Catalina 22

Owner's Manual
and
General Handbook

1987 Edition

FORWARD

Congratulations on the acquisition of your new Catalina 22. All Catalina yachts are designed and built with care using quality materials to assure you years of sailing enjoyment with a minimum of upkeep and maintenance.

Before attempting maintenance or operation of your Catalina 22, please read the Catalina Yachts Limited Warranty booklet and fill out the enclosed warranty registration card.

The registration card enables Catalina to inform you of developments and modifications to enhance the performance or comfort of your yacht. It is also important to be able to contact owners to comply with Coast Guard notification requirements.

The launching and rigging of the Catalina 22 should be handled by experienced boat yard personnel under the direction of your authorized dealer.

The index page lists the contents of this manual. Warrantees and information regarding installed optional equipment have been included when available and applicable.

Maintaining your yacht properly can become a satisfying part of your sailing activities. A regular inspection is the best preventive maintenance. It will help keep your boat safe and in good condition while in use, and insure peace of mind when the boat is left unattended.

Take good care of your boat and take the time to learn and practice good seamanship.

PREFACE

This manual is intended and supplied to help owners of Catalina 22's understand their boats and answer common questions about maintenance and systems design specific to the Catalina 22.

This manual is not intended to provide sailing instructions. It is assumed the operator will consult books written for that purpose, or take sailing lessons or courses to gain the knowledge necessary for the safe operation of the vessel.

The systems descriptions and illustrations in this manual apply to boats built at the time of publication. Our policy of constant improvement necessitates that changes have been made to the Catalina 22 since its introduction. Therefore, these illustrations and descriptions may not apply to boats built before the time of publication.

Owners of earlier hulls, who have questions not answered herein should consult with their local Catalina dealer, or write to Catalina Yachts. Please include your hull number in all correspondence.

The maintenance check lists contained within this manual are intended as guidelines for boats in normal service under typical conditions.

Climate and use will vary and may require additional or special maintenance. Consult with your local boat yard or Catalina dealer for specific maintenance and precautions recommended for your purposes and climate.

INDEX

1.0 Introduction

CAUTION

The aluminum and other metal parts conduct electricity coming in contact with or near an electrical power line or lightning can cause severe injury or death. Stay away from overhead electrical power lines when sailing and/or launching the boat.

BARRIER COAT AND ANTI-FOULING PAINT

It is recommended that the underwater surfaces be covered with a barrier coat to prevent water penetration into the gel coat. Barrier coatings are available from several paint manufactures, and the coating manufacturer's recommendations should be carefully followed for a successful application.

1.1 Reference Data Sheet

_____ State Registration Number	_____ Radio Telephone Call Number
_____ Hull Number	_____ Insurance Company _____ Insurance Policy Number
_____ Outboard Engine Model _____ Outboard Engine Serial Number	_____ _____ Owner's Address

Length Overall	21' - 6"	Beam	7' - 8"
Length Waterline	19' - 4"	Draft	
		Swing Keel Board Up	2' - 0"
		Swing Keel Board Down	5' - 0"
		Fixed Keel	3' - 6"
Ballast		Displacement	
Swing Keel	550 Lbs.	Swing Keel	2250 1bs.
Fixed Keel	800 Lbs	Fixed Keel	2490 Lbs.
Masthead To Waterline	29.1 Ft.	Water Tank Capacity	Portable
Fuel Tank	Capacity For 6 Gallon Portable	Holding Tank	Self Containing Head
Berths	Sleeps (5)	Height On Cradle	8' - 9"
Head Room			
Pop Top Up	5' - 7"		
Pop Top Down	4' - 4"		

_____
Sail Number

2.0 Commissioning Checklist

2.1 Pre-Launch Check

1. ___ Check hoses and clamps.
2. ___ Check all through hull fittings.
3. ___ Barrier coat applied, antifouling paint applied.
4. ___ Hull sides clean, gel coat OK.
5. ___ Decks clean.
6. ___ Teak cleaned and oiled.
7. ___ Interior finished, oiled, clean.
8. ___ Cushions, carpeting, curtains - clean and in place.

9. ___ Table converts to berth OK; dinette, traditional table stows OK.
10. ___ Hatch lids present and fit OK.
11. ___ Lifelines and pulpits rigged and OK.
12. ___ Spreaders taped and drilled at base end; upper shroud wired to tip end, and taped.
13. ___ Standing rigging pinned to mast.
14. ___ Rigging lengths verified with check list in kit.
15. ___ Mast and boom inspected; cotter pins, sheaves, tangs, spreaders OK.
16. ___ Mast lights checked before mast stepped.
17. ___ Check overhead for electrical wires which may interfere with the space required to raise the mast to its full upright position. If there are wires of any kind, anywhere near the boat, do not raise the mast. Move boat to another location, away from any wires. Contact with wire can be fatal.

2.2 In Water Check

2.2.1 Electrical

1. ___ Electrical equipment operational:
   Running, Cabin, Bow, Anchor, Spreaders, Master
2. ___ Shore power outlet OK.
3. ___ Check battery switch #1___ OK, #2___ OK.
4. ___ Check battery fluid level.
5. ___ Check battery terminal for tightness.

2.2.2 Plumbing

1. ___ No leaks at thru hull fittings with seacocks open.
2. ___ Fill all water tanks.
3. ___ Check all water tanks.
4. ___ Test faucet for leaks.
5. ___ Check for leaks at sink drain, sink drains OK.
6. ___ Put water in icebox and check for proper drainage.
7. ___ Check bilge pump operation, handle present.
8. ___ Check head by flushing and pumping.
9. ___ Main hatch no leaks, slides freely; hatch boards fit OK.
10. ___ Cabin windows hose tested for leaks.
11. ___ Anchor locker drain OK, no leaks at bow lights.
12. ___ Stove operates OK; check tank, fuel line, burner.

2.2.3 Rigging And Hardware

1. ___ Mast stepped.
2. ___ Pin, tape and tune standing rigging.
3. ___ Backstay adjuster, whisker pole, spinnaker gear, boom vang.
4. ___ Blocks, cars, cleats rigged, OK.
5. ___ Test all winches, winch handles present.

2.3 Sailing Check List

1. ___ Tiller moves freely, 45 degrees minimum, at each side of center line.
2. ___ Sails and halyards, OK.
3. ___ Boat performance under power and sail, OK.

2.3.1 Final Check

1. ___ All accessory equipment operates, OK.
2. ___ All boat, engine and accessory literature and/or manuals aboard.
3. ___ Warranty cards completed and mailed, owner registration card attached, owner informed of warranty responsibilities.

3.0 Maintenance Guide

3.1 Pre-Use Maintenance

Rigging

1. Inspect turnbuckles - tighten, if necessary.
2. Inspect clevis pins and cotter pins.
3. Visually inspect spreader tips and other areas where sails may chafe during sailing; replace tape as necessary.
4. Halyards free and not tangled.
5. Inspect mast hardware attachment bolts; tighten as required.

Hull And Deck Inspection

1. Tiller moves freely.
2. Bilges and compartments are dry.
3. Thru hull valves, hoses and clamps, OK.
4. Check running lights.

3.2 Monthly Maintenance

Rigging

1. Inspect chain plates, fastenings and bolts; tighten as necessary.
2. Inspect blocks, shackles and cotter pins.
3. Check rigging tune, rigging wire condition.
4. Check turnbuckles and locking pins.

Hull And Deck

1. Check cockpit drains, clear debris.
2. Winches turn freely, lubricate as per manufacturer's recommendations.
3. Clean and oil exterior teak as necessary.
4. Clean and wax gel coat surfaces as necessary.

3.3 Seasonal Maintenance

Rigging

1. Mast head pins and sheaves turn freely.
2. Halyards and nicropress fittings are in good condition and are taped.
3. Spreader tips and bases; mast fittings.
4. All shroud terminations and swaged fittings.
5. Gooseneck assembly and boom assembly.
6. Mast, boom and spreaders cleaned and waxed.

Hull, Deck And Cabin

1. All chainplates and thru bolts tight.
2. Disassemble winches and lubricate bearings and pawls.
3. Coat electrical system, battery tie downs and terminal connectors to prevent corrosion.
4. Drain and flush fresh water system.
5. Hatch gaskets and hold down dogs.
6. Bottom, keel and rudder condition.
7. Lifelines, stanchions and pelican hooks.

3.4 Fiberglass Maintenance And Repair

One of the major benefits of a fiberglass boat is the elimination of maintenance chores required by other materials. You have only three relatively easy maintenance rules to follow to keep your boat looking like new:

1. Each year, clean, buff and wax the exterior of the boat.
2. Touch up and patch scratches, scars and small breaks.
3. Repair any major breaks as soon as possible to avoid additional damage to the hull of decks.

Most fiberglass boats are manufactured of two "layers" of material, permanently bonded together by a chemical reaction. The outside surface is formed by a colored gel coat. This is a special resin material containing concentrated color. It provides a smooth, finished surface.

The second "layer" is made up of polyester resin reinforced with laminations of fiberglass mat, cloth or woven roving. Both the gel coat and polyester resin are "cured" by a chemical catalyst which causes them to form a hard, strong mass that is highly resistant to impact and, damage.

After sailing, a good hosing down with fresh water and a mild detergent will keep your boat sparkling fresh and clean. The non-skid surfaces may need to be scrubbed with detergent. Smooth glass areas may be polished with liquid wax or any good fiberglass wax to add extra luster. In the case of older boats, where some fading of the gel coat has occurred, the surface should be buffed with polishing compound and then wax finished.

When buffing the boat to restore its finish, care should be taken not to cut through the gel coat surface. This is especially true on corners and edges of the hull. A power buffer may be used, or the work may be done by hand, using a lightly abrasive rubbing compound such as Mirror Glaze No. 1 for power buffers, or Dupont No. 7 for hand buffing. Any high quality paste wax may be used after buffing.

3.4.1 Fiberglass Touch-Up And Repairs

Scratches, Shallow Nicks, Gouges, Small Holes
(That do not penetrate through the hull)

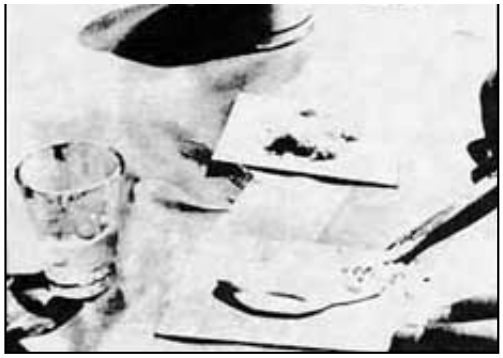
These repairs are easy because only the surface of the boat is damaged. They fall into two categories: (1) damage to the gel coat colored outer surface, and (2) holes or gouges that are deep enough to penetrate the fiberglass reinforced area of the boat. The repair operations are similar.

For damage to the gel coat surface, you will need a small can of gel coat, of the same color as your boat, and a small amount of catalyst. For deeper holes or gouges (1/8" or more) you will also need some short strands of fiberglass which can be trimmed from fiberglass mat or purchased in the form of "milled fibers." These materials can be purchased from your dealer.

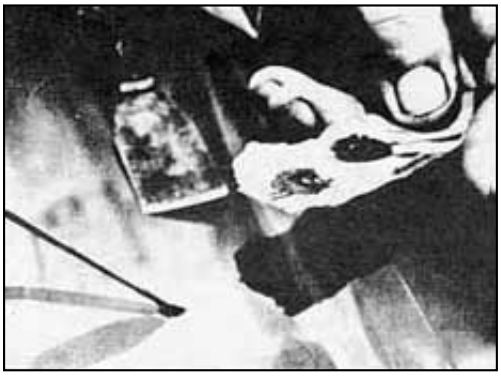
1. Be sure the area around the damage is wiped clean and dry. Remove any wax or oil from the inside of the hole or scratch.
2. Using a power drill with a burr attachment, roughen the bottom and sides of the damaged area and feather the edge surrounding the scratch or gouge. Do not "undercut" this edge. (If the scratch or hole is shallow and penetrates only the color gel coat, skip to step No. 8.).

3. Into a jar lid or on a piece of cardboard, pour a small amount of gel coat ... just enough to fill the area being worked on. Mix an equal amount of milled fibers with

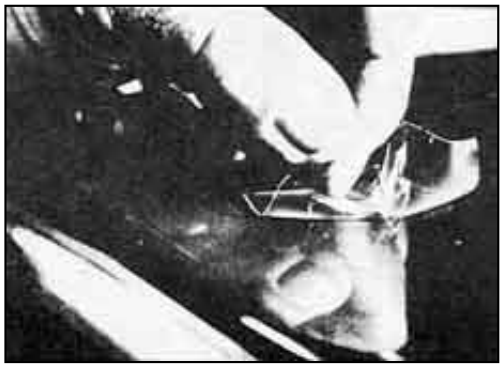
this gel coat, using a putty knife or small flat stick. Then add two drops of catalyst, using an eyedropper for accurate measurement. For a half-dollar-size pile of gel coat, this amount of catalyst will give you 15 to 20 minutes working time before it begins to "gel". Carefully cut the catalyst into the gel coat and mix thoroughly.



