Catalina Yachts
MORGAN DIVISION

CATALINA 380

OWNER'S MANUAL

FOREWARD

Congratulations on the acquisition of your new Catalina 380. All Catalina yachts are designed and built with care using quality materials to ensure that you have years of sailing enjoyment with a minimum of upkeep and maintenance.

Before attempting maintenance or operation of your Catalina 380, please read the Catalina Yachts Limited Warranty booklet and fill out the enclosed warranty registration card.

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

The launching and rigging of the Catalina 380 should be handled by experienced boat yard personnel under the direction of your authorized dealer. After the boat is launched, the dealer will complete the last stages of rigging and mast tuning.

The Table of Contents pages list the contents of this manual. Warranties and information regarding installed optional equipment have been included when available and applicable.

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

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

PREFACE

This manual is intended and supplied to help owners of Catalina 380's understand their boats and answer common questions about maintenance and systems design specific to the Catalina 380.

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

The systems descriptions and illustrations in this manual apply to boats built at the time of publication. Our policy of constant improvement necessitates that changes have been made to the Catalina 380 since its introduction. Therefore, these illustrations and descriptions may not apply to boats built before the time of publication.

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

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

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

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

TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

CATALINA 380 SPECIFICATIONS

L.O.A.	38'5"
L.W.L.	32'5"
BEAM	12'4"
Distance from W/L to Masthead	56'0

WING KEEL

Draft	5'0"
Ballast	7,300 Lbs.
Designed Weight	16,500 Lbs.
Disp./Length	217
Sail Area/Displacement	17.8

FIN KEEL

Draft	6'6"
Ballast	6,800 Lbs.
Designed Weight	16,000 Lbs.
Disp./Length	210
Sail Area/Displacement	18.1

SAIL AREA

Sail Area, Rated Total	719 Sq. Ft.
Mainsail, Rated	346 Sq. Ft.
100% Foretriangle, Rated	373 Sq. Ft.

I	50'11"
J	14'8"
P	44'2"
E	15'8"

THEORETICAL HULL SPEED, KNOTS 7.6

L.P.G.
(1) 10 Lbs ..... Aluminum Tank With Solenoid

WATER TANK CAPACITY

(1) Aft @	30
(1) Forward @	25
(1) Water Heater @	11
Total U.S. Gal	66

PRIMARY WINCHES
Lewmar 54 ..... Chrome Brz. Self-Tailing

HALYARD WINCHES
Lewmar 40 ..... Chrome Brz. Self-Tailing

ICE BOX
Approx. .....(1) 6.0 Cu. Ft
Optional .....(1) 6.0 Cu. Ft

HOLDING TANK CAPACITY
(1) Midship @ .....30 U.S. Gal

FUEL TANK CAPACITY .....34 U.S. Gal

ESTIMATED CONSUMPTION AT
2500 R.P.M. .....1.8 G.P.H.

HEADROOM
Main Cabin .....6'9" Max

STANDARD ENGINE
Yanmar 3JH3-BE .....
40 HP Diesel .....F.W. Cooled
3 Cylinder .....Reduction Gear 2.64:1

PROPELLER
18x12 On 1.25" Dia. Shaft .....3 Blade RH

RIGGING
Double Spreaders .....In-Line
Intermediate and Backstay Bridle
Shrouds .....1/4" Dia. 1x19 Wire
Forestay, Upper .....5/16"
Backstay, Fore & Aft Lower
Shrouds .....5/16" Dia. 1x19 Wire
Rope Halyards .....Low Stretch, Led Aft
Boom Vang .....Spring Loaded Solid

Specifications and equipment subject to change without notice.

2.0 COMMISSIONING CHECK LIST

2.1 PRE-LAUNCH CHECK:

1.____ Shaft turns freely by hand, zinc collar installed if required.
2.____ Check intake hoses and clamps.
3.____ Check all through-hull fittings.
4.____ Drain plugs tight, engine, muffler and exhaust line OK.
5.____ Bottom clean, paint OK.
6.____ Hull sides clean, gel coat OK.
7.____ Decks clean, gel coat OK.
8.____ Cushions, carpeting, curtains, clean and in place.
9.____ Table converts to berth OK, dinette.
10.____ Hatch lids present and fit OK.
11.____ Lifelines and pulpits rigged and OK.
12.____ Spreaders taped and drilled at base end, shrouds wired to tip end and taped or boots installed.
13.____ Standing rigging pinned to mast.
14.____ Rigging lengths verified with check list in kit.
15.____ Mast and boom inspected: cotter pins, sheaves, tangs, spreaders OK.
16.____ Mast lights checked before mast stepped.
17.____ Check over head 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.
18.____ Masthead sheaves lubricated and rotate freely.

2.2 IN WATER CHECK:

2.2.1 ELECTRICAL:

1.____ Electrical equipment operational, panel switches functional
2.____ Shore power outlet OK.
3.____ Check battery switch #1, #2 OK.
4.____ Check battery fluid level.
5.____ Check battery terminals for tightness.
6.____ Check battery hold-downs.

2.2.2 PLUMBING:

1.____ No leaks at through-hull fittings with seacocks open.
2.____ Fill all water tanks.
3.____ Check all water tanks at fittings, and vent for leaks.
4.____ Test all faucets and foot pumps for leaks.
5.____ Check for leaks at sink drain fittings, sink drains OK.
6.____ Put water in ice box and check for proper drainage.
7.____ Check bilge pump operation, handle present.
8.____ Check head by flushing and pumping.
9.____ Check shower sump drain line.
10.____ Check holding tank, pump vent and fittings.
11.____ Main hatch no leaks, slides freely, hatch boards fit OK.
12.____ Cabin windows hose tested for leaks.
13.____ Anchor locker drains OK.
14.____ Stove operates OK: Check tank, fuel line, burner and oven.

2.0 COMMISSIONING CHECK LIST - (Continued)

2.2.3 RIGGING AND HARDWARE:

1.____ Mast stepped.
2.____ Pin, tape and tune standing rigging.
3.____ Spinnaker gear, boom vang, OK.
4.____ Blocks, cars, cleats rigged OK.
5.____ Test all winches, winch handles present.

2.2.4 ENGINE:

1.____ No leaks: shaft, rudder, stuffing box, or shaft log.
2.____ With fuel tanks full, no leaks at fill pipes, vent, or any fuel line connections.
3.____ With coupling disconnected, engine and shaft alignment OK -- Recheck alignment after rigging is tuned.
4.____ Transmission oil level OK.
5.____ Propeller shaft coupling bolts lockwired and coupling is secured.
6.____ Crank case oil level OK.
7.____ Fuel valves open, bleed and prime lines for diesel engine.
8.____ Check that shaft is coupled and aligned to .003" maximum tolerance.
9.____ Engine wiring OK, connections tight.
10.____ Throttle control cable travel and brackets OK.
11.____ Clutch control cable travel and brackets OK.
12.____ Start engine.
13.____ Exhaust water flow OK.
14.____ No leaks in fuel lines at fittings, fuel filter, fuel pump or injectors.
15.____ No engine or oil leaks.
16.____ Idling speed set ____R.P.M.'s.
17.____ Shutoff cable for diesel engine OK.
18.____ Check forward and reverse shifting lever friction OK.
19.____ Check engine instruments for operation, tachometer for calibration.
20.____ Run in gear for ten (10) minutes minimum.
21.____ Recheck packing gland after engine stops for proper lubrication.
22.____ Bilge blower and vent system OK.
23.____ Exhaust system, check for leaks, insulation in place.

2.3 OPERATION CHECK LIST:

1.____ Emergency tiller trial fitted and operational.
2.____ Pedestal steering operation OK, Compass OK.
3.____ Sails and halyards OK.
4.____ Boat performance under power and sail OK.

2.3.1 FINAL CHECK:

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

3.0 MAINTENANCE GUIDE

3.1 PRE-USE MAINTENANCE:

RIGGING:

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

HULL AND DECK INSPECTION:

1. Pedestal steering OK.
2. Bilges and compartments are dry.
3. Through-hull valves, hoses, and clamps, OK.
4. Check running lights.

ENGINE:

1. Check engine oil and fuel levels.
2. Packing gland OK, cooling water intake valve opens and closes OK.
3. Throttle/Shift OK.
4. Blower system OK.
5. Check bilge areas for fuel before starting engine.

3.2 MONTHLY MAINTENANCE:

RIGGING:

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

HULL AND DECK:

1. Inspect hull valves, open and close freely.
2. Winches turn freely, lubricate as per manufacturer's recommendations.
3. Clean and wax gel coat surfaces as necessary.

ENGINE:

1. Check oil and fluid levels.
2. Battery: Check fluid levels and tie-downs.
3. Tighten all bolts and nuts to proper torque.
4. Check fuel tank fittings, and hose clamps.
5. Disassemble and inspect cooling system anti-siphon.
6. Check bolts.
7. Check filters.

3.3 SEASONAL MAINTENANCE:

RIGGING:

1. Mast head pins and sheaves turn freely.
2. Halyards and fittings are in good condition.
3. Spreader tips and bases, and mast fittings, OK.
4. Check all shroud terminations and swedged fittings for cracks and/or corrosion.
5. Gooseneck assembly and boom assembly.
6. Mast, boom, and spreaders cleaned and waxed.
7. Lifelines and stanchions all OK. All pins and fittings are secure, cotter rings taped. Turnbuckles, pelican hooks and connector loops OK. Screw fittings checked for thread wear.

3.0 MAINTENANCE GUIDE - (Continued)

HULL, DECK AND CABIN:

1. All chainplates and through bolts tight.
2. Disassemble winches and lubricate bearings and pawls.
3. Inspect and coat electrical system connections, battery tie downs and terminal connectors to prevent corrosion.
4. Drain and flush fresh water system.
5. Check head and anti-siphon valve in toilet.
6. Hatch gaskets, and hold-down fasteners.
7. Condition of anti-fouling paint on bottom, keel, and rudder.
8. Lifelines, stanchions, and pelican hooks.

ENGINE:

1. Check shaft alignment, repack stuffing box if necessary.
2. Clean motor thoroughly.
3. Inspect fuel system.
4. Tune engine as per manufacturers recommendations.
5. Exhaust system, check for leaks or deterioration, insulation in place.

3.4 FIBERGLASS MAINTENANCE AND REPAIR:

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

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

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

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

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

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

FIBERGLASS TOUCH UP AND REPAIR

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

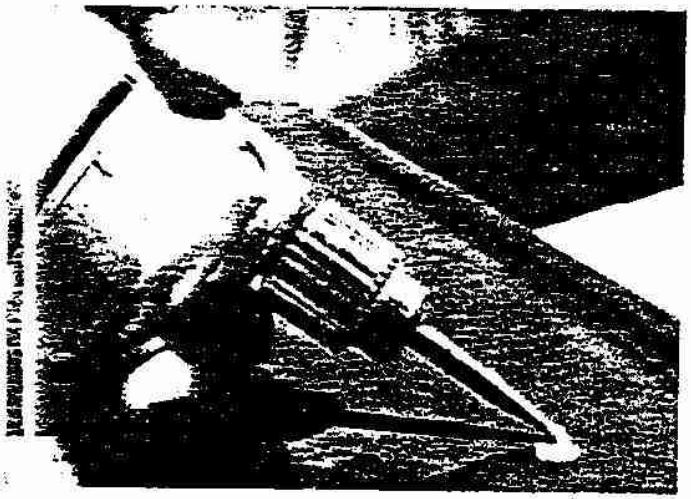
These repairs are easy because only the surface of the boat is damaged. They fall into two categories: (1) damage to the gel coat colored outer surface, and (2) holes or gouges that are deep enough to penetrate the fiber glass reinforced area of the boat. The repair operations are similar.

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

(1) Be sure the area around the damage is wiped clean and dry. Remove any wax or oil from the inside of the hole or scratch.

(2) Using a power drill with a burr attachment, roughen the bottom and sides of the damaged area and feather the edge surrounding the scratch or gouge. Do not "undercut" this edge. (If the scratch or hole is shallow and penetrates only the color gel coat, skip to step No. 8.)

(3) On a piece of cardboard or other non-metallic material, pour a small amount of gel coat . . . just enough to fill the area being worked on. Mix an equal amount of milled fibers with this gel coat, using a putty knife or small flat stick. Then add two drops of catalyst, using an eyedropper for accurate measurement. For a half-dollar-size pile of gel coat, this amount of catalyst will give you 15 to 20 minutes working time before it begins to "gel." Carefully cut the catalyst into the gel coat and mix thoroughly.



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

(5) Lay a piece of cellophane or waxed paper over the repair to cut off the air and start the "cure."

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

(7) Again use the electric drill with burr attachment to rough up the bottom and edges of the hole. Feather hole into surrounding gel coat, do not undercut.

(8) Pour out a small amount of gel coat into a jar lid or on cardboard. Add a drop or two of catalyst and mix thoroughly, using a cutting motion rather than stirring. Use no fibers.

(9) Using your finger tip or the tip of a putty knife, fill the hole about 1/16" above the surrounding surface with the gel coat mixture.

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

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

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

3.0 MAINTENANCE GUIDE

3.5 BOTTOM PAINT PREPARATION:

Anti-fouling paint should be applied to the bottom of your Catalina 380 if it is to be moored in either fresh or salt water for any length of time. There are many brands available. Anti-fouling paint prevents the growth of algae, barnacles, and other fouling organisms on underwater surfaces.

The hull, bottom and rudder of your Catalina 380 are molded gel coat surfaces. The keel is lead casting which has been faired with a minimum amount of epoxy compound. The hull to keel joint is faired and fiberglassed over to create a smooth connection. The keel and joint are painted with epoxy paint at the factory. Be sure to check for compatibility if you are painting your keel for the first time.

Catalina 380 models are manufactured with an integrally molded blister protection system in the hull laminate. This water absorption barrier material is between the gel coat surface layer and laminates of the hull.

The bottom may be prepared for painting using conventional dewaxing solvents, then sanding the gel coat surface or using a chemical etching type primer. The keel has been painted using epoxy primer, filler-fairing compound and finished with epoxy paint. This material is a suitable substrate for most anti-fouling systems, however a "test patch" of the intended anti-fouling paint should be tried on a small area to insure compatibility before coating the entire keel area.

3.6 TEAK MAINTENANCE:

The companionway hatch boards are teak and can be kept looking good by occasional oiling with teak oil.

Should the teak become weathered, cleaning and bleaching with a commercially available teak cleaner and bleach will restore the color of the wood. Oil the wood with a good grade teak oil to restore the golden color of the teak. Do not use wire or hard bristle brushes on the wood, as this will remove the softer wood between the annual rings and leave a rough surface.

Before applying oil or varnish, test it in an inconspicuous area to ensure that no discoloration will occur.

IMPORTANT: Always be sure to have adequate ventilation when working with varnishes, cleaners, oils or paints.

TARGET COATINGS™
WATERBASED FINISHES AND SPECIALTY CHEMICALS
P.O. BOX 1582 • RUTHERFORD, NJ 07070 • USA • 1-800-752-9922 • 1-201-804-0993 • Fax: 1-201-939-0518

TECHNICAL INFORMATION

OXFORD II HYBRID VARNISH SERIES

Oxford II Hybrid Varnish is the most chemically advanced waterborne wood finish to be manufactured for fine woodworking applications. By bringing together the best features of oil-based varnishes and waterborne urethanes, the Oxford II Hybrid technology offers the discriminating finisher a beautiful alternative. This oil/water emulsion is formulated to provide a durable, interior and exterior grade coating for marine and architectural applications. Oxford II Hybrid Varnish will create the warm glow of long-oil varnish with the speed and safety of a water-based system.

Oxford Hybrid Spar contains a high level of UV filters and absorbers that help to protect the wood substrate from the damaging effects of the sun. Our Hybrid Spar Varnish builds quickly due to the highest percentage of solids available in any water-based coating formula. The high gloss and depth-of-clarity of Oxford Hybrid Spar Varnish is exceptional.

Oxford Hybrid Satin Varnish is designed for new interior construction and restoration applications. An exceptionally hard finish when cured, Oxford Hybrid Satin Varnish exhibits a beautiful hand rubbed, satin sheen and silky feel. We recommend it for custom yacht interiors, fine furniture and custom architectural applications.

Oxford Hybrid Gloss Varnish builds quickly due to the high solids content, and develops a brilliant gloss when cured. For use on all interior applications that require a deep, rich gloss finish. Oxford Hybrid Gloss responds well to post-cure buffing and machine polishing.

FEATURES AND BENEFITS

- ***Extremely Low VOC Content***
- ***Water Clean-Up***
- ***Fast Recoat Time***
- ***Exotic Color Tones***
- ***Spray or Brush Friendly***
- ***UV Stable***

OXFORD HYBRID VARNISH
ASTM TEST RESULTS

This test was performed to determine the fluid resistance of Oxford Hybrid Gloss Varnish under ASTM D3023-88. This test was performed after a cure cycle of 150 hours at 70F/50%. Tests were performed on horizontal Mahogany veneer panels with 4 coats applied.

Reagent	Numerical Score
Black Marker	4
Ball Point Pen	4
Iodine	3
Lipstick	5
Water Soluble Food Dye	5
Coffee	5
Tea	5
Mustard	5
Water	5
Acetone	5*
5% Ammonia	5
409 Cleaner	5
Windex	5
Diesel Fuel	5
Mineral Spirits	5
Ethanol Double Rubs	100+
MEK Double Rubs	100+
Xylene Double Rubs	100+
Isopropyl Alcohol Double Rubs	100+

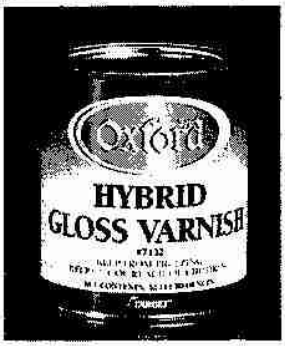
Legend
5- No Stain (or effect)
4- Very Slight Stain (or effect)
3- Slight Stain (or effect)
2- Moderate Stain (or effect)
1- Severe Stain (or effect)
0- Destruction of film

Date Test Performed: 5/97

Oxford

Oxford Hybrid Varnish is the most chemically advanced waterborne wood finish to be manufactured for fine wood-working applications. By bringing together the best features of oil-based varnishes and waterborne urethanes, the Oxford Hybrid technology offers the discriminating finisher a beautiful alternative. This oil/water emulsion is formulated to provide a durable interior and exterior grade coating for furniture, architectural and marine applications. Oxford Hybrid Varnish will create the warm glow of tung-oil varnish with the speed and safety of a water-based system.

OXFORD HYBRID GLOSS VARNISH

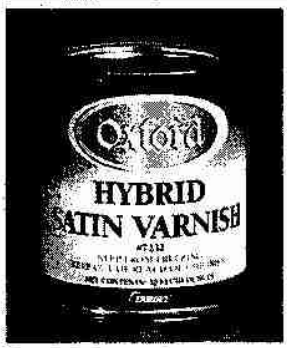


Traditional Beauty, Depth and Clarity

Oxford Interior Gloss is an economical, easy-to-use water-based wood finish formulated to give the quality conscious craftsman the color and feel of a tung-oil varnish, but with all the benefits of a water-based finish. Its classic fine varnish hues bring out the bright color contrasts in cherry, teak, mahogany and light woods prized by fine furniture craftsmen. Oxford Interior Gloss dries to a hard, scuff resistant, easy-to-repair finish in 1 hour. Recoat in 1-1.5 hours for fast project completion time.

No.	7132	7128	7105
Size	32 oz.	Gal.	5 Gal.

OXFORD HYBRID SATIN VARNISH



Fast-Drying Classic Rubbed Effect

Oxford Satin is the standard coating for manufacturers who understand the labor savings and environmental advantages of water-based coatings. The natural, warm glow of this fine classic coating is virtually indistinguishable from the rubbed effect obtained with labor intensive and dangerous oil-based varnishes. Formulated for easy brush or spray applications, this economical, quick drying varnish is ready for recoating in 1-1.5 hours. Cleans up with water and is VOC compliant.

No.	7232	7228	7205
Size	32 oz.	Gal.	5 Gal.

OXFORD HYBRID SPAR VARNISH

The Strongest Water-Based Exterior Coating Available

Oxford Hybrid Spar contains a high level of UV filters and absorbers that help to protect the wood substrate from the damaging effects of the sun. Our Hybrid Spar Varnish builds quickly due to the highest percentage of solids available in any water-based coating formula. The high gloss and depth-of-clarity of Oxford Hybrid Spar Varnish is exceptional. It features a traditional amber varnish color, but with all the benefits of a water-based coating—fast-drying for reduced production time, low odor, non-flammable, water cleanup, and VOC compliance. Oxford Spar Varnish can be applied with a brush or spray. Recoat time is 1-1.5 hours.

No.	7032	7028	7005
Size	32 oz.	Gal.	5 Gal.

TARGET COATINGS

P.O. BOX 1582 • RUTHERFORD, NJ 07070 • **1-800-752-9922** • **1-201-804-0993**

www.targetcoatings.com

Dealer Inquiries Welcome!

Interior
Clear Wood Coating
6060

PRODUCT DESCRIPTION: INTERLUX® INTERIOR CLEAR WOOD COATING 6060 represents the latest in brightwork technology. INTERLUX® INTERIOR CLEAR WOOD COATING 6060 has a warm, rich satin sheen finish that applies easily, and flows out well to yield a very smooth surface. INTERLUX® INTERIOR CLEAR WOOD COATING 6060 looks milky white in the can but when applied becomes crystal clear and has a hard, abrasion resistant finish. INTERLUX® INTERIOR CLEAR WOOD COATING 6060 is self-sealing which means that there is no need to apply a sealer coat on bare wood. INTERLUX® INTERIOR CLEAR WOOD COATING 6060 dries rapidly and can be recoated quickly. Fast overcoating time makes it possible to achieve a complete application much more quickly than when using traditional varnish. This quick overcoating time also reduces the need to sand between coats.

TECHNICAL DATA

NUMBER OF COMPONENTS:	1
MIXING RATIO:	N/A
INDUCTION TIME:	N/A
POT LIFE:	N/A
COLOR:	CLEAR
FINISH:	Matte
SOLVENT:	Brush - Water Spray - Water
WIPE DOWN SOLVENT:	Bare Surfaces - BRUSHING LIQUID 333 Varnished Surfaces - BRUSHING LIQUID 333
CLEAN UP SOLVENT:	Water
METHOD OF APPLICATION:	Brush, Roller or Spray
V.O.C.:	Less than 265 grams per liter
VOLUME SOLIDS:	31.59%
WEIGHT PER GALLON:	8.7 Lbs. per Gallon
PRACTICAL COVERAGE:	475 sq. ft./gal. (brush) yields mils Dry Film Thickness 11.6 M² per liter
RECOMMENDED APPLIED THICKNESS:	Mils (microns) total Dry Film Thickness
FLASH POINT:	N/A
SHIPPING DOCUMENTATION REQUIRED:	ORM-D Consumer Commodity all pack sizes

DRYING TIMES

TEMPERATURE °F	TEMPERATURE °C	TO TOUCH DRY	OVERCOATING TIME (MINIMUM)
50°	10°	2 Hours	2 Hours
60°	15°	1 Hour	2 Hours
75°	24°	45 Minutes	1 Hour
90°	32°	30 Minutes	1 Hour

APPLICATION TEMPERATURE LIMITS

	PRODUCT °F	PRODUCT °C	AMBIENT °F	AMBIENT °C	SURFACE °F	SURFACE °C
MINIMUM	50°	10°	50°	10°	50°	10°
MAXIMUM	85°	29°	95°	35°	95°	35°

APPLICATION DATA - SPRAY

EQUIPMENT	PRESSURE (PSI)	TIP SIZE
N/A	N/A	N/A

Interior Clear Wood Coating 6060

COMPATIBILITY: INTERLUX® INTERIOR CLEAR WOOD COATING 6060 can be applied over previously varnished surfaces that have been cleaned and sanded as well as bare wood.

SURFACE PREPARATION: Surface must always be clean, dry and properly prepared prior to varnishing. All bare wood and previously varnished surfaces that have been sanded must be wiped clean with cheesecloth dampened with INTERLUX® BRUSHING LIQUID 333 to remove sanding residue. Between coats of INTERLUX® INTERIOR CLEAR WOOD COATING 6060 the surface may be wiped down with a rag that has been dampened with water.

APPLICATION SYSTEMS

BARE WOOD: Sand entire surface thoroughly smooth with 80 grit production paper; wipe clean with BRUSHING LIQUID 333. To enhance the appearance of the wood and to fill porous, open grain, apply INTERLUX® PASTE WOOD FILLER AND STAIN according to label directions and allow the surface to dry overnight. Apply 2 coats of INTERLUX® INTERIOR CLEAR WOOD COATING 6060 allowing a minimum of 2 hours between coats. Allow the second coat to dry for a minimum of two hours and then sand (by hand or with a finishing sander) using 220 grit sandpaper. Remove sanding residue by wiping the surface with a clean rag that has been dampened with water. Apply 3 to 5 more coats. Before the last coat sand with 400 grit sandpaper. Remove sanding residue by wiping the surface with a clean rag that has been dampened with water.

PREVIOUSLY VARNISHED - Good Condition: Sand old finish thoroughly with 150-220 grit production paper, being sure not to sand through the paste wood filler stain. Wipe clean with BRUSHING LIQUID 333 and finish with at least 3 coats of varnish. Before the last coat sand with 400 grit sandpaper. Remove sanding residue by wiping the surface with a clean rag that has been dampened with water.

Poor Condition: When surface is badly checked or peeling, remove finish to bare wood with INTERLUX® PINTOFF® PAINT and VARNISH REMOVER 199. Follow directions for varnishing bare wood.

3.7 SPAR AND RIGGING MAINTENANCE

Your boat is equipped with stainless steel standing rigging, and Dacron running rigging to give you years of trouble free service. However, due to normal wear and tear, it is recommended that a periodic inspection be made in all fittings and wires. Turnbuckles should never be neglected and should be unscrewed from time to time in order that they so not seize. Every three months should be about right for the average sailor. A slightly bent turnbuckle shaft or broken wire in your shrouds should be replaced immediately.

Under most conditions, 1x19 standing rigging has a safe "working" life span of approximately five years, seven years under ideal conditions. Factors which reduce the life of the wire are environmental factors such as high humidity (Florida, the Caribbean, and Gulf States), and high salinity (Great Salt Lake, Gulf States, or mooring near a sea wall with constant salt spray), extremes in temperature, and industrial pollution (pulp mills, generating plants, acid rain and smog). High loading of the rigging as required in most racing boats also induces stress in the rigging system.

Many of us have to deal with at least one of these conditions and should consider replacing standing rigging at the five year period.

3.0 MAINTENANCE GUIDE - (Continued)

Unlike running rigging wire rope, which gives us clear signs that it is deteriorating by broken strands and "meat hooks", standing rigging may give no sign that failure is imminent. The usual point of failure of stay or shroud is approximately 1/4" inside the bottom swedged threaded stud fitting which threads into the turnbuckle barrel.

Although the stud is compressed around the wire during the swedging process, salt water and pollutants work down into the tiny cavities between the wire strands and the inevitable corrosive process starts in the crevice the first time the rigging becomes wet with salt water.

A common method of visually monitoring swedge fitting conditions, employed by distance racers and cruisers, is to dab a small ring of enamel paint around the joint between the wire and the swedge fitting. This will help provide a means to see if the wire is pulling out of the fitting.

Another technique used to check the condition of swedge fittings is a "dye penetrant" test. This simple test will detect any cracks which may develop in the fittings due to internal pressure from the corrosive process. Inexpensive dye test kits usually are available at most welding supply stores. Dye tests usually are not required by weekend sailors, but may be done before an extended cruise or ocean passage if any doubt about the integrity of the rigging exists.

All stainless steel wire rope rigging will develop some rust film when new. <u>This is normal</u>.

The rust is caused by two factors. When wire rope is manufactured, the wire strands are fed over steel rollers during the process of twisting or laying the wire. Trace amounts of the ferrous steel from the rollers and dies are transferred to the wire strands. As this small amount of steel rusts it causes a film on the new wire.

The second cause of the rust film on new wire rope is the microscopic veins of ferrous material which exist in stainless steel. After a period of time, as the surface material veins are depleted, and the stainless steel has been cleaned several times, new rust film development will slow to a minimum.

For the average sailor, the best insurance against a rigging failure is a periodic (every six months is recommended) inspection of all rigging parts, including turnbuckles, and replacement of standing rigging as required.

<u>IMPORTANT:</u> If any wear or sign of broken strands is found on the running or standing rigging, it is time to replace that part. Using your boat when the rigging is worn could cause the rigging to fail when you least expect it.

<u>FITTINGS:</u>

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

3.0 MAINTENANCE GUIDE - (Continued)

SPARS:

The mast and boom are clear anodized aluminum. Like all other fittings, masts and booms suffer from the corrosive effects of salt water, air and spray. These should be kept waxed where possible, and at least always hosed down with fresh water. Always see that the halyards are tied off away from the mast. This will eliminate slapping in the wind, and subsequent marking of the mast. Use a high pressure nozzle and shoot fresh water to the top of the mast and spreaders. This will help keep your sails clean too, as they rub on the mast and spreaders.

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

3.8 SAIL MAINTENANCE:

Your sails should be protected from chafing. This can be done by either padding the areas that touch the sail or by having your sailmaker attach chafe patches to the sails themselves.

You should check your sails frequently for any signs of wear and have any tears or frayed stitches repaired immediately.

Sails should never be stored in the sun because they are susceptible to decay through exposure to too much ultraviolet light. Always keep your sails covered when they are not in use.

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

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

IMPORTANT: FOR WHITE SAILS ONLY!

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

OIL, GREASE, TAR AND WAX: Warm water, soap and elbow grease seem to be effective. On hard stains, propriety stain remover and dry cleaning fluids should do the trick. Be careful to remove all fluids, as they can soften the various resinated coatings on sailcloth.

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

3.0 **MAINTENANCE GUIDE** - (Continued)

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

PAINT AND VARNISH: Acetone and M.E.K. should remove most common paint and stains. Varnish can be easily removed with alcohol.

Mylar sails are coated with a plastic film and are easily damaged. Avoid solvents, as they can destroy the film and fabric over a period of time. Soap and diluted bleaches should take care of most stains.

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

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

3.9 **INTERIOR CUSHION, FABRIC COVER:**

CLEANING:

1. Regular vacuum cleaning or brushing in the direction of the pile with a soft brush.

2. Stains should, if possible, be removed at once with a damp cloth. Do not allow stains to harden and age.

3. Greasy stains can be removed with ordinary cleaning fluid.

4. For overall cleaning, use commercial types of upholstery shampoo using only the foam to protect the back padding from moisture. After a minute or so, remove foam, and when dry, vacuum or brush in the direction of the pile.

5. Do not use heat such as an iron or steam.

6. The use of some kind of fabric protector, such as "Scotch Guard" is strongly recommended when the cushions are new, and after each cleaning.

4.0 YACHT SYSTEMS

4.1 RIGGING:

4.1.1 STEPPING THE MAST:

1. Before stepping the mast check all standing rigging lengths against the checklist.

2. Check all mast light wiring, be sure the masthead anchor light, steaming light and deck light function. The wires exiting at the base of the spar should be taped up to prevent damage when the spar is set on the step.

3. Prepare to step the mast in the following sequence:

   a) Check all rigging lengths and inspect all end fittings.
   b) Attach all shrouds, forestay and backstay. Tape clevis pins and spreader tips, check all halyards and secure to mast.
   c) Check mast wiring and mast light wiring at mast step.
   d) Before mast contacts maststep casting make electrical connections at base of mast for mast lights and check circuits.
   e) Tune rigging at dock and when under sail.

4.1.2 TUNING THE MAST:

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

AT THE DOCK:

1. Adjust forestay and backstay so that the mast is straight up and down. Tie a bolt to a 6 or 7 foot long piece of light line to make a quick plumb bob, and tape the free end of the line to the front of the mast as high up as you can reach. This device will help you to determine if the mast is perpendicular or not.

2. Adjust the upper, intermediate, and lower shrouds so that the mast is centered athwartship. That is, from side to side as opposed to bow and stern.

3. The upper and lower shrouds should be taut, but not bar tight.

4. The intermediate shrouds should not be as tight as the upper shrouds.

5. The lower shrouds (4 of them) should be adjusted so that they are looser than the upper shrouds. While at dock, they should have no slack, but no tension either. No lower shroud, when pushed, should deflect the mast more than any other shroud when pushed equally hard. If this cannot be achieved, the upper shrouds are too tight. Back off one half turn at a time of the upper shroud turnbuckles until the tension on the lower shrouds is brought into balance.

4.0 YACHT SYSTEMS - (Continued)

UNDER SAIL:

The object of fine tuning is to have the mast "in column" (not bent fore or aft or athwartships) when sailing in conditions typical for your area. This is accomplished through adjustments to the shroud turnbuckles. Here are some points to look for:

1. When sailing on port tack, sight up the mast from the base. If the middle (where the spreaders are) is sagging to leeward, take up equally on both port lower shrouds and/or intermediate shrouds until the mast is "in column". Repeat this procedure on starboard tack.

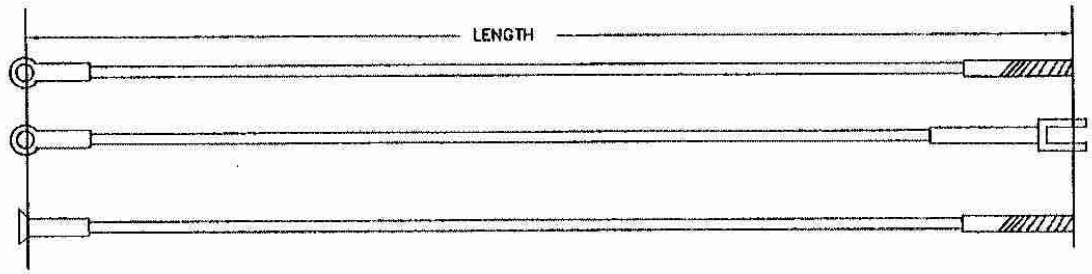
2. If, when sighting up the mast while on port tack, the middle is bowed forward (but not to leeward), take up a turn on the port aft lower shroud and let out a turn on the port forward lower shroud turnbuckle. Reverse these adjustments if the middle of the mast is aft on the "in column" position.

3. If a perfectly straight mast is not obtained, the mast head (top) may be curved aft and to leeward. The mast head should never be "hooked" or bowed forward, nor to weather.

All rigging wire used on yachts has a tendency to stretch, especially on a new yacht, and after you have sailed in heavier wind than you are normally experienced for. Therefore; you should periodically check the tension on the shrouds and stays, and tighten them, if it is required. Rigging, as well as tuning, becomes all too important when setting up the mast. A knowledgeable person should oversee the rigging and tuning so as to eliminate the possibility of an eccentric load, which might occur with an improperly loaded shroud. Special attention should be given to the initial stretch of the shrouds and a further gradual stretch of the wire over the first few hard outings.

