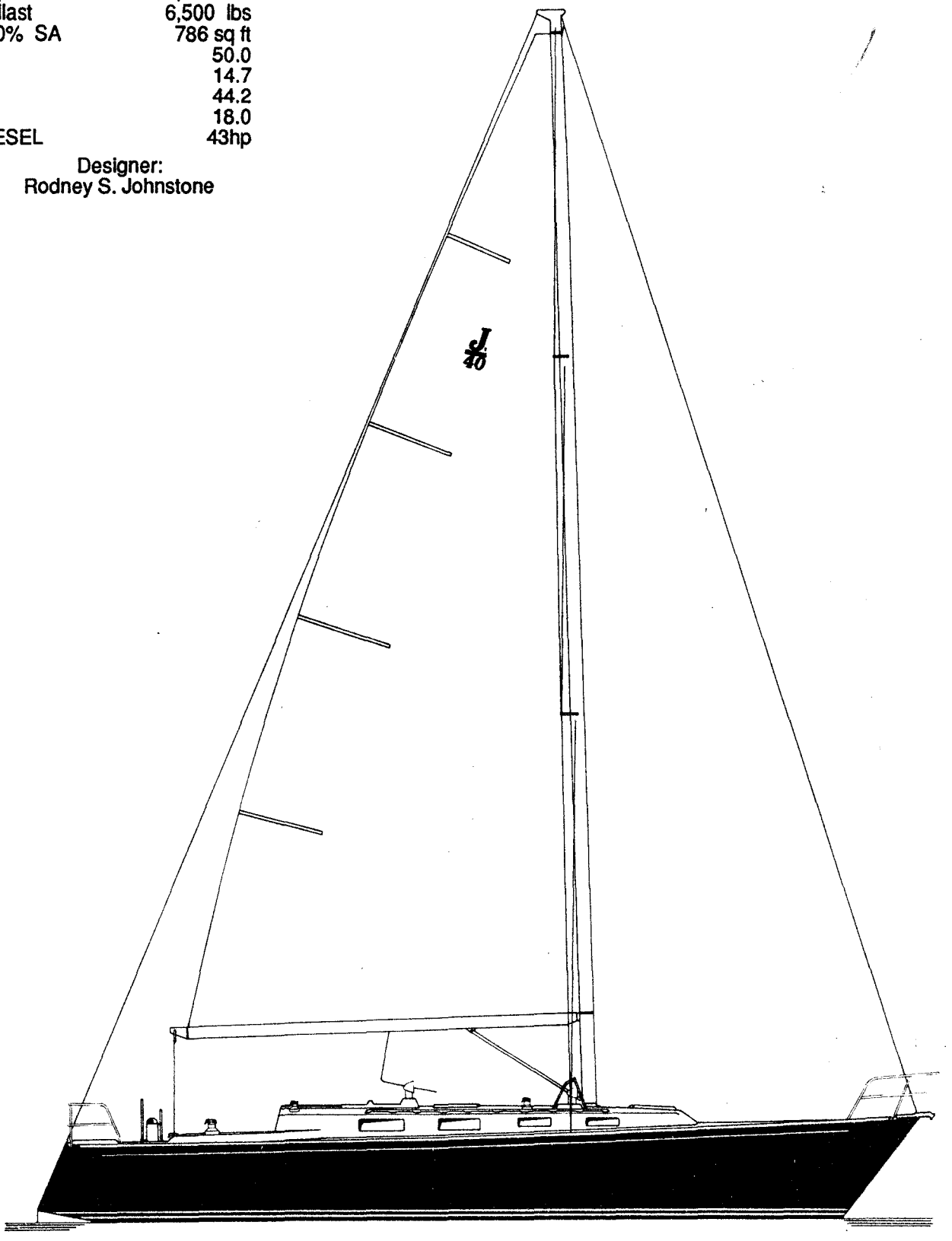
Specifications

LOA	40.3
LWL	34.0
Beam	12.1
Draft	6.5
Dspl.	17,000 lbs
Ballast	6,500 lbs
100% SA	786 sq ft
I	50.0
J	14.7
P	44.2
E	18.0
DIESEL	43hp

Designer:
Rodney S. Johnstone



J40 OWNER'S MANUAL

TABLE OF CONTENTS

ILLUSTRATIONS AND TABLES

INTRODUCTION

WELCOME ABOARD and welcome to the "J/family". We take tremendous pride in our product and want you to feel the same. Your boat is designed and engineered to be the strongest, swiftest, easiest-to-use, and most comfortable sailing boat of its type. In order to maintain your boat for years of trouble-free enjoyment be sure to READ ON!

J/Boats has prepared this Owner's Handbook to get you sailing safely and comfortably. This handbook is divided into three parts. The first part, the REFERENCE SECTION, includes important guidelines and descriptions of onboard systems and pertinent information needed to commission, rig, and find all components necessary to maintain, replace, or upgrade your present boat.

The next portion, the APPLICATIONS SECTION, is a brief discussion on "how to." Included are procedures for use of onboard systems and tips on how to make sailing safer and more comfortable.

The last segment, the MAINTENANCE SECTION, has helpful tips and checklists to be used periodically to keep your yacht operating in superb condition.

Finally, the back of the handbook contains APPENDICES, WARRANTY CARDS and information, and an INDEX to help you locate specific items more easily.

BE SURE TO FILL OUT YOUR WARRANTY CARD
AND IMMEDIATELY SEND IT TO TILLOTSON-PEARSON, INC.

J/BOATS is committed to continually improving its products and with its builder (TILLOTSON-PEARSON) reserves the right to change, modify, or replace, or remove, or add equipment from either this manual or sales literature without prior notificatins or obligations.

BACKGROUND

J/Boats are produced by TILLOTSON-PEARSON, INC (TPI) in their Warren, Rhode Island facility. TPI is renowned throughout the industry as the pioneer and expert in quality fiberglass yacht construction. Their extensive staff of craftsmen, engineers, production specialists, and quality control inspectors ensure that your yacht has been carefully built and thoroughly inspected.

The technology developed by TPI for designing and constructing the boats is the most advanced in the marine industry. Only the highest quality materials are utilized and they undergo constant testing in TPI laboratories to ensure they meet stringent construction and material specifications.

MATERIALS

The following describes the various materials used to build all fiberglass components:

1. GELCOAT-- All J/BOATS have an neo pentyl glycol (NPG) isophthalic gelcoat. NPG iso gelcoats yield a denser, more frequently branched molecular network which inhibits migration of water molecules. Because of their structure, these gelcoats offer superior resistance to moisture penetration, blistering, and fading. They're formulated to "yield" more than other gelcoats and this "flexibility" improves cracking resistance. Testing also indicates that NPG ISO GELCOATS produce the highest gloss and the best color retention under harsh exposure.

2. GLASS FABRICS-- throughout the hull and deck are high performance unidirectional, biaxial, and triaxial fibers. Their use in the sandwich laminate offers superior strength and stiffness to conventional cloth and woven roving laminates. These unidirectional fibers are oriented in the laminate structures along lines of stress for greatly improved hull/deck strength and stiffness. These specially woven fabrics also require less resin for lamination than low cost fabric matrixes; producing stronger, lighter structures without excess weight.

3. RESINS-- TPI are chemically formulated to their exacting specifications to incorporate the best balance of properties based on extensive testing.

For the hull, a special vinylester resin is used as a barrier coat behind the gelcoat to prevent moisture penetration; this reduces the likelihood of blistering within the laminate structure. It is also formulated, like the gelcoat, to reduce "cracking."

The combination of this vinylester resin with NPG ISO gelcoats and properly specified glass fibers yields the most blister resistant hull in the industry.

A high quality polyester is used to complete inside and deck laminates. Again, a superior chemical formulation is specified to assure resistance to "cracking" and "fatigue." Furthermore, its properties also assure high strength and stiffness for the life of the boat.

4. SANDWICH CONSTRUCTION-- is used in all J/BOAT hulls and decks to produce lighter, faster performing boats. A fiberglass sandwich functions similarly to an "I" beam. "I" beams are used for construction because they make the most efficient structural use of materials. The inner and outer skins of the sandwich function in much the same way as the horizontal top and bottom flanges of the "I" beam, and the core works similarly to the vertical

support of the "I" beam. This means consistently lighter hulls and decks can be produced which are stiffer and stronger than conventional solid glass hulls or decks.

Many different cores are available for sandwich construction. TPI uses LLOYD'S OF LONDON approved CONTOURKORE end-grain balsa core manufactured by BALTEK CORPORATION; it has superior physical properties in performance over any other type. Its excellent "thermal stability" is superior in warm climates or direct sunlight. When compared to foam cores, the fatigue properties of the end-grain balsa core are far superior. It also has excellent impact and puncture resistance.

PRODUCTION CONTROL

Great care is taken in producing quality laminated structures, both on the exterior components(hull and deck) and in the interior components. The following quality control checks exemplify the factory's concern with achieving designed specifications:

1) Ultrasonic inspection of hulls and decks measures laminate thicknesses.
2) Weights of resins, glass, wood, balsa, are checked on a regular basis.
3) Resin burn-off tests are run randomly to check on the ratio of resin to glass built into the laminates...the only exact method to determine this balance.
4) Barcol hardness testers are used to check the relative cure of both resins and gelcoats.
5) Gelcoat application is carefully controlled and monitored to ensure the proper coating thicknesses. This is crucial to control blister resistance.
6) Proper catalyzation, thickness, and low porosity are constantly checked as they are key elements in producing a finish that will best resist the osmotic passage of moisture. Control of catalyzation is also critical for "weatherability."

THE STRUCTURAL COMPONENTS

BULKHEADS-- Major structural framing and bulkheads are glassed on both fore and aft faces to the hull and deck using non-woven biaxial glass fabric. This provides a strong bond between the hull, deck, and frames.

HULL/DECK JOINTS-- Extremely strong and watertight hull-to-deck joints are created by through-bolting the hull and deck flanges on 4" centers, mechanically and chemically, with 3M 5200 high strength urethane adhesive sealant. The hull and deck flanges have extra glass laminates and are designed to withstand high local area stresses produced by pounding seas.

HARDWARE-- To make your sailing as enjoyable and trouble-free as possible equipment is chosen from the best suppliers in the business, such as HARKEN, BARIENT, SCHAEFFER, HALL OR KENYON SPARS, ORIGO STOVE/OVENS, EDSON, and MERRIMAN. All internal and external hardware fastenings are engineered or specified for longevity and durability. Backing plates and additional laminates are incorporated when necessary to ensure reliable fastening.

THRU-HULL FITTINGS-- are high quality bronze or glass-reinforced nylon fittings. The metal fittings are individually grounded to protect against galvanic corrosion. All are sealed with 5200 sealant to ensure watertightness. The hull core terminates several inches from the thru-hull fittings and is replaced with solid glass to prevent water contact with the core.

KEEL STUB/SUMP-- section is designed using multi-layered solid glass laminates to accomodate the locally high loads induced by the keel. The keel is seated in an epoxy and thru-bolted to the keel stub. A specially formulated epoxy which adheres well to lead and fairing compounds covers the keel; it is highly resistant to water permeation and cracking due to "thermal cycling".

The keel is manufactured to factory specified templates and molds. They're composed of lead reinforced with antimony (for strength) and have high-strength stainless steel L-bolts cast in. Keels made in this manner are far superior to other configurations, especially iron (which rusts).

ELECTRICAL SYSTEMS-- have pre-assembled wiring harnesses and breaker protected central panels to ensure safety and organization. The wiring follows the industry accepted coloring codes of the N.M.M.A.

JOINERY/WOODWORK-- is of the finest woods available and is manufactured and finished off by hand. Curved and straight fiddles are usually laminated using the best wood resorcinol glues to ensure permanent and beautiful looks. And the finish is hand-sanded and oiled or varnished to bring out their beauty, and lustre.

GENERAL PREPARATION

Your boat is designed to be strong, simple, easy-to-care-for, and easy to tune. And if you take the time to read these instructions thoroughly it will prevent unnecessary headaches later, prolonging both the life of your sails, rigging, plumbing, and electrical systems.

THINGS TO KNOW ABOUT COMMISSIONING

Generally, your boatyard/dealer will help you prepare your boat before launching. And in most instances with a boat this size they will probably undertake the entire commissioning job. They are trained experts in the field and are capable of completing most commissioning tasks.

BEFORE LAUNCHING

Before you even begin to think of assembling your boat, do yourself a favor and do three things in order:

1) Go over the PARTS BOXES CHECKLISTS!

2) READ THIS MANUAL

3) REVIEW THE COMMISSIONING CHECKLIST

Your dealer will have completed # 1. Read the reference sections on 1) Sail Control Systems, 2) Steering System, 3) Engine/Fuel Systems, 4) Plumbing Systems, 5) Electrical Systems, and 6) Propane Systems to make yourself completely familiar with the various components and functions.

Get the COMMISSIONING CHECKLIST from page 8 and use it to ensure the boat is assembled properly. If a yard other than an authorized J/Boat dealer is performing the commissioning work, go over the list with them to establish what has to be done and by whom.

The REFERENCE SECTION of this manual is organized so that you can both read and commission in sequence, from opening the boxes and rigging the deck to turning on the stove. We begin first with the exterior components, such as the hull, engine, mast, boom, hydraulics, and then procede to the interior to describe the plumbing and electrical systems.

THE TOPSIDES

First wash off all the dirt and grime accumulated from delivery. Use only soft scrub cleaners (non-abrasives) on the gelcoat. Then apply a coat of high quality carnauba car or boat wax or use a synthetic poly-based coating. Either finish will prolong the life and sheen of the gelcoat.

THE BOTTOM

Bottom preparation is critical to long-lasting enjoyment. When done properly a great looking, clean bottom means faster, safer passages.

To ensure a professional finish 1) READ the paint manufacturers recommendations for prepping the bottom, and 2) get your dealer to spray it on. This will give the smoothest and, more importantly, the most uniform application.

Do not go light on paint as it will come back to haunt you later in the season. Generally, at least two coats are best, preferably three. And if possible, paint the first layer a different color than the subsequent overcoats. This helps you more readily determine where paint is wearing off as the first layer begins to show through.

COMMISSIONING CHECKLIST

PRE-LAUNCH

___ Read owner's manuals
___ Pre-rig mast and check installation of:
    1. halyards
    2. blocks
    3. electronics
    4. shrouds
___ Pre-rig boom
___ Install bow pulpit
___ Install lifeline stanchions and lifelines
___ Bottom painted or touched up
___ Check propeller/strut/zinc
___ De-winterize engine and check status of:
    1. engine oil/ filter
    2. coolant level
    3. transmission
    4. water intakes/filter
    5. fuel lines/filter
___ Check battery charge
___ Install wheel on pedestal
___ Align rudder on center and mark wheel on centerline
___ Align prop vertically & mark shaft
___ Check all hose clamps, tighten as required
___ Instrument transducers
___ Close all seacocks

LOOSE GEAR

___ Fenders and lines
___ Dock lines
___ Winch handles
___ Ignition keys
___ Bilge pump handle
___ Install portlight screens
___ Mast wedges ready
___ Double-check sling locations

LAUNCH

___ Check for leaks
___ Checks seacocks
___ Check stuffing box

ENGINE START

___ Read engine owner's manual
___ Check alignment and hook up couplings
___ Start engine
___ Check exhaust for cooling water flow
___ Check oil pressure, water temperature, charging gauges
___ Check transmission- forward/reverse
___ Check stuffing box

STEP MAST

___ Remove interior headliner piece around mast opening
___ Hoist spar and lower into boat
___ Run vang hydraulic hose through mast step into bilge
___ Attach hydraulic backstay cylinder to backstay plate
___ Attach all shrouds and hand tighten
___ Install wedges
___ Install mast boots
___ Install overhead trim
___ Make mast electronic connections at mast junction box

RIGGING

___ Install boom
___ Lead all halyards to stoppers on cabin top
___ Rig reef lines
___ Install and connect hydraulic vang
___ Connect hydraulic backstay cylinder
___ Rough tune spar

SYSTEMS CHECK

___ Fill water tanks- flush twice to eliminate non-toxic antifreeze
___ Check water pressure system, bleed air if necessary
___ Fill and check LPG system
___ Fill fuel tanks
___ Check operation of electrical systems and pumps
___ Check electronics (optional)
___ Check refrigeration (optional)

TRIAL SAIL

___ Raise and lower sails to check for fit
___ Monitor engine performance and check stuffing box
___ Check bilge for leaks
___ Check electronics (optional)
___ Check reef points and lines

The engine and fuel system is engineered to be conveniently accessible for repairs and general maintenance.

Located beneath the sink and "sidetable" in the main cabin, the engine can be reached by sliding off the four hooks on the "sidetable" or by opening the doors under the sink. All important functions can be reached; including water strainer, turbocharger, fuel injectors, fuel filter, fuel primer, expansion chamber, and alternator.

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. Notify your local engine warranty center.

ENGINE CONTROL PANEL lies on the starboard side of the helmsmen cockpit. It contains the starter, kill switch, warning lights, and gauges. The throttle and gear are on the Edson pedestal. Make sure cotter pins and nuts on connections to engine and transmission.

ENGINE BED is heavily reinforced fiberglass and the engine mounts are the same construction. This provides a superior mount over wood and is also rot-proof. The engine sits on the mounts on heavy duty rubber shock mounts to help isolate the engine vibration from the boat. Check to see that the engine is sitting correctly on them and the bolts tightly secured.

DRIVE TRAIN (FIG. 1) is the complete system which propels your boat. It includes the following components; the flex coupling, coupling, stuffing box, shaft log, shaft, strut, and the propeller.

TRANSMISSION is attached to the after end of the engine and houses the reduction and reverse gears. These gears generally need little maintenance, but the oil should be checked periodically, (see Maintenance Schedule). Prolong the life of the transmission by always ensuring that the...

** ENGINE IS IDLING WHEN SHIFTING GEARS **

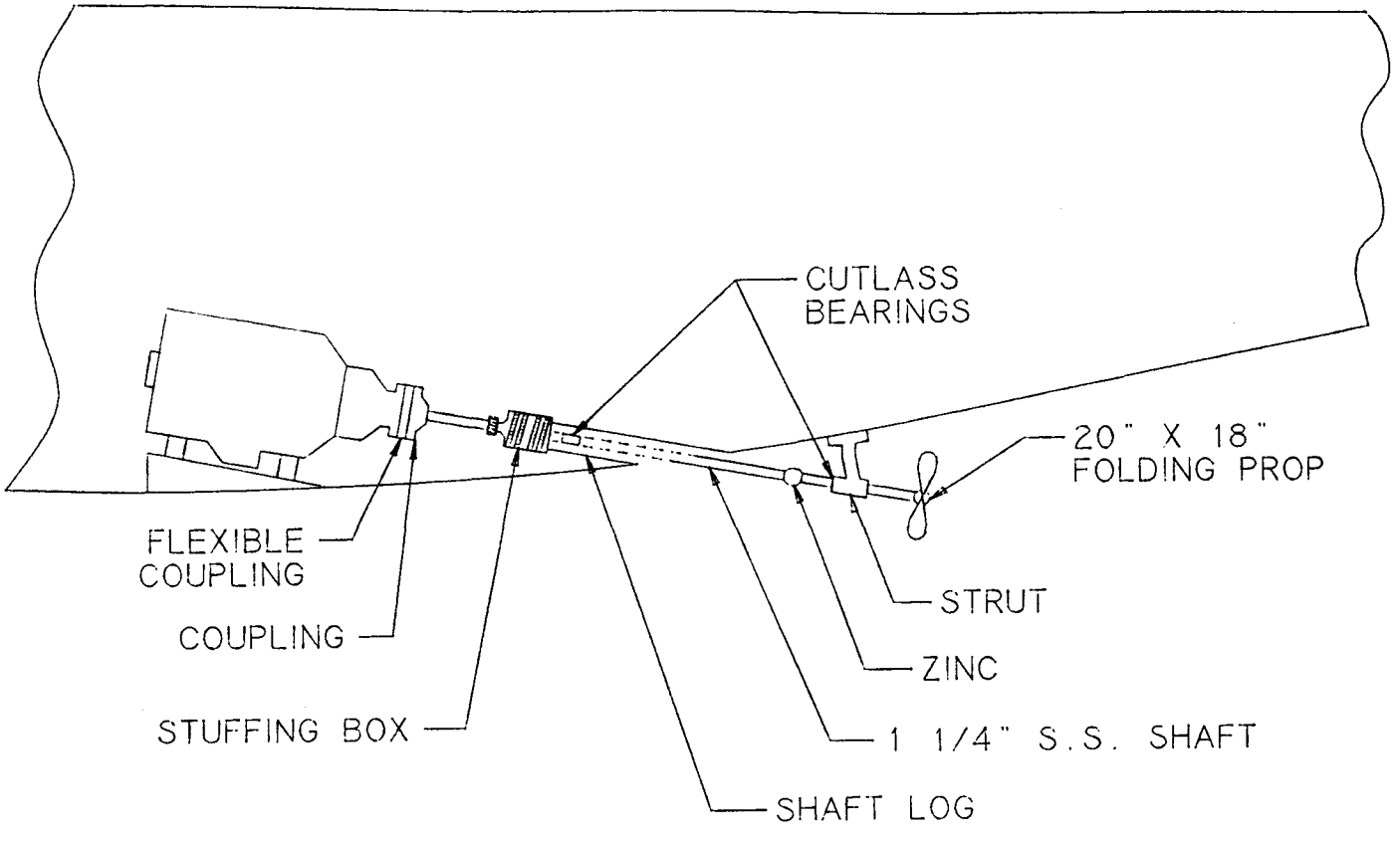
FLEX COUPLING is a device which fits between the coupling and the engine drive shaft. It utilizes heavy duty rubber mounts to mechanically reduce vibration between the engine and shaft.

STUFFING BOX is aft of the engine underneath the floorboards; where the propeller shaft passes through the hull from the engine to the propeller. It is a waterproof housing consisting of a rubber "jacket" attached to the tube and brass bearing with hose clamps.

When the engine is running, check to see that intermittent drips of water appear where the shaft enters the stuffing box. If the drips are a continuous stream, ie. more than one-a-minute, you must tighten the compression nut on the forward end of the stuffing box. This requires two large pipe wrenches to tighten the forward nut over the aft "core nut." It should not get hot when running.

