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CLASSIC MORGAN 41

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I. FOREWARD

A. Welcome

With your purchase of your new Morgan Classic 41 yacht, you became a member of a fraternity of Morgan owners. Welcome to the group!

We have maintained contact with many of the owners and users of our yachts. Feedback from them has been extremely useful in our continual upgrading of our product. This feedback, coupled with our internal R&D programs and the application of new technologies developed in the marine industry and related industries, is reflected in your yacht's design and construction. We believe that your yacht represents the current state-of-the-art; and, we believe she will satisfy your expectations with respect to aesthetics, function, and safety.

The Morgan Division is committed to producing and marketing the best value in sailing yachts available in the world. While each person's concept of value varies, factors generally considered are quality of design and workmanship, performance, safety, aesthetics, purchase price, and resale value. How these factors are weighed differs over time and from individual to individual. We welcome your assessment of our product. Input from you will help us measure and, if necessary, change the balance of priorities assigned to our product.

We wish you many happy years of sailing with your new yacht.

CATALINA YACHTS

MORGAN DIVISION

I. FOREWARD

B. Purpose and Scope of Owner's Manual

The purpose of the Owner's Manual is to provide you with the following information:

1. General operating procedures for your yacht and all of the factory installed systems.

2. General Maintenance procedures.

3. Specifications, drawings, and schematics on the yacht, her components, and her systems.

Volumes could be written on the operation, maintenance, and repair of your yacht and her systems. To keep the text manageable in terms of readability and easy reference, much of the detail has been omitted. Supplementing the text, you will find separate manuals for most of the major equipment in your yacht. The separate manuals, coupled with the general text and drawings provided in the Owner's Manual, should allow you or your yard to diagnose and correct most problems you are likely to encounter.

We encourage you to first study the Owner's Manual carefully and then read the various equipment manuals. This will provide you with an understanding of the basics and a knowledge of where to locate specific details.

Discussions on navigation and general boat handling are beyond the scope of the Owner's Manual. Information on these extremely important areas is available in numerous publications.

Morgan Division continually upgrades its product. Every effort is made to update the Owner's Manual to reflect these changes, and the manual is believed to be current at the time of printing. If, However, you find a discrepancy between the manual and the yacht, consult your dealer before operating the system in question.

I. FOREWARD

C. Sources of Additional Information and Parts

Our dealers have been selected on the basis of their knowledge in the marine field. In most cases, your dealer will be able to answer questions which arise and are not covered in the manual. He can also obtain replacement parts for you from Morgan. You should contact your dealer first for information or repair parts.

Morgan has a Customer Services Department which provides general and technical information on all Morgan products. Also, this department sells replacement parts for Morgan. This is located at the main plant at 7200 Bryan Dairy Road, Largo, FL 33543. The phone number is 813/544-6681.

All Warranty Claims must be made through your dealer.

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II. SPECIFICATIONS

A. Design Concept

The original Morgan Out Island 41 earned a reputation as a comfortable and seaworthy cruiser. Through extensive use in charter fleets the Morgan Out Island 41 has introduced more people to the pleasures of charter than any other yacht in the world.

Catalina Yachts new Morgan 41 continues the Out Island tradition of quality and durability and maintains the distinctive appearance of the early 41's, while incorporating many important improvements in performance and accomodation.

The sailing characteristics of the Classic 41 have been significantly improved by her new high performance keel and separate rudder, finer entry and firmer bilges; the new 41 points higher and tacks easily in all conditions.

On deck the new cockpit seats are all the same level & additional seating has been built into the aft cabin coach roof behind the helmsman. The deck and cockpit are now more comfortable, as well as improved aesthetically, with serveral styling and functional refinements.

Below deck, the Classic 41 makes excellent use of the tremendous volume of the 41 hull.

The galley has been expanded into a 'U' shape so the cook can work facing the social area. New overhead cabinets aft, a dry food locker, space for the available microwave oven, and many drawers and cabinets create a modern gourmet galley.

In the main cabin a large dinette is to starboard and a settee & pilot berth are to port. An entertainment center with two swivel seats is available in lieu of the settee. The forward cabin has private access to the head with shower. A full navigation station is on the port side with a seat, chart storage and electronics space above.

The passage to the aft cabin has an opening port, increased headroom and a large counter top which can be used as a work bench. In the aft cabin ventilation and visibility have been improved by new opening ports. The aft head has a separate stall shower, new vanity and additional storage.

The one piece molded fiberglass deck liner creates a clean uniform finish on the overhead and assures low maintenance.

The one piece molded fiberglass hull liner is engineered for structure and bonded to the hull to insure rigidity, strength and low maintenance for private ownership or charter use. Fuel and water tank capacities have been increased for a longer cruising range.

II. SPECIFICATIONS

B. General Design Specifications

LOA	41' 3"
LWL	34' 0"
Beam	13' 10"
Draft	4' 10"
Sail Area	780.5 Ft.^{2}
Auxiliary Power (Diesel)	Yanmar 4JHE 44HP
Transmission	Kanzaki Hurth
Design Displacement	23,000 lbs.
Ballast	8,500 lbs.
Mast Height above DWL	57'-5"
Tankage	1 aluminum fuel tank 85 gal. (approx.) 2 aluminum water tanks; 125 gal. Port 90 gal. Starbd. (total 215 gal. (approx.) Holding tanks; 1 - 26 gal., 1 - 21 gal.
Prop Shaft	1¼" stainless, 98" length
Propeller	3 blade RH 18" x 14"
Batteries	Ship's 2 - 12V 155amp Heavy Duty
Pumps	1 - Pressure Water Par 36950-2080 2 - Std. Shower Par 37202-0005 1 - Ice Box Rule #141 F/1" hose 1 - Auto Bilge Rule #1750-108 1 - Manual Bilge Whale gusher
Sea Valves	6 - R.C. Marine 3/4" 6 - R.C. Marine 1½"
Fuel Filter	Racor #500FG-SS + fittings
Stove Standard Optional	Seaward 2-burner/oven CNG 2-burner/oven

II. SPECIFICATIONS

B. General Design Specifications - continued .....

Compass	Ritchie Navigator 2000, Cat. No. DNP 200 or equivalent
Water Heater	Attwood w/heat exchanger
Exhaust	Vernalift
Steering System	Edson 1-3/4" dia. shaft
Raw Water Strainer	Perko 1½" PE 493-7
Shorepower	Marinco or Hubbell, Capacity 120V AC/30amp, Wire - 3 conductor
Winches	2 - Model #16 CH - Halyard 1 - Model #40 CH - Self tail mainsheet 2 - Model #43 CH - Self tail primary

II. SPECIFICATIONS

C. Serial Numbers and/or Model Numbers

Hull Number (Coast Guard) _____

Engine Serial Number _____

Hot Water Heater Serial Number _____

Range Serial Number _____

Battery Charger Serial Number _____

Stereo Serial Number _____

Steering System _____

Bilge Pump _____

Pressure Water Pump _____

Shower Pump _____

Ice Box Pump _____

Utility Pump _____

Batteries _____

Compass _____

II. SPECIFICATIONS

D. Manufacturer's Documents

For every yacht manufactured by Morgan, A Builder's Certificate (MCC) and Manufacturer's Statement of Origin (MSO) are prepared upon request. Both the MCC and MSO must be prepared with the name of the dealer to which the yacht was originally sold. The dealer, then, upon payment in full, endorses these documents over to the person to whom the yacht was sold. The MCC is used for U.S. Coast Guard documentation, and the MSO is used for state registration.

Morgan issues only one original MCC and MSO. If they become lost, no duplicate will be issued. However, if you wish to document your yacht and the MCC has been lost, Morgan will provide a letter which will enable you to proceed with documentation of your yacht with the U.S. Coast Guard.

II. SPECIFICATIONS

E. Procedures and Data for Documentation

For your information and references, the next two pages contain sample copies of an MCC and MSO containing the vital information on your boat.

These forms are signed by Morgan with the authorized signature and title of the person or responsibility, and are notorized.

...continued

MORGAN MARINE

7200 BRYAN DAIRY RD.
LARGO, FLORIDA 33543
(813) 544-6681

SAMPLE

MANUFACTURERS STATEMENT OF ORIGIN FOR A BOAT SOLD IN THE STATE OF FLORIDA

The undersigned manufacturer hereby certifies that the new boat described below, the property of said manufacturer, has been sold this ____ day of _____, 19____ on Invoice No. _____.

Dealer's Name _____

Address _____

City, State and Zip Code _____

Model Year 198 Serial No. of Boat #MRY50xxxmxxx

Hull Length 41 ft. 0 in. Beam 13 ft. 10 in.

Hull Material: __ Wood __ Aluminum __ Steel X Fiberglass

Type Boat: ___ Outboard ___ Inboard ___X Sail ___ Other

This form must be presented with application for state title.

The manufacturer certifies that all information given herein is true and accurate to the best of his knowledge.

FIRM NAME Morgan Marine

/ _____
Authorized Signature

TITLE OR POSITION _____

Before me personally appeared _____ who by me being duly sworn upon oath says that the statements set forth above are true and correct. Subscribed and sworn to before me this _____ day of _____, 19 _____.

_____ Notary Public.
(SEAL)

Date Commission Expires _____

MORGAN MARINE

7200 BRYAN DAIRY RD. • LARGO, FLORIDA 33543
(813) 544-6681

BUILDER'S CERTIFICATION

1. Vessel Data

A. Hull number or hull Identification Number #MRY52xxxMxxx

B. Vessel name (if known) _____

C. Length 41'3" Breadth 13'10" Depth 6'4"

D. Place of build Largo, Florida, U.S.A.

E. ☒ Self-propelled
☐ Non-self-propelled

F. Hull material

☐ Wood ☐ Steel ☐ Aluminum ☒ Fiberglass reinforced plastic ☐ Other

2. Phase of Construction covered by Certificate

☐ Hull only
☐ Completion only Year completed _____
☐ Entire construction Year completed _____

3. Party(ies) for Whom Built

4. United States Build

☐ A. All major components of the hull and superstructure were fabricated in the United States.

☐ B. The vessel was constructed entirely in the United States.

☐ C. At least fifty (50) percent of the cost of all machinery (including propulsion) and components which are not an integral part of the hull or superstructure relate to items procured in the United States.

5. I, _____ Do Hereby Certify:
(Name)

that the facts recited herein are true and that I have personal knowledge of these facts because I:

☐ A. Personally performed the construction

☐ B. Supervised the construction at and on behalf of

CATALINA YACHTS/MORGAN DIVISION
(Name of Company)

_____
Signature

_____
Date

Before me personally appeared _____ who by me being duly sworn upon oath says that the statements set forth above are true and correct. Subscribed and sworn to before me this _____ day of _____, 19 ____.

Date commission expires:

_____
Notary Public
(Seal)

SAMPLE

II. SPECIFICATIONS

E. Procedures and Data for Documentation - continued...

Documentation must be accomplished with the United States Coast Guard in the United States or with the governing agency in the country where your vessel is to be registered. We suggest you contact the Documentation Office nearest you for full details, forms, and instructions.

The following notes and references are made for your information and convenience. They should in no way be miscontrued as complete and detailed instructions.

Procedure:

Pleasure Class	Under 20 tons requires a Yacht License. Twenty tons and over requires a Certificate of Enrollment and Yacht License.
Application for Admeasurement	Requires a Builder's Certificate issued by the builder on the prescribed Coast Guard form. This certificate will be retained by the Coast Guard with certificated copies available to the owner.
Admeasurement	The Admeasurer uses data on the Builder's Certificate (MCC) to compute net tonnage. The following formulas are used for sailboats: Gross Tonnage - 1/2 (LDB/100) Net Tonnage - 0.9 (Gross Tonnage) where L - Length D - Depth B - Breadth
Official Number	After Admeasurement files your certificate to tonnage, application is made for an official number. Title and mortgage papers are required.
Additional Forms	Application for Number. Declaration of Ownership and/or Extent of Interest. Identification of Owner's or Existing Mortgages. Declaration of No Foreign Interest Involved. Designation of Master of Vessel. Delcare No Freight or Commercial Passengers to be carried on Board.

II. SPECIFICATIONS

E. Procedures and Data for Documentation - continued...

Additional Forms - cont'd.	Designated Home Port - Licensing Office Designated Hailing Port - Berth Marking Certificate
Commercial Class	Contact your U.S. Coast Guard Documentation Office for information, due to complexity of application.

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III. COMMISSIONING AND DECOMMISSIONING

A. Initial Commissioning

The initial commissioning of your yacht must be done by a Morgan Dealer or a competent yard with the dealer's supervision.

The initial commissioning is extremely important. In addition to putting the yacht into service, the following functions are also served:

- Shipping damage is revealed. The trucking company is liable for shipping damage. They require prompt notification of any claims against them.

- Part shortages are revealed. Morgan boxes the loose gear in a wood crate. We do occasionally make errors. It is much more convincing to us that the error is ours if we are notified before the yacht is sailed.

- Quality defects are revealed. Your yacht is thoroughly checked at our plant. Our quality program for each yacht includes a water drench test, functional testing of all systems and visual checks of the entire yacht. However, overland travel often causes leaks and other problems which are difficult to detect by visual inspection alone. Also, we occasionally miss something. As with claims of short shipments, early notification to the factory adds credibility to the claim of a quality defect.

The following functions should be performed during the initial commissioning. Detailed procedures are described in their respective sections of the manual.

1. Inspect hull, deck, rudder, propeller and shaft, and spars for shipping damage.

2. Inventory all loose gear and report shortages or damaged parts, if any.

3. Install thru-hull fittings for owner and/or dealer supplied equipment.

4. Bottom Paint - If the available bottom paint has not been purchased from the factory, all under water areas of the hull must be properly prepared in accordance with the paint manufacturer's recommendations. (Please note however, that in order for the Catalina Yachts Gel Coat 5 Year Limited Warranty to apply, the bottom must not be sanded, sandblasted or subjected to any other processes which might reduce the gel coat thickness.) Anti fouling paint prevents the growth of algae, barnacles, and other fouling organisms on underwater surfaces. For maximum anti-foulant life, a full two coats of bottom paint is recommended.

III. COMMISSIONING AND DECOMMISSIONING - continued .....

A. Initial Commissioning - cont'd.

5. Launch and inspect all underwater fittings for leaks.

6. Fill fuel and water tanks and search for leaks. CAUTION: Be sure to bleed hot water heater before turning on the 100v element. The element will burn out immediately if energized in a dry or partially filled tank.

7. Install pulpits, stanchions, and lifeline wires. Safety-wire lifeline ends and gates.

8. Install standing and running rigging on mast. Check mast wiring and lights. Record rigging lengths from tags supplied. (See following check list.)

9. Step mast, set up and adjust rig, pin and tape all turn-buckles, check halyards, and install mast partner and boot.

10. Reeve sheets, bend on and hoist sails. Furl sails and install sail covers.

11. Connect prop shaft coupling. Align engine to .002" max. clearance. NOTE: The coupling was disconnected at the plant after alignment check. This is necessary to prevent damage to the drive train during overland shipping, hauling and/or launching.

12. Check oil and water level in engine.

13. Complete installation of owner or dealer supplied equipment.

14. Check battery condition and recharge, if necessary.

15. Check operation of all systems and equipment after reviewing prospective manuals for each system.

III. COMMISSIONING AND DECOMMISSIONING - continued .....

A. Initial Commissioning - cont'd.

17. Check all doors and drawers for proper movement and secure latching.

18. Water test deck, fittings, ports, and search for leaks.

19. Sea trial under power and sail.

20. Re-check for leaks in interior plumbing systems (fuel, water and waste) and exterior hardware.

21. Complete Registration Certificate and National Sailing Association Registration Card and return to Morgan.

22. Clean interior and exterior of yacht thoroughly.

The next few pages provide you with a check list to inspect and commission yachts. Your completing this check list will provide you with a 'condition report' of the yacht before and after initial commissioning.

NOTE: Your yacht may have been partially winterized at the plant. Winterization plugs for toilets and hot water heater, along with faucet aerators and ignition keys, are now put in a plastic bag and placed inside the chart table. Replace all drain plugs before launching yacht.

