

08/31/09

*Spirit*  
SABRE

## OWNER'S MANUAL



# SABRE SPIRIT

## OWNER'S MANUAL

### TABLE OF CONTENTS

#### **INTRODUCTION**

**Responsibilities of Your Dealer**

**Responsibilities of the Owner**

**Design Concept**

Hull

Deck

Deck to Hull Joint

Bulkheads

Keel

Rudder

**Commissioning Procedure**

Commissioning Checklist

Proper Lifting

Trim

**Warranty Record**

**Sabre Limited Sailing Yacht Warranty**

**Dealer Commissioning Checklist**

1. **Getting Started**

a. **Safety Equipment**

Distress Signals

Personal Flotation Devices

Fire Extinguishers

Lifelines

Radar Reflectors

Charts

First Aid Kits

EPIRBs

Safety Harnesses

Man Overboard Recovery Systems

- b. **Sails**
  - Sail Selection
  - Setting of Sails
- c. **Anchors and Anchoring**

## 2. **ENGINE**

- a. **Engine Specifications and Operation**
  - Auxiliary Engine
  - Engine Key Switch
  - Before Starting Engine
  - After Starting the Engine
  - Stopping the Engine
  - Oil Change
  - Engine Condensation
  - Engine Lay-Up
  - Engine Clean Out
  - Cruising Speed
  - Folding Props
  - Engine Gauge Condensation
- b. **Engine Cooling and Exhaust System**
  - Possible Causes and Solutions for
  - Engine Overheating
  - Engine Backfire
  - Hot Water Heaters
- c. **Fuel System**
  - Deck Fill Plate
  - Fuel Tank Ventilation
  - Shut-Off Valve
  - Fuel Filters
  - Fuel Gauge
  - Fueling Safety Checklist
- d. **Troubleshooting**

## 3. **DRIVE AND STEERING SYSTEM**

- a. **Drive Shaft and Propeller System**
  - Engine Alignment
  - Propellers
  - Propeller Removal
  - Propeller Installation
  - Propeller Shaft

- b. **Steering System**
  - Wheel Steering Detail
  - Emergency Tiller
  - Maintenance and Inspection

4. **RIGGING**

- a. **Standing Rigging**
  - Standing Rigging Lengths- Sabre SPIRIT
  - Mast Installation
  - Initial Tuning of the Rig
  - Mast Step and Collar
  - Boom Vang Attachments
  - Checking the Rig for Wear
- b. **Running Rigging**
  - Halyard and Sheet Lengths
  - Furling Systems

5. **PLUMBING**

- a. **Fresh Water System**
  - Water Tank
  - Vent
  - Leaks
  - Filters
  - Shower Sump Pump
  - City Water Inlet (Option)
- b. **Marine Head**
  - Head Unit and Holding Tank
- c. **Drainage and Seavalue Systems**
  - Seavalves
  - Installation of Additional Seavalves
  - Bilge Pumps
  - Bilge Pump Troubleshooting

6. **ELECTRICAL SYSTEM**

- a. **12V DC System**
  - Battery Switch and Combiner
  - Batteries
  - Switch Panel
  - Wire Identification

- b. **120V AC System**
  - 120 Volt Power
  - Voltage
  - ProSafe Galvanic Isolator Monitor
  - Polarity
- c. **Lightning Protection and Bonding System**
  - Bonding System
  - Lightning Protection System

7. **STOVE SYSTEM**

8. **MAINTENANCE**

- a. **A Few Words Concerning Maintenance**
- b. **Safety Maintenance**
  - Standing Rigging
  - Running Rigging
  - Thru-Hulls
  - Installation of Thru-Hulls
  - Bilge
  - Fire Extinguishers
  - Lifelines
  - Stanchion Posts
  - Deck Hardware
  - Annual Safety Maintenance Checklist
- c. **Exterior Maintenance**
  - Fiberglass and Gelcoat
  - Gelcoat Crazing
  - Gelcoat Repair
  - Bottom Paint
  - Blistering of the Gelcoat Layer
  - Stainless Steel and Aluminum
  - Deck Hardware
  - Ports and Hatches
  - Winches
  - Exterior Teak
  - Sails
  - Mast
  - Boom

d. **Interior Maintenance**

- Wood
- Ports
- Cushions
- Sinks
- Laminated Plastic
- Stoves
- Ice Box
- Head
- Lockers and Bilge

e. **Deck Leaks**

- The Most Common Sources of Hull Leaks
- Toerails
- Ports
- Deck Drains
- Genoa Tracks
- Mast Collar
- Traveler and Spray Hood Bolts
- Spray Hood Drain
- Instruments
- Winch Pockets
- Pedestal
- Cockpit Drains
- Hatches
- Stanchions
- Rail Bases
- Waste and Deck Water Fittings
- Winches
- Handrails

f. **Hull Leaks**

- Keel Bolts
- Anchor Well
- Strut Bolts
- Thru-Hulls
- Water Hoses
- Hot Water Tank
- Engine Coolant
- Drainage System

g. **Keel Maintenance**

- Rebedding Keel Bolts

9. **CHECKLISTS**

Rig Inspection Checklist  
Safety Maintenance Checklists  
Winterizing Checklists  
Pre-Launch Checklists

10. **DRAWINGS**

Sail Plan

Interior Arrangements Plan View

Fire Extinguisher Locations

Construction:

Hull to Deck Joint Assembly

Shroud Chainplate Assembly

Keel to Hull Joint Assembly

Rig: Mast Tie Rod Assembly and Mast Step

Mast Collar Block Attachment Locations

Sail Maker's Data Sheet

Deck Layout

Mainsheet Block / Traveler Rigging Detail

Plumbing:

Potable Water System (hot & cold) – include non-pressured system

Grey Water System

Waste Water / Sewage System (aft head & forward head)

Fuel System Details (perspective)

Tank Locations/Sealvalve Thru-Hull Locations

Bilge Pump Systems

Mechanical:

Rudder Post and Radial Drive Assembly

Steering /Emergency Tiller System

Propeller

Propane Stove System

Engine Exhaust System

Electrical:

Wire Number Identification Sheet

D.C. Interior Lighting Plan

D.C. Exterior Lighting Plan

D.C. Battery System

A.C. /D.C. Panel Wiring

AC Outlet Layout

Lightning Protection

Shipping Details:

On the Road Specs with Travel-Lift Pick Locations

# **INTRODUCTION**

This manual has been designed to help you enjoy your Sabre SPIRIT to the fullest. We hope that this information will become a permanent part of your crew - a manual that is both a solid reference for maintenance, upkeep, and repair, as well as a guide to fully understanding the operation of your boat. It has been designed, much as your Sabre SPIRIT, to be versatile and easy to use.

A separate binder has been provided containing manuals and warranty registration cards from the suppliers of many of the major components of your boat. We strongly suggest that you take the time to fill out and send in the cards to the suppliers, as well as familiarize yourself with their manual. A few minutes examining these materials may save significant amounts of time later.

We are certain that you share with us the belief that little in life is more enjoyable than a day on the open water. We ask that you keep in mind the power of the sea, and the hazards that it can present. Your Sabre SPIRIT has been constructed to meet the rigors of the sea, but only when handled in a cautious manner. Your boat must be maintained in accordance with the instructions provided in this manual, as well as those set forth by the American Boat and Yacht Council ([www.abycinc.org](http://www.abycinc.org)).

Sabre and Sabreline yachts are constructed at our facility in the town of Raymond, Maine – near the shore of Sebago Lake. The original building is still the primary production facility, where yachts ranging in size from 28 to 45 feet in length have been built since 1970. In the summer of 2002, a new building was added to facilitate the construction of the Sabreline 43 and 47, and more recently the 52. Sabre lies in the heart of a region with a rich tradition of dedicated craftsmen, each of which brings a special skill to the construction of every Sabre and Sabreline yacht. Our design and production teams are staffed with engineers and experienced boaters who monitor every aspect of production, ensuring that our demanding standards remain among the highest in the industry.

It is the policy of Sabre Corporation to continually look for ways to improve the quality and detail of all our yachts. Improvements in finishing and construction techniques help to ensure that Sabre stays "ahead of the times" in the production of our boats. These changes come after thorough testing and review by both the design and production teams. Variation from the details covered in this manual and your vessel are the result of this continuous improvement program as well as the options that you have selected.

Your Sabre is identified by a Hull Identification Number (HIN), molded into the gelcoat at the top right hand corner of the transom. The standard for the HIN is set forth by U.S. Coast Guard Regulations. Knowing this number will make it significantly easier to get an accurate and timely response to your questions and comments.

***Note: You may contact us by e-mail or by telephone. If you call Sabre and are connected to the voice mail system, please leave your model and hull numbers along with your message, as this will help your Sabre representatives to have a better prepared answer when they return your call.***

It is the responsibility of your dealer to commission your Sabre SPIRIT in accordance with Sabre's commissioning procedure, a copy of which has been included in this manual.

**It is imperative that the checklist, as well as the warranty registration card is returned promptly to Sabre. Until these documents have been received, Sabre Corporation can cover no warranty claims.**

We have attempted to provide you with the most thorough Owner's Manual in the boatbuilding industry. Your Sabre dealer or our Customer Service Department will be happy to provide you with any additional information you require. Our daytime telephone number is (207) 655-3831, and you can fax us at (207) 655-5050 and email us at [sabre@sabreyachts.com](mailto:sabre@sabreyachts.com).

Boat smart from the start, take a Boating Education Course and get a free vessel Safety Check annually for your boat. For more information contact; United States Coast Guard Auxiliary, 800-368-5647, [www.cgaux.org](http://www.cgaux.org), or United States Power Squadrons, 888-FOR USPS, [www.usps.org](http://www.usps.org).

Happy reading and happier boating!

## **RESPONSIBILITIES OF YOUR DEALER**

All Sabre yachts are sold through Authorized Sabre Dealers who have been selected to represent the company on the basis of their knowledge of our yachts and their ability to provide you with the service you deserve. They are experts in their profession who realize that they must provide you with a high level of service and attention when you purchase a Sabre. Your Sabre Dealer is responsible for the following procedures connected with the purchase and commissioning of your yacht.

- Preparing and communicating to Sabre a detailed specification list for your yacht, including options, colors, and upholstery selections at the time of ordering.
- Inspecting the yacht on delivery for loss and damage in transit, and the processing of all claims against the transport company. Should you notice any loss or damage you must notify your dealer within 30 days of arrival, as neither the carrier nor Sabre can honor claims beyond 30 days.
- Inspecting the packing boxes that come with the yacht to ensure that all items are received in accordance with the Sabre packing list.
- Commissioning the yacht in accordance with the Sabre Commissioning Checklist. The dealer must check and initial each item on the list, review it with you, and send a copy to Sabre.
- Activating and checking all mechanical systems under the conditions of actual usage.
- Instructing you on the use of your yacht and all its systems.
- Providing all necessary assistance and service under the terms of the Limited Warranty on your yacht, including the processing of all claims with Sabre Corporation.

## **RESPONSIBILITIES OF THE OWNER**

For maximum safety and enjoyment of your Sabre SPIRIT, due regard must be given to the hazards of the sea, and to proper maintenance procedures detailed in Section 8 of this manual. The following is a **partial** list of items that are the **Responsibility of the Owner** for the safe operation of your yacht. Consult your local U.S. Coast Guard and Power Squadron offices for additional information on the safe operation of your yacht.

- Complete the Warranty Registration form and the dealer-commissioning list and return them within 15 days of the commissioning of your yacht.
- Advise Sabre of any change of address, or change of ownership, in order to assist us in maintaining an accurate list of owners for future mailings regarding the safety and upkeep of your Sabre SPIRIT.
- Confirm that all items, which are the Responsibility of the Dealer, are completed by your dealer. If your yacht is delivered to a location other than the official address of your Sabre Dealer and, subject to the dealer's agreement with you, it may become your responsibility to supervise the commissioning of your yacht.
- Operate your yacht in accordance with instructions provided in all sections of this Owner's Manual, the individual supplier instruction manuals provided, and all applicable Coast Guard regulations.
- Supervise the maintenance of your yacht by competent marine service personnel, in accordance with all instructions provided in this Owner's Manual, the individual supplier instruction manuals provided, the U.S. Coast Guard standards, the American Boat and Yacht Council standards, and all other applicable standards.
- Supply and maintain all additional safety equipment on board as required or recommended by the U.S. Coast Guard for your size yacht and the nature of your boat usage.

Before operation, observe the requirements of the **Sabre Boating Safety Checklist** each time you use your boat. Additional copies of this list are available from Sabre upon request.

- **EXPERIENCED CREW** - Be certain that there are at least two experienced boaters on board capable of safely operating the boat and all safety gear. Make sure that the entire crew understands the right-of-way rules.
- **WEATHER CONDITIONS** - Check the weather forecast to be sure that it is safe to go out, given the experience and readiness of the crew.
- **FLOAT PLAN** - Notify someone onshore that you are going out, and when you plan to return.
- **CHARTS** - Be sure that you have **up-to-date** charts of the waters you will be navigating.
- **PERSONAL FLOTATION DEVICES** - Provide one for each person on board.
- **FUEL SYSTEM** - Check for fuel leaks, fumes, and adequate fuel. Operate the blower for at least four (4) minutes before starting the engines.
- **EXHAUST SYSTEM** - Check for wear or deterioration in the exhaust system that may allow hazardous fumes to escape.
- **ELECTRICAL SYSTEM** - Make sure that all navigation lights are working properly and that your batteries are fully charged.
- **EMERGENCY GEAR** - Check fire extinguishers, anchors, first aid kit, and any other safety equipment.

## **DESIGN CONCEPT**

The Sabre Design Team and Jim Taylor Yacht Design have collaborated on five award winning designs over the past 15 years, and, for 2007, are proud to introduce the Sabre Spirit weekender with classic good looks and spirited performance.

For 35 years, Sabre Yachts has built sailing yachts with a performance pedigree; all built for people who love sailing and who treasure the exhilarating feeling that a great sailboat design can offer her crew. But just as some owners allow the time for long range cruising, there are those whose schedules require a different sailing lifestyle.

And so Sabre again turned to Jim Taylor to design a weekender with the style and elegance of sailing yachts of a bygone era, and added to the design mandate blending the performance of a youthful sport boat with “grown-up” ease of handling available with today’s modern sailing hardware.

To merely use a number to describe such a boat seemed inadequate, and so the name “SPIRIT” was chosen to better describe the very essence of the yacht.

## **HULL**

The hull is a single unit fiberglass molding; hand laminated using the finest polyester and vinylester resins. All fiberglass materials are pre-cut using templates to maintain design thickness and uniformity. Isophthalic gelcoat is first sprayed onto the polished hull mold. Next, one layer of 2.0 oz. gun roving is placed with an epoxy/vinylester resin throughout the hull, providing a stronger and more even back up for the gelcoat finish.

The structural laminate is formed with alternating layers of bi-directional knitted glass and mat. Divinycell Foam core panels are used to provide yet more strength and stiffness, while keeping added weight to a minimum. Additional reinforcement is then provided in all key stress areas by overlapping extra layers of fiberglass.

## **DECK**

The deck on your Sabre SPIRIT is a single unit, hand-laminated fiberglass molding, with anti-skid surface molded in Cross linked PVC foam coring of various thicknesses is then applied to all walking surfaces and other stressed areas of the deck. Additional reinforcement is provided in such key stress areas as the mast collar, rudder post, upper bearing support, and the stanchion bases using appropriate thicknesses of solid glass, aluminum plates, and Cross linked PVC hardcore foam.

## **DECK TO HULL JOINT**

The deck to hull joint consists of an in-turning fiberglass flange molded onto the hull, allowing the stainless steel bolts and aircraft locknuts to tighten the toerail, deck flange, and hull into one integral unit. To ensure a watertight joint, urethane sealant is placed on the hull flange before the deck is fastened into place. In addition, each stainless steel bolt is individually caulked as it is installed. When the bolts are tightened, the urethane sealant is compressed in order to fill all voids. A leak at the deck to hull joint can usually be overcome by additional tightening of the stainless steel locknuts.

## **BULKHEADS**

Structural bulkheads and other major interior components are fastened to the hull with fiberglass bonding tapes and to heavily reinforced fiberglass ribs in the headliner with stainless steel screws.

## **KEEL**

The one-piece lead keel is cast in a ceramic foundry mold to close tolerance. Stainless steel bolts are cast into the lead. These bolts extend through the heavily reinforced fiberglass keel attachment area, and are secured by silicone bronze nuts and washers. The joint between the keel and the hull is filled with high-compression epoxy to ensure a precise fit. It is not unusual for a hairline crack to occur between the hull and keel. This is due to the brittleness of the epoxy and is not a need for concern. If this does occur it is best to apply a bead of 3M 5200 into the crack (be sure to clean off all paint and sand the surfaces prior to application).

## **RUDDER**

The rudder shaft is constructed of a lightweight, carbon fiber composite tube, which is bonded to one of the epoxy/ E-glass skins, forming one-half of the fiberglass shell. The other half of the fiberglass shell is then bonded into place, creating the optimum hydrofoil section and ensuring maximum helm control.

After assembly, the rudder molding and shaft are filled with high-density closed-cell urethane foam to maintain watertight integrity and designed rudder weight.

## **COMMISSIONING PROCEDURE**

The proper commissioning of your Sabre SPIRIT is the responsibility of your dealer. This is a very important step in assuring the satisfactory operation of your yacht. The construction and inspection of each Sabre is completed to the fullest possible extent in the factory. However, further commissioning and inspection is necessary under actual yachting conditions and usage. Also, this commissioning procedure should be followed in subsequent seasonal relaunchings.

### **COMMISSIONING CHECKLIST**

The Commissioning Checklist included in this manual should be followed and completed by your dealer at the time of commissioning. The dealer should check off each item on this list as the work is completed. Both the owner and the dealer should sign the bottom of the list, confirming that all items are completed. This signed copy must be returned to Sabre as part of your Warranty Registration.

### **PROPER LIFTING**

The careful placement of the lifting straps used to lift your Sabre SPIRIT is very important in avoiding damage to the propeller shaft as well as ensuring that the center of gravity of the yacht is centered over the straps. Caution should be exercised to avoid placing the straps in contact with a thru-hull fitting.

