

Silverton General Owners Manual  
For Models 1986 – 1999

For warranty information, please contact Silverton Customer Service  
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800-882-9266

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# 1 INTRODUCTION

We appreciate your selection of the Silverton Yacht. We have designed and manufactured this yacht to bring you a strong, safe, attractive yacht that will provide many pleasure-filled years of yachting.

## 1.1 GENERAL INFORMATION

This Owner's Manual together with the equipment manuals will help you operate and maintain your yacht. Please take the time to read this manual and the equipment manuals. Keep them with the yacht in a safe place that is easily accessible.

All Silverton yachts are built in compliance with applicable United States Coast Guard regulations and recommendations. In addition, our yachts comply with the standards developed by the National Marine Manufacturers Association for its Yacht Certification Program.

### *About Your Owner's Manual*

This owner's manual includes descriptions of the yacht's various systems and general information about yacht handling, operation, and maintenance. This manual also includes basic information about operating and maintaining your yacht and its equipment. However, please note that information in this manual only summarizes more detailed information in the equipment manuals. The summaries are intended to be a convenient reference for daily use.

### *Hazard Communication*

This manual uses signal words to call your attention to specific information.



**DANGER** calls attention to immediate hazards that WILL result in severe personal injury or death.



**WARNING** identifies hazards or unsafe practices that COULD result in severe personal injury or death.



**CAUTION** indicates hazards or unsafe practices that COULD result in minor personal injury or product or property damage.

Always observe the hazard signal words! Also, refer to Section 2 for more information about safety.

### *Owner Advisory Statements*

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

**Important:** This is an advisory statement or procedure intended to prevent damage to the equipment or associated components.

**Note:** This is a general advisory statement relating to equipment operation and maintenance procedures. Its intent is to call attention to information more important than normal text.

### *Equipment Manufacturer Manuals*

Silverton purchased various equipment and components from other manufacturers and installed them on your yacht while it was being built. Examples include the engines, pumps, and the generator.

Most OEMs (original equipment manufacturers) have provided operation and maintenance manuals for your yacht's equipment. Although this manual summarizes information from the OEM manuals, it does not replace them. In case of conflicts between the information in this manual and the OEM manuals, the OEM manuals take precedence.

Keep the OEM manuals with your Silverton Owner's Manual in a safe and accessible place. Be sure to pass them along to the new owner if you sell your yacht.

Nearly all OEM equipment has its own limited warranties. Warranty registration cards are in your owner's packet.

**Note:** The OEM manuals take precedence over the Silverton Owner's Manual. If information in the Silverton Owner's Manual differs from that in the OEM manual, follow the information in the OEM manual.

## *Summary of Manual Contents*

Following are summaries of each section of this manual:

### **1 Introduction**

Included in this section is a general information about your yacht and this manual including warranty information, your responsibilities as the owner, laws and regulations, logs and records, and the warranty for your yacht.

### **2 Boating Safety**

This section discusses potential hazards associated with boating, safety recommendations, safety information, and safety practices. It also discusses safety equipment needed to provide a reasonably safe operating environment.

**Note:** For your safety, this manual has specific safety warnings and comments where appropriate. Be sure to read the entire manual.

### **3 Systems**

Here you will find detailed information about your yacht's engines and transmissions, the DC and AC electrical systems and fuel systems needed to operate your boat. This section also discusses the equipment and accessories which make your yachting experience more comfortable.

### **4 Operation**

This section explains what you need to do before, during, and after your boating excursion to make it an enjoyable and safe experience. It also explains what must be done to get your yacht ready for a new boating season.

### **5 Maintenance**

Preventive maintenance is the key to trouble free operation and helps protect your investment. This section explains what you should do to maintain your boat and how to make basic adjustments and repairs. A maintenance chart summarizes maintenance tasks by frequency. Included here are procedures for winterizing and storing your yacht.

### **6 Glossary**

The glossary defines nautical terms and terms associated with your yacht.

## **1.2 WARRANTY INFORMATION**

### ***Silverton Yacht Dealers***

Your Silverton yacht dealer is a trained professional with facilities and resources available to serve you. Your dealer can assist you in servicing your yacht. Bring to his attention any problems you cannot correct using the information in this manual. The selling dealer must also handle all warranty repairs. A copy of the warranty is at the end of this section.

### ***Pre-Delivery Service Record***

Your Silverton yacht was thoroughly inspected before it left the factory. Your dealer also inspected it during the pre-delivery service inspection. Take the time to discuss these inspections, the Silverton yacht warranty, component warranties, and yacht operation with your dealer.

Your Silverton dealer completes the Pre-Delivery Service Record before you take delivery of your yacht. It is the dealer's responsibility to both you and to Silverton to give your yacht a final inspection. The purpose of this inspection is to assure proper adjustment and operation of the entire vessel. Your dealer should provide you with the Pre-Delivery Service Record at the time of delivery. After you and your dealer have signed the form, the original copy, along with your warranty card, is sent to Silverton.

Silverton will not pay warranty costs for items that should have been covered in the pre-delivery service inspection and recorded on the Pre-Delivery Service Record.

### ***Warranty Registration***

All Silverton yachts are shipped to the dealer with a warranty registration form for the yacht. A copy of the warranty is at the end of this section. The warranty card should be filled out with the dealer and returned to Silverton together with signed copies of the Pre Delivery Service Record within 15 days of delivery. Failure to do so may void the warranty.

### ***Warranty Conditions***

To avoid misunderstanding of Silverton's warranty policy, we suggest that you discuss the following with your Silverton yacht dealer.

1. All customer warranty problems must be handled through the selling dealer.

2. Yachts must be returned to the selling dealer for warranty repairs unless other arrangements between the dealer and the customer have been made before delivery. Silverton will not pay travel time or mileage for warranty work.
3. Silverton allows a set hourly rate for labor. If an “outside” service is used for warranty labor, either the owner or the dealer must absorb any difference between what Silverton allows and what the “outside contractor” may charge.
4. Silverton will not assume any responsibility or liability for parts replaced or work done by anyone other than an authorized Silverton dealer without prior authorization from Silverton.
5. Silverton will not warrant items that should have been covered on the pre-delivery service check. See Section 1.4, Pre-Delivery Service Record.
6. Silverton will not be responsible for any problems or inconveniences caused as a result of a defect. Silverton will not be responsible for any losses caused on board for any reason whatsoever.

### ***Second Owner’s Warranty***

Some Silverton yacht owners trade up to a newer or larger yacht before the warranty on their current yacht has expired. Silverton will transfer the remaining warranty on your yacht to its new owner. At the end of this section is a second owner’s warranty letter. Be sure to give this manual and the letter to the new owner.

## ***1.3 OWNER’S RESPONSIBILITIES***

### ***Warranty and Registration***

Silverton service and support does not end when you buy your yacht. Our dealers do everything they can to make sure you are satisfied with your yacht. They cannot accomplish this objective without your assistance. You are responsible for:

- Obtaining state registration or federal documentation.
- Providing and maintaining safety equipment required or recommended by the U.S. Coast Guard.
- Completing all manufacturer warranty registration and procedures.

### ***Boating Instruction Classes***

Silverton strongly supports the work of the United States Coast Guard Auxiliary and the United States Power Squadrons. We urge you to take advantage of the opportunity to attend the instruction classes sponsored by these fine organizations.

Boat safety courses provide owners and operators the opportunity to gain knowledge and experience in a variety of skills:

- Navigation
- Seamanship and boat handling
- Rules of the road
- Knowledge of federal, state, and local regulations
- Weather prediction
- Safety at sea
- Survival in bad weather
- Respect for others on the water
- First aid
- Radio communication
- Distress signals
- Rendering assistance to others
- Use of lifesaving equipment
- Pollution control
- Knowledge of the boat and its systems
- Seaworthiness
- Leaving or approaching a dock or mooring
- Anchoring and weighing anchor
- Beaching the boat and shallow water operation
- Towing and being towed
- Handling mooring lines and tying up
- Procedures for emergencies including fire, flooding, collision, medical emergencies, etc.

### ***Books and Publications***

Silverton recommends that you purchase and read the following:

*Piloting, Seamanship and Small Boat Handling*  
(Chapman)  
Motor Boat And Sailing  
P.O. Box 2319, FDR Station  
New York, NY 10002

*Boatman’s Handbook*  
by Tom Bottomly  
Motor Boat And Sailing  
P.O. Box 2319, FDR Station  
New York, NY 10002

*The Complete Book of Maintenance and Repair*  
by Dave Kendall  
Doubleday and Co.  
Garden City, NY 11530

*Pleasure Boating and Seamanship*  
U.S. Coast Guard Auxiliary  
306 Wilson Road Oaklands  
Newark, DE 19711

## **Records**

Inserted at the end of this section are several records you will find helpful.

Use the **Boat Record** to record all important information about your yacht and its equipment. After your dealer has recorded all the information, remove the record from your Owner's Manual and store in a safe place. Do not keep this form aboard your yacht.

The **Float Plan** provides a record of your destination, departure and return times, yacht 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 yachting season to make sure you have a good supply.

The **Maintenance Log** provides the means to keep maintenance records in one place. Using this log will allow you to track maintenance work completed and to determine when maintenance is required. Your dealer will also find this information helpful. If you decide to sell your yacht, the maintenance record will make your yacht more saleable because it tells prospective buyers that you have taken good care of your yacht.

## **Accident Reports**

No one likes to think about having a boating accident, but boating accidents do happen. You must file an accident report after a boating accident just as you must file an accident report after an automobile accident. A copy of the U.S. Coast Guard Accident Report is included at the end of this section. You can get more copies of the report by calling the U.S. Coast Guard Boating Safety Hotline at 1-800-368-5647.

You must file this report with the U.S. Coast Guard within 48 hours after an accident resulting in one of the following:

- Loss of life
- A person disappears from a vessel under circumstances that indicate death or injury
- Personal injury requiring medical treatment beyond first aid
- Damage to the vessel or property damage
- Complete loss of the vessel

State statutes determine whether you must file an accident report in this case. An accident report must be filed if the damage exceeds a threshold dollar value as established by the state in which the accident occurred. In most states, the threshold is \$100 to \$200. Call the Boating Safety Hotline (800-368-5647) to verify the threshold for a particular state.

For all other accidents, you must file the report within 10 days.

**Note:** State and local agencies may also have accident , reporting requirements. Check with local enforcement agencies or with your local Silverton dealer regarding local requirements.

## **1.4 FIRST CRUISE**

The first cruise is a time for you to get acquainted with your yacht. As its new skipper, you can learn how your yacht operates and handles. Before you go on the first cruise, you should be able to answer "Yes" to the following questions:

- Has your dealer completed the pre-delivery service inspection? Have you and your dealer signed the Pre-Delivery Service Record?
- Have you filled out and mailed all warranty registration cards?
- Have you read and do you understand this owner's manual and the OEM manuals?
- Does your yacht's safety equipment comply with Federal and local regulations?



- Has your yacht been registered with the proper authorities? Does your hull display the proper identification?
- Has your dealer reviewed with you the operation of the yacht and its systems? Has your dealer answered all your questions?

If you have taken care of these preliminary steps, you are ready to take your first cruise. Before you start, give some thought to the cruise itself. Choose a calm day if you can. Take with you only those people who will make up your regular crew (family or friends). Leave guests on the shore so you can concentrate on learning as much as possible about your new yacht. Ask your dealer's sales representative or other knowledgeable member of his staff to come with you.

Follow the procedures in Section 4.2 to fuel your yacht and start its engines. Start out slowly until you get the feel of the yacht and how it handles. Make sure you can read all the gauges. Operate at different speeds. Practice making wide and tight turns. Learn how to maneuver your yacht in tight places.

Be sure to bring paper and pencil with you. Write down questions as soon as you think of them. Don't trust your memory. Later you can discuss these questions with your dealer.

Taking your time on this first cruise will help assure many happy times on future cruises.

EXHIBIT #4  
SAMPLE WARRANTY TRANSFER LETTER

(date)

Mr. John Joyce  
1456 Joy Street  
Sarasota, FL 34266

Dear Mr. Joyce:

Thank you for providing written notice of transfer of ownership. We are pleased you have selected a SILVERTON Yacht and we will make every effort to assure SILVERTON ownership will be a satisfying experience for you.

Based on the information you have provided, we are pleased to notify you of the expiration dates of the limited warranties.

- The limited one year New Boat Warranty expires(d) \_\_\_\_\_ .
- The limited five year Hull Structure Warranty expires(d) \_\_\_\_\_ .

Should you require assistance at any time during ownership, we encourage you to contact your SILVERTON dealer or to call us direct at 1-800-882-9266.

Please confirm the information at the bottom of the page and advise us if any corrections are required.

\_\_\_\_\_  
Customer Service Manager

-----  
Hull No. STN \_\_\_\_\_ Model \_\_\_\_\_ Date of Purchase \_\_\_\_\_

Telephone: (H) \_\_\_\_\_ (B) \_\_\_\_\_

Purchased From: Name: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip: \_\_\_\_\_

(        ) Private Owner                      (        ) Dealer

# BOAT RECORD

The Boat Record is provided to record information about the boat and its components. This record should be filled out by the selling dealer at the time of delivery.

Owner's Name \_\_\_\_\_ Phone \_\_\_\_\_

Address \_\_\_\_\_

Dealer \_\_\_\_\_ Phone \_\_\_\_\_

Address \_\_\_\_\_

Boat Name \_\_\_\_\_ Hull Number \* \_\_\_\_\_

*(\* Hull Identification Number is located on the outside of the transom, on the starboard side, upper corner.)*

Delivery Date \_\_\_\_\_ Registration No. \_\_\_\_\_

Length \_\_\_\_\_ ft Beam \_\_\_\_\_ ft Draft \_\_\_\_\_ ft

Approximate Displacement (lbs) \_\_\_\_\_ Approximate Height Above Waterline \_\_\_\_\_ ft

## DOCKSIDE INFORMATION

Fuel Capacity \_\_\_\_\_ Fuel Type \_\_\_\_\_ Fuel Filter \_\_\_\_\_

Engine Oil Type \_\_\_\_\_ Oil Filter \_\_\_\_\_

Generator Oil Type \_\_\_\_\_ Oil Filter \_\_\_\_\_

Transmission Oil Type \_\_\_\_\_ Water Capacity \_\_\_\_\_

## ENGINE AND TRANSMISSION

Engine Manufacturer \_\_\_\_\_ Model \_\_\_\_\_

Engine Serial No. Port \_\_\_\_\_ Stbd \_\_\_\_\_

Transmission Manufacturer \_\_\_\_\_ Model \_\_\_\_\_

Transmission Serial No. Port \_\_\_\_\_ Stbd \_\_\_\_\_

## GENERATOR

Manufacturer \_\_\_\_\_

Model No. \_\_\_\_\_ Serial No. \_\_\_\_\_

## PROPELLER AND SHAFTS

Propeller Manufacturer \_\_\_\_\_ Model \_\_\_\_\_

No. Blades \_\_\_\_\_ Bore \_\_\_\_\_

Diameter \_\_\_\_\_ ft Pitched \_\_\_\_\_ ft Cupped \_\_\_\_\_ ft

Shaft Length \_\_\_\_\_ Diameter \_\_\_\_\_

## BATTERIES

Battery Manufacturer \_\_\_\_\_ Model \_\_\_\_\_

Rating: Engine \_\_\_\_\_ Generator \_\_\_\_\_

NOTE: The following is provided for your use in recording electronic equipment which you may add to your yacht. All equipment should be recorded so that the information is available in case of repair or for any insurance claim.

**ELECTRONIC EQUIPMENT**

ITEM: \_\_\_\_\_

Manufacturer \_\_\_\_\_

Model No. \_\_\_\_\_ Serial No. \_\_\_\_\_

ITEM: \_\_\_\_\_

Manufacturer \_\_\_\_\_

Model No. \_\_\_\_\_ Serial No. \_\_\_\_\_

ITEM: \_\_\_\_\_

Manufacturer \_\_\_\_\_

Model No. \_\_\_\_\_ Serial No. \_\_\_\_\_

ITEM: \_\_\_\_\_

Manufacturer \_\_\_\_\_

Model No. \_\_\_\_\_ Serial No. \_\_\_\_\_

ITEM: \_\_\_\_\_

Manufacturer \_\_\_\_\_

Model No. \_\_\_\_\_ Serial No. \_\_\_\_\_

ITEM: \_\_\_\_\_

Manufacturer \_\_\_\_\_

Model No. \_\_\_\_\_ Serial No. \_\_\_\_\_

ITEM: \_\_\_\_\_

Manufacturer \_\_\_\_\_

Model No. \_\_\_\_\_ Serial No. \_\_\_\_\_

ITEM: \_\_\_\_\_

Manufacturer \_\_\_\_\_

Model No. \_\_\_\_\_ Serial No. \_\_\_\_\_

ITEM: \_\_\_\_\_

Manufacturer \_\_\_\_\_

Model No. \_\_\_\_\_ Serial No. \_\_\_\_\_

ITEM: \_\_\_\_\_

Manufacturer \_\_\_\_\_

Model No. \_\_\_\_\_ Serial No. \_\_\_\_\_

# FLOAT PLAN

Name of Operator \_\_\_\_\_ Age \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_ Phone \_\_\_\_\_

Yacht Make \_\_\_\_\_ Model \_\_\_\_\_

Length \_\_\_\_\_ Hull Color \_\_\_\_\_ Deck Color \_\_\_\_\_

Registration No. \_\_\_\_\_ Home Port \_\_\_\_\_

Radio Frequencies \_\_\_\_\_

Equipment on Board, PFDs, Flares, Anchor

\_\_\_\_\_  
\_\_\_\_\_

Fuel Capacity \_\_\_\_\_ Water Capacity \_\_\_\_\_

Distinguishing Features \_\_\_\_\_

\_\_\_\_\_

Departed From \_\_\_\_\_

Date \_\_\_\_\_ Time \_\_\_\_\_

Destination \_\_\_\_\_

Stops \_\_\_\_\_

Estimated Arrival: Date \_\_\_\_\_ Time \_\_\_\_\_

Name, age, address, and phone number of other persons on board:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_


# MAINTENANCE LOG

DATE	MAINTENANCE PERFORMED	HOURMETER

# 2 BOATING SAFETY

YOU are responsible for your own safety, as well as the safety of your passengers and your fellow boaters. Remember: "Safe boating is no accident."

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

1. The hazard symbol 
2. A signal word which indicates the severity of the hazard.
3. A concise description of the hazard.
4. The results of ignoring the hazard.
5. Steps for avoiding the hazard.

The three signal words indicating the severity of the hazard are danger, warning, and caution. The meanings they convey are as follows:



**DANGER** calls attention to immediate hazards that WILL result in severe personal injury or death.



**WARNING** identifies hazards or unsafe practices that COULD result in severe personal injury or death.



**CAUTION** indicates hazards or unsafe practices that COULD result in minor personal injury or product or property damage.

## 2.1 SAFETY RECOMMENDATIONS

Yachting safety and the safety of your passengers are your responsibility. You should fully understand and become familiar with the operating procedures and safety precautions in this manual and the other manuals also in the owner's packet before you launch your Silverton yacht.

### Safe Operation

Following is general information about safe operation.

- Keep your yacht and equipment in safe operating condition. Inspect the hull, engine(s), safety equipment and all boating gear regularly.
- Be very careful when fueling your yacht. Be sure you know the capacity of your yacht's fuel tank and the amount of fuel you use when operating at frequently used engine speeds (RPMs). Ask your Silverton dealer about the capacity of your yacht's fuel tank.
- Make sure you have enough fuel on board for anticipated cruising requirements. In general, use 1/3 of your supply to reach your destination and use 1/3 to return. Keep 1/3 in reserve for changes in your plans due to weather or other circumstances.
- Be sure lifesaving and fire extinguishing equipment is on board. This equipment must meet regulatory standards, and it should be noticeable, accessible and in safe operating condition. Your passengers should know where this equipment is and how to use it.
- Keep an eye on the weather. Be aware of possible changing conditions by checking local weather reports before your departure. Monitor strong winds and electrical storms closely.
- Always keep accurate, updated charts of the area on board your yacht.
- Before you leave the port or harbor, file a Float Plan with a family member, relative, friend, or other responsible person ashore.
- Always operate your yacht with care, courtesy and common sense.

- Instruct at least one other passenger aboard in the basic operating procedures in handling your yacht. This person can take over if you unexpectedly become unable to do so.
- Do not allow passengers to ride on parts of your yacht other than designated seating areas.
- Ask all passengers to remain seated while the yacht is in motion.
- Do not use the swim platform or boarding ladder while the engine or engines are running.
- Understand and obey the “Rules of the Road.” Always maintain complete control of your yacht.
- Do not overload or improperly load your yacht.

### ***Safe Boating Courses***

Your 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 BoatU.S. Foundation at 1-800-336-BOAT (2628), or in Virginia 1-800-245-BOAT (2628). For a course schedule in your area you may also contact your local U.S. Coast Guard Auxiliary or Power Squadron Flotilla for the time and place of their next scheduled class.

### ***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 your yacht for compliance with safety standards and required safety equipment. You may voluntarily consent to one of these inspections, and you are allowed time to make corrections without prosecution. Check with the appropriate state agency or the Coast Guard Auxiliary for details.

### ***Rules of the Road***

Navigating a yacht 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.

As a responsible yachtsman, you will comply with the “Rules of the Road,” the marine traffic laws enforced by the U.S. Coast Guard. There are two sets of rules: the United States Inland Navigational Rules and the International Rules. The United States Inland Rules apply to all vessels inside the demarcation lines separating inland and international waters. The Coast Guard publishes the “Rules of the Road” in its publication “Navigational Rules, International-Inland.” You can get a copy from your local U.S. Coast Guard Unit or the United States Coast Guard Headquarters, 1300 E. Street NW, Washington, D.C. 20226.

Other helpful publications available from the U.S. Coast Guard include “Aids to Navigation” (U.S. Coast Guard pamphlet #123), which explains the significance of various lights and buoys; the “Boating Safety Training Manual”; and “Federal Requirements For Recreational Boats.” Check with your local Coast Guard station, your Silverton dealer, or a local marina about navigational aids unique to your area.

If you have a ship-to-shore radio telephone, heed storm warnings and answer any distress calls from other boats. The word “MAYDAY” spoken three times is the international signal of distress. Monitor marine radio channel 16 which is reserved for emergency and safety messages. You can also use this channel to contact the “Coast Guard or other boaters if you have trouble. **Never send a “MAYDAY” message unless there is a serious emergency and you are in need of immediate assistance.**

### ***Drugs and Alcohol***

Drugs and alcohol affect a person’s ability to make sound judgments and react quickly. As a responsible boater, you will refrain from using drugs or alcohol (singly or combined) while operating your yacht. Operation of motorized vessels while under the influence carries a significant penalty. Drugs or alcohol decrease your reaction time, impair your judgement, and inhibit your ability to safely operate your yacht.



## 2.2 SAFETY AFLOAT

### Carbon Monoxide Hazard

#### **▲ DANGER**

**DANGER:** Carbon Monoxide can be harmful or fatal if inhaled. Carbon Monoxide in high concentrations can be fatal in minutes. To prevent excess exposure and reduce the possibility of carbon monoxide accumulation in the cabin of the yacht, ensure adequate ventilation by opening cabin hatches, cabin doors, cabin windows, and side windshield vents to increase air movement.

Carbon monoxide (CO) is a poisonous gas which is odorless and colorless. Burning any fuel containing carbon (for example, gasoline) produces carbon monoxide. Common sources of carbon monoxide include the exhaust from internal combustion engines and open flame devices such as cooking ranges and charcoal grills. Because its weight is about the same as that of air, it can quickly spread throughout a confined space such as the yacht's cabin without the occupants being aware of its presence. It does not rise or fall as do some other gases.

Carbon monoxide inhaled into the lungs combines with the blood to reduce the ability of the blood to carry oxygen. Reducing the oxygen supply to body tissues results in death of the tissue. Carbon monoxide requires the operator's special and immediate attention! Carbon monoxide in high concentrations can be fatal in minutes. However, the effects of exposure to lower concentrations are cumulative, and lower concentrations can be as lethal as high concentrations.

The symptoms of excessive exposure to carbon monoxide concentrations may include watering and itchy eyes, throbbing temples, ringing in the ears, inattentiveness, headache, nausea, dizziness and drowsiness.

Certain health problems (for example, lung disorders or heart problems) and age will increase the effects of carbon monoxide as does consuming alcohol or high concentrations of cigarette smoke.

Many variables can affect carbon monoxide accumulation. Among these are the following:

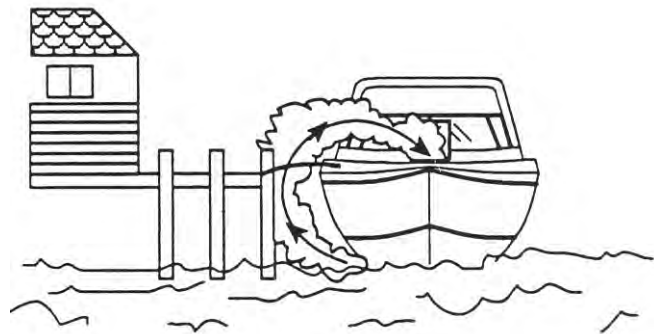
- Yacht layout and configuration
- Location of hatch, window, door and ventilation openings
- Location of structures and other boats
- Wind direction
- Vessel speed

Because this manual cannot identify or describe every possible variable or combination of variables, boat operators must remain aware of the possibility of carbon monoxide accumulation.

The illustrations in **Figures 2-1** through **2-4** show how carbon monoxide can accumulate in your yacht while either at the dock or underway. Become familiar with these examples and their precautions to prevent dangerous accidents from occurring on your yacht.

#### **▲ DANGER**

**DANGER:** Blocked hull exhaust outlets near a pier, dock sea wall bulkhead or any other means can cause excessive accumulation of poisonous carbon monoxide gas within the cabin areas. Make sure hull exhaust outlets are not blocked. (**See Figure 2-1**)



**Figure 2-1 – Blocked Hull Exhaust Outlets**

**▲ DANGER**

**DANGER:** Engine and generator exhaust from other vessels alongside your yacht, while docked or anchored, can emit carbon monoxide and cause excessive accumulation within the cabin and cockpit areas. Be alert for exhaust from other vessels alongside (See Figure 2-2)

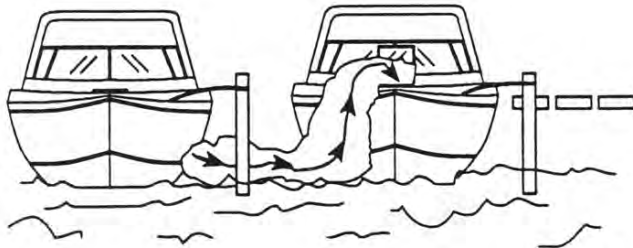


Figure 2-2 – Exhaust From Other Vessels

**▲ DANGER**

**DANGER:** When protective weather coverings are in place, hull exhaust from your yacht while underway can cause excessive accumulation of carbon monoxide within the cabin and cockpit areas. Provide adequate ventilation when the canvas top, side curtains, and/or aft curtains are in place. (See Figure 2-3)

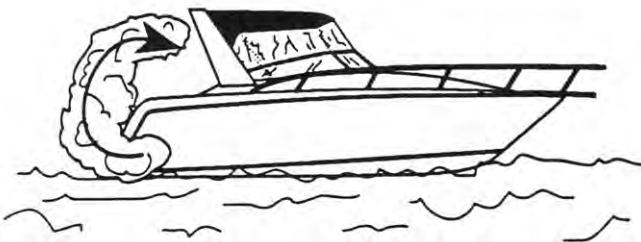


Figure 2-3 – Exhaust With Protective Coverings

**▲ DANGER**

**DANGER:** Engine exhaust from your yacht while underway can cause excessive accumulation of carbon monoxide within the cabin and cockpit areas when operating at slow speed or stopped in the water. Tail wind can increase accumulation (force of wind entering from aft section of yacht). Provide adequate ventilation or slightly increase speed if possible. (See Figure 2-4.)

**▲ DANGER**

**DANGER:** Engine exhaust from your yacht while underway can cause excessive accumulation of carbon monoxide within cabin and cockpit areas or when operating yacht with a high bow angle. Provide adequate ventilation, redistribute the load, or bring yacht out of high bow angle. (See Figure 2-4)

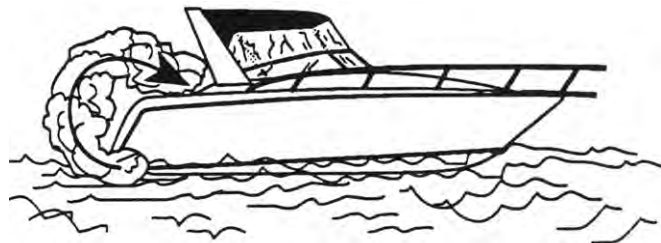


Figure 2-4 – Exhaust Build Up Operating at Slow Speed or High Bow Angle

Be aware of the possibility of carbon monoxide poisoning, Ensure proper ventilation aboard your yacht while underway, as shown in Figure 2-5, Keep it in safe operating condition, Periodically, inspect the hull, engine and engine compartment, and all other equipment and gear.



