can cause serious damage to a boat and associated underwater gear. If the boat should become grounded, distribute personal flotation devices and inspect the boat for possible damage. Thoroughly inspect the bilge area for signs of leakage. An experienced service 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.

If towing or being towed is absolutely necessary, use the strongest lines available, and attach them to the bow eyes or stern eyes only. Have all passengers slip on life jackets and take a seat in the cabin or other protected area.

WARNING

Lines can snap or other hardware can be loosened or broken while towing. Under certain conditions, this can cause severe injury or fatality.

A - 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 and 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.

SAFETY & SAFETY EQUIPMENT

B - 1 GENERAL

As the owner/operator of the boat, you are responsible for assuring that all required safety equipment is aboard. You should also consider supplying additional equipment as needed for your safety and that of your passengers. Check state and local regulations and call the U.S. Coast Guard Boating Safety Hotline at 1-800-368-5647 for information about required safety for information about required safety equipment.

A. Required Safety Equipment

Most of the safety equipment required by federal regulations is provided as standard equipment. Personal Floatation Devices (life jackets) must fit the person wearing it. If local regulations require additional equipment, it must be approved by the U.S. Coast Guard (USCG). Minimum requirements include the following:

- Personal Floatation Devices
- Visual Distress Signal
- Bell or Whistle
- Fire Extinguisher
- Navigation Lights

NOTICE

As the owner/operator of the boat, you are responsible for assuring that all required safety equipment is aboard and meets the boating regulations as prescribed by both federal and local authorities in your area.

B. Personal Floatation Devices (PFDs)

Federal regulations require that you have at least one Coast Guard approved personal floatation device (PFD) for each person in a recreational boat. You should not use your boat unless all PDFs are in serviceable condition, readily accessible, legibly marked with the Coast Guard approval number, of an appropriate size (within the weight range and chest size marked on the PDF) for each person aboard.

A PFD provides buoyancy to help keep your head above the water and to help you remain in a satisfactory position while in the water. Body weight and age should be considered when selecting a PFD. The buoyancy provided by the PFD should support your weight in water. The size of the PFD should be appropriate for the wearer. Body weight or chest size are common methods used to size PFDs. It is your responsibility to ensure that you have the proper number and types of PFDs on board and that your passengers know where and how to use them.

C. PFD Types

Five types of PFDs have been approved by the U.S. Coast Guard. The PFDs are described as follows:

PFD Type 1, Wearable (Figure B1) has the greatest required buoyancy. Its design allows for turning most unconscious persons in the water from face down position to a vertical or slightly backward, face-up position. It can greatly increase the chances of survival. Type 1 is most effective for all waters, especially offshore when rescue may be delayed. It is also the most effective in rough waters.

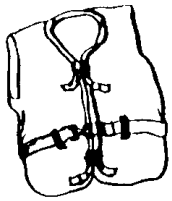


Figure B1: Type I, Wearable

PFD Type II, Wearable (Figure B2) turns its wearer in the same way as Type I, but not as effectively. The Type II does not turn as many persons under the same conditions as a Type I. You may prefer to use this PFD where there is a probability of quick rescue such as in areas where other people are commonly involved in water activities.

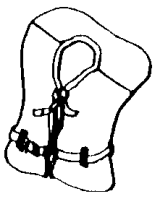


Figure B2: Type II, Wearable

PFD Type III, Wearable (Figure B3) allows the wearer to place themselves in a vertical or slightly backward position. It does not turn the wearer. It maintains the wearer in a vertical or slightly backward position and has no tendency to turn the wearer face down. It has the same buoyancy as a Type II PFD and may be appropriate in areas where other people are commonly involved in water activities.

Figure B3: Type III, Wearable

PFD Type IV, Throwable (Figure B4) is required in addition to the PFDs previously discussed. The most common Type IV PFD is a buoyant cushion or ring buoy. It is designed to be thrown to a person in the water, grasped and held by the user until he or she is rescued. A Type IV PFD should always be in serviceable condition and immediately available for use. Grasping this PFD may be difficult if the rescue is delayed or if the user is overcome by hypothermia (loss of body heat).

Figure B4: Type IV, Throwable

PFD Type V, Wearable (Figure B5) when inflated, it provides buoyancy equivalent to Type I, II, or III PFDs. When it is deflated, however, it may not support some people.

Figure B5: Type V, Wearable

D. PFD Pointers

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

1. Try the PFD on and adjust it until it fits comfortably in and out of the water. Mark your PFD if you are the only wearer.

2. To make sure the PFD works, wear it in the water. This will show you how it works and give you confidence when you use it.

3. Teach children how to put a PFD on and allow them to try it in the water. That way, they know what the PFD is for and how it works. They will feel more comfortable with it if they suddenly find themselves in the water.

4. If the PFD is wet, allow it to dry thoroughly before storing it. Do not dry it in front of a radiator or heater. Store it in a well ventilated area.

5. Keep PFDs away from sharp objects which can tear the fabric or puncture the floatation pads.

6. For their own safety and the safety of others, all nonswimmers, poor swimmers, and small children should wear PFD's at all times, whether the boat is stationary or moving.

7. Check the PFD frequently to make sure that it is not torn, that floatation pads have no leaks, and that all seams and joints are securely sewn.

8. If a PFD contains kapok, the kapok fibers may become waterlogged and lose their buoyancy after the vinyl inserts are punctured. If the kapok becomes hard or if it is soaked with water, replace it. It may not work when you need it.

E. Fire Extinguisher

As the owner/operator of the boat, you are responsible for supplying a fire extinguisher approved by the U.S. Coast Guard.

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

WARNING

Fire!

In case of fire do not open the engine compartment. Shut down engine(s), generator(s), and blower(s). Discharge entire contents of fixed fire suppression system. If using portable CO2 fire extinguisher continuously discharge entire contents. On European models, discharge contents through fire port.

NOTICE

Using a portable fire extinguisher with an access/fire port in the engine compartment is preferred to opening the engine compartment to fight the fire. However, using a portable extinguisher in this way provides less protection against fire than a fixed suppression system.

NOTICE

Do not test fire extinguishers by squirting small amounts of the extinguishing compound. The fire extinguisher might not work when you really need it.

All Class 2 powerboats (26 to less than 40 feet) are required to carry two (2) B-1 type approved hand portable fire extinguishers or one (1) B-2 type approved hand portable fire extinguisher. When a fixed fire extinguishing system is installed in machinery space(s), at least one (1) B-1 type approved hand portable fire extinguisher is required.

F. Fire Extinguisher System

A self-contained, Halon fire extinguisher system is an available option. 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 in the owner's packet.

G. Visual Distress Signal Devices

Visual distress signal devices approved by the U.S. Coast Guard are required on all recreational boats operating on coastal waters and to boats owned in the United States when they are operating on the high seas. Coastal waters include territorial seas and those waters directly connected to the Great Lakes and the territorial seas up to a point where the waters are less than two miles (3.2km) wide. Visual distress signal equipment may be of the pyrotechnic or non-pyrotechnic type. Regulations prohibit display of visual distress signals on the water under any circumstances except when assistance is required to prevent immediate or potential danger to persons on board a vessel.

The equipment must be approved by the U.S. Coast Guard, be in serviceable condition, and be stowed in a readily accessible location. Equipment having a date for serviceable life must be within the specified usage date shown. Careful selection and proper stowage of visual distress equipment is very important if young children are aboard.

DAY USE ONLY	NIGHT USE ONLY	DAY AND NIGHT USE
Three orange smoke signals (one hand held and two floating) or one orange flag with black square and disk.	One S-O-S electric distress light.	Three flares of the hand held, meteor or parachute type.

Distress Signal Table

The minimum visual distress signals required in coastal waters for a Class 2 powerboat is the following:

One orange flag with black square-and disc (daytime); and an S-O-S electric light (nighttime); or three orange smoke signals, hand held or floating (daytime); or three red flares of hand held, meteor, or parachute type (daytime/nighttime).

NOTICE

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

H. Sound Signaling Devices

Class 2 powerboats (26 to less than 40 feet) are required to carry a hand, mouth or power operated horn or whistle. It must produce a blast of two-second duration and audible at a distance of at least one-half (1/2) mile. The 348 Vista model is equipped with a dual trumpet horn which meet this requirement. See Figure B6.

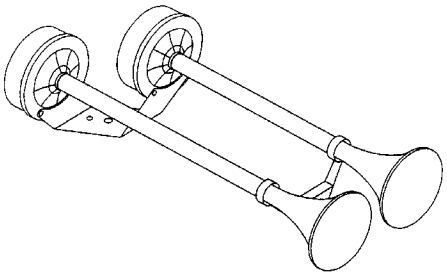


Figure B6: Dual Trumpet Horn

The following are standard whistle signals:

- One Prolonged Blast — Warning Signal
- One Short Blast — Pass on my Port Side
- Two Short Blasts — Pass on my Starboard Side
- Three Short Blasts — Engines in Reverse
- Five or More Blasts — Danger Signal

I. Navigation Lights

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

J. Additional Recommended Equipment

Four Winns recommends that you acquire additional equipment for safe, enjoyable cruising. This list, which is not all inclusive, includes items you should consider acquiring.

Basic Gear

Flashlight	Spare batteries	Tow line
Oar, paddle	Mooring lines	Compass
Dock fenders	Distress signals	First aid kit
Boat hook	VHF radio	EPIRB*
Sunscreen	Extra warm clothing	Charts
Second anchor & line		
Dewatering device (pump or bailer)		

Emergency supply of drinking water and food.
*Emergency Position Indicating Radio Beacon

Tools

Spark plug wrench	Hammer	Screwdriver
Jackknife	Pliers	Electrical tape
Adjustable wrench	Lubricating oil	Prop wrench
Duct tape		

Spare Parts

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

Gear For Extended Cruises

Foul weather gear — Parallel rulers — Dividers
Loran or Global Positioning System navigation equipment

B - 2 CARBON MONOXIDE

DANGER

Carbon Monoxide!

Carbon monoxide (CO) can be harmful or fatal if inhaled. Brain damage or death can occur if exposed to carbon monoxide. Keep exhaust outlets clear of blockage. Provide adequate ventilation. Open hatches, doors, windows and vents to insure adequate ventilation. Close engine compartment doors and hatches when engine or generator is running. Avoid operating the boat for extended periods of time at idle speed, and be sensitive to weather conditions that may prevent CO from dissipating into the air. Do not stand or swim near engine or generator exhausts when engines are running. (See Preface for actual warning label regarding 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 B-2E 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. Properties and Characteristics of Carbon Monoxide

1. Carbon Monoxide is a colorless, odorless and tasteless gas. It is commonly referred to as CO.

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 odorous) gases.

B. 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

C. 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.**

D. 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 exposure 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.

E. 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.

F. 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.

G. 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 space(s).

H. 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.

DANGER
The following are examples of possible situations where carbon monoxide can accumulate within your boat while docked, anchored, or underway. Become familiar with these examples and their precautions to prevent **dangerous** accidents or death.

I. 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 B7.

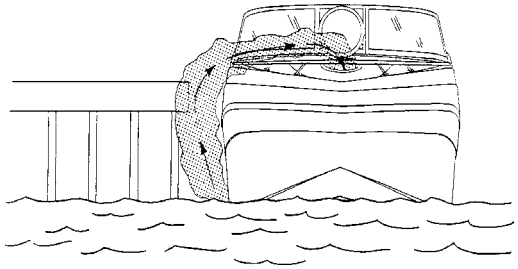


Figure B7: The effect of sea walls and other confined spaces.

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 B8.

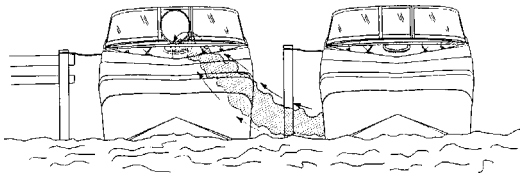


Figure B8: The effect of boats moored along side.

J. 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 B9 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:

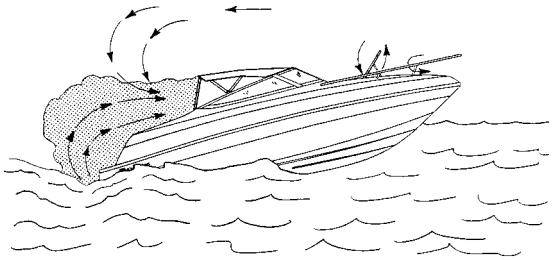


Figure B9: Backdrafting - Air flows over boat and behind transom.

1. Inefficient trim angle. See Figure B10.

2. Excessive or unequally distributed weight.

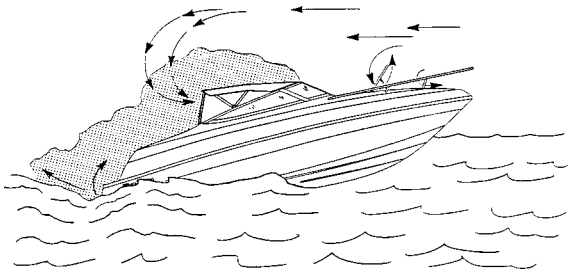


Figure B10: Inefficient trim angles.

3. Canvas Configurations - Under various conditions, adding or removing canvas may raise or lower CO levels. See Figures B9, B10 & B12.

DANGER

Exhaust Fumes!

Hull exhaust from your boat can cause excessive accumulation of poisonous carbon monoxide gas within cockpit areas when using protective weather coverings (while underway or while stationary). Provide adequate ventilation when the canvas top, side curtains and/or back (aft) curtains are in their closed protective positions. (See Preface for actual warning label regarding carbon monoxide and weathering cover/canvas.)

4. Opening and closing ports, hatches, doors, and windows may raise or lower CO levels on board a boat. See Figures B11 and B12.

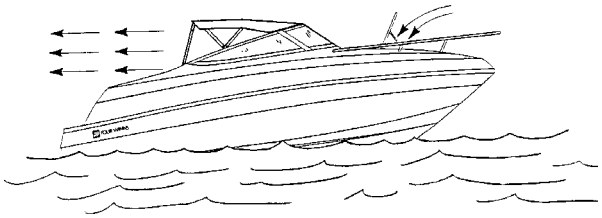


Figure B11: Desired air flow through the boat.

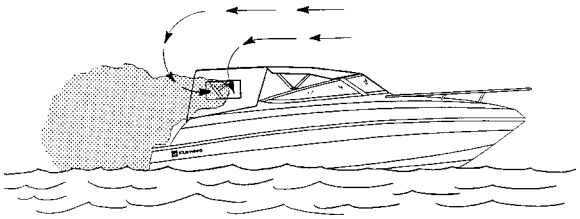


Figure B12: The effect of canvas configurations.

K. Cabin Appliances

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

L. 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.

M. 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.

N. Running of Engines in Idle

Engines running in idle exhaust carbon monoxide that can accumulate near the hull of the boat. Do not stand or swim near the engine exhaust or outdrive when engines are idling or generator is running.

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.

1. Failure to make adjustments to ignition systems, fuel systems, and propeller size may cause an increase in CO production.

2. Heavy sea conditions tend to load engines resulting in reduced performance and thereby increasing their CO production.

P. Portable Generator Sets

Gasoline powered portable generators are available in the marine market place and are not an option available through Four Winns. Portable generators 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:

1. Fuel Systems - Fuel that is contaminated, stale or incorrect octane number.

2. Carburetors/Injectors

   a. Dirty or clogged flame arrester.

   b. Malfunctioning automatic choke plate or faulty adjustment of manual choke plate.

   c. Worn float needle valve and seat.

   d. High float level.

   e. Incorrect idle mixture adjustment.

   f. Dirty or worn injectors.

3. 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 System

Four Winns has included two CO detectors as a standard feature. One of the CO detectors is located in the forward berth and the other is located in the aft cabin.

WARNING

CO monitors should be professionally installed and calibrated. Failure to do so may result in the improper function of the CO detector.

WARNING

Never disarm a CO detector. If a CO detector alarms, immediately ventilate the area and check passengers for symptoms of CO intoxication. See your Four Winns dealer for assistance in diagnosing the cause for the alarm.

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.

NOTICE

A CO detector is not a gas/fuel vapor detector. Gas/fuel vapor detectors do not monitor the buildup of carbon monoxide in an enclosed area. For further information on the design, construction, and testing of boats in consideration of carbon monoxide, see ABYC TH-23.

NOTICE

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

B - 3 SAFE BOATING PRACTICES

NOTICE

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

A. Drugs and Alcohol

WARNING

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

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

B. Safe Operation

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

- Observe all safety signs and warnings both inside the boat and in the immediate boating area.
- Become familiar with, and adhere to, the “Rules of the Road”.
- Maintain boat speed at or below the legal limits. Avoid excessive speed or speeds not appropriate for operating conditions.
- Be sure at least one other passenger is familiar with the operation and the safety aspects of the boat in case of an emergency.
- Load the boat within the limits listed on the capacity plate. Balance loads bow and stern and port to starboard.

- Do not use the boat in bad weather or sea conditions beyond the skill or experience of the operator or the comfortable capability of the boat or passengers.

- Make sure the passengers and gear do not obstruct the operator's view or impede his ability to move.

- Do not exceed the maximum engine power rating stated on the certification plate located inside the boat.

C. Passenger Safety

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

D. Propeller

WARNING

Personal Injury!

Do not allow anyone near a propeller, even when the engine is off. Propeller blades can be sharp and continue to turn even after the engine is shut off. Do not allow anyone near the propeller when the throttle is in neutral position. Accidently engaging the shift can result in a serious injury or death. (See actual ladder warning labels and helm boarding ladder warning label below.)

DANGER

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

Ladder Warning Label

DANGER

Shut off motor when near swimmers. Severe injury or death will result from contact with rotating propeller.

Helm Boarding Ladder Warning Label

WARNING

When pulling skiers do not turn on the engine until you are at least a boat length away from the person in the water. When approaching a downed skier, turn off the engine at least one boat length away before reaching the skier in the water.

E. First Aid

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

F. Operation By Minors

Minors should always be supervised by an adult whenever operating a boat. Many states have laws regarding the minimum age and licensing requirements of minors. Be sure to check local laws or contact the state boating authorities for information.

G. "Rules of the Road"

As a responsible boater, you must comply with the "Rules of the Road," the marine traffic laws enforced by the U.S. Coast Guard. Navigating a boat is much the same as driving an automobile. Operating either one responsibly means complying with a set of rules intended to prevent accidents. Just as you assume other car drivers know what they are doing, other boaters assume you know what you are doing. Information regarding navigational rules and the "Rules of the Road" are discussed in further detail in C-1 & C-2 of the next section.

H. Voluntary Inspections

State boating officials in many states or the U.S. Coast Guard Auxiliaries offer courtesy inspections to check out your craft. They will check for compliance with safety standards and required safety equipment. You may voluntarily consent to one of these inspections, and you are allowed to make corrections without prosecution. Check with the appropriate state agency or the Coast Guard Auxiliary for details.

I. Safe Boating Courses

The local U.S. Coast Guard Auxiliary and the U.S. Power Squadrons offer comprehensive safe boating classes several times a year. You may contact the Boat/U.S. Foundation at 1-800-336-BOAT (2628) or, in Virginia, 1-800-245-BOAT (2628) for a course scheduled in your area. Also contact the U.S. Coast Guard Auxiliary or Power Squadron Flotilla for the time and place of their next scheduled class.

B - 4 WATER SPORTS

WARNING

Personal Injury!

Four Winns® boats are not designed for and should not be used for pulling parasails, kites, gliders or any device which can become airborne. Use boat only for appropriate water sports. (See Preface for actual warning label.)

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

A. Water Sport Guidelines

Everyone participating in a water sport should observe these guidelines:

1. Allow only capable swimmers to take part in any water sport.
2. Always wear a personal floatation device (PFD) approved by the U.S. Coast Guard. Wearing a properly designed PFD helps a stunned or unconscious person stay afloat.
3. Be considerate of others you share the water with.
4. Give immediate attention to a person who has fallen. He or she is vulnerable in the water alone and may not be seen by other boaters.
5. Approach a person in the water from the lee side (opposite the direction of the wind). **Turn off the motor at least a boat length from the person.**
6. Turn engine off and anchor before swimming.
7. Always participate in water sports in safe areas. Stay away from other boats, beaches, restricted areas, swimmers and heavily traveled waterways.
8. Swim only in areas designated as safe for swimming. These are usually marked with a swim area buoy (see Figure B13). Do not swim alone or at night.

Figure B13: Swim Area Buoy

WARNING

Rotating Propeller!

Rotating propeller can cut or sever causing serious injury or death. Shut engine off and remove ignition key when anyone is swimming nearby. (See Section B-3D.)

9. Do not allow anyone near the propeller(s), even when the engine is off. Propeller blades are sharp and can continue to turn even after the engine is off. Stay at least 150 feet away from areas marked by diver down float. See Figure B14.

Figure B14: Diver Down Float

10. Do not drive the boat directly behind a water skier. At 25 miles per hour, the boat will overtake a fallen skier who was 200 feet in front in about 5 seconds.

BASIC SEAMANSHIP

C - 1 GENERAL

Basic rules of seamanship, general information about navigational aids, and sources for additional reading and boater education are presented in this portion of your owner's manual.

A. Boating Regulations

The U.S. Coast Guard is the authority of the waterways. State boating regulations are enforced by local authorities. Your boat is subject to the marine traffic laws known as "Rules of the Road," which are enforced by the U.S. Coast Guard. You are subject to marine traffic laws and "Rules of the Road" for both federal and state waterways; you must stop if signaled to do so by enforcement officers, and permit them to board if asked. The "Rules of the Road" can be obtained from the local U.S. Coast Guard Unit or the United States Coast Guard Headquarters by calling (202) 512-1800 or faxing your request to (202) 512-2250, and asking for the publication titled "Navigational Rules, International-Inland.

Many pamphlets prepared by the Coast Guard are available. They explain signal lights, buoys, safety, international and inland regulations and other information which goes beyond the scope of this manual. "Aids to Navigation" (U.S. Coast Guard pamphlet #123) explains the significance of various lights and buoys. Because of proposed alterations to buoys and markers, contact the U.S. Coast Guard to stay informed of changes. Other pamphlets, including the "Boating Safety Training Manual" and "Federal Requirements For Recreational Boats," are also available from the U.S. Coast Guard Headquarters.

NOTICE

The spoken word **"MAYDAY"** is the international signal for distress. **"MAYDAY"** should **NEVER** be used unless there is grave or imminent danger, and you are in need of immediate assistance.

B. Rules of Seamanship

1. Right-of-way

In general, boats with less maneuverability have right-of-way over a more agile craft. You must stay out of the way of the following vessels:

A vessel not under command or aground.	These vessels have no maneuverability.
A vessel restricted in its maneuverability.	These vessel are performing work which limits their maneuverability such as surveying, dredging, laying pipe or cable, servicing navigational markers among others.
A vessel engaged in fishing.	These include boats fishing with lines, trawl or nets; but not trolling lines.
Sailboats	Sailboats have the right-of-way over power boats; however, if a sailboat is using a propeller to move forward, it is considered a power boat even if its sails are up.

2. Meeting Head-On

When two boats meet head-on neither boat has right-of-way. Both boats should decrease speed and pass; port to port. However, if both boats are on the left side of a channel, each vessel should sound two short horn blasts and pass to starboard to starboard. See Figure C1.

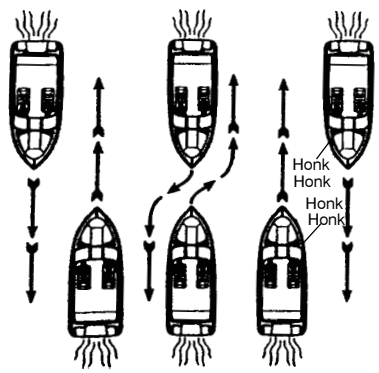


Figure C1: Meeting Head-On

3. Crossing Situations

In a crossing situation, the boat on the right from the 12-4 o'clock position has the right-of-way. It must hold course and speed. The boat without the right-of-way must keep clear and pass to the stern. See Figure C2.

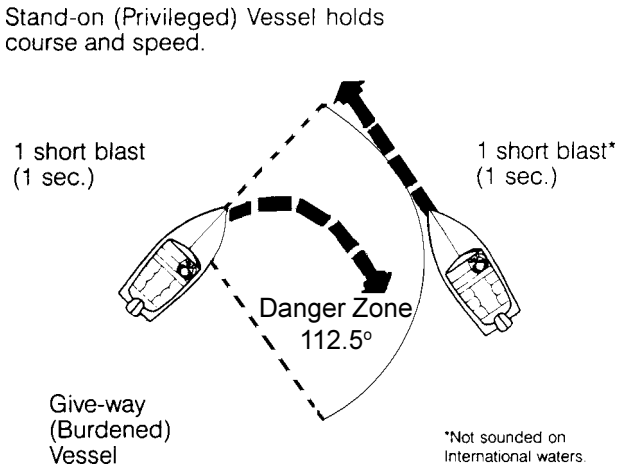


Figure C2: Crossing Situation

4. Overtaking

The boat overtaking the one ahead must yield the right-of-way to the boat being passed. The overtaking boat must make necessary adjustments to keep out of its path. The boat being passed should hold its course and speed. See Figure C3.

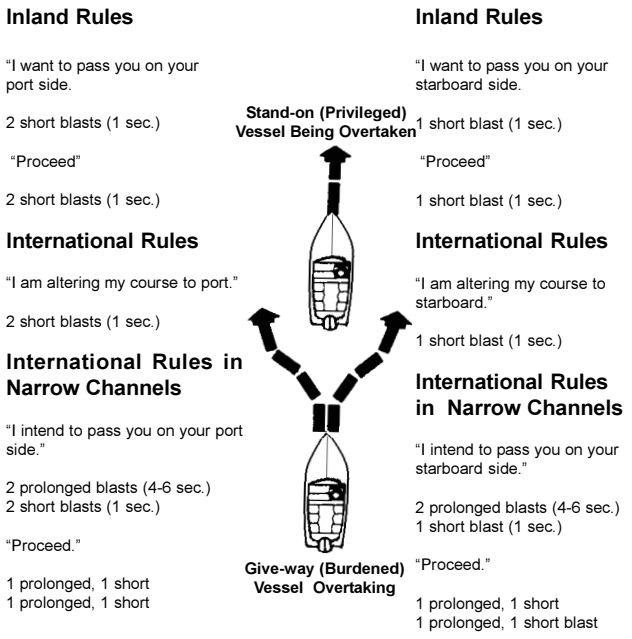


Figure C3: Overtaking

5. The General Prudential Rule

The general prudential rule regarding right-of-way is that if a collision appears unavoidable, neither boat has right-of-way. As prescribed in the "Rules of the Road", both boats must act to avoid collision.

6. Night Running

Boats operating between sunset and sunrise (hours vary by state), or in conditions of reduced visibility, must use navigational lights. Nighttime operation, especially during bad weather or fog, can be dangerous. All "Rules of the Road" apply at night, but it is best to slow down and stay clear of all boats regardless of who has right-of-way.

To see more easily at night, avoid bright lights when possible. Also, it is helpful to have a passenger keep watch for other boats, water hazards, and navigational aids.

To determine the size, speed and direction of other vessels at night, you should use running lights. A green light indicates the starboard side, and the red light indicates the port side. Generally, if you see a green light, you have the right-of-way; if you see a red light, give way to the other vessel. See Figure C4.

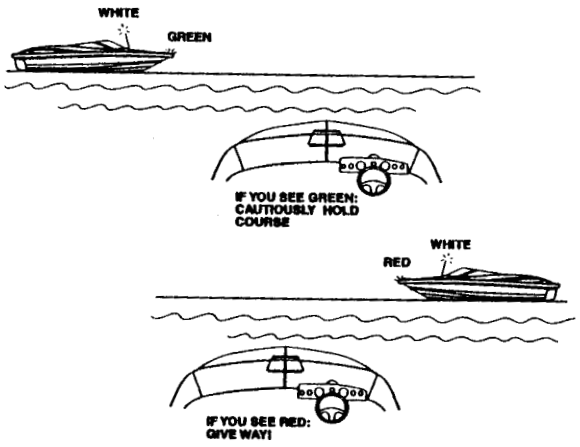


Figure C4: Night Running

7. Whistle Signal

Out on the water, whistle signals are commonly used. Although using a whistle signal is not necessary every time a boat is nearby, operators must signal their intentions when necessary to avoid potentially confusing or

hazardous situations. Use whistle blasts early enough to be noticed and understood by other boaters.

It is customary for the privileged boat to signal first and the yielding boat to return the same signal to acknowledge she understands and will comply. Use the danger signal (five or more short and rapid blasts) if intent is not clear. A short blast is one or two seconds long. A long blast is 4 to 6 seconds long. The Navigational Aids Chart at the end of this section lists the meanings of the various whistle signals.

C - 2 NAVIGATIONAL AIDS

Aids to navigation (ATONS) help you to travel safely on the water. They help you get from one place to another and are most helpful if you have a nautical chart. A navigational aids chart is at the end of this section.

WARNING

NEVER tie your vessel to an ATON. It is illegal because it blocks the ATON from view of other boaters. Decreased visibility can contribute to a serious accident which may result in property damage, personal injury, or death.

There are two ATON systems. The system used on federal waters is known as the International Association of Lighthouse Authorities System B (IALA-B). The Coast Guard maintains this system. The second system is the Uniform State Waterway Marking System (USWMS). This system is maintained by state authorities.

A. International Association of Lighthouse Authorities System B (IALA-B)

IALA-B uses four types of ATONS. This section discusses the two most common markers: lateral markers and safe water markers. Other federal markers include special markers and isolated danger markers. The Navigational Aids Chart at the end of this section shows these aids.

B. Lateral Markers

Lateral markers indicate the sides of navigable channels. They consist of lighted can or nun buoys and daymarks. Each has a number and is either red or green. The numbers on the green markers are odd. Red markers have even numbers.

Buoys are red or green floating ATONS. If lighted, they have either red or green lights. Unlighted green buoys, called cans, look like cylinders. Unlighted red nun buoys have a cone shaped top with their points cut off. Do not pass too close to a buoy. You may foul the propeller in its chain.

NOTICE

Buoys are anchored floating objects and may not always be in exactly the same position.

Daymarks are red or green boards with numbers. They are on posts or groups of pilings tied together and called dolphins. Daymarks and their supports are daybeacons. Daybeacons may or may not have lights. If a red or green daybeacon has a light, it is the same color as the marker-red or green. Red daymarks are triangular and have even numbers. Green daymarks are square and have odd numbers.

Red, Right, Returning is a basic rule to assist you in using lateral markers. When you are returning from seaward , keep red markers on the starboard (right) side when you pass them. Keep green markers to the port side.

Returning from seaward is very clear if you have been on the ocean. You are returning to port. By agreement, going upstream on a navigational river is returning from seaward. The outlet ends of the Great Lakes are also the seaward ends. Traveling from a large body of water to a smaller one is considered returning from seaward.

C. Safe Water Markers

Safe water markers have vertical red and white stripes and mark the center of navigable channels and fairways. Safe water markers included both lighted and unlighted buoys and daymarks. If a marker is lighted, the light is white and flashes the letter “A” is Morse Code.

Preferred Channel markers have horizontal red and green bands. If lighted, the color of the light is the same as the top of the band. They show the preferred channel for you to use at a junction point. Be sure to notice the color of the top of the band, and treat it as any other marker you would of that color. If the band is red and you are returning from seaward, keep the marker to the right.

Most lights on markers flash on and off. Others such as lights on aids with no lateral significance are fixed.

They stay on all night. ATON lights flash in regular patterns. For example, they may flash every three seconds, or in groups such as two flashes and a pause. There are a number of flashing patterns, which help you identify the light at night. To identify a light, note its color and pattern or timing of flashes, and compare it to your chart to find its location.

D. The Uniform State Waterway Marking System

This section discusses three kinds of markers in this system: Regulatory, Informational, and Lateral.

Regulatory markers in this system are either signs or buoys. Signs are square with orange borders. Regulatory buoys are white and shaped like cylinders. They have horizontal orange bands near their tops and just above the water's surface. An orange circle on a marker means a controlled area. A message such as "No Wake, Idle Speed, No Skiing, or 5 M.P.H." may appear on a marker. An orange diamond means danger. If a diamond has an orange cross inside it, do not enter the area. The reason you should stay out, such as "Swim Area" may be printed in black on the marker.

Informational Markers are white signs with orange borders. They give information such as direction, distance, and location.

Lateral markers in the USWMS system are either numbered red or black buoys. Black buoys may have green reflectors or lights. They are the equivalent of green buoys in the IALA-B system. Red buoys may have red reflectors or lights. They are the same as red buoys in the IALA-B system. Red or black buoys are usually found in pairs - pass between them.

E. A Special Sign

In Florida, you may see a special sign: "Caution, Manatee Area". When you see this sign, slow down to idle speed. Manatees, an endangered species, are passive, large, slow-moving mammals. Many Manatees are seriously injured or killed each year by boat propellers.

F. Noise

Always be aware of local laws on noise limits. Noise means engine noise, radio noise or even yelling by people on your boat. Good seamanship demands that you operate your boat quietly so as not to infringe on the rights of others. Do not use thru-hull exhaust unless you are well offshore.

G. Anchoring

The weight of the anchor and diameter of anchor line should be governed by the size and weight of your boat. The 348 Vista comes standard with a windlass and a 22-pound Delta Fast Set™ anchor and 150 feet of 1/2" rope and chain. Refer to the manufacturer's literature included in the owner's packet.

Keep anchor secure while underway to prevent damage or injury due to sudden shifting in the boat's attitude.

Use two or more anchors if anchoring overnight or for extended periods. If not using two anchors, make certain there is sufficient clearance for your boat to swing in a full circle to prevent damage in case of shifting winds.

Make certain you have enough anchor line (or scope) for the depth of water. Your anchor line should be 6 to 7 times the depth of water anchored in. For example, if you are in 20 feet of water, use 120 to 140 feet of anchor line.

CAUTION

Secure anchor line to bow eye or deck cleat. Never tie anchor line to a rail, rail fitting or other hardware not designed to support this stress.

To drop anchor:

Approach your selected anchoring site from downwind and come to a dead stop over the spot where you want to drop anchor. Lower the anchor using the windlass.

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

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

To weigh anchor:

Start the engine running before pulling in anchor.

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

Raise the anchor using the windlass. Make sure the chain stop is engaged.

WARNING

Always be sure to raise the anchor prior to operating your boat. The anchor can rebound into the boat resulting in damage to the boat and/or result in injury or death to individual(s) aboard the boat.

WARNING

Always utilize the chain stop provided with the windlass/bow roller combination. The chain stop prevents the anchor from accidently releasing while the boat is moving thus preventing damage to the boat or possible injury or death to individual(s) aboard the boat.

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

Anchors are available in different shapes, sizes and weights to fit different boats, uses, and conditions. Your Four Winns dealer can tell you which anchor will work best for your boat.

C - 3 RECOMMENDED READING

We recommend that you read the boating literature published by your state boating agency and the U.S. Coast Guard. Other suggested reading includes the following:

Damford, Don. Anchoring. (ISBN 0-915160-64-1). Seven Seas.

United States Coast Guard Auxiliary. Boating Skills and Seamanship. LC74-164688.(illus.). (ISBN 0-930028-00-7). U.S. Coast Guard.

Bottomley, Tom. Boatman's Handbook, (illus.). 316 p. (ISBN 0-688-03925-1, Hearst Marine Book). Morrow.

Whiting, John and Bottomley, Tom. Chapman's Log and Owner's Manual. 192 p.(ISBN 0-686-96737-2). Hearst Marine Book.

Chapman, Charles F. and Maloney, E.S. Chapman's Piloting, Seamanship and Small Boat Handling. (illus.). 62 p. (ISBN 0-87851-814-2, Pub. by Hearst Bks.); deluxe ed. (ISBN 0-87851-815-0). Morrow.

National Fire Protection Association. Fire Protection Standard for Pleasure and Commercial Motor Craft. (ISBN 0-317-07388-5, NFPA 302). National Fire Protection Association.

Brotherton, Miner. Twelve- Volt Bible. (ISBN 0-915160-81-1). Seven Seas.

C - 4 CONTACTS

There are many good boating publications that have information about your area and what other boats are doing, such as clubs and other activities. Education programs are sponsored by publications and organizations such as the U.S. Power Squadron, U.S. Coast Guard Auxiliary and the American Red Cross. See your dealer about special courses available in the area. For detailed information contact:

American Red Cross
Local address (see local telephone directory)

Boat U.S. Foundation for Boating Safety Hotline
1-800-336-BOAT
1-800-245-BOAT (in Virginia)

U.S. Coast Guard Info Line
1-800-368-5647

NMMA Sources of Waterways Information - National Marine Manufacturers Association has five (5) booklets which list sources for safety, cruising, and local waterway information. Each covers a different region of the U.S. (North Central, South Central, Northeastern, Southeastern and Western). For single copies, write Sources of Waterways information, NMMA, 401 N. Michigan Avenue, Chicago, Illinois 60611. Ask for the booklet for your region.

Skippers Course
GPO Superintendent of Documents
Washington, DC 20012
202-512-1800
202-512-2250 (fax)

United States Coast Guard Auxiliary
Local Flotilla or contact appropriate Coast Guard District Headquarters

United States Coast Guard Headquarters
2100 2nd St., SW
Washington, D.C. 20593-0001
202-267-1060

United States Power Squadron
P.O. Box 30423
Raleigh, NC 27617

C - 5 OWNER'S LOGS AND RECORDS

At the end of this owner's manual are several forms which you will find very helpful.

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

The **Fuel Log** is a handy way to record information covering engine hours, fuel consumption, miles traveled, as well as RPM (revolutions per minute), average M.P.H. (miles per hour) and GPH (gallons per hour).

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

The **Service Information Sheet** allows you to record all the pertinent information regarding your Four Winns® boat. This sheet will be extremely helpful when ordering additional/optional parts for your boat or when having service work done.

C - 6 NAVIGATIONAL AIDS CHART

The illustrated Navigational Aids Charts contain information concerning whistle signals, storm warnings, bridge signals, and buoy descriptions. See Figure C5 and Figure C6.

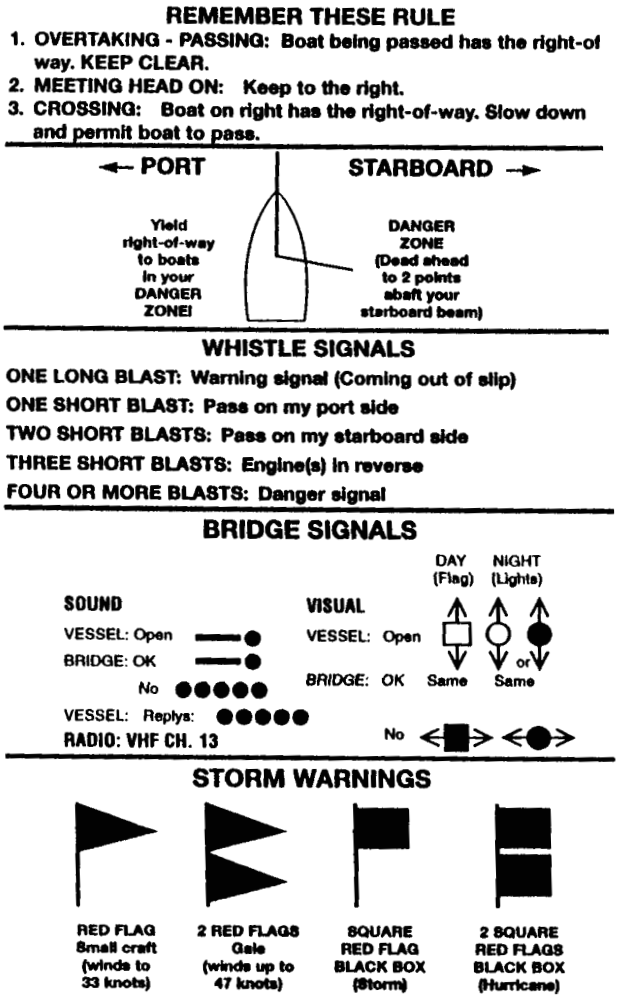


Figure C5: Navigational Aids Chart

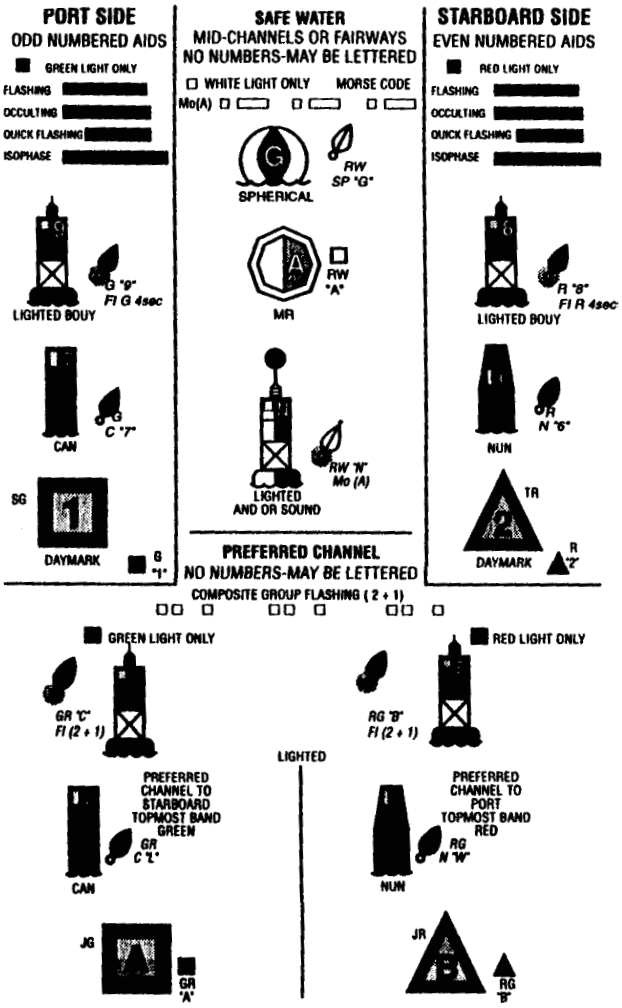


Figure C6: Lateral Aids as Seen Entering From Seaward

WARRANTY AND SERVICE

D - 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 defines the warranty coverage on all units manufactured by Four Winns. 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.

