

ENDEAVOUR 37 OWNERS MANUAL
Model: Endeavour 37B

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1. INTRODUCTION

Welcome to the ever growing family of Endeavour Yacht owners. This manual is intended to help you understand your new yacht more thoroughly and to assist in maintaining and operating it in a safe and efficient manner. Individual instruction manuals from the various manufacturers of installed equipment, along with detailed schematics and diagrams, may be found in your owner's package for more in-depth information if required.

It is Endeavour Yacht's policy that our line of sailing yachts is constantly upgraded and improved. Thus, you may find your yacht is equipped with gear different from that seen on other boats or shown in this manual. Any new piece of equipment will be equal to, or better than, its predecessor.

We've made every effort to design and build a trouble-free, high-quality yacht that we hope will bring years of sailing enjoyment and pride of ownership. We wish you fair winds and smooth sailing.

Best regards,

ENDEAVOUR YACHT CORPORATION

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3. CONSTRUCTION

3.1) Hull:

The hull is molded as a single unit of a combination of polyester resin and fiberglass woven roving and multi-directional chopped strand fiber (MCSF). The keel is molded integrally with the hull and all ballast is contained inside.

The exterior finish is a pigmented gelcoat molded onto the fiberglass. The boot and sheer stripe are also gelcoat molded permanently into the hull. *now painted*

3.2) Deck:

The deck and cockpit, like the hull, are molded as a single unit of a combination of polyester resin and fiberglass woven roving and MCSF. Plywood coring is incorporated between layers of fiberglass in the cabin top, deck, seat, and cockpit sole areas to give additional stiffness. The non-skid finish is molded into the deck. All exterior deck surfaces are a pigmented gelcoat molded onto the fiberglass.

3.3) Deck/Hull Joint:

The joint between the hull and deck is one of the most important assembly steps in the construction of a

yacht. The method used by Endeavour Yacht is simple, strong, and reliable. Figure #1 illustrates details of this assembly.

During assembly, the top of the integral hull flange is liberally coated with a combination adhesive/sealant. The deck is then lowered onto the hull and fastened in place with stainless steel bolts. When the bolts are tightened, the excess compound is forced into all crevices and out the sides. The teak cap is then installed, bedded in a heavy layer of the same compound and secured in place, doubly ensuring water tightness.

3.4) Rudder and Steering:

The rudder is molded as a single piece of solid high density foam with a protective skin of fiberglass and a gelcoat finish. The foam material is of high strength structural grade and has exceptional toughness. The rudder post, molded integrally inside rudder, is solid stainless steel, which is welded to a steel blade in the interior of the rudder.

Where the rudder post passes through the hull, water tightness is ensured by means of a stuffing box. It is recommended that the packing inside the stuffing box be

replaced annually to ensure continued water tightness. Packing of the proper size is available from most marine hardware stores. The Endeavour 37 requires 3/16" square packing. Cut packing in individual rings rather than a long spiral to prevent binding on the rotating shaft.

The pedestal steering system installed on your yacht operates with stainless steel cables rotating a quadrant bolted and keyed to the rudder post. The cables run through guide sheaves to the pedestal where they are shackled to a stainless steel chain running over a sprocket on the steering wheel shaft. Normal maintenance should only require occasional oiling of all moving parts, inspection of cables for wear and proper tension, and a check of all bolted connections for tightness. Always make certain all sheaves are properly aligned with the cables to prevent undue friction and excessive cable wear.

3.5) Ballast:

All ballast is internally mounted inside the keel, which is molded integrally with the hull. Cast pieces of lead are placed in the hull, encapsulated in a polyester bonding resin, and then covered with a layer of woven roving to form a fiberglass cap. When finished, the ballast becomes a structural part of the hull.