Figure 2-5 – Proper Ventilation

Once your boat is launched and your excursion is underway, you need to be aware of your surroundings and how they may affect your safety and that of your passengers, No matter how many laws are passed, there is no substitute for good judgment and common sense.

## *Weather*

Storms rarely appear without advance notice. Check the weather forecast before you begin a day of yachting. Be aware, however, that weather conditions can change rapidly. If you have a marine radio, listen to the weather reports issued by the U.S. Coast Guard and others. If you have a portable radio, keep it tuned to a station broadcasting frequent weather reports. Many boating clubs fly weather signals. Learn to recognize these signals, and listen to your local forecasts before leaving port.

Your surroundings can also be a good indicator of changing weather conditions. Watch for changes in wind direction or cloud formations. There is no substitute for a good understanding of weather conditions and what to do when the weather takes a turn for the worse.

## *Fog*

Fog is a result of either warm-surface or cold-surface conditions. You can judge the likelihood of fog formation by periodically measuring the air temperature and dew point temperature. If the difference between these two temperatures is small, fog is likely to develop. Remember the following guidelines:

- Unless your yacht is well equipped with charts, head for shore at the first sign of fog and wait until conditions improve. If you have charts on board, take bearings as fog sets in, mark your position, and continue to log your course and speed.
- Make sure all persons on board have put on their personal flotation devices (PFDs).
- If your yacht has sounding equipment, take soundings regularly and match them with depths shown on your charts.
- Station a person forward in the yacht as a lookout.
- Reduce your speed. From time to time, stop engine(s) and listen for other fog signals.
- Sound the horn or fog bell intermittently to warn others.
- If there is any doubt in continuing your excursion, anchor. Listen for other fog signals while continuing to sound your fog horn or bell.

## *Storms*

The present and forecasted weather conditions are a primary consideration, and the possibility of storms should always be a concern. If storms are a possibility, keep a watch on the horizon, especially to the west, for approaching storms. Monitor the weather forecast on a marine channel or local weather station. The best possible situation is to return to a safe port if time allows.

Other steps to follow to weather the storm include:

- Close portals and hatches and secure them. Stow all loose gear below deck and tie down any gear on deck.
- Reduce speed as the seas build. Make sure all persons on board have put on their personal flotation devices.
- Drop a sea anchor over the stern to maintain the bow into the seas. If you do not have a sea anchor aboard, use a canvas bucket, tackle box, or other object that will work like an anchor.
- Radar reflectors (if installed on your yacht) should be 18 inches diagonally. They should be placed 12 feet above waterline. Otherwise, a yacht with radar may have trouble “seeing” your yacht.

## *Fire*



**DANGER:** A fire aboard your yacht is serious. Explosion is possible. Respond immediately. Develop a fire response plan.

Every boater should develop a fire response plan to determine what kind of fire (fuel, electrical, etc.) might break out, where it might break out, and the best way to react. Having a plan and, if possible, assigning responsibilities to others result in quicker decisions and quicker reactions.

**Important:** Everyone on board should know where fire extinguishers are and how to operate them.

Any fire requires stopping the engine(s) **immediately**. Then:

- If the fire is in the engine compartment, shut off the bilge blower **immediately**.

- **Do not open the hatch to the engine compartment!** The fire will flare up if the fresh air supply increases suddenly.
- Have all persons on board put on their personal floatation devices.
- If you can get at the fire, aim the fire extinguisher at the base of the flames and use a sweeping action to put out the fire.
- If the fire gets out of control, make a distress signal, and call for help on the radio.

Deciding whether to stay with the yacht or abandon ship will be difficult. If the decision is to abandon ship, all persons on board should jump overboard and swim a safe distance away from the burning yacht.



**WARNING:** Smoking, poor maintenance, or carelessness when refueling can cause hazardous conditions. Always follow proper refueling procedures for your yacht.

### *Swamped or Capsized Yacht*

If your yacht becomes swamped or capsizes, put on a PFD immediately and set off a distress signal. Chances are good a capsized yacht will stay afloat. For this reason, stay with the yacht. Do not leave the yacht or try to swim to shore except under extreme conditions. A capsized yacht is easier to see than a swimmer, and the shore may be further away than it appears.

### *Hypothermia*

If a person falls overboard, hypothermia may be an immediate concern. Hypothermia means a person's body loses heat to the water faster than the body can replace it. If not rescued, the person will become exhausted or likely drown. In general, the colder the water, the shorter the time for survival. PFDs will increase survival time because they provide insulation.

Water Temperature (°F)	Exhaustion Unconsciousness	Expected Time of Survival
32.5	Under 15 min	Under 15 to 45 min
32.5-40	15-30 min	30-90 min
40-50	30-60 min	1-3 hr
50-60	1-2 hr	1-6 hr
60-70	2-7 hr	2-40 hr
70-80	3-12 hr	3 hr-Indefinite
Over 80	Indefinite	Indefinite

### *Collision*

If a serious collision occurs, first check the persons on board for injuries. Then inspect the yacht to determine the extent of damage.

- Prepare to help the other craft unless your yacht or its passengers are in danger.
- If the bow of the other boat penetrated your yacht's hull, prepare to plug the fracture once the boats are separated.
- Shore up the hole inside your yacht with a spare life jacket or bunk cushion.
- While plugging the hole, trim weight to get the hole above the water level out of the water during repairs.
- If your yacht is in danger of sinking, have all persons put on their personal floatation devices.
- If your yacht has a radio, contact the U.S. Coast Guard or other rescue authorities immediately (VHF channel 16 or 22 CB radio).

## Running Aground

If your yacht runs aground, check everyone for injury and inspect damages to the yacht or propeller(s). If possible, shift weight of passengers or gear to heel the yacht while reversing engine(s). If towing becomes necessary, do not attach tow line to deck cleats. These are not designed to take full load of the yacht. **Silverton recommends using a commercial towing service.**



**WARNING:** Never attach tow line to deck cleat or anchor windlass. Cleat or windlass may pull free from deck and cause serious personal injury or property damage.

## 2.3 SAFETY EQUIPMENT

**Important:** Federal law requires you to provide and maintain safety equipment on your Silverton yacht. As the yacht owner, you are responsible for supplying all required safety equipment. Consult your Coast Guard, state, and local regulations to ensure your yacht has all required safety equipment on board. Additional equipment may be recommended for your safety and that of your passengers. Make yourself aware of its availability and use.

### *Personal Flotation Devices (PFDs)*

There must be one United States Coast Guard approved wearable personal flotation device of Type I, II, or III for each person on board your yacht. The PFDs must be of a suitable size for each person aboard and must be in serviceable condition and readily accessible. A minimum of three PFDs (two wearable and one throwable) is required regardless of the number of persons on board.

**PFD Type I, Wearable:** This off-shore life jacket has the greatest buoyancy. It is most effective for all waters where rescue may be delayed. Its design allows for turning most unconscious persons in the water from face down position to a vertical or face-up position.

**PFD Type II, Wearable:** This near-shore buoyant vest provides less buoyancy than a Type I PFD. It is intended for calm inland water or waters where there is a chance of quick rescue. It turns its wearer to a face up position as does the Type I PFD, but the turning action is not as pronounced as the Type I, and it will not turn as many persons under the same conditions as a Type I.

**PFD Type III, Wearable:** Classified as a flotation aid, this PFD allows wearers to place themselves in a vertical or face-up position in the water. Type III has the same minimum buoyancy as a Type II PFD. It has little or no turning ability. People participating in water sports often prefer this PFD because it is intended for use in waters where quick rescue is possible and it is generally the most comfortable for continuous wear.

**PFD Type IV, Throwable:** You must also have aboard at least one throw able PFD Type IV device. The Type IV device can be thrown to a person in the water and grasped and held by the user until rescued. The design does not allow it to be worn. The most common Type IV PFDs are buoyant cushions or ring buoys. This PFD must be immediately available for use and in serviceable condition.

### *Fire Extinguishers*

As the yacht owner, you are responsible for making sure you have the required number of fire extinguishers. Fire extinguishers must be approved by the U.S. Coast Guard. Each Coast Guard classification includes foam, carbon dioxide, and chemical fire extinguishers. Below are the requirements for fire extinguishers at the time this manual was prepared.

- Boats longer than 26 feet and shorter than 40 feet: Two Type B-1 or at least one Type B-II portable hand extinguishers. If your boat has a fixed fire extinguishing system approved by the U.S. Coast Guard, one Type B-1 extinguisher is required.
- Boats longer than 40 feet and shorter than 65 feet: Three Type B-1 or one Type B-1 and one Type B-II portable hand extinguishers. If your boat has a fixed fire extinguishing system approved by the U.S. Coast Guard, Two Type B-1 or one Type B II extinguisher is required.

All fire extinguishers should be mounted in a readily accessible location away from the engine compartment. Everyone on board should know where the fire extinguishers are and how to operate them.

If your fire extinguisher has a charge indicator gauge, cold or hot weather may affect the gauge reading. Consult the instruction manual supplied with the fire extinguisher to determine the accuracy of the gauge.

## ***Visual Distress Signals***

The U.S. Coast Guard requires all boats operating on U.S. coastal waters have visual distress signal equipment on board. In general, coastal waters include all waters except rivers, streams, and inland lakes. The Great Lakes are considered coastal waters as is a river mouth more than two miles wide. Boats owned in the United States and operating on the high seas must also carry visual distress signal equipment.

Visual distress equipment must be in serviceable condition and stowed in a readily accessible location. Equipment having a date showing useful service life must be within the specified usage date shown. Both pyrotechnic and non-pyrotechnic equipment must be U.S. Coast Guard approved.

Pyrotechnic U.S. Coast Guard approved visual distress signals and associated equipment include:

- Red flares, hand held or aerial
- Orange smoke, hand held or floating
- Launchers for aerial red meteors or parachute flares

Non-pyrotechnic equipment includes an orange distress flag, dye markers, and an electric distress light.

No single signaling device is ideal under all conditions for all purposes. Consider carrying various types of equipment. Careful selection and proper stowage of visual distress equipment are very important. If young children are frequently aboard, you should select devices with packages which children, but not adults, will find difficult to open.

## ***Sound Signaling Device***

Your Silverton yacht must have a device that can produce a sound signal when conditions require. For boats over 26 feet and under 39 feet, 4 inches, the device must be able to produce a four-second blast which can be heard one-half mile away. It can be hand- or power operated. Refer to the U.S. Coast Guard's publication "Navigational Rules, International-Inland" for details about the appropriate signals.

Boats longer than 39 feet, 4 inches, must have a whistle and a bell. Both these devices must meet the requirements of the Inland Navigational Rules Act of 1980.

## ***Running and Navigation Lights***

Your boat must have running and navigation lights for safe operation after dark. Observe all navigation rules, for meeting and passing. Do not run at high speeds during night operation. Always use common sense and good judgment.

## ***Additional Equipment***

You should consider having additional equipment on board to help make your yachting experience safer and more enjoyable. Some examples include the following:

- Anchor and line
- Boat hook
- Bucket & sponge
- Commonly used spare parts
- Compass, navigational charts
- Distress signal kit
- Docking lines
- Engine and accessory manuals
- Extra keys
- Extra V-belts
- Fenders
- First aid kit
- Flashlight & extra batteries
- Manually operated bilge pump
- Owner's manual
- Replacement light bulbs
- Ship-to-shore radio
- Spare fuel and oil filters
- Spare propeller with fastening hardware
- Spare set of spark plugs and ignition parts
- Tool kit

# 3 SYSTEMS DESCRIPTION

**Note:** If your yacht has inboard/outboard stern drive power, some of the information in Section 3.1 may not be pertinent. You should, however, read this section to become familiar with other aspects of yacht operation. Refer to Section 3.5 for information about stern drives.

## 3.1 ENGINES AND TRANSMISSIONS

This section of the manual summarizes information about the engines. Details about the engines are in the operation and maintenance manuals supplied with the engines by the manufacturer. You are urged to read and become familiar with the engine manual. The life and performance you receive from your engine depends greatly on the way you care for it. Following a sound maintenance schedule will result in many hours of pleasurable boating.

Silverton yachts are equipped with two marine gasoline or diesel engines. Each engine drives a propeller through a transmission and a propeller shaft. The engines are started with controls at the helm using batteries as a power source. Mounted on each engine is an alternator that keeps the batteries charged.

The engines are below the floor of the main cabin. Lifting the center hatch in the salon provides access to the engines for daily inspection. **Figures 3-1** through **3-4** show the various engine configurations.

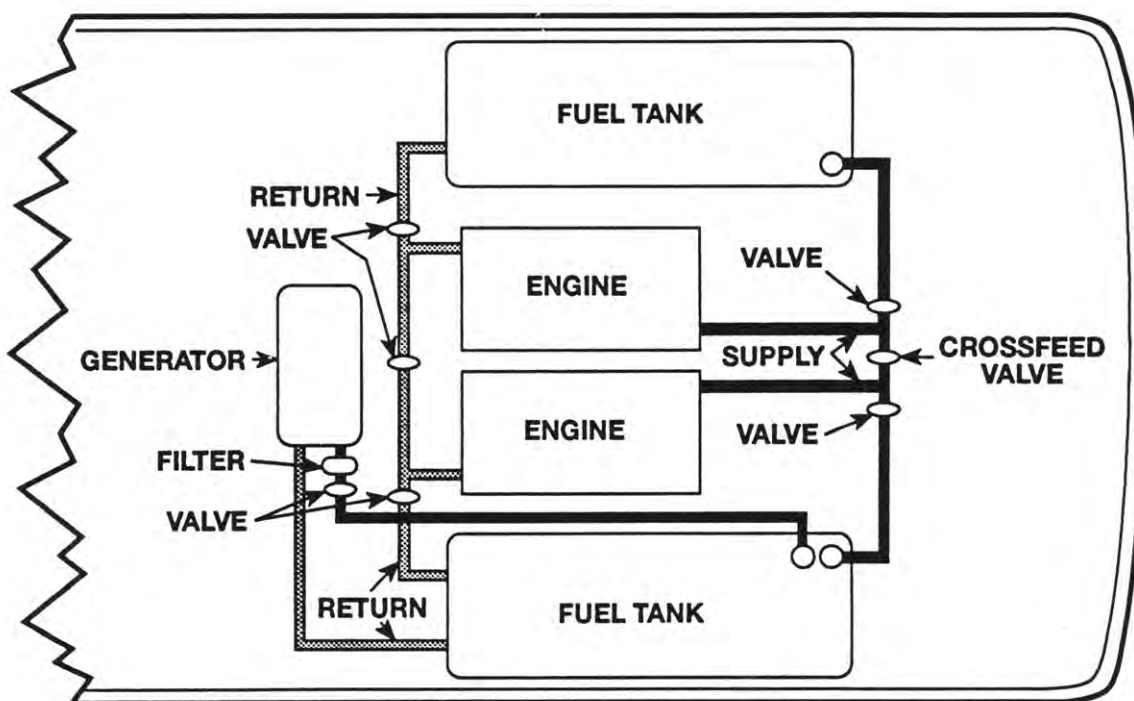


Figure 3-1 - Twin Tank Diesel

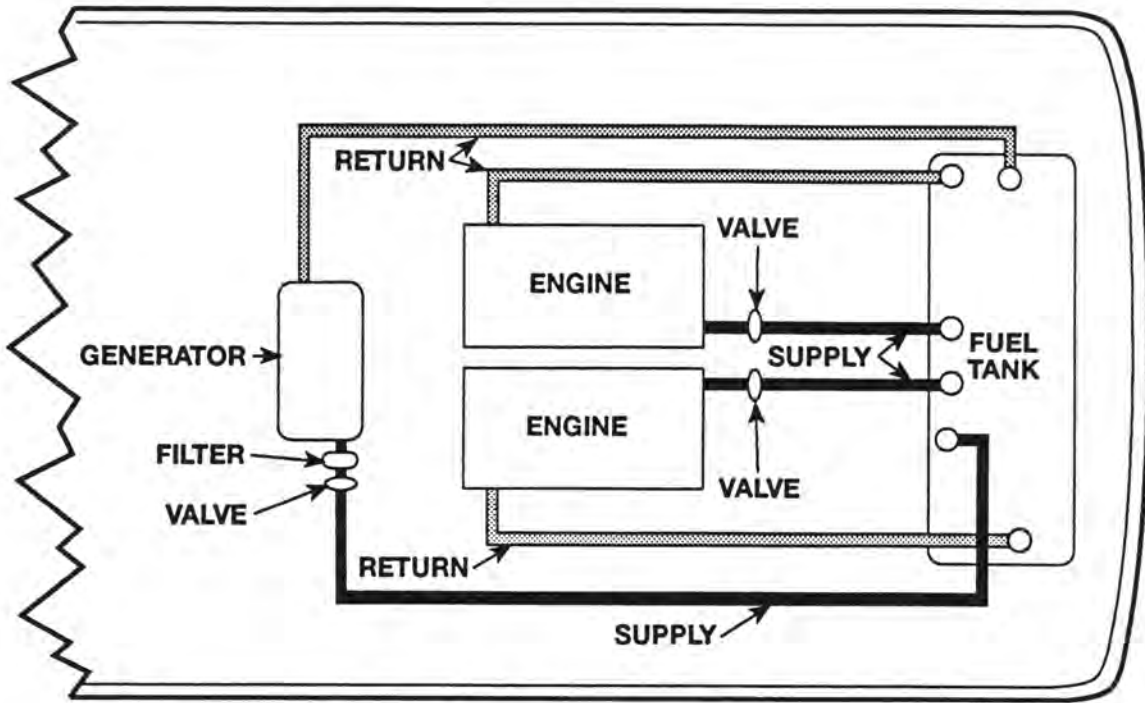


Figure 3-2 - Single Tank Diesel

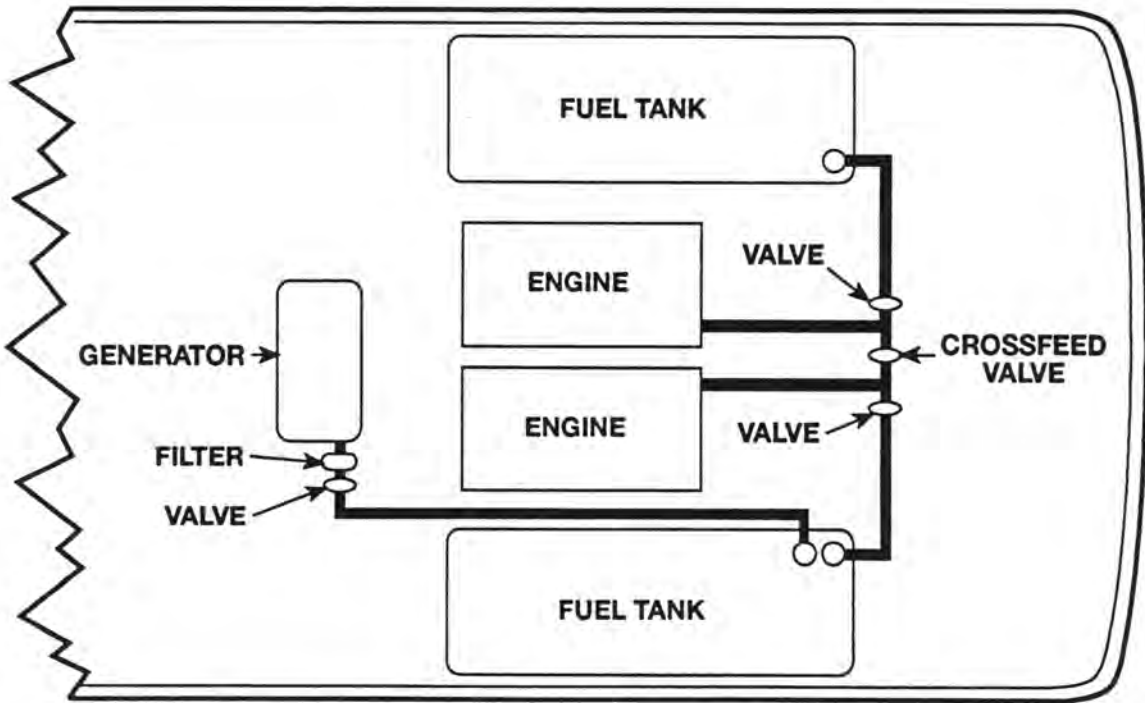
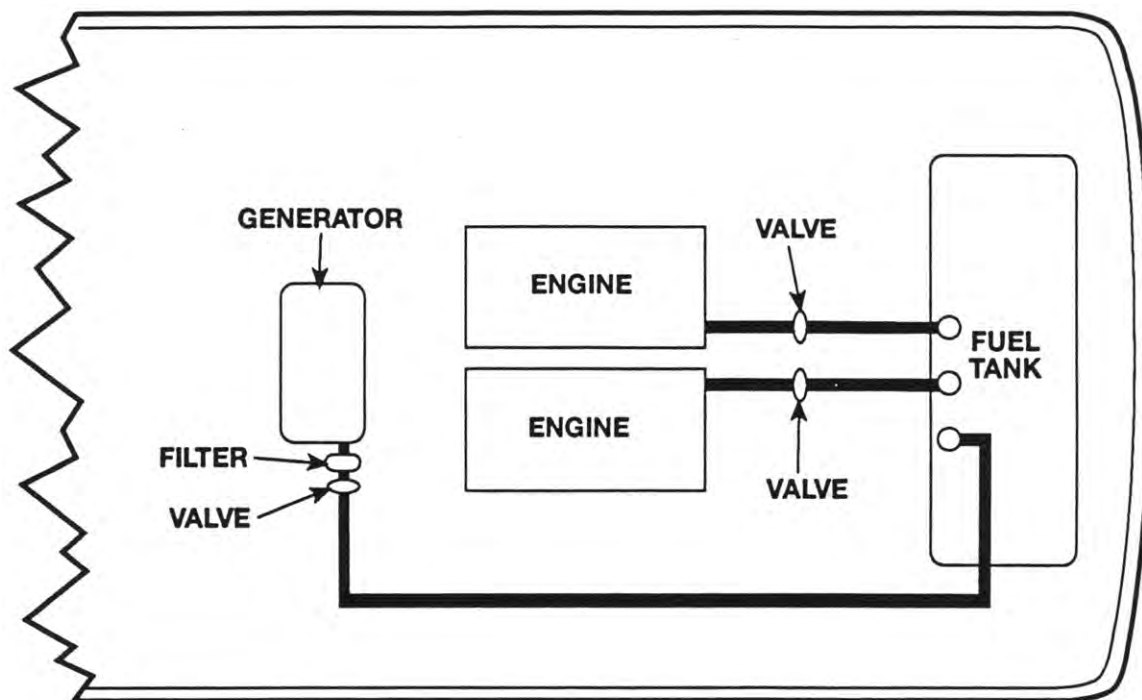


Figure 3-3 - Twin Tank Gas





**Figure 3-4 - Single Tank Gas**

### ***Fuel System***

The fuel system consists of the following:

- Fuel tank or tanks
- Fuel lines and valves
- Fuel filters
- Fuel gauge
- Tank selector switch (on models equipped with two fuel tanks)

### **Fuel Tank**

The fuel tank or tanks are 5052 aluminum with baffles. On models equipped with twin tanks, the starboard tank supplies fuel to the starboard engine; the port tank supplies fuel to the port engine and the generator. Each engine and the generator have separate fuel pickup tubes. Inside the tanks are sending units which provide an electrical signal to the fuel gauge to indicate the fuel level in the tank. Each tank also has a fill fitting on the port and starboard gunwales and a fuel vent. The fill fittings are marked GAS (gasoline engines) or DIESEL (diesel engines).

### **Fuel Shutoff Valves**

Yachts with gasoline engines have a fuel shutoff valve on each supply line for the engine or engines and for the generator. Closing the valve shuts off the fuel supply to the engine or the generator. On twin tank models there is a crossfeed valve between the engine shutoff valves. Opening this valve allows crossfeed from either fuel tank to either engine.

Yachts with diesel engines have fuel supply and return lines for each engine and the generator. Each engine supply line and each engine return line has shutoff valves. The generator has a shutoff valve on only the supply line. On twin tank models, the system has a crossfeed valve between the engine supply shutoff valves and a fuel balancing valve between the return lines to balance the level of fuel in the tanks.

### **Fuel Filters**

Each gasoline engine has a separate fuel filter on the forward inboard side of each engine. The generator has a remote-mounted filter and valve. The filters have replaceable filter elements. Each diesel engine has primary and secondary fuel filters. Refer to the engine owner's manual for information about replacing fuel filters.

### **Fuel Gauge**

The fuel gauge on the command console indicates the amount of fuel remaining in the tank. The gauge is marked in 114 tank increments. **Figure 3-15** on page 3.9 shows a typical location of this gauge.

Note: The fuel gauges have a tolerance for accuracy. Determine your average fuel consumption. Always make sure you have enough fuel.

On models having two tanks, a FUEL selector switch on the helm command console determines the fuel tank to be read on the gauge. The gauge indicates the fuel level in the port tank when you set the switch down. Setting the switch up indicates the fuel level in the starboard tank.

### *Exhaust System*

The exhaust system serves two purposes: It reduces the sound of an operating engine and it keeps water from entering the engine. The exhaust outlet is on the side of your yacht.

**Important:** The engine cooling system sea water is discharged overboard through the exhaust system. With the engine running, check to see if water is being discharged. If water is being discharged, the cooling system is operating properly.

Keep both engines running while underway. If you must shut one engine down, be very careful when slowing down, backing up, or running in a following sea. Under these conditions water can enter the exhaust system and possibly the engine.

### *Cooling System*

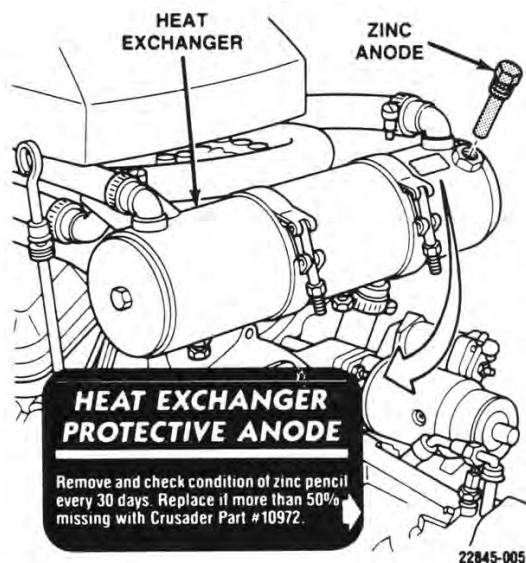
The engines on your yacht are cooled by either a fresh water or a raw water cooling system. Check with your Silverton dealer if you are not sure what type of system is used on your yacht.

#### Fresh Water Cooling System

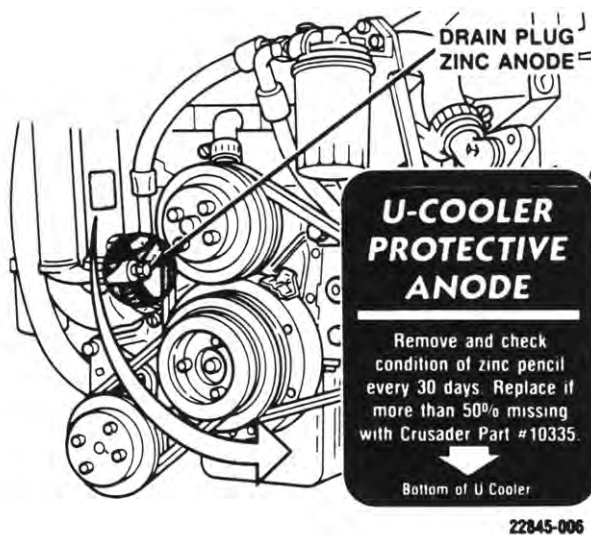
The engines on some yachts have a fresh water cooling system. This is a closed cooling system. This type of system cools the engines by transferring heat from the engines to sea water pumped through a heat exchanger, the same principle as that used to cool automobile engines. (See **Figure 3-5**.) The raw water pump takes in sea water through the sea cocks and circulates through the heat exchanger. The heated sea water is then discharged through the exhaust outlet. Be sure the sea cocks are open before you start the engines.

**Note:** Depending on local conditions, you may wish to install an internal strainer for extra protection. Consult your Silverton dealer for details.

On fresh water cooled engines, zinc anodes are on the raw water side of the heat exchanger and in the bottom of the oil cooler. A decal marks the location of these anodes as shown on **Figures 3-5** and **3-6**. The zinc anodes decompose to prevent engine metals from decomposing. Check the zinc anodes every 30 days and replace them as necessary. Refer to Section 5.0 for additional information.



**Figure 3-5 – Zinc Anode Location on Heat Exchanger**



**Figure 3-6 – Zinc Anode Location on Oil Cooler**

The level of the fresh water coolant can be checked by removing the fill cap on the heat exchanger. (See **Figure 3-7**.) Chemically treating the cooling system “protects the engines by keeping the system free of rust and sludge. Refer to the engine Operation and Maintenance Manual for additional information.