All engines utilized in the Four Winns® product are warranted by the engine manufacturer. Your Four Winns dealer is authorized to repair your engines and will work closely with the engine manufacturer to resolve any problems you have.

D - 2 DECK/HULL STRUCTURE WARRANTY

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

D - 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 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. Warranty registration cards are provided in the owner's information packet.

D - 4 TRANSFER OF WARRANTY

Four Winns confidence in the product and our warranty commitments can extend after the original purchaser may choose to move on to a new boat. The remainder of the Four Winns warranty coverage is transferable to the second owner of the boat for a fee. The warranty may be transferred only once. Registration of the second owner is required and the amount of the transfer fee is $250.00. Transfer of the remainder of the warranty must occur within five (5) years of the original retail sale. The transfer fee must be paid within fifteen (15) days of purchase of the used boat by check, money order or cashier's check payable to Four Winns. We will notify the appropriate engine manufacturer of the engine warranty transfer. The Four Winns Owner Protection Plan thoroughly describes the action required to transfer warranty coverage.

D - 5 PRE-OWNED UNIT REGISTRATION

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

Purchasers of all Pre-Owned Four Winns® models, regardless of the decision to transfer warranty coverage, are encouraged to register ownership with Four Winns. 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. The hull serial number plate is permanently affixed to the starboard side of the transom.

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 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 welcomes every purchaser of a Four Winns® boat, new or used, to our family.

D - 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. Please contact your local agent for assistance on insurance coverage.

D - 7 SERIAL NUMBER RECORD

The manufacturer, model, and serial number of major components are recorded during the assembly of each Four Winns® boat. Two copies of this completed form are included at the end of this section. 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.

D - 8 PRE-DELIVERY SERVICE

Four Winns makes every effort to deliver your boat in "turn key" condition to the dealer. 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.

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 Pre-Delivery Inspection Form is part of the Warranty Registration Card. It lists the many items encompassed by the pre-delivery service previously described. 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 Pre-Delivery Inspection Form of the Warranty Registration Card upon completion of the work. You will also be asked to sign the Pre-Delivery Inspection Form upon accepting delivery of the boat. You are to retain the two copies marked "Boat Owner". Your dealer is to retain the copy marked "Dealer copy" for his records. The Manufacturer's copy is to be mailed to the Four Winns Customer Service Department.

D - 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 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 the dealer does not have the needed item, the dealer has the capability, through direct 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 the nearest dealer in your area.

D - 10 WINNGEAR™

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

ENGINE AND DRIVE SYSTEMS

E - 1 GENERAL

WARNING

DO NOT attempt to service any engine without being totally familiar with the safe and proper service procedures. Do not attempt to maintain or adjust an engine while it is running. Certain moving parts are exposed and failing to shut off the engine can result in serious injury or death.

Four Winns 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 owner's 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 I on Fuel Systems, and Section F on Control Systems.

E - 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 or injuring people in the vicinity:

1. DO NOT allow the boat to remain stationary with the engines running for an extended period of time. Do not stand or swim near the exhaust output or outdrive when the engine is idling.

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 under way. Open a forward hatch or window to allow air to travel through the cabin. Be very careful of operating the boat with the cabin door or windows 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 R - 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 B-2 - Carbon Monoxide.

B. Carbon Monoxide Monitor

A carbon monoxide (CO) monitor(s) will sound an alert should carbon monoxide reach an unsafe level in the cabin of your Vista. The CO Monitors are standard equipment and are located in the aft cabin and forward cabin. Refer to the manufacturer's literature included with the owner's packet.

WARNING

Never disarm a CO detector. If a CO detector alarms, immediately ventilate the area and check passengers for symptoms of CO intoxication. See your Four Winns dealer for assistance in diagnosing the cause for the alarm.

E - 3 ENGINE & DRIVE SYSTEM

A. Engine

Powering your 348 Vista inboard is your choice of twin Mercury Mercruisers® or twin Volvo-Penta® engines. Please consult the Engine Owner's manual provided with this manual for operation and maintenance information.

B. Inboard V-drives

On the V-drive propulsion system of the 348, all shifting and gearing components are installed inside of the hull, only the propeller shafts and associated equipment are under water. The V-drive system has the engine mounted

in the extreme stern of the boat with the output shaft facing 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 E1.

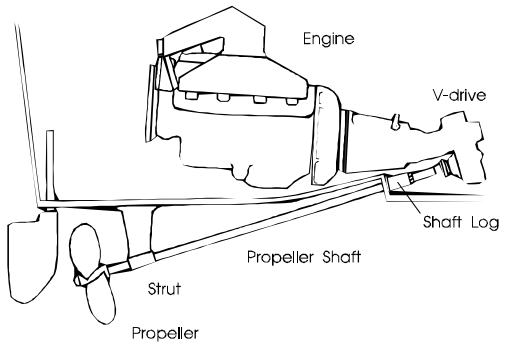


Figure E1: V-drive

NOTICE

Always return the engine throttle lever to the extreme low speed position before shifting. NEVER shift the unit while engine speed is above 800 rpm.

E - 4 UNDERWATER EQUIPMENT (Inboards)

WARNING

Avoid running aground or striking a (submerged) object. Serious damage to the engine(s) or inboard underwater gear can result and the boat 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. Minor dripping may occur and is not abnormal during operation. See Figure E1 & E2.

Proper performance of the shaft seal is directly dependent upon correct propeller shaft alignment. 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.

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.

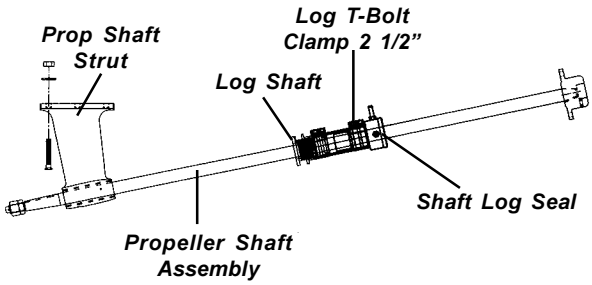


Figure E2: Shaft Log

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 equipment to hold the packing nut stationary.

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. Improper lifting technique will not be covered under warranty.

The prop shafts of all our 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 damage 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 0.004 inches. Always be sure the prop shaft is centered in the strut bearing and shaft log before alignment adjustments are made. Refer to Figure E3.

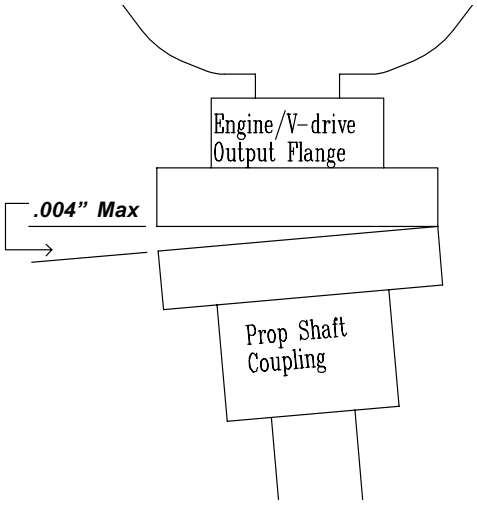


Figure E3: Coupling Alignment

Coupling Alignment Procedure:

1. Boat must be in water for at least 24 hours before alignment is started.
2. Check to be sure that the shaft can be turned with one hand on the coupling.
3. Assure that all shaft coupling nuts and bolts are installed but loose.
4. Seperate coupling face from transmission output flange.
5. Using a set of feeler gauges, measure the gap between the coupling face and the transmission output face, next to each bolt, without rotating the shaft.
6. Subtract the smallest measurement from the largest.
   A. If the difference is .004" or less, snug up each nut and bolt, then tighten each nut to 10 to 15 ft.-lbs of torque, then re-tighten each nut to 30 to 35 ft.-lbs. of torque.
   B. If the difference is greater than .004", adjust engine and transmission mounts up or down, sideways and/or fore and aft until the difference between the highest of the measurements and lowest is .004" or less. Snug up each nut and bolt, then tighten each nut to 10 to 15 ft.-lbs of torque, then re-tighten each nut to 30 to 35 ft.-lbs. of torque.
7. Check to be sure that the shaft can be turned with one hand on the coupling.
8. If the engine can not be turned with one hand on the coupling, readjust the engine and transmission mounts up and down, sideways, and/or fore and aft until the difference between the highest of the measurements and lowest is .004" or less. Snug up each nut and bolt, then tightening each nut to 10 to 15 ft.-lbs. of torque, then re-tightening each nut to 30 to 35 ft.-lbs of torque. Be sure the shaft can be turned with one hand on the coupling.
9. Repeat this procedure on the other side.

D. 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. It should be noted that the 348 Vista is equipped with nibral propellers.

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 E4.

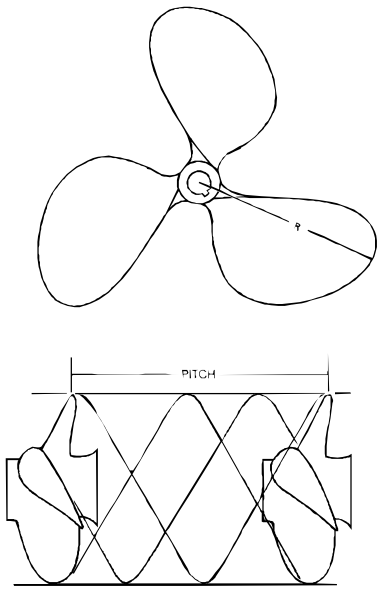


Figure E4: Propeller Pitch & Diameter

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 semisolid such as butter or gelatin. 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 E4.

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.

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 propellers 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 engines should turn within the maximum RPM range when at full throttle. If the engines exceed 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 affect performance of the engine. Always be sure the engine is properly tuned and load conditions are those normally experienced, before changing propellers.

NOTICE

For twin engine installations, always check drive shaft rotation before propeller installation. A right hand rotation propeller must be installed on the starboard propeller shaft. Similarly, a left hand prop must be installed on the port propeller shaft.

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 E5.

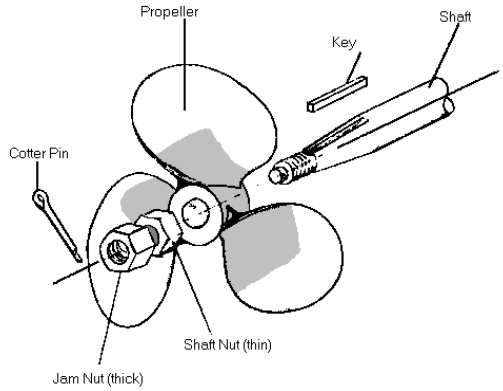


Figure E5: Prop Installation

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. The propellers **must** rotate outboard not inboard.

Be sure the propellers are of the correct blade configuration, diameter, pitch, and shaft size to assure good performance. For additional information on factors affecting performance and/or assistance with your selection , please consult your Four Winns dealer.

E - 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 P-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.

E - 6 ENGINE FLUSHING

The engine flush out option is offered on all Vista® 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 R - General Maintenance for flushing procedures.

E - 7 RUNNING ANGLE

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 E6.

The running angle can be controlled through the use of trim tabs. See Section E-8 - Trim Tabs, for information on the use of trim tabs.

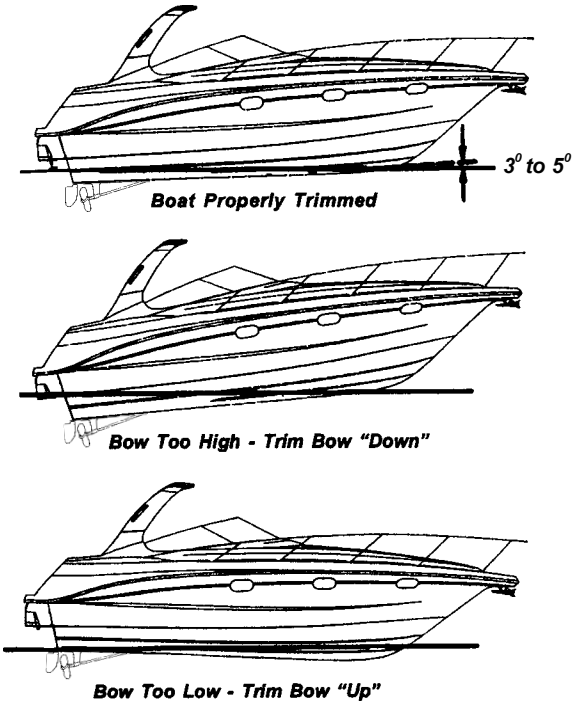


Figure E6: Running Angle

E - 8 TRIM TABS

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

a. Compensate for wind and load listing (level the boat side to side).

b. Induce faster planing and help achieve optimum running angle (see Section E-7 Running Angle.

basic understanding of trim tab operation and some practice in calm water. Be sure to read the manufacturer's literature included in the owner's packet.

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 labeled by position such as "Bow Up" and "Bow Down". They are also labeled for "Port" and "Stbd". When depressed, the label indicates what happens to the bow of the boat.

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

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

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

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

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.

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

C. Trim Tab Maintenance

Check the fluid level of the trim tab reservoir often. Always keep the fluid level between the designated marks on the trim tab pump-reservoir. Refer to the manufacturers information for specifications on the type of fluid to be used and other operation and maintenance information.

E - 9 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.

The 348 Vista has individual VDO gauges in the dash panel as standard instrumentation. See Figure E7.

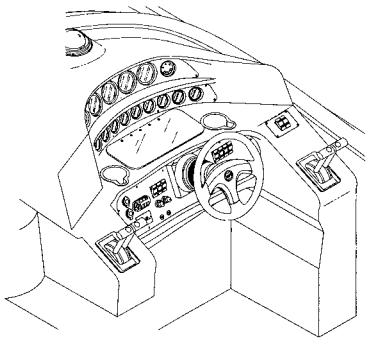


Figure E7: 348V Helm Station

A. Tachometer

The tachometers indicate the speed of the engines in revolutions per minute (rpm) and are preset by Four Winns. This speed is not the boat speed or necessarily the speed of the propeller. They may not register zero with the Ignition Key in the OFF position.

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

Some engines are equipped with devices that limit engine rpm in accordance with the oil pressure or engine temperature. Refer to the Engine Owner's manual for additional information.

B. Speedometer

A speedometer is **not** available on the 348 Vista. With the optional GPS/Navigational package the ability to monitor your speed becomes available. Please refer to the manufacturer's information on how to program the Nav 398 for speed readings. This information is included in the owner's packet when the boat is order with the navigation package. If the navigation package is ordered later the manufacturer's information will be included.

NOTICE
Speed indicators are not precision instruments. The indications are relative and should never be used for navigational purposes or similar critical situations alone. Use other navigation systems in conjunction with the speedometer.

NOTICE
DO NOT rely on the speed indicator when trying to achieve a "NO WAKE" condition in a harbor or other enclosed waterway. ALWAYS be cognizant of the size of your waves your boat is making and reduce throttle until you are sure that they will not cause any damage. You are responsible for damage caused by the wake of your boat.

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 engine serviced immediately upon a reduced oil pressure indication.

E. Voltmeter

The voltmeter monitors battery condition and thus alternator performance. See Section H - 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. Refer to Section E - Engine and Drive Systems and Section I - Fuel System for additional information.

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
Fuel gauges are not precision instruments. The reading is relative, and should never be relied upon as the sole indicator of fuel availability.

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. Refer to Section I - Fuel System for additional information.

G. Depthsounder

The depthsounder is standard equipment on your 348 Vista . It consists of two main components, the transducer and the display unit. The transducer is mounted to the hull and the display unit is installed in the dash. The transducer and display unit communicate by means of a cable, and are powered by your boat's 12-volt DC

battery. The transducer and display unit use the basic principle of sonar to indicate the water's depth. Please read the manufacturer's literature included with the owner's packet for information regarding operation and maintenance.

Operation Instructions: Humminbird HDR 600

1. Control Functions

The HDR 600 uses a blacklit 7-segment display in conjunction with a 3-button keypad to control all user functions. At initial power up, the unit will begin normal operation and display the digital depth and the units of measure. Figure E8 shows a typical view you might see on-screen at initial power-up.

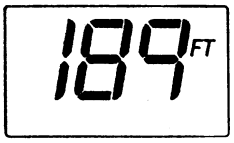


Figure E8: Depthsounder (HDR 600)

The HDR600 uses 3 buttons to control the Shallow Alarm, Deep Alarm, Keel Offset and Units of Measure function. While in normal operation, pressing the SET button selects a function and blinks its corresponding indicator on the display. Once a function has been selected it may be adjusted by pressing the UP and DOWN arrow buttons to adjust the setting. Further presses of the SET button will sequentially select the other functions for adjustment. All user settings are remembered by the HDR600, even when powered off.

When in the active function, a single press to an arrow button will result in a single incremental adjustment. Pressing and holding an arrow button will sequence through a range of adjustments. If no adjustment is made in 5 seconds, the unit will return to normal operation.

2. Shallow Alarm

The SHALLOW ALARM function can be set for depths ranging from 1 to 20 feet and sounds an alarm when the depth is less than the setting. See Figure E9.

Figure E9: Shallow Alarm

From normal operation, pressing SET once will display the SHALLOW ALARM setting and blink the "SHALLOW" icon. The UP ARROW will activate the SHALLOW ALARM and also increase the selected value. The DOWN ARROW will reduce the value. Hold the UP ARROW until you reach the desired depth setting. See Figure E10.

Figure E10: Shallow Alarm Setting Value

NOTICE
The maximum SHALLOW ALARM setting can not meet or exceed the current DEEP ALARM setting.

After your selection is made, the unit will return to normal operation after 5 seconds. The "SHALLOW" icon should now be visible. See Figure E11.

Figure E11: "SHALLOW" Icon

If the depth of the water is less than the selected value, the alarm will sound and the "SHALLOW" icon will blink to indicate the alarm. Pressing any button will mute the alarm; pressing SET will mute the alarm and activate the SHALLOW ALARM function for additional adjustment. To permanently turn off, use the DOWN ARROW to return the display to "OFF".

3. Deep Alarm

The DEEP ALARM can be set for depths up to 99 feet and sounds an alarm when the depth is greater than the setting.

Press SET until the DEEP ALARM function becomes active. This is indicated by the blinking "DEEP" icon. The UP ARROW will activate the DEEP ALARM and also increase the selected value. The DOWN ARROW will reduce the value. Continue to press and hold the UP ARROW until you reach your desired value. See Figure E12.

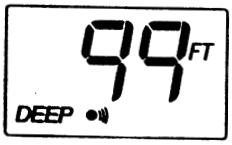


Figure E12: Deep Alarm Setting Value

NOTICE
The minimum DEEP ALARM setting can not meet or go below the current SHALLOW ALARM setting.

After your selection is made, the unit will return to normal operation after 5 seconds. The "DEEP" icon should now be visible. See Figure E13.

Figure E13: "DEEP" Icon

If the depth of the water is greater than the selected value, the alarm will sound and the icon will blink to indicate the alarm. Pressing any button will mute the alarm; pressing the SET will mute the alarm and activate the DEEP ALARM function for additional adjustment. To permanently turn off, use the DOWN ARROW to return the display to "OFF".

4. Units

The UNITS Control Function selects the UNITS of measure for depth readout and alarm functions. The three settings available are Feet, Meters or Fathoms. See Figure E14.

Figure E14: Units Control Function

Press SET until the units function is activated on-screen. This is indicated by the blinking UNITS icon. Pressing either arrow will allow you to select from the choices. Continue to press an arrow until the desired readout is selected: FT for feet, M for meters, FA for fathoms.

After your selection is made, the unit will return to normal operation after 5 seconds. The selected units icon should now be visible as shown in Figure E14.

Figure E14: Selected Units Icon

5. Keel Offset

The Keel Offset function adjusts the digital depth readout to display depth reading from either the waterline or the keel (lowest point) of the boat, instead of from the location of the transducer which is usually somewhere in between. This permits optimum transducer location and depth readouts suited to your needs.

To determine the value to enter into the KEEL OFFSET setting, first decide whether depth from the waterline or depth from the keel is desired. **Measurements will need to be made for the location desired**.

For depth from the keel of the boat, accurately measure the vertical distance between the face of the transducer and the keel of the boat. This measurement will then be entered into the Keel Offset function as a negative (-) number. See Figure E16.

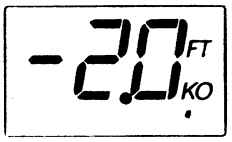


Figure E16: Negative Keel Offset

For depth measurements from the waterline, accurately measure the vertical distance from the face of the transducer and the waterline of the boat. This measurement will then be entered into the Keel Offset function as a positive (+) number. See Figure E17.

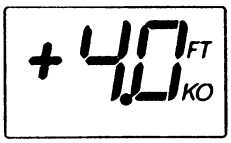


Figure E17: Positive Keel Offset

To Enable Keel Offset press SET until the KO icon is displayed on the screen. The default setting of the unit is off which is displayed as zero. From the default setting of 0.0, use the DOWN arrow to enter the negative (-) number to set the unit for depth from the keel. Or, from the default setting of 0.0, use the UP arrow to enter the

positive (+) number to set the unit for depth from the waterline.

The available settings are +10 to -10 feet. After your selection is made, the unit will return to normal operation after 5 seconds. The "KO" icon should now be visible as shown in Figure E18.

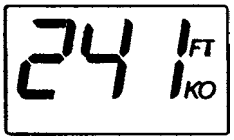
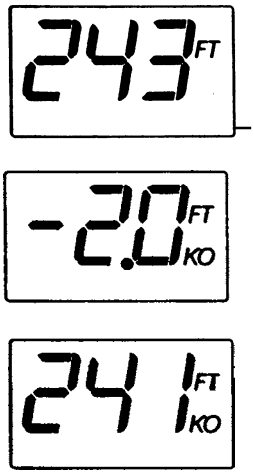


Figure E18: Keel Offset Icon

Figure E19 depicts a scenario where the KEEL OFFSET has been set to -2 feet. The last drawing shows the return to normal operation with the updated depth readout.



Return to Normal Operation w/ Updated Depth Readout

Figure E19: Keel Offset Scenario

NOTICE

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.

WARNING

Do not rely on depth sounder to avoid submerged objects. Depth sounders provide a relative indication of water depth only.

6. Maintenance of HDR 600 Depthsounder

If the unit comes into contact with salt spray, simply wipe the affected surfaces with a cloth dampened in fresh water. **DO NOT USE a chemical glass cleaner on the lens**. Chemicals in the solution may cause cracking in the lens of the unit.

When cleaning the LCD protective lens, use a chamois and nonabrasive, mild cleaner. Do not wipe while dirt or grease is on the lens. Be careful to avoid scratching the lens. Refer to the manufacturer's literature included in the owner's packet for additional information.

General Description: Depthsounder Faria

1. The depth finder will read to 199ft. or the corresponding number of meters or fathoms. If the reading is less than 19.9 ft, meters or fathoms, 1/10th increments will be displayed. If the reading is more than 19.9ft, all readings will be in whole numbers.

2. The depth finder has an audible and LCD displayed depth alarm with adjustable shallow and deep limits and a depth below keel offset feature. These settings once made are stored in memory and will remain even if the battery is disconnected.

Operation Instructions: Depthsounder Faria

1. Power on. The depth sounder will activate automatically when the power to it is initially turned on. You do not have to press the combination "ON / OFF MODE" keypad. The LCD will illuminate showing the depth and will also show the type of units selected, feet (FT), meters (M), or fathoms (F). To turn the depth sounder off, press and hold the "ON / OFF MODE" keypad for 4 seconds. Pressing the "ON / OFF MODE" keypad again will reactivate the unit.

NOTE: The instrument is designed to have the internal LED lighting remain on as long as power is supplied even if the unit is turned "off" at the keypad.

2. Depth alarm. Shallow mode: Pressing the "ON / OFF MODE" keypad again displays the "SH" shallow depth alarm setting. This is the shallowest water that will activate the alarm. Press and hold the up or down arrow keypads to adjust the reading to the desired depth.

Deep mode: Pressing the "ON / OFF MODE" keypad again displays the "DP" deep depth alarm setting. This is the deepest water that will activate the alarm. Press and hold the up or down arrow keypads to adjust the reading to the desired depth. When the shallow depth setting is read by the depth sounder, the "SH" will flash on the LCD and the audible alarm will sound rapidly. When the deep depth setting is read by the depth sounder, the "DP" will flash on the LCD and the audible

alarm will sound at 2 beeps per second.

NOTE: To fully deactivate an alarm, reset it to zero. Pressing the "ON / OFF MODE" keypad temporarily deactivates the alarm. To reactivate the alarm press the "ON / OFF MODE" keypad until the depth reading appears.

3. **Keel offset**. Pressing the "ON / OFF MODE" keypad again displays the "KL" keel offset setting. This can be set so that the depth sounder either shows the depth below the keel or the depth below the transducer. Press the up or down arrow keypads to adjust the reading to the desired depth no more than 19.9 ft. For example if the bottom of the keel is 2ft below the transducer and you want the depth sounder to read the depth below the keel, the display should be adjusted to read 2.0 FT.

NOTE: Once a keel offset is programmed, the shallow and deep alarms will be activated by the depth below the keel.

4. **Units.** Pressing the "ON / OFF MODE" keypad again displays "Un" on the LCD indicating the units mode. Press either the up or down arrow keypads to set the units desired to feet (FT), meters (M), or fathoms (F). These units once set, will remain the same for all modes. Pressing the "ON / OFF MODE" keypad again returns the depth sounder to normal operation.

H. Gas Vapor Detector

The Gas Vapor Detector is optional equipment on the 348 Vista. The gauge mounts in the dash. Additional information can be found in Section I-1H in this manual.

I. Engine Hour Meter

Engine hour meters are optional on all Vista® 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. The hour meters are located in the engine compartment on all engines.

J. 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 batteries. Additional information on ignition switch operation is covered in Section A - Operation of this manual.

K. Engine Synchronizer Gauge

An engine synchronization gauge is standard on the 348 dash. 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 F-2 - Control Operation and the engine manufacturer's literature for additional information on throttle usage and engine synchronization.

L. Alarm Systems

An engine alarm system is installed on the 348 Vista (gas or diesel engines). This 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 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.

M. Navigational Packages (Optional)

Also available are optional navigational packages. See Figure E20. Navigation Package I includes the Raytheon VHF-210 radio and Raytheon GPS/Loran-398.

Navigation Package II option is also available on the 348 Vista and it includes Raytheon VHF-210 radio and Raytheon Radar System with GPS interface.

Please consult the manufacturer's literature included in the owner's packet for operation and maintenance of these navigational systems.

NOTICE

Four Winns does not limit you to these specific navigational packages mentioned above. There are many navigational systems on the market today. You may desire to use a different system based on your needs, personal preference, and mounting space available.

NOTICE

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.

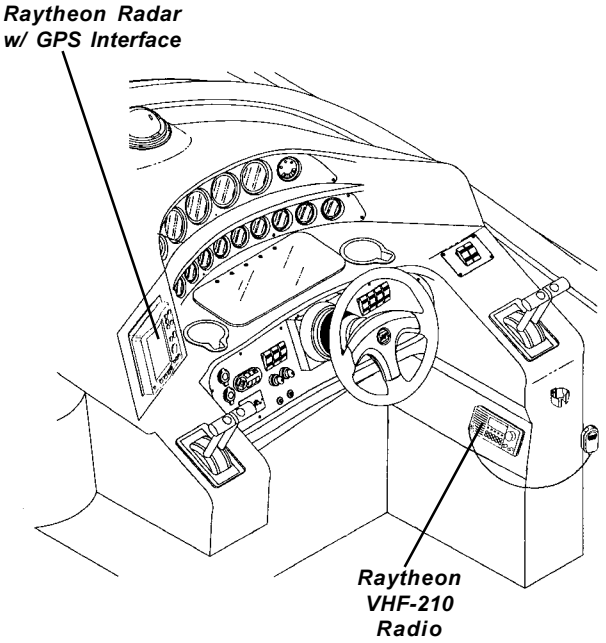


Figure E20: 348V Navigation Package II

N. Rudder Angle Indicator Gauge

This gauge provides you with the information regarding the angle of the rudders relative to the straight ahead position. A rudder angle sender sends the angle information to the rudder angle indicator gauge mounted on the lower instrument dash panel. See Section G-4 for more information regarding the rudder angle indicator.

O. Instrument Maintenance

Electrical protection for instruments and ignition circuitry is provided by a circuit breaker on the ignition panel. Periodically, spray the ignition switches with a contact cleaner. The ignition switches 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

F - 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.

The 348 Vista model is equipped with twin lever, single action shifter and throttle levers. See Figures F1 & F2. The port shifter lever operates the port engine and the starboard shifter lever operates the starboard engine. This is also true for the throttle levers. See Section F2 - Control Operation for further details.

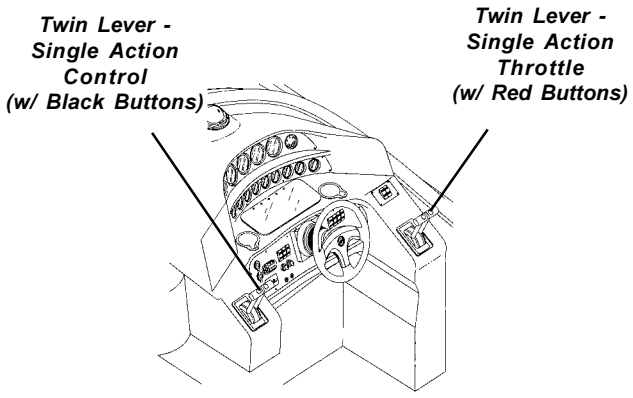


Figure F1: 348V Helm Station

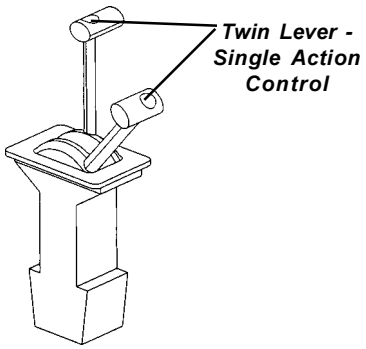


Figure F2: 348V Control Lever

NOTICE

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

NOTICE

Allow the engine to warm up before engaging the shift control. Monitor all instruments while engine is idling during warm-up.

Additional information on controls and their operation is discussed in Section F-2 and the engine manufacturer's information included in the owner's packet.

F - 2 CONTROL OPERATION

A. General

NOTICE

Do not run a cold motor any faster than necessary to keep motor from stalling. Do not exceed 2500 RPM in NEUTRAL.

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 E-8l). Attempting to synchronize the engines solely by using tachometer readings or throttle 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.

B. Shifting and Control Speed

NOTICE

If your boat is equipped with a non-OEM remote control system, ask your dealer how to properly operate it.

1. Move shifter levers to the neutral detent position and throttle levers to the idle position. Placing the shifter levers in the neutral detent position will engage neutral start switch and allow engine to start.

CAUTION

DO NOT shift into FORWARD or REVERSE unless engine is running. Damage to the shift system could result from trying to shift without the engine running. Carefully check function of all control and engine systems before leaving the dock.

2. To go FORWARD - Briskly move the shifter levers forward. Once forward gear engagement is complete, push throttle levers forward until desired speed is achieved.

3. To go in REVERSE - Briskly move the shifter levers rearward. Once rearward gear engagement is complete, push throttle levers forward until desired speed is achieved.

WARNING

DO NOT shift from forward to reverse when the boat is planing.

NOTICE

DO NOT shift if engine speed is above 800 RPM.

4. To go from FORWARD to REVERSE, or REVERSE to FORWARD; always pause at NEUTRAL and allow engine speed to return to idle.

5. After shifting is completed, continue to move the throttle levers slowly in the desired direction to increase speed.

F - 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 control levers may be necessary to locate the neutral position and disengage the safety cutout 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.

F - 4 CONTROL SYSTEM MAINTENANCE

Periodic inspections of the controls, 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. Reapply the grease if necessary.

Lubrication should be performed as often as necessary to keep the system operating smoothly. Cable manufacturers such as Teleflex 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

G - 1 GENERAL

348 Vista model is equipped with tilt steering wheel and hydraulic steering as standard features.

A. Tilt Steering (Hydraulic)

The steering wheel can be tilted up or down so as to enhance the driver's comfort and enjoyment. The tilt steering is also hydraulic. See Section G-1B for details.

To tilt the steering wheel, depress the release lever with your thumb . See Figure G1. Be sure to hold the top of the wheel to assist in positioning. Refer to the steering manufacturer's literature for additional information.

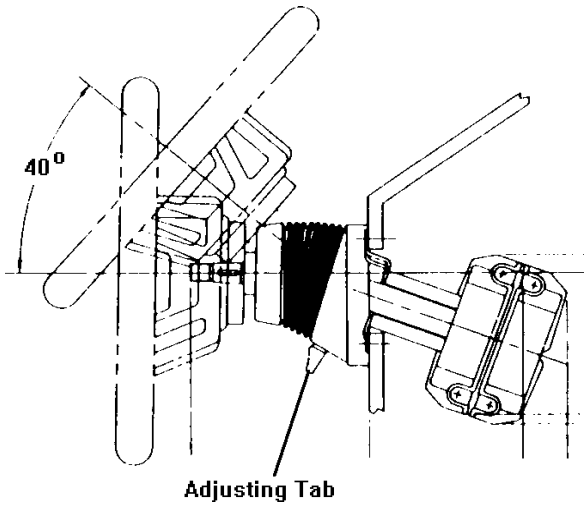


Figure G1: Tilt Steering

WARNING

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.

WARNING

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.

B. Hydraulic Steering

NOTICE

DO NOT force the steering wheel to either extreme position. This can place undue strain on the unit and can lead to hydraulic steering damage.

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 hydraulic steering units are critical and should be performed only by a qualified service technician.

CAUTION

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

Check the fluid level in the reservoir periodically. Low hydraulic fluid levels may increase steering difficulty.

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 fluid 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 to turn. See Figures G3 & G4.

NOTICE

Only use manufacturer's suggested hydraulic fluid. The hydraulic steering uses a fluid which meets Mil H5606 specifications. Please note that automatic transmission fluid (Dexron II) may be used in an emergency. **Never use brake fluid**.

NOTICE

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.

Additional information on steering operation can be found in your Engine Owner's manual.

G - 2 STEERING LOAD

A load is placed on the steering system by the propeller torque, and/or water flowing past the rudder. 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.

CAUTION

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

G - 3 RUDDER

The 348's dual v-drives 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 preset at the Four Winns factory. Further alignment adjustments should not be necessary unless the rudder or steering system incurs damage. See Figures G2, G3, & G4.

Rudder Alignment Procedures:

1. Dimension A must be 1/2" to 3/4" larger than dimension B.

2. Dimension A & B must be measured between the inside faces and at the bottom of the rudders.

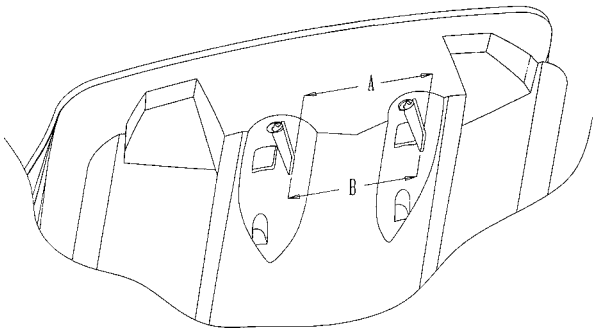


Figure G2: Rudder Alignment Specifications

G - 4 RUDDER ANGLE/POSITION INDICATOR

A rudder angle/position indicator is a device that indicates the location of the rudders relative to the straight ahead position. Such a unit is provided on the 348 Vista and consists of a gauge on the dash and an electrical sending unit connected to a rudder tiller arm or the steering assembly. See Figures G2 & G3.

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.

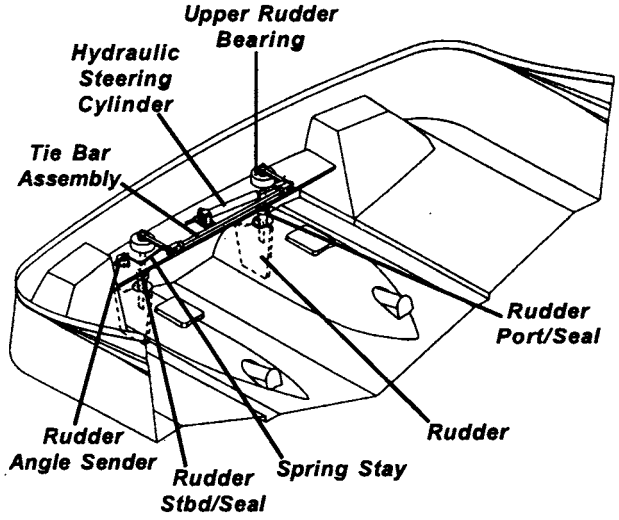


Figure G3: Hydraulic Steering

G - 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 call 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.

G - 6 STEERING SYSTEM MAINTENANCE

A periodic inspection of the helm pump and reservoir, hydraulic hoses, the hydraulic cylinder, tie bar assembly, bearing, seals, rudder angle sender and rudder should be made. See Figures G4 - G6. 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 should be so adjusted that the steering wheel is centered with the rudders 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 in the owner's packet.