### **TRIM**

Your yacht is designed to float correctly on her lines under normal conditions. You may find that the trim of your Sabre is affected by the weight of optional equipment and tankage, the fullness of the water tank, and by the placement of equipment and supplies. In most cases the trim can be corrected by storing heavy items in appropriate locations. If you find that it is necessary to further adjust the trim of your Sabre, 60 lb. lead ballast blocks can be purchased from Sabre.



# SABRE

## LIMITED SAILING YACHT WARRANTY

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE

This Limited Warranty is extended by Sabre Corporation ("Sabre") to the original retail purchaser of the sailing yacht and is not transferable to any subsequent purchaser.

Sabre disclaims all responsibility for loss of use of the yacht, loss of time, inconvenience, consequential, incidental or other damages, including but limited to, the cost of transporting the yacht, travel, lodging, loss of revenue, or loss or damage to personal property.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so these limitations may not apply to you.

Sabre reserves the right to make changes in design, materials, or specifications of its yachts or parts without obligation or liability to incorporate such changes in yachts or parts of prior manufacture.

### What is covered and for how long:

- a) Sabre warrants all sailing yachts and parts manufactured by it to be free from defects in material and workmanship, under normal use and maintenance, for a period of twelve (12) months after the date the yacht is first commissioned for the original purchaser.
- b) Sabre warrants all fiberglass hulls supplied by it to be free from structural defects which would make the yacht unfit for the use intended, under normal use and maintenance, for a period of ten (10) years from the date the yacht is first commissioned for the original purchaser.
- c) Sabre warrants the gelcoat below the waterline of all fiberglass hulls manufactured by it against premature weathering or deterioration for a period of five (5) years after the date the yacht is first commissioned for the original purchaser.

### Validation of Limited Warranty:

To validate this Limited Warranty, the Sabre Warranty/Commissioning checklist must be returned to Sabre Corporation, Hawthorne Road, Box 134, South Casco, Maine 04077 within fifteen (15) days of the delivery of the yacht to the original purchaser. Additional Warranty Registration Forms are available at Authorized Sabre Dealers. The Federal Boat Safety Act requires that we obtain the information contained on the Warranty Registration from all original purchasers of Sabre yachts.

### What is not covered:

- A. The twelve (12) month Limited Warranty referred to above does not apply to:
  1. Labor or material charges for engine, batteries, controls, instruments, pumps, propellers, or other equipment or accessories carrying their own individual warranties;
  2. Items installed by anyone other than Sabre;
  3. Gelcoat damage such as crazing caused by stress, impact, weathering, or from improper maintenance or use of harsh solvents or cleaners;
  4. Finishes or upholstery damage due to weathering, improper maintenance, or use of harsh solvents or cleaners;
  5. Alignment of the engine and adjustment of the stuffing box which is considered part of normal maintenance;
  6. Damage to, or vibration in, the transmission, shaft, shaft seal or strut, caused by propellers

not provided by Sabre Corporation.

7. Repairs to leaks at stanchions, deck hardware, the hull to deck joint, the mast collar or port frames, caused by the day to day operation of the yacht and which are considered part of routine maintenance;
  8. Damage or excessive wear caused by abuse, neglect, or unfamiliarity during charter operation.
  9. Adjustments to doors, drawers, and other interior wooden components;
  10. All interior or exterior varnish;
  11. Damages caused by overland transportation of the yacht;
  12. Charges for delivery to the repair facility, moving within the facility, or hauling; or
  13. Normal maintenance including, but not limited to those operations included on Sabre's Annual Safety Maintenance Checklist.
- B. The below waterline gelcoat portion of this Limited Warranty does not apply:
1. If the gelcoat has been sanded, sand blasted, or subjected to abrasives or damaged by impact or contact.
  2. If the gelcoat has been prepared for painting other than with an approved solvent wash or painted other than with an approved bottom paint consistent with the recommended procedures and products in the owner's manual.
  3. To fairing of all underwater surfaces at the keel joint, through-hull fittings, strut, shaft, and rudder.

Under what circumstances the Limited Warranty will not apply:

There will be no warranties whatsoever if:

- a. Prior approval, except in cases of clear emergency, is not received from Sabre;
- b. The yacht or part is repaired for warranty service or maintenance by persons unauthorized by Sabre;
- c. The yacht is subjected to misuse, misapplication, negligence, or accident; or
- d. Defects or damages arise from improper maintenance, commissioning or storage.
- e. A hydraulic backstay adjuster puts greater stresses on the hull and deck structure of the yacht than does any backstay adjuster provided by Sabre from Sabre's optional equipment list.
- f. Rigging changes are made without prior written authorization from Sabre.

What Sabre will do in the event of a defect:

Sabre's sole obligation under this Limited Warranty shall be limited to the repair or replacement of defective components or parts within a reasonable time except as limited below. No claim or breach of warranty shall be cause for cancellation or rescission of the contract of sale for any yacht. An Authorized Sabre Dealer or Authorized Service Agent is not an agent for Sabre except for the purpose of administering the above Limited Warranty and Sabre does not authorize an Authorized Dealer or Authorized Service Agent to assume liability for expenses incurred in the replacement or repair of parts other than those expressly authorized in the Limited Warranty.

With respect to the below waterline gelcoat portion of this Limited Warranty covering premature weathering or deterioration of the underwater hull surface, Sabre will repair or, at its option, pay for the labor and materials cost in excess of \$250.00 necessary to repair the hull surface, not to exceed the industry standard costs and excluding hauling, launching, storage, and bottom paint costs, in the amount of 100% of such cost during the first two years of use, 90% during the third year, 80% the fourth year, and 70% during the fifth year of use.

Where and how to make Warranty Claims:

To obtain performance under the Limited Warranty, the original purchaser must notify

08/31/09

Sabre Corporation Customer Service Department at P.O. Box 134, South Casco, Maine, 04077 within thirty (30) days after discovery of the defect. Any claim under this Limited Warranty must be fully documented with photographs, and provide full estimates of all materials and labor hours, quantities, and rates. Sabre may require an inspection of the defect by Sabre, an Authorized Sabre Dealer, or an Authorized Sabre Service Agent prior to authorizing repair or replacement by Sabre. Sabre may also require a core sample from the fiberglass hull to evaluate the existence of a defect or to confirm that gelcoat blistering is covered by this Limited Warranty.

Authorization must be granted by Sabre before any work is carried out under this Limited Warranty. Work carried out prior to receipt of Authorization will not be covered by this Limited Warranty.

Sabre reserves final judgement on the acceptance and reflection of all claims made under this Limited Warranty.

This Limited Warranty is given and accepted in lieu of : (i) All other express warranties and (ii) Any obligation, right, claim or remedy, in contract or in tort, including product liability, based upon strict liability or negligence, actual or imputed. Any implied warranties of merchantability or fitness or a particular purpose on this yacht shall be limited to the duration of twelve (12) months after the date the yacht is first commissioned for the original purchaser.

Note: Some states do not allow limitations on how long implied warranties last, so the above limitations may not apply to you. July 2000

# SABRE CORPORATION DEALER WARRANTY/COMMISSIONING CHECKLIST

## SABRE SPIRIT

Owner's Name: \_\_\_\_\_ Street:

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code:  
Telephone: \_\_\_\_\_ Charter Yes: \_\_\_\_\_ No:

**Dealer:**

Boat Name: \_\_\_\_\_ Hull Serial Number:  
Home Port: \_\_\_\_\_ Last Boat Owned:

Date Contract Signed: \_\_\_\_\_ Commissioning Date:

The following checklist should be followed as part of the minimum dealer commissioning procedure for a Sabre yacht. All work should be carried out in accordance with American Boat and Yacht Council Standards, U.S. Coast Guard regulations, the Sabre SPIRIT Owner's Manual, and all additional manuals provided for engine and other equipment. Failure to properly carry out this procedure will invalidate the manufacturer's warranty.

If a conflict occurs between the information in this checklist and the individual manufacturer's product literature, the individual manufacturer's instructions should be followed.

This checklist must be completed and returned to Sabre Corporation within fifteen (15) days of commissioning to validate the limited warranty on this boat per section two (2) of the warranty.

Upon completion of this checklist, please mail to:

**Customer Service Department  
Sabre Corporation  
P.O. Box 134  
South Casco, ME 04077**

## **1.) BEFORE LAUNCHING**

- Paint Bottom.
- Install knotmeter sender unit (optional).
- Check propeller and propeller shaft nuts.
- The Sail Drive zinc is installed just forward of the propeller hub. It is **NOT** connected to the boats bonding system.

*Note: Proper galvanic protection or “zincing” of the boat can vary due to salinity, temperature, pollution, and flow of water in your area. To assure correct galvanic protection, test the boat’s bonding system after it has been in the water for 24 hours or more.*

*Note: The Sail Drive Zinc should be checked at least twice a year to determine if the boat has the proper amount of galvanic protection.*

*Note: Over zincing of the boat can cause keel material to be wasted and cause damage to some bottom paints.*

- Check action of the rudder.
- Inventory all loose equipment and report all shortages and damages.

## **2.) LAUNCHING**

- Check action of all thru-hull seavalves.
- Check all hose clamps on engine and engine fittings, exhaust lines, cockpit drains, heads, and all thru-hull fittings.
- Water test windows, hatches, and deck fittings for leaks.
- Check lifeline, stanchion, and rail set screws. Check lifeline turnbuckles and end fittings, and tension accordingly; secure and tape cotter pins and/or rings.

### **3.) RIGGING AND TUNING OF PARTS**

- Inspect rigging for kinks and defects.
- Install standing rigging on mast. Open all cotter pins fully.
- Install spreaders on mast, run the shrouds through the spreader tips securing the end caps.
- Check operation of all halyards and lifts. Lubricate sheaves, if necessary
- Install masthead instruments (option).
- Step mast and attach boom.
- Adjust rigging tension to assure a straight mast when boat is heeled under sail at 25°.
- Secure turnbuckles, clevis pins, and cotter pins, and protect with rigging tape. Install turnbuckle boots, if desired.
- Review all running rigging for completeness.
- Install mainsail reef lines on boom to suit reefing eyes in sail.

### **4.) BEFORE STARTING ENGINE**

- Review engine manual.
- Check engine coolant drain plugs.
- Check action of throttle, shift, and engine stop controls.
- Fill fuel tank to at least one-half full.
- Check fuel tank, fuel lines, and fuel filter for leaks.
- Check engine and transmission oil levels.
- Check that engine water seavalue is open.
- Check levels of water in engine fresh water cooling reservoir.
- Run engine compartment blower for four minutes, check air suction and discharge of vent ducts.
- Check battery water level.
- Check that batteries are properly secured.
- Check battery switch and battery charge indicator.
- Check main breaker and breaker panel light.

#### ***CHECK:***

- Navigation lights.
- Combination bow light.
- Masthead lights.
- Stern lights.
- Check that added equipment does not obscure the lens light arc.
- Review current regulations with owner.

**CHECK:**

- Anchor light.
- Foredeck flood light.
- Engine instrument lights.
- Compass light.
- All cabin lights.
- Check shower sump pump.
- Check electric bilge pump operation, check tightness of bilge pump screen.
- Check 120V AC shore power.
- Verify that each of the ProSafe Galvanic Monitor lights are green.
- Check 120V AC voltmeter/polarity indicator, and instruct owner on its' use.
- Check 120V AC receptacles.
- Check operation of navigational instruments option.

**5.) STARTING ENGINE**

- Review engine operation manual with boat owner.
- Open fuel valve.
- Start engine. Water temperature / oil pressure alarm should activate and shut off when engine starts.
- Check voltmeter and water temperature gauges.
- Check exhaust water flow.
- Inspect engine water cooling system for leaks.
- Inspect exhaust system for water and exhaust leaks.
- Check gear shift lever in all positions and adjust cable, if necessary.
- Check throttle action and adjust cable, if needed.
- Adjust idle speed in accordance with engine manual. This is important in order to minimize vibration problems from excessively low idle.
- Check bilge for signs of fuel leaks.
- Recheck entire fuel system for leaks.

**6.) FRESH WATER SYSTEMS**

- Fill fresh water tank.
- Check function of galley hand pumps.
- If system is has been winterized, thoroughly flush the entire system with fresh water, including the hot water heater to remove all of the non toxic antifreeze.
- Install the fresh water filter element that is provided in the equipment box.
- Check water system for leaks.
- Check pressure water faucets and systems.
- Commission water heater and check for both engine assisted and 120V AC heating operation.

**7.) HEAD SYSTEM**

- Check function of head.
- Check function of holding tank macerator.

**8.) STOVES AND OVENS**

- Review stove or oven manual with owner. Stress the importance of always shutting gas off at the tank.
- Check Propane tank(s), and system.
- Check function of all burners.
- Check function of oven.
- Check hoses and connections for pressure or fuel leaks. Test system as described on label located at LPG locker lid.

**9.) SEA TRIALS**

- Check fit of sails.
- Adjust rigging to assure straight mast and proper tension of stays at maximum design angle of heel (25°).
- Check electronic instruments and calibrate in accordance with instructions (option).
- Compensate compass; note: this should be performed by a competent technician and may require an additional fee to the owner.

**10.) FINAL**

- Check the fit of all drawers, door, and latches after rigging is tensioned, and adjust if necessary. The stress of rigging tension usually requires that door latches be reset.
- Water test deck hardware and rebed, if necessary. Repeat this test and rebed after the first test sail.
- Check adjustment of steering cables after sea trials, and make sure wire clamps and cable adjustment nuts are tight.
- Check fit of emergency tiller and instruct owner on its' use.
- Clean boat throughout, both interior and exterior.
- Review Owner's Manual and accessory instructions with owner.

I HEREBY CERTIFY THAT THE DEALER COMMISSIONING CHECKLIST HAS BEEN SATISFACTORILY COMPLETED:

DEALER SIGNATURE: \_\_\_\_\_

DATE: \_\_\_\_/\_\_\_\_/\_\_\_\_

BOAT OWNER'S SIGNATURE: \_\_\_\_\_

DATE: \_\_\_\_/\_\_\_\_/\_\_\_\_

# 1.) **GETTING STARTED**

At Sabre, we build each boat to the highest possible structural and design standards. The following chapter is offered to help make you aware of the current safety requirements for the Sabre SPIRIT. We will also address sail and anchor selection, although your sailmaker and dealer are the best sources of information on these subjects.

## **Safety Equipment**

- Distress Signals
- Personal Flotation Devices
- Fire Extinguishers
- Lifelines
- Radar Reflectors
- Charts
- First Aid Kits
- EPIRBs
- Safety Harnesses
- Man Overboard Recovery Systems

## **Sails**

- Sail Selection
- Setting of Sails

## **Mooring and Anchoring**

## **SAFETY EQUIPMENT**

Quality safety equipment should be a top priority for every sailor. Because of the sheer numbers of boats on the water today, as well as the ever-present threat of bad weather, boating is a sport that comes with certain inherent dangers. The first step towards practicing safety on the water is to understand that these dangers do exist, and knowing how best to deal with them, should a dangerous situation arise. Every passenger on board should be familiar with the basic operation of the boat, and understand what precautions should be taken to avoid a crisis. The following safety equipment should be kept on board at all times, and checked regularly for wear or damage.

### **DISTRESS SIGNALS**

Visual distress signals are required for all boats sixteen feet (16') or longer. This, of course, applies to your Sabre SPIRIT. These signals include, but are not limited to, flares and flags. The U.S. Coast Guard has minimum requirements regarding the numbers and types of flares, which you are required to have aboard. While carrying the minimum required will keep you in line with regulations, you might want to consider purchasing some extra SOLAS type flares, which may be more easily seen. Your local chandlery or marine chain should have a large selection of these flares in stock.

Audible distress signals, such as bells, whistles, and horns, are also important pieces of safety equipment. An emergency whistle should be attached to each PFD, and one manually operated bell should be kept in an accessible location. A variety of environmentally safe air horns are available, and it is a good idea to keep one or more on board.

Note: Be sure that your crewmembers are familiar with the operation of all distress signals carried aboard.

### **PERSONAL FLOTATION DEVICES**

The U.S. Coast Guard requires that you carry one approved Type I, II, or III PFD for each person onboard your boat. In addition, you are required to carry one Type IV throwable cushion. Furthermore, it is suggested that these be stowed in a conveniently accessed location. Remember, life jackets are useless when left in the dock box!

Note: It is a good idea to attach a whistle to each life jacket as an audible emergency signal. Many boaters also attach personal strobes for added nighttime safety.

## **FIRE EXTINGUISHERS**

Your Sabre SPIRIT comes with three approved type A:B:C: fire extinguisher. They are dry extinguishers because they use sodium bicarbonate as the extinguishing agent. Do not remove any of these extinguishers from the boat, except to refill or replace. If you find that you would like an extinguisher in another part of the boat, we suggest that you add one rather than move any of the existing three.

Make sure that your entire crew is aware of the location and operation of all three extinguishers. In an emergency, there is little time for reading instructions. Make sure that you are certain of the proper operation of all safety devices **before** a crisis occurs.

Your fire extinguishers require regular inspection and maintenance. The pressure indicator on the side of the extinguisher should be checked monthly to see that it is full. It is also a good idea to gently shake the extinguisher once a month to prevent the extinguishing agent from caking at the bottom.

Finally, in addition to the fire extinguishers kept aboard, it is wise to keep a small box of baking soda in the galley for fighting small oven and stove fires.

## **LIFELINES**

The Lifeline system on the Spirit is constructed in a way that allows the stanchions and rails to be removed and then replaced with stainless steel coverplates. Sabre strongly advocates and recommends that the Lifeline system remain installed at all times. If the system is removed it is strongly recommended that safety harnesses and jacklines be used anytime personnel leave the cockpit area.

The Spirit stanchions and rails are installed using a 5/8" threaded bolt with a socket head. It is recommended that a reputable boat yard be used for the reinstallation. A 6" long 1 / 2 " hex driver socket with a 1/2" drive may be used to reinstall the stanchions if removed (Armstrong part #12-757 is supplied with each boat). A 1/2" drive torque wrench (not supplied) **MUST** also be used to achieve a 90 ft/lb. torque required for the reinstallation of these bolts. Please contact Sabre customer service if there are any questions concerning the reinstallation of the Lifeline system.