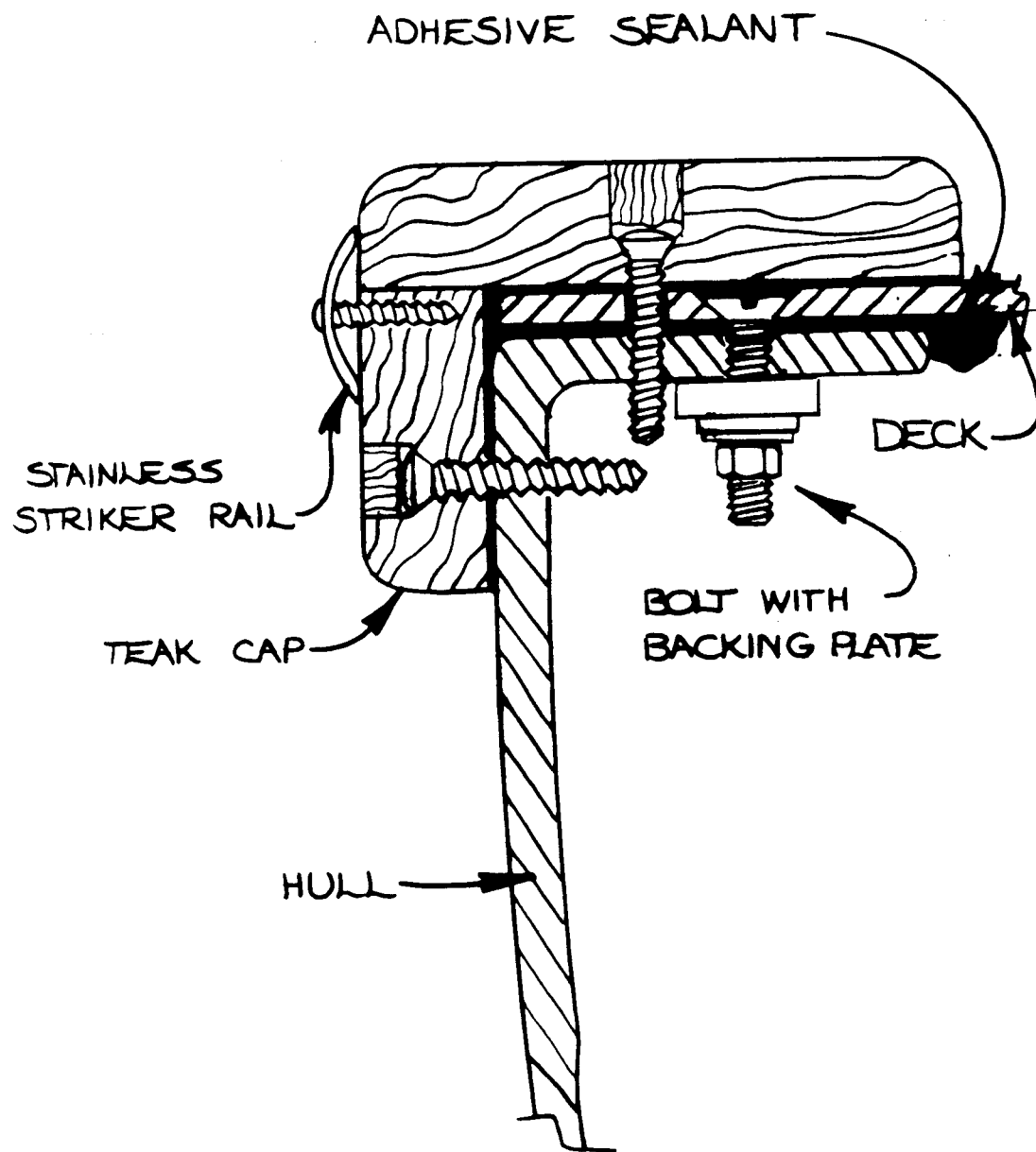
3.6) Interior Construction:

The interior of your Endeavour 37 is built up of wood. First, a framework of floor timbers is constructed and placed in the bilge and heavily bonded in place with woven roving. A plywood sole is glued and screwed on top of these floor timbers and bonded to the hull all around its periphery with woven roving.

All timbers and plywood are saturated with polyester resin before assembly to seal all exposed wood.

Next, the entire sole is covered with teak parquet flooring, bonded in place with a waterproof adhesive. All bulkheads are bonded to the hull with two layers of woven roving on both sides.

FIG. 1
DECK TO HULL
JOINT



4. SPARS AND RIGGING

4.1) Spars:

All spars (masts, booms, and spreaders) are extruded aluminum 6061-T6 alloy, with a protective coating on all external surfaces. The main mast is stepped through the cabin roof onto the keel.

4.2) Standing Rigging, Running Rigging, Chainplates:

Standing rigging refers to all the fixed pieces of stainless steel wire which support the mast. If they principally support the spar in a fore and aft direction, they are called "stays" (backstay, forestay, etc.). If they support mainly from side to side, they are called "shrouds" (upper shroud, etc.).