III. COMMISSIONING AND DECOMMISSIONING - continued .....

A. Initial Commissioning - cont'd.

RECEIVING AND COMMISSIONING CHECK LIST - (For Owner's Records)

	Yes	No	Corrected
Pre-Launch Inspection			
Rudder moves freely.	✓		
Prop shaft turns freely.	✓		
All below waterline fastenings are tight.	✓		
All plumbing to thru-hulls connected and securely fastened.	✓		
All thru-hull valves closed.	✓		
All drain plugs and petcocks closed.	✓		
Engine Installation			
All mounting bolts tight.	✓		
Engine aligned to .002" max clearance.	✓		
Coupling bolts tight.	✓		
Shaft set screw tight and secured w/safety wire.	✓		
Adjust and tighten intermediate bearing reese.	✓		
Fill intermediate bearing w/grease.	✓		
Crankcase oil level full.	✓		
Throttle/shift linkage secure.	✓		
Engine stop connection secure.	✓		
Drain plugs installed and petcocks closed.	✓		
Cooling water level full.	✓		
Tankage and Plumbing Connections			
Fuel tanks and lines leak-free.	✓		
Water tanks and lines leak-free.	✓		

III. COMMISSIONING AND DECOMMISSIONING - continued .....

A. Initial Commissioning - cont'd.

RECEIVING AND COMMISSIONING CHECK LIST - (For Owner's Records)

	Yes	No	Corrected
Pulpits and Lifelines			
Pulpits and stanchions secure.	✓		
Lifelines properly tensioned.	✓		
Lifeline end fittings safety-wired.	✓		
Gates function properly.	✓		
Lifeline wires free of physical damage.	✓		
Spars and Standing Rigging (Pre-Stepping)			
Mast wiring and lights functional.	✓		
Masthead pins secured and sheaves free wheeling.	✓		
Standing rigging and topping lifts properly fastened to spar and pinned.	✓		
Halyards installed.	✓		
Spreaders fit and properly secured.	✓		
Sail tracks free of burrs.	✓		
All fasteners tight.	✓		

NOTE: 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 wires can be fatal.

III. COMMISSIONING AND DECOMMISSIONING - continued...

A. Initial Commissioning

RECEIVING AND COMMISSIONING CHECK LIST - (For Owner's Records)

	Yes	No	Corrected
Spars and Rigging (After Stepping)			
Standing rigging adjusted.	✓		
Turnbuckles pinned and taped.	✓		
Boom fits.	✓		
Spreader angle correct.	✓		
Mast bend correct.	✓		
Winches run free.	✓		
Sails fit and slide freely.	✓		
Internal outhaul checked and functional.	✓		
Jiffy reefing rigged and functional.	✓		
Halyards function properly.	✓		
Furling gear operates properly.	✓		
Sail covers fit.	✓		
Mast partner installed.	✓		
Mast boot installed.	✓		
Mast lights operational.	✓		
Batteries Fully Charged	✓		
Edson Steering Inspection			
Wheel rotates easily and uniformly.	✓		
Connections at rudder post tight.	✓		
Electrical System Check			
All 110v systems work with shorepower.	✓		
All 12v. systems operate properly.	✓		
All light bulbs OK.	✓		
Fresh Water System Check			
Cold water runs freely from all faucets.	✓		
Hot water runs freely from all faucets.	✓		
Tank valves operational.	✓		
Hand pump operational.	✓		
Shower operates properly.	✓		
Electric pump shuts off w/faucets closed.	✓		
Shore water system operates properly.	✓		
Plumbing system free of leaks.	✓		
Marine Toilet and Waste Line			
Marine toilets operate properly.	✓		
Marine toilets free of leaks.	✓		
Sinks drain properly and no leaks.	✓		
Shower drain properly and no leaks.	✓		

III. COMMISSIONING AND DECOMMISSIONING - continued...

A. Initial Commissioning

RECEIVING AND COMMISSIONING CHECK LIST - (For Owner's Records)

	Yes	No	Corrected
Bilge Pumps			
Electric bilge pump operates in manual setting.	✓		
Electric bilge pump operates in automatic setting.	✓		
Manual bilge pump operates properly.	✓		
Other Systems & Equipment			
Refrigeration system operates properly.	✓		
Range operates properly.	✓		
Engine room blower operates properly.	✓		
All dealer or owner installed electronics operate properly.	✓		
Emergency tiller operates properly.	✓		
All deck mounted winches operate.	✓		
All deck blocks rotate smoothly.	✓		
All portlights and hatches operate correctly. Port screens present.	✓		
Check Joinerwork			
All drawers pull smoothly and latch in closed position.	✓		
All doors open smoothly and latch in closed position.	✓		
Sole drop-ins fit properly.	✓		
Berth access panels fit properly.	✓		
Water Test Deck			
All fasteners tight.	✓		
Portlights free of leaks.	✓		
Hatches free of leaks.	✓		
Toe rail free of leaks.	✓		
Other deck hardware free of leaks.	✓		
Cockpit drain operates properly.	✓		
All Required Coast Guard Safety Gear Aboard		✓	

III. COMMISSIONING AND DECOMMISSIONING - continued...

A. Initial Commissioning

RECEIVING AND COMMISSIONING CHECK LIST - (For Owner's Records)

	Yes	No	Corrected
Sea Trial			
Engine, engine controls, engine instruments, and drive train operate properly.	✓		
Steering system operates properly.	✓		
All sail handling gear operates properly.	✓		
All sails OK.	✓		
No excessive weather or lee helm.	✓	✓	
Mast tuned under sail.	✓		
Compass swing.	✓		
All electronics operate properly.	✓		

III. COMMISSIONING AND DECOMMISSIONING - continued...

A. Initial Commissioning

RECEIVING AND COMMISSIONING CHECK LIST - (For Owner's Records)

Sea Trial

Comments: _____

Names of Company & Individuals Involved

Commissioned by: Hirshberg-Massey Enterprises, Inc.

Sea Trials by: Hirshberg-Massey Enterprises, Inc

Compass swung by: _____

Electronics checked by: Hirshberg-Massey Enterprises, Inc.

Other: _____

III. COMMISSIONING AND DECOMMISSIONING

B. Decommissioning for Storage (Winterizing)

Winterizing consists of removing gear and equipment that may be damaged, removing liquids which may freeze, thorough cleaning of the yacht, and protecting the yacht from the elements. Procedures for winterizing are described below:

1. Drainage of fresh water system.

   a. Open faucets and run pump until water flow stops.
   b. Disconnect hoses at pump and use air pressure to blow out water in low spots.
   c. Remove drain plug on bottom fitting of water heater.
   d. Pump hand pump until water flow stops.
   e. Leave all faucet valves in open position.

NOTE: Non-toxic anti-freeze for fresh water systems is available from many marine supply stores. This is recommended, since it will protect the system from any accumulations of water that were missed in the draining operations. Follow the instructions on the can. We understand that some owners have used vodka for the same purpose - with favorable results.

2. Head and holding tank.

   a. Winterize head by following the procedure given in the Head Manual.
   b. Empty holding tank and rinse with fresh water and pump out again.

3. Thru-hulls

   a. For in-water storage, all thru-hull valves, except cockpit scupper valve, should be closed.
   b. For out-of-water storage, leave valves open.

4. Engine

   a. Engine coolant. Two acceptable methods of winterizing the engine cooling system are described below. Your Classic Morgan 41 was winterized at the plant prior to shipping, using the second, and preferred method, adding anti-freeze to the system.

      1) Complete drainage - involves closing thru-hulls, removing all drain plugs on the engine and muffler, and opening drain petcocks per manufacturer's instructions. Store with expansion tank cap off and salt water pump cover loose.

B. Decommissioning for Storage (Winterizing) - continued...

2) Anti-freeze - Drain system per instructions above. Close petcocks and replace drain plugs. Disconnect intake side of raw water pump hose and feed it into a bucket of pre-mixed anti-freeze solution. Run engine until anti-freeze is discharged from the exhaust, and then shut the engine off. Finally, fill the fresh water cooling system with anti-freeze mixture.

NOTE: Engine was winterized using anti-freeze method at the plant prior to shipping.

b. Drain and clean engine seawater strainer and leave top loose.
c. Check water separators in fuel system for water accumulation. Drain as needed.
d. Check engine handbook for further "lay-up" details.

Failure to adhere to the manual can affect your engine warranty.

5. Clean Yacht Interior

a. Clean and drain bilges.
b. Remove all perishables.
c. Wash out and dry ice box. Leave lids open.
d. Empty all compartments, drawers and hanging lockers. Clean and leave compartments open.
e. Clean all interior surface.
f. Clean and apply spray lubricant to steering units, engine coupling, hose clamps, shaft log packing gland, and throttle/shift controls.

6. Remove the following gear:

a. Electronics. Store at home or send out for any professional attention that may be required.
b. Compass.
c. Cushions, seat backs, carpet, curtains, towels, etc. Store in dry area to prevent mildew.
d. Batteries. Store in a warm, dry location. Check condition periodically and slow charge as required.
e. Sails. Wash and let dry thoroughly. Store in a dry area.

7. Drain shower pan, pumps and strainers.

8. Wash exterior. Polish, wash, and lubricate metal deck hardware.

9. Wash and wax spars. Lubricate winches and sheaves. Inspect for any damage.

III. COMMISSIONING AND DECOMMISSIONING

B. Decommissioning for Storage (Winterizing) - continued...

10. Clean standing rigging and inspect for damage.

11. If boat is hauled, clean and inspect bottom thoroughly. Pay particular attention to signs of structural damage to glass, rudder operation, gudgeon and fasteners, electronic senders, thru-hulls, propeller and zincs.

12. CAUTION: Be certain that the prop shaft coupling is disconnected prior to hauling the yacht, and follow hauling instructions in this manual.

13. It is a good practice to record items that were given attention and any defects found during decommissioning. This list will be valuable to you when re-commissioning in the Spring.

14. Check manuals for any optional equipment present on the yacht for specific instructions on winterization.

15. You may wish to use deck covers and/or various devices available to prevent ice formation around a yacht stored in the water. These will provide additional protection to the yacht during the winter months. Consult your local marina for further information and sources of this equipment.

III. COMMISSIONING AND DECOMMISSIONING

C. Re-Commissioning After Lay-Up

Re-commissioning after lay-up is somewhat less involved than the initial commissioning. The following steps are suggested:

1. Check operation of all thru-hulls before launching boat.
2. Apply anti-foulant bottom paint. Add zincs, if required.
3. Clean exterior of boat thoroughly.
4. Reinstall charged batteries, checking terminals for correct polarity.
5. Check notes on decommissioning. Make any necessary repairs.
6. Launch, step spars, connect rigging, and tune mast. Bend on sails. Check all components prior to reinstalling them.
7. Reconnect coupling and check engine alignment.
8. If engine was drained, replace all drain plugs, tighten caps, and shut drain cocks. Fill and bleed engine cooling system.
9. Fill fuel tanks. Bleed engine fuel system per instructions in the Yanmar engine manual.
10. Replace hot water heater plug and reconnect waterline at pump. Flush the fresh water system, then fill the water tanks.
11. Clean and inspect engine and engine room equipment. Check oil levels throughout.
12. Clean interior thoroughly.
13. Check operation of all systems.
14. Install cushions, carpet, electronics, and other loose gear removed during winterization.
15. Sea trial.

The check list provided in Section III-A will be a useful reference for the yacht's condition after re-commissioning.

III. COMMISSIONING AND DECOMMISSIONING

D. Hauling and Cradling

Improper hauling or cradling procedures can result in serious damage to the yacht. The following guidelines should be followed:

1. Prior to hauling, disconnect prop shaft coupling.

2. Sling location are identified just under the rubrail.

3. To prevent abrasion damage, the hull topsides may be protected by placing carpet between the sling and the gelcoat. Be sure the carpet backing surface is against the sling.

4. If spars are removed, be certain spars are properly supported for prolonged storage.

5. The hull should be cradled so that most of the weight is borne by the bottom of the keel. Side supports should contact the hull at or near a major bulkhead location.

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IV. OPERATING PROCEDURES

A. Spars and Rigging

1. Stepping the Mast and Dockside Tuning

Assembling the rigging and stepping the mast is normally part of the commissioning procedures. The following steps should be followed:

a. Check all rigging diagrams in this manual for proper attachment of the rigging to the mast. Rigging changes are much easier to effect on the ground than in a bosun's chair at the masthead.

b. Record lengths of each piece of standing rigging in the appropriate section of the commissioning check list (in the preceding section). In the first column, record the length shown on the Morgan tag attached to the piece of rigging. This is the correct design length. In the second column, record the actual measured length. Both numbers should agree to within ½".

Actual measurements should include the end fittings (pin to pin) attached to the ends of the wire rope. The turnbuckles should be 2/3 extended during the measurement. The measurement is taken from the centerlines of the pin holes (used to attach the piece of rigging to the mast) and the centerline of the pin hole for attachment to the turnbuckle.

c. Install spreaders, standing rigging, and halyards to the spar. Install any required electronics wiring in the PVC mast conduit provided. Check all attachments and test lights and electronics wiring for proper functioning. Check that the mast step is ready to accept the mast. Slip mast boot on mast before stepping, and temporarily secure.

d. Schedule the crane and suitable manpower to manually guide the mast during stepping.

e. Remove cotterpins from turnbuckles and extend to their full open position. Raise the mast to the vertical position and lower slowly into the deck partner. Guide electrical mast wiring through the hole carefully to prevent damage. Place the neoprene mast partner around the spar and work into place inside the aluminum collar as the mast is lowered in place.

Spray lubricant and a rubber mallet will help. Be sure wiring is held away from the step when lowering the mast onto the step.

IV. OPERATING PROCEDURES

A. Spars and Rigging - continued...

1. Stepping the Mast and Dockside Tuning - cont'd

f. Attach the headstay first and then the backstay(s). Next connect the main shrouds and tighten turnbuckles by hand. Fully release crane support to the spar.

g. Tighten backstay(s) until about a 2" deflection is visible when side pressure is applied approximately four (4) feet above deck. Tighten main shrouds so that they are equally engaged and tension will allow approximately one (1) inch deflection with a side load applied about four (4) feet above deck level.

h. Connect lower shrouds and tension equally for approximately two (2) inch deflection. Sight up the mast to determine the straightness of the mast. If any bends are visible, adjust lower shrouds accordingly until mast is reasonably straight. Final adjust under sail.

i. Install cotterpins, bend over, and tape with rigging tape. Be sure spreader angle bisects shroud angle, then seize the spreaders and install spreader boots or tape ends. Install mast boot. Install boom and connect topping lift. Bend on sails and furl.

2. Tuning Under Sail

With a 10 to 12 knot breeze, sail your yacht to weather. Sight the mainsail tracks for visual straightness. If the mast appears to take on an "S" curve laterally, luff up and adjust the weather shrouds accordingly. It will usually take only three or four turns on any single turnbuckle. Go back on the same tack and sight the track. If straight, change tacks and repeat the same procedure.

Adjust the fore and aft lowers to remove any bends in the longitudinal direction. The mast should be straight fore and aft. You may also notice the masthead falling off to leeward slightly, which is acceptable.

Check the final tuning by tacking several times until satisfied.

In moderate to heavy weather, a noticeably visible slack should appear in the leeward main shrouds. The lower shrouds to leeward should not be loose enough to flop around, but should have a feel of reduced applied load.

A. Spars and Rigging - continued .....

2. Tuning Under Sail - cont'd.

You may find it necessary to re-tune during the first fifty (50) hours of sail. During this period, the shrouds may stretch slightly.

3. Halyards and Outhauls

The halyards are located on the mast and are used to raise and tension the sail in the vertical direction. When the sail is fully up, there should be three (3) to five (5) wraps around the halyard winch before cleating.

The outhaul is located on the boom and is used for sail foot tensioning. It can be thought of as the horizontal halyard of the sail. The main outhaul is internally rigged.

The clew of the sail is attached to the outhaul car on the top of the boom. The car is controlled via a multi-purpose rope assembly that leads internal thru the boom and exits on the gooseneck under side to an aluminum cleat.

If a fuller sail shape is desired for prevailing air conditions, the tension on the clew of the sail can be reduced by releasing the outhaul rope. This will allow the sail and outhaul car to travel forward on the track.

If prevailing air conditions require a flatter sail, tension is added to the clew outhaul rope, pulling car and sail toward the aft end of the boom.

Amount of adjustment required for each condition of sail is at the skipper's direction.

It is recommended that when the yacht is at anchor, the clew outhaul tension be released to avoid stretching the sail.

NOTE: Winches should not be used for operating the optional roller furling line on the jib. This over stresses the roller furling hardware and could result in rig failure and possible dismasting. For ease in furling the jib, head the boat up until the jib starts to luff, then furl.

IV. OPERATING PROCEDURES

A. Spars and Rigging - continued...

4. Quick Reefing (optional)

The following operating procedure is simply a suggested method of quick reefing with actual practice left to each individual skipper's discretion.

Reefing points are provided on the mainsail with reefing lines, blocks, etc. If your mainsail does not have lace lines, they should be added.

It is suggested that the aft end of boom (sail clew) be reefed first, then the tack. The reef line on the boom should be uncleated and tension added to line via the winch on the mast to raise boom to reef point. The reefing line should then be re-cleated.