NO	REVISIONS	DATE
1	CHANGED LENGTH, WAS 50' 7-1/8".	6/25/99

SHROUD	QTY.	LENGTH	MATERIAL	TOP FITTING	BOTTOM FITTING
FORESTAY	1	49' 6 3/4"	5/16" DIA	MARINE EYE	5/8" x 18 STUD
BACKSTAY	1	40' 2 7/8"	5/16" DIA	MARINE EYE 5/8 PIN	FORK 7/16 PIN
UPPERS	2	[1] 49' 5 1/8"	5/16" DIA	STEMBALL	5/8" x 18 STUD
INTERMED.	2	35' 5 1/2"	1/4" DIA	STEMBALL	1/2" x 20 STUD
FWD. LOWERS	2	18' 8 3/4"	5/16" DIA	STEMBALL	5/8" x 18 STUD
AFT LOWERS	2	18' 11 1/4"	5/16" DIA	STEMBALL	5/8" x 18 STUD
BRIDLE	2	14' 6"	1/4" DIA	MARINE EYE	1/2" x 20 STUD



NOTE
FOR SHEAFER FURLING
SYSTEM 3100

HULLS 149 AND LATER

NOTE:
1) ALL WIRE TO BE STAINLESS STEEL 1 X 19
2) FORESTAY INCLUDES ALLOWANCE FOR FURLING

Catalina Yachts
MORGAN DIVISION

7200 BRYAN DAIRY RD
LARGO, FL
33777-(813)544-6681

SCALE:	APPROVED BY:	DRAWN BY
DATE 6-12-98	FILE RIGGING2	CARL DAVIS

TITLE: STANDING RIGGING. STD SPARCRAFT CHARLESTON

BOAT: CATALINA 380

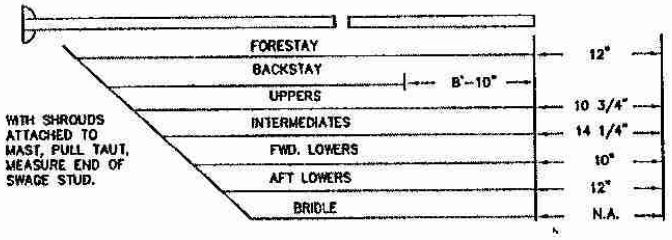
DRAWING NUMBER: 380-34055-1

NO	REVISIONS	DATE
1	CHANGED LENGTH, WAS 51' 5 7/8"	6/25/99

– RUNNING RIGGING –

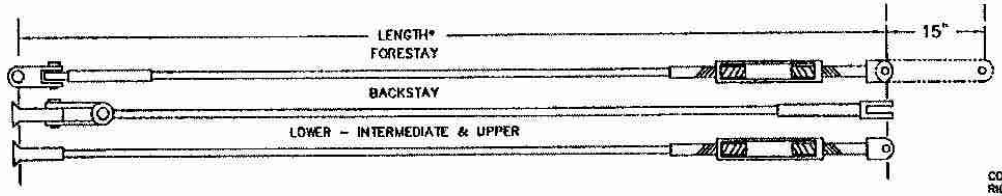
ITEM	QTY.	LENGTH	MATERIAL	NOTES
SPINNAKER SHEETS	2	80'	1/2" Ø Y.B.	(OPTIONAL) LGE. SNAP SCHACKLES
BOOM VANG	NA			
MAINSHEET	1	100'	1/2" Ø Y.B.	
GENOA SHEETS	2	50'	1/2" Ø Y.B.	
MAIN HALYARD	1	120'	1/2" Ø ULS	BLUE, HEAD BOARD SCHACKLE
GENOA HALYARD	2	120'	1/2" Ø ULS	1 W/GREEN, 1 W/RED, LGE. SNAP SCHAC.
TRAVELER	2	35'	3/8" Ø Y.B.	
BOOM TOP. LIFT	1	115'	3/8" Ø Y.B.	
SPINNAKER HALYARD	1	130'	1/2" Ø ULS	(OPTIONAL) LGE, SNAP SCHACKLE, BLUE
1ST REEF LINE	1	60'	3/8" Ø Y.B.	W/ NON-FURLING MAST
2ND REEF LINE	1	90'	3/8" Ø Y.B.	OPTIONAL W/ NON-FURLING MAST

NOTE:
RIGGING LENGTHS ALLOW FOR A 3100 SHEAFER FURLING SYSTEM



– STANDING RIGGING –

ITEM	QTY.	LENGTH*	MATERIAL	TOP FITTING	BOTTOM FITTING
FORESTAY	1	51' 5 1/2"	5/16" DIA 1x19 S.S.	MARINE EYE–DOUBLE JAW TOGLE	5/8" TURNBUCLE
BACKSTAY	1	40' 10 1/2"	5/16" DIA 1x19 S.S.	STEMBALL EYE–DOUBLE JAW TOGLE– MARINE EYE	FORK, 7/16" PIN
BACKSTAY BRIDLE	2	15' 2 7/8"	1/4" DIA 1x19 S.S.	FORK, 3/8" PIN	1/2" TURNBUCLE
UPPERS	2	50' 3 7/8"	5/16" DIA 1x19 S.S.	STEMBALL	5/8" TURNBUCLE
INTERMED.	2	36' 2 3/8"	1/4" DIA 1x19 S.S.	STEMBALL	1/2" TURNBUCLE
FWD. LOWERS	2	19' 7 1/2"	5/16" DIA 1x19 S.S.	STEMBALL	5/8" TURNBUCLE
AFT LOWERS	2	19' 10"	5/16" DIA 1x19 S.S.	STEMBALL	5/8" TURNBUCLE



HULL 149 AND LATER

Catalina Yachts
MORGAN DIVISION
7200 BAYAN BAIRY RD.
LARGO, FLORIDA
33777–(813)544–8681

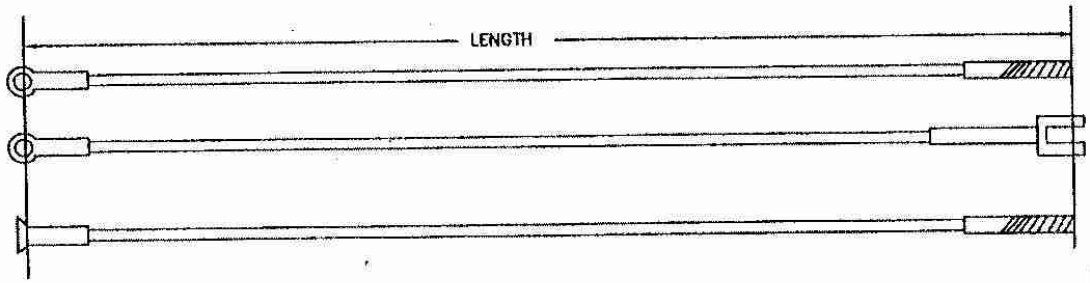
SCALE	APPROVED BY	DRAWN BY
DATE 12–2–97	FILE RIGGING1	CARL DAVIS

TITLE
RIGGING LENGTH SCHEDULE. STD SPARCRAFT CHARLESTON

BOAT	DRAWING NUMBER
CATALINA 380	380–34054–1

NO	REVISIONS	DATE

SHROUD	QTY.	LENGTH	MATERIAL	TOP FITTING	BOTTOM FITTING
FORESTAY	1	52'- 6 1/8"	5/16" DIA	MARINE EYE	5/8" x 18 STUD
BACKSTAY	1	43" 7 3/4"	5/16" DIA	STEMBALL EYE DOUBLE JAW TOGGLE MARINE EYE	FORK 7/16 PIN
UPPERS	2	53'- 7 5/8"	5/16" DIA	STEMBALL	5/8" x 18 STUD
INTERMED.	2	37'- 1 3/4"	1/4" DIA	STEMBALL	1/2" x 20 STUD
FWD. LOWERS	2	18'- 9"	5/16" DIA	STEMBALL	5/8" x 18 STUD
AFT LOWERS	2	19'- 0"	5/16" DIA	STEMBALL	5/8" x 18 STUD
BRIDLE	2	14'- 8"	1/4" DIA	MARINE EYE	1/2" x 20 STUD



HULLS 149 AND LATER

NOTES
1) ALL WIRE TO BE STAINLESS STEEL 1x19
2) FORESTAY INCLUDES ALLOWANCE FOR FURLING

Catalina Yachts
MORGAN DIVISION
7200 BRYAN DAIRY RD
LARGO, FL
33777-(813)544-5581

SCALE:	APPROVED BY:	DRAWN BY
DATE 6-12-98	FILE: RIGGING2	CARL DAVIS

TITLE: STANDING RIGGING. TALL SPARCRAFT CHARLESTON

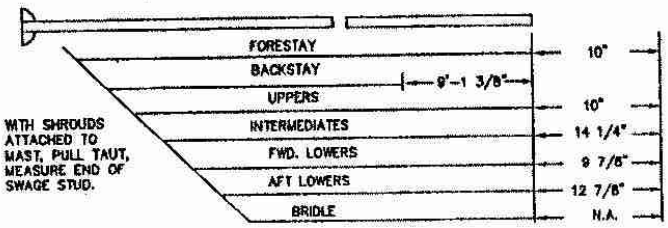
BOAT: CATALINA 380 DRAWING NUMBER: 380-34056-0

NO	REVISIONS	DATE

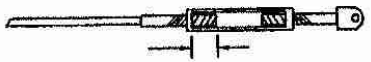
– RUNNING RIGGING –

ITEM	QTY.	LENGTH	MATERIAL	NOTES
SPINNAKER SHEETS	2	80'	1/2" D Y.B.	(OPTIONAL) LGE. SNAP SCHACKLES
BOOM VANG	NA			
MAINSHEET	1	100'	1/2" Ø Y.B.	
GENOA SHEETS	2	50'	1/2" Ø Y.B.	
MAIN HALYARD	1	126'	1/2" Ø ULS	BLUE, HEAD BOARD SCHACKLE
GENOA HALYARD	2	126'	1/2" Ø ULS	1 W/GREEN, 1 W/RED, LGE. SNAP SCHAC.
TRAVELER	2	35'	3/8" Ø Y.B.	
BOOM TOP. LIFT	1	121'	3/8" Ø Y.B.	
SPINNAKER HALYARD	1	136'	1/2" Ø ULS	(OPTIONAL) LGE, SNAP SCHACKLE, BLUE
1ST REEF LINE	1	60'	3/8" Ø Y.B.	W/ NON-FURLING MAST
2ND REEF LINE	1	90'	3/8" Ø Y.B.	OPTIONAL W/ NON-FURLING MAST

NOTE
RIGGING LENGTHS
ALLOW FOR A 3100
SHEAFER FURLING SYSTEM



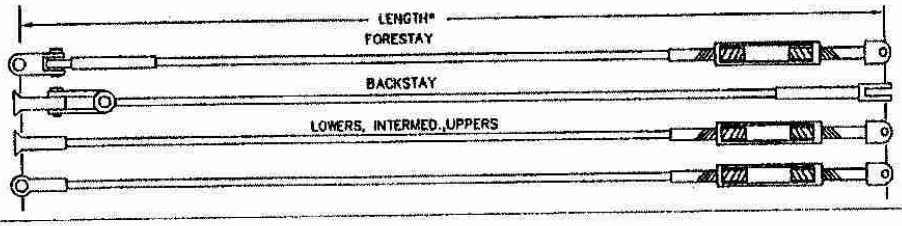
WITH SHROUDS ATTACHED TO MAST, PULL TAUT, MEASURE END OF SWAGE STUD.



1" FOR 5/8" TURNBUCLE; 2/3 OPEN
7/8" FOR 1/2" TURNBUCLE

– STANDING RIGGING –

ITEM	QTY.	LENGTH*	MATERIAL	TOP FITTING	BOTTOM FITTING
FORESTAY	1	53'-7 1/4"	5/16" DIA 1x19 S.S.	MARINE EYE-DOUBLE JAW TOGLE	5/8" TURNBUCLE
BACKSTAY	1	43'-8 1/4"	5/16" DIA 1x19 S.S.	STEMBALL EYE-DOUBLE JAW TOGLE- MARINE EYE	FORK, 7/16" PIN
BACKSTAY BRIDLE	2	15'-4 7/8"	1/4" DIA 1x19 S.S.	FORK, 3/8" PIN	1/2" TURNBUCLE
UPPERS	2	54'-6 3/8"	5/16" DIA 1x19 S.S.	STEMBALL	5/8" TURNBUCLE
INTERMED.	2	37'-10 1/8"	1/4" DIA 1x19 S.S.	STEMBALL	1/2" TURNBUCLE
FWD. LOWERS	2	19'-7 3/4"	5/16" DIA 1x19 S.S.	STEMBALL	5/8" TURNBUCLE
AFT LOWERS	2	19'-10 3/4"	5/16" DIA 1x19 S.S.	STEMBALL	5/8" TURNBUCLE



HULLS 149 AND LATER

Catalina Yachts
MORGAN DIVISION
7200 BRYAN DAIRY RD.
LARGO, FLORIDA
33777-(813)544-6881

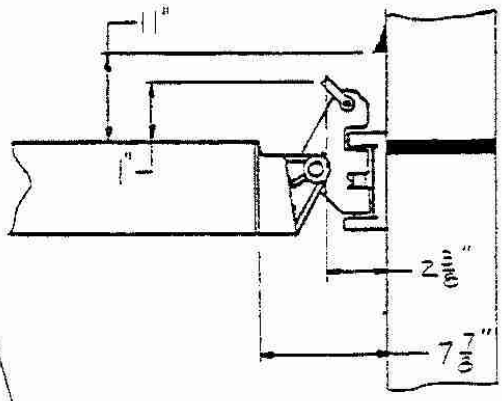
SCALE	APPROVED BY	DRAWN BY
DATE 6-12-98	FILE RIGGING5	CARL DAVIS

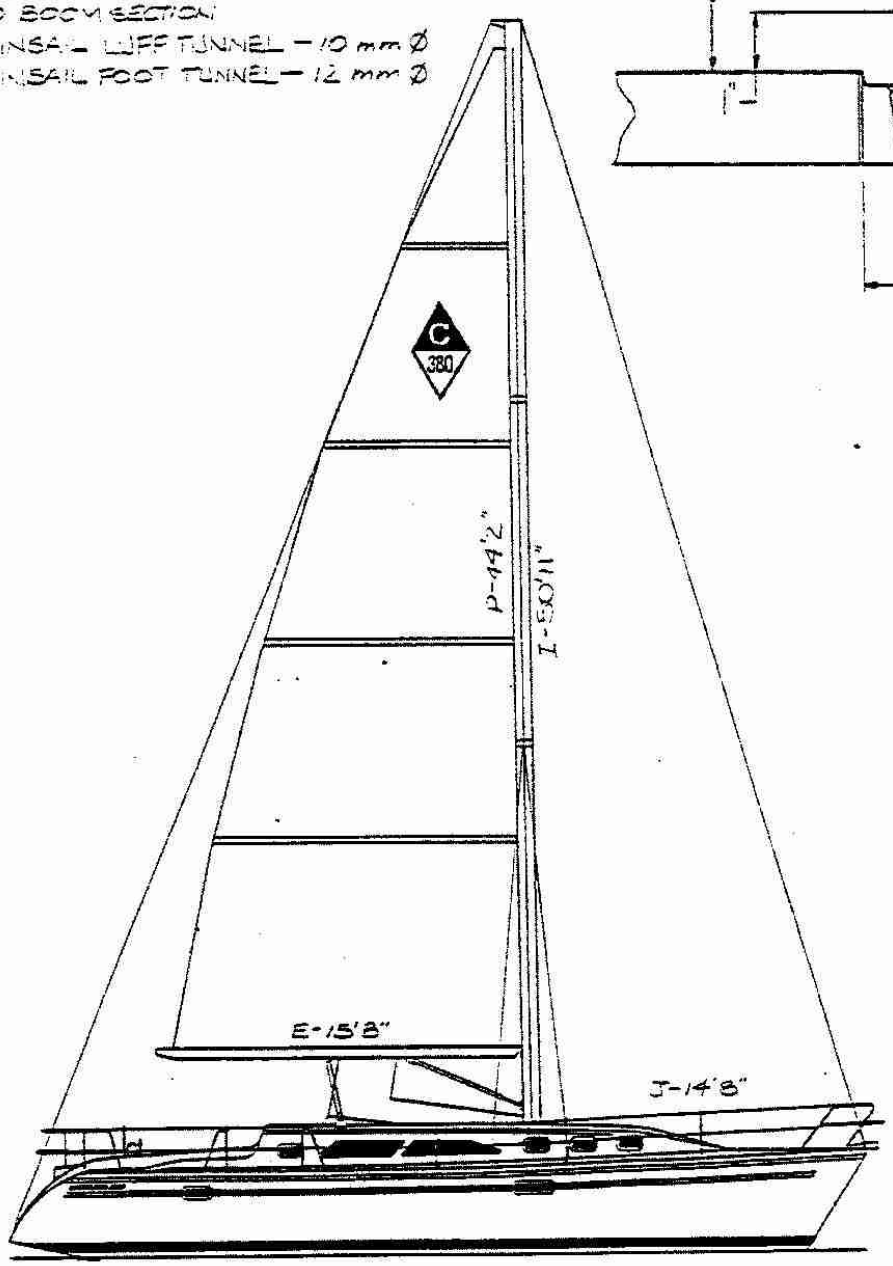
TITLE: RIGGING LENGTH SCHEDULE. TALL SPARCRAFT CHARLESTON

MODEL CATALINA 380	DRAWING NUMBER 380-34057-0

NOTE

1) SAILMAKERS OFFSETS APPLY TO ESPAR 701 MAST/480 BOOM SECTION
2) MAST MAINSAIL LUFF TUNNEL — 10 mm Ø
3) BOOM MAINSAIL FOOT TUNNEL — 12 mm Ø





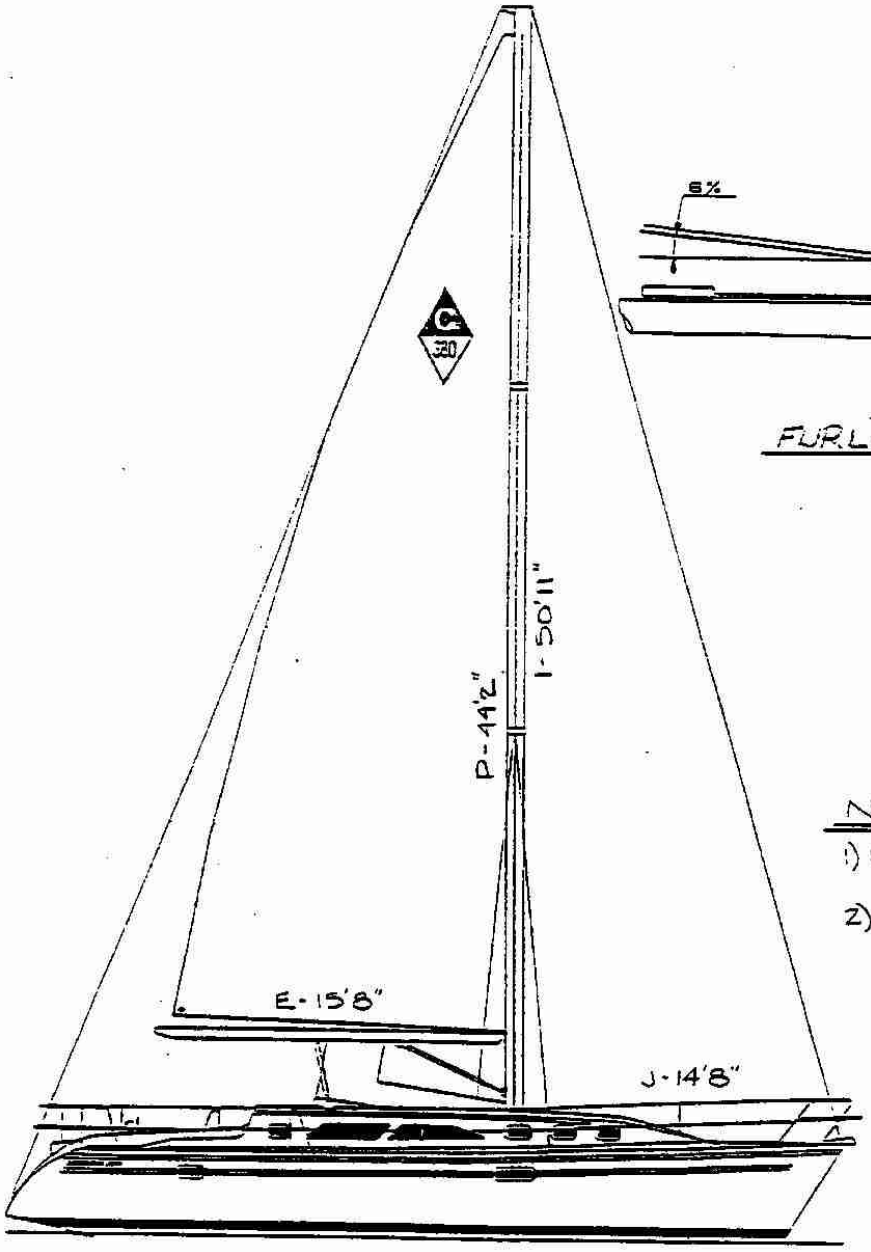
SAIL PLAN DIMENSIONS		
MAIN SAIL	346 FT²	32.14 m²
100% FORE Δ	373 FT²	34.65 m²
TOTAL SAIL AREA	719 FT²	66.79 m²

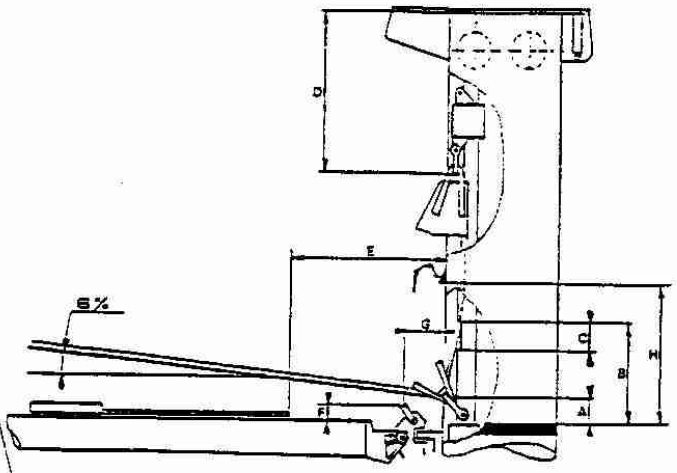
I	50' 11"	15.52 m
J	14' 8"	4.47 m
P	44' 2"	13.46 m
E	15' 5"	4.78 m

CATALINA YACHTS/MORGAN DIVISION
7200 Bryan Dairy Road
Largo, Florida

CATALINA 380
SAIL PLAN

DESIGNED BY	DATE 1-31-96	DRAWING NO. 380-3000C-0
DRAWN BY		
CHECKED BY	SCALE —	
APPROVED BY		





Z-SPAR 700E
FURLING MAST DIMENSIONS

LTR.	DIMENSION, MM
A	60
B	500
C	100
D	450
E	1000
F	35
G	60
H	100

NOTES

1) USE NO BATTENS ON MAINSAIL
2) MAIN SAIL FOOT SLOPE AT CLEW IS 6% OF 'E'.

SAIL PLAN DIMENSIONS

MAIN SAIL	346 FT^2 - 32.14 m^2
100% FORE Δ	373 FT^2 - 34.65 m^2
TOTAL SAIL AREA	719 FT^2 - 66.79 m^2

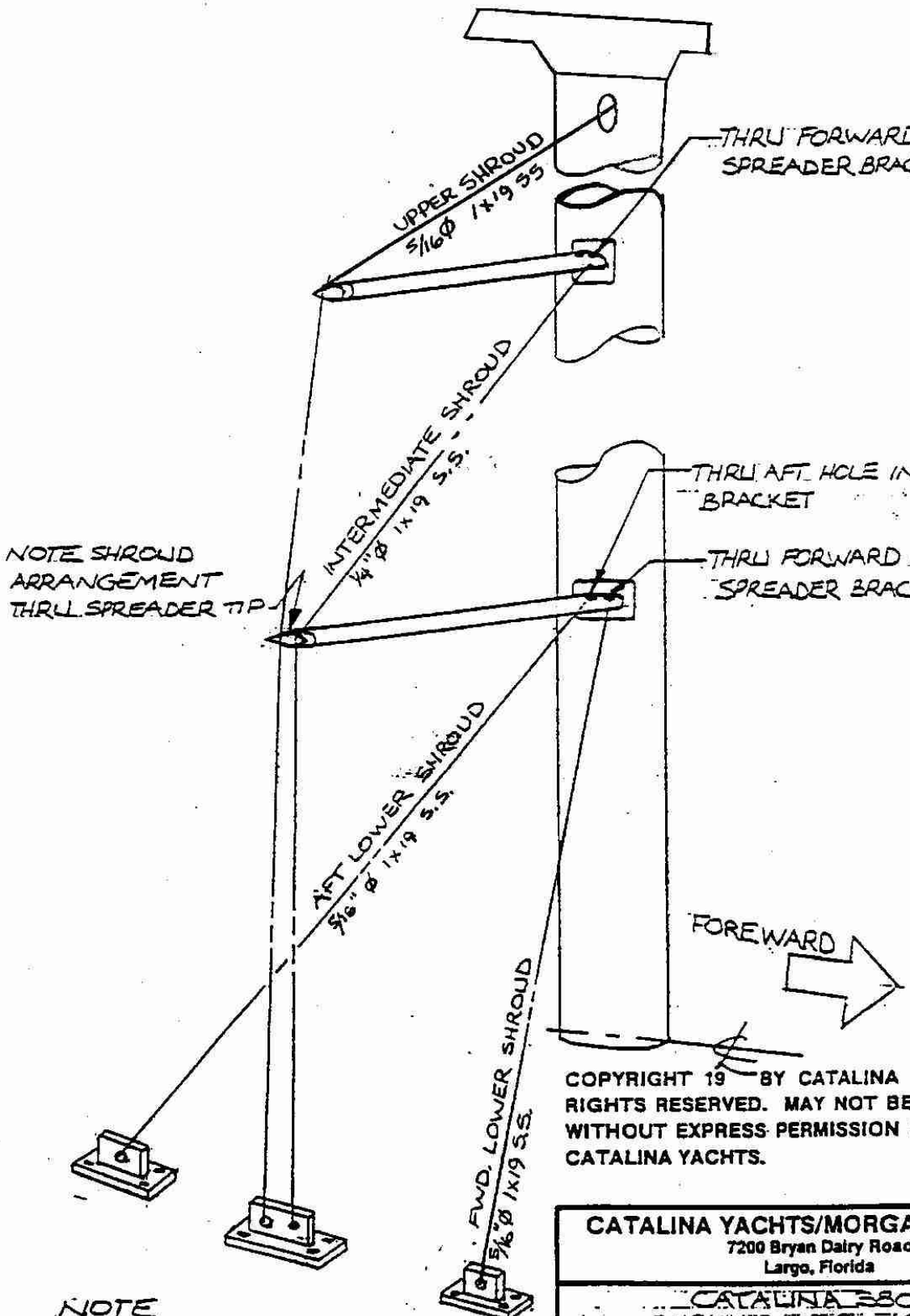
I	50'11"	15.52 m
J	14'8"	4.47 m
P	44'2"	13.46 m
E	15'8"	4.78 m

CATALINA YACHTS/MORGAN DIVISION
7200 Bryan Dairy Road
Largo, Florida

CATALINA 380
SAIL PLAN - FURLING MAST

DESIGNED BY	DATE 6-25-96	DRAWING NO. 380-30001-0
DRAWN BY		
CHECKED BY	SCALE —	
APPROVED BY		

NO.	REVISION	DATE



NOTE

1). DRAWING FOR CHARLESTON SPAR MAST SECTION

CATALINA YACHTS/MORGAN DIVISION
7200 Bryan Dairy Road.
Largo, Florida

CATALINA 380
SHROUD ARRANGEMENT

DESIGNED BY	DATE 1-15-96	DRAWING NO. 380-34003-1
DRAWN BY		
CHECKED BY	SCALE	
APPROVED BY		

4.0 YACHT SYSTEMS - (Continued)

4.1.8 MAIN SAIL REEFING

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

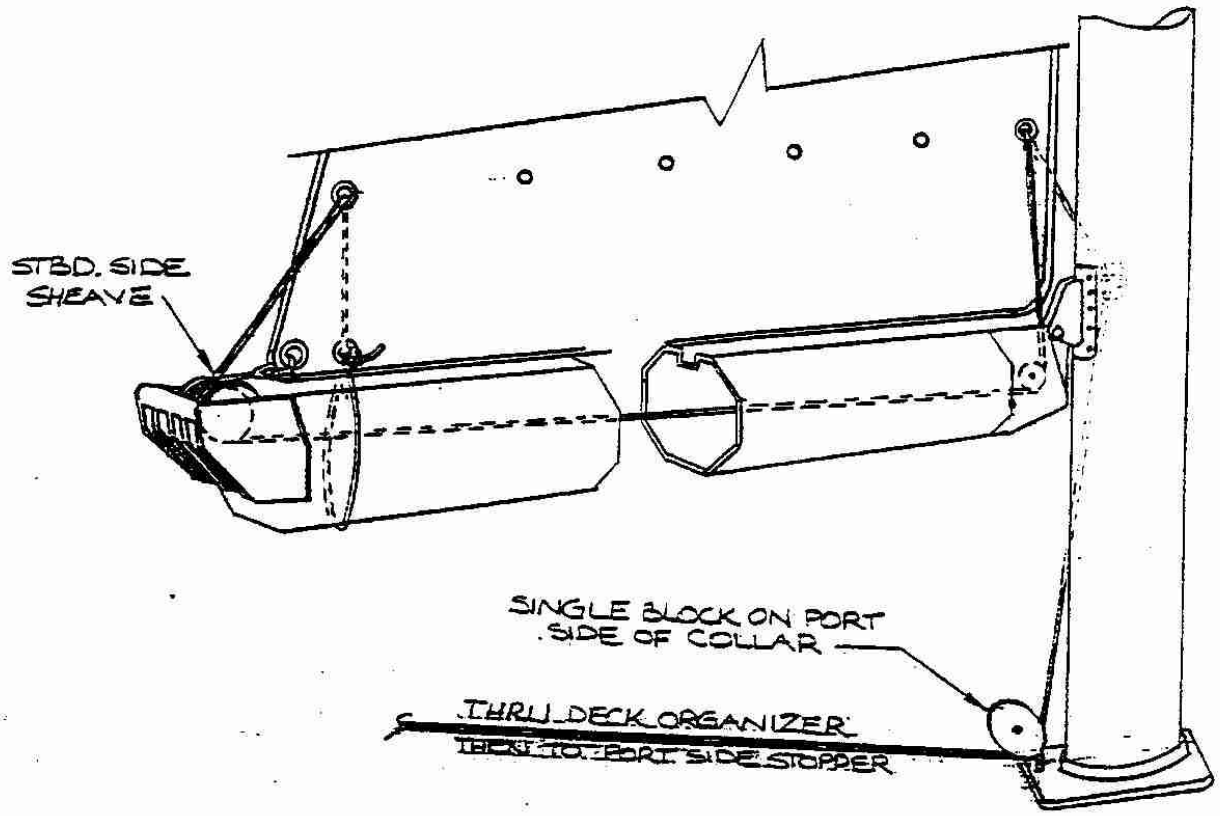
Your Catalina is equipped with single line reefing, for reefing the mainsail. The system consists of a line tied around the boom and reeved through the cringles, internal boom sheaves, and blocks as shown in the illustration. It is controlled through the port cabin top winch. A second reef line may be installed in a like manner, but to the opposite side of the boom, and led to the starboard side of the cockpit.

To set up the first reef, tie a loop of line around the main boom with a bowline, through the clew cringle at the first reef and into the boom on the starboard sheave. The line exits the starboard forward sheave and up through the luff cringle in the sail at the first reef. Lead the line to the port side turning block at the base of the mast, through the organizer on deck and through the sheet stopper to the winch on the port side.

REEFING PROCEDURE:

1. Take up the slack in the main boom topping lift, which is led to the port side of the cabin top.
2. Ease the mainsheet.
3. Release the main halyard on the starboard side of the cabin top, to a predetermined point. (Marking the halyard with ink or a colored thread sewn into the line is helpful.) Recleat the halyard after lowering.
4. Pull the luff and leech cringles down to the boom by pulling the reefing line through the blocks with the port cabin top winch and cleat off.
5. Snug up the main halyard as required to flatten out the mainsail.
6. Ease the topping lift.
7. Trim in the mainsheet.
8. Tie off remaining reef points with lines around boom.

NO.	REVISION	DATE



NOTES

1) USE WITH Z-SPAR 701 MAST, 480 BOOM SECTION.
2) USE STARBOARD SIDE BOOM SHEAVES FOR FIRST REEF, PORT SIDE SHEAVES FOR SECOND REEF.
3) SECOND REEF LEADS TO SINGLE BLOCK ON STBD. SIDE OF COLLAR.

