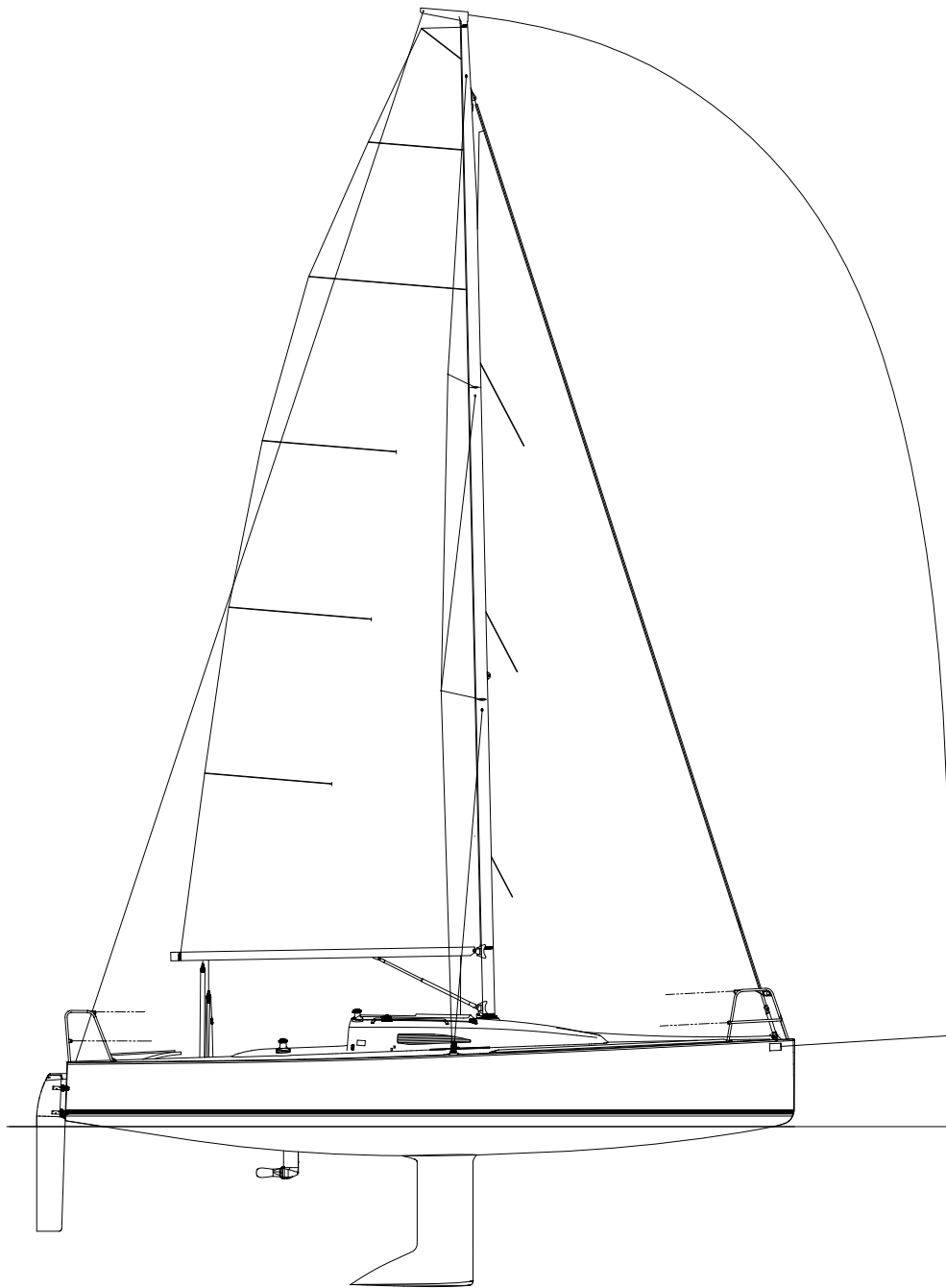




J/88 Owner Manual



HIN:.....

Yacht Name:.....

Owner Name:.....

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Table of Contents

Introduction	4
CE Certification	5
Specifications	8
Important Contacts	9
Commissioning Checklist	14
Important Commissioning Follow-up	15
Tuning the Rig	16
Diagrams, Layouts, & Schematics	18
Mainsheet Diagram.....	18
Traveler System Layout.....	19
Adjustable Jib Lead System.....	20
Cabin Top Layout.....	21
Reefing System Layout.....	22
Backstay System.....	23
Cunningham System.....	24
Spinnaker Sheet Blocks.....	25
Engine Fuel and Exhaust Layouts.....	26
Bilge Pump Layout & Switch.....	27
Thru-Hull & Seacock Locations.....	28
Head & Holding Tank Schematic.....	29
DC Distribution Panel.....	30
DC Component Layout.....	31
DC Battery Charging Schematic.....	32
AC Optional Schematic & Panel.....	33
Bonding System.....	34
Engine System	35
Sail Drive.....	35
Fuel System.....	35
Engine Cooling & Exhaust Systems.....	35
Engine Safety Precautions.....	36
Engine Start & Shutdown.....	37
Engine Maintenance.....	38
Plumbing Systems	39
Thru-Hulls & Seacocks.....	39
Pump Systems.....	39
Head System.....	39
Electrical System	40
Optional 110V AC System	41
Safety	43
Maintenance Tips & Checklist	45
Storage Tips	48
APPENDIX A - Best Practices - Boat Inspection.....	50
APPENDIX B - ABS (Dated) Guidelines for Survey After Construction.....	55
APPENDIX C - Care and Cleaning Recommendations for Acrylic Portlight.....	56
APPENDIX D - J/88 Supplier List.....	58
CCFC Limited Warranty	See Warranty Package Included with the Yacht

Introduction

WELCOME ABOARD and welcome to the J/Boats family of owners. Your boat is designed and engineered to be the strongest, best performing, easiest-to-use, and most comfortable sailing boat of its type.

Sailing involves risk, most of which can be minimized with advance planning and proper seamanship. The J/88 owner should become proficient in all aspects of handling the vessel under sail and power, and be well versed with emergency procedures before undertaking any offshore passage. The owner is further responsible for any required state registration or federal documentation, accident reporting, outfitting the vessel with proper safety equipment, and the safe operation of the vessel. Your J/Boats Dealer will be happy to refer you to Boating Safety Courses or other seminars available.

Please be sure to complete the enclosed warranty card and mail to C&C Fiberglass Components, Inc. (CCFC)

This owner manual is furnished for your benefit, but shall in no way be construed as any sort of warranty or contract, express or implied, creating any obligation on the part of J/Boats, Inc., with respect to any fact or facts or any advice or opinions contained herein. The sole and exclusive warranty of the product is the CCFC Warranty described in the appendix hereto and on the Warranty Card furnished with the yacht.

J/BOATS, INC. HEREBY DISCLAIMS ANY AND ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY OF MERCHANTABILITY.

CE Certification:

CE Design Category:

- With standard equipment the J/88 meets Category B or C Requirements for CE Certification.

CE Certification Notice:

This manual has been compiled to help you to operate your J/88 with safety and pleasure. It contains details of the J/88, the equipment supplied or fitted its systems and information on its operation. Please read it carefully, and familiarize yourself with the craft before using it.

Even when your boat is categorized for them, the sea and wind conditions corresponding to the design categories A, B, and C range from strong gale to severe conditions, open to the hazards of a freak wave or gust, and are therefore dangerous conditions, where only a competent, fit and trained crew using a well maintained boat can satisfactorily operate.

Ensure that the anticipated wind and sea conditions will correspond to the design category of your boat, and that you and your crew are able to handle the boat in these conditions.

This owner's manual is not a course on boating safety or seamanship. If this is your first boat, or you are changing to a type of boat you are not familiar with, for your own comfort and safety, please ensure that you obtain handling and operating experience before "assuming command" of the boat. Your dealer or national sailing federation or yacht club will be pleased to advise you of local sea schools, or competent instructors.

This owner's manual is not a detailed maintenance or trouble shooting guide. In case of difficulty, refer to the boat dealer, builder or its representative. Always use trained and competent people for maintenance, fixing or modifications. Modifications that may affect the safety characteristics of the craft shall be assessed, executed and documented by competent people. The boat builder cannot be held responsible for modifications he has not approved.

NOTE: Any change in the disposition of the masses aboard may significantly affect the stability, trim and performance of your boat. Users of this boat are advised that:

- All crew should receive suitable training;
- The boat should not carry more than the manufacturer's recommended load;
- Bilge water should be kept to a minimum;
- Stability is reduced by any weight added high up;
- In rough weather, hatches, lockers and doorways should be closed to minimize the risk of flooding;
- Stability may be reduced when towing or lifting heavy weights using a davit or boom;
- Breaking waves are a serious stability hazard.

In some countries a driving license or authorization are required, or specific regulations are in force.

Always maintain your boat properly and make allowance for the deterioration that will occur in time and as a result of heavy use or misuse of the boat.

Any boat – no matter how strong it may be, can be severely damaged if not used properly. This is not compatible with safe boating. Always adjust the speed and direction of the craft to sea conditions.

If your boat is fitted with a life raft, read carefully its operating manual. The crew should be familiar with the use of all safety equipment (harness, flares, life raft, etc.) and emergency maneuvering (man overboard recovery, towing, etc.); sailing schools and clubs regularly organize drill sessions.

PLEASE KEEP THIS MANUAL IN A SECURE PLACE, AND HAND IT OVER TO THE NEW OWNER WHEN YOU SELL THE CRAFT.

Definitions of CE design categories:

A OCEAN: Designed for extended voyages where conditions may exceed wind force 8 (Beaufort scale) and significant wave heights of 4 m and above but excluding abnormal conditions, and vessels largely self-sufficient.

B OFFSHORE: Designed for offshore voyages where conditions up to, and including wind force 8 and significant wave heights up to, and including, 4 m may be experienced.

C INSHORE: Designed for voyages in coastal waters, large bays, estuaries, lakes and rivers where conditions up to, and including, wind force 6 and significant wave heights up to, and including, 2 m may be experienced.

D SHELTERED WATERS: Designed for voyages on sheltered coastal waters, small bays, small lakes, rivers and canals when conditions up to, and including, wind force 4 and significant wave heights up to, and including, 0,3 m may be experienced, with occasional waves of 0,5 m maximum height, for example from passing vessels.

NOTE: The significant wave height is the mean height of the highest one third of the waves, which approximately corresponds to the wave height estimated by an experienced observer. Some waves will be double this height.

J/88 Recommended Loading

ISO 12217-2

Category B - Maximum Crew = 6 People at 75 kg (165 lbs.) each.

Category C or D - Maximum Crew = 8 People at 75kg (165 lbs.) each.

Category B or C Manufacturer's Recommended Maximum Total Load = 911 kg (2,008 lbs.) - includes crew

This assessment has been made assuming that all standard equipment is aboard and that the boat in light craft condition has a mass of 2,302 kg. (5,078 lbs.) This recommended maximum load takes into account the mass of the following:

- a) The number of persons onboard: Where children are carried as part of the crew the maximum number of persons may be exceeded provided that each child's mass does not surpass a limit of 37.5 kg (83 lbs.) and the total persons mass (75 kg) is not exceeded.
- b) basic equipment mass of (LH-2.5)² considered not to be less than 10kg.
- c) stores and cargo (if any), dry provisions, consumable liquids [not covered by d) or e)], and miscellaneous equipment not included in the light craft mass or in b);
- d) consumable liquids (fresh water, fuel) in portable tanks filled to the maximum capacity;
- e) Consumable liquids (fresh water, fuel) in permanently installed tanks filled to the maximum capacity;
- f) a life raft or dinghy when intended to be carried.

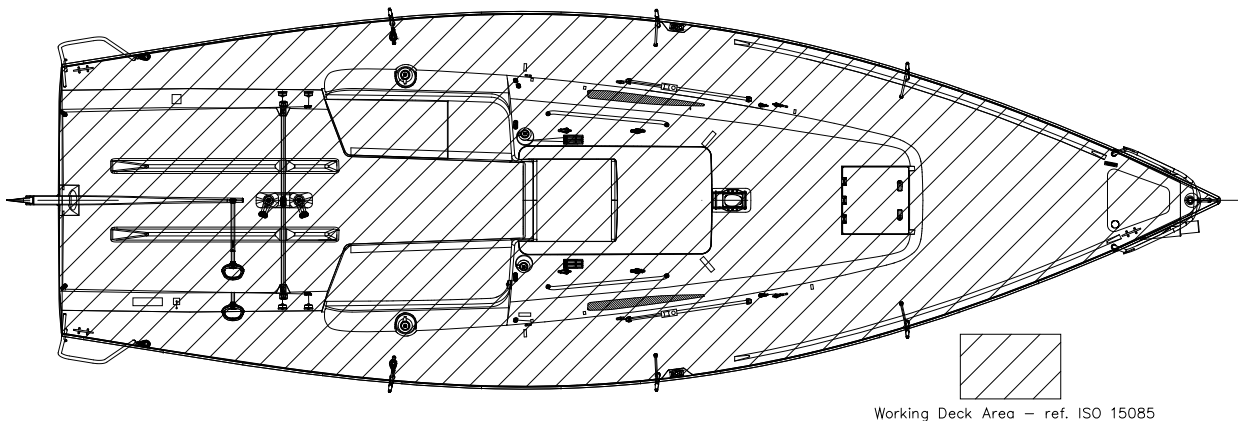
This boat has been assessed using the Stability Index (STIX), which is a measure of the overall stability safety and considers the effects of boat length, displacement, hull proportions, stability characteristics and resistance to downflooding. This assessment has yielded the following data:

J/88 Minimum Operating Condition:

- STIX = 31.36
- Angle of Vanishing Stability = 131 degrees

J/88 Loaded Displacement Condition:

- STIX = 28.82
- Angle of Vanishing Stability = 123 deg.



J/88 is equipped with 610mm height double wire lifeline system supported by SS stanchions as well as SS bow and stern rails for man overboard prevention. A stern boarding ladder is standard for man overboard recovery.

Specifications

MODEL	J/88
LOA (Lh)	8.90m (29.19')
LWL (Lwl)	8.18m (26.84')
Beam (Bh)	2.90m (9.50')
Draft : [Max Loaded Draft]	1.98m (6.50') : [2.024m (6.64')]
Ballast	830 kg (1,830 lbs.)
Ballast Type	Fabricated SS spar/GRP skin/with cast lead with 3% antimony
Displacement - standard boat	2,264 kg (4,990 lbs.)
100% Sail Area	40.80 sq m (439 sq ft)
IM	11.79m (38.67')
ISP	12.68m (41.60')
J	3.44m (11.28')
P	11.22m (36.82')
E	3.66m (12.00')
Engine	Yanmar 2YM15, 10.0kw (13.2hp), SD 20 Saildrive
Fuel Capacity*	57 liters (15 US gallons)
Engine Alternator	80 amp standard Yanmar marine alternator
House Battery Capacity	90 amp hours, add'l 90 amp option
Standard Propeller	Flex-O-Fold geared folding prop 14"dia x 11"pitch
Battery Type	AGM Group 27 Glass Mat
Holding Tank Capacity	23 liters (6 gal.)
Optional Water Capacity**	19 liters (5 US gallons)
Limit of Positive Stability (mMOC)	131 degrees
Hull & Deck Core Material	Hull - Baltek® AL600 Balsa, Deck - Corecell Foam
Hull & Deck Molding Process	Hull & Deck - Resin Infusion,
Hull Osmotic Blister Warranty	10 Years: Owner Transferable
Mast Height Above Water	13.68 m (44' 10") not including masthead instruments
Displacement/Length Ratio	112
Sail-Area/Displacement Ratio	24
CE Certification Design Category	Category B or C

*Fuel capacity may not be completely usable depending upon trim and loading of the craft and a 20% reserve should be kept on board.

**All water capacity may not be usable depending upon trim and loading of the craft.

Important Contacts

Dealer:	Phone:
Street:	Web Site:
City, State, Zip:	E mail:

Marketing & Design	J/Boats, Inc. PO Box 90 Newport, RI 02840 www.jboats.com	Phone: 401-846-8410 Fax: 401-846-4723 email: info@jboats.com
Builder:	CCFC, Inc. 75 Ballou Blvd. Bristol, RI 02809 www.ccfci.com	Phone: 401-254-4342 Fax: 401-254-8978 email: info@ccfci.com
Cushions:	Ken's Upholstery 101 Narragansett Ave. Barrington, RI 02806	Phone: 401-246-1244 Fax: 401-246-0731 email:
Spars/Rigging:	Hall Spars & Rigging 33 Broadcommon Rd. Bristol, RI 02809 www.hallspars.com	Phone: 401-253-4858 Fax: 401-253-0370 email: info@hallspars.com
Canvas:	Thurston Sails 112 Tupelo Street Bristol, RI 02809	Phone: 401-254-0970 Fax: 401-253-7830 email: thurstoncanvas@fullchannel.net

Note: See Appendix D for specific J/88 equipment supplier list

Getting Started With Your J/88

Generally, your dealer or commissioning yard will help you prepare your boat before launching. And in most instances they will undertake the entire commissioning job. They are experts in the field and are capable of completing most commissioning tasks.

Before Proceeding

Before you begin to assemble your new boat you should become familiar with the different sail control systems and associated hardware. All running rigging and loose deck hardware items are shipped from the factory in parts boxes. To help you properly install these items please refer to the rigging and hardware sections and diagrams in this guide.

The Commissioning Checklist: will help you double check that the J/88 is assembled properly and all systems and rigging are functioning properly. If a boatyard other than an authorized J/Boat dealer is performing the work, review this list with them to establish what needs to be done and by whom.

Topsides: wash off all dirt and grime accumulated from delivery. Use only non-abrasive cleansers on the gelcoat. Then apply a coat of high quality car or boat wax to prolong the life and sheen of the gelcoat.

Bottom: Bottom preparation is critical to long-lasting enjoyment. To ensure a professional finish, carefully review the paint manufacturer's recommendations for preparing the bottom. Be sure that there is a healthy amount of epoxy primer (using paint manufacturer build-up recommendations) to cover the keel and rudder PRIOR to final coating of bottom paint. Avoid use of copper or any metallic based bottom paints on or in the proximity the aluminum Saildrive leg. Saildrive leg should also be thoroughly coated with epoxy primer and any nicks or scratches properly sealed.

Chainplates: are manufactured of polished stainless steel. Shroud chainplates are mounted directly to a highly reinforced area of the hull flange and attached to large aluminum backup plates. The backstay stainless steel padeyes are bolted to a reinforced area of the transom.