The halyard should now be eased, and the sail pulled down, bringing the sail down to the boom gooseneck reefing hook, leveling the boom. The halyard should be re-secured. The sail should now be laid on the boom, and the lace lines tied around the boom. The sail should now be neatly reefed to the boom.

If your sail has double reefing, the procedure should be the same as that above.

See reefing drawing 41-107 for details.

IV. OPERATING PROCEDURES

B. Engine

1. Pre-Starting Check-Off

It is advisable to use a pre-start check list, as even the most experienced skipper can overlook an important detail that may evolve into an unpleasant or costly mishap. The check list will vary, as each owner may have optional equipment that will require attention at this time.

The following procedures are offered to help you develop your check list:

a. Check fuel level.
b. Open fuel shut-off valve.
c. Check engine oil and transmission oil.
d. Check for signs of fuel or oil leakage.
e. Check fresh water level in manifold.
f. Open sea water intake to engine (sea valve).
g. Check bilge, shaft log area.
h. Turn battery switch "on".
i. Turn on "blower".
j. Remove any obstruction caught in air intake screen.

2. Starting Procedures

a. Set controls in neutral.
b. Check operation of "stop" control.
c. Advance throttle slightly - approx. 1/3
d. Turn ignition switch to "on".
e. Turn key to full "right" position to crank engine. Release key immediately after start.
f. Check oil pressure light. (Should go out after engine starts).
g. Check for normal water discharge from engine exhaust.
h. Check voltmeter for "charge" indication.
i. Allow engine to reach normal operating temperature and observe any tendency to continue to rise.
j. A final visual check of the engine room is recommended as the engine is warming up.
l. Check forward and reverse operation at idle speed before "casting off" lines.

IV. OPERATING PROCEDURES

B. Engine - continued...

3. Engine Operation

a. Run engine at speeds as recommended in engine manual. Always reduce engine rpm to "idle" before shifting, and make throttle adjustments gradually.
b. Observe engine instruments periodically.
c. Avoid long periods of maximum rpm, as well as extended "idle" periods. Always run engine long enough to reach normal operating temperature, as short run causes excess engine deposits and sludge formation in oil.
d. Become familiar with the sound of your engine at its cruising speeds, and note any vibration characteristics. When an abnormal sound or vibration occurs, reduce rpm and make a quick check of instruments and conditions. Have problem checked as soon as possible.
e. Observe voltmeter readings periodically; and as battery becomes charged, you may switch over to the #2 battery.

CAUTION: Do not turn battery switch to "off" position while engine is running. To do so will damage voltage regulators and possibly destroy diode rectifier in the alternator. It is advisable to reduce rpm to idle if possible while switching batteries to prevent unnecessary surge on the system.

4. Engine Shutdown

a. Place throttle in the idle position and transmission shift lever in neutral.
b. Allow the engine to idle for one minute before stopping and check instruments for proper readings.
c. Pull "stop" control and hold until engine stops. Return to "run" position.
d. Turn "off" ignition switch and blower.
e. Close fuel valve and seacock if boat is to be left unattended.
f. Visually check engine room and bilges for leakage.

NOTE: Check engine "hours" for maintenance scheduling (see engine manual).

READ AND USE YOUR ENGINE MANUAL

IV. OPERATING PROCEDURES

C. Fuel System

One 85 gallon aluminum fuel tank is mounted Starboard side, forward in the Engine Room. Access to the shut-off valve is through the Starboard cockpit seat locker access cover. The cockpit locker liner may be removed for easier access to fuel and vent lines.

The fuel level can be checked by removing the deck fill plate, and using the marked fuel dipstick that is stored in the Engine Room in a PVC holder.

NOTE: Wipe off excess fuel oil before returning the dipstick to the storage holder.

A fuel filter/water separator is located in the Engine Room, mounted Forward and to the Starboard side of the engine. Check periodically for water accumulation at this point (visual check at filter). Replace the element at least once each season, or as required by manufacturer's recommendations. There is also a final fuel filter on the engine itself, and should be changed at intervals specified in your engine manual.

1. Taking on Fuel Procedure

a. Turn off heater and galley equipment.
b. Extinguish all cigarettes, pipes, etc.
c. Stop engine and turn battery switch to "off".
d. Close all hatches and ports to prevent entry of fumes.
e. Do not attempt to take on fuel in rough water or inclement weather, as water might enter through the deck plate.
f. Avoid fueling after dark or in poorly lighted areas.
g. Maintain continuous contact between the nozzle and the deck plate fitting to eliminate the possibility of static electric discharge while filling.
h. Take on only gallon amount anticipated by dipstick reading. Do not overfill to point where fuel remains in fill hose.
i. Wipe up or wash down spills after replacing and tightening deck plate cap.
j. Open all hatches and operate blower before starting engine or re-lighting galley stove.
k. Turn batteries "on".
l. See engine manual for "bleeding" procedures.

IV. OPERATING PROCEDURES

Another note worth mentioning is to acquire your fuel from a reliable source. A diesel engine requires clean fuel; water and dirt being its worst enemy. Keep a clean and tight fuel system, and you will have a most reliable engine.

D. Electrical System

It is important to remember that the DC electrical system in a boat is not the unlimited source of power that one is accustomed to in the home. The battery is a rechargeable storage cell, and you can only take out of it what you have put into it, for a limited period of time. There is generally an overabundance of electrical equipment drawing from the battery, and it is not intended to supply all these fixtures at one time.

1. Batteries

The battery requires periodic attention to terminal connections, electrolyte level and secure fastening. The use of a hydrometer is an inexpensive and accurate measure of a battery's condition. Specific gravity measurements of the electrolyte should read between 1.275 and 1.280 on a normally "charged" battery. All cells should read relatively equal, any one cell that has a noticeably low reading is an indication of a bad cell, and the battery should be replaced. The electrolyte (acid) level should be maintained to cover the plates in the battery. Add distilled water as necessary to maintain that level. Excessive need of water is an indication that the charging rate is too high. A check of the charging voltage should not read over 14.5 volts.

Exercise care in using a hydrometer, as well as all operations around the battery, due to the corrosive nature of sulfuric acid. It is a good practice to have a solution of baking soda around to clean up spills or drippings before they can do damage. Flush with fresh water. Baking soda is excellent for cleaning around batteries, providing the solution is not allowed to get into the cells. After cleaning the battery post and cable connections, a light coat of grease, Permatex, or special spray paint is an effective means of controlling further corrosion.

2. Alternator

The next most critical point in the electrical system is the alternator, whose job it is to maintain the battery's charge and cover the demands on the electrical system while the engine is running. The alternator converts mechanical energy into electrical energy and the drive belt is its only link. This is normally the

IV. OPERATING PROCEDURES

D. Electrical System - continued...

2. Alternator - cont'd.

only periodic attention the alternator will need maintenance-wise. With the engine stopped, the drive pulley on the alternator should not be able to be turned by hand. Belt tension may seem tight enough but the pulley may still slip if the belt is glazed or oily. When checking or tightening the alternator and its connections, it is advisable to turn off the battery switch to prevent accidental "shorting" of the output terminal which is "live" even when the engine is at rest.

3. Starter

The engine starter motor is the most demanding load that will be placed on the elctrical system and is not fused or protected by an overload device. Therefore, it is wise to make periodic checks on the connections at the starter and solenoid switch for tightness and cleanliness. Do not allow tools or other metal object to come into contact with these connections while the battery is "on".

4. Battery Switch

The main battery switch connects either or both batteries to the engine circuit and the DC switch panel, which serves the boat's interior circuits (refer to drawing). Do not switch to "off" position with engine running. "Both" position is intended for emergency or extended engine cranking ability; continuous running in the "both" position when the batteries are in a low state of charge can cause overload and possible damage to the engine alternator.

Do not allow future additional circuits to bypass or defeat the function of this switch. The battery switch must be "on" when boat is unattended to power the automatic bilge pump. Located on the side of the main electrical panel is the DC main 60 amp breaker. This breaker must be in the on position before the DC system will work.

On either side of the battery switch is a breaker labeled Conv. #1 & 2. This breaker allows you to charge either main battery without having the battery switch turned on.

5. Electrical Panel

The DC breaker panel is located in the passageway bulkhead across from the work bench. This panel is equipped with high quality hydraulic magnetic circuit breakers.

Each circuit breaker is wired to an indicator light to show at a glance if the circuit is on. The DC indicator lights are solid state light emitting diodes which require very little current draw.

IV. OPERATING PROCEDURES

D. Electrical System - continued...

5. Electrical Panel - cont'd.

The DC ammeter monitors the amount of current drawn from the battery, and the voltmeter gives an indication of the battery's condition.

The voltage reading may be interpreted as follows:

		Battery Condition
Engine off and electrical system under minimal or no load.	Below 11 volts	Very low
	11 - 12 volts	Low
	12 - 13 volts	Well charged
Engine running fast idle.	13 - 13.5 volts	Low charge rate
	13.5-15.5 volts	Normal charge
	15.5 or higher	Excessive voltage (voltage regulator defective. Replace or adjust.)

The voltage readings should be taken in either battery position, not in "both". Start your engine on the highest charge battery and allow time for the battery to return to its full charge state before putting it on reserve. When switching over to the other battery, be sure not to switch through the "off" position, as this will damage the regulator and possibly the alternator diodes. The "both" position is for emergency or extended cranking periods and should not be used to charge two batteries at the same time, since this can overload and charging circuit if the batteries are low.

6. Cockpit Switch and Engine Panel

The blower motor, compass light and bilge pump circuits are wired to the cockpit panel. Each is fused on the backside of the panel in the engine room.

The following instrumentation for the engine is also located in this panel:

Tachometer
Hour meter (engine room on side of AC/DC panel)
Voltmeter
Temperature gauge
Temperature light
Oil pressure gauge
Oil light
Kill switch (on pedestal face)
Ignition key switch

See drawing for wiring details.

IV. OPERATING PROCEDURES

D. Electrical System - continued...

7. AC 110 Volt Shore Power System

The AC system is a three-wire shore-grounded circuit. The shore power inlet is rated at 30 amps and is mounted on the starboard side of the cockpit coaming.

The top circuit breaker on the panel is the main AC feed, and will trip if reverse polarity is indicated: also, the red polarity light will come on. The entire AC system will not function until the incoming power polarity is corrected and the top breaker stays on. Each circuit (AC) is protected by a single pole breaker. There are six breakers provided for the six separate circuits. For reasons of safety, it is recommended that all appliances used aboard be equipped with a three-wire grounded cord. The AC indicator lights are neon.

The hot water heater is connected to a breaker on this panel, but also has a high temperature re-set button built into the heater. Before applying power to the water heater, always be sure the heater has been filled, by turning on one of the hot water faucets long enough to get a steady flow. An empty hot water heater will burn out the heating element before the temperature re-set button can bread the circuit.

See drawings for wiring details.

The proper procedures for connecting shore power to the boat safely is as follows:

a. Turn ship's main breaker to "off".
b. Turn receptacle on dock to "off", if possible.
c. Connect cable to power inlet on boat first (to prevent handling a "live" power line and possibly coming in contact with water).
d. Route the cable in such a way as to prevent strain on either connector, allowing for the rise and fall of the tide and to prevent chafing.
e. Connect to dockside receptacle and turn shore switch on.
f. Turn on ship's main breaker.

Disconnect procedure:

a. Turn off ship's main breaker.
b. Turn off dockside power and disconnect cord.
c. Replace all weather-tight caps on receptacles.

D. Electrical System - continued...

The owner must be aware of the hazards of using high voltage AC aboard ship and should maintain this system in safe condition.

Do not take a chance handling AC equipment in wet weather, or while washing down topsides. Caution guests and children aboard about hazards, and do not use any equipment that does not function properly or is suspected of being defective.

8. Battery Charger Option

The battery charger, or converter as it is also referred to, is connected to the feed or "output" side of the main battery switch. This allows you to select either or both batteries to be put "on the line" for charging when the engine is at rest. It also insures that, when the battery switch is "off", that all circuits are positively disconnected from the batteries during an emergency shutdown.

Do not turn the battery charger on, when the battery switch is in the "off" position, as this will possibly feed the ship's circuit without the back-up support of the batteries. It may also cause premature failure of electrical equipment in the boat, if the regulator section of the charger should fail, allowing high voltage into the system.

The battery charger has an automatic cut-off circuit which is wired to the engine electrical system. Whenever the engine is started, the charger will shut off and allow the engine-driven alternator to take over, returning to service when the engine is stopped.

The charger is protected by internally mounted fuses on the AC and DC circuits, as well as the main circuit breaker on the AC panel.

See drawing for wiring details.

Be sure all the related circuits are "off" when opening the charger cabinet for service. The charger is an air-cooled unit with louvers on top and bottom. Care must be taken not to restrict the ventilation provided, nor allow small tools or hardware to fall into the charger while performing maintenance work in the engine room.

IV. OPERATING PROCEDURE

E. Plumbing System

1. Thru-Hull Valves (see locator charts in last section)

Below is a list of thru-hull valves and their locations. It is advisable to become familiar with the location and operation of each one, with the thought in mind to maintain a quick access in the event of emergency.

Forward Head

Access under sink in cabinet.
Sink drain 3/4" seavalve.
Head intake 3/4" seavalve.
Head discharge 1-1/4" seavalve.
Shower drain 3/4" seavalve.

Galley

Access under galley sink cabinet.
Galley sink and ice box drain 1-1/2" seavalve.

Engine Room

Portside aft of engine, cockpit drain 1-1/4" seavalve.
Engine intake 1-1/4" seavalve.
Starboard side of engine, engine exhaust
Fiberglass thru-hull 2-1/4"

Aft Head

Access under sink in cabinet.
Sink drain 3/4" seavalve.
Shower drain 3/4" seavalve.

Aft Cabin

Access under starboard locker, aft head.
Intake 3/4" seavalve, aft head discharge.
3/4" seavalve.

NOTE: It is a good practice to close all sea valves when leaving the boat unattended. This is not only intended as a safety factor, but also insures that valves are maintained in working condition, in the event it becomes necessary to close them in an emergency situation.

2. Fresh Water System

Fresh water is supplied by two aluminum water tanks for approximate total gallons of 215. One large tank (125 gal) is located under

95
125
220

E. Plumbing System - continued...

Fresh Water System - cont'd.

the workbench in the passageway walkthru. The other (95 gal.) tank is located in the engine room starboard side aft of the fuel tank. The Port water tank has a control valve under the chart table seat and is filled on deck directly over the aft end of the tank. Water capacity can be checked by using the dipsticks thru the deck fill. The Port tank vents thru the sheer aft of the fill. Water dipsticks are marked Port & Starboard.

The pressure pump is located in the galley sink cabinet. There is an in-line strainer at the water pressure pump. This prevents foreign material from reaching the pump and should be checked periodically.

The pressure water pump is activated by a switch at the DC breaker panel and will run until the water pressure reaches 30 psi. When a faucet is opened and pressure water drops, it will automatically re-start at 16 psi. Upon closing the faucet, the pump will again shut off at 30 psi. If the pump cycles on and off by itself, it is an indication of a leak in the system.

When filling the fresh water system for the first time, or whenever the system has been completely run out of water, it will be necessary to run the pressure pump long enough to purge the air from the lines. Starting from the faucet closest to the pump, run the hot water side until a solid stream of water flows. It is important that the hot water heater is bled in this manner before turning on the AC breaker, as the heating element will be damaged if the tank is empty.

Operate each faucet in turn until air is out of the system, and "top off" the water tank.

3. Bilge Pump

The bilge pump is a submersible type pump. It is actuated by a switch on the cockpit panel, "automatic" via the float switch, or in themanual position which overrides the float switch, and will run continuously until returned to "off" or automatic. The water is routed to the cockpit drain manifold in the engine room.

E. Plumbing System - continued...

4. Sump Pumps

A sump pump is provided for each shower and is controlled by a switch in the head which must be turned on when using the shower. The circuit is protected by a breaker on the DC breaker panel.

5. Marine Heads and Holding Tanks

The marine head is manually operated, using sea water for flushing. The inlet and discharge valves should be checked to be open before using. At the head, there is a sea valve at the pump inlet that must also be opened before using. Further detailed instructions for winterizing, etc., will be found in the manual supplied by the manufacturer.

The basic instructions for operating the head as suggested by the manufacturer are:

"To operate toilet, inlet valve should be in open position. Before using, pump to wet inside of bowl. After using, pump until thoroughly cleaned. Pump a few more times to clean lines. If excess waste should cause water to rise in bowl, stop pumping until water recedes."

"To winterize toilet: Shut off intake valve. Pump until dry. Remove drain plug in base. Pump again to remove all water. Do not use anti-freeze."