J40 DRIVE TRAIN- FIG. 1

J-40 DRIVE TRAIN



PROPELLER is a MARTEC folding prop of high quality bronze alloy. Check to see that the blades on the prop open almost perpendicular to the shaft.

It is simple to take care of and can withstand a lot of years of hard use. However, there are a few easy precautions which can prolong its life. Coat it with an excellent silicone grease film. Check to see the joints in the folding prop have a good coating of waterproof grease, that all cotter pins are bent over properly, and that the blades are smooth (sounds simple, but it's worth it).

PROPELLER SHAFT is of stainless steel and is supported at the inboard end by the shaft couupling and at the outboard end by the strut containing a rubber "cutlass bearing." Before launching attach a "shaft zinc" to offset the perils of corrosion. These should be replaced every time the boat is hauled...the prop will look great even after many summers.

Check the "cutlass bearing" within the strut periodically for wear and tear. If it is loose, replace it.

ENGINE/SHAFT ALIGNMENT is set by the dealer to ensure that the engine, shaft, stuffing box, and prop are properly adjusted to minimize engine vibration. If there seems to be excessive vibration, notify your dealer and have them investigate.

FUEL SYSTEM (FIG. 2) is located centrally in the boat for effective weight distribution. It consists of the fuel tank, fill hoses & caps; fuel lines and filters; and the vent.

Use only DIESEL fuel in the system as it reduces the risk of fouling the injectors.

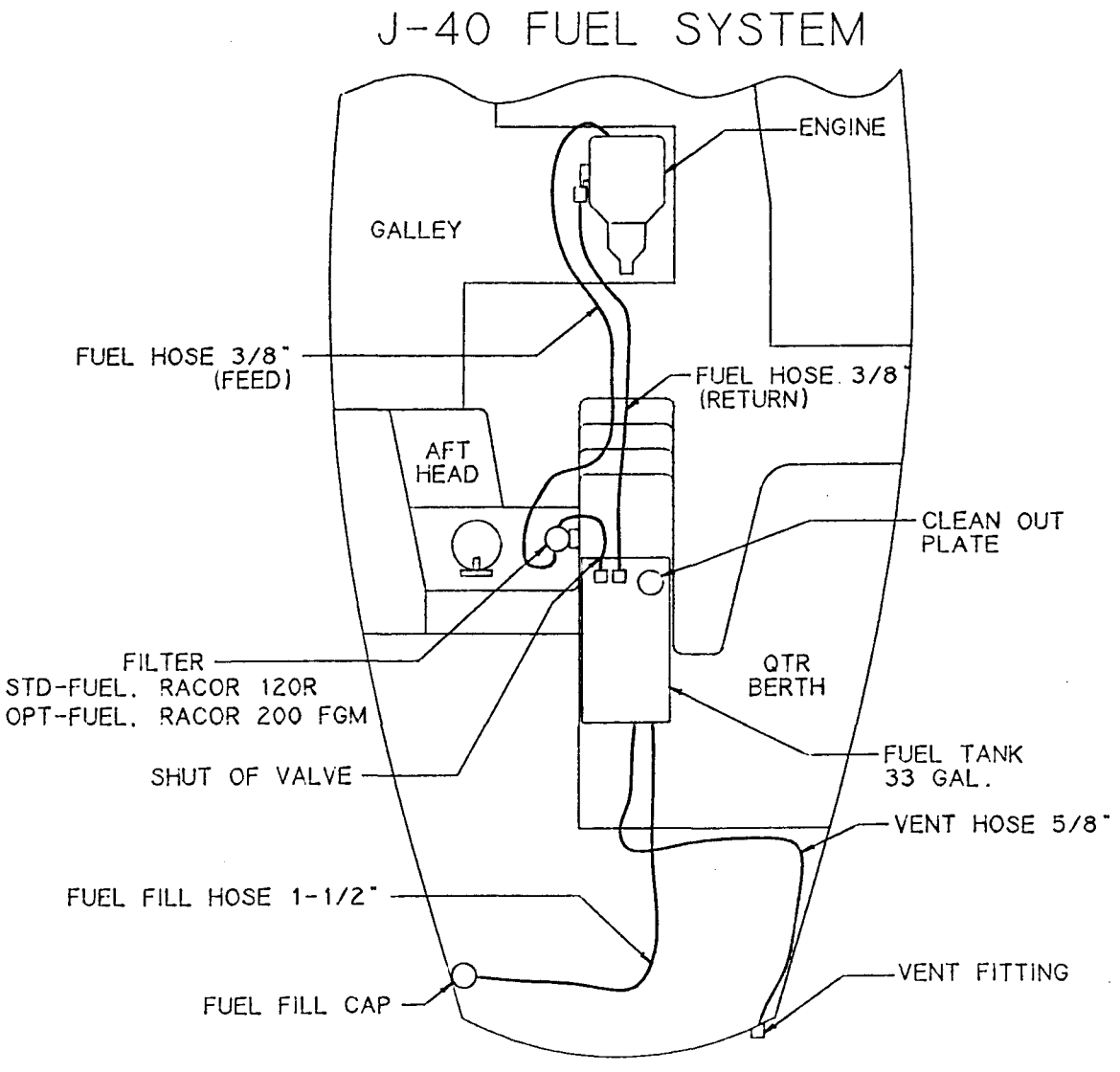
FUEL TANK AND LINE run from underneath the aft cabin berth, on centerline, under the cabin sole below the steps, and up to the fuel primer pump. From there fuel flows into the injectors. The tank is aluminium and baffled to prevent fuel slosh.

FUEL LEVEL GAUGE is located next to the engine panel in the helmsman cockpit. The electronic fuel level measuring device sits atop the tank at its forward end. The gauge reflects level (height) of fuel in the 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 also sits atop the tank at its forward end. Since diesel engines require bleeding after they have been deprived of fuel, it's important 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 tank or check fuel gauge.

J40 FUEL SYSTEM- FIG. 2



NOTE: FUEL GAUGE IN COCKPIT AT PANEL

ENGINE COOLING SYSTEM

The engine utilizes a closed system (FIG. 3) in which a mixture of water and anti-freeze is circulated within the engine for cooling. This liquid is cooled by a heat exchanger which uses sea water, in a similar fashion to the radiator on a car which uses air to cool the contained liquid.

The filler cap for the fresh water (closed) cooling system is located on top of the engine manifold, and looks like a radiator cap. Check the level in the manifold frequently (ensure engine is cool). If additional liquid is necessary, add only a mixture of anti-freeze/fresh water.

If the fresh water system is drained, or has a substantial leak, an air lock may develop in the fresh water cooling system. It may be necessary to disconnect a hose running from the engine to the water heater and fill the hoses and exchanger inside the water heater with coolant mixture.

In colder climates where freezing may occur over the winter, be sure to test the coolant anti-freeze/water mixture for freezing point and add anti-freeze as needed if the system is not drained for winter layup. Follow engine manual recommendations for proper water/anti-freeze ratios.

WATER STRAINER is located in the engine compartment and is a two-stage design to prevent "clogging" of the cooling system. Its simple design facilitates cleaning periodically.

1) Ensure the engine water intake thru-hull is closed. Check that the lever is perpendicular to the intake.

2) Simply unscrew the wing-nuts atop the filter and remove the strainer from inside the glass case. Wash thoroughly with water or replace with a new one if badly soiled.

3) Replace strainer back into case and tightly affix lid with the wing-nuts.

EXHAUST SYSTEM

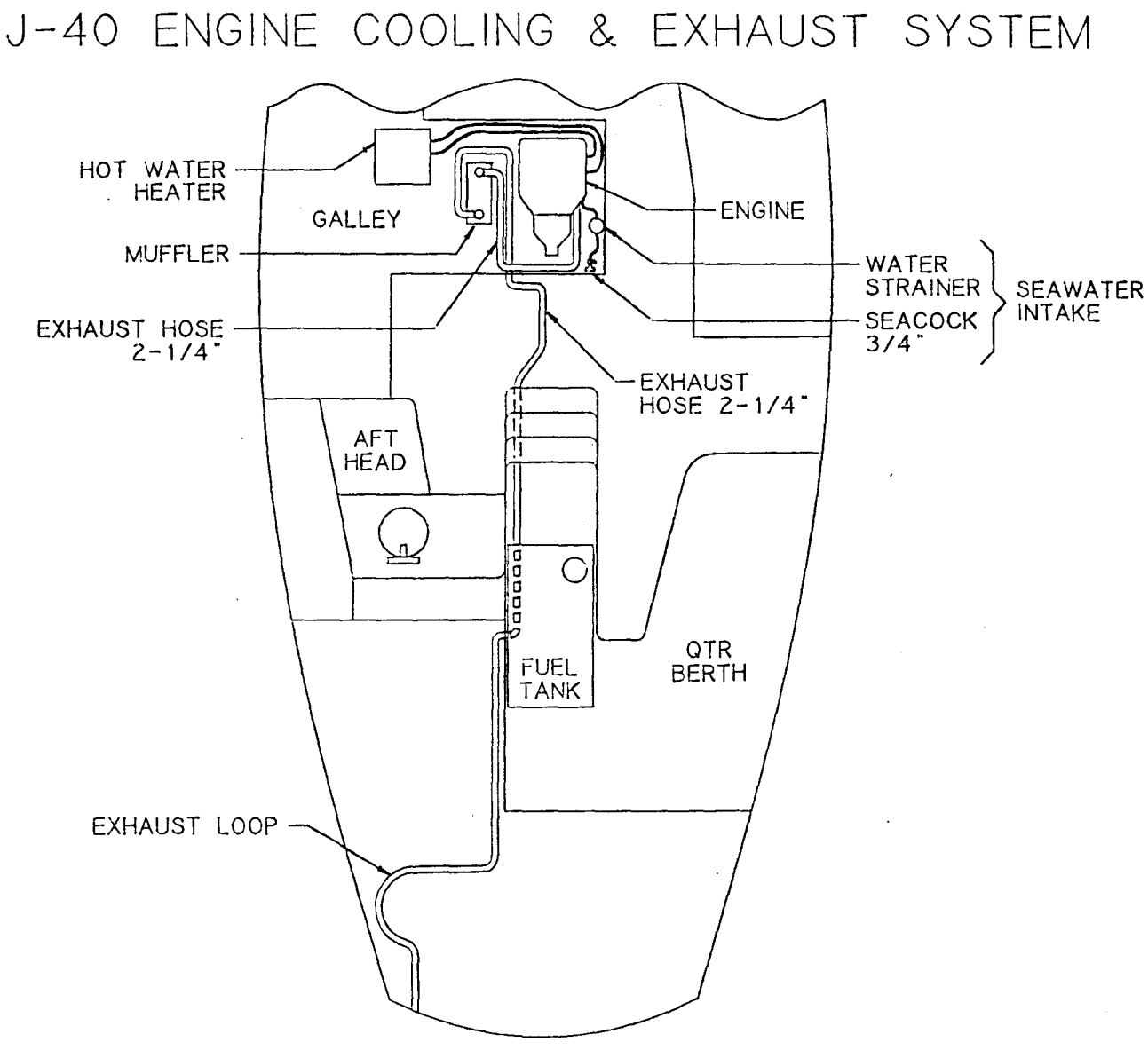
The boat is equipped with a water-injected exhaust system which cools the exhaust (FIG. 3). It is designed to both dissipate heat and act as the exhaust muffler.

If the flow of cooling water is interrupted and the engine overheats severely, the rubber hose coming from the engine exhaust elbow may melt. Always check this hose after an occurence of overheating.

Water can accumulate in the bottom of the water lift "pot." In fall de-commissioning, the pot should be drained using the drain plug, or anti-freeze added to the pot so residual water doesn't freeze.

If the engine does not start after a prolonged period of cranking over (starting), be sure to drain the pot or exhaust loop. Water accumulates here and may fill enough to flow back into engine manifold if engine does not start.

J40 ENGINE COOLING & EXHAUST SYSTEM- FIG. 3



DECK EQUIPMENT

The following items are safety and comfort features. They are made of the highest quality materials and are engineered for your peace of mind and sailing enjoyment.

LIFELINES- can now be installed once the bow pulpit is in place. The lifelines are white vinyl coated 3/16" 7x19 wire. They run the length of the boat and are fastened at either end by S.S. forks and S.S. turnbuckles. The lifeline height has been set at 24" so that for most people, the upper lifeline will hit above the knee, reducing the likelihood of someone being "tripped" overboard by the lifeline itself.

Each lifeline is clearly marked and is intended to fit specific portions of the lifeline/stanchion system. The installation follows:

1) Insert all lifeline gates/stanchions into the sockets provided in the extruded aluminium toe-rail. Secure each stanchion in place by tightening down on the allen screw in each base.

2) Install all lifelines without tightening down on the turnbuckles. You will notice that you must remove the eyes on the ends of the lifelines to push them through the plastic inserts in the stanchions.

3) Secure lifeline gate stanchion supports by tightening the allen screw. Again, it is helpful to "thread" and tap the stanchion to more firmly hold the gate in position. This is helpful as the "pelican hook" on the gate won't be loaded with pressure when you attach/release it.
4) Finish off the job by tightening the turnbuckles, adjust the lifeline gate pendants for the proper length, and tape off the turnbuckle "split rings" (or cotter pins) for a finished appearance.

RONSTAN LATCHWAY SYSTEM- is a device designed to allow you to hook in your safety harness tether to moving "block" which travels with you around the perimeter of the deck, giving you hands free operation.

1) Take the 70' piece of 1x19 wire which has rectangular hoops swaged onto either end and lay it around the deck, from one side of the transom, outside around the shrouds, up to the bow and back down the other side.
2) Fasten the wire retainers onto the stanchions as low as possible and secure tightly. Be sure you have captured the wire inside the S.S. U-shaped hoops which fit inside the S.S. D-rings affixed to the stanchions.
3) Take the Ronstan "tether blocks" and slide onto the S.S hoops on the end of the retaining wire.
4) Finally attach the ends of the wire to the toe-rail with the elongated u-shackles, be sure the system is as taught as possible. You may even consider taking 1/8" nylon line to further tighten the system, but keeping the shackles attached as the ultimate backup.
This helpful when moving fore and aft past the attachment points as the tighter the wire the easier the "tether block" moves past the stanchion attachment points.

VENTILATION HATCHES- are of anodized extruded aluminium frames with scratch-resistant lexan covers, and are "ready-to-use.". The Lewmar Super Hatches are unique in that they "ratchet" into three opening positions; venting, 1/2 open(45 deg.), full open (90 deg.), and flipped open (170 deg.).

They rely on a specially formed rubber slug in the pivot point to hold the hatch in position. It is lubricated with a silicone grease.

DORADE VENTS- are located abreast the mast and over the galley in the main cabin. The dorade boxes all come equipped with lids for inclement weather. Simply unscrew these and replace with the small diameter dorades aft and the larger diameter ones forward. It is good to lubricate the threads with a silicone spray (won't pick up dirt) for easier removal and oxidation prevention.

WINDOWS- are of extruded aluminum frames with smoke colored Lexan (this keeps the inside cooler on warm days) and arrive "ready-to-use". They were specifically engineered to maximize interior comfort and cross-flow ventilation. Every cabinside window is an opening port.

After a period of time you may find that you need to adjust the window "dogs"; the levers which hold the windows closed. Use an allen wrench and a small adjustable wrench to correctly adjust the lever, it should close firmly. Test window for leaks by spraying a hose directly on it. If leakage persists, check to see that window frame is straight. If not notify your dealer immediately.

THE COCKPIT

From within the confines of the cockpit one can control the entire boat...an absolute necessity for shorthanded or couple cruising. All primary sail controls lead into the cockpit; the jib sheets, roller furling tail, reef lines, mainsail halyard, and mainsheet and traveller lines. This important feature is just one of the many that have been incorporated into this design.

MAINSAIL CONTROL LINES lead aft through a large splash rail which encircles the aft part of the cabin top. Two "notches" allow the lines to pass through it on either side of the companionway. This splash rail also provides a "lip" to attach the bottom of the companionway dodger.

INSTRUMENT location is designed into the aft face of the seatback/winch islands. They are angled to face the helmsman and have enough room to fit three repeaters of approximately four inches square.

MAN-OVERBOARD LIFE RING is located beneath the white helmsmen's seat cushion. The seat cushion snaps into position on the forward face of the cockpit wall. It is prudent to attach a drogue and whistle to the life-ring. And if sailing offshore, ensure this device is attached to a Man-overboard Pole or a M.O.M. unit (manoverboard module from Survival Technologies).

EMERGENCY STEERING is located underneath the helmsmen's seat cushion and is accessed through a waterproof removable hatch. An emergency steering aluminium short tiller (to fit behind the steering quadrant) is provided and fits over the head of the rudder shaft.

PROPANE LOCKER is located immediately to starboard of the helmsman seat and contains two propane tanks. It vents and drains overboard. Be sure that the tanks are always secured in place with the S.S. wing nut and wooden retainer piece.

ENGINE CONTROLS are conventional Edson equipment mounted on the pedestal. The red throttle handle is located on the starboard side and the gear lever on the aft face. Be sure to note the locations of forward and reverse before embarking on your first trip (see Engine/Fuel Systems section). If it is necessary to avoid throttle lever "spring-back", you may secure the bolt in the pedestal under the compass.

ACCESS FOR THE ABOVE EQUIPMENT is from the port lazarette locker or through the starboard access door in the aft cabin.

STEERING SYSTEM

The steering system (FIG. 4) was carefully engineered to provide "tiller-like response". This is achieved by utilizing the highest quality bearings from Harken and a custom quadrant which enables one to turn the wheel one turn lock-to-lock.

PEDESTAL is a standard Edson model which turns a chain on a sprocket inside the pedestal which, in turn, are connected to 7x19 wire to the aluminium quadrant. Adjustment to this linkage is achieved by a set of turnbuckles connected to the steering wire. These can be accessed by going through the port lazarette locker and crawling around behind the aft holding tank.

WHEEL is mounted on the pedestal by aligning the "keyhole" slots together and sliding the wheel onto the steering shaft. The plastic "Edson nut" screws down over the exposed thread to secure the wheel in place.

RUDDER is of unidirectional glass, two halves bonded together, with a highly reinforced fiberglass shaft. It's engineered to withstand tremendous shear loads in storm conditions.

RUDDER STOCK spins on two Harken rudder bearings which are mounted inside a waterproof rudder tube. Atop the shaft is a S.S. head fitting to which the emergency tiller can be attached. This fitting is accessed through the white plastic "manhole cover" underneath the helmsman seat cushion.

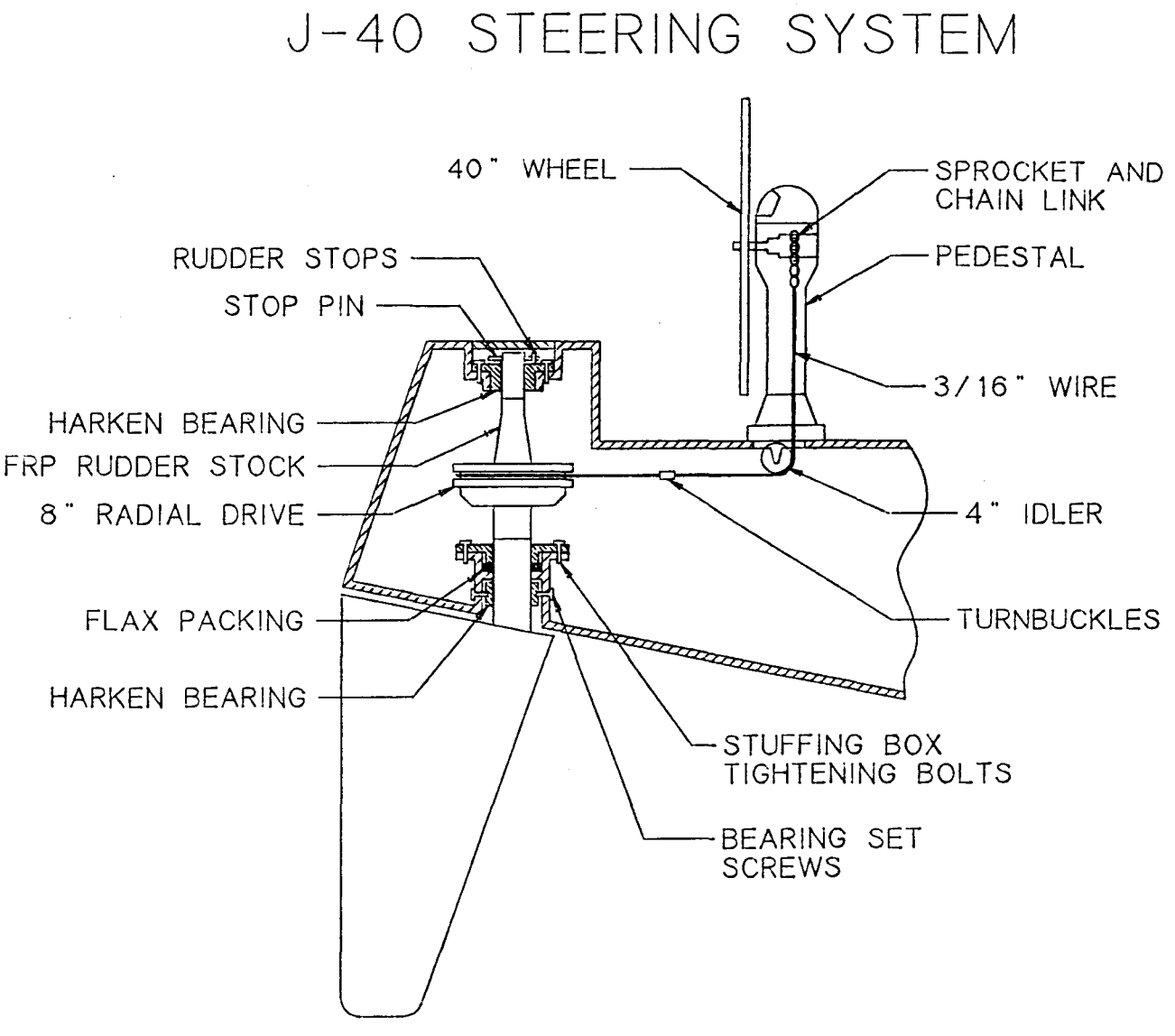
RUDDER STOCK STUFFING BOX is located at the top of the fiberglass rudder tube beneath the decks. It is a simple design which prevents water from entering the hull. A S.S. sleeve bearing surface surrounds the rudder tube at the point where a "stuffing" is forced against it to prevent water from rising up the tube. A circular flange is bolted down onto the rudder tube to hold the "stuffing" in position. (Fig. 4).