Stemhead Fitting: is a custom stainless fabrication bonded to the hull inside the foredeck anchor locker area. The stem head fitting is engineered to withstand all headstay loads.

Mast Step Tabernacle: is a custom stainless fitting for a deck step mast arrangement and incorporates two large stainless pins that attach to a matching mast step plate bolted to the deck. This deck plate includes an internal chase way to allow mast wires to enter the boat. There are locations for halyard and reefing line turning blocks on each side. The carbon mast sits atop a G-10 mast base plug and a SS thru-bolt prevents the mast from jumping off the plug. With the forward pin removed, the tabernacle arrangement allows the mast to hinge aft during unstepping.

Toe Rail: J/88 is equipped with molded toerails at the deck edge forward of the mast and support toerails in the cockpit for the helmsman and mainsheet trimmer just aft of the cockpit seats.

Stanchions & Pulpits: are designed for proper offshore safety as well as to facilitate access to the boat. Optional are two full length lifeline gates to port and starboard. The double lifeline arrangement includes (2) standard stern lifelines. All stanchions and rails are 1" diameter stainless steel with smaller diameter inboard support legs on the stanchions. Optional black powder coat is available for stanchions and rails.

The J88 is equipped with Hall Rigging provided 5/32" 1 x 19 SS wire lifelines. To assemble the system:

- Attach jaw to bow rail termination points port and starboard.
- Remove threaded eye from swage fitting and thread through stanchions.
- Thread through aft stanchion and through optional lifeline pad if so equipped.
- Secure threaded eyes to lifelines.
- Lash to stern rail with provided lashing lines.
- Attach and lash ends of stern gates between stern rails across transom.

Your lifelines and lashings should be checked for wear as part of a regular boat maintenance program. Potential chafe areas are stanchion pass-throughs and lashing points. Also remember to rinse lifelines whenever you rinse your boat and deck hardware, as sharp salt crystals deposited when sea water dries can be a source of corrosion.

Flush Skylight Ventilation Hatch: is made of extruded anodized aluminum and scratch-resistant acrylic cover. The hatch comes equipped with 180 degree articulation. Care should be taken when opening the hatch to prevent the lid from slamming onto the deck.

Fixed Acrylic Portlights are pre-installed and sealed. Owners should take great care not to use any abrasive or harsh cleaners on these ports. Specific cleaning instructions from the manufacturer are included in the appendix.

Optional Opening Ports: are of painted aluminum frames with scratch-resistant acrylic and arrive "ready-to-use".

DO NOT PERMIT ACETONE OR OTHER HARSH CLEANSERS TO GET ON PORTS OR HATCHES AS THEY MAY DAMAGE THE FINISH & CLARITY OF SOME DECK HARDWARE.

Deckhouse Handrails: Stainless handrails are standard for secure maneuvering on deck and ease of maintenance.

Winches: Standard winches are aluminum self-tailing models. The location of these winches facilitates sailing shorthanded. Each is geared to match the load requirements of the specific task.

Rudder, Tiller and Steering Hardware

J/88 rudder is molded with E-glass & VE resin with an epoxy foam core. The skins include triaxial glass fabric with several unidirectional supporting layers. There is additional reinforcement and/or blocking at all hardware penetrations as well as along the leading and trailing edges and the rudder head. The trailing edge is very narrow and as such is a damage prone area when handled poorly. Owners should use great care when removing and installing the rudder to avoid trailing edge damage.

The tiller is a molded gelcoat and E-glass curved tiller with an extendable offshore tiller extension. This is attached to the top of the rudder and articulates. Care should be taken not to stress the tiller by placing unnecessary weight on top of the forward end while sailing as this could lead to gelcoat cracks and other issues where it attaches to the rudder.

The rudder hardware includes two SS rudder straps bolted to the rudder, two SS transom mounted gudgeons and two SS rudder pins. Be sure to install the retaining rings below each gudgeon once the pins are installed.

J/88 Rigging

The running and standing rigging items supplied with your boat are designed for efficiency. A wealth of racing and cruising experience has gone into the deck layout to make sailing and boat handling safe and easy to handle by a couple or a racing crew.

- **Harken Headsail Furling:** The Harken furler is provided with the boat standard and requires assembly prior to installing the mast. A complete instruction manual is included with this hardware detailing the proper procedure. In addition, an important Harken service bulletin is included at the end of this manual.
- **Mast:** Rigging the J/88 mast is a common procedure, and best handled by a qualified marine rigger. Be sure all mast related electronics and wind indicators are properly wired and installed prior to stepping the mast. After stepping the mast it is VERY IMPORTANT to properly secure the mast to the mast step with the provided through-bolt. We recommend that a small cord is tied and taped approx. 24" above each lower spreader between the intermediate shroud and upper shroud if you plan to sail with a spinnaker. Simply tie this line to each shroud (allowing for some slack) and tape ends over with rigging tape. This prevents the spinnaker (during a take-down) from potentially dropping into the V that is formed at the lower spreader between these two shrouds.
- **Backstay Tackle:** The J/88 is equipped with a double ended cascading backstay adjustment system that leads to each side of the cockpit just forward of the traveler. Please refer to the complete system diagram included in the next section of this manual for proper configuration.

A WORD ABOUT DYNEEMA (soft) BACKSTAYS: The standard Dyneema backstay may need to be properly stretched out in order to allow cascade legs in the system to fit properly. You can expect some stretching of the upper backstay and the cascade legs initially, but this should work itself out after a couple of nights of tensioning the system. If you find any of the parts are too short, then please try a temporary Dyneema lashing and some tension on the system to attempt to stretch things out and make everything fit.

- **Boom:** The J/88 is provided standard with one continuous reef line. Single line reefing is achieved by first tying off the outboard end on the boom after running through the clew reef grommet on the reef at the leech of the mainsail. This line then runs forward and deflects up at the inboard end sheave on the boom (see diagram) to a block with a hook and then down through the padeye on the side of the mast and aft to the inboard starboard rope clutch.
- **Boom Vang:** The Hall QuikVang is a mechanically operated spring loaded boom vang with a Harken block and tackle purchase system. This vang system allows for quick and easy adjustment and also acts as a boom topping lift. The vang is affixed to the vang plate welded underneath the boom and to the mast at the vang gooseneck located just above the mast step. See the QuikVang operating instructions for how to adjust the internal spring for best results.

Sail Control Systems

After stepping the mast and connecting the boom, Quikvang, furler, and backstay, rig all halyards and the remaining sail control systems on deck.

- **Main Halyard:** exits the mast on the port side, runs through the aft mast block on the mast step out to the inboard triple organizer and then aft through the inboard rope clutch and finally to the winch when necessary.
- **Jib Halyard:** exits the mast to port, leads through a mast base block, out to the middle organizer position aft to the outboard rope clutch.
- **Spinnaker Halyard:** exits the mast to starboard, leads through mast base block, out to the middle ferrule of the organizer aft to the outboard rope clutch.
- **Mainsheet Traveler:** is a 4:1 Harken low friction mid-range system. The purchase system on each side of the cockpit controls a Harken traveler car mounted on the track (see diagram for set-up).
- **Outhaul:** is an internal 8:1 system adjusted at the cleat on the underside of the boom and comes pre-assembled from Hall Spars.
- **Cunningham:** The cunningham is a simple 6:1 system that is installed at the mast. See diagram for details.
- **Mainsheet:** system is a 6:1/18:1 system (see diagram). The system includes a strop for the rough tune to minimize length of line in cockpit. The system is designed to allow easy and quick adjustments of the mainsheet with power on the fine tune for highly loaded adjustments. The hardware is within easy reach of the helmsman and facilitates short-handed sailing.
- **Jib Sheet:** attaches to the headsail and leads to the adjustable jib block on the track, aft to the deflector eye on the deck and then directly to the primary winch.
- **Spinnaker Gear:** The J/88 includes hard points for the spinnaker at the forward leg of the sten rails and on the stanchion bases just outboard of the cockpit. See the deck hardware layout diagram for more info.

Commissioning Checklist

Pre-Launch

- Read equipment owner manuals
- Pre-rig mast and check installation of:
 - halyards
 - blocks
 - electronics
 - shrouds
 - spreader end chafe guards
 - shroud spinnaker protection
 - lifeline pins
- Pre-rig boom
- Bottom painted or touched up
- Saildrive leg touched up – engine intake holes clear of any debris or growth.
- Check propeller/zinc
- De-winterize engine and check status of:
 - engine oil/ filter
 - coolant level
 - transmission fluid level
 - water intakes/filter
 - fuel lines/filter
- Check battery charge
- Check all hose clamps, tighten as required
- Close all seacocks
- Wire tie wooden plugs near all thru-hulls

Loose Gear

- Fenders and lines
- Dock lines
- Winch handles
- Ignition/boat keys/combination
- Bilge pump handle
- Double-check sling locations and mark
- Anchor, chain and rode
- Fire extinguishers installed
- First aid kit
- Coast Guard Required Safety Gear

Launch

- Check for leaks
- Check seacocks
- Check engine seal for leaks

Engine Start

- Read engine owner's manual
- Open raw water valve on Saildrive leg
- Start engine

- Check exhaust for cooling water flow
- Check oil press., water temp., charging gauges
- Check transmission- forward/reverse
- Check Saildrive seal

Steering System

- Attach Tiller Extension
- Check for free rotation of rudder
- Check SS pins are secured

Step Mast

- Check & remove SS deck mast step bolts
- Hoist spar and lower to deck (or pin aft hole of step and rotate mast up in place with a safe means of lifting)
- Be sure to thread mast wires down the chase way into the interior
- Install both SS bolts for the mast step
- Thread headstay through furler drum and attach turnbuckle to stemhead fitting in anchor locker.
- Adjust turnbuckle as desired & assemble toque tube according to Harken manual (see service bulletin at end of this manual).
- Attach all shrouds and hand tighten.
- Dock tune shrouds.
- Attach and rig backstay and cascade system.
- Install the mast through bolt just above the step.
- Run and connect mast junction box wires (on centerline forward to main bulkhead and to junction box in head area).

Rigging

- Install boom
- Lead all halyards to stoppers on cabin top
- Rig single line reef system.
- Install and connect boom vang
- Rough tune spar

Systems Check

- Fill optional water tank
- Fill fuel tank
- Check operation of electrical systems, pumps, head, etc.
- Check sailing electronics

Trial Sail

- Raise and lower sails to check for fit
- Monitor engine performance
- Check bilge for leaks
- Check sailing electronics
- Check for backstay stretch

Important Commissioning Follow-up

The initial sea trial period, or the first 30 days after launching a new boat always requires important follow-up by the owner including sail fit checks, rig tuning and adjustments, instrument and compass calibration, maintenance and systems checks, etc... Your dealer and their support staff and other local suppliers will help you with this process. It is imperative that the following areas of the boat are inspected and confirmed to be operating properly after the initial 30 days.

30 DAY INSPECTION LIST:

- **SAILDRIVE ZINC** - Inspection of the Saildrive zinc is very important in the first 30 days following launch. Accelerated zinc corrosion may be a sign that the galvanic isolator on the boat has been defeated or indicate some other electrical wiring problem onboard. **RAPID CORROSION OF THE SAILDRIVE ZINC SHOULD NEVER BE IGNORED. IMMEDIATE ATTENTION IS REQUIRED BY THE OWNER & DEALER.** Failure by the owner or dealer to respond to this important sign of electrolysis may lead to severe damage to and/or failure of the aluminum saildrive leg.
- **MAST, SPARS, RIG & RIGGING** – The standing rigging terminations will seat and the SS wire and the Dyneema backstay will stretch during initial sea trials. It is prudent to inspect all fittings, terminations, turnbuckles, halyards, mast step, to look for any signs of unusual wear after sea trials. Checking and adjusting rig tuning is also recommended.

The following ship systems must also be tested for proper operation:

- ENGINE, THROTTLE CONTROL & FUEL SYSTEM.
- OPTIONAL FRESH WATER SYSTEM.
- HEAD SYSTEM.
- MANUAL AND ELECTRIC BILGE PUMP SYSTEMS.

Finally:

- REVIEW PROPER SAFETY EQUIPMENT – confirm all required safety gear is onboard and in working order.
- CHECK ALL LIFELINE TERMINATIONS & LASHINGS – Confirm cotter pins in end fittings are properly set-up.
- RE-VISIT & REVIEW COMMISSIONING CHECKLIST

Any problem areas identified above must be addressed promptly.

Tuning the Rig

Tuning the Mast

Following is a general guide to tuning your J/88 mast. Please consult your sailmaker for “fine-tuning” the mast to match the sails in varying wind conditions.

BEFORE YOU BEGIN INSURE THE MAST THROUGH BOLT IS PROPERLY INSTALLED TO PREVENT THE MAST FROM JUMPING OFF THE MAST STEP.

With the standard length J/88 headstay (turnbuckle ½ open) the mast rake as measured from the back of the mast at deck level to a plumb on the main halyard should be approximately 12-14 inches.

For shroud location the “Uppers” (V1) are attached to the aft outside chainplate hole, the “Lowers” (D1s) are connected to the hole on the portion of the chainplate that angles inboard. The “Intermediates” (D2s) are positioned in the forward location at each lower spreader and attach to the forward outboard position on each chainplate.

Begin by hand tightening the upper shrouds, being careful to keep the mast centered aloft. Check alignment by hoisting a tape measure up the main halyard and comparing measurements to the port and starboard chainplates. When the top of the mast is centered, sight up the mast track to check for alignment of the lower part of the mast. Adjust the shrouds as necessary to center the mast.

After the rig is centered and hand tight, we recommend additionally tightening the shrouds. Here is a good conservatively tight all-purpose setting based on the initial J/88 sea trials as measured with a PT2 Loos Gauge.

Shroud	Wire	Load	Loos Gauge
Uppers (V1)	6mm	1850 lb.	40
Lowers (D1)	6mm	860 lb.	33
Intermediates (D2)	5mm	229 lb.	17

Typically the Intermediates should remain loose until the Uppers and Lowers are close to their intended tensions. Thereafter the Intermediates can be taken up to hand tight and adjusted after going sailing and checking the mast on both tacks for straightness.

You'll find it easiest to tighten the Upper shrouds if you apply some backstay tension first to bend the mast and thereby reduce load. Under sail, it is easiest to adjust the leeward shrouds, then tack to adjust the other side. The shroud turnbuckles are best adjusted with a crescent wrench and strong screw driver. It is also a good idea to use grease on the threads of the turnbuckles to help reduce friction as the loads increase.

Once you have initially tuned your J/88, go sailing in a brisk breeze, spending equal time on both tacks. Even though compacted strand wire rigging is a low stretch material, you'll still see a little loosening after the initial breaking in period. Be sure to sight up the mast while it is under load to confirm that the mast remains in column. Make the appropriate adjustments as necessary.

A note about the standard Dyneema backstay. When reaching and running you may notice a vibration sound that can take place due to the larger relative diameter of the backstay vs. wire. There are some tricks to making this go away like wrapping shock cord up the backstay about 2' or so like a hockey stick grip. This harmonic typically only happens in some decent breeze (15 knots or so) and is considered normal.

Rigging the Boom

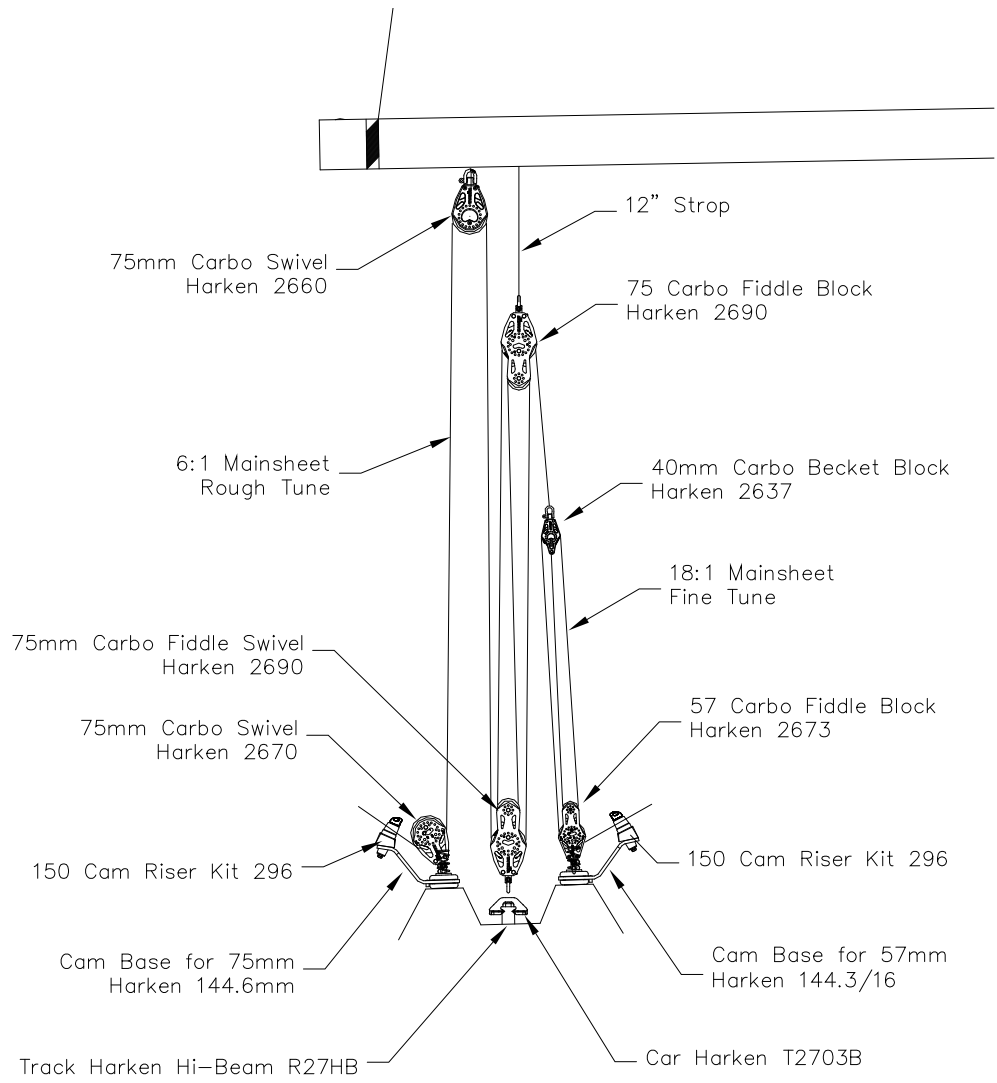
Run the reef line from the clew to the forward end of the boom, up through a sheave on the boom, to an individual turning block attached to the tack reef grommet in sail. This line will then lead down through the SS padeye on the side of the mast near the gooseneck then down to a turning block at the mast collar, through the organizer and aft to a rope clutch to starboard (inboard position).