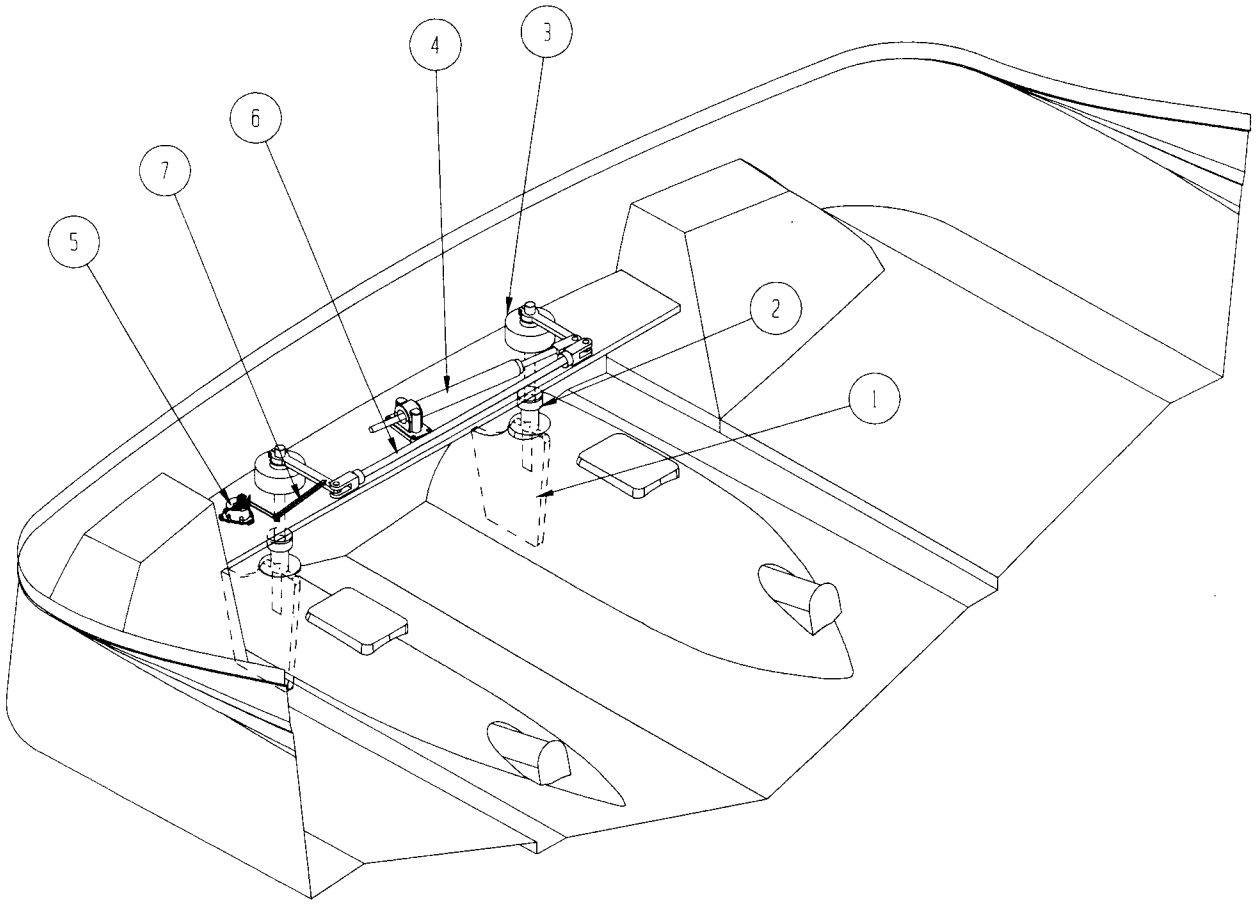
Inboard boats should also be inspected for leakage around the rudder port seal. The packing nut(s) should be tight enough to prevent leakage, yet loose enough so excessive drag is not placed on the rudder shafts. Hard steering could otherwise result. If the leakage cannot be stopped without exerting excessive drag on the rudder shaft, replacement of the seal is required.

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.

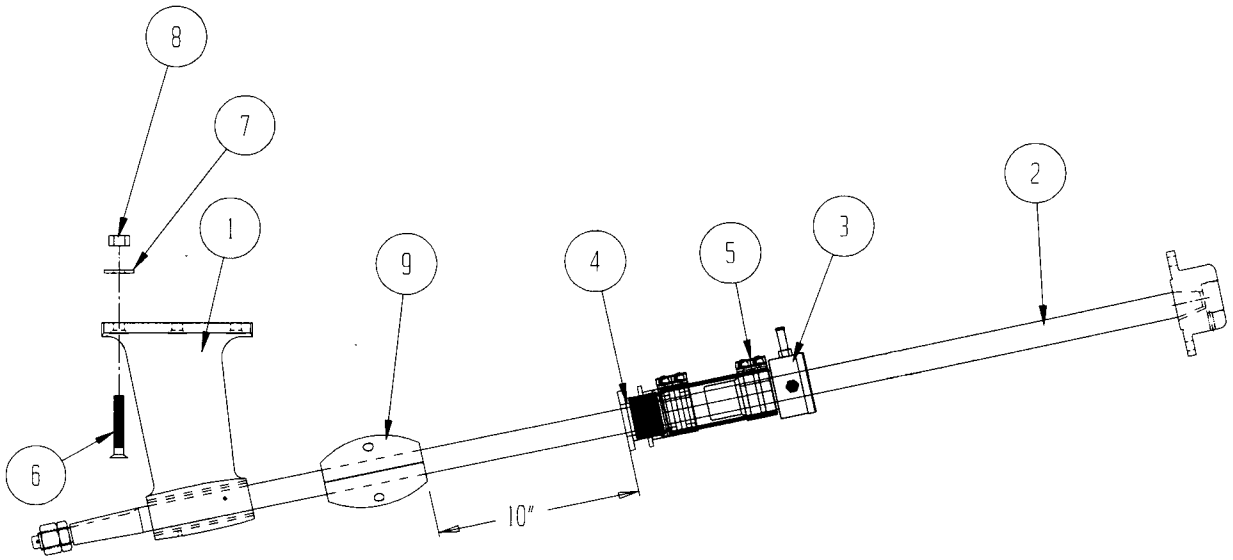
Figure G4: Hydraulic Steering Parts Breakdown



(*) NOT SHOWN

#	DESCRIPTION	PART #	QTY.	#	DESCRIPTION	PART #	QTY.
1	RUDDER, 338 VISTA	**040-0525**	2	7	SPRING STAY, 6" 03400-1	030-0218	1
2	RUDDER PORT/SEAL 338 VISTA*	040-0476	2	*	BOLT, 5/16-18 X 4" HHCS SS	080-1034	8
3	BEARING, UPPER RUDDER 338 VISTA	040-0477	2	*	HELM, HYDRAULIC TILT STEERING	040-0117	1
4	CYLINDER, HYD. STEERING #HC5313	040-0508	1	*	HOSE, HYD. STEERING TELEFLEX HT-5101	040-0047	50 FT
5	SENDER,RUDDER ANGLE,VDO 440-003	028-0213	1	*	SCREW, 1/4-20 X 1 1/2" PPMSSS1/4C1.5	080-0070	4
6	ASSEMBLY, TIE BAR 34-1/2" TILLER ARM**	**040-0521**	1	*	SCREW, #8 X 3/4" POHSMSS	080-0022	3
*	STEERING WHEEL, SILVER LEATHER SS SPOKE	040-0506	1	*	NUT, 1/4-20 HEX SS	080-0095	4
*	HUB, #QMI0499	040-0506-01	1	*	NUT #10-24 KEPS S.S NUT	080-0097	4
*	WASHER, FLAT 3/8" (7/8 OD) WFSS3/8	080-0099	8	*	WASHER, LOCK 5/16" SS WMLSSS5/16	080-0101	8
*	NUT, 5/16-18 SS HEX FINISH NFISS5/16C	080-0413	8	*	WASHER, 1/4 X 1 1/4 FLAT FENDER WFESS	080-0159	4
					***PRIOR TO BOAT CV020A000**		
					USE PART NUMBER 040-0474.		
					****PRIOR TO BOAT CY012A000**		
					USE PART NUMBER 040-0510.		

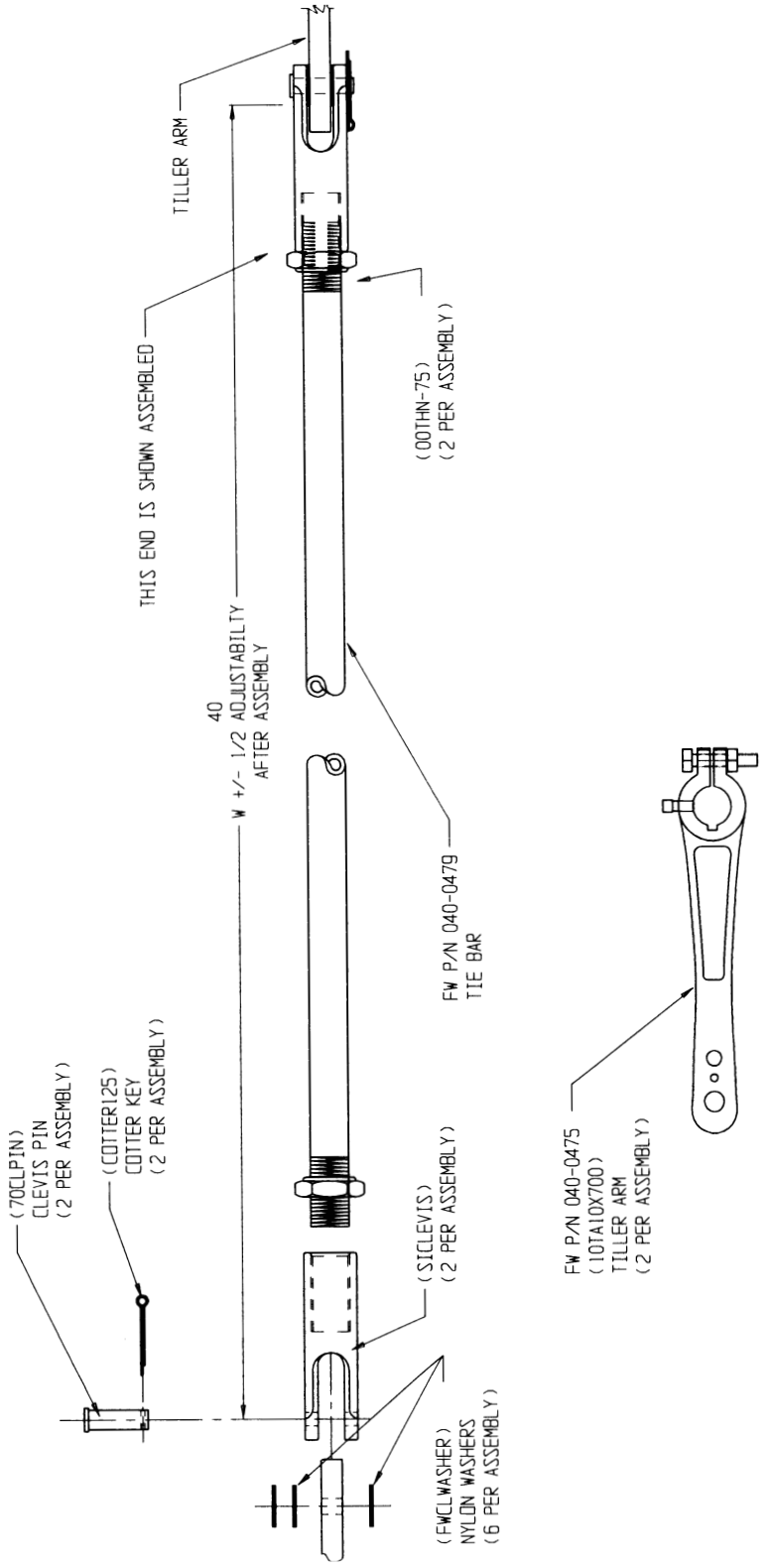
Figure G5: 338V Inboard Propulsion System



(*) NOT SHOWN

#	DESCRIPTION	PART #	QTY.	#	DESCRIPTION	PART #	QTY.
1	STRUT, PROP SHAFT 338V INBOARD	040-0473	2	8	NUT, 1/2-13 NYLON INSERT ESN 79	080-0056	12
2	SHAFT ASSEMBLY, 338V INBOARD	040-0484	2	*	CONTROL,TWIN LEVER/SINGLE ACTION CH4451	041-0268	2
3	SEAL, SHAFT LOG ASS'Y 1.25 SS1250200001	040-0511	2	9	ANODE ZINC, SHAFT, 1-1/4 X-5	040-0056	2
4	SHAFT LOG, SLL-125-FG BUCK ALGONQUIN	040-0516	2				
5	CLAMP, LOG T-BOLT 2 1/2"	021-0362	8				
*	CABLE, CONTROL 22' #CC17230	041-0272	1				
*	CABLE, CONTROL 26' #CC17226	041-0271	2				
*	CABLE, CONTROL 30' #CC17230	041-0270	1				
*	LUBE, MOLY #175356	084-0085	.050 TU				
*	GREASE, OMC TRIPLE GUARD #5082	084-0083	.006 TU				
*	CAULK, 1/4" BEAD #3M 4200	084-0175	30 IN				
6	BOLT, 1/2-13 X 3" FH SOC. MS S	080-0292	12				
7	WASHER, FENDER WFESS.530X1.44X.150 SS	080-0747	12				

Figure G6: Tie Bar 40" Tiller Arm Assembly



ELECTRICAL SYSTEMS

H - 1 GENERAL

All electrical equipment on the Four Winns Vista® models operates on either 12 volts DC or 120 volts (220 volts on 50 Hertz models) AC electrical power. A triple battery system along with dockside power (including battery charger) is standard on the 348 Vista. Batteries are located in the engine compartment.

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 experienced in making such installations.

Circuit breakers are installed on the battery switch to protect various system components. The SHIP SYSTEMS breaker supplies power to all DC electrical components except the aft and forward bilge pumps, ignition, and instrumentation. Additional breakers are located in the cabin circuit breaker panel. The circuit breakers and fuses are labeled for amperage and use.

H - 2 DUAL ENGINE - TRIPLE BATTERY SYSTEM

Two battery selector switches are installed on dual engine, triple battery installations. This allows DC power to be used from any of the three batteries. Refer to the schematics in the back of the manual.

A. Installation

Connect each of the red (positive) battery cables leading from the battery selector switch to the positive (+) terminal on each of the three batteries. Refer to Figure H1.

NOTICE

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

2. Connect each of the black (negative) battery cable leading to the engine block to the negative (-) battery terminal on each of the three batteries.

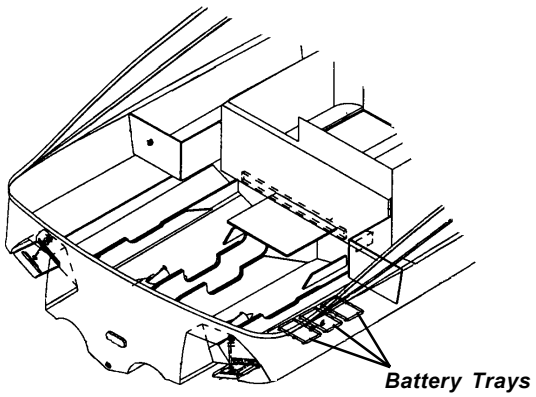


Figure H1: Triple Battery Location

B. Operation

Power to the engines and all 12 volt electrical equipment is controlled at the battery selector panel. On the 348 Vista model, separate breakers are provided on the battery selector switch panel to protect the engine, windlass, forward and aft bilge pump, battery charger, and ship systems.

1. Battery Selector Switch

The battery selector switch positions for the 348 Vista is as follows:

“OFF” - With the battery selector switches in the “OFF” position and the “SHIPS SYSTEMS” circuit breaker in the “off” position, all 12 volt power to the boat is shut off except to the automatic bilge pumps. Always turn the battery selector switch to the “OFF” position when the boat is unattended for an extended period.

NOTICE

Twelve volt power to the cabin panel is supplied by the “SHIPS SYSTEMS” circuit breaker on the battery selector panel. This must be turned on to operate any 12 volt accessories on the cabin panel. The bilge pumps receive power from the ships system battery and remain on at all time regardless of battery selector or ship systems switch position.

NOTICE

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

2. Port Engine Battery Switch:

"ON" - Turning the switch to position "ON" will use the port engine battery to power the port engine and 12 volt engine related equipment. The ships system battery will not be used for any engine related equipment, but will power all other 12V equipment on the boat. The isolator will allow the alternator to fully charge all three batteries, but not allow the operator to drain down either engine start battery. "ON" is the recommended switch position for normal boat operation. This position allows maximum use of 12V equipment on the boat and leaves a full charge in both engine batteries for starting.

"SHIP SYSTEMS" - Turning the switch to position "SHIPS SYSTEMS" will use the ships system battery to power the port engine and 12 volt engine related equipment. The isolator will allow the alternator to charge all batteries, but the boat systems (including the engine) will operate off of the ships systems battery.

"PARALLEL" - With the battery selector switch in the "PARALLEL" position, the port engine and ships systems 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 through the isolator.

3. Starboard Engine Battery Switch:

"ON" - Turning the switch to position "ON" will use the stbd engine battery to power the stbd engine and 12 volt engine related equipment. The ships system battery will not be used for any engine related equipment, but will power all other 12V equipment on the boat. The isolator will allow the alternator to fully charge all three batteries, but not allow the operator to drain down either engine start battery. "ON" is the recommended switch position for normal boat operation. This position allows maximum use of 12V equipment on the boat and leaves a full charge in both engine batteries for starting.

"SHIP SYSTEMS" - Turning the switch to position "SHIPS SYSTEMS" will use the ships system battery to power the stbd engine and 12 volt engine related equipment. The isolator will allow the alternator to charge all batteries, but the boat systems (including the engine) will operate off of the ships systems battery.

C. Battery Charger

The battery charger is standard equipment and is located in starboard engine compartment. The batteries will be charged by the battery charger when the boat is connected to dockside power.

Additional information on the battery charger can be found in Section H-6B - 120 Volt AC Equipment in this manual and refer to the manufacturer's literature included with the owner's packet.

H - 3 VOLTMETER

On the 348 Vista, two voltmeters are installed in the dash panel to monitor the condition of the batteries. When the voltage is checked during engine or battery charger operation, the voltage of the respective battery will be indicated on the voltmeter. It is common to have a 14 volt reading when the engines are running. It should be noted that located in the cabin panel are voltmeters which monitor the "SHIPS SYSTEMS". Additional information on voltmeters may be found in the engine owner's manual.

H - 4 12 VOLT ELECTRICAL EQUIPMENT

A. Helm Equipment

Ignitions are protected by circuit breakers on all Vistas. Equipment on the helm is protected by circuit breakers in the helm and in the cabin's AC/DC panel.

NOTICE

On the 348 Vista, a separate SYSTEMS breaker on the battery switch can be used to shut down all DC equipment (except bilge pump) on the cabin panel.

To assist you, we have listed below descriptions of individual switches and their uses:

CAUTION

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

Accessories - Accessory equipment that is customer or dealer installed. These circuits are wired to a circuit breaker in the 348. For additional information on adding accessories, refer to Section H-4B.

Aft Bilge Pump - The BILGE 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.

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

Gasoline vapors can explode resulting in injury or death. Before starting the engine, check engine compartment bilge for gasoline or vapors. Operate blower for four minutes, and verify blower operation. ALWAYS run the blower when the vessel is operating below cruising speed.

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

Horn - To sound the horn, press the HORN switch.

Instrument Lights - On the 348, the INST LTS switch is used to activate the instrument lights on the dash. It has a two position switch that provides bright and dim lights.

Navigation & Anchor Lights - Moving the NAV/ANC LTS switch towards the NAV position activates the bow lights and the all-around light (or arch light if installed). Move the switch to the ANC position to activate the all-around light or arch light. The center switch position is OFF.

Trim Tabs - The boat is equipped with electric-hydraulic trim tabs, the trim tabs are controlled by the TRIM TAB switches. Refer to Section E-8 Trim Tabs for more information.

Windlass - The WINDLASS switch activates the windlass. Refer to the Section M-12 in this manual and the manufacturer's literature for additional information.

Stbd Wiper - The STBD WIPER switch activates the stbd windshield wiper. The wiper will self park to the stbd.

Port Wiper - The PORT WIPER switch activates the port windshield wiper. The wiper will self park to the stbd.

B. Installation of Additional 12 Volt Equipment

Accessories may be added to the boat by wiring directly to the cabin panel. Non-factory installed 12 volt accessory equipment can be connected to the "ACC" switch on the dash.

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

Cabin equipment will be protected by the 12 volt DC cabin panel on the 348 Vista. Cabin equipment information is listed as follows:

CO Monitor - The CO monitors are protected by a circuit breaker in the cabin panel.

Cabin Lights - To turn the overhead lights on, activate the LIGHTING circuit breaker on the 12 volt cabin panel on the 348. Use the corresponding switch panels or ON/OFF switch located on mid cabin lights to activate.

Forward Bilge Pump - The forward bilge compartment can be activated manually by the FWD BILGE breaker switch.

Any water from the stringers or from other sources within the cabin will drain into the forward bilge compartment. The pump is equipped with an automatic float switch and will operate whenever bilge water rises to a level that will cause the float to move upward. The water will be pumped overboard.

Head Compartment Blower - A blower is installed in the head compartment. A separate ON-OFF switch is provided in the head compartment. The head blower is protected by a circuit breaker on the cabin DC panel.

Pressure Water - A pressure water pump delivers water to the faucets, shower, and transom washdown. The pressure water pump will operate automatically as long as the FRESH WATER breaker is ON in the 348 Vista.

Turn the FRESH WATER switch OFF when the water tank becomes empty, or when water will not be required for an extended period. The 348 comes standard with tank monitoring systems to check water levels. Refer to Section J-1 and J-2 in this manual for additional information.

Cockpit Refrigerator (Optional) - A circuit breaker is provided on the DC cabin panel. The refrigerator has a separate ON-OFF switch. Refer to Section L-2 in this manual and to the manufacturer's literature for additional information.

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 of the 348.

Sump Pump - A sump pump is used to discharge water from the shower and sink drains overboard. It is installed on all Vistas. 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 SUMP circuit breaker located in the 12 volt cabin panel.

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.

H - 5 120 (220) VOLT ELECTRICAL SYSTEM

The boat is 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 the following items: battery charger, refrigerator, water heater, range, microwave, icemaker, and outlets. The air conditioner has its own dockside power plug. 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 348's MAIN dockside inlets are in the aft transom storage tub. The 348 has MAIN circuit breakers on the cabin panel. Both MAIN breakers must be turned ON for AC system operation. 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. Once the shore power is securely connected, turn the MAIN breaker back on. If the connection is broken and later re-secured, the circuit breaker may trip. Connections must be secure for uninterrupted dockside service.

H - 6 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 adapters 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(s).

2. Connect shore power cable(s) at the boat first, then connect it to dockside shore power outlet(s).

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(s). See Section H-6C - Reverse Polarity Indicator.

4. To disconnect shore power, turn off the main breaker switch on the AC electrical panel and disconnect the power cord(s) from the shore power dockside receptacle(s) first. Then, disconnect the cord(s) 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 all AC systems on the boat. The receptacles can be used for 120 volt (220 volts on 50 Hertz models) household appliances. Refer to the following list for information on appliances and other equipment.

Battery Charger - The battery charger is controlled by a circuit breaker on the AC electrical panel in the cabin labeled BATTERY CHARGER

Refrigerator - 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 L-1C - Galley Equipment in this manual for more information.

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

NOTICE

DO NOT supply electrical power to an empty water heater. Activate the FRESH 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 immediate damage to the heater element.

Electric Stove - The RANGE circuit breaker must be activated to supply power to the electric stove on all Vista® models. Refer to Section L-1A - Galley Equipment in this manual for more information.

Microwave - The MICROWAVE breaker must be activated to supply power to the microwave on all Vista® models.

Icemaker - The ICEMAKER breaker must be ON to supply power to the icemaker. The icemaker is standard on the 348 Vista.

Receptacles - The OUTLET circuit breakers supply power to the corresponding receptacles in the AC system.

Air Conditioner - The AIR CONDITIONER circuit breaker supplies power to the air conditioner. Dual Dockside is installed on the 348 with this option. Refer to Section L-4 - Air Conditioning in this manual for more information.

Most receptacle circuits are capable of handling 15 amperes. Refer to Table III for 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 III: 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

.

If a problem exists, the reverse polarity indicator light will come on when the shore power cable is attached to the inlet. DO NOT activate the shore power switch in the cabin when the Reverse Polarity light is on.

WARNING

ALWAYS check the reverse polarity indicator light in the AC distribution panel immediately upon connecting the shore power cord before turning on the AC SHORE POWER circuit breaker. If the light is on, a problem with a reversed electrical connection exists. Disconnect the shore power cord immediately. Notify the marina and have the dock's shore power connection inspected.

Under proper operating conditions, the reverse polarity indicator light **will not** be on. A green light is provided for the shore power and will be ON when dockside power is being used.

NOTICE

Some marina shore power systems may be improperly grounded to retard electrolysis (see Section H-9 - Stray Current Corrosion). Before using any 120 volt equipment, make sure the reverse polarity light does not activate when connecting the cord to the inlet.

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.

H - 7 GENERATOR OPTION

An optional generator is available on the 348 Vista. It provides 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. See the generator manufacturers information for specifications and additional details.

The 348 Vista is pre-wired for generators. If you wish to use dockside power, be sure the generator is off, connect the shore power cords as explained in Section H-6A, and turn on the shore power breakers on the AC cabin panel. If you wish to use generator power,

1. Be sure the shore power cord(s) are disconnected.
2. Check the bilge for fumes, operate the blower for at least 4 minutes, and verify blower operation.
3. Start the generator using the remote generator start switch on the dockside panel.
4. Turn on the generator's main breakers located in the AC cabin panel.

WARNING

Be sure to operate the bilge blower for at least four (4) minutes before starting engine or generator, or whenever operating the engine(s) at idle speed. Check the bilge blower output before each use.

WARNING

Generator exhaust contains carbon monoxide. Review information regarding carbon monoxide at Section B-2 - Carbon Monoxide and Section E-2 - Engine Exhaust.

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

H - 8 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.

Check the battery fluid level often, especially when a charger/converter is being used. 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 overuse. Alternating battery usage is important. Refer to the battery manufacturer's instructions included with your battery.

DANGER

Batteries produce hydrogen and oxygen gases when being charged. These explosive gases escape through the vent/fill caps and may form an explosive atmosphere around the battery if the ventilation is poor. This gas may remain around the battery for several hours after charging. Sparks or flames can ignite the gas and cause an explosion.

WARNING

Fire or Explosion Hazard!

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

WARNING

Poison!

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

WARNING

Disconnect the battery before working on electrical or ignition system to prevent electrical shock and accidental ignition.

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.

H - 9 STRAY CURRENT CORROSION

A. General

Electrically induced underwater corrosion occasionally affects 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 surrounding boats; an improperly wired battery/charger installation or other boats that are in close proximity which have electrical power leakages.

Periodically inspect the engine components to determine if corrosion damage exists. If stray current corrosion damage is found, determine and correct the cause of the 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 a battery charger designed to meet U.S. Coast Guard regulations for external ignition protection.

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

Anticorrosion anodes are attached to the transom and propeller shafts to prevent corrosion to your electrical systems 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. See Figure H2.

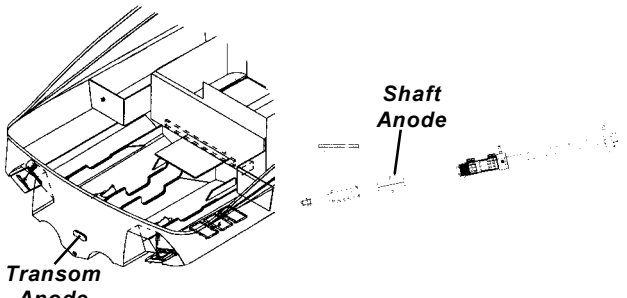


Figure H2: Transom & Shaft Anodes

FUEL SYSTEMS

I - 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. Engine damage resulting from the use of a lower octane gasoline is considered misuse of the engine and will void the engine warranty. Refer to the section on Gasoline Requirements in the engine manual for information on octane specifications.

The port and starboard fuel tanks are located forward of the engine. See Figure I1 below. The capacity of each fuel tank is 110 gallons. Each 348 Vista is equipped with a manual fuel valve system. This system allows you to choose which fuel tank you want your engines to draw from and also your generator (if so equipped). Please see Figure I7 at the end of this section for more details.

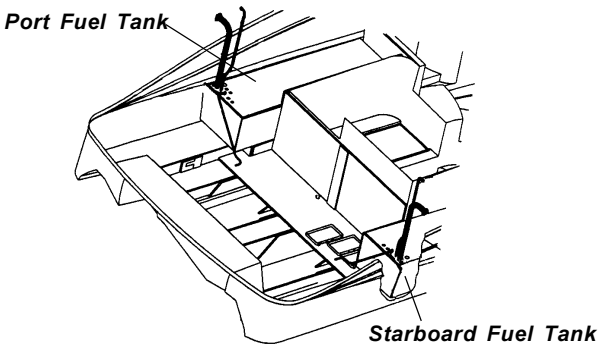


Figure I1: 348V Fuel Tank Locations

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 Inspection Form portion of the Warranty Registration Card will attest to the dealer's performance of this service.

B. Fuel Fills

The fuel fill deck plates are located on the port and starboard rear decks and are marked "GAS". Be sure to utilize the proper type and grade fuel. Refer to Section I-3 for information regarding fueling instructions.

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 gasket/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 should be inspected for cracks or damage and replaced as necessary. Lubricating with a light, waterproof oil or grease is recommended and can extend the o-ring's longevity.

C. Fuel Vents

The 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

Spilled fuel is a fire and explosion hazard. DO NOT overfill or overflow the tank, or allow fuel spills into the hull or bilge. If spillage occurs, clean up immediately and dispose of soiled rags/towels in a proper container.

NOTICE

When fueling at a marina, DO NOT overfill. Fuel may spill into the water.

After fueling, replace the fill cap, and wash the areas around the fuel fill plate and below the fuel vent. Residual fuel left on the deck and hull sides can be dangerous, and will yellow the fiberglass. It will also damage the tape stripes and logos.

Periodically, inspect the vent for any dirt, wax, etc. Carefully remove any obstruction with a pipe cleaner or similar device. **Be sure not to puncture the screen**. The vents are designed to keep insects and foreign matter from contaminating the fuel and fuel system. The stainless steel cap is not removable.

D. Anti-Siphon Valves

The fuel withdrawal line is equipped with an anti-siphon valve where the line attaches to the fuel tank. The valve prevents gasoline from siphoning out of the fuel tank should a line rupture. See Figure I2 for anti-siphon location.

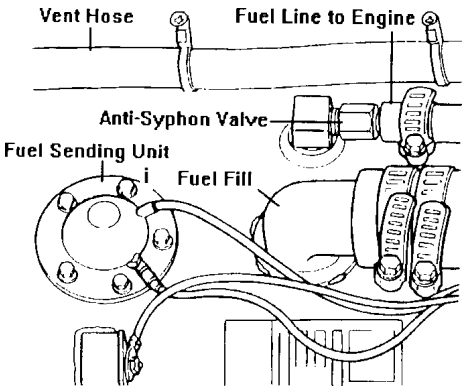


Figure I2: Fuel Tank Fittings

CAUTION

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

CAUTION

The fuel withdrawal is positioned in the fuel tank to achieve optimum fuel usage, and fuel line routing. At certain speeds and hull trim angles, the fuel supply at the withdrawal 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, the relative trim angle of the boat may cause the fuel to flow away from the withdrawal.

NOTICE

On all Vista® models, access to the anti-siphon valve and fuel sender is by either an access plate or through the engine compartment.

E. Fuel Gauge

The fuel gauge indicates the amount of fuel in the fuel tank. See Section E-9F - Fuel Gauge for additional information on fuel gauge use.

NOTICE

Fuel gauges are not precision instruments. The reading is relative, and should never be relied upon as the sole indicator of fuel availability.

F. Fuel Sender

The fuel sender consists of a mechanical arm with float which measures the fuel in the tank. The sender arm adjusts with the amount of fuel in the tank and sends a signal to the fuel gauge. See Figure I3.

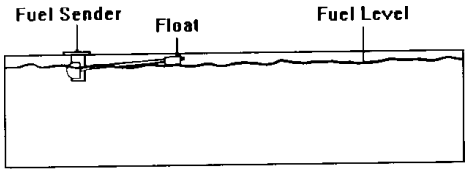


Figure I3: Fuel Sender Operation

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 your Four Winns dealer by bending the fuel sender float arm.

The gauge readings will also vary with the trim angle of the boat. When sitting at a dock and the boat is nearly level, the fuel gauge will register accurately. Refer to Figure I3. When boating, the trim angle of the boat changes and affects the gauge readings. Under these conditions, the fuel sender will register "full" for the first few hours of running time until the fuel level drops below the 3/4 or 1/2 mark. This is caused by the angle of the fuel in the tank as shown in Figure I4.

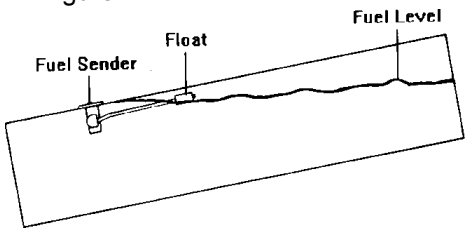


Figure I4: Effects of Trim Angle

It is very important to keep track of hours and fuel consumption to obtain an average gallon per hour consumption figure. This will prevent any problems with running out of fuel on the water.

Dealers are equipped with some general figures on consumption which can be used as a guide until specific information on your boat is determined. Because of boating conditions, speed, weight and other factors common to your situation, fuel consumption will vary between your boat and consumption figures developed by Four Winns.

When the fuel gauge begins to register below the "full" mark, the gauge readings will drop much faster until it reads "empty". When this occurs, the trim angle has affected the sender reading. When the gauge registers "empty", the sender has bottomed out and there may be 3 to 4 gallons of fuel in the tank. See Figure I5.

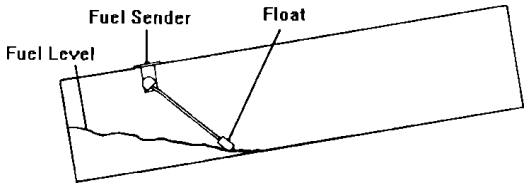


Figure I5: Trim Angle Effect with Low Fuel

G. Fuel Filters

Fuel filters are installed on each engine. Filters should be cleaned or changed frequently to assure an adequate supply of fuel to the engine. Refer to the engine manual for additional information. The engine manual is included in the owner's information packet.

NOTICE
Canister-type filters should be changed annually.

H. Gas Vapor Detector

A gas vapor detector is optional on 348 Vista model. 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.

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

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

I. Use and Maintenance

WARNING
DO NOT let the odor of gasoline go unchecked. If the odor of gasoline is noted, DO NOT START ENGINE. If engine is running, SHUT OFF ENGINE, ELECTRICAL AND HEAT GENERATING EQUIPMENT. Investigate and correct the situation immediately! Have all passengers put on personal flotation devices and keep fire extinguishers at hand until the situation is resolved.

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

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.

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

I - 2 FUEL STANDARDS

Be cautious when using gasoline which 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.

A. Problems With Alcohol In Gasoline

Below is a list of problems which may be experienced when using blended gasoline.

1. Premature deterioration of fuel system components may occur. Alcohol will attack rubber fuel hoses, fuel tanks, fuel filters, fuel pumps and rubber gaskets. This deterioration will lead to fuel system leakage.

2. Phase separation of fuel will cause contamination. Water which 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 widespread. 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.

B. Recommendations

Assume blended gasoline is being used and follow these recommendations below.

1. 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.

2. Ventilate the engine compartment before starting the engine(s). Operate the engine compartment blower for four (4) minutes. Then, prior to starting the engine(s), check the bilge area for the scent of gasoline fumes; DO NOT start the engines if the odor of gasoline is detected.

3. Frequently inspect the fuel system fittings. Inspect the fuel tank, pump and filter for signs of leaks or corrosion. Visually inspect for deteriorating metal fittings at the fuel hose connections.

4. If areas are found within the fuel system that appear questionable, have a qualified marine technician inspect the system. Have those fuel system components that do not pass inspection replaced. A thorough fuel system examination should be made by an experienced marine technician at least once a year.

I - 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 stove.

   d. Position the Battery Selector Switch to OFF.

3. Before starting to fuel:

   a. Ensure that boat is moored securely.

   b. Close all ports, windows, doors and hatches.

   c. Be sure the proper type of grade of fuel as recommended by your engine owner's manual is used.

   d. Determine how much additional fuel is required to avoid overflow.

4. During fueling:

   Keep the fill nozzle in contact with the fuel opening at all times to guard against possible static spark. See Figure I6.

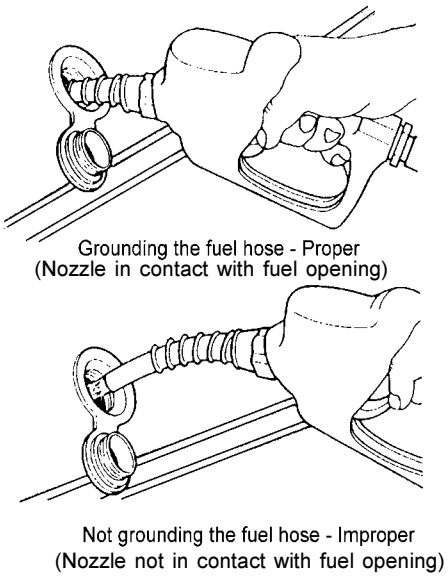


Figure I6: Grounding Fuel Hose

WARNING

Spilled fuel is a fire and explosion hazard. DO NOT overflow the tank or allow fuel spills into the hull or bilges. Avoid overboard spills. Visually monitor the fuel vent located on either the transom or side of the hull. When the tank is full, fuel will flow from the fuel vent.

5. After fueling:

   a. Replace all fill caps securely.

   b. Wipe up any spilled fuel.

   c. Open all ports, windows, doors and hatches.

   d. Determine that there is no odor of gasoline in the engine compartment or below decks before starting machinery, turning on lights or lighting stove. Operate the bilge blower system for at least four (4) minutes before engine start-up.

   e. Be prepared to cast off moorings as soon as engines are started.

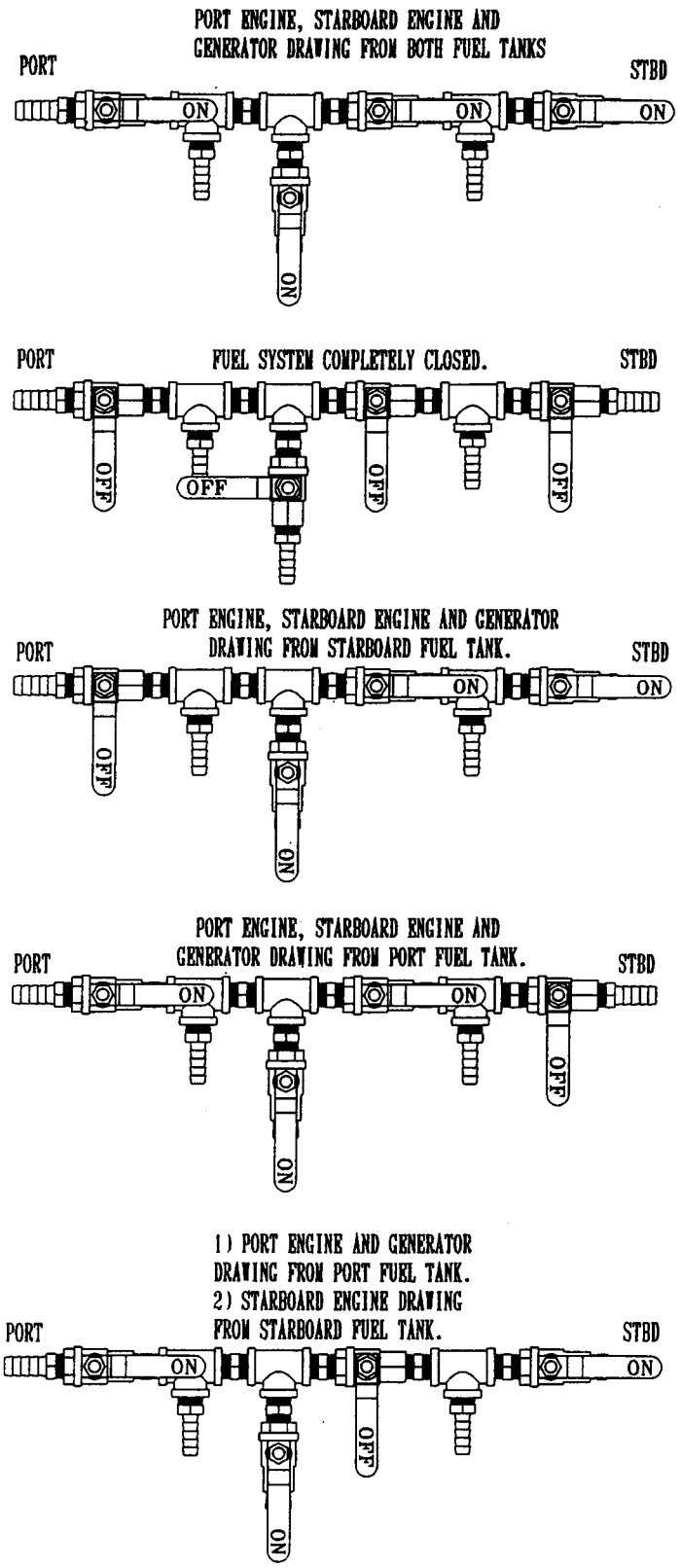


Figure I7: 338 Fuel Valve System w/ Generator Option

WATER AND WASTE SYSTEMS

J - 1 GENERAL

All Four Winns Vista® 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 forward starboard deck. Always fill the tank slowly.

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 will become pressurized and could rupture.

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 capacity of the fresh water tank for the 348 Vista is 44 gallons/166 liters. This model comes standard with tank monitoring system, located in the head, to check water/waste level. The tank location is below the forward V-berth. Access to the tank is gained through an access lid under the V-berth storage lid. See Figure J1.

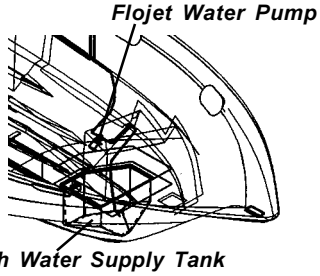


Figure J1: 348 Vista Water Tank Location

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 nontoxic antifreeze 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.