## **PRIOR TO REMOVAL OF RAILS AND STANCHIONS**

**NOTE:** To make the reinstallation of the stanchion and rail bases easier it is important to label each of the removeable bases with its location ( i.e.# 1 port through #9 port and # 1 starboard through # 9 starboard). Also it will be best to note the position of each base relative to the non removeable base with an alignment mark. One way to do this would be to use masking tape or something similar on the removable base, labeling the number of the base and then also marking a line that aligns exactly with a small mark made with a permanent marker on the non removeable base. This will help to insure that the set screw holes will line up during reinstallation.

## **RADAR REFLECTORS**

A radar reflector is a vital piece of safety equipment for any boat traveling in coastal areas or heavy shipping lanes. A variety of reflectors are currently available on the market, and easily found at most marine distributors. When mounted properly in a location well above the water, a reflector returns the outgoing radar signals to nearby ships, allowing them to see your vessel.

## **CHARTS**

Regardless of your boating experience or familiarity with a certain body of water, it is always necessary to carry high-quality, up-to-date charts and chart kits. These should be kept in waterproof pouches in an accessible area, preferably in the navigation station. To use these properly, it is recommended that you purchase a navigating kit with a compass, parallel rule, and triangle. Familiarizing yourself with the principles of navigation will help make your trips faster and safer.

## FIRST AID KITS

There are a number of first aid kits on the market, which are thorough enough to be carried aboard your Sabre SPIRIT. A good kit will be waterproof, and constructed from a material that is not likely to crack or puncture. As you use items from the kit, be sure to replace them. Your kit should be checked regularly to see that all of it's' contents are in order. Keeping an inventory list inside will help to ensure that you always have the necessary supplies.

It is recommended that you keep a thorough medical text aboard, located in or near the First Aid Kit. Sailing and Yachting First Aid, published by U.S. Sailing is both thorough, inexpensive and it can be purchased from:

U.S. Sailing  
PO Box 1260  
15 Maritime Drive  
Portsmouth, RI 02871-0907

Phone 401-683-0800  
E-mail <http://www.ussailing.org/e-ussailing/>

A good first aid kit for regular use on your Sabre SPIRIT should include:

- 3" Gauze Pads
- 4" Gauze Pads
- Abdominal Wound Pads
- 2" Gauze Bandages
- 4" Gauze Bandages
- Butterfly Closures
- Adhesive Medical Tape
- Eye Irrigate Kit
- Zinc Oxide
- Ammonia Inhalants
- Motion Sickness Tablets
- Aspirin
- Scissors
- Forceps
- Ace Bandages
- Wire Splint
- Rescue Blanket
- Burn Relief Unit

## EPIRBS

### (EMERGENCY POSITION INDICATING RADIO BEACONS)

Owners should consider equipping their vessel with a **registered** EPIRB. These small devices relay "mayday" type warnings to satellites, notifying safety patrols and nearby ships that you are in danger. Not only will the EPIRB let them know that you are in trouble, but will also give your location, exponentially increasing your chances of obtaining outside assistance.

While the cost of Type A and B EPIRBs has fallen significantly in recent years, we recommend that owner's consider a type "406" EPIRB, so named because they transmit at 406 MHZ. These satellites store a code, which contains the identification number of your boat; Ground station operators can then quickly confirm that your vessel is out to sea and take appropriate measures. This reduces the false alarm rate of "406" EPIRBs to around 5%, as opposed to 95% for Type A and B EPIRBs. *This system only works if you register your EPIRB immediately after purchasing it.* Ground stations take significantly longer to respond to unregistered beacons than to one that is registered.

## SAFETY HARNESES

When moving about the deck in a seaway, it is often a good idea to use a protective safety harness. A good harness is designed to keep you safely on board in the pitching and rolling seas, which often accompany heavy weather. Most harnesses are designed to attach to a deck through the use of jack lines. Harnesses should have clips that attach easily, but will not detach under load. Check your local chandlery for a harness that meets ORC standards, and is the right fit for you.

## MAN OVERBOARD RECOVERY SYSTEMS

For years, the Offshore Racing Council has required these systems for offshore racers. Most coastal sailors, however, saw them as overkill. Today, however, as more and more boats are heading out to open water the need for effective overboard recovery systems for all types of sailing vessels has become apparent. While the selection of a good system is significant, paramount is the need for the crew to understand and practice using the system. Here are a few critical points to remember in sailboat overboard rescue:

- **Do not attempt to recover the person overboard while under power.** Use your engines to bring your vessel into the vicinity of the victim, and then establish contact with throwable flotation or your recovery system.
- **Maintain visual contact with the person overboard.** Have a member of the crew keep a constant view of the victim. Losing sight of the victim significantly reduces your chances of recovery.
- **Get the victim back onboard as soon as possible.** Once contact has been established through the use of your overboard recovery system, attempt to bring the victim back on board as quickly as can be safely accomplished. Especially in offshore waters, shock and panic can set in quickly if the victim remains in the cold water for extended periods.

# SAIL SELECTION

The rigors of cruising and racing place many demands on a sail inventory. Which and how many sails you carry aboard depend on your specific plans.

The following comments are only a guide to sail selection. Any decisions regarding the selection of sails for your Sabre SPIRIT should come from speaking with your local sailmaker and dealer about your sail needs.

The Sabre SPIRIT boom standard setup is with one single line reef. An optional second reef maybe added for boats used for extended offshore sailing, with additional deck hardware being required.

For additional information contact Sabre Yachts or Hall Spars at 401-253-2558  
[www.Hallspars.com](http://www.Hallspars.com):

The Hall Spars Carbon mast is equipped with an Antal track system. There are (5) batten slides and (11) intermediate slides included .

- **Mainsail:** The Hall Spars Carbon mast is equipped with an Antal slide system. There are 5 batten slides and several intermediate slides included with this system
- The mainsail should incorporate at least one single line reef point. An optional second reef point is suggested for boats used for offshore sailing .
- **Jib:** The Spirit Self tacking jib is cut at 90% of the foretriangle area.
- **Optional Sails:** A Cruising Genneker can be added with the addition of one 75mm stand up block (forward), a Spinlock side mounted rope clutch and two fairleads for the tack line (starboard), along with two Wichard folding padeyes and two Snatch blocks for the sheets which will lead to the cabin top winches. Genneker Halyard, Tack line and sheets/guys may be purchased through Sabre. Contact Sabre Yachts customer service for additional information.

## SETTING OF SAILS

Excellent books have been written about sail trim to optimize performance on various points of sail. The following comments are therefore very brief and should be supplemented with other sources. One of the greatest pleasures of sailing is in trimming your sails and getting that incremental performance out of your Sabre that experience allows.

- **Mainsail:** Upwind in moderate conditions, the traveler car should be moved about 3" - 6" to weather off the centerline and the main sheet tightened until the top batten is parallel to the boom in plan view.

The boom should then be just about on the centerline of the boat. If a 25-degree angle of heel is exceeded, the traveler should be moved to leeward to reduce the heeling moment, and the tension on the main sheet increased to flatten the sail. A very full mainsail will increase weather helm, whereas a relatively flat sail will reduce it. Adjust the halyard, outhaul, and optional cunningham for a flatter sail as the wind velocity increases.

- **Angle of Heel While Sailing:** All Sabre yachts perform best at angles of heel less than 25°. Greater angles of heel will result in weather helm, leeway (sliding sideways) and reduction in speed. This is typical of all boats of this general design type.
- **Reducing Sail Area in Heavy Winds:** To insure safety and comfort in higher winds, it is important to build into your sail inventory the ability to reduce sail area quickly and efficiently. Your local sailmaker can assist you with recommendations and instructions on reducing sail area under varying conditions.
- **Caring for Your Sails:** Most types of sails are designed to endure several seasons of hard sailing, if cared for properly. To keep exposure to ultraviolet rays to a minimum, keep the sails properly covered when not in use. After a wet and windy day of ocean sailing, it is often a good idea to rinse the sails in fresh water to remove any salt. Small salt crystals left on the sails can retain moisture and cause mildew. We recommend that you wash the sails with mild detergent at the end of each season, and leave them with your sailmaker over the winter for inspection and storage.

<p><b>HINT:</b> Ask your sailmaker to make the sail bags for your head sail extra-large. This will make it easier for you or your crew to bag the sails in heavy seas, or when you are sailing shorthanded.</p>
---

# **ANCHORS AND ANCHORING**

## **ANCHORS**

There is no single anchor type or size, which will give your Sabre SPIRIT ideal holding power in all conditions. It is a good idea to carry two different types of anchors onboard, in case a unique anchoring situation (fore-and-aft, Bahamian style) should develop. The Sabre SPIRIT anchor well can accommodate a Fortress FX-16 anchor. Your dealer can advise you on what other types and sizes of anchor you should carry for your variety of bottom conditions.

## **ANCHOR RODE**

The Sabre SPIRIT is designed for a combination rope/chain rode made-up of 5/16" HT chain and 1/2" line. A typical primary anchor rode for the Sabre SPIRIT would consist of 10' to 15' of chain and 150' to 200' of line.

The single most valuable property in an anchor or mooring line is the ability to stretch without breaking. For this reason, nylon is widely considered the superior anchor line material. It is generally capable of withstanding the variable loads applied to your boat by wind and wave action, and will absorb energy, which prevents your anchor(s) from pulling free. A three-strand line should give you all the stretch you need. Your dealer can advise you on what length of anchor rode you should carry for your variety of bottom conditions and water depths.

## 2.) **ENGINE**

### **Engine Specifications and Operation**

- Auxiliary Engine
- Before Starting Engine
- After Starting the Engine
- Stopping the Engine
- Oil Change
- Engine Condensation
- Engine Lay-Up
- Engine Clean-out
- Cruising Speed
- Shift Lever Location
- Folding Props
- Engine Gauge Condensation

### **Engine Cooling and Exhaust System**

- Possible Causes and Solutions for Engine Overheating
- Engine Backfire
- Hot Water Heater

### **Fuel System**

- Deck Fill Plate
- Fuel Tank Ventilation
- Shut-Off Valve
- Fuel Filters
- Fueling Safety Checklist

### **Troubleshooting**

# ***ENGINE SPECIFICATION AND OPERATION***

This section is in no way to be used in lieu of the engine manufacturer's owner's manual, which has been supplied with your boat. Before starting the engine, you should read the engine manual in order to be sure that you are familiar with the operation of this particular model. The manual contains running instructions, technical specifications, maintenance schedules, and information on replacement parts and fluids. Your engine has been engineered to run for many years, and will do so faithfully if the proper attention is paid to routine, preventive maintenance.

## **AUXILIARY ENGINE**

The engine foundation is mounted on a rigid fiberglass reinforced bed. It has been designed to withstand the forward thrust of the propeller, while supporting the weight of the engine under a variety of conditions, which occur on the open sea. The engine is firmly secured to the bed with a series of rubberized motor mounts. These specialized devices absorb vibration, and help to cushion the engine, holding it securely in place.

You will find that the engine is very accessible. Access is provided by lifting the hinged stairway, removing the side access panels in the galley and head area or through removable access panels in the sail lockers.

**WARNING:** Prolonged cranking of the engine may lead to seawater filling the engine mounted exhaust system. This seawater can enter the engine's cylinders by way of the exhaust manifold once the exhaust system fills. Engine damage resulting from this type of seawater incursion is NOT covered by warranty.

## **Engine Key Switch**

### **WARNING :**

The Engine key switch located in the galley must be **ON** to activate the Electronic Vessel Control (EVC) panel. The key switch must also **REMAIN ON** to deactivate this panel. If the key switch is turned off before deactivating the EVC panel, the panel will remain active and will allow the engine to be started even while the key is in the **OFF** position.

***Personal injury could result if someone is near the engine or propeller and the engine is started.***

**Always** follow the proper sequence when stopping the engine.

To turn the engine OFF:

1. Push and hold the "STOP" button until the engine stops.
2. Push and hold the ON /OFF button until the engine gauges go to zero.
3. Turn the key switch OFF.

## ***ENGINE OPERATION CHECKLIST***

### **BEFORE STARTING ENGINE**

- 1.) Turn battery switch on.
- 2.) Check sea water strainer for debris and clean, if necessary.
- 3.) Open intake seawater seavalve.
- 4.) Check coolant level in reservoir. (located on the front of the engine.)
- 5.) Check transmission and engine oil levels.
- 6.) Check fuel level and fuel shut-off valve. Start the engine in accordance with instructions given in the engine owner's manual. (See previous section on **Engine Key Switch**)

### **AFTER STARTING ENGINE**

- 1.) Check for warning lights/alarms for low oil pressure and seawater flow.
- 2.) Check immediately for seawater flow through the transom exhaust port.
- 3.) If oil has just been changed, stop the engine and check the crankcase oil level. It is often necessary to add more oil to compensate for oil, which may be filling internal passages and the oil filter.
- 4.) If transmission fluid has just been changed, check this level also.
- 5.) Be aware of engine operating temperature by checking the temperature gauge during operation.

**NOTE:** The single best warning you will have that your engine is not running properly will be the sound it makes while running. When you know that the engine is running well, pay special attention to the sound that it makes. You will be surprised how quickly you will sense a sudden change in pitch or frequency. These will be the first signs that your engine is not running properly.

**Note:** Before stopping the engine, allow it to idle for a few minutes in neutral. This will help to dissipate some of the heat from operation.

## **OIL CHANGE**

Change the oil and other engine fluids according to the recommendations in the engine owner's manual. Check the oil as part of your routine before starting the engine. It is recommended that you warm up the engine before draining the oil.

## **ENGINE CONDENSATION**

Regardless of frequency of operation, it is not good practice to operate the engine for short periods of time. The engine should always be allowed to run for at least 15 minutes at a time, after it has warmed up to full operating temperature. Using the engine for shorter periods does not allow the engine to heat up enough to overcome normal amounts of condensation, especially in colder weather. Failure to adequately warm the engine will result in internal corrosion, and is often the cause of "sticky valves". The engine warranty does not cover damage caused in this way.

## **ENGINE LAY UP**

If the engine is not used for a month or so, it is suggested that you "fog" the engine with oil through the air intake, and place oil in the cylinders as described in the engine manual. This will help to overcome the effects of salt air, which enters the cylinders through an open exhaust valve.

## **ENGINE CLEAN OUT**

It is recommended that you occasionally run the engine at full power for around five minutes in order to clean out excess moisture and carbon accumulations.

## **CRUISING SPEED**

A throttle setting anywhere between two-thirds and three-quarters should provide an adequate cruising speed. A full throttle will not move the boat through the water at a faster speed, due to the hull speed limitations inherent to a displacement boat such as the Sabre SPIRIT. Although periodic full RPM operation will cause no permanent harm, it should be noted that regular full throttle operation will cause significant damage.

## SHIFT LEVER LOCATION

The recommended practice is to leave the shift lever in reverse when sailing.

## FOLDING PROPS

Putting the gearshift lever into forward or reverse should only be done while the engine is idling. Changing gear at higher RPM's can cause serious damage, due to the stress exerted on the prop as the blades fold out. Stop the engine immediately if any strange sounds or vibrations are noticed coming from the propeller. Do not turn the propeller shaft over until the boat is in the water.

## ENGINE GAUGE CONDENSATION

Gauge condensation is quite common, as the damp marine environment makes a certain amount of condensation unavoidable. This condensation does not reduce the effective life of the gauge, nor does it affect the gauge's accuracy. The condensation is relatively harmless, resulting when the warm air from the boat's interior strikes the exterior lens of the gauge. Because the cooler exterior air cannot support as much water vapor as the warmer air, moisture is precipitated onto the lens. While the condensation can make the gauge difficult to read, it causes no damage.

## ENGINE COOLING AND EXHAUST SYSTEM

Heat expelled from combustion and developed by friction is absorbed by water circulating through the engine's internal cooling passages. The proper functioning of this system is critical to engine operation.

The marine diesel engine in your boat is equipped with fresh water-cooling. This means that the engine's internal cooling passages contain a coolant mixture of fresh water and antifreeze, like automobile engines. Instead of using a radiator that cools the coolant with air, the marine engine utilizes a heat exchanger that cools with seawater. This transfer of heat from engine fresh water to sea water is accomplished by circulating hot engine coolant through small tubes contained in the heat exchanger, while simultaneously circulating cool sea water around these tubes, thus allowing for the transfer of heat. The sea water and engine coolant are kept entirely separate, leaving the engine's internal cooling passages free from exposure to the corrosive actions of salt water.

The seawater enters the system through the lower unit and there is a seavalue handle that is located in the aft port side of the engine compartment accessible through deck plate below the galley sink area.

**NOTE:** This engine intake seavalue must be opened at all times during engine operation and closed when the engine is not used for extended periods.

A water pump on the engine draws seawater through this seavalue and then through a raw water strainer mounted forward of the engine. This strainer should be checked regularly for any

blockage or debris.

**NOTE:** This water pump utilizes a neoprene rubber impeller. The nature of this impeller requires that it never be run dry. A spare impeller and impeller cover gasket should always be kept on board. Refer to engine owner's manual for type, location, and replacement procedures.

The seawater is then circulated through the heat exchanger, and into an exhaust riser and water lock canister of the exhaust system. The exhaust riser acts as a deterrent to water backing up into the engine exhaust manifold. The waterlock canister provides a method to lift and push the water with exhaust gasses out of the system through the transom exhaust port. It also acts to muffle the inherent engine noise.