CATALINA YACHTS/MORGAN DIVISION
7200 Bryan Dairy Road
Largo, Florida

CATALINA 380
SINGLE LINE REEFING

DESIGNED BY	DATE 1-15-96	DRAWING NO. 380-35001-0
DRAWN BY ES		
CHECKED BY	SCALE	
APPROVED BY		

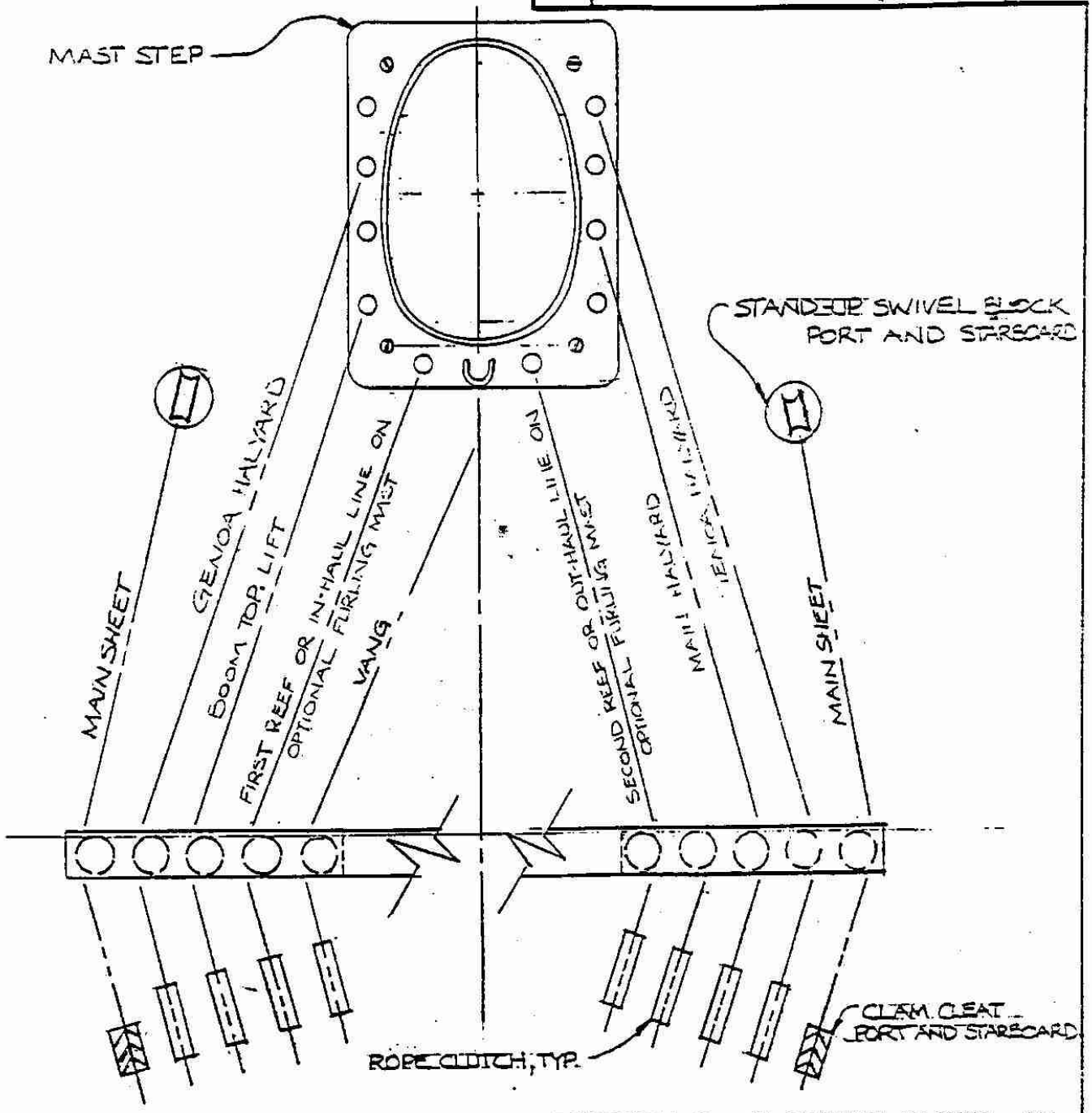
NO.	REVISION	DATE
1	STAND-UP SWIVEL WAS PIVOT LOW LEAD	10-7-94
2	ADDED DETAIL "F"	5-15-96

CATALINA YACHTS/MORGAN DIVISION
7200 Bryan Dairy Road
Largo, Florida

CATALINA 380
MAINSHEET/TRAVELER ASSEMBLY

DESIGNED BY	DATE 1-15-96	DRAWING NO. 380-35002-0
DRAWN BY		
CHECKED BY	SCALE 1=1	
APPROVED BY		

NO.	REVISION	DATE



NOTES

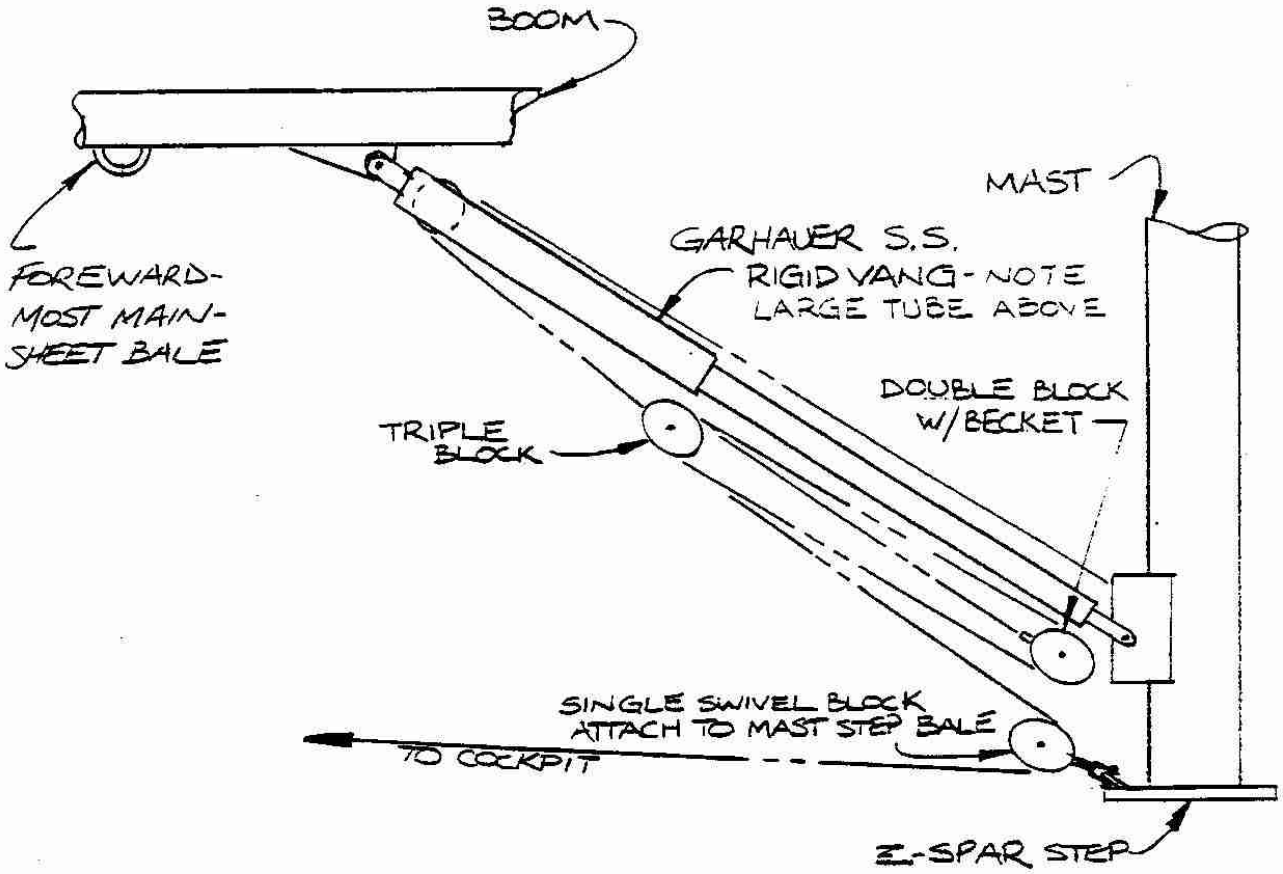
1) USE WITH Z SPAR 701/700E MAST SECTIONS
2) NOTE ORIENTATION OF BLOCKS ON MAST STEP.

CATALINA YACHTS/MORGAN DIVISION
7200 Bryan Dairy Road
Largo, Florida

CATALINA 380
"CABIN TOP" HALYARD ARRANGEMENT

DESIGNED BY	DATE	DRAWING NO.
DRAWN BY	1-15-96	380-35003-C
CHECKED BY	SCALE	
APPROVED BY		

NO.	REVISION	DATE

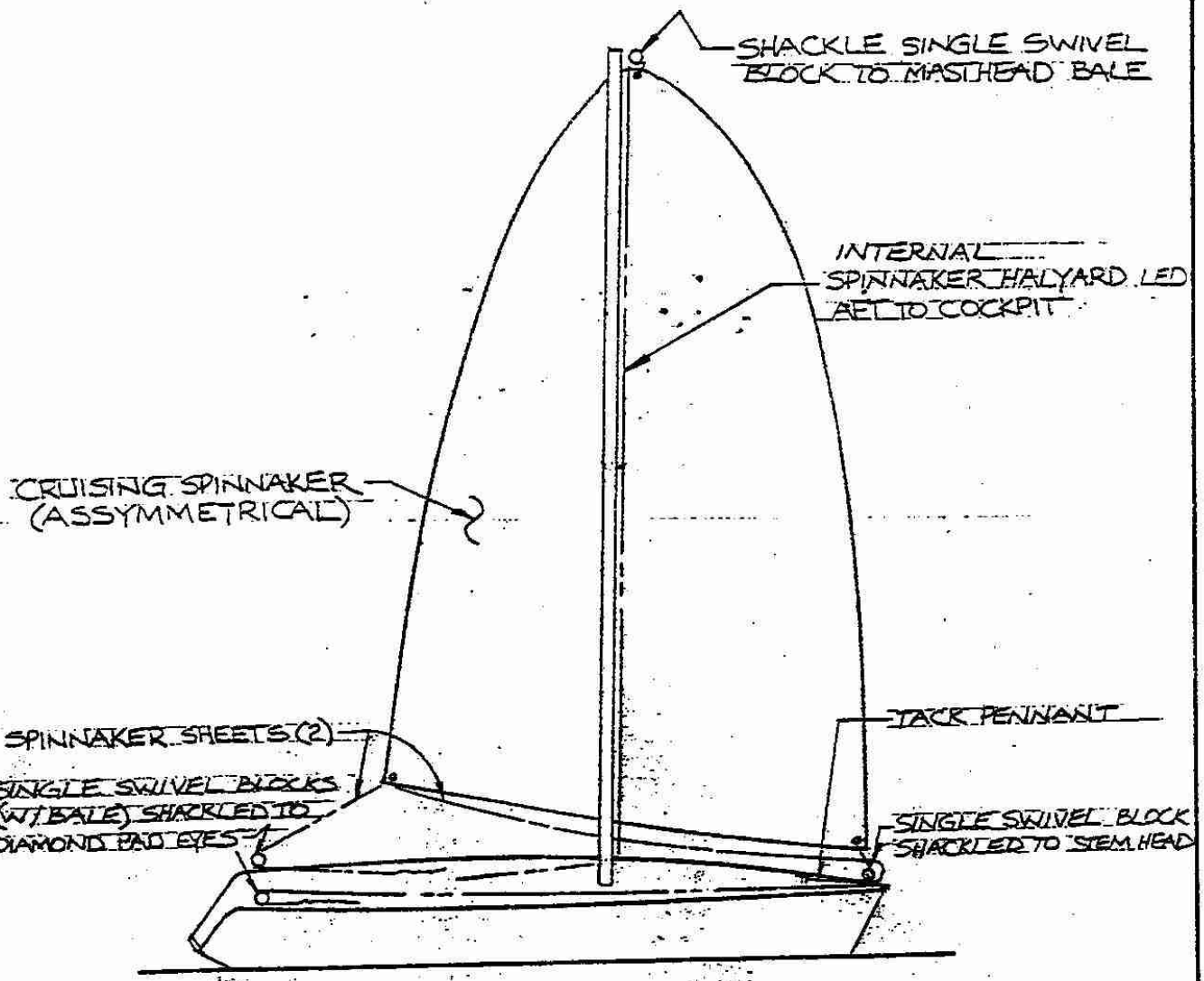


CATALINA YACHTS/MORGAN DIVISION
7200 Bryan Dairy Road
Largo, Florida

CATALINA 380
BOOM VANG SCHEMATIC

DESIGNED BY	DATE 12-21-95	DRAWING NO. 380-35004-0
DRAWN BY ES		
CHECKED BY	SCALE	
APPROVED BY		

NO.	REVISION	DATE



NOTES

1) LEAD SPINNAKER TACK PENNANT THRU SINGLE SWIVEL BLOCK AND AFT TO MOORING CLEAT ON FORE DECK
2) SHOCK CORD AFT SHEET BLOCKS TO LIFELINES.
3) BLOCKS ARE GATCHALER SERIES 60

DESCRIPTION	QTY/SIZE
SPINN. HALYARD	½" x 130' Y.B.
TACK PENNANT	½" x 20' Y.B.
SHOCK CORD	2 - ¼" x 24"
BLOCKS:	
SINGLE SWIVEL W/BALE	2
SINGLE SWIVEL	2
SPINN. SHEETS	2 - ½" x 80' Y.B.

CATALINA YACHTS/MORGAN DIVISION
7200 Bryan Dairy Road
Largo, Florida

CATALINA 400/380
SPINNAKER OPTION RIGGING

DESIGNED BY		DATE	DRAWING NO.
DRAWN BY	ES	4-18-95	400-35007-0
CHECKED BY		SCALE	
APPROVED BY			

4.0 YACHT SYSTEMS - (Continued)

4.2 ELECTRICAL:

4.2.1 BATTERIES:

Your electrical system is powered by two (2) marine grade 12 volt, deep cycle, 400 minute reserve capacity batteries. Attention should be given to maintaining the proper level of distilled water. Do not overfill. The batteries are located under the sole beneath the companionway opening.

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

With proper care, the batteries installed in your Catalina 380 will provide long and satisfactory service. Proper care is not difficult if a few basic points are kept in mind, as follows.

Your battery should be checked periodically for any cracks or breaks in the case or cover, and any cracks in the sealing compound. If there is any damage, the battery should be repaired at once.

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

ELECTROLYTE LEVEL:

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

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

CHARGING THE BATTERY:

Before adding water, a hydrometer reading of the battery should be taken. If the reading shows the battery to be above 1.225 specific gravity, the battery has a sufficient charge. If the reading is below 1.225, the battery should be removed for bench charge.

Once charged, the battery should have a specific gravity of at least 1.260. If this cannot be reached, the battery should be inspected by a battery supplier.

The batteries should be checked often to ensure that they do not run down. Check that all battery cells keep an even fluid level and that the fluid is about 3/8" above the top of the separators.

If one or two cells have lower fluid levels, it is a good indicator that something is wrong with the battery, and it should be checked.

DISCHARGED STATE:

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

CLEAN CONNECTIONS:

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

4.2.2 MAIN BATTERY SWITCH:

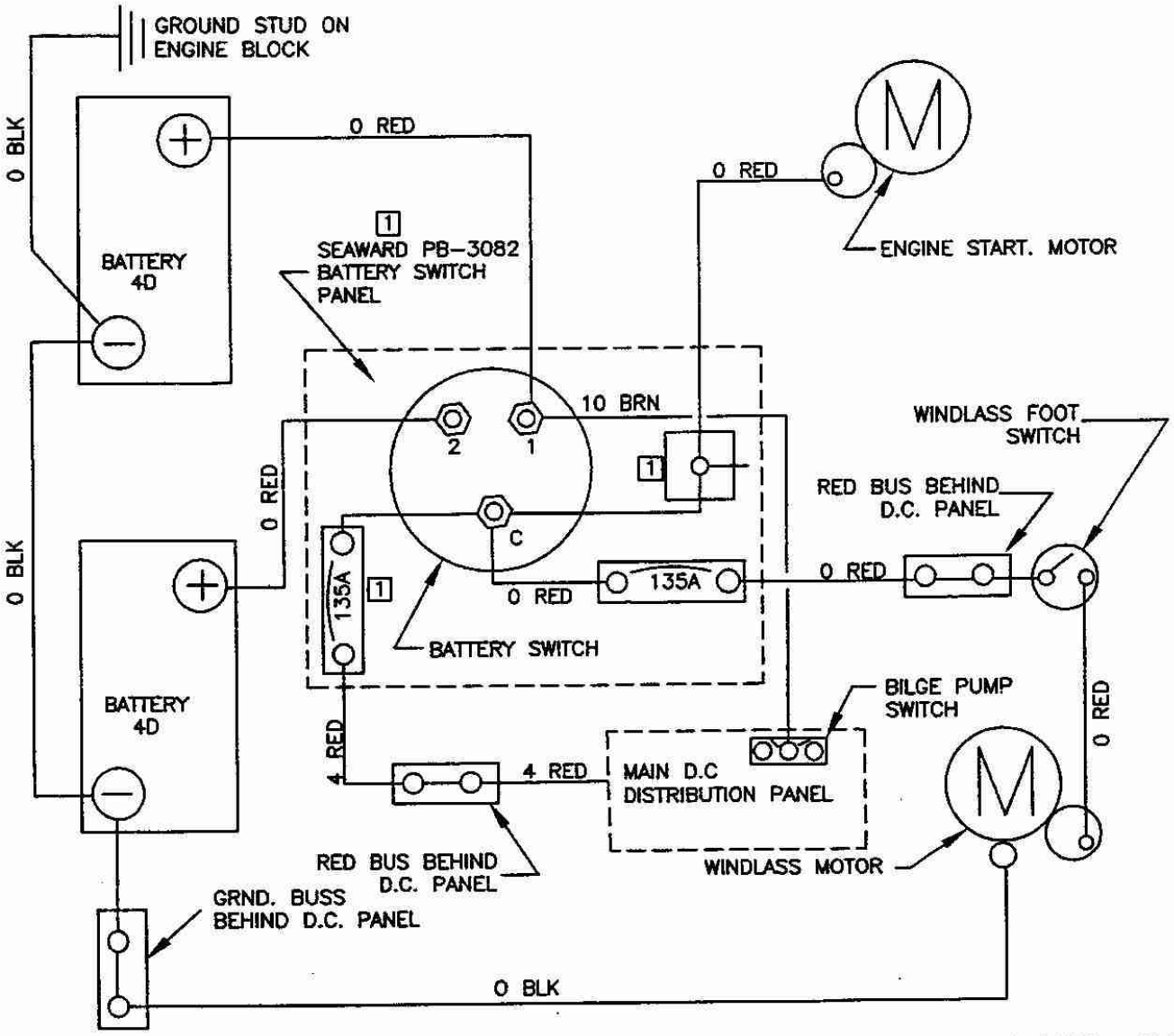
Electrical circuits are protected by circuit breakers on the distribution panel. The power to the engine and the distribution panel is controlled by a master switch.

The circular battery switch has the markings 1, 2, and "ALL" as well as "OFF", therefore, you can selectively charge the battery with the engine alternator. Many experienced sailors use battery #1 for electrical lighting needs and keep #2 in reserve for starting the engine.

When the engine is running, never pass through the "OFF" position to charge from one battery to the other or the alternator diodes will be burned out. Switching from one battery to another should only be done when the engine is stopped. If both batteries are of equal charge, keep the selector switch on "ALL" position, and use "ALL" to start the engine if both batteries are low.

NO.	REVISION	DATE

[1] REVISED BATTERY SWITCH PANEL. WAS SEAWARD PB-2712. ADDED ENGINE SWITCH AND 135 AMP BREAKER FOR MAIN DISTRIBUTION PANEL 4/13/99



CATALINA YACHTS/MORGAN DIVISION
7200 Bryan Dairy Road
Largo, Florida

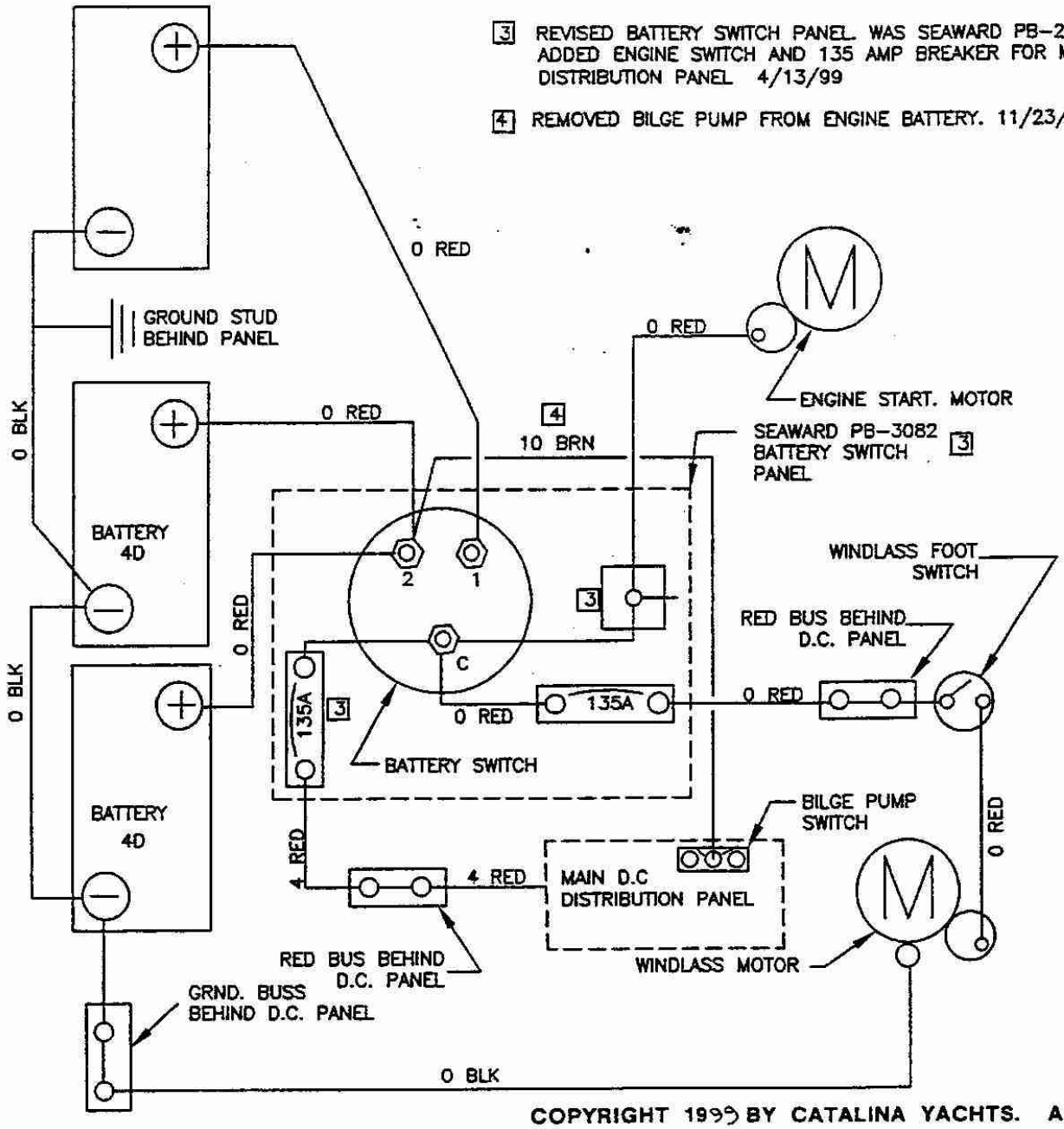
C-380 BATTERY SCHEMATIC

DESIGNED BY	DATE 1-16-96	DRAWING NO. 380-72002-1
DRAWN BY CARL DAVIS		
CHECKED BY Jerry Lowe	SCALE N/A	
APPROVED BY		

NO.	REVISION	DATE

[3] REVISED BATTERY SWITCH PANEL. WAS SEAWARD PB-2712. ADDED ENGINE SWITCH AND 135 AMP BREAKER FOR MAIN DISTRIBUTION PANEL 4/13/99

[4] REMOVED BILGE PUMP FROM ENGINE BATTERY. 11/23/99

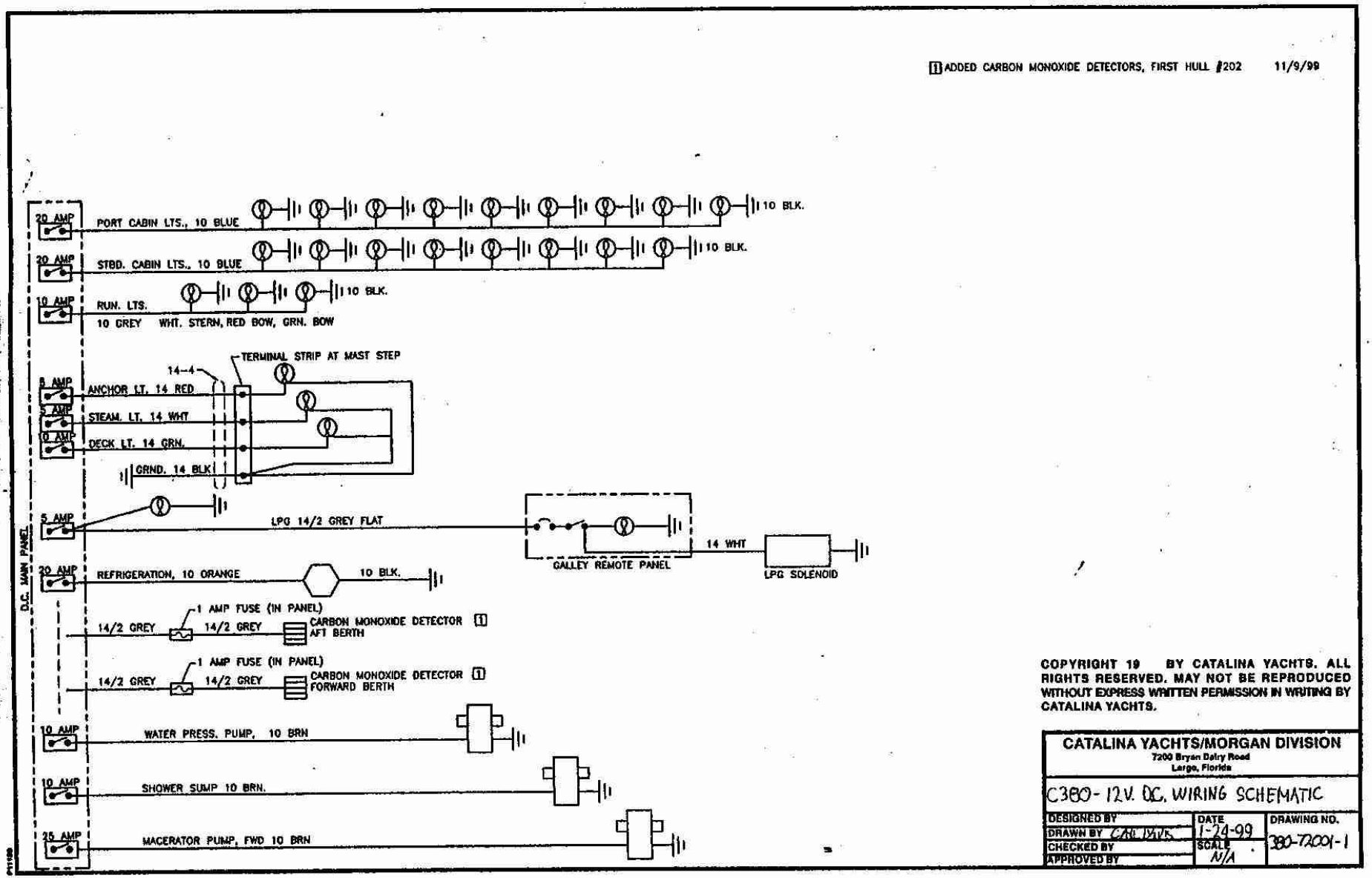


CATALINA YACHTS/MORGAN DIVISION
7200 Bryan Dairy Road
Largo, Florida

C380 - BATT. SCHEM. W/OPTIONAL START BATT.

DESIGNED BY	DATE 4-21-98	DRAWING NO. 380-72003-4
DRAWN BY CARL DAVIS		
CHECKED BY Jeff Lava	SCALE N/A	
APPROVED BY		

[1] ADDED CARBON MONOXIDE DETECTORS, FIRST HULL #202 11/9/99



CATALINA YACHTS/MORGAN DIVISION 7200 Bryan Dairy Road Largo, Florida		
C380 - 12V. DC. WIRING SCHEMATIC		
DESIGNED BY	DATE	DRAWING NO.
DRAWN BY CARLSON'S	1-24-99	380-72001-1
CHECKED BY	SCALE	
APPROVED BY	N/A	

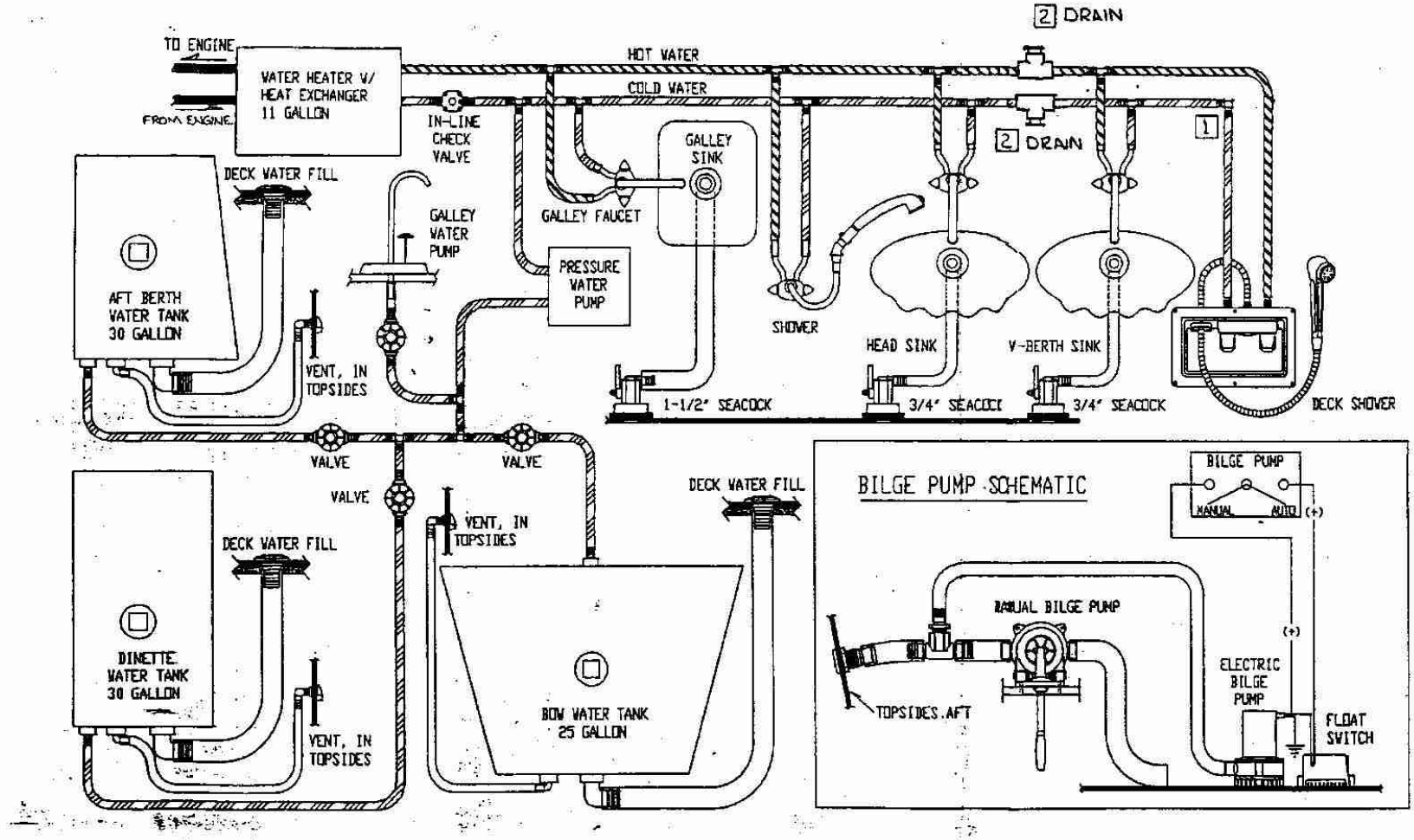
4.0 YACHT SYSTEMS - (Continued)

4.2.5 110 VOLT SYSTEM:

The optional 110 volt AC system is connected to shore power by a grounded twist-lock connector mounted on the starboard side of the transom.

A thirty (30) amp double pole circuit breaker is located under the starboard helm seat as well as at the main distribution panel. Seven (7) duplex outlets for the 110 volt system are located in the cabin. Be certain that all 110 volt appliances, other than lamps, have an adequate grounding connector. Wet feet or moist atmosphere increases the potential shock hazard.

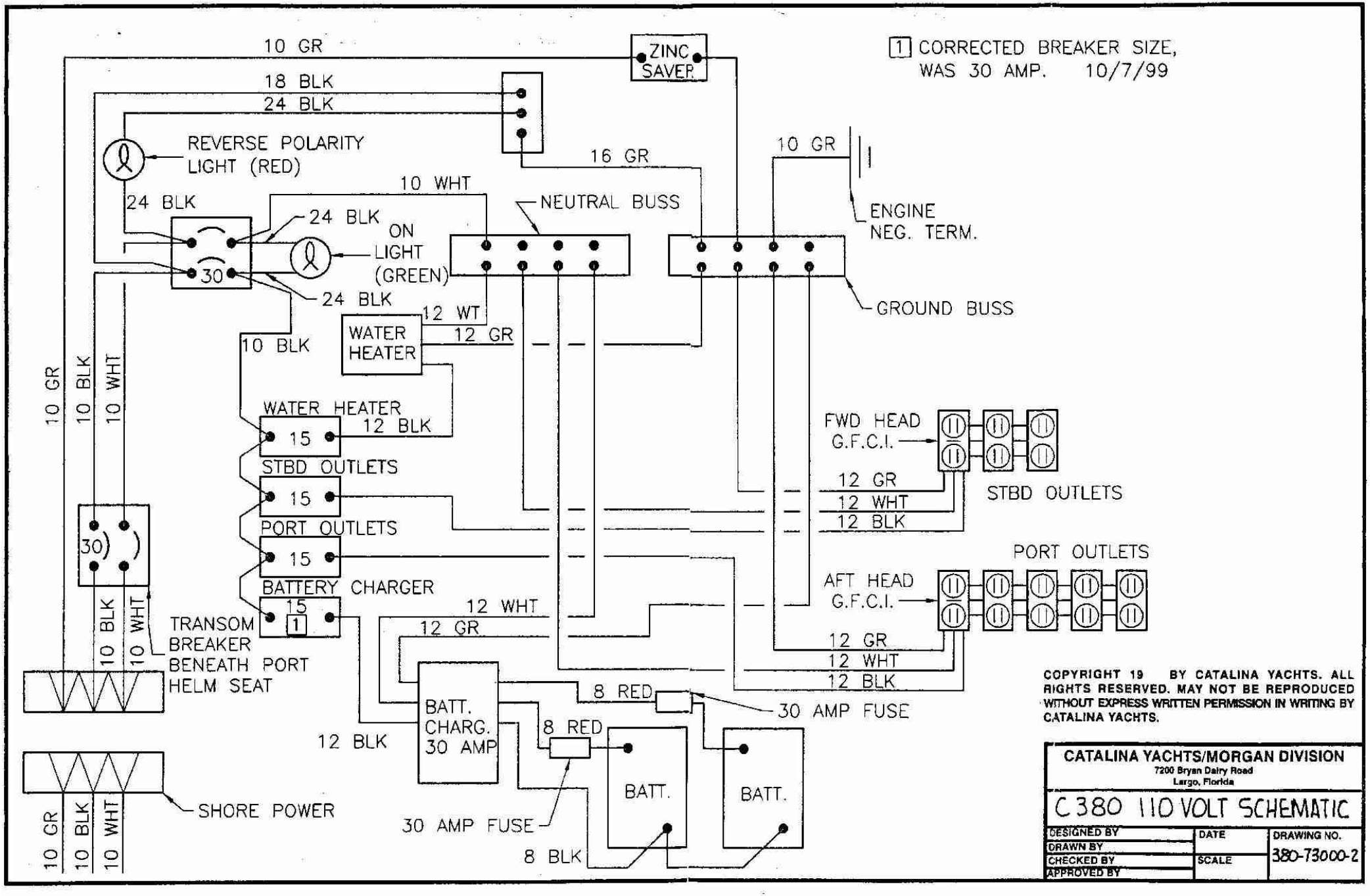
IMPORTANT: Do not open the electrical panel for any purpose with the 110 volt shore power connected to the dock. 110 volt wiring is exposed when the panel is open. Contact with 110 volt wiring can cause shock and death.