4. Work this mixture of gel coat, fibers and catalyst into the damaged area, using the sharp point of a putty knife or knife blade to press it into the bottom of the hole and to puncture any air bubbles which may occur. Fill the scratch or hole above the surrounding undamaged area about 1/16".



5. Lay a piece of cellophane or waxed paper over the repair to cutoff the air and start the "cure."



6. After 10 or 15 minutes the patch will be partially cured. When it feels rubbery to the touch, remove the cellophane and trim flush with the surface, using a sharp razor blade or knife. Replace the cellophane and allow to cure completely (30 minutes to an hour). The patch will shrink slightly below the surface as it cures.

7. Again use the electric drill with burr attachment to rough up the bottom and edges of the hole. Feather hole into surrounding gel coat, do not undercut.
8. Pour out a small amount of gel coat into a jar led or on cardboard. Add a drop or two of catalyst and mix thoroughly, using a cutting motion rather than stirring. Use no fibers.
9. Using your finger tip or the tip of a putty knife, fill the hole about 1/16" above the surrounding surface with the gel coat mixture.

10. Lay a piece of cellophane over the patch to start the curing process. Repeat step 6, trimming patch when partially cured.

11. Immediately after trimming, place another small amount of gel coat on one edge of the patch and cover with cellophane. Then, using a rubber squeegee or back of the razor blade, squeegee level with area surrounding the patch. Leave cellophane on patch for 1 to 2 hours, or overnight, for a complete cure.

12. Using a sanding block, sand the patched area with 600 grit WET sandpaper. Finish by rubbing or buffing with a fine rubbing compound. Some slight color difference may be observed. Weathering will blend touch-up, if properly applied.

3.5 Barrier Coat And Anti-Fouling Paint

It is recommended that the underwater surfaces be covered with a barrier coat to prevent water penetration into the gel coat. Barrier coatings are available from several paint manufacturers, and the coating manufacturer's recommendations should be carefully followed for a successful application.

For those owners who apply anti-fouling paint themselves, it should be noted that most brands require all underwater fiberglass surfaces to be very carefully sanded and primed immediately prior to the first application on a new boat. In any event, the instructions of the manufacturer of the paint used should be followed.

Anti-fouling paint should be applied to the bottom of your Catalina 22, if it is to be moored in either fresh or salt water for any length of time. There are many brands available. Anti-fouling paint prevents the growth of algae, barnacles and other fouling organisms on underwater surfaces. Before applying bottom paint, the bottom should be thoroughly cleaned with a solvent to remove any wax.

3.6 Teak Maintenance

Wood Trim And Parts

Most exterior wood is teak, and may be kept looking good by regular oiling with teak oil.

Should the teak become weathered, cleaning and bleaching with a commercially available teak cleaner and bleach will restore the color of the wood; then, oil of the wood with a good grade teak oil to restore the golden color of the teak should be applied. Do not

use wire or hard bristle brushes on the wood, as this will remove the softer wood between the annual rings, and leave a rough surface.

3.7 Spar Maintenance

Your boat is equipped with stainless steel standing rigging, and stainless, dacron running rigging to give you years of trouble-free service. However, due to normal wear and tear, it is recommended that a periodic inspection be made on all fittings and wire. Turnbuckles should never be neglected; they should be unscrewed from time to time in order that they do not seize ... every three months should be about right for the average sailor. A slightly bent turnbuckle shaft, or broken wire in your shrouds should be replaced immediately. As a rule of thumb, stainless steel standing rigging should be replaced after five (5) years of service.

Fittings

Marine fittings today need little maintenance. Deck hardware should be hosed down with fresh water after each sail in salt water. Stainless steel fittings such as pulpits and lifeline stanchions should be cleaned and waxed periodically to maintain their appearance. Winches require occasional cleaning and lubrication. Where possible, a maintenance brochure for your winches has been included in this manual. Mast head fittings, halyard sheaves, etc., should be inspected, cleaned and lubricated periodically. Keep your equipment clean of dirt and salt.

Spars

Like all other boat fittings, mast and booms suffer from salt water, air and spray. These should be kept waxed, where possible and, at least, always hosed down with fresh water. Always see that the halyards are tied off, away from the mast. This will eliminate slapping in the wind and subsequent marking of the mast. Keep tack pin (located on front of boom) well lubricated, as without proper lubrication-the stainless steel pin may become seized in the aluminum gooseneck casting.

Find a high pressure nozzle and shoot fresh water to the top of the mast and spreaders. This will help keep your sails clean, too, as they rub on the mast and spreaders.

Inspect spreaders and spreader brackets for signs of fatigue. See that ends of spreaders are wired and well covered with tape to prevent wear on the sails.

3.8 Sail Maintenance

Sails should never be put away wet. If they are wet after sailing, leave them in loose bundles and dry them at your first opportunity.

For most problems such as common dirt, dried or caked salt, etc., try scrubbing the surface with a soft bristled brush and liquid detergent. Avoid harsh powder detergents and stiff brushes, as they may damage the finish or stitching. This approach should work nicely for most applications. More severe stains can be taken care of by the following:

*IMPORTANT: For white sails only.

Blood: Soak the stained portion for 10-20 minutes in a solution of bleach (Clorox) and warm water; generally 10 parts water to 1 part bleach. Scrub and repeat, if necessary. Rinse thoroughly - particularly nylon - and dry completely.

Oil, Grease, Tar and Wax: Warm water, soap and elbow grease seem to be effective. On hard stains, Propriety Stain Remover and dry cleaning fluids should do the trick. Be careful to remove all fluids, as they can soften the various resinated coatings on sailcloth.

Rust and Metallic Stains: These types of stains are very often the most frustrating and difficult to remove. First, scrub with soap and water, then apply acetone, M.E.K., or alcohol. As a last resort, you might try a diluted mixture (5%) of oxalic acid soaked for 15-20 minutes. Hydrochloric acid, 2 parts to 100 in warm water, will also work.

Mildew: Hot, soapy water with a little bleach will generally prevail. After scrubbing, leave the solution on the fabric for a few minutes and rinse thoroughly. When using a bleach, a residual chlorine smell may be present after rinsing. A 1% solution of Thiosulphate (photographer's hypo) should remove all chlorine traces. Here, again, rinse and dry well.

Paint and Varnish: Acetone and M.E.K. should remove most common paint and stains. In most cases, varnish can be removed with alcohol.

Temperkote or mylar sails are still new and experimental. At this point in time, avoid most solvents, as they may damage the fabric over a period of time. Soap and diluted bleaches should take care of most stains.

Generally speaking, use all solvents with care. Always rinse and dry thoroughly. It should be emphasized that nylon ripstop spinnaker fabrics are less durable and more sensitive than their polyester counterparts. Bleaches and solvents can ruin nylon if not used properly.

Follow the above guidelines, take your sails into your sailmaker for periodical inspection and, I am sure, you will have many effective seasons of racing and cruising pleasure.

3.9 Interior Cushions, Fabric Covers

Cleaning Instructions

1. Regular vacuum cleaning or brushing in the direction of the pile with a soft brush.
2. Stains should, if possible, be removed at once with a damp cloth. Do not allow stains to harden and age.
3. Greasy stains can be removed with ordinary cleaning fluid.
4. For overall cleaning, use commercial types of upholstery shampoo, using only the foam to protect the back padding from moisture. After a minute or so, remove foam and, when dry, vacuum or brush in the direction of the pile.
5. Do not use heat such as an iron or steam.

3.9.1 Curtains

When curtains become soiled, DO NOT hand or machine wash, for it will weaken the material. Dry cleaning is the recommended procedure for the removal of any dirt or stains.

4.0 Yacht Systems

4.1 Rigging

4.1.1 Stepping The Mast

CAUTION: The aluminum and other metal parts conduct electricity coming in contact with or near an electrical power line or lightning can cause severe injury or death. Stay away from overhead electrical power lines when sailing and/or launching the boat.

When trailering your boat, always try to undo as little rigging as possible. It is necessary only to undo the two forward lower shrouds and the forestay before lowering the mast.

1. Before raising mast, make sure halyards are neatly tied down and that they are on proper sides of the spreaders. You should never attempt to raise the mast unless the upper shrouds (those that pass over the spreaders and the aft lower shrouds are attached to the deck fittings and the turnbuckles well "started" into their barrels. The turnbuckles must not be completely tightened, however, because slack is needed in the shrouds to enable the mast to be fully raised. The backstay should be attached to the transom chainplate. The upper shrouds, aft lower shrouds, and backstay will keep the mast from falling over when it's raised, therefore, all of these must be attached to the chainplates before the mast is raised.
2. Make sure that the shrouds and stays are not fouled. Backstay should lie clear of the transom. You may step the mast on land or while the boat is in the water. It seems to be easier on land because the boat is more stable. Also, it keeps other sailors from getting impatient while they wait for you to move out of the launch area.
3. Walk the mast aft and drop the mast foot into the mast step located on top of the deck, keeping the mast in center line of boat, insert the pivot bolt and locking nut.
4. One crew member should pull on a line tied securely to the forestay while another pushes up on the mast and walks from the cockpit forward. With the mast erect, attach the forestay and forward lower shrouds.

4.1.2 Tuning The Mast

Your mast is held aloft by the standing rigging (forestay, backstay, upper shrouds, fore and aft, lower shrouds). The term "tuning" refers to adjustment of the standing rigging so that the mast remains "in column" (not bent) when under load. This is accomplished by following the procedure outlined below:

At The Dock

1. Adjust forestay and backstay so that the mast is straight up and down. Tie a bolt to a 6 to 7 foot long piece of light line to make a quick plumb bob, and tape the free end of the line to the front of the mast as high up as you can reach. This device will help you to determine whether the mast is perpendicular or not. Otherwise, sight your mast with a corner of a building.
2. Adjust upper shrouds so that the mast is straight up and down athwartships. That is, from side to side as opposed to bow and stern.
3. The upper shrouds should be firm but not far apart. A 50 pound push should deflect the upper shroud about 1" at shoulder height.
4. The lower shrouds (4 of them) should be adjusted so that they are looser than the upper shrouds. While at dock, they should have no slack, but no tension either. No lower shrouds, when pushed, should deflect the mast more than any other shroud when pushed equally hard. If this can't be achieved, the upper shrouds are too tight. Back off one-half turn at a time on the upper shroud turnbuckles until the tension of the lower shrouds is brought into balance.

4.1.3 Setting Up The Boom

1. Slide the gooseneck fitting into the slot in mast and let it fall to rest on the mast stop screw or downhaul cleat, whichever the case may be.
2. Attach downhaul line to hole in gooseneck slide. Do not cleat at this stage.
3. Attach block to the boom.
4. Shackle mainsheet cam-cleat block to the traveller bar which is located on the transom or across the middle of the cockpit, depending on the model. Some models do not have traveller bars and the mainsheet block will attach at the center of the boom and to a barney-post or pad-eye arrangement on the floor of the cockpit in the center of the boat.
5. "Dead-end" tie the mainsheet line to the mainsheet camcleat block and "reeve" the mainsheet by alternatingly passing the line through the fiddle block pulleys and the camcleat block pulleys and tie knot at end of mainsheet "figure eight" to keep from losing end of mainsheet while under sail. You dealer can demonstrate this procedure.