The forestay attaches to the stem head fitting at the bow. This is fabricated of welded stainless steel back-up plates and through bolted to the hull. All other stays and shrouds are attached to chainplates at the edge of the deck. These chainplates are stainless steel straps through bolted to the hull. Additional fiberglass reinforcement is molded into the hull in all chainplate areas. See Figure #2 for a description of this installation.

All standing rigging is attached to chainplates with adjustable turnbuckles that allow fine tuning of rigging tension.

Running rigging includes all working lines or cables that normally require adjustment when sailing. Examples of these include halyards, sheets, reefing gear, outhauls, etc.

All halyards are stainless steel wire rope spliced to dacron line tails to minimize stretch, reduce windage aloft and maximize service life. All halyards are run externally to the mast to facilitate inspection, repair, or replacement.

4.3) Static Tuning (At The Dock)

First, make certain that the mast is centered on the boat, straight up and down when viewed from the bow or stern. To make certain the mast is plumb transversely, slacken the lower shrouds fully by undoing their turnbuckles. Make sure the mast wedges are removed from the main mast, which is stepped through the deck. Take the main halyard and lead the shackle end to a point at the deck edge so the shackle just touches the chainplate or rail with a given tension. Tie off the halyard.

Take the halyard to the same location on the other side and with the same tension the shackle should just touch the rail or chainplate. If not, let off one upper shroud's turnbuckle and take up on the other to bring the masthead closer to centerline until the halyard shackle touches both points under the same tension. The particular part of the rail or deck you choose as your reference point is not important as long as it is the same point on each side. After the mast is centered transversely, tighten both upper shroud turnbuckles uniformly, one full turn on one side, then one full turn of the other. Repeat until the turnbuckles become difficult to turn. Pin the turnbuckles. Tighten up the lower shroud turnbuckle so that almost all of the slack is removed. That is, the shroud itself should be able to flop about 1" in each direction. Sight up the trailing edge of the spar to make sure that it is still straight. Now, check your rake. With the main halyard hanging plumb behind the mast, the shackle end should be about one mast width away from the back face of the mast, near the gooseneck. It's best to do this on a calm day and to hang a weight on the halyard such as a hammer, wrench, or bucket of water.

Ease off the forestay or backstay as required and tighten the other to adjust the rake. Large adjustments

may also necessitate tightening and loosening of the forward and aft lower shrouds. Once proper rake is established, further adjustment should not be necessary of either the forestay or backstay. Tighten the turn-buckles to obtain proper tension and pin.

Reinstall the mast wedges and trim collar on the main mast.

Check that the spreaders are angled upward slightly to equalize the angles above and below between the spreader and the shroud. Tape and pad the spreader ends to avoid wear and tear on sails.

4.4) Dynamic Tuning (Under Sail)

Select a pleasant day with a steady 8 to 12 knots of breeze. Put the boat on a starboard tack, close hauled. Sight up the luff groove of the spar. If the mast seems to fall off to leeward at the spreaders, luff up slightly and tighten the starboard lower shrouds a couple of turns. Put the boat back on the wind and check the spar again. When the mast appears straight, put the boat about and do the same on the port side. Check the following carefully. First, if the upper shrouds are at optimum tension, then the leeward rigging should begin to look slack when at about 15° - 20° of heel. This is

quite natural and the leeward shrouds should never be tightened. Secondly, when close hauled under genoa and main, the forestay will appear quite sagged. Tensioning the backstay will reduce the amount of sag, but the sag itself can never be completely eliminated.

The forward lower shrouds should be tightened marginally more than the aft lowers to encourage a bit of a forward bow to the mast. This forward bow is counteracted by the luff of the mainsail and the aft lowers. Aft bow of the mast should not be allowed. It destroys the sail shape and is countered only by the forward lower shrouds. If you find that the mast tends to bow aft rather than forward under backstay tension, the problem may then lie in your mast step. For example, if the mast is resting on its forward end, it may tend to bow aft. Therefore, to correct this situation, wedge up the after part of the heel to encourage a forward bow.

If yours is a brand new boat, chainplates may seat and the rigging may stretch to the extent that tuning from scratch will be necessary in a matter of weeks. This is expected and typical of any new boat. However, after this initial working-in period, you will find that your boat tends to hold this tune for fairly long periods

of time. After becoming used to the feel of the boat, you may wish to either increase or decrease the amount of "weather helm" - that is, the amount of feel on the wheel. Any sailboat, when going upwind, should have a tendency to "round up" slightly or head into the wind if you let go of the helm. However, if you're constantly fighting the boat in order to hold her off the wind, you have too much weather helm. This can be alleviated by taking some rake out of the spar; i.e., raking the spar further forward, and thus moving the center of effort of the sailplan further forward. If you find when sailing upwind that the boat tends to fall off the wind and you are constantly having to push her to weather, then you probably have lee helm. This can be overcome by putting a bit more rake into the spar.