- Attach boom gooseneck to lug on mast.
- Attach QuikVang to mast lug at deck and then boom lug (hoist end of boom with main halyard if necessary).
- Install mainsheet blocks.

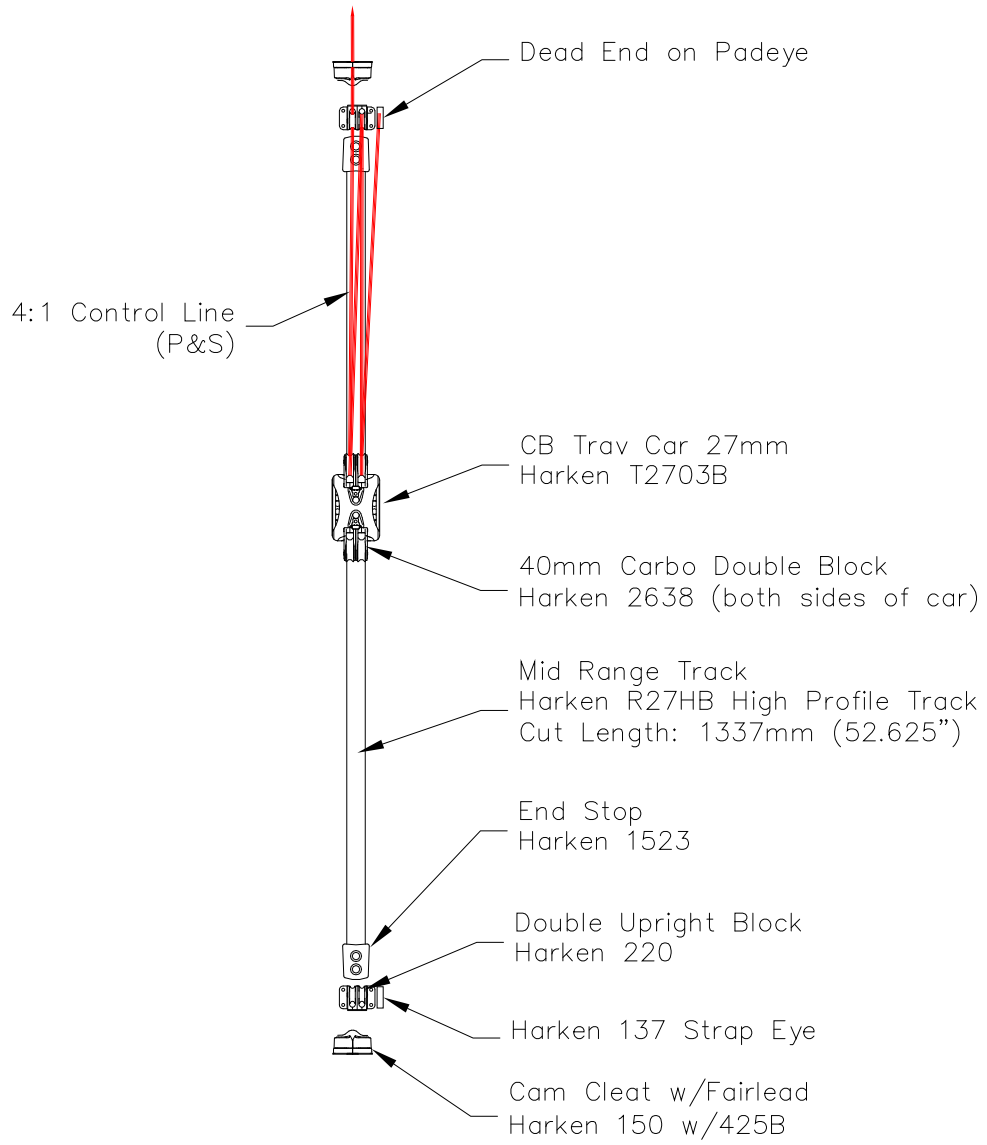
Rig the mainsheet per the rigging diagram.