"Do not put rags, matches, paper towels or any foreign material in bowl that will plug up valves."

Holding tanks, for use in restricted waters, allow the head to be used as needed, but one must remember to minimize the amount of water pumped for flushing to extend the capacity of the tank. The holding tanks are made from high density polyethylene and are F.D.A. approved. A 26 gal. tank is located under the V-berth and a 21 gal. tank is located under the aft cabin starboard side with access thru dropins.

It is connected to a "tee" fitting in the normal overboard head discharge system. To use the holding tank, rather than the overboard discharge, the valve at the thru-hull must be closed first and then open the holding tank shut-off valve.

E. Plumbing System - continued...

A deck plate provides for pumping out at dockside, and the system should be rinsed and re-pumped out which can be done by pumping through the toilet or by hose through the deck plate. Use of a commercial chemical toilet treatment and deodorizer is recommended.

6. Dockside Water Supply (Optional)

The optional dockside water supply allows the boat's fresh water system to operate without drawing from the tank, or using the ship's DC power supply to operate the pump.

The water inlet fitting is mounted on the starboard cockpit coaming and is connected by means of a garden hose to the shore supply.

A pressure regulator valve, which maintains 40 psi or less to the fresh water system, is located in the engine room near the inlet fitting penetration.

The electric pressure pump has a check valve in the outlet fitting which prevents water from flowing back to the boat's water tank.

CAUTION: Do not leave the boat unattended with the pressure water line "on". A failure in any of the yacht's water lines could result in sinking of the yacht.

IV. OPERATING PROCEDURES

F. Refrigeration - Ice Box

The ice box is a dual lid divided one-piece molded fiberglass unit insulated with a nominal three-inch thick surrounding of polyurethane foam sealed with fiberglass. The inner surface is gelcoated with a sanitary-ware formula, which is non-toxic and will not "flavor" food.

The drain is connected directly to a manual pump located under the galley sink, and is pumped overboard through a connection in the galley sink drain.

When the boat is to be idle for a prolonged period, it is advisable to flush the ice box and leave it open to the air to prevent mildew or odor formation.

IV. OPERATING PROCEDURES

G. Opening Ports and Hatches

Ports

The glazing is Lexan, an extremely tough plastic, which flexes but is almost impossible to break. A neoprene "O" ring is the primary seal between the glazing and the frame.

When dogging down the ports, it is not necessary to use more than "finger" tightening force. Excessive force, for example, through the use of pliers, may damage the gasket. If finger tightening does not provide a complete seal, open the port and check the seating of the gasket. The usual causes for leaks through the portlights are shifted or damaged gaskets and/or dirt on the gasket or lens surface.

Hatches

The operation of the hatches is straight forward. The following precautions will prevent accidents and reduce the chance of damaging the hatches.

-Open and close hatch carefully. The thermoformed acrylic hatches can be damaged (at the hinge attachment) by slamming the hatch opened or closed.

-When the hatch is to be left open, be sure that all positioning devices are used.

-Before closing the hatches, be sure all obstuctions (particularly fingers and heads) are clear.

-When dogging down the hatches, do not use excessive force. You should not need to use any tools for this purpose.

IV. OPERATING PROCEDURES

H. Navigation Lights

Navigation, or "running" lights must be in accordance with the rules and regulations of the navigable water the yacht owner intends to use.

International rules and regulations are required to be observed on seagoing vessels. The inland rules and regulations are for intracoastal waterways, with certain areas such as the Great Lakes and Western Rivers having special requirements and rules pertinent to their local areas.

Morgan has listed the following notes, for your reference, from the International rules. We suggest the owner of any vessel acquire a copy of the United States Coast Guard publications on the "Rules of the Road: for their intended areas of navigation.

In general, the navigation lights are required from sunset to sunrise, weather conditions good or bad. It is suggested that, in times of reduced visibility, from sunrise to sunset, navigational lights be operational.

If vessel is underway by use of power, and is under 150 feet in length, it is required to operate a forward light, white in color, 20 point angle (225^{o}), 5 miles visibility range; a stern light, white in color, 12 point angle (135^{o}), 2 mile visibility range; side lights, green to starboard, red to port, in color, 10 point angle ($112\frac{1}{2}^{o}$), 2 mile visibility range.

If vessel is anchored, it is required to operate its anchor light, white in color, 32 point angle (360^{o}), 2 mile visibility range.

The yachtsman is encouraged to become familiar with the complete rules and regulations of the above mentioned situations, as well as other possible conditions of operation. Proper operation and use of navigational lights is important for the safety of the yachtsman and the future of boating. A diagram illustrating navigation lights installed on your Classic 41 at the factory is given in the last section of this manual.

IV. OPERATING PROCEDURES

I. Lightning Protection

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

1. We are not aware of a procedure for lightning protection which is proven reliable under all conditions. We are aware of situations where 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 confidence in the owner/operator, leading to less than prudent actions when lightning threatened.

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 and 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 Morgan to control changes, you, the owner, may make to the yacht which could affect the lightning protection system.

You, the owner, must decide whether you wish to equip your yacht with lightning protection, and if so, the method of doing so. For your guidance, a copy of ABYC recommendations is attached. The following suggestions and comments are also offered:

1. Keep the system as simple as possible. This will facilitate both installation and inspection/maintenance. Perhaps a single oversize ground (battery cable) from the mast base to the engine, coupled with external shroud grounds (see 2. below), will maximize reliability.

2. ABYC recommends straight line wire runs, which 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 advantages of keeping the power surge outside the boat and allowing easy and routine inspection. The obvious disadvantage is that the clip-on cables are not a permanent installation and may not be in place when an unexpected lightning strike occurs.

IV. OPERATING PROCEDURES

I. Lightning Protection - continued...

3. Use only top quality materials and go oversize where possible.

4. Keep all permanent attachment points and connections where they are readily available for inspection, yet protected from damage or inadvertent disconnection.

Factory installed metal tanks, 110 volt systems and major metal components are grounded to the engine. The engine is grounded via the shaft and prop to the water. The purpose of the internal grounding is for static charge control and accidental shorts in the internal systems not to provide lightning protection. However, you can incorporate the ground lines present in a lightning protection system you may wish to add.

By far the most important consideration regarding lightning is observing common sense safety precautions when lightning threatens. The key considerations are listed in appendix E-4 of the attached ABYC recommendations.

RECOMMENDED PRACTICES AND STANDARDS COVERING LIGHTNING PROTECTION

PROJECT E–4

ABYC E–4–85

Based on ABYC's assessment of the state of existing technology and the problems associated with achieving the requirements of this standard, ABYC recommends compliance with this standard by August 1, 1985.

E–4.1 *PURPOSE*

These recommended practices and standards establish requirements for the design, construction and installation of lightning protection equipment on boats.

E–4.2. *SCOPE*

These recommended practices and standards apply to power and sailboats as indicated.

NOTE: A lightning protection system offers no protection when the boat is out of water and is not intended to afford protection if any part of the boat comes in contact with power lines while afloat or ashore.

E–4.3. *DEFINITIONS*

a. *Air Terminal* – A metal rod that terminates in a sharp point.

b. *Lightning Ground Plate* – A means to conduct the electrical current from a boat's conductive elements to the water in which the boat floats. A separate lightning ground plate may be used or it may also serve other purposes. (See ABYC E–4.6.g.)

c. *Lightning Protective Mast* – A conductive structure or if non-conductive, equipped with a conductive means and an air terminal.

d. *Zone of Protection* – An essentially cone shaped space below a grounded air terminal or mast or overhead ground wire which is substantially immune to direct strokes of lightning. (See Appendix)

E–4.4. *REQUIREMENTS – IN GENERAL*

Successful protection of persons and watercraft from lightning is dependent upon a combination of design and maintenance of equipment, and on personnel behavior. The basic guides contained in this standard shall be considered and used in designing and installing a lightning protection system. However, in view of the wide variation in structural design of boats, specific recommendations cannot be made to cover all cases.

– Design is covered in this and the following sections of this standard.

– Maintenance of equipment is covered in the Appendix.

– Personnel behavior is covered in the Appendix.

a. To provide an adequately grounded conductor or lightning protective mast, the entire circuit from the top of the mast to the ground shall have a conductivity not less than that of an 8 AWG copper conductor and the path to ground followed by the conductor shall be essentially straight.

b. If there are large metal objects such as tanks, engines deck winches, stoves, etc. in proximity to the grounding conductor, there will be a strong tendency for sparks or sideflashes to jump from the grounding conductor to the metal object at the closest point. To prevent damage from such sideflashes, an interconnecting conductor at least equal to 8 AWG copper shall be provided at all places where they are likely to occur.

c. Large metallic objects which are not part of the electrical system of the boat and which are not already grounded due to their own functional or other requirements may be grounded directly to the ground plate, provided that it is not practical to interconnect with the lightning conductor or bonding systems. (See ABYC E–4.6.d.)

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E–4.5. *REQUIREMENTS – MATERIALS*

a. *Corrosion* – The material used in a lightning protective system shall be resistant to corrosion. If, as in certain installations, it is impractical to avoid a junction of dissimilar metals, the corrosion effects can be reduced by the use of suitable platings or special connectors which are available for such purposes.

b. *Wire Conductors* –

(1) Wire conductors shall be stranded copper not less than 8 AWG.

(2) The size of any strand of a bare copper wire shall be not less than 17 AWG. Stranding of insulated copper wire shall be Type II stranding per ABYC E–8, "AC Electrical Systems" or ABYC E–9, "DC Electrical Systems Under 50 Volts".

c. *Other Conductive Means* –

(1) Conductivity shall be equal to or greater than 8 AWG copper wire.

(2) The thickness of metal ribbon or strip shall be at least 1/32 inches.

E–4.6. *REQUIREMENTS – INSTALLATIONS*

a. *Conductive Joints* – Conductive joints shall be made and supported in accordance with ABYC E–9, "DC Electrical Systems Under 50 Volts".

b. *Lightning Protective Mast Height* – A lightning protective mast shall be of a height to provide the desired zone of protection in accordance with the following:

(1) For a mast height not exceeding 50 feet (15m) above the water, the base radius is approximately equal to the mast height. (See Figures 1 and 2)

(2) For mast heights in excess of 50 feet (15m) the zone of protection is based on the striking distance of the lightning stroke. Since the lightning stroke may strike any grounded object within the striking distance of the point from which final breakdown to ground occurs, the zone of protection is defined by a circular arc. (See Figure 3) The radius of the arc is the striking distance (100 feet (30m)). The arc passes through the tip of the mast and is tangent to the water. If more than one mast is used, the zone of protection is defined by arcs to all masts.

(3) The zone of protection afforded by any configuration of masts or other elevated, conductive, grounded objects can readily be determined graphically. Increasing the height of a mast above the striking distance will not increase the zone of protection.

c. *Lightning Protective Mast Alternatives* –

(1) If the mast is of non-conducting material, the associated lightning or grounding conductor shall:

(a) be essentially straight,

(b) be securely fastened to the mast,

(c) extend at least 6 inches (150mm) above the mast,

(d) terminate in an air terminal, and

(e) be led as directly as practicable to the grounding connection. (See ABYC E–4.g.)

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(2) A radio antenna or outrigger may serve as a lightning protective mast provided it has conductivity equivalent to 8 AWG copper and is equipped with:

(a) lightning arresters,

(b) lightning protective gaps, or

(c) means for grounding during electrical storms.

NOTE: Non-conducting antenna masts with spirally wrapped conductors are not considered suitable for lightning protection purposes.

(3) The grounding of metal rod type radio antennas provides some protection for boats without masts and spars, provided:

(a) Conductors in the grounding circuit of the antenna have a conductivity equivalent to 8 AWG copper in accordance with ABYC E—4.5.b.

(b) The top of the antenna is not more than 50 ft. (15m) above the water, and a line drawn from the top of the antenna downward toward the water at an angle of 45 degrees to the vertical does not intercept any part of the boat. (See ABYC E—4.6.b.)

(c) The antenna loading coil is provided with a suitable protective device for bypassing the lightning current.

NOTE: Because a loading coil presents a high impedence to the flow of lightning current, the portion of an antenna above the bottom of a loading coil is not effective as a lightning protective mast.

d. *Interconnection of Metallic Masses* – Metallic masses aboard boats which are a permanent part of the boat or are permanently installed within or about the boat, and whose function would not be seriously affected by grounding, shall be made a part of the lightning-conductor system by interconnection with it. (See ABYC E—4.6.f.)

EXCEPTION: Comparatively small size metallic masses.

NOTES: 1. The object of interconnecting the metal parts of a boat with the conductor is to prevent damage from sideflashes, especially in the case of rather extensive metal objects that are nearby. The main principle to be observed in the prevention of such damage is to identify on a boat the places where sideflashes are most likely to occur and to provide metallic paths for them.

2. To minimize flow of lightning discharge current through engine bearings, it may be preferable to bond engine blocks directly to the ground plate rather than to an intermediate point on the lightning conductor.

e. *Exterior Bodies of Metal* – Metal situated wholly on the exterior of boats shall be electrically connected to the grounding conductor.

NOTE: Exterior metal bodies on boats include any large masses such as horizontal guardrails, handrails on cabin tops, smokestacks from galley stoves, electric winches, davits, metal signal masts, and metallic hatches.

f. *Interior Bodies of Metal* – Metal situated wholly in the interior of boats and which at any point comes within 6 ft. (1.8m) of a lightning conductor shall be electrically interconnected with this lightning conductor.

NOTE: Interior bodies of metal include engines, water and fuel tanks, and control rods for steering gear or reversing gear. It is not intended that small metal objects such as compasses, clocks, galley stoves, medicine chests, and other parts of the boat's hardware be grounded.

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(1) Metal which projects through cabin tops, decks or sides of boats above the sheer shall be bonded to the nearest lightning conductor at the point where the metal emerges from the boat and shall be grounded at its lower or extreme end within the boat.

(2) In order to protect the radio transmitter, antenna feedlines shall be:

(a) equipped with means for grounding during electrical storms, or

(b) protected by lightning arresters or lightning protective gaps.

g. *Lightning Ground Connection* – A lightning ground connection for a boat may consist of any metal surface which is submerged in the water and which has an area of at least 1 sq. ft. (0.093m^2).

(1) Metallic rudder surfaces, metal centerboards and keels, or the ground plate for radio transmitters may be used for this purpose.

(2) A metal hull itself constitutes an adequate lightning ground plate.

E—4.7. *REQUIREMENTS – VESSELS WITH METAL HULLS*

If there is electrical continuity between metal hulls and masts or other metallic superstructure of adequate height in accordance with ABYC E—4.6., then no further protection against lightning is necessary.

E—4.8. *REQUIREMENTS – SAILBOATS WITH NON—METALLIC HULLS*

a. Sailboats with metallic standing rigging will be adequately protected provided that all rigging is grounded so that the mast and rigging meet the requirements of ABYC E—4.5. and E—4.6.

b. Sailboats will be adequately protected if all shrouds, back stays, preventers and continuous metallic track on the mast and boom are grounded. These shall be electrically connected at the lower or forward end and grounded to a metal plate on the hull or to a metal rudder, centerboard or keel.

c. All stays and sail tracks shall be grounded.

d. Grounding of other objects on sailboats shall be in accordance with ABYC E—4.6.

e. Multihull boats shall provide a lightning ground connection in accordance with ABYC E—4.6.g. for each hull that has items to be grounded, attached, or fitted to it.

E—4.9. *REQUIREMENTS – POWER BOATS WITH NON—METALLIC HULLS*

a. Power boats may be adequately protected by a grounded radio antenna, outrigger, or other grounded lightning protective mast in compliance with ABYC E—4.6., provided the height of the mast conforms to that described for the zone of protection.

b. Interconnection and grounding of metallic masses shall be in accordance with ABYC E—4.6.

E—4.10 *REQUIREMENTS – SMALL BOATS*

a. Small boats may be protected by means of a temporary lightning protective mast which may be erected when lightning conditions are observed in the distance.

b. Grounding provisions may be made by means of a flexible copper wire and a submerged ground plate of at least 1 square foot (0.093m^2) in area.