With constant tuning as the season progresses, your boat performance will improve. The boat will feel more comfortable to sail. You will find that tuning is a bit of an art; you will begin to notice subtle changes in the behaviour and response of your boat as you make subtle changes in tuning. The important thing to remember is to go about things in a slow and orderly fashion, and before you make any change, make sure it makes sense in your own mind.

RIGGING SPECIFICATIONS

<u>MAIN</u>	<u>ENDEAVOUR-37</u>
HEADSTAY	
Length (Pin-to-Pin)	43'-2 1/2"
Diameter	5/16"
BACKSTAY	
Length (Pin-to-Pin)	46'-10 1/4"
Diameter	5/16"
UPPER SHROUDS	
Length (Pin-to-Pin)	41'-6 5/8"
Diameter	1/4"
LOWER FWD SHROUDS	
Length (Pin-to-Pin)	23'-1 3/8"
Diameter	1/4"
LOWER AFT SHROUDS	
Length (Pin-to-Pin)	23'-5 3/4"
Diameter	1/4"

4.5) Reefing:

A) How to Setup Boom

1. A deadend for the reef line must be installed (unless 3550 boom is being used and then you can tie the reef line around the boom in proper location). This will vary in location depending on the cut of the sail and the reef location in the sail.
2. To determine the location of the deadend, lower the mainsail at the dock to the reef position. Place

tack reef cringle on reef hook provided at gooseneck. Stretch sail tight by pulling on the clew reef cringle towards the outhaul. Mark position of clew reef cringle on boom when sail is tight. From this mark, measure 4" towards outhaul and mark on boom. At this point, install an eyestraps (Kenyon SM-225-2) using (2) 10-24 x $\frac{1}{2}$ " round head machine screws. An alternative deadend can also be a grommet installed by your sail-maker in the foot tape of the mainsail in the same location as described for the eyestraps.

3. Use similar method to locate second reef deadend point.

SEE FIGURE #3

B) Rigging the Reef Line

1. Take reef line from outhaul casting up through clew reef cringle and back down to the eyestraps on boom (tie bowline in eyestraps).
 - 1a. Alternative method: Take reef line from outhaul through clew reef cringle back down and around boom. Pass end line through grommet in foot tape of main and tie figure eight knot or timber hitch.

2. Use similar method to rig second reef line (use available second outside sheave in outhaul casting).
3. If you have a third reef point, rig an endless messenger between the second and third cringles with a short end loose as shown. After you've put in the second reef, untie the now unused first reefing line, tie it to the messenger and pull it through the third cringle and tie to the appropriate eyestrap (or through the grommet in the foot of the sail if you prefer this method) and you are ready to set the third reef.