**▲ WARNING**

**WARNING:** Hot coolant under pressure may boil over and cause burns or other personal injury when pressure cap is removed. Allow engine to cool. Open pressure cap slowly to allow pressure to vent before removing cap.

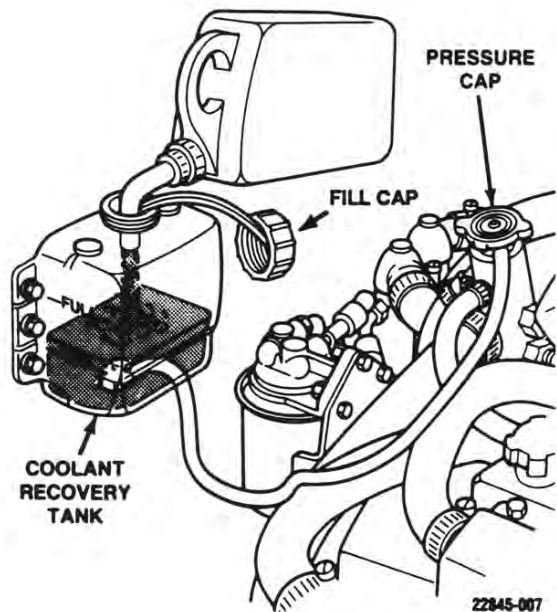


Figure 3-7 – Checking Coolant Level

**Fresh Water Cooling System**

On boats having a raw water cooling system, raw water is taken in through a sea cock. Instead of pumping the water through a heat exchanger, the water pump circulates the raw water directly through the engine cylinder block. The water is then emptied through the exhaust system. If your yacht has this type of system, be sure to monitor engine temperatures closely. If the water intake becomes clogged, the engines will overheat quickly.

**3.2 UNDERWATER GEAR**

**Propeller Shaft and Propellers**

The propeller shaft is made of stainless steel Aquamet which has excellent corrosion resistance and very high strength. The coupling at one end of the shaft is bolted to the transmission. The other end of the shaft is tapered, threaded, and keyed for installation of the propeller.

The propellers supplied with your Silverton yacht have been selected as the best propeller for average usage for your yacht. Consider keeping an extra set

of propellers on your yacht. If the propellers become damaged, you can replace them with the spares and continue your outing. Check with your Silverton dealer if you want to purchase an extra set.

**Note:** You, as the owner, can change propeller sizes to suit other conditions. However, Silverton assumes no liability for damage caused by the change in propeller size .

Each propeller shaft is supported by manganese bronze struts fastened to the bottom of the hull. The struts have replaceable bearings to minimize wear and to protect the shaft at the points where it passes through the strut hubs.

**Shaft Log and Stuffing Box**

The shaft log is a bronze tube inserted in an opening in the bottom of the yacht for the propeller shaft. A short length of flexible hose connects the shaft stuffing box to the shaft log. See Figure 3-8.

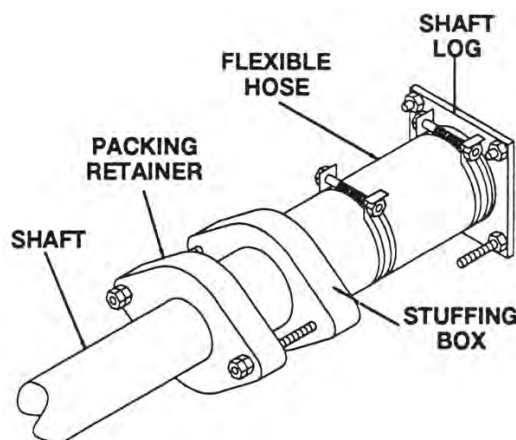


Figure 3-8 – Propeller Shaft Stuffing Box

The stuffing box keeps water from leaking around the shaft into the boat. The stuffing box has a packing gland filled with waxed flax or synthetic fiber rings compressed around the shaft by the packing retainer.

**Important:** Overtightening the packing retainer may score the propeller shaft.

A very slight leak helps lubricate the packing. One drop every 60 seconds is desirable. More than one drop per minute indicates wear caused by the rotating shaft. Tightening the packing retainer slightly will usually stop excessive leakage. If the leakage continues after tightening the retainer, the packing may need replacement. Have your dealer check any persistent excess leakage.

## Alignment

Engine alignment with the propeller shaft is critical for smooth operation of your yacht. Sometimes shaft alignment will change slightly after your yacht is in use. Your dealer should check alignment occasionally, particularly if there is vibration, a drumming sound, or loss of rpm.

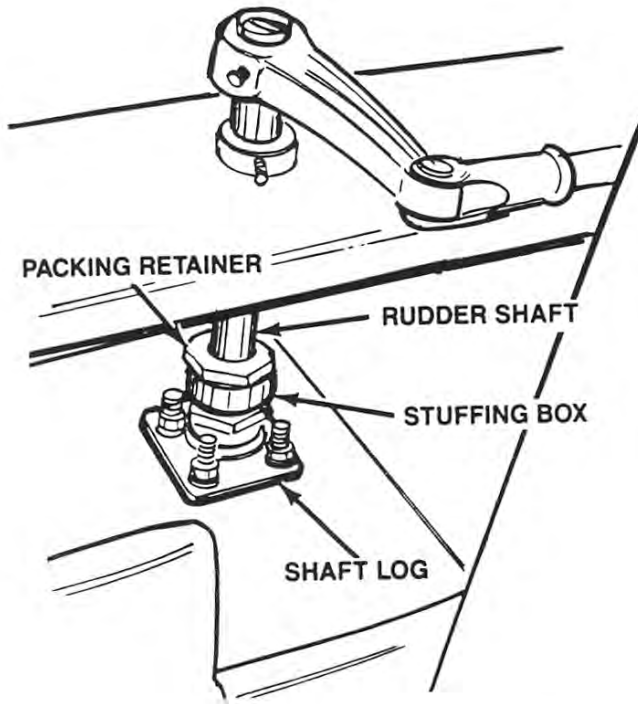


Figure 3-9 – Rudder Shaft Stuffing Box

## Rudders

Your Silverton yacht has dual manganese rudders. (See **Figure 3-9.**) The rudder shaft stuffing box provides an opening through the boat bottom for the rudder shaft. The stuffing box keeps water from leaking around the shaft into the boat. The rudder stuffing boxes are the same as those for the propeller shafts.

**Important:** Overtightening the packing retainer to stop stuffing box leakage may score the rudder shaft.

## Steering

Your Silverton yacht has a modern, manual, hydraulic steering system. The system consists of the “head” pump at the helm, two hydraulic lines (port and starboard), a hydraulic cylinder, linkage attached to the rudders and the cylinder, and the rudders. (See **Figure 3-10.**) The oil reservoir in the head unit was filled when it was installed. It cannot be serviced except by dealer personnel having the correct tools.

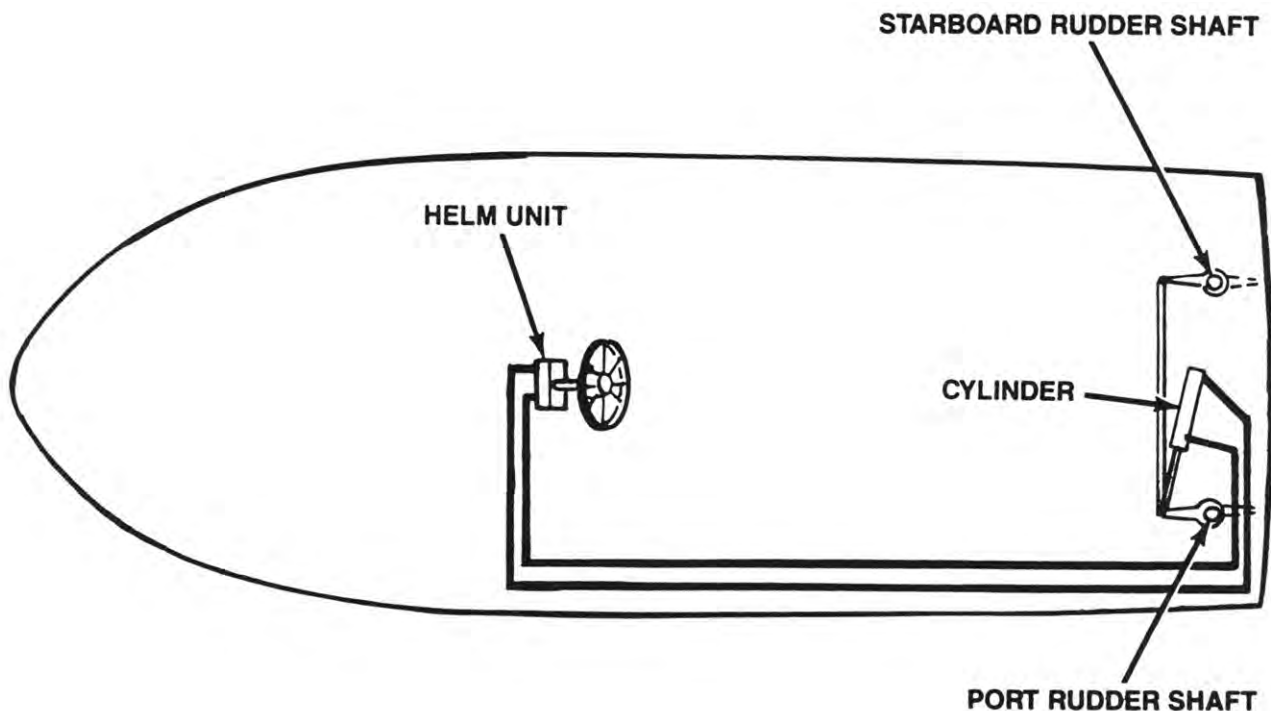
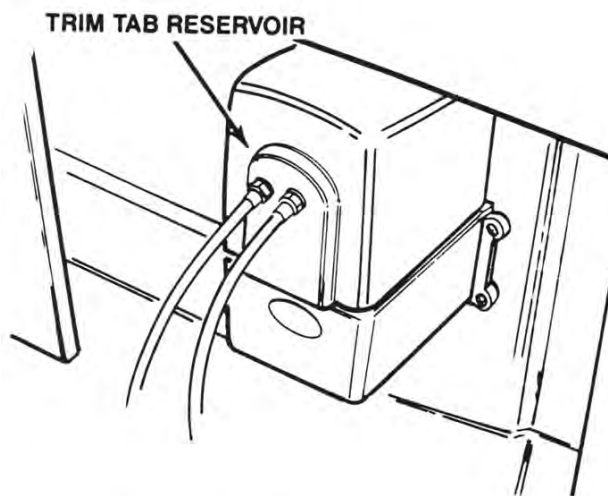


Figure 3-10 – Steering System

## Trim Tabs

Trim tabs are mounted on the port and starboard transom near the water line. Trim refers to the way your yacht floats on the water. For efficient operation, trim your yacht to run at an angle between 4-7 degrees to the water. You can trim your boat by adjusting the single-piston trim tabs to achieve the most efficient planing angle.

A set of switches on the helm command console controls the trim tabs. The switches operate a hydraulic pump in the reservoir under the berth on aft cabin models or under the cockpit on convertible models. (See **Figure 3-11.**) The pump applies hydraulic pressure to operate the pistons attached to the trim tabs.



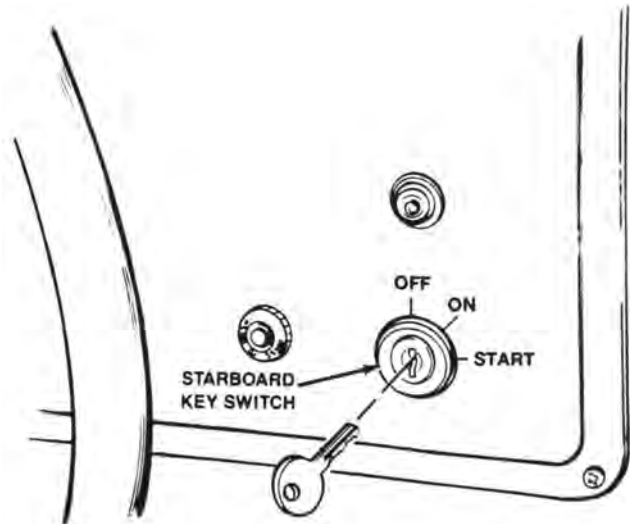
**Figure 3-11– Trim Tab Reservoir**

When you first throttle up, your yacht's trim angle increases and the bow tends to rise. As you continue to accelerate, the planing attitude tends to level out. Use the trim tabs to trim your yacht for ease of handling, and maximum fuel efficiency. If the trim tabs are angled down, they cut into the water as it passes under the hull to force the stem up and the bow down. Trim tabs also compensate for uneven loads in the boat by allowing the operator to trim up one side of the boat or the other.

## 3.3 CONTROLS AND INDICATORS

### Key Switch

The key-operated switches (**Figure 3-12**) on the bridge activate the power to each engine. For yachts with diesel engines, the ON position on the switch provides power to open the fuel shutoff solenoid. Do not leave the key switch turned on when the engine is not running.



**Figure 3-12 – Engine Key Switch**

**Important:** The hourmeter will run if you leave the ignition switch on when the engine is not running. This unnecessarily increases the number of engine hours.

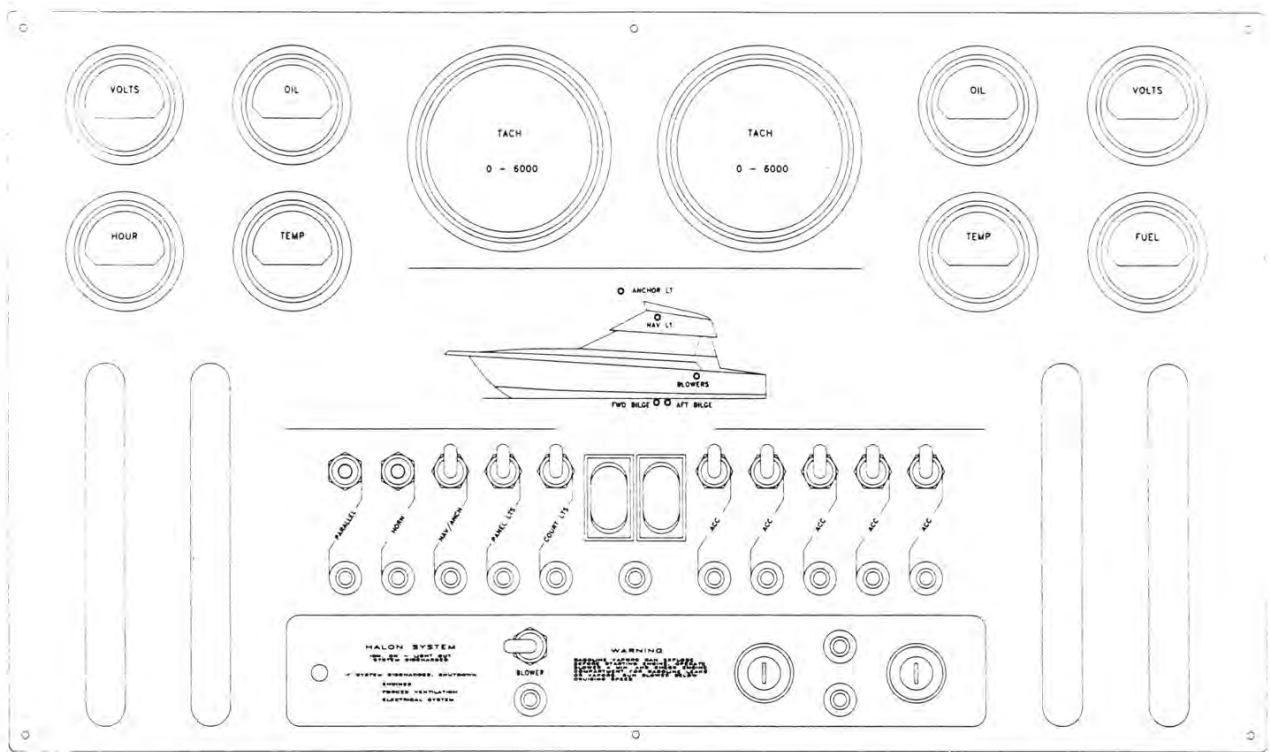
### Parallel Start Switch

On the switch panel is the battery PARALLEL START switch. Activating this switch connects both batteries to the engine during starting in case one battery is low. Moving the switch up energizes the parallel solenoid to start the starboard engine from the port battery. Moving it down energizes the parallel solenoid to start the port engine from the starboard battery.

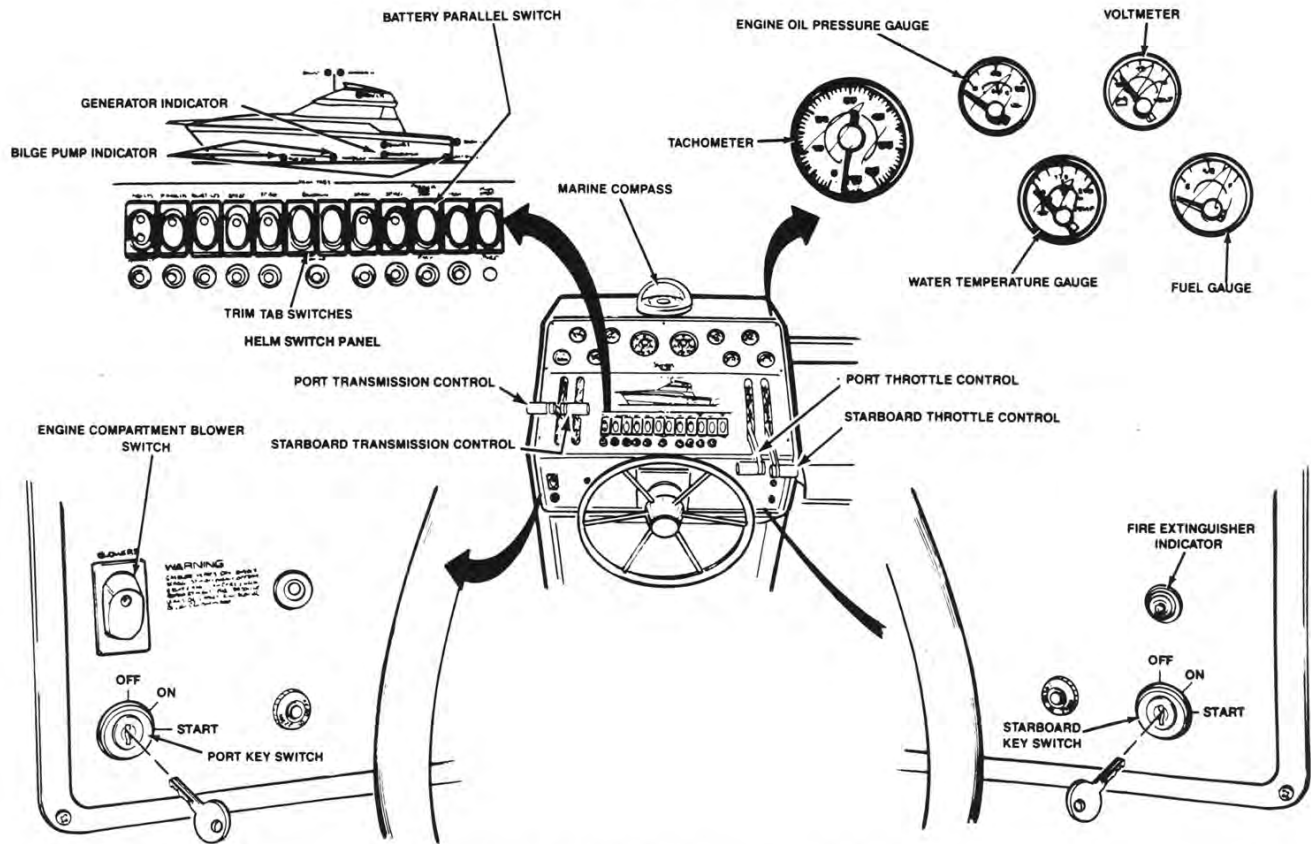
**Figure 3-13** shows a typical location for this switch. The actual location varies by model.

### Throttle Control

The engine throttle control levers are directly to the starboard of the steering wheel as shown on **Figure 3-14**. The lever closest to the wheel controls the port engine; the outside lever controls the starboard engine. Cables and linkage connect each lever to the engine carburetor's throttle valve (on gasoline engine-powered boats) or the fuel



**Figure 3-13 -Typical Helm Switch Panel**



(POSITIONING OF SOME EQUIPMENT MAY VARY BY MODEL)

**Figure 3-14 - Typical Helm Command Console**

distributor (on diesel engine-powered boats). Moving the throttles up will increase the engine's speed by increasing the fuel supply to the engine. Move the throttle slowly and smoothly. Rapid throttle movement can "flood" a gasoline engine and cause it to shut down.

Be careful when you are in the engine room. Stepping on the cables and linkage may cause them to bind. Ordinarily, they require very little adjustment or service after your dealer has adjusted them.

Hard operation of the controls is not normal. At the first sign of difficult or stiff operation, examine the cable and linkage for distortion or misalignment at the control head or the engine end terminals. If you cannot get them to work smoothly, have your dealer service them.

### Engine Instruments

Note: The engine instruments have a tolerance for accuracy. In addition, each engine may operate at differing values at the same RPM. As long as the instruments are reading within the proper operating range, the engine is operating properly.

The engine instruments are on the command console. (See **Figure 3-15.**) The instruments include the following:

- Tachometer indicates engine speed in RPM (revolutions per minute).
- Oil Pressure gauge indicates the pressure of the engine oil. At 2000 RPM, the normal pressure is 30- 50 psi for gas engines or 35-70 psi for diesel engines.
- Engine Coolant Temperature gauge indicates the

temperature of the engine coolant. The normal operating temperature is 170°F for gas engines with fresh water cooling or 140°F with raw water cooling. The normal temperature for diesel engines is between 175° and 190°F for diesel engines.

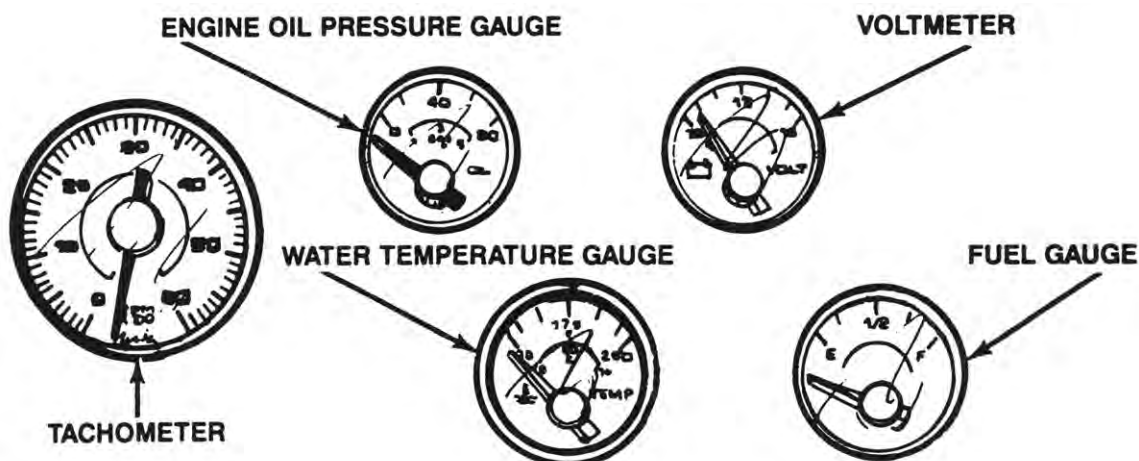
- Engine Hourmeter records engine operating time in hours.
- Voltmeter indicates battery condition when the engines are not running and battery charging voltage when the engines are running. Readings below 11 volts indicate a poor battery charge or heavy load on the battery. (A heavy load means that many systems and components are operating off the battery.) If you do not plan to use your yacht for a time, keep the battery on charge to avoid having the load drain the battery.

Readings between 12 and 14 volts indicate that the condition of the battery is good. Readings above 14 volts are normal when you have increased engine speed. If this high reading continues for more than 15 minutes, have your dealer check the regulator.

### Engine Alarm System

An alarm system protects each engine. The system monitors oil pressure and water temperature and sounds a buzzer if the oil pressure drops below or the water temperature rises above preset limits.

The buzzer sounds when you start the engine and then stops when the oil pressure reaches a proper level. Sounding the buzzer at engine startup indicates that the engine alarm is operating. Shut down the engines immediately if the buzzer sounds at any other time. Check the engine and determine the cause for the alarm. Correct the problem before restarting.



**Figure 3-15 - Engine Instruments**

**Important:** If the alarm buzzer continues to sound after the engine has been running for several seconds, stop the engine immediately to prevent engine damage. Determine and correct the cause of the alarm before restarting the engine.

### *Transmission*

The transmission control levers directly to the port side of the steering wheel in the command console control the direction of operation. The lever closest to the wheel controls the starboard engine; the outside lever controls the port transmission.

Each lever has three positions: FORWARD (up), NEUTRAL (center), and REVERSE (down). The neutral position has a detente positioning pin. You can feel the pin drop into the detente when a lever is in exact neutral. A safety switch allows you to start the engine only when the lever is in the neutral position.

Once in a while, an engine may not start even if the lever is in neutral. The reason may be that the neutral safety switch is slightly out of adjustment. Move the lever up and down slightly over the detente until the starter kicks in. Have your Silverton yacht dealer check the switch as soon as practical.

**Important:** Shift the transmission only when the engine speed is at or below 1000 rpm. Shifting at higher engine speeds could severely damage the yacht, the transmission, and the engine. Allow the transmission to remain in neutral for a few seconds before reversing the rotation of the propeller.

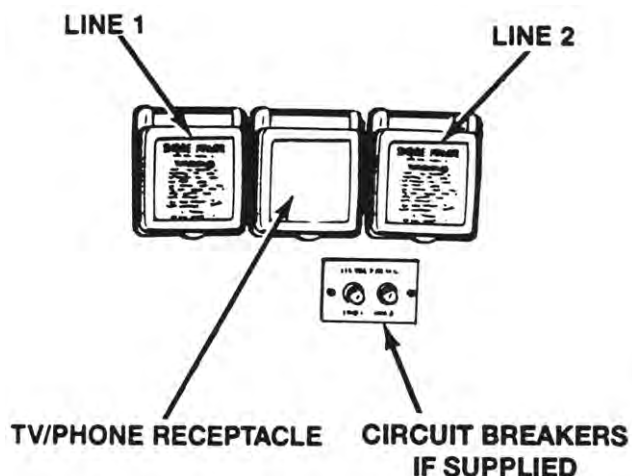
The transmission has a hydraulic sump and pump separate from the engine. Transmission oil level can be checked using the filler cap and dipstick assembly. Refer to the transmission manual for more detailed information.

### **3.4 ELECTRICAL SYSTEM**

Your Silverton yacht has a 12V DC negative ground and a 120V 60 Hz (Hertz) AC electrical system. The DC system is powered by the two engine batteries. The batteries are charged by the alternators on the engines or by a converter (battery charger) powered by 120V AC system from either shore power or the generator. The port battery supplies power to the BATTERY 1 MAIN on the main electrical control panel in the salon. The starboard battery supplies

power to BATTERY 2 MAIN.

The AC (alternating current) system is a three-wire system powered by either the generator or shore power. A 30 amp, 120 V system provides shore power to your yacht. Some yachts have one shore power inlet; others have two, depending on the model and how it is equipped. Each 30 amp shore line provides power on one line in the main electrical control panel. **Figure 3-16** shows two shore power inlets.