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FIGURE 1 – BOAT WITH MAST NOT EXCEEDING 50 ft. (15m) ABOVE THE WATER

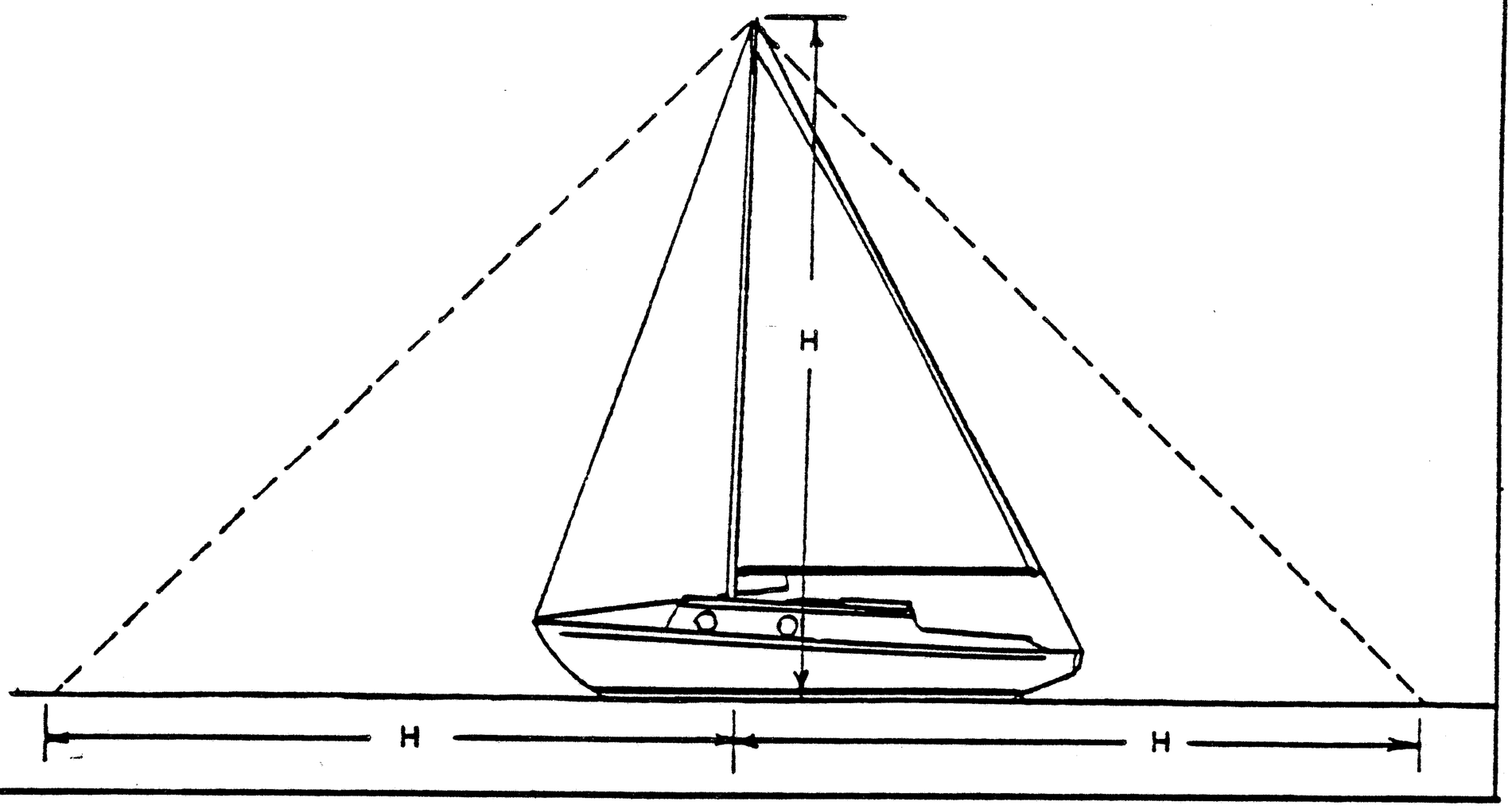
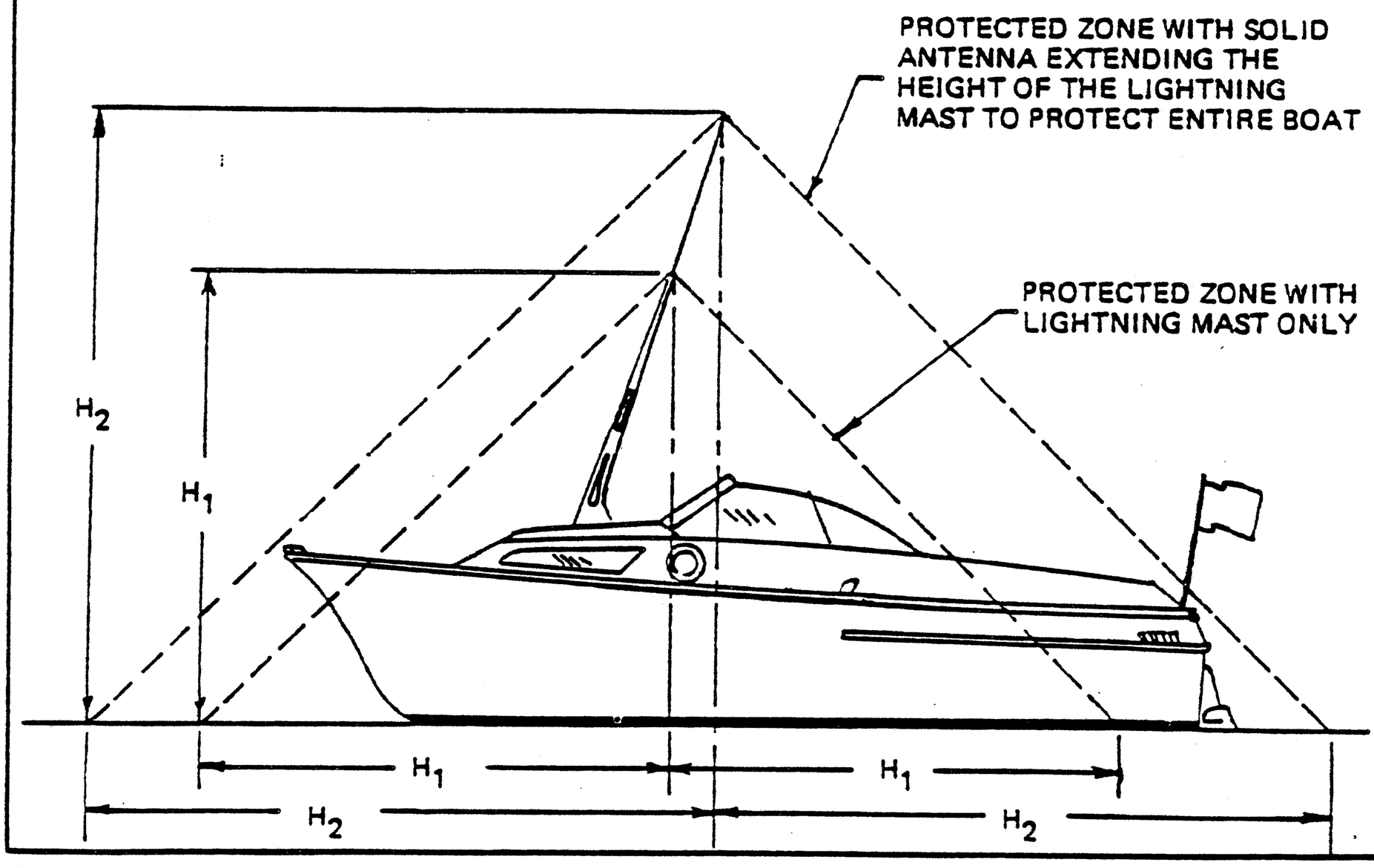


FIGURE 2 – BOAT WITH MAST NOT EXCEEDING 50 ft. (15m) ABOVE THE WATER



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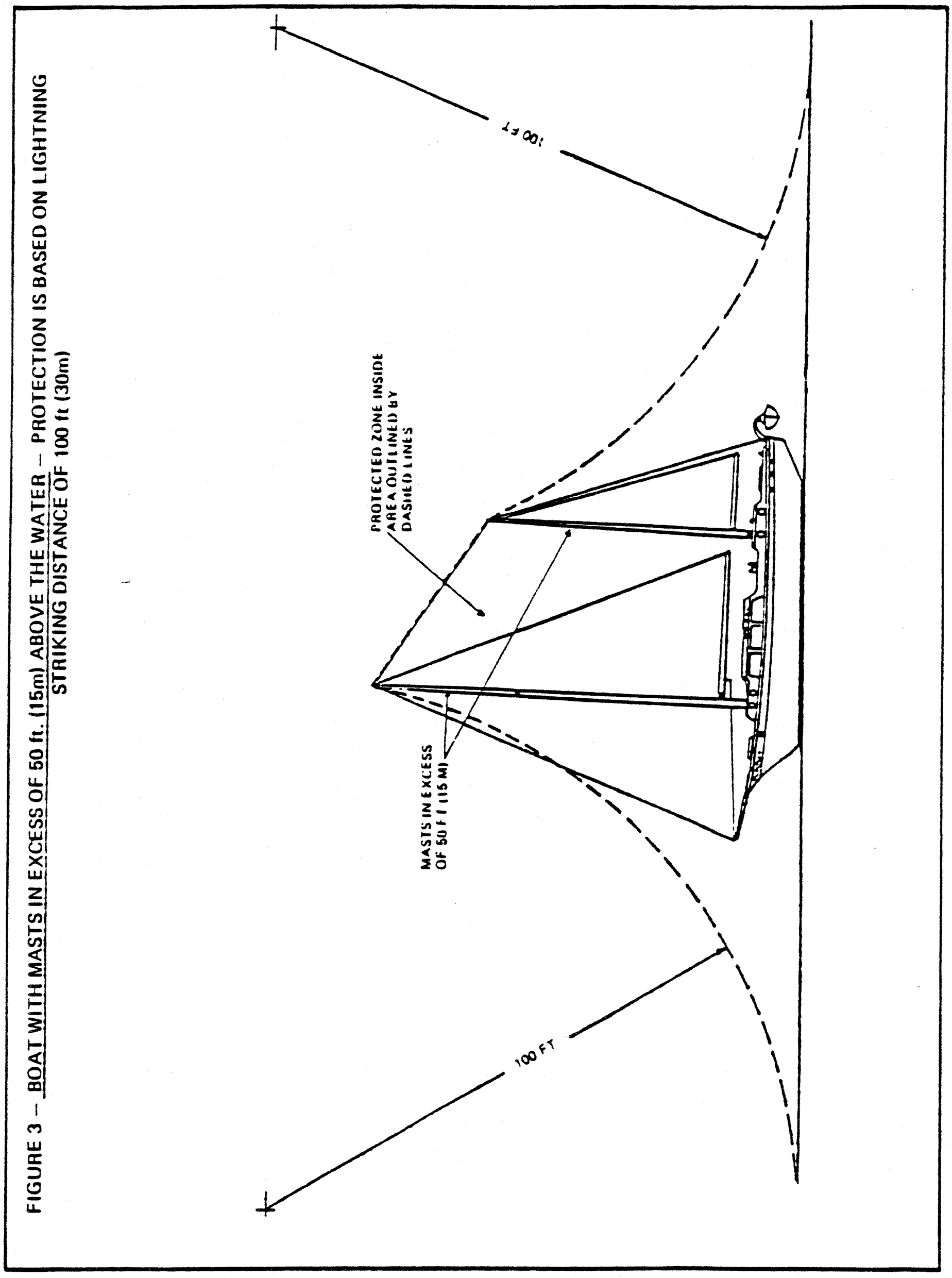


FIGURE 3 – BOAT WITH MASTS IN EXCESS OF 50 ft. (15m) ABOVE THE WATER – PROTECTION IS BASED ON LIGHTNING STRIKING DISTANCE OF 100 ft (30m)

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APPENDIX – LIGHTNING PROTECTION

This appendix contains additional information of a descriptive nature and recommendations pertaining to maintenance and behavior of personnel.

E–4.Ap.1. *Zone of Protection* – A grounded conductor, or lightning protective mast, will generally divert to itself direct hits which might otherwise fall within a cone-shaped space, the apex of which is the top of the conductor of lightning protective mast and the base a circle at the surface of the water having a radius which is related to the height of the top of the conductor or lightning protective mast.

a. To protect a boat of the size that renders the use of a single mast impracticable, additional lightning protective means shall be erected to form overlapping zones of protection.

b. Boats with ungrounded or non-conductive objects projecting above the metal masts or superstructure may have these objects protected by a lightning ground conductor terminating in an air terminal above the object.

c. Whip-type radio antennas shall not be tied down during a lightning storm if they have been designed as a part of the lightning protection system.

E–4.Ap.2. *Maintenance* – Lightning protection provisions are quite likely to receive scant attention after installation, and therefore their composition and assembly shall be strong and materials used shall be highly resistant to corrosion.

a. Grounding of metallic objects for lightning protection may increase the possibility of harmful galvanic corrosion. (See ABYC E–2, "Cathodic Protection")

b. If a boat has been struck by lightning, compasses, electrical and electronic gear shall be checked to determine whether damage or changes in calibration has taken place.

c. If a boat has been struck by lightning the lightning protection system shall be inspected for physical damage, system integrity and continuity to ground.

E–4.Ap.3. *Precautions for Personnel* – The basic purpose of protection against lightning is to ensure the safety of personnel. It is therefore appropriate that the following precautions be taken:

a. personnel shall remain inside a closed boat, as far as practical, during a lightning storm,

b. arms and legs shall NOT be dangled in the water,

c. consistent with safe handling and navigation of the boat during a lightning storm, personnel shall avoid making contact with any items connected to a lightning protection system and especially in such a way as to bridge between these items; for example it is undesirable that an operator be in contact with reversing gear levers and a spotlight control handle at the same time,

d. personnel shall NOT be in the water during a lightning storm, and

e. personnel shall avoid contact with metal parts of a sailboat's rigging, spars, fittings and railings.

* * * * * *

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V. MAINTENANCE PROCEDURES

A. Engine: Yanmar Diesel

Please consult your engine manual for detailed procedures. The engine manual must be followed exactly to obtain maximum engine life and to keep your warranty in effect. The following sections summarize the maintenance requirements described in the manual and are intended as general information only.

1. Break-in Period -

During the first twelve (12) hours of operation, the engine should not be run at maximum RPM. At 25 hrs., the following service should be performed:

a. Change engine oil and filter.
b. Check belt tension.
c. Check all external nuts, set screws, etc. for tightness.
d. Check shaft coupling alignment.
e. Check fuel, oil, and coolant levels and look for leaks.
f. Adjust idle speed, if necessary.

2. Before each outing -

a. Check coolant level.
b. Check engine oil level.
c. Check transmission oil level.
d. Look for evidence of leaks under engine.

3. Every 150 hours or 4 months (whichever occurs first) -

a. Change engine oil and filter.
b. Check drive belt tensions.
c. Clean air intake.
d. Clean water (fuel strainer) trap.
e. Look for evidence of leaks.

4. Every 500 hours or 12 months (whichever occurs first) -

a. All steps under Item 3. above.
b. Change final fuel filter element.
c. Check hoses and clamps.
d. Drain and clean fuel tank.
e. Change gearbox oil.

IV. MAINTENANCE PROCEDURES

A. Engine: Yanmar Diesel - continued...

5. Every 2400 hours -

a. Have Yanmar representative examine and service proprietary equipment such as starter, generator, etc.
b. Adjust valve tip clearances.
c. Service atomizers.

6. Bleeding the fuel system -

a. Check fuel tank shut-off to be "on".
b. Check fuel filter for sediment or water by opening drain plug on bottom. Replace plug.
c. Follow routing of hose from fuel filter to engine lift pump, inspecting hoses as you go. On the engine lift pump, you will find a lever which allows you to manually operate the diaphragm inside, against spring tension. It may be necessary to turn the engine over with the starter slightly to allow the pump arm to relax against the camshaft. This allows more stroke with the manual lever you are operating.
d. Follow the fuel line from the pump to the engine fuel filter and locate the vent plug on top. Loosen plug two or three turns.
e. It is avisable to have some large rags on hand to catch oil that will be expelled from this point in the course of bleeding.
f. Begin operating the manual lever. This may take several minutes as the filters will need to fill up (as well as the lines). Operate the manual lever until fuel flows freely from the filter plug with no signs of air bubbles.
g. Loosen the one bleed screw on the injection pump.
h. Operate pump again until fuel flows freely with no bubbles.
i. Re-tighten the vents beginning with the lowest point.
j. Wipe up any spills at this time.
k. Slacken the union nut at the injection nozzles.
l. Move throttle to full RPM and check to see if the "Stop" control is in "run" position.
m. Crank engine with starter motor until fuel flows from each injector.
   NOTE: Do not run starter motor continuously. It normally takes 30 to 60 seconds of cranking to completely bleed the injector lines. Twenty seconds of cranking with about a two minute rest between periods will be easier on the starter motor and battery than steady cranking.
n. Re-tighten injector lines, wipe spills.

V. MAINTENANCE PROCEDURES

A. Engine: Yanmar Diesel - continued...

6. Bleeding the fuel system - cont'd.

o. Reset throttle position and proceed with normal start-up.
p. Allow sufficient running time to re-charge battery.