SEE FIGURE #3

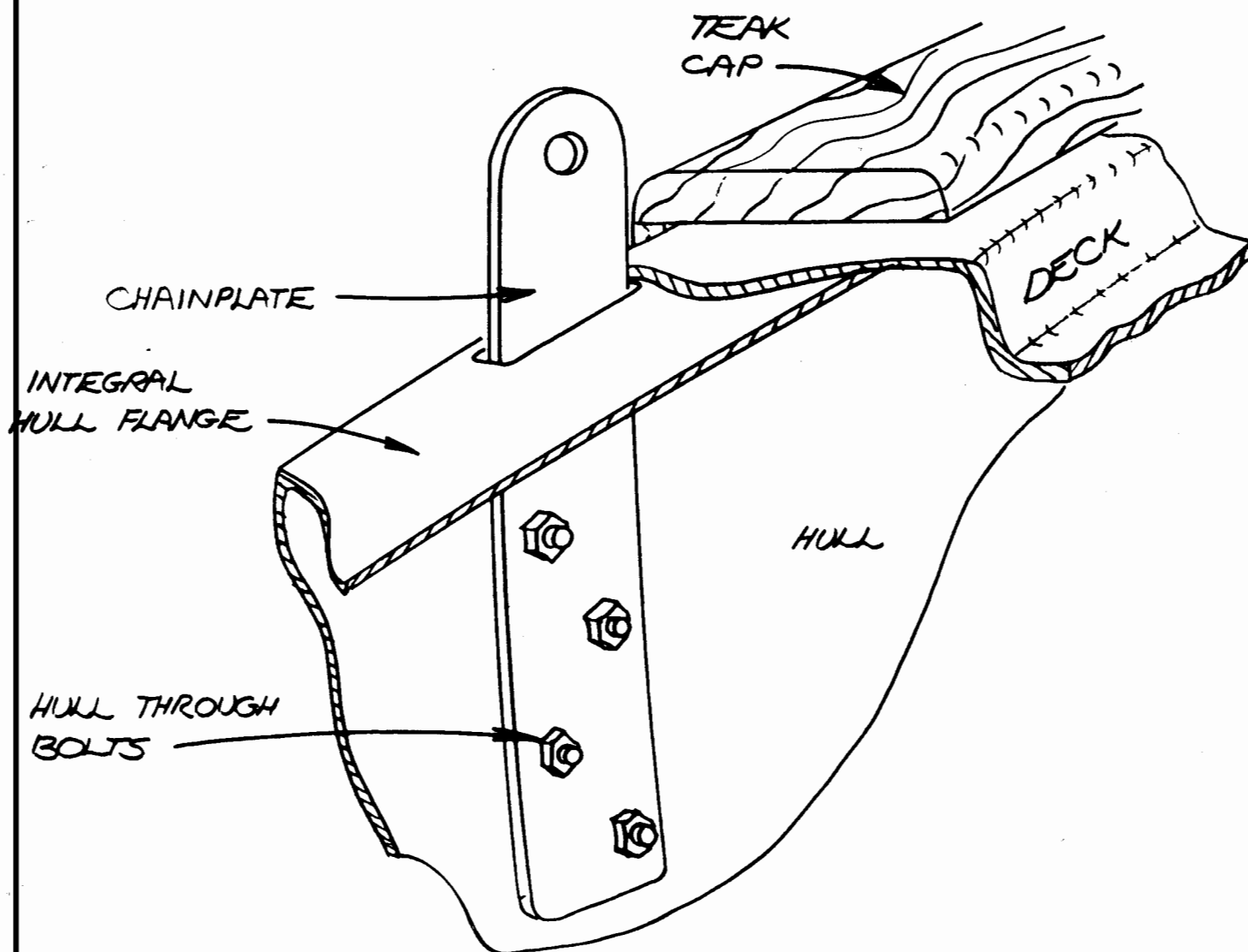
C) Reefing Procedure

1. Ease boom vang and mainsheet--make sure topping lift is secured in position.
2. Lower main halyard so that tack reef cringle can be placed on gooseneck reef hook. Retension main halyard when hooked in place.
3. Clew reef line must now be tensioned so that clew reef cringle is brought down snugly against boom.
4. Readjust mainsheet and boom vang.
5. Use similar method for second reef.
6. The reefed folds of cloth can be rolled up and secured with short lines through the reef points and

around the folds and boom. Be sure to untie these first when preparing to shake out the reef.