EMERGENCY TILLER is operated by removing helmsmen's seat cushion, lifting off access plate, and placing base of tiller over head of rudder stock (see also Deck Equipment-Cockpit section).

BEFORE LAUNCHING, check the system of cables, quadrant, and sheaves to see if they're working smoothly. Grab the bottom tip of the rudder, spin it left and right to check the fit and tightness of the steering cables. If the steering seems loose, tighten the turnbuckles by hand and repin them. If you overtighten the wire, the steering becomes too "stiff" as a result of "front-loading" the bearings with pressure from the steering cable. Please note that steering cables will stretch so check their "tightness" periodically.

NOTE- BEFORE LAUNCHING CENTER THE RUDDER AND MARK THE WHEEL WITH TAPE OR A TURK'S HEAD KNOT ON CENTERLINE. THIS IS EXTREMELY HELPFUL WHEN MANEUVERING OR DETERMINING AMOUNTS OF WEATHER HELM.

J40 STEERING SYSTEM- FIG. 4



The running and standing rigging that come with your boat have been designed and engineered to make you sail your boat efficiently. A wealth of ocean racing and cruising experience has gone into the deck layout to make sail and boat handling as safe and easy to handle by a couple as it is for a racing crew.

The rigging of the mast is a complex procedure and is best handled by a qualified marine rigger. Be sure to remind the dealer what you desire, if any, for marine electronics as some of them may need to be wired and mounted on the mast.

Have the yard step the mast and hand tighten the rig to prevent it from swaying excessively at dockside.

TUNING THE RIG AT REST

1) Hand tighten all stays to prevent mast from wobbling around.

2) Measure aft equidistant from the bow to a position in line with the shroud chainplates and make a mark on the hull sheerline.

3) Using the centerline genoa halyard or the main halyard, attach a tape measure to the shackle and pull it to the masthead. Then measure side to side to the marks on the hull to center the mast athwartships; adjust only by hand the upper shrouds. Once the mast is centered, further tighten the uppers with tools until you have difficulty spinning the turnbuckle screw. If you cannot spin it easily, STOP, before you risk the chance of stripping the threads. Double-check position of mast head with centerline jib halyard.

   a. Tighten lower shrouds even turns to straighten mast and establish the correct amount of pre-bend.

   b. Tighten intermediate shrouds evenly to four to five complete turns beyond hand tight. The reason is that the intermediates simply "hold" the upper middle section of the mast in place....most people tend to overtighten these on their first try. Consequently you must go sailing first before these can be tuned.

4) Check the amount of mast rake. Attach a measuring tape to your spinnaker halyard and hoist to the top. Your headstay should measure 52′ 5" to the stemhead pin centerline; this should leave you approximately 10" of rake measured from a plumb line from the masthead (the main halyard with a weight attached) perpendicular to the mast at deck level. Adjust the headstay turnbuckle to achieve the necessary rake.

5) Tighten backstay turnbuckle so the backstay is just snug... ie, if you grab the backstay and "swing" it in a circle; the circle it prescribes in the air should be under one foot.

THE BOOM

Rigging the boom is straightforward (FIG. 6). Run the reef lines so the red line (port) is going through the port sheaves and the green line (starboard) is going through the starboard sheaves at both the outboard end and the gooseneck. Check the fit for the hydraulic vang on the boom bale, it may need a little filing to smooth out any sharp edges.

HYDRAULIC CONTROLS

The J/40 is equipped with Navtec hydraulics to help you fine tune your rig and sails for optimum performance. These hydraulics are simple, easy to maintain, and highly reliable.

The J/40 has adjustable, remotely controlled hydraulic cylinders for both the BACKSTAY and the BOOM VANG. The control panel for both lies on the starboard wall of the helmsmen's cockpit.

HYDRAULIC PANEL (FIG. 5) is the control center of the hydraulic system. The hydraulic pump (operated by the handle) draws fluid from the reservoir and gets distributed to the cylinder selected by the control panel swith.

BOOM VANG (FIG. 5 & Sailplan) is affixed to the vang plate welded underneath the boom and to the mast at the vang gooseneck located just above the mast collar.

The hydraulic hose (with the S.S. fitting) exiting from the mast is attached to the "nipple" at the base of the vang cylinder. Do not tighten the fitting at this time.

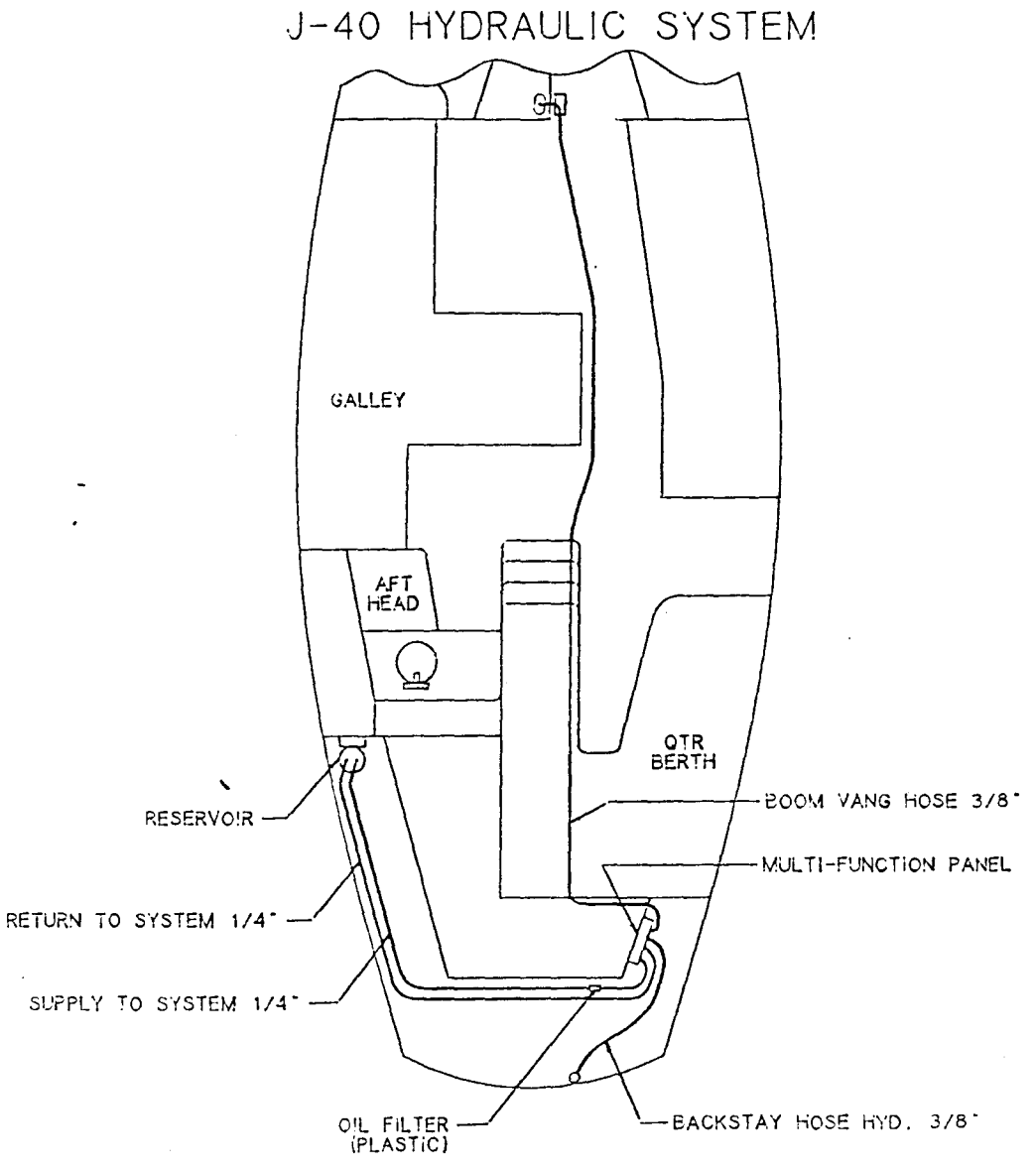
> NOTE- The vang is shipped pre-presurrized with air so there is no need to "pump-up" the cylinder with 100 lbs. of air pressure. The cylinder will automatically extend when there is no hydraulic pressure applied. Do not worry about the fact that when the boom is initially attached the boom "skies" into the air much like a derrick on a freighter! This is normal until you fill the hoses with hydraulic fluid and pump them up.

BACKSTAY (FIG. 5 & Sailplan) is affixed to the S.S. backstay tang on the transom and to the Navtec turnbuckle on the backstay. In order to make the cylinder fit, you must pull out the S.S. shaft and extend it as far as possible. This cylinder doesn't need any pressure to extend once installed as the natural pressure of the rig will do this.

"BLEEDING THE SYSTEM" is the final stage of installing your new hydraulic and is a simple process if you follow the steps correctly. Both cylinders are in place and all you need is fluid to make them work. You will need two people to perform this operation.

1) Get a 10' long 1/2" dia. clear tube and a funnel. Firmly attach the funnel to one end of the tube.
2) Insert the tube into the opening atop the hydraulic fluid reservoir located on the wall in the upper forward portion of the port lazarette locker and hold the funnel end 4' above the cockpit sole.
3) Take the cans of non-detergent 40 weight motor oil and slowly pour into the funnel, taking care that copious amounts of rags are handy to wipe up any oil spill at the reservoir. Fill the reservoir completely, usually four quarts of oil.
4) Get one person to go forward to the vang and unscrew the hose fitting...be sure to have a plastic bucket under the end of the hose and plenty of rags.
5) Turn the dial on the hydraulic panel to the vang position. Open the large thumbscrew on the panel by turning counter-clockwise 1/2 to 3/4 turn. This just opens the valve to the vang hose and cylinder system.

J40 HYDRAULIC SYSTEM- FIG. 5



6) Pump the handle continuously until you get fluid squirting out the hose in a steady stream (this ensures you eliminate all air bubbles), then stop pumping.
7) Attach the hose fitting to the vang cylinder fitting and screw on 1 1/2 turns only.
8) Pump the handle at the hydraulic panel again to get fluid again flowing out of the threads on the vang cylinder fitting until there are no bubbles. If there are none after three to four pumps, then firmly screw down the hose fitting onto the vang fitting.
9) Next, switch the dial on the hydraulic panel to the backstay position. Be sure to open the large thumbscrew on the panel by turning counter-clockwise 1/2 to 3/4 turn.
10) Remove the hose fitting from the backstay cylinder and repeat steps #4 to #8.
11) Finally, check the whole system by pumping both cylinders completely to ensure that they work. If you notice any time lag when the individual cylinders are being pumped up to the max, try releasing them completely and pump them up again. If the time lag persists, ie. the cylinder doesn't continuously close as you pump the hydraulic panel handle, then you may still have an air bubble or two in the system. Repeat steps #4 to #8 to remove the bubble in the specific cylinder/hose system.

SAIL CONTROL SYSTEMS

The sail control systems have been designed for maximum efficiency and complete ease of handling by a couple; making for relaxing singlehanded sailing in most any wind or sea condition.

MAINSAIL:

The main is easily controlled from the cockpit to simplify singlehanding. All controls, including mainsail, reef lines, mainsheet and winches, and vang all lie and are adjustable within the confines of the cockpit.

The MAIN HALYARD (FIG. 8) exits the mast on the port side, goes down through a turning block at the mast collar and runs aft along the portside cabin top through the halyard stopper to the cockpit halyard winch.

** HINT- If you are having difficulty running the halyard lines through blocks and stoppers, try wrapping a one foot piece of duct tape lengthwise around the end of the rope... this flat piece of tape leads through the stoppers far easier, plus it helps pull through the fat piece of rope.

The MAINSHEET (FIG. 7) is a 2:1 continuous system running to both port and starboard side mainsheet winches. The line is lead from one winch through the one block on the traveller car, up to the single boom block, back down to the second block on the traveller car, and out to the other mainsheet winch.

It was designed to allow extremely easy adjustments of the mainsheet by any size or age person. The self-tailing feature also facilitates single-handed sailing and rapid adjustments during maneuvers under sail. Just be sure to put a knot in both ends of the sheet in case somebody goofs.

The MAINSHEET TRAVELER (FIG. 7) is controlled by a 4:1 purchase system led to either side of the cockpit. Put the spliced eye of the traveller control line(the fixed end) into the upper portion of the double block at the end of the traveller. This requires removing the bolt, inserting the plastic spacer into the rope eye, and replacing the bolt. Be sure the line exiting the lower sheave cage leads into the cleat correctly, if not, repeat the above steps.

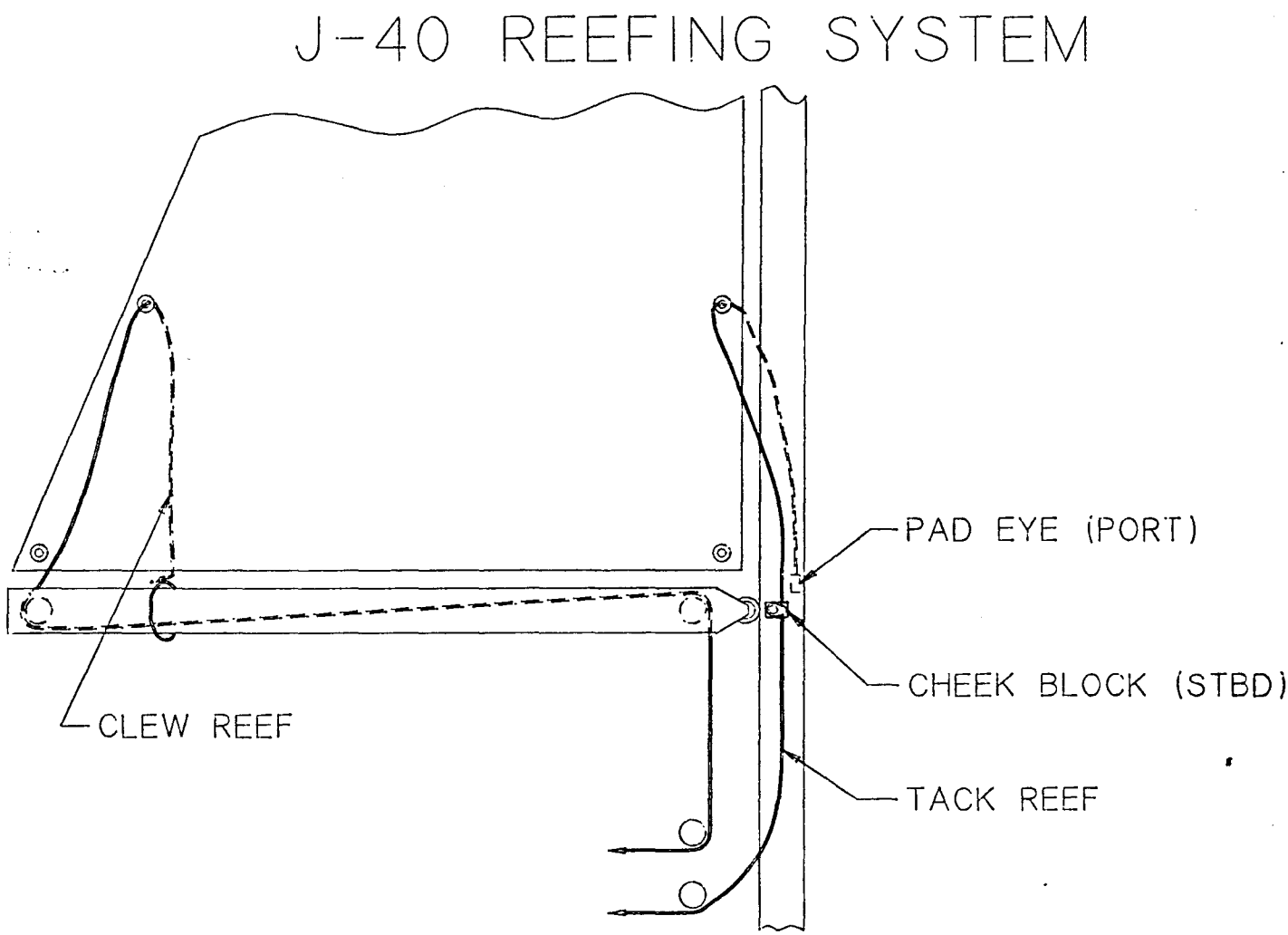
The MAINSAIL OUTHAUL (FIG. 6) is adjusted underneath the boom and comes pre-assembled.

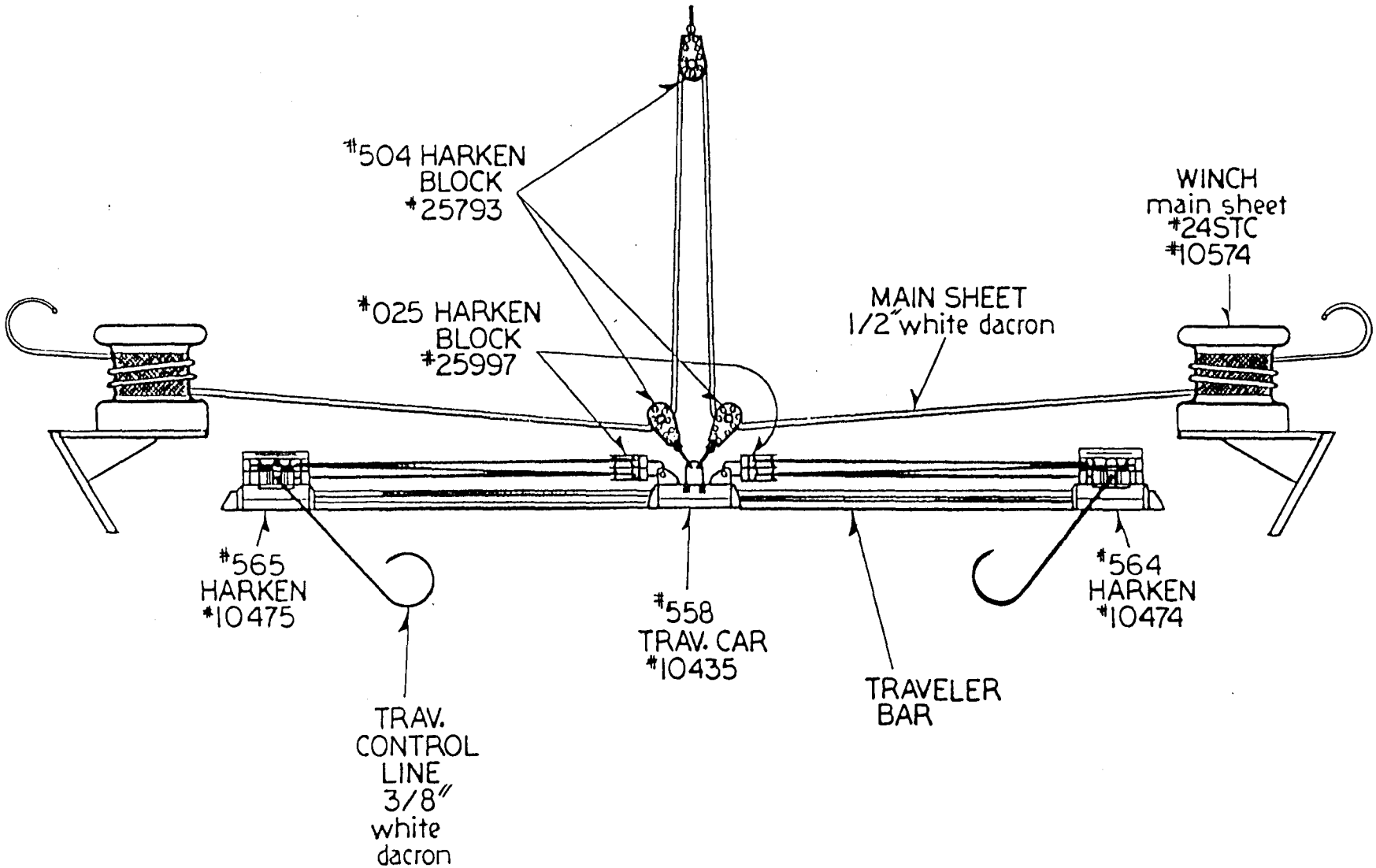
The MAINSAIL REEF LINES (FIG. 6) have been designed to be fully functional from the cockpit. Therefore, there is never any need to move forward to the mast until the mainsail has been fully reefed.

The mainsail TACK reef lines lead from an eye on the port side of the mast below the gooseneck, up through the tack cringle in the mainsail, and back down through a cheek block mounted on the starboard side of the mast, down through a mast collar turning block, then aft to the starboard cockpit cabintop winches.

The mainsail CLEW reef lines exit the forward end of the boom, lead aft through the mast collar turning block to the port cockpit cabintop winches.

J40 REEFING SYSTEM DIAGRAM- FIG. 6





J•40 MAIN SHEET SYSTEM

GENOA:

The STARBOARD GENOA HALYARD (FIG. 8) exits the mast on the starboard side, goes down through a turning block at the mast collar and leads directly into the cabin top halyard winches, just behind the cowl vent. The reason for this placement is that most cruisers have roller-furling systems and once the jib is up and furled there is no need to quickly access the halyard.

The optional PORT GENOA HALYARD (FIG. 9) exits the port side of the mast and leads to the port bank of halyard stoppers and winch.

The GENOA SHEET is attached to the headsails by a bowline and, depending on the headsail size, lead aft outside the shrouds to the genoa fairlead along the side-decks, then led straight into the primary winches situated atop the cockpit islands.

** NOTE- It is sometimes helpful to lead two genoa cars along the track so there is one lead forward and one aft near the winch islands to make it easier to grab them from the cockpit and gets around dodger flaps.

The GENOA SHEET WINCHES are the primary winches located atop the cockpit islands. They are two-speed self-tailing chrome winches designed to allow virtually anyone to "grind" in a full-sized genoa.
The winches are installed by the factory and "ready-to-go", so no special installation or care is required to begin sailing immediately.