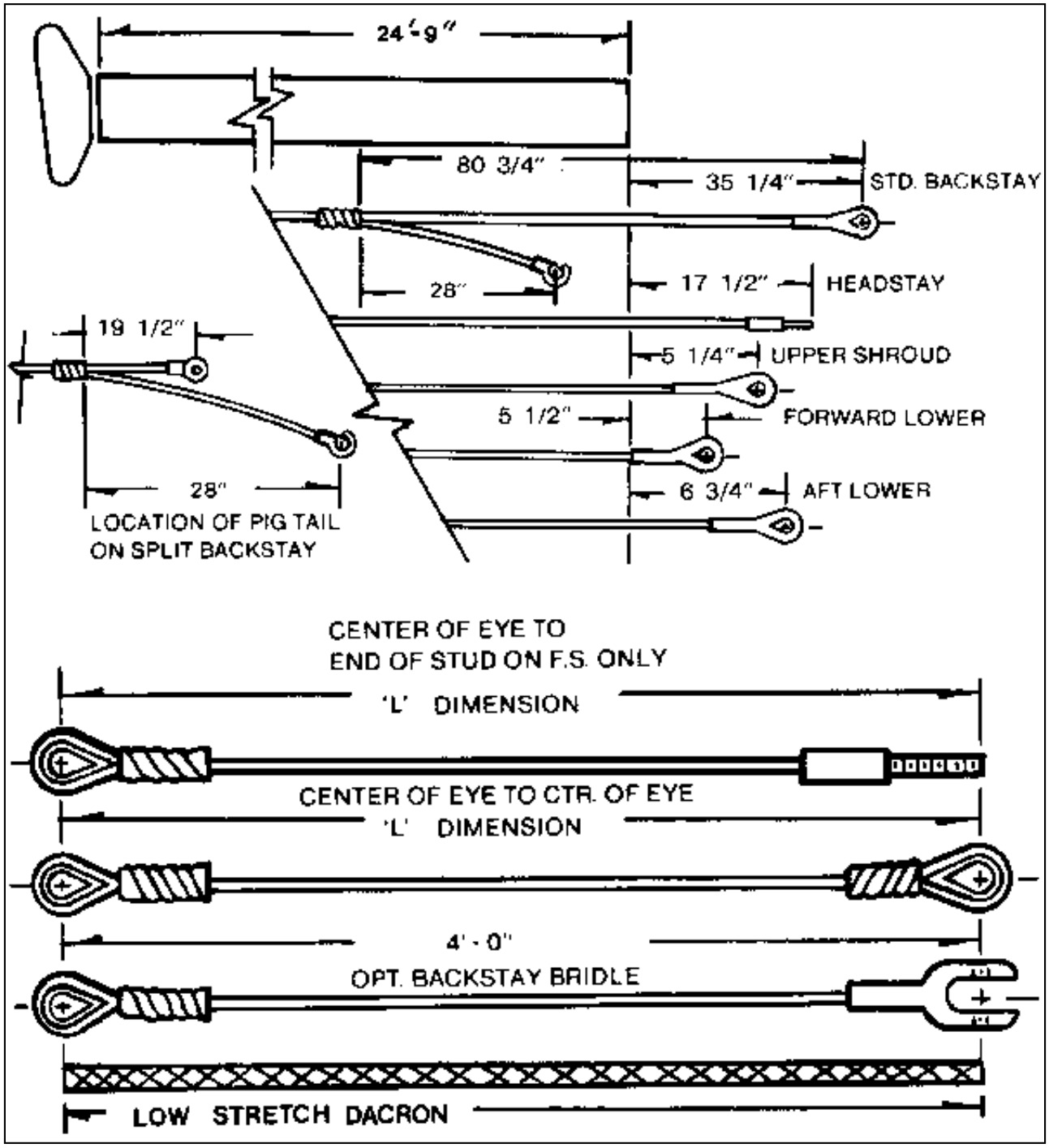
4.1.4 Bending On The Mainsail

1. Feed the clew of the mainsail into the groove on the boom starting at gooseneck fitting and pulling out to end of boom. This is much easier if done by two persons, one feeding, the other pulling out.
2. Insert tack pin at the gooseneck fitting, passing the pin through the sail's grommet. Pull the sail foot out to remove wrinkles and tie the line to the clew (aft end) of the sail, run the line thru the fitting at the end of the boom and fasten it to the cleat on the port side of the boom.
3. Insert battens.
4. Shackle headboard to end of wire halyard. Look aloft to ensure that halyard is not fouled.
5. Start headboard into mast groove and take slight hoist on main halyard. Sail is now ready for hoisting.

4.1.5 Bending On The Jibsail (If Required)

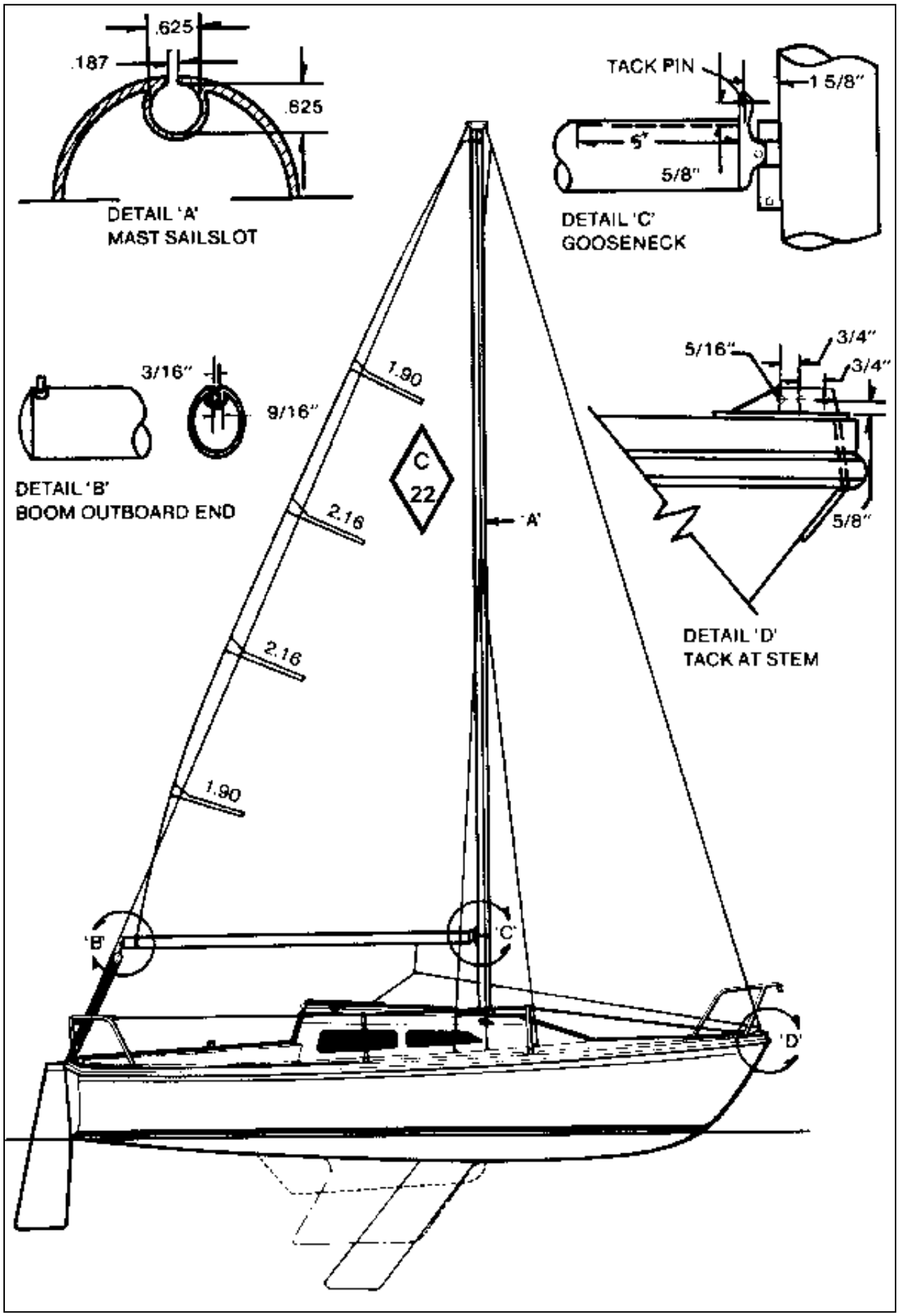
1. Find tack of sail - this is the forward lower corner of jib.
2. Connect jib to forestay by starting at the bottom snap and working up to the top snap in sequence.
3. Shackle head of jib to wire halyard, again sighting aloft to ensure that halyard is running clear.
4. Find middle of jib sheet line and attach the jib sheet lines to the clew of the jib sail. Run the jib sheet lines back to the cockpit keeping them outside of all shrouds and life lines, if your boat is equipped with lifelines. Pass the ends of the jibsheets through the jib fairlead blocks which have been previously attached to the tracks which are located on the gunwale (railing) of the boat. Tie figure-eight stopping knots in the ends of the jib sheets to keep them from falling overboard.
5. Boats equipped with the factory supplied roller furling gear for the jib, should read all instructions supplied with the furling gear, before operating the furling unit.

4.1.6 Rigging Wire Length Check List

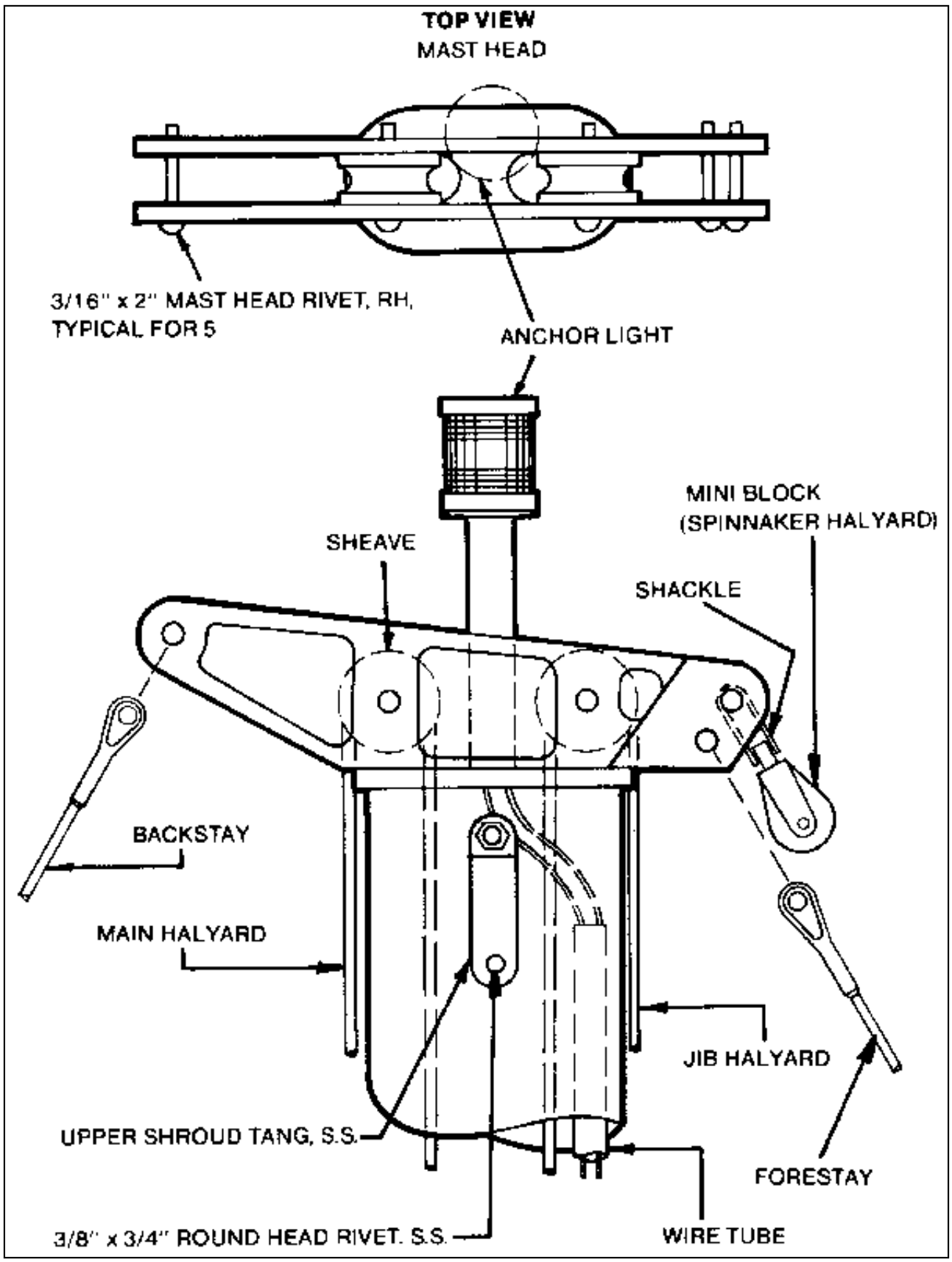


SPLIT BACKSTAY (OPT.)	24' - 1 3/4"	1/8" 1 x 19	1
BACKSTAY BRIDLE	4' - 0"	1/8" 1 x 19	2
BACKSTAY STANDARD	28' - 2 1/4"	1/8" 1 x 19	1
FORESTAY	26' - 5 1/2"	1/8" 1 x 19	1
UPPER SHROUD	25' -3"	1/8" 1 x 19	2
FORWARD LOWER	12' - 10 1/4"	1/8" 1 x 19	2
AFT LOWER	12' - 11 3/4"	1/8" 1 x 19	2
MAIN HALYARD	60' - 0"	5/16" L.S. DACRON	1
JIB HALYARD	63' - 0"	5/16 " L.S. DACRON	1

