Catalina Yachts
MORGAN DIVISION

CATALINA 387
OWNER'S MANUAL

04/01/03

FOREWARD

Congratulations on the acquisition of your new Catalina 387. 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 387, 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 387 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 387's understand their boats and answer common questions about maintenance and systems design specific to the Catalina 387.

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 387 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.

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Gerald Lavalette

From: Gerald Lavalette
Sent: Thursday, May 27, 2004 2:39 PM
To: Kent Nelson
Subject: 387 spec sheet

please revise yanmar engine now is model 3JH4E, 40 HP and 29.4KW thanks

Catalina 387 Specifications
Rev: 5/10/05

PRINCIPAL DIMENSIONS

Length Over All	39' 10"	(12.14 m)
Length of Hull	38' 9"	(11.81 m)
L.W.L.	32' 5"	(9.88 m)
BEAM	12' 4"	(3.76 m)
Distance from W/L to masthead:	56' 0"	(17.07 m)
Theoretical hull speed	7.63 knots	

WING KEEL

Draft	4' 10"	(1.47 m)
Ballast	7300 lbs.	(3311 kg)
Designed weight	19500 lbs.	(8845 kg)
Disp/Length	255.6	
Sail Area/displacement:	15.88	

FIN KEEL

Draft	7' 2"	(2.18 m)
Ballast	6800 lbs.	(3084 kg)
Designed weight	19000 lbs.	(8618 kg)
Disp/Length	249.0	
Sail Area/displacement:	16.16	

STANDARD RIG

Mainsail, Rated:	346 ft^2	(32.14 m^2)
Total w/100% Foretriangle:	719 ft^2	(66.80 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)

RATINGS

PHRF (May vary by area) = 111
IMCI (CE) Boat design category: "A"

ICE BOX

6.0 ft^3 (0.17 m^3)
Additional 4.0 ft^3 (0.11 m^3) optional.

HEAD ROOM

Max: 6' 9" (2.06 m)

TANKAGE AND CAPACITIES

Water: Fwd.	25 Gal.	(95 lt.),
Aft	26 Gal.	(98 lt.),
Midships	31 Gal.	(117 lt.),
Water heater, electric & engine heat exchanger,	20 Gal.	(76 lt.)
Total Water:	102 Gal.	(386 lt.)
Holding Tank:	23.8 Gal.	(90 lt.)
Fuel:	36.8 Gal.	(139 lt.)

Berths: 1 Double, fwd & aft; 1 convertible double and 1 single in the salon.

ENGINE AND CONTROLS

Yanmar 3JH4BE, 40 HP (29.4 kW) Diesel, 3 cyl., 91.29 in^3 (1.5 lt.)., fresh water-cooled.
Approx. fuel consumption:
0.71 GPH (2.7 LPH) @ 2500 RPM.
Edson, Pedestal steering diamond series with 40" (1.02 m) Destroyer wheel.
Compass: 5" Illuminated Binnacle Compass.
Single lever shift and throttle control.
Panel w/ Tach., Temp., Volt, & Fuel Gauge.

PROPELLER

3 Blade 17x12 (43.18 cm x 30.48 cm)

RIGGING

Double Spreaders in line.
Shrouds:

Intermediate	1/4" (0.64 cm) wire 1x19
Upper	5/16" (0.79 cm) wire 1x19
Aft & Fwd Lowers	5/16" (0.79 cm) wire 1x19
Forestay	5/16" (0.79 cm) wire 1x19
Backstay	5/16" (0.79 cm) wire 1x19
Backstay Bridles	1/4" (0.64 cm) wire 1x19

Rope Halyards, Low Stretch, led aft.
Solid Boom Vang, Spring Loaded.

WINCHES

Primary: (2) Harken B48.2 STC, Chrome Bronze, Self-Tailing.
Halyard: (2) Harken B32.2 STC, Chrome Bronze, Self-Tailing.
Optional Halyard: (1) Harken Electric B40.2 STEC12, Chr. Bronze, Self-Tailing, in lieu of standard halyard on port cabin top.

ALL SPECIFICATIONS ARE APPROXIMATE

Note: Specifications And Or 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.____ Interior clean.
9.____ Cushions, curtains, clean and in place.
10.____ Table converts to berth OK, dinette.(2)
11.____ Hatch lids present and fit OK.
12.____ Lifelines and pulpits rigged and OK.
13.____ Spreaders taped and drilled at base end, shrouds wired to tip end and taped or boots installed.
14.____ Standing rigging pinned to mast.
15.____ **Rigging lengths verified with check list in kit.**
16.____ Mast and boom inspected: cotter pins, sheaves, tangs, spreaders OK.
17.____ Mast lights checked before mast stepped.
18.____ 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.
19.____ 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 tie-down.

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. Check gauge to detect leaks with system pressurized.

Note 1. The system is shipped from the factory with the tank Filled with compressed air for testing purposes.
Note 2. Read the stove and oven instructions completely Before operating.

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.____ Propeller shaft coupling bolts lockwired and coupling is secured.
3.____ With fuel tanks full, no leaks at fill pipes, vent, or any fuel line connections.
4.____ With coupling disconnected, engine and shaft alignment OK -- Recheck alignment after rigging tuned.
5.____ Transmission oil level OK.
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.
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.
24.____ **Calibrate tachometer.**

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 tie rods, 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 mounting 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 tie rods 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 or vinyl-ester resin reinforced with laminations of fiberglass. 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.

3.4.1 TOUCH UP AND REPAIR INSTRUCTIONS

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

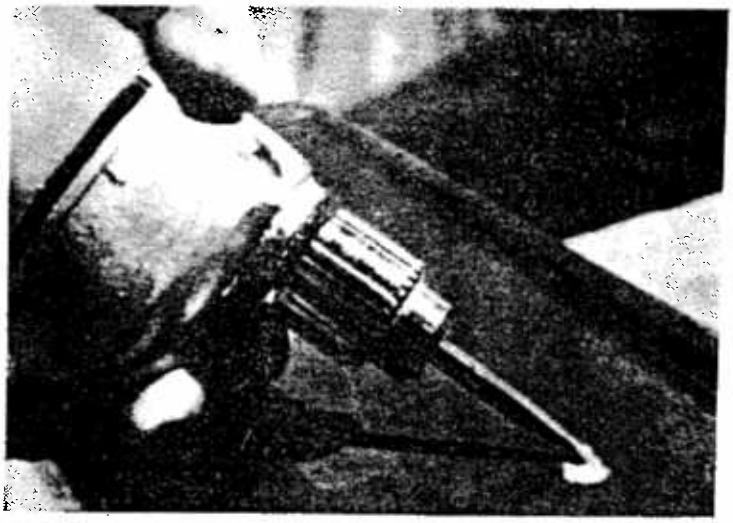
These repairs are easy because only the surface of the boat is damaged. They fall into two categories: (1) damage to the gel coat colored outer surface, and (2) holes or gouges that are deep enough to penetrate the fiber glass reinforced area of the boat. The repair operations are similar.

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.

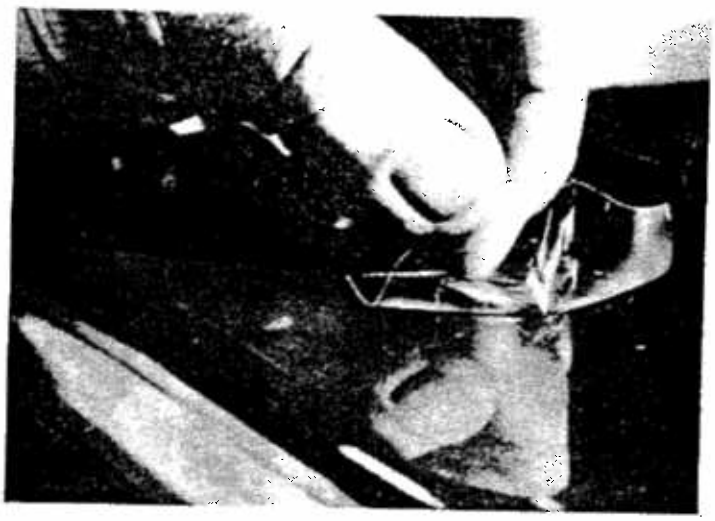
(1) Be sure the area around the damage is wiped clean and dry. Remove any wax or oil from the inside of the hole or scratch.

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



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

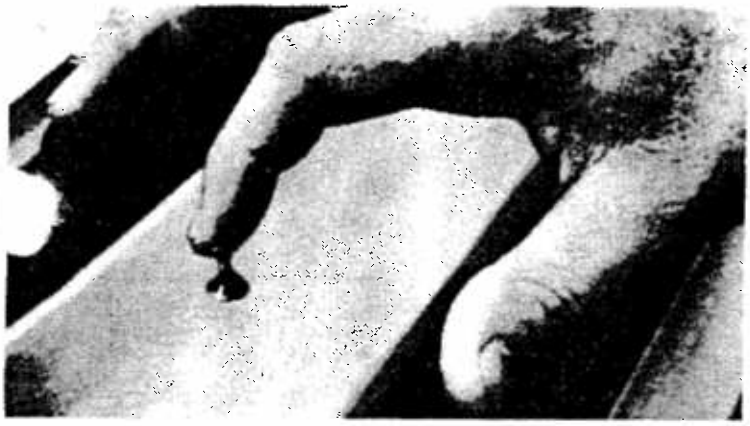


(5) Lay a piece of cellophane or waxed paper over the repair to cut off the air and start the "cure."

(2)

(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 thoroughtly, 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.

(Z-1)

3.0 MAINTENANCE GUIDE - (Continued)

3.5 BOTTOM PAINT PREPARATION:

Anti-fouling paint should be applied to the bottom of your Catalina 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.

Catalina 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 the 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 companion way 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.

3.7 SPAR AND RIGGING MAINTENANCE:

STANDING RIGGING:

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 on all fittings and wire. Turnbuckles should never be neglected and should be unscrewed from time to time in order that they do not seize. Every three months should be about right for the average sailor. A slightly bent turnbuckle shaft or broken wire in your shrouds should be replaced immediately.

Under most conditions, 1 X 19 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 racing boats also induces stress in the rigging system.

Many of us have to deal with at least one plants, acid rain and smog). High loading of the rigging as required in most of these conditions and should consider replacing standing rigging at the five year limit.

OXFORD HYBRID VARNISH
ASTM TEST RESULTS

.s 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

TARGET COATINGS™
WATERBASED FINISHES AND SPECIALTY CHEMICALS
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

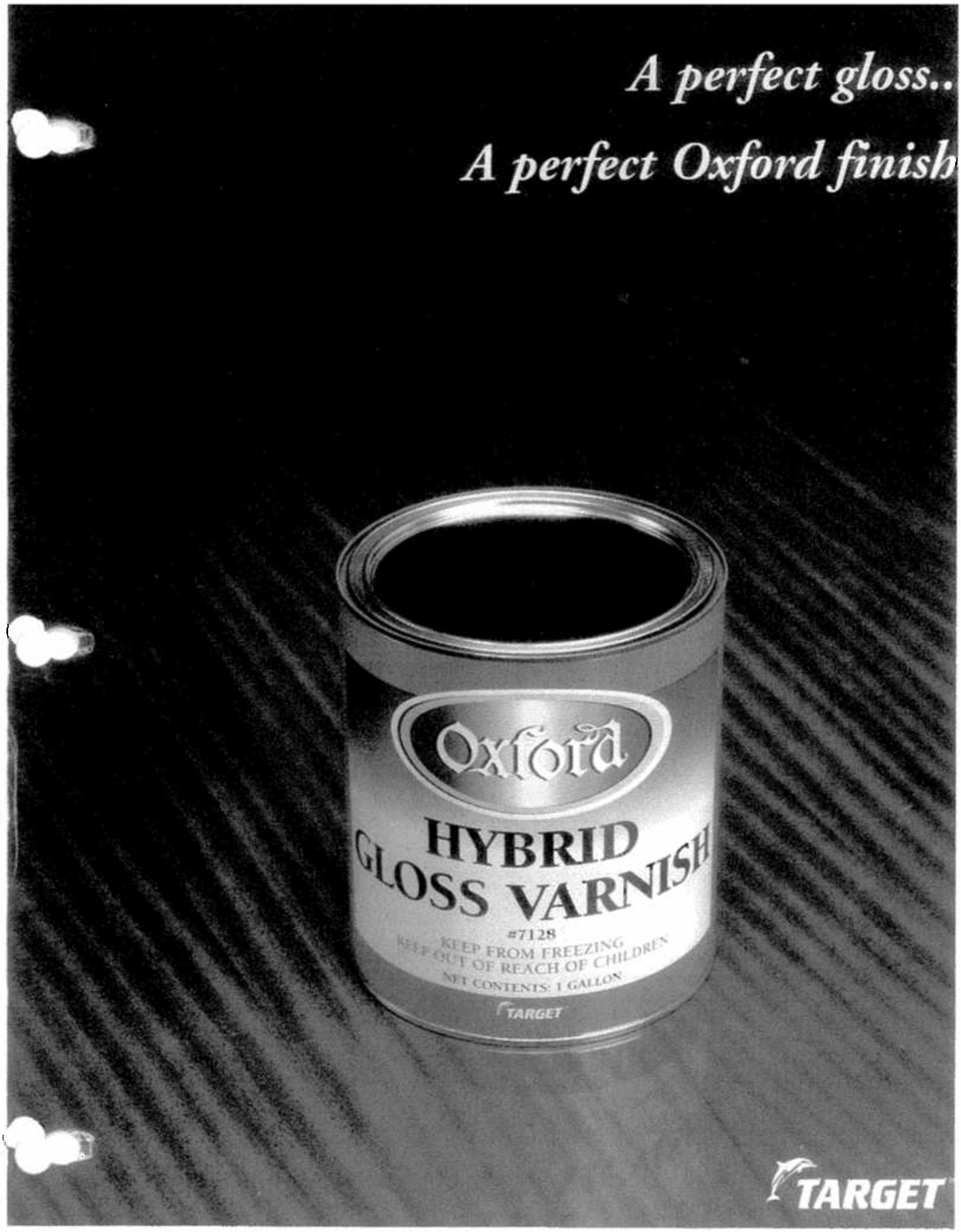
Fast Recoat Time

Exotic Color Tones

Spray or Brush Friendly

UV Stable

Unit # 19 and later


A perfect gloss..
A perfect Oxford finish
Oxford
HYBRID
GLOSS VARNISH
#7128
KEEP FROM FREEZING
KEEP OUT OF REACH OF CHILDREN
NET CONTENTS: 1 GALLON
TARGET
TARGET

Oxford

Oxford 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 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!

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 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.

3.9 INTERIOR CUSHIONS, ULTRALEATHER COVER:

CLEANING:

1. Spot clean with mild soap and water.
2. Air dry or dry quickly with warm setting of a hair dryer.
3. For stubborn stains, use mild solvent.

Type of stain	Mild Detergent	Mild Cleaning Fluid
Coffee, Tea	X	
Red Wine, Liquor	X	
Coke, Soft Drink	X	
Milk	X	
Ketchup	X	
Steak Sauce, Soy Sauce	X	
Mayonnaise, Butter	X	X
Salad Oil	X	X
Chocolate	X	X
Cosmetic Foundation	X	X
Lipstick	X	X
Face Cream	X	X
Suntan Oil/ Lotion	X	X
Shoe Polish	X	X
Machine Oil	X	X
Urine	X	X

LEWMAR

User Notes

Small "vent" hatches are restricted to 90 degree opening and should not be forced beyond their "stop" position, as damage to the lever mechanism may occur. Larger hatches are not self supporting beyond the vertical position and will fall fully open if unrestrained.

The locking ventilation position is used by closing the handles into the catch block center slot. Care should be taken not to stand on or load the hatch lid in this position, as damage could occur to the handle or catch block.

Always wash the hatch with soap, water and a soft cloth.

Never use abrasive or solvent cleaners on the acrylic lid, as this may at a later date damage the acrylic.

To avoid risk of injury care should be taken to keep hands and limbs clear of lever and lid pinch zones while operating and adjusting the hatch.

Always wash the Portlight or Fixedlight with soap, water and a soft cloth.
Never use abrasive or solvent cleaners on the window, as this may damage the acrylic.

Friction lever adjustment

The friction lever units installed on Ocean hatches are pre-set when manufactured to give e correct positioning with a minimum opening load. It may be necessary occasionally to adjust the lever setting to correct the operation of the hatch.

Adjustment is made by means of the socket head screws on either side of the lever assembly

Using a 4mm (5/32") hexagon key, turn the adjusting screw approximately 1/8th of a turn in a clockwise direction to increase the positioning force. This is most easilty carried out in the fully open or closed positions.

Do not over tighten the adjusting screws.
On* hatches *with multiple lever units, care must be taken to adjust all levers to a similar loading.

Open the hatch and check for correct operation.

Re-adjust if necessary until desired operation is achieved.

Lubricants should not be used on the friction lever assemblies as this will adversely affect the function of the units.

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

To optimize performance and minimize the chance of mast failure, your mast should be tuned properly. The aims of rig tuning are as follow:

A. Ensure a straight mast athwartship.
B. Control sail shape.
C. Achieve proper helm balance in a variety of conditions.
D. Spread loads appropriately on spars, rigging, and boat.

1. First, set mast rake at 0 degree rake to ensure proper performance of the spreaders in conjunction with the shrouds. Increasing the rake of the mast allows the spreaders to fall aft of the chainplates, which neutralizes their proper function. To determine the rake of the mast, hang a weight from the main halyard and adjust the headstay turnbuckle so that the weight falls just to the aft edge of the mast. Make sure that the boat is level and that there is no bend in the mast.

2. Since the boat is deck stepped, you need to induce prebend to achieve the greatest performance for your rig and sails. Inducing prebend in the mast will increase performance of your mainsail and stabilize the middle part of the mast and thus minimize rig pump in a seaway. Before tightening your lowers, induce prebend by putting a good amount of backstay, which should pull the mast forward. To also aid in this process you can attach your main halyard to the end of your boom and cleat off the halyard so that the boom is resting parallel to the water. You can then put tension onto your boom vang to help push the mast forward in its mid section. With the

(Continue Page 17)

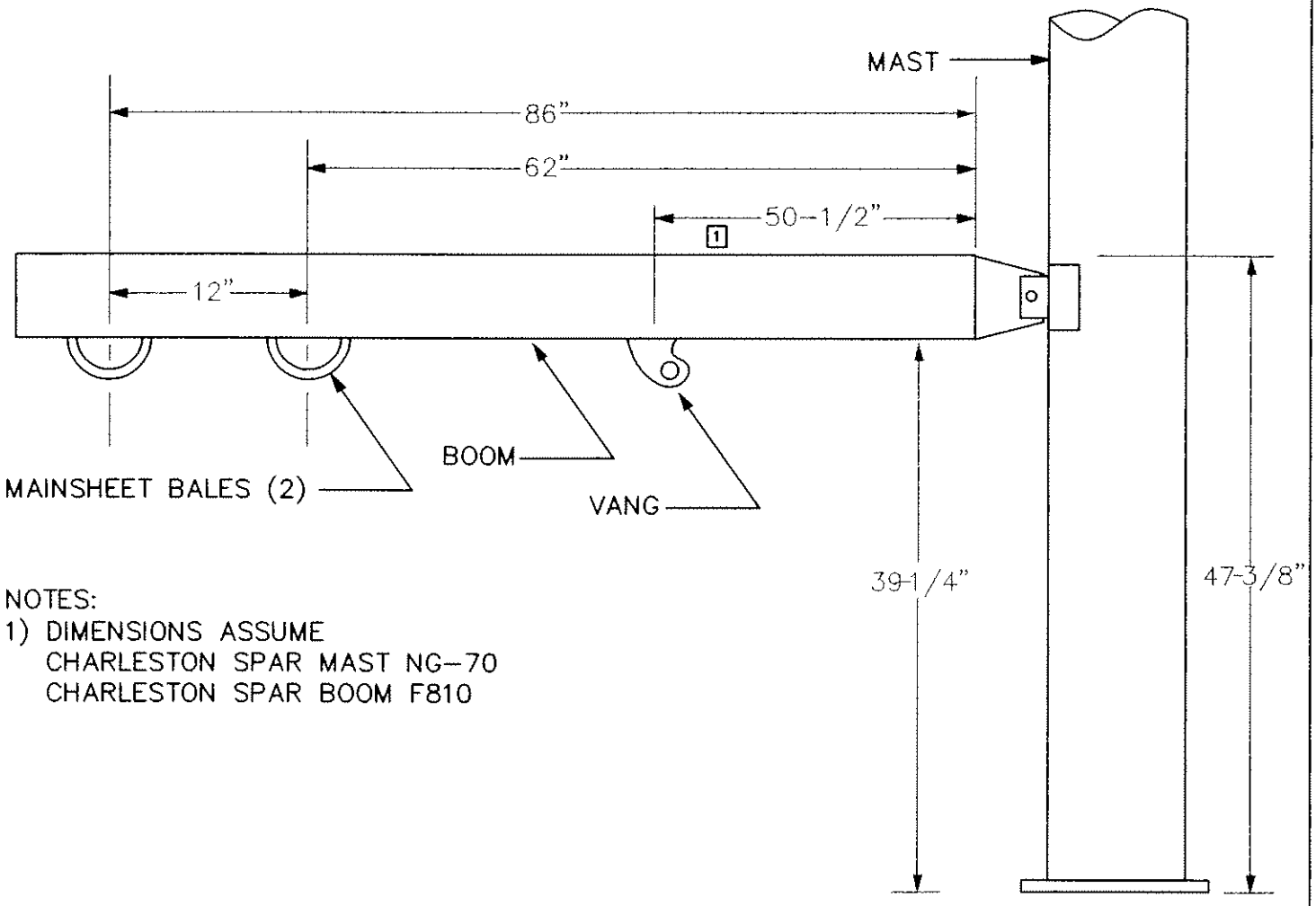
combination of both backstay and vang tension you should be able to achieve the proper amount of pre bend in your mast. As you tighten the babystay and aft lower shrouds the degree of prebend can be taken out accordingly.

3. For shroud adjustments, make sure that there is enough backstay to give a slight aft bend in the mast. Next the shrouds should be adjusted. First tighten your cap shrouds and ensure that the mast is in the column by taking your main halyard and checking that the distance from the masthead to each chainplate is equidistant. Once this is achieved and the cap shrouds are tensioned, you can now adjust the lower shrouds. Follow the same procedure as you did with the cap shrouds and as you tighten the lower shrouds a slight amount of prebend will be taken out. At this stage the cap shrouds should be tighter than the lowers. The intermediate shrouds should be the last shrouds adjusted. The intermediates should be the least tensioned shroud on the rig. As a gauge, they should be slightly less tensioned than the lowers. Check for mast straightness by sighting up the sail track and adjust the shroud turnbuckles accordingly. Slightly ease the tension in the backstay to double check that you are happy with the fore, aft, and sideways bend of the mast, (there should be of course none of the latter).

4. The shrouds should be fine tuned while sailing to weather in a moderate breeze. Always adjust the shrouds starting from the lowers and progressing up and be sure to check for mast straightness on both tracks. Check the leeward rigging tensions as follows:

   A. Cap shrouds and lowers fairly tight with a slight decrease in tension.
   B. Intermediates just about to go slack.
   C. Continue tacking to ensure equal tension on all leeward shrouds on both tracks.
   D. Back at the dock; check that the mast is still straight athwart ship.