J - 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. Refer to Figure J1 and the drawings at the end of this section.

A. Priming The System

After filling the water tank, open all faucets partially. Then, activate the FRESH WATER switch on the cabin panel to supply the system with water. Let the pump run until water comes out of the galley faucet, head faucet and transom shower.

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 H-4 - 12 Volt Electrical Equipment and the manufacturer's literature included in the owner's packet 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 heater used on 348 Vista has a 10.5 gallon capacity. The water heater is installed on the port side of the engine compartment. Refer to Figure J2 and to the drawings at the end of this section.

NOTICE

Water heater 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 immediately. The water system must be filled and primed before attempting to use the water heater.

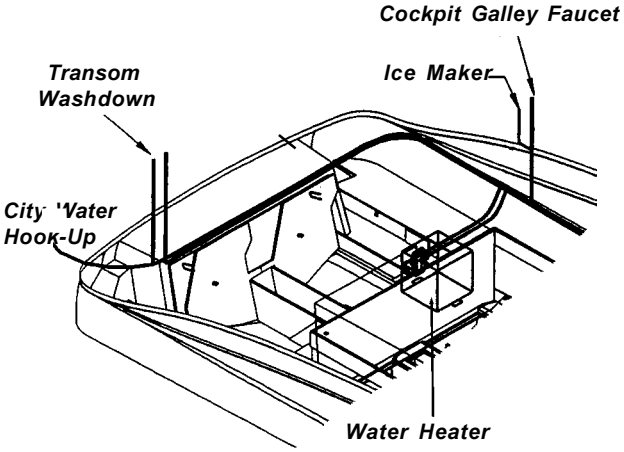


Figure J2: Water Heater & System Components

A water heater that incorporates a heat exchanger is standard on the 348. The 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 H - Electrical Systems for additional information.

D. Using The Shower

Turn on the faucets to desired temperature, remove the shower spout from the sink faucet receptacle, move the lever on the shower head, and the shower is operational. The shower hose is connected to the shower spout and runs inside the faucet receptacle and underneath the sink.

When using the shower, draw the shower curtain 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.

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.

A shower sump pump is incorporated into the drain system of the shower. The shower drains into the sump pump located forward of the aft cabin. The water will be pumped overboard. If a grey water system is installed, the water will be pumped into a holding tank.

The sump pump includes an automatic bilge switch and is protected by a circuit breaker at the cabin panel. The sump pump will automatically start as soon as the water in the sump reaches a level that will cause the float on the switch to rise.

After showering, let the water flow for a period of time to flush the pump of soap residue. Check the sump for excess residue. When rinsed out, the pump will automatically shut off.

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 in the owner's packet.

J - 3 GREY WATER SYSTEM

The grey water system is optional on 348 Vista models. The water from the galley sink, head sink and shower will drain into a sump and is pumped into a 30 gallon (114 liters) holding tank. The waste level indicator is located in the head compartment. A pumpout fitting labeled WASTE but designated for grey water is provided on the deck. Refer to Figure J3 for location of the pumpout fitting. Also, refer to the drawings at the end of this section.

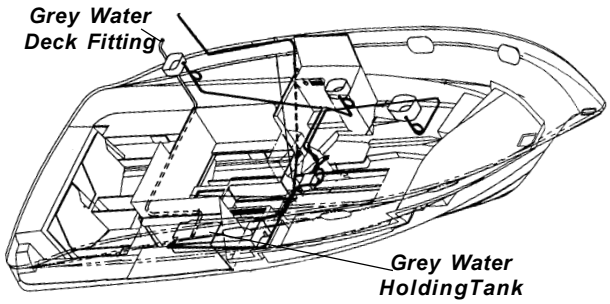


Figure J3: Grey Water Deck Fitting & Tank Location

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.

J - 4 SHORE WATER CONNECTION

Shore water connection is standard on all Vista® models. This feature allows the direct connection of a city or shoreside water supply to the boat's water system to provide a constant supply of fresh water without the need to constantly refill 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 boat's water system so the shore connection also regulates the water pressure to a maximum of 35 psi.

The female inlet deck fitting is in the transom door storage area.

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 by city water if the system was previously primed.

The water pump should be turned off when using city water. City water pressure varies from area to area. If the pump is ON and water pressure drops below 35 p.s.i., the pump will activate to maintain pressure at 35 p.s.i. It will draw water out of tank and bypass city water.

If the pump is OFF, the pump will not function and the water in the storage tank of the boat will not be utilized.

NOTICE

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

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 J-1 for general water system information and instructions on filling the water tank. The water tank will not be filled while connected to shore water.

J - 5 TRANSOM SHOWER

The transom shower is standard on the Four Winns 348 Vista model. The shower unit is usually located on the starboard side of the transom near the boarding ladder grab rail. Refer to Figure J2 and to the drawings at the end of this section.

The water supply system can be used for showering or washing down the transom. As long as there is water pressure, the shower faucet will operate.

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

J - 6 HEADS

The various antipollution 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 drawings at the end of this section. Also, refer to the manufacturers literature included in the owner's packet.

A. VacuFlush® Sanitation System

The 348 has the VacuFlush sanitation system as a standard feature. The system eliminates the unpleasant sulfide odors which plague saltwater systems. Flush water is no longer drawn through the through hull fittings, seacock and vented loop. It also extends the life of the system components by eliminating salt water and impurities from accumulating in the system over time.

The VacuFlush toilet operates in a different way from other marine toilets. VacuFlush systems use a small amount of water (a little more than a pint) per flush in addition to a simple vacuum. The toilet is connected to a fresh water system. Fresh water is the key to an odor free bathroom compartment. VacuFlush toilets are equipped with an intergrade vacuum breaker which prevents the possible contamination of the potable/fresh water supply. See Figures J4 & J5 and refer to the drawings at the end of this section. Also, refer to the manufacturers literature included in the owner's packet.

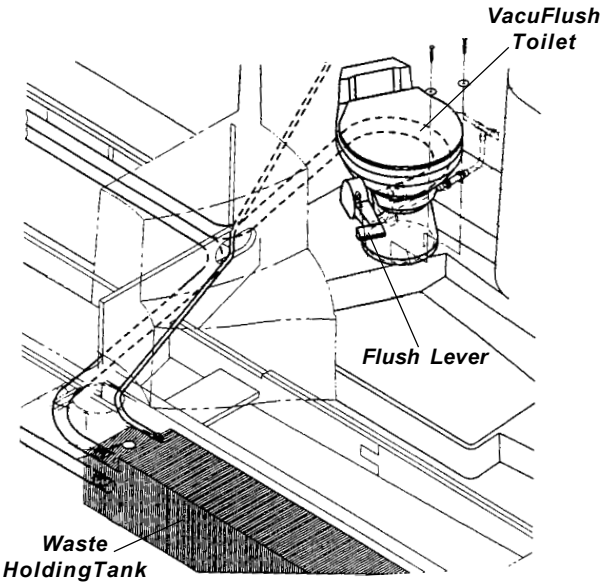


Figure J4: VacuFlush Toilet

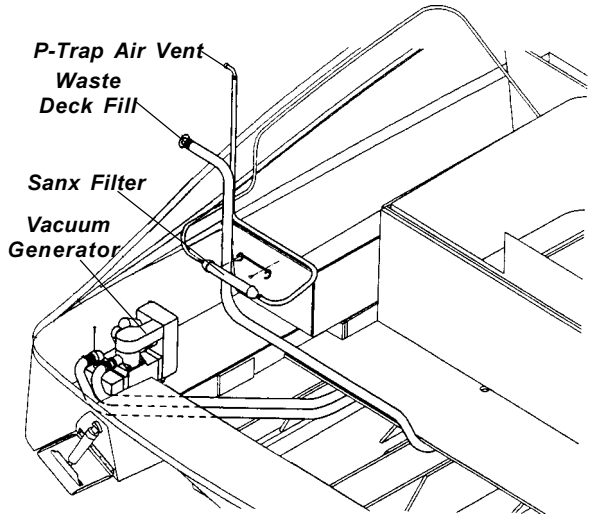


Figure J5: VacuFlush Vacuum Generator and Waste Deck Fill

To operate:

1. To add water to the toilet before using, raise flush lever until desired water level is reached. Generally, more water is required only when flushing solids. See Figure J6.

2. To flush toilet, press flush lever sharply down to the floor until contents clear bowl. A sharp popping noise is normal when the vacuum seal is broken and the flushing action begins. **Be sure to hold lever down for 3 seconds.** If flush lever is accidentally released before waste clears bowl, do not attempt to flush toilet again until vacuum pump stops running. A small amount of water should remain in the bowl after flushing.

3. Do not dispose of sanitary napkins or other non-dissolving items in toilet, such as facial tissue or paper towels. These items can cause plugging of the system. Refer to the Deodorants and Special Tissue section in the manufacturer's manual for more information.

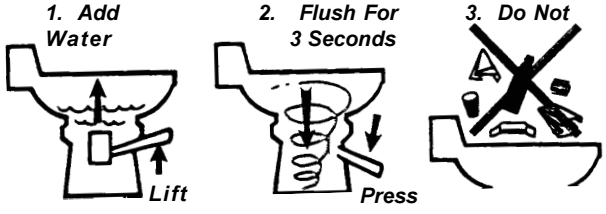


Figure J6: VacuFlush Operations

B. Head With Overboard Discharge

This option is available on all Vista® models. The head operates the same as the VacuFlush system above but an additional line with a "Y" has been installed for overboard discharge. The waste will be pumped into the holding tank from the head. The macerator pump is installed after the "Y". Refer to Figures J4 & J7.

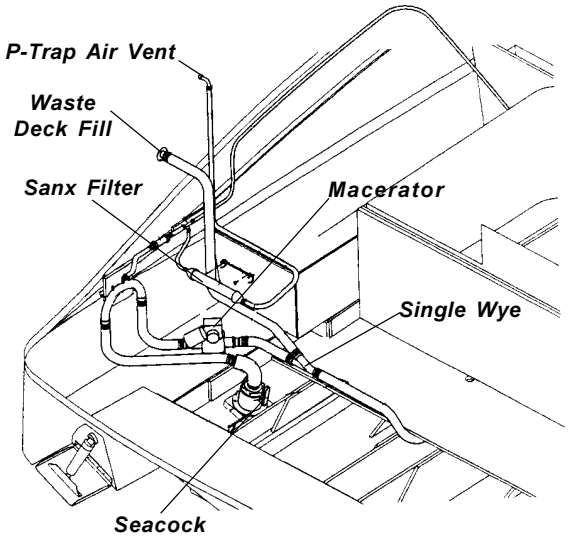


Figure J7: Overboard **Discharge Option**

NOTICE

The macerator pump must be used to discharge waste overboard. However, DO NOT use the macerator pump to discharge waste at a pumping station. If the hose is not air tight or connected properly, waste could spurt out or leak around the deck fitting and into the boat.

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 macerator pump switch which is located in the head on the switch 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 the switch 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.

NOTICE

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

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.

C. 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 station's disposal tank.

4. Remove the pump out connection from the deck plate. Add at least 5 gallons 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 to the head bowl. It is available from the dockside pumping station or can be obtained from your dealer. 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.

J - 7 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.

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 unresolved.

A. Clean Vents and Screens

Periodically, inspect the water tank vents and thru-hull vent fittings for any dirt, wax, etc. Carefully remove any obstruction with a pipe cleaner or similar device. **Be sure not to puncture the screen**. The stainless steel cap is not removable.

NOTICE

Failure to keep the water tank vent fittings clean will cause excessive pressure buildup 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 buildup 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. The filter unit will twist apart.

Inspect and clean the shower sump every 30 days. Some water will always be in the compartment. Sediment and other debris will buildup 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.

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, fresh and grey water tanks, transom shower, 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 nontoxic antifreeze (such as R.V. antifreeze) 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 antifreeze 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).

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 immediately by supplying electrical power to an empty water heater.

DO NOT run the water pump without water in the system. Pump damage will result. Be watchful and turn the pump off as soon as the tank becomes empty.

2. Add 15 gallons of R.V. antifreeze to the water tank.

NOTICE
The hot water heater will require approximately five gallons of antifreeze before the hot water lines will have antifreeze running through them. The cold water faucet should be turned OFF at some point to test for antifreeze in the hot water line.

3. Turn ON faucets (both hot and cold) one at a time until undiluted antifreeze is seen. Make sure the transom shower, head faucet and galley faucet have antifreeze coming out, too.

4. Activate the shower sump pump and pour approximately 1 quart of nontoxic antifreeze down the shower drain. The shower sump will discharge some of the antifreeze overboard.

⚠ DANGER
Use only nontoxic antifreeze solutions such as R.V. antifreeze. 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 antifreeze that has been spilled on the fiberglass shower surfaces.

C. Winterizing the Waste System

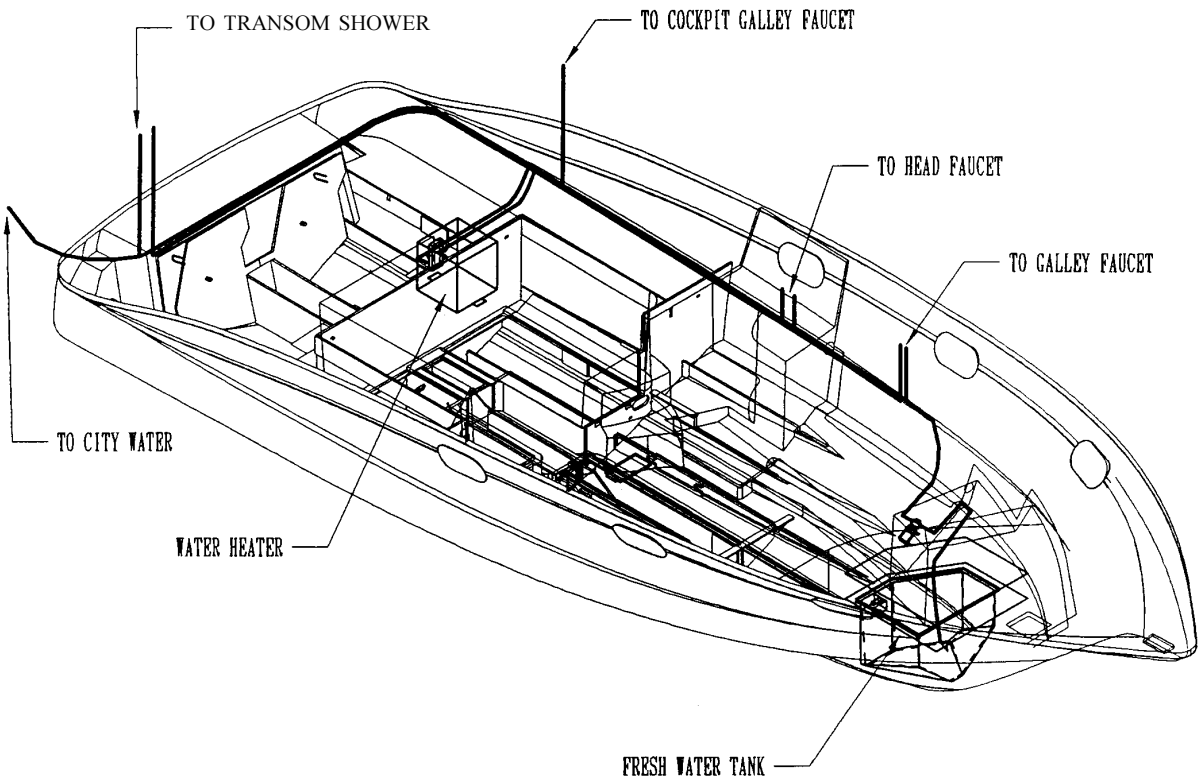
To winterize the waste holding tank, flush the tank with soap, water and a deodorizer (e.g., Lysol Liquid). Empty the tank and pour two (2) gallons (3 gallons if equipped with overboard discharge) of R.V. antifreeze into the bowl and flush.

If the boat is equipped with overboard discharge capabilities, follow the normal procedures above. Run the discharge pump only long enough until the antifreeze solution is being pumped overboard.

For additional information, refer to the manufacturer's manuals in the owner's packet.

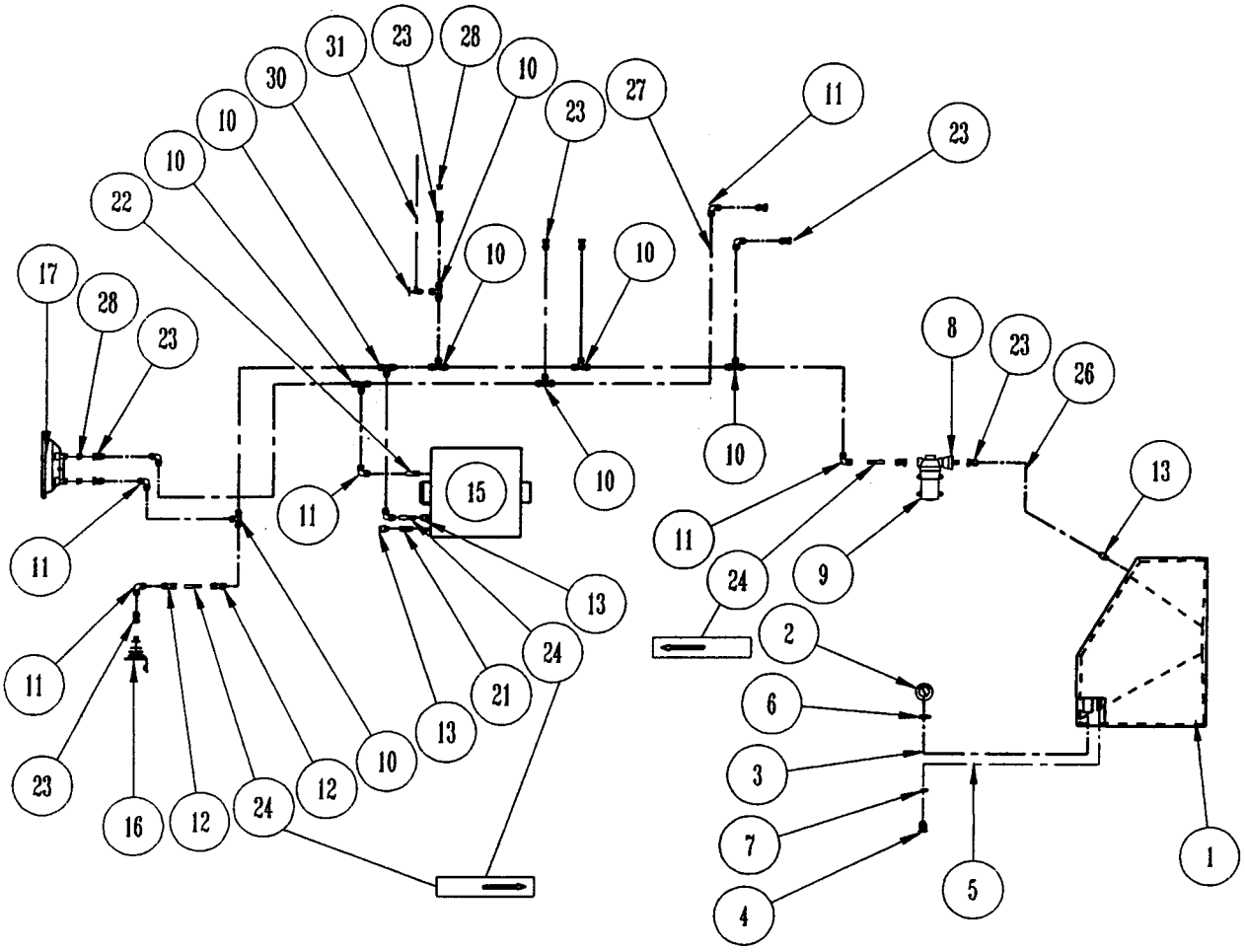
NOTICE
The instructions listed in this section provide a working knowledge to winterize the water and waste systems. However, to prevent possible damage to components in your boat, Four Winns recommends having the boat winterized by your Four Winns dealer.

FIGURE J8: 348V FRESH WATER SYSTEM



NOTE: FOR PARTS LIST REFER TO DRAWING 2 OF 2.

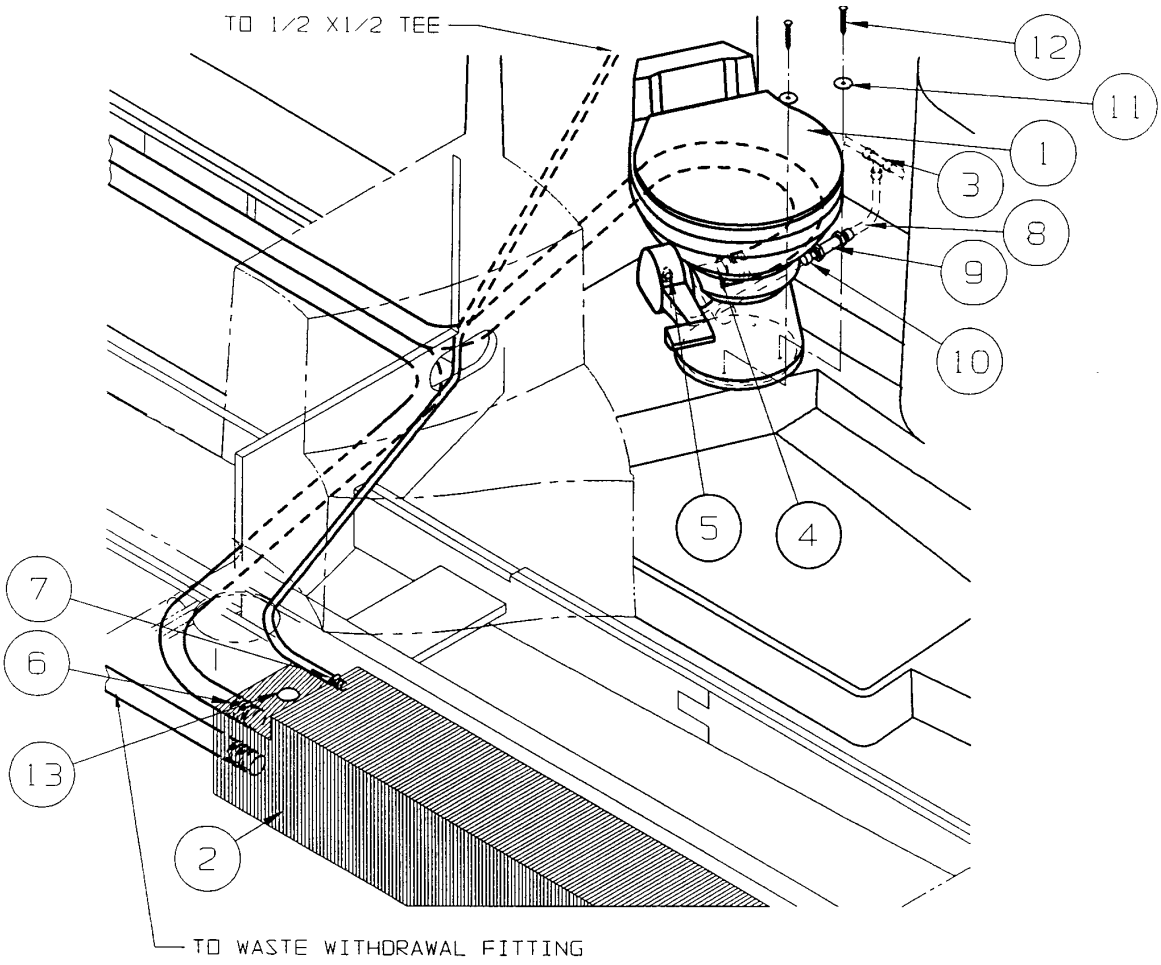
FIGURE J9: 348V FRESH WATER SYSTEM



NOTE: 1) * NOT SHOWN
2) ASSURE CHECK VALVE DIRECTION IS CORRECT.

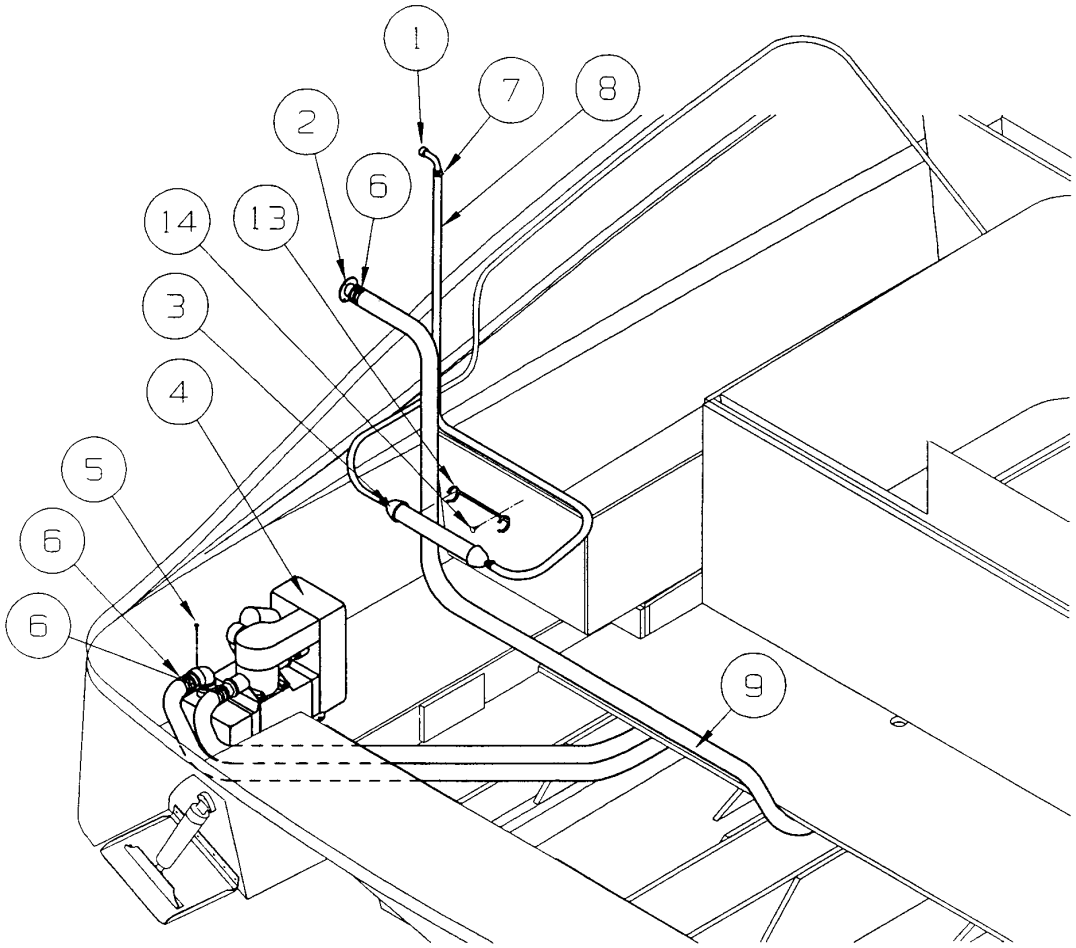
#	DESCRIPTION	PART #	QTY.	#	DESCRIPTION	PART #	QTY.
1	TANK, FRESH WATER 45 GAL	035-0816	1 EA	17	SHOWER, TRANSOMMIXER H/C	035-0988	1 EA
2	DECK FILL, S.S. WATER #66408-1	031-0087	1 EA	*18	FITTING, KIT, FLOJET #C 20381-0	035-0729	1 EA
3	HOSE, 1 1/2" WATER WHITE #143-1120	022-0007	5 FT	*19	HOT WATER HEATER KIT #3856265	035-0334	1 EA
4	VENT, CHROME PLATED BRASS #352030	035-0812	1 EA	*20	ANTIFREEZE, NON-TOXIC, 55 GALLON	084-0043	3 GAL
5	HOSE, 5/8" WASTE #148-0580	022-0013	5 FT	21	COUPLING, MALE 1/2" x 1/2" #QC33	035-0078	1 EA
6	CLAMP, 1 1/2" FILL HOSE	021-0032	2 EA	22	ADAPTER, STEM 1/2" MPT x 15mm WS1524B	035-0935	1 EA
7	CLAMP, 5/8" VENT HOSE	021-0031	2 EA	23	ADAPTER, FEMALE 1/2" BSP x 15mm WS1532B	035-0933	10 EA
8	FILTER, IN LINE SHURFLO #170-06	035-0158	1 EA	24	CHECK VALVE, 15mm WS1582B	035-0931	3 EA
9	PUMP, FLOJET #f4405-143B	026-0331-02	1 EA	*25	COLLET COVER, 15mm WS1590B	035-0940	57 EA
10	TEE, 15mm WS1502B	035-0928	8 EA	26	TUBING, BLUE 15mm x 50mm WS7152B	035-0936	60 FT
11	ELBOW, 15mm WS1503B	035-0929	8 EA	27	TUBING, RED 15mm x 50mm WS7154B	035-0937	40 FT
12	EQUAL STRAIGHT 15mm WS1504B	035-0959	2 EA	28	ADAPTER, 3/8 BSP x 1/2 NPT	035-0691	3 EA
13	ADAPTER, MALE 1/2" BSP x 15mm WS1514B	035-0934	3 EA	*29	SENDER, LEVEL INDICATOR WTG-W19.5 (UNI)	025-2099-02	1 EA
*14	COLLET CLIP 15mm WS1518B	035-0939	57 EA	30	VALVE STEM FITTING, 15mm WS1577B	035-0938	1 EA
15	WATER HEATER, ELECTRIC W/ HEATEX	065-0829	1 EA	31	TUBING, POLYETHYLENE #15978	035-0823	3 FT
16	FITTING, WATER INLET / REGULATOR	035-0027	1 EA				

FIGURE J10: 348V VACUFLUSH WASTE SYSTEM (1 OF 2)



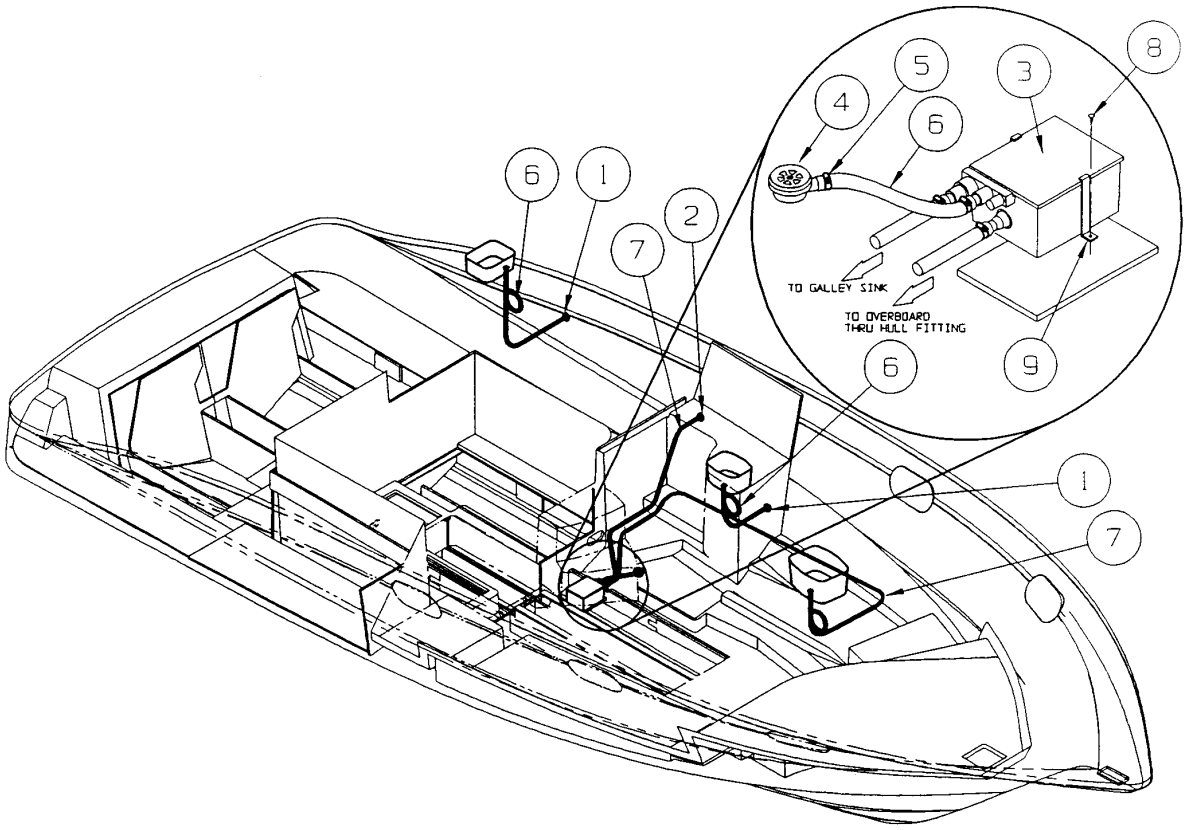
#	DESCRIPTION	PART #	QTY.	#	DESCRIPTION	PART #	QTY.
1	TOILET,VACUFLUSH 848	035-0815	1EA				
2	TANK,96" LONG 30 GAL	035-0814	1EA				
3	TEE,1/2P X 1/2P	035-0439	1EA				
4	ELBOW,100DEG 1-1/2 X 1-1/2	035-0824	1EA				
5	ELBOW,1/2P X 1/2P	035-0441	1EA				
6	CLAMP,1-1/2" #24	021-0032	2EA				
7	CLAMP,5/8" #10H FUEL VENT	021-0031	1EA				
8	TUBE,POLY 1/2 X 5/8 OD	035-0434	5FT				
9	CHECK VALVE, 1/2 X 1/2FPT	035-0015	1EA				
10	ADAPTOR 1/2M X1/2P	035-0437	2EA				
11	WASHER,FLAT 1/2"	080-0092	4EA				
12	SCREW,#14 X 1-1/2" PPHSMS	080-0043	4EA				
13	SENDER,WASTE LEVEL IND.	025-2098	1EA				

FIGURE J11: 348V VACUFLUSH WASTE SYSTEM (2 OF 2)



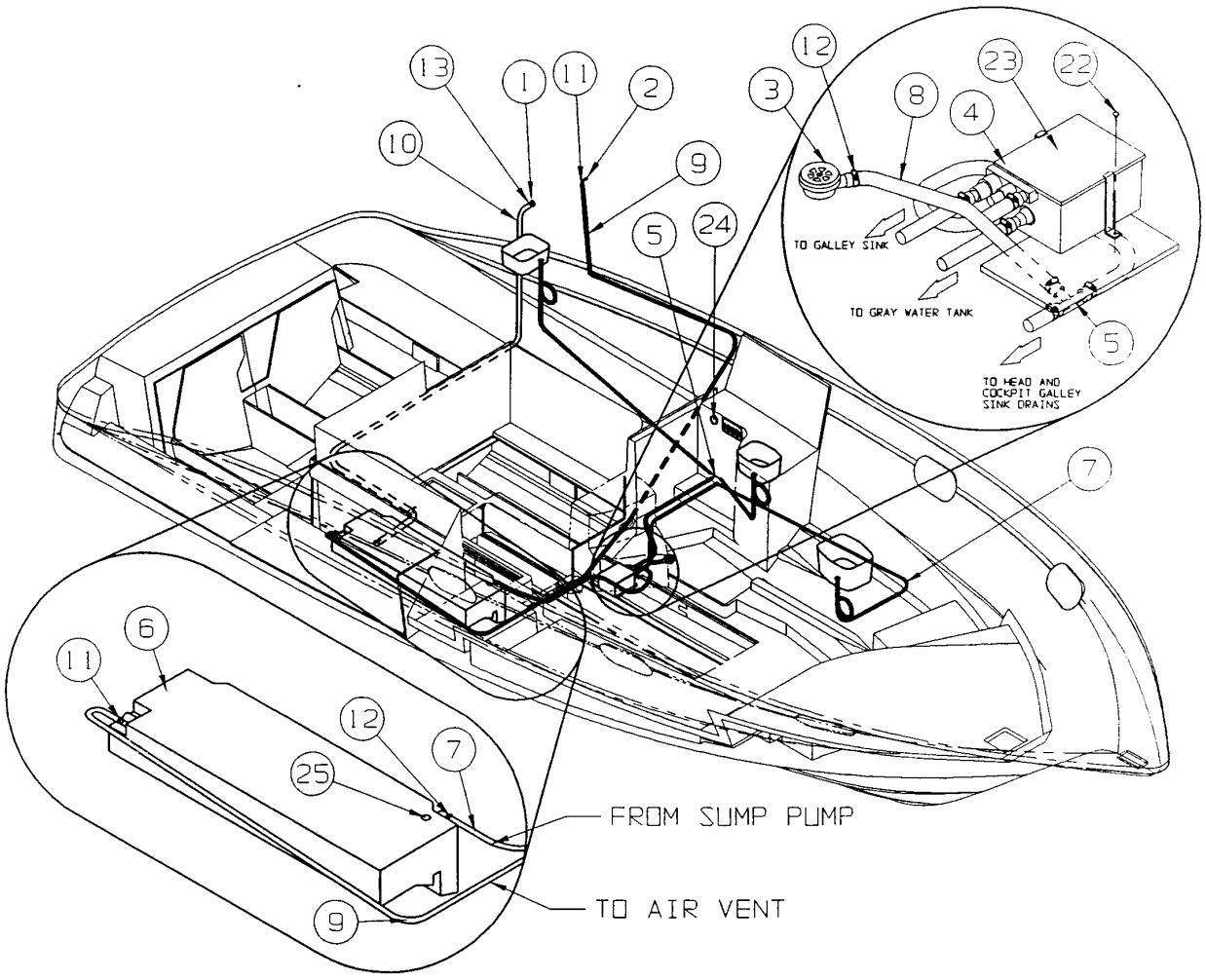
#	DESCRIPTION	PART #	QTY.	#	DESCRIPTION	PART #	QTY.
1	VENT, CHROME PLATED BRASS #352030	035-0812	1EA				
2	DECK FILL, S.S. WASTE	031-0086	1EA				
3	FILTER,SANX	065-0070-1	1EA				
4	VACUUM GENERATOR,VACUFLUSH	065-0832	1EA				
5	SCREW,#10 X 1-1/2" POHSMS	080-0032	4EA				
6	CLAMP,1-1/2" #24	021-0032	6EA				
7	CLAMP,5/8" #10H FUEL VENT	021-0031	3EA				
8	HOSE, 5/8" WASTE	022-0013	15FT				
9	HOSE,1-1/2" SANITATION	022-0055	40FT				
10	*BLOCK,TIE WRAP SCREW MOUNT	032-0584	10EA				
11	*TIE,CABLE 7.4 W/O HOLE	080-0286	10EA				
12	*SCREW,#8 X 3/4" POHSMS	080-0022	10EA				
13	BRACKET,SANX (INCLUDED W/FILTER)	-	2EA				
14	SCREW,#10 X 3/4" PTHSMS	080-0033	4EA		*NOT SHOWN		