1 DELETED DOCKSIDE WATER CONNECTION. 11-18-98

2 ADDED SYSTEM DRAINS. 3-10-00

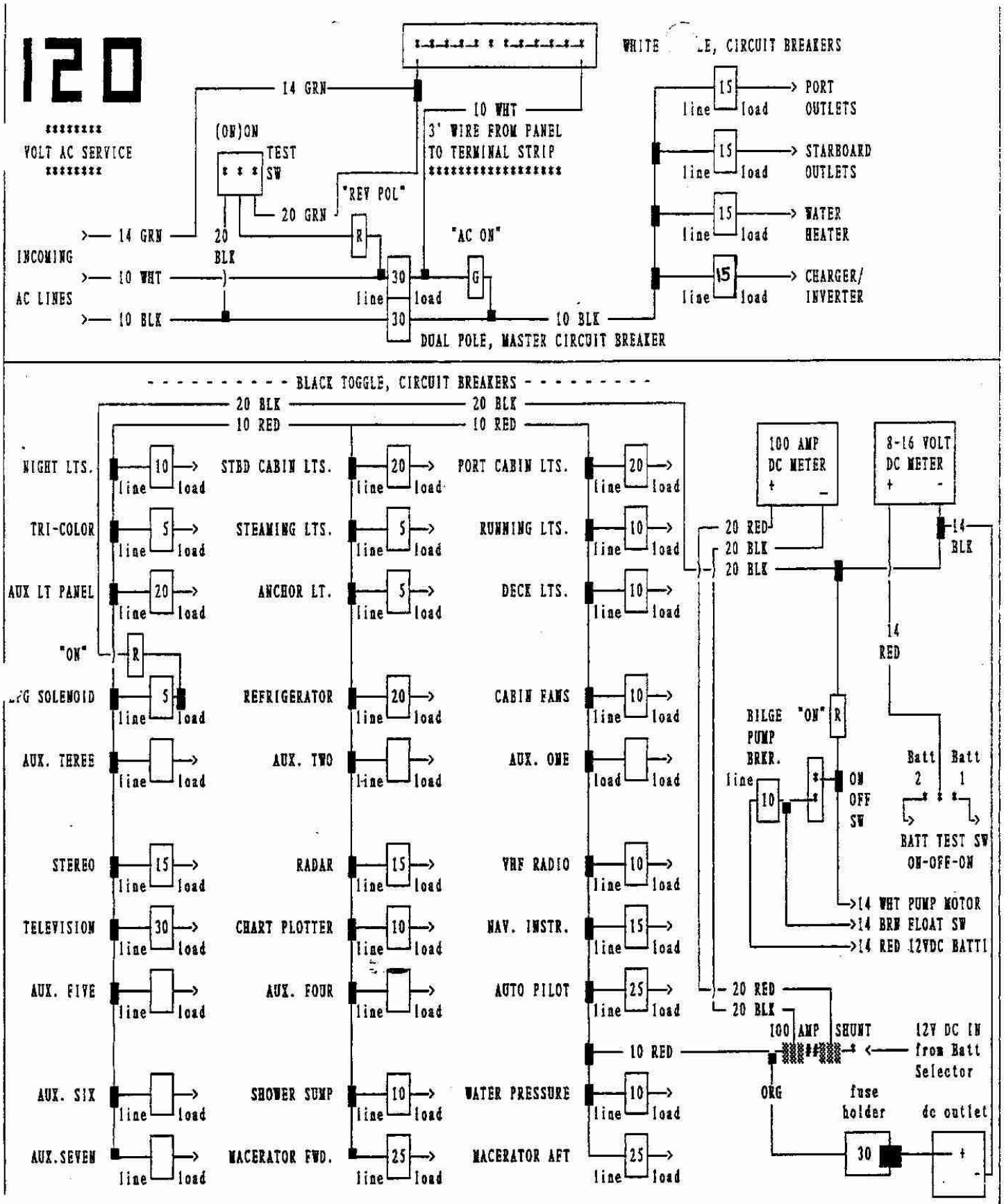
CATALINA YACHTS/MORGAN DIVISION 7200 Bryan Dairy Road Largo, Florida		
CATALINA 380 PLUMBING SCHEMATIC		
DESIGNED BY	DATE 1-29-96	DRAWING NO. 380-64000-2
DRAWN BY		
CHECKED BY	SCALE	
APPROVED BY		



CATALINA YACHTS/MORGAN DIVISION
7200 Bryan Dairy Road
Largo, Florida

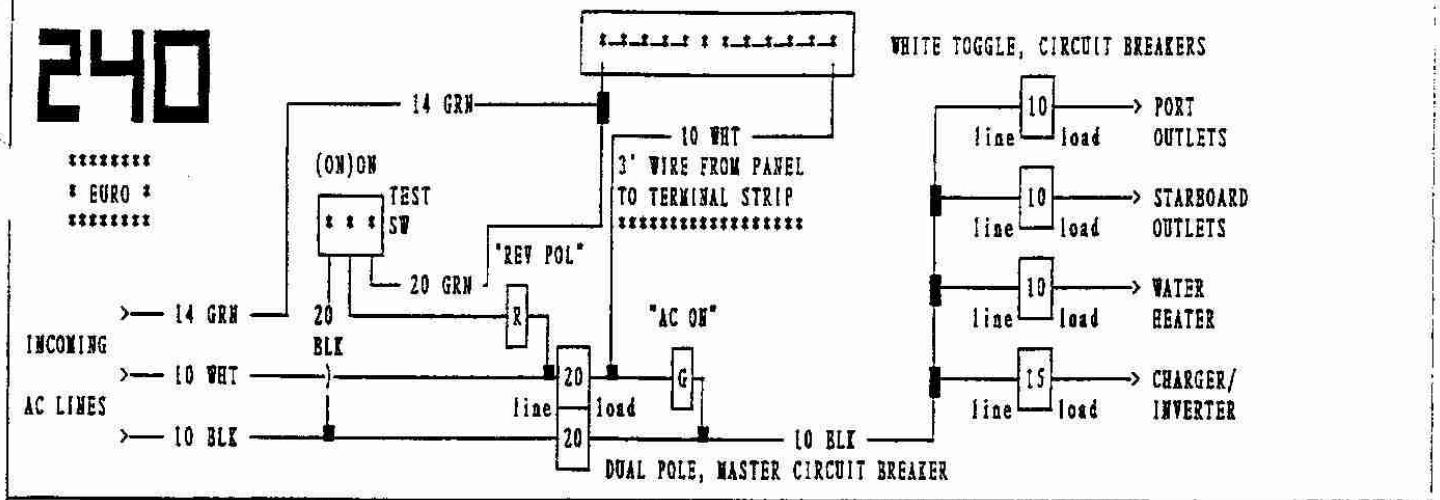
C380 110 VOLT SCHEMATIC

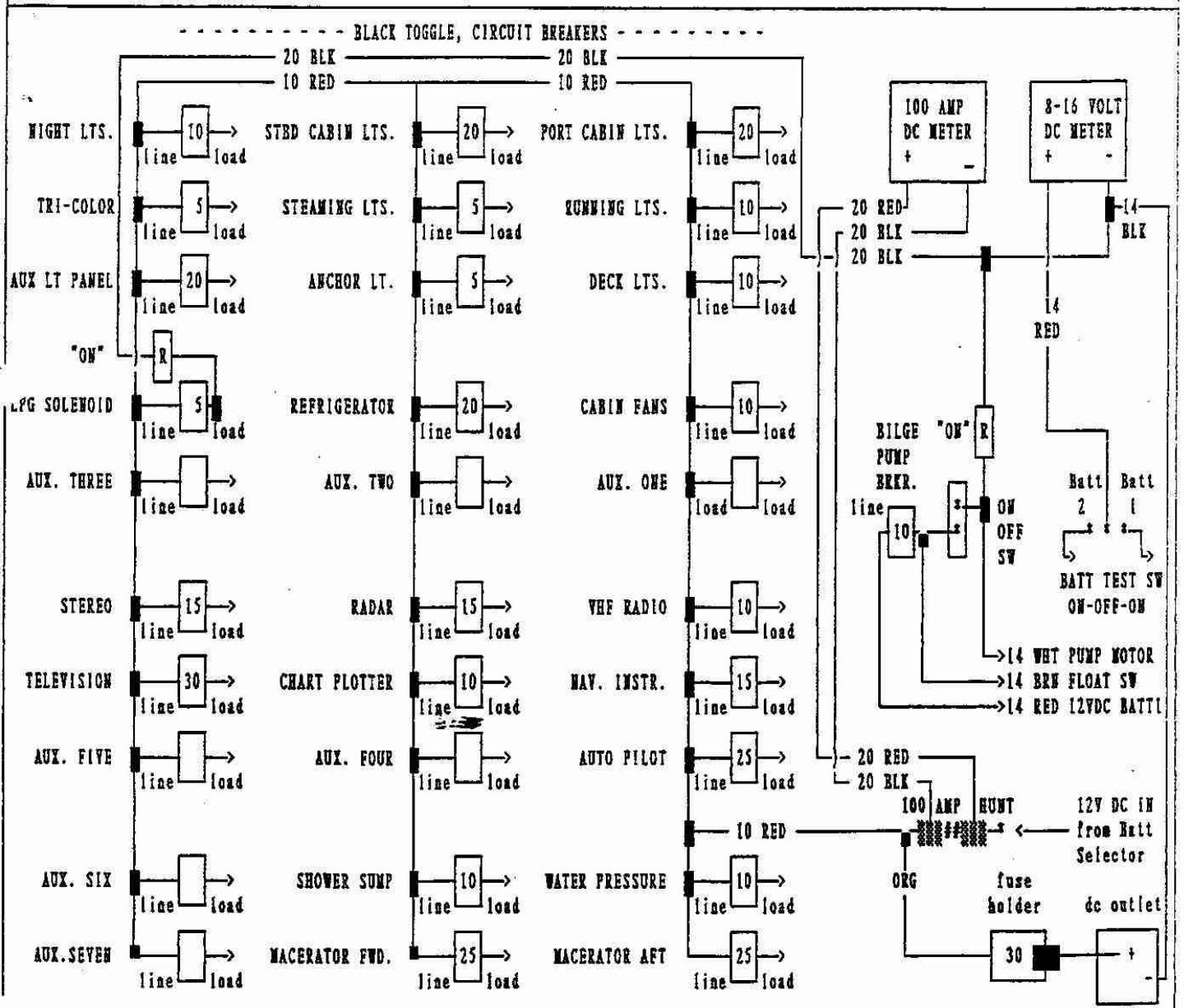
DESIGNED BY	DATE	DRAWING NO.
DRAWN BY		380-73000-2
CHECKED BY	SCALE	
APPROVED BY		


120
VOLT AC SERVICE
WHITE TOGGLE, CIRCUIT BREAKERS
14 GRN
10 WHT
3' WIRE FROM PANEL
TO TERMINAL STRIP
(ON)ON
TEST
SW
20 GRN
"REV POL"
INCOMING
AC LINES
14 GRN
10 WHT
10 BLK
20
BLK
"AC ON"
line
load
PORT
OUTLETS
STARBOARD
OUTLETS
WATER
HEATER
CHARGER/
INVERTER
DUAL POLE, MASTER CIRCUIT BREAKER
BLACK TOGGLE, CIRCUIT BREAKERS
20 BLK
10 RED
NIGHT LTS.
STBD CABIN LTS.
PORT CABIN LTS.
TRI-COLOR
STEAMING LTS.
RUNNING LTS.
AUX LT PANEL
ANCHOR LT.
DECK LTS.
"ON"
REFRIGERATOR
CABIN FANS
AUX. THREE
AUX. TWO
AUX. ONE
STEREO
RADAR
VHF RADIO
TELEVISION
CHART PLOTTER
NAV. INSTR.
AUX. FIVE
AUX. FOUR
AUTO PILOT
AUX. SIX
SHOWER SUMP
WATER PRESSURE
AUX.SEVEN
MACERATOR FWD.
MACERATOR AFT
100 AMP
DC METER
8-16 VOLT
DC METER
20 RED
20 BLK
14
BLK
14
RED
BILGE
PUMP
BRKR.
ON
OFF
SW
Batt
2
Batt
1
BATT TEST SW
ON-OFF-ON
14 WHT PUMP MOTOR
14 BRN FLOAT SW
14 RED 12VDC BATT1
100 AMP SHUNT
12V DC IN
from Batt
Selector
ORG
fuse
holder
dc outlet
12
VOLT DC SERVICE
CATALINA YACHTS
04/10/98
** W-3061 **
AC-DC HORIZ CONTROL PANEL, 120 VAC/12VDC
FOR C-380, MORGAN 38, C-400, C-42, C-470

240

****
* EURO *
****





12 VOLT DC SERVICE

REV A, 05/12/98

CATALINA YACHTS	11/20/97	** W-3062 **
EURO AC-DC HORIZ CTRL, 240 VAC/12 VDC FOR C-380, MORGAN 38, C-400, C-42, C-470		

4.0 YACHT SYSTEMS - (Continued)

4.3.2 MANUAL BILGE PUMP:

The manual bilge pump is located in the cockpit. Insert the handle through the water tight fitting in the cockpit to operate the pump.

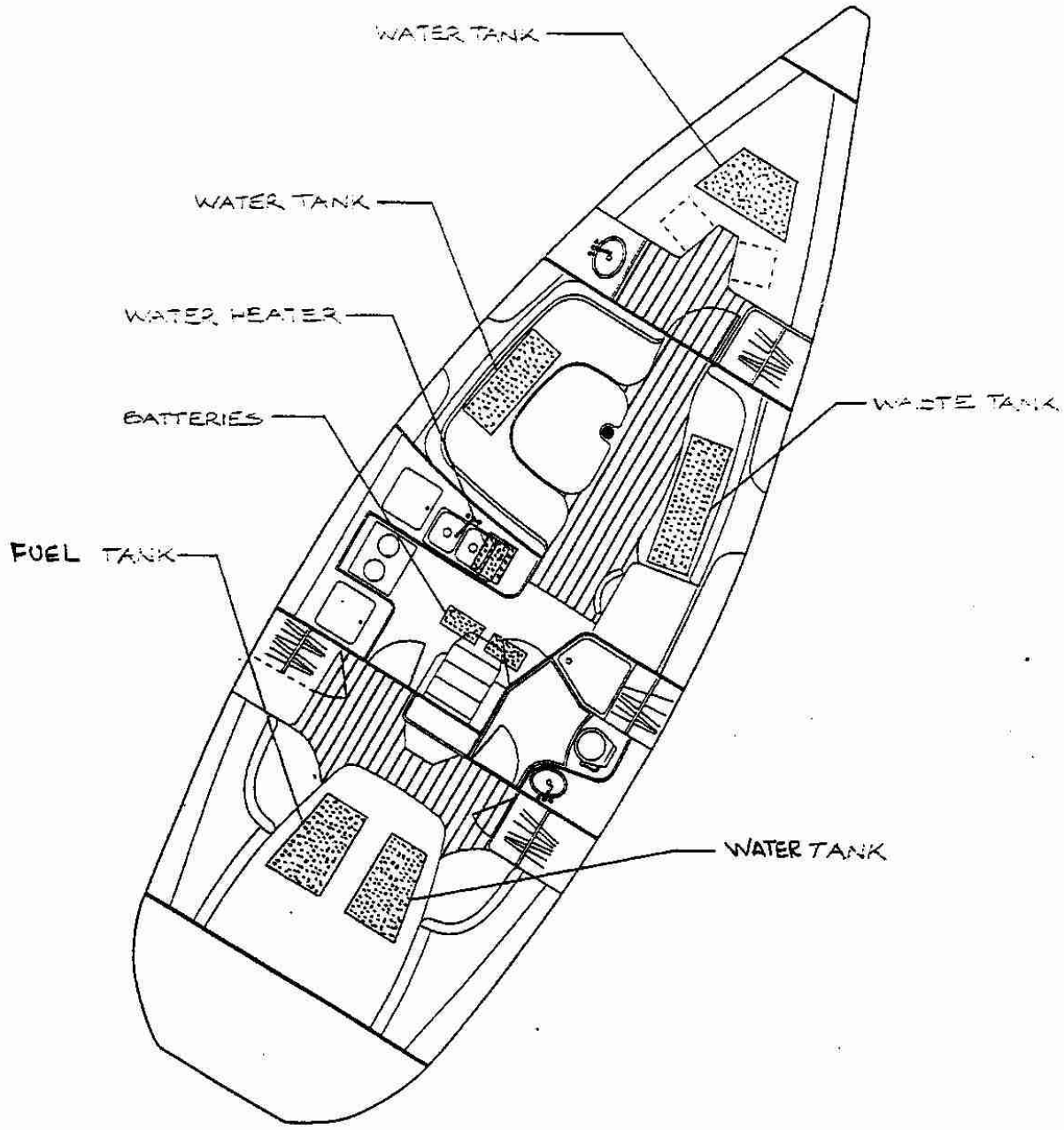
The pump intake hose is in the keel stub under the main cabin sole. The bilge pumps are shown on the plumbing schematic.

4.3.3 SEACOCKS:

All underwater through-hull fittings are equipped with ball valves. It is good practice to close all valves when leaving the boat, especially for long periods of time.

To close seacocks, the handle must be perpendicular to main body of seacock. To open, handle must be in-line with main body of seacock.

It is good practice to operate the valves at least once a month to keep them in good working order, and lubricate the seals on a regular schedule, following the valve manufacturer's recommendations.



CATALINA YACHTS/MORGAN DIVISION
7200 Bryan Dairy Road
Largo, Florida

CATALINA 350
ARRANGEMENT PLAN

DESIGNED BY	DATE 2-1-96	DRAWING NO. 380-40000-0
DRAWN BY		
CHECKED BY	SCALE	
APPROVED BY		

4.3.5 MARINE TOILET OPERATION:

USING THE HEAD:

1. Read the instructions for operation of the toilet supplied with the marine head by the manufacturer. These instructions are also printed on the toilet pump housing. Be sure everyone who will be using the head is familiar with these instructions.

2. Immediately before using the head, the inlet valve "A" must be opened. This provides flushing water to the toilet. The valve should be kept closed when the head is not in use. This will prevent water from flooding the boat if the valve in the toilet pump or anti-siphon should fail.

3. Waste will be pumped directly into the holding tank when the bowl is emptied. A minimum amount of water for every flush should be used in order to take best advantage of the tank's capacity between pump-outs.

4. The condition of the holding tank should be checked from time to time. Overfilling can cause the tank to burst.

5. To clean the head, use hot water and soap. High strength cleaners may cause damage to the valves and seals in your pump system. If there is any problem with the head, it should be corrected immediately.

EMPTYING THE TANK THROUGH THE DECK DISCHARGE PLATE:

1. The holding tank should be emptied via the deck discharge plate only at approved shore-based pump-out stations.

2. Remove the cap from the deck discharge plate. The threads on the plate cap should be periodically coated with silicone spray or petroleum jelly to ensure a good seal.

3. The pump-out station suction hose should form a seal at the deck plate.

4. Be sure inlet valve "A" is closed when the tank is being emptied.

5. After the tank is empty, you may wish to open valve "A" and pump some water through the toilet and into the tank to dilute residual sludge and rinse the tank and lines.

6. Close all valves after the tank is emptied and recap the deck plate.

EMPTYING THE TANK USING THE OPTIONAL MACERATOR PUMP:

1. Read the macerator pump operating instructions supplied by the pump manufacturer.

2. Close the inlet valve "A".

3. Open the through-hull valve "B".

4. Turn on the pump with the switch on the 12 volt panel.

5. The pump will change tone after it becomes primed. It will resume the higher pitched tone after the tank is emptied.

6. You may wish to rinse the tank, hose lines, and macerator pump by pumping clear water through the head, then repeating the procedure for emptying the tank.

7. Close valve "B" immediately after emptying the holding tank.

4.3.6 MACERATOR PUMP AND TROUBLESHOOTING:

PROBLEM 1: The macerator pump motor starts then stops.

A. Check the breaker: Identify problem and reset as required.

B. Check the valves: "B" valve must be open.

C. Check the vent line. If the boat has been sailed at extreme angles of heel, fluid may be clogging the vent line. Disconnect the vent at the tank and empty the hose into a disposable container.

D. Sludge may have formed in the bottom of the tank. This should be emptied regularly to prevent sludge build up.

PROBLEM 2: The head toilet pump has excessive back pressure and will not evacuate the bowl.

A. Refer to the toilet manufacturer's specifications and operating instructions.

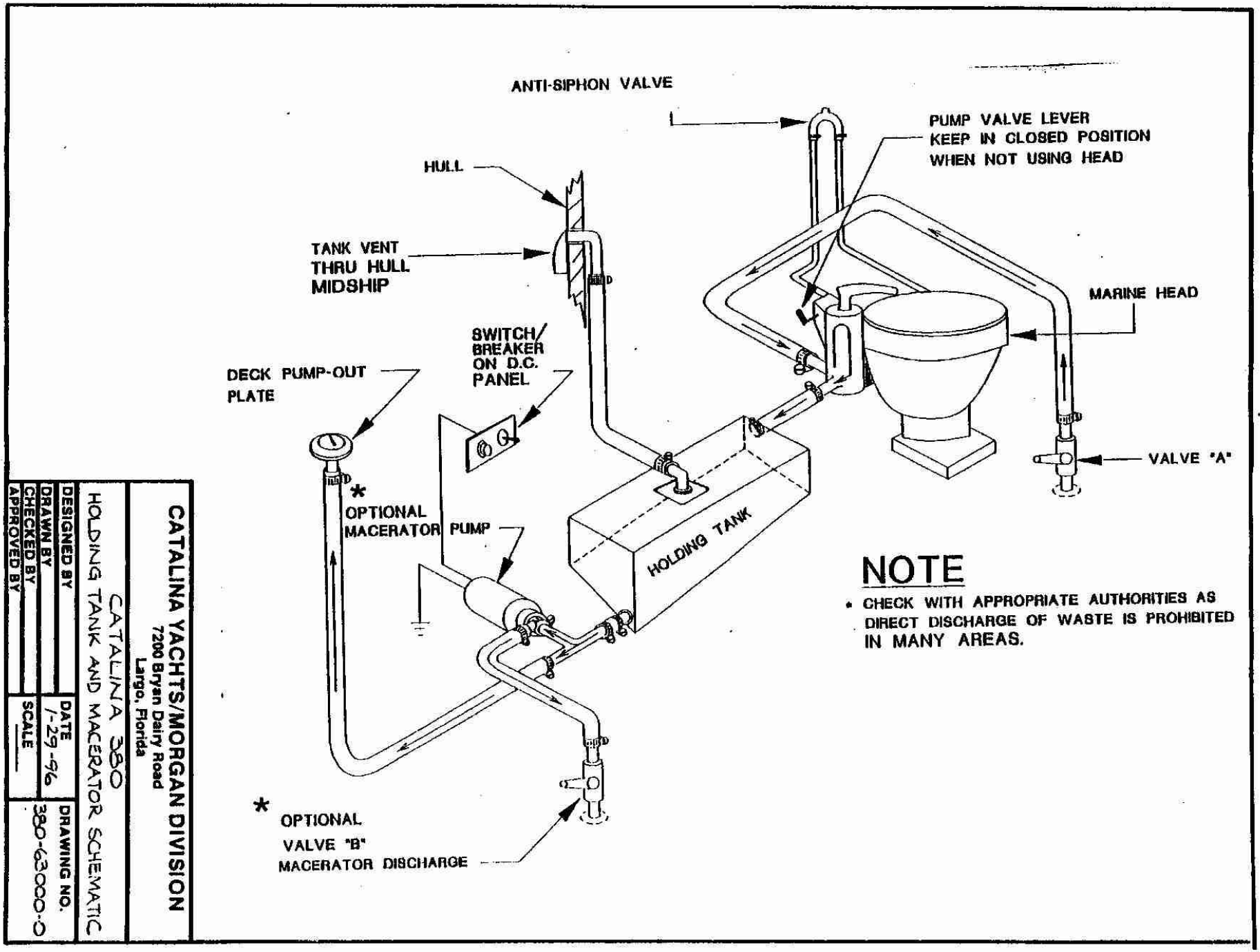
PROBLEM 3: The macerator pump, when on, makes a high pitched sound but does not empty the tank.

A. Impeller in macerator pump is faulty and must be replaced.

B. The vent is clogged and the pump cannot pull a prime against the vacuum in the tank.

C. The hose into the pump may be clogged.

D. The pump may be drawing air through the deck plate preventing a prime. Check seal at deck plate marked "WASTE", and lubricate threads.



CATALINA YACHTS/MORGAN DIVISION
7200 Bryan Dairy Road
Largo, Florida

CATALINA 380
HOLDING TANK AND MACERATOR SCHEMATIC

DESIGNED BY	
DRAWN BY	
CHECKED BY	
APPROVED BY	
DATE	1-29-96
SCALE	
DRAWING NO.	380-63000-0

4.0 YACHT SYSTEMS - (Continued)

4.4 AUXILIARY POWER:

4.4.1 GENERAL ENGINE INFORMATION:

For a complete description of your engine, please consult the guide supplied by the engine manufacturer. This can be found in your owner's manual enclosure, or contact Universal Motors/ Westerbeke Corporation at (508) 588-7700 and request a duplicate if a Universal engine has been installed.

Two points are worth special attention. Firstly, marine engines work under conditions tougher than those of automotive engines. Your marine engine faces constant torquing not encountered in other applications. For this reason, you must change your engine's crank case oil as recommended in the engine manufacturer's guide. Secondly, before using your engine, the propeller shaft coupling must be adjusted within a tolerance of .003" (thousandths of an inch) after launching. This is done during commissioning of the yacht. Be sure that your dealer has made this adjustment before using your engine.

Change the oil regularly. Keep spare parts and alternator belts on hand and use only 3/4 throttle on long passages. Keep your fuel tank full whenever possible to prevent water condensation in your fuel tank.

To retard electrolysis, we recommend installing a zinc collar immediately on the propeller shaft when the boat is to be used in salt water.

There are also zinc anodes in the engine heat exchanger which must be checked and replaced as recommended by the engine manufacturer.

4.4.3 SHAFT PACKING GLAND (STUFFING BOX):

The packing gland is located under the cabin sole on the boat's centerline in the aft cabin.

A properly adjusted shaft packing gland should drip slightly with the engine off. Too loose an adjustment will allow too much water in the bilge and propeller shaft rotation will spray water from the shaft. Too tight an adjustment will rob the engine of power, and the lack of water lubrication in the packing gland can generate enough heat to damage the gland and/or score the propeller shaft.

ADJUSTMENT:

1. Hold the packing nut with one wrench, use a second wrench to loosen the lock nut. Turn the lock nut far enough to keep it from interfering with the next adjustment (2 or 3 turns).

2. Tighten the packing nut to obtain 4 to 5 drops per minute. Hand tightening of the packing nut is often sufficient to obtain this adjustment. If this is not the case, an additional 1/4 to 1/2 turn with the wrench should produce the desired results.

3. Hold the packing nut in place with one wrench, and use the second wrench to bring the locking nut securely against the packing nut. Make certain that the locking nut is tight. Failure to do this could allow the packing nut to back off when the engine is operating.

4. Operate the engine at slow speeds in forward and reverse and use a light to check for excessive water at the packing nut. Shut off the engine and recheck packing for proper drip.

4.4.4 SHAFT ALIGNMENT:

For proper operation of the engine, the propeller shaft and engine must be aligned.

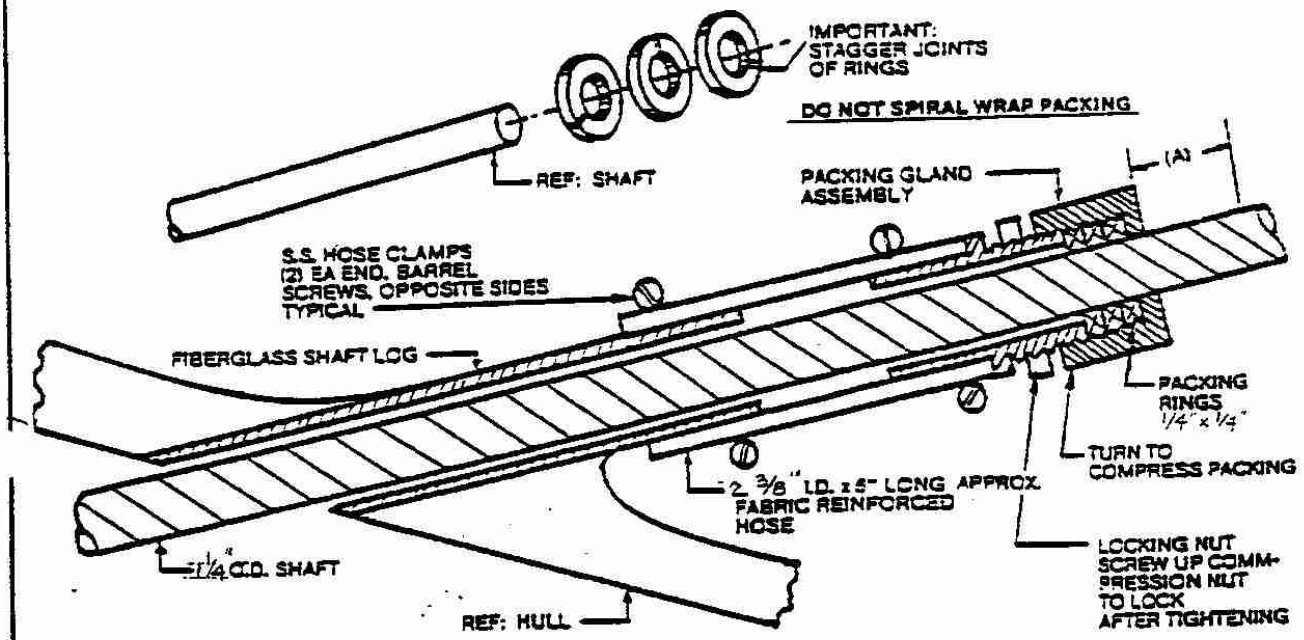
Alignment is gauged at the engine and shaft coupling. Alignment procedures must be done with the boat in the water after the mast is stepped and the rig is tuned.

1. The propeller shaft must be dimpled (1/8" deep) for two (2) coupling set screws. The set screws must be safety wired, using the stainless steel wire provided, as illustrated. Check key in keyway, as it must be in place between shaft and coupling.

2. Remove coupling flange bolts and check propeller shaft for clearance. Adjust stuffing box so that excessive seepage is prevented, yet the shaft is allowed to spin freely.

3. Slide shaft away from engine and check coupling mating surfaces. These must be clean.

NO.	REVISION	DATE



(A) MAINTAIN CLEARANCE BETWEEN ENGINE COUPLING AND PACKING GLAND FOR REMOVAL AND REPACKING OF GLAND

(B) SHAFT MUST NOT CONTACT GLAND OR LOG. SHAFT MUST BE IN CENTER OF LOG AND GLAND.

(C) PACKING GLAND SHOULD NOT BE OVER TIGHTENED. ONE TO TWO DROPS PER MINUTE IS NORMAL

CATALINA YACHTS/MORGAN DIVISION
7200 Bryan Dairy Road
Largo, Florida

CATALINA 380
PACKING GLAND ASSEMBLY

DESIGNED BY	DATE 1-30-96	DRAWING NO. 380-58001-C
DRAWN BY		
CHECKED BY	SCALE —	
APPROVED BY		

4. Slide shaft forward to connect coupling surfaces. Pilot on transmission flange must align with recess in shaft coupling flange. This is an indication of correct axial alignment.

5. With coupling flanges in contact, measure gap around edge of coupling flanges with .003" feeler gauge. Maximum allowable gap at any point is three thousandths of an inch. Take this measurement several times ... rotating shaft 1/4 turn each time. Any gap in excess of .003" must be corrected by changing engine position, especially fore/aft tilt.

   For example, excessive gap at the bottom of the coupling (see drawing) indicates engine is tilted too far aft (front too high). Use a wrench, loosen lock nuts on forward motor mount(s). Lower front of engine by clockwise rotation of motor mount nuts. Remeasure gap at coupling. A gap at the top of the coupling would require the exact reverse procedure.