**NOTE:** During motoring it is important to periodically check to ensure that water is being expelled with engine exhaust through the transom exhaust port. This indicates that water is being circulated and the engine is being cooled. **THE ENGINE SHOULD BE SHUT OFF IMMEDIATELY IF WATER IS NOT FLOWING THROUGH THE TRANSOM EXHAUST PORT.**

### ***POSSIBLE CAUSES AND SOLUTIONS FOR ENGINE OVERHEATING***

1. Blockage at the sea water strainer: **Inspect and clean.**
2. Blocked or clogged engine intake seavalue: **Open and close seavalue several times to free blockage.**
3. Clogged water filter: **Inspect and clean.**
4. Broken impeller blades in seawater pump: **Remove water pump cover plate, replace impeller and cover gasket, if needed. (If parts of old impeller are not recovered in the body of the pump, engine may require back flushing to prevent internal blockage. Refer to engine owner's manual for complete procedure.**
5. Low fresh water coolant level: **Add coolant after engine has cooled. Adding coolant to hot engine may damage the cylinder head. The Sabre SPIRIT utilizes an expansion tank located on the front of the engine. This coolant tank should be within the MIN - MAX marks on the expansion tank when the engine is cold.**
6. Collapsed or ruptured water hose or loose connections: **Tighten or replace hose.**
7. Defective thermostat: **Replace.**
8. Loose or broken fresh water pump belt: **The one belt on the front of the engine drives both**

**the alternator and fresh water pump. A loose or broken belt may prevent the pump from functioning. Tighten or replace belt.**

## **ENGINE BACKFIRE**

The exhaust system as a unit is constructed of parts designed to withstand internal pressure several times greater than that which is expected in a normally operating wet exhaust system. Engine backfires are capable of very high instantaneous pressures, which may exceed the system's capacity. If a backfire occurs, the entire exhaust system should be examined thoroughly for any damage.

## **HOT WATER HEATERS**

The hot water heater, utilizing the engine's hot water as a source of heat, taps into the cooling system as the water leaves the engine at its hottest point. It then circulates through the water heater where a heat exchanger heats the domestic hot water. Due to the fact that the engine temperature runs @ 190 degrees the domestic water heated from the engine can be hotter than necessary. The water heater is equipped with a "Temperature Control Valve" that controls coolant flow through the heat exchanger, preventing excessively high water temperatures to reduce the risk of scalding. Potable water temperature is maintained at a safe level of 140 degrees F.

## **FUEL SYSTEM**

Great care has been taken in the selection and installation of parts related to the fuel system. Caution is advised during any procedure affecting this system in order to maintain proper operation.

## **DECK FILL PLATE**

A deck fill plate and cover are mounted flush with the deck, on the aft port side of the boat. Use only the spanner wrench provided to remove or install the cover. In the event that this cover is lost overboard during or after fueling, replacements are available through Sabre.

## **FUEL TANK VENTILATION**

The aluminum fuel tank is vented through a flexible rubber hose, which extends from the top of the tank to a screened vent at the stern. The screen should be checked periodically for insects or debris, which could obstruct venting and therefore prevent the flow of air.

## **SHUT OFF VALVE**

A fuel-shut off valve is located in the port sail locker over the fuel tank. The handle is labeled to indicate that the valve is opened or closed. The valve should be shut each time the boat is put away, although there is no need to keep the valve shut while sailing.

## **FUEL FILTERS**

A dependable supply of clean diesel fuel is necessary to ensure satisfactory operation of the engine. Cleanliness and care are important to all aspects of the fuel system, and special care against contamination during fueling should be used.

A Racor 230R MAM Primary fuel filter with a R20T (10micron) element separates water and air from the fuel is mounted in the aft area of the engine compartment. Foreign particles are trapped in a replaceable filter element. The element should be checked periodically, and requires changing a minimum of once per season. Any water or air can be removed by opening the petcock on the bottom, as the water is denser than fuel, and will sink to the bottom of the bowl. An Auxiliary pick-up is provided on the fuel tank for later installation of diesel fueled systems such as cabin heaters. A secondary filter is fitted on the engine between the fuel lift pump and the injector pump. Both the filters and the replacement elements can be purchased through any Volvo Distributor.

## ***FUEL GAUGE***

The fuel gauge is mounted next to the engine instruments area and is activated by turning on the engine key switch.

## ***FUELING SAFETY CHECKLIST***

Following safety precautions before, during and after fueling is critical. Being familiar with all procedures and adhering to them each time you take on fuel will help insure your safety. Avoid fueling at night or during a storm. Please be sure to avoid spilling any fuel into the water. Should some fuel spill into the water, dropping liquid soap onto the spill can disperse it.

1. Close all hatches and ports.
2. Allow no smoking aboard, on or near the fuel docks.
3. Check fuel level.
4. Turn off any equipment, which may generate heat or spark such as engine, stove, heaters, radios, lights, etc. Turn off all electrical switches. Main switch and battery switch are turned off after engine is stopped.
5. Anyone not involved with fueling should leave the boat.
6. Remove deck plate and position fill nozzle to remain in contact with metal deck plate to prevent the generation of static electricity charges.
7. Have fire extinguisher(s) readily available.
8. Be aware of how much fuel is being taken on and double check that the appropriate diesel fuel is being delivered.
9. Slowly fill to no more than 95% full to allow for thermal expansion of the fuel.
10. Replace deck plate cover securely and carefully clean up any spillage, discard any oily rags.
11. Check fuel tank vent at stern for overflow.
12. Check below decks and in bilge for fumes or fuel.
13. Open all ports and hatches for ventilation. Air out any fumes present.

# TROUBLESHOOTING

**Problem: Engine speeds up, slows down, or cuts off immediately while running.**

**Solution: Check for air in the fuel line by:**

- Disconnect fuel return line at the engine.
- Put end of fuel return line into bucket.
- Run the engine at several different speeds. If there is only fuel in the line, then flow out of the hose into the bucket should be smooth. Bubbling or stoppage of flow signifies an air leak in the return line. If there is an air leak in the fuel return line, then you will need to replace it with 3/8" hose of the same length as the original hose.

**Problem: Engine Overheats**

**Solution:** 1.) Check for air in cooling system.

- Bleed off air at the highest point, usually at the engine manifold.

2.) Check for blocked or closed engine intake seavalve.

- Open and close the valve several times

3.) Check for damaged or defective thermostat

- replace

\* To purchase replacement thermostats for your Volvo diesel engine, contact either Sabre or your local Volvo marine distributor.

**Problem: Key Switch ON, but Engine does not Crank**

**Solution:** 1.) Battery OFF

- Turn battery switch ON

2.) Loose battery cable connection

- Check "+" connection to the starter and the "-" connection to the ground stud near the bell housing.

**Problem: Engine Cranks, but does not Start**

**Solution:** 1.) Check fuel tank shut-off valve

- Return shut-off to ON position and try again. If engine still won't start it may be necessary to bleed the fuel system.

2.) Fuel Filters are clogged

- Clean/Replace filters

- 3.) Fuel Pump not operating
  - Check pump operation
  - Check for 12V power at pump

Problem: **Battery Runs Down**

Solution: 1.) Low Alternator Output

- Check drive belt tension
- Check output with voltmeter at "B+ Alternator" terminal

- 2.) Check the Alternator output breaker located near the Alternator. Battery system will not charge from Alternator if this breaker is tripped. See Chapter 10, Battery Charge System drawing.

3.) Bad Battery Connections

- Connections corroded or loose at battery and/or engine

## ***3.) DRIVE AND STEERING SYSTEM***

### **Propeller System**

- Propellers
- Propeller Installation
- Rubber Seal of Saildrive

### **Steering System**

- Wheel Steering Detail
- Emergency Tiller
- Maintenance and Inspection

## ***PROPELLER SYSTEM***

The drive system is one of the most important systems on your Sabre SPIRIT. Although we hope that sailing will take up most of your time on the water, there are times when it is critical that you be able to move under auxiliary power, such as when mooring in a crowded harbor. For this reason we ask that you familiarize yourself with the operation of the propeller and drive systems, as described in this chapter.

### **PROPELLERS**

A “Flexo-Fold” two-blade bronze folding propeller is standard on your Sabre SPIRIT.

### **PROPELLER INSTALLATION**

**SAILDRIVE Hub Installation:** Insure that engine spacer at rear of engine is mounted and that anode has good contact with saildrive. Mount the hub on the splined shaft, tighten the nut and secure with the lock screws and tab washer.

### **RUBBER SEAL OF SAIL DRIVE**

Check the rubber seal between the drive and the hull regularly for cracks and wear.

**WARNING!** The seal must be changed every seven years or earlier if it is defective. This work

should be carried out by an authorized workshop.

## STEERING SYSTEM

Your Sabre SPIRIT is equipped with a 48" destroyer type steering wheel. It has been designed to give you superior power and delicate control, enabling you to steer with confidence in even the most severe of conditions.

### WHEEL STEERING DETAIL

Wheel steering uses a radial drive wheel, which is thru-bolted to the rudderpost and turned by the wheel through a chain and cable system. A stop assembly allows approximately 60 degrees of travel, and prevents rudder over-travel which could damage the cable and chain assembly.

### EMERGENCY TILLER

As a safety precaution an emergency tiller is supplied in the port side sail locker. It is readily lifted from its supports and after removing the threaded rudder post cover (using a standard winch handle to loosen) will slip onto the top of the rudderpost.



**CRITICAL SAFETY NOTE:** When backing under auxiliary power in reverse gear, it is necessary to maintain hold on the steering wheel the entire time. The rudder and steering wheel have a tendency to rotate with force if left unattended while backing. This is due to the normally large area aft of the rudderpost becoming the forward area. The rudder stop system is designed to produce a positive stop to prevent over-turning the mechanisms of the steering system. It is not designed to absorb the potentially tremendous load of a rudder turning freely while backing. Allowing the rudder and wheel to spin out of control when backing may cause serious damage to the steering system, possibly resulting in a dangerous loss of steering control.

When leaving the boat at a mooring or slip, make sure the wheel brake is properly tightened. Do not allow the system to freewheel as excessive wear or damage may result.

## **MAINTENANCE AND INSPECTION**

The steering system is very durable and, as with any mechanical system, susceptible to loosening and wear. Prudent maintenance practice would include a thorough inspection of the rudder at least once every two years. The rudder should be lowered to allow inspection of the rudder shaft and to check for unusual wear at the bearings. Be alert to any unusual noise or reaction from the steering system and check immediately

The compass and mounting base must be removed to service the wheel steering mechanism. Refer to the Edson Owner's Manual for maintenance procedures.

Needle bearings located on the wheel shaft in the pedestal bowl need to be sprayed with Teflon lubricant through the holes located on top of the bearing housing. Spin the wheel while lubricating to ensure that the entire bearing is reached. Winch grease or water pump grease may be substituted, but Teflon lubricant is preferred. Be careful that the lubricant does not run off onto the friction brake pads. Pedestal maintenance kits are available from Edson International ([www.edsonintl.com](http://www.edsonintl.com)) Tel. (508) 995-9711.

The stainless wire cable is connected to the wheel steering system by means of a roller chain, which rides over a sprocket and to the drive wheel, by two eyebolts. The wire can be best lubricated with a piece of oiled toweling. Any breaks or burrs on the wire will snag on the tissue. Replace and discard a damaged wire immediately. An undamaged wire should be replaced every five years. The removed wire may be kept as an emergency spare.

Check for proper wire tension by locking the wheel with the friction brake, and then trying to move the radial drive wheel by hand. With a 48" wheel, the steering drive wheel should be able to move, even with the brake on. The brake, however, is designed to prevent the wheel from moving on its' own. If the wheel cannot be turned then cable tension is too tight and should be adjusted.

A grinding noise while steering is an indication that the cables are too tight. Adjustment is made by turning the double nuts on the eyebolts. A pair of idler pulleys is located at the base of the pedestal. They are adjustable, making it easier to guide the cable to the drive wheel with minimum friction and wear.

Alignment is critical and correct when the cable, properly attached to the drive wheel, sits squarely in the center of the groove in the pulley wheel. Tightening the cable may affect this alignment. A squeaking noise when the wheel is used indicates the idler pulleys need lubrication with SAE 30 oil. (Refer to the Edson Catalog in the Manufacturer's Binder for additional steering information).

## **4.) RIGGING**

### **Standing Rigging**

- Standing Rigging Lengths - Sabre SPIRIT
- Mast Installation
- Initial Tuning of the Rig
- Mast Step and Collar
- Boom Vang Attachments
- Checking the Rig for Wear

### **Running Rigging**

- Halyard and Sheet Lengths
- Furling Systems

## STANDING RIGGING

The standing rigging on your Sabre SPIRIT includes the double-spreader mast, shrouds, forestay, backstay, and turnbuckles. Because this rigging takes the bulk of the stress applied to the boat in heavy air and choppy seas, it is very important to check the stays and spar for wear and tear before and after each use. The entire rigging has been specifically engineered for the Sabre SPIRIT, and is built to perform extremely well, even in heavy seas. Because the rig plays such a large part in the integrity of the boat, it is recommended that the initial installation of the mast, as well as the annual stepping of the mast, be done by a professional rigger. This will help to ensure that the job has been done to the highest standards.

Once the mast has been stepped, and the stays attached, it is the responsibility of the owner to tune the rig for optimum performance and safety. Besides slowing the boat, a poorly tuned rig may put significant strain on your mast and shrouds, as well as the hull. A mast collar boot is supplied. The bottom of the boot is secured to the collar with ss hose clamps. Hall Spar rigs also include a *Spartite* kit for a watertight seal around the mast.

### ***Standing Rigging Lengths - Sabre SPIRIT w Hall Spar Rigs*** **(Length measured pin to pin with the turnbuckle 1/2 open)**

	<u>Length</u>	<u>Wire Size</u>
<b>Headstay:</b>	47' 8 1/2"	7mm Dyform wire (from marine eye on top of stay to pin hole <b>inside</b> anchor well)
<b>Backstay:</b>	50' 6 3/4"	-8 Rod (Does not include Adjuster )
<b>Shrouds:</b>		
Lowers	17' 8 7/8"	-10 Rod
Intermediates	32' 8 3/4"	-8 Rod
Caps	45' 3 1/2"	-8 Rod

**\* These are the lengths for STANDARD Sabre Hall rigs. Any special considerations, such as lengthened masts or different spreader configurations are not taken into account in the above figures.**

The following procedure should be used to adjust the standing rigging on double spreader rigs in order to obtain optimum performance and to assure the structural integrity of the rig. The correct adjustment of the rig will result in a straight mast with a slightly perceptible fall-off of the masthead to leeward, a slight curve aft to the masthead fore and aft, and leeward shrouds that are just slightly slack but still firm when the boat is sailing at a 25 degree angle of heel.

## MAST INSTALLATION

All stays should have an equal degree of tension before the start of mast tuning procedure.

**CAUTION:** The mast tie rods must be installed and tightened just enough to prevent them from rattling @ 5 ft/lbs. BEFORE the start of mast tuning.

## INITIAL TUNING OF THE RIG

See the Hall Spars Manual supplied with the Owner's Equipment Manuals. We recommend you use competent riggers and call on assistance from your sail maker to tune the mast correctly. It is critical for safety reasons that this is done correctly. Excessive rig pressure will overload the hull and may lead to structural damage.

## MAST STEP AND COLLAR

The mast is stepped into a mast base that allows adjustment of the base in a fore and aft direction. A stainless steel through bolt is provided for securing the base of the mast to the step.

A # 4 green wire is connected to a static dissipater at the masthead. The lower end of this wire must be connected to the grounding washer on the forward keel bolt when the mast is stepped. This connection must be maintained in good order to maintain the integrity of the lightning ground system.

**Check:** Be sure that all, toggles, that use clevis pins are secured with cotter pins that are properly bent back and taped.

**CAUTION:** The majority of mast failures are caused by improperly adjusted rigging which allows the mast to bend more than 3" to the side or 5" fore-and-aft at mid-height (putting the mast out of column), and by improperly placed or missing cotter pins.

## *Hints for Fine-Tuning the Rig*

- To ensure that the rig is completely vertical, try lowering a masthead halyard to a position just a few inches off of the deck. Then, swing the halyard outboard, to either side. If the mast is perfectly vertical, then the end of the halyard should cross the shrouds at an equal height on both sides of the deck. If the line appears shorter on one side than on the other, then some small rig tension adjustment is required.

- On-the-water rig tuning should be performed in about fifteen knots of breeze, with fairly flat seas. The imperfections in the tuning of the rig will be most apparent when sailing close to the wind under a large headsail. Remember to ease the sheets and head the boat off the wind before trying to make any rig adjustments!

**CAUTION:** All halyards that run through the mast must be run with regard to the through bolts at the masthead, tangs, spreaders, etc. The replacing of any through bolts in the mast must not alter the original positioning of the halyards with respect to the bolts, or serious chafing and halyard damage may occur.

## **HALL QUIK VANG**

The Spirit is equipped with a Hall B -18 Quik-Vang. In addition to keeping the main under control, the vang flattens the mainsail exposing more sail area to the wind, lowers the center of effort of the sail plan, and reduces the tendency of the boat to roll or yaw.

Boom preventers are not recommended. Mishaps, such as accidental jibes could cause damage to the boom or gooseneck. If a preventer is to be used, a “tear away” is recommended. A tear away is a piece of shock cord or other attachment that should break away when the boom goes in the water or when the boat jibes severely. A boom brake could also be used as a preventer.

This page intentionally left blank

## ***CHECKING THE RIG FOR WEAR***

The standing rigging on your Sabre SPIRIT should be checked each season for wear. For those of you who store your boats out of the water, the obvious time to check the rig is just before it is stepped at the beginning of each year. For those of you who leave the boat in the water year-round, it will be necessary to come up with a routine by which you will annually go aloft and check for wear. It is recommended that the following areas be checked:

### **MASTHEAD**

- 1.) Check all sheaves to see that they turn freely, and that they are held in place.
- 2.) Check all welds for cracking.
- 3.) Check all pins and pinholes for signs of stress or cracking.
- 4.) Check for sharp edges where the halyards exit.
- 5.) Check headstay and backstay ends for cracks.

### **SHROUDS**

- 1.) Check clevis pins for signs of wear.
- 2.) Check all swages for cracks or discoloring.
- 3.) Check cotter pins, and tape any sharp edges.
- 4.) Be sure that stemball insert fasteners are secure to mast.
- 5.) Check shroud tangs for wear.

### **SPREADERS**

- 1.) Check to see that spreader bases are secure.
- 2.) If spreader boots are used, remove and check for corrosion.

### **DECK**

- 1.) Check gooseneck for signs of fatigue.
- 2.) Check shrouds and stays for cracks and/or discoloration.
- 3.) Check to see that mast butt is not showing wear, and that it is properly seated.
- 4.) Check all turnbuckles and lifeline swages for signs of wear.
- 5.) Check to see that all chainplates are tight to the deck and sealed and show no evidence of movement.