FIGURE J12: 348V DRAINS - WASTE SYSTEM



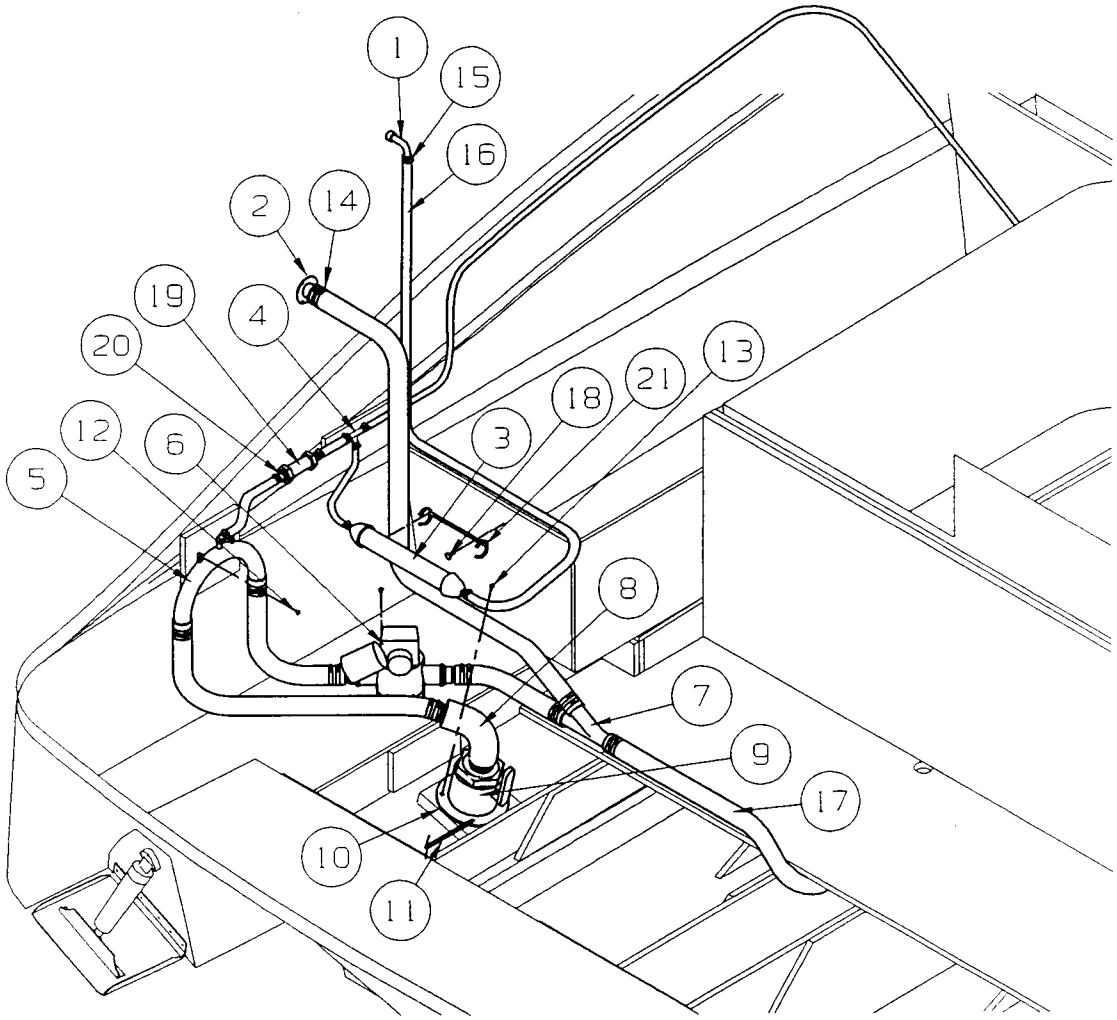
#	DESCRIPTION	PART #	QTY.	#	DESCRIPTION	PART #	QTY.
1	THRU-HULL,1" PLASTIC (REF ONLY)	035-0208	2EA				
2	THRU-HULL,3/4" PLASTIC (REF ONLY)	032-0012	1EA				
3	SUMP,SHOWER	026-0212	1EA				
4	DRAIN,SHOWER (REF ONLY)	035-0616	1EA				
5	CLAMP,1 1/4" HOSE	021-0035	10EA				
6	HOSE,1" BLACK PVC	022-0047	25FT				
7	HOSE,3/4" BLACK PVC	022-0046	7FT				
8	SCREW,#10 X 3/4" PTHSMS	080-0033	2EA				
9	-BRACKET PROVIDED WITH SUMP PUMP		2EA				

FIGURE J13: 348V GRAY WATER SYSTEM



#	DESCRIPTION	PART #	QTY.	#	DESCRIPTION	PART #	QTY.
1	DECK FILL,S.S. WASTE	031-0086	1EA	15	*TIE,CABLE 7.4" W/O HOLE	080-0286	16EA
2	VENT, CHROME PLATED BRASS #352030	035-0812	1EA	16	*BRACKET,TOP STORAGE CUDDY	029-0005	1EA
3	DRAIN,SHOWER	035-0616	1EA	17	* SCREW,#8 X 3/4" POHSMS	080-0022	16EA
4	SUMP,SHOWER	026-0212	1EA	18	*SCREW,#10 X 1 1/2" POHSMS	080-0032	3EA
5	TEE,1" ALL BARDED	035-0252	2EA	19	*SCREW,#10 X 3/4" PTHSMS	080-0033	2EA
6	TANK,WASTE 30 GAL	035-0783	1EA	20	*TAPE,FUEL TANK SUPPORT	021-0280	12FT
7	HOSE,3/4" BLACK PVC	022-0046	21FT	21	*CAULK,1/4" BEAD #3M 4200	084-0175	12IN
8	HOSE,1" BLACK PVC	022-0047	25FT	22	SCREW,#10 X 3/4" PTHSMS	080-0033	2EA
9	HOSE,5/8' SANITATION	022-0053	19FT	23	-BRACKET PROVIDED WITH SUMP PUMP		2EA
10	HOSE,1 1/2" SANITATION	022-0055	13FT	24	GAUGE,WASTE LEVEL INDICATOR	024-0323-02	1EA
11	CLAMP,5/8" #10H FUEL VENT	021-0031	5EA	25	SENDER,WASTE LEVEL INDICATOR	025-1963-02	1EA
12	CLAMP,1 1/4" HOSE	021-0035	10EA				
13	CLAMP,1 1/2" #24 FILL HOSE	021-0032	4EA				
14	*BLOCK,TIE WRAP, SCREW MOUNT	032-0584	16EA		* NOT SHOWN		

FIGURE J14: 348V OVERBOARD WASTE DISCHARGE SYSTEM



#	DESCRIPTION	PART #	QTY.	#	DESCRIPTION	PART #	QTY.
1	VENT,CHROME PLATED BRASS #052030	035-0812	1EA	15	CLAMP,5/8" #10H FUEL VENT	021-0031	9EA
2	DECK FILL, S.S. WASTE	031-0086	1EA	16	HOSE,5/8" WASTE	022-0013	15FT
3	FILTER,SANX	065-0070-1	1EA	17	HOSE,1-1/2" SANITATION	022-0055	25FT
4	TEE,5/8" HOSE BARB	035-0166	1EA	18	SCREW,#10X3/4" PTHSMS	080-0033	2EA
5	VENT LOOP,1 1/2" W/HOSE BARB	035-0110	1EA	19	CHECK VALVE,1/2X1/2FPT	035-0015	1EA
6	PUMP,T-12 MACERATOR	065-0081-2	1EA	20	HOSE BARB,1/2MPTX5/8HB	035-0005	2EA
7	KIT,SINGLE WYE 1-1/2"	035-0305	1EA	21	BRACKET, SANX (INCLUDED W/FILTER)	-	1EA
8	ELBOW,1.5MP X 1.5HB BRONZE	035-0199	1EA	22	*BLOCK,TIE WRAP SCREW MOUNT	032-0584	10EA
9	SEACOCK,1-1/2"	035-0105	1EA	23	*TIE,CABLE 7.4 W/O HOLE	080-0286	10EA
10	THRU HULL,1-1/2" BRONZE	035-0204	1EA	24	*SCREW,#8 X 3/4" POHSMS	080-0022	10EA
11	HARNESS ASSY,DISCHG BOND	027-1518	1EA	25	*PLATE,"HEAD DISCHARGE"	056-0183	1EA
12	SCREW,#10 X 1" POHSMS	080-0035	6EA				
13	SCREW,#10 X 1 1/2" POHSMS	080-0032	4EA				
14	CLAMP,1-1/2" #24	021-0032	18EA		* NOT SHOWN		

VENTILATION AND DRAINAGE SYSTEMS

K - 1 ENGINE COMPARTMENT VENTILATION

All Four Winns Vista® models 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 Vista® models 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 H - 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 or death.

WARNING

Fumes can come from batteries while charging. A concentration of hydrogen fumes can be explosive under the right conditions. Ensure to follow the above warning.

NOTICE

A gas vapor detector is a monitor which will alert the operator of an accumulation of gasoline fumes in the engine compartment. It is optional on the 348 Vista and can be installed by your Four Winns dealer. DO NOT rely solely on detectors or similar equipment. ALWAYS conduct a physical inspection of the engine compartment.

C. Engine Ventilation System Maintenance

Periodic inspection and cleaning of the ventilation ducts is necessary to ensure adequate air circulation. A buildup 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.

K - 2 CABIN VENTILATION

All Vista® cabins are equipped with deck hatches for ventilation. The aft cabin window also opens to provide ventilation. The cabin side windows (portlight) on the 348 Vista may be opened to provide additional ventilation.

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 E-2 - Engine Exhaust and Section B-2 - Carbon Monoxide for additional information.

Screens for the forward deck hatches are available for all Four Winns® boats. The screens are removable and must be stored properly when not in use.

NOTICE

Be sure deck hatches are secured while underway. Damage to the hatch may result. Store screens in a safe place to prevent damage.

K - 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 pump is controlled by the BILGE PUMP switch on the helm control panel (see Section H for a detailed description of the bilge pump switches).

The aft bilge pump is equipped with an automatic switch 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 "SHIP SYSTEMS" battery regardless of battery selector switch position.

NOTICE

While at rest, any bilge water accumulation may flow forward. Therefore, operate the bilge pumps 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 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 pumps. 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 in the owner's packet for additional information.

C. Sump

A sump box is installed forward of the aft cabin below the steps. It is equipped with an automatic bilge switch and will pump water overboard or into the grey water tank. Refer to Section J-2D on using the shower and for additional information on sump pump operation.

D. 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.

E. Cockpit Drainage

The 348 incorporates 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.

INTERIOR EQUIPMENT

L - 1 GALLEY EQUIPMENT

CAUTION

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

A. Electric Stove

An electric stove is standard on the 348 Vista cruiser model. The stoves is equipped with dual burners. A circuit breaker is provided in the 120 Volt AC cabin electrical panel. Refer to the Section H-6B and the manufacturer's literature included in the owner's packet. See Figure L1 for stove and other appliance locations.

B. Microwave Oven

A microwave oven is standard on the 348 Vista. A circuit breaker is provided in the 120 Volt AC cabin electrical panel. Refer to the manufacturer's literature provided in the owner's packet.

CAUTION

Do not restrict air flow while microwave is in use, or damage to microwave oven or cabinet may result.

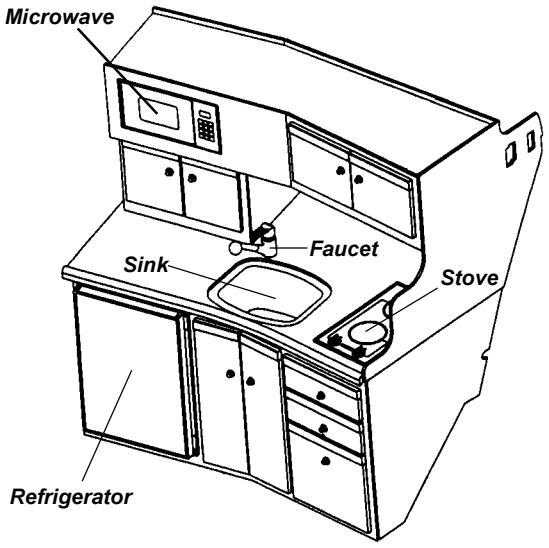


Figure L1: Galley

C. Refrigerator

A refrigerator is standard equipment. The refrigerator is designed to operate efficiently on AC Shore Power (120 volt) or battery power (12 volt). The refrigerator will automatically transfer to 12 volt operation when dockside power is not available and the 12 volt refrigerator breaker is on.

The thermostat is a full range thermostat that will maintain the unit at the temperature you desire. Turning the control to the highest setting will give you the coldest temperature and setting the control to the lowest setting will give you the warmest refrigerator temperature. See the manufacturer's information included in the owner's packet for additional information.

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.

A magnetic strip is used inside the seal of the refrigerators. The magnetic strip allows the seal to draw tight to the inside of the refrigerator when the door is closed. Also, make sure retaining latch is in place to secure refrigerator door while underway.

L - 2 COCKPIT ICEMAKER OR REFRIGERATOR

The icemaker is available as a standard feature on the 348 Vista and an optional cockpit refrigerator can be exchanged. The icemaker or refrigerator is mounted underneath the cockpit galley next to the port lounger assembly. See Figure L2.

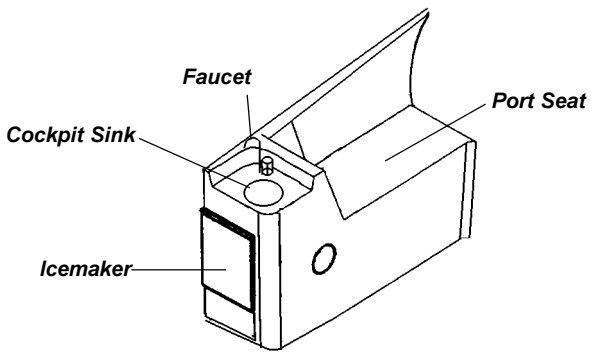


Figure L2: Icemaker & Cockpit Sink

The refrigerator operates on 12V DC electrical system. It runs continuously and does not utilize water. Unlike the icemaker, no winterization is required. Please follow the manufacturer's instructions regarding the use, care and maintenance of the refrigerator. These instructions are found in the owner's packet.

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 H - Electrical Systems for more information.

To operate, make sure the unit is plugged in and the main water supply is on. Ensure the "ice bin arm" is in the DOWN position. The first ice cubes may take approximately 45 minutes to be made.

To control the temperature, turn the temperature control clockwise to make it colder or turn control counterclockwise to make it warmer. Remember, a warmer setting increases the rate of ice production (maximum ice is achieved at the warmest setting). Refer to the manufacturer's information in the owner's packet for further information.

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 antifreeze, refer to Section J-7 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.

L - 3 ENTERTAINMENT CENTER

A. Stereo System

Four Winns offers a CD stereo as standard equipment. A CD player and 10 disc CD changer are optional. Speakers are installed within the interior cabins and exterior cockpit areas to provide excellent sound quality. In addition, the cabin and cockpit speakers can be faded in or out depending on the effect desired. For stereo operation, please refer to the manufacturer's manual included in the owner's information packet.

B. TV/VCR

A TV/VCR's combination with remote is optional. It uses an internal speaker only. The TV/VCR is not wired into the stereo speaker system. Please read the manufacturer's information on the TV/VCR in the owner's packet. The TV/VCR remote control is also found in the owner's packet. See Figure L3.

Included with this feature is a dockside cable/antenna TV connection. The deck connection for the TV is mounted in the shore power inlet panel located in the transom storage compartment.

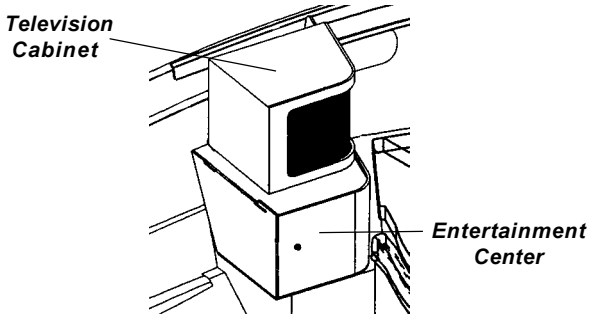


Figure L3: Entertainment Center

L - 4 AIR CONDITIONING

Air Conditioner/Heater provides either cooling or heating and is optional on the 348 Vista. The unit operates on 120 volt (220 volt on 50 hertz models) AC power. The output of the air conditioner is 12,000 BTU. Be sure the appropriate shore power cord is connected or the generator is running whenever the air conditioning is to be used.

The air conditioning breaker must be turned on to activate the air conditioning unit. Depending upon humidity, the air conditioner will condense 5 to 15 gallons of water a day and this water drains into the aft bilge.

The air conditioner is located underneath the dinette lid. Air conditioner vents are located throughout the cabin to provide good air circulation. The 348 has a vent in the head for additional air circulation. The vents are adjustable to change air flow direction and can be closed. See Figure L4.

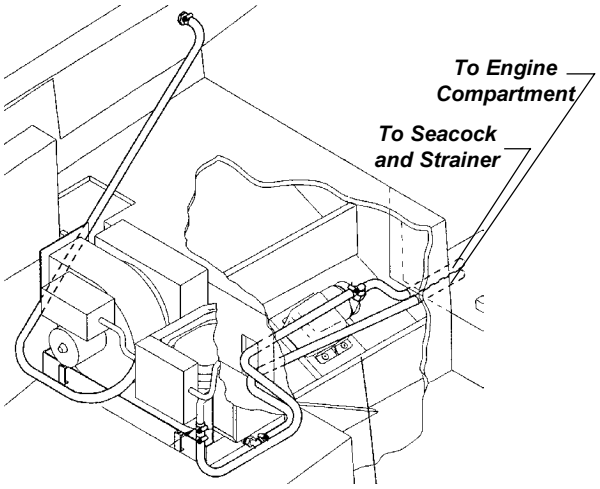


Figure L4: Air Conditioner

NOTICE

In order to use the air conditioner, you must first open the seacock valve (handle parallel to the flow of valve). When not using the air conditioner be sure to close the seacock

.

The air conditioning control panel is located in the aft closet fore wall. See Figure L5. Please read the manufacturer's information on the air conditioner contained in the owner's packet (if applicable).

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 below the aft cabin access panel. Operating air conditioners without proper cooling water will cause damage to the air conditioning system.

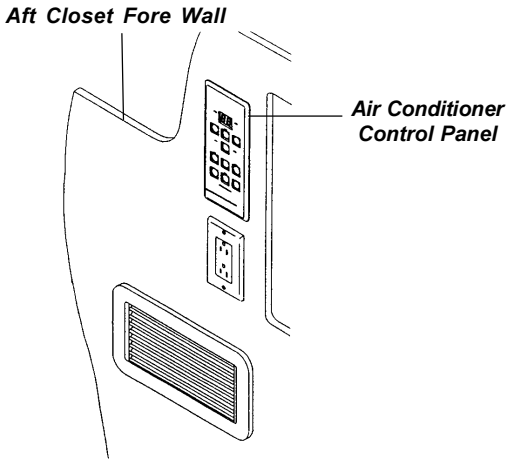


Figure L5: Air Conditioner Control Panel

Air conditioners utilized in Four Winns boats are equipped with reverse cycle heat. Thus, some heat effect can be derived from the unit. It must be noted that 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.

NOTICE

During cold conditions, an alternate or supplemental heating system should be used.

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.

To winterize, refer to the manufacturer's literature included in the owner's packet.

EXTERIOR AND SAFETY EQUIPMENT

M - 1 RAILS & DECK HARDWARE

Hand and bow rails have been installed to provide security for passengers while outside the cockpit area (i.e. swim platform and bow areas). 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 nonabrasive 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 rewaxing.

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 A - Operation for additional precautions regarding grounding and towing.

M - 2 TRANSOM DOOR

A transom door is provided and allows access from the swim platform to the cockpit. A slide bolt is used to secure the transom door. To prevent a possible man overboard situation, make sure the transom door is secure before each cruise.

WARNING

Prevent falls overboard. Close, latch, and stay inside gate(s) while underway.

DANGER

To prevent personal injury, swim platform must not be occupied and transom door must be closed while engines are running.

CAUTION

To prevent personal injury, DO NOT sit on or lean against the transom door.

M - 3 COMPANIONWAY DOOR

The 348 Vista have a one-piece sliding companionway door on a track. See Figure M1. The companionway door is comprised of plexiglass. A hinged stop at threshold secures the door in the open position.

NOTICE

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

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

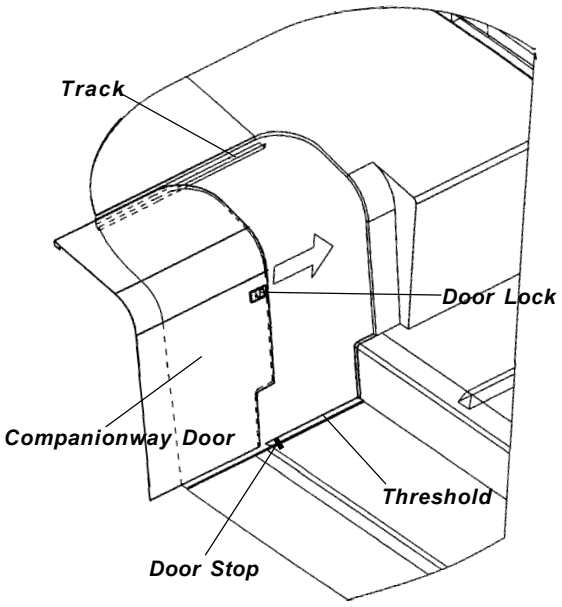


Figure M1: Sliding Companionway Door

M - 4 WINDOWS

A. Windshields and Cabin Windows

The windshield consist of tempered safety glass and cabin port lights consist of plexiglass. The windshield frame is aluminum.

A walk-thru windshield is standard. Steps are provided between the companionway and helm station to allow easy access through the walk-thru windshield opening.

WARNING

DO NOT use walk-thru during bad weather or on rough seas. Make sure deck hatches are 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 dish washing soap and water. See the following section for information on the care of plexiglass.

Aluminum can be cleaned with similar products or with nonabrasive 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 windshields, or cabin windows. Plexiglass will scratch easily and must be handled with care.

To clean, wash gently with dish washing 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.

M - 5 FOREDECK HATCHES

The foredeck hatches consist of a translucent plexiglass. The hatch is supported by one locking hinge and can be secured in a partially open position for ventilation. See Figure M2. Hatch screens are provided on all Vista® models. Follow the cleaning directions for plexiglass described above.

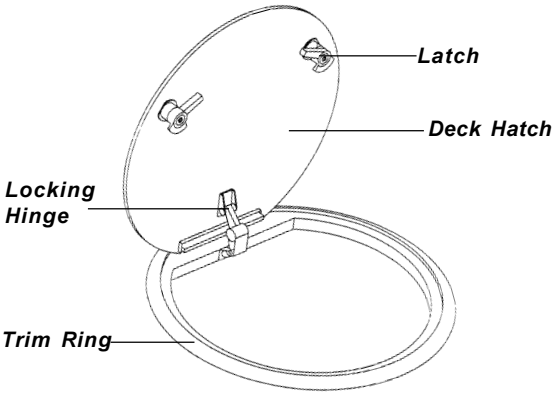


Figure M2: Forward Deck Hatch

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.

M - 6 SWIM PLATFORM

Four Winns provides an integrated fiberglass swim platform on all models. An “add on” swim platform is standard and when installed extends the platform to approximately 45” on the 348. For better footing, a skid-resistant surface is provided. The ladder and hand rails are located for easy access when boarding. See Figure M3.

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

Always secure the ladder before boating. Damage to the ladder may otherwise result.

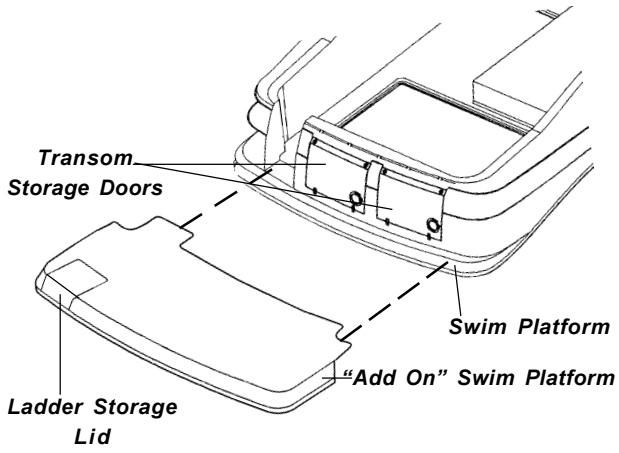


Figure M3: 348V Swim Platform & Add-On Swim Platform

M - 7 COCKPIT STORAGE

Storage compartments are provided throughout the cockpit area. See Figure M3 and M4. The doors have latches and roller-type catches for easy opening and closing. Storage space or shelves behind the doors are easily accessible.

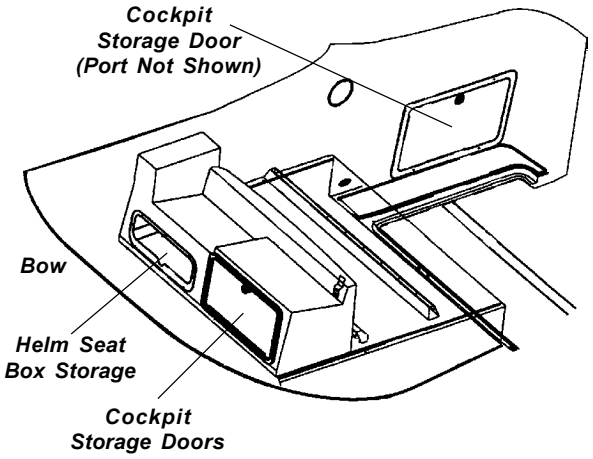


Figure M4: Cockpit Storage Compartments

M - 8 TRANSOM STORAGE LOCKER

The transom storage provides fender storage and dockside power cord storage. The storage lockers are latched closed and have the capability to be locked. To open, lift the handle. The latches are flush mounted to prevent injury or accidental opening while underway. See Figure M5.

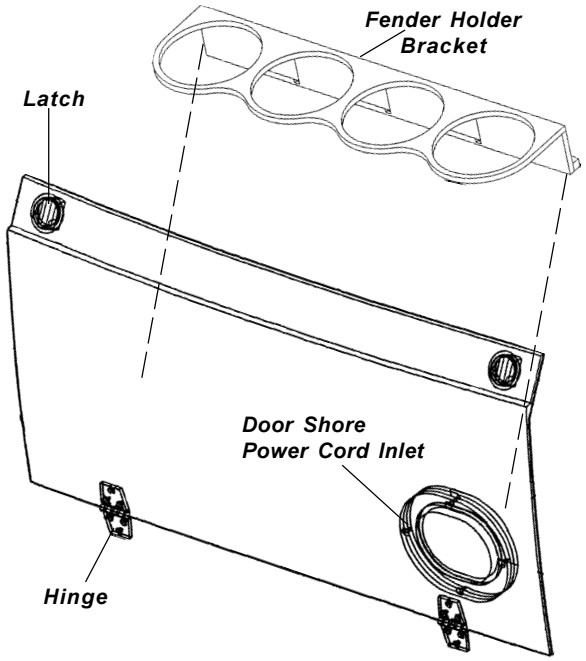


Figure M5: 348V Transom Door Storage Locker

M - 9 BOW PLATFORM

The Four Winns 348 Vista is designed with an integrated bow platform. This bow platform provides a functional base for anchoring. The anchor is stored in the anchor chute of the platform. See Figures M6 & M7 below. Refer to Chapman's Piloting, Seamanship and Small Boat Handling or local anchorage authority for anchor type and size recommendation.

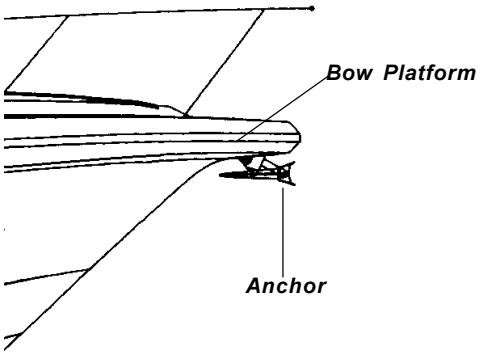


Figure M6: 348V Bow Platform with Anchor Roller

WARNING

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

M - 10 BOW ROLLER

The bow roller assembly is standard equipment on the 348 Vista model. It extends beyond the bow and below the anchor chute on the 348. Refer to Figure M7. The function of the bow roller is to allow easier retrieval of the anchor. It also protects the hull/deck from surface abrasions or gouges when either moored or retrieving the anchor.

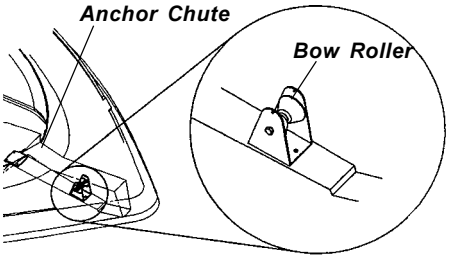


Figure M7: 348V Bow Roller Location

M - 11 ANCHOR LINE STORAGE LOCKER

The anchor line is stored in the anchor line locker. The locker keeps the line secure while underway and keeps the deck clear of unsightly anchor line when docked. Also contained in this anchor line locker is the windlass. Please see Section M-12 below for details regarding the windlass. Also, refer to Figures M8.

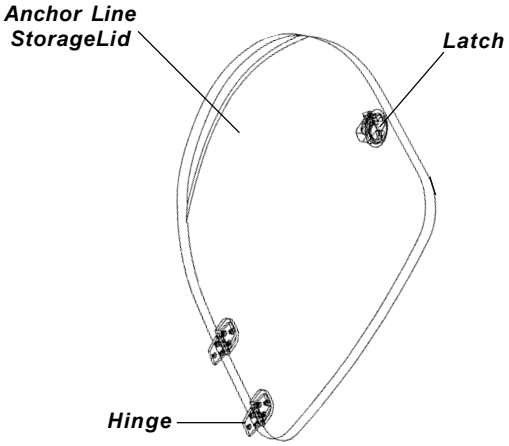


Figure M8: 348V Anchor Line Storage Lid

M - 12 WINDLASS

A windlass is an electrically controlled winch mechanism for retrieving the anchor. The mechanical winch portion is mounted on foredeck. See Figure M9. The windlass can be controlled by a set of foot pads (electrical switches) mounted on the deck or can be operated from the helm. The windlass is standard on the 348. Along with the windlass comes a 22-pound Delta Fast Set™ anchor and 150 feet of 1/2" rope and chain. Refer to the manufacturer's literature included in the owner's packet.

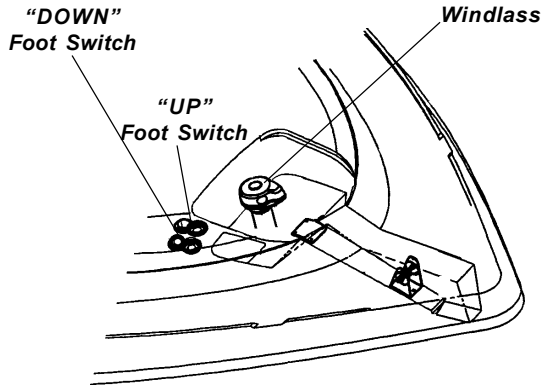


Figure M9: Windlass

WARNING

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

WARNING

Always be sure to raise the anchor prior to operating your boat. The anchor can rebound into the boat resulting in damage to the boat and/or result in injury or death to individual(s) aboard the boat.

WARNING

Always utilize the chain stop provided with the windlass/bow roller combination. The chain stop prevents the anchor from accidently releasing while the boat is moving thus preventing damage to the boat or possible injury or death to individual(s) aboard the boat. See Figure M10.

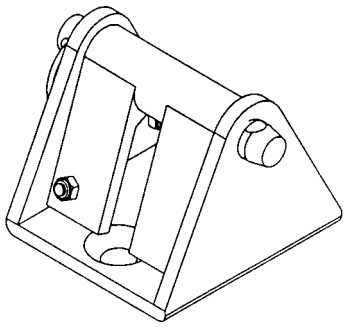


Figure M10: Chain Stop

M - 13 NAVIGATIONAL EQUIPMENT

A. Compass

A compass is standard on the Four Winns 348 Vista. It is a valuable piece of equipment when operating offshore, in unfamiliar waters, or in adverse weather 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. The boat has a factory installed compass, the manufacturer's instructions are provided in the owner's packet. 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. Depthsounder

The depthsounder is standard equipment on your 348 Vista . It consists of two main components, the transducer and the display unit. The transducer is mounted to the hull and the display unit is installed in the dash. The transducer and display unit communicate by means of a cable, and are powered by your boat's 12-volt DC battery. The transducer and display unit use the basic principle of sonar to indicate the water's depth. Please read the manufacturer's literature included with the owner's packet for information regarding operation and maintenance.

WARNING

Do not rely on depth sounder to avoid submerged objects. Depth sounders provide a relative indication of water depth only.

NOTICE

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 the 348 Vista model. It provides reliable communication between vessels, and from ship to public or private shore stations. It is programmed for two-way communication on all the International, U.S. and Canadian channels plus reception on ten separate weather channels, and the international calling and safety channels (16/9).

The VHF radio, and microphone is mounted on the helm. If equipped, additional information is included in the manufacturer's literature included in the owner's packet.

D. GPS Navigation Package

A GPS is an electronic system through which a navigator can determine his position regardless of weather. The GPS sensor receives high frequency radio signals generated from satellites to generate coordinate readings on the display. The GPS navigational unit takes this information and uses it to determine the vessel's exact position. Factory installed GPS system is optional only. It is mounted at the helm. If equipped, refer to the manufacturer's literature included in the owner's packet.

NOTICE

This device is only an aid to navigation. Its accuracy can be affected by many factors including equipment failure or defects, environmental conditions, and improper handling or use. It is the user's responsibility to exercise common prudence and navigational judgement, and this device should not be relied upon as a substitute for such prudence and judgement.

E. Radar Arch

The radar arch is a standard feature and is swept forward in design. This presents a sleek, new look while providing an adequate platform necessary for installation of radar equipment. See Figure M11. Four Winns does not offer radar equipment, however, excellent "aftermarket" equipment is available. The 348 helms provide plenty of space for such instrumentation i.e.. GPS, auto pilot, radar, fish finder, tridata, etc.

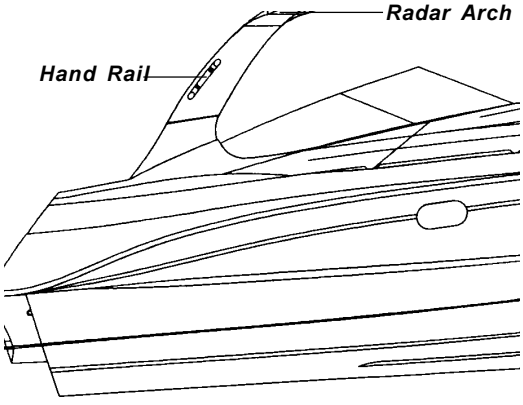


Figure M11: Radar Arch

M - 14 SPOTLIGHT

A properly operating spotlight is essential for safe cruising at night. Four Winns offers electrically controlled spotlights as standard equipment on the 348. See Figure M12. The spotlights use electric motors and helm switch controls to direct the spotlight beam. Refer to the spotlight manufacturer's literature included in the owner's packet.

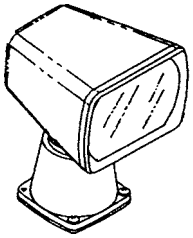


Figure M12: Spotlight

UPHOLSTERY

N - 1 INTERIOR SEATING

A. Cabin Tables

A dinette is standard on the 348 and is conveniently located in the main cabin, on the starboard side across from the galley. Table bases are "flush" mounted for convenience. Table legs are removable. Rotating the leg while lifting will ease the removal. See Figure N1. Storage is provided below the dinette cushions.

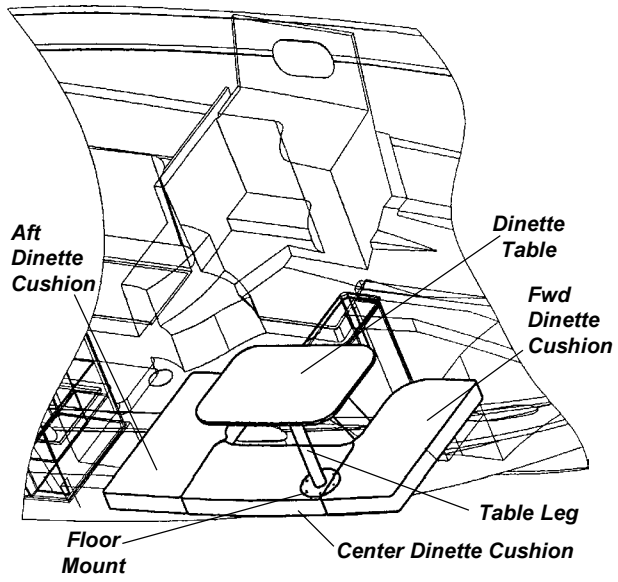


Figure N1: Dinette Table

The dinette area can be converted into sleeping quarters with the use of filler cushions, "short" table leg, and dinette table. (Note: The filler cushions are also the backrest cushions). To convert the dinette area into a berth follow the steps below:

1. Remove the dinette table from the "long" table leg.

2. Remove the "long" table leg from its floor mount. Rotating the leg while lifting will ease the removal.

3. Insert "short" table leg into the floor mount.

4. Place the dinette table onto the "short" leg.

5. Remove the backrest cushions and place them on the dinette table.

Reverse this procedure to return the berth back into a dinette.

A mid cabin table is also provided. The mid cabin table can be stored in the aft cabin storage closet. The table leg screws into the floor mount and the table then mounts onto the table leg.

B. V-berth or Forward Cabin

Four Winns provides cushions for the v-berth/forward cabin area. These cushions simply drop into place. To gain access to the v-berth storage and water storage tank, remove the cushions. See Figures N2 and N3.

The forward cabin also comes with a privacy curtain and hanging locker storage.

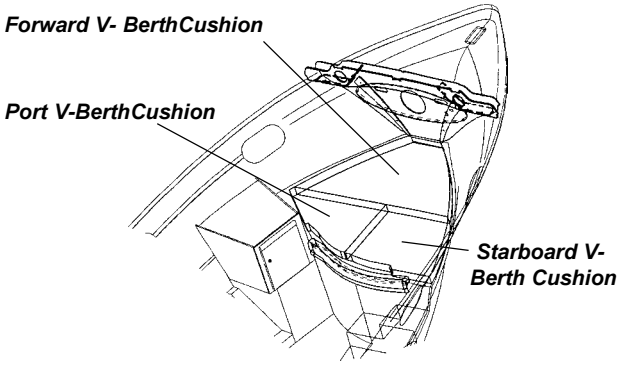


Figure N2: 348V V-Berth Cushions

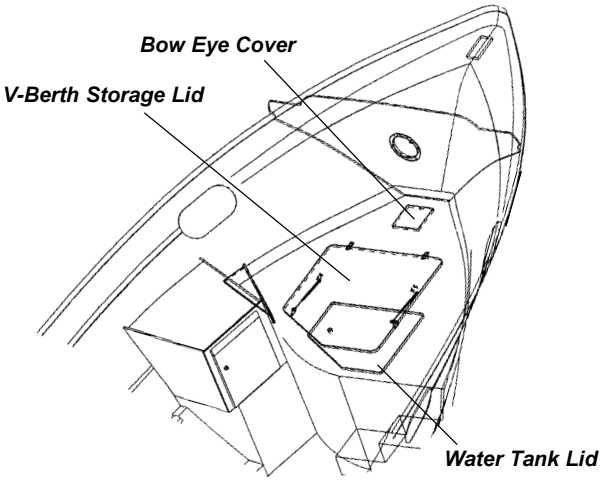


Figure N3: V-Berth Storage Lid & Water Tank Lid

C. Mid Cabin (Aft Cabin) Berth

The mid cabin provides a large berth and includes a window for ventilation. The mid cabin can be converted into private sleeping quarters with the use of filler cushions, fill-in cushion support assembly, and privacy curtain. (Note: The filler cushions are also the port and starboard backrest cushions). The mid cabin has two storage lockers, plus a hanging storage locker . Also, access lids are installed below mid cabin cushions for servicing plumbing and other equipment. See Figures N4 & N5.

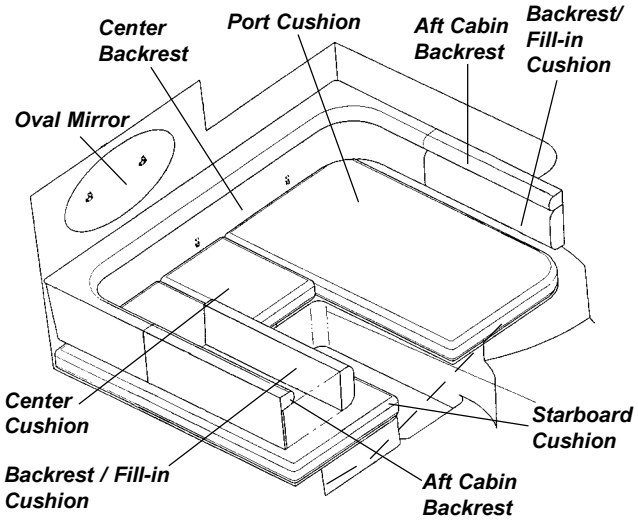


Figure N4: Mid Cabin Cushions

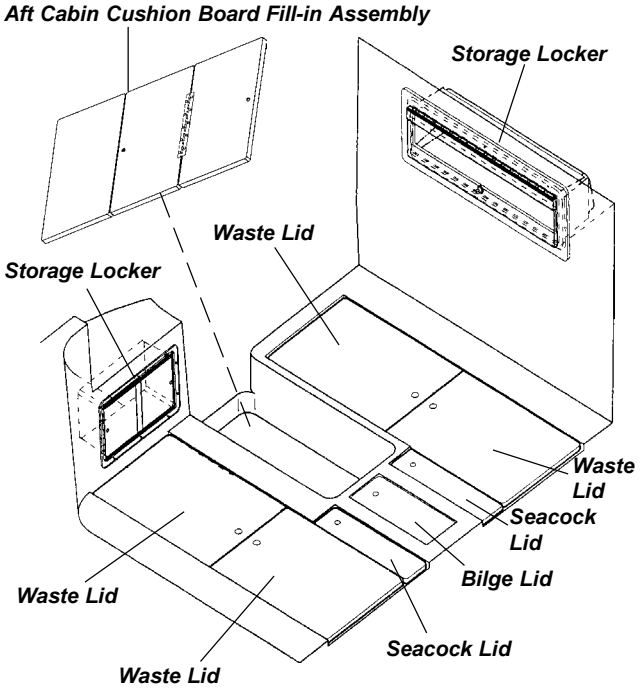


Figure N5: Mid Cabin Access Lids

CAUTION

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

N - 2 EXTERIOR SEATING

A. Helm Seat

The helm seat is standard and can seat two or three people comfortably. A manual, slider mechanism is mounted under the driver's seat. This allows the driver of the boat to adjust his portion of the helm seat to meet his or her needs. To adjust, lift the lever below the pilot's seat and slide the seat forward or aft to the desired position. There is approximately six inches of adjustment available. See Figure N6.