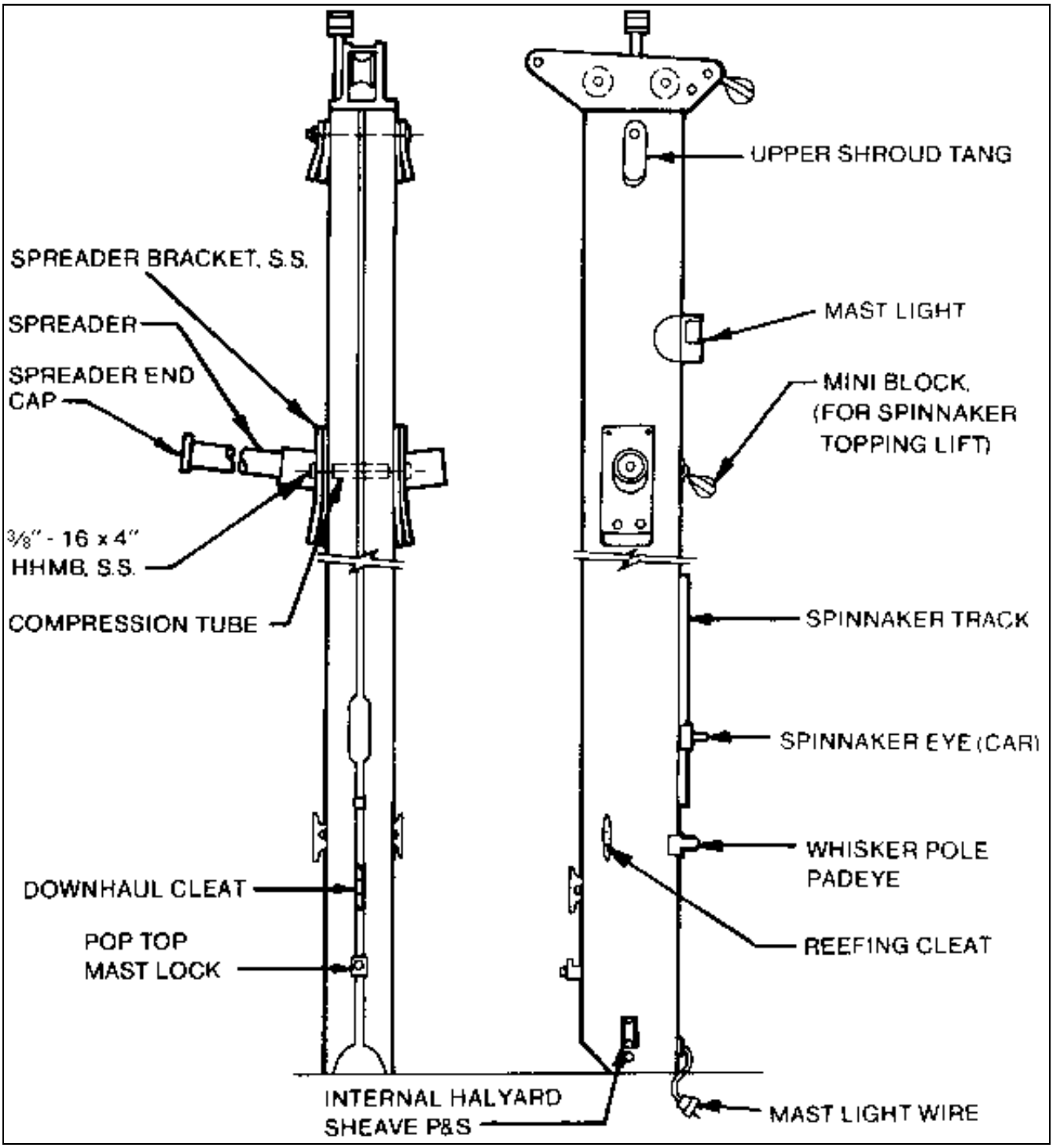
4.1.7 Sail Plan Illustration



4.1.8 Mast Head Illustration



4.1.9 Mast Illustration



4.1.10 Main Sail Reefing

Reefing should always be done before it becomes necessary. Some sailors use the rule of thumb that, if the thought of reefing occurs to you, it is time to reef. Sailing at extreme angles of heel -- 25 degrees or more -- is not efficient, fast or comfortable.

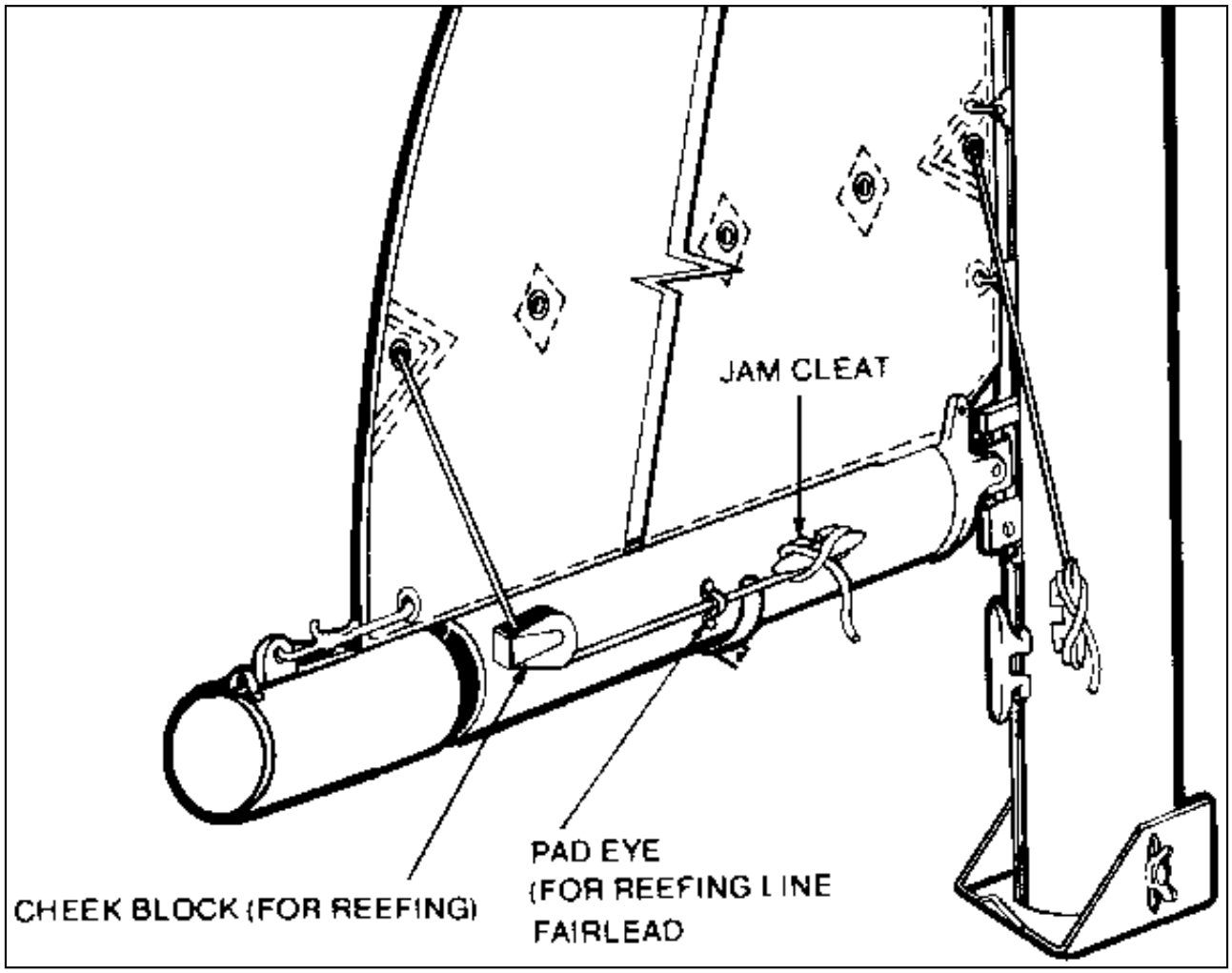
The Catalina 22 may be equipped with jiffy reefing (also called slab reefing) for reefing the main sail. The system consists of reefing blocks mounted on the starboard, outboard end of the boom. A cleat is located on the mast below the gooseneck, for reefing the luff of the main.

Run the reefing lines provided through the cringles (grommets) in the luff and leech of the main sail in preparation for reefing. Per illustration, one crew stationed in the cockpit and one crew at the mast are recommended for fast, safe reefing.

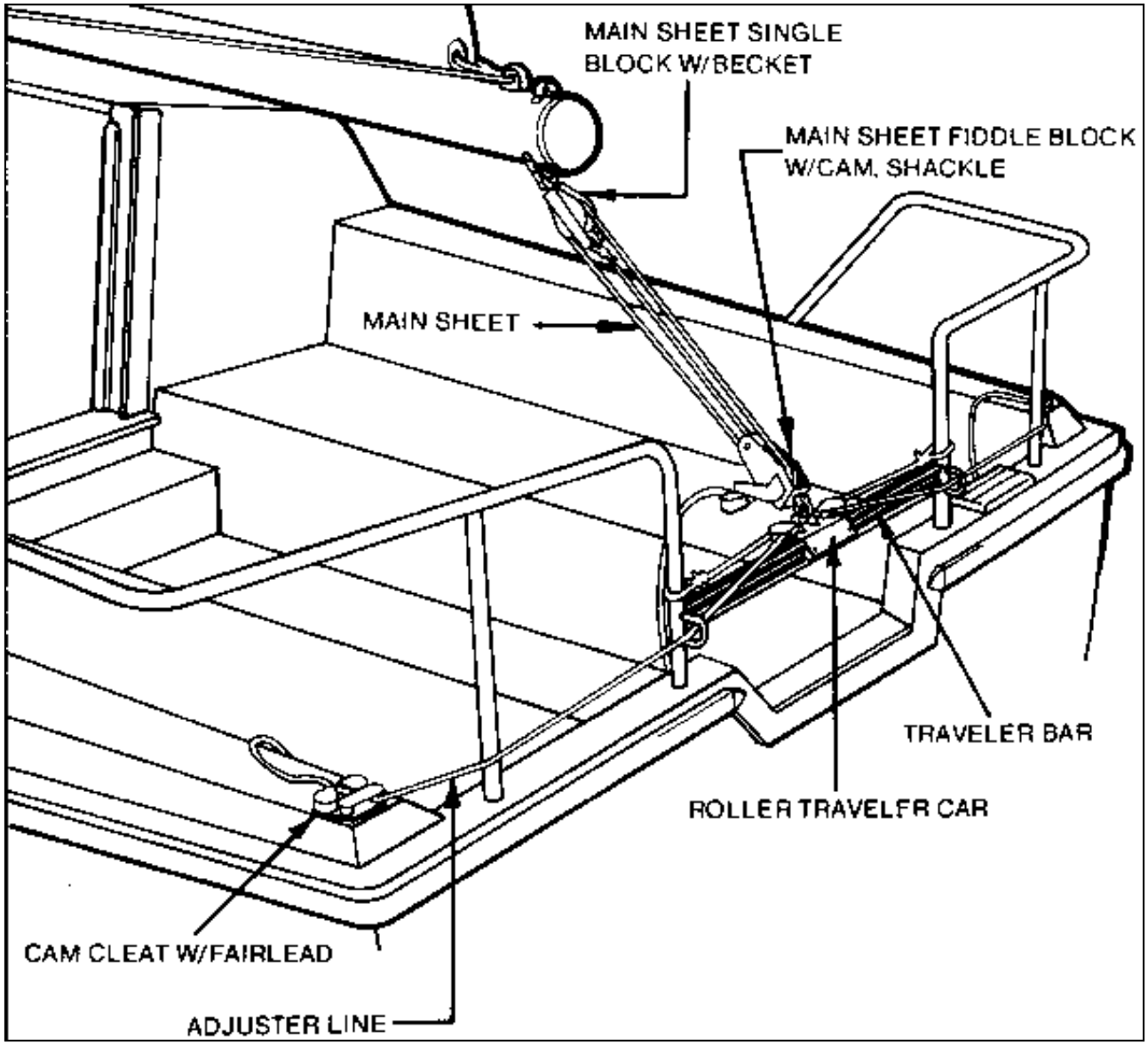
Reefing Procedure

1. Take up slack in main boom topping lift, cleated to port side of boom.
2. Release the main halyards to a predetermined point. Marking the halyard with ink or a colored thread woven into the line is helpful. Re-cleat the halyard after lowering.
3. Pull the luff cringle down to the gooseneck by pulling the luff reefing line through the cleat on either side of the mast. By pulling the line up through the cleat, a 2:1 purchase is created on the luff. Tie off the luff reefing line when the cringle meets the gooseneck.
4. Ease the mainsheet.
5. Pull the leech cringle down to the boom by pulling the leach reefing line on the starboard side of the boom, and make the line fast.
6. Trim in the mainsheet.
7. Snug up the main halyard, as required, to flatten out the main sail.