REV	DESCRIPTION	APPROVAL	DATE
1	REVISED LOCATION OF VANG BRACKET. WAS 47"		04/19/04



NOTES:
1) DIMENSIONS ASSUME
CHARLESTON SPAR MAST NG-70
CHARLESTON SPAR BOOM F810

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

GENERAL TOLERANCES
ANGLES : ±0.5°
X.X : ±0.1
X.XX : ±0.01
X.XXX : ±0.005
SURFACE FINISH:

DO NOT SCALE DRAWING

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

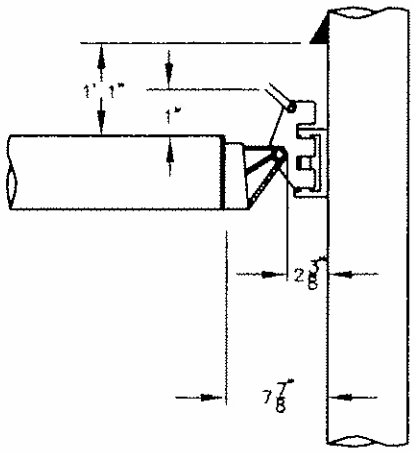
SCALE: N.T.S.
APPROVED BY:
DRAWN BY: GUY BAKER
DATE: 02/03/03
FILE:

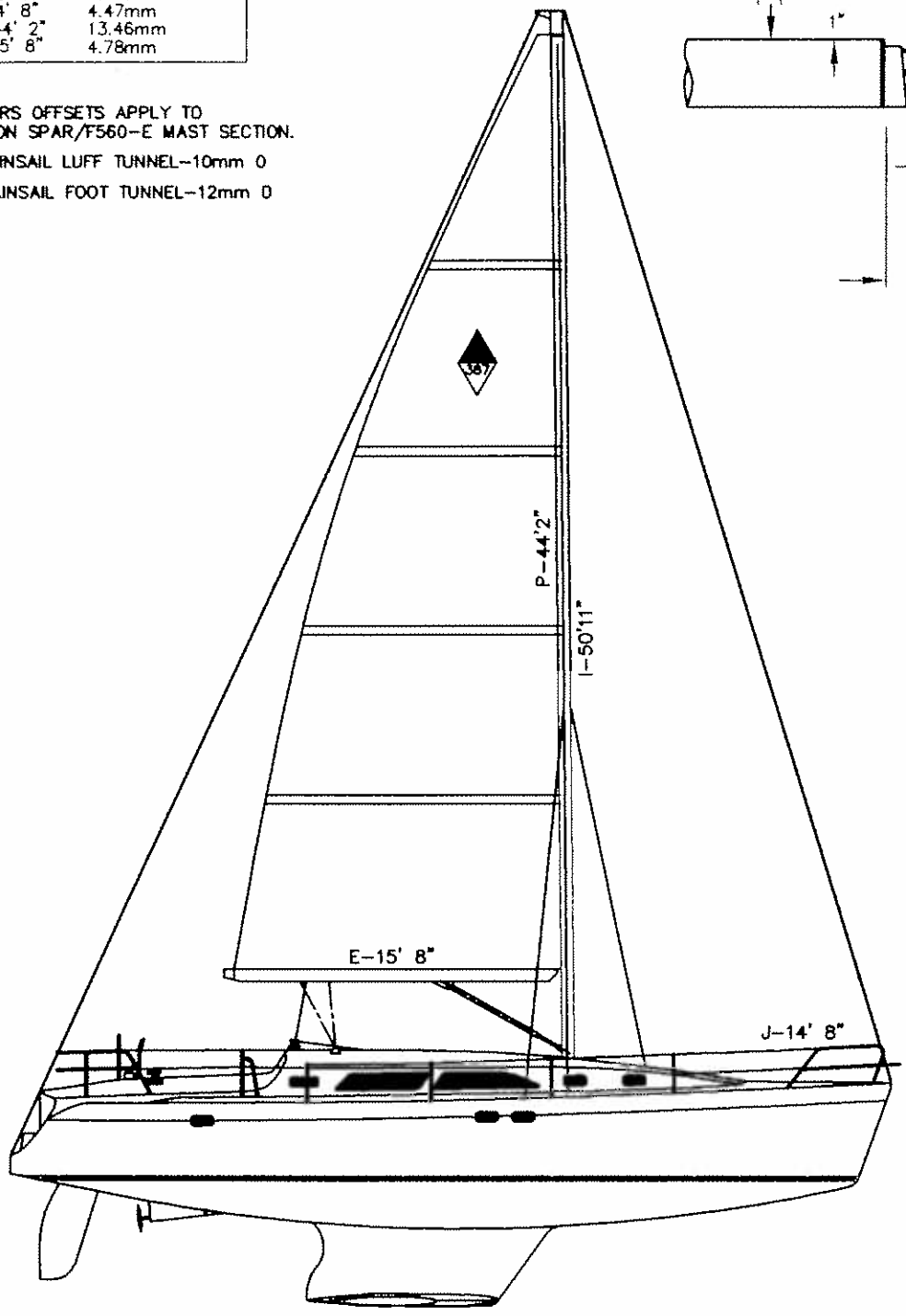
TITLE: BOOM & MAST

BOAT: 387
DRAWING NUMBER: 387-34054-1

SAIL PLAN DIMENSIONS		
MAIN SAIL	346' 2"	32.14mm
100% FORED	373' 2"	34.65mm
TOTAL SAIL AREA	346' 2"	32.14mm
I–50' 11"		15.52mm
J–14' 8"		4.47mm
P–44' 2"		13.46mm
E–15' 8"		4.78mm

NOTE:
1. SAILMAKERS OFFSETS APPLY TO CHARESTON SPAR/F560–E MAST SECTION.
2. MAST MAINSAIL LUFF TUNNEL–10mm 0
3. BOOM MAINSAIL FOOT TUNNEL–12mm 0





UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

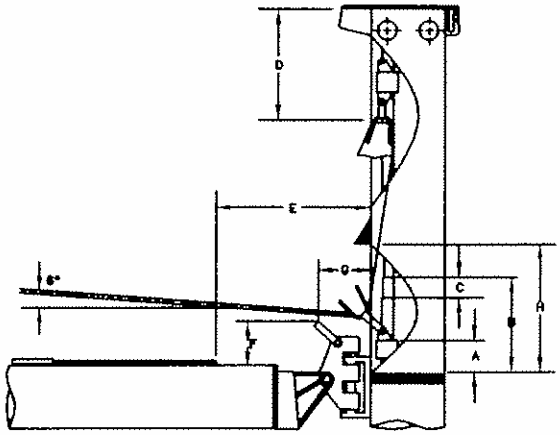
GENERAL TOLERANCES
ANGLES : ±0.5'
X.X : ±0.1
X.XX : ±0.01
X.XXX : ±0.005
SURFACE FINISH: 63

DO NOT SCALE DRAWING

Catalina Yachts
7200 BRYAN DIARY RD.
LARGO, FL. 33777
(727) 544–6681

TITLE: SAIL PLAN					
MODEL: 387			DRAWING NO: 37001–0		
DESIGNED BY:	CHECKED BY:	SCALE: N.T.S.	SIZE: D	SHEET: 1/1	
DRAWN BY: GTB	APPROVED BY:	DATE: 1/16/03			

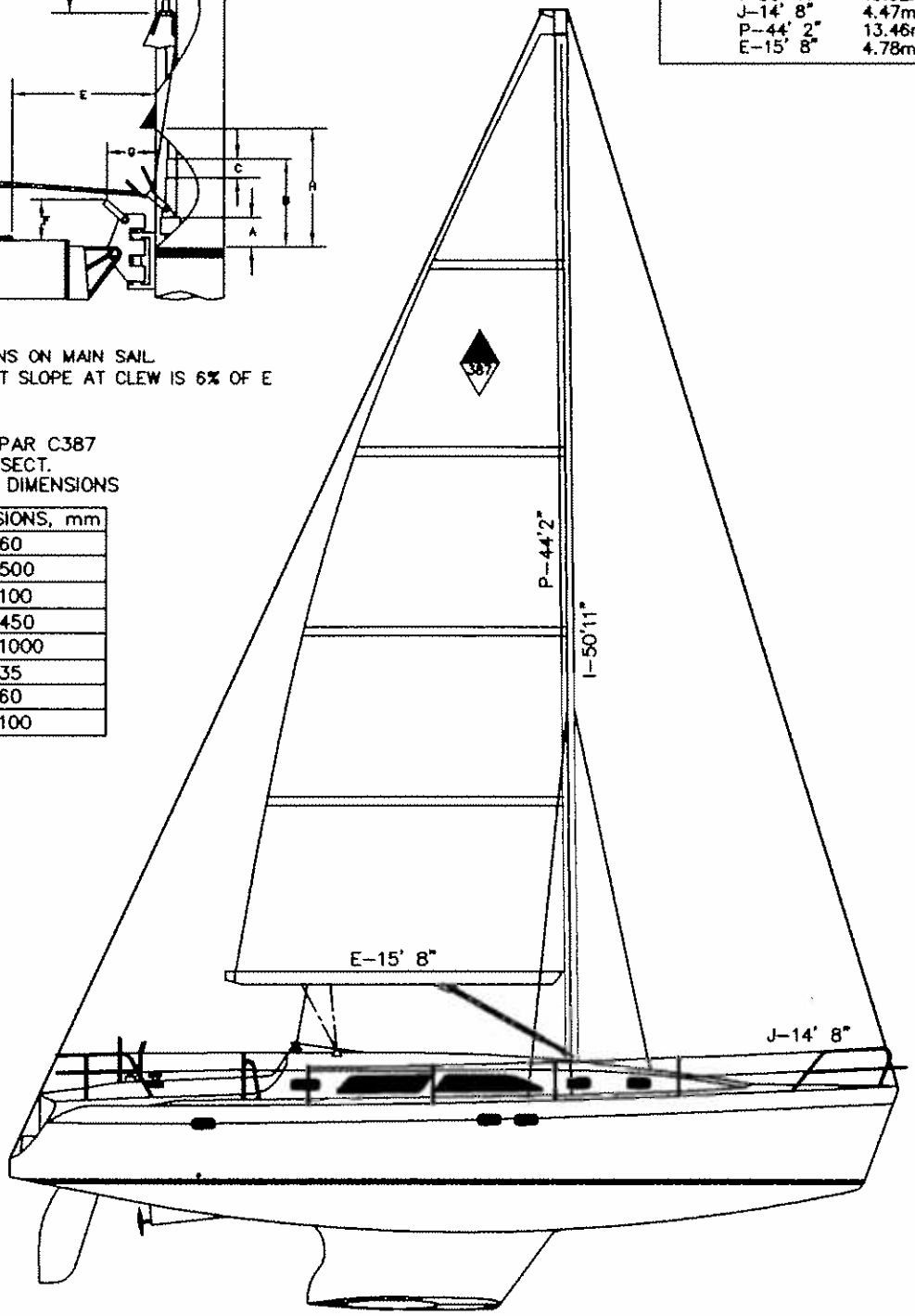
SAIL PLAN DIMENSIONS		
MAIN SAIL	346' 2"	32.14mm
100% FORED	373' 2"	34.65mm
TOTAL SAIL AREA	719' 2"	66.79mm
I	50' 11"	15.52mm
J	14' 8"	4.47mm
P	44' 2"	13.46mm
E	15' 8"	4.78mm



NOTE:
1. USE NO BATTENS ON MAIN SAIL
2. MAIN SAIL FOOT SLOPE AT CLEW IS 6% OF E

CHARESTON SPAR C387
F560-E SECT.
FURLING MAST DIMENSIONS

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



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

GENERAL TOLERANCES
ANGLES : ±0.5°
X.X : ±0.1
X.XX : ±0.01
X.XXX : ±0.005
SURFACE FINISH: 63

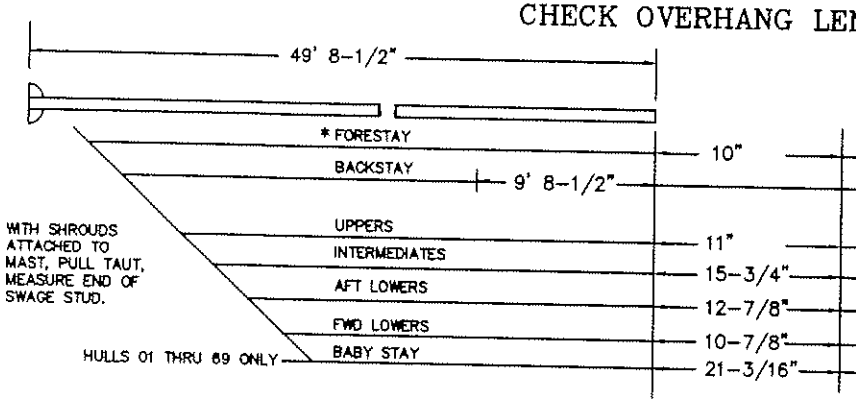
DO NOT SCALE DRAWING

Catalina Yachts
7200 BRYAN DIARY RD.
LARGO, FL. 33777
(727) 544-6681

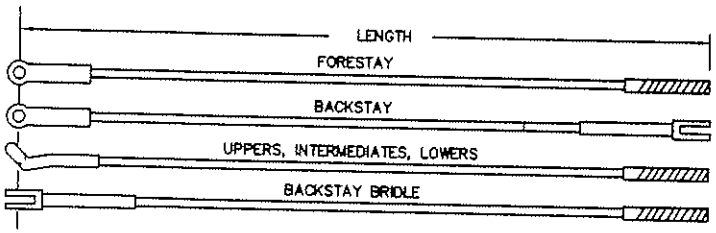
TITLE: SAIL PLAN-FURLING MAST

BOAT: 387		DRAWING NO: 37002-0		
DESIGNED BY:	CHECKED BY:	SCALE: N.T.S.	SIZE: D	SHEET: 1/1
DRAWN BY: GTB	APPROVED BY:	DATE: 1/16/03		

CHECK OVERHANG LENGTHS BEFORE STEPPING MAST



– STANDING RIGGING –					
ITEM	QTY.	LENGTH*	MATERIAL	TOP FITTING	BOTTOM FITTING
FORESTAY *	1	50' 2-3/4"	5/16" DIA 1x19 S.S.	MARINE EYE 5/8" PIN (ME10S)	5/8" TURNBUCKLE
BACKSTAY	1	39' 3"	5/16" DIA 1x19 S.S.	MARINE EYE 5/8" PIN (ME10S)	FORK, 7/16" PIN
BACKSTAY BRIDLE	2	14' 4"	1/4" DIA 1x19 S.S.	FORK 3/8" PIN	1/2" TURNBUCKLE
UPPERS	2	49' 4-1/2"	5/16" DIA 1x19 S.S.	GIBB (N841-08)	5/8" TURNBUCKLE
INTERMED.	2	34' 11-1/2"	1/4" DIA 1x19 S.S.	GIBB (N841-10)	1/2" TURNBUCKLE
AFT LOWERS	2	18' 4-1/4"	5/16" DIA 1x19 S.S.	GIBB (N841-10)	5/8" TURNBUCKLE
FORWARD LOWERS	2	17' 6-1/4"	5/16" DIA 1x19 S.S.	GIBB (N841-10)	5/8" TURNBUCKLE
BABY STAY	1	20' 7-1/2"	1/4" DIA 1x19 S.S.	T-BALL (N741-08)	1/2" TURNBUCKLE



– RUNNING RIGGING –				
ITEM	QTY.	LENGTH	MATERIAL	NOTES
SPINNAKER SHEETS	2	80'	1/2" D Y.B.	(OPTIONAL) LGE. SNAP SCHACKLES
BOOM VANG	NA			SUPPLIED WITH GARHAUER VANG (STANDARD MAST ONLY)
MAINSHEET	1	100'	1/2" Ø Y.B.	
GENOA SHEETS	2	50'	1/2" Ø Y.B.	
TRAVELER	2	35'	3/8" Ø Y.B.	
BOOM TOP. LIFT	1	115'	3/8" Ø Y.B.	
1ST REEF LINE	1	60'	3/8" Ø Y.B.	W/ STANDARD MAST ONLY
2ND REEF LINE	1	90'	3/8" Ø Y.B.	OPTIONAL W/ STANDARD MAST ONLY

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

– HALYARDS –				
ITEM	QTY.	LENGTH	MATERIAL	NOTES
MAIN HALYARD	1	120'	1/2" Ø ULS	BLUE, HEAD BOARD SCHACKLE
GENOA HALYARD	2	120'	1/2" D ULS	1 W/GREEN, 1 W/RED, LGE. SNAP SCHAC.
SPINNAKER HALYARD	1	130'	1/2" D ULS	(OPTIONAL) LGE, SNAP SCHACKLE, BLUE

NOTES:
1) ALL WIRE TO BE STAINLESS STEEL 1X19
2) USE WITH CHARLESTON SPARCRAFT SECTIONS
*3) FORESTAY INCLUDES 3100 SCHAEFER FURLING SYSTEM KIT (SK-7181-387) WITH 15" INCH LINK PLATE PIN TO PIN.

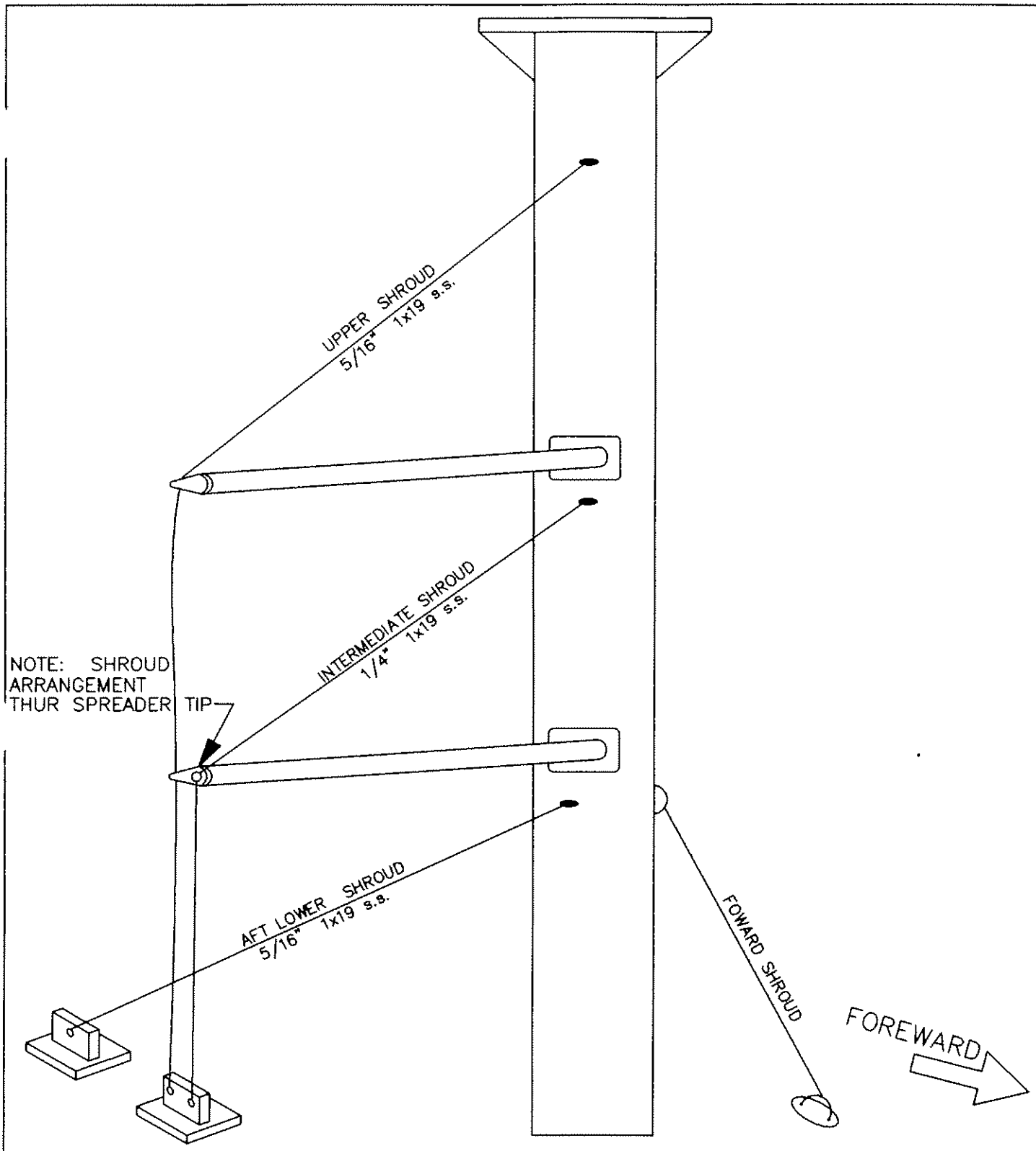
Catalina Yachts
MORGAN DIVISION
7200 BRYAN DAIRY RD.
LARGO, FLORIDA
33777-(813)544-6681

SCALE:	APPROVED BY:	DRAWN BY
DATE: 5/9/05	FILE:	DCJ

TITLE: RIGGING LENGTH SCHEDULE. STANDARD AND FURLER

BOAT: CATALINA 387

DRAWING NUMBER: 34052-6



NOTE:
1. DRAWING FOR CHARLESTON SPAR MAST SECTION.

Catalina Yachts
7200 BRYAN DAIRY RD.
LARGO, FL. 33777
(727)544-6551

SCALE	APPROVED BY:	DRAWN BY
NONE		GTB
DATE	FILE	
1/13/03	387-34001-0	

TITLE	SIZE	SHEET
SHROUD ARRANDEMENT		1/1
BOAT		DRAWING NUMBER
CATALINA 387		387-34001-0

4.0 YACHT SYSTEMS - (Continued)

4.1.7 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 starboard side of the cabin top.

2. Ease the mainsheet.

3. Release the main halyard on the port side of the cabin top, to a predetermined point. (Marking the halyard with ink or a colored thread into the line is helpful.) Recleat the halyard after lowering.

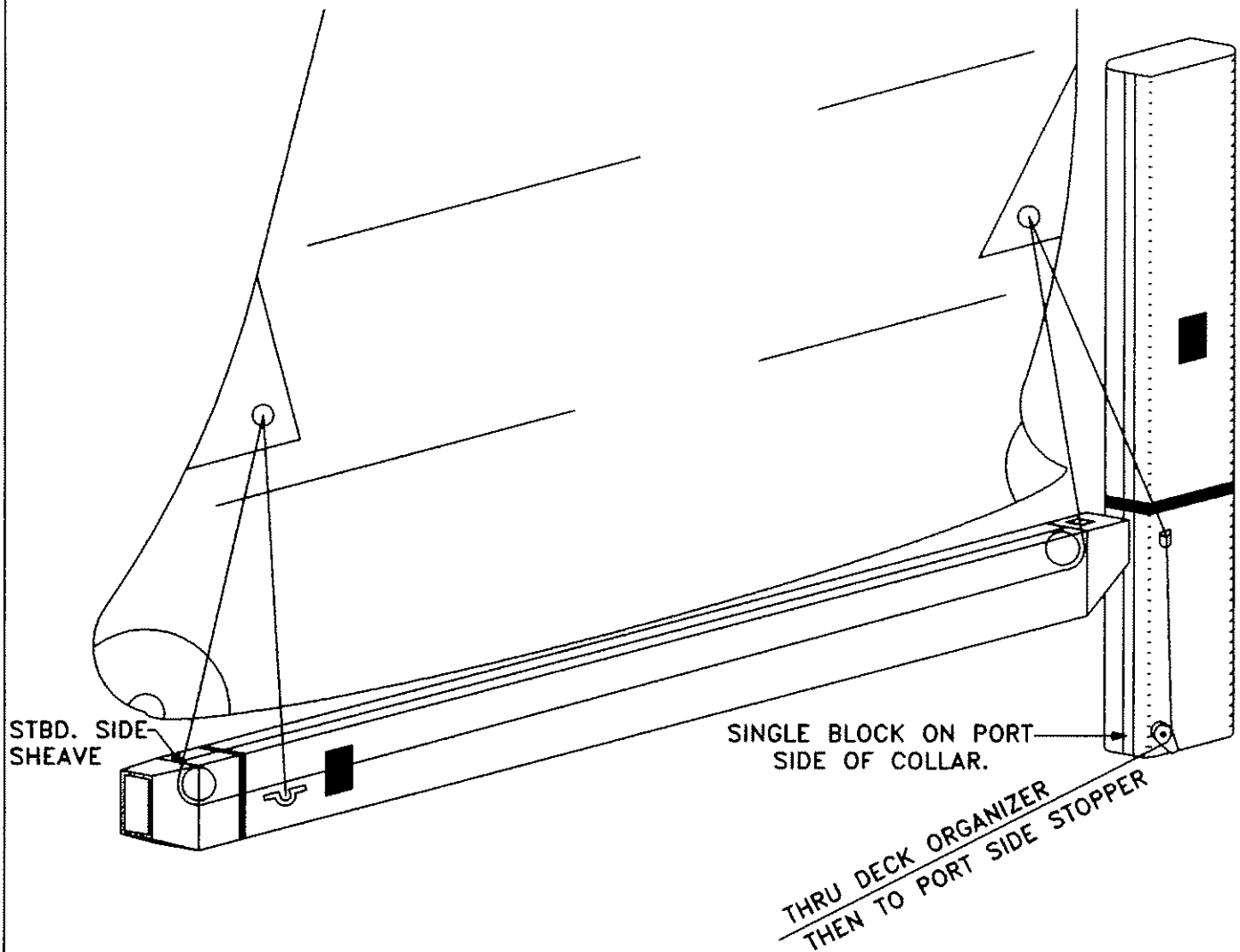
4. Pull the luff and leech cringles down to the boom by pulling the reefing line through the blocks with the port cabin top winch and cleat off.

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.