# RUNNING RIGGING

Running rigging refers to all sheets, halyards, and control lines. Because these "running" lines pass through blocks and sheaves, around winches, and are jammed into cleats, they are subject to a great deal of wear. They are also often asked to hold tremendous loads, especially when used as halyards or sheets in heavy air. In addition to fraying, some lines will stretch over a period of time. For these reasons, it is important that you check your lines each time the boat is sailed. Halyards, especially, are subject to wear. Never rely on just one halyard when going aloft in a bosun's chair. Always rig a secondary back-up halyard.

The ends of all halyards should be taped and/or burned to prevent fraying. All shackles should be inspected for signs of corrosion, wear, and distortion. Because of the tremendous load on these shackles, replace them at the first sign that one is weakening.

The following are the halyard and sheet lengths for the Sabre SPIRIT. If, at some point, it becomes necessary to replace any of these lines, we suggest that they be replaced with lines of the same or slightly greater length. These lines have all been selected to suit the hardware and sail area of your boat. For this reason, never change the diameter of any line without first consulting a professional rigger or your Sabre Dealer.

## ***HALYARD AND SHEET LENGTHS***

<b>Line</b>	<b>Size</b>	<b>Length</b>	
Main Halyard	10mm	115'	Wichard # 1494 shackle
Jib Halyard	10mm	105'	Ronstan RF6210 shackle
Jib sheet/self tack	10mm	75'	tapered 25'
Single Line Reef	10mm	65'	
Spinnaker Halyard	10mm	120'	Ronstan RF6210 shackle, 1315 black ball
Spinnaker tack line	8mm	55'	Ronstan RF6210 Shackle
Spinnaker sheets set	8mm	75'	tapered 15' Ronstan RF6210
Boom Topping Lift	3/16"	47'	two thimbles

<b>Line</b>	<b>Size</b>	<b>Length</b>
Flag Halyard	3/16"	90'
Spreader Halyard	3/16"	36'

In order to keep lines in the best possible condition, coil any wet sheets and hang them in the main cabin to air dry. Storing wet sheets in damp areas such as the lazarette and cockpit lockers will not allow them to dry thoroughly, inducing mildew. Any knots or stoppers put into the line while under sail should be undone before storage, so as to prevent undue bending or stretching.

**Note: When going aloft to make repairs to the rig, it is essential to use common sense and safety precautions, even when the work is done at the dock. To minimize the risks while working "upstairs", keep the following suggestions in mind:**

- Use a D-shackle, not a snap shackle when attaching the bosun's chair to the halyard. If you must use a snap shackle, tape it with rigging tape to prevent it from accidentally releasing.
- Attach two halyards to the chair, in case one of them accidentally lets go.
- Clear the decks below the person aloft, in case a tool or fitting is dropped to the deck.
- If the repairs are done away from the dock, be certain that the person aloft wears long sleeves, long pants, shoes, and a life preserver. The padding in the life preserver will help to cushion the rigger from the exaggerated rocking of the boat.

## FURLING SYSTEMS

The SPIRIT is supplied with a Furlex TD 250 below deck furling system. For operation instructions please read the Furlex manual supplied with the owner's equipment manuals. Due to the below deck installation it is important that a routine visual inspection of the furling mechanism be done to prevent any possible furling issues. Any items stored in the anchor well must be kept secured away from the furling drum and line.

- 1.) **If a wrap has occurred, do not force the furler.** Do not try to "pull" the wrap out by force, as this will only increase the tension on the furling luff. Never try to adjust the furler with a cockpit winch once a wrap has been spotted.
- 2.) **Look aloft.** The earlier a wrap has been spotted, the greater the chance that it can be easily undone.
- 3.) **Check halyard tension.** Improper halyard tension is the most common source of halyard wraps. Try tightening the halyard, and attempting again to furl/unfurl. Next, try easing the halyard a bit, and attempting to furl/unfurl. If these are both unsuccessful, keep adjusting the halyard, being careful to neither over ease or over tighten.
- 4.) **Check backstay tension.** Tightening the backstay will help to increase halyard tension. After tightening, check to see if the furler has been freed.

**WHEN ADJUSTING THE HALYARD AND/OR BACKSTAY, THINK IN TERMS OF INCHES, NOT FEET. THE ADJUSTMENTS REFERRED TO ABOVE ARE SMALL AND INCREMENTAL. NEVER EXCEED RECOMMENDED BACKSTAY TENSION.**

If the furler does not respond to changes in halyard or backstay tension, then the sheets should be detached from the clew, and the sail should be wrapped around the forestay and secured with sail ties. The wrap can be worked out of the forestay once the boat returns to harbor. Never unwrap the sail, even if this is shorter. You will not be able to drop it to the deck, and the sail will flog out of control.

## **5.) *PLUMBING***

### **Fresh Water System**

- Water Tank
- Vent
- Leaks
- Filters
- Shower Sump Pump
- City Water Inlet (Option)

### **Marine Head**

- Head Unit and Holding Tank

### **Drainage and Seavalve System**

- Seavalves
- Installation of Additional Seavalves
- Bilge Pumps
- Bilge Pump Troubleshooting

# ***FRESH WATER SYSTEM***

## **WATER TANK**

Sabre water tank is constructed of a rigid, high-density polyethylene. The sides and top panels are somewhat flexible and can expand outward when full. Over filling causes pressurization, which can lift the top of the tank, distorting the inspection port and causing leaks and damage to the berth top and face. The pressure in an over-filled tank is a result of the height of the column of water in the fill tube.

This pressure applied over the area of the top face of the tank creates a large upward force. This force can be eliminated by opening the wide mouth access/inspection port during filling, preventing water from backing up the fill tube. The water flows out the top of the tank and into the bilge if the water source is inadvertently left on after the tank is full.

The recommended tank filling procedure is to remove the flush mounted deck fill plate with the spanner wrench provided. Open the berth top and remove the inspection port cover. Fill tank to below the point of overflow of the inspection port and then shut off water source. Replace removed covers.

Inspection and cleaning of the tank interior is also accomplished through the inspection access port. Water left in a tank for a long period of time will become stale. The tank should be pumped out if this occurs and cleaned with a baking soda and water solution followed by a fresh water rinse. Replacement water tanks are available through Sabre's Customer Service Department.

## **VENT**

The fresh water tank is vented through a vented loop and drains into the bilge.

## **LEAKS**

If the water storage tank appears to be leaking check that the water inlet hose is secure and dry at the deck fitting and at the tank. Also check the vent line and outlet hose at their connections. Leaks here or at other fitting locations may be overcome by refitting and tightening the hose clamps.

## **FILTERS**

An in line strainer is provided before the pump. This strainer will pick any particles that may find their way into the water system.

A domestic water filter is installed in line under the galley. This filter is activated carbon, which removes odor, color, and sediment. The filter should be replaced as recommended, based on usage levels. It should be removed when winterizing the system.



“Shurflo” RV-5UC water filter below galley.

## SHOWER SUMP PUMP

The shower stall is equipped with a switch-activated pump out unit located below the sink in the head unit. It is important to activate this system by turning on the “shower sump” breaker prior to taking a shower.

The shower sump pump discharges through the head sink seavalve directly into the water we are sailing and swimming in. Do not discharge anything damaging to the environment though it. Be sure the seavalve is open to avoid water backing up through the head sink.



Jabsco Par Max 3 shower sump pump below head sink area

## CITY WATER INLET (OPTION)

The city water option connects the yacht's freshwater system to a dockside water supply. A pressure-limiting valve in the system protects the yacht's water system from excessive dockside pressure.

To use the city water option:

- Turn "OFF" the branch circuit breaker for the pressure water pump. This circuit breaker is located in the 12-volt DC electrical distribution panel at the navigation station.
- Connect a garden hose between the freshwater inlet on the Sabre SPIRIT and a dockside water supply.

*Note: The diameter of the garden hose used to connect the Sabre SPIRIT to the dockside water system will affect the quantity and pressure of water available. Use a 5/8" inside diameter garden hose for best results.*

- Open the dockside water supply.
- Check the yacht's freshwater system for leaks.

## MARINE HEAD

All Sabre SPIRIT's come equipped with a marine head, a holding tank and a macerator as standard equipment. Regulations for the waterways being traveled must be observed concerning overboard discharge. Be aware of Federal, State and local laws.

## HEAD UNIT AND HOLDING TANK

The Jabsco Quiet Flush toilet system is standard on your Sabre SPIRIT. The system's water intake is directly from the pressure water system, thus eliminating the need for the head intake seavalue. The water pump breaker must be on for pressure water to be available. Please refer to the Jabsco instruction manual supplied with the owner's equipment manual. The lockable discharge seavalue (lock is owner supplied) is located under the head sink. This seavalue must be opened prior to the operation of the macerator or damage may occur to the system.

Do not discard paper towels, rags, matches, etc., in the toilet or clogging and damage of the unit can result. A replacement holding tank can be purchased through Sabre.

## **DRAINAGE AND SEAVALVE SYSTEMS**

Seavalves have proven their reliability as a dependable means of controlling access through the hull for the disposal and intake of liquids. They are the single most important mechanical device responsible for the watertight integrity of the hull. The seavalve is open when the handle is perpendicular to the hull, and closed when the handle is turned one-quarter turn, making it parallel to the hull.

**NOTE:** It is advisable to close the sink drain and head discharge seavalves while sailing to prevent water from entering the boat when heeled over.

### **SEAVALVES**

All seavalves should be checked each time that the boat is used. Close all seavalves before leaving the boat, with the exception of cockpit drain valves.

Closing seavalves while the boat is in the water will trap water inside the seavalve - a situation that can potentially freeze and damage the system. Each seavalve should be thoroughly examined when it is hauled at the end of the season. Be sure all seavalves are properly drained before winter storage and left open.

Be aware of the importance of opening the appropriate seavalve for the system in use. This is particularly true in regard to the engine cooling and head disposal systems. Sink drains are also protected by seavalves, which must be open when the drains are in use.

### **INSTALLATION OF ADDITIONAL SEAVALVES**

The installation of further thru-hulls may be made in certain areas of the boat. Due to issues of drainage, accessibility, and installation, we strongly suggest that you contact your Sabre Dealer before installing any seavalves in your boat, so that they might help you in choosing the proper location and parts for the job.

### **BILGE PUMPS**

A manual bilge pump has been located under the cockpit seat. To pump manually, insert the handle into the pump in the cockpit diaphragm. This pump removes water from the bilge, pumping it overboard at the transom. A strainer at the end of the reinforced bilge hose protects the pump from foreign objects. Check this strainer frequently for debris.

The electric bilge pump on your boat works in much the same fashion. Mounted upright inside the starboard settee, it too pumps water out through a small hole in the transom. The Bilge Pump switch and glass 15A fuse are located on the port side on a panel in the salon berth face. This is a rocker type switch for "Auto", "Off" and "Manual" operation modes. When the Bilge pump switch "Auto" is selected, (regardless of the Battery switch position) the pump is in the "automatic" mode, when the float switch senses water in the bilge, it automatically turns the pump on and off. When the bilge pump switch "Manual" is depressed, it is a momentary type switch, activating the bilge pump.

It is also important to frequently check the float switch on an automatic bilge pump to ensure that it is functioning properly. Small debris in the bilge can cause the float to stick. A quick disconnect coupling has been installed in the hose coming from the pump to facilitate cleaning of this section of hose and the check valve. Clean any solid debris out of the bilge immediately.

## **BILGE ALARM**

An audio high water bilge alarm is supplied on the SPIRIT. This alarm will sound if the water in the bilge reaches the area above the bilge sump. An independent float switch is mounted above the sump on port which activates this alarm. If this alarm sounds check that the bilge pump is on and working and if necessary operate the manual bilge pump in the cockpit until the alarm goes off.

## **BILGE PUMP TROUBLESHOOTING**

<b>Problem:</b>	<b>Reduced Flow</b>
Possible Cause:	Plugged strainer (1) in bilge (1) by the pump in starboard main salon berth
Solution:	Clean both strainers
Possible Cause:	Discharge line plugged with debris
Solution:	Clean out hose by back flushing.
Possible Cause:	Low battery voltage
Solution:	Check battery condition and charge, if necessary.
<b>Problem:</b>	<b>No Water Pumped</b>
Possible Cause:	Faulty wire connections
Solution:	Check for corroded wire connections. Visual checks are not always sufficient, although a slight pull on each wire should suffice. Check to see that no wires are hanging into the water.
Possible Cause:	Fuse blown
Solution:	Check to see that the fuse is OK. If pump runs with the manual switch then fuse is OK. Next check impeller inlet opening to see that is not jammed.
Possible Cause:	Float switch failure
Solution:	Lift end of float switch up. If pump runs, then float switch is operating properly. If pump does not run, then

turn the manual switch to "on" position. If pump then runs, then the automatic switch has failed.

**Problem: Pump Will Not Shut Off**

Possible Cause: Object caught under float  
Solution: Clean underneath the float to make sure that debris is not holding the float up.

Possible Cause: Stuck float  
Solution: Check to see that float is loose and free of bilge oil. Soak the switch in an all purpose marine cleaner for ten to fifteen minutes, checking for smooth operation of the float.

Possible Cause: Clogged bilge pump screen / check valve / filter  
Solution: Disconnect hose and check for blockage. Using a screwdriver or wrench disconnect bilge pump screen / check valve / filter from hose and then clean. Reinstall.

## **6.) *ELECTRICAL SYSTEM***

### **12V DC System**

- Battery Switch and Combiner
- Battery Charger
- Batteries
- Battery System Information
- Switch Panel
- Wire Identification

### **120V AC System**

- 120V Power
- Voltage
- ProSafe Galvanic Isolator Monitor
- Polarity

### **Lightning Protection and Bonding System**

- Bonding System
- Lightning Protection System

# 12 VOLT DC ELECTRICAL SYSTEM

Wiring for the 12 volt system has been installed in accordance with industry standards, and quality wire and connectors have been used throughout. A salt air environment and continual boat vibrations require that wires and terminals be checked routinely for corrosion or wear.

## BATTERY SWITCH AND COMBINER

The battery system consists of two banks, the House Bank has two 31 DCM batteries and the Engine Start has one 31-950T battery. One Battery Switch is used to operate both Battery Banks, this Switch, “The Dual Circuit Plus ® Battery Switch”, is located on the aft face of the port settee.

**CAUTION: DO NOT SHUT OFF THE BATTERY SWITCH WHILE THE ENGINE IS RUNNING OR SERIOUS ALTERNATOR DAMAGE WILL RESULT.**

The Dual Circuit Plus ® Battery Switch turns the House and Start Battery on at the same time, but isolates them from each other. Battery isolation protects the start battery from being discharged from the house loads preserving it for starting the engine. This Battery isolation also protects sensitive electronics from voltage spikes and sags that may occur during engine starting. The Dual Circuit Plus ® Battery Switch simplifies battery switch operation; it performs the same operation as three ON/OFF battery switches. The engine and house batteries are turned ON at the same time when the boat is boarded and OFF when the boat is not in use. This minimizes the opportunity for error. In a situation when the start battery is discharged, simply turn the switch knob to the COMBINE BATTERIES position.

Your Sabre SPIRIT is also equipped with an Automatic Charge Relay® which automates the charging of two battery banks when coupled with the Dual Circuit Plus ® Battery Switch. This combination creates a complete battery management system of isolated battery circuits, emergency cross connection (emergency parallel) functions, and automated charge management.

## BATTERY CHARGER

The Sabre SPIRIT comes equipped with a ProMariner Model 1250 50 Amp Battery Charger using two outputs, one to the house bank and the other to the Start battery. To charge your batteries using the Battery Charger, activate the Shore Power and the Battery Charger Circuit Breaker. For complete instructions see the ProMariner Owner’s Manuals included with the other Equipment Manuals.

## BATTERIES

It is important to keep batteries fully charged at all times. Low batteries will affect the function of the radio, depth sounder, and other electronics. Batteries that are allowed to remain in a discharged state for a period of time may become permanently damaged. Check and charge batteries frequently during periods of regular usage.

Do not attempt to charge dead or extremely low batteries with the alternator. These batteries should be charged out of the boat. Batteries should also be removed and fully charged before winter storage.

## **BATTERY SYSTEM INFORMATION**

Sabre recommends that you not leave any electrical device in the "on" position while the boat is unattended (other than the bilge pump switch that powers the bilge pump float switch and the Charger switch when charging is desired). If the batteries are continually charged they may lose electrolyte and dry out. This is a significant cause of premature failure and is not covered by your limited warranty.

Inspect and clean the battery cable terminals at least once each month. The terminals should also be cleaned annually using a stiff brush and a solution of baking soda and water. After cleaning, apply a light layer of petroleum jelly or special preparation to cable terminals to retard corrosion.

Check fluid level in each battery cell once each month (not applicable to optional AGM batteries). If low, add distilled water to about 1/2" above the top of the plates. Do not overfill, and never add anything to fluid except water.  
**CAUTION:** Never expose battery to open flame or electric spark. Chemical action generates hydrogen and oxygen, which are inflammable and explosive. Do not allow battery fluid to contact skin, eyes, fabrics, or painted surface.

Battery fluid is a corrosive sulfuric acid solution, which could cause serious personal injury or property damage. Thoroughly flush any contacted area with water immediately. Wear eye protection when working on or near battery. Remove rings, metal watchbands, and other metal jewelry before working on or around battery. Be careful in using metal tools and equipment. If such metal should contact the positive battery terminal (or metal in contact with it), and any other metal on the boat, a short circuit may occur which could cause personal injury. Batteries and battery acid must always be kept out of the reach of children.

## **SWITCH PANEL**

Circuits may be selected individually after turning on the main breaker by flipping the appropriate breaker switch for the desired circuit. This enables you to energize only those systems needed. A fuse or circuit breaker located in the panel protects each circuit. Any additional accessory circuits must be installed with appropriate fuses or batteries, and not wired directly to the battery.

## Wire Identification

All wiring throughout the Sabre SPIRIT has been numbered to assist in following circuits and to add in troubleshooting. Please refer to the wire number sheet included in the drawing section of this manual.