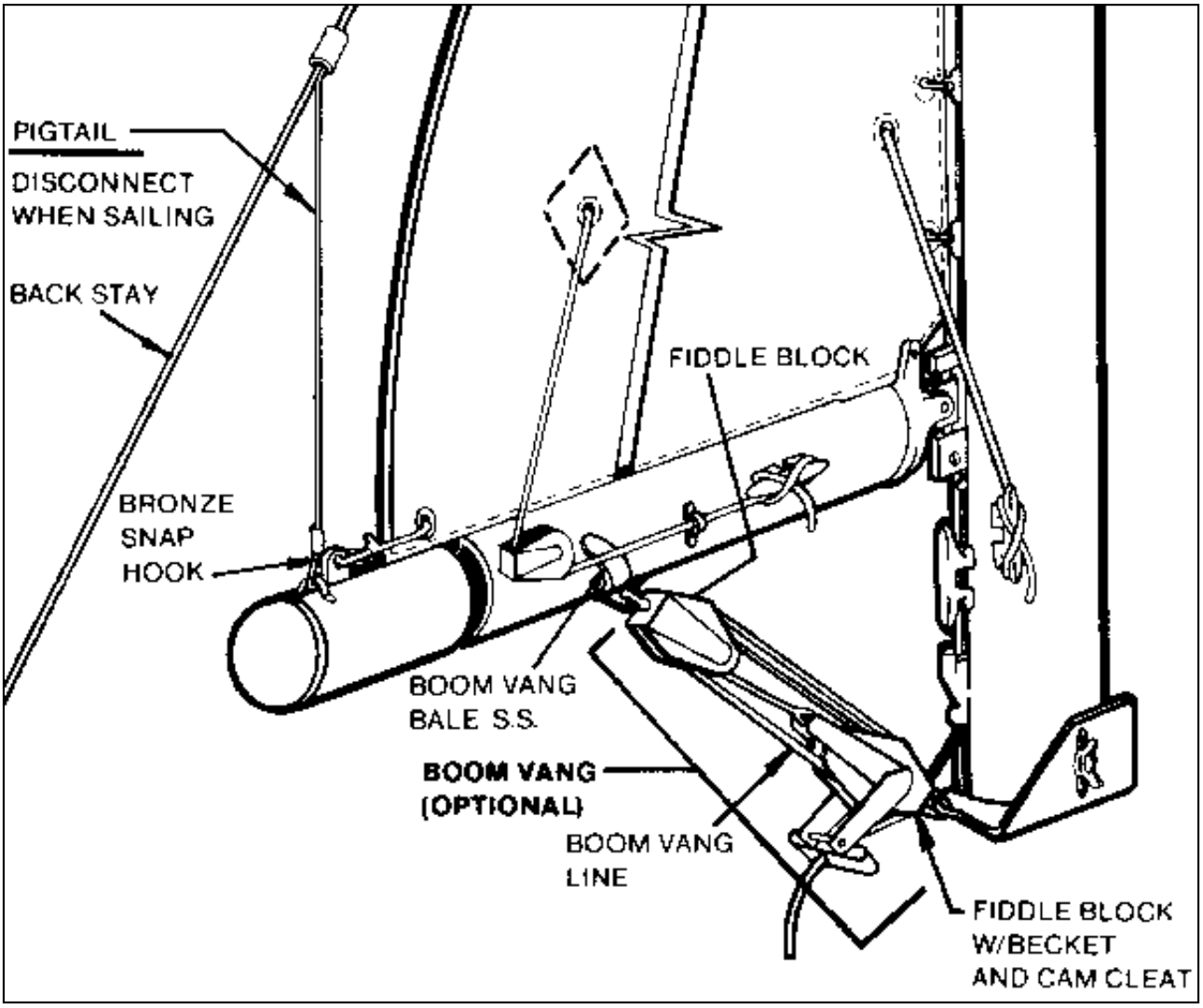
4.1.11 Main Sail Reefing Illustration



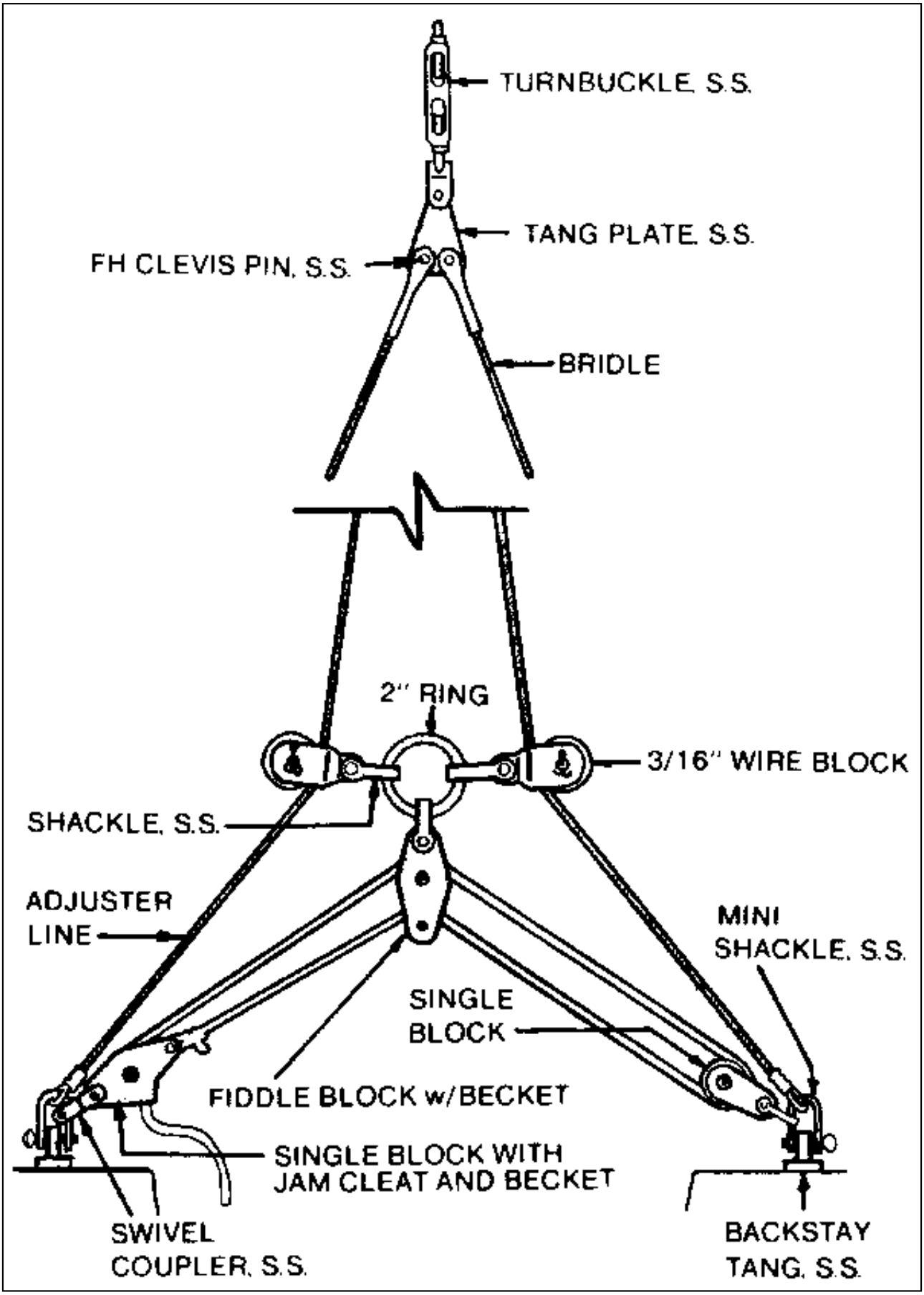
4.1.12 Mainsheet/Traveler Illustration



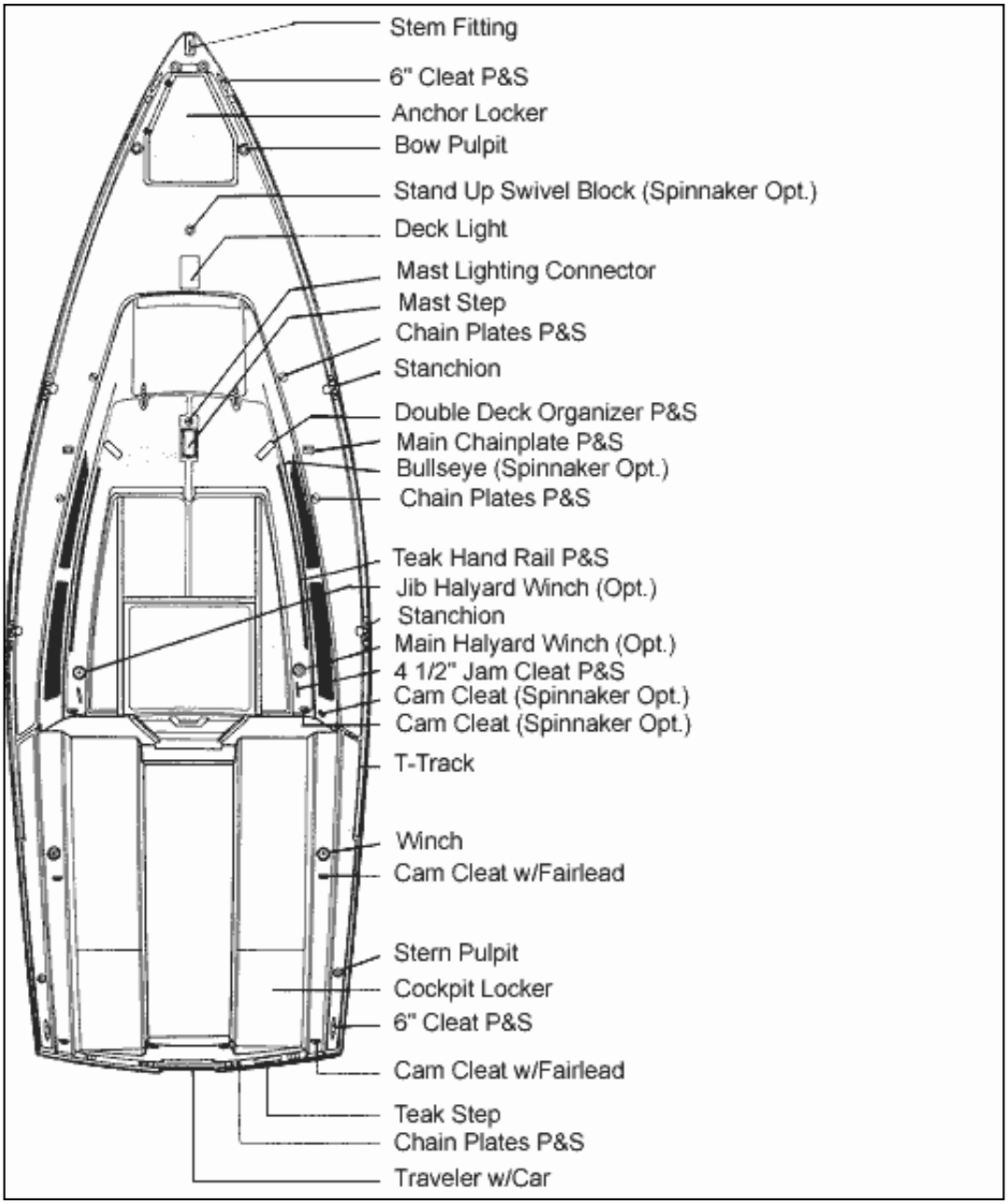
4.1.13 Boom Vang/Pigtail Illustration



4.1.14 Backstay Tension-Adjuster System



4.1.15 Deck Plan Illustration



4.2 Sailing And Docking Tips

4.2.1 Hoisting And Setting Sails

1. Always attempt to have your best head to the wind when hoisting sails, even if this entails moving to another spot after launching.

   If your boat has an outboard, motoring slowly dead to windward while hoisting sail is good seamanship. Raise the sails and secure the halyards so that the leading edges of the two sails are smooth and wrinkle or "scallop" free.
2. If leaving the dock under sail, always leave by pushing off with enough FORWARD momentum to allow you to steer and in such a direction that sails will fill immediately after pushing off. Often bystanders will try to help you shove off and then merely shove your boat sideways. This will not allow your sails to fill and soon you will be drifting backwards out of control. While underway, move the jib fairlead block along its track on the gunwale (railing) of the boat so that neither the foot or leech (trailing edge) of the sail flutters appreciably. Moving the jib block forward a few inches pulls down on the leech of the sail. Moving the jib block back or aft a few inches pulls the foot of the sail tighter and flatter. An experienced sailing friend can help you find the most efficient setting.
3. If your boat was ordered without a boom vang, be sure you always pull in the excess mainsheet line when you execute a downwind "jibe". Otherwise, the boom can raise up in the air and catch on the backstay, if your boat is so equipped. If this inadvertently happens, reach up and jerk the boom free immediately and let it go.