V. MAINTENANCE PROCEDURES

B. Drive Train

1. Engine Alignment

The propeller shaft of the Classic 41 is 1-1/4" diameter, corrosion-resistant stainless.

The shaft is checked for accuracy initially at the factory during installation and is carefully aligned to the engine with the hull being properly supported and level. At this time, the shaft log and bearing is bonded to the hull penetration. The coupling to the engine is checked again for alignment by the commissioning dealer or agent prior to delivery of the boat. This alignment check should be made periodically, since the action of a rough sea could possibly change the shape of a boat enough to disturb engine alignment. If, after the first rough water experience, the alignment has not changed, it is usually only necessary to make the check once per season. The coupling should always be disconnected before the boat is lifted out of the water, and alignment will then be necessary.

The alignment is considered acceptable if there is a gap less than .0005" per inch of face diameter of the coupling (.002 for a 4" coupling, .0025 for a 5" coupling). The feeler gauge is inserted between the flanges at four points 90 degrees at a time. Then check again, keeping the engine coupling stationary and rotating the shaft coupling 90 degrees at a time. This checks the squareness of the coupling face to the shaft centerline. The engine alignment is adjusted by raising and lowering the adjusting nuts at each mount. To make lateral adjustment, loosen the mounting pad screws which anchor the engine to the bed. You will note there are slots in the mount pad which allow a reasonable amount of adjustment side-to-side.

After adjusting and re-tightening all mount screws and lock nuts, double check the alignment.

In the absence of a feeler gauge, the alignment can be checked fairly accurately with a strip of paper. Insert the paper between the two halves of the outer flange and rotate both together 360 degrees. The paper should remain in place through the complete turn.

2. Transmission

Kanzaki Hurth reversing gearbox units are equipped with helical gear sets and a mechanical friction clutch. They are designed for direct shifting at maximum engine rpm. Emergency reversing operations in the event of danger can thus be performed at full speed. Gear changing requires only little effort, making the transmissions

V. MAINTENANCE PROCEDURES

B. Drive Train - continued...

2. Transmission - cont'd.

suitable for single-level remote control. The clutches are exactly rated to suit the engine torque, so that shock loads originating from the propeller will not affect the gearbox or engine.

The transmissions have oil bath lubrications. Rotation of the propeller shaft without load while the boat is sailing, being towed, or anchored in a river, as well as running of the engine while the propeller shaft is standing still, will have no detrimental effects on the gearbox.

NOTE: Place the transmission in reverse position to lock shaft.

3. Stuffing Box

The stuffing box provides a seat for the propeller shaft at the inner end of the shaft log. It is connected to the shaft log with heavy wall hose, double clamped at each end. This flex hose allows the stuffing box to maintain alignment with the prop shaft without creating excess wear at the packing due to misalignment or vibration.

The packing used is wax impregnated 3/16" x 3/16" square flax.

When the shaft is turning, it is normal to have a slight leakage at the seal. This acts as a coolant, as well as a lubricant, to protect the seal and shaft surface. Should excessive leakage be apparent, release the lock nut and tighten the packing nut slightly and re-tighten the lock nut. Re-start engine and check again with shaft turning.

When it becomes necessary to replace the packing (boat must be hauled), loosen the lock nut, back off the packing gland nut and slide it forward on the shaft. Remove all the old packing and replace it with three rings of new packing. Stagger the ends of each ring so as not to provide a path for water to leak through.

Do not wind one continuous strip spirally around prop shaft to make a seal.

Slide the packing gland back and tighten enough to create a heavy drag on the shaft. This will seat and form the packing.

Back off the packing nut until the shaft feels free and re-set the lock nut. Re-check for proper leakage when the boat is returned to the water. Be sure the lock nut is secure, as operating the boat in reverse could cause the packing gland to screw off the stuffing box, allowing water into the boat.

V. MAINTENANCE PROCEDURES

B. Drive Train - continued...

4. Propeller Shaft Removal

It will be necessary to drop the rudder to remove the propeller shaft. The rudder lower bearing is designed for easier removal of the rudder for maintenance.

V. MAINTENANCE PROCEDURES

C. Exhaust System

Check for leakage and proper supporting. The section of exhaust hose leading to the exhaust thru-hull should be inspected for leakage at its connections. Look for physical damage to the hose, particularly at support points.

V. MAINTENANCE PROCEDURES

D. Steering System

1. Stuffing Box

The rudder stuffing box is packed with a wax impregnated flax packing. The cap nut is packed with three rings of packing and tightened down on the upper bearing tube to the point where no leakage occurs. This fixture has a tapered thread and will nold its position when properly tightened and packed. Should the fitting leak and further tightening is not practical, remove cap and re-pack with new packing, spacing each successive ring so that the ends are 180 degrees apart.

2. Gudgeon Assembly

Each time the yacht is hauled, carefully inspect the gudgeon assembly and all its fasteners for signs of physical damage and/or electrolysis.

3. Steering System

The Edson pull-pull steering system is presently being used on the 41 model. This system requires periodic lubrication, using Teflon lubricant. Lubrication information from the Edson Manual is reprinted below.

> "The roller chain should be oiled (not greased), the steerer bearings oiled if bronze and greased if needle bearings."
>
> "The wire should be inspected at least once a year and re-lubricated more often if the boat is contemplating an offshore or long distance cruise. After five years, the wire should be replaced and the old wire kept for spares if it is in usable form. The steering is the one piece of machinery used all of the time that the boat is away from the dock. Most of the "horror stories" that are heard regarding steerers is one of unfamiliarity of the system combined with lack of maintenance. With a well designed, well maintained steerer the boat should be a pleasure to all."
>
> "NOTE: At all times make sure that the entire assembly is tight, all screws and bolts are well fastened down and all parts are well aligned and that the cable is well lubricated."

Cable tension is adjusted lightly just to the point of removing "play".

V. MAINTENANCE PROCEDURES

E. Electrical System

1. Preventive Maintenance

Electrical systems are adversely affected by moisture and a salt air environment. Preventive maintenance consists of protecting the system from the elements and periodic inspection for damage created by the elements.

There are numberous aerosol spray products available for moisture-proofing terminals and connections. RTV silicone can also be used. The silicone provides a more permanent seal, but is more difficult to remove should you wish to disconnect the wiring. If RTV silicone is used, it should be a transparent grade so that the connection will be visible through the sealant.

Periodically, check all wire harnesses and connections for secure fastening, cleanliness, and any signs of physical damage or corrosion. All terminals should be clean and bright at their mating surfaces. A dirty or corroded contact area will cause resistance, and, depending on the load attempting to pass through, generate heat. This, in turn, increases resistance and will eventually burn the terminal with a resulting failure of the circuit. Battery drainage and possible electrolysis problems will occur prior to the circuit failure. Thus, it is extremely important that connections be kept clean. Correct any problems detected in the inspection.

CAUTION: Do not perform any maintenance or repair functions on a "live" circuit. Be certain that the battery switch is off when working on the 12 volt system and the 110 volt main breaker is off when working on the 110 volt system. It is also a good practice to remove all metal jewelry (rings, watches, wristbands, etc.) when working near the batteries or on any electrical component.

2. Repair

Refer to the schematics shown in the last section of the owner's manual in trouble-shooting and repairing electrical system problems.

With the exception of the engine harness (connector plug at the engine) and the mast harness (connector at the mast step), the wire runs are continuous from point to point.

V. MAINTENANCE PROCEDURES

E. Electrical Maintenance - continued...

2. Repair - cont'd

The wiring is color coded to ABYC recommendations where practical, according to wire color availability. The following list describes the color coding system used in your yacht:

Interior Harness

Red - All feed circuits (from source of power - negative
Black - All return circuits (ground) - negative
Green - All bonding circuits (non-current carrying) - static ground
Blue - Cabin lights
Brown - Pumps
Orange - Accessory circuits, bilge pump
Grey - Navigation lights

Engine Harness

See Cockpit Engine Panel Drawing.

Mast Harness

Red - Masthead light
White - Bow light
Green - Spreader or foredeck light
Black - Ground

3. GFCI Protection

The receptacle in the Fwd. head area is equipped with ground-fault circuit interrupter devices. The GFCI receptacle is connected in line with other receptacles which are protected by this device.

The purpose of this device is to provide protection against the hazards of ground-fault currents that can cause loss of life. An example of ground fault current is the current that would flow through a person who is using an appliance with faulty insulation and at the same time is in contact with an electrical ground such as a plumbing fixture or wet floor.

Even with GFCI protection, an electric shock may be felt, but such shock will be less dangerous. The GFCI does not protect a person who contacts both the hot and neutral wire. There is no known device that can offer complete protection against electrical

V. MAINTENANCE PROCEDURES

E. Electrical System - continued...

3. GFCI Protection - cont'd.

accidents under all conceivable conditions. There is no substitute for remembering that electricity is dangerous when handled carelessly or misused.

The GFCI is not an overload type of circuit breaker, but senses an unbalanced condition between the "hot" and neutral circuit and immediately interrupts the circuit.

When the GFCI circuit opens, all other receptacles down line from it will also be "off". Remove the appliance at fault and reset the button GFCI unit to restore service.

Test the circuit frequently as instructed by the manufacturer, or at least every 30 days.

V. MAINTENANCE PROCEDURES

F. Cathodic Protection

Cathodic protection is a means to control underwater galvanic corrosion. This is an owner's maintenance responsibility. Your local boat yard or commissioning dealer can provide you with the necessary zinc sacrificial anodes suitable for the area and type of water in which the boat will be operated and moored.

Generally speaking, most boats have dissimilar metals somewhere below the waterline, and the seawater acts as an electrolyte. This causes a current to flow from one to the other, with the yielding structure gradually corroding and weakening. This is a natural situation; but, when a zinc anode is attached to the section under attack, the zinc will yield instead, giving itself up and preventing corrosion damage. The zinc anode must be securely attached and electrically grounded to the fixture it is intended to protect.

For example:

> "If the boat is equippped with a bronze propeller and stainless steel rudder heel supports, the stainless steel is lower on the galvanic scale than bronze and would yield itself to the prop. A zinc anode, attached to the stainless steel plate would protect it."

Periodic checks, to determine the rate of deterioration of the zinc and the need for replacement, must be made to determine the size anode necessary. This depends a lot on the area in which the boat is moored. For this reason, the factory does not install anodes, nor does it offer warranty against galvanic corrosion.

V. MAINTENANCE PROCEDURES

G. Deck Hardware

All deck hardware should be rinsed off with fresh water after each outing and periodically washed with a soap or detergent solution. See section on finishes for additional information on care of deck hardware finsihes. This section in concerned with lubrication and inspection of the deck hardware.

1. Winches

a. Monthly: All winches should be lightly oiled and greased.

b. Two or three times during season: All winches should be stripped, cleaned, inspected and re-lubricated.

c. Start and end of season: Complete strip, clean inspection and lubrication. Inspect mounting bolts for proper seal and tightness.

Follow detailed procedures given in the Winch manual.

2. Blocks

a. Inspect periodically for cracks, burrs, or other physical damage. Burrs can be removed with a file and emery paper. If the block is structurally damaged, replace it immediately.

b. If the block is equipped with a removable sheave, remove and lubricate with Lubriplate Marine Lube "A". If not removable, oil shaft with SAE 30 oil.

3. Lifelines

Inspect lifelines, stanchions, and pulpits at least once a month. The following should be checked, with any needed corrections made immediately.

a. Lifelines properly tensioned.

b. Turnbuckles lubricated, pinned and taped. All locking devices present.

c. Plastic coating intact.

d. Look for bulges or defority in the plastic coating. This usually indicates rust or corrosion damage. Remove vinyl in this area and inspect wire. If wire is OK, wrap the wire with rigging tape.

V. MAINTENANCE PROCEDURES

G. Deck Hardware - continued...

3. Lifelines - cont'd.

e. Inspect swage fittings. Look for cracks and/or corrosion damage on the fitting and the wire.

f. Check eyelets on pulpits for structural integrity.

g. Check all set screws on pulpit and/or stanchion bases.

h. Examine stanchions and pulpits for structural damage and secure attachment to the deck.

4. Deck Hardware Mounting

Periodically check the tightness of all bolts used to attach the genoa track and all deck hardware. In the process, inspect for proper hardware seating and look for signs of loose or missing bedding. If small sections of bedding are missing, silicone can often be applied locally. If the sealant problem is more extensive, remove, re-bed and install the piece of hardware.

While sailing, observe the individual pieces of hardware as stress is applied. Look for any signs of movement.

5. Running Lights

a. Check that all lights operate before each outing.

b. At least once a month, carefully inspect the fixtures for cracks or obstructions in the lenses, any signs of failure of the sealing gasket, and signs of corrosion on the bulb, bulb socket, electrical wires, or connectors. If the bulb is removed, spray the bulb base and the socket with WD-40 or CRC 6066 before reinstalling.

V. MAINTENANCE PROCEDURES

H. Spars and Rigging

Care and protection of finishes on the spars and rigging are discussed in the next sub-section. Listed below are inspections which should be made at least once a month during the active season.

1. Check fasteners for damage and tightness.

2. Insure blocks, tracks, sheaves, swivels, and pins are lubricated and operate freely.

3. Check sheaves and travelers for burrs. Emery paper and file will rid burrs.

4. Make sure sail tracks are straight.

5. Check fiarleads and blocks for burrs and oxidation. File and emery paper will fix both conditions.

6. Check cleats for cracks and burrs. If cracked, replace immediately.

7. Examine and carefully check boom gooseneck, pin, cotters, and welds. If welds are cracked, professional attention is required immediately.

8. Examine chainplates for damaged eyelet (egg-shaped) or cracks to make sure they fair in line with shrouds. If cracks or eyelet damage occurs, replace chainplate (professional attention).

9. Be sure that turnbuckles turn freely, cotters are OK, and threads are lubricated and undamaged.

10. Check shrouds and stays for broken wires, chafing, and fair-leading to chainplates. Check end fittings for cracks, corrosion, and any signs of wire slippage. Defects found in any of these areas require professional attention and/or replacement of the defective part.

11. Check all sheets and halyards for fraying. Raveled or frayed ends, etc., need only to be whipped and burned. Burning melts ends and prevents unraveling.

12. Treat the swage point (where the wire joins a fitting) with automotive-type paste wax to resist corrosion.
IMPORTANT: The standing rigging is designed with a 2.5:1 safety factor with the yacht heeled 30^{o}. While this factor is significant, you must realize that corrosion, etc. of the wire rope and fittings will reduce that margin. A careful inspection of the swage points at least annually is recommended. Also, many marine surveyors recommend replacing all the standing rigging every 5 to 8 years, depending on the environment where the yacht is kept/used.

VI. CHARTS AND DRAWINGS

The drawings which follow are for descriptive purposes only and not to scale. They are not intended to be used as construction drawings.

The location of some accessories may vary in your yacht from the drawings due to engineering changes or the particular combination of options on your yacht. Consult your dealer on any discrepancies you may discover.