NOTE:

1. USE WITH CHARESTON SPAR C387 F560-E SECT
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.

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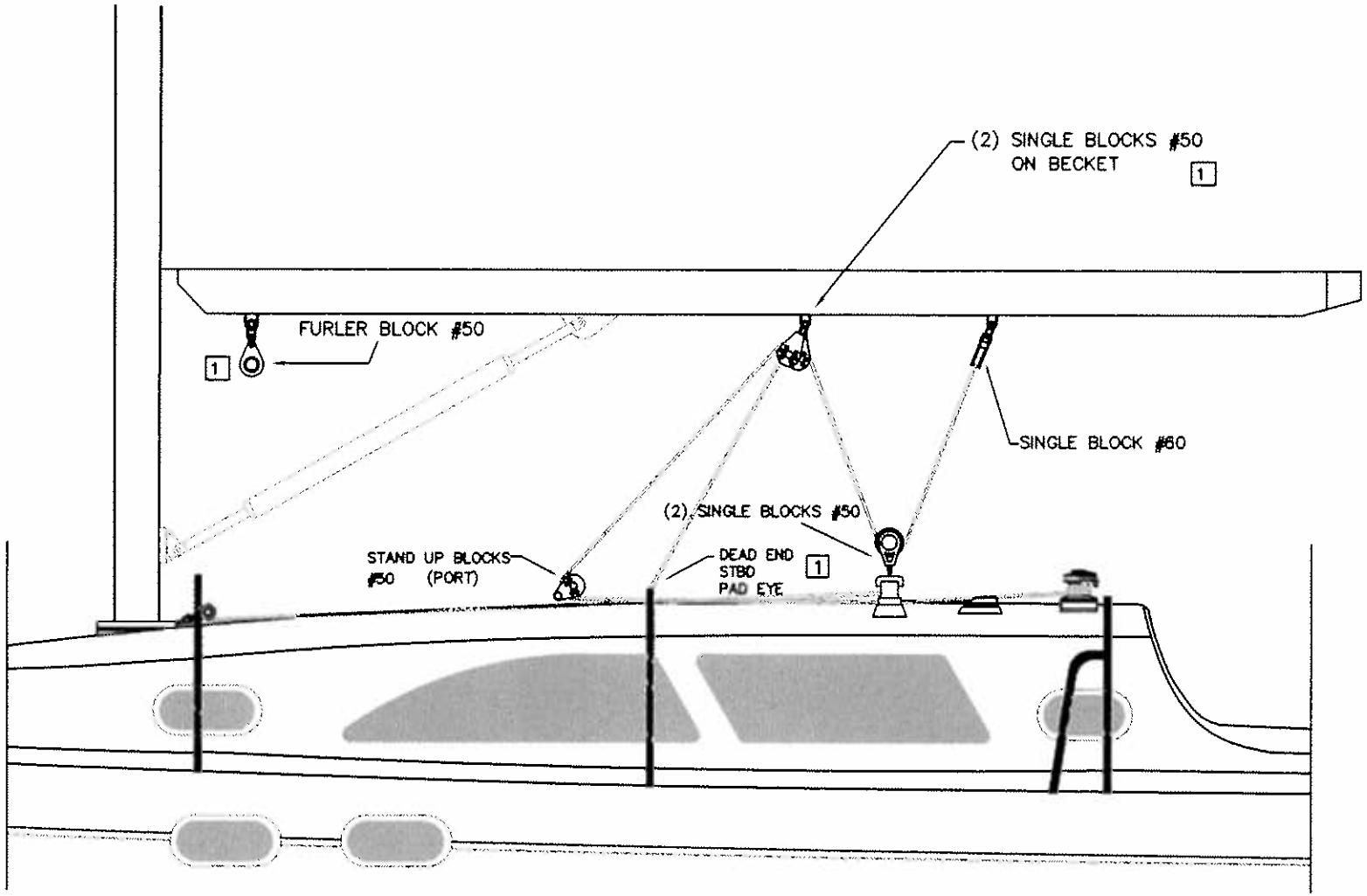
SCALE	APPROVED BY:	DRAWN BY
NONE		GTB
DATE	P.O.	
1/13/03	387-35001-0	

TITLE: SINGLE LINE REEFING — SIZE — SHEET 1/1

BOAT: CATALINA 387 — DRAWING NUMBER 35001-0



Catalina Yachts

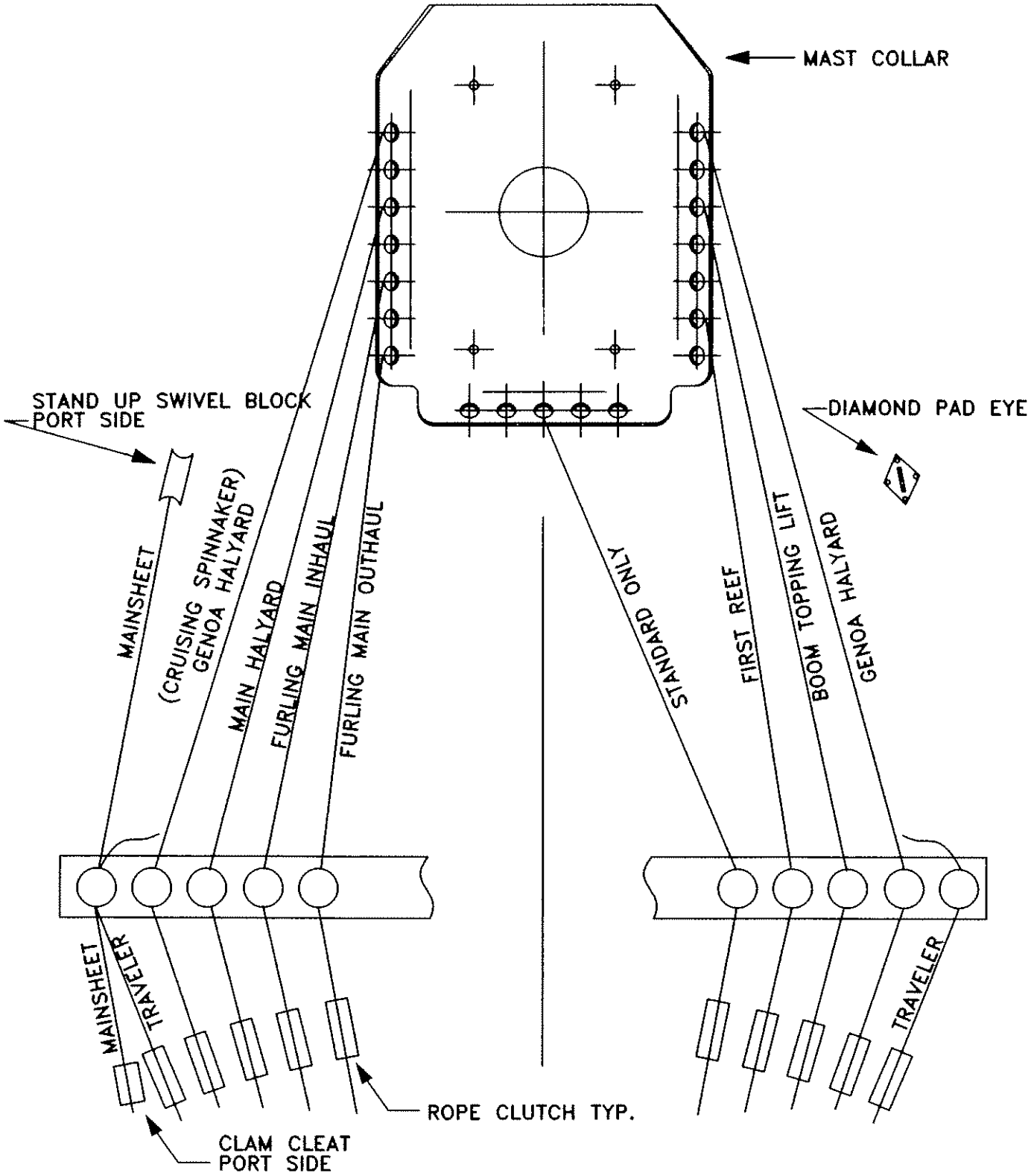
7200 BRYAN DAIRY RD.
LARGO, FL. 33777
(727)544-6681

TITLE:

MAINSHEET / TRAVELER ASSEMBLY

BOAT: CATALINA 387		DRAWING NO: 387-35000-1		
DESIGNED BY: GTB	CHECKED BY:	SCALE: NONE	SIZE	SHEET
DRAWN BY: GTB	APPROVED BY:	DATE: 1/13/03	A	1/1

NO.	REVISION	DATE
1	TO CLARIFY BLOCK SIZE.	11/06/03

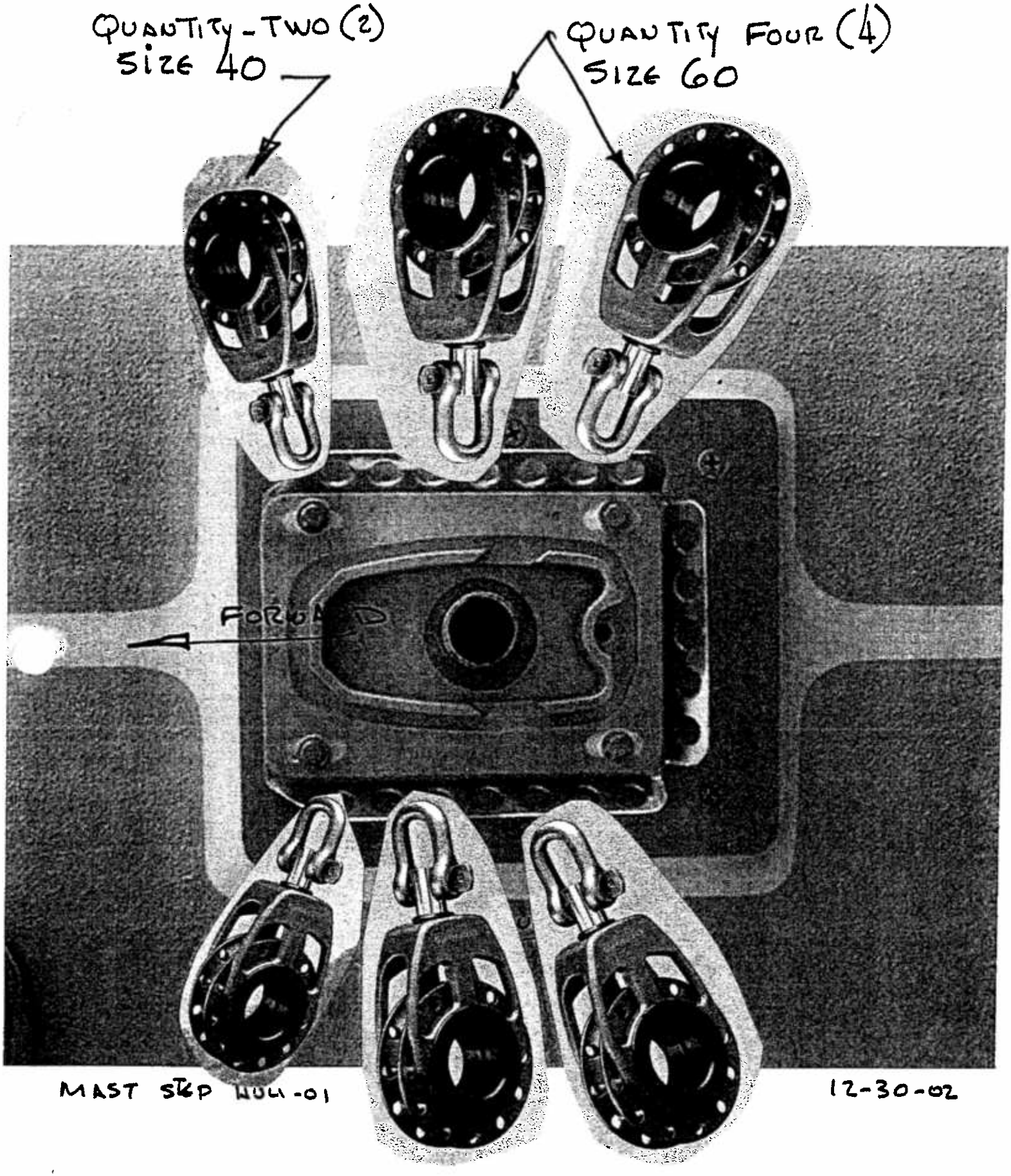


NOTES

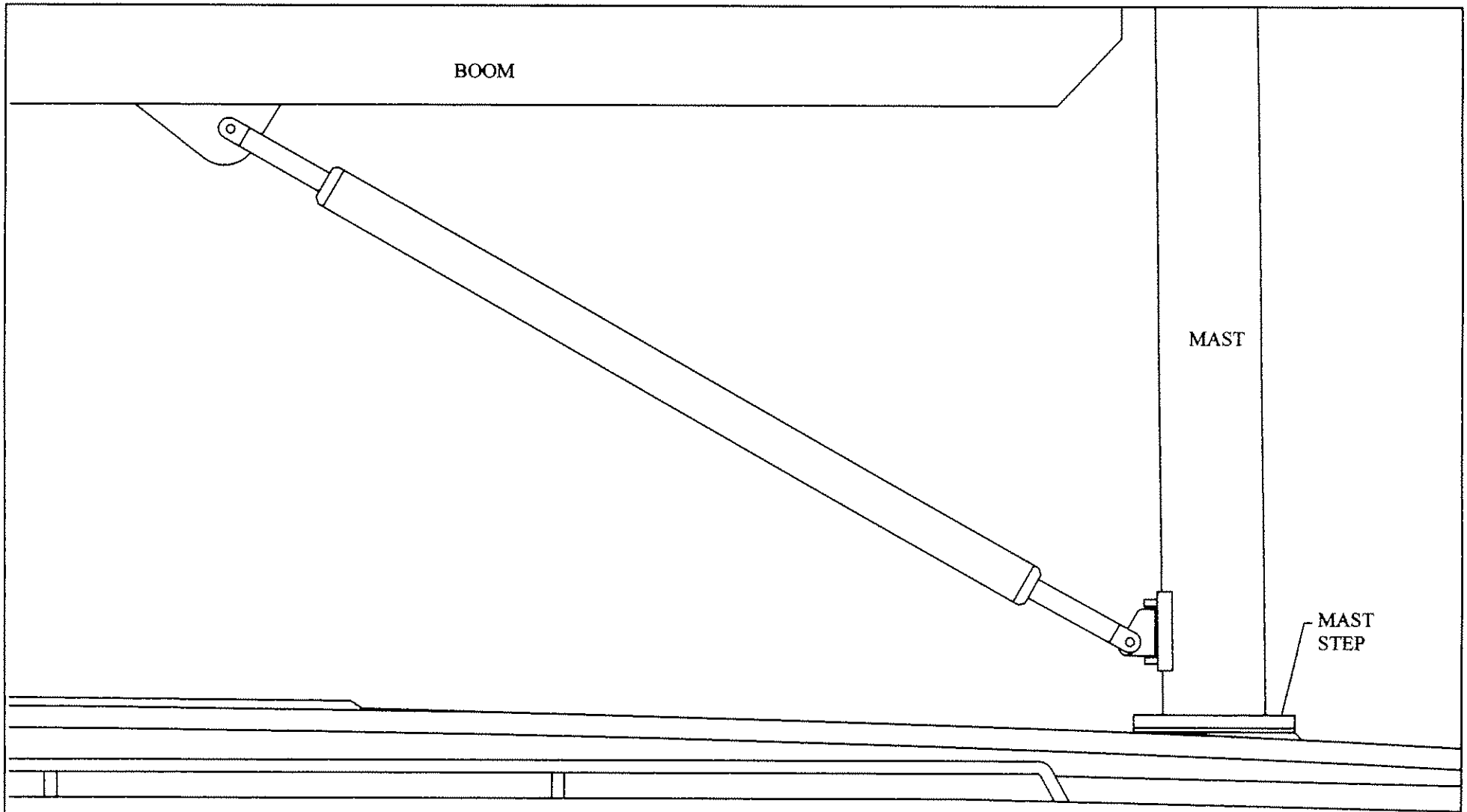
USE WITH CHARESTON SPAR
F560-E SECT.

Catalina Yachts
7200 BRYAN DAIRY RD.
LARGO, FL. 33777
(727)544-6581

SCALE: NONE	APPROVED BY:	DRAWN BY: GTB
DATE: 12/28/95	FILE: 387-35003-0	
TITLE: CABIN TOP HALYARD ARRANGEMENT	SIZE	SHEET: 1/1
BOAT: CATALINA 387		DRAWING NUMBER: 387-35003-2



387 FURLER AND STANDARD



PROPRIETARY INFORMATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

GENERAL TOLERANCES
ANGLES : ±0.5°
X.X : ±0.1
X.XX : ±0.01
X.XXX : ±0.005
SURFACE FINISH: 63

DO NOT SCALE DRAWING

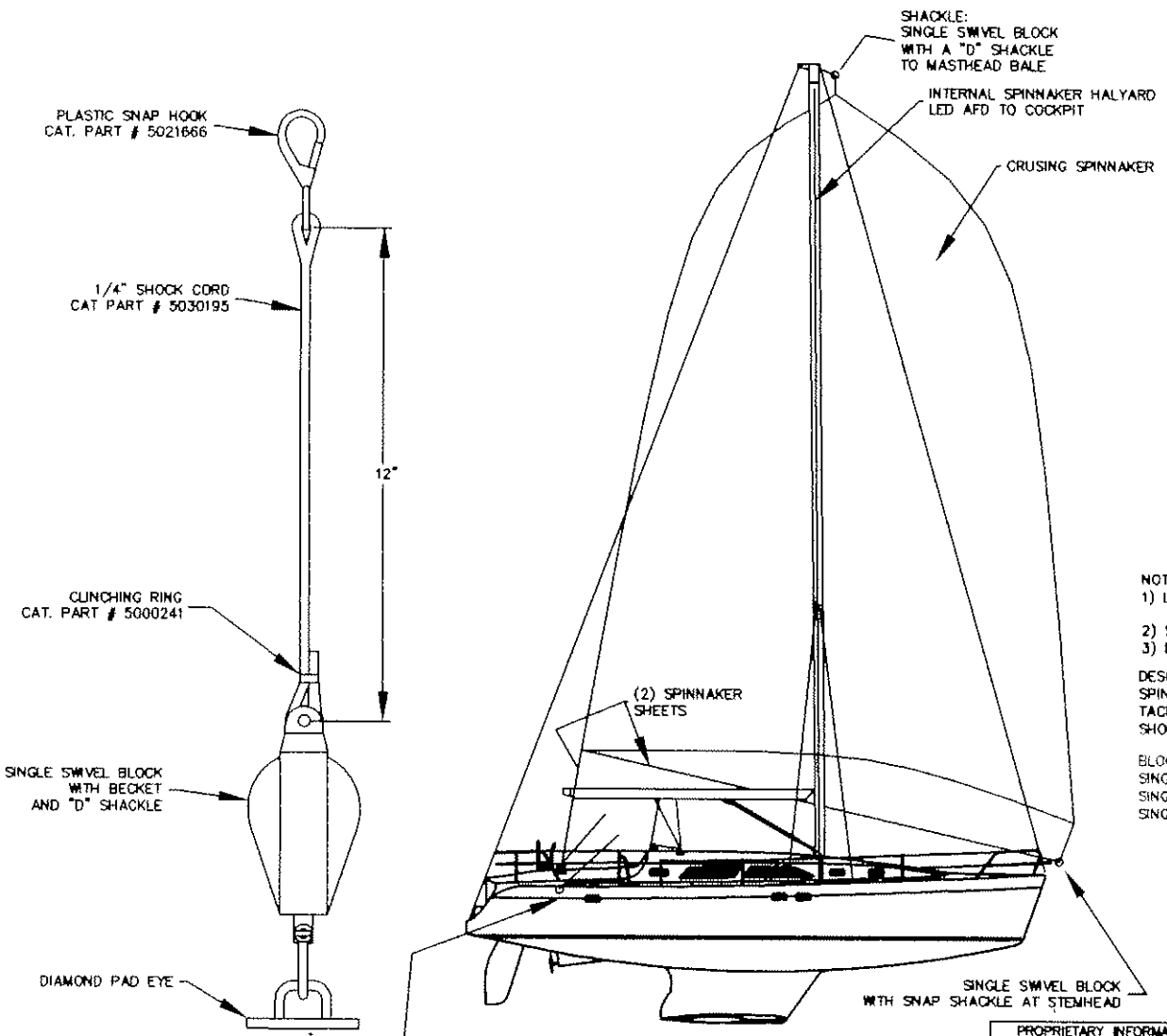
Catalina Yachts
7200 BRYAN DAIRY RD.
LARGO, FL. 33777
(727) 544-6881

SCALE: N.T.S.	APPROVED BY:	DRAWN BY G.T.B.
DATE: 12/31/03		REVISED

STRAIGHT FURLING

BOAT: CATALINA 387

DRAWING NUMBER 38051-0



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 LIFE LINES
3) BLOCKS ARE GARHAUER SERIES 60

DESCRIPTION:
SPINN. HALYARD– 1/2" X 130' Y.B.
TACK PENNANT– 1/2" X 20" Y.B.
SHOCK CORD– (2) 1/4" X 12"

BLOCKS:
SINGLE SWIVEL W/ SNAP SHACKLE (1) 60-15SL
SINGLE SWIVEL W/ "D" SHACKLE (1) 60-13
SINGLE SWIVEL W/ BECKET AND
SWIVEL "D" SHACKLES (2) 60-14

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
GENERAL TOLERANCES
ANGLES : ±0.5°
X.X : ±0.1
X.XX : ±0.01
X.XXX : ±0.005
SURFACE FINISH: 63
DO NOT SCALE DRAWING

Catalina Yachts
7308 BRYAN DAIRY RD.
LARGO, FL. 33777
(727)544-6866

NONE		C.T.B.
1/13/03	387-35002-0	

SPINNAKER OPTION RIGGING | B | 1/1

CATALINA 387 | 387-35002-0

4.0 YACHT SYSTEMS - (Continued)

4.2 ELECTRICAL:

4.2.1 BATTERIES:

Your electrical system is powered by two (2) marine grade 12 volt,4-D 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 a tie down to prevent tipping over at extreme angles of heel. Be sure these tie downs are fastened securely.