4.2.2 Docking Under Various Conditions

1. There are many docking methods depending upon the wind velocity and dock position relative to the wind direction. You should get advice from experienced local sailors and watch how they dock their boats under varying wind conditions.
2. Always arrange to come into a dock such that the boat can be easily stopped when you get there.
    1. Either under power, in neutral, with no sails up.
    2. Going slowly with only the jib up, which can be made to luff by releasing the jib sheet.
    3. Coasting downwind with bare poles onto a downwind dock.
    4. Or such that both sails can be luffed completely when your boat finally comes to rest beside the dock. "Luffing" means that the sails are shaking harmlessly in the wind and not driving the boat. If you are underway with both main and jib sails raised, always come into a dock headed directly into the wind and with both sails luffing. Otherwise you will ram the dock or your crew may get hurt trying to stop the boat. Always plan it so that the boat will almost coast to a standstill when you reach the dock. If you must come into a leeward or downwind dock, either motoring, bare pole coasting, or using JUST A LUFFING JIB will get you in safely.
3. Remind your crew to make sure both his feet are clear before he steps onto the dock and stops the boat by pushing on its gunwales or "railing". He should have ample bow line in his hand when stepping off. Ask him to "stop" the boat and keep it from banging against the dock.
4. Practice docking with an experienced sailing friend before you take beginners out in your boat who will not yet understand how to help you dock the boat.

4.2.3 Points Of Sail

1. While underway, you will always be on one of the following "points of sail":

    Beating: The sails are hauled in close and the boat heels as you sail into (across) the wind at about 45ºto the direction of its source.

    Reaching: The sails are let out about halfway with the boat heeling less than on a beat. You are now sailing across the wind; REACHING is broken down into close, beam, and broad reaching.

    Running: The sails are let out all the way with boom nearly touching the after shrouds. The jib is often pulled over on the side opposite the side the boom is over in a condition called "wing and wing." The boat sails upright with little or no heeling.
2. You can execute two kinds of turns:

    Tacking by Coming About: You turn the boat through the "eye of the wind." The sails luff or flap briefly, then fill on the opposite side of the boat.

    Tacking by A Jibe: You turn away from the source of the wind, the boom is hauled in rapidly, the main sail flips across to the other side and the main sheet is quickly paid out again. (Not to be attempted in strong winds without the risk of damaging the rigging.)
3. In general, in light wind let the sails out to get more forward drive and less side slipping. In heavy winds, let out the main sail and spill the wind so that the boat does not heel over excessively. Always ease off the main sail to prevent heeling. The jib must be sheeted in to keep the boat moving. In the event there is too much wind, stay off the water. If you are caught in too much wind, reduce sail area by reefing or taking down the mainsail and jibsail and motoring.

The key to good sailing in various wind conditions is "balance." The main sail can be eased off to adjust the boat's balance. You should never have to push or pull the steering tiller to great extremes in order to keep the boat going straight ahead. You are not balancing the wind pressure on the two sails if this is the case. Ask questions of more experienced sailors and find out how to keep the boat in balance under different kinds of sea and wind conditions. Better yet, enroll in a sailing class, or refer to **Chapman's Piloting, Seamanship and Small Boathandling** for a complete list of rules. Become familiar with the rules for safe operation of your boat before you leave the dock.

4.2.4 Rules Of The Road (Partial List)

Some specific basics from he Rules of the Road which will help to introduce you to them. This is just a very partial list and you should investigate the rules as soon as possible.

1. When two sailing vessels approach each other having the wind on opposite sides, the one with the wind from the port side shall avoid the other (starboard tack is privileged). Avoidance maneuvers should be made as soon as possible.

2. When both have the wind from the same side, the windward boat will avoid the other.
3. When overtaking another (including a power craft), the overtaking vessel must keep clear.
4. In all situations IN OPEN WATER, sailing craft are privileged over power craft except when overtaking, or unless the power craft is military or commercial. Common sense dictates that you keep clear of large ships of all types.
5. In no situation in restricted waters shall a sail boat embarrass a large ship.

4.3 Electrical

4.3.1 Batteries

Your electrical system is powered by a marine grade 12 volt, deep cycle 90 AMP hour battery. Attention should be given to maintaining the proper level of distilled water. Do not overfill. The batteries are located in the port cockpit locker.

The batteries are provided with a tie-down to prevent tipping over at extreme angles of heel. Be sure these tie-downs are fastened securely.

With proper care, the battery installed in your Catalina 22 will provide long and satisfactory service. Proper care is not difficult, if a few basic points are kept in mind:

WARNING!

> The electrolyte in a battery is a solution of sulfuric acid. If any should enter the eyes, rinse immediately with large amounts of fresh water and seek medical attention. Electrolyte spilled on skin should be rinsed well with fresh water, also. Even a small amount of electrolyte spilled on clothing will destroy the clothing.

Electrolyte Level

The electrolyte level in a battery should never be allowed to fall low enough to expose the plates. This not only results in a loss of battery capacity while the battery is low, but will cause hardening of the active material on the battery plates. This will result in a permanent loss of battery capacity.

CAUTION!

> Use only pure distilled water to replenish electrolyte levels. The water from many city water supply systems is unsatisfactory for battery use.

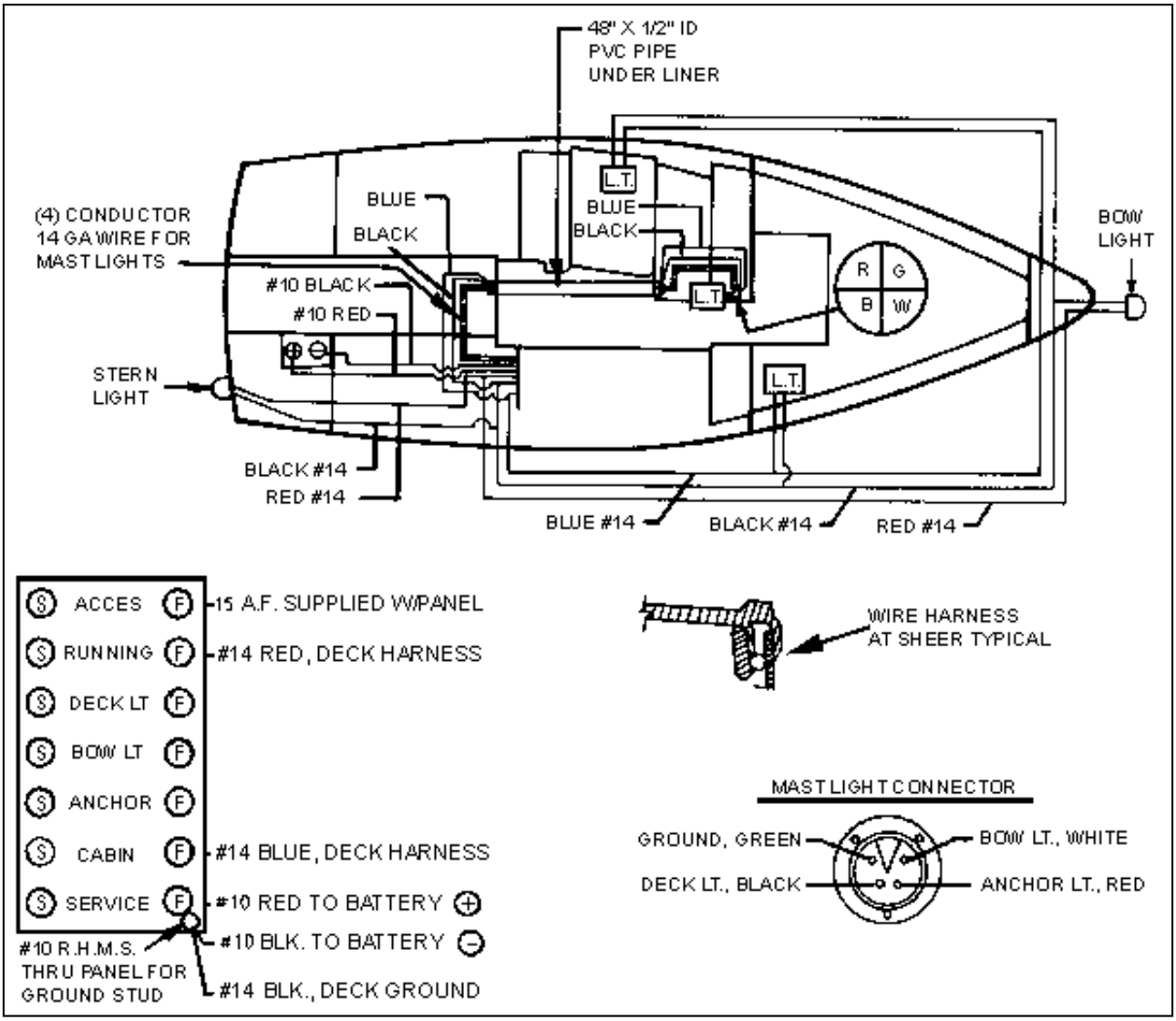
Discharged State

Leaving a battery in a discharged state for any length of time can also result in a permanent loss of capacity for the battery. Doing so, in cold weather, can destroy the battery, since it will freeze at relatively low temperatures.

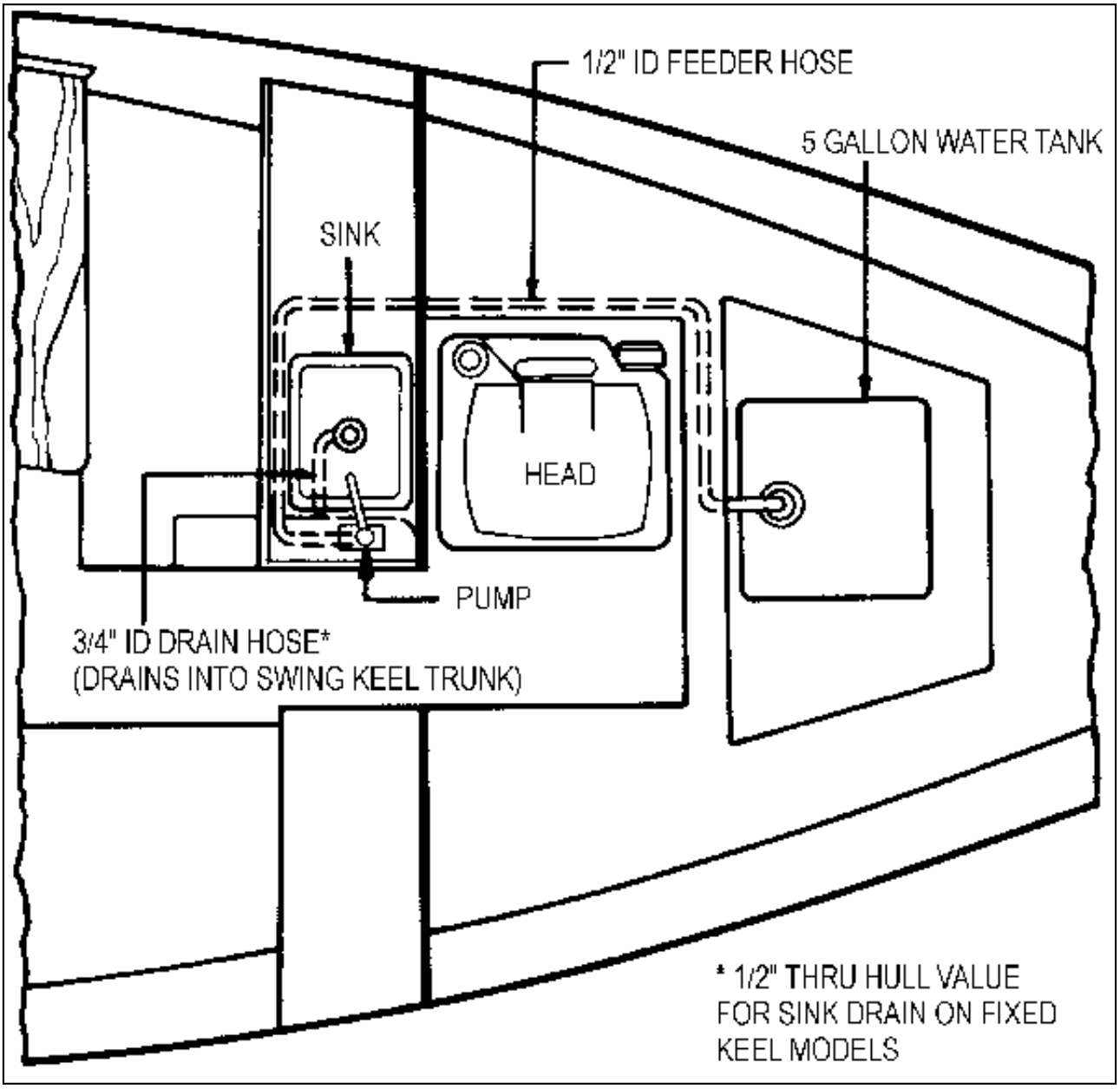
Clean Connections

Keep battery connections clean and tight. A cupful of strong baking soda solution and a toothbrush will clean corrosion from the terminals and neutralize any spilled acid. (Do not allow any of the solution to enter the battery cells.) A coating of petroleum jelly on the battery terminals will inhibit corrosion.