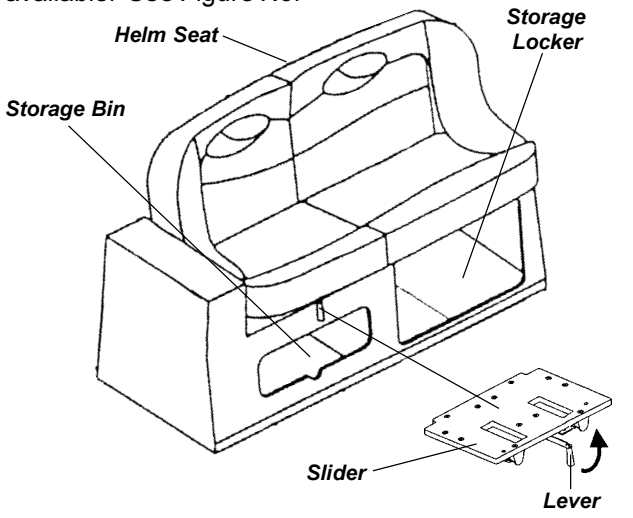


Figure N6: Helm Seat and Slider Mechanism

WARNING

DO NOT sit on the backrest portion of any cockpit seat. The operator 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. Stern Seat

The custom U-shape stern seat includes support legs and fiberglass base. The U-shape seating arrangement continues around the back of the boat to create more usable seating area. Refer to Figure N7. Fill-in cushions are also provided to extend the cushion area for such things as sunbathing, napping or overnight sleeping.

The aft cockpit stern seat cushion folds up against the transom to allow for more floor space and access to the engine lids. The forward cockpit cushion can be locked in a raised position with a block attached to the bottom of the cushion. This too, provides easier access to the forward engine lid. Some cushions can be removed. Refer to Figure N7.

WARNING

Make sure legs are vertical and locked before using the aft stern seat.

WARNING

When storing the aft stern seat up against the transom, be sure the legs are folded and secured to prevent damage to the seat or injury to people.

Nylon straps are provided to secure the seat in the stored position against the transom. The straps snap to the underside if the aft stern seat and are designed to wrap around the stern rail.

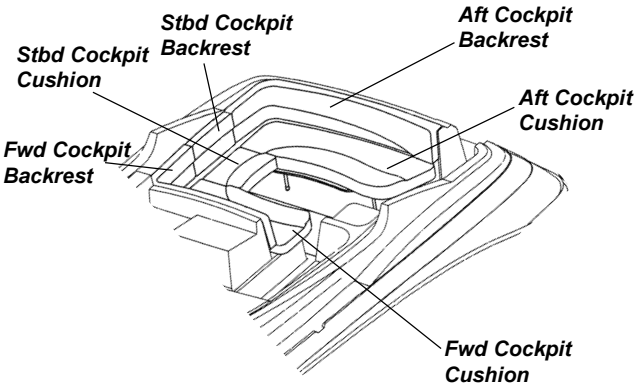


Figure N7: Stern Lounge

C. Port Chaise Lounger Seat

The port "wrap around" chaise lounge provides seating capacity for two people. It is conveniently built into the fiberglass base which also contains the icemaker and cockpit sink. Storage is provided underneath the hinging seat cushion. See Figure N8.

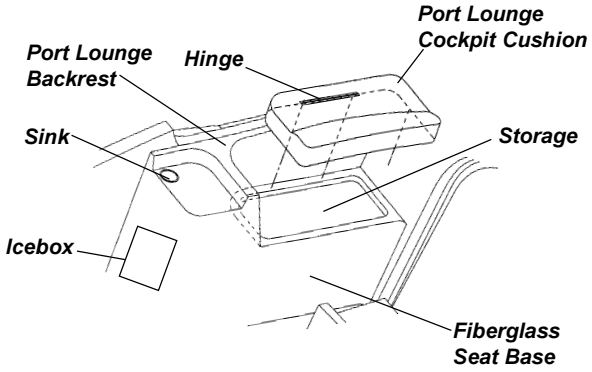


Figure N8: Port Chaise Lounge

D. Cockpit Table

The aft cockpit table is standard on the 348. Table bases are "flush" mounted for convenience. The cockpit is stored underneath the aft stern seat and the legs are stored behind the aft stern seat. To set up the cockpit table:

1. Slide the aft stern seat forward to gain access to the table legs.
2. Lift up the aft stern seat and pull the table top out.
3. Screw the table legs into the floor mounts.
4. Mount the cockpit table onto the table legs.

To remove the cockpit table simply reverse the procedure above.

NOTICE

To prevent damage to cockpit table and/or cockpit interior ensure the cockpit table and legs are properly stored.

E. Deck Sunpads

These twin sunpads are optional. These cushions securely snap in place and provide comfort while sunbathing on the foredeck.

N - 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.

A recommended "Cleaning Kit" includes:

- Westley's Clear Magic™
  (for ordering information call 1-800-416-1600 or 800-321-8577)
- Fast & Easy Glass Cleaner™
  (to locate the nearest distributor, call 800-537-8990)
- Tough Duty Cleaner™
  (to locate the nearest distributor, call 800-537-8990)
- Clean, white towels
- Portable/Compact Deep Cleaner Vacuum (Bissell Spot Lifter™ or similar product)
- 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:

Tough Duty Cleaner™

3. Water Stains:

a. While fabric is still wet, use a deep cleaner vacuum to go over the wet area. This will remove the stain from the fabric. It is always best to get the stain before it dries.

b. For water stains that have dried, use a deep cleaner vacuum system. Follow the instructions that come with the deep cleaner system. Repeat if necessary.

c. If this does not work we recommend a professional cleaning service. One such service is Service Master®. Please call 1-800-937-3783 for the Service Master location nearest you.

4. Tough Stains/Set Water Stains:

a. 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.

b. Let set approximately five (5) minutes.

c. 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.

d. Use a deep cleaner type vacuum to remove excess wetness. Allow to dry.

f. Repeat if necessary.

g. If stain still persists, use a professional cleaning service.

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. Privacy Curtains

After a season or more use and exposure, you may wish to remove the curtains. 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.

N - 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 removes the oils present in vinyl that keeps vinyl soft.

A recommended "Cleaning Kit" includes:

- Ivory Dishwashing Liquid™ and water
- Clean, white towels
- Medium-soft brush
- Fantastik Spray Cleaner™
- Denatured Alcohol
- Tough Duty Cleaner™
  (to locate the nearest distributor, call 800-537-8990)
- 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:

Tough Duty Cleaner™ ; rinse with soap and water.

NOTICE
To prevent possible damage to the vinyl, rinse with soap and water after applying the Tough Duty 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 O - 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. It is 100% UV stabilized Olefin™ Polypropylene fiber with rubber backing. See Figure N-9.

NOTICE
DO NOT dry carpeting in an automatic dryer.

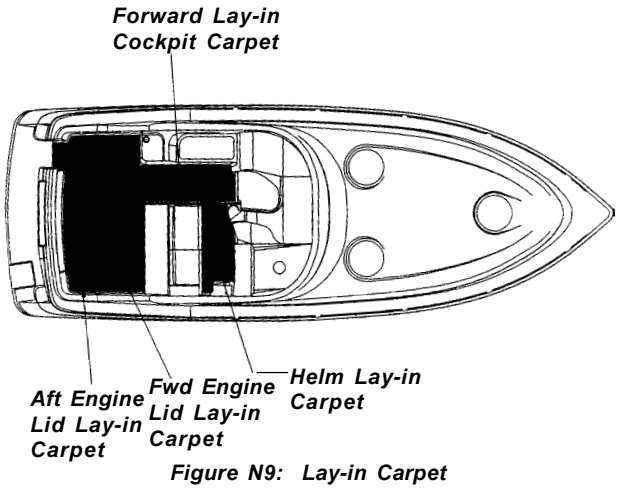


Figure N9: Lay-in Carpet

C. Cleaning and Maintenance

The following information should be useful in helping you keep your carpet looking well maintained.

Carpet made with Olefin™ fiber possesses built-in stain and soil release for easy, less costly maintenance. Regular vacuuming and occasional shampooing help it stay attractive and serviceable.

D. Stain Removal Testing

Even the most stubborn stains can be removed from Olefin fiber following the procedures outlined. A total of thirty-four stains were selected as being representative of spills commonly occurring on carpets. Stains were pressed into the carpet to simulate foot pressure following a spill. Stains were applied to a two-inch square section and allowed to penetrate. Removal was performed after two weeks. Carpets were tested for stain removal by an independent laboratory. Stain removal was effective for all 34 stains. Results are shown in the table.

E. Stain Removal Procedures

Regular maintenance such as vacuuming, hosing or washing should be performed. Most stains and mildew are easily removed from carpet made with Olefin fiber using common household cleaners. Refer to Table I. Olefin™ fiber is so resistant to chemical attack that Clorox™ bleach may be used to clean up any mildew that may result from excessive wetness.

Code for stain removal procedure (See Table 1):

"A" Apply hot water and detergent.

"B" Apply volatile dry solvent, work with bone spatula, blot.

"C" Flush by hot water extraction.

Recommended reagents:

Carpet detergent such as Mintex™ (Hydromaster®) or any carpet detergent suitable for hot water extraction.

- Volatile dry solvent such as Carbona™, Energene™, or Picrin™ (Street®).
- Oily type paint remover such as nail polish remover, Energene™ or Pyrotex™ (Street®).
- Neutral lubricant such as Streetex Spray Spotter™ (Street®) or alternate treatment with detergent and Energene™.

N - 5 REPLACEMENT UPHOLSTERY

Should upholstery become severely soiled, torn, or in some manner damaged, replacement upholstery cushions are available. Larger upholstery items have separate component parts for easier serviceability.

Depending upon the year and model of the boat, most upholstery parts can be obtained through your Four Winns servicing dealer within a short period of time.

Table I: Stain Removal

STAIN	REMOVAL PROCEDURE
Automotive Grease	A
Automotive Oil (New or Used)	A
Bacon Grease	A
Berry Stain	A
Blood	A
Butter	A
Catsup or Mustard	A
Chewing Gum	A, B (Repeat)
Chlorine Bleach (5%)	A
Chocolate (Melted)	A
Clay (Red)	A
Coffee or Tea	A
Cola	A
Crayon	A, B, C
Egg	A
Feces	A
French Dressing	A
Furniture Polish	A
Grape Juice	A
Gravy	A
Ink (Permanent Black)	A, B, C
Ink (Scripto, Ballpoint)	A, B, C
Iron Rust	A
Lipstick	A, B
Mayonnaise	A
Milk	A
Shaving Cream or Lotion	A
Urine	A
Vomit	A
Wine	A

WEATHER COVERS

O - 1 GENERAL INFORMATION

Weather covers for the cockpit areas are available on all Four Winns® models. Bimini top with camper is standard on the 348 Vista. Four Winns® covers are designed and intended to provide protection of the cockpit seating areas.

Four Winns utilizes 100% acrylic-type material. During the manufacturing 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 weather 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 type water repellent or a seam sealing compound can be applied. 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. The material relies on swelling to seal itself. If too 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 (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 O-6 - Winter Storage in this manual for more information.

Four Winns is utilizing a different snap for the canvas. The snap socket is notched towards the outer edge of the canvas. To unsnap, just lift on the side by the notch.

NOTICE

Remove snaps one at a time to prevent damage. DO NOT rip off or pull the weather cover as a whole; acrylic material will tear at snaps.

NOTICE

On all 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. Adjustments should be minimal with factory setup and installation.

O - 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.

NOTICE

DO NOT tow your boat at highway speeds with weather covers in place. High winds encountered during trailering your boat can severely damage most weather covers. Damage to weather covers incurred as a result of trailering your boat is not covered under warranty.

O - 3 BIMINI CAMPER TOP

The bimini camper top are standard and completely encloses the cockpit area. The bimini camper canvas is one complete piece which affords better protection from leaking as compared to two separate pieces zippered together. It has been designed to be install below the radar arch.

A window is provided forward of the bimini camper of the top. Side and aft curtains are removable and have window covers which roll up or are removed to expose the screens. The camper will square off and attach to the stern. Installation information is also included in Figures O2 & O3 at the end of this section.

The bimini camper top is factory installed, therefore, minimal adjustment is necessary. To utilize the bimini camper top:

1. Remove the canvas boot from the top.

2. Extend the forward connector bow forward and attach the straps to the strap eyes mounted on the windshield. Some adjustment may be necessary.

3. Extend secondary bow aft and attach the straps to the strap eyes mounted on the stern of the deck. Some adjustment may be necessary.

4. Zip in forward clear section and snap to windshield. Starting at the walk-thru windshield may prove to be easiest. Windshield snaps can be adjusted to match snaps in canvas.

5. Slide each end of the clear forward section into their respective slide tracks located along each side of the radar arch. Use of a silicone spray may ease their insertion.

6. Zip in side and aft curtains. Snap canvas to deck beginning at forward edge. Readjust bows if necessary.

7. Attach the aft curtain's shock cords to knobs along the stern as shown in Figure O1. Be sure canvas is centered on stern.

NOTICE

Canvas should be snug. If too taut or extremely tight, canvas could tear or pull at seams.

NOTICE

The bimini camper has been designed and is intended to remain installed in the boat. Four Winns does not recommend the bimini camper assembly be removed from the boat unless absolutely necessary.

NOTICE

Two people are required if removal or installation becomes necessary. Care must be exercised so the radar arch does not become damaged. Use a protective covering to prevent damage to arch.

NOTICE

In the event the canvas requires some maintenance or repair, remove the bimini camper canvas from the bow assembly. Unzip the bow sleeves, unsnap all snaps and straps, and remove the canvas.

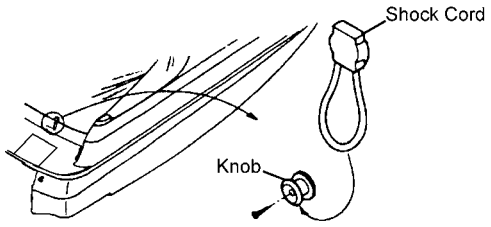


Figure O1: Shock Cords

O - 4 USE OF WEATHER COVERS AND CARBON MONOXIDE

When an engine is running, a natural vacuum may exist with the right wind and sea conditions to allow exhaust gases (which includes carbon monoxide) to seap into the boat. When the camper or side curtains are installed, this compounds the possibility of this occurring and inhibits natural ventilation. For more information, refer to Section B-2 - Carbon Monoxide in this manual.

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

Exhaust fumes from engines contain carbon monoxide. Boats with canvas deployed are more likely to collect exhaust fumes. Avoid brain damage or death from carbon monoxide. Keep cockpit and cabin areas well ventilated at all times. Signs of exposure include nausea, dizziness, and drowsiness. See Section B-2 of the boat owner's manual for more details. If using a catalytic heater, provide ventilation. Do not use catalytic heater while sleeping.

O - 5 COCKPIT COVER

The 348 Vista's optional cockpit cover is used to cover the complete cockpit area and is intended as a short term storage cover.

To install:

1. Snap the forward edge of the cockpit cover to the walk-through on 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 O1.

3. Snap the cockpit cover sides and rear (if applicable) to the deck.

Adjustable poles are provided to adjust the canvas for tautness.

O - 6 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 R - General Maintenance for additional winter storage information.

O - 7 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.

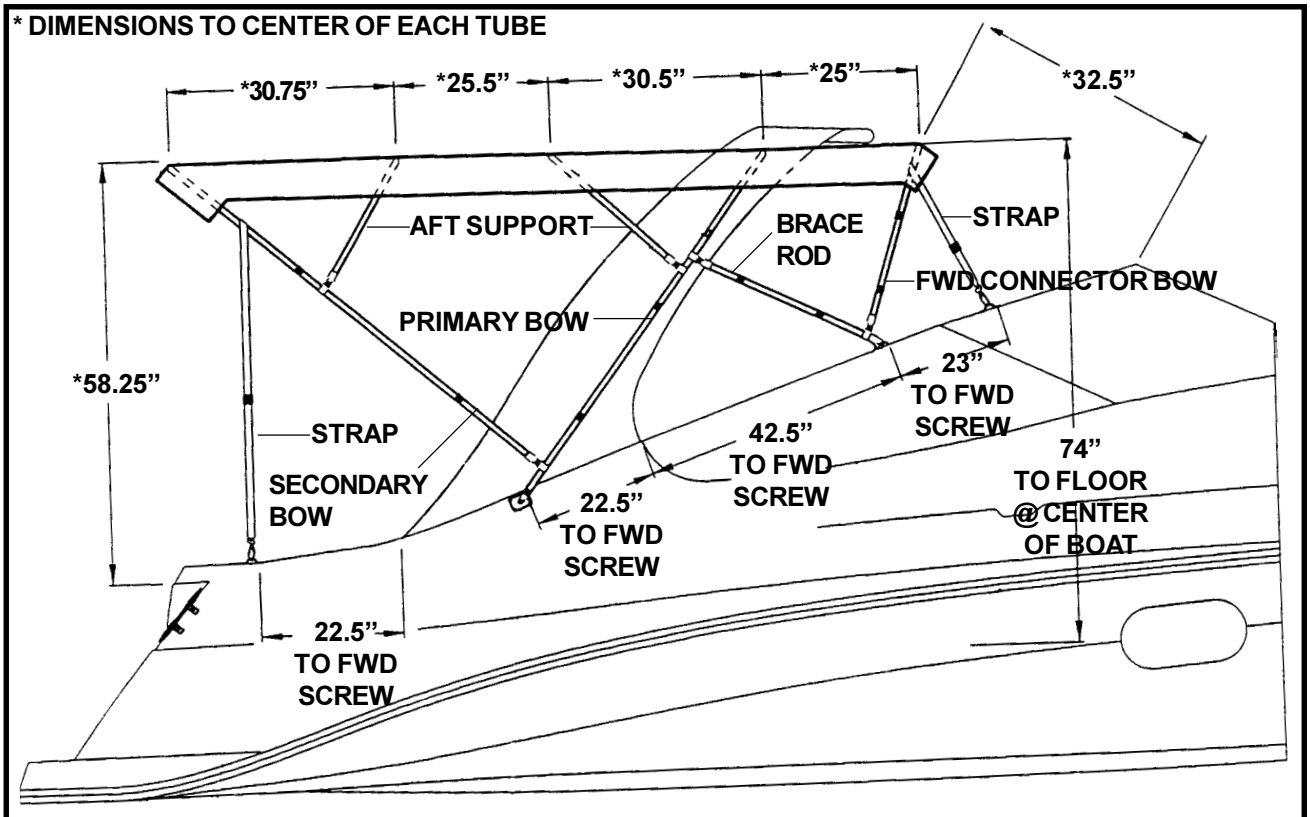


Figure O2: Bimini Camper Installation

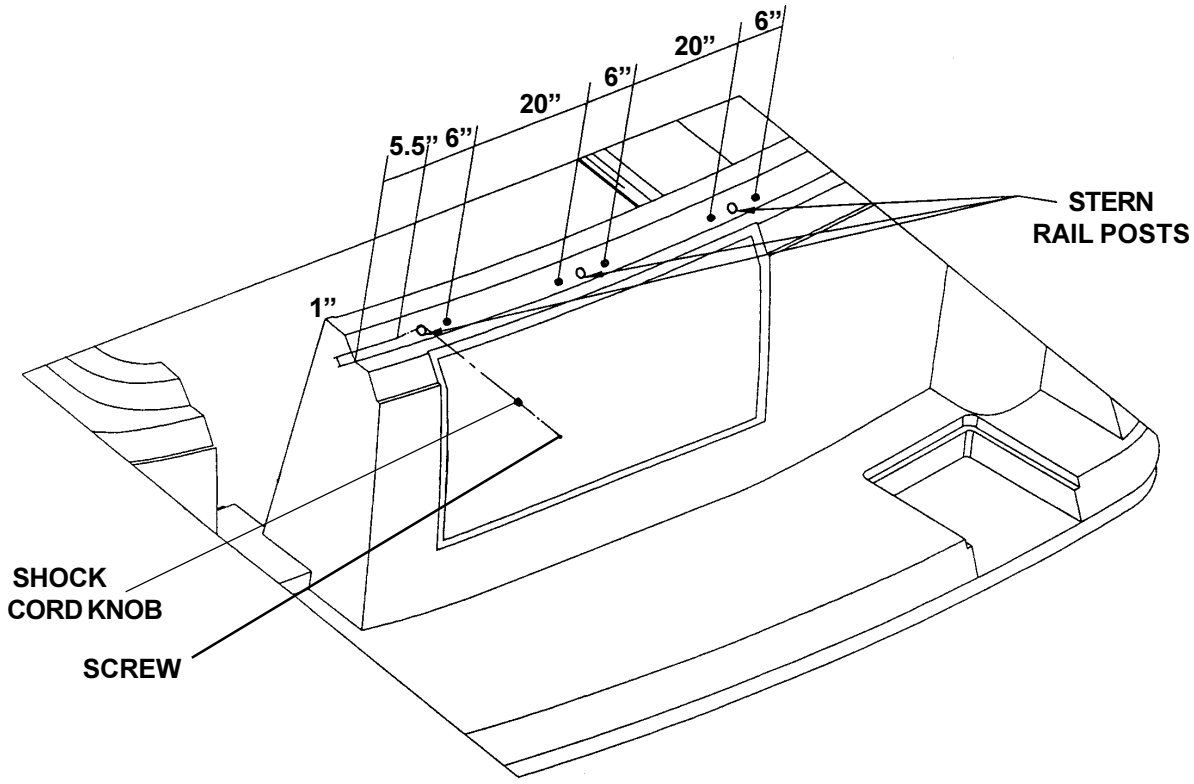


Figure O3: Shock Cord Knob Installation

FIBERGLASS AND HULL INFORMATION

P - 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.

All Four Winns® models include our patented **Stable-Vee™** hull design. 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.

P - 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 25 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, of which the 348 Vista is one, 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 and seat base 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.

P - 3 EQUIPMENT INSTALLATION

Many boats are used for specific purposes or under conditions which require the addition of special equipment to the hull or deck. 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 absorption and thus cause serious hull damage.

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, countersink holes to prevent the gel coat from chipping.

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.

P - 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.

Four Winns utilizes fade-fighting gel coat in the exterior finish. It is specially formulated to resist fading and yellowing, and retain more of its original gloss than better grade gel coats. However, it is still important to maintain the gel coat to protect the finish.

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. Hand dish washing detergents are usually gentle and are recommended for cleaning gel coat. Cleaning products such as Ivory™ or Dawn™ hand dish washing 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™, Fantastik™, 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 & Johnson®, 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 skid-resistant areas, DO NOT attempt to use a wire brush or sandpaper because this will remove the skid-resistant gel.

Apply wax once or twice a year to maintain gel coat lustre. Read the label before using any product. Make sure product is formulated for gel coat surfaces. Also, consult a Four Winns dealer for their recommendations.

NOTICE

Do not use carnuba based waxes. This type of wax yellows over time and makes the fiberglass appear yellow.

CAUTION

Waxing decks, cockpit floors or other walking areas is not recommended. Waxing will produce a very slippery surface, especially when wet. Wax may also buildup in the skid-resistant 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.

A darkening or discoloration of the skid-resistant 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 buildup. 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 a result of the gel coat's top surface being 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 P-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 buildup.

NOTICE

To prevent gouges, uneven areas, or other damage from occurring, DO NOT use a power or belt sander when sanding. 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 hand dish washing 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 hand dish washing 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 hand dish washing 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.

P - 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 relaunch.

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 does 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, antifouling 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 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 antifouling 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 P-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.

P - 6 ANTIFOULING PAINT

Four Winns recommends antifouling or bottom paint for boats which will be kept in the water for extended periods of time. Antifouling 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.

Antifouling paint begins reaction upon contact with water. After a season's use or sooner under certain conditions, the antifouling 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 reapplication of the antifouling paint seasonally. The effectiveness of the paint will be drastically reduced if used longer. Though Four Winns has found the antifouling 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 antifouling 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 antifouling paint manufacturer. The surface must be clean and slightly rough to ensure paint adhesion.

Prior to application of the antifouling 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 antifouling paint manufacturers also supply a line of epoxy undercoatings. Consult your Four Winns dealer for recommendations on epoxy undercoatings.

P - 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 homemade. 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.

CAUTION
While lifting the boat, ensure slings are in the proper locations as indicated by the sling location labels . **Failure to do so may result in permanent hull structure damage and will invalidate the hull structure warranty.**

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 and are in proper location as indicated by the sling label location.

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.

WOODWORK AND COMPOSITES

Q - 1 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 hand dish washing soap and water or other cleaning solutions such as Fantastik™. 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.

Q - 2 CHERRY

Four Winns utilizes cherry trim for Vista® 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 cherry as it is for fine, household furniture.

Q - 3 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, nonabrasive cleaner such as hand dish washing 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.

Q - 4 SYNTHETIC CHERRY

A synthetic-type of cherry is used in the dash panels and switch panels. This provides the rich look of cherry without the maintenance. To clean, a damp cloth will usually suffice.

Q - 5 "ALEXANDER" CABIN GALLEY COUNTERTOP

The 348's countertop for your cabin galley is made of laminated fiberglass with an exterior skin of "Alexander" grain coat gel. This makes for an extremely strong yet light weight countertop. The grain coat gives the appearance of "granite" and is both temperature and stain resistant. It can be cleaned with hand dish washing soap and water or other cleaning solutions such as Fantastik™. Always read the label before using any product. Please read the notices below.

NOTICE
DO NOT use abrasive cleaners or solvents on countertop. DO NOT use Soft Scrub™ soap or similar cleaning products; they will scratch the surface and remove the shine.

NOTICE
DO NOT set hot pans or dishes directly on the countertop. The countertop may become burnt and/or discolored. Use of a hot pad will prevent any discoloration from occurring.

NOTICE
DO NOT use countertop as a cutting board. The knife will leave gouges/marks in the surface of the countertop. A cutting board that fits over the sink is provided.

Q - 6 "AVIAN" COCKPIT GALLEY COUNTERTOP

The 348 Vista cockpit galley countertop consist of "Avian", which is an acrylic type material. The "Avian" gives the 348 a rich look and makes for an extremely strong yet light weight countertop. It can be cleaned with hand dish washing soap and water, or other cleaning solutions such as Fantastik™. Always read the label before using any product.

GENERAL MAINTENANCE

R - 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 either 75%-80% full (to allow for expansion) 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 a 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. Portions of this winterization procedure may require that the boat be lifted.

5. Lift the boat only at the designated “sling” labels. See Section P-7 Hull Support in this manual for additional details.

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 nontoxic, fresh water system antifreeze is recommended as an alternative to disassembling the water system. Refer to Section J-7 - 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 antifreeze solution and pour it into the head. Transfer some of the antifreeze to the holding tank by flushing the head. Also, refer to Section J-7 - System Maintenance for additional information.

6. Drain or winterize the air conditioning and generator system. 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 pump and bilge pump lines. Dry the hull bilge, and self-bailing cockpit drain troughs. Water freezing in these areas could cause damage. See Section K-3 - Hull Drainage Systems.

8. Remove the batteries and store in a cool place. Clean the batteries using clear, clean water. Be sure the battery has sufficient water and clean terminals. Keep the batteries charged throughout the storage period. DO NOT store the batteries 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 hand dish washing 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 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 upholstery, 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.

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.

5. DO NOT use the bimini top 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.

R - 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.

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.

R - 3 GENERAL MAINTENANCE SCHEDULE

SERVICE	AT LAUNCH AND FIRST OPERATION*	25 HOUR CHECK EACH SEASON*	BI-SEASONAL-LY OR EVERY 6 MONTHS OR EVERY 100 HOURS*	SEASONALLY OR EVERY 12 MONTHS OR EVERY 200 HOURS*
Engine and Instrumentation	**Refer to Section E**			
Engine Maintenance	**As Recommended by the Manufacturer**			
Inspect Exhaust System Hoses and Connections				
Check Propellers				
Check All Thru-Hull Fittings				
Gauge Cleaning				
Controls Systems	**Refer to Section F**			
Throttle and Shift Adjustment				
Neutral Safety Switch Test				
Cable and Control Lubrication				
Steering Systems	**Refer to Section G**			
Linkage and Connection Inspection				
Power Steering Service	**As Recommended by the Manufacturer**			
Steering Adjustments				
Steering System Lubrication				
Electrical Systems	**Refer to Section H**			
Inspect Battery Connections				
Check Battery Water				
Battery Cable Inspection				
12 Volt Electrical Equipment Operation				
12 Volt Wiring and Connection Inspection				
120 Volt Electrical Equipment Operation				
120 Volt Wiring Inspection				
120 Volt System Continuity Test				
Shore Power Cord and Adapter Inspection				
Polarity Light Operation				
Receptacle and Connection Inspection				
Generator Maintenance	**As Recommended by the Manufacturer**			
Inspect Generator Water Intake and Exhaust				

*** Or as Required**

SERVICE	AT LAUNCH AND FIRST OPERATION*	25 HOUR CHECK EACH SEASON*	BI-SEASONAL-LY OR EVERY 6 MONTHS OR EVERY 100 HOURS*	SEASONALLY OR EVERY 12 MONTHS OR EVERY 200 HOURS*
Fuel System	**Refer to Section I**			
Inspect for Leaks				
Fuel Sender Inspection				
Fuel Filter Inspection				
Fuel Tank Inspection				
Water Systems	**Refer to Section J**			
Inspect All Water Systems				
Fresh, Grey & Holding Tank Inspections				
Drain & Flush Fresh Water System				
Drain & Flush Waste Water System				
Drain & Flush Grey Water System				
Ventilation and Drainage	**Refer to Section K**			
Engine & Head Blower Operationn				
Blower Vent System Cleaning				
Bilge Pump Operation and Cleaning				
Check Transom Drain Plug				
Deck Hatch & Aft Window Cabin Operation				
Interior Equipment	**Refer to Section L**			
Head Maintenance	**As Recommended by the Manufacturer**			
Thru-Hull Fitting Inspection				
Ice Box and Refrigerator Cleaning				
Stove Fuel System				
Stove Maintenance	**As Recommended by the Manufacturer**			
Stereo Head Cleaning and Demagnetizing				
Cabin Hatch & Aft Cabin Window Operation				
Exterior Equipment	**Refer to Section M**			
Clean Spotlight				
Check Compass for Magnectic Deviation				
Check Trim Tab Fluid Level				
Check Trim Tab System for leakage				
Upholstery	**Refer to Section N**			
Clean Upholstery				
Clean Carpet				

*** Or as Required**

SERVICE	AT LAUNCH AND FIRST OPERATION*	25 HOUR CHECK EACH SEASON*	BI-SEASONAL-LY OR EVERY 6 MONTHS OR EVERY 100 HOURS*	SEASONALLY OR EVERY 12 MONTHS OR EVERY 200 HOURS*
Spray Upholstery with Lysol				
Check Seat Hinges and Mounting Hardware				
Weather Covers	**Refer to Section O**			
Wash Weather Covers				
Spray Weather Covers with Lysol				
Fiberglass Components and Hull	**Refer to Section P**			
Check All Fastenings (securing rails, seats, etc.)				
Clean FiberglassThoroughly				
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				
Woodwork & Composite Maintenance	**Refer to Section Q**			
Clean Star Board	**As Needed**			
Clean Cherry Trim & Tables				**As Needed**

*** Or as Required**

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, noncurrent 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 dislocated 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 rodes, 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 markers 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.

FLOAT PLAN

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

Name _____ **Telephone** _____

Description of Boat _____ **Type** _____ **Color** _____ **Trim** _____

Registration Number _____

Length _____ **Name** _____ **Make** _____

Four Winns Hull Identification Number _____

Other Information _____

Persons Aboard: Name	Age	Address	Telephone

Engine Type _____ **HP** _____

Number of Engines _____ **Fuel Capacity** _____

Survival Equipment:

PFDs _____ **Flares** _____ **Mirror** _____

Smoke Signals _____ **Flashlight** _____ **Food** _____

Paddles _____ **Water** _____ **Anchor** _____

Raft or Dinghy _____ **EPIRB** _____ **Sea Anchor** _____

Navigation Equipment:

Compass _____ **Loran** _____ **GPS** _____ **Radar** _____

Radio: Yes _____ **No** _____ **Type** _____ **Frequency** _____

Phone: Yes _____ **No** _____ **Phone Number** _____

Destination _____ **Estimated Time of Arrival** _____

Expected to Return By _____

AutoType _____ **License No.** _____ **Where** _____

If not returned by _____ **call the Coast Guard, or** _____
Local Marine Authority

Coast Guard Telephone Number: _____

Local Marine Authority Telephone Number: _____

FUEL LOG

DATE	HOURS RUN	FUEL (GAL.)	RANGE (MILES)	RPM	MPH	GPH

FUEL LOG

DATE	HOURS RUN	FUEL (GAL.)	RANGE (MILES)	RPM	MPH	GPH

FUEL LOG

DATE	HOURS RUN	FUEL (GAL.)	RANGE (MILES)	RPM	MPH	GPH

SERVICE LOG

DATE	HOURS	MAINTENANCE PERFORMED

SERVICE LOG

DATE	HOURS	MAINTENANCE PERFORMED

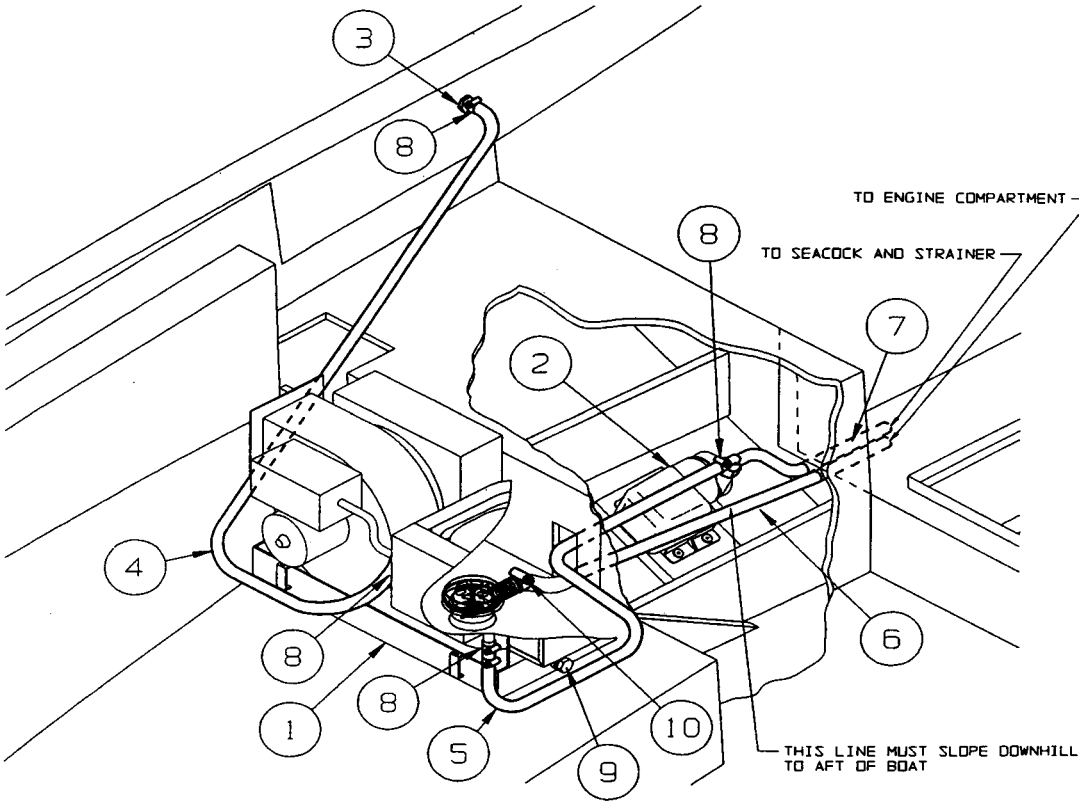
SERVICE LOG

DATE	HOURS	MAINTENANCE PERFORMED

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: EST. AVG. GALLON/HR USAGE	
IGNITION KEY NUMBER(S)	
GLOVE BOX KEY NUMBER	
COMPANIONWAY KEY NUMBER	
SELLING DEALER	
ADDRESS	
CITY & STATE	
PHONE NUMBER	
MISCELLANEOUS	

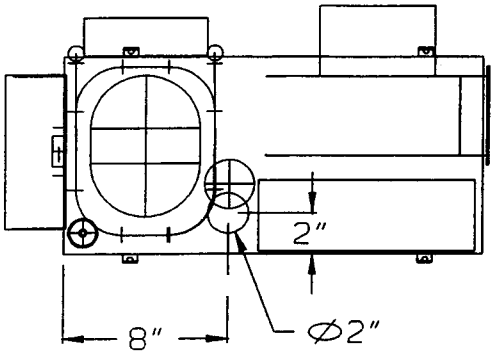
348 VISTA AIR CONDITIONER



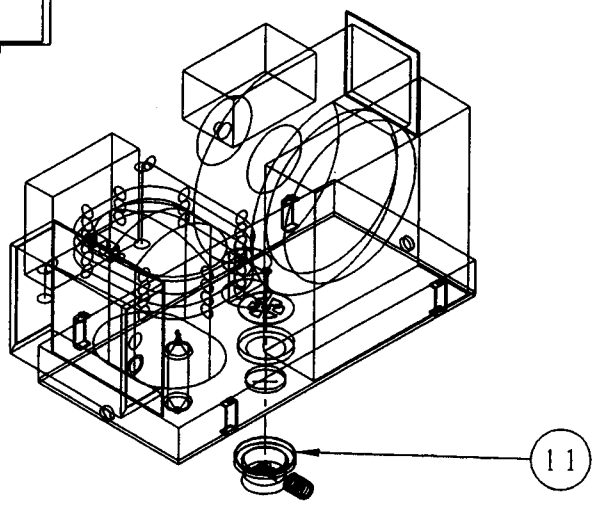
#	DESCRIPTION	PART #	QTY.	#	DESCRIPTION	PART #	QTY.
1	AIR CONDITIONER, CRUSAAIR SX12	065-0844	1 EA				
2	PUMP, SEAWATER PMP500	*	1 EA				
3	THRU-HULL, 5/8" BRONZE CHROME	035-0789	1 EA				
4	HOSE, 5/8" WATER #164-0580	022-0006	5 FT				
5	HOSE, 5/8" WATER #164-0580	022-0006	4 FT				
6	HOSE, 1" BLACK PVC	022-0029	12 FT				
7	HOSE, 3/4" WATER #148-0340	022-0029	6 FT				
8	CLAMP, 5/8" #10H FUEL VENT HOSE	021-0031	8 EA				
9	PLUG, 1/2" WATER TANK	035-0014	2 EA				
	CLAMP, 1 1/4" HOSE	021-0035	1 EA				