SPINNAKER:

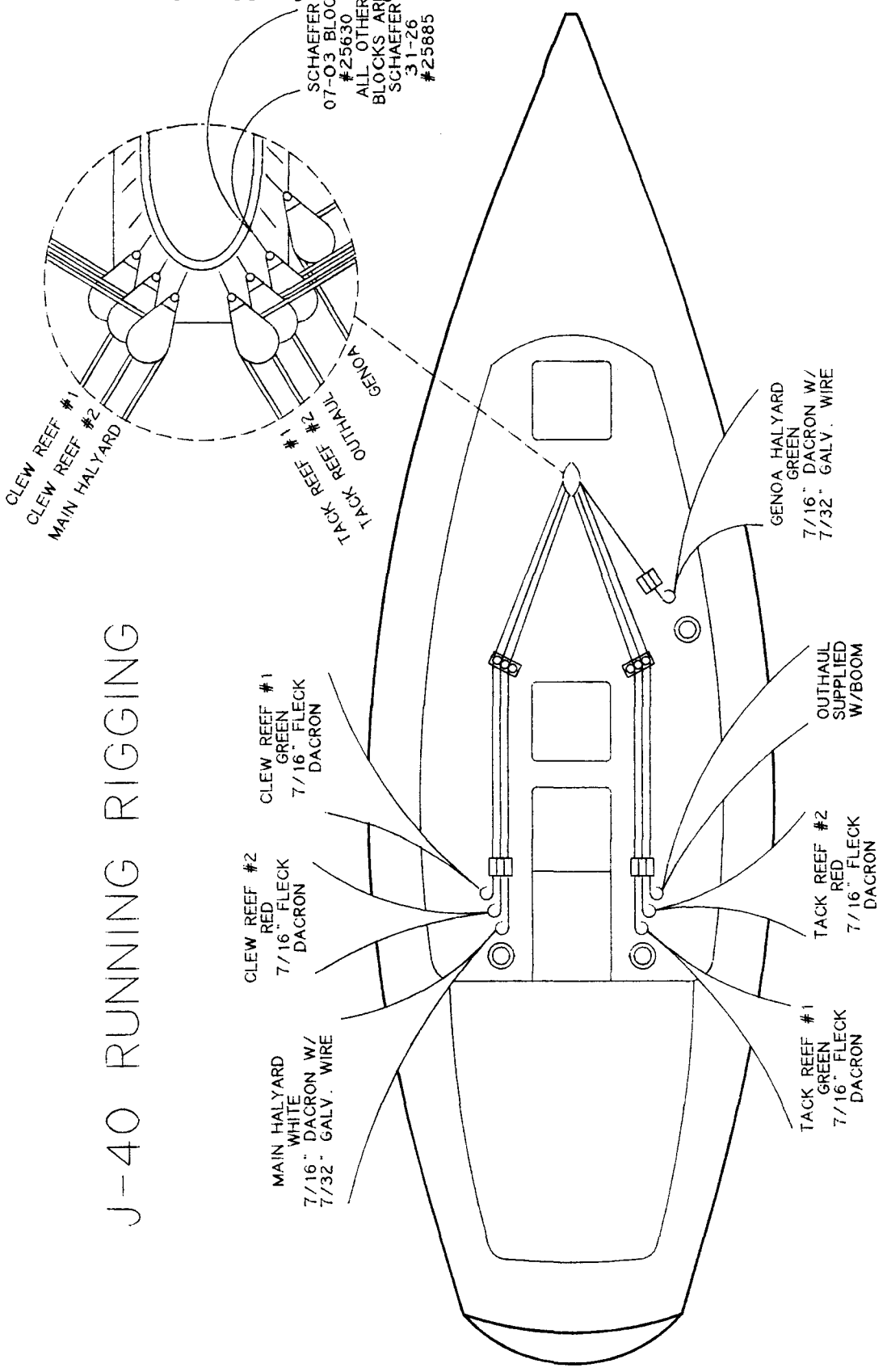
The SPINNAKER HALYARD (FIG. 10) exits the starboard side of the mast and leads down through a turning block at the mast collar to the starboard halyard winch. At the masthead, it leads from a "halyard crane" and down into the mast through a slot cut in the mast.

The SPINNAKER SHEET (FIG. 10) is led from the clew of the spinnaker aft outside the lifelines through the spinnaker sheet blocks (large diameter, low friction Harken blocks) turning forward to the primary cockpit winches. The spinnaker sheet blocks are mounted on large S.S. U-bolts mounted just outboard and aft of the cockpit winch islands.

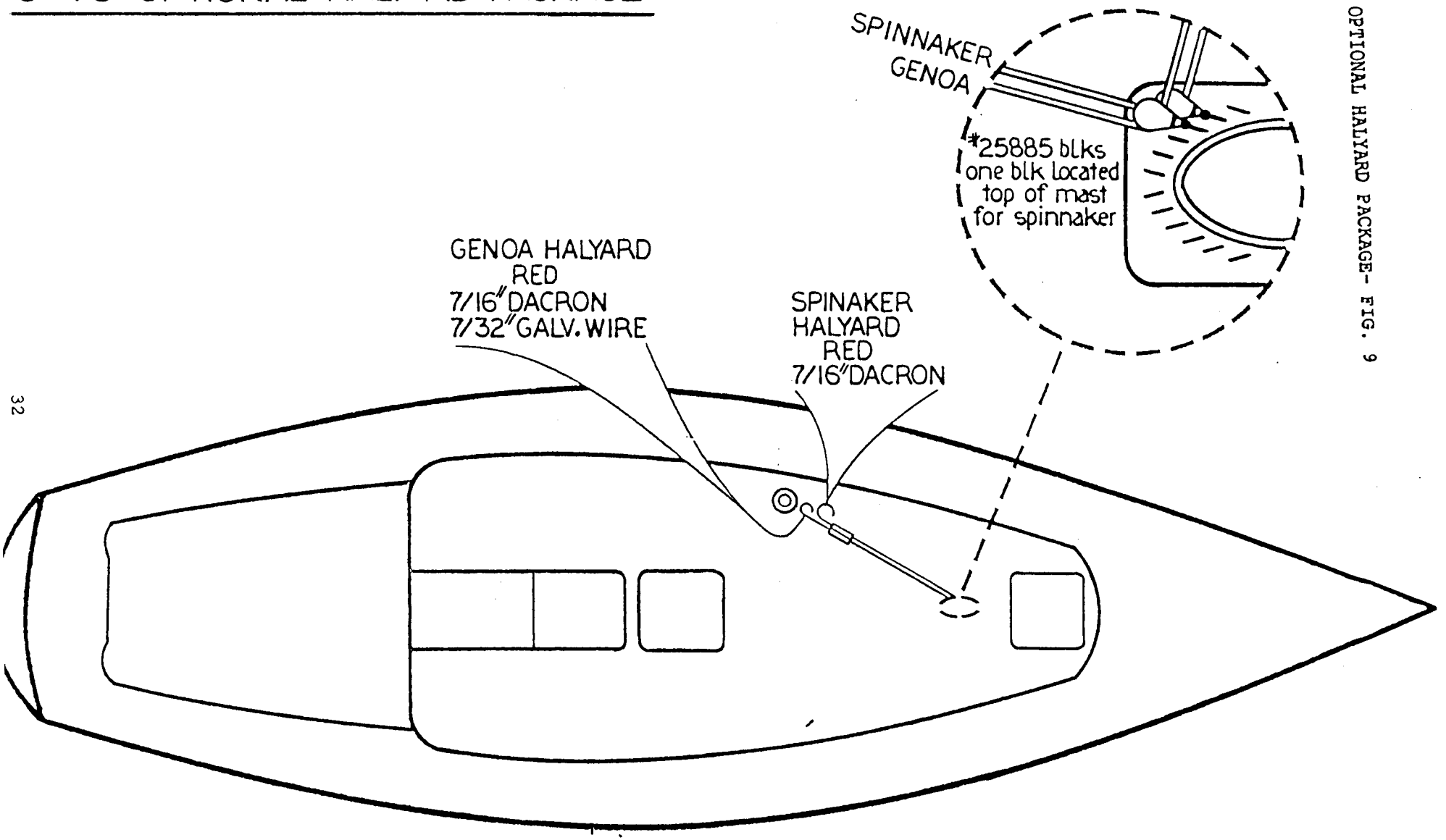
The SPINNAKER GUY SHEETS (OPTIONAL EQUIPMENT) (FIG. 10) are led aft inside the lifelines to the spinnaker afterguy blocks (the larger diameter, low friction Harken blocks) located amidships on the sidedecks and straight into the primary cockpit winches.

The SPINNAKER POLE FOREGUY (downhaul) (FIG. 10) is led from the end of the spinnaker pole down through the foreguy block and aft along either the starboard side to a ratchet/cam mounted with a shackle along the rail.

The SPINNAKER POLE TOPPING LIFT (uphaul) (FIG. 10) is led aft along the starboard cabin top, through the bank of stoppers.

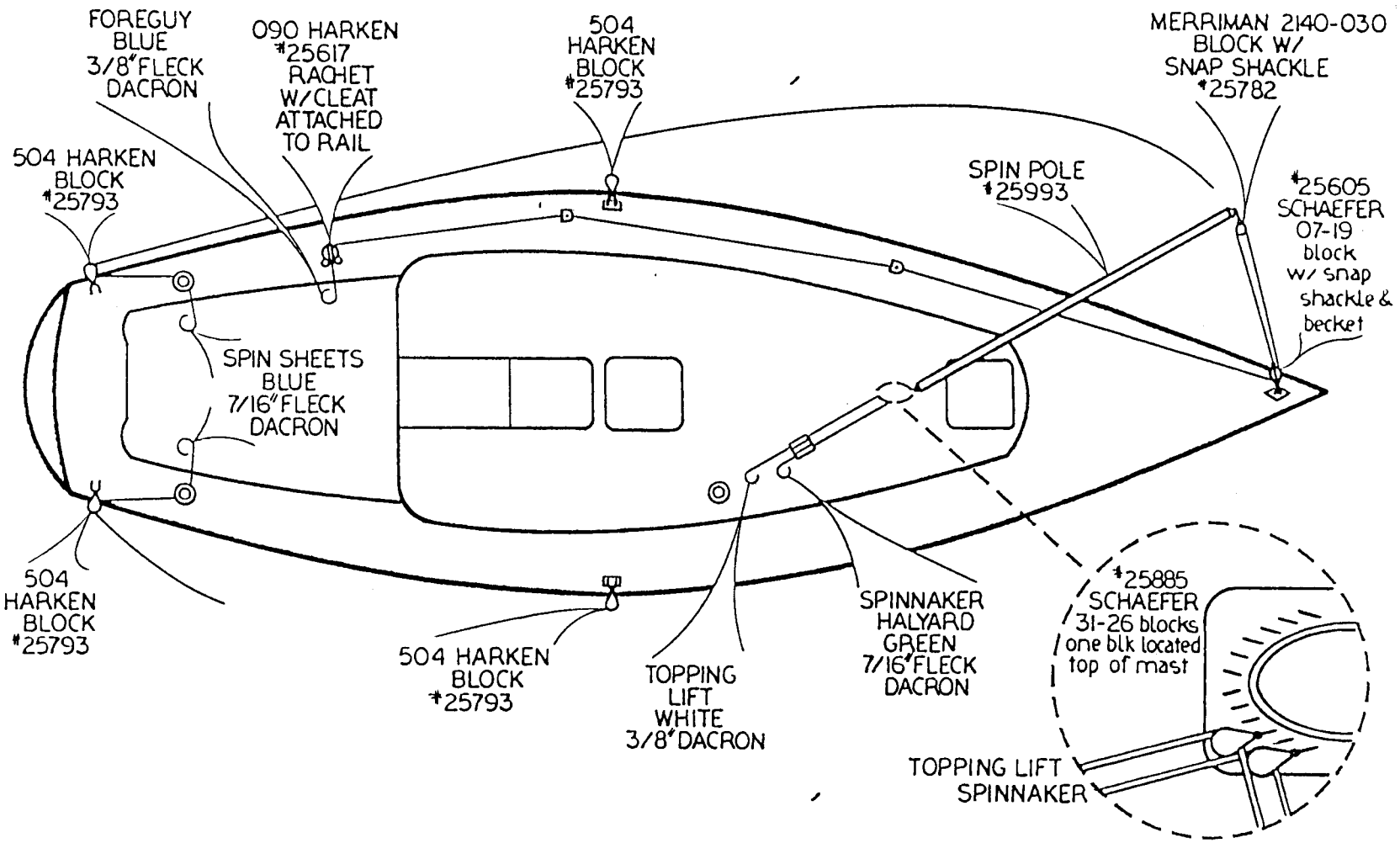

SCHAEFER
07-03 BLOCK
#25630
ALL OTHER
BLOCKS ARE
SCHAEFER
31-26
#25885
CLEW REEF #1
CLEW REEF #2
MAIN HALYARD
TACK REEF #1
TACK REEF #2
OUTHAUL
GENOA
J-40 RUNNING RIGGING
CLEW REEF #1
GREEN
7/16" FLECK
DACRON
CLEW REEF #2
RED
7/16" FLECK
DACRON
MAIN HALYARD
WHITE
7/16" DACRON W/
7/32" GALV. WIRE
GENOA HALYARD
GREEN
7/16" DACRON W/
7/32" GALV. WIRE
OUTHAUL
SUPPLIED
W/BOOM
TACK REEF #2
RED
7/16" FLECK
DACRON
TACK REEF #1
GREEN
7/16" FLECK
DACRON

J•40 OPTIONAL HALYARD PACKAGE



J40 OPTIONAL HALYARD PACKAGE- FIG. 9

J•40 SPINNAKER GEAR



TUNING FOR SPEED

Tuning is a straightforward, step-by-step process to achieve a predictable end; a boat tuned for maximum efficiency and safety.

First, let's briefly discuss theory. Helm balance is a function of both sail trim and mast rake. The latter is critical because it has the strongest affect on "weather or leeward helm" (the amount one must turn the wheel to keep the boat going straight). The principles which produce this tendency are center of effort(CE) and center of lateral resistance(CLR). Center of Effort is a spot on your sailplan which indicates the sum of all aerodynamic pressure; usually halfway up and one third back on the mainsail. The Center of Lateral Resistance is a similar hydrodynamic pressure point on the keel. Whether or not a yacht develops weather helm is a function of where the CE is in relation to the CLR. If they both align vertically, the boat will have neutral helm. If the CE is aft of the CLR, you'll notice the wind pivots the bow into the wind, creating weather helm. Have you ever noticed why boats put up small steadying sails on the backstay at anchor? This forces the CE far aft of the CLR and makes the boat "weathervane" into the wind. Should the CE be forward of the CLR, the bow wants to blow away from the wind, developing the most disconcerting (and dangerous) tendency leeward helm.

Consequently, mast rake (the fore and aft angling of the mast) is the primary determinant of weather helm. Aft rake moves the CE aft, creating more weather helm, while forward rake creates more leeward helm. What is the proper amount of weather helm and how is it determined? Sail upwind in a straight line, adjust sails for proper upwind trim and let go of the helm, the boat should turn slowly into the wind.

In order to apply the foregoing principles practically follow this step-by-step process to tune the rig. Be sure you have consulted with your sailmaker in regards to the correct amount of "pre-bend" in the mast...it determines the location of your mast-step. In most cases, you want to position the mast-step all the way aft to induce mast bend (see Stepping the Mast section).

In fact, it is recommended that you
CONTACT YOUR SAILMAKER AND ASK HIM TO GO SAILING WITH YOU TO CHECK THE TUNING AND THE FIT OF THE SAILS.

TUNING THE RIG AT SEA

Try to pick a day with a steady, moderate breeze of 10-15 knots as this will give you the proper amount of pressure on the rig to properly tune it for all conditions.

1) Sail close-hauled on a tack, at about 15-20 degrees of heel, and check the slackness of the leeward upper shroud. If it is loose enough to swing in over a 1" arc, tighten the uppers even turns to eliminate excess slack. TIGHTEN ONLY THE LEEWARD SHROUD TO PREVENT STRIPPING THE TURNBUCKLE THREAD!!

2) Sight up the mainsail luff groove. What are you looking for? Check the straightness of the mast through the shroud attachment points to ensure they line up with the masthead. Why? You've centered the masthead so use this as the point of reference. Chances are likely the mast will be sagging off to leeward and to straighten it will require working from the bottom up. In other words, begin with the lower shrouds, then move to the intermediates.

Sail along on a tack, check the sag, tack to make an adjustment, then immediately tack back to determine if more adjustment is needed. Continue this process on both tacks until the lower panel of the mast is aligned with the masthead.

Next, adjust the intermediate shrouds in the same manner until the upper mast panel aligns with the masthead. You will find that little pressure is needed on the intermediates to straighten the upper third.

3) Cotterpin the shroud turnbuckles and tape thoroughly to prevent your beautiful tuning job from getting out of line! Cover these turnbuckles with a shroud boot.

After sailing in good breeze for 10-15 hours be sure to tighten your rig as you will have to compensate for stretch.

PLUMBING SYSTEMS

GENERAL

The plumbing systems in your J/40 consist of water, hot water, salt water, manual and electrical pumps, and the heads (toilets). This section will describe their locations and how they operate.

FRESH WATER SYSTEM

The water system (FIG. 11) is engineered to distribute the tremendous amount of water weight around the boat to minimize its effects on sailing performance. Consequently, the tank placement requires a water distribution system located beneath the chart table to manage the water supply.

WATER TANKS are of rotationally molded polyethelyne. Connected to each are the following hoses: a) fill hose- is located on the tank top and connects to the deck water fill pipe; b) feed hose- located along the tank bottom connects to the water ssytem at the water distribution center; c) vent hose- is external and diverts overflow into the cockpit.

WATER FILL is through individual fill pipes on deck, ensure the water cap threads are cleansed of dirt for a better seal.

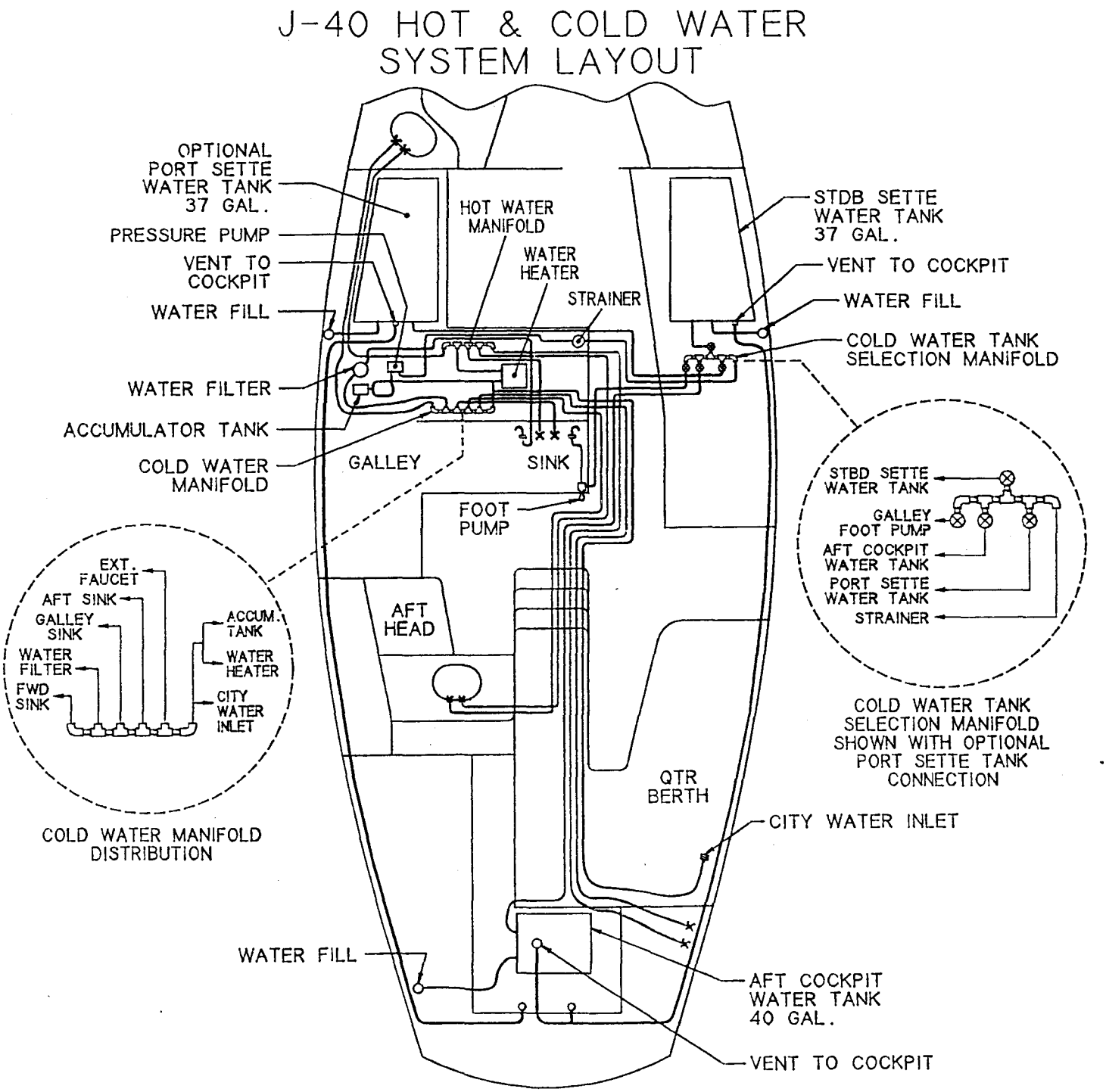
The water may develop a "taste" after a long period of time. Instead of flushing it out you can add a commercial water preservation agent, such as Sudbury Aqua Fresh crystals, to greatly improve the taste.

WATER DISTRIBUTION CENTER is a system of valves controlling which tank feeds the central water system. There are four valves, three for the tanks and the fourth to shut it all off. Please note that at all times only one valve should be open. This is especially important while sailing at significant angles of heel where the water from one tank will drain through the open valves to the tank on the low side and will overflow through the vent. It is possible to lose an entire tank of water if this restriction is not observed.

When a tank runs dry, be sure to close the valve to the empty tank before opening the valve to the full tank; this will minimize the amount of air sucked in by the pressure water system when a tank has run dry. After the valves have been changed so that there is water available to the pressure pump (turn it on), open a water faucet to allow air to escape. When the water trickles out, close the faucet momentarily to allow the pump to build up pressure; then open the faucet until a steady stream of water issues from the faucet. It may be necessary to repeat the process several times to bleed all the air from the system.