With proper care, the batteries installed in your Catalina 387 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:

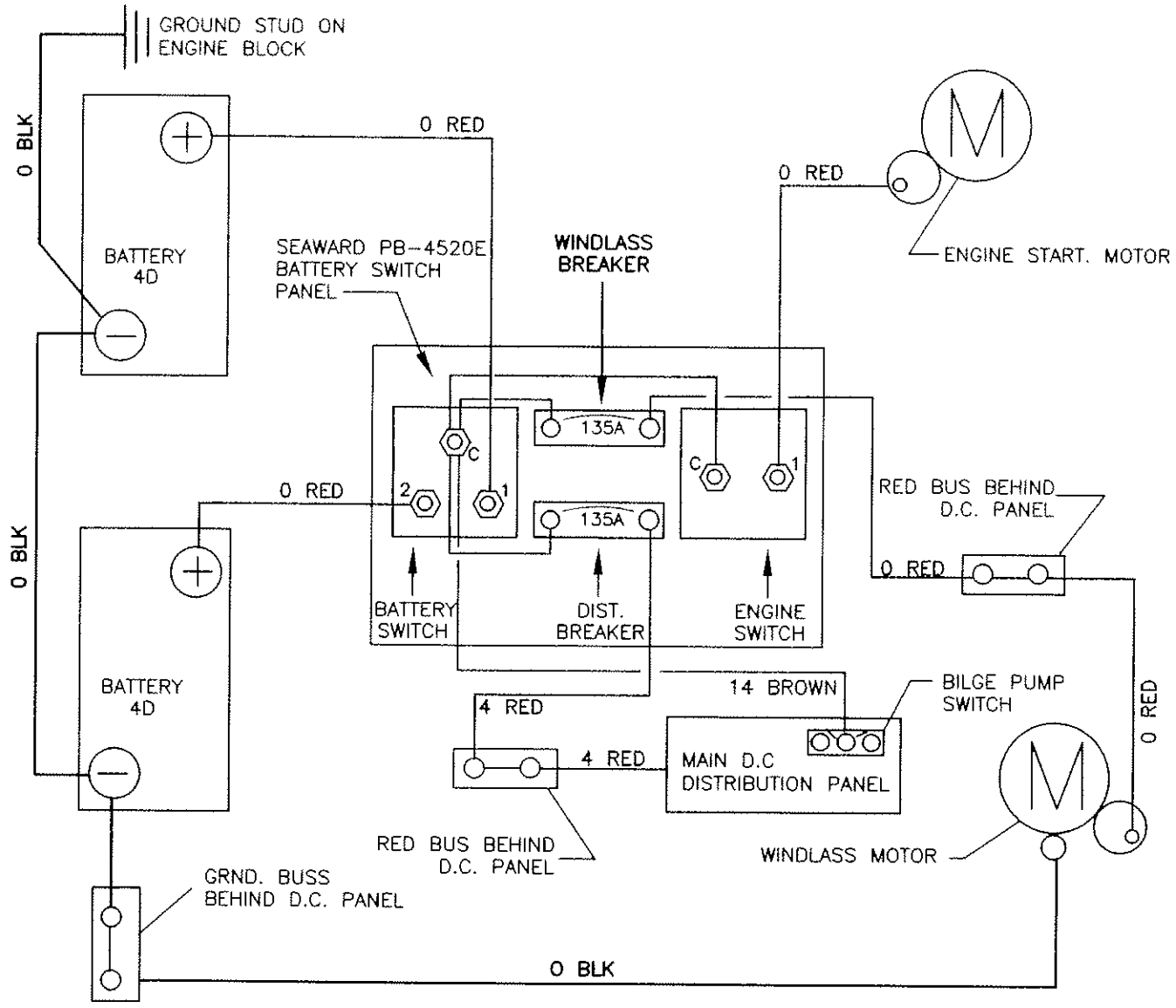
Keep battery connections clean and tight. A cupful of strong baking soda solution and a toothbrush will clean corrosion from the terminals and neutralize any spilled acid (do not allow any of the solution to enter the battery cells). A coating of petroleum jelly on the battery terminals will inhibit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



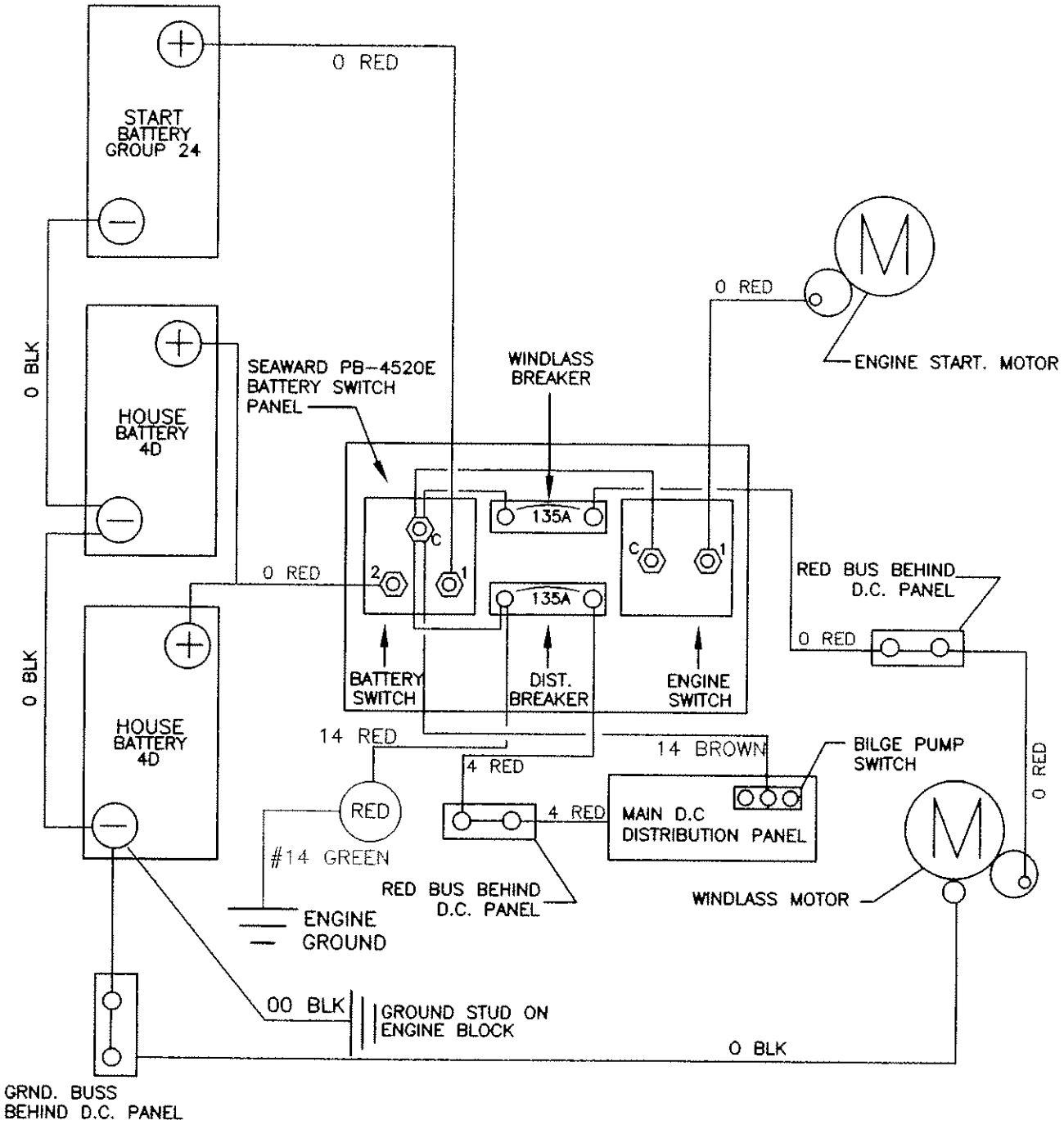
Catalina Yachts
7200 BRYAN DAIRY RD.
LARGO, FL. 33777
(727)544-6881

SCALE	APPROVED BY:	DRAWN BY
NONE		GTB
DATE: 10/31/03	PLN: 35072002-0	

TITLE: BATTERY SCHEMATIC

BOAT: CATALINA 387

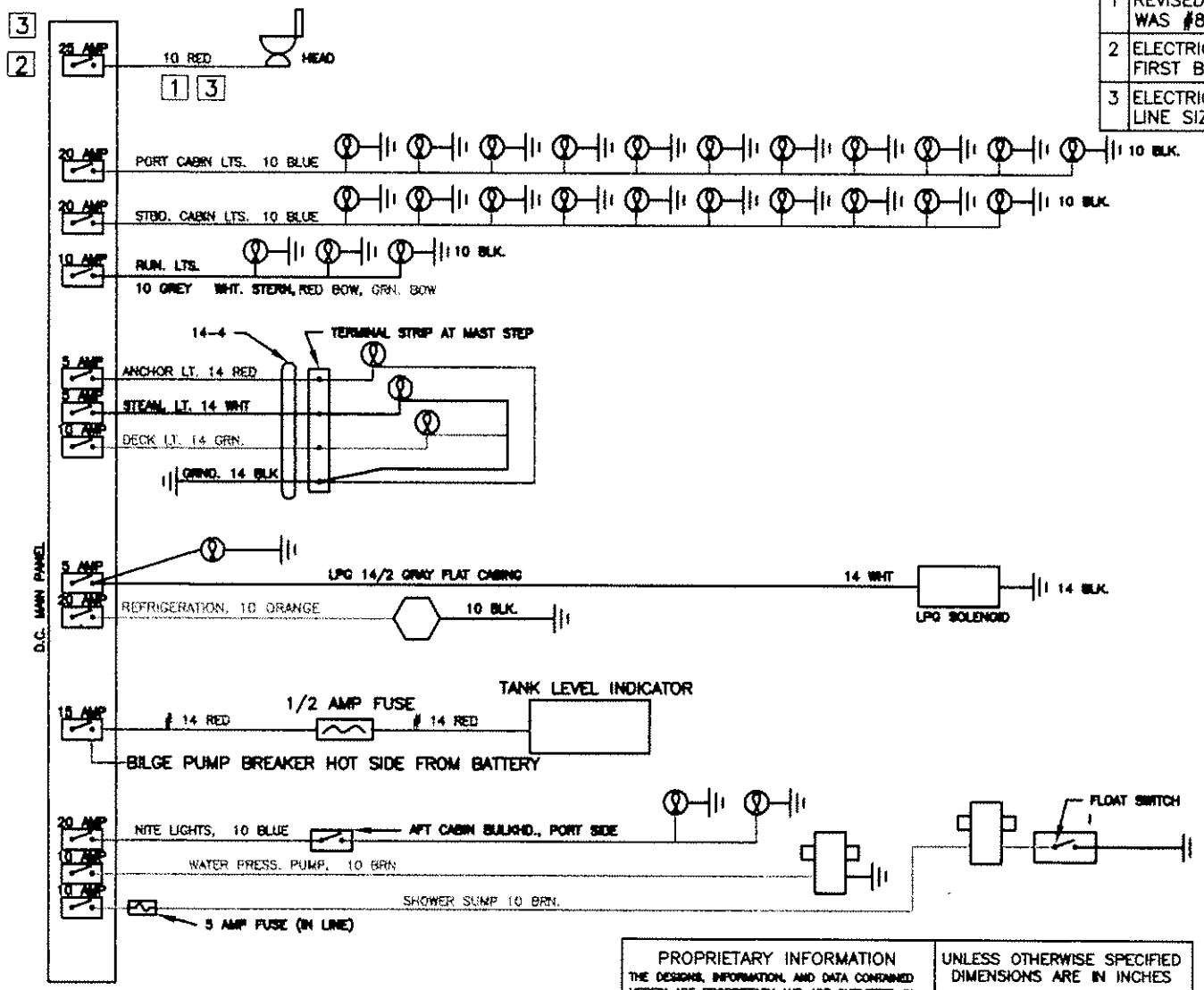
DRAWING NUMBER: 72002-0



Catalina Yachts
7200 BRYAN DAIRY RD.
LARGO, FL. 33777
(727)544-6881

SCALE: NONE	APPROVED BY:	DRAWN BY: GTB
DATE: 1/13/03	FILE: 387-72003-0	
TITLE: BATTERY SCHEMATIC/W OPTIONAL START BATTERY	SIZE	SHEET: 1/1
BOAT: CATALINA 387		DRAWING NUMBER: 387-72003-0

NO	REVISIONS	DATE	BY
1	REVISED ELECTRICAL HEAD WIRE SIZE WAS #8 IN ERROR	08/22/03	C.D.
2	ELECTRIC HEAD BREAKER WAS 25 AMP FIRST BOAT – 30	09/08/03	G.T.B.
3	ELECTRIC HEAD BREAKER WAS 30 AMP LINE SIZE WAS #6 GAGE.	10/28/03	G.T.B.



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

GENERAL TOLERANCES
ANGLES : ±0.5°
X.X : ±0.1
X.XX : ±0.01
X.XXX : ±0.005
SURFACE FINISH: 63

DO NOT SCALE DRAWING

Catalina Yachts
7200 BRYAN DAIRY RD.
LARGO, FL. 33777
(727) 544-6661

SCALE: N.T.S.	APPROVED BY:	DRAWN BY G.T.B.
DATE: 12/16/02		REVISED 08/22/03

12 VOLT D.C. WIRING SCHEMATIC

BOAT: CATALINA 387	DRAWING NUMBER 72001-3

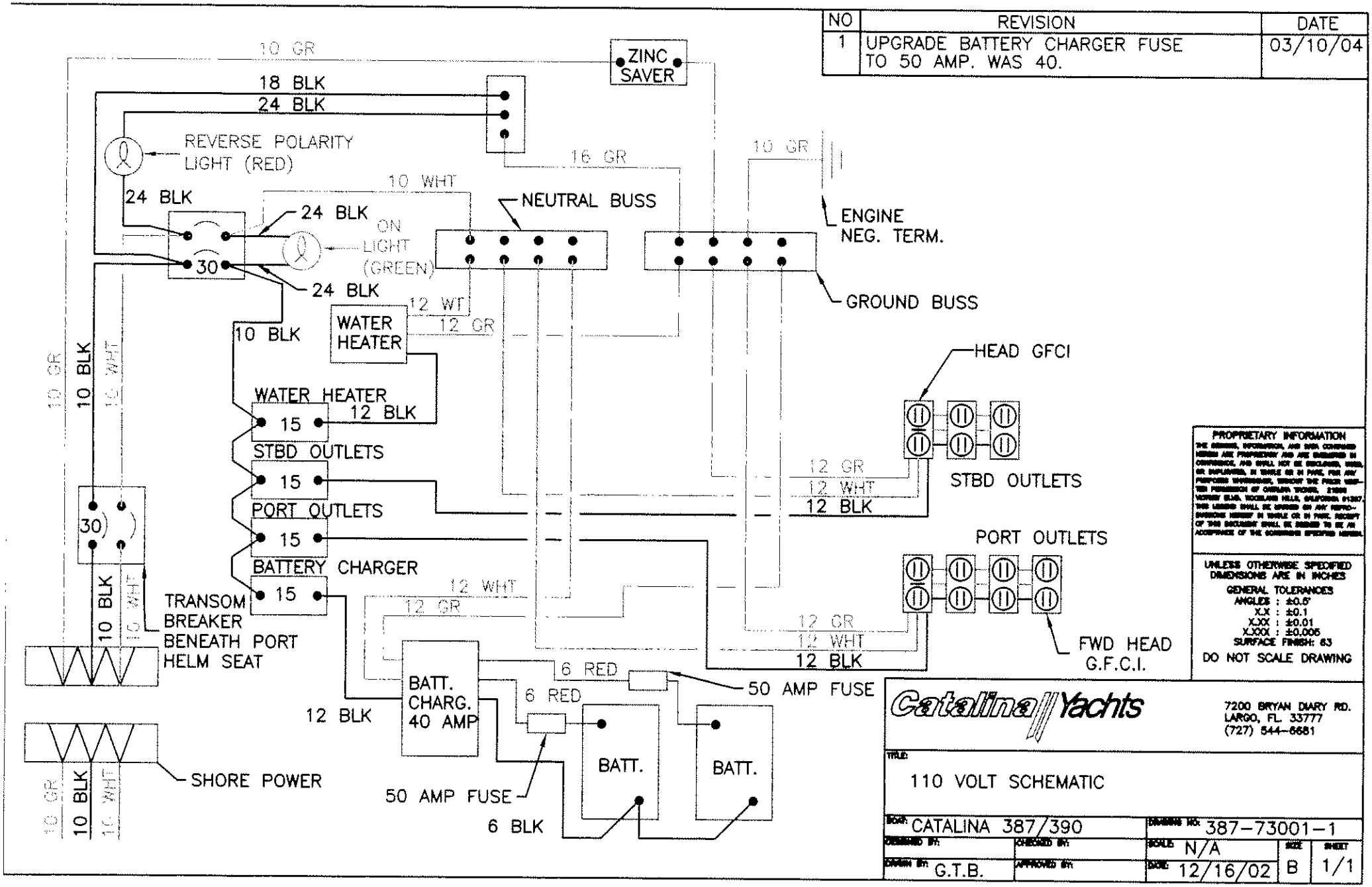
4.0 YACHT SYSTEMS - (Continued)

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 (8) 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.



NO	REVISION	DATE
1	UPGRADE BATTERY CHARGER FUSE TO 50 AMP. WAS 40.	03/10/04

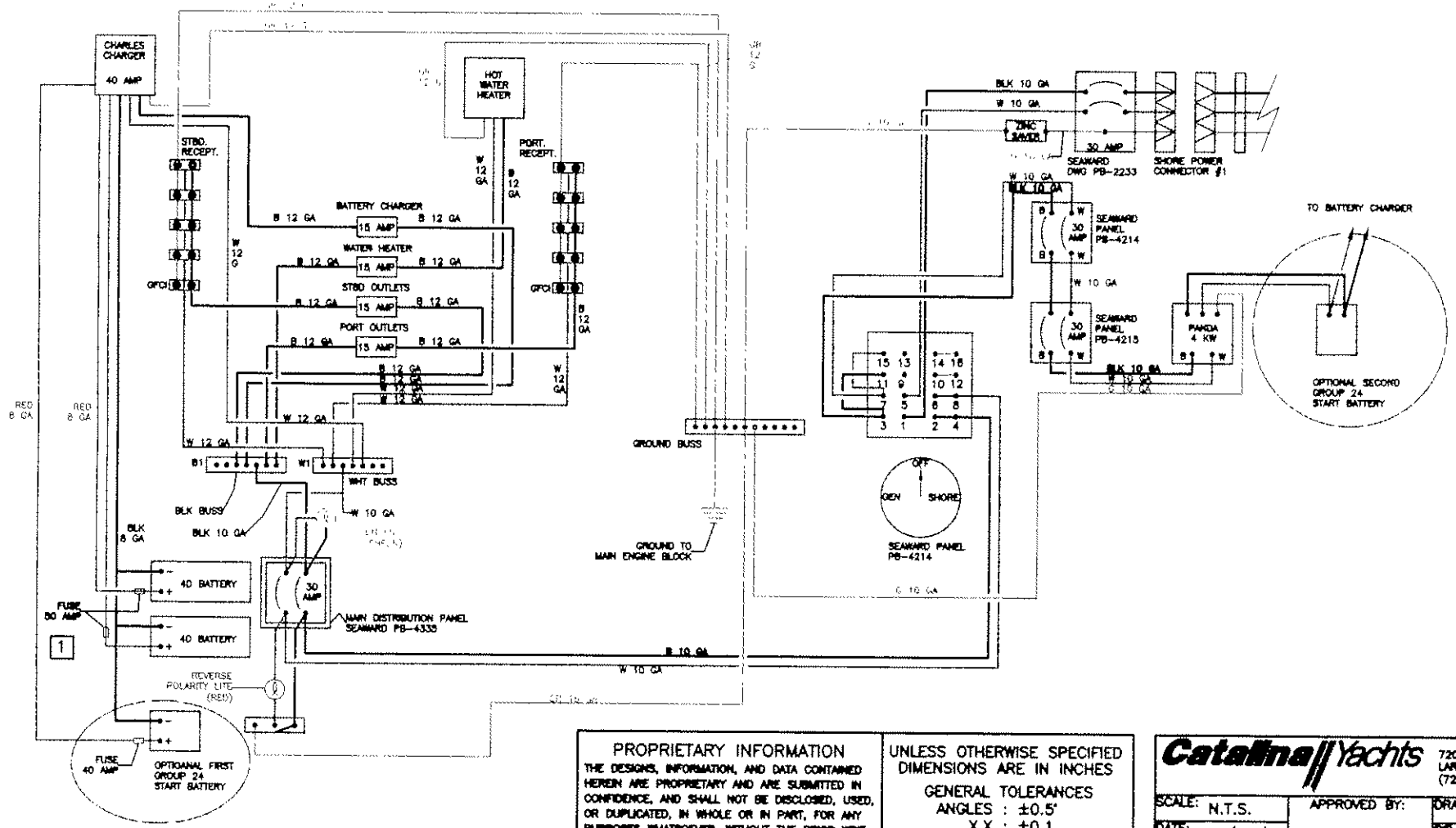
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
GENERAL TOLERANCES
ANGLES : ±0.5°
X.X : ±0.1
X.XX : ±0.01
X.XXX : ±0.005
SURFACE FINISH: 63
DO NOT SCALE DRAWING

Catalina Yachts
7200 BRYAN DIARY RD.
LARGO, FL 33777
(727) 544-6681

TITLE: 110 VOLT SCHEMATIC

BOAT: CATALINA 387/390		DRAWING NO: 387-73001-1		
DESIGNED BY:	CHECKED BY:	SCALE: N/A	SIZE: B	SHEET: 1/1
DRAWN BY: G.T.B.	APPROVED BY:	DATE: 12/16/02		

NO	REVISIONS	DATE	BY
1	UPGRADE BATTERY CHARGER FUSE TO 50 AMP. WAS 40.	03/10/04	G.B.
2	REVISED WIRE SIZE FROM GEN. TO PANEL, WAS #6.	03/17/04	G.B.



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

GENERAL TOLERANCES
ANGLES : ±0.5°
X.X : ±0.1
X.XX : ±0.01
X.XXX : ±0.005
SURFACE FINISH: 63

DO NOT SCALE DRAWING

Catalina Yachts
7200 BRYAN DAIRY RD.
LARGO, FL 33777
(727) 544-6581

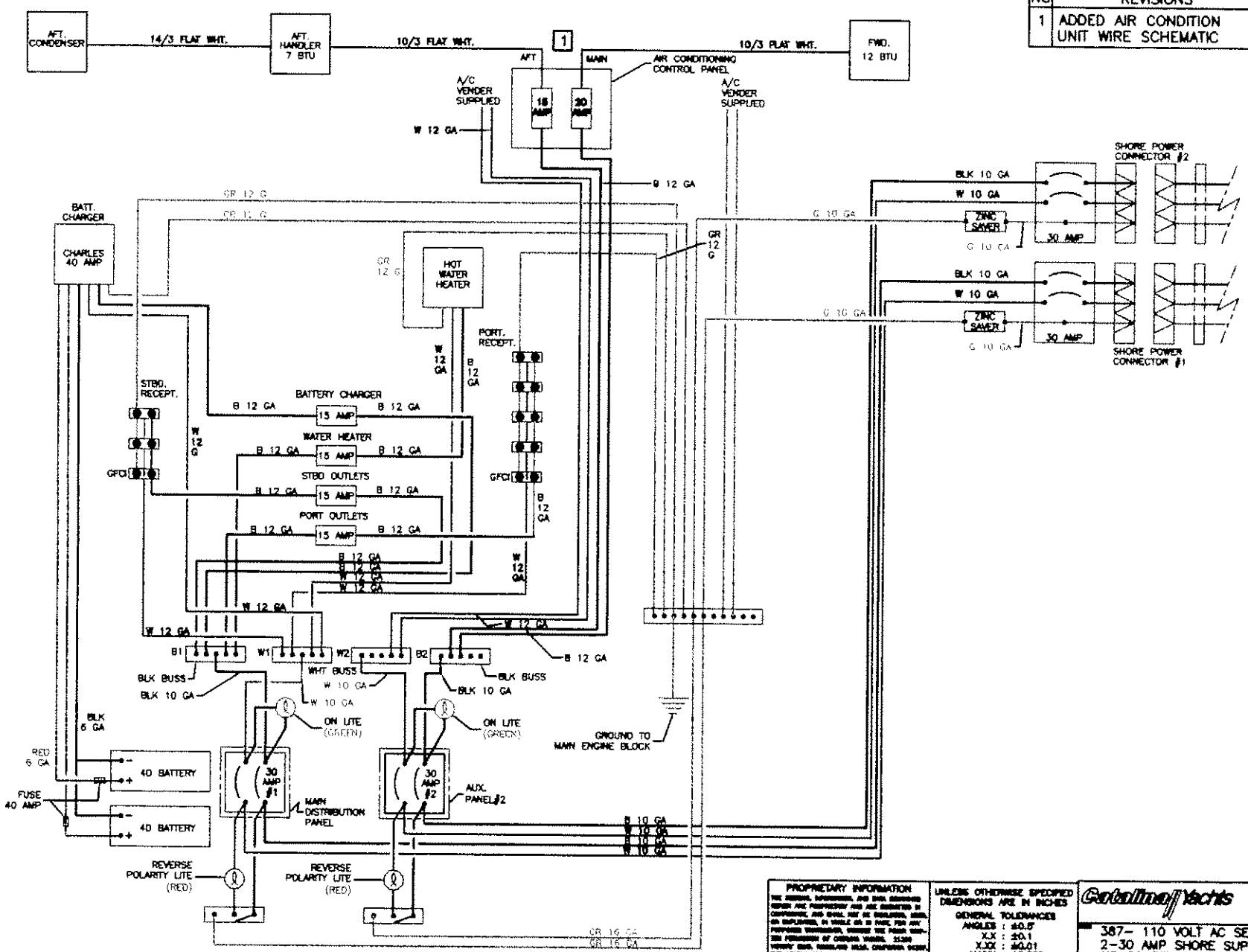
SCALE: N.T.S.	APPROVED BY:	DRAWN BY G.T.B.
DATE: 02/16/00		REVISED 03/15/04

1-30 AMP. SHORE SUPPLY, 4KW PANDA GENERATOR

BOAT: CATALINA 387

DRAWING NUMBER 73053-2

NO.	REVISIONS	DATE	BY
1	ADDED AIR CONDITION UNIT WIRE SCHEMATIC	08/27/03	G.B.