**Figure 3-16 – Shore Power Inlets**

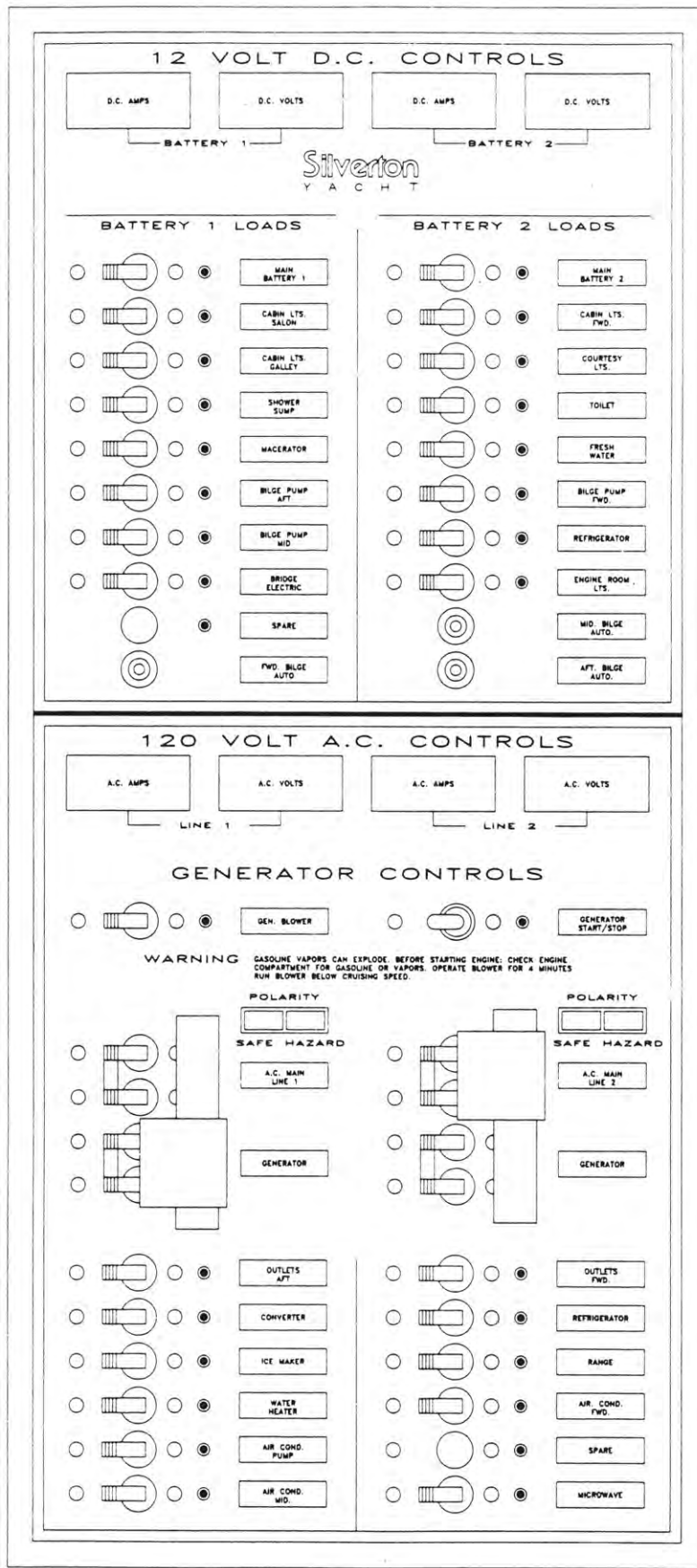
Circuit breakers and fuses on the main electrical control panel protect the AC and DC circuits. The panel is in the salon. **Figure 3-17** shows the layout of this panel on the 41A (aft cabin) and 41C (convertible) models. **Figure 3-18** shows the layout of the panel on all other models. These models may also have the add-on panels shown in **Figures 3-19** and **3-20**, depending on how the boat is equipped.

#### **WARNING**

**WARNING:** Power supplied to main electrical panel can cause injury or death. Before changing fuses, turn off electrical power to panel. Disconnect power from batteries at battery circuit breakers, or turn off shore power if connected.

Behind the electrical panel face is a fuse box which has fuses for the shower sump pump, stereo, and other components. If changing a fuse on this panel is necessary, a key or a screwdriver must be used to unlock the door before swinging it open. Opening this door also provides access to electrical wiring and terminal strips.





**Figure 3-17 - Main Electrical Control Panel**

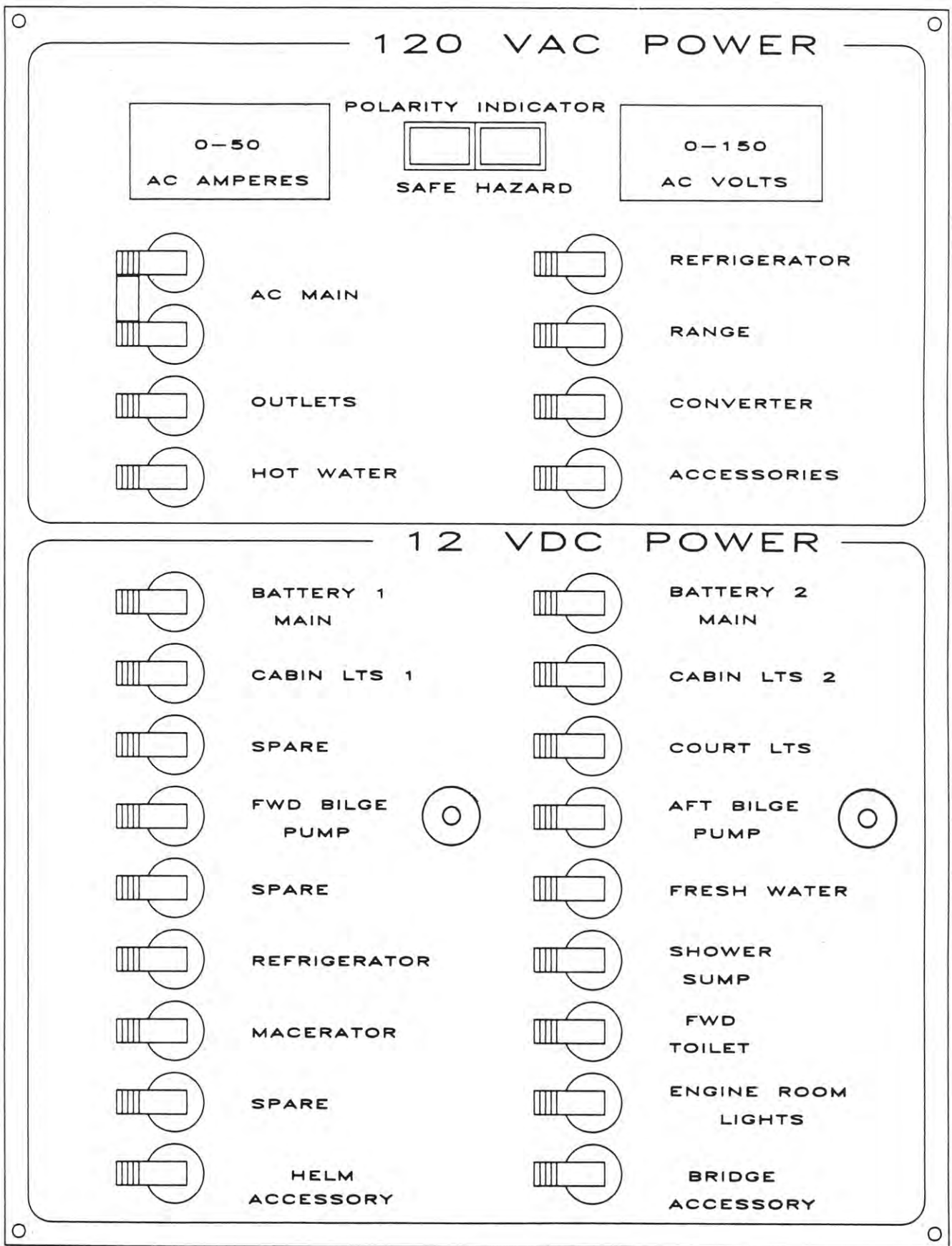
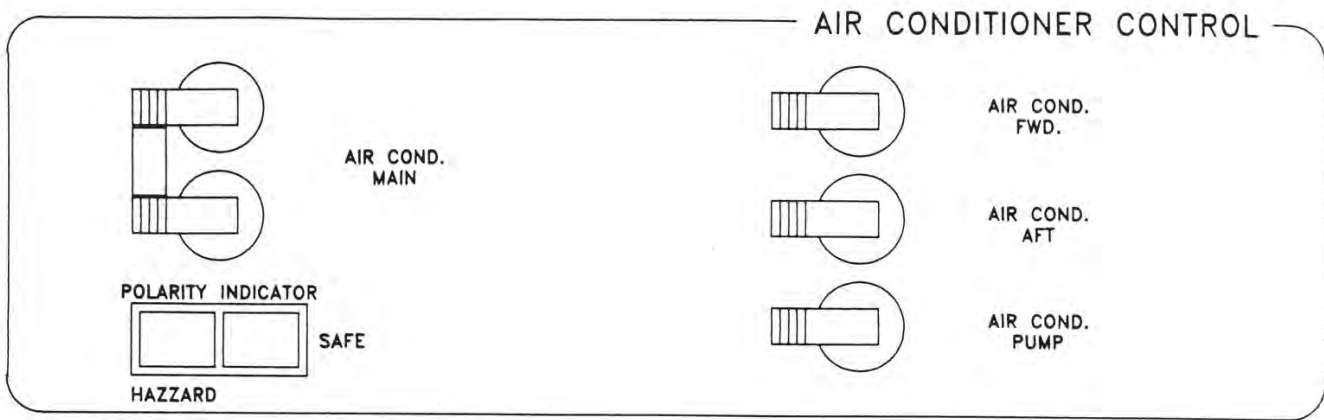
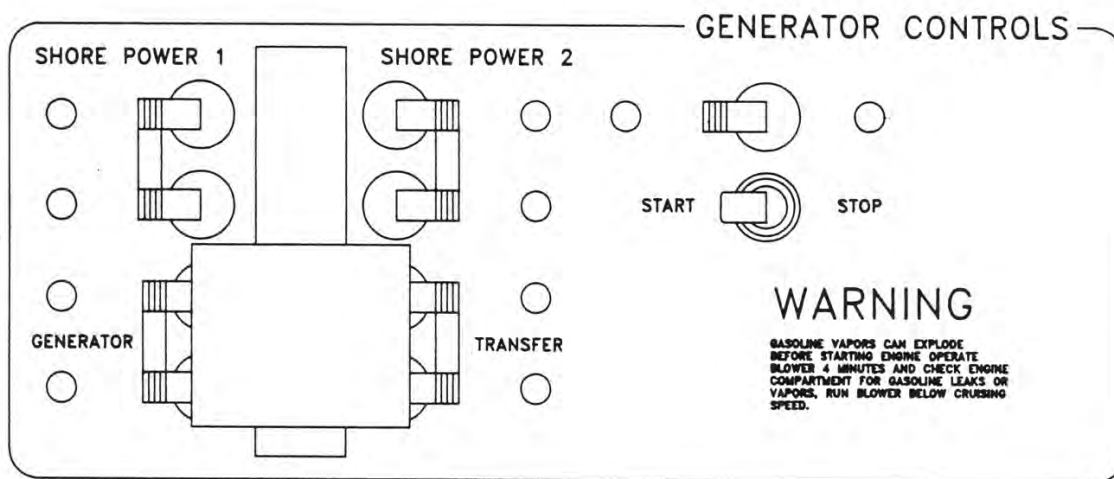


Figure 3-18 - Main Electrical Control Panel



**Figure 3-19 - Optional Air Conditioner Control Panel**



**Figure 3-20 - Optional Generator Control Panel**

### *DC Electrical System*

The 12V DC electrical system installed in your Silverton yacht has been tested at the factory before delivery to your Silverton dealer. The system has color coded appliance grade wiring which is properly secured to prevent accidental damage.



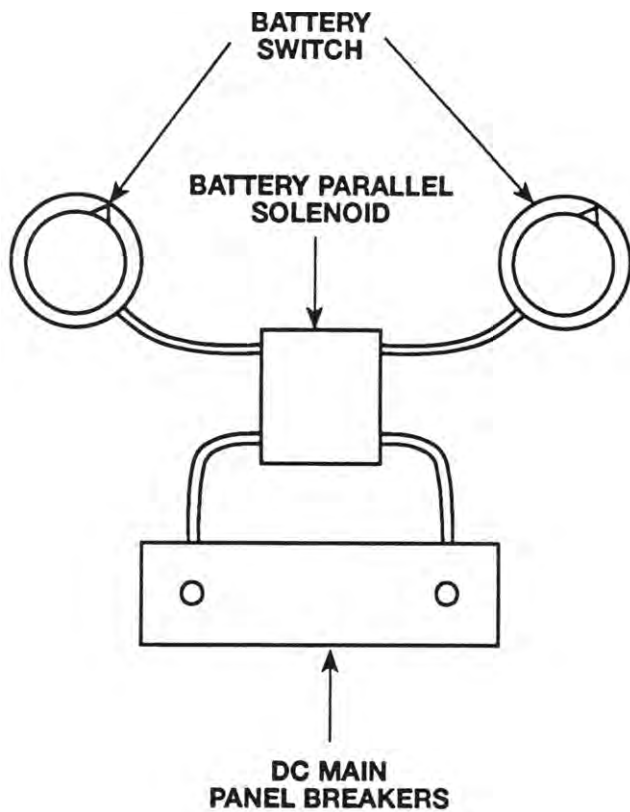
**WARNING:** Alterations or extensions to the electrical system can cause electrical shock or fire. Only competent electricians should make system changes following U.S. Coast Guard regulations.

The DC system derives its power from the batteries which are kept charged by the engine alternator. Your yacht also has a converter which converts 120V AC power from either the generator or shore power into 12V DC power. The converter will also charge the batteries without running the engines.

The batteries supply power to the main electrical control panel in the salon. (See **Figure 3-17** or **3-18**.) From this panel, power is distributed to various items such as the cabin lights, instruments, and accessories.

**Note:** Automatic bilge pumps are wired directly to the battery through circuit breakers in the electrical control panel in the salon.

The batteries are in the engine compartment. Two ignition-protected circuit breakers near the battery switches connect the batteries to the electrical system. (See **Figure 3-21**.)



**Figure 3-21 – Typical Battery Switches**

**Note:** If you wish to have extra batteries installed, be sure that they are certified marine batteries and that they are installed in compliance with U.S. Coast Guard regulations.

The negative terminal of all banks is attached to the grounding stud on the engines. This system, known as a “negative ground system,” is the approved system for marine DC electrical systems. The battery wiring system has two color-coded wires. The black wire is the ground (negative), and the red wire is the positive.

If you add any additional items to the yacht’s electrical system, they must be adaptable to the negative ground system. Before adding items, have your Silverton dealer analyze your yacht’s DC power needs.

**▲ WARNING**

**WARNING:** Fuel fumes in engine room can explode. Before working on electrical wiring, ventilate engine room and disconnect battery cable to prevent sparks.

The current draw and voltage for each battery can be checked on the ammeters and DC voltmeters on the main electrical control panel (if the meters are provided).

**AC Electrical System**

The 120V AC system is a three-wire grounded system. Circuit breakers at the main electrical control panel in the salon protect this system. (See **Figure 3-17**, page 3.11, or **Figure 3-18**, page 3.12.) The circuit breakers at the panel supply power to various 120V appliances and standard outlets. The AC power source is either shore power or the on board generator.

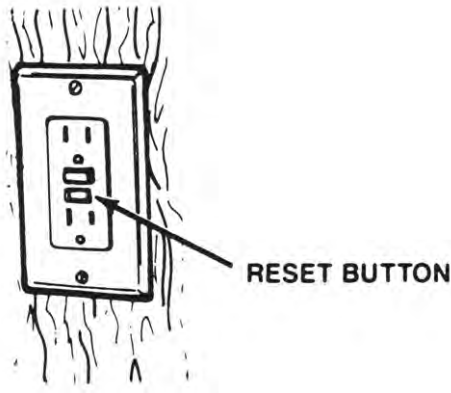
**Note:** The generator is either not available or is available as optional equipment on some models. Shore power is available as standard equipment on all models.

The panel also contains polarity indicating lights. When the green indicator is on, the polarity is correct (SAFE). The red light will illuminate if the polarity is reversed (HAZARD). If the red light is illuminated, immediately disconnect the shore power cable and have a qualified marine electrician correct the problem.

The current draw and voltage for each AC line can be checked on the ammeters and voltmeters at the main electrical panel.

The generator, if the yacht is so equipped, is controlled from the main electrical control panel or a separate plug-in electrical control panel. **Figure 3-17** (page 3.11) and **Figure 3-20** (page 3.13) show the panel options depending on model. The panel has breaker switches for switching from shore power to generator power or vice versa.

A ground fault interruption circuit (GFI) protects all outlet circuits. (See **Figure 3-22**.) This system prevents accidental electrical shock. If power is lost to an outlet, reset the breaker at the GFI outlet.



**Figure 3-22 – GFI Outlet**

Refer to Section 4.0 for operation of the electrical system and the generator and for procedures for connecting the electrical system to shore power.

### **3.5 YACHT EQUIPMENT**

#### ***Marine Compass***

The marine compass shown on **Figure 3-14** (on page 3.8) is a sensitive and very useful instrument. However, instruments or objects containing iron or magnets can affect the compass or impair its usefulness if they are close to it. Wires carrying electric current in the vicinity of the compass can also affect its operation. A newly installed compass must be adjusted to compensate for these influences. Silverton recommends a qualified specialist make the initial and subsequent periodic adjustments.

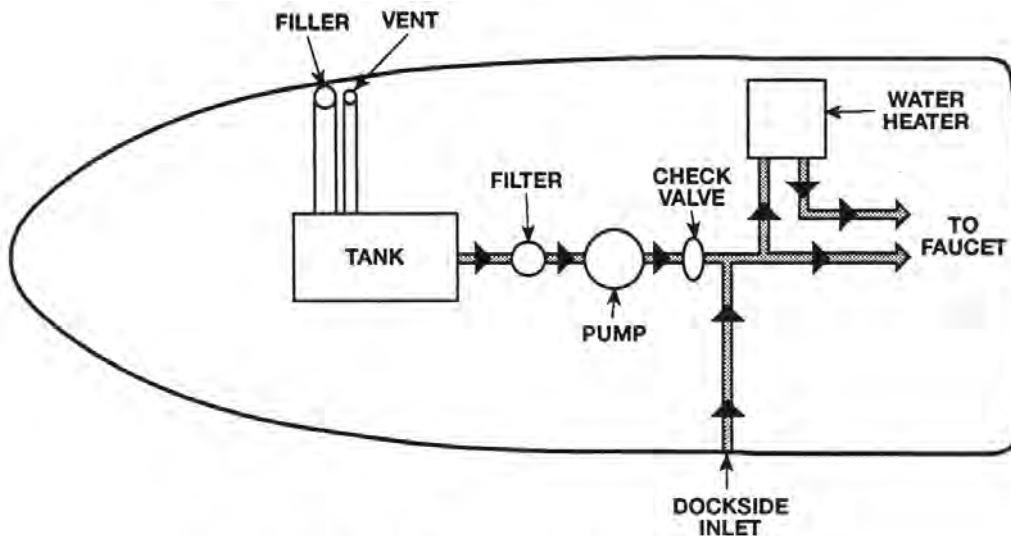
#### ***Fresh Water System***

The fresh water system provides fresh water to various areas of the yacht. **Figure 3-23** shows the fresh water system. The system consists of the following:

- Water tanks
- Fresh water pump with built-in check valve
- Water filter
- Dockside water inlet with pressure regulator and check valve
- Water lines to the water heater, sinks, shower, and (if so equipped) the ice maker in the salon and the cockpit sink

#### **Fresh Water Pump**

The FRESH WATER breaker switch or fuse on the main electrical control panel controls the fresh water pump. When energized, the pump will run until the system is pressurized. The pump pressurizes both the cold and the hot water systems. An automatic pressure switch shuts the pump off until the pressure drops to a preset level (for example, a pressure drop caused by opening a faucet). The tanks and the entire fresh water system should be drained for winterization.



**Insert Figure 3-23 – Typical Fresh Water System**

## Dockside Water Supply



**CAUTION:** Always disconnect dockside water supply when leaving yacht unattended. Major leak or break in system can flood yacht. Excess water in bilge may sink yacht or flood batteries and engine. Warranty does not cover this damage.

A dockside water inlet is located on the exterior of the boat. (See **Figure 3-24.**) Connecting a potable (drinking) water hose from a local water source to this inlet provides water under pressure to the fresh water system without using the pump.



**DOCKSIDE WATER INLET**

**Figure 3-24 – Dockside Water Inlet**

**Important:** Carefully observe your yacht's water system when you use the dockside water hookup the first time. Watch for water leaks. Always disconnect the dockside water supply when you leave your boat unattended. A major leak or break in the system could flood or sink your yacht. Excess water in the bilge may also flood the batteries and engine. Your warranty does not cover this damage!

Dockside water is often from a municipal water supply or similar sources which supplies water at a higher pressure than the yacht's on board system pressure. The pressure regulator on the water inlet reduces the pressure of the dockside supply to match the yacht system's lower pressure. This dockside water does not fill the water tanks. The check valve mounted in the water line ahead of the pump prevents backflow into the tanks.

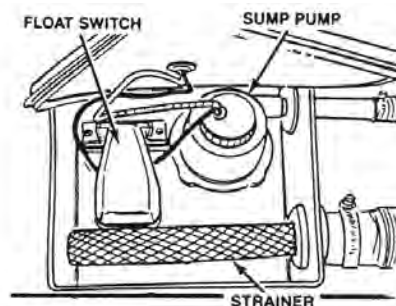
The tanks must be filled through the filler located on the gunwale.

**Important:** Before you fill the water tanks, make sure the dockside water supply is for drinking. Not all dockside water is drinking water. Check with the dockmaster to be sure.

## Shower

**Note:** Some yachts have two showers and two shower sump pumps.

The shower has an automatic sump pump. (See **Figure 3-25.**) The water from the shower drains into an enclosed plastic sump below the shower and at the center of the yacht. Inside the sump is a pump and an automatic float switch. When the water reaches a preset level in the sump, the pump starts and pumps water from the sump directly overboard. The SHOWER PUMP switch on the DC panel controls the operation of this pump. The sump on most models also has a breaker on the panel or a fuse in the fuse box behind the electrical panel.



**Figure 3-25 – Shower Sump**

Both hot and cold water is supplied to the shower. To operate the shower using hot water, either shore or generator power must be available and the FRESH WATER and WATER HEATER breaker switches must be ON. Some models have fuses instead of breakers.

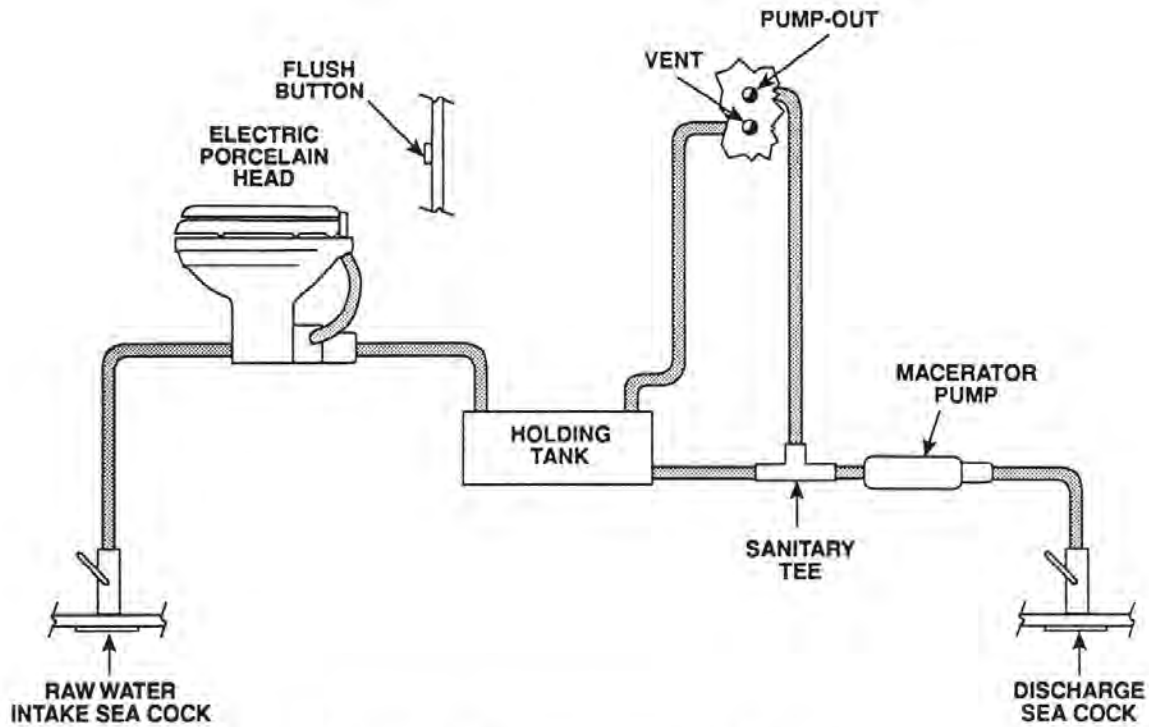
The sump will require periodic cleaning to keep hair and other debris from building up. If the shower does not drain properly, you should check the sump first.

## Water Heater

The water heater is usually in the engine compartment. The fresh water pump supplies water to the heater from the water tanks. Check with your Silverton dealer for the capacity of the water heater installed on your yacht. The water heater operates on the 120V electrical system. The WATER HEATER breaker switch on the AC panel controls the operation of the heater.

**Important:** Before turning the water heater circuit breaker ON, make sure the water heater is full of water. Turning on power to an empty heater could damage the heating elements.

The water heater is equipped with a heat exchanger that may be connected to the engines to provide hot water when the engine is running and away from electrical power. This connection is not provided as standard equipment.



**Figure 3-26 - Typical Marine Sanitary System**

## *Sanitary System*

Your yacht has a toilet, holding tank and macerator.

**Figure 3-28** shows the location of the sanitary system components.

**Note:** **Figure 3-26** shows a typical system. The location of components on your yacht may vary from that shown.

## Toilet

The TOILET breaker switch on the main electrical control panel controls the power supply to the electric toilet. Depressing a push switch near the toilet starts a water pump which brings sea water into the toilet and pumps out the waste to the holding tank. The sea water is taken in through the intake sea cock in the bilge under the floor hatch near the head. (See **Figure 3-27.**)



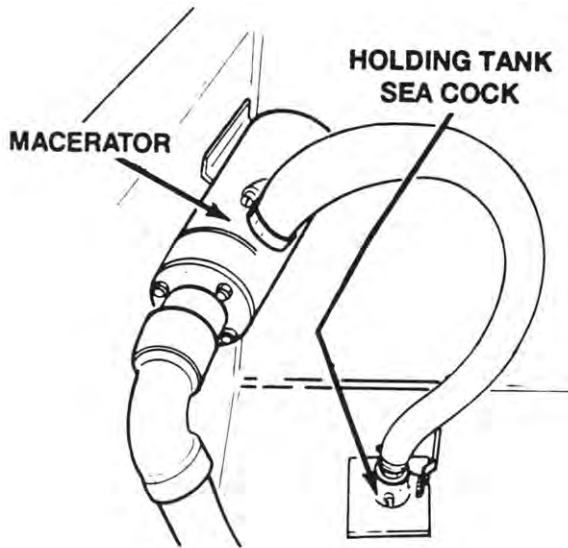
**Figure 3-27 - Toilet Sea Cock**

## Holding Tank

Waste from the toilet is pumped to the holding tank. The holding tank can be emptied either overboard with the macerator (where permitted) or through a dockside pumpout facility connected to the WASTE fitting on the side deck.

## **Macerator**

The MACERATOR circuit breaker switch on the main electrical control panel controls the power supply to the macerator. The macerator pulls the waste from the holding tank, grinds the waste into small particles, and pumps the waste overboard through the sea cock. (See **Figure 3-28.**)



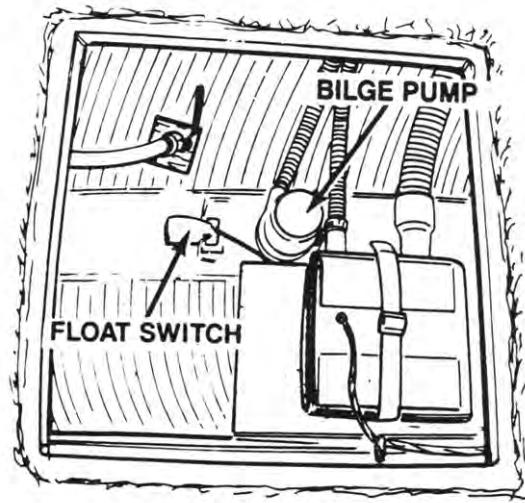
**Figure 3-28 – Macerator and Holding Tank Sea Cock**

**Important:** Discharging waste overboard is in most cases prohibited. Check with the Coast Guard regarding regulations in your area.

## ***Bilge Pumps***

Your yacht will have two or three bilge pumps, depending on yacht model. Yachts having three pumps have one in the forward bilge, one in the engine compartment bilge, and one in the aft bilge. The pumps, which operate automatically, have circuit breakers on the DC panel or fuses in the fuse box behind the panel.

When the water in the bilge reaches a preset level, a float switch at the bilge pump turns the pump on automatically. (See **Figure 3-29.**) The pump runs until the water level reaches preset low level. Some models have indicator lights on the helm command console which light up when the pumps are running. **Figure 3-14** (on page 3.8) shows these indicator lights (if provided).



**Figure 3-29 – Bilge Pump**

The bilge pumps can also be operated manually. For manual operation, set the breaker switches for the pump(s) in the main electrical control panel to ON. On most yachts, these switches are labeled FWD BILGE, MID BILGE, and AFT BILGE. (**Figure 3-17** (page 3.11) or **Figure 3-18** (page 3.12) shows the location of these switches.)