CITY WATER INLET is located on the starboard side of the helmsmen's cockpit. This unique feature enables you to attach a hose from the town water system and pressurize the entire water distribution system without using your pressure water pumps. Before the hose is attached check that all valves are closed to the water tanks.

J40 HOT & COLD WATER SYSTEM- FIG. 11



WATER PRESSURE PUMP is located beneath the port settee aft. The pump operates off the DC electrical system and pressurizes the entire water system. Should any problems arise, read its manual. The most common breakdown is the rubber gasket and/or its seal; or the pump mechanism itself. The gasket is easily replaceable.

If the system is not pressurizing be sure to check the pump is working correctly first, ie. it's pumping water. Secondly, check that all hoses are securely connected to their fittings. Thirdly, ensure all air pockets are eliminated as outlined above. If there is still a problem, consult your dealer.

Finally, because it will turn on intermittently to maintain pressure, you may consider turning the water pressure pump off at night to sleep more peacefully.

WATER HEATER is located under the port settee. Water is heated by either the engine or shore AC power.

If the water heater is on shore power ensure a continuous supply of water is available to it, otherwise the electrical element within it will burn out. Due to this potential risk, water heater elements are excluded from warranty. Thus, be certain the water pressure pump is always on while hooked up to shore power.

WATER PURIFIER is located underneath the port settee aft and is a simple two stage macrocosm filtration module. It has a replaceble filtration cartridge which should be routinely maintained.

To clean the water strainer, simply remove the top, pull out the strainer and wash under lukewarm water to eliminate most impurities. If heavily soiled or "dirty" looking, replace it.

SEAGULL WATER PURIFIER is located beneath the sink. It is a multi-stage microcosm filtration module to ensure absolutely pure fresh water. Its water faucet is on the sink-top.

Like the standard purifier, it has a two-stage filtration system. However, its patented technology eliminates bacteria and most viruses. Read its manual for proper care and maintenance.

THRU-HULLS

All thru-hull fittings (Fig. 12) are of brass or glass reinforced nylon. Be sure to review the diagram carefully to become familiar with their locations. For safety reasons, we recommend that you tape a soft wooden plug adjacent to all thru-hull fittings in the event of a hose or valve failure.

All thru-hull fittings have valve-handles. To reduce confusion, remember the long end of the handle indicates the direction of flow.

PUMP SYSTEMS

There is an extensive system of pumps to handle a variety of tasks to discharge the accumulation of liquids. Most are activiated by automatic "float switches" which turn them on when the water rises to a certain level. Others are manual, operated by foot or hand.

Pumps are easy to maintain and just as easily forgotten...they always happen to seize up when you need them most. Consequently, take care to keep their screens clean and rubber gaskets/bellows working correctly.

SHOWER SUMP is a set of common bilge sumps, one forward behind the main cabin bulkhead, one aft between the head and the sinks to drain off head shower water. A float switch electric bilge pump then discharges water overboard.

SINK DRAIN emptys directly overboard through a common thru-hull fitting beneath the sinks.

ICEBOX SUMP/DRAIN emptys into the same sump for the head/showers. There is a small shut-off valve at the end of the hose. This should be closed most of the time so the cool air of the ice box is not lost.

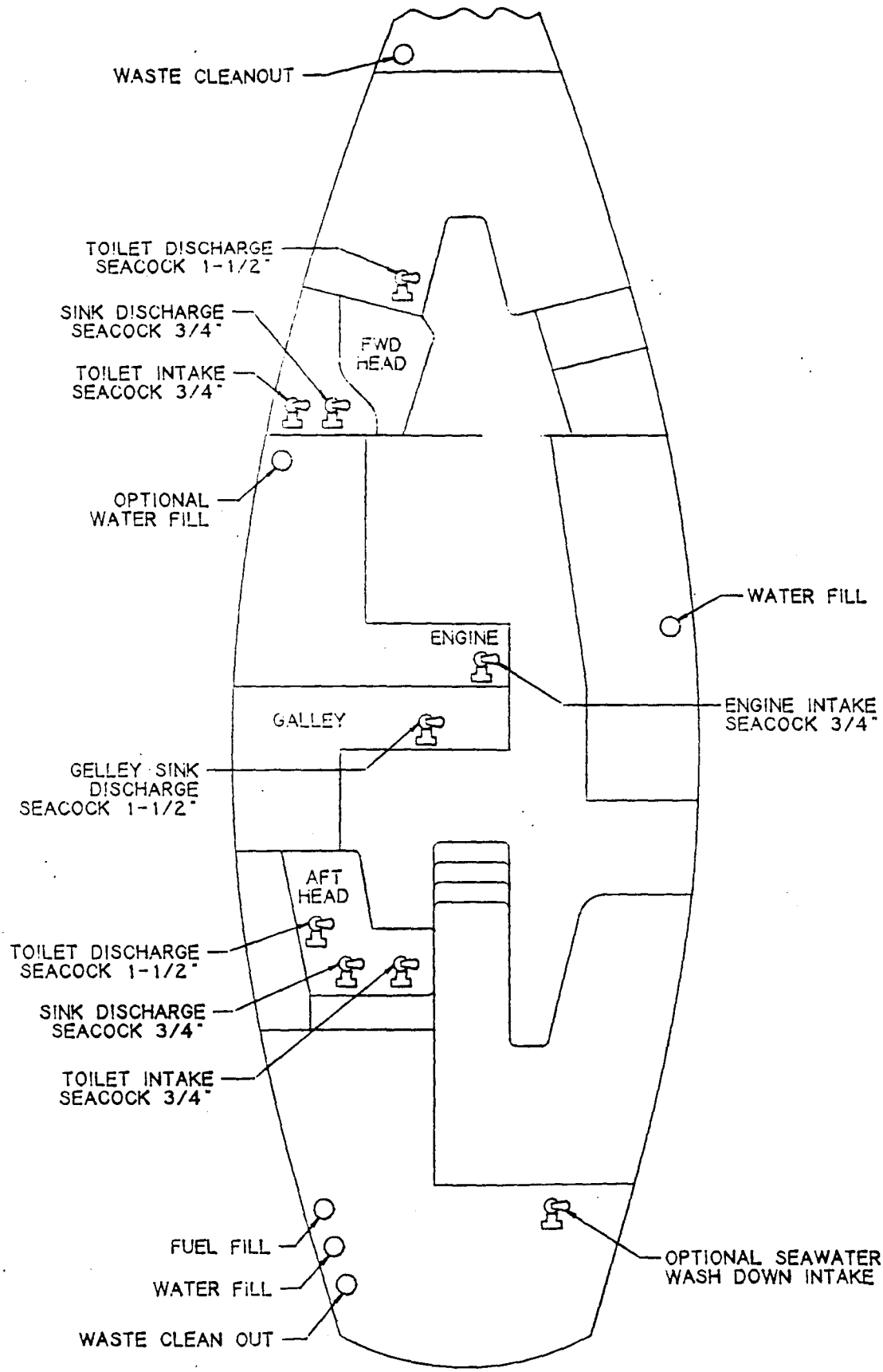
BILGE PUMP is both electrical(optional) and manual. Both are located in the keel stub under the main cabin floor.

MANUAL pump can be utilized from on-deck in the helmsmen cockpit. A large hollow stainless steel pump handle fits into the pump behind the PVC white plastic face.

ELECTRICAL(optional) bilge pump is wired direct with an inline fuse to the battery switch, so it is always "on." This useful feature helps eliminate any accumulation of water in the bilges.

J40 DECK PLATES & SEACOCK LOCATIONS- FIG. 12

J-40 DECK PLATES & SEACOCK LOCATIONS



HEAD SYSTEM

The boat is equipped with a certified marine head (Figures 13-forward & 14-aft) which is capable of discharging effluents into a holding tank or overboard (in compliance with U.S.C.G. regulations). It is easy to operate and with correct usage and proper maintenance, will provide many years of use. If it is not taken care of you will most certainly have trouble.

HEAD--before operating the head, ensure you have read its manual thoroughly and understand the proper procedures. It is silly mistakes which can cause severe "head"-aches at the worst possible time!

And a word to the wise,

PLEASE TRAIN YOUR GUESTS ON ITS OPERATION.
NEVER, 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 or overboard. Both the salt-water intake and the discharge thru-hulls are in the head area underneath the sink. Remember open/closed positions on these thru-hulls. It is good seamanship to...

CLOSE THE INTAKE AND DISCHARGE SEACOCK FOR
THE HEAD WHEN NOT IN USE...OTHERWISE THE
HEAD MAY FILL WITH WATER.

Y-VALVE-- is installed to give you the option to pump effluents overboard when the vessel is operated outside U.S. territorial waters. Some waters prohibit the existence of a "y" valve, so the device should be removed (or bolted to the holding tank position) for navigation in these waters. Conformance with sanitation laws is an owner responsibility.

HOLDING TANK-- is attached to your head system to satisfy federal regulations. It is for the retention of sewage and, like the water tank, is made from polyethelene.

The tank is connected to the following hoses:

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

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 shoreside pump-out station (ie. vacuum cleaner) can empty the tank.

With the standard holding tank, it is not necessary to "pre-charge" the tank by adding water before using the system.

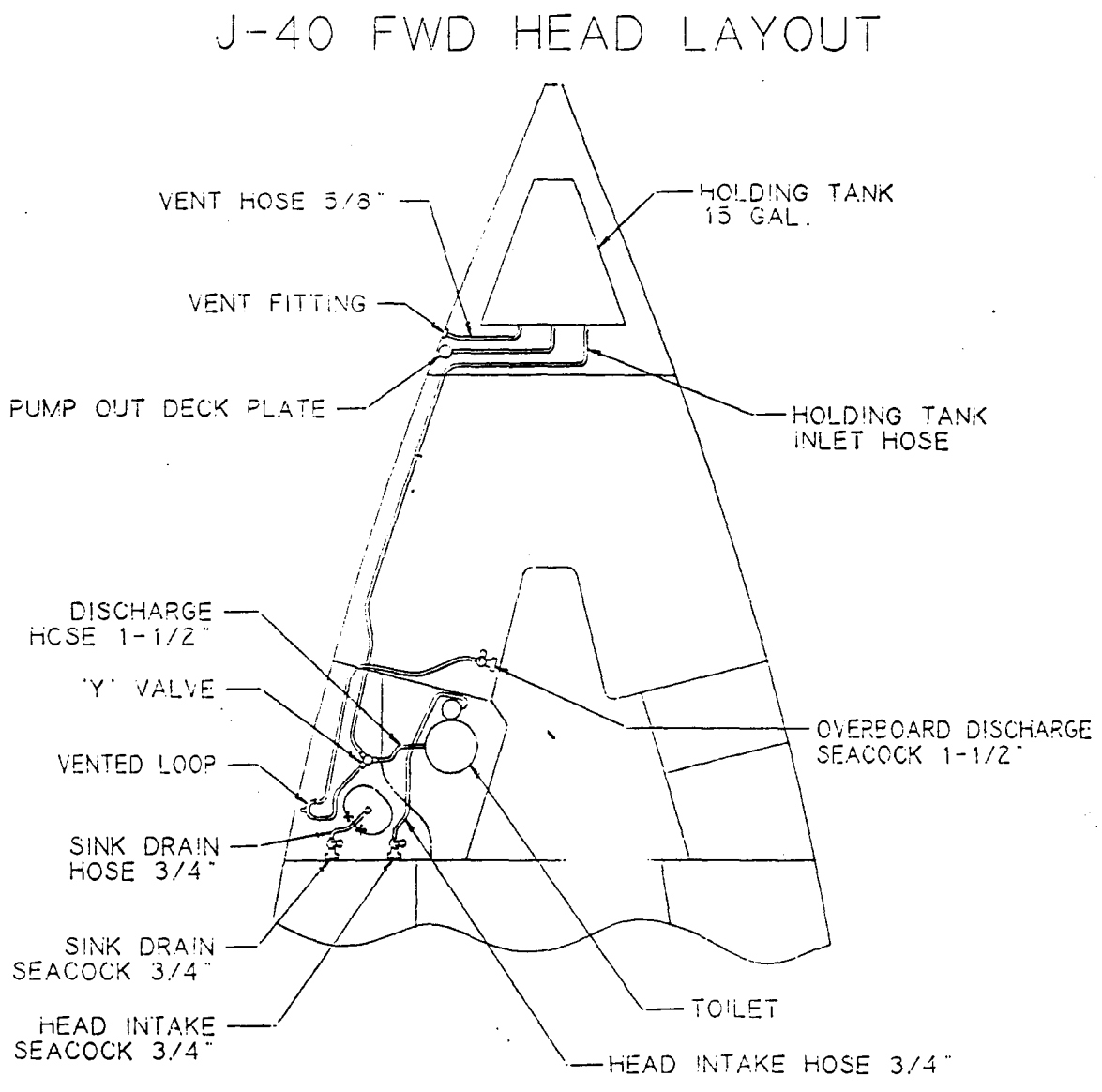
Care should be taken not to overfill the holding tank as effluent can block the vent hose and may damage the tank... or worse, burst the hose and have it spray the interior! If the toilet is difficult to pump, check t see if the holding tank is overfilled. "When in doubt, pump it out!"

The holding tank must be pumped out before winter storage and a quart of anti-freeze pumped through the heads will prevent the seals and equipment from cracking.

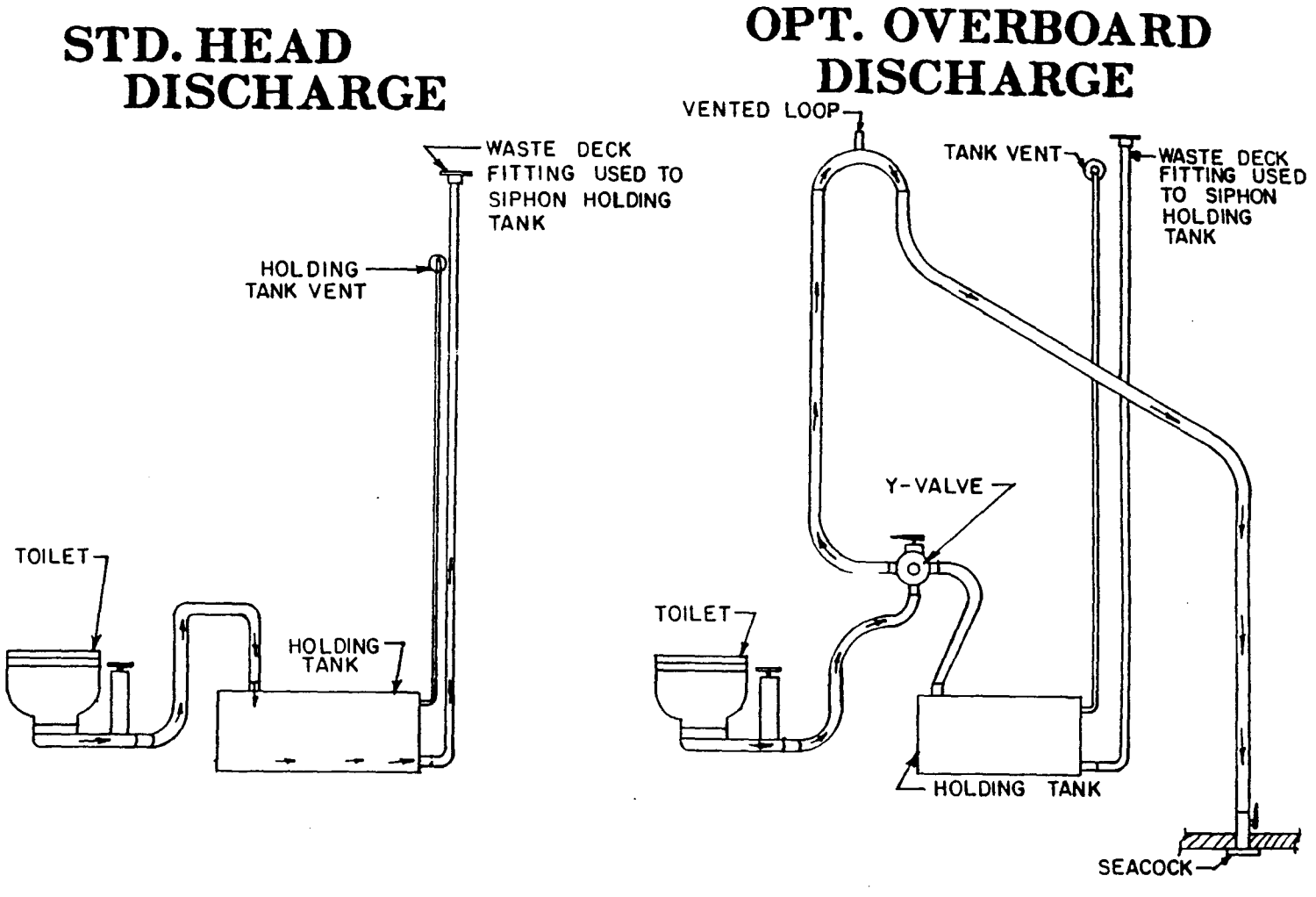
THE FINAL WORD!!

BE CERTAIN THE PUMP ON THE TOILET IS PUMPED 15 TO 20 STROKES
AFTER WASTE IS EMPTIED FROM THE TOILET BOWL TO INSURE THE
WASTE IS PUMPED FULLY THROUGH THE HOSES AND INTO THE TANK.

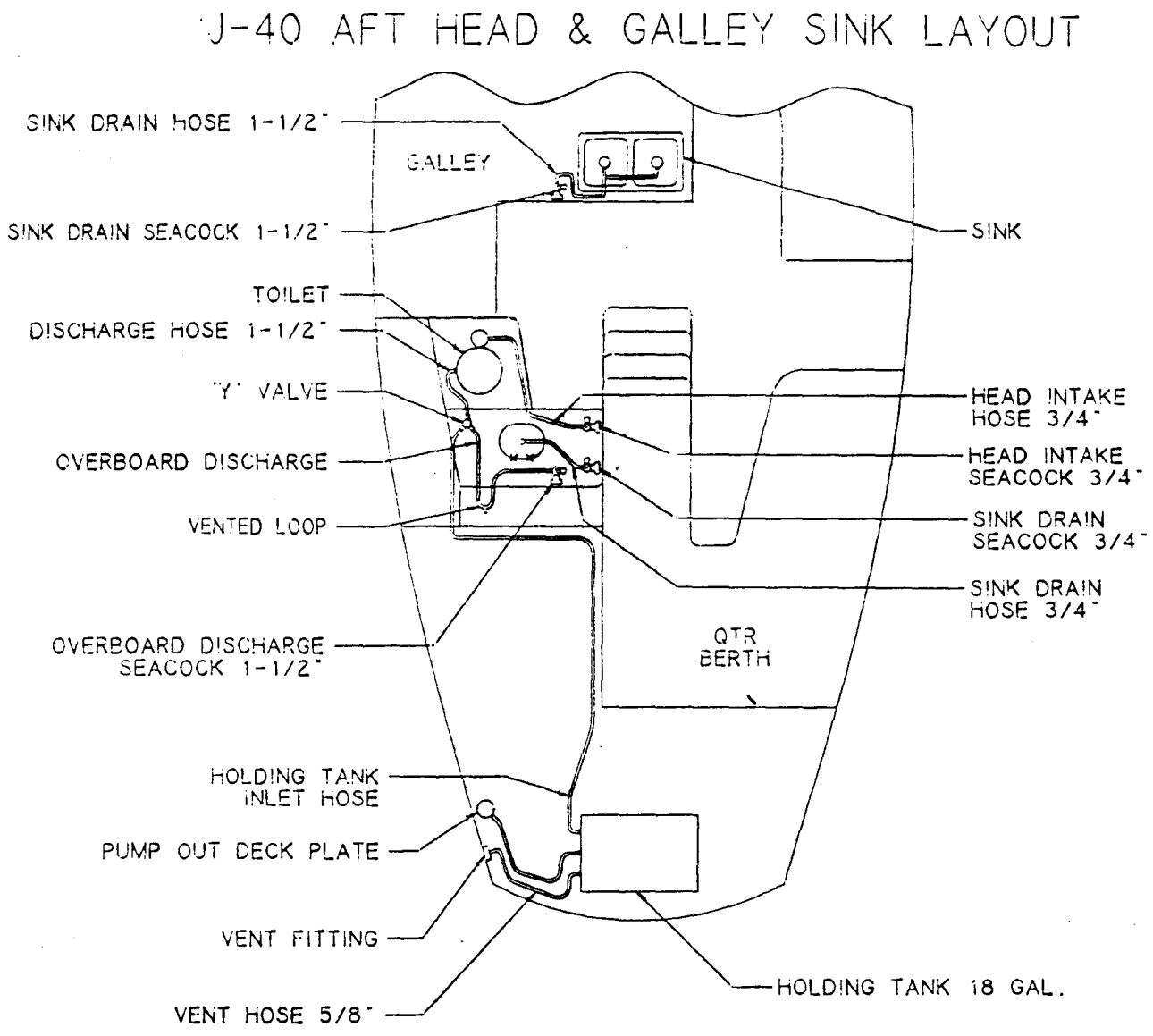
J40 FWD HEAD LAYOUT- FIG. 13



J40 HEAD DISHCARGE SCHEMATIC- FIG. 13A



J40 AFT HEAD LAYOUT- FIG. 14



GENERAL

The following section describes the electrical systems aboard the boat, how they operate, where they lead, and how not to get yourself in trouble. Please read this section over more than once as it can save you should you have problems.

DC ELECTRICAL SYSTEM

A 12 VOLT D.C. electrical system is used throughout for lighting (Fig. 15) and operation of pumps and various accessories (Fig. 16).

ELECTRICAL PANEL is the "nerve center" of this system as it controls distribution and contains all circuit breakers and switches. From it run the wiring harnesses underneath the hull-to-deck sheer fore and aft. The batteries, charged by the engine or the A.C. charger, feed the panel.

For any 12 V. current to be delivered, the following criteria must be met:

1. Charge in the battery
2. Master switch in "Bat. 1", "Bat. 2", or "Both" position.
3. Master circuit breaker on the electrical panel- "ON".
4. Circuit breaker for the appliance- "ON" (cabin lights, running lights, etc.).
5. Switch on the appliance- "ON".

MAST WIRING TERMINAL BOX (Fig. 17) is located on the upper portion of the bulkhead aft of the mast. A wiring harness exits the mast just beneath the deck and is wired directly into the D.C. system. Ensure the color coding matches so the switch at the master electrical panel corresponds with the instrument/light you're turning on.