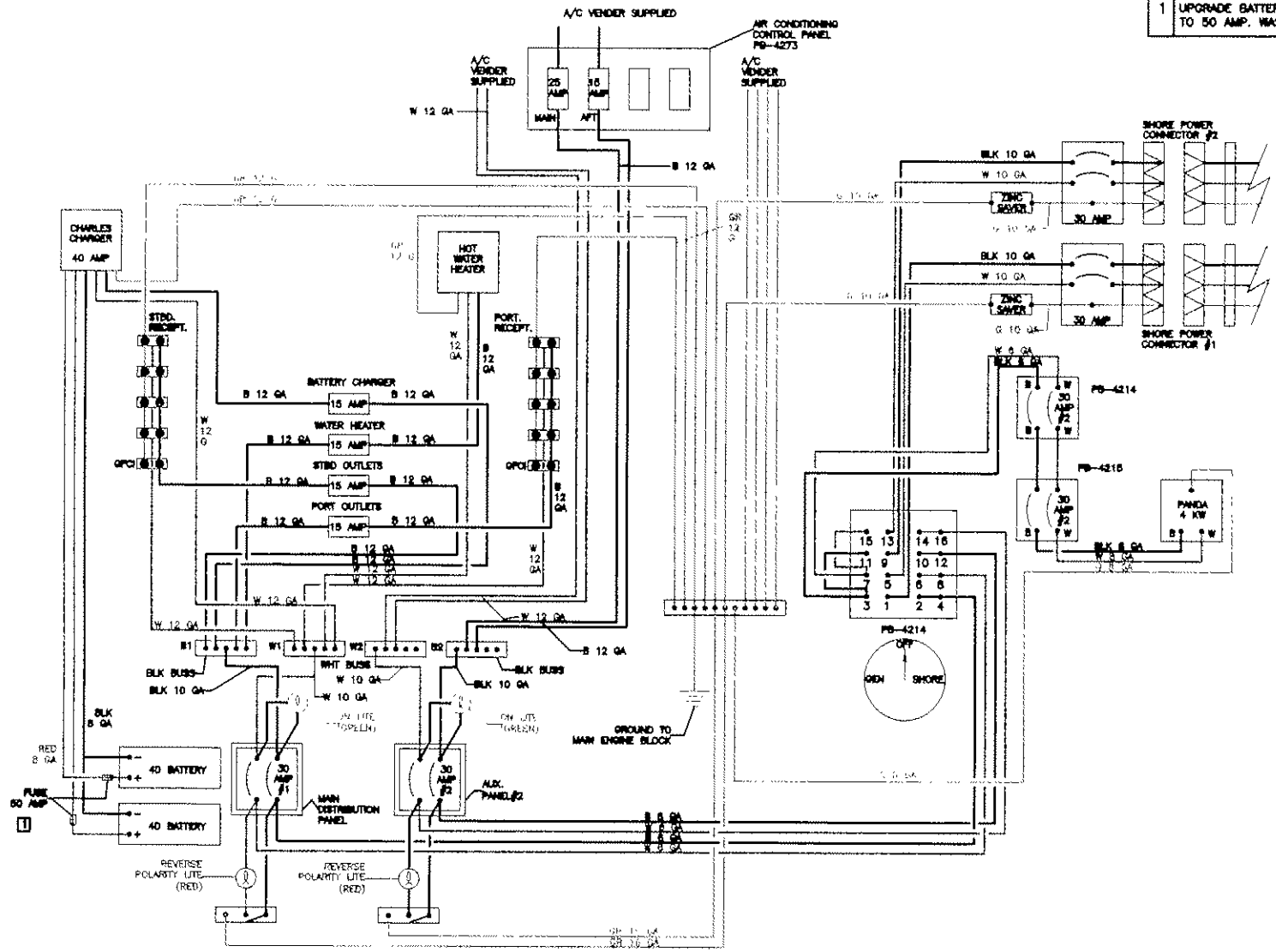
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
GENERAL TOLERANCES
ANGLES : ±0.5°
X.X : ±0.1
X.XX : ±0.01
X.XXX : ±0.005
SURFACE FINISH: 63
DO NOT SCALE DRAWING

Catalina Yachts

387- 110 VOLT AC SERVICE, 2-30 AMP SHORE SUPPLIES, AIR CONDITIONING

CATALINA 387		387-73050-1	
F.T.J.	N.J.	N/A	
G.T.B.	G.D.	3/17/00	F 1/1

NO	REVISION	DATE
1	UPGRADE BATTERY CHARGER FUSE TO 50 AMP. WAS 40.	03/23/04



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

GENERAL TOLERANCES
ANGLES : ±0.5°
X.X : ±0.1
X.XX : ±0.01
X.XXX : ±0.005
SURFACE FINISH: 63

DO NOT SCALE DRAWING

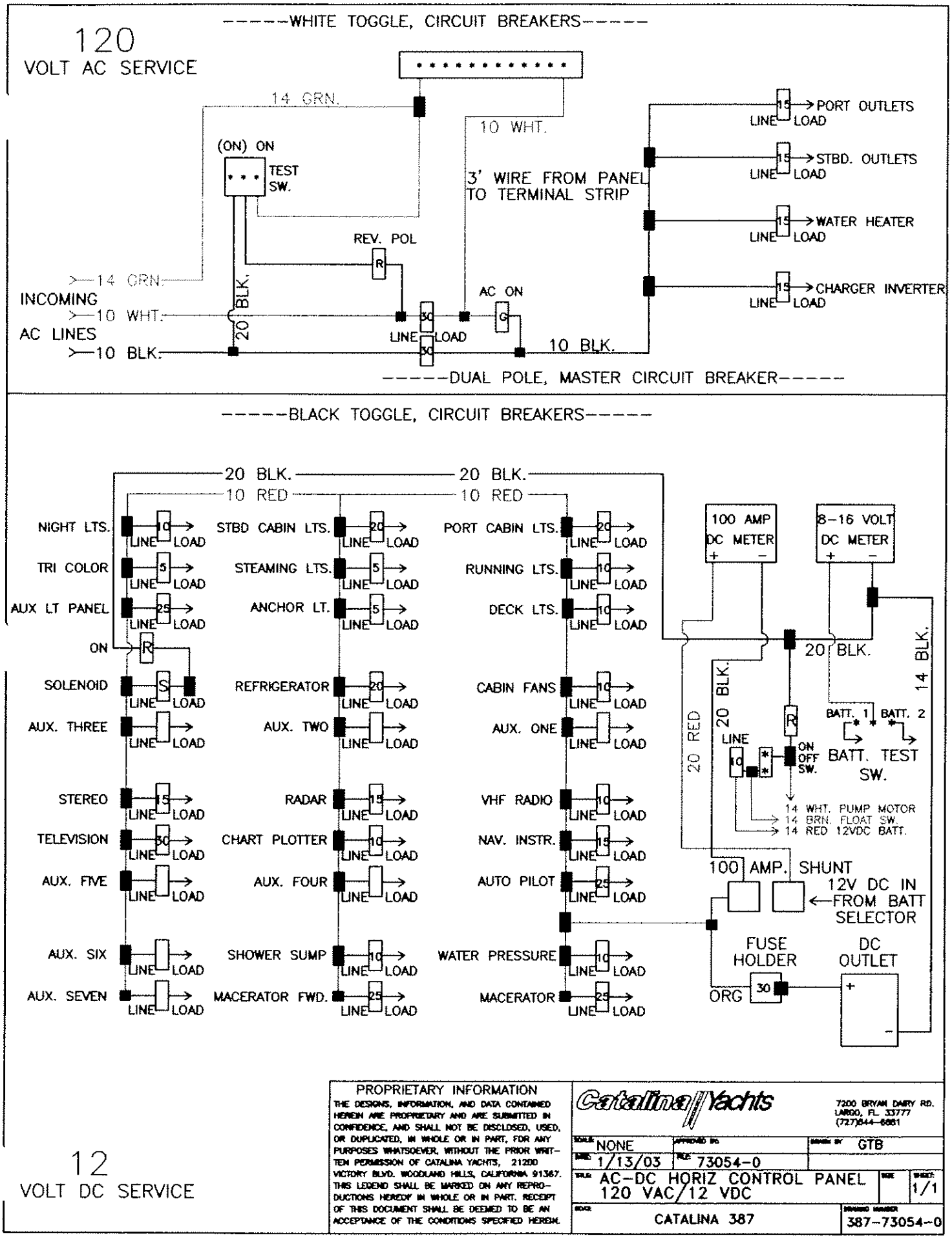
Catalina Yachts
7200 BRYAN DAIRY RD.
LARGO, FL. 33777
(727) 544-6681

SCALE: N.T.S.	APPROVED BY:	DRAWN BY G.T.B.
DATE: 08/03/99		REVISED 03/23/04

C387-110 VOLT AC SERVICE
2-30 AMP SHORE SUPPLIES
AIR CONDITIONING AND GENERATOR

BOAT: CATALINA 387

DRAWING NUMBER 73051-1

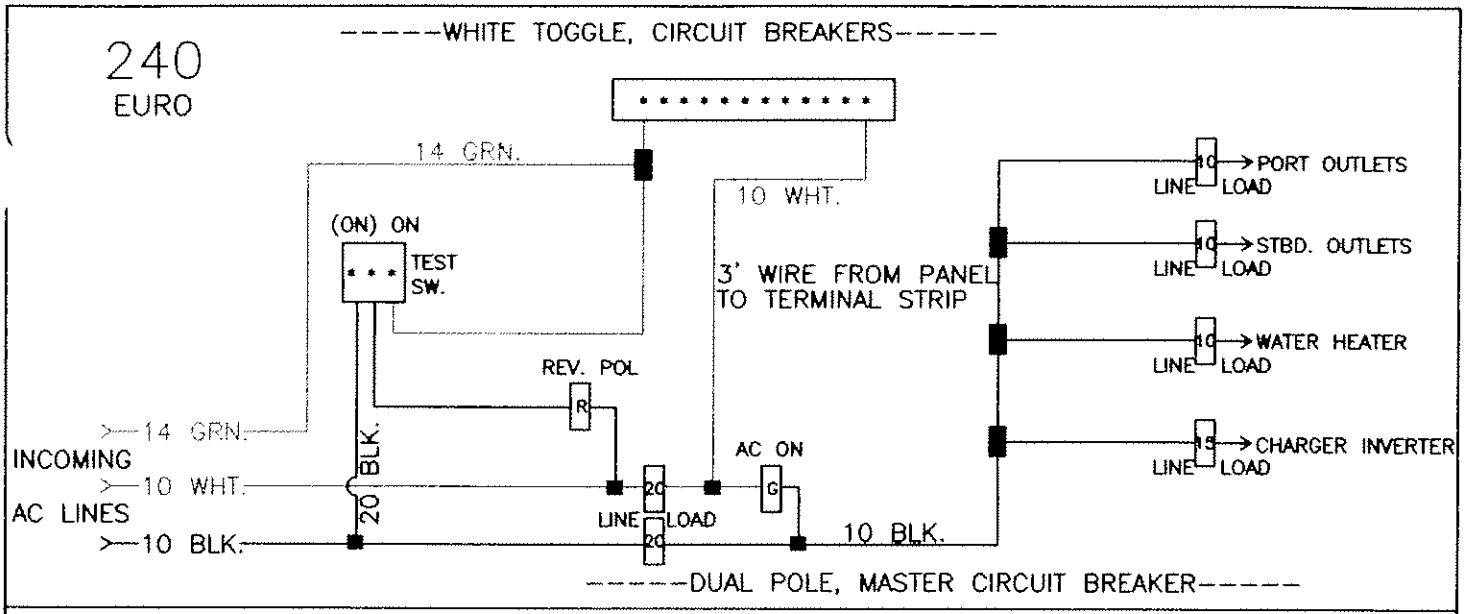


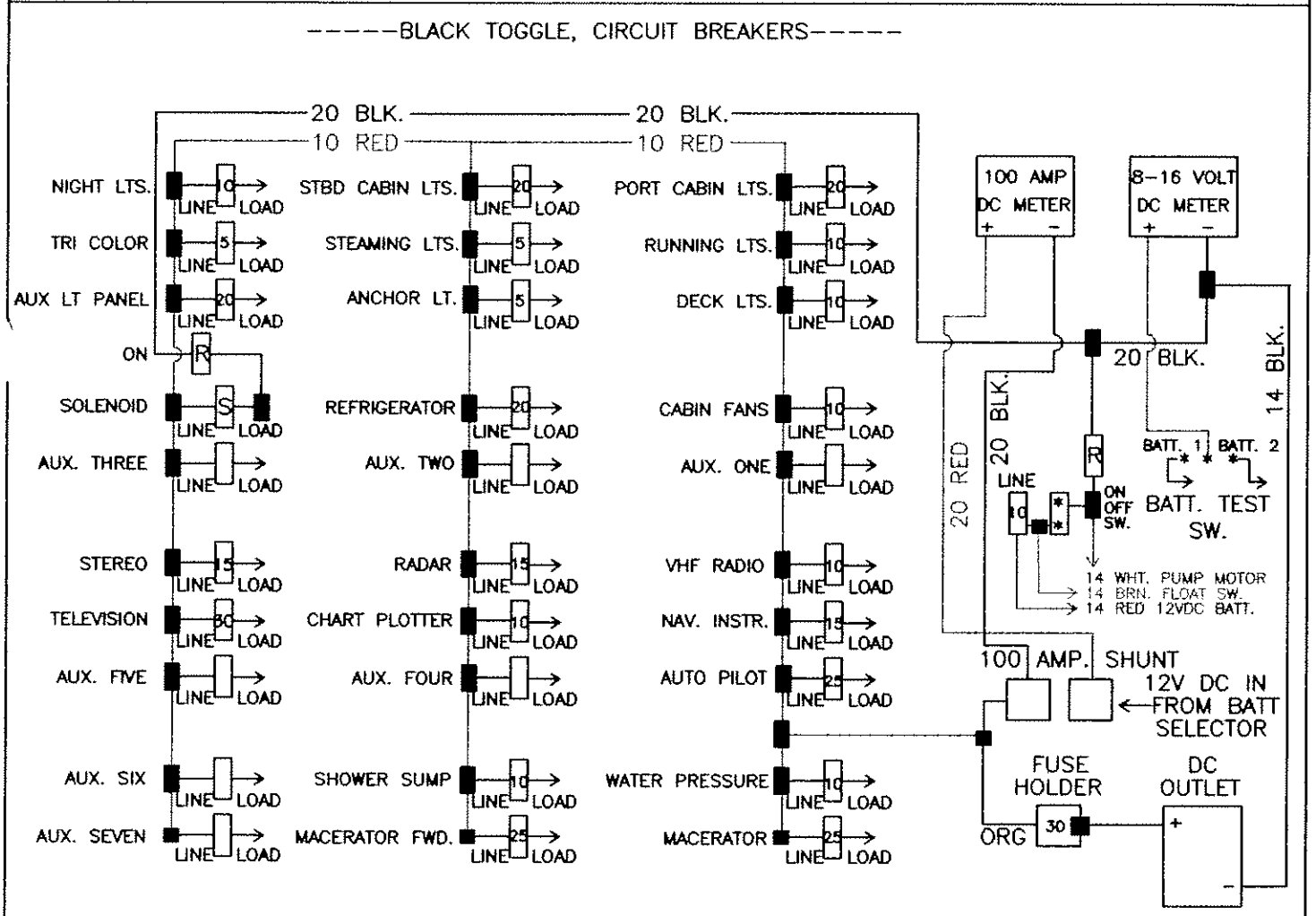
12
VOLT DC SERVICE

Catalina Yachts
7200 BRYAN DAIRY RD.
LARGO, FL 33777
(727)544-6581

SCALE: NONE	APPROVED BY:	DRAWN BY: GTB
DATE: 1/13/03	FILE: 73054-0	
TITLE: AC-DC HORIZ CONTROL PANEL 120 VAC/12 VDC	SIZE	SHEET: 1/1
MODEL: CATALINA 387		DRAWING NUMBER: 387-73054-0

240
EURO

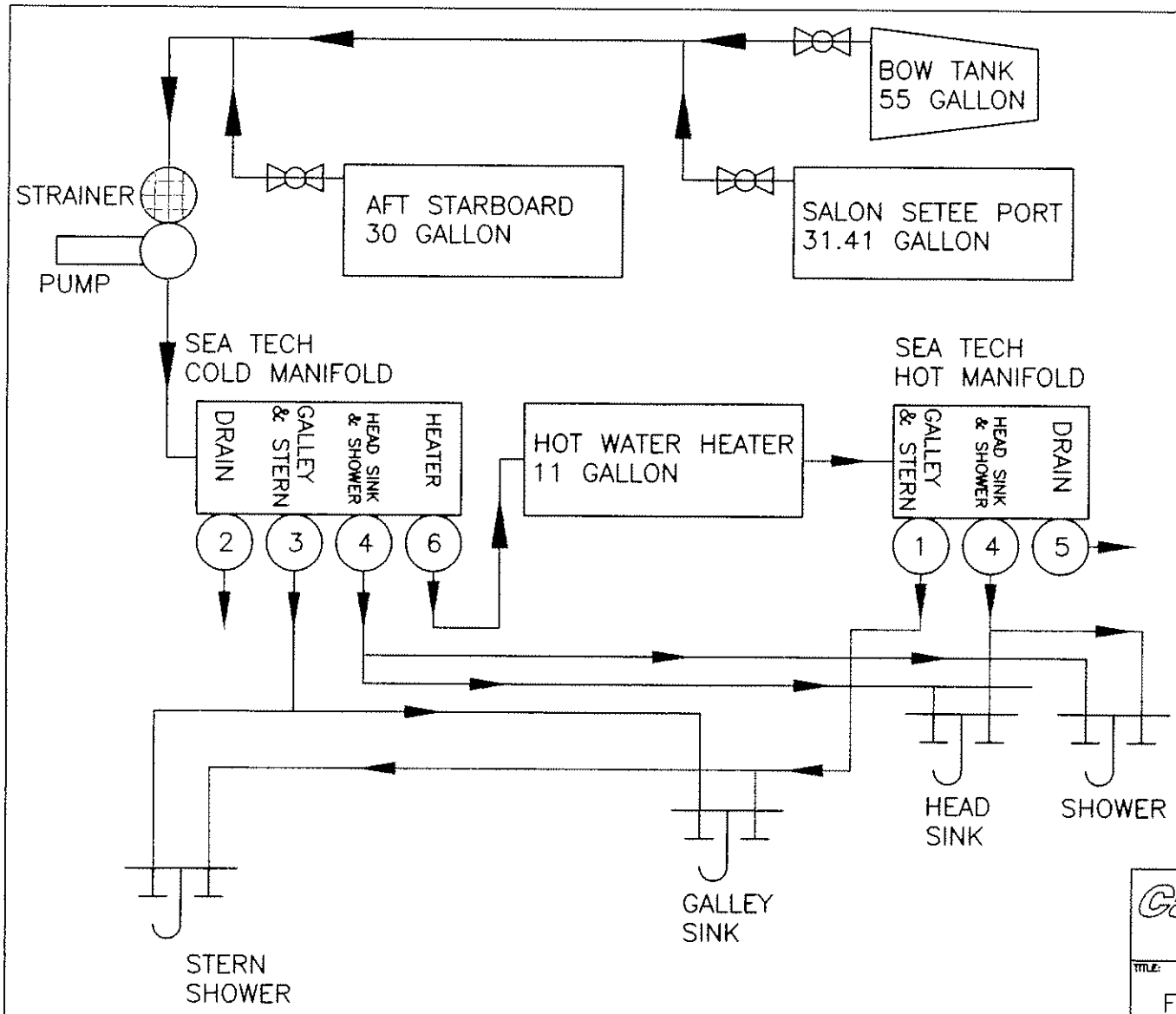




Catalina Yachts
7200 BRYAN DAIRY RD.
LARGO, FL. 33777
(727)544-6881

SCALE: NONE	APPROVED BY:	DRAWN BY: GTB
DATE: 1/13/03	FILE: 73055-0	
TITLE: EURO AC-DC HORIZ CTRL, 240 VAC/12 VDC	SIZE:	SHEET: 1/1
BOAT: CATALINA 387		DRAWING NUMBER: 387-73055-0

12
VOLT DC SERVICE



UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES

GENERAL TOLERANCES
ANGLES : ±0.5°
X.X : ±0.1
X.XX : ±0.01
X.XXX : ±0.005
SURFACE FINISH: 63

DO NOT SCALE DRAWING

Catalina Yachts
7200 BRYAN DIARY RD.
LARGO, FL. 33777
(727) 544-6581

TITLE: FRESH WATER SCHEMATIC

BOAT: CATALINA 387		DRAWING NO: 387-64001-0			
DESIGNED BY:	CHECKED BY:	SCALE: NONE	SIZE: B	SHEET: 1/1	
DRAWN BY: G.T.B.	APPROVED BY:	DATE: 12/10/02			

Snake River Electronics Ultra-8 Display Panel Calibration Instructions

Description:

Calibration instructions for Ultra-8 display panel. Note: this is only a quick calibration guide. For installation, operation and troubleshooting information for this panel refer to its owners manual.

Tools Required:

None, panel is calibrated by pressing buttons on the panel.

Procedure:

Note: this procedure assumes that the panel and sensors are already installed in your vehicle. Refer to the owners manual for installation instructions.

(1) Fill or drain the tank that is to be re-calibrated.
(2) Turn off panel, press and hold **C** button, turn on panel, then release **C** button
(3) Press up and down arrow keys to the sensor channel to be calibrated.
(4) Press **C** button to enter calibration mode.
(5) Following the instructions on the display, press the up arrow key for full calibration or the down arrow key for empty calibration (whatever you did in step (1)).
(6) Again following the instructions on the display, press the up arrow if you are sure that you want to record the calibration value. If you are unsure press the down arrow to abort.
(7) Fill or drain the tank that is to be re-calibrated (opposite of what you did in step (1)).
(8) Repeat steps (2) through (6) to set this calibration level.
(9) Repeat all of the above steps for all tanks to be re-calibrated.

Trouble Shooting:

If you encounter an error message when you attempt to calibrate a tank, then try setting the opposite point (i.e.: if you attempted to set the full calibration point, drain the tank and try doing the empty point first). If you still get the error message you may need to check your sensor installation for problems; see troubleshooting guides in the Ultra-8 owners manual and sensor owners manuals

If the above procedure does not result in satisfactory panel operation, you may need to check the sensor installation for problems. Refer to the owners manuals and calibration sheets for the sensors you have installed. These manuals also have additional troubleshooting information that may be of assistance. If these do not fix your problems, contact Snake River Electronics Tech. Support for additional advice and information.

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.

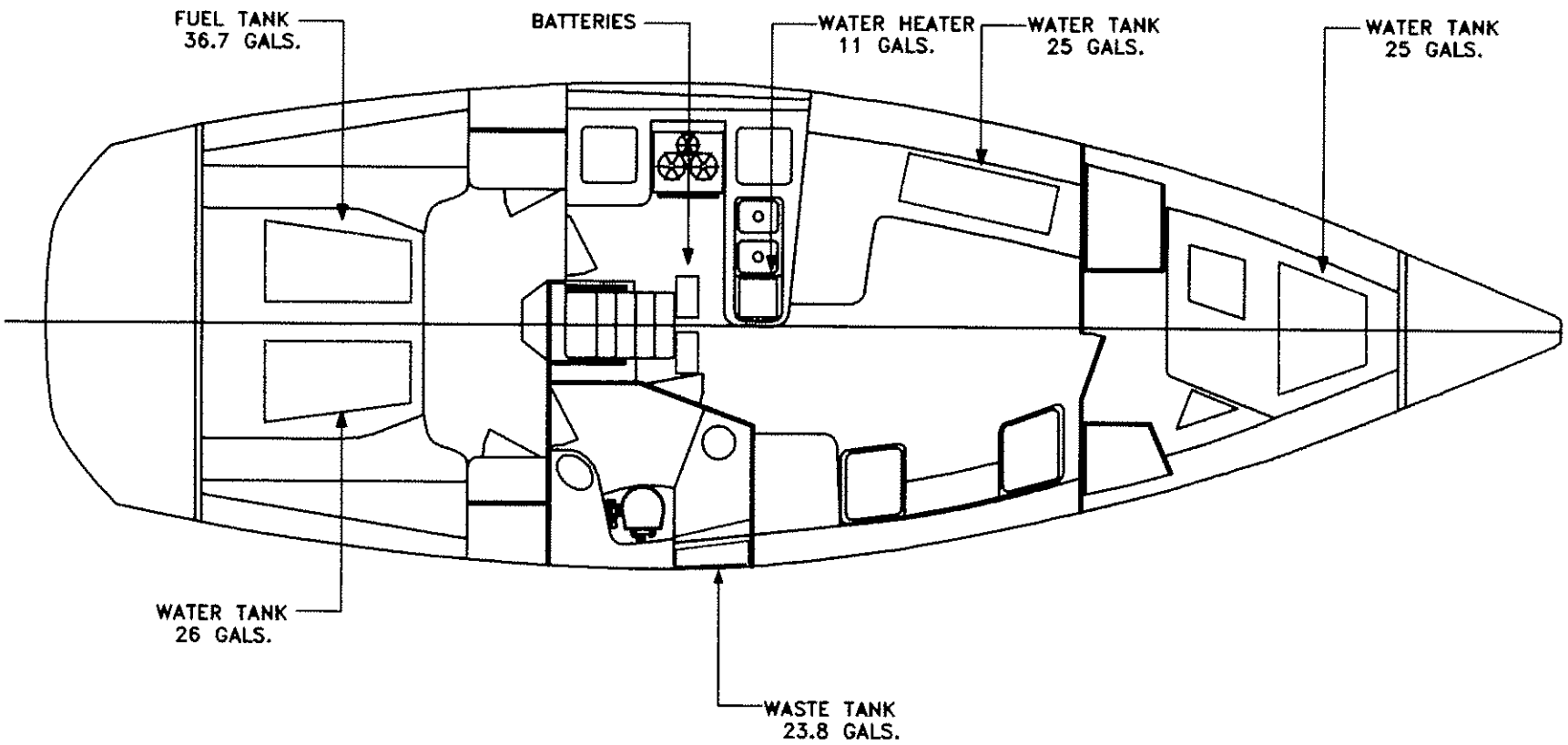
The pump intake hose is in the keel stub under the main cabin sole. The bilge pumps are shown on the plumbing schematic.