Diagrams, Layouts, & Schematics

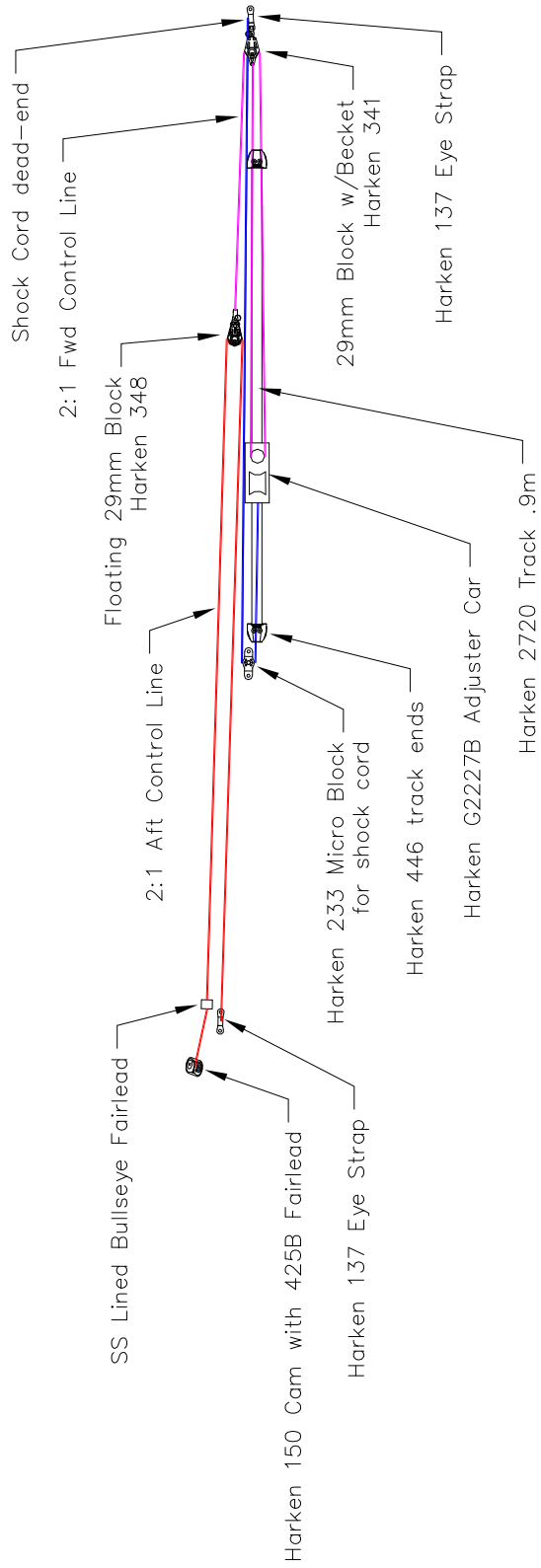
Mainsheet Diagram



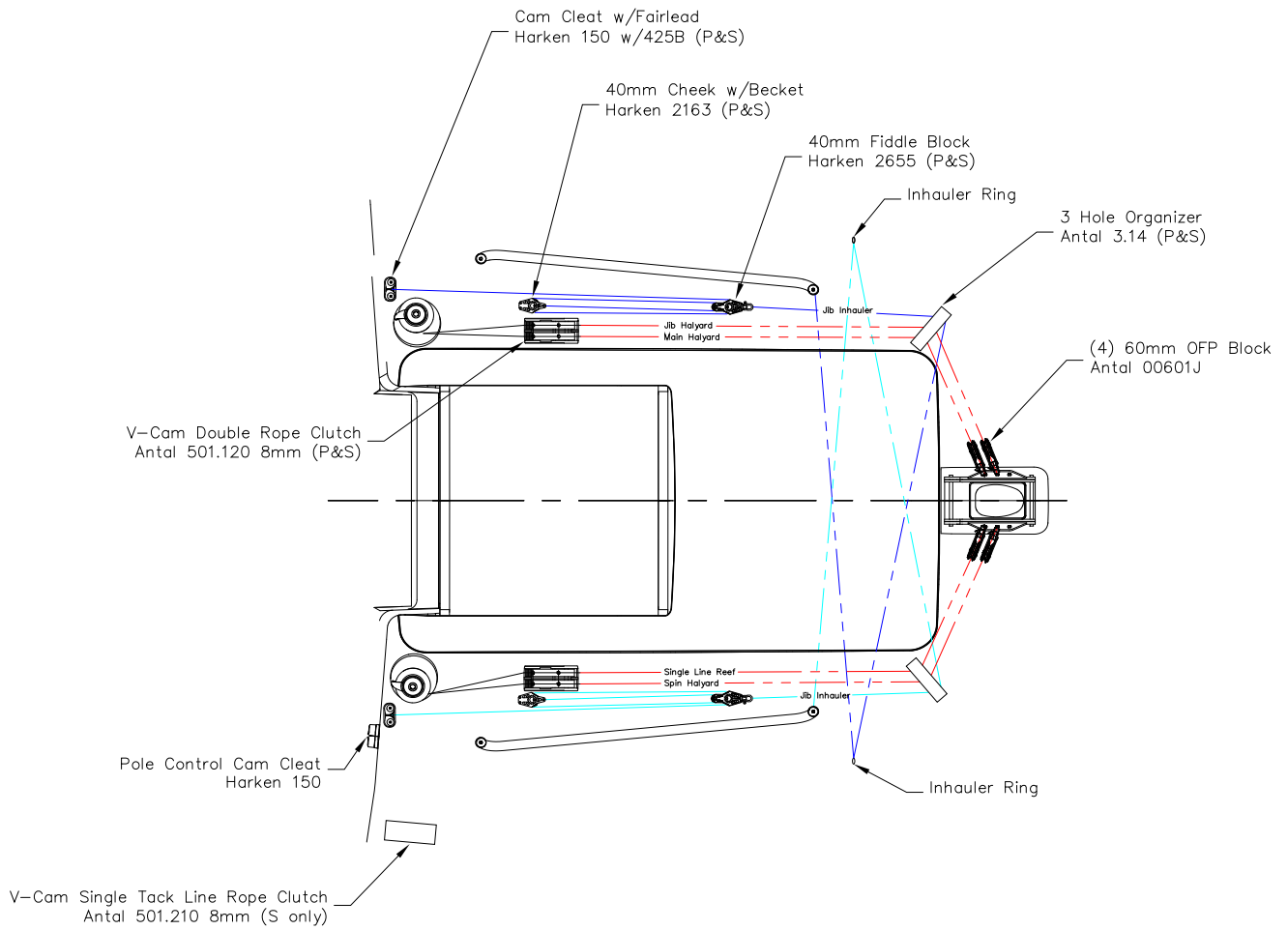
Traveler System Layout



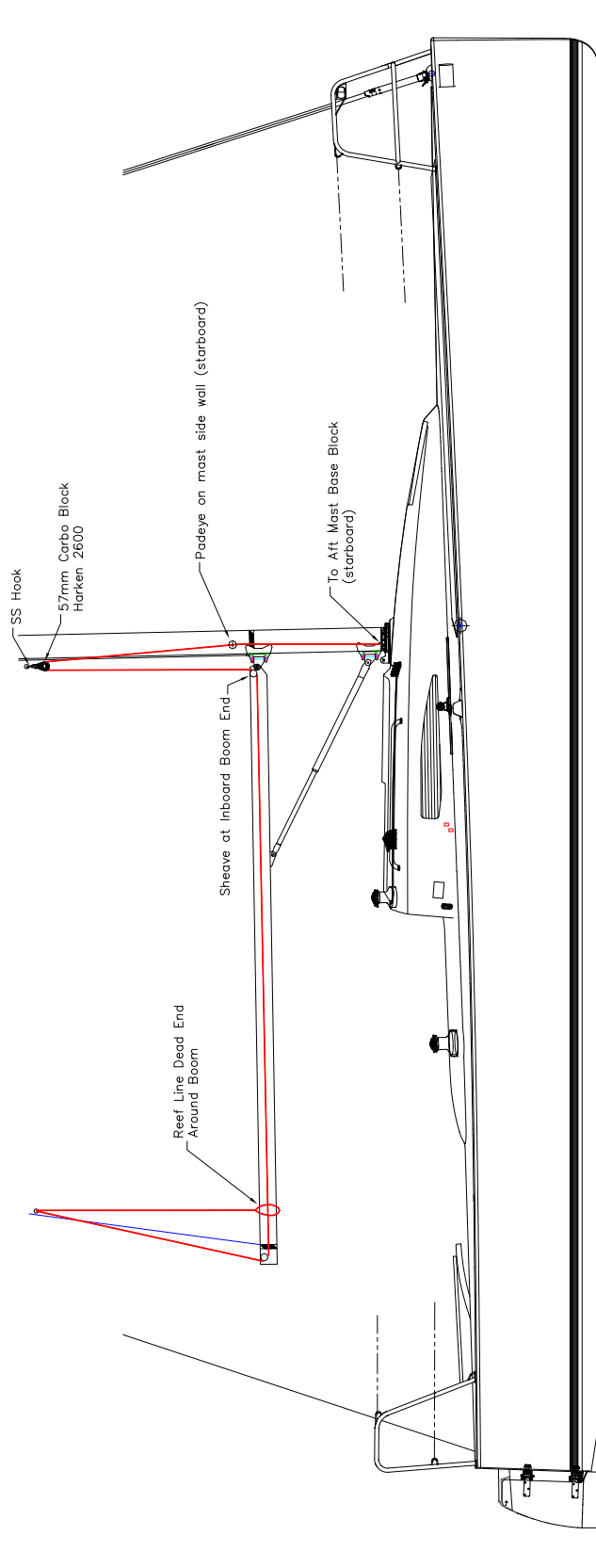
Adjustable Jib Lead System



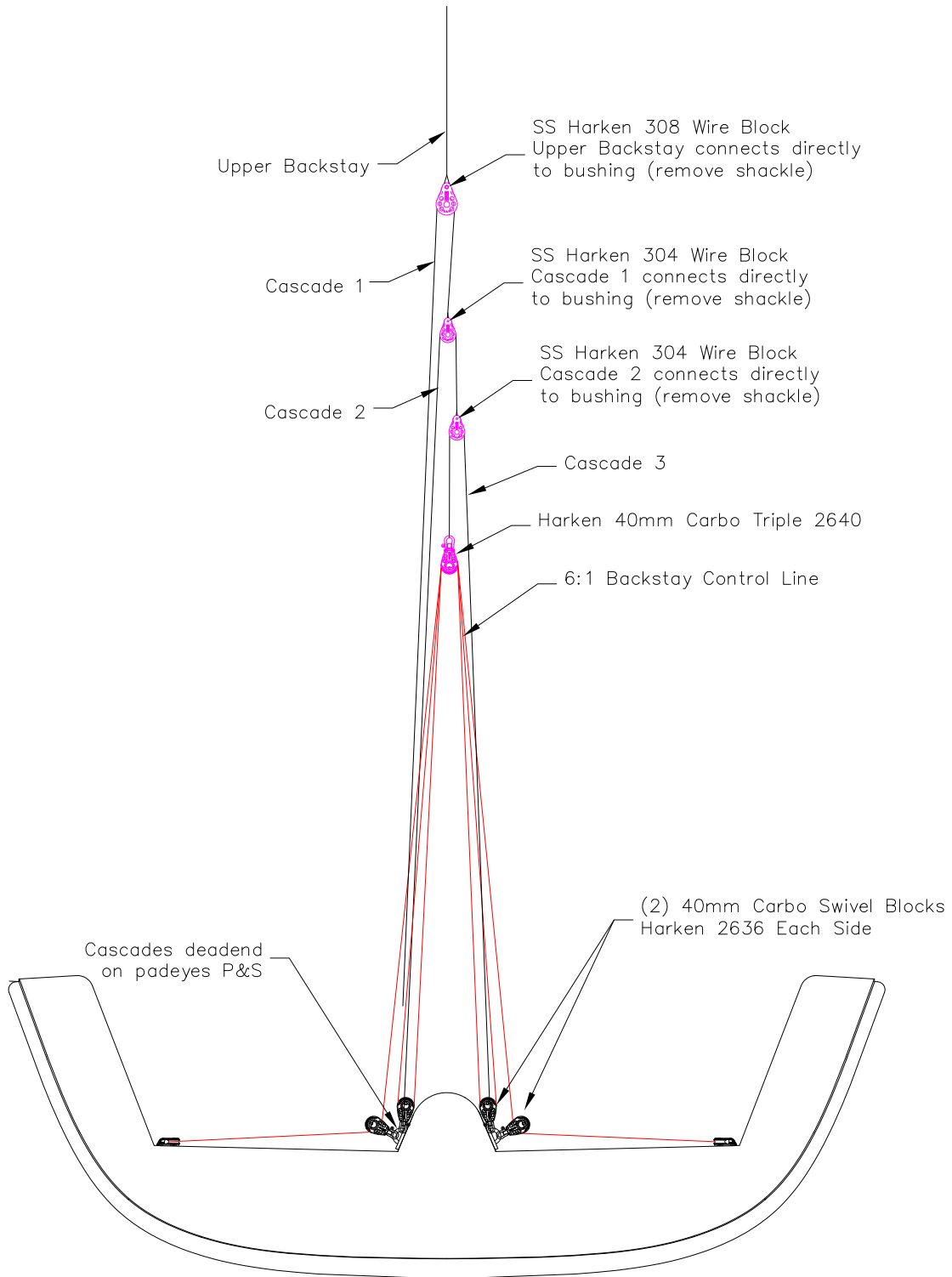
Cabin Top Layout



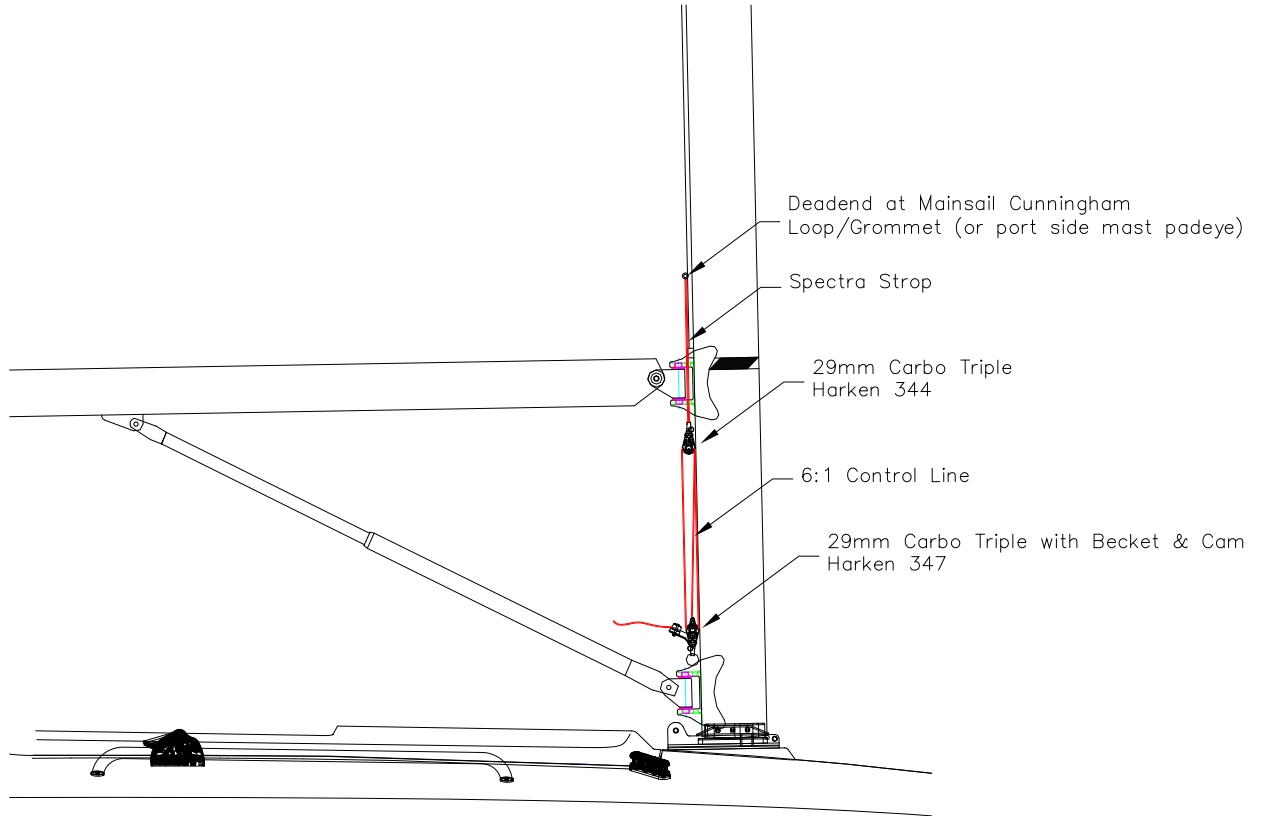
Reefing System Layout



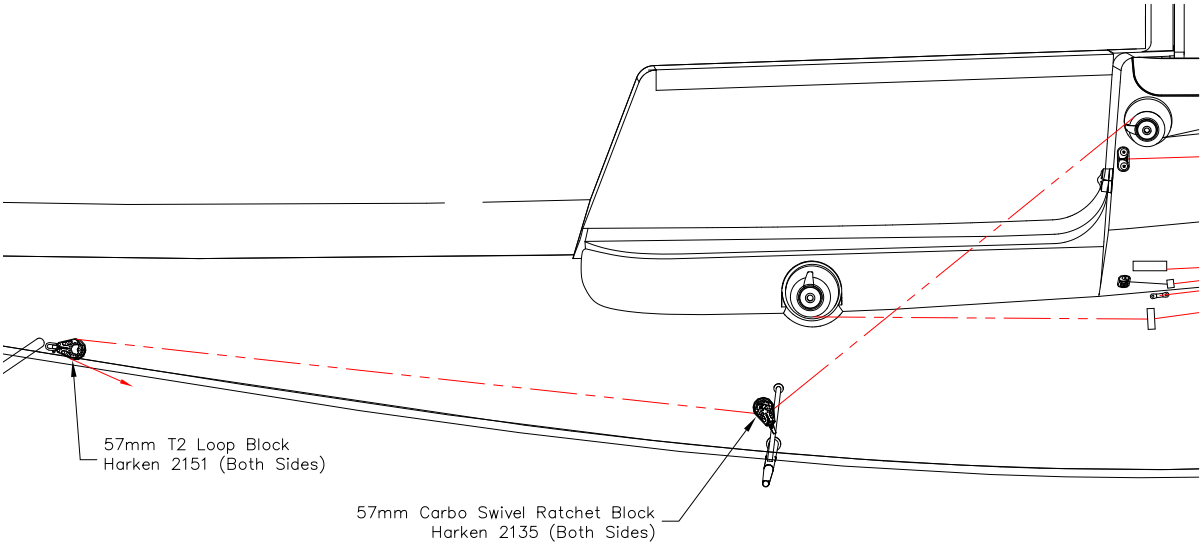
Backstay System



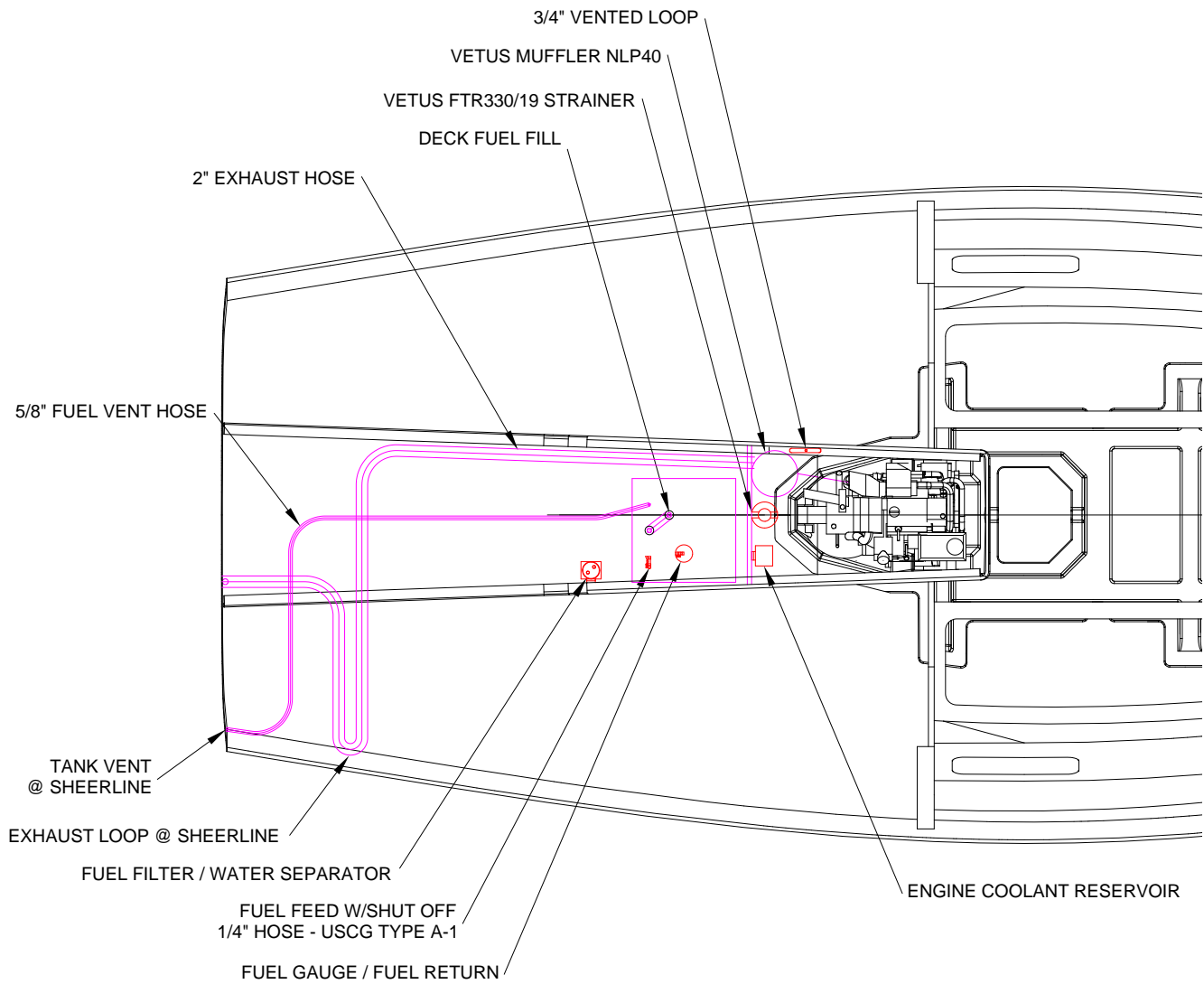
Cunningham System



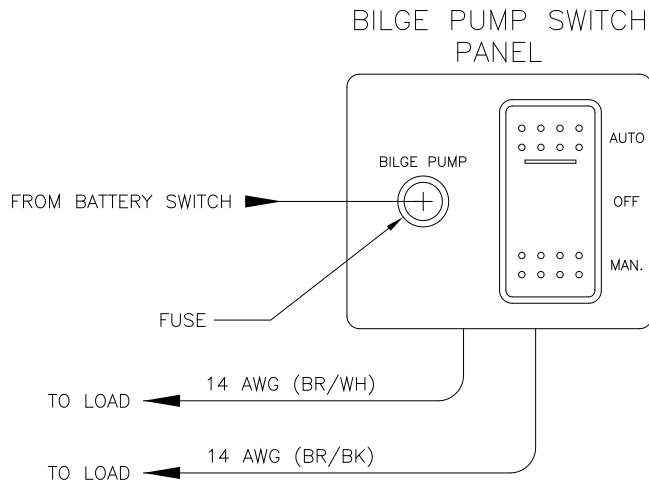
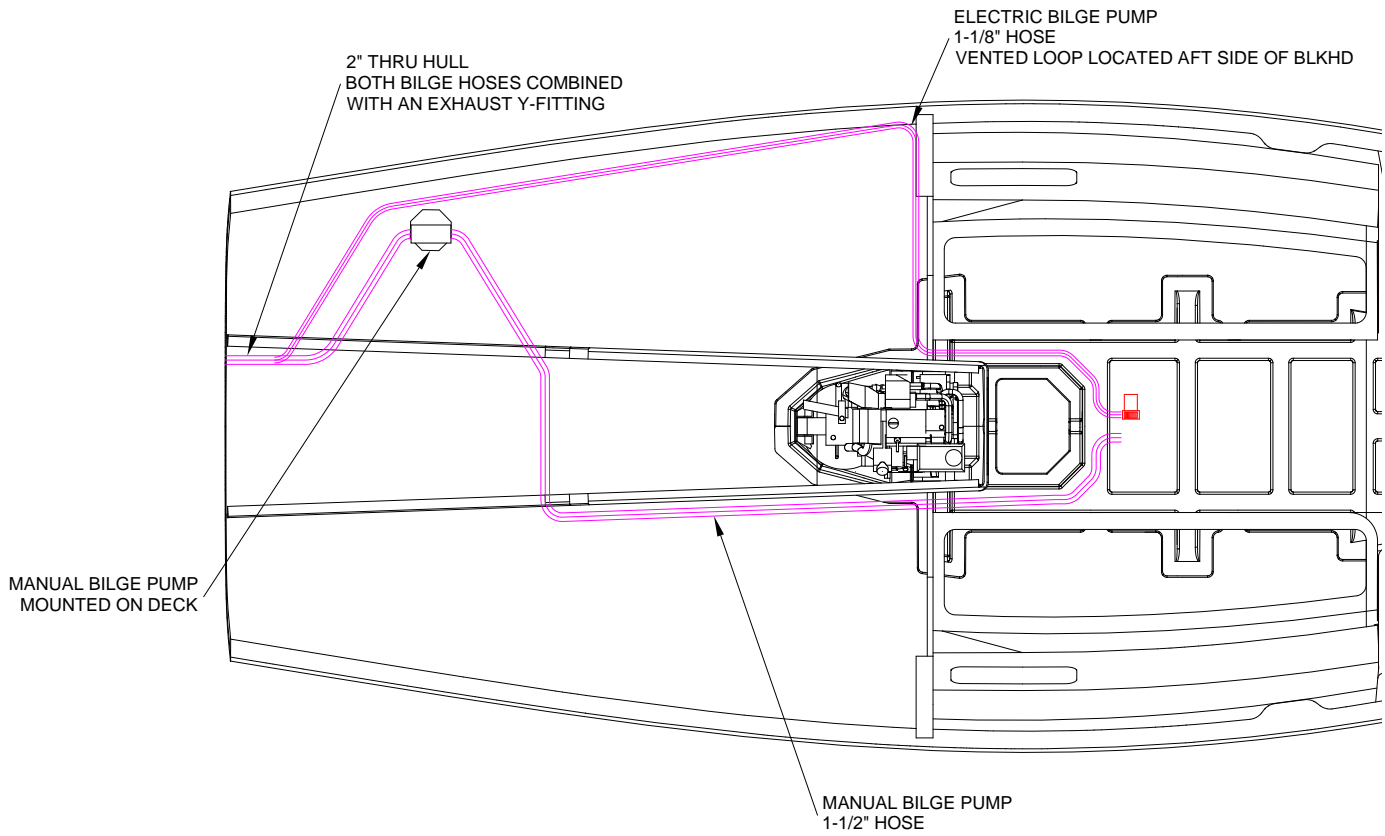
Spinnaker Sheet Blocks