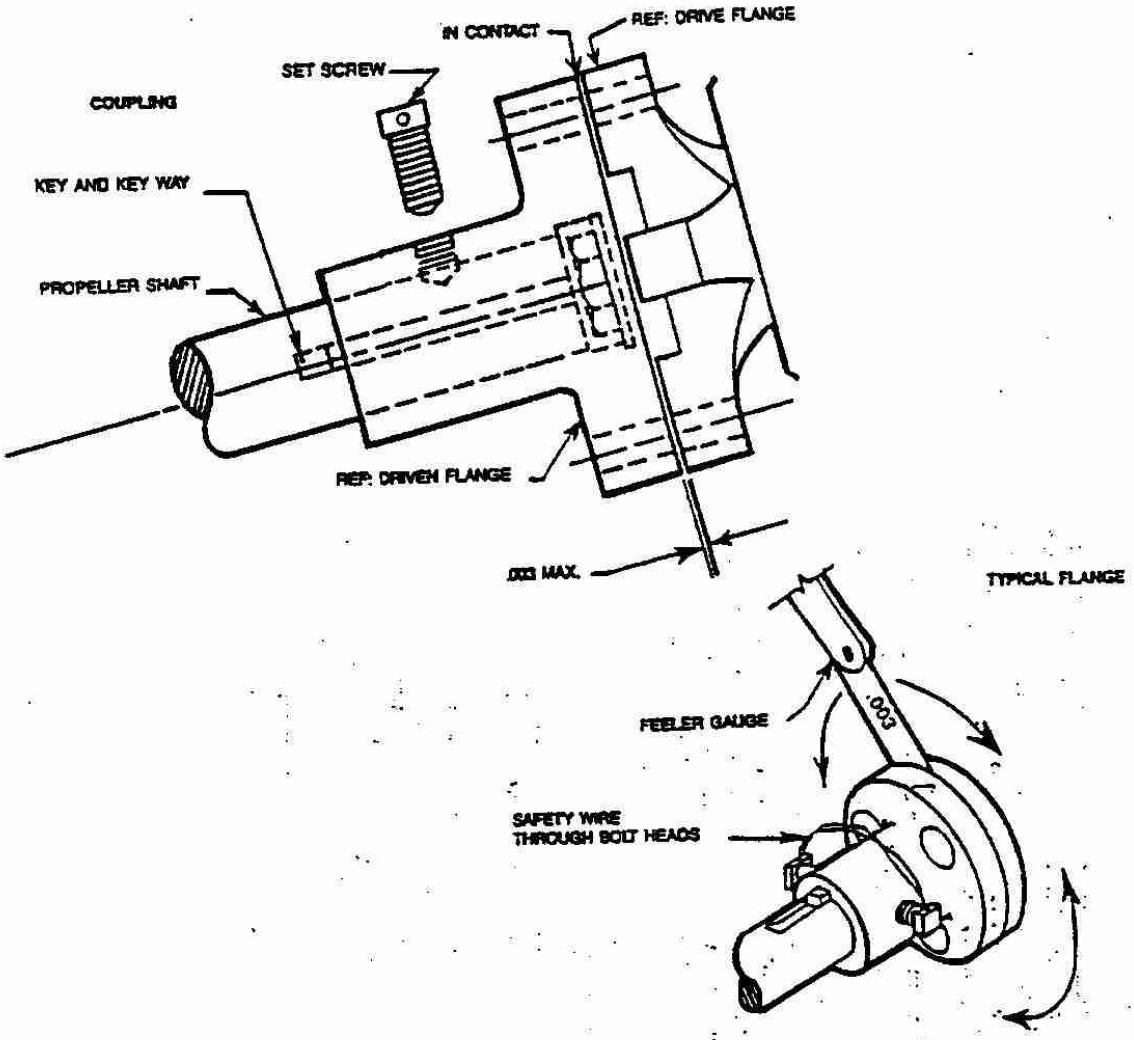
6. Pull shaft aft as in step 3. Again slide shaft forward, rechecking axial alignment as in step 4.

7. Repeat steps 5 and 6 until alignment within tolerance is achieved.

8. Tighten motor mount lock nuts and install coupling.

NOTE: Alignment should be checked yearly, or whenever any excess vibration is noticed. The alignment can also be affected by changes in rigging tension.

NO.	REVISION	DATE



MEASURE GAP BETWEEN MATING FACES OF COUPLING FLANGES. MAXIMUM ALLOWABLE GAP AT ANY POINT IS .003 WHEN ANY POINT OF COUPLING FACES ARE IN CONTACT. TAKE THIS MEASUREMENT SEVERAL TIMES, ROTATING SHAFT ¼ TURN EACH TIME. THIS MEASUREMENT MUST BE MADE WITH COUPLING BOLTS REMOVED.

CATALINA YACHTS/MORGAN DIVISION
7200 Bryan Dairy Road
Largo, Florida

CATALINA 380
SHAFT ALIGNMENT

DESIGNED BY	DATE 1-30-96	DRAWING NO. 380-58000-C
DRAWN BY		
CHECKED BY	SCALE	
APPROVED BY		

4.4.6 FUELING:

The fuel system of the Catalina 380 is illustrated and consists of a 30 gallon aluminum fuel tank, fuel suction and return lines, a secondary fuel filter on the engine, a primary remote filter and water separator, and an electric fuel pump controlled by the engine key switch, a deck fill plate, and an overboard vent through the transom.

Refer to the engine manual provided for recommended fuel type. A diesel engine does not require an ignition system and is superior to a gasoline engine in dependability. This depends on the clean fuel being supplied to the engine since the close tolerances required by the engine's fuel delivery system make it intolerant of dirt or water contamination. The engine is supplied with primary and secondary filters that prevent contaminants from reaching the engine where they could cause damage. However, a clogged filter, although providing this protection, can also stop an engine. Keeping the filters free of dirt and water is critical.

BEFORE FUELING:

1. Extinguish all smoking materials and check the fueling area for other sources of spark or flame. Remove if found.
2. Shut off the engine and any electrical accessories or devices.
3. De-energize all electrical equipment by turning the selector switch to the off position.
4. Close all hatches and ports.
5. Ensure that a fire extinguisher is readily available.
6. Ensure that the proper fuel (diesel, not gasoline) hose is about to be used.

WARNING: Do not fuel during an electrical storm. Besides the obvious hazard of lightning, the possibility of static discharge is greatly increased at this time.

FUELING PROCEDURE:

IMPORTANT: The fill plates for fuel, waste and water tanks appear similar. Verify you are using the fuel fill plate.

1. Remove fill pipe cover using the proper tool.
2. Place nozzle of fuel hose in the fill pipe. Keep the nozzle in contact with the deck plate rim during fueling to avoid the possibility of a static spark.
3. Fill slowly, do not overfill. If it is not possible to see the meter on the fuel pump, the attendant or a crew member should call out the gallonage from the fuel dock. Filling the tank to only 95% of capacity will avoid overflow problems on a hot day.

4. Replace cover, clean up any spilled fuel. If any rags, etc., were used for this purpose, dispose of them ashore.

5. Check below decks for presence of fumes or fuel leakage. Check bilge, engine space, and main cabin. If fumes or evidence of leakage are found, determine the cause, correct it, and clean up any spillage before proceeding.

6. Open all hatches and ports to ventilate the boat.

7. Switch on battery.

8. The engine should be started only when it is certain that no potentially hazardous conditions exist.

4.4.7 **FUEL SANITATION:**

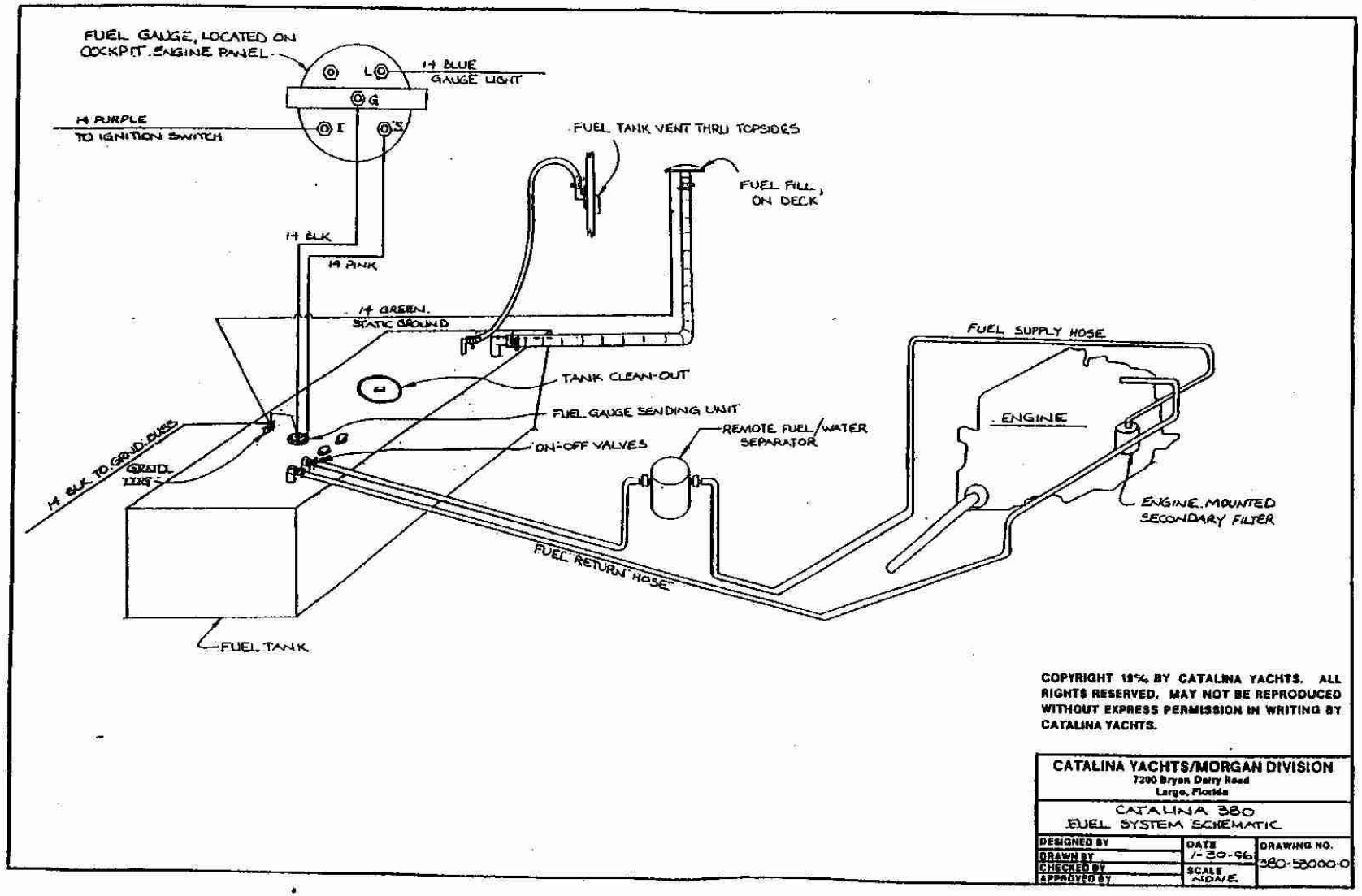
BACTERIAL CONTAMINATION:

Bacterial contamination of the diesel fuel can cause problems. The bacteria needs both water and fuel to exist, and thrive at the fuel/water interface in a fuel tank. As they multiply, they form more water and a filter choking brown slime. Their presence will not be known until rough weather churns up the fuel tank causing clogged filters at the worst possible time.

Keeping water out of the fuel will prevent the problem entirely. However, a certain amount of water due to normal condensation in the tank is to be expected.

FUEL ADDITIVES:

Fuel additives or fungicides provide another means of combating contamination. Additives break the water down to a molecular level, dispersing it throughout the fuel and allowing it to pass harmlessly through the fuel system. Several brands of this product are available at marine stores.



CATALINA YACHTS/MORGAN DIVISION 7200 Bryan Dairy Road Largo, Florida		
CATALINA 380 FUEL SYSTEM SCHEMATIC		
DESIGNED BY	DATE 1-30-96	DRAWING NO. 380-58000-0
DRAWN BY		
CHECKED BY	SCALE NONE	
APPROVED BY		

4.4.9 EXHAUST SYSTEM MAINTENANCE:

In-board engine installations on sailboats differ from the engine installations on power boats. The primary difference is that the engine is usually installed below the waterline of the vessel.

The benefits of these locations are that the weight of the engine is where it will not adversely effect trim and that the shaft is at an efficient angle for powering and minimum drag when sailing.

Engine installations below the waterline require special attention to the design of the exhaust system. The discharged cooling water must be exhausted above the waterline to avoid excessive back pressure on the engine and prevent sea water from traveling up the exhaust line and entering the engine.

To exhaust the engine above the waterline, the discharged cooling water and exhaust gas must be "lifted" to a level above the through-hull fitting on the hull.

In the Catalina 380, the exhaust cooling water and exhaust gas are lifted above the waterline by an "Aqua-lift" type muffler. The Aqua-lift muffler performs three jobs:

1. It mixes engine gas and water to cool the gas and lower exhaust line temperature.

2. It baffles and deadens engine exhaust noise.

3. It creates pressure required to lift and expel cooling water.

As shown in the illustration, the inlet tube into the Aqua-lift is short and the outlet tube is long, near the bottom of the tank.

As water accumulates in the bottom of the tank, exhaust gas pressure builds in the top of the tank. This forces the cooling water up the exit tube and through exhaust line overboard.

The system requires exhaust pressure in the tank to function. When the starter motor is turning over, before the engine fires, water is being pumped through the cooling system by the belt driven cooling water pump. It is very important not to operate the starter motor for more than 30 seconds if the engine does not fire. Should it be necessary to operate the starter motor more than 30 seconds, water must be drained from the Aqua-lift by opening the drain at the base of the Aqua-lift. The drain valve may be opened until the engine fires, if desired. All Catalina 380's are equipped with anti-siphon valves as an additional precaution to prevent cooling water from entering the engine.

The function of the anti-siphon valve is to prevent cooling water from being siphoned through the through-hull valve, through the engine cooling system and into the Aqua-lift muffler when the engine is not operating.

If the muffler were to fill completely with water, water would travel up the inlet tube and enter the engine block.

The Catalina 380 exhaust system is basically simple and will provide trouble free service if you perform regular maintenance and inspection. The important points to remember are:

1. Close the engine cooling water through-hull valve when you are not operating the engine.

2. Do not operate the starter motor for more than 30 seconds without draining the Aqua-lift muffler.

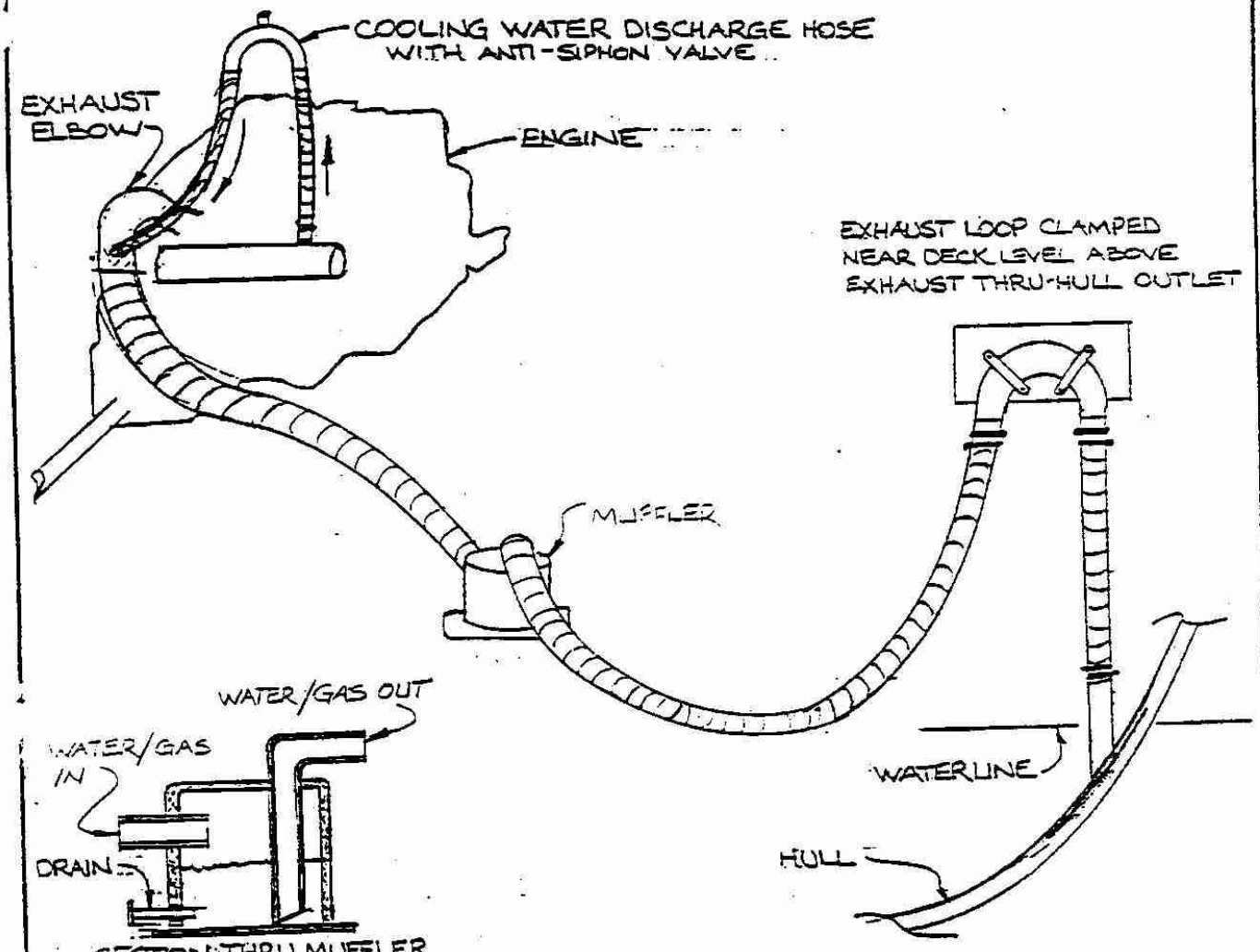
3. Periodically disassemble the anti-siphon valve. Be sure the valve is not fouled with salt deposits and that it opens freely under the cap.

4. Check the operation by removing the valve:

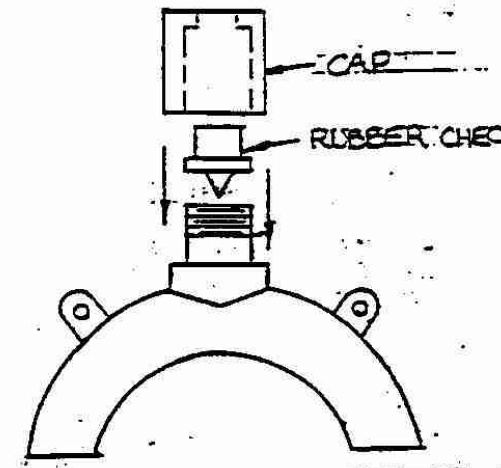
   A. Put a finger over one large hole and blow through the other. Air should not escape through the cap.

   B. If you suck through one large hole with a finger over the other, air should enter the valve through the cap.

NO.	REVISION	DATE



SECTION THRU MUFFLER



TYPICAL ANTI-SIPHON VALVE

CATALINA YACHTS/MORGAN DIVISION
7200 Bryan Dairy Road
Largo, Florida

CATALINA 380
ENGINE EXHAUST SYSTEM

DESIGNED BY	DATE 1-30-96	DRAWING NO. 380-59000-0
DRAWN BY		
CHECKED BY	SCALE	
APPROVED BY		

4.0 YACHT SYSTEMS - (Continued)

4.5.1 EMERGENCY TILLER

It is recommended that the skipper and crew become familiar with the emergency tiller and its use.

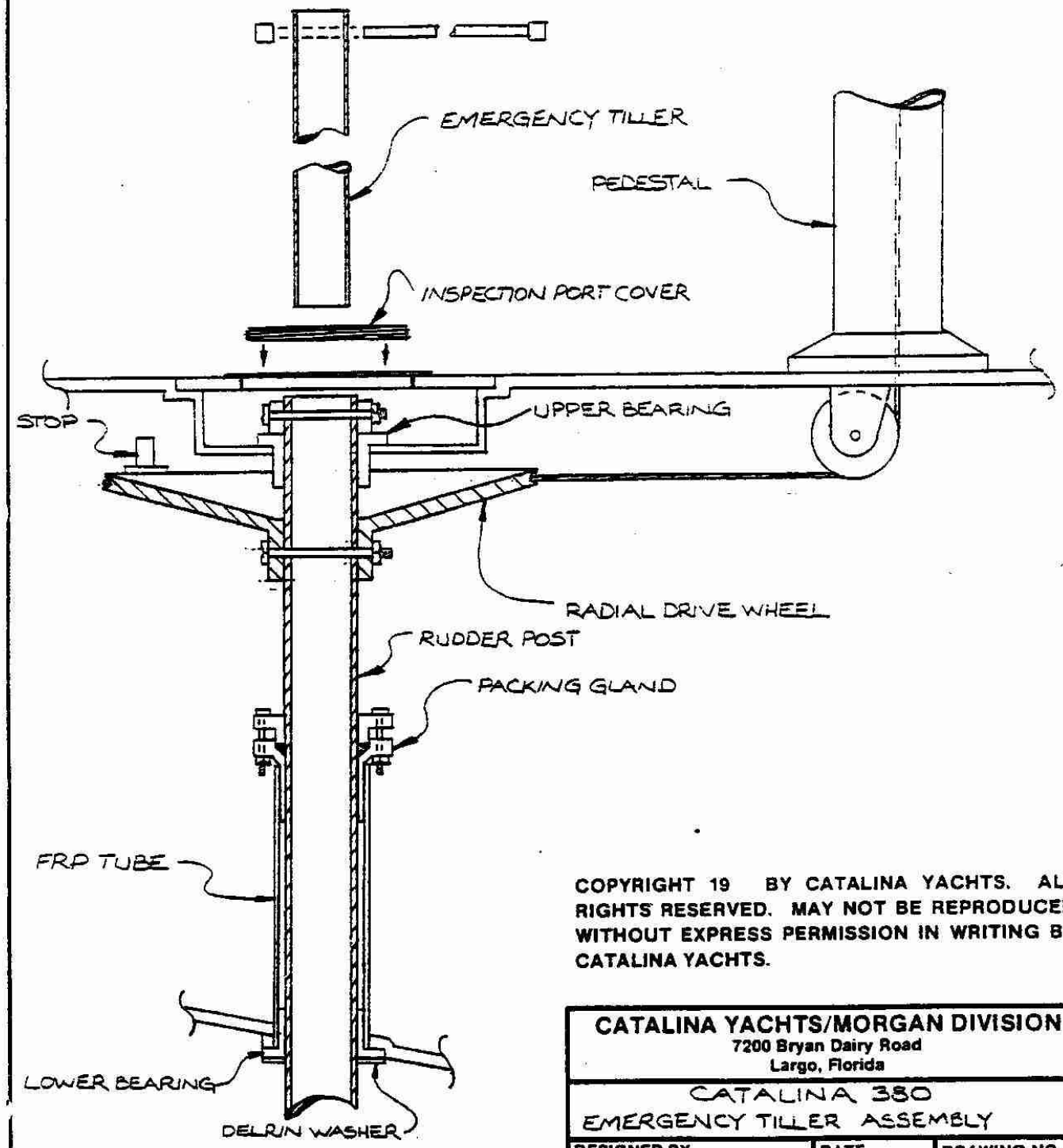
The emergency tiller is stored in a blue bag.

A dry run of the system will minimize confusion in an emergency:

1. Locate the emergency tiller.
2. Remove inspection port cover.
3. Insert the emergency steering tiller in the top of the rudder post.

NOTE: The emergency tiller moves the whole steering assembly, including cables and quadrant. These components must be free to move in order to steer the boat.

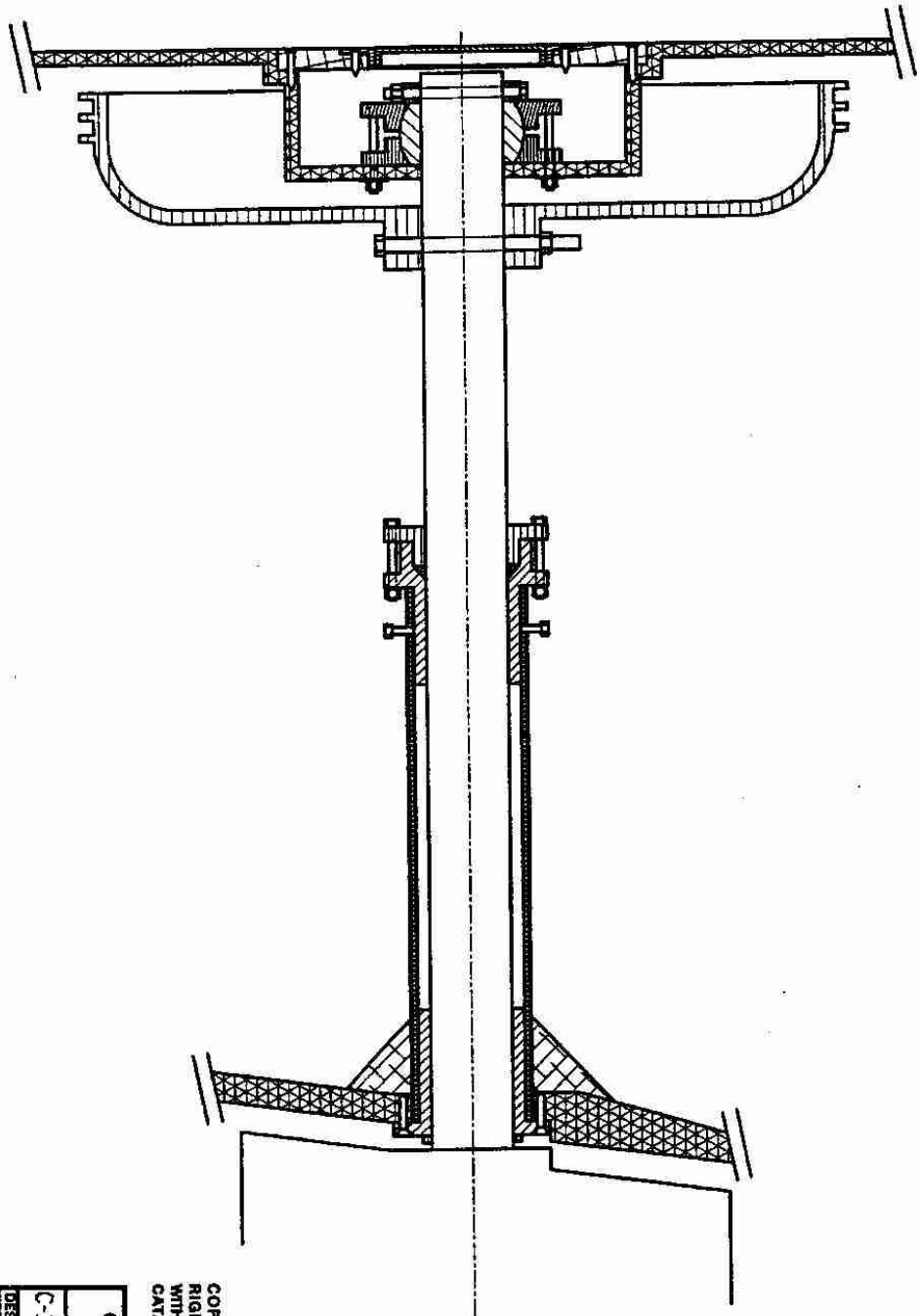
NO.	REVISION	DATE



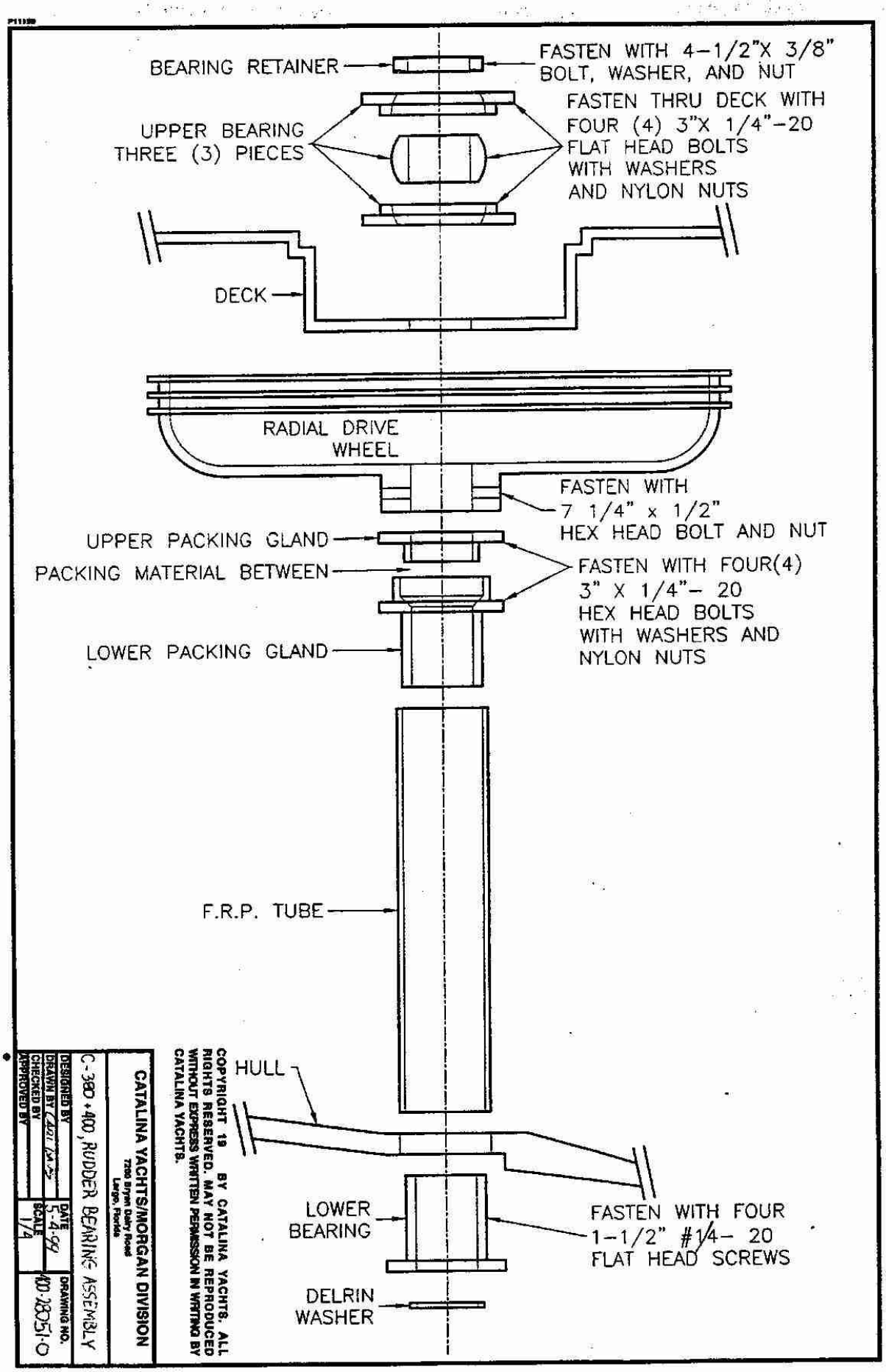
CATALINA YACHTS/MORGAN DIVISION
7200 Bryan Dairy Road
Largo, Florida

CATALINA 380
EMERGENCY TILLER ASSEMBLY

DESIGNED BY	DATE	DRAWING NO.
DRAWN BY	2-4-96	380-28000-0
CHECKED BY	SCALE	
APPROVED BY		



CATALINA YACHTS/MORGAN DIVISION 7200 Bryan Dairy Road Largo, Florida	
C-380,400,470, TYPICAL RUDDER BEARING ASSEMBLY	
DESIGNED BY	DATE 5-5-99
DRAWN BY CAROL DAVIS	
CHECKED BY	SCALE 1/4
APPROVED BY	DRAWING NO. 400-28052-0



CATALINA YACHTS/MORGAN DIVISION
7200 Bryan Dairy Road
Largo, Florida

C-380 + 400, RUDDER BEARING ASSEMBLY

DESIGNED BY
DRAWN BY Curt M-2
CHECKED BY
APPROVED BY
DATE 5-4-99
SCALE 1/4
DRAWING NO. 10-28051-0

Forespar

DATE: 5/19/99

SUBJ CATALINA SAILBOATS WITH MARELON RUDDER BEARINGS AND PACKING GLAND

This non-metalic bearing system is designed to operate with no lubrication other than water.

* Specifically no lubricants such as: petroleum grease, WD-40, aerosol, or paste, silicone gel, Teflon gel or Lanolin paste. ONLY WATER.

In the event that leakage occurs around the rudder shaft at the packing gland, and it becomes necessary to take up on the packing, observe the following precautions:

1. Overtightening the take-up will result in stiffening the steering system
2. The take-up must be equal at the bolt locations around the shaft. If not, stiffening will occur.
3. The proper amount of take-up should permit an occasional drop or two of water to weep out when the shaft is being turned.

rdrbrng5.doc

Products That Perform
- *Sailboat Accessories & Spars*
- *Carbon Fiber Composite Structures*
- *Marelon™ Valves & Fittings*
- *Seiki™ Tube Fittings*
- *ELECTraVOTE™ Roll Call Voting*

Forespar Products Corp.
R.C Products Corp.
Light Composite Corp.
23302 Gilberto
Rancho Santa Margarita, CA 92688, USA
Tel (714) 858-0820 Fax (714) 858-0505

FORESPAR

Edson INTERNATIONAL

Marine Steering Inspection

As with all mechanical systems used in the harsh marine environment, proper inspection and maintenance is required of an Edson Steering System for long life and years of proper service. Systems which have not been maintained and lubricated properly show signs of wear early and perform less than satisfactory. Therefore, it is important that all boats fitted with Edson Steering Systems get an annual inspection of the critical system parts and that routine maintenance guidelines are followed. This inspection can be done by an Authorized Edson Service Center, or can be done by the boat owner.

After each item is inspected , check the appropriate box on the left-hand side of the checklist. If a replacement part is required, or an upgrade part is needed, make a check in the appropriate box on the right-hand side of the checklist next to the Part#. After the Inspection is complete, copy those Part#'s needed onto the order page attached. This order form can then be taken to your Edson Dealer or Service Center for fulfillment.

Note: Some parts need size designations - refer to your Edson Catalog, Price Page or Specific Boat Data Sheet for sizing information. If you have any questions during the Inspection or while filling out the order form, please contact the Edson Customer Service Department between 8am - 5pm Eastern Time.

Edson International 146 Duchaine Blvd., New Bedford, MA 02745-1292 Tel: (508) 995-9711 Fax: (508) 995-5021 E-Mail: sales@edsonintl.com

Edson Steering Inspection Checklist

Please Fill Out This Section Completely.