## 120 VOLT AC ELECTRICAL SYSTEM

The 120-volt AC wiring system has been installed to provide a safe and dependable source of AC power. The running of wires has been carefully planned to keep them unexposed, whenever possible and protected when exposed to chafing or water.

### 120 VOLTAGE POWER

A 50 foot, 30 amp, UL listed cord is supplied for shore power hook-up. This cord provides a watertight connection to the boat. Always secure docking lines in such a fashion that strain will not be applied to the cord, regardless of tide and sea conditions.

Two in line fuses located in the port sail locker protects the 120-volt inlet line. These will only blow if a large short circuit occurs. Always check the main breaker(s) at the electrical panel if you experience problems with incoming power.

### VOLTAGE

Permanent damage can occur to motorized equipment if subjected to hyper currents resulting from low voltage. Resistive appliances, such as light bulbs, will have shorter lives if exposed to prolonged higher-than-normal voltages.

Voltage fluctuations, especially severe drops during periods of high demand, are not uncommon. The voltmeter gives you the ability to monitor the voltage on board continuously.

## PROSAFE GALVANIC ISOLATOR MONITOR

The Sabre SPIRIT is equipped with a ProSafe 1 Monitor system, which will verify that the incoming dockside power is grounded properly to earth. It is very important that while your vessel is at the dock, plugged into shore power, that it's bonding system be electrically connected to earth. Without this connection the chance is increased that, through accident or failure in the electrical distribution system, the bonding system could become electrically "HOT" (presence of 120 or 220VAC). An occurrence of this type could quickly become deadly both to anyone in the water or anyone boarding or even aboard the vessel.

Also of importance to note is the presence of a device called a "Galvanic Isolator". This device is installed in the ground wires circuit between shore ground and the vessels bonding system. The purpose of the Galvanic Isolator is to allow the bonding system to be isolated

electrically from the dock and other vessels at low voltages (below 1.4 volts) but to keep it connected to the shore ground at high voltage potentials. The reason for this is so that the vessel's zincs only protect the vessel you are on. You may have heard the term zinc saver, a term used often to describe the galvanic isolator.

**Automatic Operation:** To use your ProSafe Monitor the following steps are suggested: Be sure that your main AC panel breaker is in the "OFF" position. Also be sure your dock post AC breaker is in the "OFF" position. Attach both ends of the vessel shore cord, one end to the power inlet on your vessel, then the other to the dock post receptacle. Turn on the dock post breaker. The presence of AC on the input side of the Main Panel Breaker will activate the ProSafe Monitor. After the ProSafe Monitor cycles through its test it will display the condition of the shore ground wire and of the galvanic isolator. The ProSafe Monitor will repeat this test automatically every three hours.

**Manual Operation:** To operate the ProSafe Monitor manually you simply press the "Test" button on the display panel, wait for the test to complete (about 10 seconds) and read the displayed test results.

#### **Interpretation of test results.**

The display consists of six LEDs, three are green and three are red. The three green LEDs should be lit to show proper polarity, good ground wire continuity and a good galvanic isolator.

With any of the faults listed below present and because of the possibility of high AC voltages on the bonding system it is highly recommended that the vessel shore cord be disconnected until a marine technician can determine and repair the fault.

A **Reverse Polarity Red LED** indicates that the line and neutral wires are reversed. Unless you have had recent electrical work done on your AC electrical system or shore cords, this is typically a fault of the receptacle that your shore cord is plugged into. This needs to be corrected as it enhances the chance of accidentally having 120VAC (220VAC in Europe) on the vessel's bonding system.

A **Ground Wire Red LED** indicates that the AC ground wire (green wire) is not connected to shore properly. The fault can be caused by the green wire being open or disconnected, by a bad connection at the galvanic isolator, shore cord plug, the dock plug or even the metal tip of the plug itself not making good contact. The ground wire not being properly connected to the neutral wire back on the dock can also cause the fault.

A **Galvanic Isolator Red LED** indicates that there has been a failure of the Galvanic Isolator. The Galvanic Isolator can fail as a short or as an open. As a short it will no longer isolate the boat in a low-level DC manner and will increase the erosion of your zincs. As open you will no longer have AC ground protection to your bonding system. Both situations are cause for concern, the later being a *Life threatening situation*. If the galvanic isolator shows a "FAIL" it should be replaced without hesitation due to this danger.

## **POLARITY**

Appliances requiring a continuous ground or proper polarity rely on the correctness of the wiring in every shore power connection you make. Improper wiring of the shore outlet can

result in equipment damage and is potentially dangerous to all passengers.

The polarity indicator shows when polarity is reversed or the ground is improper in the AC wiring. . If the reverse polarity light is on, disconnect the boat from the shore connection and have a qualified electrician determine where the problem exists before reconnecting.

## **LIGHTNING PROTECTION AND BONDING SYSTEM**

All Sabre yachts are equipped with a heavy duty lightning ground and bonding system connecting all essential equipment to the keel using #6 stranded copper wire and #4 wire at the mast step.

### **BONDING SYSTEM**

The bonding system provides low resistance to electrical connections of all underwater fittings, fuel fills, etc. at the same electrical potential to minimize the effects of any galvanic or electrical corrosion that may occur.

Any additional underwater hardware installed on the boat that is potentially connected to the ships electrical system or below the waterline must be tied in to the bonding system to maintain proper operation and protection from corrosion.

The integrity and operation of the system should be checked each year at launching and hauling times.

### **LIGHTNING PROTECTION SYSTEM**

The lightning protection system provides a "cone" of protection around the boat in the event of a lightning storm. Copper grounding wires connect all chainplates and the mast step to the keel.

The integrity of the lightning ground system should be checked regularly. Inspect all wire and terminal connections at the mast step, all chainplates and the keel for tightness and signs of corrosion.

Allow no one in the water during an electrical storm. Remain inside the boat and avoid making contact with any large metal objects such as the mast, shroud, stanchions, bow pulpit, stern rail or any of the items connected to the lightning grounding system, especially in such a way as to bridge between any of these items.

If a boat is struck by lightning, there is likely to be damage to delicate electronic instruments due to a high voltage-low ampere surge of electricity through the boat. If a boat is struck by lightning, compasses, electronic, and electrical gear must be checked for damage and/or change in calibration. It is also recommended that the lightning protection system itself be inspected for integrity.

If the boat is struck by lightning, serious structural damage is possible. Sabre recommends hauling the boat to inspect the underwater surfaces. Lightning strikes have been known to cause delamination of hulls, forcibly "blow out" underwater fittings, and leave a series of holes in hulls.

## 7.) *Stove System LPG*

The stove in your galley can be locked into a stationary position when not in use. The stove has been designed to gimbale in order to facilitate cooking while the boat is heeled over or rocking at a mooring. This gimbal will compensate for a heel of up to 20 degrees, yet discretion should be used to determine whether conditions are safe for cooking.

### **WARNING!**

**LIQUEFIED PETROLEUM GAS (LPG) IS FLAMMABLE AND EXPLOSIVE.**

Liquefied petroleum gas (LPG/propane/butane) is potentially hazardous if it is not maintained and used in accordance with safe standards of practice. It is strongly suggested that the owner become familiar with the system and carefully read the product literature supplied with the boat, **even if you do not plan to cook aboard the boat.**

### **WARNING!**

**A LPG STOVE SHOULD NOT BE USED AS A SPACE HEATER AT ANY TIME. THIS IS AN UNVENTED APPLIANCE AND THE BY-PRODUCTS OF LPG COMBUSTION ARE FATAL IF ALLOWED TO ACCUMULATE IN AN ENCLOSED SPACE. ALWAYS COOK WITH ADEQUATE VENTILATION.**

## **LPG FUEL**

LPG is heavier than air. Any leaking LPG tends to settle in pockets in the bilge, creating a fire and explosion hazard. A specially engineered locker has been provided on the port deck area, to safely enclose the LPG storage tank(s) and vent any leakage directly overboard. The lid to this locker should be kept securely fastened. The water drain / gas vent must be kept free debris or any blockage at all times.

### **WARNING!**

**THIS SYSTEM IS DESIGNED FOR USE WITH LPG. DO NOT CONNECT COMPRESSED NATURAL GAS (CNG) TO THIS SYSTEM.**

What is the pressure I should expect on the tank when full?

***LPG is a two-phase fuel. This means the LPG in the storage tank exists as both a liquid and a gas. The gas pressure of a two-phase fuel within a tank does not vary with how full the tank is. However, ambient air temperature does affect the gas pressure. The prominent LPG sold in the USA is propane. Normal cylinder storage pressures for propane are about 109 psi at 70° F and 172 psi at 100° F, per ABYC standard A-1. Pressures in the supply line (after the pressure regulator) are typically about 0.4 psi with a maximum of 0.735 psi. Weighing the storage tank is the most accurate way of determining the quantity of propane remaining in the tank.***

On average, how long (hours) does one tank of LPG fuel last?

***Burner size and tank capacity determine how long a tank of fuel will last. Typically, small stove burners are rated at 5,000 BTUs, large stove burners are rated at 8,000 BTUs and oven burners are rated at 10,000 BTUs. A pound of LPG contains about 21,600 BTUs. When full, the two aluminum storage tanks provided on board the Sabre SPIRIT, hold 6 pounds of LPG each. This means there is enough LPG on board to run a small stove burner for about 48 hours or the oven for 24 hours. In practical terms, two 6-pound storage tanks will typically last about 1/2 season for a weekender, or 1 to 2 months for a live aboard.***

## **OPERATION**

The LPG storage tank is switched off in two ways: manually, by the supply valve on the end of the tank, and with an electric solenoid, which shuts off the flow through the hose. The solenoid should not be used as a safety shut-off, but rather as a temporary convenience feature. Always manually shut off the supply valve at the storage tank when you are not cooking.

Carefully read the owner's manual(s) for any LPG appliances installed on your Sabre SPIRIT. Following this section are some excerpts from the Xintex Propane Fume Detector with Valve control manual. For more information see this manual this is included with the Owner's equipment Manuals. Some general operation guidelines are:

- Make sure any control valves at the appliance are turned "OFF".
- Open the manual supply valve at the LPG storage tank.
- Turn on the 12-volt DC branch circuit breaker labeled "GAS VALVE"
- Turn "ON" the gas solenoid valve at the control panel by the stove.
- Follow the manufacturer's directions for lighting the stove. Always apply an ignition source to the burner before opening the stove valve.

- Attend stove to make sure it is re-lit if flame goes out.
- When finished cooking, switch “OFF” the gas solenoid valve at the control panel by the stove.
- Turn “OFF” the 12-volt DC branch circuit breaker labeled “GAS VALVE”.
- Close the manual supply valve at the LPG storage tank.

When I shut-off the system and the tank is off, it still shows pressure on the gauge. Going back a little later that reading is gone. Is this normal?

*Sabre LPG systems are tested in accordance with ABYC standard A-1 which specifies that the pressure gauge reading shall not change for at least three minutes after the cylinder supply valve is closed. Over longer periods of time the small amount of gas downstream of the supply valve may eventually bleed out of the system. If any significant leakage is suspected, either as the result of a rapid pressure drop or the odor of gas, the entire system should be checked with a non-corrosive detergent solution to locate the leak. The system should also be checked for leaks in accordance with the instructions in the storage locker each time the manual supply valve is opened or when the tank is changed.*

## **WARNING!**

NEVER USE A FLAME TO CHECK FOR LPG LEAKS!

*As a precaution, use the following procedure overnight or when leaving the boat for an extended period: With a stove burner on and burning, shut-off the manual gate valve at the LPG storage tank. When the burner flame goes out, all LPG has been removed from the supply line. Now shut off the burner valve and the electric gas solenoid valve.*

## **XINTEX S-1A PROPANE FUEL DETECTOR WITH VALVE CONTROL**

### **OPERATION**

The display module on the S 1A contains three (3) windows. The left window is a green power on indicator. The right window is red danger indicator. The center window is a valve on/off indicator. When the center green light is on the valve is open and propane will flow. When center green light is off, the valve is closed and propane will not flow. Upon power up, the green power on indicator (far left) will come on and the red danger indicator may light momentarily to indicate a warm up period

for the sensor. If the sensor takes more than 25 seconds to warm, the alarm will sound. After the warm up period, the red danger indicator will go out. Should the horn sound; the alarm will stop when the red danger indicator shuts off. Should a fume build up reach 10 to 20 percent of LEL (Lower Explosion Limit), the red danger indicator will come on. If this condition lasts longer than 20 to 25 seconds, the alarm horn will sound. The red danger indicator will remain on until the fume problem has been corrected. When the red danger indicator shuts off, the alarm will stop. If the green valve on indicator is lit and the red danger indicator comes on, the solenoid valve will close and the green valve indicator will extinguish.

**NOTE: THE PROBLEM SHOULD NOT BE CONSIDERED CORRECTED UNTIL THE RED DANGER INDICATOR GOES OUT.**

## **IN THE EVENT OF AN ALARM**

**Immediately have all passengers and crew exit the passenger compartment. If an explosion or fire should occur, the probability of injury will be reduced if no one is in a confined area of the vessel.**

**Turn off the fuel supply and ventilate the area. Do NOT turn the fuel source on until qualified personnel have checked all fittings, gas lines, and appliances.**

## 8.) **MAINTENANCE**

### **Safety Maintenance**

- Standing Rigging
- Running Rigging
- Thru-Hulls
- Installation of Thru-Hulls
- Chainplates
- Bilge
- Fire Extinguishers
- Lifelines
- Stanchion Posts
- Deck Hardware
- Annual Safety Maintenance Checklist

### **Exterior Maintenance**

- Fiberglass and Gelcoat
- Gelcoat Crazing
- Gelcoat Repair
- Bottom Paint
- Blistering of the Gelcoat Layer
- Stainless Steel and Aluminum Deck Hardware
- Ports and Hatches
- Winches
- rubrail
- Exterior Teak
- Sails
- mast
- Boom

### **Interior Maintenance**

- Wood
- Vinyl
- Ports
- Cushions
- Sinks
- Laminated Plastic
- Stoves
- Ice Box
- Head

- Lockers and Bilge

### **Deck Leaks**

- The Most Common Sources of Hull Leaks
- Chainplates
- Toerails
- Ports
- Deck Drains
- Genoa Tracks
- Mast Collar
- Traveler and Spray Hood Bolts
- Spray Hood Drain
- Instruments
- Winch Pockets
- Pedestal
- Cockpit Drains
- Hatches
- Stanchions
- Rail Bases
- Waste and Deck Water Fittings
- Winches
- Handrails

### **Hull Leaks**

- Keel Bolts
- Anchor Well
- Strut Bolts
- Thru-Hulls
- Water Hoses
- Hot Water Tank
- Engine Coolant
- Drainage System

### **Keel Maintenance**

- Rebedding Keel Bolts

# SAFETY MAINTENANCE

Upkeep of your boat's equipment is a necessary part of its usage, ensuring your safety and the maintenance of the boat's value.

## STANDING RIGGING

Standing rigging includes all parts concerned with support of the mast. Components should be examined each time before going sailing and given a more thorough examination on a monthly basis.

- Spreaders should be positioned at the appropriate angles. Bent or damaged spreaders must be replaced.
- Turnbuckles should be locked, top and bottom, to secure their position and have boots, or be taped with plastic tape to prevent snagging of clothes or sails.
- Wire rigging should be inspected for damage and misalignment at terminal ends.
- Review the recommended rigging and mast maintenance information contained in the rigging manual.

## RUNNING RIGGING

Running rigging includes all control lines for sail adjustments.

- The rope halyards should be examined frequently.
- Rope ends should be protected from fraying. All shackles should be inspected for corrosion, wear, signs of distortion, and proper operation. Eye splices are also especially important to check.

## THRU-HULLS

At each hauling, all seavalves and thru-hulls should be fully inspected. If the boat is left in the water year round, it is recommended that each thru-hull be worked and checked periodically. Before launching and every time before the boat is sailed, each seavalve should be checked for tightness and to assure that they are functioning properly.

Keep all but the cockpit seavalves closed whenever the boat is left unattended. Cockpit drain seavalves should be worked and inspected frequently in spite of being continually left opened. They protect the boat by maintaining the hull's watertight integrity in the event of drain hose failure.

## **INSTALLATION OF THRU-HULLS**

The installation of additional thru-hulls may be made in certain areas of the hull. We recommend contacting your Sabre dealer before having additional thru-hulls installed to discuss the area of location with regard to drainage, accessibility, and installation.

**NOTE:** 1. We recommend that only thru-hulls of the flange type of surface mount are installed in retrofit situations and that any thru-hull installation be done by experienced service personnel. Flush mount type thru-hulls require substantial alteration of the hull surface and may affect the integrity of the hull when not installed during initial molding of the hull.

2. When installing thru-hulls on boats in areas where coring is present, the coring between the inner and outer hull laminates should be removed at least 3/4" in from the edge of the thru-hull and replaced with a marine putty to seal the core.

## **CHAINPLATES**

Chainplates are thru-bolted to the FRP reinforced bulkheads with 1/2" nuts and bolts with lock washers. Check nut and bolt tightness monthly. Check for any leaks and reseal if necessary with Silpruf sealant.

## **BILGE**

The bilge should be checked for water and drained every time you board or leave the boat. A reinforced hose leads from the pump to the bilge. A strainer in the bilge protects the pump from large foreign objects. It should be checked and cleaned frequently. In the event that something clogs the pump, it may be disassembled.

## **FIRE EXTINGUISHERS**

Each fire extinguisher should be checked monthly. A gauge on each extinguisher allows you to easily check its charge. Each crewmember and passenger should be made aware of the location of the fire extinguishers and of the best way to exit the cabin in case of a fire or other emergency.

## **LIFELINES**

All lifelines have swaged end fittings. As with the rigging, a thorough examination of the cable and cable ends should be conducted monthly. A routine inspection should be done every time the boat is sailed.

- Look for longitudinal cracks in the swages, loose cables, frayed wire, and wire strand failure at the ends of the swages and rusted fasteners. Replace worn parts.
- Turnbuckles should be fully engaged onto the threaded rod, and gate locknuts tightened securely. Line tension should be snug without being overly tight.
- Small cotter pins or rings will ensure that turnbuckles will remain tight. The entire turnbuckle assembly should be wrapped in vinyl tape to prevent snagging and chafing.