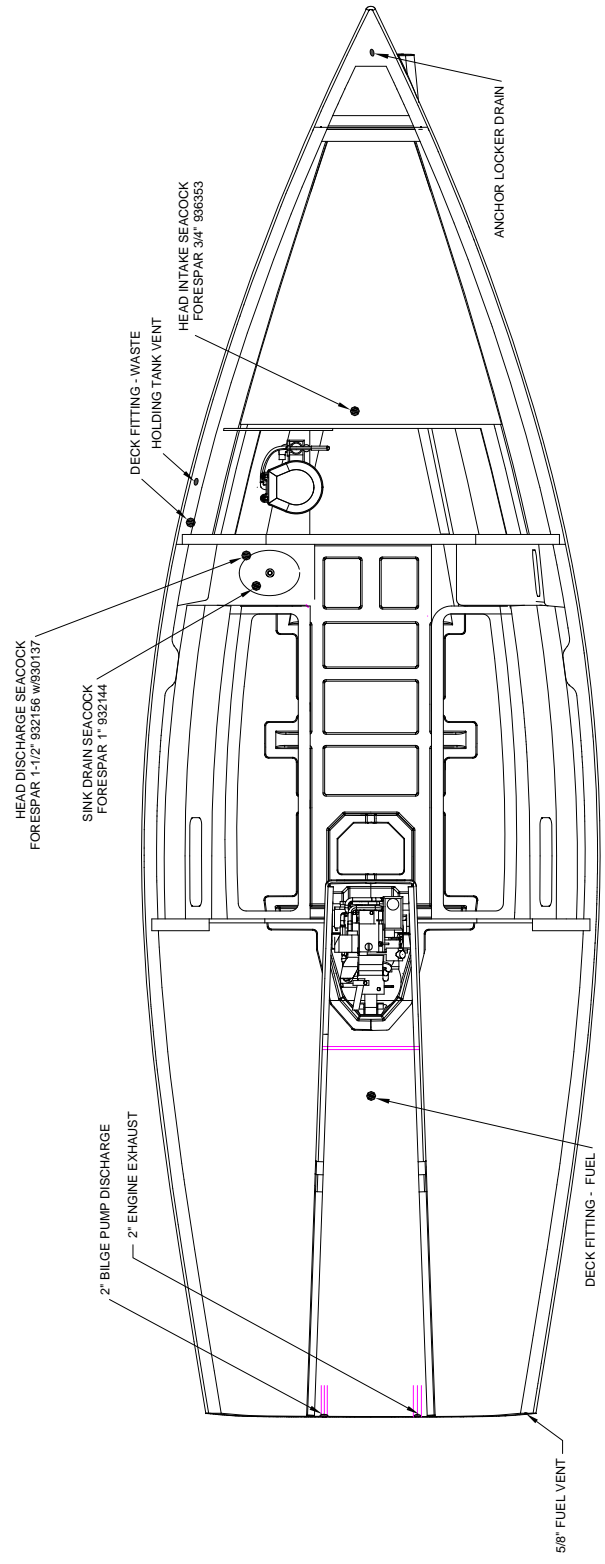
Engine Fuel & Exhaust Layout



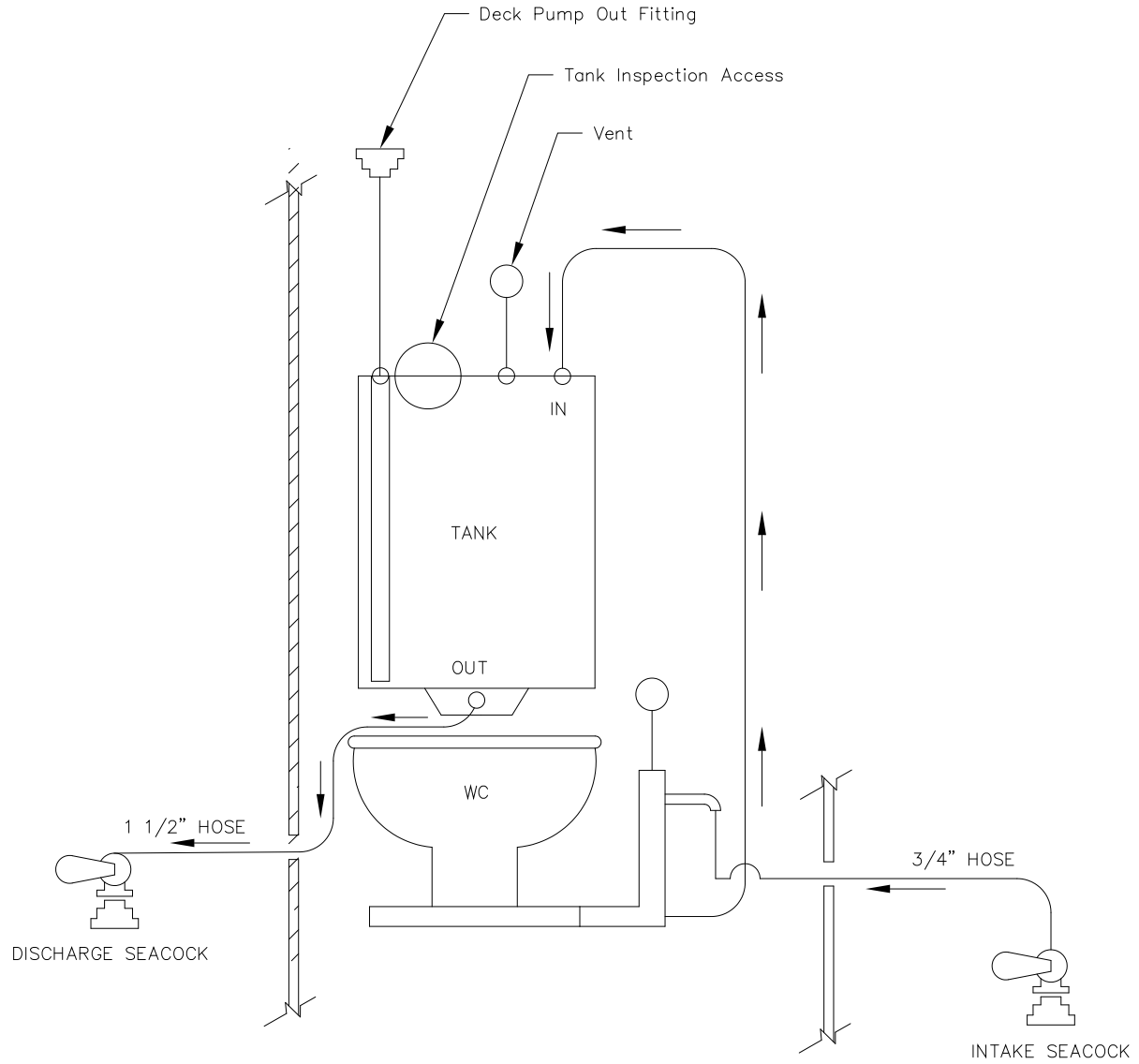
Bilge Pump Layout & Switch



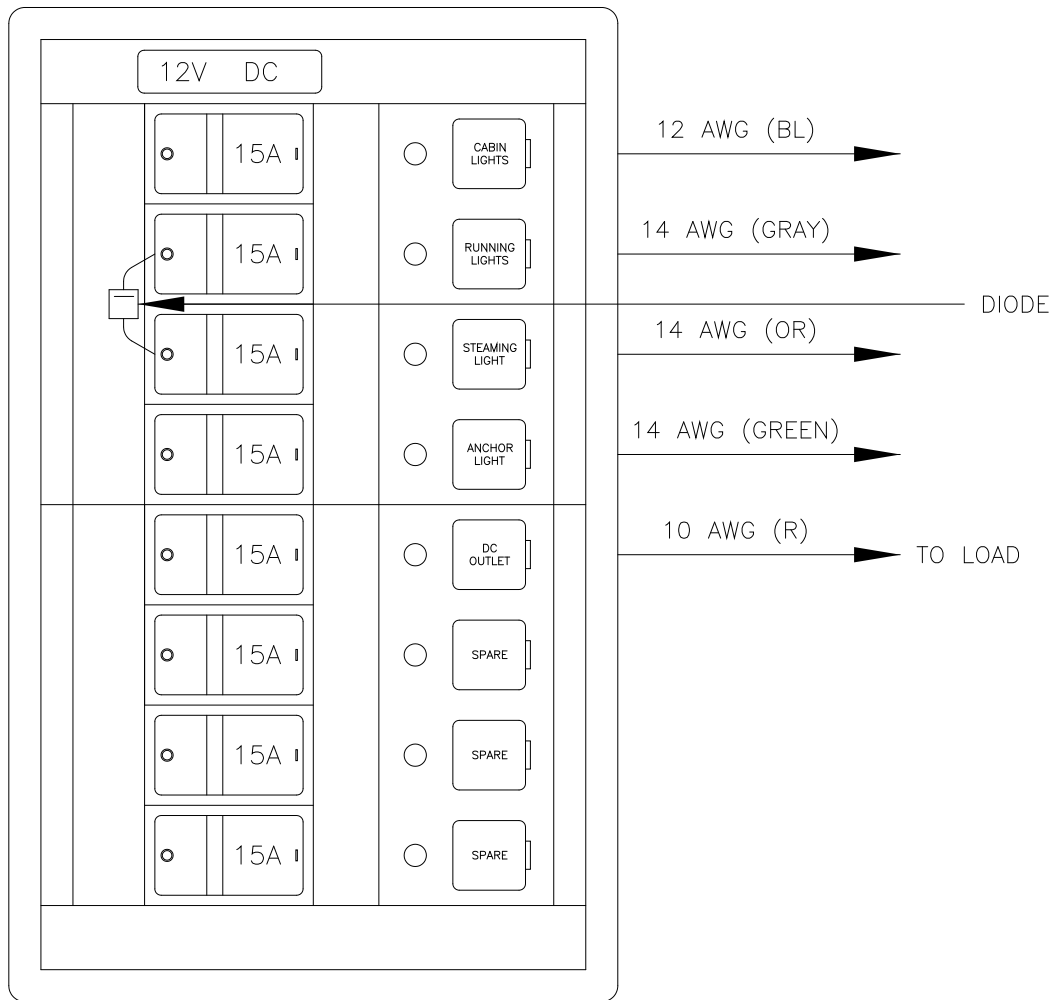
Thru-Hull & Seacock Locations



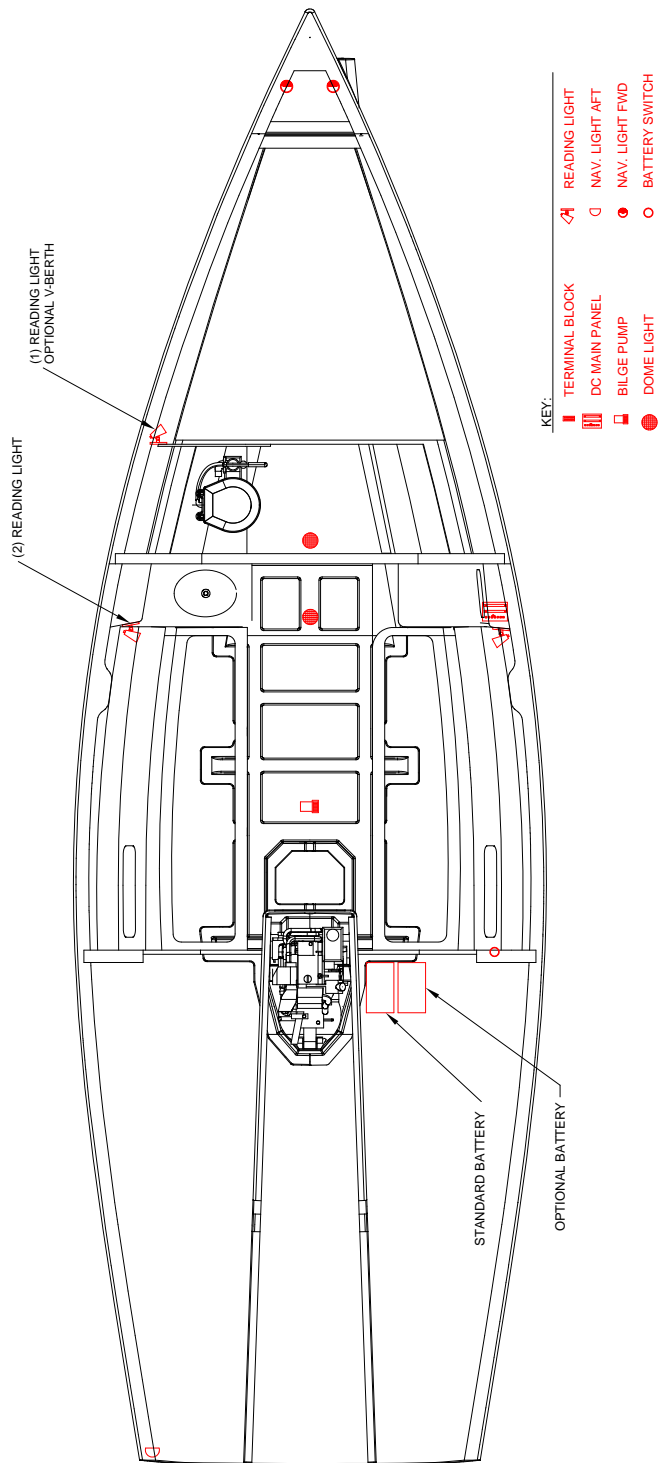
Head & Holding Tank Schematic



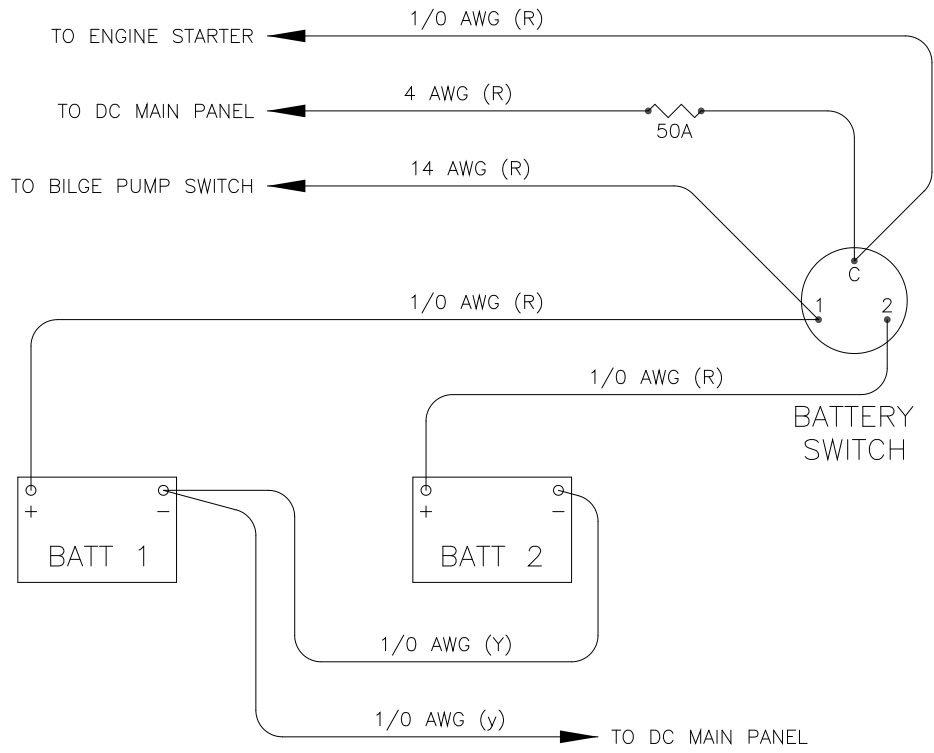
DC Distribution Panel



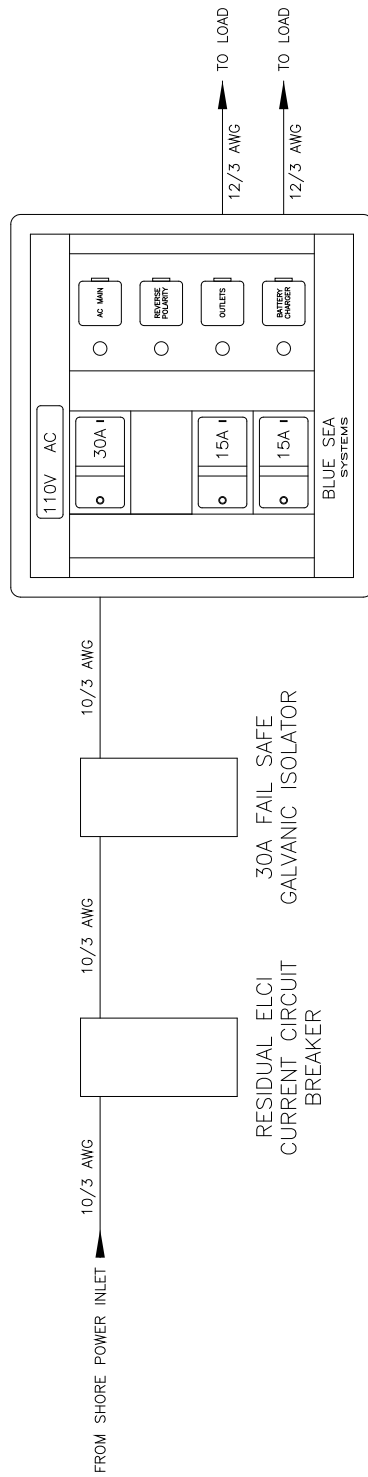
12V DC Component Layout



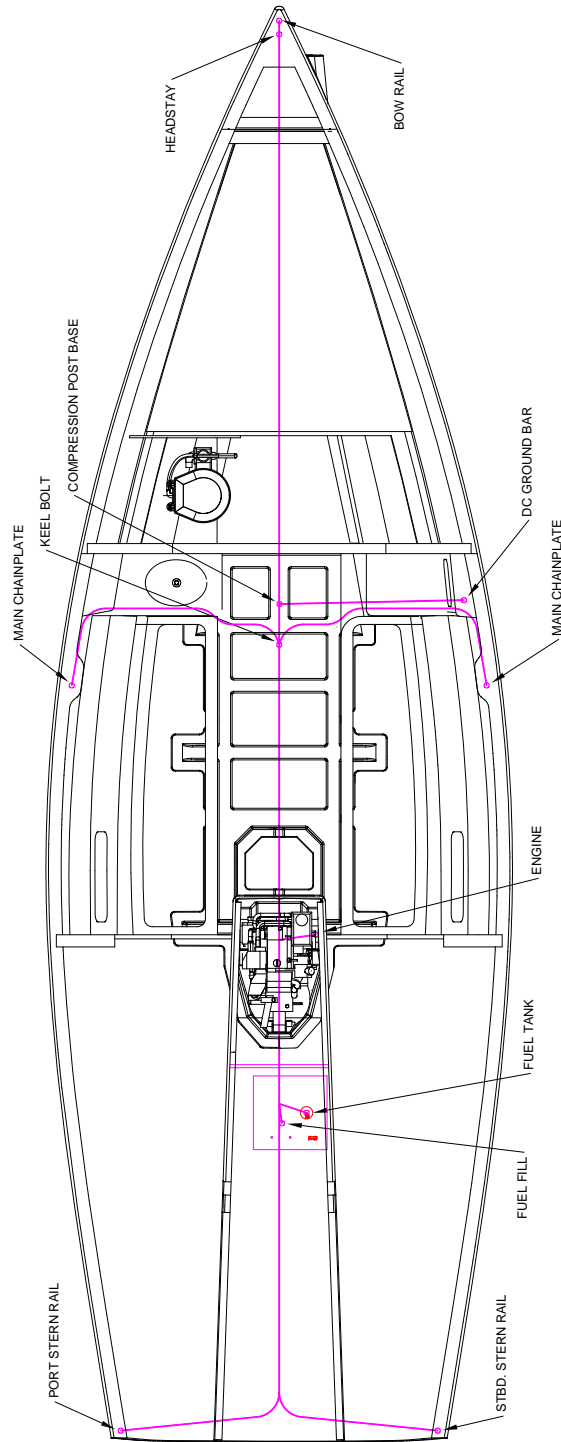
12V DC Battery Charging Schematic



Optional AC Schematic & Panel



Bonding System



Engine System

The engine and fuel system is engineered to be conveniently accessible for repairs and general maintenance. Located aft of the companionway ladder, there is access to the forward and sides of the engine and saildrive systems via removable access panels.

Before starting the engine read the engine manufacturer's owner's manual for proper break-in and operating procedures. Once the engine is running, inspect it for any discrepancies, like oil leaking, excessive water leaks, or anything out of the ordinary.

- **Engine Control Panel:** is mounted aft on the starboard side of the cockpit. It contains the start & stop buttons, warning lights, and tachometer. The combination throttle/gearshift is also mounted to starboard. Double-check all mechanical connections between engine and on-deck equipment.
- **Engine Bed:** is constructed of heavily reinforced fiberglass. The engine sits on rubber shock mounts to help isolate the engine vibration from the boat. Check to see that the engine is sitting correctly on these mounts and the bolts tightly secured.
- **Neutral Safety Switch:** the J/88 is equipped with a neutral safety switch and the engine will not start without the throttle control in a proper neutral or advanced neutral position.

Sail Drive

The J/88 is equipped with the Yanmar SD-20 Saildrive. This system provides a clean quiet alternative to conventional yacht drive trains. We recommend that you follow all Yanmar guidelines included with the boat for maintenance and service of this system.

Fuel System

- **Fuel Tank & Hoses:** The J/88 is equipped with one 15 gallon fuel tank located aft of the mechanical space behind the engine. Fuel lines run from the tank to the fuel primer pump. From there fuel flows into the injectors on the engine. The tank is built of polyethylene and vented overboard. For a layout, please see the Fuel & Exhaust System diagram.
- **Fuel Gauge:** is located near the engine panel recess in the cockpit. The *gauge reflects level (height) of fuel in the primary tank, not the quantity.* Try to maintain a minimum level of 1/3 to 1/2 tank filled at all times.
- **Fuel Line Shut-Off Valve:** sits atop the tank. Since diesel engines require bleeding after they have been deprived of fuel, it's important that the shut-off valve be in the "ON" position (lever parallel to piping) anytime the engine is started.
- **Fuel Tank Access Plate:** is atop the fuel tank and provides access inside to clean the tank.

Engine Cooling System

The J/88's engine utilizes both a "closed" cooling system, in which a mixture of fresh water and antifreeze is circulated within the engine, and a "raw water" system, in which a heat exchanger supplies a constant flow of outside water, pumped in through the raw-water intake, to cool the coolant mixture.

Coolant system: The filler cap (it looks like a radiator cap) for the freshwater-and-antifreeze cooling system is located on top of the engine manifold. Check the coolant level of the manifold and the coolant sub-tank aft of the engine, (check when the engine is cool). When adding coolant, follow the engine manufacturer's recommendations for the proper fresh water/antifreeze ratio. In climates where freezing may occur in winter, test the coolant mixture for freezing point. Add coolant as needed if the system is not drained for winter storage.

Raw-water system: Located in the engine compartment, the J/88's raw-water strainer helps prevent clogging of the raw-water cooling system and overheating of the engine. Check the strainer basket often to insure that the flow of cooling water is unimpeded. Unscrew the strainer basket lid, remove the strainer and clean it, and be sure that the basket is seated properly in the bowl before screwing the lid on hand-tight. It is also possible that foreign objects in the water, like plastic bags or other debris could block water from entering the saildrive intake for raw water. For this reason, use caution if the engine alarm sounds and always double check that water exits the transom from the starboard side exhaust fitting when the motor is running.