Owners Name: _____ **Boat Name:** _____

Address: _____

City: _____ **State:** _____ **ZIP:** _____ **Phone: ( )** _____

Boat Type/Mfr: _____ **Length:** _____ **Year:** _____

Engine Mfr. and Type: _____ **Transmission Mfr. and Type:** _____

☑	Inspection Area	Action	Parts Needed	☑
	Steering Wheel/Shaft	**Remove** Steering Wheel for room to work		
		Inspect Wheel, Key and Snap Ring		
		Replace Key if loose in keyway	#684-250W	
		Replace Snap Ring if there are signs of corrosion	#960-A-660	
		Remove compass and cylinder (follow mfr. rec.)		
		Replace Compass Bolts if corroded	3 1/2" - #817-3.5	
		Coat Compass Bolts with Tef-Gel before re-installing.	1" - #817-1	
	Engine Control	**Inspect** handles, levers, shafts, bushings		
		Upgrade plastic handles to stainless	Throttle -#963SB-55	
			Clutch -#963PT-55	
		Replace Delrin Bushings if deteriorated or stiff	#960-A-125	
		Inspect Engine Cables		
		Replace cables if deteriorating or stiff	#734-33-*spec length*	
			#735-64-*spec length*	
	Wheel Brake	**Inspect** Brake. Tighten to determine if working properly		
		Visually inspect pads. Clean grease off of knurling.		
		Replace Pads if worn or ineffective	Brake Kit - #316-689	
		Upgrade plastic knob to stainless	#960-A-91ST	
	Steering Chain/Sprocket	**Inspect** chain for proper lubrication and free-movement		
		Replace if dry, corroded, or does not "roll"	#886-*spec size*	
		Inspect sprocket for broken, worn or bent teeth		
		Replace sprocket if broken or bent	#855-*spec size*	
	Steering Shaft Bearings	**Inspect** condition of bearings by turning shaft and checking		
		for play or resistance while chain is disconnected.		
		Replace bearings if stiff or excessive play	#314-335	
	Steering Cables	Oil tissue and run along wire. **Inspect** Steering Cable for		
		signs of wear such as "meat-hooks" or kinks.		
		Replace wires if there are any signs of wear	#885-*spec size*	
		Check cable tension. Cable should deflect 1" per foot.		
		Tighten cables at the quadrant take-up eyes if loose.		
		Inspect Conduit (if used) for worn areas or tight bends.		
		Replace if worn through	#797-250	
		Lubricate conduit with Teflon Grease if dry.	#827-3	
		Continued		

PEDESTAL STEERING MAINTENANCE

To properly maintain the moving parts in the top of the pedestal, it is necessary to remove the compass and its cylinder. For proper alignment when re-installing the compass, we recommend placing three or four lengths of tape on the pedestal and compass as shown below. Slit the tape when removing compass, align the strips of tape when re-installing the compass for visual realignment. Your compass MUST then be checked out for accuracy. Lubrication of needle bearings should be done by squeezing Edson Fig 827 Teflon Lubricant into the holes located on top of the bearing housings inside the pedestal bowl. Spin the wheel when squeeezing the lubricant in to make sure the entire bearing is serviced. Winch grease or water pump grease can be used as an alternative, but don't let the bearings run dry. Do not over grease as it will run onto the brake pads. Oil the chain with #30 weight motor oil. Do NOT grease chain as it does not penetrate the links.

Inspect the condition of the wire, tension of the wire and lightly oil. Edson recommends placing about five layers of "Kleenex" on the palm of your hand, squirt oil on the tissues and lightly oil the wire. This will lubricate the strands but will also "flag" a broken or hooked strand by tearing off a small section of tissue. If you do have a wire break, replace the wire immediately. See Edson Fig 775 Wire and Chain Replacement Kits. (**Caution:** Wire splinters can cause painful cuts.) Replace the wire after 5 years. If still good, keep the old wire on board as a spare.

STEERING WIRE TENSION

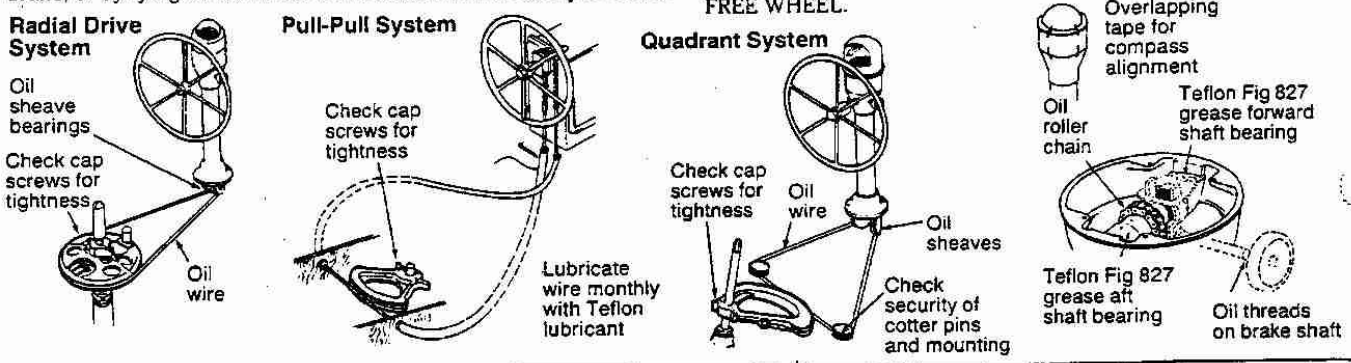
A top quality roller chain to wire steering system can be kept in "as new" sensitivity by keeping the wire at a correct tension. To check for proper wire tension, lock the wheel in position by using the pedestal brake, or by tying off the wheel. Cable tension is best when you cannot move the quadrant or drive wheel by hand with the wheel locked in place. Over tightening will greatly reduce the sensitivity of the system.

It must be emphasized that all on board must be familiar with the care and operation of the Steering System and engine controls. One person must be assigned the job of maintenance and must be thoroughly familiar with the operation and intent of all the equipment. If at any time your Steering System makes strange noises or reacts differently than it has previously, you must find the causes immediately and correct the problem.

Screws, nuts, bolts, as well as clevis and cotter pins that are part of the steering system, engine controls or pedestal accessories, must be checked regularly for tightness and wear. Failure to inspect all steering parts, engine controls and pedestal accessories may cause loss of control or failure of the engine or steering system. *All boats must have an emergency tiller or its equivalent and all on board must be familiar with its location and operation. An emergency tiller drill is just as important as a man-overboard drill and must be regularly conducted.*

On a new boat and at least once a year, inspect the system when under a strong load. On a calm day and under power, go away from the other boats and with the person who is assigned the maintenance watching from below, put the wheel hard over at full throttle. The maintenance man should watch carefully for all parts of the system bending, distorting, creaking, or giving any indication of failing if placed under a heavy load for a period of time. If, for any reason something did fail or needs adjusting, the day is early and you will have plenty of time.

When leaving your boat at her mooring or slip, make sure that your wheel is properly tied off. DO NOT LEAVE THE STEERING SYSTEM TO FREE WHEEL.



CLEANING STAINLESS STEEL

Pedestal guards, steering wheels and shafts are all made from top quality stainless steel. The implication of its name "stainless steel" does not mean it is totally rustproof. All stainless steel will rust to a certain degree due to chemical reaction to air and saltwater. This is mainly cosmetic and will require an occasional polishing with an abrasive type cleaner such as "Brasso" or equivalent.

CLEANING PEDESTAL AND ACCESSORIES

Clean them with soap and water; don't use chemicals such as MEK or acetone as they break down the super finish on your Edson pedestal system, compasses and instruments. Most manufacturers of compasses and electronic instruments suggest that they all be removed during winter storage and kept in a warm dry area. Compasses are normally held in place by two or three slotted-head screws, placed near the top of the compass. A Fig 672 Rubber Connector will assist in removing the compass. Instruments can be removed by the screws in the Edson faceplate. Just unplug the instrument and you are all set.

CAUTION: When the equipment is in the tropics or in charter service, the maintenance schedule must be speeded up. Or, to put it in a few words: clean it up, oil it, inspect it, cover it. The effects of sun, saltwater and inexperienced operators can be severe.

LUBRICATION RECORD

component	lubricant	schedule	1st year 19____	2nd year 19____	3rd year 19____	4th year 20____	5th year 20____	6th year 20____	7th year 20____
sheave bearings	#30 oil*	check and oil monthly							
pull-pull cables	Teflon Fig 827	check and grease monthly							
wire rope	#30 oil*	check and oil annually							
roller chain	#30 oil*	check and oil annually							
pedestal shaft bearings	Teflon Fig 827	check and grease annually							

*Any light oil is suitable. We recommend #30 weight motor oil since most boat owners have it aboard.

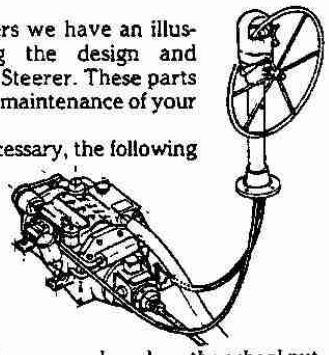
CAUTION: 1.) On extended voyages your steering system should be inspected each day and lubricated weekly. Carefully inspect your steering system at least one week before a vacation cruise to avoid last minute maintenance.
2.) When the boat is unattended secure the wheel with the brake or a line. In rough weather the rudder can swing violently from stop to stop causing damage.

Edson INTERNATIONAL
146 DUCHAINE BLVD, NEW BEDFORD, MA 02745-1292 • TEL (508) 995-9711 • FAX (508) 995-5021

PEDESTAL STEERING ASSEMBLY

As a further service to our customers we have an illustrated parts breakdown showing the design and construction of your Edson Pedestal Steerer. These parts d ngs will assist you in the proper maintenance of your s. .ng system.

If disassembly should become necessary, the following instructions will provide a simple but precise method of removing and replacing the steering shaft and its components.



DISASSEMBLY

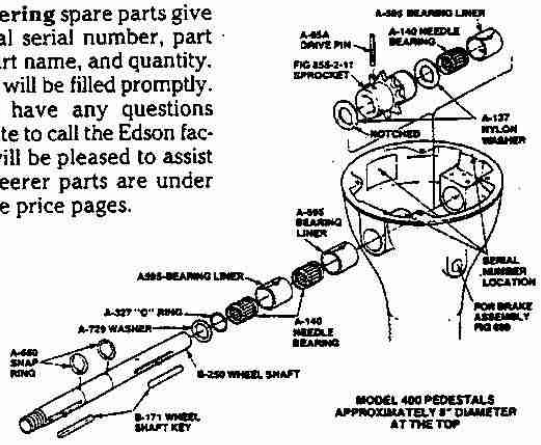
1. With the wheel and brake assembly removed, replace the wheel nut with any standard thread ¾" or 1" hex nut.
2. Loosen the steering cables and chain by backing off the take-up eyes at the Quadrant or Radial Driver, lift the chain off the sprocket and tie to the forward part of the bowl.
3. Put a cloth just under the sprocket so no parts drop down.
4. Align the notch in the aft nylon washer with the "V" stamped on the sprocket.
5. Carefully drive the pin out of the sprocket (drive from the round end toward the grooved end).
6. With a piece of wood against the ¾" or 1" hex nut, gently tape the wheel shaft from the housing (see illustration); be careful not to drop the shaft components into the pedestal.
7. Remove the sprocket, two nylon washers and forward needle bearing.
8. Remove aft needle bearing and washers.
9. Wipe out any dirt or old grease before reassembly.

To reassemble, reverse the above procedure; do not grease the bearings until reassembly is completed.

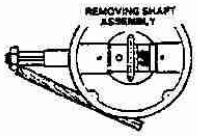
NOTE: Check your compass for possible readjustment.

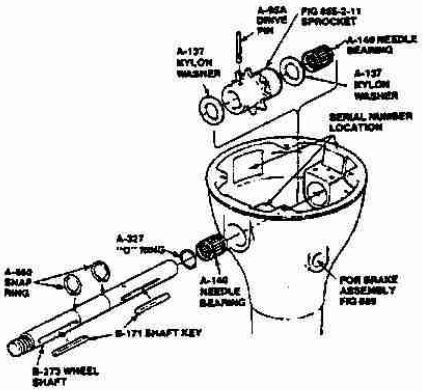
Y ordering spare parts give ti. edestal serial number, part number, part name, and quantity. Your order will be filled promptly.

If you have any questions don't hesitate to call the Edson factory. We will be pleased to assist you. All steerer parts are under Fig 960; see price pages.



MODEL 400 PEDESTALS
APPROXIMATELY 8" DIAMETER AT THE TOP

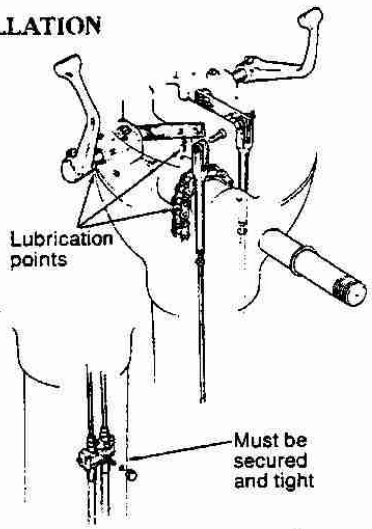




MODEL 334 OR 335 PEDESTALS
APPROXIMATELY 7" DIAMETER AT TOP

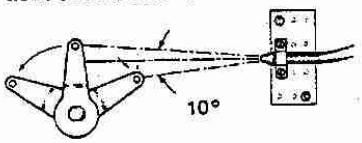
ENGINE CONTROLS INSTALLATION

Great care must be taken to assure ease and safety of engine controls operation. Components must be installed and adjusted so the engine goes into gear smoothly and completely, and the throttle operates easily. Cables must be installed straight or in broad curves. Refer to the Engine Connections illustrations (opposite) for installation procedures. Don't force engine controls when operating above idle. Force-shifting can result in broken cables and loss of boat control. Familiarize yourself with the operation of the engine controls. Caution and train all those on board.

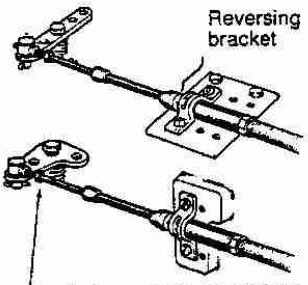


ENGINE CONNECTIONS

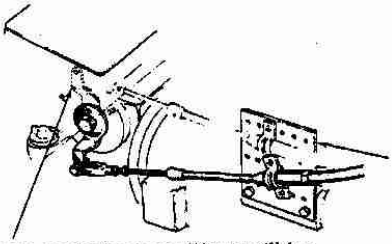
NOTE: Use the information below as a guideline. Most engine and control cable manufacturers furnish instructions for installing their products. Use their instructions if there is any variance with the instructions shown below.



When aligning the cable anchor point with the control lever, the centerline of the cable must be aimed to the mid point of the lever to allow an equal amount of swivel to each other. No more than 10° total cable bend is allowed.

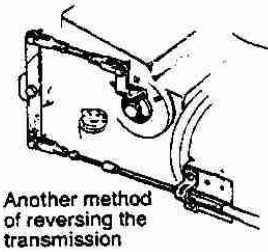


Two holes must be provided in the engine throttle lever to optionally select the proper travel. Holes, both 1¾" R or 2¾" R. Inner hole will provide increased throttle travel control handle pressure.

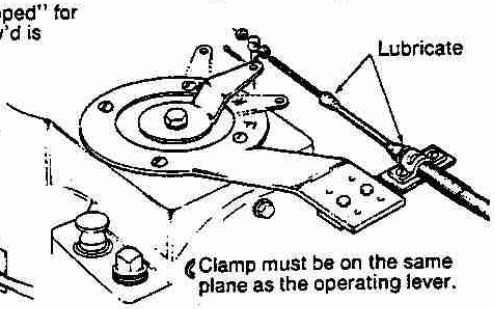


Transmission lever "flopped" for directional shifting — Fw'd is forward, etc.

Typical working end clamping brackets with extra holes for centering and reverse if required. Straight lead is very important.



Another method of reversing the transmission



ENGINE CONTROLS MAINTENANCE

Oil the control handle shaft bearings with #30 motor oil. Use a good grade of Teflon spray with an extender nozzle for the pedestal end of the engine control push/pull cables.

At the engine, clean off the control cable metal ends and spray with Teflon grease. This will increase cable life and make operation easier. Engine cables are subject to high heat from the transmission, and salty bilge water, both very hard on moving parts. If stiff, replace.

Edson INTERNATIONAL
146 DUCHAINE BLVD, NEW BEDFORD, MA 02745-1292 • TEL (508) 995-9711 • FAX (508) 995-5021

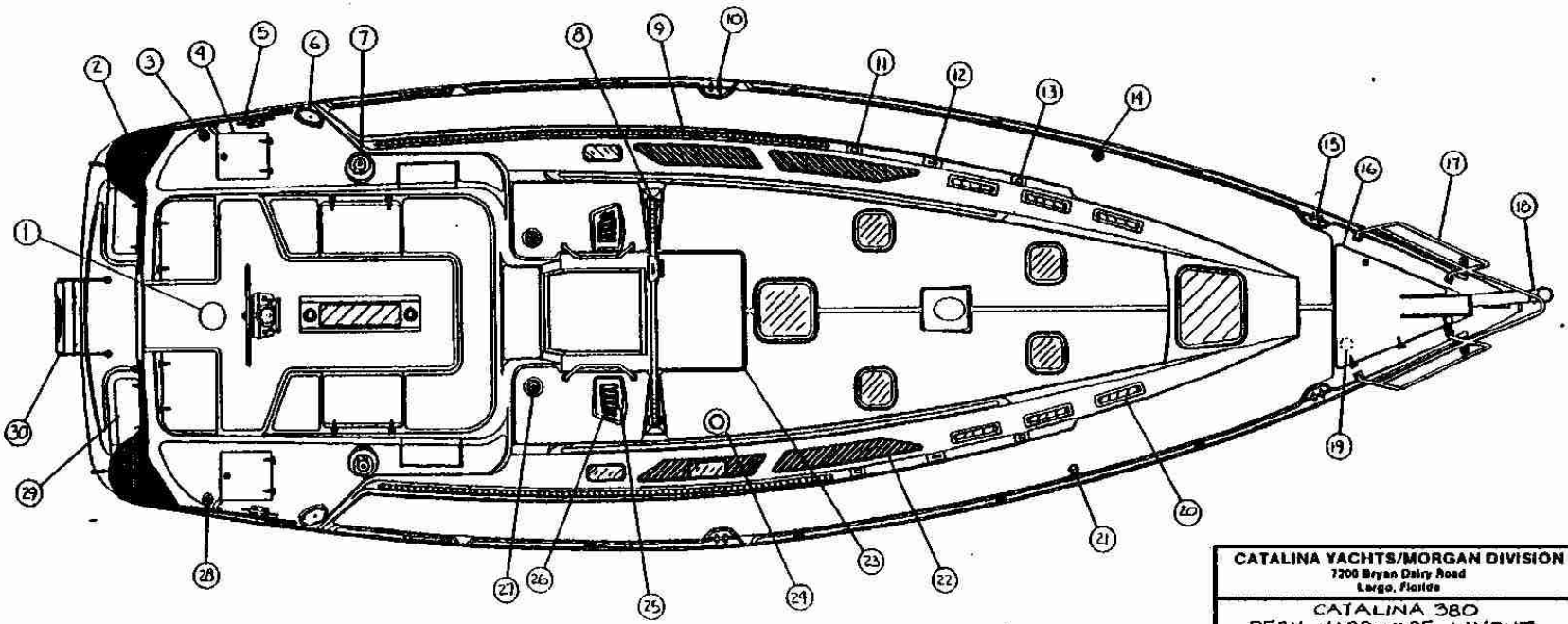
☑	Inspection Area	Action	Parts Needed	☑
	Cable Sheaves/Idler	**Inspect** Idler Plate and Sheaves for corrosion or wear		
		from misaligned cables. Look for metal dust under sheave.		
		Inspect Sheave Pins for excessive wear.		
		Replace Idler, Sheaves or Pins if corroded or worn.	See Data Sheet	
	Steering Cable Alignment	Correct cable alignment within the sheave system is		
		required to insure longevity of the system. **Check** that Cables		
		are centered in the groove of the sheaves and quadrant.		
		Adjust sheave placement to insure a fair wire lead.		
	Quadrant / Radial Wheel	**Inspect** Quadrant or Radial for signs of wear or corrosion.		
		Inspect for cable wear along wire groove.		
		Inspect connection at rudderpost for tightness.		
		Inspect Rudderstop. Is it hitting supports on both sides?		
		Replace Quadrant if weakened by corrosion.	See Data Sheet	
		Replace Rubber Bumper on Stop if missing.	#960-A-534	
		Tighten all bolts clamping Quadrant on rudderpost.		
		Align Quadrant or Sheaves for fair wire runs.		
	Overall Inspection	**Tighten** all fasteners including pedestal bolts, wire rope		
		clamps, and quadrant rudderpost/connections.		
		Inspect Pedestal base for water leakage.		
		Seal with bedding compound if leaking.		
	Lubrication	***For longevity of the steering system, proper***		
		lubrication is required.		
		Lubricate Shaft Roller Bearings with Teflon Grease	#827-3	
		Lubricate Cable Conduit with Teflon Grease		
		Oil Wire Rope, Chain and Sheave Pins w/ #30 Motor Oil		
	Upgrades	Many parts that Edson used to make in plastic are now		
		built of Stainless Steel. Upgradeable items include:		
		Stainless Shift Handle	#963SB-55	
		Stainless Throttle Handle	#963PT-55	
		Stainless Wheel Nut	#673ST 1" or 3/4"	
		Stainless Quick-Release Wheel Nut	#826ST 1" or 3/4"	
		Stainless Brake Knob	#960-A-91ST	
		These items are easily replaced during an inspection.		
	Customer information	**Give** your customer a copy of Edson's Pedestal	Edson Catalog	
		Maintenance Guide and Catalog. Periodic Maintenance is	EB-204-2	
		very important in keeping the Steering System in like-new		
		condition - Kits are available for routine maintenance:		
		Brake Maintenance Kit	#316-689	
		Pedestal Maintenance Kit	#314-335	

If during the steering inspection you find that the Steering Pedestal needs repainting, please request the Edson Pedestal Repainting Guide (EB-95-345). This Engineering Bulletin will outline the steps required to properly repaint or replace the pedestal as well as areas to check for possible electrolysis. Contact Edson Customer Service for this and other Engineering Bulletins.

Many of these parts are available in kit form. If you are replacing several items, you may consider purchasing the Brake Maintenance Kit (#316), the Pedestal Maintenance Kit (#312), or the Pedestal Rebuild Kit (#314). These are available through Edson Dealers or Factory Direct.

When the Steering Inspection is completed, copy the Part #'s of the required replacement and upgrade parts onto the attached order form.

1. RUDDER POST ACCESS
2. STERN PULPIT
3. DIESEL FUEL FILL PLATE
4. PROPANE BOTTLE LOCKER
5. STERN CLEAT
6. FOOT BLOCK
7. PRIMARY WINCH
8. MAIN SHEET TRAVELER
9. GENOA TRACK
10. MID-SHIP CLEAT
11. AFT LOWER CHAIN PLATE
12. MAIN CHAIN PLATE
13. FORWARD LOWER CHAIN PLATE
14. MID-SHIP WATER TANK FILL
15. BOW CLEAT
16. ANCHOR LOCKER
17. BOW PULPIT
18. ANCHOR ROLLER
19. BOW WATER TANK FILL
20. OPENING PORTLIGHT
21. HOLDING TANK DECK PLATE
22. FIXED PORTLIGHT
23. SEA HOOD
24. SOLAR VENT
25. HALYARD STOPPER
26. CLAM CLEAT
27. SECONDARY WINCHES
28. AFT WATER TANK FILL PLATE
29. TRANSOM LOCKER
30. SWIM LADDER

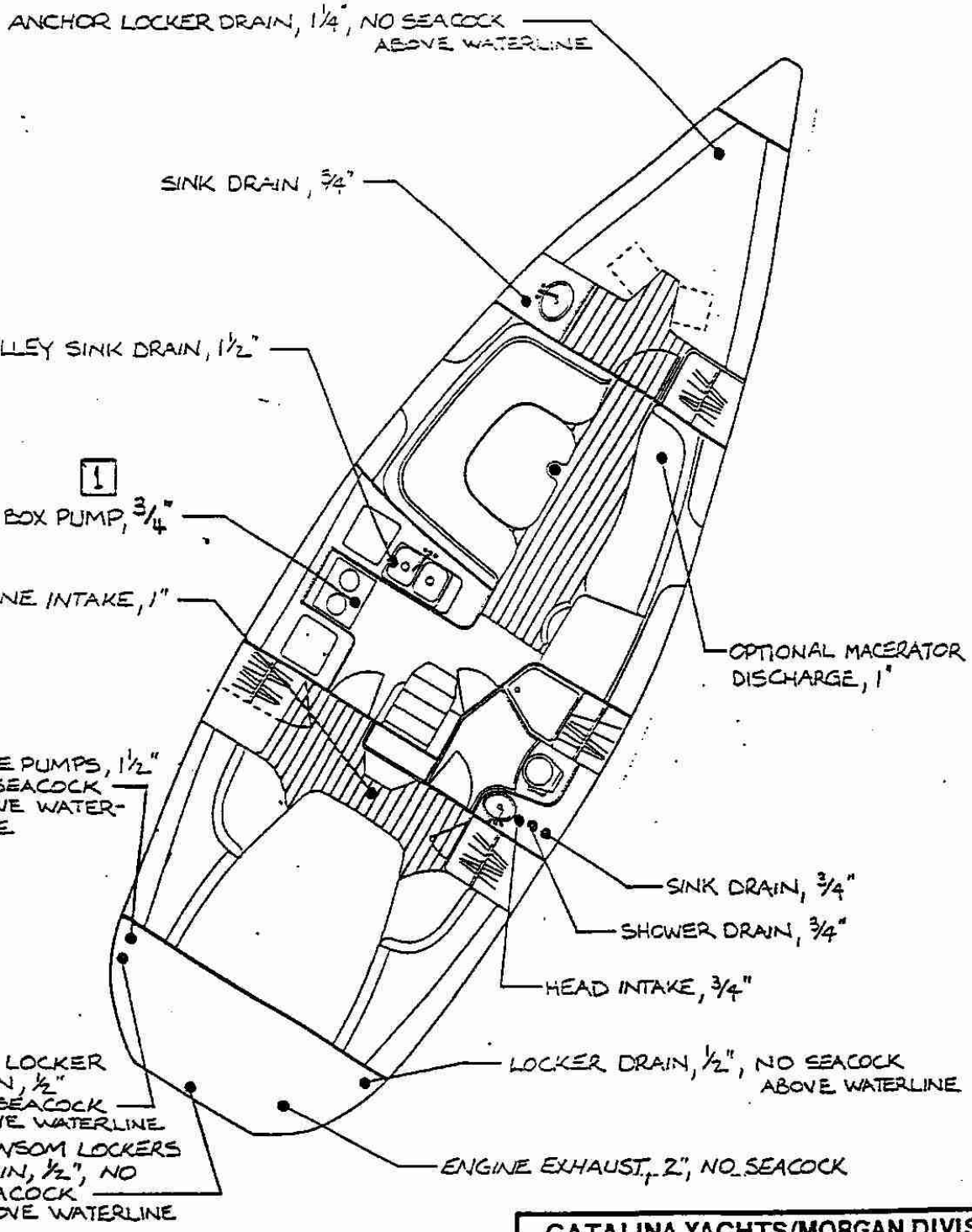


CATALINA YACHTS/MORGAN DIVISION
7200 Bryan Dairy Road
Largo, Florida

CATALINA 380
DECK HARDWARE LAYOUT

DESIGNED BY	DATE 4-16-96	DRAWING NO. 380-24000-0
DRAWN BY		
CHECKED BY	SCALE	
APPROVED BY		

1	REVISED SIZE OF ICE BOX DRAIN. WAS 1/2" 8-21-98



CATALINA YACHTS/MORGAN DIVISION 7200 Bryan Dairy Road Largo, Florida		
CATALINA 380 THROUGH HULL LOCATIONS		
DESIGNED BY	DATE 1-31-96	DRAWING NO. 380-68000-1
DRAWN BY		
CHECKED BY	SCALE —	
APPROVED BY		

4.7.2 **GALLEY STOVE:**

A three-burner LPG stove with oven is the factory standard installation. It comes with an operation and maintenance booklet provided by the stove manufacturer. The standard LPG gas bottle is in a vapor-tight locker located in the port side of the cockpit. The locker is fitted with a drain/ vent fitting on the transom. Keep the vent clear at all times. (A spare tank may be stored in the locker on the starboard side.)

Follow the stove operation instructions located on the stove and on the tank compartment carefully.

A few additional points of operation for the standard LPG stove are:

It is recommended that every time the LPG tank valve is opened for use, the operator close the valve and watch that the gauge needle remains constant. The gauge should read approximately 110 PSI. If you can detect a fall in pressure over a 15-minute period of time, there is a leak. LEAKS CAN BE DANGEROUS.

a. If a leak occurs, check all appliance burners to see if they are in the "OFF" position.
b. Make sure the oven control is in the "OFF" position.
c. Check all fittings with a soap and water solution. NEVER USE FLAME TO CHECK FOR LEAKS.

If you cannot find the leak, contact the stove manufacturer promptly.

To light the oven: Light the right front burner to bleed air from the system for at least one (1) minute. Turn the temperature control knob from the "OFF" position to the "PILOT ON" position. After this has been done, light the pilot in the oven (constant pilot).

After the oven pilot is lit, turn the oven temperature control knob to the desired temperature.

Notes on the Solenoid: The solenoid must be turned on to read gauge for leaks. Both the solenoid and the tank valve must be turned on to receive fuel. The solenoid is an electrical device for turning on or off the fuel from inside the cabin at the electrical panel.

"It is important to check out your LPG appliance system each time you fill the tank, but certainly at least once per year. As a reminder please follow the enclosed operating and test procedures."

4.0 YACHT SYSTEMS - (Continued)

LPG ONLY:
CAUTION

1. This system is designed for use with liquified petroleum gas (LPG) only. Do not connect compressed natural gas (CNG) or any other fuel to this system.

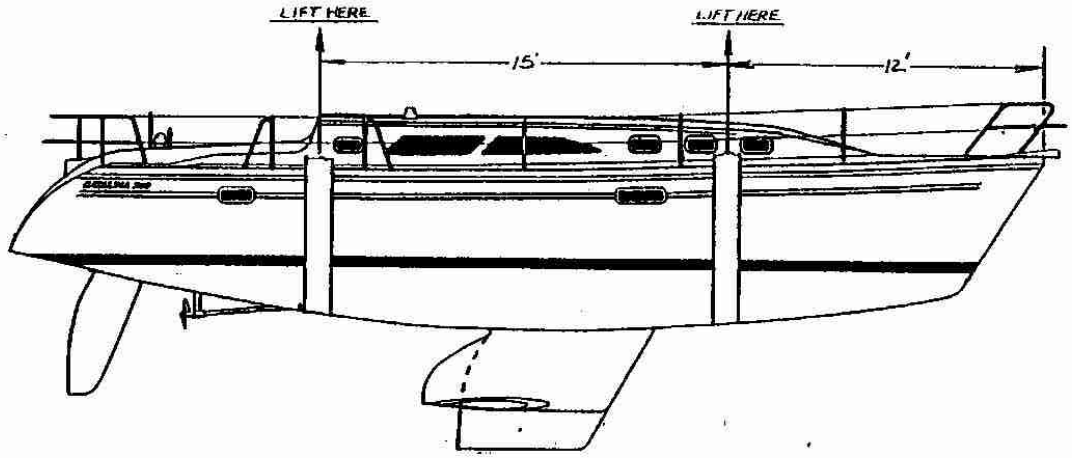
2. Keep cylinder valves closed when boat is unattended. Close them immediately in an emergency. When on board, cylinder valve or solenoid valve must be closed when stove is not in use.

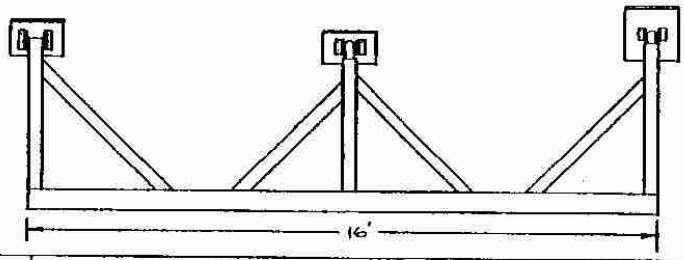
3. Be sure all stove valves are closed before opening cylinder valve.

4. Test for system leakage each time the cylinder supply valve is opened for stove use. Close all stove valves. Open, then close cylinder supply valve. Observe pressure gauge at the regulating device and see that it remains constant for not less than five minutes before any stove is used. If any leakage is evidenced by a pressure drop, check system with a soapy water or detergent solution, and repair before operating system.

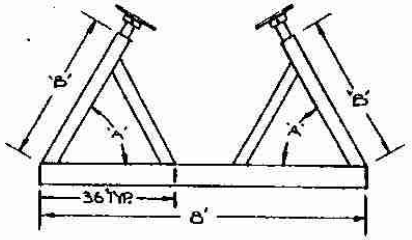
5. Test system for leakage at least every two weeks and after an emergency in accordance with paragraph four (4) above.

Never use an open flame to check for leaks!





	WING KEEL		FIN KEEL	
	ANGLE 'A', DEGREE	LENGTH 'B', INCHES	ANGLE 'A', DEGREES	LENGTH 'B', INCHES
FWD. UPRIGHT	60°	42"	65°	64"
MID UPRIGHT	70°	32"	75°	54"
AFT UPRIGHT	75°	37"	80°	58"



NOTE: 36" DIMENSION ABOVE IS LIMITED TO 20" AT MID UPRIGHTS / WING KEEL MODEL ONLY

CATALINA YACHTS/MORGAN DIVISION
7200 Bryan Dairy Road
Largo, Florida

CATALINA 380
LIFTING AND CRADLING

DESIGNED BY	DATE	DRAWING NO.
DRAWN BY	7-8-96	380-91000-0
CHECKED BY	SCALE	
APPROVED BY		

5.0 DECOMMISSIONING: - (Continued)

7. Clean and lubricate all deck hardware that contains moveable parts. Follow manufacturer's instructions on winches.

8. Remove all gear such as books, documents, bedding, PFD's, anything moveable that is subject to rust, corrosion or mildew.

9. Remove all food supplies from lockers and ice chest. Wash out ice chest interior with a weak solution of Clorox. Leave ice chest lid open.

10. Stored batteries should be fully charged, and both positive and negative terminals should be disconnected. The batteries may be either left aboard or stored in a cool, dry place. Sub-zero temperatures will not harm a fully charged battery.

11. Close all manual shutoffs for the stove fuel system.

12. Winterize the head system in accordance with manufacturer's instructions.

13. Winterize the hot and cold water system in accordance with manufacturer's instructions, drain all tanks, hoses, pumps and valves. Open system drain valves. One hot and one cold supply. Located in bilge pump area.

14. Remove all electronic gear that may require servicing during the winter.

15. Remove fire extinguishers for weighing, checking, and any necessary recharging. If an automatic fire extinguisher system is installed, return the cylinders to the yacht and reinstall as soon as possible.

16. If cushions are left aboard, bring cockpit cushions below and place all cushions on edge to encourage ventilation.

17. Leave all interior lockers open to encourage ventilation.

18. Ensure that deck scuppers are open and free.

19. If the boat is to be covered, ensure that the cover is installed in such a way as to provide adequate ventilation, and that the cover is not permitted to chafe against the hull or deck.

20. If the boat is not to be covered, ensure that mechanisms such as winches and steering pedestals are provided with adequate covers.