## **STANCHION POSTS**

Stanchion posts should be securely fastened to the base. Check periodically to be sure that the base set screws are in place and are tight. The bases are through bolted to the deck and sealed with GE Silpruf silicone based sealant.

## **DECK HARDWARE**

Considerable strain is applied to all deck hardware during the course of the season and each fitting should therefore be re-tightened annually. Most deck hardware is bolted through the deck and either reinforcement is molded into the fiberglass deck in that area, or aluminum back-up plates are used, or both. Check the tightness of these nuts and bolts frequently, especially if the boat is sailed hard. Nuts are accessible by removing access panels or plugs throughout the boat, through the anchor well and cockpit lockers, as well as along the outboard edge of the headliner flange. Be careful not to over-tighten deck hardware which could possibly strip the threads. Keeping all deck hardware clean and waxed will help reduce corrosion.

## ***ANNUAL SAFETY MAINTENANCE CHECKLIST***

The following list has been compiled as a guide to check critical safety related components of the boat. It is very important that this maintenance inspection be completed each year to assure the ongoing safety of your boat.

### ***Standing Rigging***

- Check turnbuckles, threads, swages, and pins for corrosion, cracks or wear.
- Check chainplates for hole elongation, bolts, and mount integrity.
- Check mast hardware, including masthead, tangs, and pins for wear and corrosion.
- Check rods for corrosion and wear.
- Tune rig. Refer to the manual supplied by the mast manufacturer.

### ***Running Rigging***

- Check lines and shackles for wear.
- Check block attachment and condition of sheaves.
- Service winches, check for free operation, and ratchet stop function.
- Check for secure fastening of all cleats.

### ***Deck Hardware***

- Check lifeline integrity, stanchion, and rail attachment to deck.
- Check all chocks, cleats, and other hardware for attachment and soundness.

### ***Steering System***

- Check rudder condition including the shaft.
- Check rudderpost play in bearing tube.
- Check drive wheel attachment.
- Check integrity of cables and chain clamps.
- Check steering wheel shaft lubrication and wheel security. Do not get oil or grease on brake pads.

### ***Thru-Hulls and Seavalves***

- Check seavalve integrity
- Check seavalve attachment to hull
- Check for proper adjustment and lubrication
- Check hose, integrity, attachment, and clamps

### ***Electrical***

- Check battery charge, terminal connections, and electrolyte condition.
- Check breaker panel and switch condition.
- Check terminal for tightness and corrosion.
- Check running light operation.
- Check ground wire attachments to keel, chainplates, mast step, thru-hulls, shaft strut, and engine.

### ***Mechanical Systems***

- Check stove fuel system, hoses, clamps, and shut offs.
- Check heating stove, clearances and exhaust pipes (opt).

### ***Engine and Drive Train System***

- Check engine fluid levels and systems for leaks.
- Check throttle action - start and stop controls, cable clamps, and locknut.
- Check shift cable clamps and locknuts.
- Check exhaust system soundness, hose clamps, and waterlock canister.
- Check coolant system; hose clamps, intake, and filters.
- Check transmission shift lever action, control linkage, fluid level coupling bolts, and alignment.
- Check trueness of shaft, coupling, and prop attachment.
- Check shaft log tube integrity, seal, hoses, and clamps.
- Check shaft strut attachment and cutlass bearing.
- Check all engine wire connections.

### ***Keels***

- Check keel bolt nuts for tightness. This must be done on land with weight of the boat resting on the keel. Proper tension is 170 foot pounds for the ¾" bolts and 250 foot pounds for the 1 inch bolts.

### ***Plumbing***

- Check bilge pump function, hose clamps and strainer

## **EXTERIOR MAINTENANCE**

The following is a general guide for use in the maintenance of your yacht's exterior. High quality materials have been used in construction and with regular attention, their appearance and performance should prove very durable.

### **FIBERGLASS AND GELCOAT**

As a boat building material, fiberglass is recognized as one requiring comparatively little maintenance. The exterior surface is gelcoat, a color impregnated resin. Some care and maintenance is needed however, for the boat to withstand the rigors of usage and to keep an attractive appearance.

Frequency of washing will depend on several factors yet washing several times per season should be anticipated. Wash with mild detergent and warm, fresh water, using a soft sponge or soft natural brush. Anti-skid areas may require a stiffer brush. Rinse entirely with fresh water. Stubborn stains and minor scratches can be removed with conservative use of a fiberglass cleaner containing a gentle abrasive, after which the area will need waxing with a quality automotive or boat wax.

The entire topsides and superstructure should be waxed at least once a year in northern climates and more often in areas of greater sun exposure. Dark colored hulls require more frequent waxing to maintain the attractive glossy finish. Transoms are more susceptible to damaging UV rays. Periodic application of a high quality wax with UV filters is highly recommended.

Leaving anti-skid areas unwaxed is advised.

### **GELCOAT CRAZING**

Hairline cracks may appear in the gelcoat at corners of the deck molding, especially around corners of the cockpit, the cabin house sides and backstay chainplate. This is strictly a surface condition in the gelcoat finish, and does not indicate structural weakness. The gelcoat layer is not nearly as flexible as the fiberglass laminate underneath and so some minor stress cracks, which may develop over time, are not unusual.

### **GELCOAT REPAIR**

Minor gelcoat damage may be repaired through use of a gelcoat repair kits available from various commercial suppliers. Complete instructions are included with such kits. To obtain the closest possible color match, kits prepared with the original color gelcoat should be purchased. If you are uncertain as to which gelcoat color was used on your Sabre, you may contact Sabre's Customer Service Department to verify.

## GELCOAT REPAIRS

The following has been prepared to assist in performing repairs to small scratches or voids in the gelcoat surface of your Sabre.

1. Dig out all loose material using a knife or small chisel and sand the area lightly. The surface should be clean and dry.
2. Protect the surrounding area with masking tape.
3. If the repair involves filling a void, mix the gelcoat with a small amount of cabosil powder to make a paste consistency. If the repair kit being used contains gelcoat paste rather than straight gelcoat, no thickening would be required.
4. Thoroughly mix catalyst into the gelcoat. Never add gelcoat into a container of catalyst. The ratio is as follows: 5 drops of catalyst to 1 ounce of gelcoat. \*
5. Fill the affected area using a small paintbrush or automotive filler spreader (plastic putty knife). Apply enough putty so that the repair area is left slightly raised. Allow 24 hours for cure.
6. Sand the repair area with progressively finer grades of sandpaper beginning with 200 grit and ending with either 600 or 1200.
7. To obtain the equivalent of the original factory finish, sand the repair area down so that it's slightly recessed and then apply gelcoat without any filler (cabosil) following steps 4, 5 and 6 above.
8. To bring the repaired area to the original luster, follow the final sanding with an application of fine rubbing compound. Put compound on a soft and damp cotton rag and rub until a smooth surface is obtained. The area should then be waxed.

\*This ratio can be altered slightly if repairs are being done in cooler temperatures (increase the amount of catalyst slightly) however no gelcoat repairs should be attempted in temperatures lower than 55 degrees Fahrenheit. Wet or humid conditions will adversely affect the curing of gelcoat and so conditions should be relatively dry. (Professional gelcoat repair technicians are able to achieve good results in a variety of conditions however repairs performed by inexperienced persons should be done under ideal conditions.)

## **BOTTOM PAINTING**

The most important part of blister prevention is maintaining the thickness of the gelcoat. Doing so will ensure the maximum effectiveness of the hull laminate against blistering, as well as continued coverage under our limited warranty. Please follow these guidelines for hull painting preparation:

- Choose a non-sand bottom paint system from manufacturers such as Petit or Interlux, and use their full system. Follow all manufacturers' instructions.
- If you prefer to sand the bottom as part of preparing for antifouling paint, an epoxy barrier system such as Interlux InterProtect will be required to maintain the maximum effectiveness of the laminate against blistering. Following the barrier coat manufacturers' instructions is required to maintain your osmotic blistering warranty.

### **Bottom Paint Preparation:**

- Clean off all dirt from the area using soap and water. Allow drying.
- Use a solvent designed to remove wax and oil from the hull.
- Apply solvent with a soft cloth to all "shiny" areas of the area to be painted. Repeat this step at least twice as it is very important. We recommend that one cloth be fully saturated in solvent for application to achieve a wet wash and complete coverage. Let the solvent sit on the surface for a short time, and use a second cloth to dry.

### **CAUTION!**

**Do NOT let the solvent air dry on the hull.  
This leaves the wax behind rather than removing it.**

Constantly roll the cloth, exposing fresh surface to pick up the most wax. Change application and wipe-up rags frequently. Failure to do so may result in improper bottom paint adhesion failure.

- For the non-sand bottom paint system, scuff the bottom with a Scotch-Brite or similar pad to remove the gloss, and not to remove gelcoat. Wash thoroughly with water and allow drying.
- For the sanding process, follow the de-waxing instructions above and apply the epoxy barrier system.
- Apply the bottom paint as specified in the manufacturer's instructions.

*Note: Chemicals applied to the bottom shall be restricted to water, detergents, fairing compounds, epoxy and primers, commercial bottom solvent wash, and "no-sand" gel coat primers.*

- Areas that are faired on the hull, rudder and keel have been coated with Interlux

Interprotect #2000 epoxy. These areas should be cleaned, sanded with 220X prior to bottom paint application. Properly prepared areas will look "scuffed", not shiny. The cosmetic external crack at the keel joint and around the lower rudder bushing may be filled at this time. Refer to the section on keel maintenance concerning this area.

## **BLISTERING OF THE GELCOAT LAYER**

Extensive laboratory research and experience show a strong relationship between blisters and the maintenance of the boat. Sabre Corporation has selected the combination of materials and laminating techniques that are most effective at greatly reducing the likelihood of blisters. It is your responsibility, as the owner of the boat, to correctly maintain the underwater surface of the hull. All maintenance techniques must be designed to reduce the migration of water through the gelcoat and into the laminate.

You must observe the following CAUTIONS:

1. ANY SANDING THAT DECREASES GELCOAT THICKNESS OR SCARS THE SURFACE WILL INCREASE THE LIKELIHOOD OF BLISTERS. USE EXTREME CARE WHEN REMOVING OLD BOTTOM PAINT.
2. DO NOT USE PAINT REMOVER, ACETONE, OR OTHER CHEMICALS ON THE BOTTOM AS THESE WILL SOFTEN THE GELCOAT, CAUSING A CHANGE IN ITS CHEMICAL PROPERTIES, DECREASE ITS EFFECTIVENESS AS A WATER BARRIER AND VOIDS YOUR WARRANTY.
3. STORING THE BOAT IN THE WATER YEAR ROUND WILL INCREASE THE CHANCE OF BLISTERING.

## **STAINLESS STEEL AND ALUMINUM DECK HARDWARE**

Many of the hardware pieces are custom-made for Sabre Corporation. All are made of corrosion resistant metal alloys. However, discoloration may occur in salt air environments. Routine rinsing with fresh water after a cruise will retard this. Regular cleaning with metal polish, followed by waxing, will keep these parts less susceptible to stains. (Refer to Sections pertaining to mechanical maintenance of winches, blocks, and other hardware).

- a. Always clean stainless with soap and water. Any cleaner safe for glass is usually safe for stainless.
- b. Always remove rust spots as soon as possible with a brass, silver or chrome cleaner. Irreversible pitting will develop under rust that remains on stainless for any length of time.
- c. Always use a cleaner, such as a good car wax, for added beauty and protection.
- d. Never use coarse abrasives such as Sandpaper or steel wool. That may result in rusting.
- e. Never clean with mineral acids or bleaches.
- f. Never leave stainless in contact with iron, steel or other metals, which cause contamination leading to rust or corrosion.

## **PORTS AND HATCHES**

The ports and hatches are high strength plexiglass, Lexan, or safety glass. A soft cloth should be used in cleaning, and any type of abrasive cleanser or solvent should be avoided. While plexiglass and Lexan are highly impact resistant, they have a tendency to scratch easily. Plastic cleaner and polish, available in hardware stores, may remove many surface scratches. Do not use any cleaning solvents on the fixed cabin ports. They have a scratch resistant film on them that will peel when exposed to harsh solvents. Only fresh water and soft cloths should be used on Lexan surfaces.

## **WINCHES**

During active sailing periods the winches should be stripped down, cleaned, and lubricated at least once a year. Disassemble, clean, and lubricate the internal mechanism with approved winch grease. It is recommended that you wash down winches each month with fresh water and dry. Refer to the literature in the manufacturer's binder on the winches for detailed maintenance instruction. As with other deck hardware, removable access plates allow access to nuts for the cabin top winches and the nuts for the coaming winches are accessible through the winch pockets.

## **EXTERIOR TEAK**

The exterior teak may be treated with one of many teak oil preparations available from marine stores that will maintain the brown color of the teak. This may require continual re-application at short intervals to maintain an attractive appearance.

The underside of the exterior teak has been precoated with epoxy to help prevent water wicking up into the teak.

Due to environmental and maintenance factors beyond our control, exterior varnish is not covered by Sabre's limited warranty.

Anyone considering varnish should recognize the commitment it takes in upkeep, typically requiring coating every four to five weeks to maintain its integrity. Should your varnish fail, we recommend not using chemical varnish removers as residue from them accumulates under hardware causing later varnish failure in this area.

## **SAILS**

The care given your sails will be reflected in their long life. Ultraviolet light from the sun is one of the main causes of sailcloth deterioration. Sails must be properly folded when not on the boom, and kept covered with a sail cover.

Sails that get wet must be rinsed with fresh water and dried before storing for any length of time. Washing the sails in a mild detergent and water solution each year before storage will remove minute salt crystals which otherwise can act as abrasives and hold moisture in the sail. Rinse thoroughly with fresh water and dry completely before folding and storage. We recommend returning the sails to your sail maker for annual cleaning, review and storage.

## **MAST**

The Mast should be removed once a year and inspected. The following lubrication should be done once a year.

1. Remove, inspect and lube sheaves.
2. Remove Head stay and backstay and inspect mast; clean and lube pins and reinstall.
3. Visually check alignment of shrouds in upper tang. Misalignment, especially in rod is a cause of fatigue.
4. Turnbuckles: Note tuned position, remove cotter pin and totally loosen. Spray threads with Rig Lube\*. Tighten to tuned position. Insert cotter pins.
5. 1X19 Wire Head Stays: Visually inspect swages for longitudinal cracks or wire strand failure at the top of the swage.
6. Visually inspect spreader tips and roots for damage or wear.

7. Inspect mast for sharp edges and silicone as needed.

## **BOOM**

1. Check gooseneck lugs for cracks or hole elongation.
2. Inspect vang and sheet bails.
3. Inspect condition of outhaul wire.
4. Check function of outhaul car.

.  
\* Rig Lube is a specialized thread lubricant manufactured by Navtec.

# INTERIOR MAINTENANCE

Cleaning your yacht's interior should become a regular part of maintenance. Sunny, breezy days are best suited for this, as they will aid you in the drying and airing process. The end results will increase your sailing pleasure.

## WOOD

The interior teak or cherry on new Sabre yachts may show considerable variation in color, shade and hue due to the natural variations in freshly cut surfaces. The light sensitive pigment inherent in both woods will allow it to season to a deep, rich color over the first few months of exposure to sun and air.

We recommend using a quality furniture wax. This thin polymer based material seals wood fibers and prevents absorption of surface oils and stains. It may be used repeatedly to restore the original luster of the wood. Apply with a soft cloth and wipe off the excess. Application in itself is a cleaning process. Please be aware that, as with any varnished furniture, continued use of heavy oils will result in excessive buildup and dull the appearance.

For interior oiled teak surfaces, which require aggressive cleaning, this is best done by scrubbing the surface with a diluted mixture of Murphy's oil soap and a plastic scrubbing pad. Sanding should not be done on any veneered surface such as the cabin sole or bulkheads. Harsh cleaning chemicals or solvents should be avoided as they may raise the grain of the wood.

**CAUTION: OILY RAGS ARE EXTREMELY SUSCEPTIBLE TO SPONTANEOUS COMBUSTION AND MUST NEVER BE LEFT ONBOARD.**

## PORTS

Ports are made of either plexiglass or safety glass. They should be cleaned with fresh water and a soft cloth. Avoid the use of abrasive cleanser or solvent. Plexiglass has a tendency to scratch easily. However, plastic cleaner and polish will remove most surface scratches.

## CUSHIONS

Our supplier recommends the following steps for cleaning of cushion covers: Vacuum thoroughly, rub in a foam mixture made from some Woolite and a little water. Rinse with clean water on a damp sponge and vacuum. This should all be done with the covers still on the cushions. Also, you should use as little water as possible. Placing the cushions out in a sunny breeze to dry will compliment your work. If the cushions have zippers, unzipping them will facilitate drying. Covers should never be removed from the cushions for cleaning and never be dry-cleaned or machine-washed.

Ultrasuede Fabric should be cleaned with the same procedures as above except that regular soap and water should be used. Do not use regular upholstery cleaning products on Ultrasuede.

If the yacht will be left unused for some time, standing the cushions on edge will allow air to circulate around them and reduce the chance of mildew.

## SINKS

All metal sinks on board are stainless steel. With reasonable care they will remain looking new for years. They are easily cleaned with detergent and water and then rinsed and dried. Soaps tend to leave films and, if not dried, residual minerals in water can leave watermarks. If watermarks occur they are removable with a 25% vinegar/water solution followed by cleaning with a non-scratching household or stainless steel wool, do not use other steel wool as small bits of steel may adhere to the surface, causing rust. An application of lemon oil will minimize staining and make your boat smell fresh.

Certain substances may harm and even corrode stainless steel if they remain in contact too long. These include bleach, salt solutions, disinfectants, cleaning compounds and food substances such as mustard, mayonnaise, lemon juice, vinegar and salt.

## LAMINATED PLASTIC

The off-white laminate provides a clean, hard, durable surface. It should be cleaned with non-abrasive kitchen cleaners. Protect counter tops when cutting with knives or working with other sharp objects, as gouges in the surface cannot be repaired. Otherwise, it is virtually carefree.

## STOVES

A complete owner's manual written on the use of the stove has been included with it. We recommend reading all supplied information thoroughly before first attempting to use it. Keeping your stove clean will aid you in its safe operation.