Exhaust System

The J/88 is equipped with a water-injected water-lift exhaust system that dissipates exhaust heat and acts as the exhaust muffler. Cooling water can accumulate in the bottom of the water-lock muffler; when decommissioning your boat for the season, the muffler either should be drained by unscrewing the drain plug on the bottom of the muffler, or antifreeze should be added so that residual water doesn't freeze.

A Few Best Practices

- Monitor brightness of cabin lighting and charge battery as required by running engine. Batteries are charged by either running the engine or by an optional AC battery charger.
- Stop engine by pushing engine stop button on the panel.
- NEVER turn battery switch to OFF position while engine is running as this could damage the alternator.
- For best performance and fuel economy a cruising R.P.M. of 2,600 - 2,800 works well. Please refer to the Yanmar manual for other recommendations. It is good practice to vary RPM levels periodically when cruising under power for a long distance. Be sure to thoroughly read and follow the manufacturer's manual for proper break-in procedure for the standard Yanmar Diesel engine.
- Do not run engine at full throttle for sustained periods, as breakdowns may occur. Most importantly, find an RPM that runs smoothly and follow the Yanmar guide. Avoid "vibrating" RPM speeds when possible.

Engine Safety Precautions

Due to high temperatures it is recommended that after running the diesel for more than two hours you reduce speed to idle and allow excess heat to dissipate for five to ten minutes prior to shutting the motor off.

The most common cause of trouble is contaminated or dirty fuel. Your boat is equipped with a primary fuel filter located in the engine compartment and a secondary filter on the engine. The wise skipper carries replacement filter cartridges. Familiarize yourself with the bleeding procedure for the engine and you should learn how to bleed it yourself. The procedure only takes a few minutes after you are acquainted with it, but can be exasperating to the uninitiated.

Starting Up the Engine

- 1) Turn the battery selector switch to ALL. Turn off all electronic instruments to avoid a voltage spike to the instruments while cranking the engine.
- 2) Make sure that the throttle control is in neutral, or advanced neutral
- 3) Push the power button on the panel and wait for alarm sound, press the start button (The alarm will continue until the engine starts or the power button is pushed again.)
- 4) Release button when the engine starts. If the engine does not start in 10 seconds, turn off panel and repeat process. Advance the throttle slightly (in neutral), wait 10 seconds, and repeat steps 3 and 4.
- 5) When the engine starts, the oil-pressure and charging warning light will go out and the engine-alarm buzzer will stop. If they do not, stop the engine immediately.
- 6) Once the engine starts, set the throttle at about 1,000 RPM. If all engine indications are normal, warm up the engine for 10 minutes.
- 7) Briefly test the operation of FORWARD and REVERSE gears at the dock with the dock lines in place.

CAUTION: If the engine does not start after a pro-longed period (do not exceed 10 seconds at a time) of cranking, be sure to drain the water-lock muffler and exhaust loop. ACCUMULATED WATER IN THE MUFFLER MAY FLOW BACK INTO THE ENGINE MANIFOLD AND DAMAGE THE ENGINE IF THE MOTOR IS CRANKED FOR A PRO-LONGED PERIOD AND DOES NOT START.

IMPORTANT: Check that a flow of raw-water cooling water is exiting from the transom. If cooling water is not being discharged, the engine will overheat: shut down the engine immediately. Check that the raw-water strainer basket is free of blockage. Check that the raw-water engine-intake valve is open on the Saildrive leg. If necessary, check underneath the hull to make sure that the raw-water intake holes on the Saildrive leg are not blocked.

Shutting Down the Engine

- 1) Move the throttle to the IDLE (vertical) position.
- 2) Run the engine at IDLE long enough to allow the engine to cool down.
- 3) Push the button on the engine instrument panel until engine stops.
- 4) When the engine-alarm sounds, turn off panel.

IMPORTANT: Do not stop the engine with the decompression levers except in an extreme emergency. If decompression lever is used to shut down the engine, fuel will spray out and accumulate on top of pistons, creating a danger of explosion the next time engine is started.

Fueling

When taking on fuel, follow these safety precautions:

- 1) Secure your boat to the dock using bow, stern, and spring lines.
- 2) Turn OFF all mechanical and electrical equipment, including the engine, battery selector switch, cabin lights, and electronics.

3) Remove the fuel-fill deck plate plug; clean the threads of both the plug and deck plate so that no dirt falls into the filler opening. Place the fuel hose nozzle into the fill pipe.

4) Fill the fuel tank slowly. Do not overfill the tank. Because marine fuel expands with an increase in temperature, fill the 15-gallon tank to only 95% of its capacity. If you cannot see the fuel pump, ask the attendant or a crew member to call out the total gallons.

IMPORTANT: If the fuel tank is overfilled, fuel will spill out of the tank. Be ready to contain and clean up any spillage immediately.

5) After fueling, replace the fuel-fill deck plate and clean any spillage. Check belowdeck for fumes and check the bilge for fuel leakage. If fumes or liquid fuel are present, correct the situation before proceeding. Open all hatches and ports to ventilate the boat.

IMPORTANT: In the event of a serious fuel spillage, STOP FUELING IMMEDIATELY. Replace the fuel-fill deck plate and notify the attendant. Wash all traces of fuel or source of fumes; ventilate the boat. Leave the fuel dock only when you are completely certain that a potentially dangerous condition does not exist.

When preparing to take on fuel, the following safety precautions should be followed at all times: Properly secure the boat to the dock using bow, stern and spring lines.

Engine Maintenance

Check the engine, batteries, and engine mounts once a month. Ensure the engine is fastened securely to the engine mount frames and look for any problems, such as fuel or oil spillage. If you need help, consult a professional marine mechanic or a licensed Yanmar repair mechanic.

Run the engine frequently and at occasional high speeds, even if it is not in gear. One reason why sailboat engines may burn out within a few years is that they are run infrequently and lubricating oil is not thoroughly and evenly distributed on all moving parts. Be sure to check oil and coolant levels often. If you have any doubts about the purity of the fuel you are buying, use a strainer to filter out water and dirt.

Plumbing Systems

General

The plumbing systems in your J/88 consist of manual and electrical bilge pumps, a sink, and the head (toilet). There is also a very simple fresh water system option consisting of a simple manual hand operated pump and a collapsible small bladder tank. This section will describe the standard plumbing locations and how they operate.

Thru-Hulls & Seacocks

All Seacock fittings are Forespar Marelon. For safety reasons, we recommend that you attach with wire or wire-tie an appropriate size tapered wooden plug in the vicinity of each of these fittings in the event of a hose or valve failure. The fittings each have valve-handles. To reduce confusion, remember the **long end of the handle indicates the direction of flow**. Please refer to the Thru-Hull & Seacock diagram for a complete layout of locations and sizes.

Pump Systems

- **Bilge Pumps** There is one manual and one electric bilge pump system installed standard in the J/88. Two pump intakes are located in the bilge aft of the keel under the main cabin centerline floorboard.
 - The manual **Whale Smart Bail BP5021B** bilge pump with rated capacity of 59.9 liters/minute (@70 strokes/minute) is installed on the cockpit wall and operated by opening the cover/handle and using an up and down manual pumping action. Bilge water exits the boat from the manual pump through the transom.
 - The Whale SuperSub Smart 1100 electric bilge pump with rated capacity of 69 liters per minute is wired directly to the battery with its own panel mounted in the nav station adjacent to the electrical panel. The default switch position is for automatic operation controlled by a water sensor that is integral to the pump.
 - A yellow label with black lettering is included in proximity of the pump panel with a message similar to the following:

NOTICE:

BILGE PUMP SWITCH MUST ALWAYS BE LEFT IN THE "AUTO" POSITION.

- Bilge water exits the boat from the electric pump through a hose that loops up to a siphon break and then to the overboard through the port side transom fitting.

Safety caution: Owners MUST leave the three position pole switch on the bilge pump panel (located in the nav station) in the AUTO position in order for the bilge pump to perform properly. Bilge pumps do wear out and the pump manufacturer, Whale Water Systems, Inc., recommends replacing the bilge pump every **THREE YEARS**. Please refer directly to pump manuals and/or web site information for more about best practices and maintenance of this component. Finally, it is prudent seamanship to carry replacement parts for all onboard pumps.

Warning the bilge pumping system is not designed for damage control. The combined capacity of the system is not intended to drain the craft in the case of accident or damage.

- **Sink Drain** empties directly overboard through a seacock fitting beneath the galley sink.

Head System

The standard J/88 is equipped with one Raritan PHII marine head which is capable of discharging effluents into the standard 45 liter (6 gallon) holding tank and optionally from there overboard through a gravity fed

seacock. The system is easy to operate and with correct usage and proper maintenance, will provide many years of use. **IMPORTANT** - Owners should familiarize themselves with all local and federal regulations regarding proper discharge and avoid inadvertent discharge at all times.

Before operating the **HEAD**, ensure you have read its manual thoroughly and understand the proper procedures. Silly mistakes can cause severe "head" aches at the worst possible time! And a word to the wise

PLEASE TRAIN YOUR GUESTS ON HEAD OPERATION.
NEVER ASSUME THEY KNOW HOW TO USE IT.

The head is a large pump which takes in seawater and flushes waste into the holding tank. The water intake and discharge seacocks are located under the V-berth and galley sink respectively. Remember the open/closed positions on these thru-hulls. It is good seamanship to close both the intake and discharge seacock when not in use.

When seawater and effluent are pumped through the head, they're pumped into the holding tank by the action of pumping the toilet handle. The waste discharge fitting on deck is provided so a pump-out station can empty the tank. Care should be taken not to overfill the holding tank as effluent can block the vent hose and may damage the tank... or worse, burst the hose. If the toilet is difficult to pump, check to see if the holding tank is overfilled. "When in doubt, pump it out!" A great resource for understanding and maintaining a marine head system is a book called "Get Rid of Boat Odors" by Peggie Hall - Seaworthy Publications.

Recommended cleaning solutions:

Holding Tank: Use fresh water and one gallon of white vinegar solution... flush out twice. There are also several holding tank treatment solutions available through local marine stores.

Head: refer to the head owner manual for proper cleaning solutions and maintenance.

Pumping a quart of fresh water type anti-freeze through the head system and hoses will prevent the seals and equipment from cracking. The following hoses are connected to the tank.

- Waste Discharge Hose from the head
- Pump-out Hose leading to the deck fitting
- Vent Hose to vent the tank overboard.

The holding tank must be pumped out before winter storage to avoid potential damage and the system shall be empty during storage at freezing temperatures.

Electrical System

The following section describes the electrical system aboard the boat, how it operates, where it leads, and how to avoid trouble. Please read this section more than once and refer to the electrical diagrams included in this manual.

Never:

- Work on the electrical installation while the system is energized;
- Modify the craft's electrical system or relevant drawings: installation, alterations and maintenance should be performed by a competent marine electrical technician;
- Alter or modify the rated current amperage of overcurrent protective devices;
- Install or replace electrical appliances or devices with components exceeding the rated current amperage of the circuit;

- Leave the craft unattended with the electrical system energized, except automatic bilge-pump, fire protection and alarm circuits.

DC Electrical System

A 12 Volt DC electrical system is used throughout the J/88 for lighting and operation of pumps and various accessories. The J/88 is standard with one 90 Amp Group 27 Glass Mat battery located aft of the starboard settee berth. One additional optional battery may be added within this area.

- **Electrical Panel:** controls electric distribution with circuit breakers and switches. The main wiring harness runs from the back of this panel.
- **Mast Wiring Terminal Box:** is located in the head area on the main bulkhead. A wiring harness exits the mast and leads forward on the underside of the deck to this junction box after the mast is stepped. The junction box is wired directly into the DC system through a terminal strip. Once the mast wiring is installed and mated at the junction box, be sure to test each function to insure proper operation.
- **Battery Switch:** The battery switch is located in the backrest storage bin of the starboard settee backrest.
- The 80 amp Yanmar alternator is attached to the engine and creates a charging current for the battery system when the engine is running.
- **Accessories:** such as navigation instruments, stereo, GPS, etc... can be added to the electrical panel and the 12V DC system. Extreme care and forethought is necessary for installation as these are sensitive instruments and require some measure of protection. We recommend that owners hire a qualified marine electrician to complete these tasks. Be sure all sensitive accessories are not only grounded properly but that proper fuses are run off the panel.

Light Specification

- **Bow Lights:** Aqua Signal LED (33202-1 & 33203-1)
- **Stern Light:** Aqua Signal LED (33502-1)
- **Steaming Light:** Perko #1132
Replacement 12V Bulbs (2 per card): 0071DP0CLR
Replacement Lenses (2 per card): 0278DP0WHT
- **Interior Cabin Reading Lights:** Hella 62660

Optional 110 VAC Shore power System

The optional 110 Volt AC shore power system is functional only when the boat is plugged into suitable power from shore. The cord provided as part of the option has the standard end for 30 amperage service. Ensure the plug prongs match those on the dock inlet, insert and twist to lock it. Then screw down the outer ring to seal the cord from water and to prevent it from pulling out. The AC panel for shore power is located in the navigation station next to the primary DC panel.

- **AC Main Power Switch:** Located on the panel, to activate AC power panel, use this switch.
- **AC Panel:** indicates line voltage being received from the shore circuit with an indicator light. The line voltage will vary with the number of appliances operating on the same circuit. In large marinas there may be a large number of boats on the same circuit, causing fluctuations.
- **AC Normal/AC Reverse Polarity Light:** The AC panel has a red light to show when the polarity is reversed. Care should be taken not to operate 110 AC systems on board with reversed polarity. Double-check shore connections. If problems still persist, then notify dock master to repair the shore plug. NOTE- Even though the switches are in the appropriate position, the shore power system in no way assures personal safety using electrical apparatus.

- **Galvanic Isolator:** This device is a “fail safe” isolator designed to isolate any low voltage stray current on the AC circuit. Please refer to the specific manual included with the boat for more information.
- **Residual ELCI Current Circuit Breaker:** Located in line between the dockside power inlet and the galvanic isolator.
- **Outlet:** located in the cabin supplies power for 110 AC accessories.
- **Ground Fault Systems:** There is a single ground fault system on the J/88 that protects all AC outlets.

Informational Instructions for Shore Power

- Do not modify the craft's electrical systems or relevant drawings. Installation, alterations and maintenance should be performed by a competent marine electrical technician. Inspect the system regularly.
- Disconnect shore-power connections when the system is not in use.
- Connect metallic housings or enclosures of installed electrical appliances to the protective conductor system in the craft.
- Use double insulated or grounded (earthed) electrical appliances.
- If the reverse polarity indicator is activated, do not use the electrical system. Correct the polarity fault before activating the electrical system on the craft.
- **WARNING — Do not allow the shore-power cable end to hang in the water. An electrical field can be caused which can cause injury or death to nearby swimmers.**
- **WARNING — To minimize shock and fire hazards:**
 - Turn off craft's shore-power connection switch before connecting or disconnecting shore-power cable.
 - Connect shore-power cable to craft's inlet before connecting to shore-power source.
 - Disconnect shore-power cable at shore-power source first.
 - If reverse polarity indicator is activated, disconnect cable immediately.
 - Close shore-power inlet cover tightly.

Do not alter shore-power cable connectors, use only compatible connectors.

Safety

Fire Protection & Prevention

Portable fire extinguishers: This boat, when in service shall be equipped with at least two portable fire extinguishers in recommended locations below in addition to any required equipment as designated by local and government regulations.

- Recommended Location 1: Cockpit seat locker quickly accessible from cockpit & helm position.
- Recommended Location 2: Below of starboard settee berth or nav station counter top in the cabinet.
- Type: Class B

Servicing of fire-fighting equipment: The boat owner/operator shall

- Have fire-fighting equipment checked at the intervals indicated on the equipment
- Replace portable fire extinguishers, if expired or discharged, by devices of identical fire-fighting capacity, and
- Have fixed systems refilled or replaced when expired or discharged.

Responsibility of boat owner/operator: It is the responsibility of the owner/operator

- To ensure that fire-fighting equipment is readily accessible when the boat is occupied, and
- To inform members of the crew about
 - the location and operation of the fire-fighting equipment,
 - the location of discharge openings into the engine space, and
 - the location of routes and exits

Cautionary notices to the boat operator

- Keep the bilges clean and check for fuel and gas vapors or fuel leaks frequently.
- When replacing parts of the fire-fighting installation, only matching components shall be used, bearing the same designation or having equivalent technical and fire-resistant capabilities.
- Do not fit free-hanging curtains or other fabrics in the vicinity of, or above, cookers or other open-flame devices.
- Do not stow combustible material in the engine space. If non-combustible materials are stowed in the engine space, they shall be secured against falling into machinery and shall cause no obstruction to access into the space.
- Exits other than the main companionway doors or hatches with permanently fixed ladders are identified by a symbol

Specific warnings: Never

- Obstruct passageways to exits and hatches
- Obstruct safety controls, e.g. fuel valves, gas valves, switches of the electrical system,
- Obstruct portable fire extinguishers stowed in lockers
- Leave the craft unattended when cooking and/or heating appliances are in use,
- Modify any of the craft's systems or allow unqualified personnel to modify any of the craft's systems,
- Fill any fuel tank when machinery is running, or when cooking or heating appliances are in use,
- Smoke while handling fuel or gas.

Lightning Protection

The J/88 is grounded in accordance with common industry practice. The mast, shroud chainplates, stemhead fitting, backstay fitting, stanchion bases, engine, and electrical system are grounded to the keel. In spite of this, there can be no assurance that personnel or the boat will not suffer injury if the boat is hit by lightning. The following are suggestions only and in no way guarantee safety in the event of a lightning strike.

- If possible, remain inside a closed boat during a lightning storm. Do not contact any metallic objects inside or outside the boat.
- Avoid contact with any items connected to the lightning conductive system (mast, shrouds, etc.) and especially in a manner to act as a bridge between them (mast to shroud, etc.).
- Avoid swimming during a lightning storm.
- If the boat is mildly struck by lightning, check all compasses and electrical gear to determine that no damage or change in calibration has taken place.
- Check all thru-hull fittings, keel bolts, engine rubber gasket membrane, for leakage (water).