BATTERY CHARGE MONITOR is on the electrical panel and indicates the charge status of the battery(s) in volts. Flip the switch to either side to check battery status; the meter is connected directly to the "GUEST" master switch. The battery monitor will show a high reading, between 13.6 and 14 V when the engne is on and the alternator is charging. When the battery is fresh and fully charged, the battery monitor will read between 12.8 & 13.6 V.

SPA CREEK VOLTAGE REGULATOR (Fig. 18) is an alternator override to allow more rapid charging of batteries. Consequently, it reduces engine running time. Even though an engine might have a 55 amp-hours alternator, charging the batteries for an hour will not put a full 55 amp-hours back into the battery.

It is important to note that it's possible to burn out the coil, batteries, and the bulbs in your lights if the regulator is not set correctly. The unit is adjusted at the factory for voltage output via a set screw on the unit.

In order to readjust it it is necessary to drain the batteries. Then start the engine and start to charge the battery banks. Check the dial to see that it reads between 13.8 to 14.3 volts, then slowly reduce the number (if it's at the higher end of this scale) with the set srew to 13.8.

The Spa Creek bypasses the regulator in the alternator. And if the Spa Creek is not in use, then the alternator's regulator kicks in.

BATTERIES/"GUEST SWITCH" (Fig. 18) is configured so that with three or more batteries, the #1 position on the Guest switch indicates the "PRIMARY" use or "HOUSE USE" battery bank. This #1 bank has two or more batteries wired

use or "HOUSE USE" battery bank. This #1 bank has two or more batteries wired in parallel and should be used at all times. Battery bank #2 has one battery and is reserved solely for starting the engine when bank #1 has an inadequate charge.

In the event neither bank has sufficient charge to start the engine, turn the Guest switch to "BOTH" to combine the power of the two banks to get things operating. If this fails, get them charged. You should not operate often or for prolonged periods in the "BOTH" position.

To protect the two battery banks from each other and to prevent inadvertent consumption, it's recommended the "BOTH" position rarely used.

When charging, it is best to charge one bank at a time as they will charge faster. Also,

THE ENGINE ALTERNATOR WILL CHARGE ONLY THE BATTERY SELECTED ON THE GUEST SWITCH

Some other do's and don'ts with batteries are:

1. they'll last longer if kept charged during time of no use.
2. check the water level in them every two weeks. Note that when water is added to a partially charged battery, the charge will lower.
3. never add water while it is charging.
4. when adding water ensure battery acid does not splash.
5. never add salt water.
6. distilled water only.
7. ventilate the battery compartment while charging.

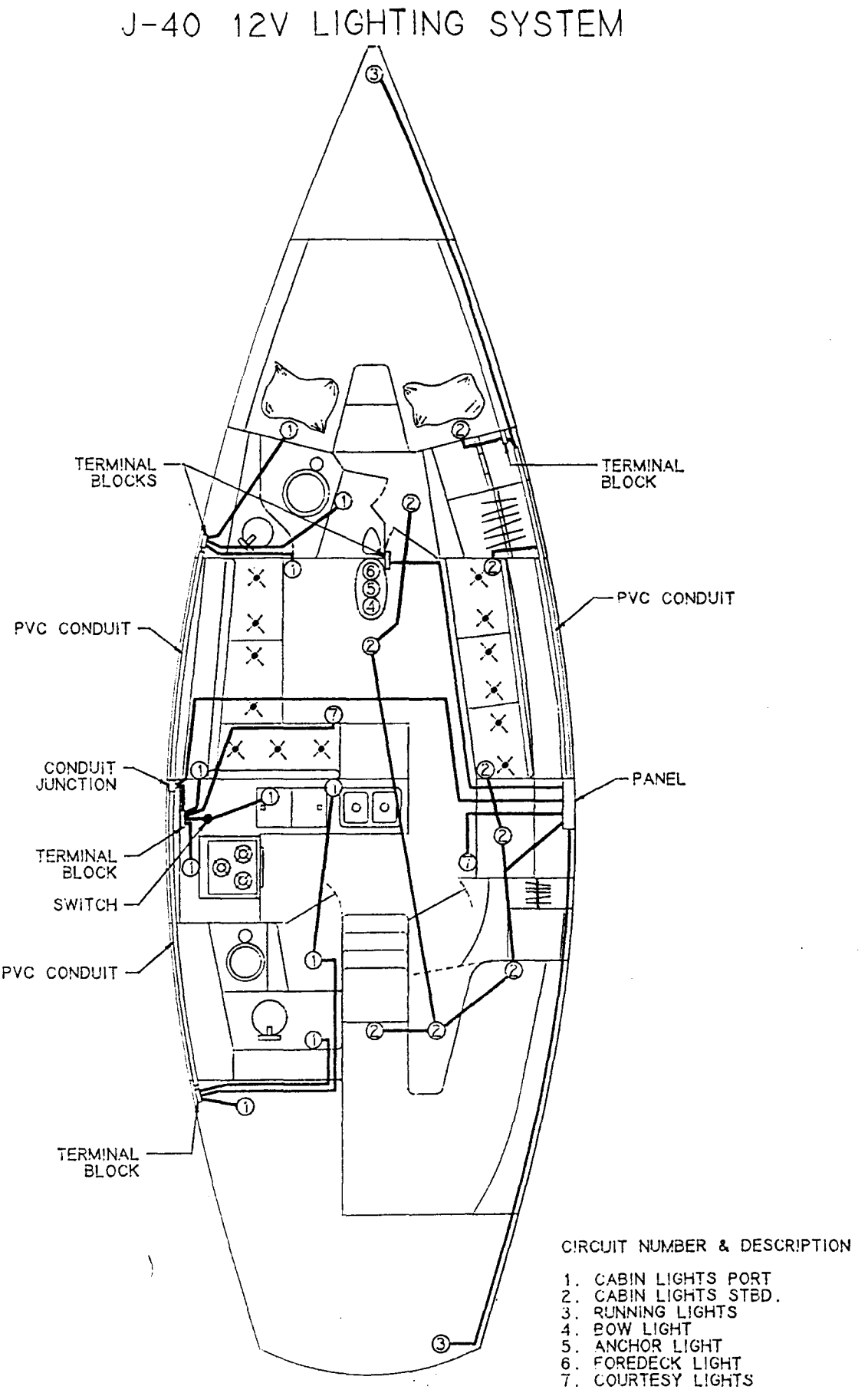
ALTERNATOR (Fig. 18) is attached to the engine and will create a charging current when the engine is running. Its output is connected directly to the Guest switch to distribute the current to the battery banks.

BATTERY CHARGER (Fig. 18) is located beneath the aft cabin berth. This unit is wired into the 110 A.C. system as a voltage regulator and is also wired into the D.C. system to charge the battery bank without using the engine. The charging of the batteries occurs only when the "Charger" breaker on the panel is turned on when the A.C. system is operating.

ACCESSORIES such as navigations instruments, stereos, radars, lorans can be added to the electrical panel and the 12 V DC system. Extreme care and forethought should be taken in their installation as these are, in general, sensitive instruments and require some measure of protection-both electrical and from the elements. Such work should be performed by a marine electrician.

Be sure all sensitive accessories are not only grounded properly but that "fast blow" fuses are run off the panel for extra insurance against damage to their components.

J40 12V DC LIGHT SYSTEM- FIG. 15



J40 WIRING CODES- FIG. 15A

WIRING COLOR CODES

D.C.

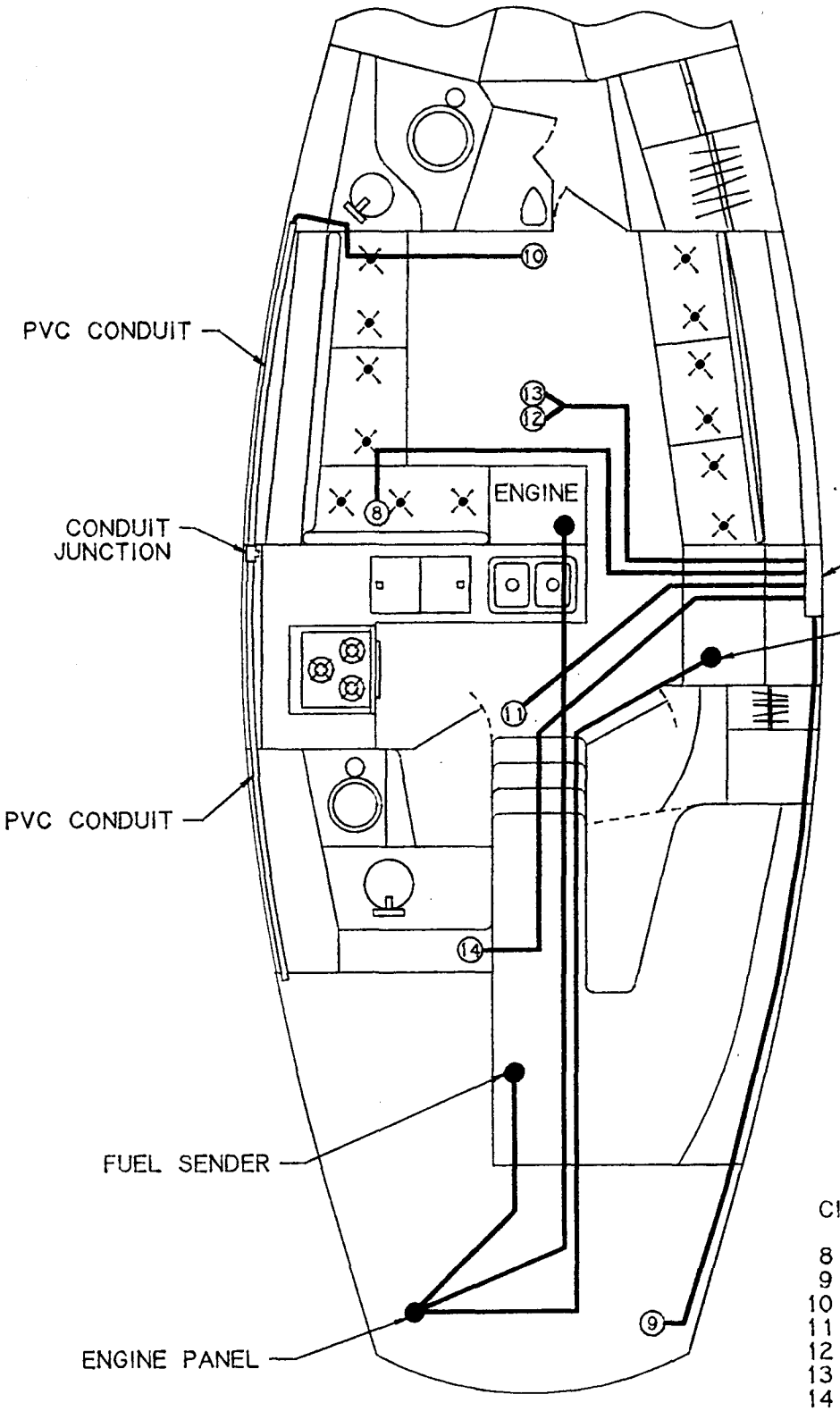
WIRE SIZE	AMPS	COLOR CODE	ITEM
14	20	BLUE	CABIN LIGHTS POR/STBD.
14	10	GRAY	RUNNING LIGHTS
16	5	GRAY/WHITE	BOW LIGHT
14	5	GRAY/ORANGE	ANCHOR LIGHT
14	5	GRAY/ORANGE	FOREDECK LIGHT
16	10	PURPLE	COURTESY LIGHTS
12	10	BROWN	WATER PRESSURE
16	2.5	TAN	L.P. GAS
14	5	BROWN	SUMPS FWD/AFT
14	15	BROWN	BILGE PUMP
8	25	RED	REFRIGERATION(OPTION)
16	5	GREY/BLACK	COMPASS LIGHT-PEDESTAL
14-16	10/5	N/A	INSTRUMENTS
8		RED	ANCHOR WINDLASS(OPTION)
8		RED	BATTERY CHARGER
1		RED	ENGINE STARTER
00		RED	BATTERY BANK
00		RED	ALTERNATOR CABLE

A.C.

WIRE SIZE	AMPS	COLOR CODE	ITEM
10	30	WHITE/BLACK	AC MAIN
12	15	WHITE/BLACK	WATER HEATER
12	15	WHITE/BLACK	BATTERY CHARGER
12	15	WHITE/BLACK	OUTLETS FWD/AFT

J40 12V DC EQUIPMENT- FIG. 16

J-40 12V DC EQUIPMENT

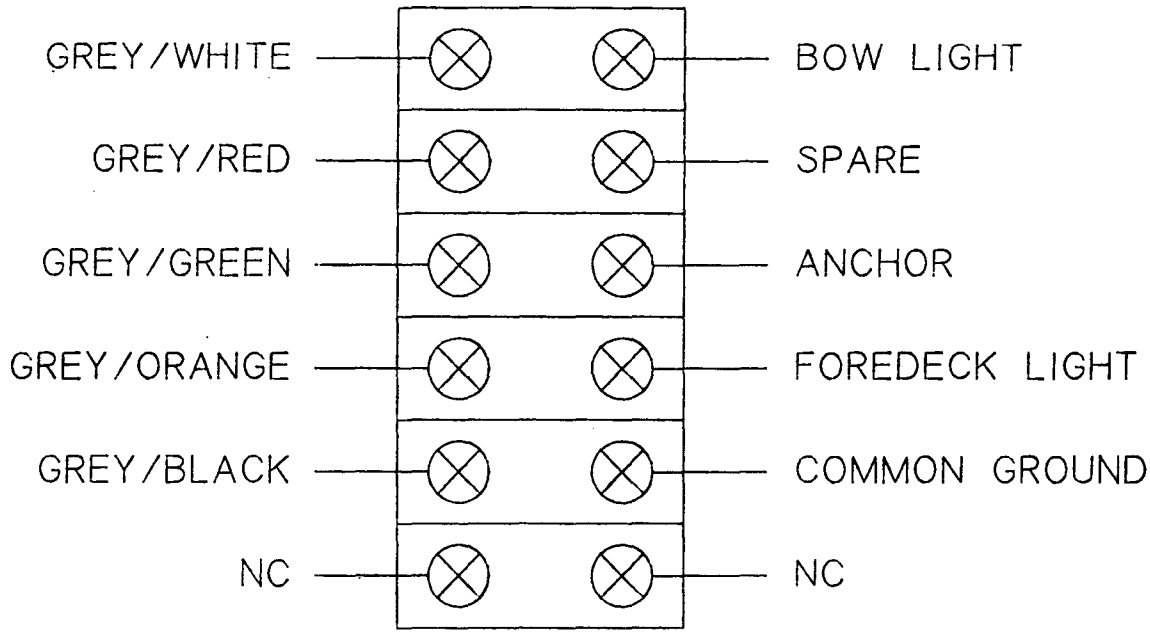


CIRCUIT NUMBER & DESCRIPTION

8. WATER PRESSURE PUMP
9. LP GAS SOLENOID
10. SUMP PUMP FWD
11. SUMP PUMP AFT
12. } BILGE PUMP
13. } BILGE PUMP
14. REFRIGERATOR (OPTIONAL)

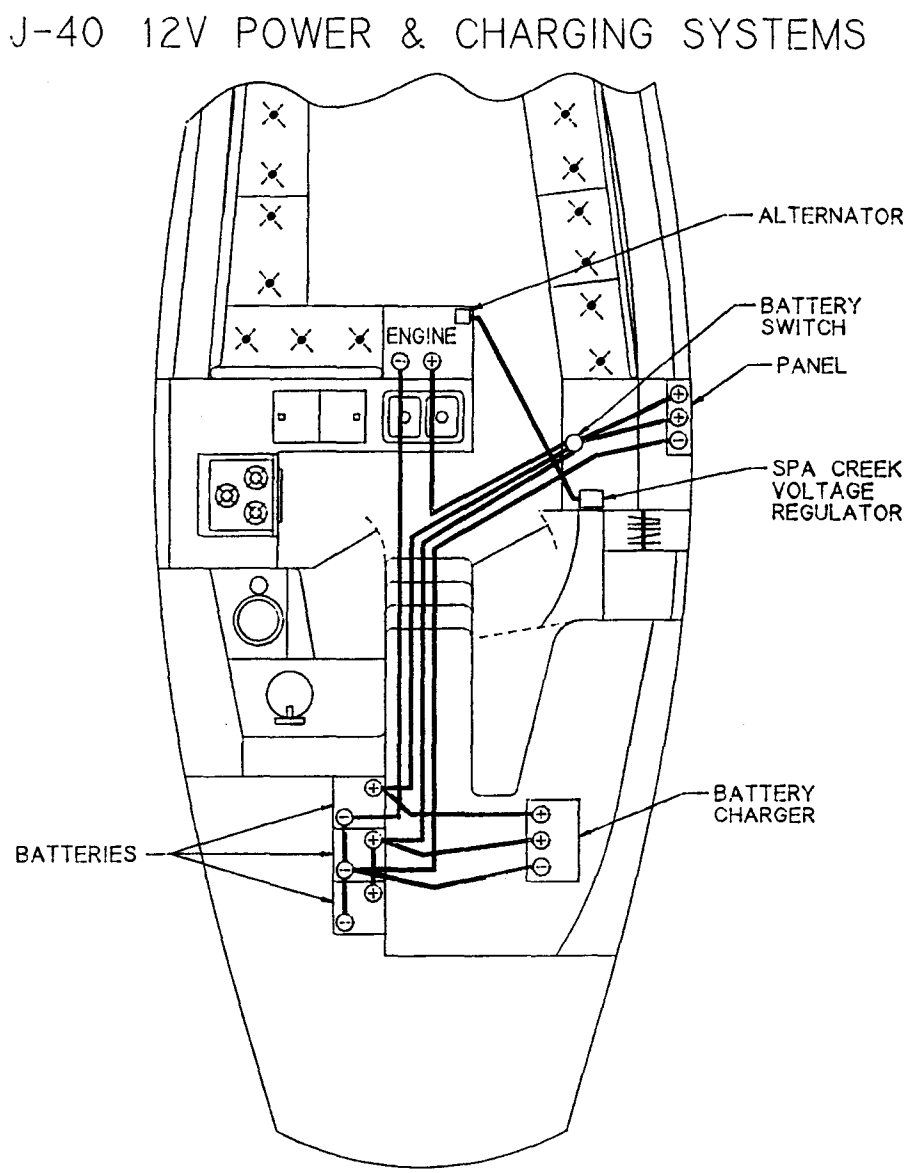
J40 MAST WIRING- FIG. 17

J-40 MAST WIRING



NOTE: TERMINAL BLOCK LOCATED
UNDER DECK HOUSE
NEXT TO MAST

J40 12V POWER/CHARGING SYSTEM- FIG. 18



110 VOLT A.C. SHOREPOWER SYSTEM

The 110 volt A.C. shorepower system (Fig. 19) is functional only when the boat is plugged into suitable power from shore. The cord provided has the standard end for the amperage service. Depending on the wiring in the facility, various adaptors may be required to plug into the shore end. The boat end of the cord plugs into the inlet inside the helmsmen's cockpit. Ensure the plug prongs match those on the 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 shorepower is located next to the DC panel. The functions on the panel are as follows:

a. ORANGE LIGHT- indicates that shore power is properly hooked up to an active shore system.

b. AC VOLTMETER- indicates line voltage being received from the shore circuit. 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.

CAUTION-- OPERATION OF AC MOTORS WITH LESS THAN 90 VOLTS IS LIKELY TO RESULT IN DAMAGE TO THE MOTORS.

c. 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 dockmaster of this problem to repair shore plug.

NOTE- Even though the switches are in the appropriate position, the shore power system in no way assures safety of personnel using electrical apparatus.

d. WATER HEATER- supplies power to the water heater 110 AC element for hot water while dockside. Note the precautions regarding the use of electrical power to heat water are contained in the plumbing section of this manual.

e. OUTLETS- located throughout the cabin supply power for 110 AC accessories; the entire system has "ground fault" protection.

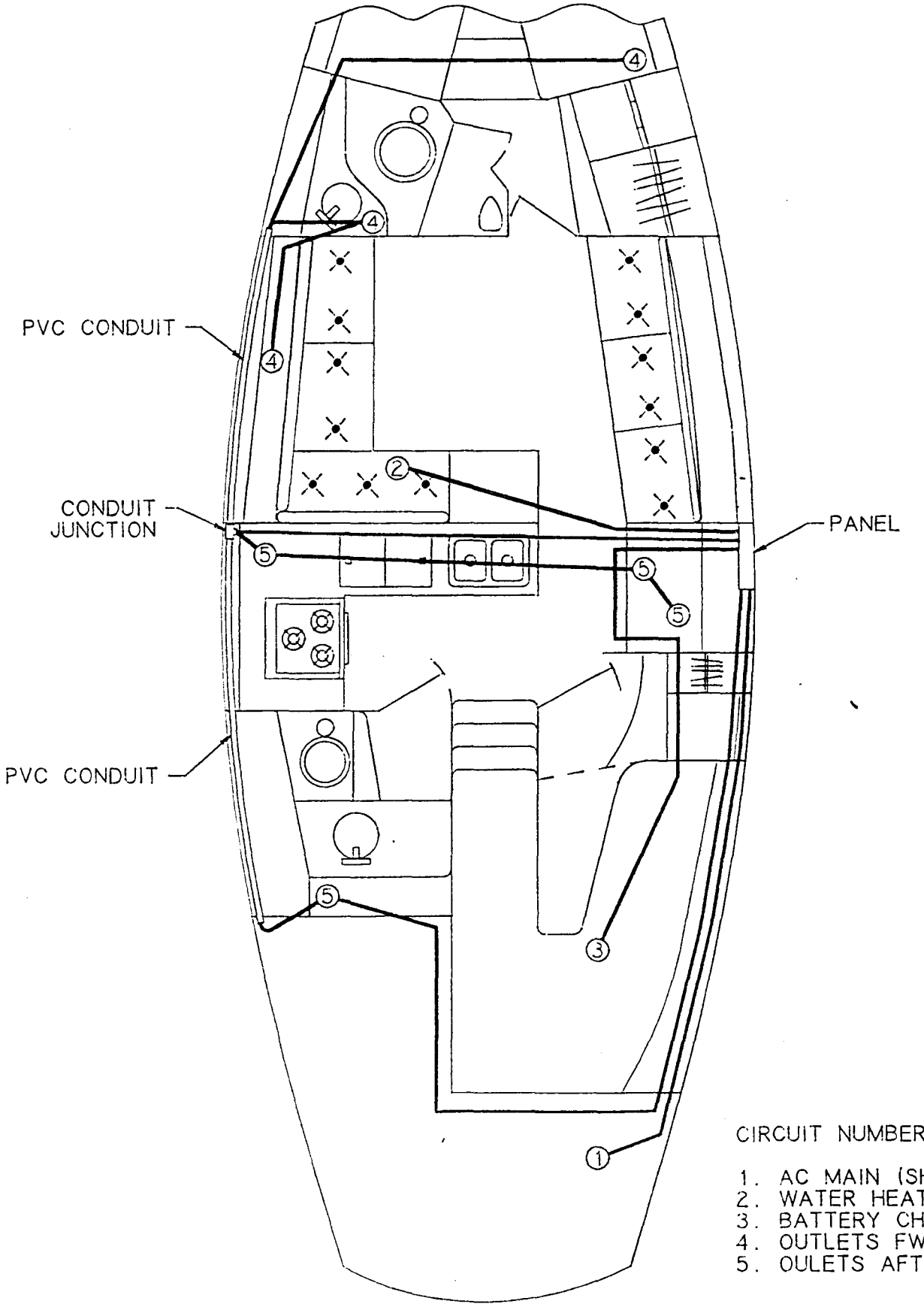
CAUTION--CAUTION--CAUTION

These precautions should be exercised to avoid shock and fire hazards:

1. Turn off the boat's shore connections switch before connecting or disconnecting shore cable.
2. Connect shore-power cable to the boat first.
3. Disconnect shore-power cable at shore-outlet first.