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 then in good working order, and lubricate the seals on a regular schedule.



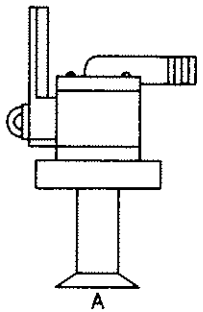
Catalina Yachts
7300 BRYAN DAIRY RD.
LARGO, FL. 33777
(727) 544-6881

TANK ARRANGEMENT PLAN

MODEL: 387		DRAWING NO: 387-67053-0	
DESIGNED BY:	CHECKED BY:	SCALE: 3/4"=1'-0"	SIZE: D
DRAWN BY: GTB	APPROVED BY:	DATE: 1/13/03	SHEET: 1/1

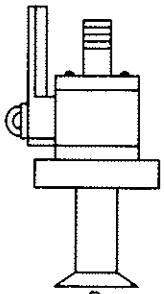
PARTS LIST		
ITEM	DISCRIPTION	EX.
1	ICEBOX PUMP, 3/4"	A
2	GALLEY SINK DRAIN, 1-1/2"	B
3	ENGINE INTAKE, 1"	C
4	SINK DRAIN, 3/4"	B
5	HEAD INTAKE, 3/4"	A
6	SHOWER DRAIN, 3/4"	A

NO	REVISION	DATE
1	REVERSED ITEM 1&2 IN ERROR	04/03/03



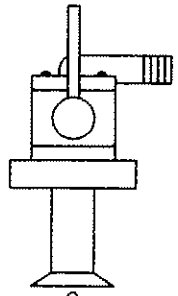
A

90°
3/4" 932153 (#0050910) FLUSH



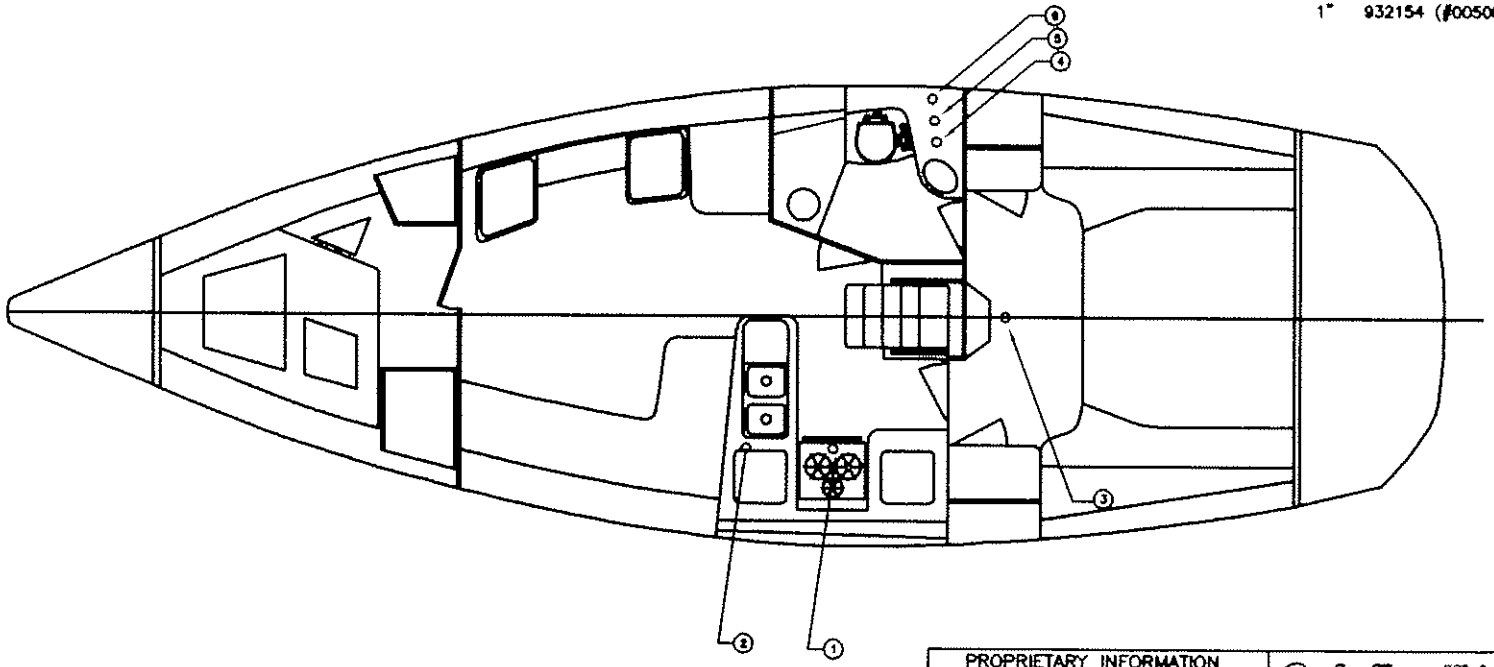
B

STRAIGHT
3/4" 932143 (#0050909) FLUSH
1-1/2" 932146 (#0050879) FLUSH



C

90° FLUSH SPECIAL
NOTE: HANDLE LOCATION (DIFFERENT FROM VALVE A)
1" 932154 (#0050880) FLUSH



Catalina Yachts
7200 BROKEN DARY RD.
LARGO, FL. 33777
(727)544-6851

ISSUE NONE	APPROVED BY	DRAWN BY GTB
DATE 1/13/03	FILE 22050-0	
TITLE THRU HALL VALVES		SIZE / SHEET 1/1
MODEL CATALINA 387		DRAWING NUMBER 387-22050-1

4.0 PLUMBING:

THE HEAD:

1. Read the instructions supplied by the toilet manufacturer for operating your marine toilet. 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 is use. This will prevent water from flooding the boat if the valve in the toilet pump 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 tanks capacity between pump-outs.

3. 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 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:

1. Open the through hull valve "B".
2. 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.

4.0
MACERATOR PUMP AND TROUBLESHOOTING:

PROBLEM 1: The macerator pump motor starts then stops.

A. Check the breaker: It should be "IN" or "ON".

B. Check the valves: "B" valve must be open. (SANITARY SCHEMATIC –PAGE 49)

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 diluted as much as possible. The tank 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 operation instructions.

INSTRUCTION FOR SANITIZING POTABLE WATER SYSTEM:

To assure complete sanitation of your potable water system it is recommended that the following procedures be used. This applies if it is a new system, one not used for a period of time, or one that may have become contaminated.

(1) Prepare a chlorine solution using one gallon water and ¼ cup Clorox 2 household bleach (5% hyperchlorite solution). With tank empty, pour chlorine solution into tank. Use one gallon solution for each 15 gallons tank capacity.

(2) Complete filling tank with fresh water. Open faucet and drain cock until all air has been released and entire system is filled.

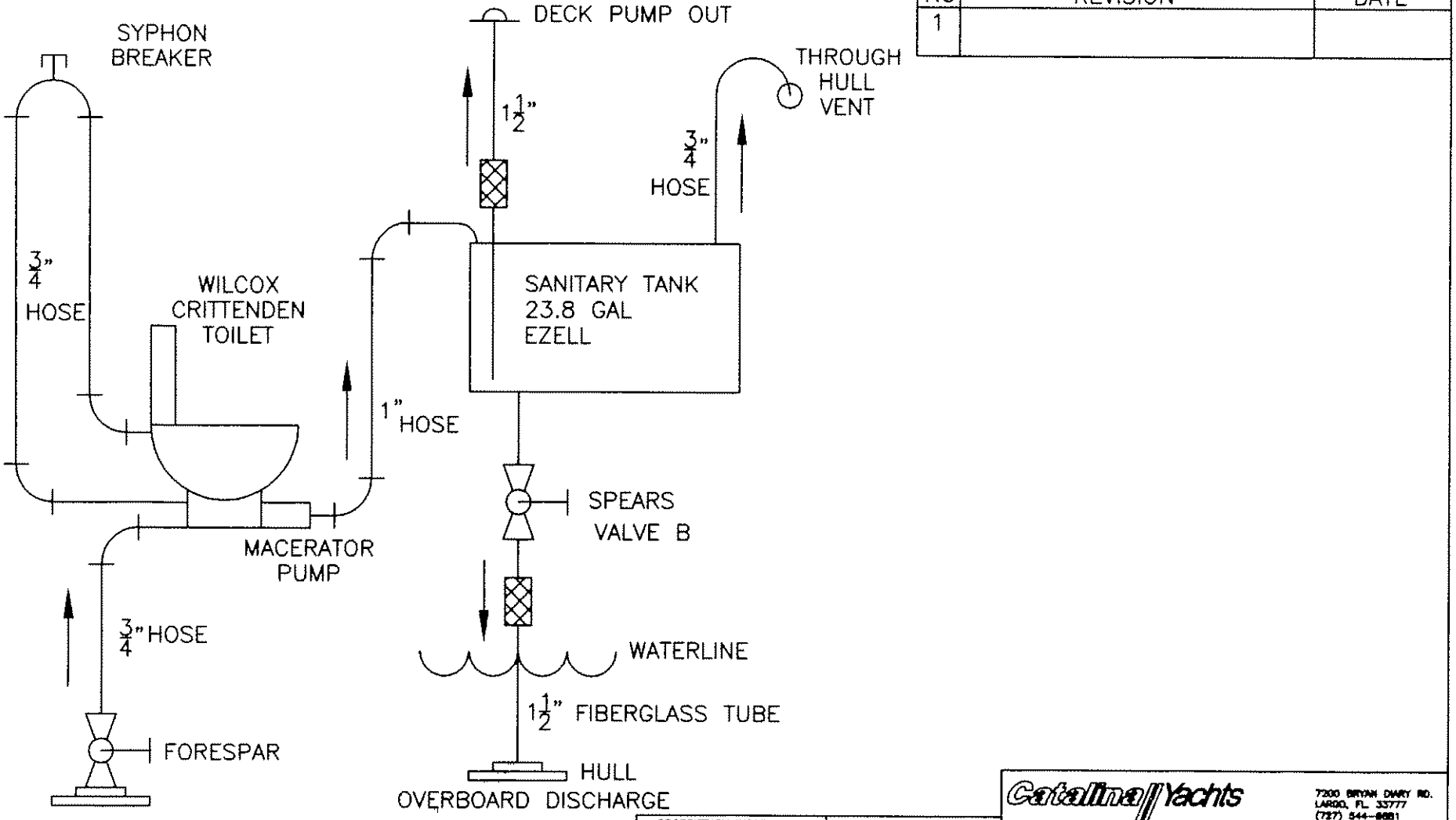
(3) Allow to stand for three (3) hours.

(4) Drain and flush with potable water. (IMPORTANT)

(5) To remove excessive chlorine taste or odor which might remain, prepare a solution of one quart vinegar to five gallons water and allow this solution to agitate in tank for several days by vessel motion.

(6) Drain tank and again flush with potable water. (IMPORTANT)

The above recommendations conform to section 10.8 in the A119.2 code covering electrical, plumbing, and heating of a recreational vehicle. The solution is approved and recommended by competent health officials.



NO	REVISION	DATE
1		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
GENERAL TOLERANCES
ANGLES : ±0.5°
X.X : ±0.1
X.XX : ±0.01
X.XXX : ±0.005
SURFACE FINISH: 63
DO NOT SCALE DRAWING

Catalina Yachts
7200 BRYAN DAIRY RD.
LARGO, FL. 33777
(727) 544-6881

TITLE: SANITARY SCHEMATIC

SIZE: CATALINA 387		DRAWING NO: 387-67052-0	
DRAWN BY: G.T.B.	APPROVED BY:	DESIGN: NONE	SIZE: B
		DATE: 1/13/03	SHEET: 1/1

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 Yanmar Diesel Engine U.S.A. Telephone no. 847-541-1900 and request a duplicate.

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. Keep your fuel tank full whenever possible to prevent water condensation in your fuel tank.

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

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

4.0 YACHT SYSTEMS - (Continued)

4.4.3 SHAFT SEAL:

The shaft seal is located under the cabin sole on the boat's centerline in the aft cabin.

4.4.4 SHAFT ALIGNMENT:

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

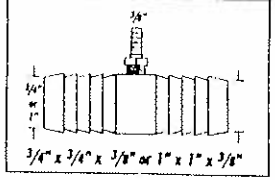
Alignment is gauged at the engine and shaft coupling. Alignment procedures must be done with the boat in the water after the mast is stepped and the rig is tuned.

1. Check key in keyway, as it must be in place between shaft and coupling.

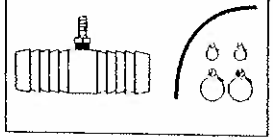
2. Remove coupling flange bolts and check propeller shaft for clearance.

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

T-ADAPTER



T-KIT



Note: PYI. T-adapter fittings or T-adapter kits (T-adapter, 6' reinforced hose, 4 hose clamps) are available for 3/4" or 1" internal hose diameters.

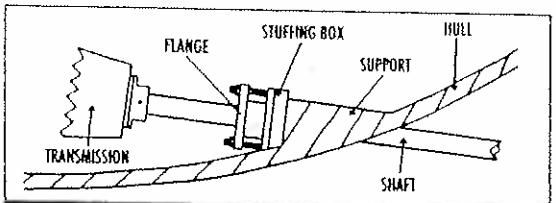
3. For keel cooled or in-line systems, water can be plumbed into the seal from an underwater scoop.

11-B. Standard speed seals. When a boat with a watertight (PSS) Seal goes back in the water, there will be an air pocket trapped in the shaft log (stern tube). This air pocket must be vented when the boat is launched, so water can reach the face of the seal to help cool and lubricate it. To vent the air pocket, simply compress the bellow (push the carbon away from the stainless steel rotor with your hand) so that water fills the shaft log (stern tube). A small amount of water will enter the boat at this time and will stop as soon as you release the bellow, allowing the two faces to come back in contact.

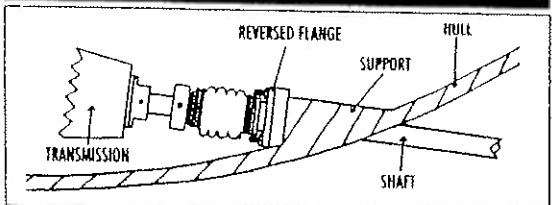
This procedure should be done every time the boat goes back in the water and is not required with high speed seals.

BOLT-ON OR RIGID STUFFING BOXES:

If your stuffing box is a bolt-on or rigid type, you will need to reverse the flange that was used to compress the packing. This flange will be bolted to the face of the bolt-on stuffing box and sealed with a gasket so no water can leak through. Once reversed, the bellow can be fit over the tube that was used to compress the packing. When completed, proceed with step #4 of instructions.



BEFORE



AFTER

THREADED STUFFING BOXES:

If your old stuffing box was threaded directly into the hull, you will need to cover the threads with a liquid gasket material like "form-a gasket" to prevent the threads from cutting into the bellow. When completed, proceed with step #4 of instructions.

BREAK-IN PERIOD:

There is, on average, a 10 minute break-in period when the carbon graphite flange will polish the face of the stainless steel rotor. During this break-in period there will be a very fine black mist being emitted when shaft is turning at high R.P.M.'s.

TROUBLESHOOTING:

1. Spray or mist during operation

Dimensions provided in the bellow compression chart are an average and should act as a guide. If you should experience any spray or misting during high speed operation (after break-in period), add an additional 1/8" compression to the bellow with the rotor and repeat until the spray has stopped.

2. Dripping while not operational:

If the seal leaks when the shaft is not turning, some foreign material such as grease or oil may be prohibiting the two faces from seating properly. To clean this foreign material from the two faces, insert a clean cloth rag between the carbon graphite and stainless steel rotor and rotate it around the shaft vigorously. As you do this, water will flush both faces of any impurities. Remove the rag from the seal and the leak should stop.

WARNING:

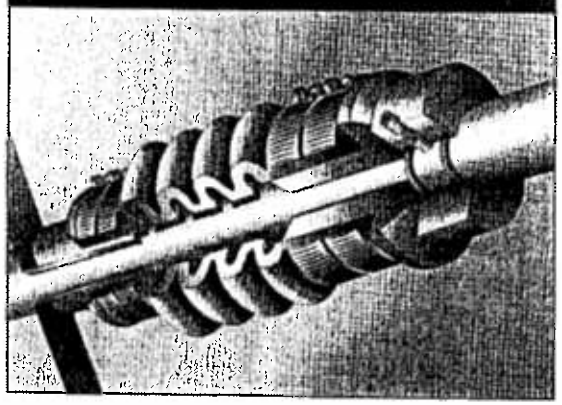
As with any rubber hose below waterline, the PSS bellow must be inspected on a regular basis (i.e. twice each year) for any sign of wear, aging or chemical deterioration. PYI suggests as preventative maintenance, the PSS bellow should be replaced every six years.

Bellows may need more frequent replacement in an environment where non-sealed batteries emit sulfuric acid. Sulfuric acid vapor will accelerate rubber deterioration.

PYI INC.

12532 Beverly Park Road • Lynnwood, WA 98037
Phone: (425) 355-3669 • Fax (425) 355-3661
Email: pyi@pyiinc.com • Website: www.pyiinc.com

PACKLESS SEALING SYSTEM



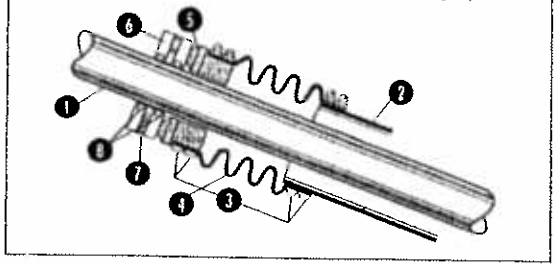
SHAFT SEAL

INSTALLATION INSTRUCTIONS

For Shafts:
3/4" to 3 3/4"
(22mm to 90mm)

STANDARD SPEED P.S.S SHAFT SEAL:

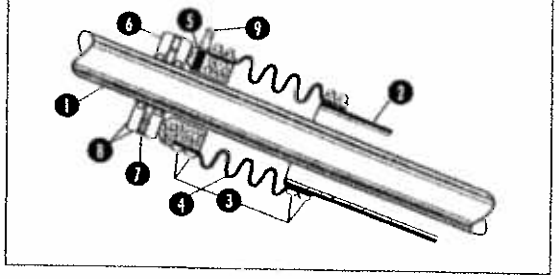
Hull Speed Under 12 Knots.
(Boats equipped with water injected stuffing box, use high speed.)



1. Propeller Shaft
2. Shaft Log (Stern Tube)
3. Stainless Steel Hose Clamps (4)
4. Reinforced Bellow (1)
5. Carbon Graphite Flange (1)
6. Stainless Steel Rotor (1)
7. Stainless Steel Set Screws (5 total / 4 for Rotor, 1 Spare)
8. Nitrile O-Rings (2 in Rotor / 2 Spare)

HIGH SPEED P.S.S. SHAFT SEAL:

Hull speed over 12 knots and boats with water injected stuffing box.



1. Propeller Shaft
2. Shaft Log (Stern Tube)
3. Stainless Steel Hose Clamps (4)
4. Reinforced Bellow (1)
5. Carbon Graphite Flange (1)
6. Stainless Steel Rotor (1)
7. Stainless Steel Set Screws (5 total / 4 for Rotor, 1 Spare)
8. Nitrile O-Rings (2 in Rotor / 2 Spare)
9. Nylon Hose Barb Fitting

READ INSTRUCTIONS THOROUGHLY

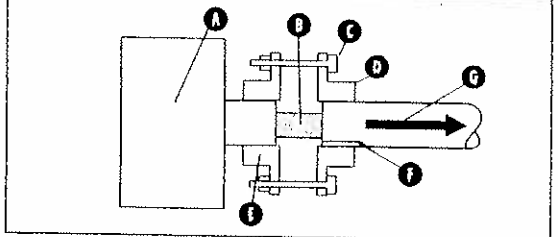
- Do not use grease or oil to slide the stainless steel rotor down the shaft.
- Do not allow petroleum based antifreeze to come in contact with face of the seal when winterizing engine
- Install the P.S.S. Only when the boat is out of the water
- Do not damage the carbon flange or stainless steel rotor while unpacking and handling
- Do not tighten nylon hose barb fitting or replace with stainless or brass.
- Do not re-use cupped point set screws. If the cupped point has been flattened replace screws.

INSTALLATION INSTRUCTIONS:

1. Unbolt the shaft coupling from the transmission coupling
2. Remove the shaft coupling from the shaft. (On most installations the coupling is fixed to the shaft by two set screws that are wired together)

   Helpful hint: Removing the shaft from the shaft coupling may be difficult. The drawing below shows the use of a spacer as a press between the propeller shaft and the transmission coupling:

REMOVING THE SHAFT COUPLING:



A. Transmission
B. Spacer
C. Bolts
D. Shaft Coupling
E. Transmission Coupling
F. Key
G. Shaft

   A. Insert a spacer (with a diameter smaller than the shaft) between the shaft and transmission coupling

   B. Bolt the transmission coupling and shaft coupling back together with the spacer in between (note: this may require longer bolts) The spacer will act as a press to drive the shaft from the shaft coupling as the bolts are tightened

3. Remove the old stuffing box and rubber hose to expose the shaft log (stern tube)

* *If your boat is equipped with a bolt-on or rigid stuffing box, please refer to heading: Bolt-on or rigid stuffing boxes*

** *If your boat is equipped with a threaded stuffing box, please refer to heading: Threaded stuffing boxes*

4. Slide the open end of the bellow and two hose clamps over the shaft log. The carbon flange (5) should already be securely attached to the bellow.
5. Clean the shaft (1) with very fine sand paper or emery paper (400 to 600 grit), paying particular attention to the shaft keyway to make certain there are no burrs or sharp edges that could tear the O-rings
6. Set screws supplied have an anti-vibration treatment applied to them. Before fitting the rotor on the shaft, thread the first pair of set-screws into the rotor. Make sure the O-rings (8) are positioned in the grooves of the rotor (spare O-rings are provided) and that the set screws (7) are backed out so that they do not extend into the inside bore of the rotor. Slide the stainless steel rotor (6) onto the shaft using a water soluble lubricant like dish soap to help the rotor slide easily. Do not use grease or oil!
7. Attach the shaft and shaft coupling (do not forget to secure coupling with set screws. Wire set screws together to avoid loosening)
8. Position the bellow on the stern tube so the carbon is centered around shaft (the carbon graphite flange is bored larger than the shaft to compensate for vibration or misalignment). Clamp the end of the bellow to the shaft log (2) with the two stainless steel hose clamps (3)
9. Slide the stainless steel rotor (6) down the shaft so it just comes in contact with the carbon graphite flange (1). Mark this "neutral" position on the shaft just in front of the stainless steel rotor with a marker or tape
10. Using the stainless steel rotor (6), compress the bellow (4) the amount indicated on the bellow compression chart (the "neutral" mark on the shaft is used as a reference to measure the amount of compression). While keeping the bellow compressed, tighten the two set screws (3/4"-1 3/8" shafts, 6 foot pounds of torque. 1 1/2"-3 3/4" shafts, 8 foot pounds of torque) to secure the rotor to the shaft. Once these set screws are secured, a second pair of screws are stacked on top of the first to act as locking screws to prevent the lower screws from possibly backing away from the shaft.