## ***3.6 YACHT ACCESSORIES***

Following is general information about accessories that you may find on your yacht depending on how it is equipped. Always refer to the manufacturer's information or manual for more detailed information.

### ***Entertainment Center***

The entertainment center is in the salon cabinet. It has AC electrical outlets controlled by breaker switches on the main electrical control panel. It also has a dockside cable TV receptacle.

### ***Systems Schematic***

The systems schematic display in the helm command console shows the location and operating status of the bilge pumps, blower, and navigation lights. Red lights in the display illuminate when these items are operating.



## Refrigerator

The refrigerator supplied with your yacht operates off either AC or DC current. The refrigerator can be operated using power supplied from the generator, dockside hookup, or the battery. On the main electrical control panel are a 120V REFRIG AC and a 12V REFRIG DC circuit breaker. A temperature on/off control knob is inside the refrigerator.

## Icemaker

If your yacht has an icemaker, it is controlled by the ICE MAKER circuit breaker switch on the main electrical control panel. Shore power or generator power must be supplied to operate the icemaker. A shutoff valve in the water line to the icemaker controls the water supply to the icemaker.

When the yacht is being winterized and anti-freeze is being added to the water system, be sure to close this valve to keep anti-freeze from reaching the icemaker.

## Dinette

You can use the dinette at mealtime and later convert it into a berth for overnight guests. For safety two people should make the conversion. The method for making the conversion varies depending on the yacht model. If you have any questions, check with your Silverton dealer.

## Sofa

Some Silverton yachts are equipped with a sofa. All sofas convert to a bed. Simply remove the seat cushions and unfold the bottom section.

**Note:** During manufacture, twist ties are installed on the underside of the sofa to keep the sofa from opening accidentally. To remove them, tilt the sofa over on its front and remove the ties.

## Range and Microwave

The range in most models is a two-burner AC electric range controlled by the RANGE breaker switch on the main electrical control panel. The microwave on some models is operated from the refrigerator circuit breaker, otherwise it has its own circuit breaker. Shore or generator power must be available to operate these components.

**Important:** A few models have an alcohol/electric stove. Before using this stove, be sure to read the manufacturer's operating manual to learn how to use this stove correctly.

### ⚠ WARNING

**WARNING:** Alcohol flame is invisible in sunlight. Fueling ignited burner can cause alcohol to explode. Do not light burner unless flame is extinguished and burner is cool. Carefully follow all instructions in owner's manual.

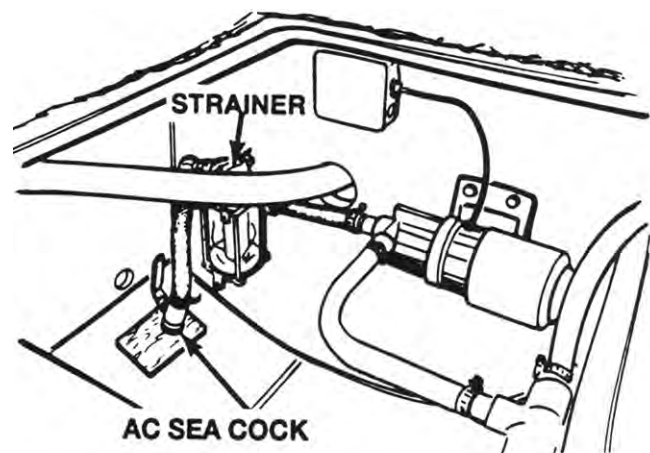
### ⚠ WARNING

**WARNING:** Stove flame consumes oxygen. Suffocation is possible. Ventilate cabin when using alcohol stove.

## Air Conditioning System

Your yacht may have one or more air conditioners, depending on the yacht model. Your Silverton dealer can show you their location. The units are reverse cycle. This type unit can heat or cool your yacht.

The air conditioning system uses sea water for operation. The air conditioning pump takes seawater in through a sea cock and a strainer. (See **Figure 3-30**.) It pumps the water to the system from which it is discharged overboard. The location of the sea cock, strainer and pump varies with yacht model. Ask your Silverton dealer to show you the location of these accessories.



**Figure 3-30 – Typical Air Conditioning Sea Cock, Strainer, and Pump**

Air conditioning units are controlled through breaker switches at the main electrical control panel (**Figure 3-17**, page 3.11) or the optional air conditioning panel (**Figure 3-19**, page 3.13) Some models have a polarity indicator as shown on **Figure 3-19**.

### 3.7 STERN DRIVE UNITS

**Note:** If your yacht has an inboard/outboard stern drive, be sure to read this section. Some of the information about engines and transmissions in Section 3.1 may not be pertinent. For example, the location of the engines is at the rear of your yacht. Neither does it have a propeller shaft, stuffing boxes, or a rudder. Check with your Silverton dealer if you have any questions.

Yachts having an inboard/outboard stern drive use inboard engines as do other Silverton yachts. The engine attaches to a drive unit that resembles the lower half of an outboard. The drive swivels right or left to control the direction of travel. The position of the drive can also be adjusted (up and down or in and out) to trim the yacht while underway.

#### *Trimming Your Yacht*

Trim refers to the way your yacht floats on the water. For efficient operation, your yacht should be trimmed to run at an angle between 4-7 degrees to the water. You can trim your yacht by adjusting the drive unit angle or the trim tabs.

Trimming the drive unit allows you to adjust your yacht to the ideal drive angle for load and water conditions. The drive angle of the boat is the relationship between propeller thrust to the planing surface of the hull's bottom. You can adjust the drive angle while underway by changing the angle of the outdrive in relation to the yacht's transom. It also allows the operator to raise and lower the drive for beaching or operating in shallow water.

**Note:** Refer to your engine owner's manual regarding the operation of the power trim controls installed on your boat.

**Important:** Be very careful when operating with drive unit raised. Severe damage to drive unit may result if unit is raised beyond the gimbal ring support flanges at high engine speeds.

Moving the drive unit in brings the propeller in toward the transom until it reaches its innermost adjustment.

This angle of the propeller causes an upward thrust aft which tends to push the boat's bow down. Shifting the drive unit out from its innermost adjustment produces a downward propeller thrust which tends to lift the bow.

If the drive unit is angled too far out, your yacht will be sluggish in coming to plane. Once on plane, it will tend to porpoise. To correct this motion, move the propeller inward to decrease the angle between the drive shaft and the transom.

If the drive is angled too far in, your yacht may tend to bury its forward section. It will begin to plow and lose speed. If the water is choppy, the yacht may yaw. It can spin out if its bow is excessively buried. Under these conditions, you should increase the angle and swing the drive unit outward.

#### *Checking the Oil Level*

Refer to the engine owner's manual for recommended frequency and procedures for checking the oil level in the stern drive unit.



**CAUTION:** Hot oil in operating stern drive can burn you. Do not remove oil vent plug immediately after using boat. Hot oil expands and flows rapidly from vent plug opening if oil vent plug is removed.

#### *Winterizing the Stern Drive*

Remove stern drive unit. Have your Silverton dealer or other qualified technician check engine alignment and adjust it as required. Inspect all gaskets and seals, grease the U-joints, and change gear oil. Remove propeller. Clean and lubricate the propeller shaft. Repair if necessary. Install new gaskets and seals, and reinstall drive unit.

# 4 OPERATION

Most people buying a Silverton yacht have boat handling knowledge and experience with other types of yachts. This section of the manual provides fundamentals in case a Silverton owner needs the information. Even an experienced yachtsman can benefit from reviewing the basic yachting principles periodically.

## 4.1 ENGINE OPERATION

### Initial (Seasonal) Startup

Silverton suggests that you establish a checklist to be followed every time you start your yacht's engines. A recommended checklist follows. Depending on how often you use your yacht, you may not need to complete some checklist items every time. Refer to the operation and maintenance manuals for the engine and the transmission for detailed startup procedures.

**Important:** Use common sense and good judgment. Remember that you, the owner, are responsible for keeping your yacht in safe operating condition.

Before the initial startup or the first seasonal startup, complete the procedures in this checklist:

1. Make sure all circuit breakers are off.

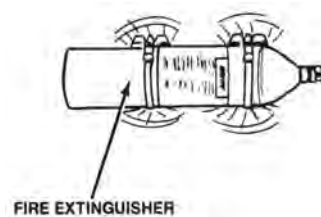
### DANGER

**DANGER:** Fuel leaking from any part of the fuel system can lead to fire and explosion that can cause serious bodily injury or death. Inspect system before starting the engines.

2. Lift up engine access hatch and the fuel tank compartment hatch. Check compartment for smell of fuel fumes. If you detect fuel fumes:
  - a. Evacuate the boat immediately.
  - b. Notify the dockmaster.
  - c. Have a qualified technician check the boat **immediately** to determine the source of the odor.
  - d. If a leak is detected, open all hatches, doors, and ports for natural ventilation. Have leak repaired as soon as possible.

3. If you do not detect fuel fumes, ventilate the yacht by opening all hatches, doors, and ports.
4. Visually check engines and generators for signs of oil leaks.
5. Check bilge for water accumulation. If necessary manually start bilge pumps to pump water out. Locate source of water leakage. (**Figures 3-17 and 3-18** show bilge pump circuit breaker or fuse locations.)
6. Turn on switches listed below at main electrical control panel unless noted otherwise:
  - Both battery switches
  - DC panel main breaker
  - Helm electronics breaker or fuse
  - Helm accessories breaker or fuse
7. Visually check that the fire extinguisher in the engine compartment has not been discharged. (See **Figure 4-1**.)

**Note:** The fire extinguisher indicator light on the helm command console will go out after discharge. Check the and weigh the fire extinguisher once a year to ensure safe operation.



**Figure 4-1 – Fire Extinguisher**

8. Check engine oil level. Refer to the engine manual for instructions. Make sure engine oil level is between lower and upper mark on dipstick.

If an engine needs oil, refer to the engine owner's manual for engine oil type and filling instructions.

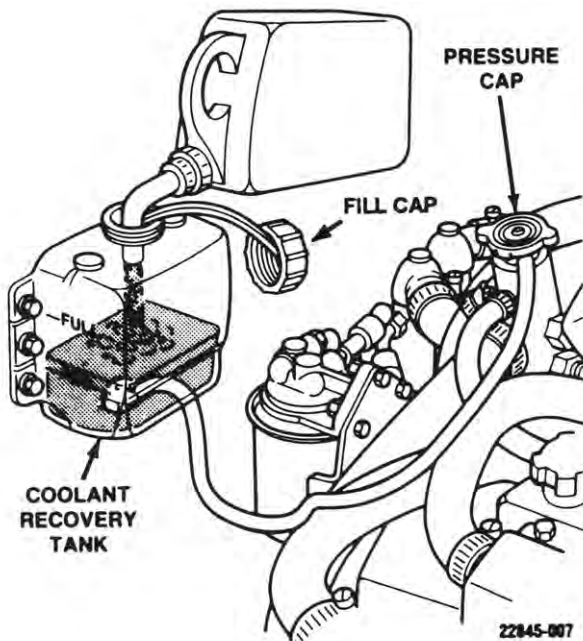
- Check that transmissions have adequate transmission fluid. Pullout dipstick and make sure fluid level shows on dipstick. If fluid level is low, add fluid. Refer to the transmission owner's manual for fluid type and filling instructions.

**Important:** Fluid level should not be at FULL mark! Otherwise transmission fluid will over flow when transmission warms up. Fluid level should be at FULL mark when transmission is at operating temperature.

**WARNING**

**WARNING:** DO NOT remove cooling system filler cap when engine is hot. Allow engine to cool and then remove pressure cap slowly, allowing pressure to vent. Hot coolant under pressure may discharge violently.

- If your yacht has fresh water cooled gasoline engines, remove pressure cap from heat exchanger and check that coolant is up to neck of filler tube. (See **Figure 4-2.**) If cooling system needs filling, refer to the engine owner's manual for details.



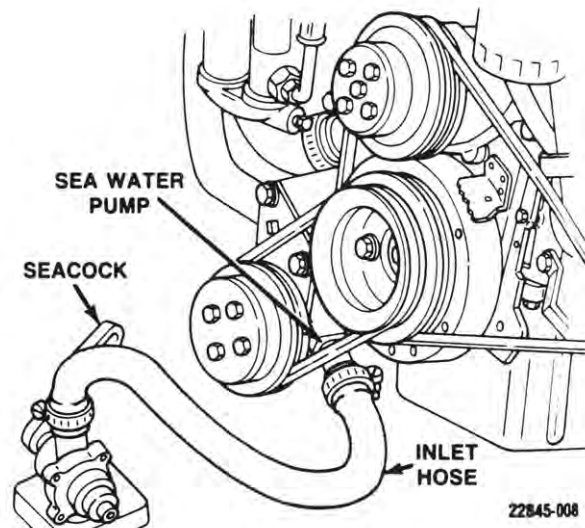
**Figure 4-2 – Checking Coolant Level**

- If your yacht has diesel engines, refer to the engine manual for proper procedures for checking coolant level. If the engine is cold, the fluid level should be at the COLD mark. If cooling system needs filling refer to the owner's manual for information about coolant.

- If your yacht has fresh water cooled gasoline engines, remove the zinc anodes and check their condition.

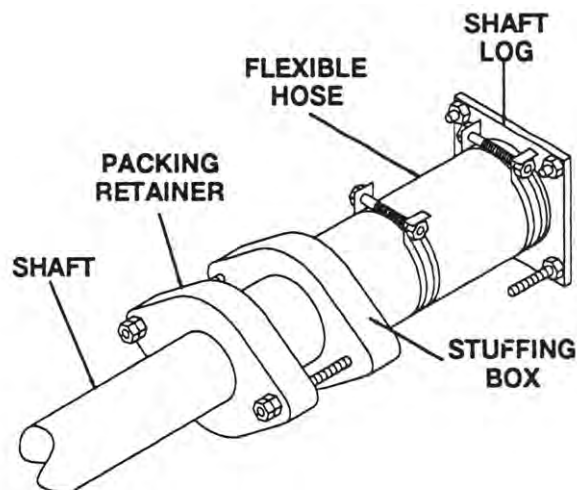
**Important:** This step is important for preventing damage to your engines if engines are being started the first time or if the anodes were not checked at the end of the previous season.

- Open both engine raw water intake valves. Valves are open when handles are in line with hoses. (See **Figure 4-3.**)



**Figure 4-3 – Typical Sea Water Inlet**

- Check that raw water strainers are clean. Clean strainers if necessary.
- Check propeller shaft stuffing boxes. (See **Figure 4-4.**) A slight leak (one drop every 60 seconds) is normal.



**Figure 4-4 – Propeller Shaft Stuffing Box**

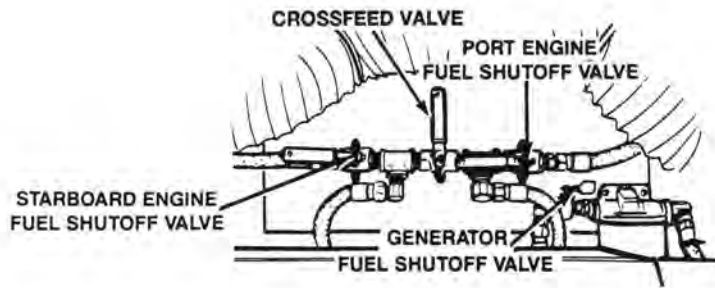


Figure 4-5 – Fuel Shutoff Valves

16. Open fuel shutoff valves for the engines and the generator. (See **Figure 4-5**). Valve is open when handle is in line with hose. (See **Figure 4-6**) If your yacht has a cross feed valve, make sure it is closed.

**Note:** Depending on how your yacht is equipped, valves may be positioned differently than shown in **Figure 4-5**.

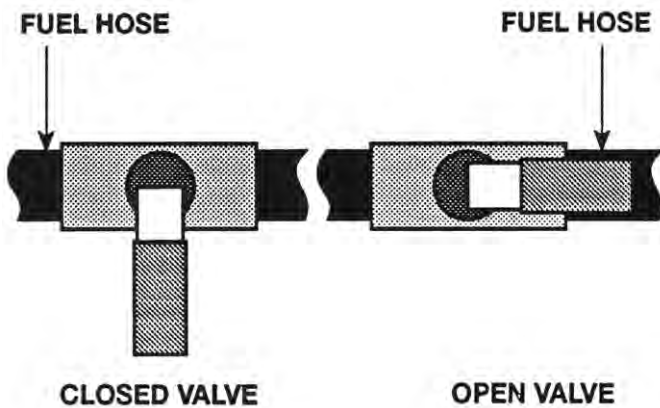


Figure 4-6 – Fuel Valve Position

17. Check the generator oil level on yachts equipped with a generator. See generator manual for instructions. Make sure oil level is in “safe range” as stated in generator manual. If generator needs oil, refer to the generator manual for engine oil type and filling instructions.
18. If your yacht has a generator, check generator coolant level. See generator manual for instructions.
19. If your yacht has a generator, check that generator water strainer is clean. (See **Figure 4-7**.) Clean strainer if necessary. Remove strainer lid and clean out debris.

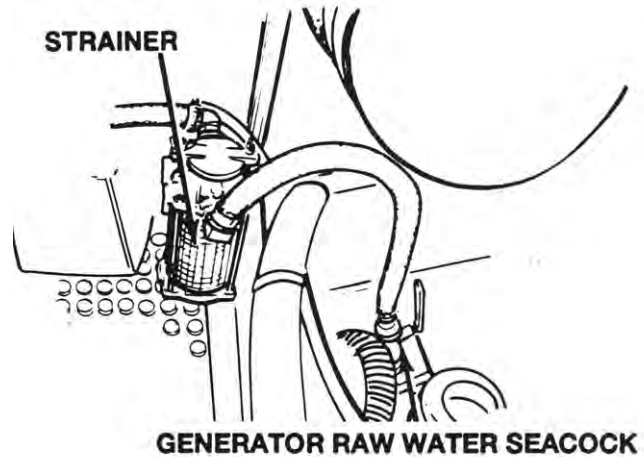


Figure 4-7 – Generator Raw Water Intake Strainer and Valve

20. Check that oil level in trim tab reservoir is between FULL and ADD marks. (See **Figure 4-8**.) Trim tab reservoir is below the cockpit deck on convertible models or under aft bunk on aft cabin models.

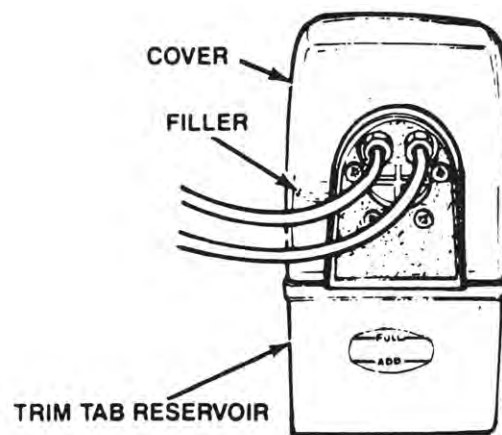


Figure 4-8 –Trim Tab Reservoir

21. Check that all safety equipment in the yacht such as fire extinguishers and personal flotation gear is in its proper place and serviceable.

## Starting the Engines

Follow these procedures whenever you start the engines. (For detailed information about the engines, refer to the engine operation manual.)

**Important:** Always be careful when starting the engines. Use common sense and good judgment. Shut down the engines immediately if you observe any unsafe operating condition.

1. Run bilge blowers for five minutes. Physically check (smell) that there are no fumes in the engine compartment.
2. Place transmission controls in neutral (indicated by detente). Place throttle controls in down position.
3. Turn key switch to ON (not START). (See **Figure 3-14**, page 3.8.) Check that engine alarm buzzer sounds. Check that the fire extinguisher system light is illuminated.

**Important:** When you turn the key switch to ON, the engine alarm buzzer will sound to indicate that the alarm system is working. The alarm should shut off as soon as the engine oil reaches normal operating pressure. If the buzzer does not shut off, stop the engines immediately to prevent damage.

4. Turn key switch to START and hold until engine starts. Release switch as soon as engine starts. (If engine starter does not turn over, neutral safety switch may be out of adjustment. Move the gear shift up and down until starter turns over.)

**Important:** If engine fails to start within 30 seconds, release switch. Allow starter motor to cool for at least 60 seconds. Then try starting the engine again. Prolonged starting attempts may damage starter motor.

**Note:** If you know one battery is dead or low, start the engine connected to the good battery first. Then start the engine with the dead battery using the PARALLEL START switch. Parallel start draws power from both engine batteries.

- a. Press the PARALLEL START switch on the helm switch panel (**Figure 4-9**) while you turn the key to START.
- b. Release both switches when the engine starts.

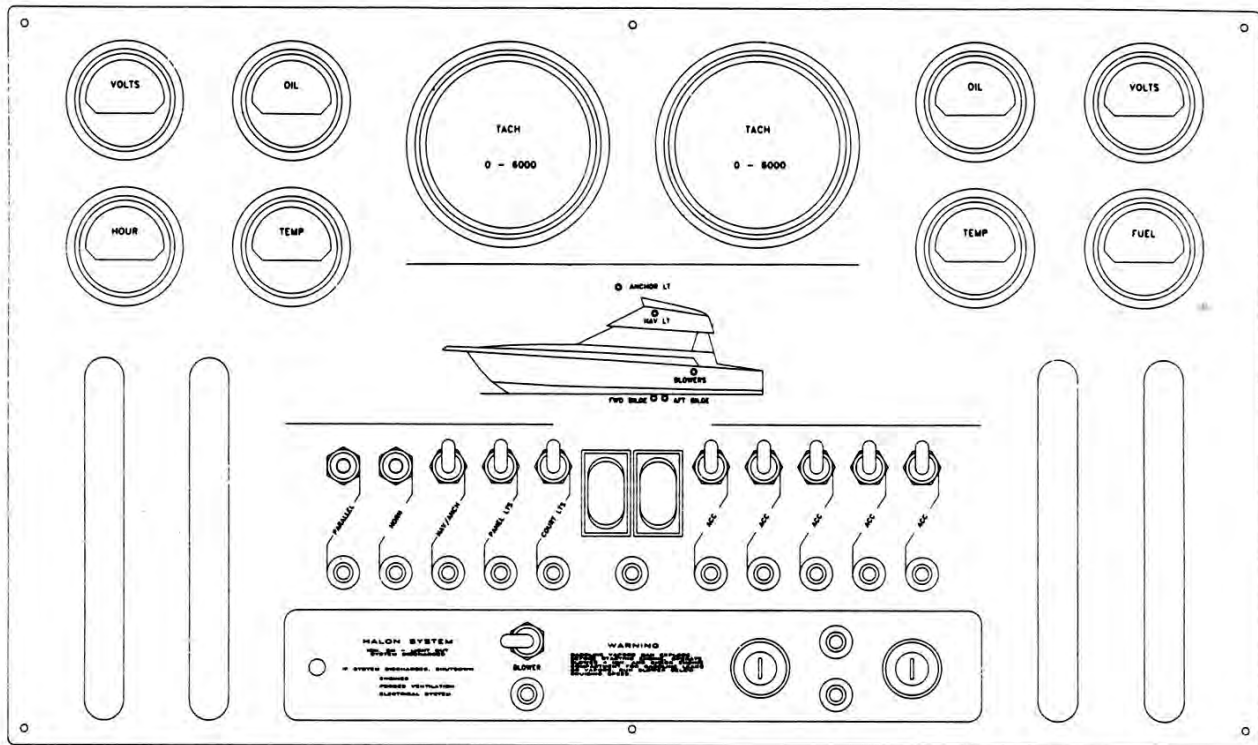
**Important:** Do not hold PARALLEL START switch in when both engines are running. Alternators may be damaged.

5. Check that oil pressure is between 30 and 50 psi (gasoline engines) or 35 and 70 psi (diesel engines). If pressure is low, immediately shutdown the engine.
6. Allow engine to run at or below rpm specified in engine operating manual until engine reaches operating temperature. Normal operating temperature for gasoline engines is 170°F on fresh water cooling systems or 140°F on raw water systems. Normal temperature for diesel engines is between 170°F and 190°F.
7. Check for water coming from the exhaust outlet pipe. This indicates water circulation in the engine cooling system. Water should begin coming from pipe shortly after the engine starts.
8. After engine reaches operating temperature, start other engine following same procedures as for first engine.
9. After engines reach operating temperature, accelerate engines to 2000 rpm. Check that voltmeters read 13 to 14.5 volts.
10. Visually inspect the engine area for fuel, oil, and water leaks.



**DANGER:** Exhaust gases contain carbon monoxide. Carbon monoxide is poisonous and can cause unconsciousness or death. Shut down engines immediately if any exhaust leaks are detected.

11. Visually inspect the exhaust system for leaks. If any leaks are detected, immediately shut down the engines and correct the problem.
12. Check level of transmission fluid after engine is warm. Transmission should be in neutral and engines off. Fluid should be at or close to FULL mark on dipstick. Add fluid if level is low.



**Figure 4-9 – Typical Helm Switch Panel**

### ***Shakedown Run***

Silverton recommends a shakedown run after initial or seasonal startup. This run will test the engines and the yacht under operating conditions. Note any condition which does not meet operating performance standards. Have the problem corrected as soon as you return.

**Important:** If you fuel your yacht before beginning the shakedown cruise, carefully follow the fueling instructions in Section 4.2.

1. Engines: Check that engines operate normally and can obtain maximum RPMs. Check for fuel, oil, and water leaks. Check exhaust system for leaks.
2. Transmissions: Check that transmissions shift properly.
3. Steering: Check that steering responds properly.

4. Trim tabs: Check that trim tabs operate properly.
5. Instruments: Check that all instruments operate properly.
6. Controls: Check that all controls operate properly.
7. Hull: Check for leaks from stuffing boxes, thru-hull fittings, and any other source for potential leakage.
8. Generator (if so equipped): Check that generator starts and operates properly. Check all AC equipment for proper operation.

After completing the shakedown run, recheck all oil levels. Check drive belts for tension. Check for items that may have come loose.

## 4.2 DAILY OPERATION

### Daily Startup

Follow these procedures whenever you start the engines.

**Important:** Always be careful when starting the engines. Use common sense and good judgment. Shut down the engines immediately if you observe any unsafe operating condition.

1. Open and inspect the engine compartment. Sniff for fumes. Check bilge water level. Check for oil in the bilge. Inspect engine compartment for any potential problems.
2. Turn battery switches to ON.
3. At main electrical control panel, turn BATTERY 1 MAIN, BATTERY 2 MAIN, HELM ACCESSORIES, and BRIDGE ELECTRONICS breakers ON. Also turn on breakers for other equipment you may need.
4. Run bilge blowers for five minutes. Check for air flowing out of bilge vent grill. If you feel air flowing, bilge blower is operating properly. Physically check that no fumes are present in the engine compartment.
5. Check engine oil level. Refer to the engine manual for instructions. Make sure engine oil level is between lower and upper mark on dipstick. If engines need oil, refer to the engine owner's manual for details.



**WARNING:** DO NOT remove cooling system filler cap when engine is hot. Allow engine to cool and then remove pressure cap slowly, allowing pressure to vent. Hot coolant under pressure may discharge violently.

6. If your yacht has fresh water cooled gasoline engines, remove pressure cap from heat exchanger and check that coolant is up to neck of filler tube. (See **Figure 4-2** on page 4.2.) If cooling system needs filling, refer to the engine owner's manual for details.
7. If your yacht has diesel engines, check the level of the coolant in the expansion tanks. If the engine is cold, the fluid level should be at the COLD mark.

Refer to the engine owner's manual for information about coolant if cooling system needs filling.

8. Make sure fuel shutoff valves in the fuel lines are open. Valve is open when handle is in line with hose. (See **Figures 4-5** and **4-6**.) If your yacht has a crossfeed valve, make sure it is closed. **Figure 4-10** (page 4.8) shows a crossfeed valve.

**Note:** Depending on how your yacht is equipped, valves may be positioned differently than shown in **Figure 4-5**.

9. Make sure both engine raw water intake valves are open. Valves are open when handles are in line with valve body. Valves are closed when handles are perpendicular to valve body. (See **Figure 4-3**.)
10. Place transmission controls in neutral (indicated by detente). Place throttle controls in down position.
11. Turn key switch to ON (not START). (See **Figure 3-14**, page 3.8.) Check that engine alarm buzzer sounds. Check that fire extinguisher system light is illuminated.

**Important:** When you turn the key switch to ON, the engine alarm buzzer will sound to indicate that the alarm system is working. The alarm should shut off as soon as the engine oil reaches normal operating pressure. If the buzzer does not shut off, stop the engines to prevent damage.

12. Turn key switch to START and hold until engine starts. Release switch as soon as engine starts. (If engine starter does not turn over, neutral safety switch may be out of adjustment. Move the gear shift up and down until starter turns over.)

**Important:** If engine fails to start within 30 seconds, release switch. Allow starter motor to cool for at least 60 seconds. Then try starting the engine again. Prolonged starting attempts may damage starter motor.

**Note:** If you know one battery is dead or low, start the engine connected to the good battery first. Then start the engine with the dead battery using the PARALLEL START switch. Parallel start draws power from both engine batteries.