J40 110V AC SYSTEMS- FIG. 19

J-40 110V AC SYSTEMS



CIRCUIT NUMBER & DESCRIPTION

1. AC MAIN (SHORE LINE)
2. WATER HEATER
3. BATTERY CHARGER
4. OUTLETS FWD.
5. OULETS AFT

LIGHTNING PROTECTION

The boat is completely grounded in accordance with industry practice. The mast, shroud chainplates, stemhead fitting, backstay fitting, engine, and electrical system are all grounded to the keel. In spite of this grounding, 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.

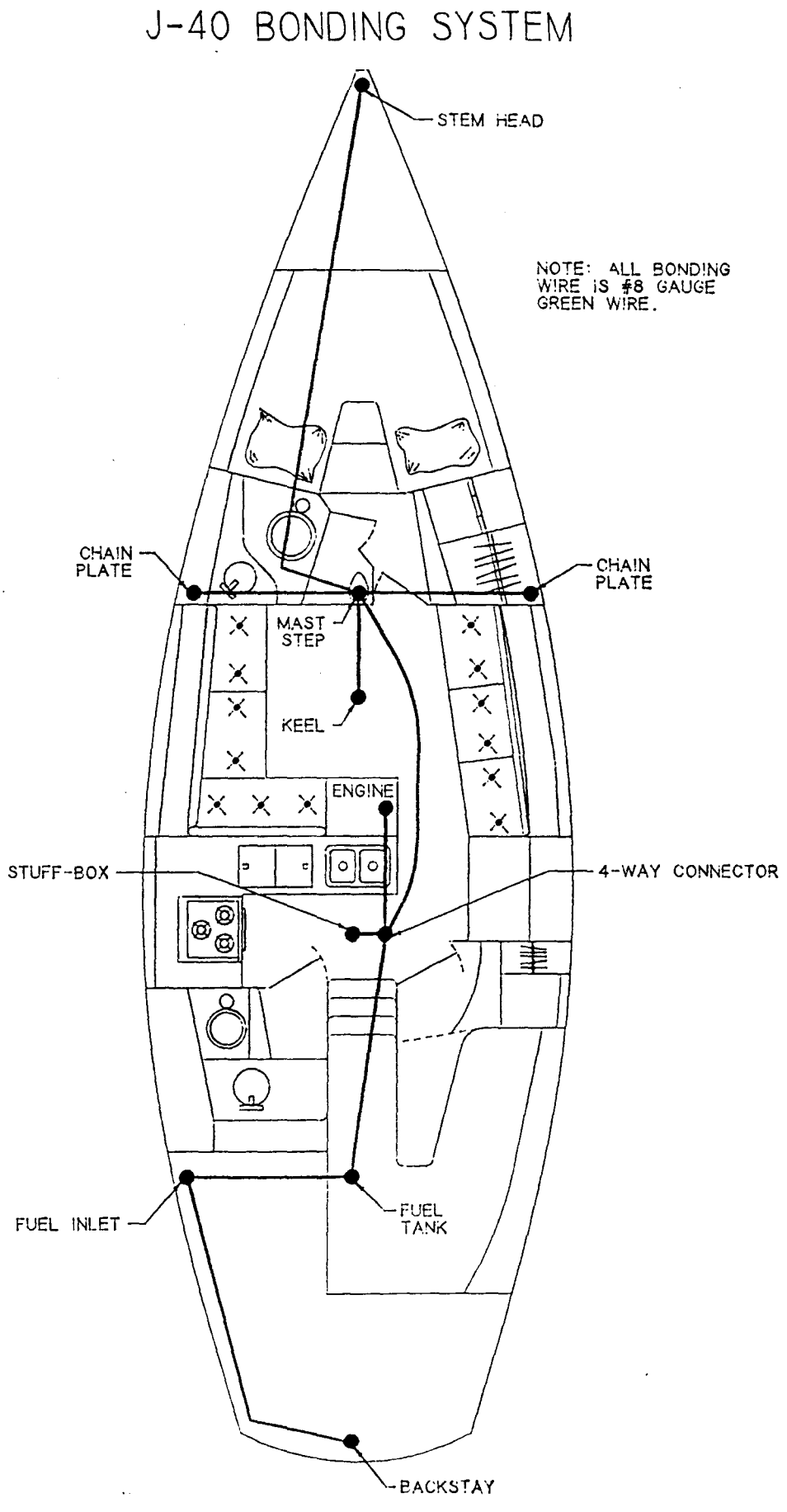
1. If possible, remain inside a closed boat during a lightning storm. Do not contact any metallic objects inside or outside the boat.

2. 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).

3. No one should be in the water during a lightning storm.

4. If the boat is struck by lightning, compasses and electrical gear should be checked to determine that no damage or change in calibration has taken place after the storm.

J40 BONDING SYSTEM- FIG. 20



PROPANE SYSTEM

The propane (LP) gas stove/oven system (Fig. 21) is engineered for the marine environment in high-grade stainless steel. It's heating is comparable to your home ranges.

The biggest difference is safety considerations. While the home gas stove has a petroleum gas which is lighter than air (it disperses easily if there is a leak) the propane stove has a gas which is heavier than air, and thus, has the disconcerting property of sinking to the bottom of its enclosed compartment or area (like the bilge)....it is not as readily dispersed by overhead ventilation. Therefore,

PREVENT THE ESCAPE OF ANY LIQUIFIED PETROLEUM GASES (ESPECIALLY PROPANE) FOR WHEN MIXED WITH AIR THEY CAN EXPLODE IF IGNITED.

PROPANE STOVE/OVEN is located in the galley and is of high quality stainless steel, especially designed to withstand the rigors of the marine environment. Be sure to read the manufacturer's operating manual.

PROPANE TANKS are located in specially designed compartments in the stern which have ventilation holes over the side to specifically eliminate the accumulation of these potentially dangerous gases.

Tank replacement should be done with extreme care. Follow this procedure to ensure the line is devoid of gas:

1. Turn off solenoid valve switch on electrical panel first to shutoff supply of gas at the tank.
2. After flame of burner goes out, turn off knob for burner (this purges gas from lines).
3. Firmly close manual valve on tank--DO THIS EVERY TIME!!
4. Unscrew fuel line fitting from tank. Remove empty tank and replace with new tank. Re-attach fuel line to tank.

LPG GAUGE sits atop the tank to measure the amount of pressure left in the tank.

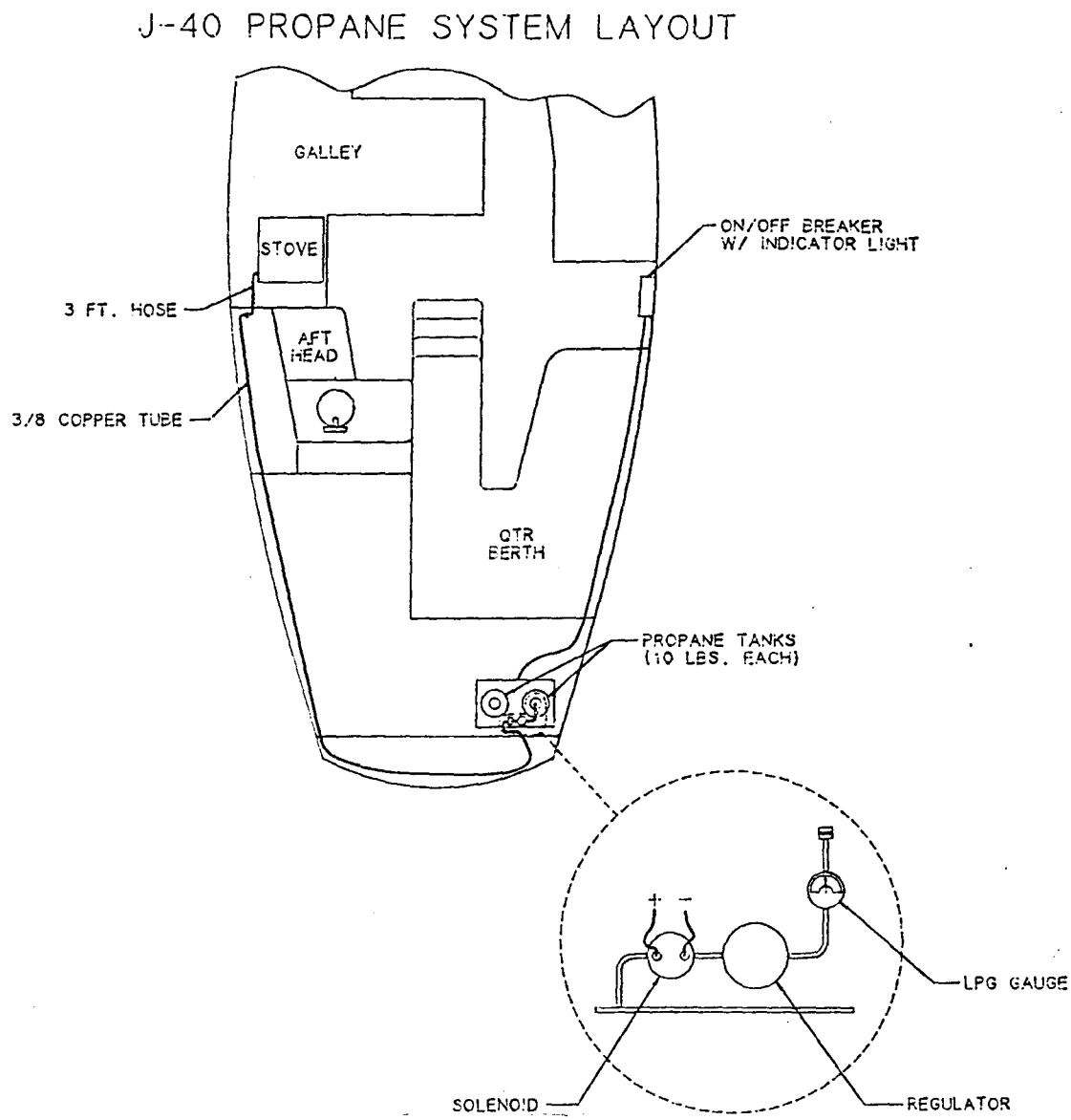
SOLENOID CAP VALVE is located on the hose in the aft propane compartment. It electronically shuts-off the flow of gas at the tank. This valve is a "normally closed" valve; therefore electrical power must be provided so gas can flow to the stove.

REGULATOR is located on the hose in the aft propane compartment. It is a screw down valve which regulates the flow of propane into the system.

PROPANE LEAK TEST

Before initial use a propane leak test should be performed as part of the commissioning procedure to double-check the factory installation. This test should be conducted every time a bottle is refilled.

J40 PROPANE SYSTEM LAYOUT FIG. 21



Test for leakage by applying a liquid detergent or soapy solution at all connections. Repeat the test for each container in a multi-container system.

Also check for leaks by watching the propane gauge. If the pressure drops while no one is cooking, then retest all connections until the leak is discovered.

NEVER USE FLAME TO CHECK FOR LEAKS

If a leak is detected, close the manual valve on the tank, temporarily seal the area of leakage with duct-tape, purge the lines of gas by blowing clean air into the stove end of the line, and then seek professional help to repair the leak.

STOVE OPERATION

Before using the stove be absolutely sure you read the stove manual in regards to all the safety procedures and what is outlined above. The following describes typical stove operation procedures:

1. Check all burner (including oven) knobs are off.
2. Check manual valve on tank and open.
3. Ensure battery switch is on and 12 volt power available.
4. Turn on solenoid valve switch on electrical panel.
5. Open burner valve on stove slightly and light burner. Always apply flame or sparker to burner before opening valve.

COOK TO YOUR HEARTS CONTENT--keep crew fat and happy

When cooking is complete, then;

6. Turn off solenoid valve switch on electrical panel first to shut-off supply of gas at the tank.
7. After flame of burner goes out, turn off knob for burner (this purges gas from lines).
8. Firmly close manual valve on tank--DO THIS EVERY TIME!!

WORDS OF CAUTION

Never leave a lighted burner unattended. A gust of wind may blow out the flame and allow gas to continue to flow from burner. The heavier than air L.P. gas can then easily accumulate below and may explode.

If gas odor is observed, immediately open floorboards and vacate the boat. Do not do anything which may cause a spark. Close manual valve on tank. Open all hatches and seek aide immediately. In other words, when in doubt, shut it down.

IN CASE OF FIRE--
TURN OFF SOLENOID ON D.C. PANEL. IF PANEL MALFUNCTIONS, TURN OFF BATTERY SWITCH AND EVACUATE VESSEL!

SAFETY EQUIPMENT

GENERAL

We strongly believe that you can never be prepared well enough for any kind of emergency which may arise at sea. The following are basic guidelines to help you in your preparation, but they do not represent, by any means, the most comprehensive list. In fact, we recommend that you contact your local U.S. Coast Guard office for up to date U.S.C.G. safety requirements.

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

SAFETY EQUIPMENT

U.S.C.G. regulations require specific safety and emergency equipment on board at all times and it's important to learn and procure the equipment when necessary and to regularly maintain it in proper working condition.

Basic requirements which should be observed include the following equipment:

DISTRESS SIGNALS are required on all vessels over 16 feet and by all boats operating at night. They have specific colors to indicate certain emergencies. They can be deployed in two ways; hand-held or "pistol" fired (parachute flares). Keep them up to date and in their plastic bags. Some have aluminium cannisters and will last longer. However, it's prudent to replace them periodically.

FLOTATION DEVICES are required for each passenger aboard, generally a Type III PFD. It is also recommended that a horseshoe life ring or seat float cushion be kept handy in or close to the cockpit in the event of a man-overboard. Furthermore, it is very prudent to carry safety harnesses for all hands on deck when sailing in storm conditions, squalls, and at night.

FIRE EXTINGUISHERS should be located for quick access. Two are required. Preferably one near the galley and the other near the forepeak. There are a number of different types of extinguishers (foams, chemicals, water), so be sure to have one which addresses the needs of your boat.

GROUND TACKLE should always be carried with proper size rodes. In general, at least two anchors with nylon anchor rode and heavy chain is suitable for most conditions. The primary, or storm anchor, stowed in the lazarette and ready for use. The secondary, or "lunch hook", on the bow or in the aft locker ready for easier short term use.

The general "rule of thumb" for determining length of anchor rode is 7 feet of rode to 1 foot of water depth, ie. a 7:1 ratio. In some areas an all chain rode is recommended to prevent rope chafe. Irrespective of these guidelines, it is the owner's responsibility to determine the number and size of anchors and rodes to be carried aboard and when and where to use them.

ADDITIONAL EQUIPMENT should also include softwood plugs for the seacocks(preferably taped onto the hose adjacent to them); hand and air horns for fog, bridges, nightime; flashlights; first aid kit; bucket with lanyard; radar reflector; heaving line; and tools and spare parts.

For a complete set of tools, refer to the commisioning section and the "Tools You'll Need."

GENERAL

This is the APPLICATION SECTION of the manual. It is included to give you basic step-by-step procedures on how to operate your boat. If you are not already familiar with operating a boat of this size, we recommend that you enlist the help of your dealer or an experienced and licensed captain. Or if you are already experienced and wish to be refresh your knowledge, we also recommend reading the ANNAPOLIS BOOK OF SEAMANSHIP or CHAPMAN'S BOOK OF PILOTING AND SEAMANSHIP.

If in doubt, never be too proud to do a little research ahead of time. Stay ahead of the boat, tides, currents, and weather when navigating.

GETTING UNDERWAY

Central to having a wonderful experience cruising is the proper handling of your boat. By now, it is evident that all systems have been designed and engineered on this boat to facilitate this process. We hope you enjoy her. Let us now take her on an imaginary voyage.

GENERAL HINTS TO AVOID PROBLEMS

1. Use one battery exclusively for engine starting. Monitor brightness of cabin lighting and charge batteries as required by running engine. Batteries are charged by either connecting it to shore power or by running the engine.

NEVER START THE ENGINE WITH SHORE POWER CONNECTED

2. Stop engine with throttle fuel cut-off. Use of the key ignition switch for stopping may blow the costly alternator diodes.

3. NEVER turn battery switch to OFF position while engine is running.

4. Remove all lines from water before starting engine. If towing dinghy, tow close to boat while maneuvering with engine.

6. NEVER launch dinghy from deck while boat is moving.

7. Open a small hatch or window while using propane stove or propane hot water heater.

8. Diesel exhaust exits in the transom and is hot. Avoid exhaust when using swim ladder. Better yet, turn off engine.

9. Check seacocks. Ensure engine intake is open. Try to keep heads closed.

ENGINE

The engine is a VOLVO 43 HP turbocharged diesel.

Cruising R.P.M. - 2400 at slightly less than hull speed.

Do not run engine at full throttle for sustained period, as breakdown may occur. Most importantly, find an RPM that runs smoothly. Avoid "vibrating" RPM speeds.

Keep engine gear shift lever in "REVERSE" position while sailing to prevent possible "free-wheeling" of shaft.

ENGINE SAFETY PRECATUIONS

Diesel engines operate with very high exhaust temperatures. The result is that any defect or restriction of flow anywhere in the cooling water system running to the exhaust line can cause excessive heat build up. In turn, this could burn the exhaust hose. Also, due to high temperatures it is recommended that after running the diesel for more than two hours you should reduce speed to idle and allow excess heat to dissipate for five to ten minutes.

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 try bleeding it yourself. The procedure only takes a few minutes after you are acquainted with it, but can be exasperating to the uninitiated.

As with any engine, do not shift from forward to reverse at high engine RPM.

PRESTART

1. Check fuel level at cockpit engine control panel. Running engine with no fuel or fuel shut-off will result in air lock, and requires stepby-step bleeding of air from all lines.

2. Check to see if fuel shut-off valve is open (under aft cabin bunk...it sits atop fuel tank).

3. Check oil level. Dipstick on starboard side of engine. Engine is under sink in center of boat. It can be accessed by removing "coffee table" cover or by opening doors under sinks.

4. Check gear box screw for correct oil level.

5. Check fresh water level in manifold.

6. Check stuffing box, should be damp to touch.

7. Assure that sea water valve to water pump is open.

8. Remove any visible water from fuel filter.

9. Check battery water level

10. Turn battery master switch to "BOTH." Battery switch is located in navigation station.

STARTING THE ENGINE

1. If installed, VHF and LORAN "OFF."

2. Transmission lever: black lever on aft side of pedestal.
   Horizontal= neutral
   Up= reverse
   Down= forwards

3. Rudder amidships- wheel spoke with centerline tape mark.

4. Secure transom swim ladder.

5. All lines should be out of water.

6. Place throttle 1/3 open (move forward). Red lever on right side of pedestal.

7. Turn ignition key to "ON" position. Audible alarm indicates low oil prtsessure, and will continue until engine starts. There is an oil pressure alarm test switch on the cockpit engine panel.

8. Turn ignition key to "START" position. Release immediately after start. If it does not start in ten seconds, release key. Advance throttle slightly and after ten seconds, repeat.

9. Oil pressure light and audible alarm should go out after starting. If not, stop engine.

10. Once engine starts, set throttle at about 1,000 RPM. Check transom for exhaust water. If no water, shut down engine immediately, check to be sure through hull valve to engine cooling system is open, or if the sea water strainer is clogged. If indications are normal, warm up ten minutes.

11. Test forward and reverse at dock with docking lines in place. Shifting should be done below 850 RPM's AT ALL TIMES. To shift at too high a speed will cause severe damage to the entire drive train.

12. Check for exhaust water from transom periodically. Engine is cooled by sea water via a heat exchange and enclosed fresh water system. Water temperature shoud read 160 degrees or less and water should exit from the stern at all times.

13. Best cruising approximately 2400 RPM. Without water exhaust discharge, engine will burn up. Check sea water strainer for debris. Ensure thru-hull is open. If necessary, check under hull to see if intake is blocked.

14. It is best to keep fuel tank 1/2 full (diesel #2) to avoid debris intake and air locks....which could require a diesel mechanic to repair.

STOPPING

1. Place red throttle lever in idle position.

2. Place black shift lever in neutral (horizontal).

3. Let engine cool down.

4. Pull fuel shut-off knob on engine instrument panel until engine stops. NEVER STOP ENGINE WITH KEY. This may result in serious damage to the electrical system.

5. When audible alarm sounds, turn key off. DO NOT use key to stop engine. Do not stop engine with decompression lever except in extreme emergency. If decompression lever is used to stop engine, fuel will spray out and accumulate on top of pistons, creating danger of explosion the next time engine is started.

6. When under sail you may hear propeller "windmilling" underneath. After shut down put engine in reverse gear and it will stop. Folding prop will close as speed builds up!