BELLOW COMPRESSION CHART:

Shaft diameter	*Compression amount*
3/4" to 1 1/8" (22mm to 30mm)	3/4" (20mm)
1 1/4" to 2" (32mm to 55mm)	1" (25mm)
2 1/4" to 3 3/4" (60mm to 95mm)	1" (25mm)

Note: *amount of compression may vary depending on motor mounts and shaft misalignment*

11. High speed seals with nylon hose barb fitting reference 11-A; Standard speed seals reference 11-B.

    11-A. High speed seals with a nylon hose barb fitting require that water be plumbed into the seal to cool and lubricate the seal. There are three methods for plumbing water into the seal:

    1. Remove the plug from heat exchanger and replace plug with a hose barb fitting (this plug would normally be used to drain water from the engine) Run a reinforced hose to the shaft seals nylon hose barb (3/8"). Secure both with hose clamps

    2. Cut into the exhaust line of the cooling system before hot water is discharged overboard. Fit t-adapter into line and plumb water into shaft seal nylon hose barb (3/8"), using reinforced hose. Secure all connections with hose clamps

4.0 **YACHT SYSTEMS** - (Continued)

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.

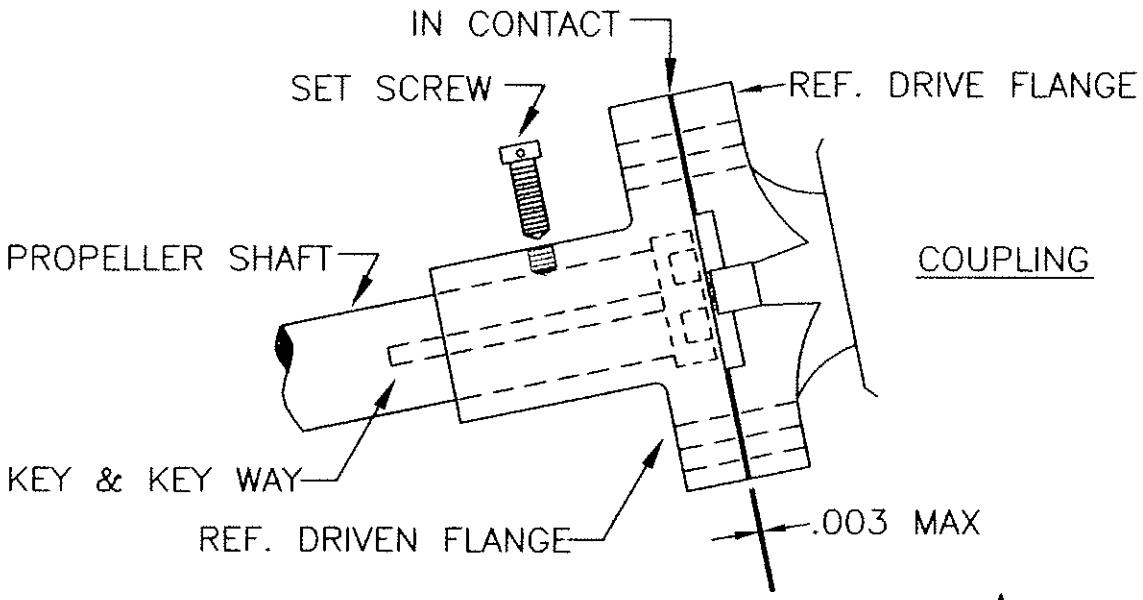
Canada Metal – Martyr Anodes

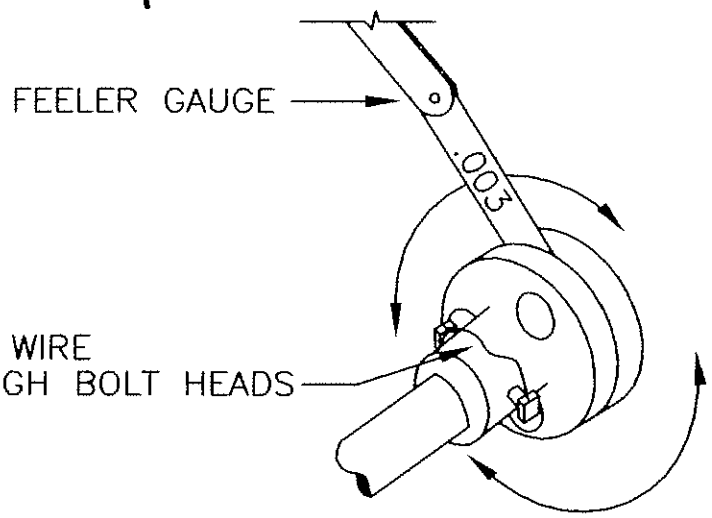
Boat Type	Prop Shaft Dia	Threads	West Marine Part # Full Kit	Replacement
Cat 270 - 36	1"	3/4" - 10	132581	132656
Cat 387 - 42	1-1/4"	7/8" - 9	132599	132664
Cat 470 - 504	1- 1/2"	1-1/8" - 8	132615	132680

Limited Clearance Collar Anodes

Boat Type	Prop Shaft Dia	Threads	West Marine Part # Full Kit
Cat 270 - 36	1"	3/4" - 10	485078
Cat 387 - 42	1-1/4"	7/8" - 9	485086
Cat 470 - 504	1- 1/2"	1-1/8" - 8	485268

As it corrodes away its surface area declines, and its effectiveness diminishes. As a general rule, anodes should be replaced when half eroded or dissolved. If an anode is allowed to dissolve altogether, the next least noble piece of metal in the circuit will start to dissolve.





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 1/4 TURN EACH TIME.
THIS MEASUREMENT MUST BE MADE WITH COUPLING BOLTS REMOVED.

Catalina Yachts

7200 BRYAN DAIRY RD.
LARGO, FL. 33777
(727)544-6681

TITLE: SHAFT ALIGNMENT

BOAT: CATALINA 387		DRAWING NO: 387-58000-0		
DESIGNED BY:	CHECKED BY:	SCALE: NONE	SIZE: A	SHEET: 1/1
DRAWN BY: G.T.B.	APPROVED BY:	DATE: 1/13/03		

4.4.6 FUELING:

The fuel system of the Catalina 387 is illustrated and consists of a 36.7 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:

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.

4.4.7 FUEL SANITATION:

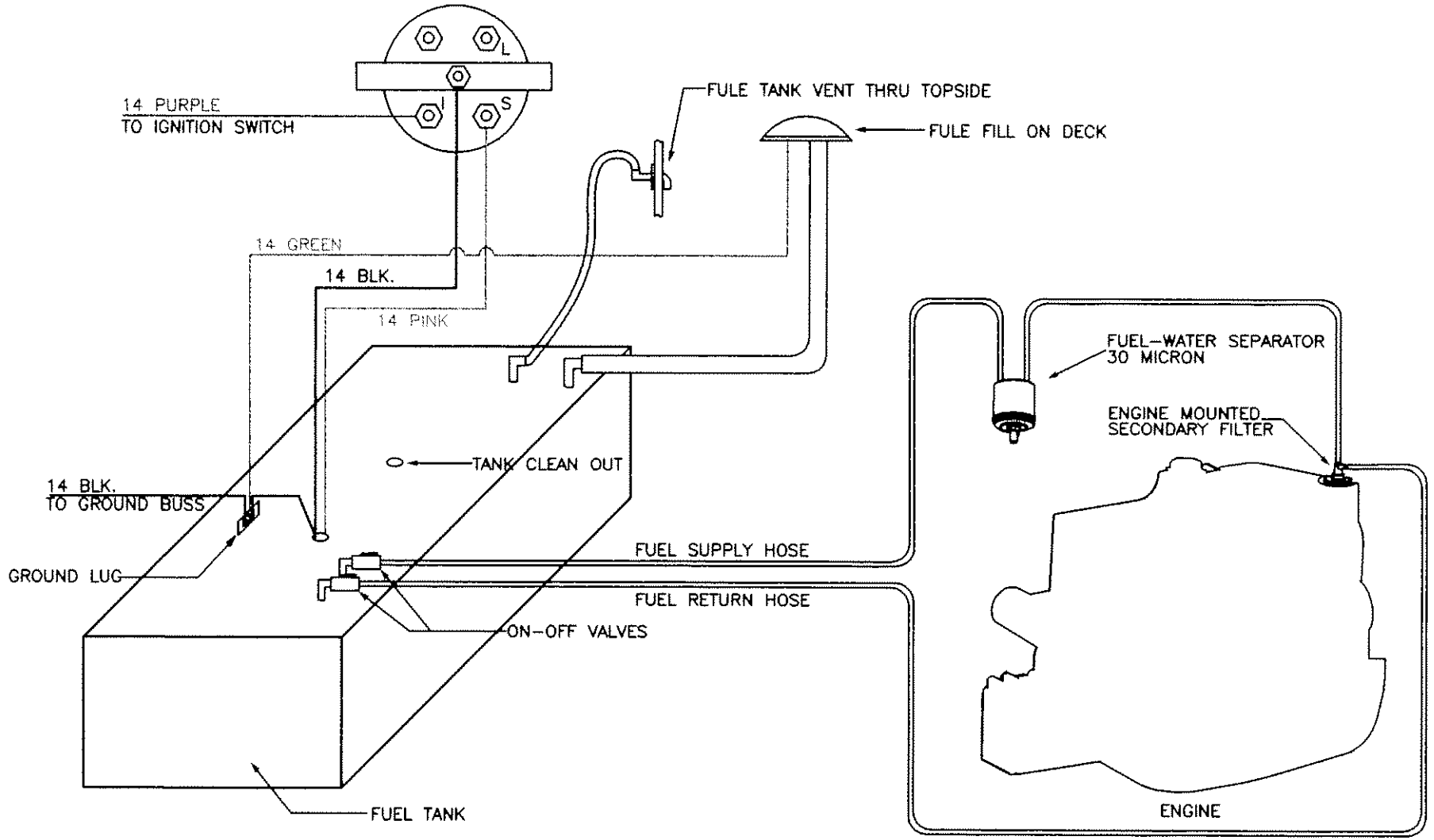
BACTERIAL CONTAMINATION:

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.



UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES

GENERAL TOLERANCES
ANGLES : ±0.5°
X.X : ±0.1
X.XX : ±0.01
X.XXX : ±0.005
SURFACE FINISH:

DO NOT SCALE DRAWING

Catalina Yachts
7200 BRYAN DAIRY RD.
LARGO, FL. 33777
(727) 544-6681

TITLE: C387- FULE SYSTEM SCHEMATIC

MODEL: CATALINA 387		DRAWING NO: 387-53000-0	
DRAWN BY: G.T.B.	CHECKED BY:	SCALE: FULL	SIZE: C / SHEET: 1/1
	APPROVED BY:	DATE: 1/13/03	

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 387, 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 387'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 387 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.

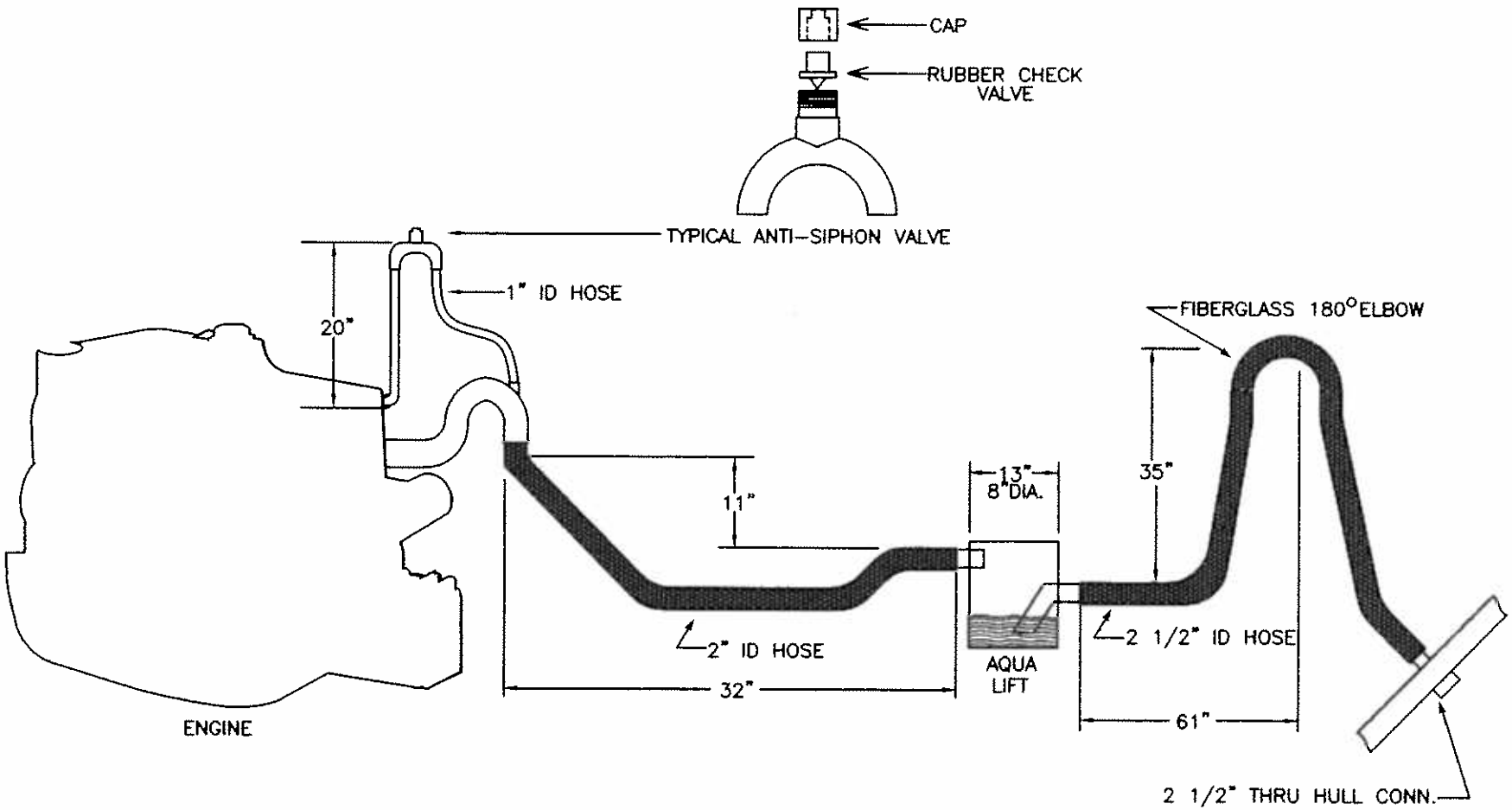
2. Do not operate the starter motor for more than 30 seconds without draining the Aqua-lift muffler.

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.



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

GENERAL TOLERANCES
ANGLES : ±0.5°
X.X : ±0.1
X.XX : ±0.01
X.XXX : ±0.005
SURFACE FINISH:

DO NOT SCALE DRAWING

Catalina Yachts
7200 BRYAN DAIRY RD.
LARGO, FL 33777
(727) 544-6661

TITLE: ENGINE EXHAUST SYSTEM

MODEL: CATALINA 387		DRAWING NO: 387-53001-0	
DESIGNED BY:	CHECKED BY:	SCALE: FULL	SIZE: C
DRAWN BY: G.T.B.	APPROVED BY:	DATE: 1/13/03	SHEET: 1/1

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 marked emergency tiller bag.

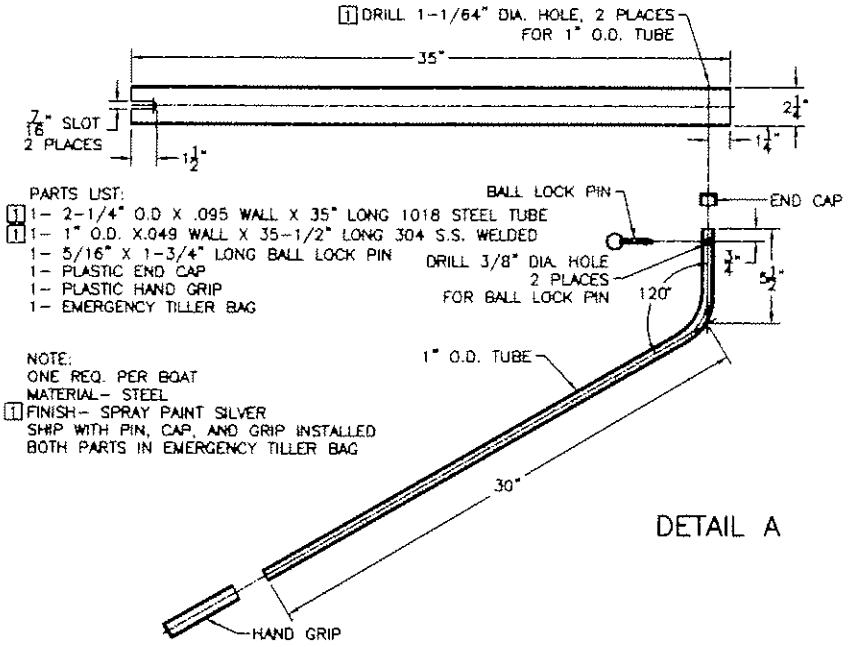
A dry run of the system will minimize confusion in an emergency:

1. Locate the emergency tiller.

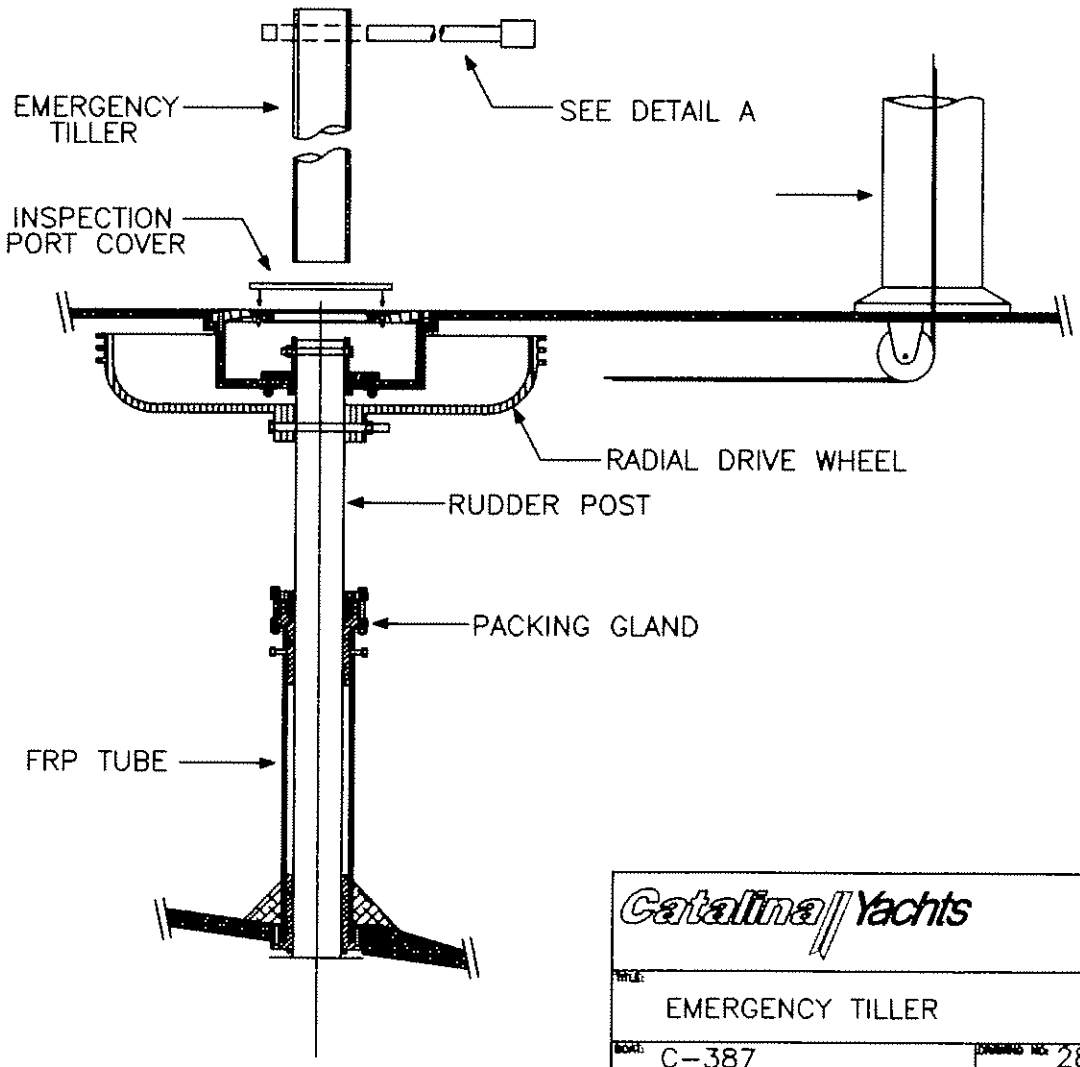
2. Remove inspection port cover.

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.



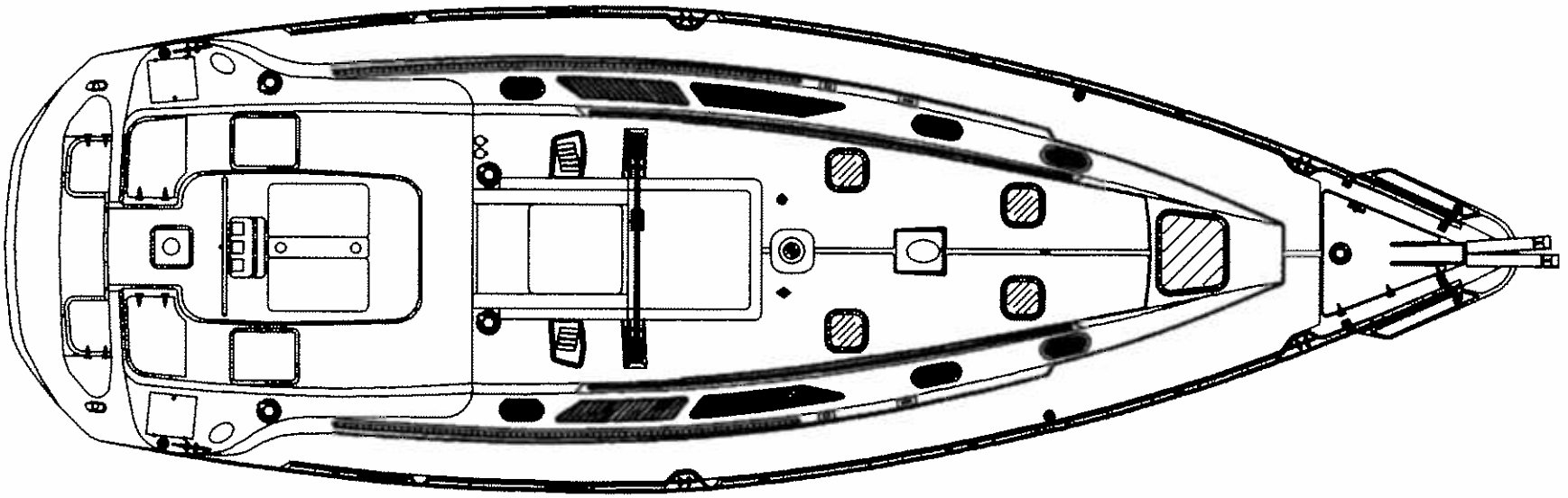
DETAIL A



Catalina Yachts
7200 BRYAN DIARY RD.
LARGO, FL 33777
(727) 544-6681

TITLE: EMERGENCY TILLER

BOAT: C-387		DRAWING NO: 28000-0	
DESIGNED BY:	CHECKED BY:	SCALE: NONE	SIZE: B / SHEET: 1/1
DRAWN BY: G.T.B.	APPROVED BY:	DATE: 2/17/03	

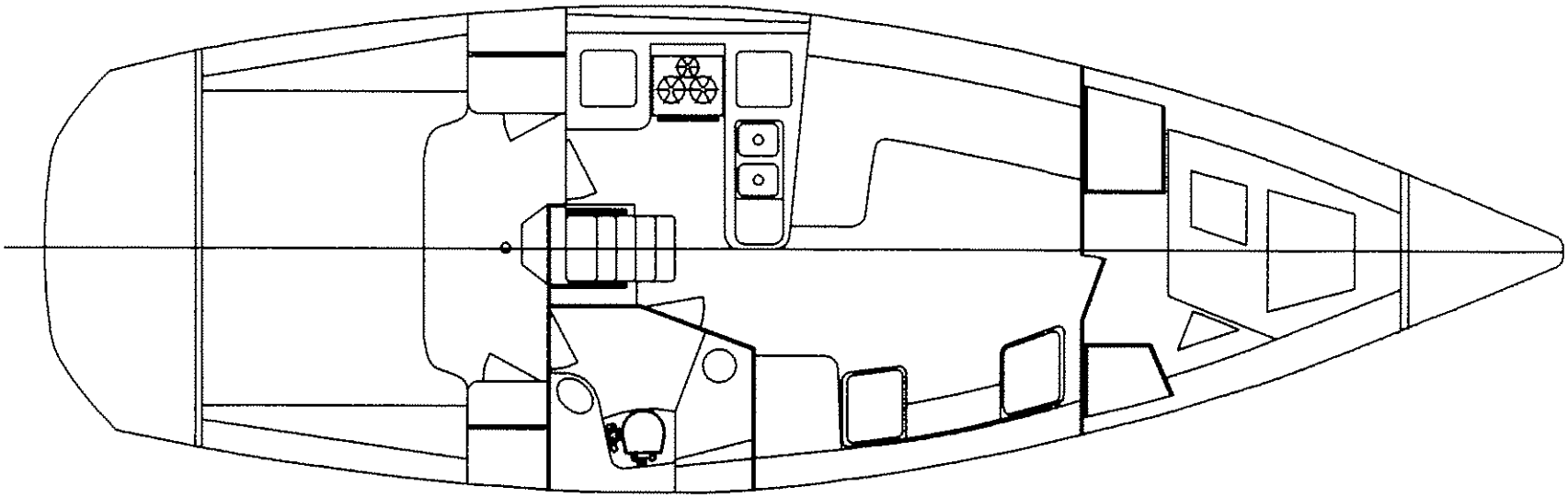


Catalina Yachts

7200 BRYAN DAIRY RD.
LARGO, FL. 33777
(727) 544-6681

TITLE: DECK PLAN

MODEL: 387		DRAWING NO.: 387-24003-0	
DESIGNED BY:	DRAWN BY:	SCALE: 3/4"=1'-0"	SIZE: D
DRAWN BY: GTB	APPROVED BY:	DATE: 1/16/03	SHEET: 1/1



Catalina Yachts
7200 BRYAN DAIRY RD.
LARGO, FL. 33777
(727)544-6881

ISSUED: NONE	DRAWING BY:	DRAWN BY: GTB
DATE: 1/16/02	FILE: 14001-0	
TITLE: INTERIOR ARRANGEMENT		SIZE: SHEET: 1/1
BOAT: CATALINA 387		DRAWING NUMBER: 14001-0

4.0 YACHT SYSTEMS - (Continued)

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.