*PART OF 065-0844

348 VISTA AIR CONDITIONER

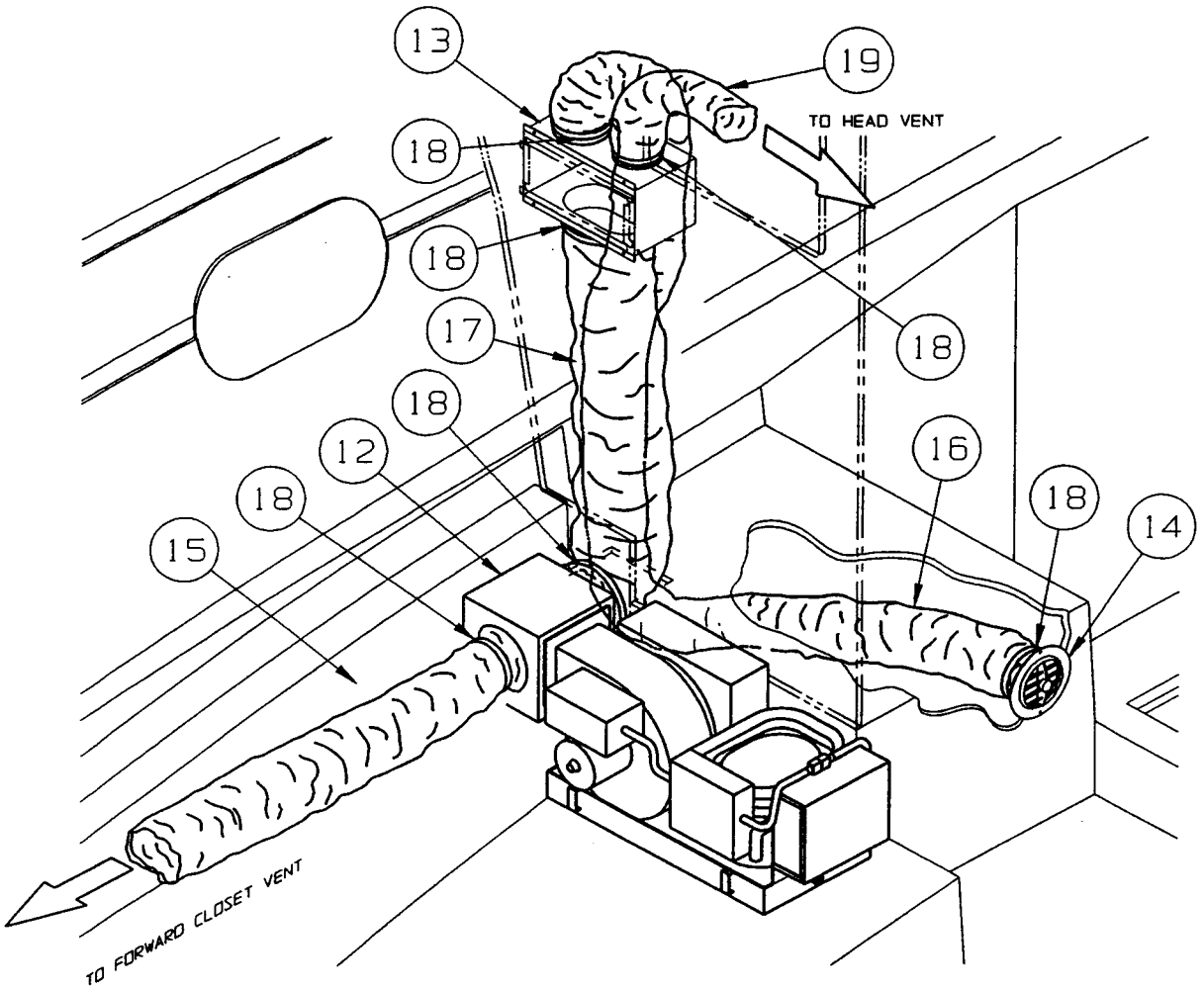


A/C DRAIN LOCATION



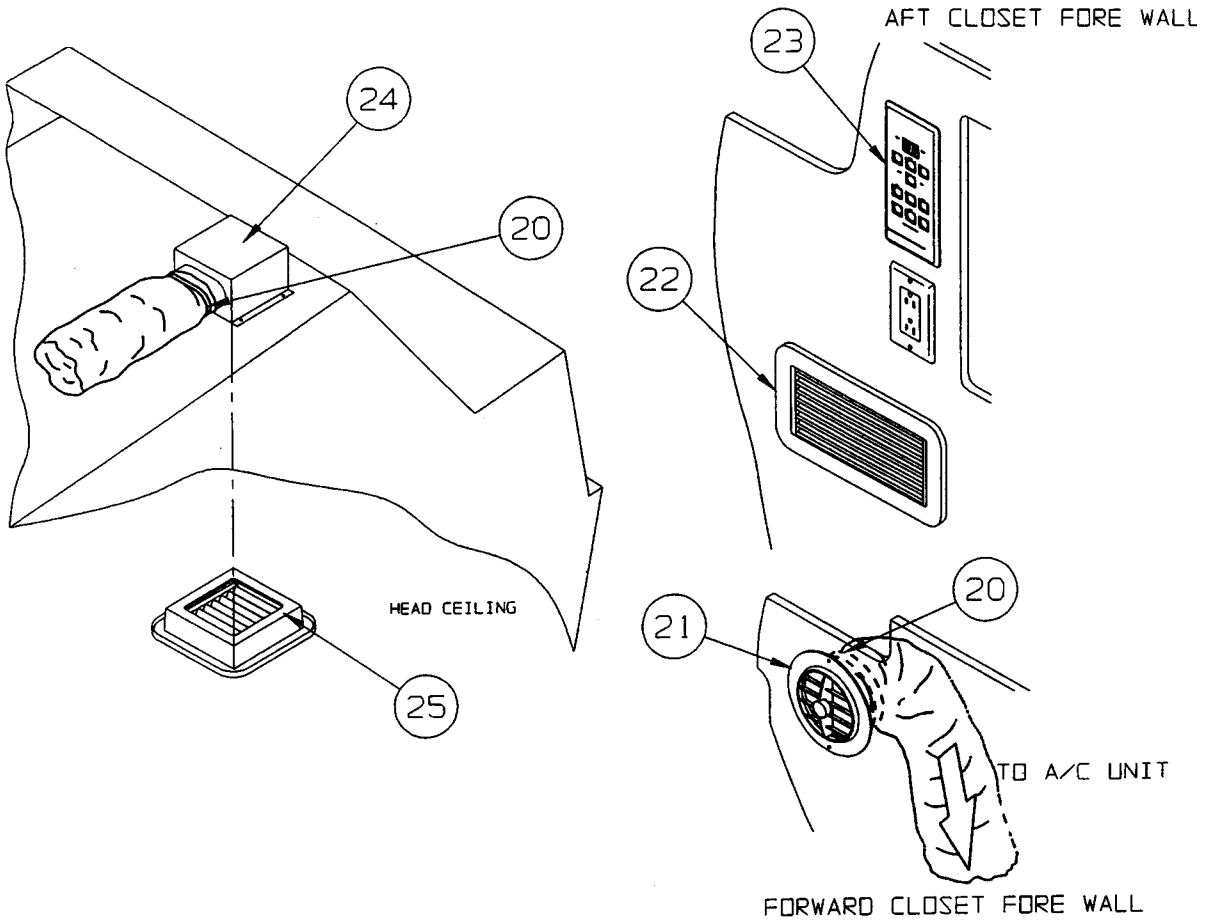
#	DESCRIPTION	PART #	QTY.	#	DESCRIPTION	PART #	QTY.
11	DRAIN, SHOWER FLOOR	035-0616	1 EA				

348 VISTA AIR CONDITIONER



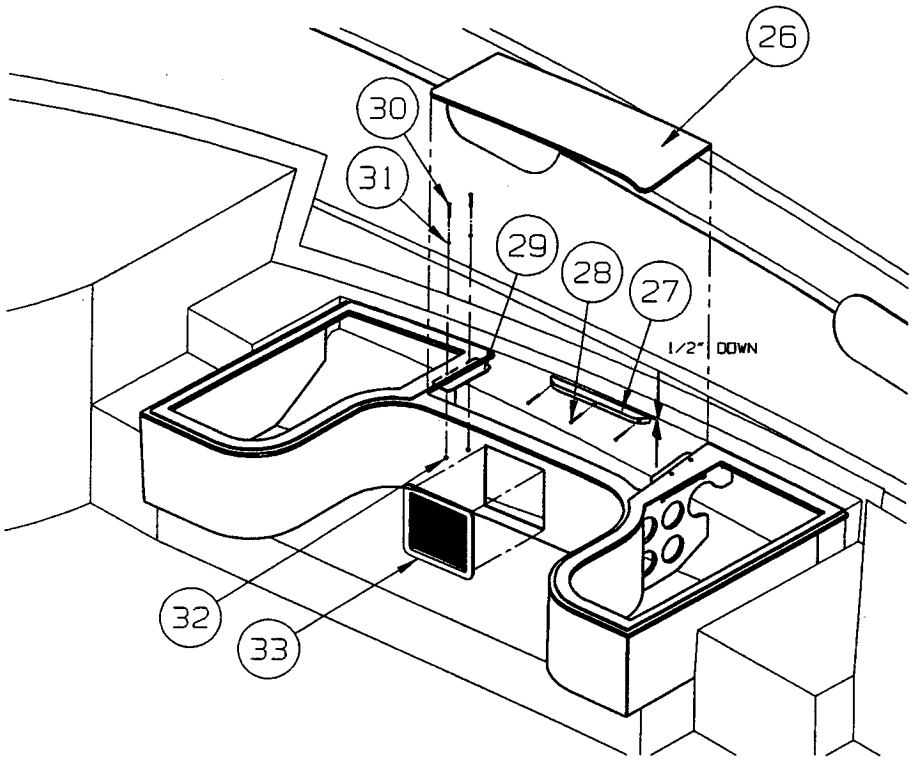
#	DESCRIPTION	PART #	QTY.	#	DESCRIPTION	PART #	QTY.
12	PLENUM, PL 1012 W/6F 40	*	1EA				
13	PLENUM, PL DD W/6T 4B 3B 5X10	*	1EA				
14	VENT, V4 RND W/DAMP TAN	*	1EA				
15	DUCT,INSUL 4IN FLEX	*	11FT				
16	DUCT,INSUL 4IN FLEX	*	8FT				
17	DUCT,INSUL 6IN FLEX	*	5FT				
18	TY-WRAP,14" TY234M	080-0396	12EA				
19	DUCT,INSUL 3IN FLEX	*	10FT				
	* PART OF 065-0844						

348 VISTA AIR CONDITIONER



#	DESCRIPTION	PART #	QTY.	#	DESCRIPTION	PART #	QTY.
20	TY-WRAP,14" TY234W	*	2EA				
21	GRILL,V4 RND W/DAMP WHITE	080-0396	2EA				
22	GRILL,WHITE V10X5	*	1EA				
23	PANEL CONTROL SMX II	*	1EA				
24	PLENUM PL4X4 W/3R	*	1EA				
25	GRILL,WHITE V4X4	*	1EA				
	*PART OF 065-0844						

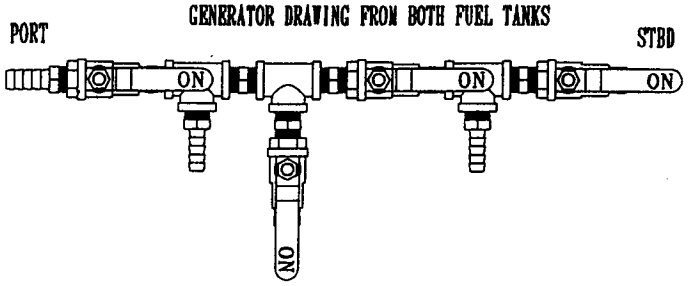
348 VISTA AIR CONDITIONER

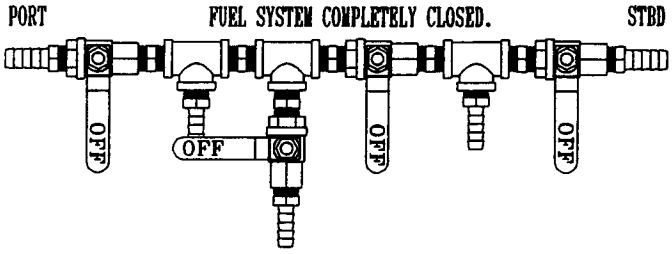


#	DESCRIPTION	PART #	QTY.	#	DESCRIPTION	PART #	QTY.
26	A/C DINNETTE LID	100-51050	1EA				
27	SUPPORT,JUMP SEAT	032-0487	1EA				
28	SCREW,#10 X 2" POHSMS	080-0109	3EA				
29	SUPPORT, A/C DINNETTE LID	032-1662	2EA				
30	SCREW,#10-24 X 1" PTHMS	080-0191	4EA				
31	WASHER,FLAT 3/16 #10 SS	080-0093	4EA				
32	NUT,#10-24 KEPS	080-0097	4EA				
33	GRILL,WHITE V10X10	*	1EA				
	*PART OF 065-0844						

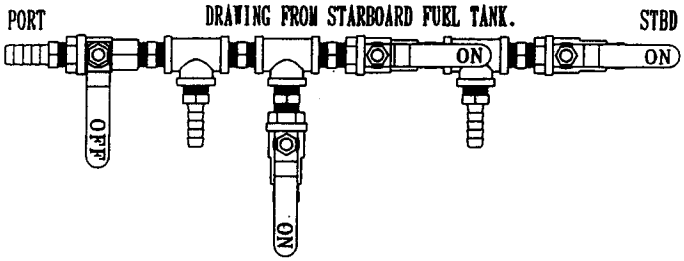
348 FUEL VALVE SYSTEM W/ GENERATOR OPTION

PORT ENGINE, STARBOARD ENGINE AND GENERATOR DRAWING FROM BOTH FUEL TANKS

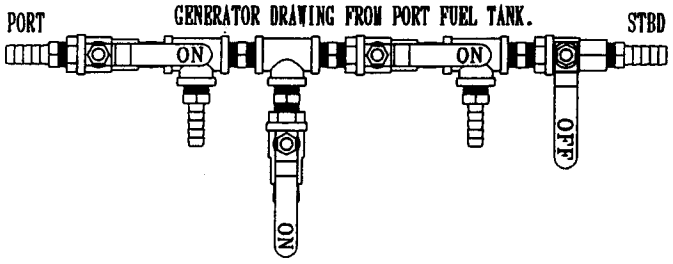




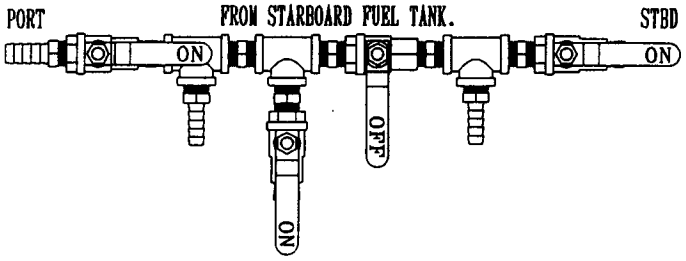
PORT ENGINE, STARBOARD ENGINE AND GENERATOR DRAWING FROM STARBOARD FUEL TANK.



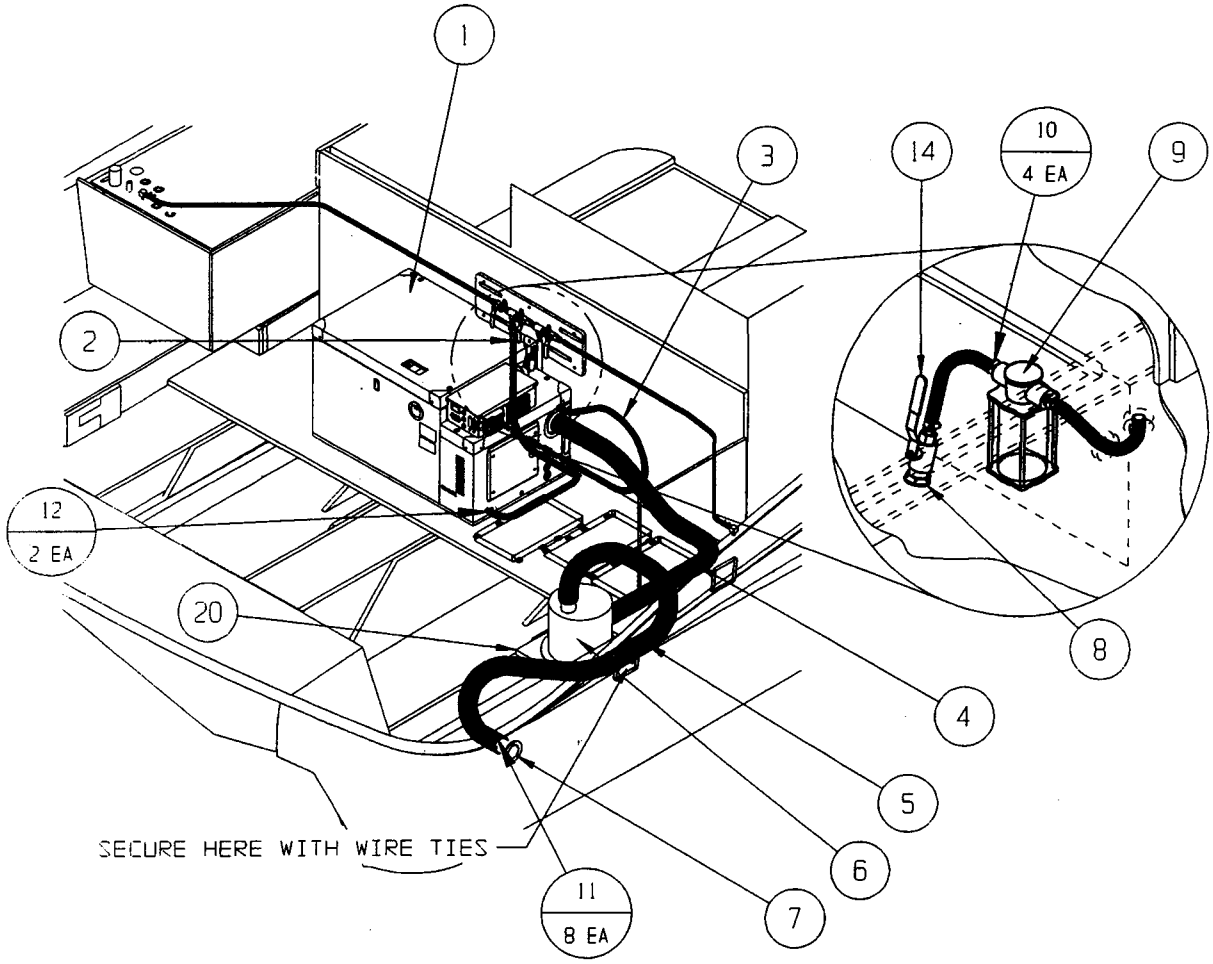
PORT ENGINE, STARBOARD ENGINE AND GENERATOR DRAWING FROM PORT FUEL TANK.



1) PORT ENGINE AND GENERATOR DRAWING FROM PORT FUEL TANK.
2) STARBOARD ENGINE DRAWING FROM STARBOARD FUEL TANK.

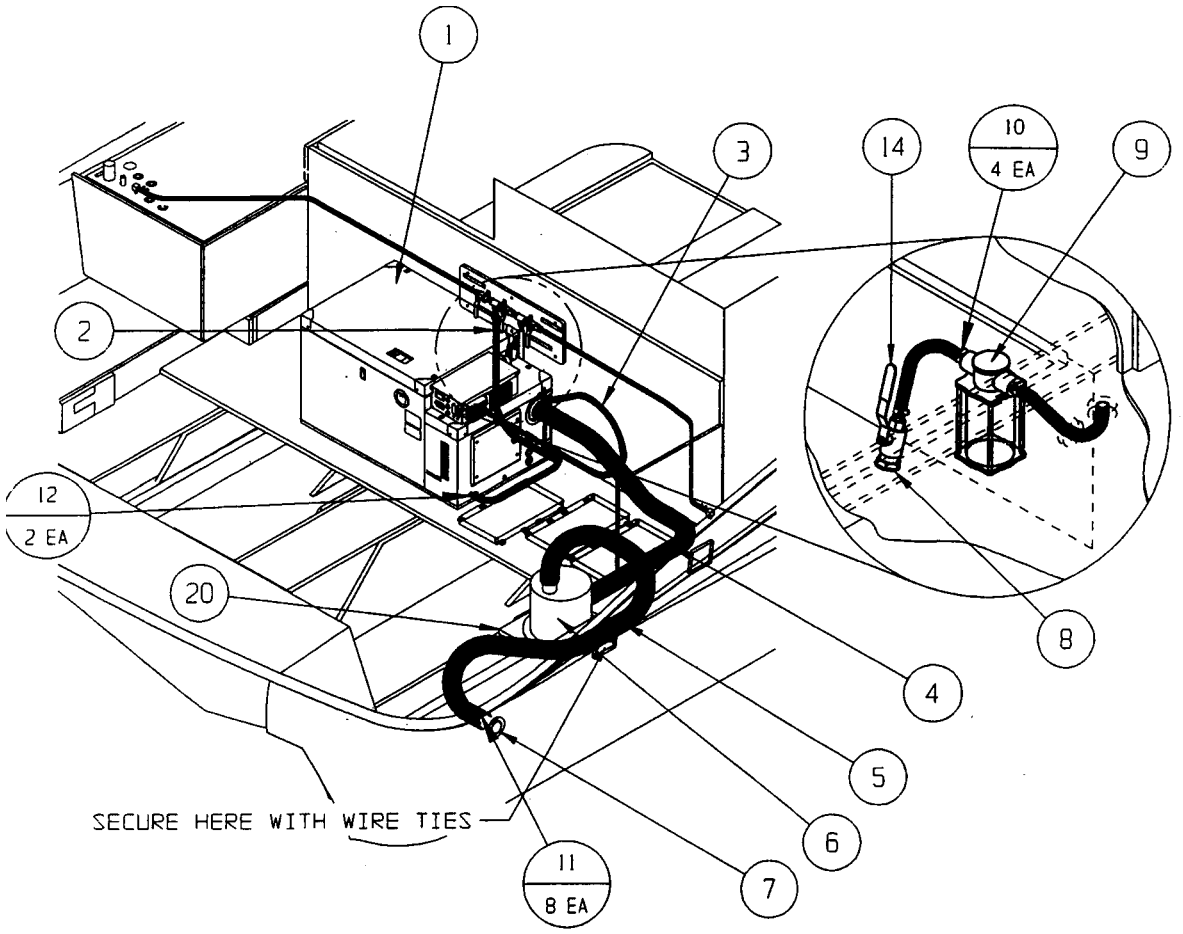


348 VISTA GENERATOR - DOMESTIC



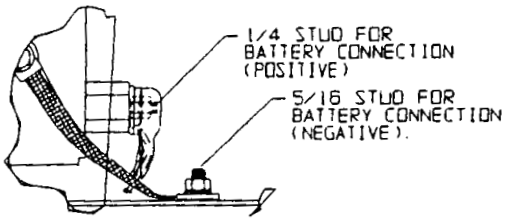
#	DESCRIPTION	PART #	QTY.	#	DESCRIPTION	PART #	QTY.
1	GENERATOR, 5kw KOHLER 5E-E 110v	065-0998	1EA	15	PLATE, GEN. SEAWATER (NOT SHOWN)	056-0103	1EA
2	HOSE, 1/4" FUEL #3010149	021-0079	9FT	16	CABLE, BATT., 2AWG BLK 8FT (NOT SHOWN)	027-0237	1EA
3	HOSE, 3/4" BLACK PVC #149-0340	022-0046	8FT	17	CABLE, BATT., 2AWG RED 8FT (NOT SHOWN)	027-0233	1EA
4	HOSE, 2" EXHAUST MPI-250-2006	022-0037	6FT	18	SCREW, #10 X 3/4" PPH SS (NOT SHOWN)	080-0281	4EA
5	HOSE, 2" EXHAUST MPI-250-2006	022-0037	9FT	19	SCREW, #12 X 1-1/2" POHSMS (NOT SHOWN)	080-0243	2EA
6	MUFFLER, KOHLER GENERATOR	032-0388	1EA	20	12" x 12" x 3/4" PLYWOOD		1EA
7	THRU HULL, 2" BRONZE CHROME	035-0792	1EA	21	PLATE, SHIP SYSTEMS BATTERY (NOT SHOWN)	056-0925	2EA
8	THRU-HULL, 3/4" BRONZE #322-005	035-0552	1EA				
9	STRAINER, WATER 3/4" #493 005 PLB	035-0248	1EA				
10	CLAMP, 5/8" #10H FUEL VENT HOSE	021-0031	4EA				
11	CLAMP, EXHAUST 2" #63360-52	021-0097	8EA				
12	CLAMP, 3/8" HOSE #67065-52	021-0034	2EA				
13	HOSE BARB, 3/4 MPT x 3/4"HB (NOT SHOWN)	035-0327	3EA				
14	VALVE, BALL 3/4" #4726K12	035-0118	1EA				

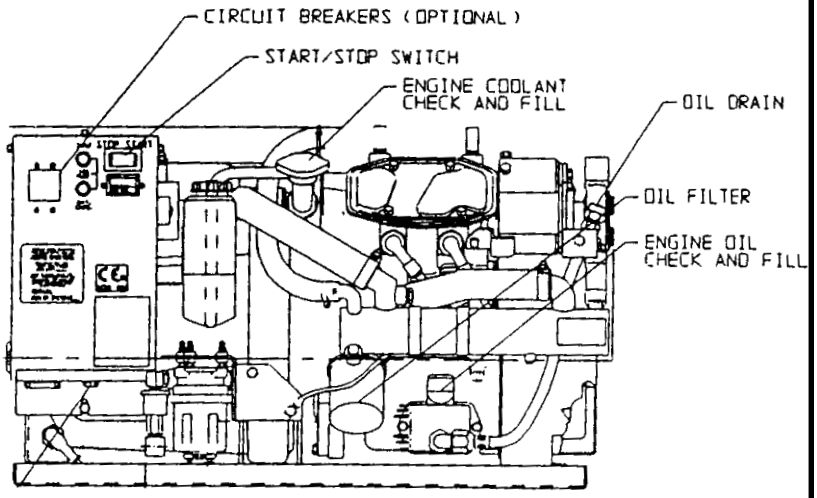
348 VISTA GENERATOR - EXPORT

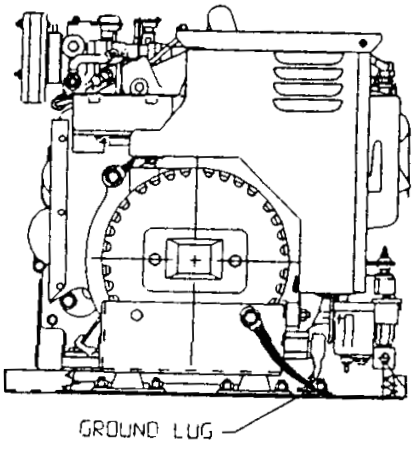


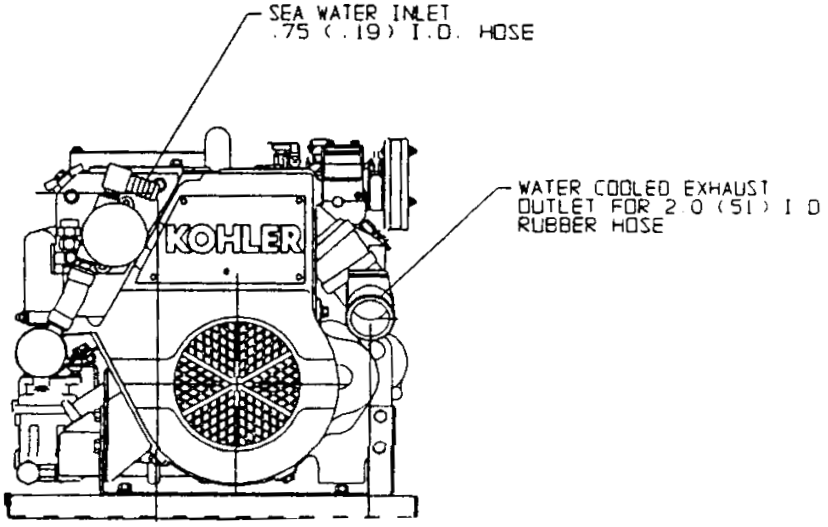
#	DESCRIPTION	PART #	QTY.	#	DESCRIPTION	PART #	QTY.
1	GENERATOR, 4kw KOHLER 4EF-E 220v	065-0999	1EA	15	PLATE, GEN. SEAWATER (NOT SHOWN)	056-0103	1EA
2	HOSE, 1/4" FUEL #3010149	021-0079	9FT	16	CABLE, BATT., 2AWG BLK 8FT (NOT SHOWN)	027-0237	1EA
3	HOSE, 3/4" BLACK PVC #149-0340	022-0046	8FT	17	CABLE, BATT., 2AWG RED 8FT (NOT SHOWN)	027-0233	1EA
4	HOSE, 2" EXHAUST MPI-250-2006	022-0037	6FT	18	SCREW, #10 X 3/4" PPH SS (NOT SHOWN)	080-0281	4EA
5	HOSE, 2" EXHAUST MPI-250-2006	022-0037	9FT	19	SCREW, #12 X 1-1/2" POHSMS (NOT SHOWN)	080-0243	2EA
6	MUFFLER, KOHLER GENERATOR	032-0388	1EA	20	12" x 12" x 3/4" PLYWOOD		1EA
7	THRU HULL, 2" BRONZE CHROME	035-0792	1EA	21	PLATE, SHIP SYSTEMS BATTERY (NOT SHOWN)	056-0925	2EA
8	THRU-HULL, 3/4" BRONZE #322-005	035-0552	1EA				
9	STRAINER, WATER 3/4" #493 005 PLB	035-0248	1EA				
10	CLAMP, 5/8"#10H FUEL VENT HOSE	021-0031	4EA				
11	CLAMP, EXHAUST 2" #63360-52	021-0097	8EA				
12	CLAMP, 3/8" HOSE #67065-52	021-0034	2EA				
13	HOSE BARB, 3/4 MPT x 3/4"HB (NOT SHOWN)	035-0327	3EA				
14	VALVE, BALL 3/4" #4726K12	035-0118	1EA				

GENERATOR OPTION

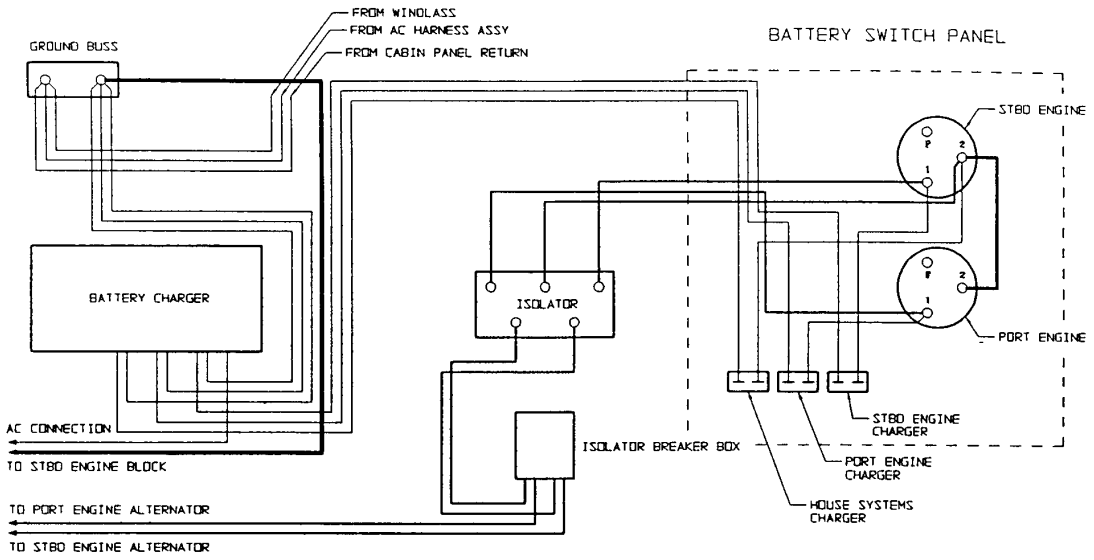


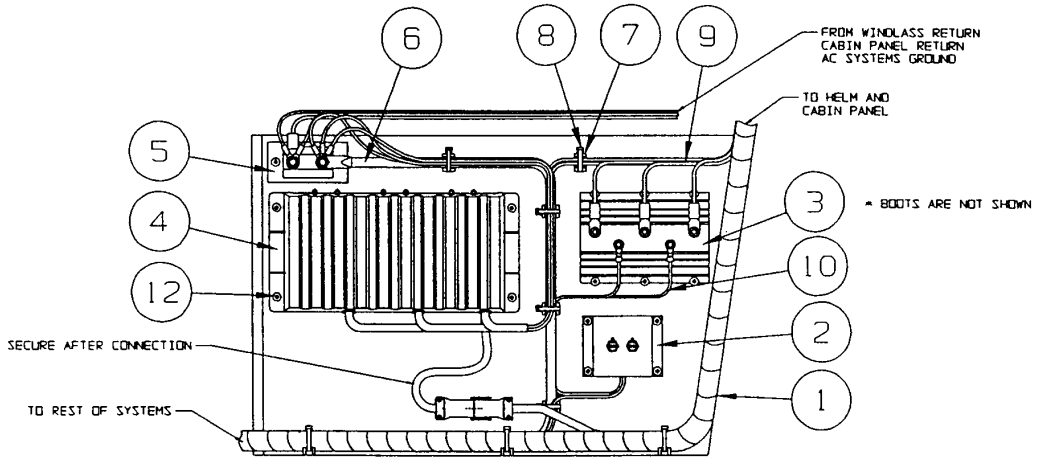






348V BATTERY CHARGER

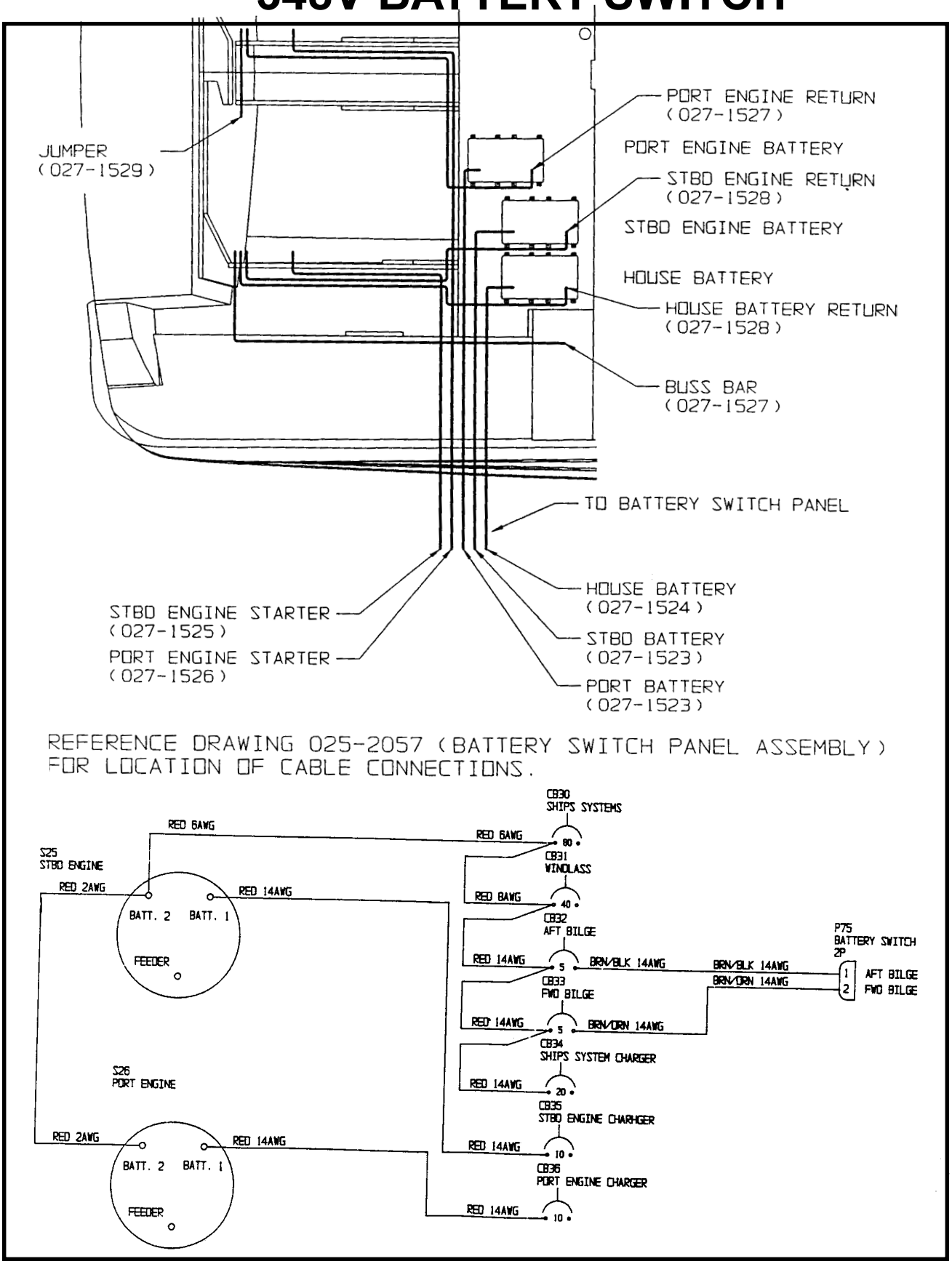




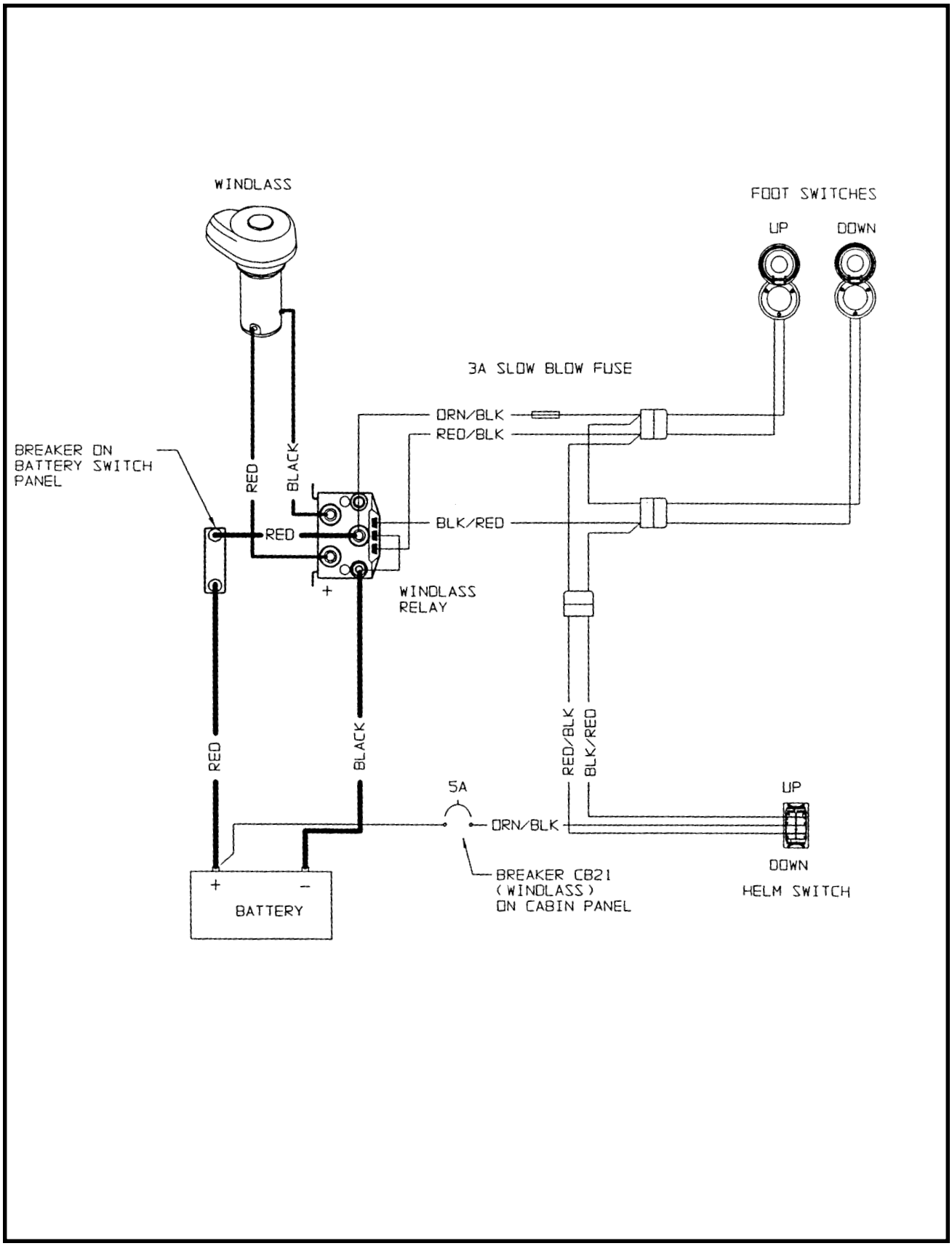
FOUR WINNS 905 FRISBIE STREET CADILLAC,MI 49601 616-779-2331	TITLE: P/L 328V WIRING 12V "99"			DATE: 03/07/98
	DRAWN BY: D4	CHECKED BY:	APPROVED BY:	DWG NUMBER: 118-50722 6of12