21. If the mast is to remain stepped, snug all shrouds and halyards to minimize noise and wear.

GENERAL NOTES:

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

All through-hull fittings should be drained and closed off. Water in the sanitation system and other tanks should be pumped out. Fill the lines and fittings with antifreeze (not the potable water system) to prevent water from running in, freezing or expanding, and cracking the lines and fittings.

5.0 **DECOMMISSIONING:** - (Continued)

7. Clean and lubricate all deck hardware that contains moveable parts. Follow manufacturer's instructions on winches.

8. Remove all gear such as books, documents, bedding, PFD's, anything moveable that is subject to rust, corrosion or mildew.

9. Remove all food supplies from lockers and ice chest. Wash out ice chest interior with a weak solution of Clorox. Leave ice chest lid open.

10. Stored batteries should be fully charged, and both positive and negative terminals should be disconnected. The batteries may be either left aboard or stored in a cool, dry place. Sub-zero temperatures will not harm a fully charged battery.

11. Close all manual shutoffs for the stove fuel system.

12. Winterize the head system in accordance with manufacturer's instructions.

13. Winterize the hot and cold water system in accordance with manufacturer's instructions, drain all tanks, hoses, pumps and valves.

14. Remove all electronic gear that may require servicing during the winter.

15. Remove fire extinguishers for weighing, checking, and any necessary recharging. If an automatic fire extinguisher system is installed, return the cylinders to the yacht and reinstall as soon as possible.

16. If cushions are left aboard, bring cockpit cushions below and place all cushions on edge to encourage ventilation.

17. Leave all interior lockers open to encourage ventilation.

18. Ensure that deck scuppers are open and free.

19. If the boat is to be covered, ensure that the cover is installed in such a way as to provide adequate ventilation, and that the cover is not permitted to chafe against the hull or deck.

20. If the boat is not to be covered, ensure that mechanisms such as winches and steering pedestals are provided with adequate covers.

21. If the mast is to remain stepped, snug all shrouds and halyards to minimize noise and wear.

GENERAL NOTES:

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

All through-hull fittings should be drained and closed off. Water in the sanitation system and other tanks should be pumped out. Fill the lines and fittings with antifreeze (not the potable water system) to prevent water from running in, freezing or expanding, and cracking the lines and fittings.

5.0 **DECOMMISSIONING:** - (Continued)

For diesel engines, consult the manufacturer's manual for special instructions.

Unless manufacturer's manual states otherwise, drain the engine block, disconnect the water intake hose from the through-hull fittings, attach an additional length of hose and place the end of this hose in a bucket of antifreeze. Run the engine until straight antifreeze comes out the exhaust line. Stop the engine at this point, plug or cap the exhaust line, and remove the additional hose and bucket.

6.0 OWNER-USER RESPONSIBILITY:

6.1 GENERAL SAFETY TIPS:

1. Do not venture out when the weather conditions are unfavorable or are predicted to become so. Listen to weather forecasts, check with your Harbor Patrol Office, and look out for small craft storm warnings.

2. Be especially careful in areas where there may be commercial shipping traffic. Keep well away from shipping channels. Keep a sharp lookout when crossing the shipping channels..

3. Learn the rules of the road. All other sailors will expect that you know them and abide by them. The U.S. Coast Guard (BBE-2) 400 S. Eleventh Street, S.W. Washington, D.C. 20590, will supply free literature on this. Your local branch or Harbor Patrol Office may also have it available.

4. If your boat has a Genoa head sail that obscures the helmsman's vision, have a dependable person in the crew keep a sharp lookout under the Genoa sail for traffic.

5. When sailing at night, provide safety harnesses for yourself and your crew, and tie these lines to the boat. Use approved harnesses.

6. Purchase all Coast Guard required safety equipment and learn how to use it.

7. Enroll in a Coast Guard class or other certified boating and sailing class. You will learn a lot and enjoy sailing even more.

8. Do not take more than a safe number of persons aboard your boat when sailing.

9. Marine insurance is worth every penny you pay for it. Take out insurance from the start. See your dealer for a recommended marine agent if you do not have one.

10. Keep all seat hatches and main hatches closed during rough weather or gusty winds which could unexpectedly strike the boat and cause a knock down.

11. CAUTION: The aluminum mast, and the metal parts conduct electricity. Coming in contact with, or approaching an electrical power line can be fatal. Stay away from overhead power lines and wires of any kind, when launching, underway, or when stationary.

6.2 REQUIRED SAFETY EQUIPMENT:

FIRE EXTINGUISHER:

It is wise to locate a minimum of two, approved for marine use, fire extinguishers, one for forward of the galley and one for behind the galley, preferably below the cockpit hatch. Should a galley fire or engine fire start, you can always reach a fire extinguisher.

For example, you do not want to locate both of your extinguishers in the head area because if you are located in the cockpit, you would have to get by the danger area to reach them if the fire is either in the galley or engine area.

6.0 **OWNER-USER RESPONSIBILITY:** - (Continued)

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

LIFE VESTS:

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

HORN:

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

FLARES:

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

6.3 **SUGGESTED SAFETY EQUIPMENT**

MEDICAL KIT:

A basic medical kit is a wise investment for any boat owner. Suggested items include: Motion sickness pills, aspirin, bandages, etc. We recommend that you personalize your medical supplies for you and your crew's specific needs.

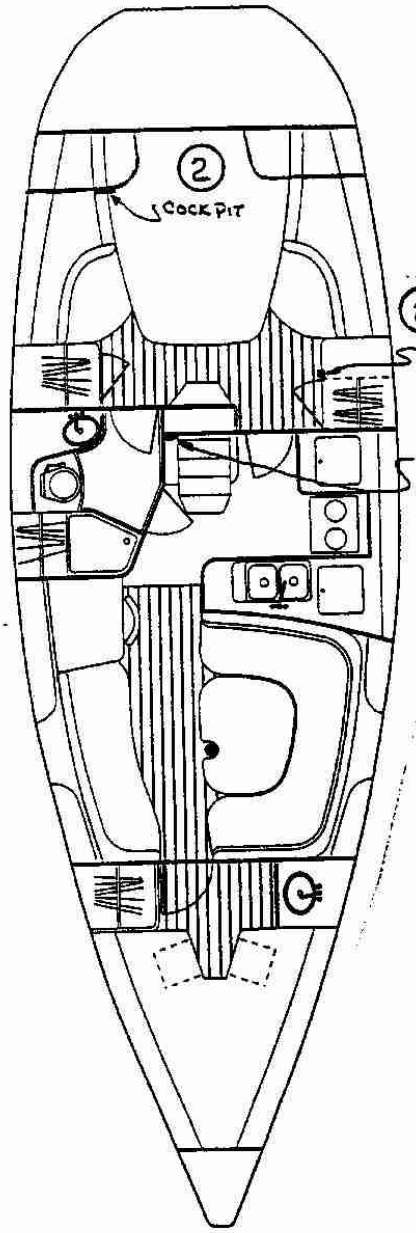
TOOL KIT:

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

6.4 **SAFETY PACKAGE, FACTORY OPTION:**
(Contents subject to change without notice)

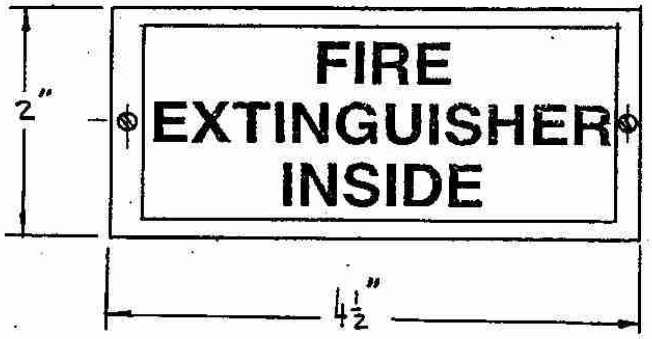
DESCRIPTION	QTY.
CQR 45 LB plow anchor	1 ea
ACCO 5/16" galv. Hi-test chain	30 ft
New England 5/8" x 250' anchor line	1 ea
3/8" galv. anchor shackle	2 ea
Taylor 10 x 30 fender	4 ea
New England 3/8" fender line (2x7')	28 ft
Sterns CG. app. white throwable cushion	1 ea
Aluminum folding radar reflector	1 ea
Olin Alert/Locate flare kit	1 ea
Tempo "Nature Safe" signal horn	1 ea
Kidde 10BC fire extinguisher	3 ea
Medical Sea Pack first aid kit	1 ea
Eveready halogen flashlight w/batteries	2 ea
Kent USCG app. Type II foam life vest	8 ea
Chapman's Piloting & smallboat handling	1 ea
New England 5/8" x 25' docklines	4 ea
AFI 8" chrome bell	1 ea

NO.	REVISION	DATE



ADD FIRE EXTINGUSHER LOCATION LABELS IN POSITIONS SHOWN TO COMPLY WITH EUROPEAN CERTIFICATION STANDARD 9094-1. EACH PLATE WILL BE ON FORMICA AS SHOWN IN DETAIL-A.

DETAIL-A



FIRE EXTINGUISHER	1

FIRE EXTINGUISHER INSIDE	2

CATALINA YACHTS/MORGAN DIVISION
7200 Bryan Dairy Road
Largo, Florida

C380 FIRE EXTINGUISHERS

DESIGNED BY	DATE	DRAWING NO.
DRAWN BY		
CHECKED BY	SCALE	
APPROVED BY		

6.0 OWNER-USER RESPONSIBILITY: - (Continued)

6.5 ANCHORS, ANCHORING AND MOORING

The manufacturer suggests an anchor in the 30 to 40 pound range to be used as a bow anchor in ordinary conditions. This anchor will only be effective with at least 15 feet of 5/16 inch or heavier gauge chain and at least 5/8 inch or heavier nylon line.

Under adverse weather conditions, a heavier bow anchor could prove necessary, and possibly a plow type anchor might be required.

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

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

6.6 LIGHTNING PRECAUTIONS:

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

1. There is not a procedure for lightning protection which is proven reliable under all conditions. Yachts with elaborate lightning protection systems have sustained serious damage from a direct lightning strike.

2. If the builder were to assert that the yacht was lightning protected, it could instill a false sense of confidence in the owner or operator, leading to less-than-prudent actions when lightning threatens.

3. Lightning systems are "out of sight, out of mind", except when lightning threatens. Generally, they are not checked and maintained on a regular basis. A defect in the system (i.e., a break in a ground line) could, in some cases, increase the risk of personal harm, as well as damage to the yacht, as compared to a yacht with no protection. The reason for this is that many lightning protection systems distribute the high voltage throughout the yacht before allowing it to exit through the ground.

4. It is impossible for Catalina Yachts to control changes which you, the owner, may make to the yacht, which could affect a lightning protection system.

You, the owner, must decide whether or not you wish to equip your yacht with lightning protection and, if so, the method of doing it. 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.

6.0 **OWNER-USER RESPONSIBILITY:** - (Continued)

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, 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.

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

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

Factory installed metal tanks, 110 volt systems and major components are grounded to the engine. The engine is grounded via the shaft and propeller to the water. The purpose of 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 the American Boat and Yacht Council (ABYC) publication, which is reprinted herein for your reference.

E-4 LIGHTNING PROTECTION

Based on ABYC's assessment of the existing technology, and the problems associated with achieving the goals of this standard, ABYC recommends compliance with this standard for all systems and associated equipment manufactured and/or installed after July 31, 1998.

4.1 *PURPOSE*

These standards and recommended practices are guides for the design, construction, and installation of lightning protection systems on boats.

*NOTE: **The probability of a lightning strike varies with geographic location and the time of the year, but, when the conditions that create an electrical charge between clouds and the earth exist, there is nothing that can be done to prevent the lightning discharge. A boat can be struck in open water or while tied to the dock.***

4.2 *SCOPE*

These standards and recommended practices apply to powerboats and sailboats if a lightning protection system is installed.

*NOTES: **1. Complete protection from equipment damage or personal injury is not implied.***

2. 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.

3. Protection of persons and small craft from lightning is dependent on 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, and the unpredictable nature of lightning, specific recommendations cannot be made to cover all cases.

4.3 *REFERENCED ORGANIZATIONS*

ABYC - American Boat and Yacht Council, 3069 Solomon's Island Road, Edgewater, MD 21037-1416. 410-956-1050

NFPA - National Fire Protection Association, 1 Batterymarch Park, PO Box 9101, Quincy, MA 02269-9101. 617-770-3000.

4.4 *DEFINITIONS*

Air terminal - A device at the upper most point of the lightning protection system to dissipate the charge or start the lightning ground process.

Equalization bus - A metallic strap, which may be installed on the interior of a boat, substantially parallel to the exterior lightning ground plate, and connected to the lightning ground plate at both ends. Secondary lightning conductors can be connected to the equilization bus. The equalization bus provides a low resistance path to the lightning ground plate.

Lightning bonding conductor - A conductor intended to be used for potential equalization between metal bodies, and the lightning protection system to eliminate the potential for side flashes.

Lightning ground plate (or strip) - A metallic plate, or strip on the hull exterior below the waterline, that serves to efficiently transfer the lightning current from the system of down conductors to the water.

Lightning protective gap (air gap) - A form of lightning arrester wherein a small air space is provided between two metallic plates, with one connected directly to the vessel grounding plate or strip, and the other to an operating electrical system, such as a radio transmitter or receiver.

Lightning protective mast - A conductive structure, or if non-conductive, equipped with a conductive means, and an air terminal.

Parallel path - A path to ground that may be followed by a lightning strike. This path is separate from the path formed by the primary lightning conductor.

Primary lightning conductor - The main vertical electrical path in a lightning protection system formed by a metallic mast, metallic structure, electrical conductors, or other conducting means, to a ground plate, ground strip, or a metallic hull.

Secondary lightning conductor - A conductor used to connect potential parallel paths, such as the rigging on a sailboat, to the primary lightning conductor, or to the lightning ground plate, strip or equalization bus.

Side flash - An arc-over discharge that occurs from the lightning system to any metallic object.

Zone of protection - An essentially cone shaped space below a grounded air terminal, mast, or overhead ground wire, wherein the risk of a direct lightning strike is substantially reduced. See Appendix 1.

4.5 *REQUIREMENTS - IN GENERAL*

4.5.1 To provide a conductive path for the adequate discharge of lightning currents, from the air terminal at the top of a lightning mast to the water (ground), the system shall

4.5.1.1 be essentially vertical, and

4.5.1.2 be essentially straight, and

4.5.1.3 have a conductivity not less than that of a #4 AWG (21.2mm^2) copper conductor, and

4.5.1.3.1 where the system consists of multiple shrouds, stays and mast, they shall have an aggregate conductivity not less than a #4 AWG (21.2mm^2) copper conductor.

4.5.2 Every metallic shroud and stay shall be connected from the chain plate directly to the ground plate or ground strip with a conductor at least #6 AWG (13.3mm^2).

4.5.3 No bend of a conductor shall form an included angle of less than 90°, nor

4.5.3.1 shall it have a radius of bend less than eight inches (203mm).

4.5.4 Large metal objects such as tanks, engines, deck winches, stoves, etc., within six feet (1.8m) of any lightning conductor shall be interconnected by means of a lightning bonding conductor at least equal to #6 AWG (13.3mm^2) copper.

NOTES: 1. 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 protection system.

2. Large metal bodies on boats include any large masses such as bow and stern pulpits, steering pedestals, horizontal guardrails, handrails on cabin tops, smokestacks from galley stoves, electric winches, davits, metallic hatches, metallic arches, towers, engines, water and fuel tanks, and control rods for steering gear or reversing gear.

3. 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.

4. For illustration purposes see Appendix, Figure 1.

4.6 *REQUIREMENTS - MATERIALS*

4.6.1 Corrosion - The material used in a lightning protective system shall be resistant to corrosion.

NOTE: Where it is necessary to join dissimilar metals, the corrosion effects can be reduced by the use of suitable plating or by installing a metal fitting between the two dissimilar metals that is galvanically compatible with both metals.

4.6.2 Wire Conductors

4.6.2.1 Wire conductors shall be stranded copper.

4.6.2.2 Stranding of copper wire shall be Type II stranding in accordance with ABYC E-8, *AC Electrical Systems on Boats*, and/or ABYC E-9, *DC Electrical Systems under 50 Volts*.

4.6.3 Other Conductive Means

4.6.3.1 Conductivity shall be equal to, or greater than, #6 AWG (13.3mm^2) copper wire.

4.6.3.2 The thickness of metal ribbon or strip shall be at least 1/32 inch (0.8mm).

4.6.3.3. Copper braid shall not be used.

4.7 *REQUIREMENTS - INSTALLATIONS*

4.7.1 To minimize side flashes, and the induction of high voltage to the boat's wiring, lightning conductors in proximity to the boat's wiring shall not be routed in parallel to the boat's wiring.

EXCEPTION: ***The primary lightning conductor.***

4.7.2 Conductive Joints - Conductive joints shall be made and supported in accordance with ABYC E-9, *DC Electrical Systems Under 50 Volts*, and

4.7.2.1 shall have an electrical resistance not in excess of that of two feet (0.6m) of the smaller diameter conductor.

4.8 *LIGHTNING PROTECTIVE MAST*

4.8.1 The lightning protective mast shall be located so that the cone of protection will cover the entire boat. See Figure 1 and Figure 2.

4.8. 2 Additional lightning protective means shall be erected to form overlapping zones of protection, to protect a boat of the size that renders the use of a single mast impracticable.

NOTE: 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.

4.8.3 Lightning Protective Mast Alternatives

4.8.3.1 If the mast is composed of non-metallic material, the associated lightning or grounding conductor shall

4.8.3.1.1 be essentially straight, and

4.8.3.1.2 be securely fastened to the mast, and

4.8.3.1.3 extend at least six inches (150mm) above the mast, and

4.8.3.1.4 terminate in an air terminal, and

4.8.3.1.5 be led as directly as practicable to the grounding connection. See E-4.5.1.

NOTE: Although partially conductive, carbon fiber materials are regarded as non-conductive (non-metallic) for the purpose of this standard.

4.8.3.2 An outrigger that serves as a lightning protective mast shall have conductivity equivalent to #4 AWG (21.2mm^2) copper.

4.9 *LIGHTNING GROUND*

4.9.1 Primary and Secondary Lightning Ground - A lightning ground for a boat shall consist of any metal surface which is submerged in the water having an area of at least 1 square foot (0.1m^2) and consist of at least one of the following methods.

4.9.1.1 External Ground Plate or Equivalent - The external ground plate shall be located as close to the base of the primary conductor as possible to minimize any horizontal runs in the primary conductor.

NOTE: The boat's rudders, struts, external ballast keel, or other external metallic surfaces may provide an external ground plate equivalent.

4.9.1.1.1 If the rudder(s) is used as an external ground plate equivalent, the lightning conductor shall be connected directly to the rudder shaft.

4.9.1.2 Grounding strip - An external grounding strip of copper, copper alloy, stainless steel, or aluminum, shall be installed under water to be used as an earth ground connection for the lightning system. This strip shall have a minimum thickness of 3/16 inch (5mm), and a minimum width of 3/4 inch (19mm).

NOTES: 1. The edges of the external ground plate or grounding strip need to be sharp, exposed, and not caulked or faired into the adjoining area.

2. A strip approximately one inch (250mm) wide, and 12 feet (3.7m) long, has nearly six times the amount of edge area exposed to the water, which, compared to the ground plates, will improve the dissipation of charges.

4.9.1.2.1 The grounding strip, if used, shall extend from a point directly below the lightning protection mast, towards the aft end of the boat, where a direct connection can be made to the boat's engine.

NOTES: 1. The use of two thru-bolts at each end of the strip will help to prevent the strip from twisting.

2. An equalization bus on the inside of the boat, paralleling the grounding strip on the outside of the boat, may be used as the lightning ground conductor.

4.9.2 Seacocks and Thru-Hull Fittings - Seacocks and thru-hull fittings, if connected to the lightning ground system, shall not be connected to the main down conductor. They shall be connected to

4.9.2.1 the underwater grounding strip, or

4.9.2.2 the lightning ground plate, or

4.9.2.3 the internal equalization bus.

4.9.3 Multihull boats shall provide a lightning ground connection in accordance with 4.9.1 for each hull that has items to be grounded, attached, or fitted to it.

4.10 *REQUIREMENTS - VESSELS WITH METAL HULLS*

4.10.1 If there is electrical continuity between metal hulls and masts, or other metallic superstructures of adequate height in accordance with E-4.8, then no further protection against lightning is necessary.

4.11 *REQUIREMENTS - SMALL BOATS*

4.11.1 Small boats without a permanent mast shall be protected by means of a temporary lightning protective mast that may be erected when lightning conditions are observed.

4.11.1.1 The base of the temporary lightning protective mast shall be located as close to the geometric center of the boat as possible, but, if necessary, can be offset, providing the cone of protection will cover the entire boat when the mast is plugged in.

4.11.1.2 The location of the mast base shall be such that persons on the boat can avoid physical contact with the mast or the base.

4.11.1.3 The base should extend as high as possible, and provision shall be made to plug in the upper section of the lightning mast so that it will not be displaced by the rolling and pitching of the boat in rough water.

4.11.1.4 The temporary lightning protective mast shall be all metal, or other material if provided with a conductor, with a conductivity at least equal to a #4 AWG (21.2mm^2) conductor.

NOTE: A solid stainless steel whip antenna or equivalent, that has a conductivity less than a #4 AWG (21.2mm^2) conductor, may be used, because of its higher melting temperature, but it will not provide as low a resistance path for the lightning.

4.11.1.5 The temporary lightning protective mast shall be connected to a submerged ground plate of at least one square foot (0.1 m^2) in area.

4.11.2 Open Daysailers - As stainless steel rigging may not provide an adequate conductive path for the discharge of lightning currents, protection will depend on the grounding of all rigging as well as the metal masts, or the continuous metallic tracks on nonmetallic masts. These shall be connected at the lower ends to a lightning grounding plate, or a lightning grounding strip located directly below the mast.

4.11.2.1 Metallic rudders at the aft end of the boat shall not be used as the lightning ground for the mast because of the need for a long horizontal conductor to the aft end of the boat.

4.11.2.2 The tiller, or other connections to metallic rudders that the operator will contact, shall be non-conductive materials.

4.11.2.3 Metallic keels or centerboards shall be directly connected to the lightning grounding plate or strip, and may serve as the lightning grounding means if they have the required one square foot (0.1 m^2) area in contact with the water. If a centerboard is used as the lightning grounding means, a warning sign shall be provided that clearly states that the centerboard must be in the down position to function as a lightning ground.

FIGURE 1 - BOAT WITH MAST NOT EXCEEDING 50 FEET (15M) ABOVE THE WATER

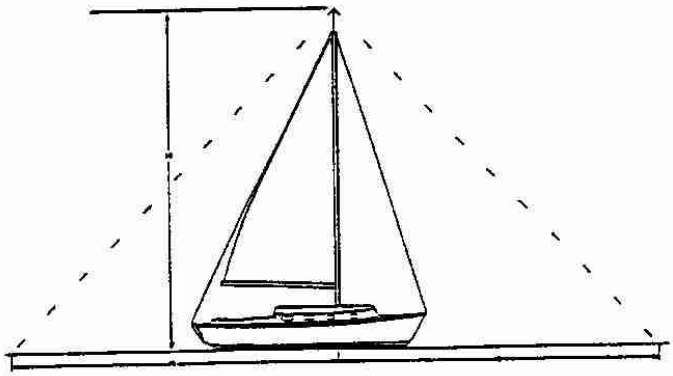


FIGURE 2 - BOAT WITH MAST NOT EXCEEDING 50 FEET (15M) ABOVE THE WATER

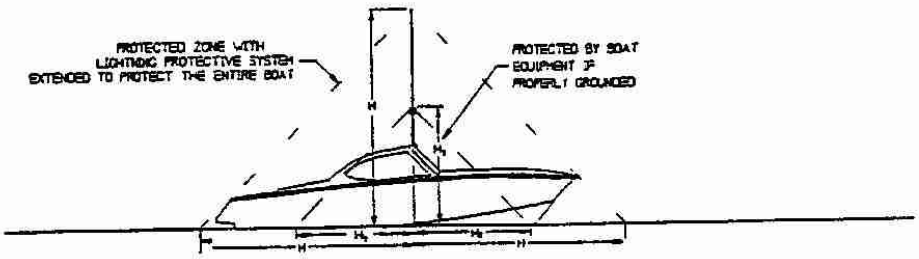
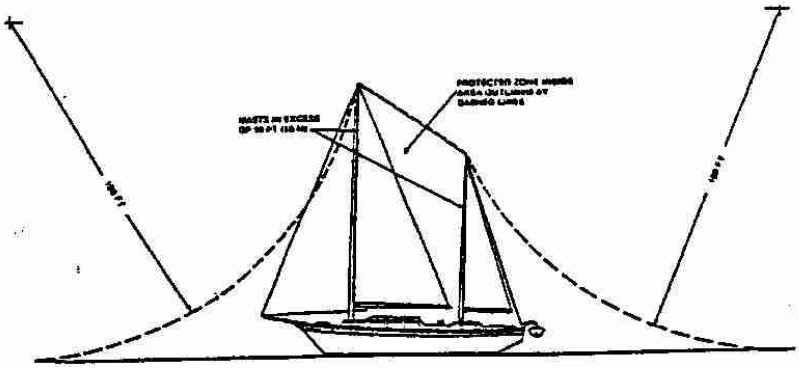


FIGURE 3 - BOAT WITH MASTS IN EXCESS OF 50 FEET (15M) ABOVE THE WATER - PROTECTION BASED ON LIGHTNING STRIKING DISTANCE OF 100 FEET (30M)



APPENDIX - LIGHTNING PROTECTION

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

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

Ap.1.2 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.

Ap.1.3 Whip type radio antennas should not be tied down during a lightning storm if they have been designed as a part of the lightning protection system.

Ap.2 Maintenance - Lightning protection provisions are likely to receive scant attention after installation. Therefore, their composition and assembly should be strong, and materials used should be highly resistant to corrosion.

Ap.2.1 Grounding of metallic objects for lightning protection may increase the possibility of harmful galvanic corrosion. See ABYC E-2, *Cathodic Protection of Boats.*

Ap.2.2 If a boat has been struck by lightning, compasses, electrical, and electronic gear should be checked to determine whether damage or changes in calibration have taken place.

Ap.2.3 If a boat has been struck by lightning, the lightning protection system should be inspected for physical damage, system integrity, and continuity to ground.

Ap.2.4 If a boat has been struck by lightning, it should be hauled for inspection of the hull, underwater structures and thru-hull fittings. Lightning can exit from one or numerous locations below the waterline. Subsequent flooding, sinking, or long term hull damage can result from undetected lightning damage.

Ap.3 Precautions for Personnel - The basic purpose of protection against lightning is to ensure the safety of personnel. It is therefore appropriate that during a lightning storm the following precautions be taken:

Ap.3.1 Personnel should remain inside a closed boat, as far as practical.

Ap.3.2 Arms and legs should NOT be dangled in the water.

Ap.3.3 Consistent with safe handling and navigation of the boat, personnel should avoid making contact with any items connected to a lightning protection system, and especially in such a way as to form a 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.

Ap.3.4 Personnel should NOT be in the water.

Ap.3.5 Personnel should avoid contact with metal parts of a sailboat's rigging, spars, fittings, and railings.

Ap.4 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 object within the striking distance of the point from which final breakdown to earth ground (the water) occurs, the zone of protection is defined by a circular arc, concave upward. See Figure 2. The radius of the arc is the striking distance, and the arc passes through the tip of the mast, and is tangent to the water. Where more than one mast is used, the arc passes through the tips of adjacent masts. See Figure 3.

The striking distance is related to the peak stroke current, and thus to the severity of the lightning stroke. The greater the severity of the stroke, the greater the striking distance. In the vast majority of cases, the striking distance exceeds 100 feet (30m). Accordingly, the zone based on a striking distance of 100 feet (30m) is considered to be adequately protected.

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.

Ap.5 Materials

Ap.5.1 The materials used in the lightning protection system should be resistant to corrosion. The use of combinations of metals that form detrimental galvanic couples should be avoided.

Ap.5.2 In those cases where it is impractical to avoid a junction of dissimilar metals, the corrosion effect can be reduced by the use of suitable plating or special connectors, such as stainless steel connectors used between aluminum and copper alloys. Except for the use of conducting materials that are part of the structure of the boat, such as aluminum masts, only copper should be used

as a lightning conductor system. Where copper is used, it should be of the grade ordinarily required for commercial electrical work, generally designated as being of 95 percent conductivity when annealed.

Ap.6 External Ground Plate - An exterior grounding plate of copper, copper alloys, stainless steel or aluminum may be provided by means of a plate which has an area of at least one square foot (0.1 m^2) area. The plate should be located as nearly as possible directly below the lightning protection mast. The boat's propeller(s), shaft(s), metallic rudder(s), and other metallic surfaces that have the required area, can be effectively used on small boats only where the lightning protective mast is located at the stern, above the in-water metallic objects to be used as the lightning system ground. The stern mast must be tall enough to provide a cone of protection that extends to the bow of the boat.

Ap.6.1 Boats that use a lightning grounding plate instead of the lightning grounding strip should ground backstays, or other objects aft, to the engine negative terminal, a metallic rudder, or other external ground at the aft end of the boat. The lightning ground shall not be routed through the boat to the lightning grounding plate forward under the lightning mast.

Ap.7 Grounding Strip - An external grounding strip of copper, copper alloys, stainless steel, or aluminum, installed under the boat in a fore and aft direction, may be used as the earth ground connection for the lightning system. Except for stainless steel, the strip should have a minimum thickness of 3/16 inch (4.8mm), and a minimum width of 3/4 inch (20mm). Stainless steel should have a minimum thickness of 1/8 inch (3.2mm). The length of the strip should extend from a point directly below the lightning protection mast, to the aft end of the boat, where a direct connection can be made to the boat's engine, but the total length of the strip shall not be less than four feet (1.22m). In a sailing vessel, the backstay and engine should be connected to the aft end of the strip. The strip should be secured to the hull with one, or preferably two, galvanically compatible through bolts at each end. The use of two bolts at each end, spaced one or two inches apart, will help prevent any tendency for the strip to rotate when the electrical connections are made inside the hull The strip must be located so that the external strip is submerged under all operating conditions. If the strip is not located so as to be submerged when a sailboat is heeled to port or starboard, then a strip will be required on both the port and starboard sides. All connections to the strip should be as short and direct as possible. Additional thru-hull bolts may be located along the length of the strip for additional connections, such as on a two masted sailboat. Because of the possibility of stray current corrosion of the securing bolts, the number of thru-hull bolts should be kept to a minimum. To minimize the number of thru-hull bolt connections, an equalization bus can be installed.

Ap.7.1 The aft end of the lightning grounding strip should be connected directly to the engine negative terminal. This will provide a path inside the hull for any DC stray currents that might be imposed on the thru-hull bolts that attach the lightning grounding strip where those bolts contact bilge water.

Ap.8 Protection of Equipment - Wherever possible, electronic equipment should be enclosed in metal cabinets that are connected to the lightning grounding system with a minimum #8 AWG (8.39mm^2) conductor. Surge suppression devices should be installed on all wiring entering or leaving electronic equipment.

Ap.8.1 The grounding of metal rod type radio antennas provides some protection for boats without masts and spars provided that

Ap.8.1.1 conductors in the grounding circuit of the antenna have a conductivity equivalent to #4 AWG (21.2mm^2) copper in accordance with E-4.5, and

Ap.8.1.2 the top of the antenna is not more than 50 feet (15m) above the water, and

Ap.8.1.3 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 E-4.8), and

Ap.8.1.4 the antenna loading coil is provided with a suitable protective device for bypassing the lightning current.

*NOTES: **1. Because a loading coil presents a high impedance to the flow of lightning current, the portion of an antenna above the bottom of a loading coil is not as effective as a lightning protective mast.***

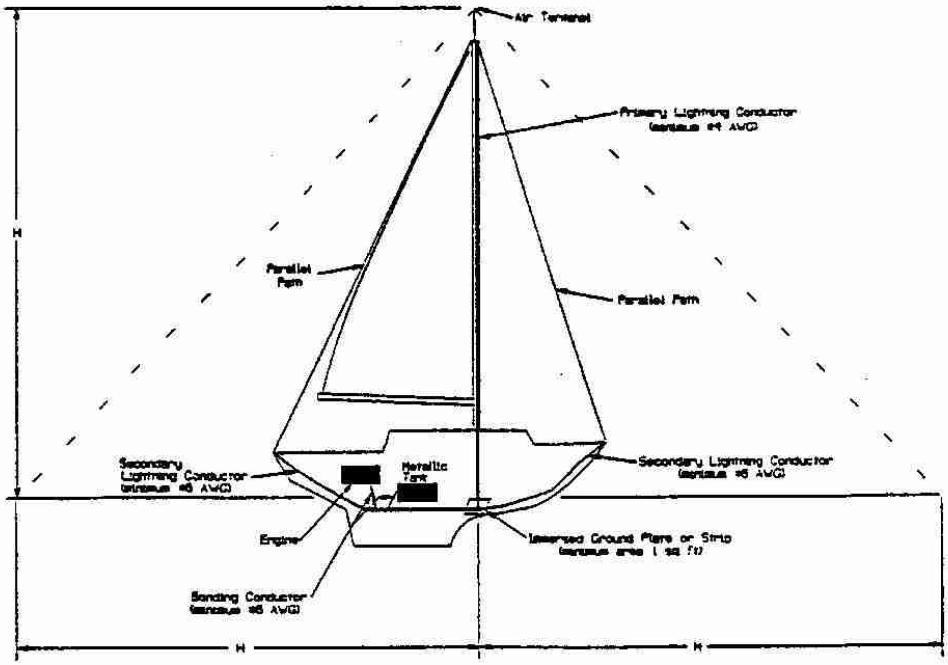
2. Non-conducting antenna masts with spiral wrapped conductors are not considered suitable for lightning protection purposes.

Ap.8.2 In order to protect the radio transmitter, antenna feed lines shall be

Ap.8.2.1 equipped with a means for grounding during electrical storms, or

Ap.8.2.2 protected by lightning arresters or lightning protective gaps.