- a. Press the PARALLEL START switch on the helm switch panel while you turn the key to START.



- b. Release both switches when the engine starts.

**Important:** Do not hold PARALLEL START switch in when both engines are running. Alternators may be damaged.

13. Check that oil pressure is between 30 and 50 psi (gasoline engines) or 35 and 70 psi (diesel engines). If pressure is low, immediately shut down the engine.
14. Allow engine to run at rpm specified in the engine owner's manual until engine reaches operating temperature. Normal operating temperature for gasoline engines is 170°F on fresh water cooling systems or 140°F on raw water systems. Normal temperature for diesel engines is between 170°F and 190°F.
15. Check for water coming from the exhaust outlet pipe. This indicates water circulation in the engine cooling system. Water should begin coming from pipe shortly after the engine starts.
16. After engine reaches operating temperature, start other engine following same procedures as for first engine.
17. After engines reach operating temperature, accelerate engines to 2000 rpm. Check that voltmeters read 13 to 14.5 volts.
18. Visually inspect the engine area for fuel, oil, and water leaks.

 **WARNING**

**WARNING:** Exhaust gases contain carbon monoxide. Carbon monoxide is poisonous and can cause unconsciousness or death. Shut down engines immediately if any exhaust leaks are detected.

19. Visually inspect the exhaust system for leaks. If any leaks are detected, immediately shut down the engines and correct the problem.
20. Check level of transmission fluid. Transmission should be in neutral and engines running at idle. Fluid should be at or close to FULL mark on dipstick. Add fluid if level is low.

## *Fueling Your Yacht*

Improper fueling procedures are the most common cause of boat fires. Careful fueling is very important for reducing the danger involved and making sure your yacht is fueled properly. Fuel evaporates at a very low temperature, and the vapors can be carried into the boat where they can collect and become an explosion hazard.

Here are some general guidelines for fueling your yacht:

 **WARNING**

**DANGER:** Fuel leaking from any part of the fuel system can lead to fire and explosion that can cause serious bodily injury or death. Inspect system before fueling.

- Before fueling, check the fuel system for leaks. Check components for weakening, swelling, or corrosion. Immediately replace any leaking or defective components before operating an engine.
- Fuel your yacht during daylight. Gasoline spills are easier to see when lighting is good.
- Keep the tanks as full as practical to reduce condensation and the accumulation of moisture in the fuel system.
- In warm and hot weather, allow for expansion of the fuel. A fuel tank may overflow when the fuel expands after being pumped from cool underground storage tanks or after fueling when air temperatures are cool (night and early morning).

Follow these procedures to fuel your yacht:

 **WARNING**

**DANGER:** Fuel vapors can explode. Do not smoke at the dock. Extinguish all flames, range, and other ignition sources before you approach a fuel dock.

1. Safely and securely moor your yacht to the dock.
2. Turn off engine and generator. Turn main battery switches off to prevent the possibility of sparks from any electrical equipment (lights, blowers, pumps, etc.).

3. Disconnect shore power if connected.
4. Put out all cigarettes, cigars, pipes, or other items that may produce a spark or flame.



**DANGER:** Fuel vapors are explosive and can become trapped within the lower portions of the boat. Close all hatches, windows, doors, and compartments while fueling your boat.

5. Completely close all ports, hatches, and doors. We suggest that all guests leave the yacht during fueling.
6. Ground the nozzle of the fueling hose.
7. Loosen the fill cap. Touch the nozzle of the fueling hose to the cap to discharge any static charge.
8. Remove cap from the fill pipe. Insert the fuel hose nozzle into the fill pipe. During fueling, maintain contact between the nozzle and the fill pipe.
9. After pumping several gallons of fuel, inspect engine compartment for any signs of fuel leakage.
10. Fill the tank completely, allowing space at the top of the tank for thermal expansion. Fill slowly near the top to avoid overflow.
11. Remove nozzle after tank is full, and replace fill cap. Make sure cap is tight. If any fuel was spilled, clean it up immediately.
12. After fueling is complete, open all hatches, doors and compartments. Visually check all fuel fittings, lines, and tanks for fuel leakage. Check all lines up to engines and generator. Smell for fumes. Correct any problem before you start the engines.
13. Turn main battery switches on.
14. Run bilge blower at least five minutes to ventilate engine compartment.
15. Restart engines, and restore boat to operating condition. Do not smoke until your yacht is clear of the fuel dock.

## *Getting Underway*

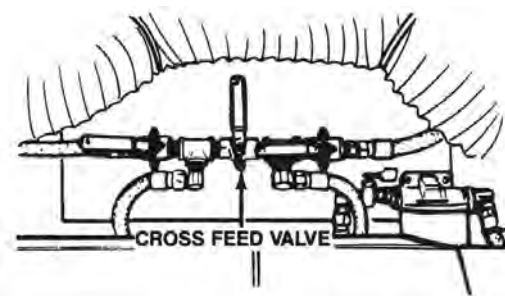
After the engine has warmed up, you are ready to leave the dock. Check wind, tide, and current to determine the best way to maneuver your yacht away from the dock. Cast off mooring lines.

Shift your boat's engine into forward or reverse depending on whether you want to move the bow or the stern away from the dock first. Your engines should be running at a slow speed as you move away from the dock.

Once your yacht is in open water, you can safely accelerate to cruising speed. Advance throttle to setting which provides your desired engine speed (RPMs).

## *Cross Feeding Fuel (Gasoline Engines)*

For yachts with two fuel tanks, providing fuel to both engines from one tank is possible. This practice is called cross feeding. Close the fuel supply line valve for the empty tank. Open the crossfeed valve between the two supply valves. **Figure 4-10** shows the crossfeed valve.



**Figure 4-10 – Fuel Valves**

## *Balancing Fuel Levels (Diesel Engines)*

The engine fuel return system has a shutoff valve in each return line at the valve board. You can shut off the fuel return from the engine to the fuel tank by closing this valve. The return fuel will then be diverted to the other tank by way of the balancing valve.

To balance the fuel level between tanks:

1. Close the fuel return line shutoff valve for the tank with the higher fuel level.

2. Open the balance valve.
3. After tanks reach a balanced level, open the closed shutoff valve and close the balance valve.

### **Daily Shutdown**

After completing the day's cruise and mooring your yacht, shut down the engines.

1. Reduce engine speed to idle. Place transmission controls in neutral. Allow engines to idle for a few minutes.
2. Turn engine key switches to OFF to shut down the engines.
3. Run bilge blowers for a few minutes after shutdown to circulate fresh air through the engine compartment.

### **Generator Operation**

Your Silverton yacht may have a generator. The generator provides 120 volt, 60 Hertz, alternating current for operating the microwave, the hot water heater, converter, range, AC outlets, and refrigerator. Circuit breakers at the generator and at the main electrical control panel protect the AC system.

Fuel for the generator is supplied from the starboard fuel tank through a filter in the engine compartment. A shutoff valve is in the supply line at the filter.



**DANGER:** Carbon monoxide can accumulate in cabin when generator is running. Carbon monoxide can be harmful or fatal if inhaled. Never sleep in yacht if generator is running. Inspect generator exhaust system for leaks at each generator startup.

### **Generator Startup**

**Note:** Infrequent use of the generator may result in hard starting. Operate the generator for 30 minutes at least once each week. For detailed information, refer to the operating manual for the generator.

1. At the main electrical control panel, set the GENERATOR BLOWER switch to ON. Run bilge blowers for five minutes.



**DANGER:** Fuel leaking from any part of the fuel system can lead to fire and explosion that can cause serious bodily injury or death. Inspect system before starting the engines.

2. Lift up the hatch to gain access, to the generator. Check generator for signs of fuel or oil leaks. If your yacht has diesel engines, check primary filter.
3. Check area for fuel fumes.
4. If you detect fuel fumes:
  - a. Evacuate the boat immediately.
  - b. Notify the dockmaster.
  - c. Have a qualified technician check the boat immediately to determine the source of the odor.
  - d. If a leak is detected, open all hatches, doors, and ports for natural ventilation. Have leak repaired as soon as possible.
5. If you do not smell fuel fumes, make sure fuel shutoff valve on fuel line to filter is open. (See **Figure 4-5** on page 4-3.)
6. Check generator oil level. See generator manual for instructions. Make sure oil level is in "safe range" as stated in generator manual. If the generator needs oil, the owner's manual has information about engine oil type and filling instructions.
7. Check generator coolant level. See generator manual for instructions.
8. Check that generator water strainer is clean. (See **Figure 4-7**.) Clean strainer if necessary. Remove strainer lid and clean out debris.
9. Open intake valve. Valve is open when handle is in line with hose.
10. At main electrical control panel, turn all 120V circuit breakers OFF.

11. Hold the GENERATOR START-STOP switch to START. Release switch as soon as the generator engine begins running.

**Important:** Do not crank generator continuously for more than 10 seconds. If engine fails to start within 10 seconds, release switch. Allow starter motor to cool for at least 10 seconds. Then try starting the engine again. If generator fails to start after three attempts, contact your Silverton dealer. Prolonged starting attempts may damage starter motor.

12. Check for water coming from the exhaust outlet pipe. Water flowing from the pipe indicates the water is circulating through the generator cooling system. You should see water flowing shortly after generator starts. (If you do not know the location of the generator outlet pipe, check with your Silverton dealer.)



**DANGER:** Carbon monoxide can be harmful or fatal if inhaled. Inspect generator exhaust system for leaks at each generator startup.

13. Inspect the exhaust system for leaks. If you detect any leaks or smell any fumes, shut down the generator immediately. Do not restart the generator until you have corrected the problem.
14. Allow generator to warm up before connecting a heavy electrical load. Keep the load within the nameplate rating.

### **Generator Shutdown**

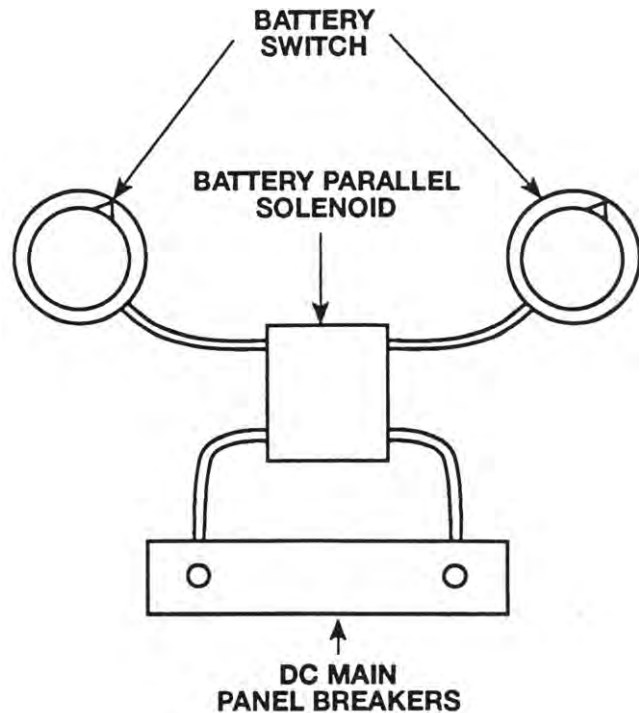
1. Shut off all 120V circuit breakers.
2. Allow generator to run for one to two minutes at no load to allow the engine to cool down.
3. Press GENERATOR START-STOP switch to STOP.
4. Close fuel and water valves.

## ***4.3 ELECTRICAL SYSTEM***

### ***DC Power***

To operate the 12V DC systems:

1. Turn the main battery switches to ON. (See **Figure 4-11.**)



**Figure 4-11 – Main Battery Switches**

2. Switch the BATTERY 1 MAIN and BATTERY 2 MAIN circuit breaker switches on the main electrical control panel to ON. (See **Figure 3-17** or **3-18** in Section 3.)

**Note:** Always switch circuit breakers to OFF when you leave your yacht unattended.

### ***AC Power***

The 120V AC system is a three-wire grounded system. Circuit breakers in the main electrical control panel protect the AC system. The AC electrical system is connected to either the shore power system or the generator. Connection to either system is by circuit breakers in the main electrical control panel.

### **Connecting AC System to Shore Power**

Some Silverton Yachts have two 30 amp shore power plugs. If your panel resembles **Figure 3-17**, your boat may be operated on one 30 amp cord by switching on the transfer switch. If your panel resembles **Figure 3-20** this transfer switch is used to distribute power from the generator only and you will need two shore power plugs to operate both 30 amp mains.

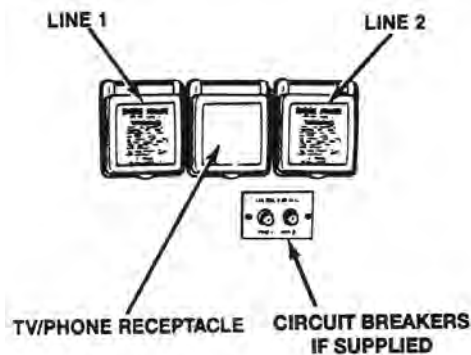
1. Turn all 120V circuit breakers at main electrical control panel to OFF. Shut down generator if it is operating.

**▲ WARNING**

**WARNING:** Using a damaged or improper cord for shore power connection can cause electric shock and serious injury. Use a cord specifically designed for shore power connection. Do not use a damaged cord. Do not use a household extension cord.

2. Connect the female end of the 30 amp (yellow) shore power cable to the yacht's Line 1 inlet receptacle. (See **Figure 4-12.**) Make sure the locking ring is tight.

**Important:** If you connect the cord to the dockside panel first, you can accidentally drop a live cord into the water.



**Figure 4-12 – Shore Power Inlets**

3. Make sure the dockside shore power outlet is OFF. Plug the male end to the dock outlet.

**Note:** When connecting the shore cable to the dock outlet, make sure the cable has enough slack to prevent stretching caused by tidal changes.

4. Turn the dockside shore power breaker on.
5. Immediately check the polarity indicator lights on the main electrical control panel. Polarity is correct if the green light is illuminated. If the red light is illuminated:
  - a. Turn off the power at the dock circuit breaker immediately.

**Important:** To prevent damage to your yacht's electrical system, never turn on a circuit breaker if a polarity indicator light is lit. Your warranty does not cover damage caused by reversed polarity.

- b. Disconnect the shore power cord. Inform the marina manager of the problem or have a qualified electrician correct the problem.

6. If you are using only one shore power cable, slide cover over the GENERATOR circuit breaker. TRANSFER circuit breaker remains on.

**Note:** If you use only one cable and TRANSFER circuit breaker remains on, the power available to both lines will be 30 amps maximum. Make sure you do not overload the power supply.

7. If you are using two cables:
  - a. Connect the second power cable to the yacht following the same procedures as for the first cable.
  - b. Slide the cover over the TRANSFER circuit breaker.

### **Connecting Generator Power**

1. Shut down all AC systems. Start generator following instructions in Section 4.1.
2. If shore power is connected, set AC MAIN circuit breakers to OFF.
3. Slide the covers over the shore power circuit breakers. Set GENERATOR circuit breaker ON. Set TRANSFER breaker ON.

**Note:** Setting the TRANSFER breaker to ON splits the output of power from the generator between Line 1 and Line 2. If the breaker is OFF, power from the generator is supplied only to Line 1. Power will not be available from the generator to equipment and components on Line 2 unless supplied from shore power.

4. Check that voltmeters read approximately 120V. If the voltage is low or high, do not attempt to operate the equipment. Equipment can be damaged if operating voltage lower than it is rated.
5. Switch on only the circuits you will be using.

### **Disconnecting Shore Power**

1. Switch off all circuits.
2. Switch off the dock circuit breaker.

3. Disconnect the shore power cables from the dock outlets.
4. Disconnect the shore power cables from the yacht's inlet receptacles. Store the cables in a safe place where they will not become wet or damaged.

**Note:** After shutting off shore power, check the refrigerator DC breaker switches. If the breaker switches are not off, refrigerator will continue to run on DC current and may run the batteries down.

## 4.4 YACHT EQUIPMENT

### Fresh Water System

The fresh water system on your yacht has one or two water tanks. Water flows by gravity to the water pump that pressurizes the system. **Figure 4-13** shows the components of the fresh water system.

When you are docked, you can connect a pressurized dock water supply to your yacht if such a supply is available. A dockside water supply will pressurize the yacht's water system without using the water pump.

Dockside water is often supplied at a higher pressure than the yacht's on board system pressure. The regulator on the water inlet reduces the pressure of the dockside supply to match the yacht system's lower pressure.

This dockside water does not fill the water tanks. The check valve mounted in the water line ahead of the

pump prevents backflow into the tanks. You must fill the tanks through the filler fitting.

**Important:** Before you connect your yacht's water system to the dockside water supply, make sure the dockside water supply is suitable for drinking. Check with the dockmaster to be sure.



**CAUTION:** Always disconnect dockside water supply when leaving yacht unattended. Major leak or break in system can flood yacht. Excess water in bilge may sink yacht or flood batteries and engine. Warranty does not cover this damage.

### Connecting Dockside Water Inlet

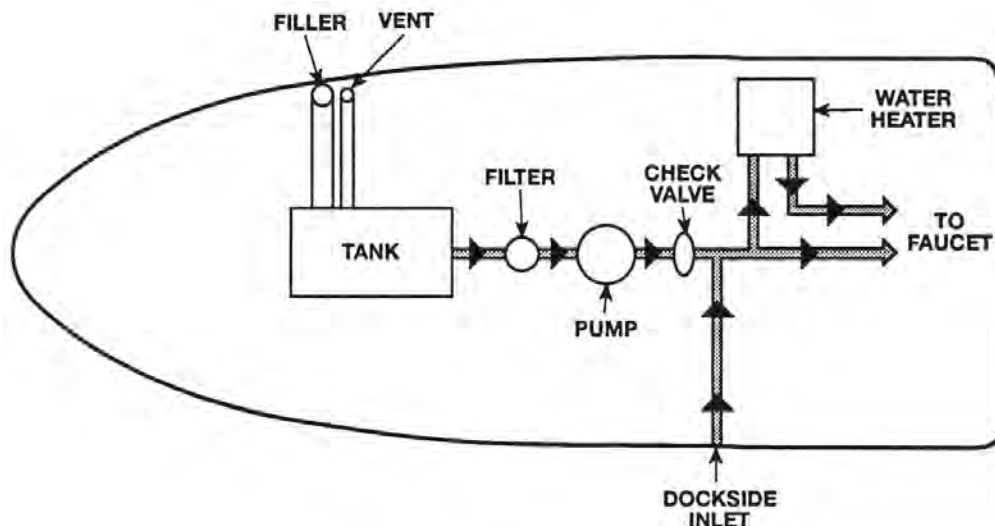
1. Connect a garden hose to the dockside water supply. (See **Figure 4-14**.)



**DOCKSIDE WATER INLET**

**Figure 4-14 – Dockside Water Inlet**

2. Connect the other end of the hose to the dockside water spigot.
3. Open the cold water faucet closest to the dockside water inlet on the yacht.



**Figure 4-13 – Typical Fresh Water System**

4. Open the dockside water supply spigot. As soon as a steady stream of water comes out of the faucet on the boat, close it.

The fresh water system is now ready for use.

### **Filling the Fresh Water Tank**

**Important:** Before you connect your yacht's water system to the dockside water supply, make sure the dockside water supply is suitable for drinking. Check with the dockmaster to be sure.

1. Open the water tank fill fitting.
2. Using the hose from the dockside water supply, fill the tank up to the fill fitting.

### **Operating the Fresh Water Pump**

Switch on the FRESH WATER circuit breaker in the main electrical control panel. The pump will run until the system is pressurized and turn itself off. It will turn itself back on again when water pressure drops below a preset level.

**Important:** Operate the fresh water pump only when there is water in the tank. Running the pump dry will damage the impeller.

### **Operating the Water Heater**

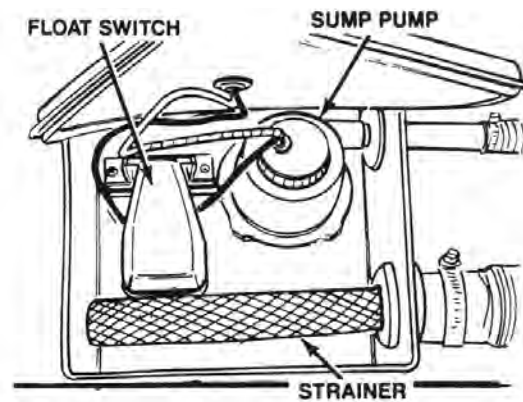
**Important:** Before turning the water heater circuit breaker ON, make sure the heater is full of water. Turning on power to an empty heater could damage the heating elements and make the water heater useless.

1. Make sure the water heater is full of water. Open a hot water faucet and allow a steady stream of water to flow out of the faucet to remove all air from the hot water circuit.
2. With the generator running or shore power connected to your yacht, switch on the WATER HEATER circuit breaker.
3. Wait for the water in the tank to heat up; then use as you would at home.

### **Operating the Shower**

**Important:** The shower drains into a sump containing a pump as shown on **Figure 4-15**. Make sure the circuit breaker for the pump is ON when using the shower.

Switch ON the SHOWER PUMP and WATER HEATER circuit breakers in the main electrical control panel. If you are not connected to a dockside water supply switch ON the FRESH WATER circuit breaker.



**Figure 4-15 – Shower Sump**

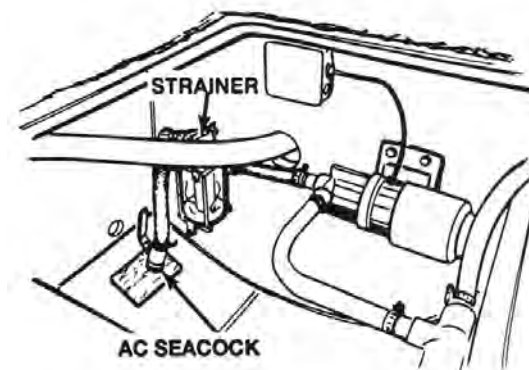
Use your yacht's shower as you would use a shower at home. Adjust the cold and hot water mix to the desired temperature. You can turn off the shower at the shower head without readjusting the temperature setting.

### **Air Conditioning System**

Your yacht may have one or several air conditioning units. Each unit is controlled by a breaker switch at the AC electrical panel. When using an air conditioner, its breaker switch and the AIR COND PUMP switch must be ON. (If your yacht has one unit, it does not have a pump breaker.)

When you operate the air conditioner:

1. Open the air conditioner sea cock. (See **Figure 4-16**.) The valve is open when it is in line with the hose.



**Figure 4-16 – Typical Air Conditioning Sea Cock, Strainer, and Pump**

2. Check the strainer. Clean it if necessary to assure a steady flow of water to the unit.

**Note:** Refer to the manual furnished with the air conditioning unit for more detailed information regarding its operation.

### ***Toilet, Holding Tank and Macerator***

**Figure 4-17** shows the location of the sanitary system components. Location of these components may vary depending on boat model.

Using marine sanitary system chemicals can control odor in the toilet and holding tank. Excessive use of chemicals may cause premature deterioration of the hoses.

### **Toilet**

**Important:** Do not deposit any foreign objects into the toilet. Even a cigarette or paper towel could damage this delicate system.

Make sure the TOILET breaker switch is ON.

Make sure the sea cock for the toilet is open. The sea cock is in the bilge under the hatch. The sea cock is open when the handle is in line with the hose.

To operate the toilet, push the button near the toilet. Silverton recommends the use of only biodegradable toilet tissue sold for marine use.

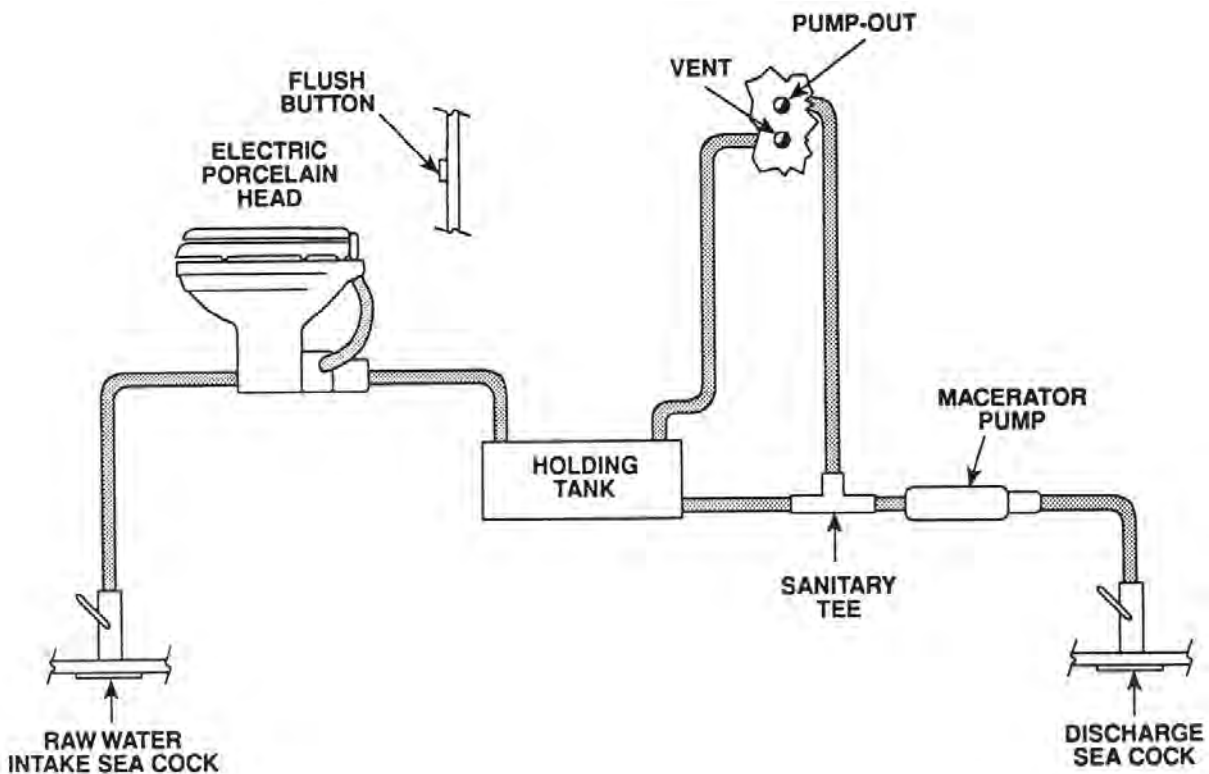
**Note:** The toilet lid should always be down when yacht is underway to prevent slamming and possible damage.

### **Holding Tank**



**WARNING:** Waste in the holding tank can lead to the formation of methane, an explosive gas. Use suitable precautions when any maintenance is done to the sanitary system.

To empty the holding tank, Silverton recommends using a dockside pumpout facility. Connect the hose from the pumpout facility to the fitting marked WASTE on the gunwale forward.



**Figure 4-17 – Typical Marine Sanitary System**



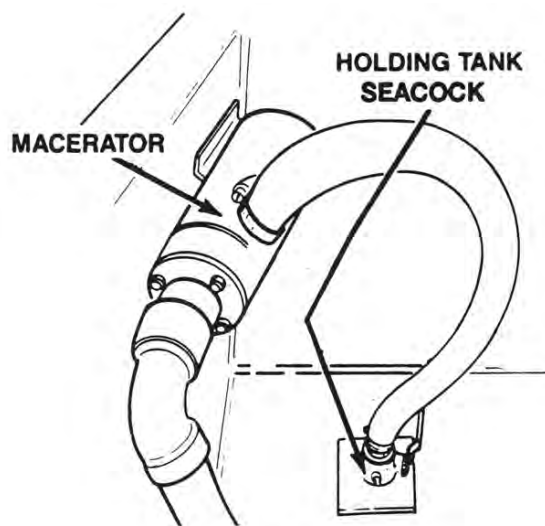
When pumping out the holding tank, place the waste cap in a secure place. If you drop it into the water or it falls overboard, you will probably not be able to retrieve it. Consider keeping an extra cap on board in case of an accident.

Flush sea water through the toilet several times to clean waste buildup out of the lines and rinse out the tank.

### Macerator

**Important:** Overboard discharge of waste in most areas is prohibited. Check with the Coast Guard regarding regulation in your area

If local regulations permit, the macerator and overboard pumpout can be used to dispose of waste. Open the hatch, and open the overboard sea cock. (See **Figure 4-18.**)



**Figure 4-18 – Macerator and Holding Tank Sea Cock**

Turn ON the MACERATOR breaker switch on the DC main electrical control panel. Allow the macerator to run until the holding tank is empty, but no longer.

**Important:** Running the macerator when the tank is empty will cause damage. You can usually hear the pump speed up when the tank is empty. Immediately turn off the macerator switch. Always close the sea cock to prevent filling the holding tank with sea water and possibly flooding the boat.

## **4.5 OPERATION UNDERWAY**

### ***Yacht Handling***

The best method to learn how to handle your Silverton yacht and get the best performance is to practice and experiment. After several hours of operation, experiment with throttle settings to find the setting that will be the most comfortable and economical range for your particular loading conditions.