#	DESCRIPTION	PART #	QTY.	#	DESCRIPTION	PART #	QTY.
1	HARNESS ASSY,AFT SYSTEMS	027-1506	1EA				
2	BOX,ISOLATOR BREAKER	028-1019	1EA				
3	ISOLATOR,BATTERY	028-1114	1EA				
4	CHARGER,BATTERY	065-0843	1EA				
5	BUSS BAR	028-0575	1EA				
6	CABLE ASSY,2AWG BLK 96"	027-1527	1EA				
7	BLOCK,TIE WRAP	032-0273	AR				
8	TIE,CABLE 7.4 W/O HOLE	080-0286	AR				
9	HARNESS ASSY,6AWG RED 40"	027-1519	3EA				
10	CABLE ASSY,RED 10" 8AWG	027-1159	2EA				
11	**SHRINK TUBE,1/4" RAYCHEM	028-1000	2EA				
12	SCREW,#10 X 3/4" PTHSMS	080-0033	16EA				
	** NOT SHOWN						

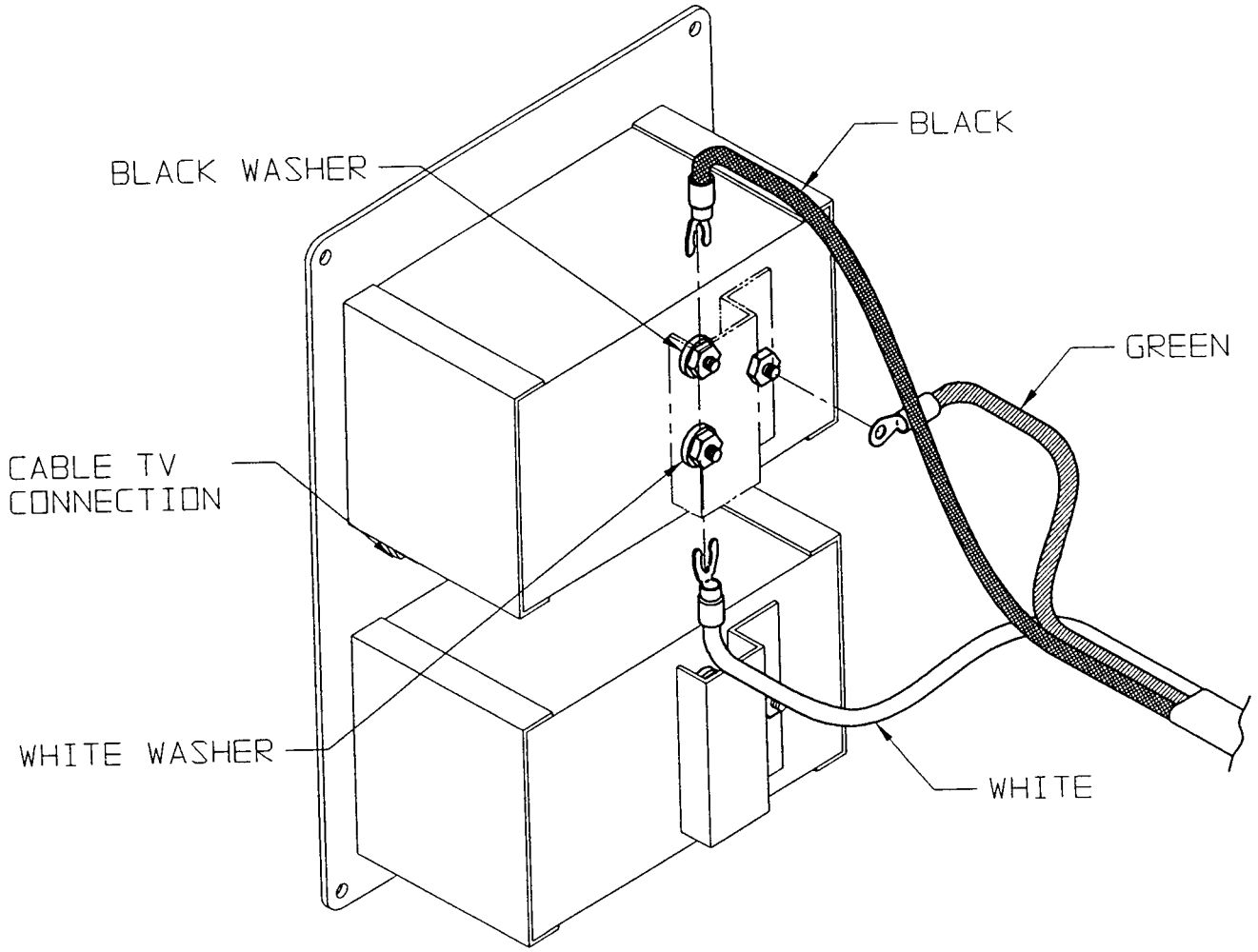
348V BATTERY SWITCH



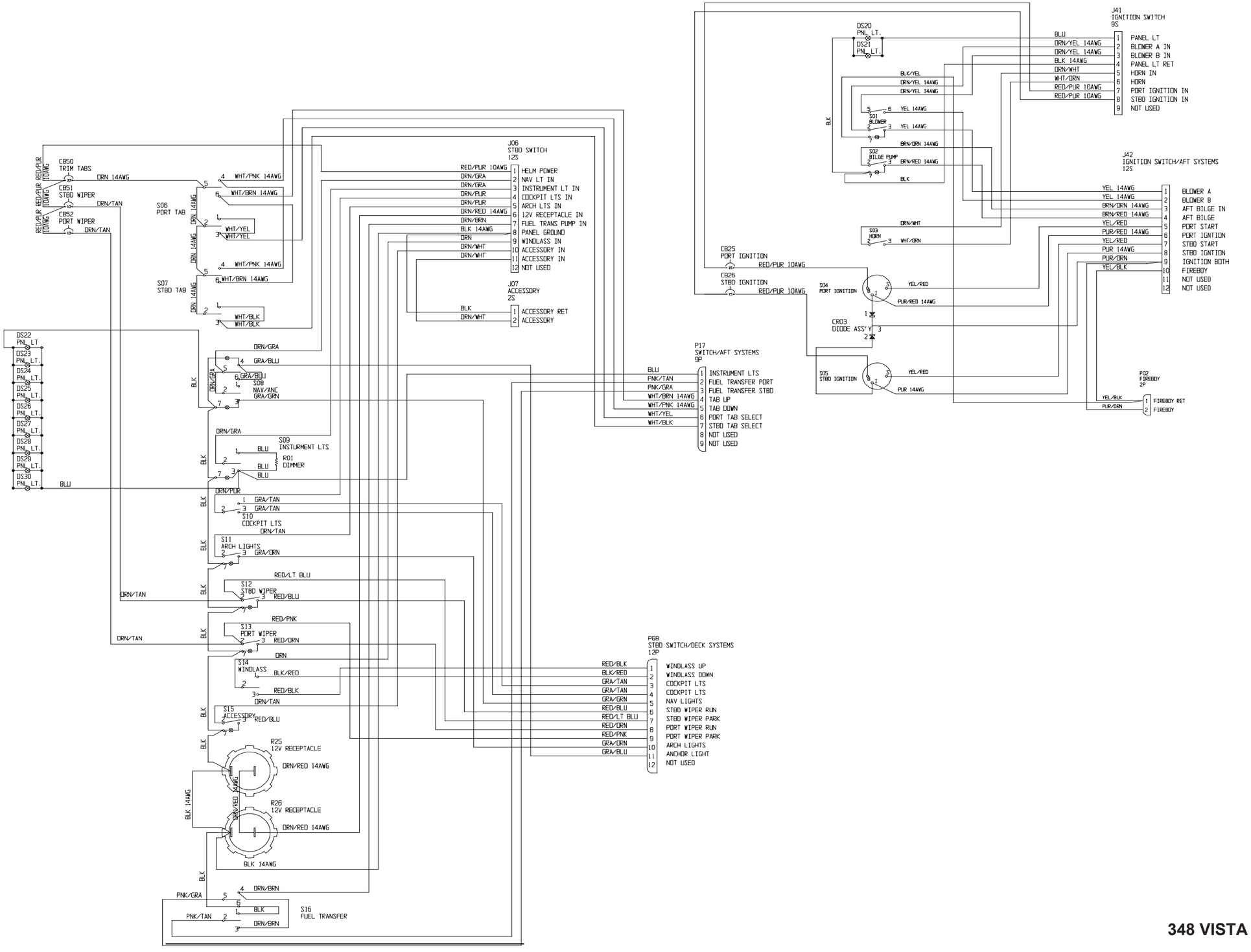
WINDLASS WIRING



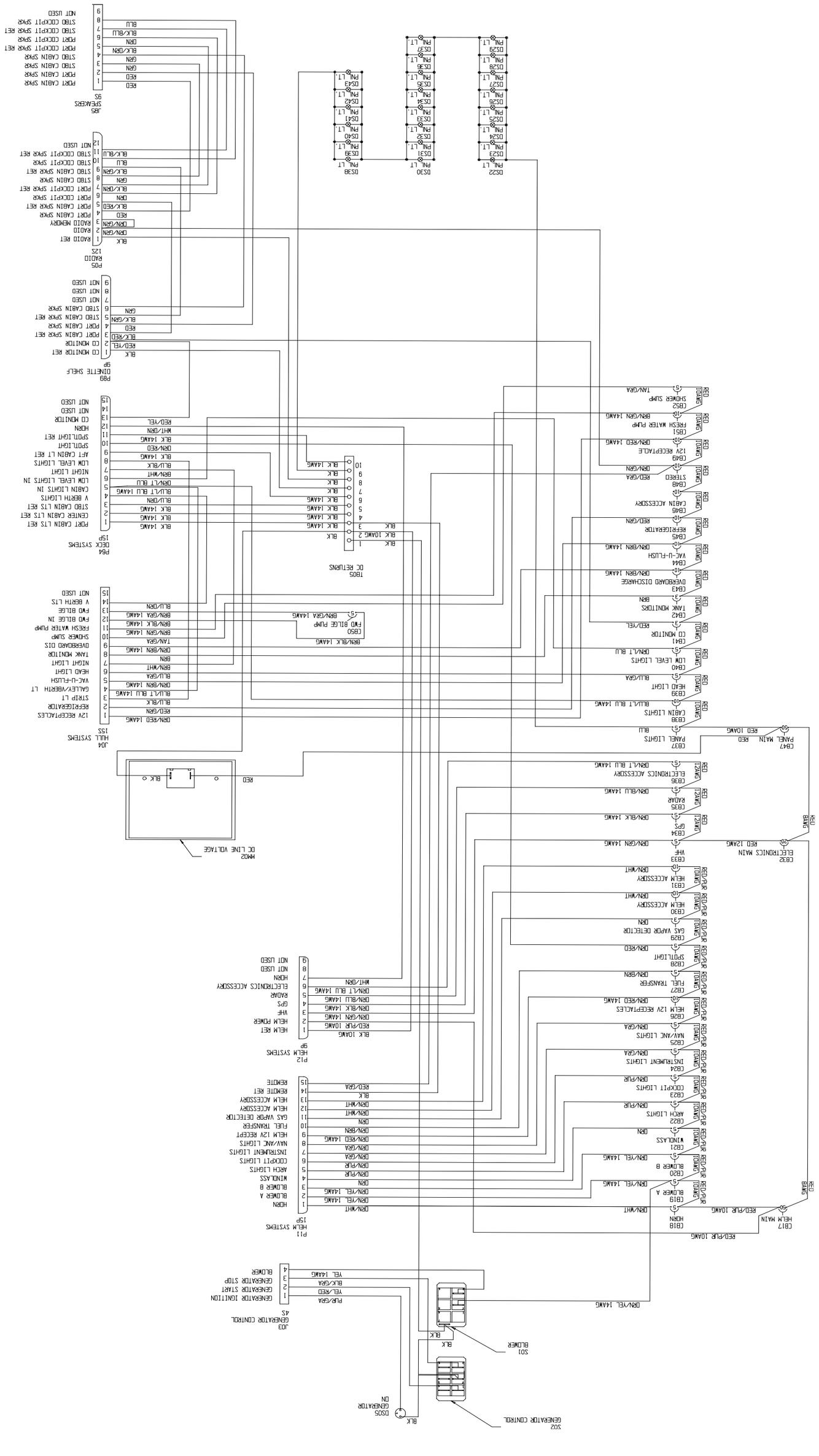
SHORE POWER CONNECTIONS

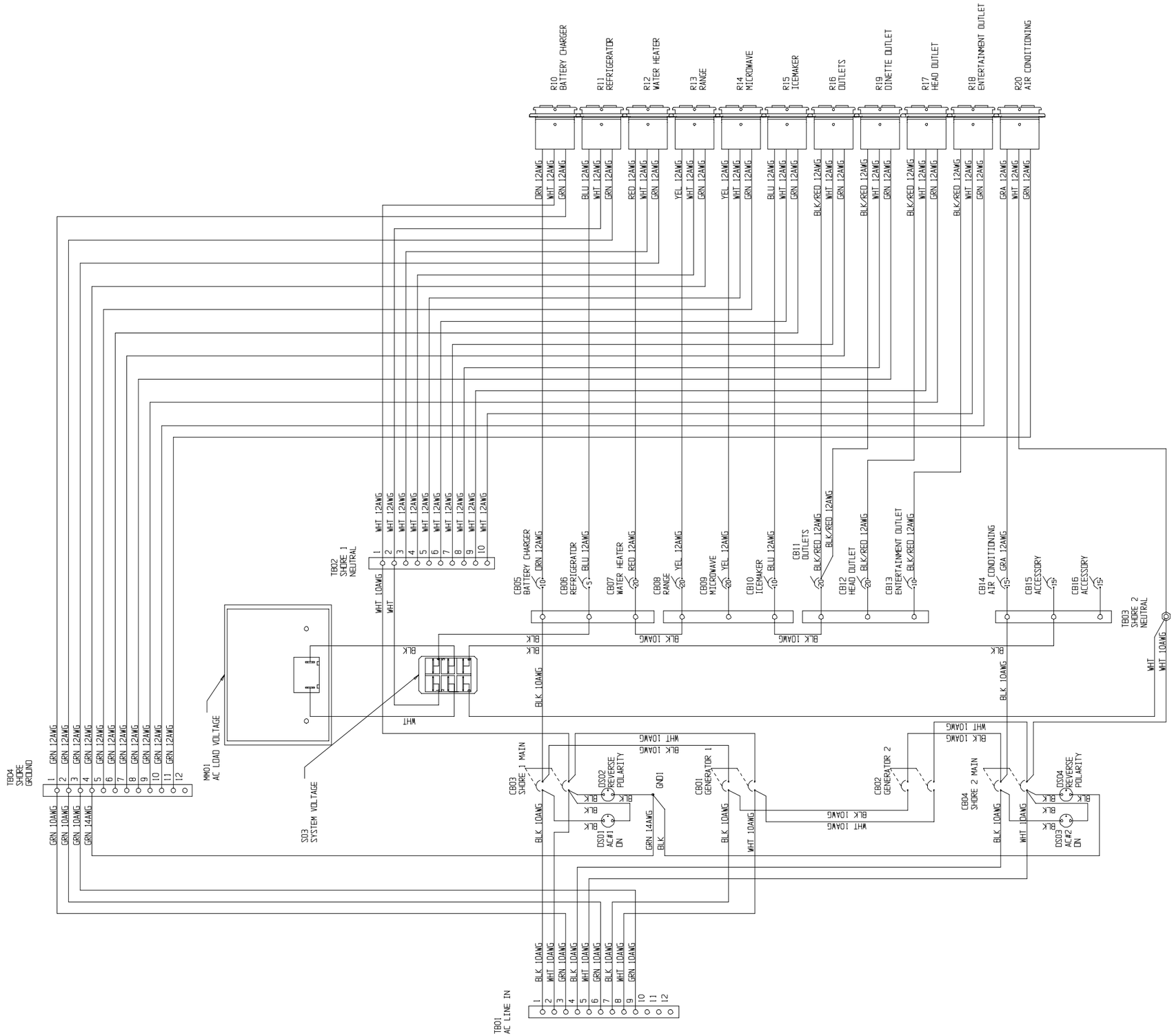


TYPICAL CONNECTION FOR SHORE POWER.
AIR CONDITIONER POWER CONNECTIONS ARE THE SAME.

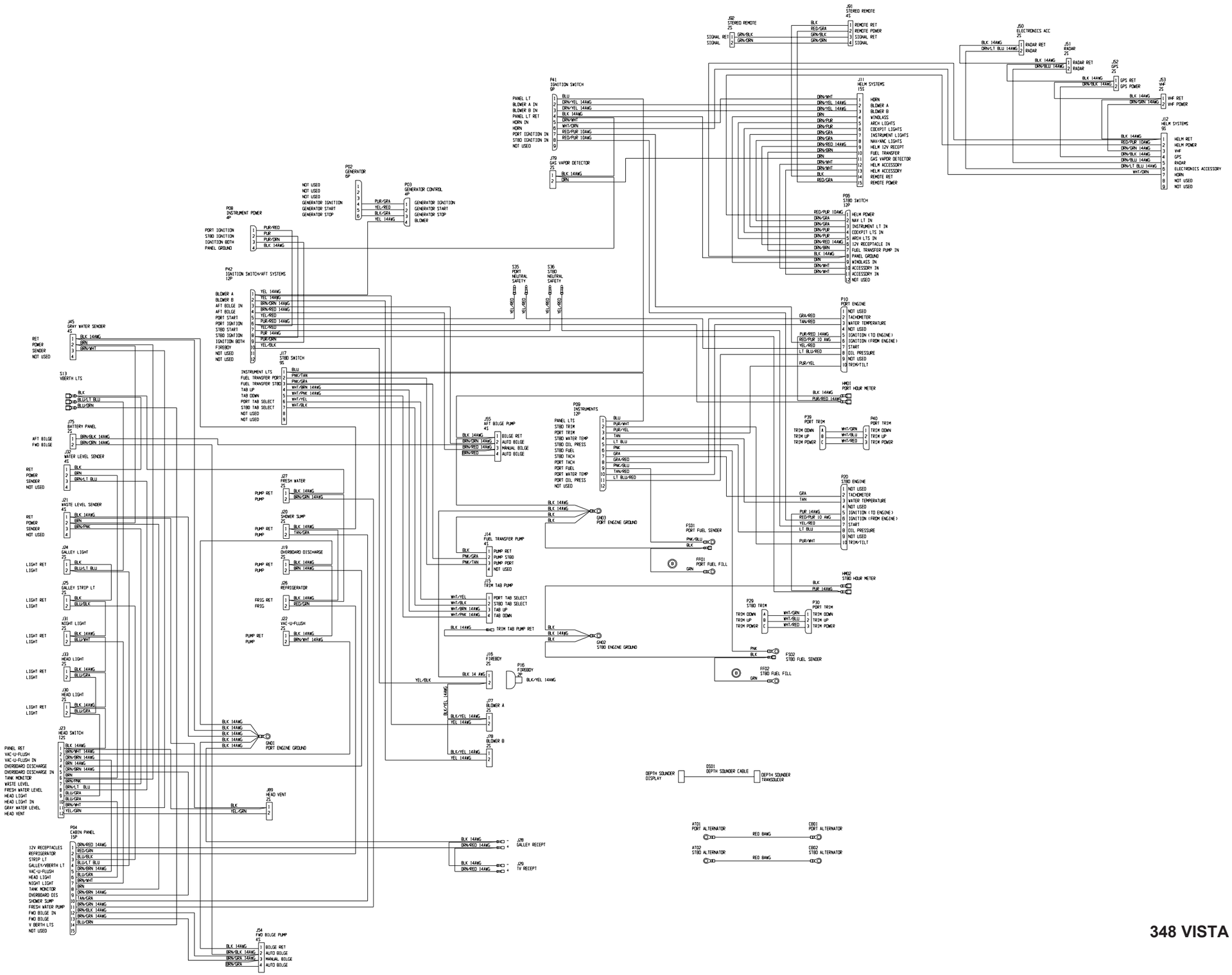

J41
IGNITION SWITCH
9S
1 PANEL LT
2 BLOWER A IN
3 BLOWER B IN
4 PANEL LT RET
5 HORN IN
6 HORN
7 PORT IGNITION IN
8 STBD IGNITION IN
9 NOT USED
DS20
PNL LT.
DS21
PNL LT.
S01
BLOWER
S02
BILGE PUMP
S03
HORN
J42
IGNITION SWITCH/AFT SYSTEMS
12S
1 BLOWER A
2 BLOWER B
3 AFT BILGE IN
4 AFT BILGE
5 PORT START
6 PORT IGNTION
7 STBD START
8 STBD IGNTION
9 IGNITION BOTH
10 FIREBOY
11 NOT USED
12 NOT USED
CB25
PORT IGNITION
CB26
STBD IGNITION
S04
PORT IGNITION
S05
STBD IGNITION
CR03
DIODE ASS'Y
P02
FIREBOY
2P
FIREBOY RET
FIREBOY
CB50
TRIM TABS
CB51
STBD WIPER
CB52
PORT WIPER
S06
PORT TAB
S07
STBD TAB
J06
STBD SWITCH
12S
1 HELM POWER
2 NAV LT IN
3 INSTRUMENT LT IN
4 COCKPIT LTS IN
5 ARCH LTS IN
6 12V RECEPTACLE IN
7 FUEL TRANS PUMP IN
8 PANEL GROUND
9 WINDLASS IN
10 ACCESSORY IN
11 ACCESSORY IN
12 NOT USED
J07
ACCESSORY
2S
1 ACCESSORY RET
2 ACCESSORY
P17
SWITCH/AFT SYSTEMS
9P
1 INSTRUMENT LTS
2 FUEL TRANSFER PORT
3 FUEL TRANSFER STBD
4 TAB UP
5 TAB DOWN
6 PORT TAB SELECT
7 STBD TAB SELECT
8 NOT USED
9 NOT USED
DS22
DS23
DS24
DS25
DS26
DS27
DS28
DS29
DS30
S08
NAV/ANC
S09
INSTRUMENT LTS
R01
DIMMER
S10
COCKPIT LTS
S11
ARCH LIGHTS
S12
STBD WIPER
S13
PORT WIPER
S14
WINDLASS
S15
ACCESSORY
R25
12V RECEPTACLE
R26
12V RECEPTACLE
S16
FUEL TRANSFER
P68
STBD SWITCH/DECK SYSTEMS
12P
1 WINDLASS UP
2 WINDLASS DOWN
3 COCKPIT LTS
4 COCKPIT LTS
5 NAV LIGHTS
6 STBD WIPER RUN
7 STBD WIPER PARK
8 PORT WIPER RUN
9 PORT WIPER PARK
10 ARCH LIGHTS
11 ANCHOR LIGHT
12 NOT USED

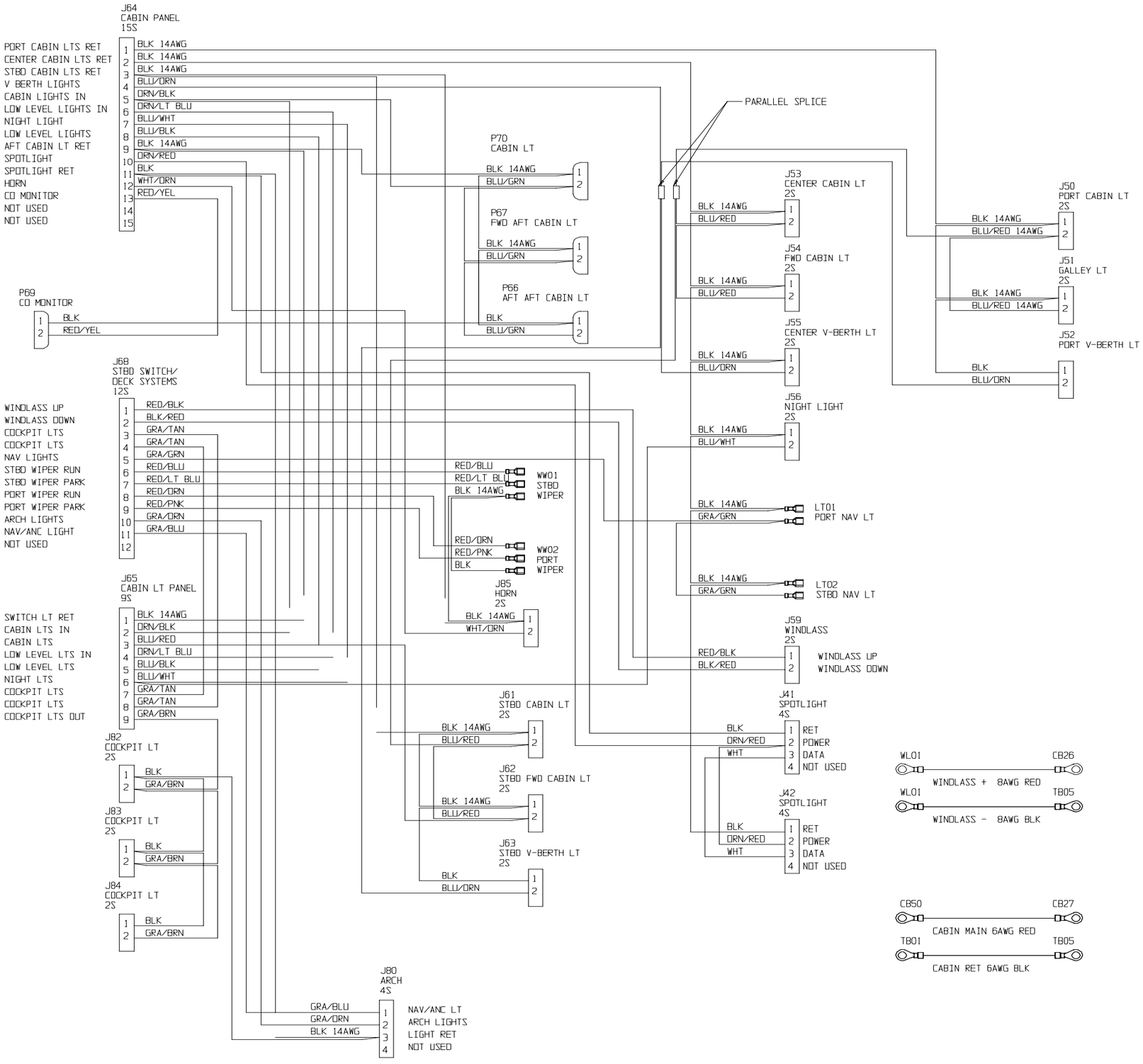
M01 STBD TRIM
M02 PORT TRIM
M03 STBD WATER TEMP
M04 STBD OIL PRESSURE
M05 STBD VOLTAGE
M06 STBD FUEL
M07 STBD TACH
J15 COMPASS 2S
M08 SYNCHRONIZATION INDICATOR
M09 PORT TACH
M10 PORT VOLTAGE
M11 PORT FUEL
M12 PORT WATER TEMP
M13 PORT OIL PRESSURE
M14 DEPTH SOUNDER
P13 DEPTH SOUNDER 4P
GROUND
POWER
LIGHT
NOT USED
J13 DEPTH SOUNDER 4S
J08 INSTRUMENT POWER 4S
PORT IGNITION
STBD IGNITION
IGNITION BOTH
PANEL GROUND
J09 INSTRUMENTS 12S
PANEL LTS
STBD TRIM
PORT TRIM
STBD WATER TEMP
STBD OIL PRESS
STBD FUEL
STBD TACH
PORT TACH
PORT FUEL
PORT WATER TEMP
PORT OIL PRESS
NOT USED


P64 DECK SYSTEMS 15P
P89 DINETTE SHELF 9P
P05 RADIO 12S
P12 HELM SYSTEMS 9P
P11 HELM SYSTEMS 15P
J04 HULL SYSTEMS 15S
J03 GENERATOR CONTROL 4S
J85 SPEAKERS 9S
MM02 DC LINE VOLTAGE
TB05 DC RETURNS
S01 BLOWER
S02 GENERATOR CONTROL
DS05 GENERATOR ON
CB01 FRESH WATER PUMP
CB02 SHOWER SUMP
CB03 STEREO
CB04 12V RECEPTACLE
CB05 CABIN ACCESSORY
CB06 REFRIGERATOR
CB07 VAC-U-FLUSH
CB08 OVERBOARD DISCHARGE
CB09 TANK MONITORS
CB10 CO MONITOR
CB11 LOW LEVEL LIGHTS
CB12 HEAD LIGHT
CB13 CABIN LIGHTS
CB14 GPS
CB15 VHF
CB16 HELM ACCESSORY
CB17 HELM ACCESSORY
CB18 GAS VAPOR DETECTOR
CB19 SPOTLIGHT
CB20 FUEL TRANSFER
CB21 HELM 12V RECEPTACLES
CB22 NAV/ANC LIGHTS
CB23 INSTRUMENT LIGHTS
CB24 COCKPIT LIGHTS
CB25 ARCH LIGHTS
CB26 WINDLASS
CB27 BLOWER A
CB28 BLOWER B
CB29 HORN
CB30 ELECTRONICS MAIN
CB31 RADAR
CB32 ELECTRONICS ACCESSORY
CB33 PANEL MAIN
CB34 PANEL LIGHTS
CB35 ENGINE BILGE PUMP
CB36 FWD BILGE PUMP
DS22 DS23 DS24 DS25 DS26 DS27 DS28 DS29 DS30 DS31 DS32 DS33 DS34 DS35 DS36 DS37 DS38 DS39 DS40 DS41 DS42 DS43
PNL LT
BLK 14AWG
BLK/BLU 14AWG
BLK/GRN 14AWG
BLK/RED 14AWG
BLK/YEL 14AWG
BLU 14AWG
BLU/BLK 14AWG
BLU/GRA 14AWG
BLU/GRN 14AWG
BLU/LT BLU 14AWG
BLU/ORN 14AWG
BRN/BLK 14AWG
BRN/GRA 14AWG
BRN/GRN 14AWG
BRN/ORN 14AWG
BRN/WHT 14AWG
GRA 14AWG
GRN 14AWG
GRY 14AWG
MAU 14AWG
ORN 14AWG
ORN/BLU 14AWG
ORN/BRN 14AWG
ORN/GRA 14AWG
ORN/GRN 14AWG
ORN/LT BLU 14AWG
ORN/PUR 14AWG
ORN/RED 14AWG
ORN/VEL 14AWG
ORN/WHT 14AWG
PNK 14AWG
PUR 14AWG
RED 14AWG
RED/BLK 14AWG
RED/GRA 14AWG
RED/GRN 14AWG
RED/ORN 14AWG
RED/PUR 14AWG
RED/VEL 14AWG
RED/WHT 14AWG
TAN 14AWG
TAN/GRA 14AWG
VEL 14AWG
WHT 14AWG
WHT/BLK 14AWG
WHT/GRA 14AWG
WHT/GRN 14AWG
WHT/ORN 14AWG
WHT/PUR 14AWG
WHT/RED 14AWG
WHT/VEL 14AWG
WHT/WHT 14AWG
BLK 10AWG-2
BLK 10AWG
RED 10AWG
BRN/GRA 14AWG
BRN/BLK 14AWG
RED 12AWG
BRN/BLK 14AWG
BRN/GRN 14AWG
BRN/ORN 14AWG
BRN/WHT 14AWG
BLU/GRA 14AWG
BLU/BLK 14AWG
BLU/LT BLU 14AWG
BLU/ORN 14AWG
TAN/GRA 14AWG
GRN 14AWG
GRA 14AWG
ORN/BLU 14AWG
ORN/BRN 14AWG
ORN/GRA 14AWG
ORN/GRN 14AWG
ORN/LT BLU 14AWG
ORN/PUR 14AWG
ORN/RED 14AWG
ORN/VEL 14AWG
ORN/WHT 14AWG
PUR 14AWG
RED/BLK 14AWG
RED/GRA 14AWG
RED/GRN 14AWG
RED/ORN 14AWG
RED/PUR 14AWG
RED/VEL 14AWG
RED/WHT 14AWG
TAN/GRA 14AWG
VEL 14AWG
WHT/BLK 14AWG
WHT/GRA 14AWG
WHT/GRN 14AWG
WHT/ORN 14AWG
WHT/PUR 14AWG
WHT/RED 14AWG
WHT/VEL 14AWG
WHT/WHT 14AWG
PLB/GRA
YEL/RED
BLK/GRA
YEL 14AWG
GENERATOR IGNITION
GENERATOR START
GENERATOR STOP
BLOWER
HORN
BLOWER A
BLOWER B
WINDLASS
ARCH LIGHTS
COCKPIT LIGHTS
INSTRUMENT LIGHTS
NAV/ANC LIGHTS
HELM 12V RECEPT
FUEL TRANSFER
GAS VAPOR DETECTOR
HELM ACCESSORY
HELM ACCESSORY
REMOTE RET
REMOTE
RADIO RET
RADIO
RADIO MEMORY
PORT CABIN SPKR
PORT CABIN SPKR RET
STBD CABIN SPKR
STBD CABIN SPKR RET
PORT COCKPIT SPKR
PORT COCKPIT SPKR RET
STBD COCKPIT SPKR
STBD COCKPIT SPKR RET
CO MONITOR RET
CO MONITOR
PORT CABIN LTS RET
CENTER CABIN LTS RET
STBD CABIN LTS RET
V BERTH LIGHTS
CABIN LIGHTS IN
LOW LEVEL LIGHTS IN
NIGHT LIGHT
AFT CABIN LT RET
SPOTLIGHT
SPOTLIGHT RET
HORN
CO MONITOR
NOT USED
12V RECEPTACLES
REFRIGERATOR
STRIP LT
GALLEY/VBERTH LT
VAC-U-FLUSH
HEAD LIGHT
NIGHT LIGHT
TANK MONITOR
OVERBOARD DIS
SHOWER SUMP
FRESH WATER PUMP
FWD BILGE
V BERTH LTS
NOT USED



348 VISTA AC PANEL WIRING


J01 STEREO REMOTE 4S
J02 STEREO REMOTE 2S
P41 IGNITION SWITCH 9P
J78 GAS VAPOR DETECTOR 2S
P02 GENERATOR 6P
P03 GENERATOR CONTROL 4P
P08 INSTRUMENT POWER 4P
P42 IGNITION SWITCH/AFT SYSTEMS 12P
J11 HELM SYSTEMS 15S
P06 STBD SWITCH 12P
J50 ELECTRONICS ACC 2S
J51 RADAR 2S
J52 GPS 2S
J53 VHF 2S
J12 HELM SYSTEMS 9S
P10 PORT ENGINE
HM01 PORT HOUR METER
P39 PORT TRIM
P40 PORT TRIM
P09 INSTRUMENTS 12P
P20 STBD ENGINE
HM02 STBD HOUR METER
P29 STBD TRIM
P30 PORT TRIM
J45 GRAY WATER SENDER 4S
S13 VBERTH LTS
J75 BATTERY PANEL 2S
J32 WATER LEVEL SENDER 4S
J21 WASTE LEVEL SENDER 4S
J24 GALLEY LIGHT 2S
J25 GALLEY STRIP LT 2S
J31 NIGHT LIGHT 2S
J33 HEAD LIGHT 2S
J30 HEAD LIGHT 2S
J23 HEAD SWITCH 12S
J17 STBD SWITCH 9S
J27 FRESH WATER 2S
J20 SHOWER SUMP 2S
J19 OVERBOARD DISCHARGE 2S
J26 REFRIGERATOR 2S
J22 VAC-U-FLUSH 2S
J89 HEAD VENT 2S
P04 CABIN PANEL 15P
J65 AFT BILGE PUMP 4S
J14 FUEL TRANSFER PUMP 4S
J15 TRIM TAB PUMP
J54 FWD BILGE PUMP 4S
S35 PORT NEUTRAL SAFETY
S36 STBD NEUTRAL SAFETY
J16 FIREBOY 2S
P16 FIREBOY 2P
J77 BLOWER A 2S
J78 BLOWER B 2S
GN01 PORT ENGINE GROUND
GN03 PORT ENGINE GROUND
GN02 STBD ENGINE GROUND
FS01 PORT FUEL SENDER
FF01 PORT FUEL FILL
FS02 STBD FUEL SENDER
FF02 STBD FUEL FILL
DS01 DEPTH SOUNDER CABLE
DEPTH SOUNDER DISPLAY
DEPTH SOUNDER TRANSDUCER
J28 GALLEY RECEPT
J29 TV RECEPT
AT01 PORT ALTERNATOR
CB01 PORT ALTERNATOR
AT02 STBD ALTERNATOR
CB02 STBD ALTERNATOR
RED BANG
RED BANG


J64
CABIN PANEL
15S
PORT CABIN LTS RET
CENTER CABIN LTS RET
STBD CABIN LTS RET
V BERTH LIGHTS
CABIN LIGHTS IN
LOW LEVEL LIGHTS IN
NIGHT LIGHT
LOW LEVEL LIGHTS
AFT CABIN LT RET
SPOTLIGHT
SPOTLIGHT RET
HORN
CO MONITOR
NOT USED
NOT USED
BLK 14AWG
BLK 14AWG
BLK 14AWG
BLU/ORN
ORN/BLK
ORN/LT BLU
BLU/WHT
BLU/BLK
BLK 14AWG
ORN/RED
BLK
WHT/ORN
RED/YEL
PARALLEL SPLICE
P70
CABIN LT
BLK 14AWG
BLU/GRN
P67
FWD AFT CABIN LT
BLK 14AWG
BLU/GRN
P66
AFT AFT CABIN LT
BLK
BLU/GRN
P69
CO MONITOR
BLK
RED/YEL
J53
CENTER CABIN LT
2S
BLK 14AWG
BLU/RED
J54
FWD CABIN LT
2S
BLK 14AWG
BLU/RED
J55
CENTER V-BERTH LT
2S
BLK 14AWG
BLU/ORN
J56
NIGHT LIGHT
2S
BLK 14AWG
BLU/WHT
J50
PORT CABIN LT
2S
BLK 14AWG
BLU/RED 14AWG
J51
GALLEY LT
2S
BLK 14AWG
BLU/RED 14AWG
J52
PORT V-BERTH LT
BLK
BLU/ORN
J68
STBD SWITCH/
DECK SYSTEMS
12S
WINDLASS UP
WINDLASS DOWN
COCKPIT LTS
COCKPIT LTS
NAV LIGHTS
STBD WIPER RUN
STBD WIPER PARK
PORT WIPER RUN
PORT WIPER PARK
ARCH LIGHTS
NAV/ANC LIGHT
NOT USED
RED/BLK
BLK/RED
GRA/TAN
GRA/TAN
GRA/GRN
RED/BLU
RED/LT BLU
RED/ORN
RED/PNK
GRA/ORN
GRA/BLU
RED/BLU
RED/LT BLU
BLK 14AWG
WW01
STBD
WIPER
RED/ORN
RED/PNK
BLK
WW02
PORT
WIPER
J85
HORN
2S
BLK 14AWG
WHT/ORN
BLK 14AWG
GRA/GRN
LT01
PORT NAV LT
BLK 14AWG
GRA/GRN
LT02
STBD NAV LT
J59
WINDLASS
2S
RED/BLK
BLK/RED
WINDLASS UP
WINDLASS DOWN
J65
CABIN LT PANEL
9S
SWITCH LT RET
CABIN LTS IN
CABIN LTS
LOW LEVEL LTS IN
LOW LEVEL LTS
NIGHT LTS
COCKPIT LTS
COCKPIT LTS
COCKPIT LTS OUT
BLK 14AWG
ORN/BLK
BLU/RED
ORN/LT BLU
BLU/BLK
BLU/WHT
GRA/TAN
GRA/TAN
GRA/BRN
J61
STBD CABIN LT
2S
BLK 14AWG
BLU/RED
J62
STBD FWD CABIN LT
2S
BLK 14AWG
BLU/RED
J63
STBD V-BERTH LT
2S
BLK
BLU/ORN
J41
SPOTLIGHT
4S
BLK
ORN/RED
WHT
RET
POWER
DATA
NOT USED
J42
SPOTLIGHT
4S
BLK
ORN/RED
WHT
RET
POWER
DATA
NOT USED
J82
COCKPIT LT
2S
BLK
GRA/BRN
J83
COCKPIT LT
2S
BLK
GRA/BRN
J84
COCKPIT LT
2S
BLK
GRA/BRN
J80
ARCH
4S
GRA/BLU
GRA/ORN
BLK 14AWG
NAV/ANC LT
ARCH LIGHTS
LIGHT RET
NOT USED
WL01
CB26
WINDLASS + 8AWG RED
WL01
TB05
WINDLASS - 8AWG BLK
CB50
CB27
CABIN MAIN 6AWG RED
TB01
TB05
CABIN RET 6AWG BLK

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