VI. CHARTS AND DRAWINGS

a - Sail Plans

b - Accommodations

c - Jiffy Reef Hardware Pkg.

d - Mainsheet Arrangement

e - Equipment Location List

f - Location Chart - Forward

g - Navigation Lights

h - Steering System

i - Edson Steering Maintenance Guide

j - Fuel & Water Dipsticks

k - Battery Layout

l - Main D.C. Junction Wiring

m - Junction Panel Labels

n - Main D.C. Panel Wiring

o - Cockpit Switch/Engine Panel

p - Battery Charger

q - D.C. Light Wire Layout

r - 110v Circuit Layout

s - Basic 110v A.C. Circuit

t - 110v Circuit Layout

u - Fuel System Schematic

v - Plumbing Schematic

w - Touch Up & Repair Instructions

x - Required Safety Equipment

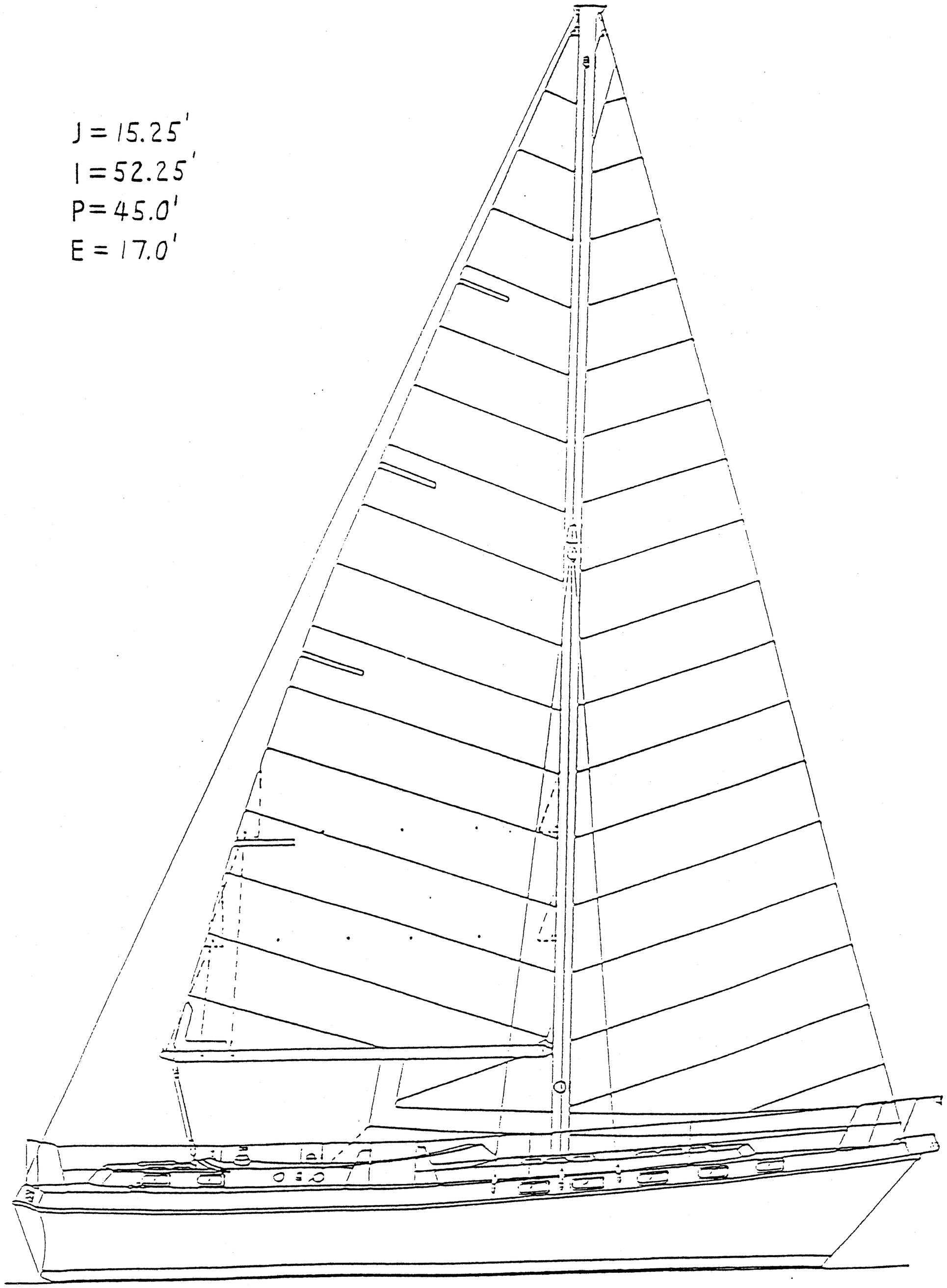
y - U.S. Coast Guard Visual Distress Signal Requirements

J = 15.25'

I = 52.25'

P = 45.0'

E = 17.0'

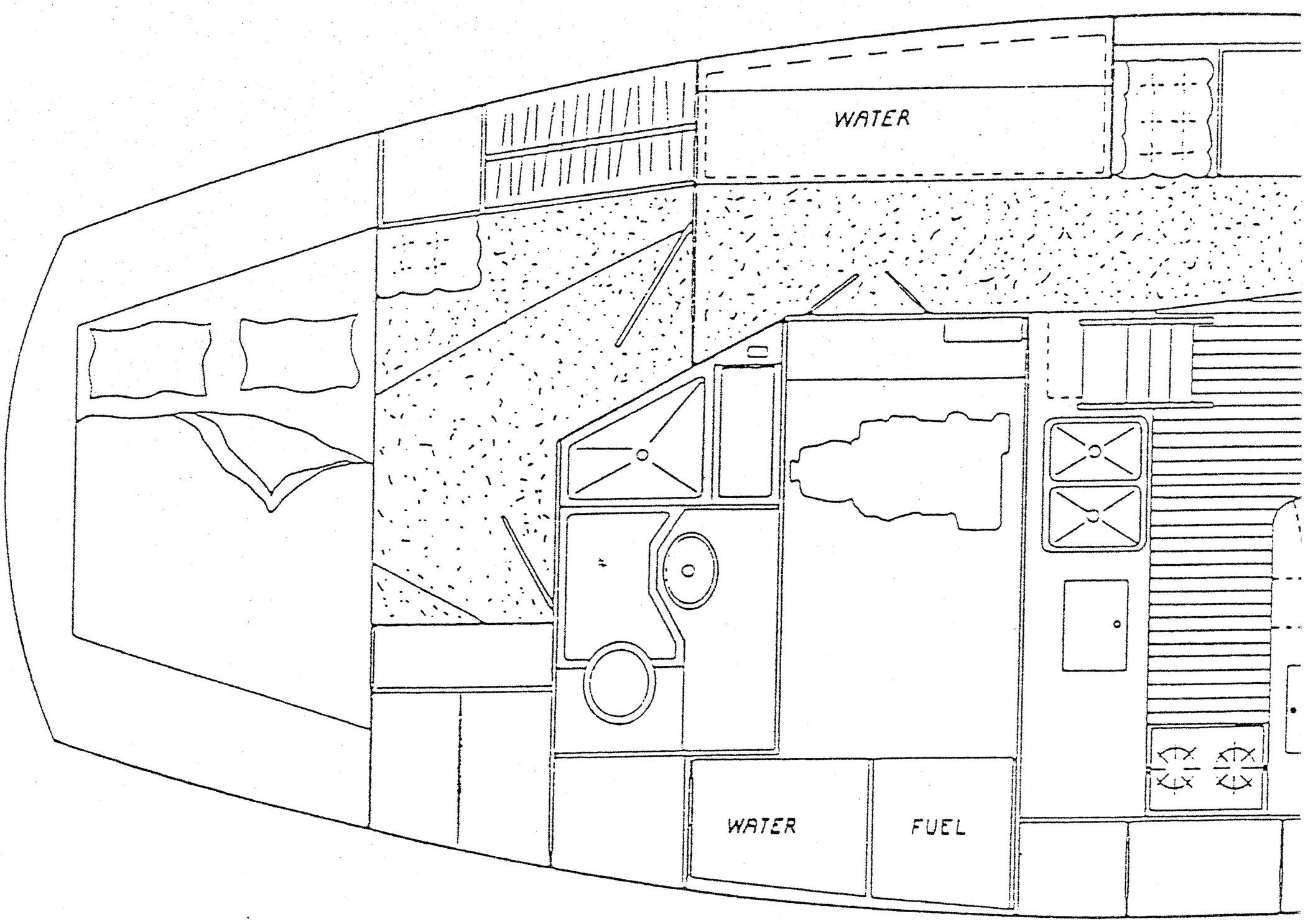


Morgan Classic 41

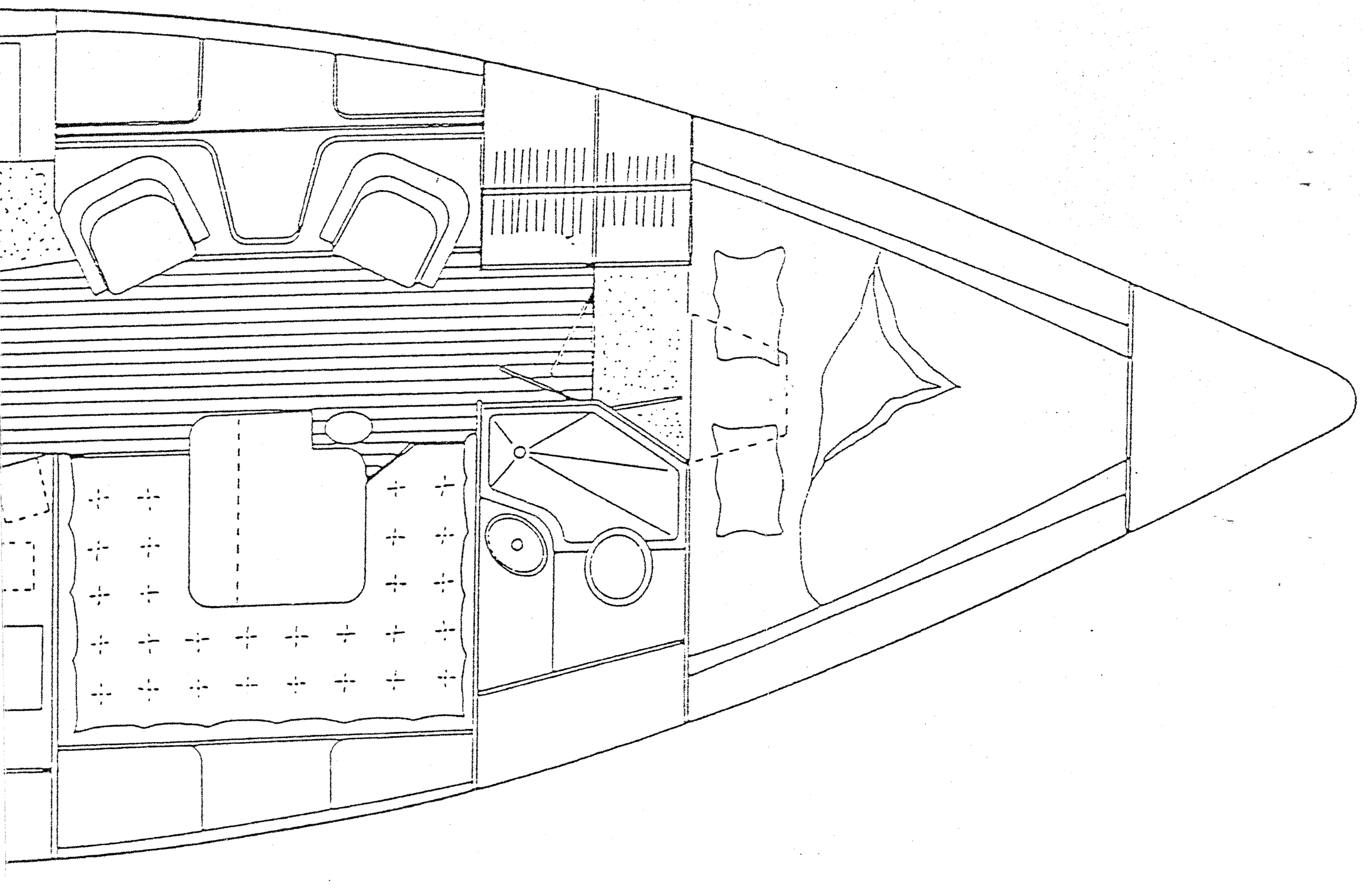
Sail Plan

Date: 6-30-88

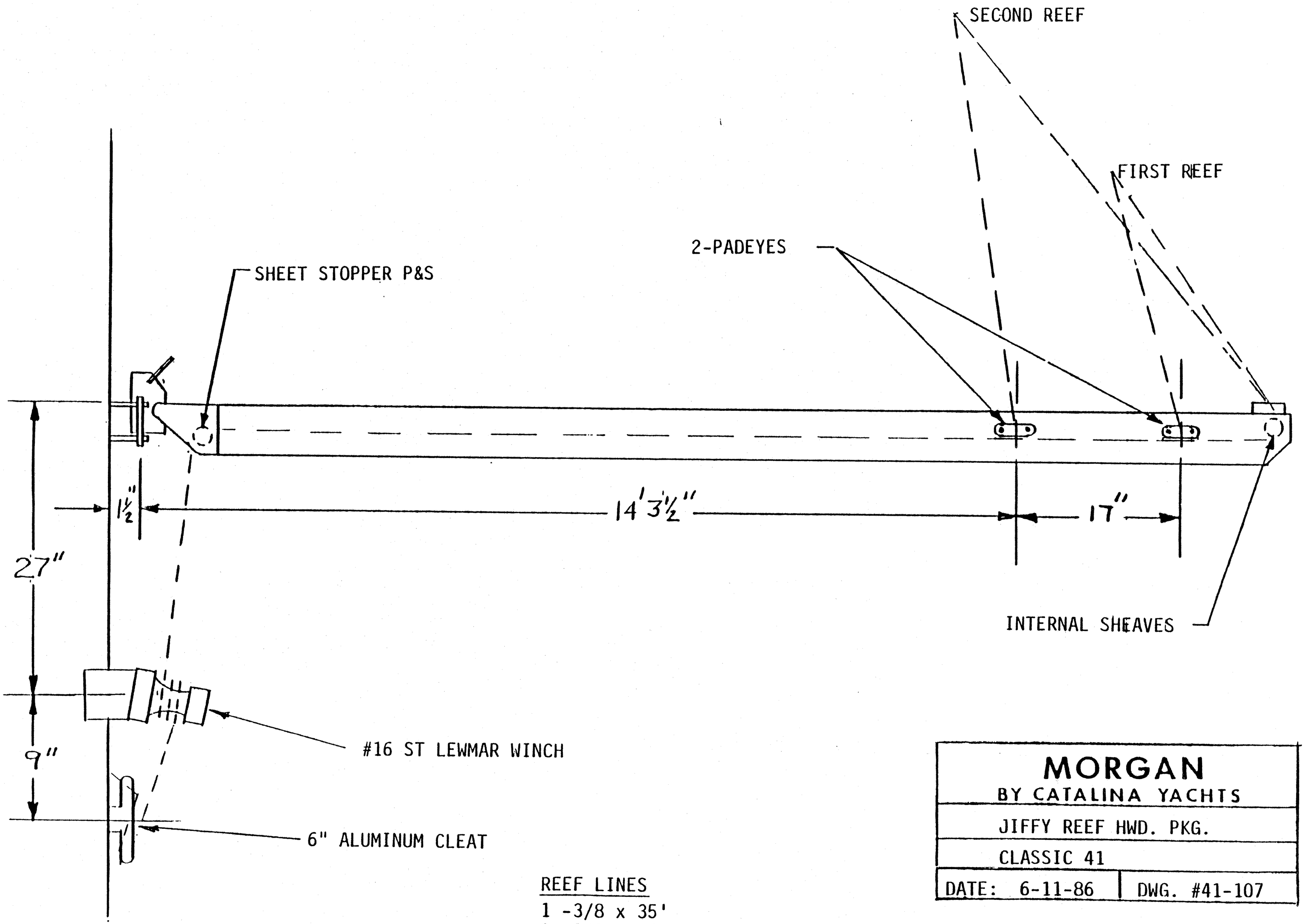
(a)



(b)



Morgan Classic 41
Accommodation Plan

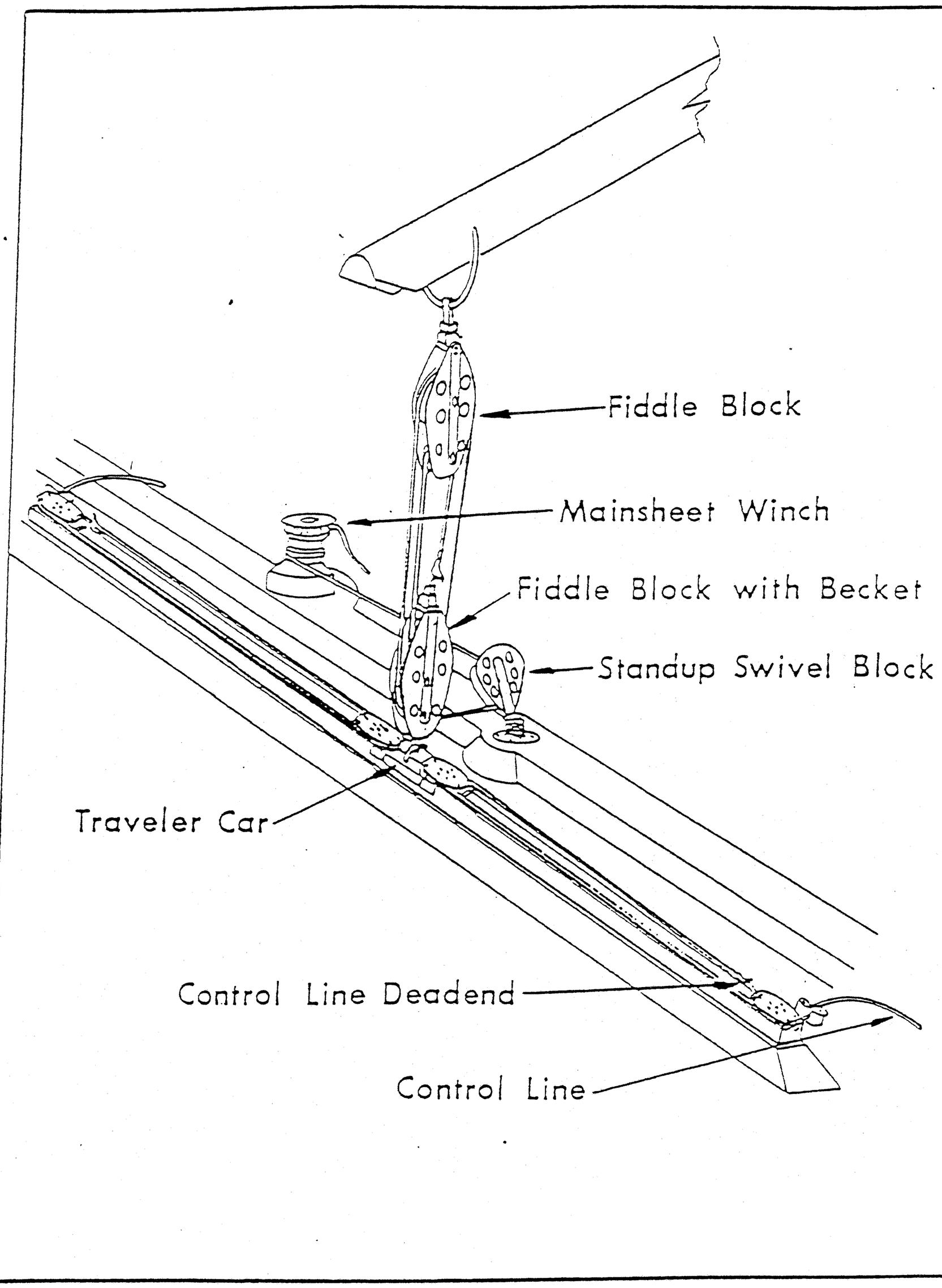


REEF LINES

1 -3/8 x 35'
1- 3/8 x 45'