4.3.2 12 Volt Wiring Diagram



4.4 Fresh Water System Illustration



4.5 Auxiliary Power

4.5.1 Recommended Outboard Engine

An outboard engine of 4 to 6 horsepower should be adequate to propel the Catalina 22 at hull speed under usual conditions.

A larger engine will not increase hull speed and may add additional unnecessary weight in the stern.

Long shaft engines are preferable, however, standard length shaft engines should be adequate for most conditions.

4.5.2 Outboard Bracket

The factory installed, optional outboard bracket is spring loaded to assist lifting and lowering the engine. It locks in both the up and down position. Always be sure the bracket is secured in position before operating the engine.

When under sail, the motor should be kept in the raised position and tilted forward so that the propeller is clear of the water to eliminate unnecessary drag.

The motor bracket manufacturers recommend that a 15 H.P. maximum engine should not be exceeded.

4.6 Accommodations

4.6.1 Galley Stove

A two-burner pressure alcohol stove is a factory option for your Catalina 22. It comes with an operation and maintenance booklet provided by the stove manufacturer. Follow the instructions for operation carefully when using the stove. Be sure cabin curtains are on aft end of track, away from the area over the stove, before lighting burners.

4.6.2 Pop Top Operation

If you r boat is equipped with a pop top hatch, the following notes will aid in its operation:

First of all, the pop top can be used in two different positions. When the pop top is in the down position, the smaller sliding hatch serves as access to the cabin. When the pop top is in the up position, access to the cabin is greatly increased and, of course, so is the available head room. To put the pop top in the up position, you must go inside the cabin. The top is raised by lifting upward and forward at the same time. With the pop top in the fully raised position, reach forward to the pop top slide lock and lock the top to the mast. Always keep the pop top down and locked in position with the fastening dogs when underway, or when in rough seas or heavy weather.

4.7 Retractable-Keel

4.7.1 The Retractable-Keel Model

The retractable-keel feature makes the Catalina 22 a very versatile sailboat. It has several important considerations associated with it.

CAUTION

> Always crank the keel up and down slowly. Never force the crank handle when operating the retractable-keel. Before raising or lowering the keel, the "lock down bolt" (on the port side of the keel trunk beneath the forward dinette seat) must be in the off position; that is, backed off about 3/4 the way until it no longer rubs against the side of the keel. Attempting to raise or lower the keel while the "lock down bolt" is screwed in tight or only unscrewed part-way, may result in damage to the fiberglass keel housing, or the keel casting.

The "lock down bolt" operates on a friction principle designed to prevent the keel from becoming severely damaged in the event of a collision with underwater obstructions. The "lock down bolt" should be kept heavily greased with a marine grease designed not to wash away in salt or fresh water. This grease will stop any slight leak through the threads of the bolt and, of course, prevent unsightly rusting of the bolt inside the forward dinette seat. Once the boat is in the water and after the keel has been fully lowered and "locked down" by tightening the bolt, a further 1/2 turn off the keel crank, which should eliminate humming in the keel cable while underway.

After a day's sailing, release the "lock down bolt," then crank the keel up slowly and feel and listen to it as it raises. At the first feel or sound of resistance to the cranking action, stop cranking immediately. Never force the handle beyond normal pressure or you may damage the hull where the tip of the keep meets the fiberglass underneath the boat. Crank slowly and you'll never have a problem.

You will note that the keel pivots on a bronze fitting recessed into the hull. Should the keel require to be removed at any time, this casting may be unbolted by removing the stainless steel cable and the four mounting bolts from the underside. Make sure that the keel is well supported before removing these fastenings.

You'll face special problems if you decide to keep your retractable keel model in the water, especially salt water. Bottom paint is a must, plus periodic cleaning and removal of marine growth from the keel trunk slot. The possibility of corrosion to the keel and keel fittings is greatly increased. Keeping a retractable-keel model in salt water for lengthy periods is not recommended.

Should you decide to keep a retractable-keel model in the water at a slip or mooring, the following suggestions may help to extend the life of the keel assembly. First of all, the keel pivot pin is made of silicon bronze, the hinge castings are of brass, and the keel itself is made of steel. To retard electrolytic action which will "eat" away the metals, drill and tap the side of the keel (near the forward

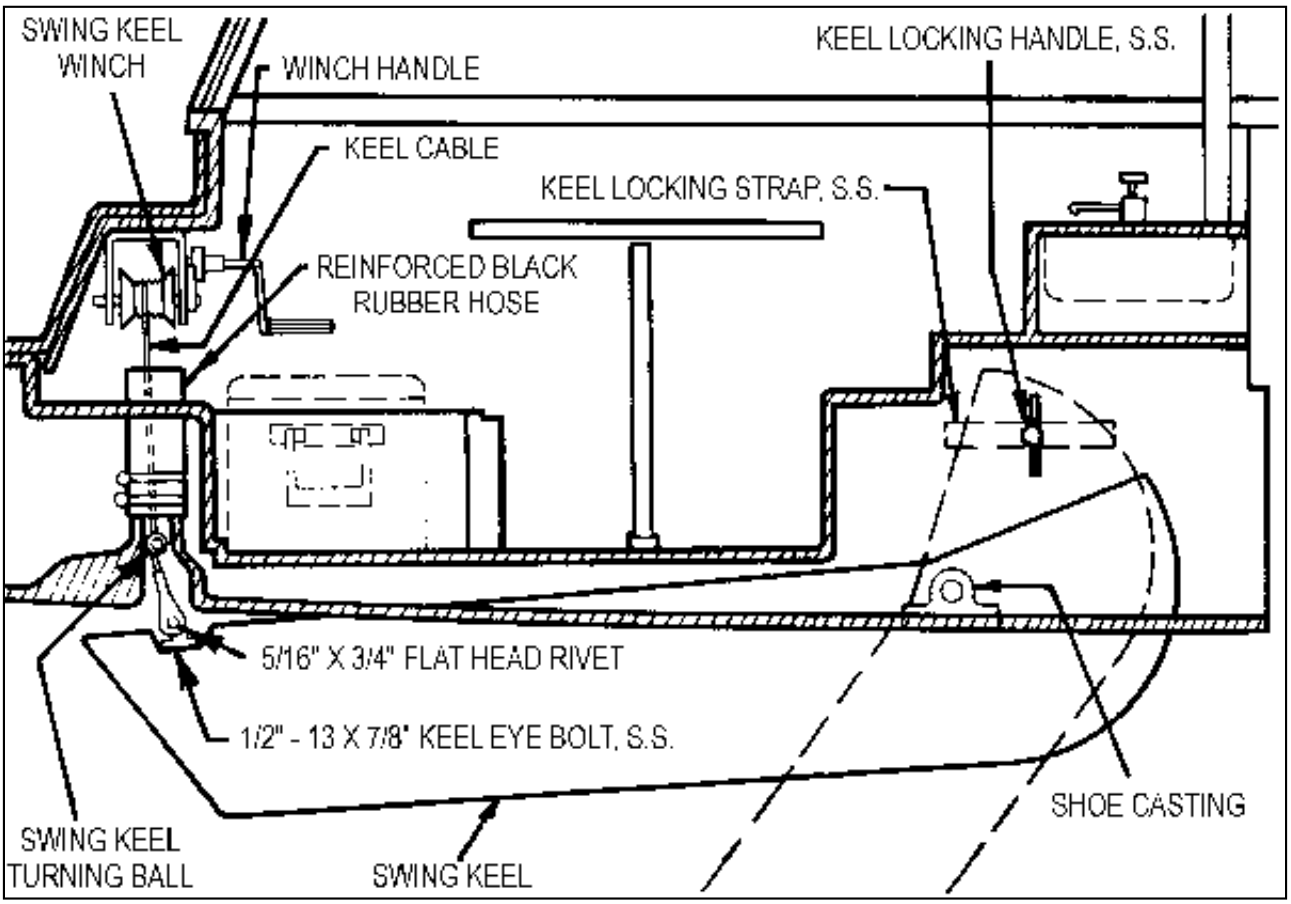
edge) as close to the keel pivot assembly as possible. Then attach a teardrop shaped "zinc." Keeping the keel in the raised position will help prolong the life of the flexible stainless steel cable by keeping as much of it out of the water as possible. Check the keel cable monthly, during the sailing season. Replacement cables are available through the local dealer.

Paint the keel itself with rust retardant paint like the commercially available "Rust-o-leum" or zinc chromate paints. If you use a zinc chromate paint, you must strip the keel down to bare metal before painting.

Paint the keep and fiberglass bottom (including portion of rudder that is underwater) with a good quality "hard finish vinyl-based" bottom paint to protect the fiberglass gel coat and reduce fouling growth. The through-hull fittings are installed so that there is very little, if any, metal exposed to water to be acted upon.

Your local dealer may have additional suggestions relative to the particular area where you plan to keep the boat.

4.7.2 Retractable-Keel Illustration



4.8 Trailering And Launching

4.8.1 Recommendations For Trailering

CAUTION

The aluminum mast and other metal parts conduct electricity, coming in contact with or near an electrical power line or lightning can cause severe injury or death. Stay away from overhead electrical power lines when sailing and/or launching this boat.

The Catalina 22 is an easy boat to trailer when certain precautions have been properly heeded. The following suggestions will prove helpful.

1. Be sure to read the trailer manufacturer's instructions and warranty carefully and do not exceed the manufacturer's gross

vehicle weight for trailer boat and gear.
2. Check tongue weight. Most trailers tow well with 7 to l0 percent of the gross trailer and boat weight on the tongue. If the trailer tends to "fish tail," add tongue weight by moving weight forward or the trailer axles aft.
3. Test the brakes by operating the master cylinder manually.
4. Inspect the winch cable for broken strands or fraying.
5. Tie the mast and boom securely to the bow and stern pulpits. The spars should also be supported in the middle by the cabin top. Pad the mast at all contact points to prevent damage.
6. In the retractable-keel model, check that the keel has been cranked down until it rests firmly on the trailer's rubber support wedge or roller. The rubber support wedge should bear the complete weight of the keel. Immediately before launching, raise the keel maximum up position to clear trailer.
7. Fixed-keel boats, as well as retractable-keel boats, should be seated properly on the trailer; that is, not ajar or tilted, and with the bow properly snugged into the rubber wedge at the front of the trailer. Fixed-keel boats should have the weight of the boat bearing on the keel, not the padded upright supports.
8. Follow normal trailer procedures of connecting lights and safety chain, and be sure your hitch is well-secured. Always test lights before leaving ramp area.
9. Do not allow anyone aft of the transom during launching or loading, who could be injured if the boat were suddenly dislodged from the trailer.

4.8.2 Ramp Launching Of Retractable Keel Model

The following generalized launching procedure will aid in launching your boat if yours is a trailerable model.

Launching Procedure

1. When launching from trailer on a ramp, make sure to back the trailer at right angles to the shore. Remember when backing, if you require the rear of the boat to move right, turn your steering wheel to the left and vice versa.
2. If your trailer has an extendible tongue, make sure you extend it while on level ground and then re-insert pegs or stops in their proper holes. If you have a tongue support wheel on the trailer, cranking it down enough to take the weight off the extendible portion of the tongue will help you slide the tongue extension in and out. Be sure to have rubber fenders or "bumpers" hanging along the sides of your boat to protect it from scratching on the dock.
3. Back the trailer into the water until the boat just begins to float. Have a line on the stern and bow to pull the boat off the trailer and tie it to the dock.
4. Set your emergency brake hard and place gear shift lever in park.
5. Take a strain on the trailer winch handle, release the locking pawl, and crank out slack in the bow rope. Then detach bow rope.
6. Next, give the bow a shove back. The boat should float free and when clear of the trailer, be pulled into the dock by the crew who then turns it BOW INTO WIND PRIOR TO RAISING SAILS.
7. Before raising sails and actually sailing the boat, make certain that the water depth is sufficient and then lower the centerboard or retractable-keel into the fully down position.
8. Crank in the excess line on the trailer winch and park the car and trailer in a suitable spot.

Rudder and Tiller

1. Always wait until the boat is in the water and at a suitable depth before installing the rudder.
2. Attach the tiller arm and secure with a wing-nut. A lock washer is also helpful. Occasionally while sailing, reach back and check that the tiller fastening wing-nut is tight. If you raise and lower the tiller arm excessively, the wing-nut can come loose, so try to avoid this unnecessary action.