We suggest that you make a speed/rpm chart to determine the most economical operation. Operate the yacht at various speeds and check the fuel consumption. Determine the amount of operating time remaining when the fuel gauge drops into the read band. Make a log of this type of information and have it available when operating your yacht. .

In addition, you should determine the following:

- Minimum speed for effective steering
- Turning radius at different speeds
- Response to steering at low speeds
- Acceleration and deceleration rates
- Time and distance required to bring the boat to a stop at different speeds
- Control of the yacht using both engines (transmissions) and rudders in close quarters

Twin screw boats are easy to maneuver. The yacht will run ahead or backward in a straight line when both engines are working together at the same speed. When you are backing the boat, the rudders can be used to steer to port as well as starboard. Most close-in maneuvering is accomplished without using the rudders.

Moving ahead on one engine will cause the bow to swing away from the running engine side and to move forward at the same time. Backing with one engine will cause the bow to swing toward the running engine side and the boat to move backward.

Running one engine ahead and one engine astern will cause the boat to turn end-for-end in a little more than its own length.

Running both engines in the same direction at different speeds will cause the boat to move in the direction dictated by the faster engine, but its influence will be modified by the slower engine.

**Important:** When operating with one engine shut down, be careful to avoid any situation where water can enter the dead engine through the exhaust. Water entering an engine can cause serious damage.

### Boat Speed

Boat speed depends on many factors and cannot be guaranteed. These factors will vary with differing conditions. Some of the factors include the following:

- Engine efficiency
- Weather conditions
- Extra load
- Marine growth
- Damaged underwater gear

Engines operate most efficiently at the RPMs stated in the operating manual for the engines. Efficiency will decrease if you do not care for and maintain them properly. If the engines are neglected, power will drop and speed will decrease. In addition, expensive repairs may become necessary. Be sure to follow all instructions in this manual as well as those in the engine operating manual.

Weather conditions can also affect engine performance. An increase in engine room temperature from 90°F to 130°F could result in a 4% decrease in horsepower. Barometric pressure and humidity also influence horsepower. The cumulative effect of weather alone could decrease engine efficiency as much as 10% on hot days.

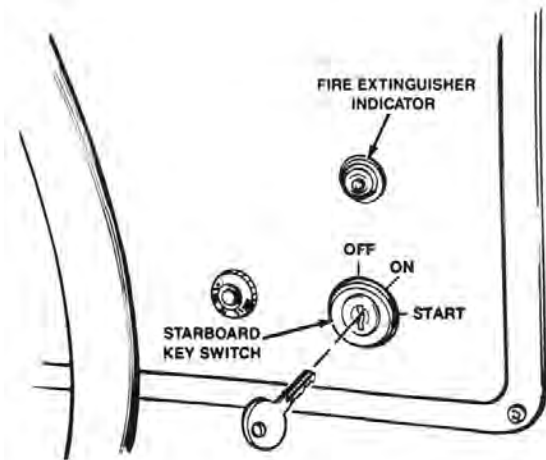
The extra load resulting from adding personal equipment, gear, and passengers to the yacht may result in a decrease in speed. The extra load could also be water in the bilge. A gallon of water weighs 8 pounds. For example, twenty gallons of water in the bilge adds 160 pounds of weight to the boat. This additional weight reduces the yacht's speed and, when combined with other extra loads, may significantly reduce performance.

Marine growth on the bottom of the yacht will increase resistance and decrease speed. Increased resistance increases fuel consumption. Keeping the bottom of the yacht clean will improve its efficiency.

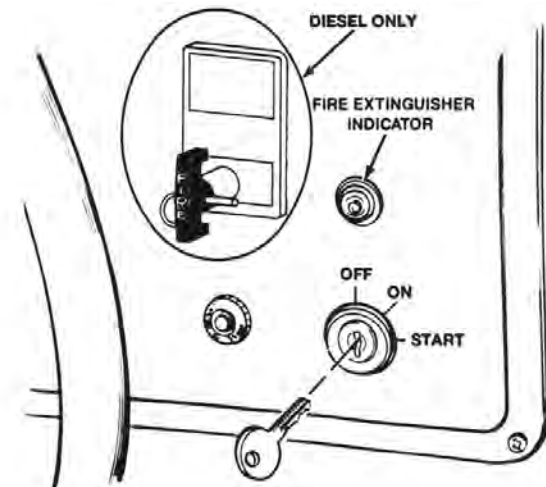
Damaged underwater gear (propeller, shaft, struts) can decrease speed and performance. Such damage is also likely to cause excessive vibration which can damage the yacht, engines, and other components. If underwater gear is damaged, avoid operation of the yacht, and have it repaired as soon as possible.

### Emergency Operation

Your yacht has a fire extinguishing system which operates automatically to extinguish a fire in the engine compartment. The system has an indicator light on the ~ helm. (See **Figure 4-19.**) Turning the key switch to ON before starting the engines activates this light. Check this light every time you start the engines. It shows that the system is charged and ready to operate. (**Figure 4-20** shows fire extinguisher shutdown panel on boats equipped with diesel engines.)



**Figure 4-19 – Fire Extinguisher Indicating Light**



**Figure 4-20 – Emergency Engine Shutdown Panel**

A loud sound (similar to that of small arms fire) followed by a “rushing” air sound indicates actuation of the extinguisher. If the green indicator light goes out or if you hear the extinguisher discharging proceed as follows:

1. Shut down the engines and generator if possible. Stop blowers. Switch breakers off at main electrical panel.
2. Evacuate all occupied enclosures immediately. If practical, evacuate the boat.



**DANGER:** Flash fire erupting from engine compartment can burn you. Opening the engine compartment will feed oxygen to the fire and can cause the fire to flash back. Keep engine compartment closed for at least 15 minutes after fire extinguisher discharges.

3. Do not open the engine compartment. Allow the fire extinguisher to soak the compartment for at least 15 minutes.
4. Wait for hot metals and fuels to cool before inspecting for damage or cause of fire.
5. Open engine compartment slowly. Have approved portable fire extinguisher at hand and ready for use. Do not breathe fumes or vapors caused by fire.

**Note:** Fire extinguisher will activate automatically on all models. It can be activated manually on diesel models by firmly pulling the pin and pulling the handle.

### ***Strong Fuel Fumes***

Fuel fumes are heavier than air and can collect in the bilge area. These fumes are extremely hazardous. If you detect strong fumes, proceed as follows:

1. Evacuate all occupied enclosures immediately.
2. Shut down engines and generator.
3. Turn off all electrical circuits.
4. Inform the dockmaster. Have a qualified technician check the boat **immediately** to determine the source of the odor.

5. Open the boat for natural ventilation.
6. When you can no longer smell fumes, locate the source. Dispose of fuel in a safe, approved manner.

### ***Sixteen Ways to Cut Your Fuel Consumption***

Your Silverton yacht comes equipped with two state-of-the-art marine engines. Although these engines are designed to be as fuel efficient as possible, you may be able to increase their efficiency even more by following the procedures below.

**Note:** Silverton Marine Corporation does not, in any way, warrant or guarantee fuel consumption figures.

1. Keep the bottom of your yacht clean. A fouled bottom can increase drag up to 10% or more for power boats. A 10% drag is the same as a 10% increase in fuel use.
2. Don't idle your engines needlessly. The warmup time for most modern engines is minimal, and you won't be working the engines hard on the way out of the harbor. Let that time serve as warmup time.
3. Watch the trim. A well-balanced power boat gets on plane faster, handles better, and runs with less surface contact. Greater surface contact causes fuel-eating drag.
4. Navigate better. By plotting courses to your destinations instead of just waiting for them to appear somewhere in front of you, you can cut miles off your running time and gallons off your consumption.
5. Know your fuel consumption. By plotting a fuel consumption/RPM curve for your yacht, you will probably find that reducing your engine RPMs 10% can often reduce your fuel consumption 30% with only a slight effect on speed.
6. Dump extra weight. If you're not using it, don't carry it. Any extra weight requires more fuel to move your boat. Don't just stop at the lockers though. Remember that water weighs 65 pounds per cubic foot, so keep the bilges dry.
7. Improve your ability. Don't let the boat labor along just shy of planing attitude. This is the absolute peak fuel waste.

8. Buy good fuel. Be sure you're using the correct fuel for your engine. You'll find fuel information in the engine owner's manual.
9. Load correctly. This is simply common sense. Don't put all the heavy gear like anchors, chain, canned goods, and spare parts in either the bow or the stern. Heavy items should be placed amidship where they won't affect the trim and the plane of the boat.
10. Check the drive train. An inboard that is improperly aligned can cost you money. Check to see if the transmission has the proper amount of oil (too little increases friction), if the stuffing box is too tight (more load on the engine), or if a bent rudder is robbing you of economy. Make sure the rudders are aligned.
11. Check compression. Low compression indicates worn piston rings or leaky valves which consume oil and reduce engine power.
12. Check the idle. For the times you need to run at idle speed, make sure the engine isn't running too fast and using unnecessary fuel.
13. Check for air leaks. A leak in the intake manifold disturbs the air/fuel ratio and reduces your performance. *A leak in the exhaust manifold is dangerous. Carbon monoxide can be entering the cabin.*
14. Check temperatures. Compare your normal operating temperature with the range specified in the owner's manual. An overheating engine is causing wear and will be less efficient.
15. Keep the oil clean. Dirty oil causes varnish to form on the moving surfaces of the engine. Varnish can cut into the piston-ring seal and contribute to fuel waste.
16. Keep hot water use to a minimum. The less hot water you use, the less time your generator will have to run and use up valuable fuel.
17. Those are the 16 ways to save fuel. This one is a bonus. Go slower, and you'll always save fuel.

**Note:** These tips are adapted from the March 1987 edition of *Lakeland Boating Magazine*. Our thanks for permission to reprint it.

# 5 MAINTENANCE

The maintenance required to keep your yacht operating properly and to retain its attractive appearance depends on how you use your yacht. Use of your yacht includes (without limitation) such variables as how often you use it, where you use it, and whether you use it in salt or fresh water.

As a general good maintenance practice, keep bilge areas clean and dry. Leaks found early and corrected will not cause damage. Do not allow grease and dirt to build up.

If you find any condition requiring corrective action, have your Silverton dealer do the work. If you are away from home, contact your dealer or the manufacturer of the equipment and ask for a referral to a qualified repair shop. Make sure any changes made during maintenance conform with Coast Guard specifications.

## 5.1 EXTERIOR

To keep the exterior of your boat in good condition, you should follow a periodic preventive maintenance program and practice good storage habits. In this section are important suggestions that will help keep your yacht in the best possible condition.

### *Care and Maintenance During Summer Months*

Before storing your boat, remove loose items such as cushions, towels, and similar items. Water trapped under these items can cause gelcoat discoloration and mildew.

After each use, rinse the entire boat with fresh water. If the boat has been used in brackish or salt water, use a mild soap during the washdown.

If you store your boat outside, cover it with a tarpaulin between uses to protect the finish from direct sun. Do not cover it with anything that will not allow moisture to evaporate, for example sheet plastic.

### *Finish Protection*

Waxing two to four times a year is recommended. If you are in a climate where you use your boat year-round, wax your boat every three months. If you have a summer boating season, wax at the beginning of the season and before winter storage.

Waxing helps protect your boat from everyday elements. Use a wax recommended for fiberglass (gelcoat) finishes. Many automotive, over-the-counter waxes can be used. Check the product label for recommended surfaces and applications.

### *Color Fading and Yellowing*

Darker colors are more prone to fading because they absorb more of the sun's ultraviolet rays. Whites and off-whites will yellow, usually on the deck radii. If the finish on your boat has started to fade or yellow and waxing will not restore the finish, compounding with a fine grit compound and a low speed buffer may be necessary. An automotive, fine-grit rubbing compound will work well in most cases.

1. Follow the manufacturer's application instructions. Do not apply compound or wax in direct sunlight.
2. Never place the buffer so the pad touches the ground. The pad will pick up dirt which will cause deep scratches in the finish.
3. After compounding, clean the surface with soap and water. Apply a good coat of wax.

### *Minor Scratches*

If you have light surface scratches and rubbing compound does not remove them, wet sanding may be necessary. To wet sand:

1. Clean the area with soap and water. During sanding try to keep the area free of dust and dirt.
2. Use a 500 or 600 grit wet and dry sandpaper. Use a sanding block. Sandpaper and sanding blocks can be purchased from automotive supply stores.
3. When sanding, keep the surface wet. On wet surfaces, press a wet sponge above the sanding area. Always keep the sanding block flat on the surface; never use the edge or corner. Doing so will make scratches that rubbing compound will not remove.

4. After completing wet sanding, compound the sanded area with a fine-grit rubbing compound. Use a low speed (1200-2800 rpm) buffer. Several applications of rubbing compound will have to be applied before all the scratches are removed.
5. Apply a good coat of wax.

### ***Stains***

You can remove stains using a cleaner specifically made for gelcoat surfaces. Any cleaner recommended for cultured marble or fiberglass tubs and sinks will work. Most of these cleaners can be purchased at a grocery store.

If a cleaner does not remove the stain, use a fine-grit rubbing compound. By hand, apply a small amount of the compound to the stain area. Using a cotton cloth and medium pressure, rub the compound into the stained area. After the stain is removed, wash the area with soap and water, and apply a good coat of wax.

### ***Stainless Steel Rails and Hardware***

Rinse the stainless steel rails and hardware after cruising. Polish them periodically to prevent salt water corrosion. Follow these procedures to clean stainless steel:

1. Wash with hot water and soap or detergent such as Bon Ami or other stainless steel cleaner available commercially.
2. Rinse with clear water after cleaning. Wipe dry with a clean, soft cloth to avoid water marks.
3. If discolorations or deposits persist, use a nonscratching household cleanser or stainless steel polishing powder with a little water and a soft cloth.

**Important:** Do not use abrasive cleaning products, pads, steel wool, or steel brushes. These products will damage the finish.

4. For stubborn deposits, use a plastic scouring pad or soft bristle brush with cleanser and water. Rub lightly in the direction of the polishing lines of the finish. Do not use too much pressure because the cleaner may mar the surface.
5. Do not allow deposits to remain on the finish for long periods of time. Do not allow salt solutions,

disinfectants, bleaches, or cleaning compounds to remain on the finish. Chemicals in many of these compounds may damage the rails or hardware. Rinse with soft water after every exposure and wipe dry with a clean, soft cloth.

### ***Windows***

The window frames on your Silverton yacht are made of high quality aluminum having an enamel paint surface. The frames need no maintenance other than cleaning with soap and water. Do not use abrasives or strong chemicals. These may damage the finish and allow corrosion to start. Frames should be protected with marine wax.

The glass in the frames is tempered safety glass and requires only normal cleaning.

The Venturi windshield and deck hatches are made of acrylic plastic. Be particularly careful not to scratch them. Clean them with a window cleaner designed for cleaning acrylic windows.

### ***Caulking***

All deck fittings, bow rails, windows, hatches, etc. have been caulked with the highest quality material to ensure a waterproof joint with the boat. However, normal use will flex the joint and eventually break down the seal between them.

**Note:** Silverton recommends that all deck fittings, hatches, windows, rail, etc. be caulked periodically to prevent damaging leaks from developing.

### ***Bottom Paint***

Although Silverton uses an expensive and time-consuming system in applying antifouling paint to hull bottoms, some owners may have problems with paint failure because of unusually deep penetration of the parting compound used in molding the hull. This condition is unpredictable and is not covered by warranty. Usually cleaning and light sanding is all that is needed before recoating with a quality antifouling paint.

**Note:** Silverton recommends an annual cleaning, sanding, and application of antifouling paint. Check with your dealer for recommendations about the specific paint to be used in your area.

**Important:** Do not paint the zinc anodes (connected to the boat's bonding system) on the outside of the transom.

## 5.2 INTERIOR

### Countertops, Fiberglass, and Toilets

You can usually clean the surfaces of these components with a mild cleaner such as Fantastic (TM). Avoid using harsh or abrasive cleaners. Use approved marine sanitary treatment chemicals to control the odor in the toilet and holding tank.

### Wood

The woodwork used in your yacht is treated at the factory with a multi-coat finish process. To maintain the finish, use a good grade of furniture polish.

### Walls

Clean the walls with a mild soap and water.

### Bilges

The bilges of your Silverton yacht are finished with a high quality gelcoat which is easy to keep clean. Several brands of bilge cleaners will dissolve dirt and grime, but will not harm the environment when pumped overboard. If you keep the bilge clean, it is much easier to identify leaks or other problems if they should develop.

**Important:** The Federal Water Pollution Control Act prohibits the discharge of oil and oily waste into or upon navigable waters of the United States. Violators are subject to a penalty.

### Shower Sump

The shower drains into a contained sump which keeps hair, soap, scum, and bacteria from building up in the bilge and developing an odor. The sump consists of a plastic box, a pump and an automatic float switch. (See **Figure 5-1.**) Periodically open the sump box and clean out any buildup of hair and scum to prevent eventual clogging of the pump.

## 5.3 DAILY MAINTENANCE

### Pre-Start

Before starting the engines, check the following:

1. Check condition of dock lines and cleats.



**DANGER:** Fuel leaking from any part of the fuel system can lead to fire and explosion that can cause serious bodily injury or death. Inspect system before starting the engines.

2. Check engine, generator, and fuel tank compartments for smell of engine fumes. If you detect fuel fumes:
  - a. Evacuate the boat immediately.
  - b. Notify the dockmaster.
  - c. Have a qualified technician check the boat **immediately** to determine the source of the odor.

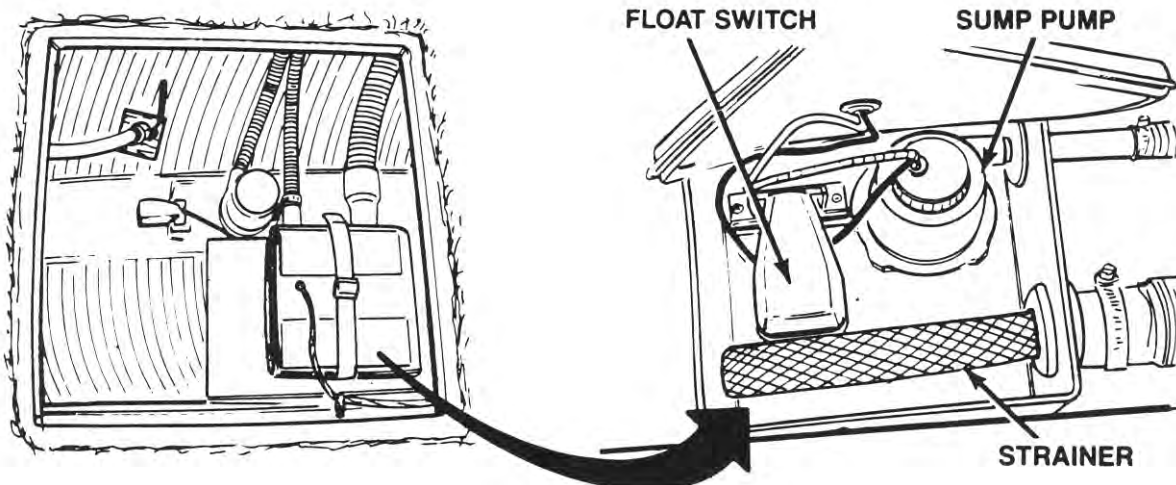


Figure 5-1– Shower Sump

- d. If a leak is detected, open all hatches, doors, and ports for natural ventilation. Have leak repaired as soon as possible.
  3. Check bilge area for water or other liquids. Clean up any liquids and dispose of properly. Make sure no loose gear is in the bilge area.
  4. Check the intake screen for the bilge pumps to make sure they are free of dirt or other material that would block or slow down the flow of water through the pump.
  5. Check engine oil level. Make sure engine oil level is between lower and upper mark on dipstick. Refer to the engine manual for instructions about checking and adding: oil.
  6. Check that transmissions have adequate transmission fluid. Pullout dipstick and make sure fluid level shows on dipstick. If fluid level is low, add fluid. Refer to the transmission manual for fluid type and filling instructions.
- Important:** Fluid level should not be at FULL mark! Otherwise transmission fluid will overflow when transmission warms up. Fluid level should be at FULL mark when transmission is at operating temperature.
7. If your yacht has fresh water cooled engines, remove pressure cap from heat exchanger and check that coolant is up to neck of filler tube. (See **Figure 5-2.**) Refer to engine manual for information about coolant.
  8. If your yacht has diesel engines, check the level of the coolant in the expansion tanks. Refer to the engine owner's manual for information about procedures and type of coolant to use if cooling system /' needs filling.
  9. Check all water and fuel lines on the engine and in the engine compartment for signs of leaks. Repair to correct any leakage.
  10. Check all drive belts on the engines for wear. If belts show wear, refer to engine operating manual for details.
  11. Check propeller shaft stuffing boxes for leaks. A slight leak (one drop every 60 seconds) is desirable to lubricate the packing.
  12. Check the generator oil level. Make sure oil level is in "safe range" as stated in generator manual. Add oil if necessary. See generator manual for instructions.
  13. Check generator coolant level. Add coolant if necessary. See generator manual for instructions.
  14. Check the rudder shaft stuffing box for leaks. (See **Figure 5-3.**) A slight leak (one drop every 60 seconds) is desirable because it helps lubricate the packing.
  15. Check fluid level in trim tab reservoir. Make sure level is above the ADD mark. Add oil if necessary.

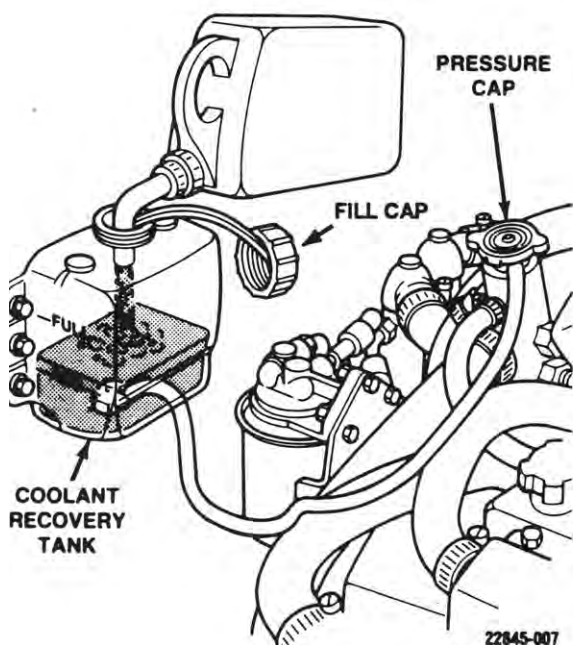


Figure 5-2 – Checking Coolant Level

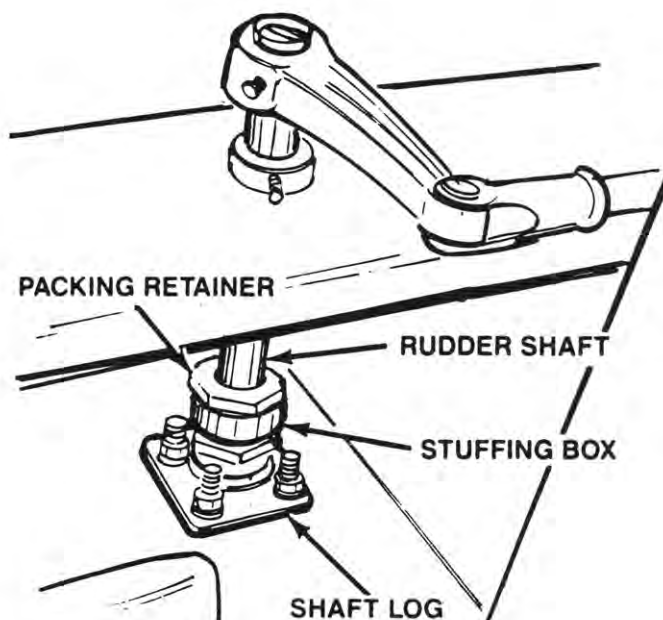


Figure 5-3 – Rudder Stuffing Box



## Shutdown

After each boating run, check the following:

1. Check that the dock lines are secured fore, aft and amidship.
2. Pump bilges dry.
3. Inspect engine, generator, and fuel tank compartment. Note any damage or required maintenance.
4. Check operation of all pumps and other equipment, particularly the bilge pumps.
5. Open all storage compartments to allow air circulation. Remove wet equipment and clothing. Dry ashore.

6. Remove garbage from galley.

7. Make sure all loose items are secured properly.

8. Wash down boat with fresh water.

9. Shut down electrical panels not in use.

## 5.4 PERIODIC MAINTENANCE

Refer to the manuals supplied by the yacht component manufacturers for their recommended periodic maintenance. The manuals may indicate maintenance requirements in addition to the minimum maintenance tasks listed in the chart following.

**Important:** In case of conflicts between the maintenance information in this manual and the manuals supplied by the equipment manufacturers, the equipment manuals take precedence.

Item	Daily	25 hr	50 hr	100 hr	Yearly
<b>Gasoline Engines</b>					
Check oil levels	X	X	X	X	X
Check fuel system for leaks	X	X	X	X	X
Check cooling system for leaks	X	X	X	X	X
Check exhaust system for leaks	X	X	X	X	X
Check for loose or damaged parts	X	X	X	X	X
Change engine oil (after first 25 hours)				X	X
Replace oil filter		X		X	X
Clean flame arrestor		X		X	X
Check electrical connections		X		X	X
Check drive belt tension		X	X	X	X
Tighten engine mounts		X		X	X
Check engine alignment		X		X	X
Check condition of zinc anodes		X		X	X
Check fuel canister for corrosion		X		X	
Check condition of spark plugs				X	REPLACE

Item	Daily	75 hr	250 hr	Yearly	2 Years
<b><i>Diesel Engines</i></b>					
Check exhaust system for leaks	X	X	X	X	X
Check for loose and damaged parts	X	X	X	X	X
Check fuel system lines for leaks	X	X	X	X	X
Drain water and sediment from primary fuel filter	X	X	X	X	X
Clean or replace air cleaner elements (more often if necessary)			X		
Check oil level	X	X	X	X	X
Change oil and filters			X		
Check cooling system for leaks	X	X	X	X	X
Check zinc anodes		X			
Clean sea water strainer and inspect and lubricate impeller (more frequently if yacht is operated in shallow water)					X
Item	Daily	25 hr	50 hr	100 hr	Yearly
<b><i>Transmissions</i></b>					
Check transmission fluid level	X	X	X	X	X
Change transmission fluid					X
<b><i>Propeller</i></b>					
Check propeller for dents or gouges; retrue if necessary					X
<b><i>Miscellaneous</i></b>					
Halon fire extinguishers			Remove and weigh every six months		
Check battery electrolyte level		X	X	X	X
Check raw water strainers (generator, engines, AC unit)		X	X	X	X
Check pumps (bilge and shower sump) for automatic operation		X	X	X	X

Item	Daily	25 hr	50 hr	100 hr	Yearly
<b>Miscellaneous (con't)</b>					
Check fluid in trim tab reservoir	X				
Check caulking on all deck hardware					X
Check electrical connectors for corrosive buildup on terminals					X
<b>Generator (Gasoline Engines)</b>					
Check oil level	X	X	X	X	X
Check fuel system lines for leaks	X	X	X	X	X
Check cooling system for leaks	X	X	X	X	X
Check flame arrestor			X	X	X
Check spark plugs			X	X	X
Clean governor linkage			X	X	X
Change crankcase oil			X	X	X
Check brushes				X	X
Inspect breaker points				X	X
Clean crankcase breather				X	X
Check valve clearance				X	X
Item	Daily	Monthly (100 hr)	6 Months (250 hr)	Yearly (500 hr)	
<b>Generator (Diesel Engines)</b>					
Inspect generator	X <sup>1</sup>				
Check oil level	X				
Check coolant level	X				
Check battery charging system		X			
Check antifreeze				X	
Check drive belt tension		X <sup>2</sup>			
Check generator air outlets		X			

Item	Daily	Monthly (100 hr)	6 Months (250 hr)	Yearly (500 hr)
<b><i>Generator (Diesel Engines) (con't)</i></b>				
Clean generator assembly				X
Check crankcase oil and filter		X <sup>3</sup>		
Drain sediment from fuel filter		X		
Clean crankcase breather			X <sup>4</sup>	
Change fuel filter			X	
Clean cooling system				X
<sup>1</sup> Check for oil, fuel, cooling, and exhaust leaks with set running. <sup>2</sup> Visually check belts for evidence of slippage. <sup>3</sup> On new generators, change after first 35 hours of operation. <sup>4</sup> Perform more often in extremely dusty conditions.				

### ***Engine Oil***

See engine operating manual for recommended oils and correct procedures for checking and replenishing oil.

‘To check the engine oil, remove dipstick. Wipe dipstick clean with a clean, lint-free cloth. Reinstall dipstick and remove. Oil level should be between ADD and SAFE marks on the dipstick for gasoline engines or at FULL mark for diesel engines.