MORGAN BY CATALINA YACHTS	
JIFFY REEF HWD. PKG.	
CLASSIC 41	
DATE: 6-11-86	DWG. #41-107

(c)



Morgan Classic 41
Mainsheet Arrangement
Date: 7-7-88

V. MAINTENANCE PROCEDURES

I. Finishes

1. Fiberglass

The exterior surface of all of the fiberglass components on your yacht is polyester gelcoat. Only the best grade marine gelcoats available are used on your yacht. The base resin is isopthalic and/or NPG type, which offers the best combination of initial gloss, resistance to weathering effects, and resistance to cracking and blistering. The pigments are carefully selected for color stability, color purity, and resistance to color float. All of the formulations include ultra-violet inhibitors and acrylic monomers which further reduce the effects of weathering.

Even the best gelcoats are not totally immune to the elements. As a general rule, you should treat the gelcoat surfaces of your yacht as you would your car's finish. The following procedures will maximize the useful life of the gelcoat:

- After every outing, rinse off the deck and topsides with fresh water.

- At frequent intervals, wash all fiberglass surfaces with a mild detergent or car wash solution. Use a sponge or towel on the high gloss areas. A brush may be used on non-skid areas. Always rinse thoroughly with fresh water.

- Apply wax to the glossy areas at least once a year and more frequently if the yacht is in southern waters. Do not apply wax to non-skid surface areas or the textured portions of the headliner. A good grade automotive wax specially formulated for fiberglass surfaces may be used. Follow the instructions on the can.

If the wax contains cleaners, extreme care must be taken if a power buffer is used. The cleaners are often abrasive which may remove some of the gel surface. Holding a power buffer too long in one spot, particularly on sharp radii, can result in "going through" the gel.

The preferred procedure is to use a wax with cleaners and to buff by hand with turkish towels. This method is a bit more work, but it results in removal of surface oxidation without risking excessive gelcoat removal.

V. MAINTENANCE PROCEDURES

I. Finishes - continued...

Fiberglass - cont'd.

If the surface becomes dull due to lack of routine care or aging, it can often be restored by hand buffing with an automotive rubbing compound such as Dupont Number 7, followed by a coat of wax. The compound will remove some of the gel-coat. Extreme care must be taken so as not to penetrate the gel layer. The factory applies gel at a thickness of 18 to 25 mils (paint films are generally 1 to 4 mils), and gelcoats normally provide full hiding power at thickness as low as 8 to 10 mils. Thus, there is some margin for gelocat removal without adversely affecting the appearance of surface.

If rubbing compound does not restore its gloss, the surface may be sanded with 320 grit paper, then sanded with 400 grit paper, polished with rubbing compound or polishing compound, and, finally waxed. This procedure can result in substantial gel removal and requires extreme care. Generally, this remedy should be undertaken by a yard experienced in fiberglass repairs. Even then, you should be prepared for the possible need to paint if the operator goes too deep in some areas.

Fiberglass surfaces may be painted; there are several types of paint specifically formulated for re-surfacing gelcoated substrates. For the ultimate in gloss and weather resistance, we recommend a top quality two-part urethane (e.g. Dupont Imron, available at paint stores). Two-part epoxies also provide glossy and durable finishes, but they may chalk with aging.

Scratches, nicks, or other surface damage which cuts deeply into the gel or penetrates the laminate should generally be repaired by a competent yard. If you choose to do this work yourself, refer to "touch up and repair instruction" section. CAUTION: Gelcoats resist most chemicals, but they are NOT resistant to strong caustics, strong oxidizing compounds, or some halogenated compounds. Materials which should be kept away from gel surfaces include:

- Paint remover containing sodium hydroxide or methylene chloride.
- Bleaches containing chlorine.
- Cleaners containing chlorine or hydroxides.
- Methylene chloride or carbon tetrachloride solvents.
- Chloro-bromomethane fire extinguishers.

CAUTION: Abrasive cleaners should not be used for routine cleaning operations, since they result in gelcoat removal and may leave scratches.

V. MAINTENANCE PROCEDURES

I. Finishes - continued .....

2. Vinyl Hull Liner

Vinyl liners used in your yacht are fire retardant, mildew resistant, and are selected for durability in marine environments. Other than occasional cleaning with a mild detergent, they are maintenance free.

The vinyl is applied at the factory with contact cement. Should a corner or edge come loose, it can be reattached with contact cement.

The vinyl will not withstand rubbing with strong abrasive or solvents such as acetone or methylene chloride. Mineral spirits may be used as a solvent if care is taken not to let it set on the surface.

3. High Pressure Laminate Surfaces

The mica surface requires only occasional cleaning with a mild detergent. Household cleaner/waxes such as Pledge may be used, and will mask small scratches that may occur. Do not use strong abrasive cleaners on mica, as they may dull the surface.

4. Upholstery Fabrics

The fabric in your yacht could be of various materials according to your selection of interior finishes and color coordination. The fabrics offered are varying in fiber content, and cover an area from cotton to nylon and dacron. Take care that they are cleaned accordingly. Most are removable and may be cleaned with household upholstery shampoo (follow instructions by manufacturer) or by dry cleaning.

5. Spars

The spars on your yacht have been painted by the manufacturer with a two-part urethane paint or an electrostatic powder coating. This coating protects the aluminum against corrosion.

To protect the finish of your spars, the following steps are recommended:

- Rinse off spars with fresh water after each outing.

- Tie the halyards away from the spar when not in use; not only does this prevent abrasion on the spar and halyards, but it will eliminate the annoying slapping noise caused by the boat's movement.

V. MAINTENANCE PROCEDURES

I. Finishes - continued...

6. Aluminum Hardware

Periodic cleaning and waxing with automotive type wax is the only surface maintenance required. If the surface becomes pitted, emery paper and polishing compound may be used to remove or reduce the prominence of pits. This will remove the anodized surface, and it will be more important than ever to keep the polished surfaces well waxed.

CAUTION: Do not use emery paper or polishing compound on black anodized aluminum surfaces. Black paint will mask scratches in the anodized surface.

7. Stainless Steel Rigging and Hardware

All of the stainless steel components and rigging are 304 or 316 grade which offers maximum corrosion and rust resistance in a salt water environment. To maintain the stainless steel surfaces, the following steps are recommended.

- After each outing, hose down the rigging and hardware with fresh water.

- Occasionally polish stainless steel surfaces with metal polish.

- At lay-up or before prolonged periods of disuse, apply automotive wax to stainless steel hardware. Wax should NOT be used on the wire rope rigging.

8. Chrome Plated Bronze Hardware

Rinse with fresh water after each outing and clean as needed with automotive chrome polish. Wax with automotive wax at least once a year, preferably before lay-up.

9. Bottom Paint

The selection of type and brand of bottom paint will depend on local water conditions and your personal preference. To allow you maximum flexibility, the yacht is delivered new to you with an unprimed and unsanded bottom.

The key to a good bottom job is close adherence to the instructions on the paint can. Do not short cut the cleaning or priming operations. It is recommended the bottom surfaces be covered with a barrier coat to prevent water penetration into the gelcoat. Barrier coatings are

9. Bottom Paint - cont'd.

available from several paint manufacturers, and their coating recommendations should be carefully followed for a successful application. Apply the recommended number of coats of paint and launch within the recommended time after painting. Because the materials are expensive and bottom preparation is hard and dirty work, there is always a temptation to do a little less than the paint manufacturer asks for. But remember, premature failure will require re-doing the job and additional expense of a haul-out.

The expected life of anti-foulant will vary significantly with water temperature, water salinity, local harbor conditions, the relative amount of use the yacht gets, and the particular owner's definition of the amount of growth that constitutes a need for removal. Under average conditions, you can expect to run six to twelve months between results.

CAUTION: The sanding dust from anti-foulant paint is toxic. A face mask, goggles, rubber gloves, and suitable protective clothing should be worn during sanding operations. After sanding, wash thoroughly and clean dust from your tools.

It is also advisable to wear an organic vapor cartridge mask and goggles while applying the paint. Wash thoroughly after painting.

10. Lexan and Plexiglass

All of the exterior glazing (portlights and hatches) are Lexan polycarbonate or plexiglass. Both materials are extremely tough and have the advantage over glass of resistance to shattering if broken. However, both materials exhibit lower chemical resistance and abrasion resistance than glass. As a result, care is needed in cleaning these materials.

V. MAINTENANCE PROCEDURES

I. Finishes - continued...

10. Lexan and Plexiglass - cont'd.

For general cleaning, a turkish towel dampened with a mild detergent solution is recommended. If the surface dirt is gritty, flush first with water. Never use acetone or other keytone solvents on either material. Never use abrasive cleaners on either material.

Minor scratches can be removed by hand buffing with jewelers rouge or cleaners specifically formulated for plastics. (Aircraft or motorcycle service centers are good sources for these cleaners.) Some scratches can be removed by hand buffing with toothpaste and water.

11. Teak Joinerwork

Teak is used for exterior and interior trim. Teak veneer plywood is used for interior joinerwork panels with solid Teak lumber trim. All of the Teak (except the Teak and Holly sole) is hand rubbed and oiled before the yacht leaves the plant.

Your Teak and Holly sole is varnished with several coats of Polyurethane clear Satin Varnish.

The varnish will require periodic maintenance to maintain the beauty of a finely finished yacht. Usage of the same varnish or varnish with the same properties is recommended; always consult your paint dealer before trying a new product.

12. Exterior Teak Trim

There are several options open to you on maintaining Teak. Your choice will depend on your preference in the aesthetic appearance of the bright work and the amount of time and/or money you are willing to devote to bright work maintenance. Some of the alternatives are described below.

A. Leaving Teak Untreated

Teak contains a natural oil which is one of the reasons it is so durable in a marine environment. As it ages, however, the oil exudes to the surface and disappears. (Direct sunlight speeds up the process). When Teak weathers, it takes on a silver gray color, which many find attractive. The disadvantage of weathered Teak is that the grain raises, and there is a tendency for the Teak to check and split. Periodic cleaning with commercial available Teak cleaners, such as Teak-Brite,

I. Finishes - continued...

Exterior Teak Trim - cont'd.

will restore the original color.

B. Oiling Teak

Periodic oiling of the Teak will help maintain the golden brown Teak color and greatly increase the resistance to checking and splitting by replenishing the natural oil in Teak. Special oils (e.g. Teak-Brite Sealer and Watco Teak Oil) have been formulated for finishing Teak. These are generally preferred over boiled linseed oil, because they contain toxicants for mildew resistance and other additives. Boiled linseed oil may be used on Teak, but more frequent cleaning and reoiling may be required.

The general procedures, is to clean the Teak (see above) and sand, if necessary, then apply oil liberally with a rag. Re-apply oil until it is no longer absorbed into the surface. Allow oil to penetrate for 15 to 30 minutes and then wipe off with a turkish towel. Rub in the direction of the grain. Be sure to observe any special instructions on the can label. (A fine bronze wool may be used prior to new oil being applied if the wood is sticky or existing look is uneven).

C. Varnishing Teak

A varnish finish provides the best protection for the teak, and most people agree that a varnish greatly enhances the appearance of the Teak. The drawbacks to varnishing Teak are the high initial cost (labor content) in obtaining a first rate job, and the comparatively high maintenance effort needed. Exterior varnished Teak will normally require a new coat of varnish every four (4) months. If the varnish fails (peels, yellows, crazes, etc.) before re-coating extensive sanding is required; and often the entire finish must be removed and re-done.

V. MAINTENANCE PROCEDURES

J. Sail Care

To help you obtain the best continued service and longest useful life from your sails, we would like to offer this advice for sail care. Good sail care is not difficult or particularly time consuming. Over a period of years, a little conscientious care can save hundreds of dollars.

Sail care for synthetic sails consists of three (3) basic elements: cleanliness, protection from unnecessary ultraviolet radiation, and proper usage.

1. Your sails should be kept clean. Simple flushing with fresh water will normally do this job. Once a year, or more often if necessary, a thorough washing using a mild detergent will keep your sails white and free of salt that can cause abrasive damage to sail fibers over a period of time.

   Sales may be spread on a smooth clean surface and scrubbed to remove imbedded dirt; but, simply soaking the sails in a detergent solution with occasional stirring is preferable since it avoids any chafing of the sail against a surface. In any case, do not put your sails in a washing machine. You will get your sails clean at the expense of a great deal of cloth damage from slides and snaps working against the cloth.

   Occasionally your sails may be stained, in which case there are several commercial stain removers that can be safely used; but be certain that the instructions verify that the product is safe for dacron or nylon.

2. The most destructive force to snythetic sails is ultra-voilet radiation. The important thing to remember here is to keep your sails out of the sun except when in use. Use a mainsail cover if you leave the sail on the boom. Never leave your sails lying on a flat surface in direct exposure to the sun. One hour on the clubhouse lawn can have the same destructive effect as a weekend's racing.

   After you have washed your sails, hang them up by the luff in the shade when possible. Put them under cover as soon as they are dry.

V. MAINTENANCE PROCEDURES

J. Sail Care - continued...

3. Proper usage consists of protection from chafing, proper storage, and prevention of over-stretch.

a. Prevention of chafe is a common sense thing. Check spreader tips, turnbuckles, stanchions, pulpits, and other parts of the boat and rigging which may have come in contact with the sails. Some fittings, such as spreader tips, can be taped or covered with leather. Others, such as screwheads, should be filed smooth. A periodic inspection of the sails will help pinpoint sources of chafe or sharp edges that may eventually tear a sail or cut the stitching.

b. All sails should be stored dry. Dacron sails should be folded, but they don't have to be. Soft unfilled sail cloth suffers little from "stuffing", since there is no filler breakdown from the repeated creasing. However, even soft cloth enjoys a longer life with folding, since folding and rolling of sails will minimize creases and strains on fibers. Also, folded sails require less space for storage and set more smoothly in light airs. Long term storage should especially be in a folded condition and in a cool, dry place.

c. Finally, proper use involves using the sail in its proper conditions. Using a 4 oz., 170% genoa on the 40 footer in 18 knots is obviously going to strain the sail and distort the shape. Unfortunately, there are no standard tables indicating the exact wind velocity at which the headsails should be changed. Sea conditions, stability of the particular boat, cloth weight, and sail shape are determining factors that all affect the decision to change sail.

While we can give you guidelines for any individual sail, ultimately your judgment is going to be called upon. Watch the sail for signs of strain or distortion of its airfoil shape. Remember that sails are made of cloth; and, while modern synthetics are extraordinarily strong, they do have limits. Sails can be ruined by carrying them in winds beyond that for which they were designed, stretching a leech over a spreader, stretching the foot over the shrouds or a lifeline, allowing leech flutter uncontrolled, and excessive luffing.

This is by no means a complete treatment of sail care. But, with common sense and the general care we have outlined, your sails will give you years of trouble-free service.