FUELING

When preparing to take on fuel, the following safety precautions should be followed at all times:

1. Properly secure boat to dock using bow, stern and spring lines.

2. Close all hatches and ports.

3. DO NOT SMOKE.

4. SHUT OFF ALL EQUIPMENT..ENGINE, MASTER BATTERY SWITCH, STOVE, CABIN HEATER, RADIOS, LIGHTS, ETC.

5. Remove fuel fill plug and clean threads of both plug and deck plate carefully so no dirt falls into filler opening.

6. Place the fuel hose nozzle into the fill pipe. Keep it in contact with the deck plate rim to avoid static electric charge.

7. Fill slowly. DO NOT OVERFILL. Marine fuel expands with an increase in temperature. Thus, fill only to 95% capacity.

8. If you cannot see the fuel pump, ask the attendant or a crew member to call out the total gallons.

9. If fuel tank is overfilled, fuel wil leak out the tank vent located on the transom. This spillage should be cleaned up immediately.

10. After fueling, replace fill plate and wash up any spillage. Go below deck and check for fumes or leakage. Check bilge. IF EITHER FUMES OR LIQUID FUEL ARE PRESENT, CORRECT THE SITUATION BEFORE PROCEEDING.

11. Open all hatches and ports to facilitate ventilation.

12. Only after you are totally satisfied that no potentially dangerous condition exists, leave the fuel dock. Be considerate of fellow yachtsmen.

13. In the event of a serious spillage, STOP FUELING IMMEDIATELY. Replace fill plate, notify attendant so he may warn others and wash down thoroughly all traces of fuel or source of fumes.

16. DO NOT fuel during electrical storms.

17. In remote areas, be sure to check fuel before filling tanks. Contaminated fuel tanks are difficult to clean.

SAILING

The whole idea of cruising is to relax with a minimum of anxieties. The "J" cruising concept has evolved to address those areas which most sailboats do not: upwind in heavy air; downwind in light air; and sailing shorthanded.

The rigging and cockpit configuration enable the helmsman to completely control the boat. The large main can be infinitely shaped by hydraulic vang and backstay; cunningham/tack reef; mainsheet; and traveler controls.....all within reach of the skipper. Because its winches are mounted aft, the jib can also be adjusted by the helmsman.

UPWIND IN HEAVY AIR is a snap. Sail under full main only, with maximum mast bend, vang on hard, flattened main with open leech, boom over leeward edge of cockpit, helmsman managing mainsheet winches and wheel.

You can sustain 6.5+ knots to windward without getting the rail under by "feathering" up or easing the main instantly in puffs, or a combination with just the helmsman working.

Tacking is simple as it is a spin of the wheel and off on the new tack with little loss of speed.

UPWIND IN MEDIUM AIR can be handled with aplomb. Just unfurl the genoa or set a 100% jib and you will generate plenty of passage-making speed. Don't overtrim the jib as it will stall the large main. Remember to keep the jib leech aimed straight aft.

UPWIND IN LIGHT AIR can be exhilirating with a 150% genoa and full main. The boat moves best by keeping the rig "breathing." Move mainsheet traveler to windward, ease mainsheet to allow plenty of leech twist, and sheet the genoa no closer than six inches at the top spreader.

DOWNWIND IN LIGHT AIR is exciting because this boat can really move in zephyr-like conditions...when others resort to the diesel alternative, you will still be barreling along.

The large main combined with the speed of the boat allows one to drive the apparent wind 30-40 degrees forward of the true wind, so jib and main sustain a ventilated air flow (rather than stall). Thus, with the true wind at 130 degrees, the apparent wind is drivenso far forward that the boat is sailing on a beam reach at close to 6 knots with a VMG downwind of about 4.3 knots! It is a nice refreshing angle for the crew with a boat that's not stabilized and not rolling.

DOWNWIND IN MEDIUM TO HEAVY AIR is a joy because the sailplan is so efficient. For lazier cruising, use the main only as 7+ knots on beam to broad reaches is easily attainable. For greater exhiliration or passage-making speed sheet the genoa/jib out to the rail or wind it out to windward.

NOTE- It is prudent to control the mainsail at all times, especially when gybing. Sheet in the mainsail during the gybe to reduce the hazard to both the crew and to avoid catching the steering pedestal.

MAINSAIL REEFING PROCEDURE

The mainsail controls all lead to the cockpit. Therefore, reefing can take place within the confines and safety of the cockpit.

Familiarize yourself with the control lines. There are primary and secondary reef lines for both the tack and clew. Practice reefing in the

marina if you are unfamiliar with this procedure. Reefing procedure follows:

1. Ease mainsheet and allow mainsail to luff.

2. Ease hydraulic vang. This forces boom to rise and relieve load on mainsail leech.

3. Ease main halyard until the tack reef cringle is even with the gooseneck. It is best to set a predetermined "mark" on the halyard to speed this process.

4. Tighten tack reef line. Tighten clew reef line.

5. Re-tighten mainsail halyard, eliminate luff wrinkles.

6. Secure intermediate reef points where necessary with mainsail ties.

7. Trim in main and readjust hydraulic vang to properly set mainsail leech twist....ie. keep upper two telltales flowing.

NOTE- To "shake-out" the reef, simply reverse the above procedure. Ease mainsheet, vang, halyard; completely ease off reef lines; raise main to eliminate wrinkles.

MANEUVERING

GO SLOW AND PLAN AHEAD. Sailboats steer quite well in forward motion and not so well in reverse. Only slight turns of the wheel are necessary in reverse, especially with transom hung spade rudders. With wheel spun hard over, the boat can turn in a circumference of about 2 1/2 times its length.

When docking approach slowly. Remember, the boat develops a tremendous amount of momentum and cannot be stopped easily. When fending off from the dock, push on the hull, not on the lifeline stanchions.

ANCHORING/DOCKING

When seeking a place to anchor, always ensure there is enough swinging room. Take into account wind shifts, forecasted weather, and tidal currents. The rule of thumb for amount of scope is 7:1 (7 feet of line to every 1 foot of depth).

The main anchor can be stored on the bow chock rollers. Make certain it is securely fastened when sailing. Tie it down with a sail tie.

Before anchoring, always double-check that anchor chain and line are securely fastened to the anchor. And once the anchor is in place and you are satisfied with the "holding ground" be sure line is lead properly and fastened tightly to the bow cleat.

A second anchor can be stored in the aft cokpit anchor well. This can be your "lunch hook"; a lighter weight anchor, chain, and rode to facilitate short stays. Remove very carefully to avoid marring the woodwork.

When docking your boat always be sure to make the approach slowly. Remember, the boat has a tremendous amount of momentum. It helps to have all fenders over the side, bow and stern lines ready, and most importantly have the SPRING LINES READY AS THEY HELP STOP THE BOAT!

To prolong the life of your topsides we recommend that you cover your fenders with a soft "terry-like" covering. Both the fenders and the boat will look better.

GALLEY

ICEBOX

The icebox is extremely efficient and can hold ice for long periods of time. Do not keep lid off as any cold air is precious.

A combination of dry ice and regular ice is not recommended. Use only one or the other.

If you have the refrigeration option, be sure to check the battery banks daily to ensure they are fully charged.

STOVE/OVEN

Before using your marine range be sure that you READ the manufacturer's operating manual. The following procedure is for typical propane range.

1. Propane locker is on starboard quarter of helmsman cockpit. Propane valve needs to be open when in use.

2. Turn on battery.

3. Turn on stove propane switch on control panel at navigation station.

4. Press red/white switch on stove to "ON" position (down).

5. Depress man bypass and hold, press sparker until pilot light ignites.

6. Continue to hold main bypass for 20 seconds, then release slowly.

7. If pilot remains lit, turn on burner. If not, repeat depressing main bypass and psarking.

8. To turn off stove, turn red/white switch to "OFF" (up). Then turn burner control switch "OFF", this eliminates fuel in the line.

OVEN

1. Light top stove pilot as in "STOVE" above.

2. Turn thermostat knob (large center control knob) from "Pilot Off" to "OFF" posiiton by depressing slightly and turning until first clikc.

3. Depress and hold oven safety bypass button right hand side.

4. Press "Sparker" button until oven pilot lights. Hold safety bypass button depressed for 25 seconds then slowly release. If it does not stay lit, depress bypass button again and respark.

5. After pilot is lit, set oven thermostat knob. Oven should light in about 25 seconds.

WATER SYSTEM

1. Salt water foot pump at galley sink to use for initial washing to conserve fresh water. Direct flow towards sink. Liquid soap works well with salt water.

2. Fresh water system is pressurized hot and cold water. Turn water pressure witch on at master electrical panel. Turn on faucet (noise heard is pressure pump). Pressure pump should not run for long periods continuously. If it does, turn off, check for empty water tanks, correct valves on water distribution system are closed/open, air lock or leak in line.

3. Water distribution system is controlled by a bank of screw valves underneath the chart table. Check that only one valve is opened to a tank that has water. If opened to empty tank, air lock can develop in system and reduce water pressure.

WATER TANK

1. Two amidships water tanks and one aft tank supply the water system.

2. Water tanks filled by on deck water fills in their appropriate locations. Aft tank fill pipe on port aft quarter. Amidships tanks fill pipes are amidships, port and starboard.

3. When filling water tanks, note that overflow drains into cockpit.

WATER PURIFIER

1. Seagull water purifier on sink for potable water, coffee, etc. It is cold water only. When in doubt use this for drinking water.

HEAD

1. Read the instructions on the head before using.

2. TO FLUSH- move red lever to vertical position and pump the handle up and down until good water flow is obtained. This will take about 12 or more hefty strokes.

   Good water flow with each use will reduce head odor.

3. TO CLEAR TOILET- depress red lever to fully horizontal position and pump dry. Between uses, leave lever in fully horizontal position to prevent taking of water into head while boat is heeled over.

HOLDING TANK

1. The Y-valve is located in the head. THE ARROW ON THE HANDLE POINTS TO THE CLOSED POSITION. If the arrow is left pointed to "tank" then discharge is overboard and tank problems are avoided. Be sure to check U.S. Coast Guard regulations in regard to overboard discharge.

2. Never leave the Y-valve between the two positions as serious damage may result to the head and your carefree sailing.

SHOWERS

1. Shower in head operates off sink faucet. Turn on water in sink. Adjust tempterature. Push button on shower head to turn-on/turn-off water flow.

ELECTRICAL SYSTEM

1. Batteries- bank located in navigator's station.

2. Red battery master switch in navigator's station.

3. Use shore power when available.

4. Good rule to follow is HOUSE POWER, battery #1 for everyday use. Battery #2 for emergency use. Turn to both for engine use.

5. Recharging is by running engine or by using shore power and battery charger. Batteries can be recharged by connecting to shore power and cabin lights, etc., will run off shore power. Do not start engine with shore power plugged in!

6. Shore power 110 AC outlets are located throughout the cabin.

INSTRUMENTS

1. Become familiar with all navigational instruments and electronics on-board. Read manufacturer's supplied manuals for operation.

2. Instruments are turned on/off at master electrical panel.

3. It never hurts to have instruments turned off when starting engine as some are very sensitive, like Loran C.

MASTHEAD LIGHTS

1. Turn on masthead light/anchor light when at anchor.

BILGE PUMPS

1. Manual handle should be kept in nav station or in lazarette locker shelf for easy access.

2. Manual pump located in helmsman's cockpit. Insert handle into socket and vigorously pump up and down to activate suction. Generally, 10 to 15 strokes will draw water. If not check for leaky or loose connections.

3. Electric bilge pump- switch on control panel. Use manually as needed. Otherwise, float switch will automatically activate pump.

4. Electric shower sump pumps- switch on control panel. Use manually as needed. Float switch will automatically activate pump.

SAFETY EQUIPMENT

1. Life jackets are best stored for ready access to crew. Best location is in cockpit lazarette.

2. Horseshoe life ring is located beneath helmsman's cockpit seat cushion.

EMERGENCY GEAR STOWAGE

1. All emergency gear should be stored in readily accessible locations.

2. Post a layout of the boat in the navigation station depicting location of important emergency gear. Items to note might be:
    1. emergency tiller
    2. first aid kit
    3. day/night flares
    4. fire extinguishers
    5. life jackets
    6. float cushions
    7. horseshoe ring(extra)
    8. VHF and emergency VHF antenna
    9. safety harnesses
    10. radar reflector

DISEMBARKING

A clean ship is always a happy and safer ship. The following is a quick guideline to help maintain your yacht in a proper and seamanlike manner.

CLEAN UP

1. Use only "softscrub" or similar non-abrasives. Strong abrasives like "Ajax" mar gelcoat finishes and varnish.

2. Cleaning supplies can be stored underneath companionway steps or in lazarette.

GALLEY

1. Clean out ice box, drain and wipe daily.

2. Thoroughly clean stove burners and oven.

3. Clean sink, counter tops and dry all wood surfaces.

4. Empty trash and replace with new garbage bag.

5. Wash and dry all utensils.

CABIN SOLE

1. Wipe cabin sole with damp mop or sponge, wash up stains, dry up water.

2. Pump out bilge.

GENERAL

1. Remove all personal items for vanity cabinet in head, small shelves and drawers/lockers in main cabin, forward, and aft cabins.

2. Clean under all berth cushions.

HEAD

1. Wipe all surfaces, dry up standing water, pump shower bilge with clean water.

2. Empty holding tank and clean if used. Pump water with chemical deoderizer into holding tank. Turn valve to off to holding tank.

EXTERIOR

1. Wash deck, hull, and cockpit with brush, cleaner, hose, and water.

2. Wash windows only with sponge or paper towel and windex...NO ABRASIVES!

3. Avoid using brush or anything that will scratch windows, ports, and hatches.

OTHER IMPORTANT INSTRUCTIONS

1. Pump bilge.

2. Check inventory.

3. Fill water, fuel, and propane tanks.

4. Shut-off propane at tank.

5. Turn battery switch off.

6. Stow snatch blocks, genoa cars, winch handles, genoa sheets in lazarette locker.

7. Close all hatches.

8. Secure all halyards.

9. Lock wheel into centerline position.

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 important, will bring you greater personal pride and joy.

EXTERIOR MAINTENANCE

FIBERGLASS/GELCOAT

The latest in gelcoat surfaces and fiberglass construction can always benefit from regular maintenance. Apply a marine wax 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 shoudl never be used for general cleaning as it can severly mar the shiny gelcoat finish. On areas difficult to wax, like nonskid, a coating such as "Armor All" will restore its original lustre.

For a beautiful and long-lasting shine, some yards/dealers can polish the topsides and cabinsides (smooth gelcoat) with "Blue Poly" and then use a top grade marine wax for extra protection.

BOTTOM PAINT

Keeping your bottom clean is of paramount importance as it not only keeps off embarrasing bottom growth, but maintains passage-making speed. Even though you have applied antifouling paint, take a swim once a month or so (or get a diver to do it) and scrub the bottom and propeller off with a scrub brush or abrasive sponge pad. Be sure to remove stains on the waterline which might accumulate from harbor pollution.

Check areas of the bow, leading edges of the rudder and keel for excess wear of bottom paint. If you followed the ideas presented earlier, you will easily see wear if the last coat is beginning to show through. Have your dealer or yard professionally apply a new coat of paint for the new season...spraying is preferrd for an ultra-smooth, uniform finish.

ZINCS

The shaft zinc should be inspected for electrolysis. If it is severely pitted, replace it. Remember, it is a sacrificial anode to protect the propeller and shaft from the perils of electrolysis. Zincs can deteriorate quickly, so inspect them frequently.

EXTERIOR TEAK

Scrub it down regularly with a stiff scrub brush and fresh or salt water. If left untreated, it will get "dirty" and discolor rapidly, turning a dull grey.

To maintain its beautiful warm brown hue, keep the teak clean and apply liberal coats of high quality teak oil. Be careful when applying these oils that you do not stain the gelcoat, if this happens be sure to hose off deck and topsides thoroughly.

DECK HARDWARE/RUNNING RIGGING

Wash deck hardware frequently with fresh water to remove accumulated salt and grime. Wash down the genoa sheets, spinnakers sheets, and other rope in fresh water. Chech for chafe and turn sheets end-for-end once a year to more equally distribute wear.

Check the blocks and also wash them down with fresh water. Most ball-bearing blocks need only hot water to cleanse them, then spray with a dry teflon lubricant. On conventional sheave/pin blocks wash off, disassemble, clean, and rub a light waterproof lubricant on the center pin, then reassemble.

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" and not turn. Apply an anhydrous lanolin(get a local pharmacy) or a dry lubricant.

In general it is handy to keep a spray can of a light lubricant, like WD40 or TRIFLON, in your tool box for frequent squirts of blocks, shackles, mainsheet travelers, and other moving fittings.

WINCHES

Read the manufacturer's manuals on winch repair and manintenance. It is a fine piece of machinery which takes surprisingly little effort to maintain them in perfect condition. However, all too frequently, they suffer benign neglect because no one can see how much they wear down or get dirty.

CLEAN AND LUBRICATE THEM! It takes little time to disassemble and put back together. Note that the gears and bearings are lubricated with special winch grease and pawls and pawl springs need only a light oil. Keep spare pawls and springs in a kit for replacement.

DECK HATCHES

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, apply a non-skid tape fore and aft.

CABIN PORTS

The ports are made of "Lexan" and are highly impact resistance. However, avoid highly abrasive cleansers which can scratch them. Instead, use mild soap and water to clean ports.

Avoid chemical solvents, notably acetone, which can "melt" the ports...ie. smear its smooth finish.

STAINLESS/CHROME

Hardware like the steering wheel and pedestal, stanchions, bow/stern pulpits, and winches can be treated with "Neverdull" or other light abrasive cleansers, even toothpaste works well. After applying cleanser, polish to a gleam with a clean cotton rag.

STEERING SYSTEM

Check the system regularly. Examine and lubricate the steering cable sheaves and make sure the stuffing box around the rudder post is not leaking. Also ensure the steering cable is not too tight or frayed.

INTERIOR MAINTENANCE

FIBERGLASS/GELCOAT

Interior gelcoat surfaces should be cleaned periodically with non-abrasive cleansers and smooth areas should be waxed. Use a coating like "Armor All" to maintain non-skid areas.

WOOD

All solid and plywood teak surfaces have been either oiled or varnished prior to delivery.

On oiled surfaces, additional coats can be easily applied with a foam brush or sponge. For an even finish the oil should be rubbed with a rag shortly after application. If desired, the factory applied oil finish can be varnished.

On varnished surfaces, the factory applies three coats and additional ones can be easily applied. Consult your dealer or a professional as to the best procedures on varnishing. Basically, it takes great care, time, and patience to do the job correctly.

BILGES

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

STAINLESS

S.S. surfaces like the galley sink and faucets in the heads can be treated with "Never-dull" or other light abrasive S.S. cleansers. Toothpaste also works well as a cleanser.

ENGINE

Check the engine, battery, and engine mounts once a month. Ensure it is fastened securely to the engine mount frames and check for fuel or oil leaks. If any problems arise, consult a professional marine mechanic or the engine manufacturer's licensed mechanics.

Run the engine frequently and at occasional high speeds, even if it's not in gear. One reason 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 and if you have any doubts about the purity of the fuel you're buying, use a strainer to filter out water and dirt.

ANNUAL MAINTENANCE

The following list has been compiled as a guide to check critical safety related components of the boat. It is important that maintenance inspection be completed each year to assure ongoing safety. This list is not all inclusive. It is intended as a guide only.

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, stanchion, and rail attachment to deck.
___ Check all cleats for signs of fatigue. Tighten fasterners or replace as required.

STEERING SYSTEM

___ Consult Edson maintenance guide.
___ Check rudder for impact damage or cracks.
___ Check rudder post play in bearing tube.
___ Check to ensure radial drive wheeel is securely attached to rudder post.
___ Check integrity of cables, chain, and fittings.
___ Check steering wheel shaft lubrication and condition of shaft/wheel key and nut.

THRU HULL AND 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, and electrolyte level.
___ Check electrical panel, breakers, and switch condition and operation; tightness of wire connections.
___ Check running light operation.
___ Check ground wire attachment to keel, mast step, thru hulls, and engine.
___ Propane system- check seal of electrical solenoid valve and ensure it closes when switched to "OFF" position.

MECHANICAL SYSTEMS

___ Check stove fuel system, hoses, clamps, and shut-offs.

ENGINE AND 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, and locknut.
___ Check shifter cable clamps and locknuts.
___ Check exhaust system soundness, hose clamps.
___ Check coolant system, hose clamps, intake, and filters.
___ Check transmission shift lever action, control cables, clamps and locknut; fluid level and alignment.
___ Check alignment of shaft, coupling, and prop attachment- key, nuts, and cotterpin.
___ Check shaft log tube integrity, packing, hoses, and clamps.

___ Check strut bolt attachment, cutlass bearing, and shaft bolts.
___ Check all engine wire connections.

FUEL SYSTEM
___ Check fuel tanks and gauges, hoses, clamps.
___ Check fuel fill hoses and connections.
___ Check fuel filters.

KEEL
___ Check keel bolt nuts for tightness (90 foot pounds). 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 toilet 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.

WINTER STORAGE

Many of the maintenance problems surrounding boats can be pinpointed during the end-of-season haul-out, when the boat is prepared for winter. This is the time when a careful inspection will reveal the ravages of a long summer. If you live in colder climates, it's 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 even mildew can affect today's synthetic materials.

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 and add an anti-bacterial agent.

BATTERIES

It is preferrable to remove the batteries 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 batteries aboard. Simply check them once a month to ensure they remain charged and the electrolyte level (water) is full.

HEAD

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

WATER SYSTEM

Drain all tanks and ensure it is also drained from between the heater and the check valve installed in the supply line. Add an anti-freeze solution specifically desgined for marine potable water systems to the residual water in the water tanks, and pump with boat manual and pressure pumps until all lines are full of anti-freeze solution.

DO NOT USE AUTOMOTIVE RADIATOR-TYPE
ANTI-FREEZE, AS MOST ARE POISONOUS
AND MAY DAMAGE THE PLUMBING.

BILGES

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

ELECTRONICS

Remove as many of them as you can as they are sensitive to condensation caused by the extreme rise and fall of temperature and humidity that come with winter.

INTERIOR AND VENTILATION

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

Leave the dorade vents in place and open so the boat can circulate fresh air. 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 and the vertical risers merely stabilize the boat. If it appears the boat is supported too much by the vertical risers, correct the problem as it could structurally damage the hull.

MAST STORAGE

Store masts on well padded supports and do not place any weights on them. Avoid tape on its 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.