## **ICE BOX**

The iceboxes on Sabre yachts are custom designed to optimize space by conforming to the hull shape. It is surrounded by insulating foam up to three inches thick. The covers are designed with an insulation core encased in an easy to maintain fiberglass shell. Food should be packed with sufficient ice to last its duration of storage. Pre-freezing items not needed immediately will benefit the planning of a long passage. Water from melted ice will drain into a recessed sump in the bottom. As water collects here it can be periodically pumped out with the hand pump on the counter.

## **HEAD**

The waste system is built in Compliance with U.S. Coast Guard regulations regarding marine sanitation systems. It is of good quality and will provide years of service. Periodic use of commercially available lubricants and flushing with fresh water is a good idea. The head unit can be cleaned with a non-abrasive cleanser and warm water. The holding tank system includes a removable in-line vent filter to reduce odor from the vent. The replacement filter is a Sealand Sani Guard (Part # SLN 310002 SXFB) which should be replaced annually and is available through most marine supply stores

## **LOCKERS AND BILGE**

Berth lockers have drains leading to the bilge which should be checked for clearance periodically. The bilge itself should be used to collect moisture only. Nothing should be swept into the bilge as debris could cause havoc with the bilge pump.

## DECK LEAKS

Small, but annoying leaks, are the scourge of the boating world. They occur after a boat is in use due to the relative movement between components caused by sailing stress. Special conditions do occur and need special repair techniques. Before contacting your dealer or Sabre Corporation, please document the condition as fully as possible.

The selective use of a water hose on the deck is the best way to locate elusive deck leaks. Isolate suspected areas and work from the deck drains forward, and from the toerails toward the center of the boat. Often a leak will not appear instantly or directly inside. The water may run between the deck and liner, and show up some distance from the source. Persistent leaks will eventually leave telltale stains on stainless steel, teak, and vinyl.

### *The Most Common Sources of Hull Leaks*

Deck Leak Sources	Hull Leak Sources
1. Chainplates	1. Keel Bolts
2. Toerails	2. Anchor Well
3. Ports	
4. Deck Drains	3. Thru-Hulls: Cockpit Drains Engine Intake Galley Sink Head Discharge Washroom Sink Head Intake Knotmeter Depth Sounder
5. Emergency Tiller Cover	
6. Mast Collar	
7. Traveler & Spray Hood Bolts	
8. Spray Hood Drain	4. H2O Tank Lines
9. Instruments	5. Hot Water Tank
10. Winch Pockets	6. Engine Coolant
11. Pedestal Base & Wheel Guard	7. Inadequate Drainage
12. Cockpit Drains	
13. Hatches	
14. Stanchions	

15. Bow and Stern Rails

16. Waste and Water Deck Fittings

17. Winches

18. Handrails

## *Troubleshooting Deck Leaks*

1. **Chainplates:** Leaks at chainplates are generally caused by a faulty seal between the plate and the deck or void in the bolt sealant. Clean old sealant off of the bolts and apply butyl tape to the threads and reinstall. Clean the old sealant off of the chainplate with a stiff brush, and reseal the plate to the deck, using 3M 5200 or similar sealant recommended for this application.

2. **Toerails:** After a boat has been in use for a period of time, the normal flexing of the boat and compression of the hull to deck joint may lead to loosening of the toerail/hull to deck bolts. This may cause leaks. Various corrective techniques may be involved depending upon the severity of the problem.

The deck sealant and the teak toerail form a waterproof bond, which is generally quite effective at preventing water from entering the hull.

3. **Ports:** If water appears to be leaking around a port, isolate the location by testing with a water hose. Dry area of leak and re-seal with silicone or urethane sealant such as GE Silpruf both on the interior and exterior. Frameless windows require black silicone around the exterior of the port. Stainless opening ports have an external trim ring held by sealant, which may need to be removed to allow thorough bedding.

4. **Deck Drains:** Clean surfaces thoroughly and apply GE Silpruf sealant between the drain fitting and the deck recess. Both screws on the deck drain grates are sealed with GE Silpruf.
5. **Pedestal, Wheel Guard Base, and Cockpit Drains:** These leaks will result in water in the lazarette. A small bead of clear sealant should be used at the base, below the shift control assembly. The pedestal base and bolt heads use GE Silpruf.
6. **Mast Collar:** Mast collar leaks often occur when there is a break in the seal at either the mast boot or the collar bolts. To prevent mast collar leaks, tape and seal the mast boot. Caulk the collar and bolts with sealant. Be sure the mast sail groove is thoroughly sealed with silicone.
7. **Traveler Bolts and Spray Hood Bolts:** Leaks at these bolts will show water at the edges of the headliner. Leaks here result from a broken sealant bond around the bolts, which can be easily remedied by resealing the bolts with sealant.
8. **Spray Hood Drain:** Water should drain aft along the molded grooves on either side of the plexiglass sliding hatch.
9. **Instruments:** Check the seal around instrument installations.
10. **Winch Pockets:** Winch pocket leaks will be apparent if water appears in the aft cabin, liner edges, and/or cockpit lockers. These leaks are the result of a void in the sealant or fiberglass taping. Caulk along all joints inside the pockets with GE Silpruf.

11. **Cockpit Drains:** Apply GE Silpruf sealant around the edge of the flange. Check hose clamps for tightness.

12. **Hatches:** There are several potential leak sources for leaks occurring at hatches. Water might enter through worn gasketing, through fastener holes or between the hatch and the deck. First verify the source. Gasketing may be replaced. Fasteners may be bedded. If water is getting between the hatch and deck, clean joint where the frame meets the deck. Tape off surrounding surfaces with masking tape. Apply a neat unbroken bead of GE Silpruf sealant along entire joint.

13. **Stanchions:** Leaks at the stanchions and rail bases will be evidenced by water on the liner edge and on the outboard shelves. The bolts should be bedded with butyl caulking if sealing the edges of the bases with GE Silpruf does not resolve.

14. **Rail Bases:** Same as stanchions, above.

15. **Waste and Deck Water Fittings:** First check the hose clamps for tightness. If leak source is between the fitting and the deck, rebed with GE silpruf caulking including the fasteners.

16. **Winches:** Rebed the bolts with sealant.

17. **Stainless Steel Handrails:** These are through bolted. Water penetrating the fastener holes would travel outboard along the liner and end up in lockers. If leak source has been traced to an exterior handrail, use GE Silpruf sealant.

Note: Do not over tighten bolts when resealing deck hardware. The bolts should be tightened until the excess sealant begins to ooze from underneath. Once this occurs, it is recommended that you wait a few hours before tightening the bolts completely. This will give the sealant a chance to cure and form a better bond with the deck.

## *Troubleshooting Hull Leaks*

1. **Keel Bolts:** Leaks at the keel bolts will generally result in more apparent water in the bilge. This occurs when the keel bolts are too loose, or when the sealant around them has broken. The bolts should be bedded and tightened as described in the keel maintenance section.
  2. **Anchor Well:** Check sealant along top edge and add if needed. Check drainage for any leak into the bilge. .
  3. **Thru-Hulls:** A leak at the thru-hulls is generally the result of a worn internal seal or broken sealant between the fiberglass and seavalve base. In this case, you will have to reseal the seavalve to the thru-hull and hull with 3M 5200 as directed in the section on seavalves.
  4. **Water Hoses:** Hose leaks are almost always at their connections. Tighten the hose clamps at either end of the line.
  5. **Hot Water Tank:** Check all hose connections. If the heater itself is leaking then it may be necessary to contact Force 10 (800) 663-8515 or on the web <http://www.force10.com/index.html>
  6. **Engine Coolant:** Refer to the engine manual for advice
  7. **Drainage:** Check bilge pump system for blockage, electrical malfunction, float switch interference.
- Other Sources of Water in the Bilge Area:** Check all water system components: small tank, internal water flow in the mast, and head units.

## **KEEL MAINTENANCE**

Although it does not generally require the same level of upkeep and attention as other parts of the boat, the lead keel on your Sabre SPIRIT should be regularly examined as part of your maintenance routine. Specifically, the keel bolts and nuts should be checked to ensure that water is not "weeping" through into the bilge. If the keel bolts are properly sealed and tightened, the area around them should stay dry. Besides increasing the likelihood of leaks at the keel bolts, inadequate bolt tension will result in the seam between the hull and keel increasing in size over time and will put increased side to side loading on the bolts.

It is possible that a small crack will develop at the keel to hull joint, soon after the boat is manufactured. This is due to the differences in the thermal expansion rates of the two surfaces that meet at this point. The crack is cosmetic in nature, not structural. The keel bolts have been engineered to support the entire weight of the keel. The crack can be filled with waterproof epoxy filler putty as part of the procedure for preparing the bottom to receive anti-fouling paint.

## **REBEDDING KEEL BOLTS**

A leak can be detected by cleaning and drying the bilge area around the bolts, as well as the bolts themselves. Drops of water weeping from the backing plate/washers will indicate a leak. If this occurs, then it may be necessary to rebed the bolt in question. This should be done while the boat is out of the water and its weight resting on the keel.

- 1.) Remove the nut and washer from the leaking keel bolt.
- 2.) Clean the entire old bedding compound from the keel bolt and surrounding area.
- 3.) Make sure the keel bolt and keel bolt hole is dry. An electric hair dryer may prove helpful here.
- 4.) Using coarse sandpaper abrade the hull surface that will be below the washer.
- 5.) Re-bed keel bolt and surrounding area with a polysulfide or urethane caulk such as 3M-5200.
- 6.) Replace the washer and nut, then using a torque wrench tighten to: 1" bolts - 250 foot pounds  
3 / 4 " bolts – 170 foot pounds

## ***ANNUAL RIG INSPECTION CHECKLIST***

The standing rigging on your Sabre SPIRIT should be checked each season for wear. For those of you who store your boats out of the water, the obvious time to check the rig is just before it is stepped at the beginning of each year. For those of you who leave the boat in the water year-round, it will be necessary to come up with a routine by which you will annually go aloft and check for wear. It is recommended that the following areas be checked:

### **MASTHEAD**

- Check all sheaves to see that they turn freely, and that they are held in place.
- Check all welds for cracking.
- Check all pins and pinholes for signs of stress or cracking.
- Check for sharp edges where the halyards exit.
- Check Head stay and backstay ends for cracks.

### **SHROUDS**

- Check clevis pins for signs of wear.
- Check all swages for cracks or discoloring.
- Check cotter pins, and tape any sharp edges.
- Be sure that tang bolt is secure to mast.
- Check shroud tangs for wear.

### **SPREADERS**

- Check to see that spreader bases are secure.
- Remove spreader boots and check for corrosion.
- Check that spreader boots are secured to shrouds with seizing wire.
- Reboot spreader ends.

### **DECK**

- Check gooseneck for signs of fatigue.
- Check shrouds and stays for cracks and/or discoloration.
- Check to see that mast butt is not showing wear, and that it is properly seated.
- Check all turnbuckles and lifeline swages for signs of wear.
- Check to see that all chainplates tight to the deck, and that there are no sealant gaps.

## ***ANNUAL SAFETY MAINTENANCE CHECKLIST***

The following list has been compiled as a guide to check critical safety related components of the boat. It is very important that this maintenance inspection be completed each year to assure the ongoing safety of your boat.

### ***Standing Rigging***

- Check turnbuckles, threads, swages, and pins for corrosion, cracks or wear.
- Check chainplates for hole elongation, bolts, and mount integrity.
- Check mast hardware, including masthead, tangs, and pins for wear and corrosion.
- Check wire for corrosion, wear, and for wire strand failure at the top of the swage.
- Tune rig. Refer to the manual supplied by the mast manufacturer.

### ***Running Rigging***

- Check lines and shackles for wear and splice conditions.
- Check block attachment and condition of sheaves.
- Service winches, check for free operation, and ratchet stop function.
- Check for secure fastening of all cleats.

### ***Deck Hardware***

- Check lifeline integrity, stanchion, and rail attachment to deck.
- Check all chocks, cleats, and other hardware for attachment and soundness.

### ***Steering System***

- Check rudder condition including the shaft.
- Check rudderposts play in bearing tube.
- Check drive wheel attachment.
- Check integrity of cables and chain clamps.
- Check steering wheel shaft lubrication and wheel security.

### ***Thru-Hulls and Seavalves***

- Check seavalve integrity
- Check seavalve attachment to hull
- Check for proper adjustment and lubrication
- Check hose, integrity, attachment, and clamps

## ***Annual Safety Maintenance Checklist (continued)***

### ***Electrical***

- Check battery charge, terminal connections, and electrolyte condition.
- Check breaker panel and switch condition.
- Check terminal for tightness and corrosion.
- Check running light operation.
- Check ground wire attachments to keel, chainplates, mast step, thru-hulls, shaft strut and engine.

### ***Mechanical Systems***

- Check stove fuel system, hoses, clamps, and shut offs.
- Check heating stove, clearances and exhaust pipes (opt).

### ***Engine and Drive Train System***

- Check engine fluid levels and systems for leaks.
- Check throttle action - start and stop controls, cable clamps, and locknut.
- Check shift cable clamps and locknuts.
- Check exhaust system soundness, hose clamps, and water lock canister.
- Check coolant system; hose clamps, intake, and filters.
- Check transmission shift lever action, control linkage, fluid level coupling bolts and alignment.
- Check prop attachment.
- Check engine to sail drive seal and seawater intake filter and clamps.
- Check all engine wire connections.

### ***Keels***

- Check keel bolt nuts for tightness. This must be done on land with weight of the boat resting on the keel. Proper tension is 170 foot pounds for ¾" bolts, 250 foot pounds for the 1" diameter bolts.

### ***Plumbing***

- Check bilge pump function, hose clamps and strainer

## *Winterizing Checklist*

### *Interior*

- Remove all food and other perishables, as well as all cans and bottles containing liquids which might freeze (medicines, soft drinks, and household cleaners...).
- Wash all counter tops and similar surfaces.
- Remove and vacuum all carpets and upholstery. Store in a warm, dry place.
- Drain ice chest. Wipe interior with a dry cloth to remove residual moisture.
- Remove curtains. Dry clean, if necessary.
- Remove all linens, blankets, and pillows from the boat for cleaning.
- Prop open all doors on lockers and in the galley. Leave drawers slightly ajar.

### *Electronics*

- All small items that can be unplugged (razor, blenders, etc.) should be removed from the boat and stored at home.
- Wipe all plugs and connectors with a fine abrasive cloth, and spray contact points with a silicone spray lubricant.
- Inspect all DC terminal blocks to see that none are loose, and that there is no corrosion. All connectors should then be sprayed with a light coat of silicon spray lubricant.
- Remove dry cell or rechargeable batteries from any equipment on board that uses them. Replace with new cells in the spring.
- Remove the radio antennas from the boat and store at home. Clean the contact bolts or screws and coat with a silicone spray lubricant.

### *Water System*

- Wipe dry all plastic surfaces to prevent mildewing.
- Completely drain shower pump to prevent sump pump from freezing.
- Drain hot water tank of fresh water.
- Treat water system with anti-freeze.
- Remove water from head unit.
- Have holding tank pumped and cleaned.

## ***Hull***

- Thoroughly scrub and scrape the hull to wipe away any growth or staining.
- Scrape away any loose paint to facilitate bottom painting in the spring.

## ***Miscellaneous***

- Remove any life preservers from the boat and store in a dry location.
- Remove life raft and other safety equipment for repair and storage.
- Coil and remove all dock lines, and remove anchor line for cleaning.
- Clean bilge and wipe dry of water.
- Electric bilge pump pumped dry and removed for cleaning/servicing.
- Replace shaft zinc, if necessary.
- Winterize engine per manufacturer's instructions.
- Drain fuel filter.
- Fuel tank filled to 90-95% full.
- Check that battery terminals are clean.
- Remove batteries, have them fully charged, and stored in dry, warm place.
- Seavalves cleaned, drained and left open.
- Have stove system depressurized and cleaned.
- Remove stove fuel tank for storage.
- Check that boat is properly covered and ventilated.

## *Pre- Launching Checklist*

*To be completed 30 days prior to launch date.*

- Check to see that all state and federal paperwork and registration for your Sabre SPIRIT is in order, and up-to-date.
- If necessary, paint the bottom, following the instructions in this manual.
- Retrieve life raft from storage, and place on the boat.
- Check to see that all safety equipment (flares, air horns) are not expired, and are on board in accordance with U.S. Coast Guard regulations.
- Retrieve PFD's from storage, and check that they are all intact and appropriate for the passengers you plan to carry.
- Check to see that all anchor line and chain is structurally sound. Replace, if necessary.
- Retrieve and clean carpets, cushions, and curtains.
- Check to see that all marine batteries are holding a proper charge. Replace, if necessary.
- Retrieve antennas and clean contact screws with silicone.
- Replace dock lines, if necessary.
- Check to see that the bilge pump is in working order. Replace, if necessary.
- Retrieve sails and awnings/biminis from sailmaker's
- Check to see that all-running rigging is properly run and is in good condition.
- Grease winches, if necessary.

## **SABRE SPIRIT OWNER'S MANUAL DRAWING LIST**

### Sail Plan

Interior Arrangements Plan View

Fire Extinguisher Locations

### Construction:

Hull to Deck Joint Assembly

Shroud Chainplate Assembly

Keel to Hull Joint Assembly

### Rig:

Mast Collar Block Attachment Locations

Sail Maker's Data Sheet (8)

Deck Running Rigging & Traveler Control Line Detail

### Plumbing:

Potable Water System

Grey Water System

Waste Water / Sewage System

Fuel System Details (perspective)

Tank Locations/Sealvalve Thru-Hull Locations

Bilge Pump Systems

### Mechanical:

Rudder Post and Radial Drive Assembly

Steering /Emergency Tiller System

Shift & Throttle Control System

Propeller

Propane Stove System

Engine Exhaust System

### Electrical:

Wire Number Identification Sheet

D.C. Interior Lighting Plan

D.C. Exterior Lighting Plan

D.C. Battery System

A.C. /D.C. Panel Wiring

AC Outlet Layout

Lightning Protection

### Shipping Details:

On the Road Specs with Travel-Lift Pick Up Locations