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 CNG/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:
CAUTION

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

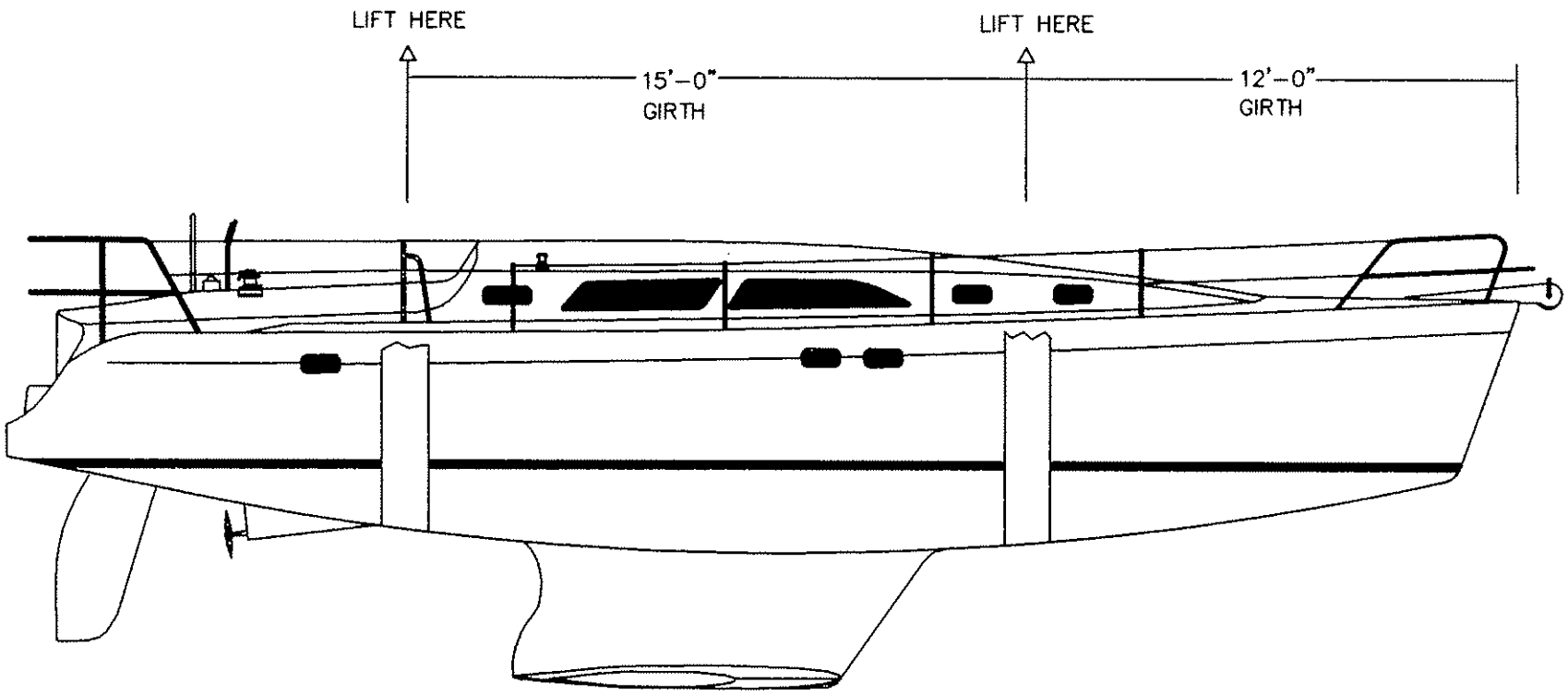
2. Keep cylinder valves closed when boat is unattended. Close them immediately in an emergency. When on board, cylinder valve or solenoid valve must be closed when stove is not in use.

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. Repeat the test for a multi-cylinder system.

Never use an open flame to check for leaks!



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

GENERAL TOLERANCES
ANGLES : ±0.5°
X.X : ±0.1
X.XX : ±0.01
X.XXX : ±0.005
SURFACE FINISH: 63

DO NOT SCALE DRAWING

Catalina Yachts

7200 BRYAN DIARY RD.
LARGO, FL. 33777
(727) 544-6681

TITLE: 387- LIFT POINTS

BOAT: CATALINA 387		DRAWING NO: 387-90001-0	
DESIGNED BY:	CHECKED BY:	SCALE: NONE	SIZE: B / SHEET: 1/1
DRAWN BY: G.T.B.	APPROVED BY:	DATE: 2/6/01	

5.0 DECOMMISSIONING:

5.2 WINTERIZING YOUR ENGINE:

LAYING UP:

In cold climates where yachts are decommissioned during the winter, your Catalina 387 may be safely stored in the water provided adequate measures are taken to prevent ice damage to the hull. Check with your yard to determine the feasibility of storing in the water.

When the boat is to be stored on land, the mast may be left stepped on the deck. However, it is recommended that the mast be removed at the time of hauling for a thorough inspection and preparation for next season.

This allows plenty of time over the winter months to order and replace any shrouds or rigging parts avoiding any delays in the spring commissioning.

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

BEFORE HAULING:

1. Refer to engine manual instructions for winterizing the engine. Perform the appropriate in-water steps.

2. Consult the manufacturer's instructions for winterizing any optional or owner-installed equipment.

3. Inspect the cradle on which the boat will be stored. Check welds and padded poppits for condition and repair as required.

4. Lift the boat with straps at the locations illustrated.

AFTER HAULING:

1. Wash bottom, removing growth and loose paint.

2. Wash topsides, deck and all other exterior fiberglass surfaces. Wax all except the nonskid surfaces.

3. Remove all sails. Follow sailmaker's instructions, or instructions in section 3.8, with regard to cleaning. Schedule any repairs required and store in a dry place.

4. Remove all sheets and lines, clean and store in a dry place.

5. If the mast had been removed from the yacht, remove all stays and shrouds from the mast. Wash the entire stay or shroud assembly, using fresh water and a stiff brush. Dry thoroughly, and coil into large non-kinking coils. Store the coils in a dry place. Wash and wax all spars. Coil halyards into non-kinking coils and put in a dark-colored plastic bag to protect from sunlight if storing outdoors. Lash them to the mast. Store the mast either inside or outside with adequate support along its length.

6. If mast is to be left in place, remove the boom, clean and store as described before. Clean shroud/stay end fittings, toggles, etc. using fresh water and a stiff brush. Apply a light coat of silicone grease, paying particular attention to the end fittings where they connect to the stays and shrouds.

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.

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.

6.0 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, 12 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. *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. 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. 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. 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

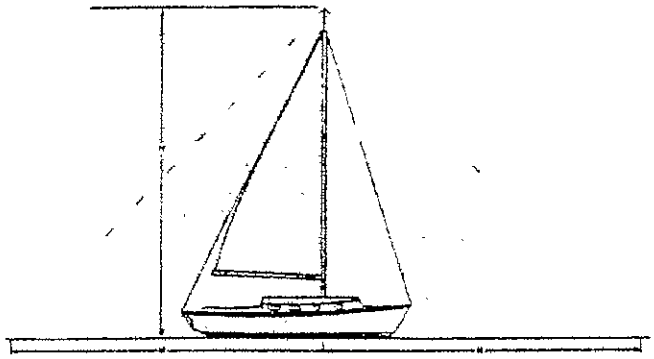


FIGURE 2 - BOAT WITH MAST NOT EXCEEDING 50 FEET (15M) ABOVE THE WATER

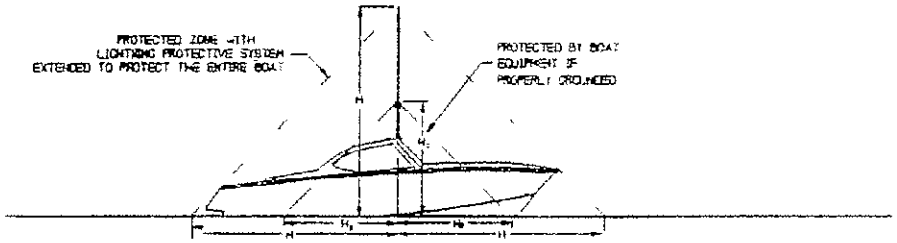
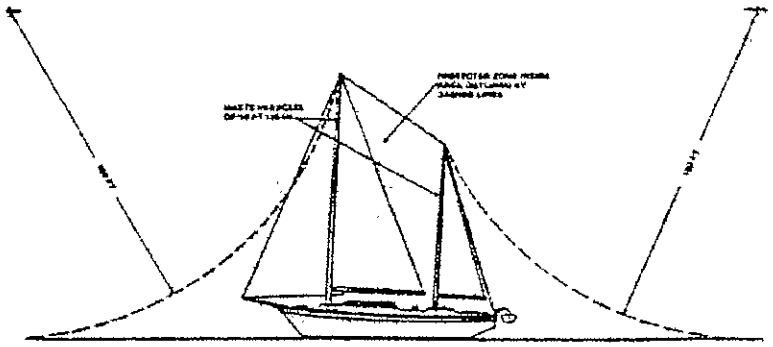


FIGURE 3 - BOAT WITH MASTS IN EXCESS OF 50 FEET (15M) ABOVE THE WATER - PROTECTION BASED ON LIGHTNING STRIKING DISTANCE OF 100 FEET (30M)



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.

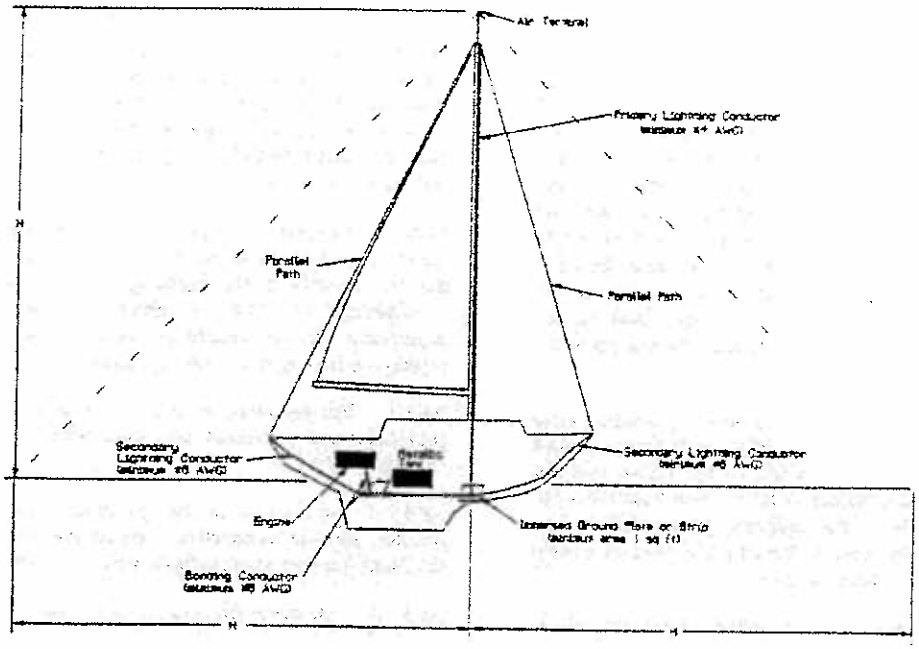
2. Non-conducting antenna masts with spiral wrapped conductors are not considered suitable for lightning protection purposes.

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.

COMMISSIONING PACKAGE SAFETY PACKAGE, FACTORY OPTIONS

Contents subject to change without notice

Quantity	***Description***
1 Each	40 Lb. Dan Forth Anchor
40 Foot	Acco 5/16" Galvanized High Test Chain
1 Each	5/8" x 250' Anchor Line
2 Each	3/8" Galvanized Anchor Shackle
4 Each	Taylor 10"x30" Superguard Fender
28 Foot	3/8" Fender Line
1 Each	Stearns USCG White Throw able Cushion
1 Each	Aluminum Folding Radar Reflector
1 Each	Orion Alert/Locate Flare Kit
1 Each	Tempo "Nature Safe" Horn
3 Each	Kidde 10 BC Fire Extinguisher
1 Each	Medical Sea Pack First Aid Kit
2 Each	Halogen Flashlight (With Batteries)
8 Each	Kent USCG Type I Life Jacket
1 Each	Chapman's Piloting & Small Boat Handling
4 Each	5/8" x 25' Dock Line
1 Each	8" Chrome Bell
1 Each	Beckson Yacht Log Book

LITERATURE AND WARRANTIES FOR EQUIPMENT WHICH MAY BE SUPPLIED WITH THIS MANUAL:

Batteries, 12 volt wet cell

Headsail furling gear

Dutchman flaking system

Furling mainsail mast

Furling mainsail boom

Diesel engine

Factory installed electronics (separate manual)

Running lights

Marine head

Galley stove with oven

Bilge pump, manual

Bilge pump, electric

Pedestal steering

Water heater

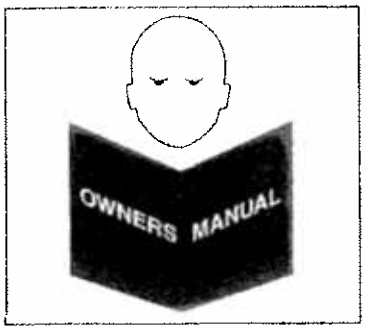
Pressure water pump

Rudder bearings

Dripless shaft seal

Anchor windlass

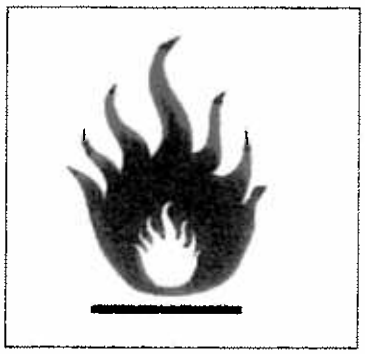
Through-hull valves "seacocks"



WARNING

Read the Owners Manual before using this vessel

INSTALL NEXT TO ENGINE PANEL OR DIRECTLY BELOW HULL I.D. PLATE.



WARNING

Keep curtains away from stove when it is being used

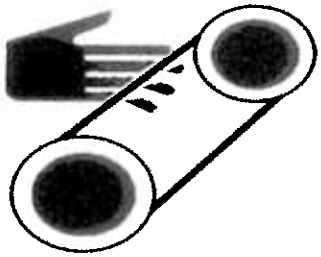
INSTALL ON DECK LINER UNDER WINDOW OVER GALLY STOVE.

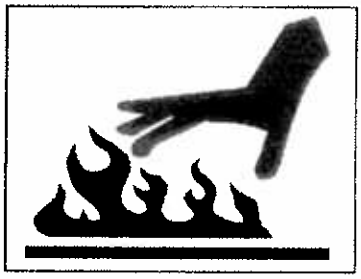
WARNING

Close the through hull valves each time the head is used

ON VERTICAL SURFACE BEHIND EACH TOILET.

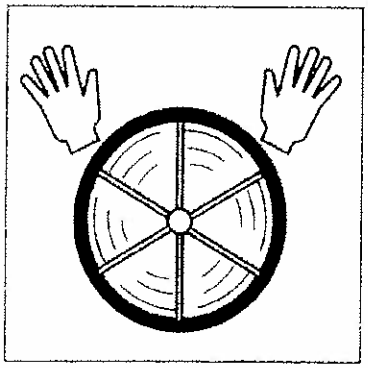
WARNING





Do Not open door to the engine compartment while engine is running

INSTALL ON ENGINE COVER.



DANGER

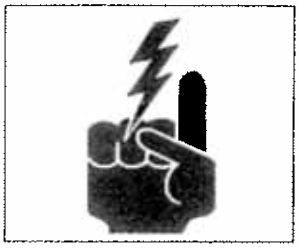
Keep hold of the wheel when backing up

INSTALL ON STEERING PEDESTAL ABOVE INSTRUMENT HOUSING.

FUEL SHUT OFF VALVES INSIDE

ADJACENT TO VALVE LOCATION ON BULKHEAD.

DANGER



- Watch for overhead wires
- Stay away from overhead power lines

EACH SIDE 2-REQUIRED ON MAST 12" FROM BOTTOM.

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 Paper Metal Rags Crockery Glass Dunnage Food	Plastic, Dunnage, Linning and Packing Materials That Float, Also If Not Ground to Less Than One Inch: Paper Crockery Rags Metal Glass Food	Plastic, Dunnage, Linning and Packing Materials that Float.	Plastic

State and Local Regulations May Further Restrict the Disposal of Garbage

INSTALL IN COMPANIONWAY

- 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.

INSTALL ON SHAFT COUPLING AFTER POOL TEST.

WARNING

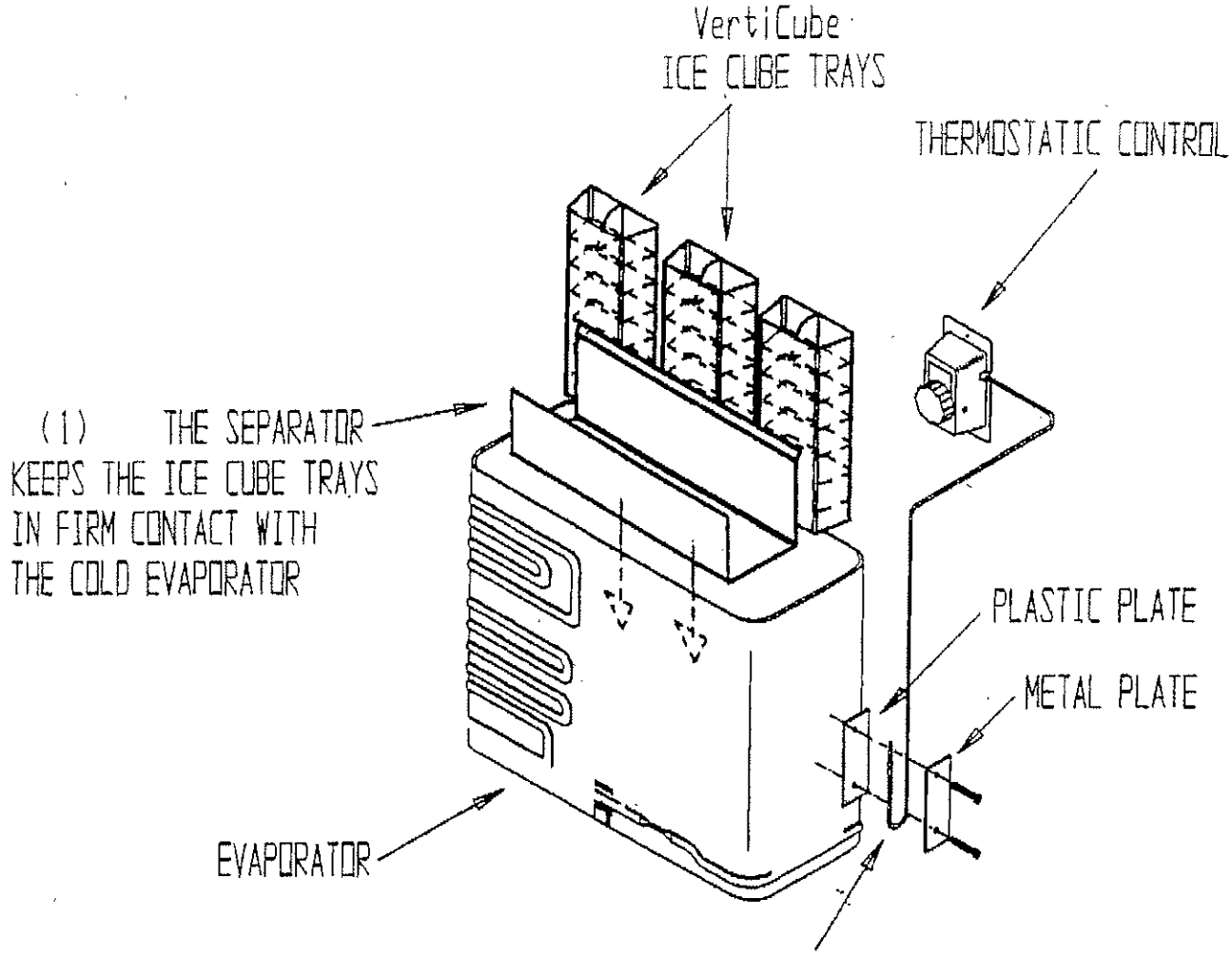
THESE TIE RODS SUPPORT THE MAST. THE LOCKING NUTS AT THE BOTTOM END MUST BE TIGHT AGAINST THE BEARING SURFACE. CHECK THE LOCKING NUTS, CLEVIS PINS AND COTTER PINS IN THIS ASSEMBLY BEFORE STEPPING THE MAST TO VERIFY THAT NO COMPONENTS HAVE LOOSENED DURING TRANSPORTATION
THIS BOAT HAS_____TIE RODS.

INSTALL ON ONE CHAIN ROD ONLY

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.

INSTALL ON ENGINE COVER.



(1) USING THE ICE TRAY SEPARATOR

(2) FORMING AND ATTACHING THE THERMOSTAT SENSING TUBE TO THE EVAPORATOR

INTERNATIONAL MARINE CERTIFICATION INSTITUTE

International Non-Profit Association
Rue Abbe Cuypers 3
B-1040 Brussels
Belgique
+32-2-741 6836
+32-2-741 2418

EXAMINATION REPORT

We hereby certify that the following boat type

Catalina Yachts, Inc.

21200 Victory Blvd., P.O. Box 989 - WOODLAND HILLS, CA 91367 - UNITED STATES

CATALINA 387

Boat Type	**Sail**
Boat design category	**A**
Module type	**Aa**
Examination type	**No**
Length of hull [m]	**11,81**
Beam of hull [m]	**3,67**
Loaded displacement mass [kg]	**10.371**
Maximum rated engine power [kW]	**30**
Number of persons recommended	**8**
Recommended load [kg]	**800**
Certificate number	**BCATAL015**

meets the Essential Safety Requirements 3.2 for Stability and Freeboard and 3.3 for Buoyancy and Floatation of the Directive 94/25/EC for Recreational C

U. Heinemann

Ulrich Heinemann (Managing Direc
for EU - Notified Body : 0609
2004-12-17

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

2005 model

References to the relevant standards used are given on the Declaration of Conformity