AP. FIGURE 1 - LIGHTNING PROTECTION SYSTEM



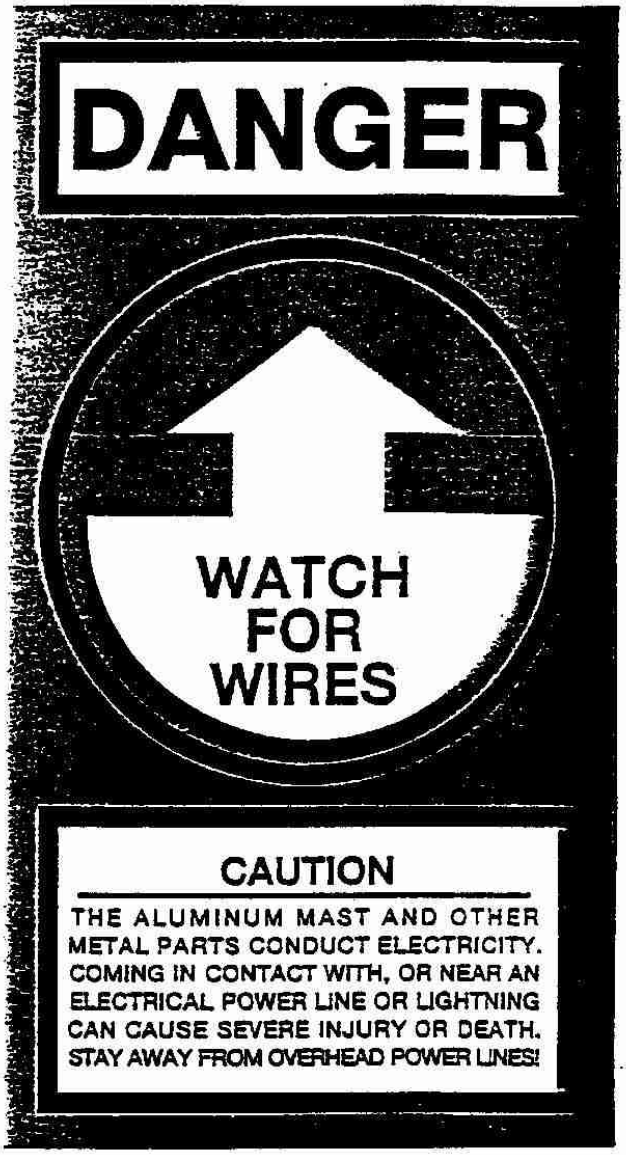
NOTES: 1. An equalization bus is used on the interior of the hull as the termination for secondary conductors and bonding conductors. The primary conductor is connected directly to the immersed ground plate or strip. See E-4.9.

2. All otherwise isolated bare metal objects within six feet (1.8m) of a lightning conductor shall be connected to the lightning protection system with a minimum #6 AWG (13.3mm^2) bonding conductor.

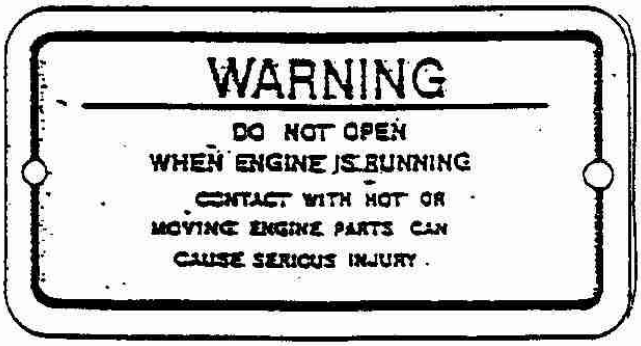
3. The probability of a lightning strike varies with geographic location and the time of the year. When the conditions that create an electrical charge between clouds and the earth exist, there is nothing that can be done to prevent the lightning discharge. A boat can be struck in open water or while tied to the dock.

WARNING LABELS

These warning labels were applied to your Catalina 380 at the factory and contain important information for safe operation of your boat. If any of the labels are missing, or require replacements or additional labels, please contact the Catalina Yachts Parts Department, (818) 884-7700.



Part # WS-1, On Forward Side Of Mast.



Part # WS-3, On Engine Covers

Catalina Yachts reminds you that is illegal for any vessel to dump plastic trash anywhere in the ocean or navigable waters or the United States, Annex V of the Marpol Treaty is an International Law for a cleaner, safer marine environment. Violation of these requirements may result in civil penalty up to $25,000. fine and imprisonment.

IT IS ILLEGAL TO DUMP THE FOLLOWING:

U.S. Lakes, Rivers, Bays, Sounds, and 3 Miles From Shore		3 to 12 Miles		12 to 25 Miles	Outside 25 Miles
Plastics	Garbage	Plastic, Dunnage, Linning and Packing Materials That Float, Also If Not Ground to Less Than One Inch:		Plastic, Dunnage, Linning and Packing Materials that Float.	Plastic
Paper	Metal				
Rags	Crockery				
Glass	Dunnage				
Food		Paper	Crockery		
		Rags	Metal		
		Glass	Food		

State and Local Regulations May Further Restrict the Disposal of Garbage.

Part # WS-9, In Companionway

DISCHARGE OF OIL PROHIBITED

THE FEDERAL WATER POLLUTION CONTROL ACT PROHIBITS THE DISCHARGE OF OIL OR OILY WASTE INTO OR UPON THE NAVIGABLE WATERS AND CONTIGUOUS ZONE OF THE UNITED STATES, IF SUCH DISCHARGE CAUSES A FILM OR SHEEN UPON, OR DISCOLORATION OF, THE SURFACE OF THE WATER, OR CAUSES A SLUDGE OR EMULSION BENEATH THE SURFACE OF THE WATER. VIOLATORS ARE SUBJECT TO A PENALTY OF $5,000.

Part # WS-8, On Engine Cover

IMPORTANT! IMPORTANT!
Close through hull valves each time the head is used.

Part # WS-6, In Head Near Access Door To Valves

IMPORTANT

READ THE OWNERS MANUAL BEFORE USING THIS VESSEL.
ADDITIONAL COPIES OF THE OWNERS MANUAL ARE AVAILABLE FROM:

Catalina Yachts

21200 VICTORY BLVD., WOODLAND HILLS, CA 91367.

Part # WS-5, In The Cockpit

CAUTION

KEEP CURTAINS AWAY FROM STOVE

Part # WS-7, Above Stove

[redacted]

ENGINEERING CHANGE NOTICE

No. [illegible]
Date: 3/14/97
Model: CAT 380

Unit No. Affected: 59
Retrofit: Yes ☐ No ☒
Owner's Manual Affected: Yes ☒ No ☐
Order Form Affected: Yes ☐ No ☒
Effective Date: 3/14/97

COST EVALUATION

	Material	Labor	Total
Additional Cost			
Deleted Cost			
Net Charge + or -			

Reason for Change: TO ADD WARNING LABELS TO TIE RODS, TO ENSURE THAT NO COMPONENTS HAVE LOOSENED DURING TRANSPORTATION.

OBSOLETE MATERIAL

Part No.	Qty.	Cost	Use

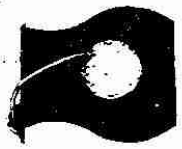
Disposition:

Change Description: ADD WARNING LABEL TO TIE RODS

DISPO:
WAREHOUSE
PRODUCTION

	Engineering	Production	Sales	Purchasing	G.M.
Aknowledged:	[signature]	C. Rummel		B. Torrey	[signature]
Date:	3/14/97	3/14/97		3-14-97	3-14-97

WARNING



THESE TIE RODS SUPPORT THE MAST. THE LOCKING NUTS AT THE BOTTOM END MUST BE TIGHT AGAINST THE BEARING SURFACE. CHECK THE LOCKING NUTS, CLEVIS PINS AND COTTER PINS IN THIS ASSEMBLY BEFORE STEPPING THE MAST TO VERIFY THAT NO COMPONENTS HAVE LOOSENED DURING TRANSPORTATION
THIS BOAT HAS 6 TIE RODS.

- THE ENGINE MUST BE ALIGNED TO THE SHAFT WITHIN .003".
- THIS COUPLING WAS ATTACHED TO THE SHAFT AT THE FACTORY.
- THIS SHAFT IS DIMPLED FOR THE SET SCREWS. THE SET SCREWS ARE SAFETY WIRED TO PREVENT THEM FROM BACKING OUT.
- IF THE SAFETY WIRE IS BROKEN OR IS REMOVED, THE ENGAGEMENT OF THE SET SCREWS MUST BE VERIFIED AND THE SAFETY WIRE SECURED BEFORE OPERATION.

1. **WHAT ARE SOME OF THE CHARACTERISTICS OF A MARINE BATTERY THAT MAKE IT DIFFERENT THAN AN AUTOMOBILE BATTERY?**

Deep cycle batteries typically feature thick plates with a high density active material. The thick plates allow for reserve energy to be stored deep within the plate which is released during a typical slow discharge such as trolling or electronic instrument usage. The high density active material remains within the plate/grid structure longer resisting the normal degradation found in cycling conditions. Automotive batteries typically feature thin plates with low density active material. These batteries are designed to release a large amount of energy within a few seconds to provide engine starting. The low density active material plates are easily shedded away when exposed to deep cycling conditions.

2. **WHAT ARE SOME OF THE COMMON MISTAKES PEOPLE MAKE WITH REGARDS TO MARINE BATTERY CARE?**

The ultimate service life and capacity your batteries will deliver is in direct relationship to how and when you recharge your battery. First, prior to recharge, check the electrolyte levels in each cell. Carefully remove the vent caps and insure that the level is approximately 1/4" +/- 1/8" below the filler tube on the inside of the cover. Too low of a level will reduce the capacity of the battery and may inhibit proper recharge. Too high of a level may lead to the spilling of electrolyte through the vent caps. If you need to add water to the battery, distilled water is your best choice. You may get by with tap water, but the impurities such as iron, chlorine, etc. may reduce the service life substantially.

Charging the battery can be performed using a wide variety of 12 volt chargers, but generally a charger with a 10 or 12 Amp rating will allow you to recharge the battery overnight. Also, a charger with a deep cycle charge mode switch will allow you to increase the voltage slightly providing a more complete recharge. Charging the totally sealed maintenance free type batteries can be a bit complex. The manufacturers of these sealed batteries usually provide their own tailored method of recharging and recommend the chargers best suited for the job.

Recharging should only be performed in a well ventilated area since lead acid batteries produce an explosive hydrogen oxygen gas mixture which is especially prevalent during the recharge period.

Recharge your battery as soon as possible after you are through using it. The most detrimental time for the internal components of the battery is when the weaker electrolyte is exposed to the battery's plates. The corrosive effect of the electrolyte is much greater on the battery components at this state-of-charge.

EXIDE™

3. HOW DO YOU DETERMINE THE CONDITION OR STATE-OF-CHARGE OF YOUR DEEP CYCLE BATTERY?

Prior to using or storing your deep cycle battery, the available capacity or state-of-charge should be checked. There are two methods of determining state-of-charge. The best method is by using a hydrometer. The hydrometer will show you the level of capacity better than any method short of a controlled laboratory time vs. discharge current test. A fully charged flooded electrolyte deep cycle battery will have a specific gravity range of 1.265 to 1.280. Hydrometers are available in various configurations, but the graduated float models provide the most accurate readings. The other method of determining state-of-charge is with a voltmeter. A fully charged lead-acid battery will have a voltage of 12.6 volts across the terminals. This voltage value is based on there being no discharge drain on the battery or leftover surface charge. If the battery is being discharged during the voltage check, chances are that you will read a much lower voltage than is actually available. On the other hand, during charging or up to 24 hours after charging, the surface charge affect will provide much higher voltage readings than the full charge volts of 12.6. If you are checking a sealed battery, you obviously will have to accept the voltage as your only indicator for state-of-charge.

The use of a voltmeter along with a hydrometer will provide you with all the information you should ever need about your battery's state-of-charge.

4. HOW LONG SHOULD A CONSUMER EXPECT TO RECEIVE MAXIMUM PERFORMANCE OUT OF DEEP CYCLE BATTERY?

The maximum performance and service life will be determined by maintenance, recharging and obviously the amount of usage. Batteries that are rated in cycle life should deliver that number of cycles. Cycles are defined, as one complete discharge and recharge. If your daily usage requirements are met by the capacity of the battery, you can assume you will get one day of use for each cycle the battery is rated at. This may not apply if the battery is stored for a long period of time or not properly maintained.

5. WHAT SPECIAL FEATURES SHOULD A BUYER LOOK FOR WHEN PURCHASING A DEEP CYCLE BATTERY?

Obviously, you should look for a battery with sufficient capacity to operate all your electrical equipment. Most manufacturers of trolling motors and electronics will post an amp requirement to operate these items. Add up the amps required along with the approximate usage time to determine your battery needs. Larger boats usually have more than one battery and almost all these manufacturers recommend your battery capacity requirements.

6. SHOULD A BUYER BE CAUTIOUS WHEN PURCHASING A DEEP CYCLE BATTERY AND IF SO, WHAT SPECIFICALLY SHOULD HE OR SHE WATCH OUT FOR?

Look for batteries with brands you are familiar with and make sure you are getting a true deep cycle and not an automotive battery. This can be difficult to determine, but a smart consumer will generally ask for a recommendation from a reputable dealer or manufacturer.

7. WHAT HAPPENS WHEN YOU "OVER-CHARGE" A DEEP CYCLE BATTERY?

Overcharging a battery occurs when the total capacity removed has been replaced by recharging and the battery remains on charge. This overcharging creates excessive heat which can cause the plates within the cells to buckle and shed their active material. Also, the battery will react to the overcharge by producing an excessive amount of hydrogen and oxygen gas. These gasses are the result of the breakdown of the water molecules within the electrolyte. The water that has been displaced by overcharging can be replaced in a serviceable (non-sealed) battery but in the maintenance free sealed batteries permanent capacity loss will result .

8. WHAT ARE YOUR RECOMMENDATIONS FOR BATTERY STORAGE OVER THE WINTER?

When storing the battery for any length of time, insure that it is at a full state-of-charge with the electrolyte levels properly adjusted. Store the battery in a cool place out of the reach of children and pets. A battery box is ideal for storage.

9. DEEP CYCLE BATTERIES ARE DIFFERENT THAN AUTOMOTIVE TYPE BATTERIES

Deep Cycle Batteries are used to power trolling motors or lights in a camper or a stereo in a van, and are designed differently than the battery you use to start your car.

That Automotive battery in your car is only asked to deliver short bursts of energy and then the alternator takes over, providing the electricity to run the car and recharge the slightly discharged battery.

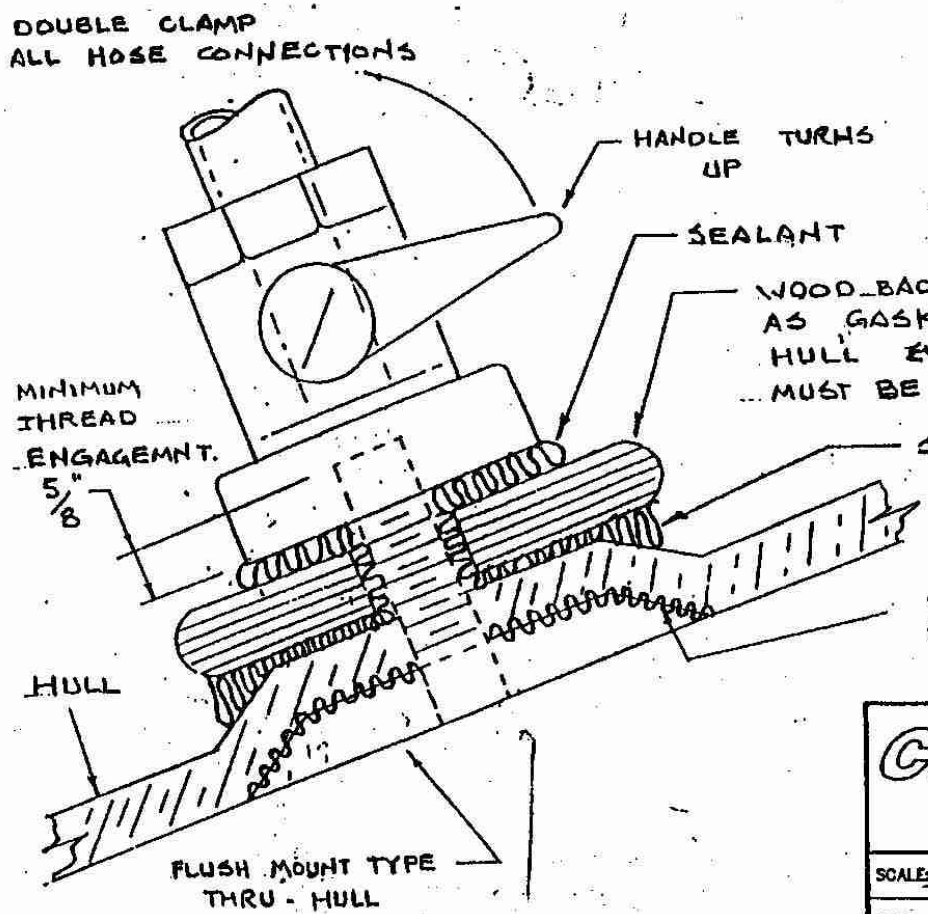
A marine battery/RV deep cycle, on the other hand, is asked to go through many deep discharges. Often, the battery is drained to nearly zero before it is recharged. This is called "deep cycling".

Deep Cycle batteries are specially designed to withstand hundreds of deep discharges. Even the best automotive type batteries won't last for more than about 75 deep cycles and of those, only the first 15 or so will recharge to a full 100%.

A marine starting battery functions in a manner similar to an automotive battery however it is specially engineered to stand up to wave pounding and engine vibration.

A thermal bond is used to seal the cover to the container for virtually leak-proof safety performance.

THRU HULL	HOLE SIZE
1/2"	1 1/8"
3/4"	1 1/8"
1 1/2"	2"



THRU - HULL INSTALLATION

1. FIND CENTER OF RECESS AND DRILL PROPER HOLE FOR THRU-HULL.

2. CLEAN OFF WAX AND DUST FROM INSIDE AND OUTSIDE OF HULL.

3. DRY FIT - CHECK THREAD ENGAGEMNT. CUT END OF THRU-HULL THREADS AS REQ'D.

4. APPLY SEALANT TO BACK OF THRU-HULL, AROUND THREADS, INSIDE OF HULL, AND BACK OF RESIN COATED BACKING RING.

5. SCREW SEACOCK DOWN TIGHT ONTO BACKING RING AND DO NOT BOTTOM OUT BODY ON THRU-HULL THREADS.

Catalina Yachts

21200 VICTORY BLVD.
WOODLAND HILLS, CA.
91367-(818)884-7700

SCALE: NONE	APPROVED BY:	DRAWN BY: GB
DATE: 10-27-93		

TITLE: FORESPAR SEACOCK INSTALLATION

BOAT: ALL BOATS

DRAWING NUMBER: 220-22022-0

CERTIFICATE

of the electrically operated ships lantern

AQUA SIGNAL 25

for Sailing or Powerdriven vessels of less than 12 meters (39.4 ft) in length.

Combined sidelights Lantern

Bulb: 12v/10w Volt/Watt Minimum Visibility(k=0,8): 1 nm

Manufacturer: AHLEMANN + SCHLATTER . D-2800 BREMEN 44 . GERMANY

APPROVED IN THE FOLLOWING COUNTRIES

U.S.A. (U.S.C.G.)
CANADA (D.O.T.)
NETHERLANDS (KNMI)
FINLAND * (M.K.H.)
DENMARK * (N.P.)
ICELAND * (S.R.)
ITALY (RINO)
SOUTH AFRICA (D.O.T.)
GREECE (MDMM)
ARGENTINE (P.N.A.)
GT. BRITAIN (D.O.T.)
AUSTRALIA (AAPMA)
FRANCE (M.M.)
NORWAY * (N.M.D.)
SWEDEN * (S.V.)
POLAND (P.R.S.)
BELGIUM (B.Z.I.)
U.S.S.R. (R.O.S.)
NEW ZEALAND (M.O.T.)

* less than 7m (23 ft.) in length for these countries.

BULB TO BE USED

In case of difficulty for replacement bulbs contact (312) 232-6425 or TLX 910 230 3110

The lantern is manufactured in compliance with the international regulations for preventing collisions at sea 1972 (IMCO 72).

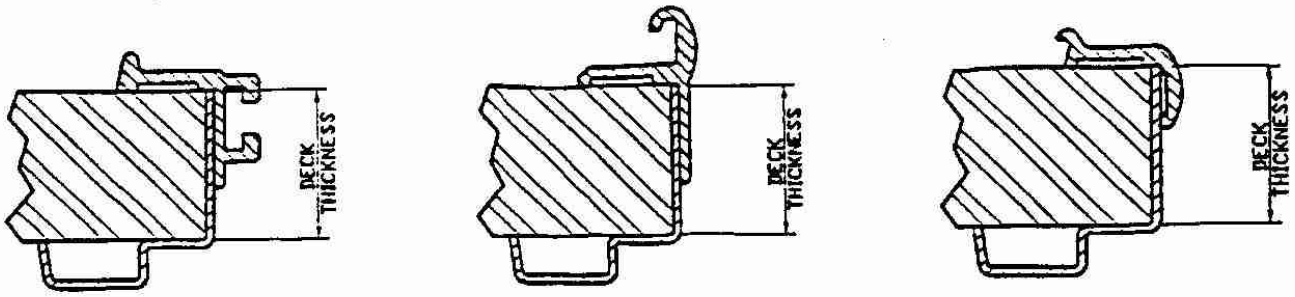
This certificate becomes invalid when a bulb other than indicated above or a lens of different properties is used.

Installed _____

LEWMAR TRIM & FLYSCREEN - FITTING INSTRUCTIONS

1. Adjust the trim moulding to suit your deck thickness, see fig 1 below, by cutting the inner edge only.

FIG.1



TRIMLINE OCEAN/ROLLSTOP COASTLINE/TRIMPORT

2. Affix over hatch frame flange, and drill through holes in trim Dia. 4mm or 5/32".

3. Assemble the lock and spacer by placing together, see fig. 2. Place this assembly on the trim and fasten with the screws provided, tighten screws, but ensure the lock can still swivel.

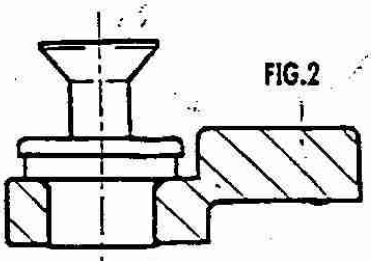


FIG.2

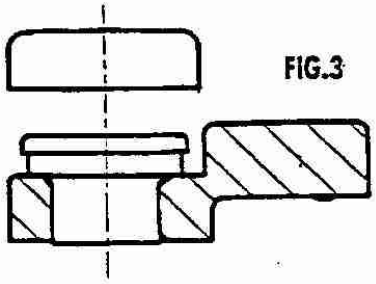


FIG.3

Press on all screws caps, fig.3.

4. The flyscreen is held by placing its mesh face towards the trim and rotating the locks 45 degrees to hold, see fig.4.

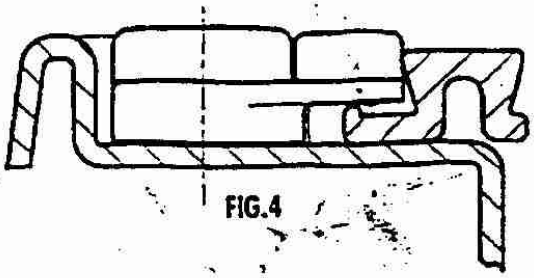


FIG.4

USER NOTES

* Use soapy water and a soft cloth. Do not under any circumstances use solvent cleaners.
* When the flyscreen is not in use, place in a safe area to protect the mesh.

Interior
Clear Wood Coating
6060

PRODUCT DESCRIPTION: INTERLUX® INTERIOR CLEAR WOOD COATING 6060 represents the latest in brightwork technology. INTERLUX® INTERIOR CLEAR WOOD COATING 6060 has a warm, rich satin sheen finish that applies easily, and flows out well to yield a very smooth surface. INTERLUX® INTERIOR CLEAR WOOD COATING 6060 looks milky white in the can but when applied becomes crystal clear and has a hard, abrasion resistant finish. INTERLUX® INTERIOR CLEAR WOOD COATING 6060 is self-sealing which means that there is no need to apply a sealer coat on bare wood. INTERLUX® INTERIOR CLEAR WOOD COATING 6060 dries rapidly and can be recoated quickly. Fast overcoating time makes it possible to achieve a complete application much more quickly than when using traditional varnish. This quick overcoating time also reduces the need to sand between coats.

TECHNICAL DATA

NUMBER OF COMPONENTS:	1
MIXING RATIO:	N/A
INDUCTION TIME:	N/A
POT LIFE:	N/A
COLOR:	CLEAR
FINISH:	Matte
SOLVENT:	Brush - Water Spray - Water
WIPE DOWN SOLVENT:	Bare Surfaces - BRUSHING LIQUID 333 Varnished Surfaces - BRUSHING LIQUID 333
CLEAN UP SOLVENT:	Water
METHOD OF APPLICATION:	Brush, Roller or Spray
VOC:	Less than 165 grams per liter
VOLUME SOLIDS:	31.59%
WEIGHT PER GALLON:	8.7 Lbs. per Gallon
PRACTICAL COVERAGE:	475 sq. ft./gal. (brush) yields mils Dry Film Thickness 11.6 M^2 per liter
RECOMMENDED APPLIED THICKNESS:	Mils (microns) total Dry Film Thickness
FLASH POINT:	N/A
SHIPPING DOCUMENTATION REQUIRED:	ORM-D Consumer Commodity all pack sizes

DRYING TIMES

TEMPERATURE °F	TEMPERATURE °C	TOUCH DRY	OVERCOATING TIME (MINIMUM)
50°	10°	2 Hours	2 Hours
60°	15°	1 Hour	2 Hours
75°	24°	45 Minutes	1 Hour
90°	32°	30 Minutes	1 Hour

APPLICATION TEMPERATURE LIMITS

	PRODUCT °F	PRODUCT °C	AMBIENT °F	AMBIENT °C	SURFACE °F	SURFACE °C
MINIMUM	50°	10°	50°	10°	50°	10°
MAXIMUM	85°	29°	95°	35°	95°	35°

APPLICATION DATA - SPRAY

EQUIPMENT	PRESSURE (PSI)	TIP SIZE
N/A	N/A	N/A

Interior Clear Wood Coating 6060

COMPATIBILITY: INTERLUX® INTERIOR CLEAR WOOD COATING 6060 can be applied over previously varnished surfaces that have been cleaned and sanded as well as bare wood.

SURFACE PREPARATION: Surface must always be clean, dry and properly prepared prior to varnishing. All bare wood and previously varnished surfaces that have been sanded must be wiped clean with cheesecloth dampened with INTERLUX® BRUSHING LIQUID 333 to remove sanding residue. Between coats of INTERLUX® INTERIOR CLEAR WOOD COATING 6060 the surface may be wiped down with a rag that has been dampened with water.

APPLICATION SYSTEMS

BARE WOOD: Sand entire surface thoroughly smooth with 80 grit production paper; wipe clean with BRUSHING LIQUID 333. To enhance the appearance of the wood and to fill porous, open grain, apply INTERLUX® PASTE WOOD FILLER AND STAIN according to label directions and allow the surface to dry overnight. Apply 2 coats of INTERLUX® INTERIOR CLEAR WOOD COATING 6060 allowing a minimum of 2 hours between coats. Allow the second coat to dry for a minimum of two hours and then sand (by hand or with a finishing sander) using 220 grit sandpaper. Remove sanding residue by wiping the surface with a clean rag that has been dampened with water. Apply 3 to 5 more coats. Before the last coat sand with 400 grit sandpaper. Remove sanding residue by wiping the surface with a clean rag that has been dampened with water.

PREVIOUSLY VARNISHED - Good Condition: Sand old finish thoroughly with 150-220 grit production paper, being sure not to sand through the paste wood filler stain. Wipe clean with BRUSHING LIQUID 333 and finish with at least 3 coats of varnish. Before the last coat sand with 400 grit sandpaper. Remove sanding residue by wiping the surface with a clean rag that has been dampened with water.

Poor Condition: When surface is badly checked or peeling, remove finish to bare wood with INTERLUX® PINTOFF® PAINT and VARNISH REMOVER 199. Follow directions for varnishing bare wood.

Thank you for selecting rope manufactured by
The American Group

Excellence In Rope Making
For Over 100 Years

WARNING:

The improper use of rope may be dangerous.

- Use the right size and rope construction for the job.
- Make sure you use the rope safely.
- *Do not* overload
- *Do not* shock load
- *Do not* bend over sharp corners
- Check temperature rating before using in hot environments.
- Avoid abrasive surfaces.
- Never stand in line with a rope under tension.

See other side for additional information

Instructions on the use and splicing of this rope are available from your local authorized distributor or by writing directly to:

The American Group
2090 Thornton Street • Ferndale, WA 98248
Tel. (360) 384-4669 • Fax (360) 384-0572

5/97

General Rope Usage
Suggested Practices and Procedures

Source: Cordage Institute • 1625 Massachusetts AVE NW, STE 505 • Washington DC 20036

Choosing a Rope:
Always consult the manufacturer before using rope when personal safety or possible damage to property is involved. Make sure the rope is adequate for the job. Do not use too small a rope or the wrong type. Specifications are available from your dealer, distributor or from The American Group which give the strength and recommended working load for various sizes and constructions of synthetic ropes.

Removing Rope From Coils and Reels:
Remove rope properly from coils or reels to prevent kinking. If the rope is in a coil, it should always be uncoiled from the inside so that the first turn comes off in a counterclockwise direction. If on a reel, the rope should be removed by pulling it off the top while the reel is free to rotate. This can be accomplished by passing a pipe through the center of the reel and jacking both ends up in a horizontal position until the reel is free from the surface. To proceed in any other manner may cause kinks or strand distortion.

Handling Rope:
Never stand in line with rope under tension. If a rope fails it can recoil with sufficient force to cause physical injury. Synthetic rope has higher recoil tendencies than natural fiber rope.

Reverse rope ends regularly, particularly when used in tackle. This permits even wearing and assures a longer useful life. When using tackle or slings, apply a steady even pull to get full strength from the rope. For maximum safety and economy, always use slings employing an angle of about 45 degrees.

Overloading:
Do not overload rope. Sudden strains or shock loading can cause failure. Avoid sudden strains—shock loads can exceed breaking strength. Shock loading can cause failure of a rope normally strong enough to handle the load. Working loads are not applicable when rope is subject to significant dynamic loading. Whenever a load is picked up, stopped, moved or swung there is an increased force due to dynamic loading. The more rapidly or suddenly such actions occur the greater this increase will be. In extreme cases, the force put on the rope may be two, three or even more times the normal load involved. Examples could be picking up a tow on a slack line or using a rope to stop a falling object. In all such applications, including towing lines, lifelines, safety lines, climbing ropes, etc. working loads as given do not apply.

Users should be aware that dynamic effects are greater on a low elongation rope such as polyester than on a higher elongation rope such as nylon and greater on a shorter rope than on a longer one. Excessive dynamic loading of a high elongation rope is equally dangerous because of stored energy which will cause the rope to recoil dangerously if it breaks. When a work load has been used to select a rope, the load must be handled slowly and smoothly to minimize dynamic effects and avoid exceeding the provision for them.

Abrasion:
Avoid all abrasive conditions. All rope will be severely damaged if subjected to rough surfaces or sharp edges. Chocks, bitts, winches, drums and other surfaces must be kept in good condition and free of burrs and rust. Pulleys must be free to rotate and should be of proper size to avoid excessive wear. Restraining clamps and similar devices will damage and weaken the rope and should be used with extreme caution.

Do not drag rope over rough ground. Dirt and grit picked up by the rope can work into the strands, cutting the inside fibers.

Checking Rope For Wear:
Avoid using rope that shows signs of aging and wear. If in doubt, destroy the used rope. If there is a question, do the same. No type of visual inspection can be guaranteed to accurately and precisely determine actual residual strength. When the fibers wear in any given area the rope should be re-spliced, downgraded, or replaced.

Check the line regularly for frayed strands and broken yarns. Pulled strands should be re-threaded into the rope if possible. A pulled strand can snag on a foreign object during rope operation.

Both outer and inner rope fibers contribute to the strength of the rope. When either is worn, the rope is naturally weakened. A heavily used rope will often become compacted or hard which indicates reduced strength.

Splicing:
Join rope by splicing. Knots can decrease rope strength by as much as 60 percent. Use the manufacturer's recommended splices for maximum efficiency. Other terminations can be used but their strength loss with a particular type of rope and construction should be determined and not assumed.

Storage and Care of Rope:
All rope should be stored clean, dry, out of direct sunlight, and away from extreme heat. Cordage should be stored in a cool, dry and well-ventilated warehouse. It should be kept off the floor on racks to provide ventilation underneath. Never store on concrete or dirt floors and under no circumstances should cordage and acid or alkalies be kept in the same building.

Do not store rope in direct sunlight. Some synthetic rope (particularly polypropylene and polyethylene) may be severely weakened by prolonged exposure to ultraviolet (UV) rays unless specifically stabilized and/or pigmented to increase its UV resistance. UV degradation is indicated by discoloration and the presence of splinters and slivers on the surface of the rope.

Chemicals:
Avoid chemical exposure. Rope is subject to damage by chemicals. Consult the manufacturer for specific chemical exposure, such as solvents, acids and alkalies. This is particularly true for natural fiber rope. Consult the manufacturer for recommendations when a rope will be used where chemical exposure (either fumes or actual contact) can occur.

Heat:
Avoid overheating. Heat can seriously affect the strength of rope. When using rope where temperatures exceed 140 degrees Fahrenheit (or if it is too hot to hold), consult the manufacturer for recommendations as to size and type of rope for the proposed continuous heat exposure conditions.

When using ropes on a capstan or winch, care should be exercised to avoid surging while the capstan or winch head is rotating. The friction from this slippage causes localized overheating which can melt or fuse synthetic fibers resulting in severe loss of tensile strength.

Note:
Because of the wide range of rope use, rope condition, exposure to the several factors affecting rope behavior and the degree of risk to life and property involved it is impossible to cover all rope applications on this page. In all cases where any risk is involved or there is a question about the condition of use, consult the manufacturer. A Rope Manual will be sent to rope users on request at a cost of $10.00.

INTERNATIONAL MARINE CERTIFICATION INSTITUTE

Rond Point Schuman 6, Box 8
B - 1040 BRUXELLES
BELGIQUE
tel: (32) 2-238-7692
fax: (32) 2-238-7700

Statement of Conformity

We hereby certify that the following boat type

Catalina Yachts, Inc.

CATALINA 380

Boat type:	**Sail**
Boat design category:	**A**
Module:	**Aa**
Type-Examination:	**No**
Length of hull [m]:	**11,75**
Beam of hull [m]:	**3,76**
Loaded displacement mass [kg]:	**10.849**
Maximum rated engine power [kW]:	**32**
Number of persons recommended:	**8**
Recommended load [kg]:	**963**
Certificate Number:	**CATAL007**

meets the requirements of the EC Directive 94/25/EC
for Recreational Craft

Lars E. Granholm (Managing Director)
EU - Notified Body: 0609
08-Oct-1999

This certificate is valid for boats identified by the HIN as a
2000 model