Safety Equipment

You can never be prepared enough for emergencies that may arise at sea. During commissioning of your J/88, triple check that you have all required safety gear and adequate spares aboard. Make it a policy to thoroughly brief any first time crew-members with emergency procedures including man-over-board, fire, and sinking. Please contact your local U.S. Coast Guard office for up to date USCG safety requirements.

IT IS THE OWNER'S RESPONSIBILITY TO COMPLY WITH ALL FEDERAL AND STATE REGULATIONS WITH RESPECT TO SAFETY EQUIPMENT; OPERATION OF THEIR VESSEL; AND SAFETY OF ALL PASSENGERS

Maintenance Tips

Even though modern construction has helped reduce upkeep, regular attention should be given to the maintenance of your boat. This includes the fiberglass exterior surfaces, the interior wood surfaces, and the mechanical and electrical systems.

A well-maintained boat will not only bring you years of enjoyment, but most importantly, will bring you greater personal pride and joy.

Fiberglass/Gelcoat

Apply a marine wax to the hull topsides at least twice annually to preserve the “factory fresh” appearance for many years. Be sure fiberglass surfaces are clean and free of salt before waxing. Abrasive cleansers should never be used for general cleaning as they can severely mar the shiny gelcoat finish.

Bottom Paint

Keeping your bottom clean is of paramount importance as it not only keeps off bottom growth, but maintains passage-making speed. Even though you have applied anti-fouling paint, take a swim once a month or so (or hire a diver) and scrub the bottom and propeller with a scrub brush or lightly abrasive sponge pad.

Zincs

The saildrive zinc should be inspected for electrolysis regularly. If it is severely pitted, replace it immediately. Remember, it is a sacrificial anode to protect the Saildrive leg from electrolysis. It can deteriorate quickly, so inspect it frequently particularly if in a known “active” harbor. The split design allows replacement while the boat is in the water. Unusually rapid zinc deterioration may be a sign of other electrical problems. Proper inspection and immediate corrective action should be taken to identify and isolate the source of electrical current. Failure to do so may damage or destroy the aluminum Saildrive leg.

Deck Hardware/Running Rigging

Wash deck hardware frequently with fresh water to remove accumulated salt and grime. Salt is VERY corrosive and a healthy wash down after each day of use will help keep things looking great. Regularly wash down the jib sheets, spinnaker sheets, and other lines in fresh water. Check for chafe and turn non-tapered sheets end-for-end once every year to more equally distribute wear.

Check all deck blocks and also wash them with fresh water. Most ball-bearing blocks need only hot water to cleanse them. On conventional sheave/pin blocks, wash off, disassemble, clean, rub a light waterproof lubricant on the center pin, and then reassemble. Use only lubricants as recommended by hardware manufacturers.

Furthermore, check and lubricate the sheaves and blocks on the mast. Also, ensure the turnbuckles are clean and well lubricated. Without proper care they can “freeze up”.

In general, it is handy to keep a spray can of an appropriate light lubricant in your tool kit for frequent squirts of blocks, shackles, mainsheet travelers, and other moving fittings.

Winches & Rope Clutches

Read the manufacturer’s manuals on winch and rope clutch maintenance. Winches are fine pieces of machinery that for the most part take little effort to maintain. However, all too frequently, they suffer neglect because no one can see how much they wear down or when they get dirty.

Clean And Lubricate Them! It takes very little time to disassemble and put back together. Note that the gears and bearings are lubricated with special winch grease. Pawls and pawl springs need only a light oil. Keep spare pawls and springs in a kit for replacement.

Deck Hatch

Hatches need lubrication of their hinges with a silicone grease once a year. Also check the seals to see they are not unduly cracked, or are losing their ability to seal correctly. To increase traction on the plastic hatch covers, some owners prefer to apply non-skid tape. The foredeck hatch seals and hinges can see the quickest wear especially if the spinnaker is being actively hoisted and doused through this hatch.

Cabin Ports

For complete care guidelines, please refer to the article in the Appendix.

Stainless/Chrome

Salt is an extremely corrosive element and whenever possible owners should spray all stainless and chrome deck hardware with a healthy amount of fresh water after sailing each day. Hardware like stanchions, handrails, bow/stern pulpits, and winches can be treated with Never-dull® or other light cleansers. After applying cleanser, polish to a gleam with a clean cotton rag. For more aggressive cleaning a product called Wichinox (made by French company Wichard) has been highly recommended for cleaning and protecting SS.

Fiberglass/Gelcoat/Formica

Interior gelcoat surfaces should be cleaned periodically with non-abrasive cleansers and smooth areas should be waxed. Formica should be cleaned with non-abrasive cleaners.

Bilges

Bilges are painted with air-dry gelcoat to prevent water permeation and accumulation of mildew. They should be washed regularly with strong solvents to keep them smelling clean and to prevent the fouling of bilge pumps.

Annual Maintenance Checklist

Running Rigging

- ___ Check running rigging lines for wear at splice, turning blocks, etc.
- ___ Inspect blocks and shackles for wear. Clean and lubricate or replace as necessary.
- ___ Service winches, check for free spinning operation (bearings) and ratchet stop action (pawls).

Deck Hardware

- ___ Check lifeline integrity, stanchions, and pulpits.
- ___ Check all cleats for signs of fatigue. Tighten fasteners or replace as required.

Steering System

- ___ Check rudder for impact damage or cracks.
- ___ Check rudder hardware for wear or play.

Thru Hull & Seacocks

- ___ Check seacock integrity, operation, and watertightness. Replace, reassemble, and lubricate as required.
- ___ Check hose attachment and clamps.

Electrical

- ___ Disconnect power source when making repairs or adjustments to electrical systems.
- ___ Check battery charge, terminal connections.
- ___ Check electrical panel, breakers, and switch condition and operation; tightness of wire connections.
- ___ Check running light operation.
- ___ Check ground wire attachment to keel, mast, and engine.

Engine & Drive Train System

- ___ Read engine owner's manual maintenance guide.
- ___ Check engine fluid levels and systems for leaks- shut-off controls.
- ___ Check throttle action - start and stop controls, cable clamps, etc.
- ___ Check exhaust system soundness, hose clamps.
- ___ Check coolant system, hose clamps, intake, and filters.
- ___ Check transmission shift lever action, control cables, clamps; fluid level and alignment.
- ___ Check prop attachment, zinc, and Saildrive.
- ___ Check all engine wire connections.

Fuel System

- ___ Check fuel tank and gauge, hoses, clamps.
- ___ Check fuel fill hoses and connections.
- ___ Check fuel filters.

Keel

- ___ Check keel bolt nuts for tightness. Do not arbitrarily tighten bolts unless you've experienced a severe grounding. If there is concern for leakage, consult your dealer or professional yard.

Plumbing

- ___ Check bilge pump function, electrical wiring, hose clamps, and strainer. Clean, disassemble, lubricate as required.
- ___ Check head and holding tank hoses, clamps, connections, and valves.

Water System

- ___ Check water tank hoses, clamps, valves, connections.
- ___ Check water heater hoses, clamps, electrical wiring.
- ___ Check water filters.

Mast & Standing Rigging

- ___ Visually inspect all mast termination fittings and halyard sheaves and exits.
- ___ Untape spreader ends and clevis pins inspect and re-tape

Storage Tips

Many of the maintenance problems surrounding boats can be pinpointed during the end-of-season haul-out. This is the time when a careful inspection will reveal the ravages of a long summer. If you live in colder climates, it is also the time to prepare the boat for what might be an even more brutal winter ashore.

First, clean your boat as thoroughly as possible. Get the yard to use a high-powered hose to clean off most of the growth before it dries onto the bottom paint. You may have to use a scrub brush and putty knife for heavy growth, like barnacles, and for areas around the propeller and shaft and underneath the keel.

Rigging

Sails and lines should be removed at the end of each season, rinsed thoroughly in fresh water and stored in a warm, dry place. This will prolong their useful life as mildew can affect even today's synthetic materials. Most sail lofts offer a cleaning/storage service.

Engine

Check the engine owner's manual for maintenance guidance during the season and for the specific haul out procedures necessary to winterize the engine. Fill fuel tank to minimize condensation. In the exhaust system, water can accumulate in the bottom of the muffler. This should be drained using the drain plug, or anti-freeze added so residual water doesn't freeze.

Batteries

It is preferable to remove the battery(ies) and store in a heated area, recharging periodically to maintain full charge status. If you are in warmer climates, it is possible to leave the battery aboard. Simply check once a month to ensure a full charge.

Head

Read the owner's manual for specific maintenance procedures. Generally, you will want to drain all water and replace with an anti-freeze agent. To maintain the lubrication of its internal seals, flush through a light oil. Again, follow the manufacturer's recommendations for winter maintenance.

Bilges

Pump bilges completely dry and use a strong cleaning solvent to eliminate odors and bacteria.

Electronics

Remove as many as possible to avoid condensation caused by the extreme rise and fall of temperature and humidity that come with winter.

Interior & Ventilation

Clean the cabin thoroughly with a damp rag, for any salt left behind will breed mildew. Clean out the head and sinks. Any paper items- books, toilet paper, and notepads- should be taken off so they don't mildew.

If a winter cover is used, it is good to leave the hatches cracked open to enhance air circulation. This helps prevent mildew. Also, remove boat cushions and store indoors.

Exterior

If storing outdoors, a winter cover is recommended. It can be a simple piece of canvas forming a tent over the entire boat or heat-shrunk plastic. In either case, a tent-like support structure is necessary to prevent pools of water and to assure proper air circulation.

Ensure the entire deck is covered to prevent uneven discoloration of the gelcoat.

Cradle

It is critical the boat is adequately supported. The keel must rest solidly on the main beam of a storage cradle and the vertical risers or bunks should merely stabilize the boat. If it appears that the boat is supported too much by the vertical risers, correct the problem.... as this could structurally damage the hull.

Mast Storage

Store masts on well-padded supports and do not place any weights on them. Avoid tape on the mast surface as it leaves a difficult to remove residue. Wash all surfaces, sheaves, standing rigging with fresh water. If possible, remove all standing rigging, halyards and mast instruments and store indoors. For painted masts, it is usually NOT advisable to wrap the mast in plastic, as moisture can become trapped, and lead to premature paint blistering.

Appendix

APPENDIX A

Best Practices – Boat Inspection

J Boats has compiled, with the help of several industry experts, the following “best practices” inspection, maintenance and use guide for J/Boat owners. We urge each owner to read carefully the recommendations, to proactively and periodically inspect all critical components of your boat, and to contact anyone in the J/Boats network of dealers, builders and class associations if you need any assistance.

INSPECTION OVERVIEW

Considering the typical high-frequency use seen by many J/Boats, at a minimum, we recommend that owners have their boats inspected on an annual basis and that a professional survey be done every five years. An inspection should include a detailed review of the high-load areas, such as the rudder and keel attachments, rigging terminals, structural bulkheads, keel floors, mast step, mast partners, steering systems, mast and boom fittings, lifelines, etc. Inspection should also include identifying any possible leaks, including thru-hull fittings, as well as identifying worn rigging and hardware. Additional inspections/surveys should be performed immediately after any instances of grounding, collision, and/or extreme weather sailing.

The American Bureau of Shipping (A.B.S.) calls for a detailed inspection every two years and a professional survey every 6 years (see Appendix B for details) following new construction.

According to Carter Gowrie of the Gowrie Group, most insurance companies mandate a professional survey for boats at 10 years. A survey may indicate a structural or safety issue that an owner needs to address in order to continue insurance coverage. For boats that haven't changed hands (which usually triggers a pre-sale survey), it's otherwise left entirely to the owner to determine when a survey should occur.

KEEL/ KEEL FLOORS

Overview - One of the most critical areas of a modern, fin-keeled composite boat is the keel and keel floor area. This is an area that absorbs incredible loads and enormous stress.

Use Considerations:

- 1) **Groundings** - after any grounding or collision with any underwater object, soft or hard, be sure to carefully inspect the keel, sump area and keel floors for any signs of cracking or weakness. This is best handled by a qualified marine surveyor. Even a seemingly minor grounding can weaken the overall structure, particularly if left un-repaired for any length of time and/or if the boat continues to sail without repairing. There have been cases where a moderate grounding revealed no visible damage (due to the bottom of the boat absorbing the impact and then returning to shape), only later to reveal the presence of fractured glass on the inner hull laminate just aft of the keel. Have repairs done by a professional yard with a follow-up survey.
- 2) **Trailing/ hauling/ poppets** - boats that are actively trailered can be subject to excessive stress and strain on the keel/hull joint. In fact, years of trailering alone can subject a keel/ hull joint to excessively sharp vertical accelerations that can cause significant wear and tear on any portion of the composite structure; including keel sump and keel floors.

According to Triad Trailers, one should first load a trailer by placing most of the weight (80-90%) on the keel as it sits in the trailer's keel tray. Then screw each individual hull support up to the hull just

until light contact is made. Do this for each of the six individual hull support stands (on the Triad Trailer). After all six stands are touching the hull release the lifting straps so the boat is now mostly on the keel with the hull support stands preventing the boat from tipping side to side. Adjust each hull support stand upwards towards the hull to a point where you are only able to spin the carpeted top on the hull with a good amount of force. After each hull support stand is properly adjusted tighten the set screw on each of the 6 hull supports. This set screw prevents the wing nut handle from vibrating down during travel.

Be particularly careful when strapping a boat down to the trailer. It's not uncommon at regatta venues to see boats quickly hauled and lowered onto their trailers, with little time to get the boat aligned and sitting properly on the poppets, then strapped down hard onto the trailer with powerful ratcheting webbing straps and then driven off. In short, the hull is being pulled down hard on top of the keel/sump and in a very short period of time is potentially subjected to excessive stresses and strains on the entire hull/keel/sump structure. **If you have a bow-stop on the trailer, use shorter strap runs (running nearly vertical) over the boat rather than long diagonal straps through the bow and stern rails. This reduces the possibility of trailer flex contributing to any excess strain.**

- 3) **Docking & mooring** - care should be taken to avoid mooring or docking your boat in locations that can result in the keel being occasionally imbedded in the mud/sand/silt when at low tide or low water. A combination of the keel bulb imbedded with any sort of wave action against the hull can cause undue stress to the hull and structure. The same is true for boats that use special dockside hoisting systems to hoist the hull out of the water, while the keel remains underwater and unsupported.

Maintenance Considerations:

- 1) Care should be taken to avoid having standing water in the bilge. Not only does standing water accelerate corrosion of wiring, fasteners and keel bolts over time, it ruins floor boards and interior woodwork. As the gelcoat/ paint ages in the bilge area, bilge water can eventually seep into the fiberglass laminate by way of pin holes in the gelcoat and weaken the fiberglass laminate structure. The *process of hydrolysis* can be initiated in the fiberglass laminate *anytime* there is ingress through cracks in the paint/gelcoat in the bilge. *The process of hydrolysis is persistent and invisible- it's water that chemically degrades the quality and strength of the laminate over time.* Bilges (all areas under the floorboards, not just the centerline bilge) should be cleaned thoroughly once per year and then every five years recoated with fresh gelcoat or epoxy paint to ensure proper protection. In northern climates, water turns to ice in the winter. If moisture gets into the laminate and freezes, this can rapidly accelerate deterioration in the laminate. The New Hampshire Materials Testing Labs website (www.nhml.com) has an informative article on hydrolysis, see Newsletter of May 1, 2006.
- 2) In any cored hull, take special care to avoid having any fasteners penetrate the inner hull laminate. Water in the bilge area can easily weep through the fastener into the laminate and cause core damage. If you need to secure a fitting or wire tie to the hull, the best fastening method is to glue a piece of epoxy coated marine ply to the hull and then fasten into the ply.
- 3) A growing trend amongst active one-design racers is to use a dehumidifier to keep the inside of the boat dry. This extra step not only keeps the boat a little lighter, but helps everything from wiring, to woodwork, to sails, last longer.

RIGGING

- 1) **Standing rigging** - The general rule of thumb from Hall Spars is that standing rigging (whether wire or rod) should be replaced every 10 years, unless excess strain due to hard ocean sailing shortens this life. Fatigue can be in any form- sailing in extreme wind conditions, unnecessary flogging of loose leeward shrouds, corrosive environment. Any signs of a broken wire strand(s) indicate immediate replacement is necessary. Otherwise keep a close look out for corrosion or cracking in the swage fittings and turnbuckle threads. In southern coastal areas, with the high salinity and year round warm weather, rigging must sometimes be replaced every 5 years. Fresh water sailed boats will generally have a longer rigging life, but are still subject to fatiguing after years of stress.
- 2) **Headstay** - The top of the headstay (wire or rod) should be checked to make sure it's not bent. The fasteners and the top of the headstay foil should also be routinely checked.
- 3) **Clevis pins** - More rigging and spar mishaps are caused by clevis pins backing out, than perhaps any other culprit. If the clevis pins are semi-permanent (only removed a few times per year), then use appropriate sized cotter pin and fully bend them back around the clevis pin. Then cover with clear sealant rather than tape so that they are visible.
- 4) **Running rigging** - suffers the greatest wear and tear (chafing primarily) and should be checked frequently for wear, particularly high load lines like main and jib halyards and jib sheets.

SPARS

- 1) Spar life can vary, but Hall's general rule is the mast should be replaced every 20 years. Frequently check your spar for problems. Spars break more often than not by a failure in the standing rigging, but there are some specific areas to keep an eye out for:
- 2) **Deck area** - The mast section at the partners (where the mast passes through the deck) is usually subject to the most fatigue over time. This is due to the rig getting set up with pre-bend, then pulling on lots of backstay tension, and the constant flexing of the spar over many years. The best prevention is a good set of mast wedges or the Spartite mast wedge system. Unchecked movement at the deck can significantly shorten the life of the spar. Be especially careful about drilling any holes in the mast near the deck, and periodically inspect any holes in the area to make sure, there are no cracks developing. Any holes must be round or have rounded corners.
- 3) **Spreader tips** - these should be untaped and inspected annually. Seizing wire should be redone annually so that the shrouds will never "pop" out of the spreader tip. Use spreader chafe covers that won't collect water.
- 4) **Rig tuning** - to provide not only the best performance but also a longer mast life, it's very important to properly "tune the mast." Tuning means adjusting the shroud tension so that the top of the mast is centered over the boat, and such that the mast is in column or straight as you site up the mast groove on the aft side. Proper tuning for all conditions usually means maintaining enough tension on the shrouds so that they do not go completely slack on the leeward side while sailing. Many successful one-design classes have tuning guides published and provided by sailmakers. Some of these may suggest very loose settings on the shrouds for better light air performance. Care should be taken by owners to avoid sailing in windy conditions with light air shroud settings. This may significantly shorten the life of the mast and lead to breakage.