Final Launching Considerations

Try not to use a launching ramp which is on a lee shore where you might have difficulty sailing off. In cases where it is necessary, use your auxiliary to get clear of the docks before hoisting the sails.

Determine the wind direction before you do anything else. Then make a plan of action for ease and safety in leaving the launch area docks. Explain to your crew what you plan to do and consider their opinions on getting away from difficult docks. The crew often has much valuable experience behind him and is very often worth listening to!

4.8.3 Hauling Out The Retractable-Keel Model

1. Crank up the keel carefully as described earlier in the manual.
2. Submerge the trailer (with the tongue extended) until boat can be floated onto the trailer and the bow secured into the rubber bow chock or V-shaped wedge.
3. Connect the trailer winch line and hook to help guide the boat.
4. Never stand with your face near the winch just in case the winch line should break due to some undetected chaffing. It could hit you in the face and be serious.
5. Don't try to winch the boat up onto the trailer; float it on.
6. Once on land, you can put away sails by folding and then un-step the mast. This is done in the reverse of the stepping procedure. One person resists, pulling on a line attached to the forestay, while standing on the ground directly in front of the boat's bow. The other person slowly lowers the mast backwards.
7. You need only release forestay and forward lower shrouds to lower the mast. (Do not disconnect the main upper shrouds.)
8. Do not allow mast to lower so far that it pries up on the deck tabernacle fitting where the mast is stepped or it may break off the prongs due to the unnatural forces working upon it.
9. Secure the mast for travel as before.
10. Properly secure the fixed or retractable-keel as described earlier in this manual; that is, be sure it is properly seated and in the case of the retractable-keel, that the locking bolt is tightened down.

4.8.4 Launching For Fixed-Keel Model

CAUTION

The aluminum mast and other metal parts conduct electricity, coming in contact with or near an electrical power line or lightning can cause severe injury or death. Stay away from overhead electrical power lines when sailing and/or launching this boat.

The fixed-keel model Catalina 22 should be launched by experienced persons with the aid of a hoist and slings. The local dealer and boat yard possessing such hoists can advise you about this and will handle the operation for you. Retractable-keel models are also often launched using a hoist and slings. Either model boat can be hoist launched with the mast stepped and in place in the vertical position by merely releasing the backstay at the turnbuckle where it attaches to the transom. However, the remainder of the mast's shrouds and forward stay must be properly connected to their deck fittings. Most importantly, check that the aft lower shrouds are secure since they will keep the mast from falling forward when the aft stay is disconnected from the transom.

5.0 Decommissioning

5.1 Winterizing Your Catalina 22

Laying Up

In cold climates where yachts are decommissioned during the winter, your Catalina 22 may be safely stored in the water, provided adequate measures are taken to prevent ice damage to the hull. Check with your yard to determine the feasibility of storing in the water.

When the boat is to be stored on land, the mast may be left stepped on the deck. However, it is recommended that the mast be removed at the time of hauling for a thorough inspection and preparation for next season. This allows plenty of time to order and replace shrouds or rigging parts needed over the winter months, avoiding any delays in the spring commissioning.

Following proper lay-up procedures will minimize the effort needed to recommission in the spring.

Before Hauling

1. Consult manufacture's instructions for winterizing any optional or owner installed equipment.
2. Inspect the cradle on which the boat will be stored. Check welds and padded poppits for condition and repair as required.
3. Lift the boat with straps per your boat yard's recommendations.

After Hauling

1. Wash bottom, removing growth and loose paint.
2. Wash topsides, deck and all other exterior fiberglass surfaces. Wax all except the non-skid surfaces.
3. Remove all sails. Follow sailmaker's instructions (or instructions in section 3.8) with regard to cleaning. Schedule any repairs required and store in a dry place.
4. Remove all sheets and lines, clean and store in a dry place.
5. If the mast has been removed from the yacht, remove all stays and shrouds from mast. Wash the entire stay or shroud assembly, using fresh water and a stiff brush. Dry thoroughly and coil into large, non-kinking coils. Store coils in a dry place. Wash and wax all spars. Coil halyards into non-kinking coils and put in a dark-colored plastic bag to protect from sunlight, if storing outdoors. Lash them to the mast. Store the mast either inside or outside with adequate support along its length.
6. If mast is to be left in place, remove boom; clean and store as described before. Clean shroud/stay end fittings, toggles, etc., using fresh water and a stiff brush. Apply a light coat of silicone grease, paying particular attention to the end fittings where they connect to the stays and shrouds.
7. Clean and lubricate all deck hardware that contains moveable parts. Follow manufacturer's instructions on winches.
8. Remove all gear such as books, documents, bedding, PFDS, anything moveable that is subject to rust, corrosion or mildew.
9. Remove all food supplies from lockers and ice chest. Wash out ice chest interior with a weak solution of Clorox. Leave ice chest lid open.
10. Stored batteries should be fully charged, and both positive and negative terminals should be disconnected. The batteries may be either left aboard or stored in a cool, dry place. Sub-zero temperatures will not harm a fully charged battery.
11. Winterize the head in accordance with manufacturer's instructions.
12. Remove all electronic gear that may require servicing during the winter.
13. Remove fire extinguishers for weighing, checking and any necessary recharging. If an automatic fire extinguisher system is installed, return the cylinders to the yacht and reinstall as soon as possible.
14. If cushions are left aboard, bring cockpit cushions below and place all cushions on edge to encourage ventilation.
15. Leave all interior lockers open to encourage ventilation.
16. Ensure that cockpit and deck scuppers are open and free.
17. If the boat is to be covered, ensure that the cover is installed in such a way as to provide adequate ventilation, and that the cover is not permitted to chafe against the hull or deck.
18. If the boat is not to be covered, ensure that mechanisms such as winches and steering pedestals are provided with adequate covers.
19. If the mast is to remain stepped, snub all shrouds and halyards to minimize noise, wear and chafe.

5.1 General Notes

We recommend the following procedures be followed when storing the yacht for prolonged winter months. Begin by consulting your authorized dealer about storing the boat in or out of the water in freezing climates. If at all possible, the manufacturer recommends keeping the yacht in dry storage for severe winters.

Thru hull fittings (if any) should be drained. Water in the sanitation system and other tanks should be pumped out.

Outboard motors should be removed, serviced and stored in a warm, dry location until reinstalled when commissioning.

6.0 Owner-User Responsibility

6.1 General Safety Tips

1. Do not venture out when the weather conditions are unfavorable, or are predicted to become so. Listen to weather forecasts; check with your harbor patrol office; look out for small craft storm warnings.
2. Be especially careful in areas where there may be commercial shipping traffic. Keep well away from shipping channels. Keep a sharp look-out when crossing the shipping channels.
3. Learn the rules of the road. All other sailors will expect that you know them and abide by them. The U.S. Coast Guard (BBE-2) 400 S. Eleventh Street S.W., Washington, D.C. 20590 will supply free literature on this. Your local branch or Harbor Patrol office may have it available.
4. If your boat has a Genoa sail which obscures the helmsman's vision, have a dependable person in the crew keep a sharp look-out under the jib sail for oncoming traffic.
5. When sailing at night, provide safety harnesses for yourself and your crew, and tie these lines to the boat. Use approved harnesses.
6. Purchase all Coast Guard required safety equipment, and learn how to use it.
7. Enroll in a C.G. Class or other certified boating and sailing class. You will learn a lot and enjoy sailing even more.

8. Do not take more than a safe number of persons aboard your boat when sailing.
9. Marine insurance is worth every penny you pay for it. Take out insurance from the start. See your dealer for a recommended marine agent, if you do not have one.
10. Keep all seat hatches and main hatch closed during rough weather or gusty winds which could unexpectedly strike the boat and cause a knockdown.
11. **CAUTION!** The aluminum mast the metal parts conduct electricity. Coming in contact with or approaching an electrical power line can be fatal. Stay away from overhead power lines and wires of any kind when launching, underway or stationary.

6.2 Required Safety Equipment

Fire Extinguisher(s)

It is wise to locate an approved marine use, fire extinguisher, in a convenient, accessible location.

Dry chemical extinguishers should be inverted occasionally to prevent the contents from packing. Extinguishers should be recharged yearly or after each use, according to manufacturer's recommendations

Life Vests

Keep a Coast Guard approved life vest on board for each crew member. Wear them during rough weather and night sailing. Children should wear vests at all times, no matter how much they object.

Horn

Your yacht should be equipped with a horn capable of producing a blast that can be heard for a distance of one mile.

Flares

The law requires that your yacht be equipped with a minimum of three (3) day/night flares.

6.3 Suggested Safety Equipment And Safety Package

Medical Kit

A basic medical kit is a wise investment for any boat owner. Suggested items include: motion sickness pills, aspirin, bandages, etc. We recommend that you personalize your medical supplies for yourself and your crew members' specific needs. First aid kits are available at most marine stores. Consult your physician for his recommendations, if you are planning a voyage away from medical facilities. A first aid procedure book is a necessity.

A varied arrangement of tools is, again, a wise investment to have on your boat. Tailor your tool box for the conditions that you sail. For local sailing, with professional help just a call away, you only need a small array of tools. However, for long-range cruising, a more extensive supply of tools will be needed. Your mechanic may be helpful in suggesting tools required for your particular engine installation.

6.4 Safety Package, Factory Option

Package Includes	Description

1 EA	8-S Anchor
1 EA	1/4" x 6'Coated Chain
1 EA	3/8" x 150'Anchor Line
2 EA	5/16 Anchor Shackle
2 EA	6 x 15 Fender w/Line
10 FT	7/16" W.Nyl. Fender Lines (2X5')
1 EA	Throwable Cushion
1 EA	Folding Radar Reflector
1 EA	Flare Kit
1 EA	Freon Air Horn
1 EA	Brass Bell
1 EA	Extinguisher
1 EA	First Aid Kit
1 EA	Marine Flashlight
1 PKG	Alkaline Batteries
4 EA	Adult Lifejacket
1 EA	Chapman's Piloting, Seamanship, Small Boat Handling
2 EA	1/2 x 15 Dock Lines

6.5 Anchors, Anchoring And Mooring

The anchor manufacturer suggests an anchor in the 8 to 13 pound range, to be used as a bow anchor in ordinary conditions. This anchor will only be effective with at least 6 feet of 1/4 inch or heavier gauge chain, and at least 3/8 inch or heavier nylon line.

Under adverse weather conditions, as much as a 25 pound bow anchor could prove necessary and, possible, a plow-type anchor might be required.

Inquire in your local area about anchoring procedures relative to the place you plan to visit. Get opinions from several experienced people and always play it on the safe side in "making up" your anchor as well as in using it. Do not forget to wire all shackle pins so they cannot come loose under water.

REMEMBER: Lighter anchors are made more effective by increasing the scope: i.e., the ratio of length of line and chain to depth of water. A 7:1 ratio is recommended. This means using 7 feet of anchor line for each foot in water depth.

6.6 Lightning Precautions

Your yacht was not provided with a lightning protection system during construction. The reasons are as follows:

1. There is not a procedure for lightning protection which has proven reliable under all conditions. Yachts with elaborate lightning protection systems have sustained serious damage from a direct lightning strike.
2. If the builder were to assert that the yacht were lightning protected, it could instill a false sense of security in the owner or operator, leading to less-than-prudent actions when lightning threatens.
3. Lightning systems are "out of sight, out of mind," except when lightning threatens. Generally, they are not checked and maintained on a regular basis. A defect in the system (i.e., a break in a ground line) could - in some cases - increase the risk of personal harm, as well as damage to the yacht, as compared to a yacht with no protection. The reason for this is that many lightning protection systems distribute the high voltage throughout the yacht before allowing it to exit through the ground.
4. It is impossible for Catalina Yachts to control changes which you, the owner, may make to the yacht, which could affect lightning protection system.

You, the owner, must decide whether or not you wish to equip your yacht with lightning protection and, if so, the method of doing it. The following suggestions and comments are also offered:

1. Keep the system as simple as possible. This will facilitate both installation and inspection/maintenance.
2. The American Boat & Yacht Council (ABYC) recommends straight-line wire runs. This is virtually impossible within the yacht. For grounding the shrouds: A battery cable, which clips to each shroud and extends outside the yacht to the water, can minimize the number of bends required. This method has the added advantage of keeping the power surge outside the boat and allowing easy, routine inspection. The obvious disadvantage is that the clip on cables is not a permanent installation and

may not be in place when an unexpected lightning strike occurs.
3. Use only top quality materials and go oversize wherever possible.
4. Keep all permanent attachment points and connections where they are readily available for inspection, yet protected from damage or inadvertent disconnection.

By far, the most important consideration regarding lightning is observing common sense safety precautions when lightning threatens. The key considerations are listed in the American Boat and Yacht Council (ABYC) publication SECTION E-4 which is enclosed in your owners package for your reference.