**Note:** The space between the ADD and the SAFE marks on the dipstick represent one quart of oil. Adding oil is not necessary unless the oil is at or below the ADD mark.

### ***Engine Coolant***

See engine operating manual for recommended coolants oils and correct procedures for checking and adding coolant.



**WARNING:** Hot coolant under pressure may boil over and cause burns or other personal injury when pressure cap is removed. Allow engine to cool. Open pressure cap slowly to allow pressure to vent before removing cap.

Engines require the cooling system to be chemically treated to keep it free from rust and sludge. If your yacht has a closed cooling system, draining and refilling it every year is recommended to prevent a buildup of harmful chemicals in the fresh water system.

### ***Engine Exhaust***



**WARNING:** Exhaust gases contain carbon monoxide. Carbon monoxide is poisonous and can cause unconsciousness or death. Shut down engines immediately if any exhaust leaks are detected.

Visually inspect the engine and generator exhaust systems (hoses, joints, manifolds, etc.) for leaks. Make sure all clamps are tight. Check hoses and exhaust boxes for damage. Replace any damaged exhaust system component.

**Note:** Any discoloration around a joint or gasket usually indicates a leak.

### ***Generator Oil***

See generator operating manual for recommended oils and correct procedures for checking and replenishing oil.

## Generator Coolant

Refer to the generator manual for detailed recommendations about checking and adding coolant.

### **▲ WARNING**

**WARNING:** Hot coolant under pressure may boil over and cause burns or other personal injury when pressure cap is removed. Allow engine to cool. Open pressure to vent before removing cap.

## Transmission Oil

Refer to the transmission manual for detailed recommendations about checking and adding oil.

## Bilge and Shower Sump Pumps

Your yacht has two or three bilge pumps and a shower sump pump, each having an automatic float switch. Check the operation of the automatic pumps by lifting the float and making sure the pump runs. Clean debris away from the pump area.

## Fuel Filter

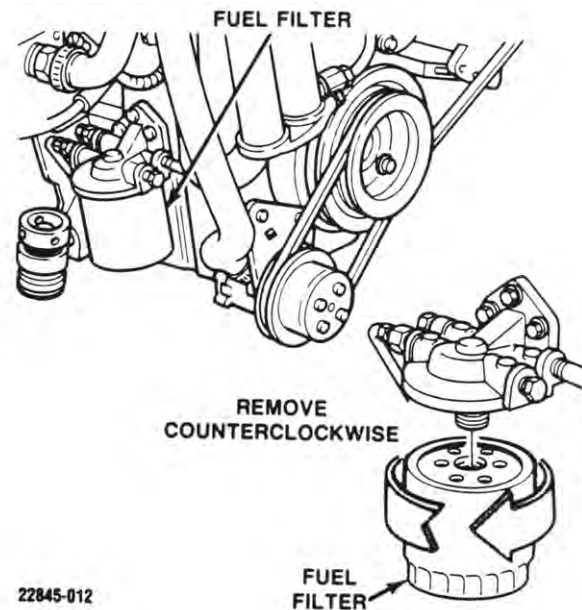
Check all fuel filters every 25 hours of operation to remove all sediment and water from the filter. Inspect the canister for possible corrosion or deterioration. Replace canister if you observe any corrosion or other deterioration.

Replace the filter element at least once each season; more often if there is contamination of the fuel system. (See **Figure 5-4.**) Always replace the bowl gasket each time the filter is reassembled. Check carefully for any signs of leakage.

## Fuel Line Connections

Check all fuel line connections for leaks at least once a year. Tighten as necessary.

**Important:** Be careful when tightening fittings. Overtightening can crack the flair fittings and flair nuts. Use only tube wrenches when tightening connections.



**Figure 5-4 – Replacing Fuel Filter Elements**

## Batteries

### **▲ DANGER**

**DANGER:** Avoid spilling battery electrolyte into the engine compartment or bilge. Also, avoid getting any salt water on or in the battery. Either condition can create a gas that is explosive and poisonous if inhaled.

If you spill electrolyte ventilate the area. Neutralize the acid in the electrolyte by pouring baking soda on the area of the spill. Clean up neutralized electrolyte with a disposable rag or paper toweling.

Your yacht has two or three 12 V deep cycle, heavy duty batteries. Although these batteries are relatively maintenance free, some simple routine maintenance can increase their effectiveness and life.

1. Keep the batteries fully charged. Batteries kept fully charged last longer than batteries kept at a partial charge.
2. Check the level of the electrolyte regularly. Correct level is just above the plates. Add distilled water only if necessary. Overfilling can cause poor performance and early failure.

3. Check the battery every 30 days. Keep the top of the battery clean. When necessary, rinse the top of the battery with a baking soda solution and rinse with fresh water.

**Important:** To prevent battery failure, do not allow the soda solution to enter the battery cells.

4. Inspect the cables and clamps regularly.
5. Remove the battery cables and clean the battery terminals and posts regularly. Use a wire brush or bronze wool. After reconnecting the terminals, apply a coating of grease or petroleum jelly (Vaseline) to protect them against corrosion.

**Important:** Before cleaning the batteries, disconnect and remove them from the yacht.

6. Replace corroded or damaged parts immediately.
7. Use the standard battery test with a hydrometer to check the condition of the battery.
8. Remove the batteries from the boat during periods of extended storage. Store the batteries in a cool (above freezing temperature), dry area. All batteries lose some charge during storage, but the loss of charge is inversely proportional to the temperature. The lower the temperature, the less charge is lost. Avoid storing the batteries in a humid area. Humidity will lead to corrosion of the terminals.

### Shore Power Cable Care

Clean the cable with a grease cutting household detergent. Apply a vinyl protector periodically.

The materials used to make the metallic parts of the cable resist corrosion. You can however, increase the life of the cable in a salt water environment by wiping the exposed parts with fresh water. Then dry them and spray them with a moisture repellent.



**WARNING:** Maintaining power cable connected to shore power source can cause electric shock and serious injury. Disconnect cord before maintenance.

If the cable is dropped into salt water, rinse the plug and connector end thoroughly in fresh water. Then shake or blowout excess water, and allow cable to dry.

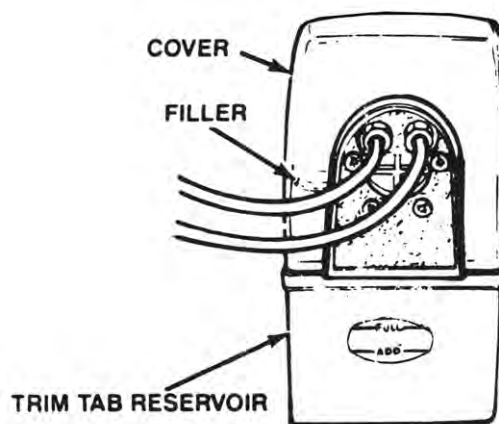
Spray plug and connector with a moisture repellent before you use the cable again.

### Electrical System Connections

At least once each year, check electrical connections in the bilge, engine, and upper control areas. Check the terminals for corrosive buildup. Have your Silverton dealer repair connectors and terminals if they are corroded.

### Trim Tabs

Check the fluid level in the trim tab reservoir once per year. (See **Figure 5-5**.) If the level is below ADD, remove the screws holding the clear cover on the reservoir. Remove the filler plug, and add automotive automatic transmission fluid through the filler tube to bring the level up to FULL. Install the filler plug and plastic cover.



**Figure 5-5 – Checking the Trim Tab Reservoir**

### Recommended Tools

Following is a list of tools we recommend you carry on board your yacht. Note that this list is minimum requirements.

- Flashlight
- Vise grips (small and medium)
- Needlenose pliers
- Screw and nut driver set with ratchet handle
- Multi-bladed knife
- Set of screwdrivers (Phillips and flat blade, including “shorty” in both)
- Offset screwdriver
- Set of combination wrenches (box at one end, open end at the other)

- Extra batteries for flashlight
- Set of tubing wrenches
- Wire crimping and stripping tool
- Hacksaw

### **Recommended Maintenance Materials**

We recommend you carry the following materials on board your yacht.

- Plastic marine tape
- Instant glue
- Silicone rubber
- Transmission oil
- Electrical tape
- Two-part epoxy adhesive
- Engine oil
- Spray lubricant

### **Recommended Spare Parts**

We recommend you carry the following spare parts on board your yacht.

- Oil filters
- Coolant pump impellers and coverplate gaskets
- Spare hoses and clamps
- Electric fuses
- Fuel filters
- Water hose or pipe for freshwater unions
- Pipe or hose unions
- Drive belts
- Propeller and shaft (for extended cruises)

## **5.6 WINTERIZATION AND STORAGE**

In most cases, the reason for storage is winter layup. The information in this section is a general guide. Your Silverton dealer or a competent boatyard should prepare your yacht for winter storage. If you are removing your yacht from the water for another reason, use the information in this section as a guideline. Following the procedures in this section helps extend the life of your yacht and its equipment and simplifies recommissioning in spring.

Indoor storage is beneficial if you are storing your yacht in a climate that produces ice and snow. However, the storage building should be adequately ventilated, not tightly closed. Ventilation, both around and throughout the yacht, is very important.

If you use outdoor storage facilities, cover your yacht with a canvas cover having provisions for ventilation to keep the yacht from “sweating.” Building a frame

over the boat to support the canvas will allow the passage of air around the yacht. The frame should be a few inches wider than the yacht so the canvas will clear the rails.

Before preparing your yacht for winter storage, thoroughly check the condition of the yacht and its systems and equipment. Note any repairs needed. The need for other repairs may become apparent during winterization. Make arrangements to have the repairs completed.

### ***Draining Your Yacht***

Your yacht has drain plugs for draining water from the bilges. See your Silverton dealer for the location of thru-hull openings. Some compartments in the bilge may not drain completely because of the position of the yacht. Pump these compartments out and then use a sponge to remove all remaining water.

Procedures for draining and winterizing the fresh water system are in this section under the “Preparing for Storage” heading.

### ***Lifting Your Yacht***

Following are guidelines which will help prevent damage to your yacht as it is being lifted.

1. Never hoist the yacht with a greater than normal accumulation of water in the bilge. Fuel and water tanks should be empty.
2. Place slings where indicated by the sling tags on the gunwales. Avoid placing slings where they may lift the propeller shaft or other underwater fittings. Blocks or pads at the chine comers will help keep pressure to a minimum at this point.
3. Disconnect the propeller shafts at the transmissions to prevent damage to the transmission.
4. Use flat, wide slings made of belting and spreader bars long enough to keep pressure off the gunwale. Do not use cable slings. Pressure by the slings on the gunwales can cause severe gelcoat crazing or more serious hull damage.

The spreader bar at each sling should be as long as the distance across the widest point the sling surrounds.

5. If a marine railway or platform hoist is being used, locate and adjust the blocking to distribute the weight over several areas. The weight borne by the keel must not be so great as to cause crushing or distortion of that member.
6. When lifting the boat, keep the bow higher than the stern so the exhaust lines can drain. This will keep water from running forward through the manifold and into the engine itself where the water can become trapped.

**Important:** Engine failure is possible if water enters the engine cylinders. This water can cause hydrostatic lock and bend the piston rods. Even a small amount of water can cause rust or other damage.

**Note:** Keep the bow higher than the stern every time the boat is lifted. Do not lift the stern to change a propeller. Doing so can cause water to enter the engine.

### ***Supporting Your Yacht During Storage***

A cradle is the ideal support for your yacht whenever it is not in the water. Properly designed and located, the cradle will support the yacht under the main frames. Support at these points is essential for preventing damage to the hull.

If a cradle is not available, the yacht may be supported on two or three timbers across a boat well or on another firm footing substantial enough to keep the yacht level. The timbers and the foundation must be substantial enough to prevent any change in shape while supporting the boat during storage. The weight carried by the supports should be evenly divided; the keel should carry a share of it.

Store the boat with the bow up so any accumulation of moisture will run off.

### ***Preparing for Storage***

1. Clean, scrub, and scrape the hull and deck as soon as the boat is pulled from the water and is still in the sling. Cleaning marine growth from the hull is easier when it is still wet.
2. Clean the inside of all hull openings, thru-hull fittings, and screens. Inspect the hull and underwater gear for signs of wear, deterioration or damage.

**Note** any damage to the engine outdrive, helm area, cabin, etc. Make repairs if at all possible before covering your yacht.

3. Fill the fuel tank(s) with treated fuel to prevent condensation. If you use a stabilizer or conditioner, be sure to follow the instructions on the container.

**Important:** Do not overfill fuel tank so fuel flows from the vent. Allow room in the tank for fuel to expand.

4. Prepare the engines for storage. Refer to the engine owner's manual for winterization and storage procedures.
5. Prepare generator and air conditioner for storage.

Refer to owner's manual for winterization and storage procedures.

6. Prepare head and holding tanks:
  - a. Empty and rinse holding tank until tank is clean.
  - b. Close head intake sea cock and remove hose.



**WARNING:** Automotive radiator antifreeze is poisonous. Use a nontoxic antifreeze. See your Silverton dealer for nontoxic antifreeze.

- c. Put hose into a container of non-toxic antifreeze. Keep flushing the head until the antifreeze reaches the holding tank.
  - d. If your yacht has a macerator discharge and the yacht is removed from the water, run the macerator pump long enough for antifreeze to run through the pump and the lines.
  - e. Remove drain plug from sea cock while valve is closed. Allow line to drain. Replace drain plug.
7. In areas where temperatures fall below freezing, the bilge area under the engines must be pumped out and sponged completely dry. Check for areas that do not drain to the pumps.
8. Pour nontoxic antifreeze into all sink drains until the antifreeze is discharged overboard.



9. Prepare the fresh water system:

- a. Remove the fresh water supply by opening the hot and cold faucets in the galley for 10-minute intervals. Repeat until the fresh water tanks are empty.
- b. Open all faucets: galley, shower, cockpit shower, etc.
- c. Remove fresh water filter bowl and strainer. Clean, dry, and replace strainer bowl.
- d. Drain the water heater. Disconnect lines from the engine heat exchanger (if provided). Drain exchanger and lines.
- e. Remove hot and cold water lines and hook them together.
- f. Remove inlet hose from tank and insert it into a container of nontoxic antifreeze. Turn pump on. Starting at faucet furthest from pump, open all faucets until antifreeze flows out.
- g. Turn off pump and reconnect hoses to water heater and pump.

10. Remove strainer and sea cock drain plugs to prevent damage from freezing. Close all seacocks.

Strainers

- Engines
- Fresh water system
- Air conditioning and/or generator if equipped

Sea cocks

- Engines
- Head system (intake)
- Head system (macerator pumpout)
- Air conditioning and/or generator if equipped

11. Prepare batteries for storage:

- a. Be sure BATTERY 1 MAIN and BATTERY MAIN breakers are OFF.
- b. Remove batteries from yacht and store in area where temperatures remain above freezing.
- c. Place batteries on a wooden pallet or bench.
- d. Keep batteries charged. Check electrolyte levels regularly. Add electrolyte if needed.

12. Prepare interior of yacht for storage:

- a. To keep mildew from forming, remove all items that will hold moisture (PFDs, towels, blankets, clothing, canvas, etc.)
- b. Make sure all garbage is removed.
- c. Scrub the inside of the yacht. Clean cabinets, drawers, and cupboards. Allow cabin area to dry and air for at least one day if possible.
- d. Stand or prop up mattresses and cushions remaining on board to allow good air circulation around them. Hang life preservers and other equipment to prevent mildew.
- e. Remove any detachable and valuable equipment and electronics.

13. Prepare exterior of yacht for storage:

- a. Wash all outside surfaces with a mild detergent.
- b. Apply a coat of wax to the entire yacht. Put rust inhibitor on all metal parts.

14. Cover the yacht with a tarpaulin or mooring cover. If yacht is stored outside, you may need to place supports under the cover to shore up pockets where rain or snow can collect.

**Note:** If possible, do not seal cabin tightly to allow ventilation of the cabin.

## 5.7 FITTING OUT AFTER STORAGE

Sand and paint the hull bottom before removing the yacht from its cradle.

**Note:** This coat of paint must be applied before the beginning of a new boating season. Check with your Silverton dealer for information about the paint you should use.

Before launching your yacht, do not load unneeded equipment, furniture, and personal items until the launch and final checkout are complete.

## Pre-Launch Checkout

Before placing your yacht in the water, check and perform the following:

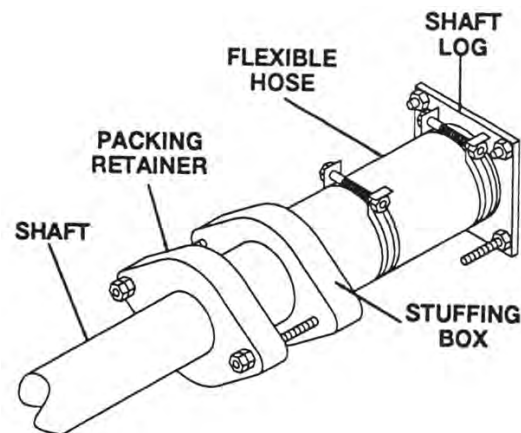
1. Check all anchor lines and gear and replace if necessary.
2. Check all thru-hull fittings to make sure they are clean. Make sure all drain plugs are installed. Check all strut and thru-hull hardware for damage and tightness. Repair or adjust as needed.
3. Check propellers and propeller shafts for proper installation and tightness. Clean propeller and shafts. Check shaft play in strut bearing. Replace bearing if play is excessive.
4. Check shaft alignment. Refer to the engine owner's manual or check with your Silverton dealer for details.
5. Clean battery terminal posts and cable terminals with a wire brush or bronze wool. Install batteries and attach cables. After cable posts are tightened down, smear posts with grease to keep out air and acid. Check all wiring connections and contacts for corrosion and tightness.
6. Check all sea cocks for easy operation. Check the condition of all hoses.
7. Check operation of bilge pumps in manual and automatic modes. Check operation of shower sump pump.
8. Check all bilge blowers for proper operation.
9. Check operation of all DC circuits.
10. Launch your yacht.

## Post-Launch Checkout

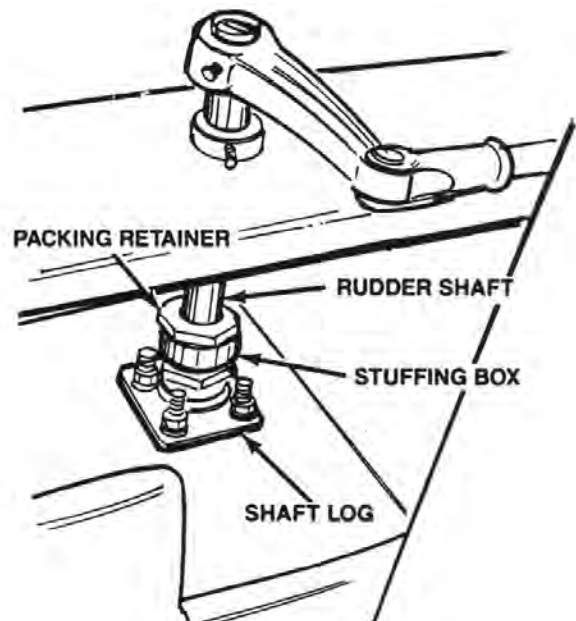
After launching your yacht, check the following:

1. Check all sources of possible leaks from bow to stern. Make this check with yacht fully in the water but still in the slings!
2. Maintain engines and generator following procedures described in equipment manuals.
3. Check the entire exhaust system for the engines and the generator carefully. Make sure all exhaust systems are gastight. If exhaust opening was plugged or covered during storage, remove it.

4. Check propeller shaft and rudder stuffing boxes for leakage. Adjust retainer or repack box as required. (See **Figures 5-6** and **5-7**.)



**Figure 5-6 – Propeller Shaft Stuffing Box**



**Figure 5-7 – Rudder Shaft Stuffing Box**

5. Check all steering controls, cables, and linkage for the engines and the transmission.
6. Purge antifreeze from water tank.. Fill with water turn pump on, and allow to flow until there is no antifreeze in the water. Fill fresh water system and check out system for air and leaks.

7. Connect yacht to shore power. Check out electrical equipment, including lights, hot water heater, air conditioning system, and all other electrical equipment.
8. Thoroughly clean interior and exterior of yacht. Polish and varnish areas as necessary. Clean range and refrigerator.
9. Check all safety equipment including flares, flags, fire extinguishers, and first aid kits. Replace equipment as necessary.
10. Test run engines and generators as directed in the equipment manuals.

# 6 GLOSSARY

As you read this manual, you will encounter many descriptive terms unique to seamanship and yachting. This section defines these terms as they are used in this manual.

<b>Abaft</b>	Toward the rear of the boat	<b>Bulkheads</b>	The interior walls of a boat
<b>Abeam</b>	At right angles to the boat's keel	<b>Cast off</b>	Let go
<b>Aboard</b>	On the boat	<b>Chine</b>	The point where the bottom of the hull and the side meet
<b>Abreast</b>	Side by side	<b>Chock</b>	A fitting or hole through a boat's deck through which a mooring or anchor line is routed
<b>Adrift</b>	Loose, not on a mooring or tow line	<b>Circuit Breaker</b>	A device used to interrupt an electrical current when current flow exceeds a predetermined level
<b>Aft</b>	Moving toward the stern	<b>Cleat</b>	A deck fitting to which lines are secured
<b>Aground</b>	Stuck fast on the bottom	<b>Cockpit</b>	An exposed aft deck area substantially lower than the forward adjacent deck
<b>Ahead</b>	In a forward motion	<b>Companion Way</b>	The steps or ladder from the deck to the cabin of the boat
<b>Amidship</b>	(1) An object or area midway between the bow and the stern of the boat; (2) An object or area midway between the port and the starboard side of the boat.	<b>Compartments</b>	Rooms or spaces divided by bulkheads
<b>Ampere</b>	The standard unit used to measure the strength of an electrical current.	<b>Cradle</b>	A wooden framework used to support a boat when it is on land.
<b>Astern</b>	(1) In the back of the boat; (2) Direction of travel when boat moves backwards.	<b>Current</b>	(1) The movement of the water, (2) The rate of flow of an electrical charge
<b>Athwartship</b>	Movement from port to starboard or starboard to port.	<b>Dead ahead</b>	Directly in front of the boat
<b>Beam</b>	(1) The widest distance across a boat; (2) A transverse structural member that stiffens and supports a portion of the deck.	<b>Dinghy</b>	A small, open boat used for ship to shore transportation
<b>Bilge</b>	The area of the hull below the surface of the water	<b>Displacement</b>	The weight of water displaced by the hull of the vessel
<b>Bilge Pump</b>	A pump used to remove water that has drained into the boat's bilge	<b>Draft</b>	(1) The depth of a boat from the actual water line to the bottom of the lowest part of the boat (for example, the propeller tip or rudder); (2) The depth of water necessary to float a boat
<b>Bow</b>	The front end of the boat		
<b>Bow Line</b>	A docking line leading from the boat's bow		

<b>Even keel</b>	To be floating evenly without listing to either side	<b>Gunwale</b>	(1) The line where the upper deck and the hull meet; (2) The upper edge of a boat's side
<b>Exhaust system</b>	The means by which the hot engine or the generator exhaust gases are moved from the engine and released into the atmosphere	<b>Hatches</b>	Covers on the hatchways
<b>Fathom</b>	Six (6) feet	<b>Hatchways</b>	Access ways through decks
<b>Fender</b>	A rubber or plastic device positioned to absorb impact between vessels or a vessel and a dock	<b>Hardtop</b>	A permanent cover over the cabin or cockpit
<b>Flare</b>	(1) Outward curve of the hull as it comes up the side from the water line; (2) A pyrotechnic device used for emergency signalling	<b>Hawser</b>	A heavy rope used for mooring or towing
<b>Flotsam</b>	Refuse that floats when discharged overboard (see jetsam)	<b>Head</b>	A toilet or lavatory
<b>Flying Bridge</b>	The uppermost steering station from which the vessel is controlled	<b>Heading</b>	The direction that a vessel is going with reference to true, magnetic, or compass north
<b>Fore-and-Aft</b>	A line, or anything else, that runs parallel to the longitudinal center of the boat	<b>Headway</b>	The forward motion of a vessel through the water
<b>Forward</b>	Toward the bow	<b>Heel</b>	To tip or tilt to one side by means of an external force
<b>Freeboard</b>	The minimum vertical distance from the center of the water to the gunwale	<b>Helmsman</b>	The individual steering the boat
<b>Galley</b>	The kitchen area of a boat	<b>Hull</b>	The main body of a boat
<b>Gasket</b>	A strip of sealing material used to make joints fluid tight	<b>Inboard</b>	(1) From either the port or starboard side of a boat to the fore and aft centerline of a boat; (2) The dock side of a moored boat
<b>Gelcoat</b>	The thin outer layer of pigmented plastic used on exposed fiberglass components	<b>Jetsam</b>	Refuse that sinks when discharged overboard
<b>Gland</b>	The movable part of a stuffing box, which compresses the packing when tightened (also referred to as "packing gland")	<b>Keel</b>	The centerline of a boat running fore and aft at the lowest point of the hull
<b>Ground (electrical ground)</b>	The electrical potential of the earth's surface, which is zero	<b>Knot</b>	(1) A maritime unit of speed equal to 1.15 miles per hour; (2) A term for hitches and bends in a line of rope
		<b>Lazarette</b>	Storage compartments below the deck at the stern of the boat
		<b>List</b>	A vessel that inclines to port or starboard by its own means

<b>Longitudinal</b>	Running lengthwise	<b>Port quarter</b>	Looking forward, a vessel's left rear section
<b>Mooring</b>	An arrangement for securing a boat to a mooring buoy or pier	<b>Quarter</b>	The sides of a boat aft of amidships
<b>Navigational Lights</b>	A set of red, green, and white lights which indicate the presence of a vessel and must be shown by all vessels between dusk and dawn	<b>Quartering Sea</b>	Sea (waves) coming from a boat's quarter
<b>Overhead</b>	A ceiling or roof of a vessel	<b>Rode</b>	The anchor line or chain
<b>Overboard</b>	Over the side of a boat	<b>Running Lights</b>	See Navigational lights
<b>Outboard</b>	(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	<b>Rudder</b>	A vertical plate used to steer the boat
<b>Passageway</b>	A corridor or hallway aboard ship	<b>Salon</b>	The main social cabin on a boat, usually the largest area
<b>Personal Flotation Device (PFD)</b>	A life preserver	<b>Screw</b>	A propeller
<b>Pier</b>	A loading platform that extends at an angle from the shore	<b>Scupper</b>	A drain from the edge of a deck or cockpit that discharges overboard
<b>Piling</b>	Support or protection for wharves, piers, etc.	<b>Seacock</b>	A positive action shutoff valve connected directly to the hull seawater intake and discharge piping
<b>Pitch</b>	(1) The vertical motion of a boat in a seaway, about the athwartship axis; (2) The axial advance in inches of a propeller during one complete revolution	<b>Shaft</b>	The long, round rod that connects the engine/transmission to the propeller
<b>Planing Hull</b>	At slow speeds, a planing hull will displace water in the same manner as a displacement hull. As speed increases, the hull provides a lifting effect up onto the surface of the water	<b>Shaft Log</b>	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
<b>Port</b>	(1) Looking forward, the left side of a boat from bow to stern; (2) A harbor	<b>Sheer</b>	The top of the hull's curvature at the deck line from the bow to stern
<b>Port Beam</b>	The left center of a boat	<b>Sheer strake</b>	The upper edge of the hull, immediately below the deck
<b>Port bow</b>	Facing the bow, the front left side	<b>Sole</b>	The deck of a boat or the floor of a cabin
		<b>Spring line</b>	A pivot line used in docking or to prevent the boat from moving forward or astern while made fast to a dock
		<b>Starboard</b>	Looking forward, the entire right side of a boat from bow to stern
		<b>Starboard beam</b>	When facing the bow, the front right side

<b>Starboard quarter</b>	When looking forward, the right right rear section of the boat
<b>Stem</b>	The leading edge of a boat's hull.
<b>Stern</b>	The back of a boat
<b>Stringer</b>	Longitudinal and transverse continuous members used to provide a vessel with strength
<b>Strut</b>	A propeller shaft support that is below the hull. The main strut is a large strut that is mounted immediately forward of the propeller. An intermediate strut is smaller than the main strut and is mounted between the main strut and the shaft log
<b>Sump</b>	A pit or well into which water is drained
<b>Superstructure</b>	A flying bridge or other structures that extend above the deck
<b>Topside</b>	To go to the uppermost deck
<b>Transom</b>	The planking or structure forming the stern of a square-ended boat
<b>Transverse</b>	Direction running across the boat
<b>Underway</b>	A vessel that is not moored, docked, at anchor, or aground
<b>V-bottom</b>	A hull with the bottom section that is shaped in the form of a "V"
<b>V-drive</b>	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
<b>Water line</b>	The line of the water on the hull when the boat is afloat and at rest
<b>Weather deck</b>	A deck with no overhead protection
<b>Windlass</b>	A device used to raise and lower an anchor