- 4) **Aluminum spars** - are subject to corrosion and fittings should be routinely inspected and replaced when necessary. Particular problem areas over time can be fasteners around boom vang, boom and mast ends, and gooseneck attachment brackets.
- 5) **Booms** - often have a shorter life than masts, particularly on race boats that do a lot of windward-leeward buoy racing in breezy conditions. In some class boats it is common practice to pull the boom vang hard going upwind (vang-sheeting) and then release the boom vang several inches going downwind. However if one bears away without first releasing the boom vang (from its vang-sheeted position) then most booms will bend under this load. Repeated occurrences will shorten the life of the boom and could cause breakage.
- 6) **Rig cutting tool** - Every sailboat should carry aboard a tool that is capable of cutting through standing rigging quickly. When a mast does break, the portion that is in the water can easily ram a hole and potentially sink a boat. You may not have time to unwrap the rigging tape and pull clevis pins at all the attachment points. The top of the line cutters are hydraulic, which can be used on wire or rod rigging. For small one designs (ex...J22, J24 & J80), a good hacksaw should be carried at a minimum.

OTHER STRUCTURE

- 1) **Bulkhead tabbing** - the primary structural bulkheads of the boat are tabbed both to the hull and to the deck. This tabbing (or fiberglass tape) should be inspected annually and, especially, after any groundings or excessive exposure to "hard trailing". If there is any evidence of gelcoat cracking or actual tabbing visibly loose or beginning to peel, ensure that a marine surveyor inspects the boat and recommends adequate remedies to correct potential damage.
- 2) **Hull-to-deck joint** - all modern J/Boats are built with a "glued" PLEXUS (2-part elastomer glue) hull to deck joint. It is an ISO/ABS approved method for hull-to-deck bonding. This joint should be inspected at least annually and, in particular, if any leaking is noticed inside the hull. Sometimes the best check is to use a "non-permanent dye" in water to squeeze into the hull/deck joint and look for "runs" inside the hull. If any leaking is observed, have the hull to deck joint surveyed and have the surveyor make recommendations for adequate remedies to correct potential damage.
- 3) **Chainplate fittings** - Both port and starboard chainplates and the bow and stern chainplates should be checked at least annually. Look for leaks where they intersect the deck.
- 4) **Bow sprit system** - the sprit system is a combination of a carbon tube, pulley system and an integral bulkhead/ bow support. The system can easily be damaged, particularly when struck laterally or vertically at the end of the pole with any force (e.g. when rounding marks hitting sterns, hitting metal buoys, or burying the bow in steep seas under full force of the asymmetric spinnaker too many times). Regularly inspect the sprit for excessive wear where the sprit intersects the outer bearing at full extension.

DECK HARDWARE

- 1) **Lifelines and lifeline fittings** - should be replaced at least every 10 years or at the first sign of corrosion or damage to the wire strands, swages or turnbuckles. Many older boats have white vinyl coated lifelines, which are no longer allowed by ORC Offshore regulations, as the vinyl can disguise ongoing corrosion or damage to the wire. These should be replaced using appropriate wire type and diameter immediately.
- 2) **Sealants** - used for deck hardware can last anywhere from 3 -10 years depending on the stress exerted on the hardware. If most of your hardware is still original, you should consider backing off the fasteners and rebedding with Sikaflex, 3M 4200 or similar. Jib and genoa tracks are usually the first areas to start to leak over time. Stanchion set screws should be re-inspected and replaced when necessary.

ADDITIONAL REMARKS

There are few industry guidelines regarding pro-active maintenance, inspection and periodic replacement of key components on aging composite boats. Many owners rely on reminders from their boatyards for upgrades or required maintenance. For trailerable one-designs, it's mostly up to the owner unless a surveyor gets involved with a pre-sale survey, and even then, not all surveyors are versed in composites. There are critical areas on every boat that need to be vigilantly looked after and routinely inspected, and we strongly encourage all owners to start by inspecting their boats now to best ensure a long, productive life.

FOOTNOTE: The contents of this article are thought to be accurate, but do not necessarily include all of the possible preventive maintenance suggestions that owners could follow to ensure long-term, safe operation of their boats. Boats incur wear and tear in unique ways. When in doubt please consult a professional for advice/instruction on maintaining, inspecting, repairing and/or operating your boat.

APPENDIX B

American Bureau of Shipping (ABS) 1994 Guidelines for Offshore Racing Yachts Section 11- Surveys after Construction

Summary:

ABS specifically recommends that a boat should be inspected every two years (the "Biennial Classification Survey"- Section 11.2) and every six years after date of construction (the "Special Periodical Survey"- Section 11.3).

The 2 year surveys defined in Section 11.2 recommend the following survey to be completed:

11.2(a)- boat hauled, cleaned, dried in satisfactory condition for examination.

11.2(b)- general examination externally and internally and placed in satisfactory condition.

11.2(c)- all thru-hull openings and valves to be examined internally and externally.

11.2(d)- basic list of items to be examined and placed in satisfactory condition; including superstructures, hatches, companionways, ventilator and airpipe coamings, skylights, flush deck scuttles, all openings in yacht sides including freeing ports.

11.2(e)- general examination of the steering gear, operationally tested and placed in satisfactory condition.

11.2(f)- general examination of anchoring equipment and placed in satisfactory condition.

11.2(g)- general examination of mast, spars, standing rigging, running rigging and sails and placed in satisfactory condition.

The 6 years surveys defined in Section 11.3 recommend a far more complete survey. In addition to all elements as described in 11.2- Biennial survey, the following components need examination:

11.3(c)- examination of the rudder, bearings and stuffing boxes and placed in satisfactory condition.

11.3(e)- complete examination of the interior, including removal of lining, ceiling, portable tanks and ballast as may be required by Surveyor to satisfy the condition of all parts of the structure.

11.3(f)- all integral tanks tested to full capacity

11.3(g)- examine anchor windlass, hawse pipes, anchors and cables and placed in satisfactory condition.

11.3(i)- examine hull/keel fastenings and "hammer tested" to ascertain soundness by Surveyor.

11.3(k)- all sails, masts, spars, standing and running rigging to be unstepped, laid down on ground and fully examined by Surveyor and placed in satisfactory condition.

11.3(m)1- examine all framing, holds, hull laminate on the interior, tanks, bilges, drains and machinery.

11.3(m)2- if there's evidence of cracking, distortion, wetness or delamination, destructive or non-destructive testing and removal and repair of the defect carried out to the satisfaction of the Surveyor.

11.3(m)3- examine engine foundations and attachment to hull

11.3(m)4- examine the hull, fastenings and backing reinforcements regards hull fittings and attachments.

APPENDIX C

Acrylico Window Care and Maintenance

J/88 fixed portlights are made by:

AcryliCo
2633 Lantana Rd. Suite "6"
Lantana, FL 33462
Phone (561) 304-2921
Fax (561) 304-2922
support@acrylico.com
info@acrylico.com

The following are the guidelines published for cleaning and maintenance of these portlights:

You can keep your boat windows looking and performing like new by using the proper care products and techniques, and by understanding a little about the material you are working with.

First, most windshields are acrylic plastic (as opposed to "Lexan" or polycarbonate), and acrylic plastic is scratchable. Proper care involves preventing scratches that are preventable and properly taking care of those that are not.

When cleaning a window, always remove as much abrasive dirt as possible without touching the surface. Ideally this would involve flushing the surface with water and allowing the accumulated bug residue to soak, possibly with a little dish washing liquid added to the water. If a little rubbing is needed, do it lightly with your bare hand. After a final flushing with more water and carefully drying with a clean soft cloth, use a good grade cleaner/polish intended for acrylic windows, following the manufacturer's directions.

We need to step back here and take a look at cleaner/polishes. Everybody seems to have a favorite, from great and proper to poor and very dangerous. The good ones, at least those that are safe to use on acrylic plastics, tend to be the commercial ones, intended to be used on this specific material. The bad ones, including the very dangerous, tend to be materials never intended to be used as an acrylic window cleaner/polish, such as glass cleaners and furniture polish. Glass cleaners invariably contain ammonia, a killer of acrylics. **DO NOT** use anything containing ammonia on acrylic plastics. It will cause crazing (thousands of microscopic cracks) in short order. Furniture polish seems to be safer, but its long term use is undocumented and reports indicate it builds up and produces smears that are hard to polish off. Something to consider about furniture polish - it is intended to be used indoors, not outdoors, and on furniture, not boat windows. Furthermore, it's not much less expensive than many acrylic window products.

Good and safe care products vary in their ease of use and other properties, so if you don't like what you're using, give another a try. Talk with other boaters about what they are using, but be sure the product you select is intended for acrylic windows. Other products to keep away from your windows include any aromatic solvent, such as MEK, acetone, lacquer thinner, gasoline (a minor fuel spill should do no harm), and, heaven forbid, paint stripper. If you have to remove masking tape residue or other sticky or greasy stuff, the safest solvents are 100% mineral spirits or kerosene. Some alcohols are safe, such as isopropyl alcohol, but not all.

Concerning the polishing cloth, use the softest cotton cloth available. One hundred percent cotton flannel is ideal and available in yard goods stores. Old washed-out cotton T-shirts are a good second choice. We at AcryliCo have never found a paper product that did not scratch, even those advertised for cleaning plastics. One benefit of cotton cloth is that it can be washed, thereby effectively recycling the material

One cloth that has recently become available at a reduced cost is microfiber cloth. We have had good results with it.

Your choice of cleaner/polish should also be based on what is needed. Basically, you have to determine what type of care is needed and pick the best products to do the job.

First, it's best to understand what types of products are available. They can be loosely grouped into three categories:

1. Non-abrasive liquid sprays, in pumps or aerosols, that may or may not have scratch filling properties.
2. Non-abrasive creams that have scratch filling properties.
3. Mildly-abrasive creams that have scratch removing properties.

Since windows do accumulate minute scratches as part of everyday life (the kind you can't feel with a fingernail but can really see when flying into the sun), the products that fill fine scratches are great for regular use. If scratches still appear when flying toward the sun, the abrasive variety and some elbow grease is called for. This type of cleaner should be used occasionally only as needed. Most manufacturers of abrasive cleaners recommend applying a scratch filling product as a second step.

So what happens when you have scratches that you can't take care of with the above methods and perhaps you can feel with a fingernail? You have to get more aggressive. The danger, though, is in getting too aggressive.

Practically speaking, the only way to remove a scratch from clear acrylic is to remove material from around the scratch down to the greatest depth of the scratch, then polishing the window back to clarity.

APPENDIX D

J/88 Supplier Contacts

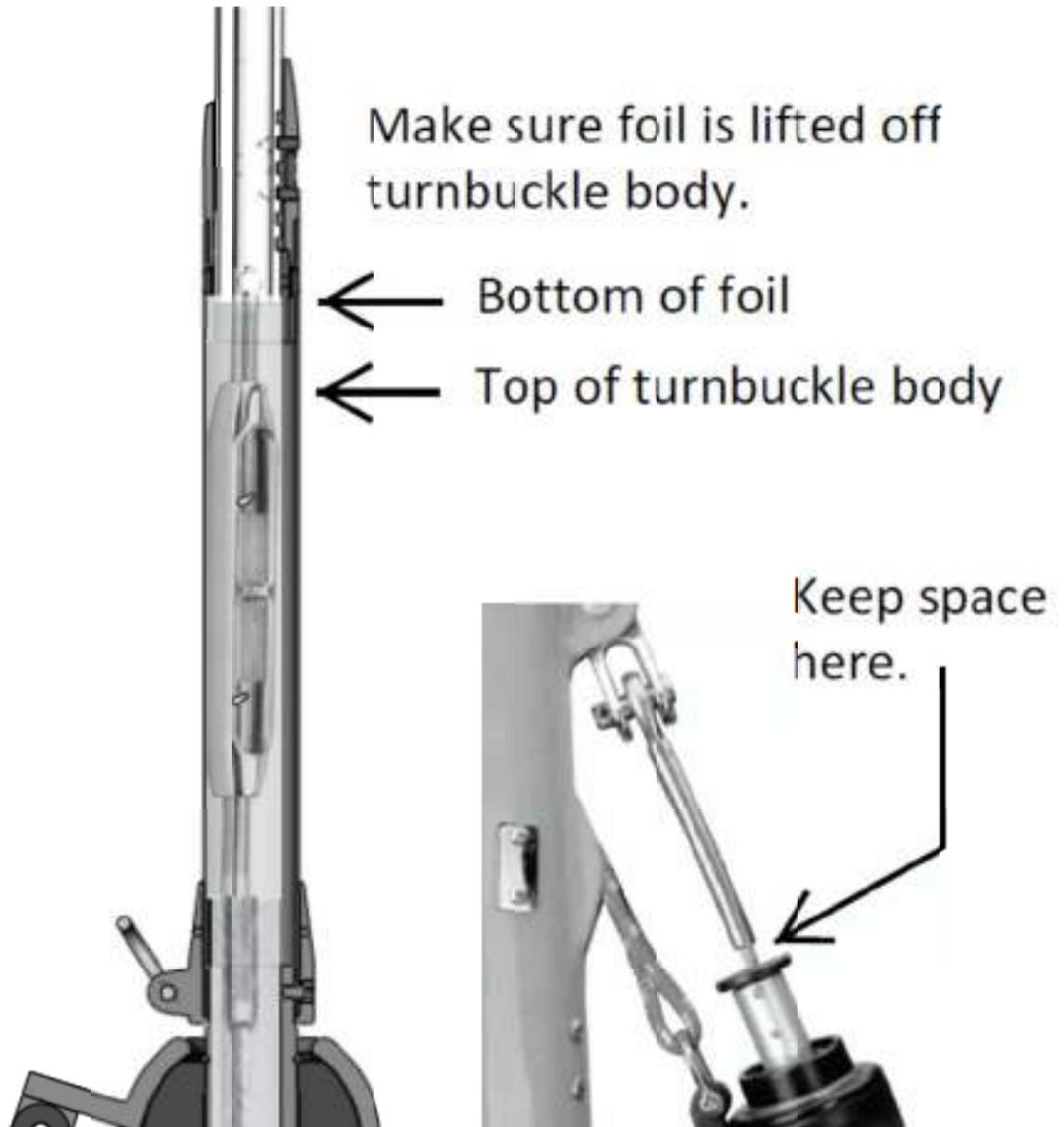
System	Supplier	Phone	Web
Electrical Panels	Blue Sea Systems	360-738-8230	www.blueseas.com
Lighting - Interior	Hella Marine		www.hellamarine.com
Lighting - Navigation	Aqua Signal Corp.	847-639-6412	www.aquasignal.net
Lighting - Mast	Perko	305-621-7525	www.perko.com
Portlights - Opening	Global BSI Inc.	45-7322-2222	www.bsidk.com
Portlights - Acrylic Fixed	AcryliCo	561-304-2921	www.acrylico.com
Deck Hatch	Global BSI Inc.	45-7322-2222	www.bsidk.com
SS Stanchions & Chain Plates	Garhauer Marine	909-985-7513	www.garhauermarine.com
SS Rails	White Water Marine	810-987-4837	www.whitewatermarineinc.com
Mast & Rigging	Hall, Inc.	401-253-4858	www.hallspars.com
Deck Hardware	Harken	262-691-3320	www.harken.com
Rope Clutches & Jammers	Euro Marine Trading - Antal	401-849-0060	www.euromarinetrading.com
Cushions	Ken's Canvas	401-246-1244	Facebook page
Canvas	Thurston Canvas Inc.	401-254-0970	www.thurstonsails.com
Engine, Saildrive, Zincs	Mack Boring & Parts	508-946-9200	www.mackboring.com
Fuel Tank	Moeller Marine	800-432-8344	www.moellermarine.com
Holding Tank	VETUS America	410-712-0740	www.vetus.com
Fresh Water & Bilge Pumps	Whale Water Systems	802-367-1091	www.whalepumps.com
Seacocks	Forespar	949-858-8820	www.forespar.com
Winches	Lewmar Marine	203-458-6200	www.lewmar.com

Harken MKIV Unit 0 Underdeck Furling

July 2015 Rondeau

Service Advisement Check foil and stay adjustment
 Check furling line dead end knot.

IMPORTANT! Check foil height adjustment relative to the turnbuckle body and top of stay. When the furler and turnbuckle are correctly adjusted, the foils will freely rotate above main body of the turnbuckle. To avoid damaging furler and rigging you must adjust the turnbuckle and foil height per the instructions below. **IMPORTANT! If the furler will not rotate do not force it or damage to the foil or stay will result. Correct the problems as directed below.**





Torque tube raised

Once turnbuckle is adjusted, use both cotter pins to lock each threaded stud in the turnbuckle. **IMPORTANT! Make sure cotter pins do not scrape the interior of the torque tube.**



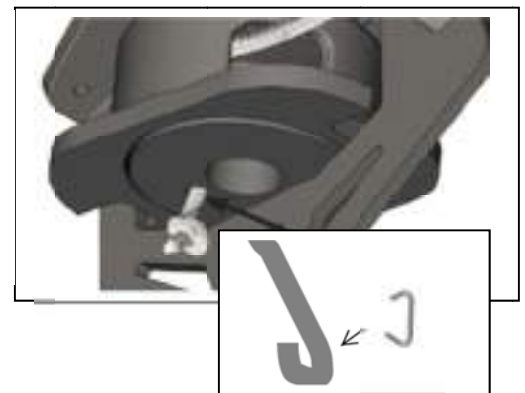
Installing torque tube

Use both cotter pins!

Once torque tube is installed, make sure the foils are lifted far enough to clear the main body of the turnbuckle. Use the four screw clamp. Lift the foils as far as they will go as a reference, then come down about 1/2" to the nearest notch. Be sure there is room at the top of the stay for foil to rotate freely. See previous page.



Check Furling Line Dead-End - Make sure furling line stop knot is a single overhand knot. Do not use a figure eight knot; it will catch on the lower bridge structure. Some line diameters require that you remove part of the core and tie a single overhand knot using the cover. Alternatively fold the end of the line back on itself about 1/2" and use a "C" shaped crimp (hogring) to make a stop. Always use a minimum of two line wraps of line on the spool when the sail is completely furled.



See complete manual by clicking this link. [Manual](#)
Especially note pages 26, 27, 28 and 35.

If you have any furling questions call (262) 691-3320 or e-mail [Contact](#)