7. UNREEFING: Just reverse this process to unreef mainsail.

FIG. 2
CHAINPLATE INSTALLATION



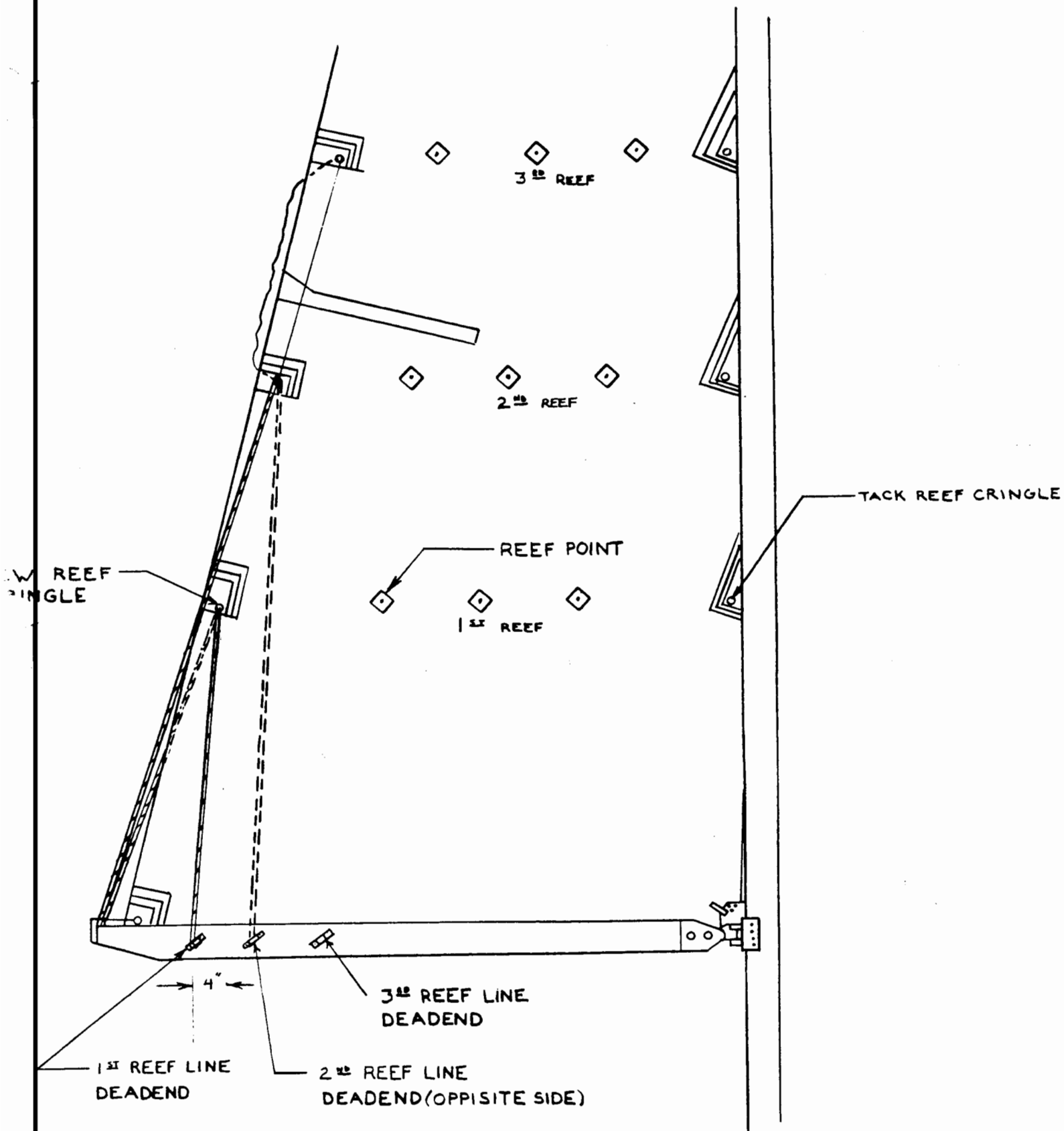


FIGURE 3
REEFING SYSTEM

5. FUEL SYSTEM

5.1) Fuel Tank:

Your fuel tank is built of welded marine grade aluminum with internal baffles.

The 37 foot model fuel tank is positioned in the keel cavity under the main cabin sole. Removable panels in the sole provide complete access to all fittings, gages, and the removable inspection plate.

5.2) Fueling:

Before opening the deck-mounted fuel inlet cap, be sure all open flames are extinguished, no person is smoking, plus that all electrical circuits and the main switch are turned to "off". The fuel nozzle must contact the metal deck plate to ground static electricity.

The fuel tank vent is located on the hull side immediately adjacent to the deck fill plate. When you hear a burbling sound from the air escaping through the vent, your tank is full. Wash off any spilled fuel on the deck or hull side with fresh water.

It is good practice to always keep your tank full when the boat is to be idle for extended periods. This will prevent condensation forming in the air cavity above

the fuel in a partially full tank and possibly contaminating the fuel with water. In some cases, the denser water settling to the tank bottom could adversely effect engine performance.

6. ENGINE AND TRANSMISSION OF POWER

6.1) Engine:

All Endeavour models are equipped with inboard diesel engines.

All necessary data and information is contained in the Engine Owner's Manual and is not repeated here. Read this manual carefully. Get to know your engine well and give it proper maintenance to have years of economical, dependable service. Specific technical questions regarding your engine may be answered by your dealer.

6.2) Transmissions:

The diesel of the 37 foot model is fitted with a hydraulic drive. This drive consists of an oil pump, which is a part of the engine unit, and hoses leading to a hydraulic motor, which drives the propeller shaft. The oil in this system is under pressure and becomes very hot. Care must be taken that the hose connections are always tight.

6.3) Propeller Shaft and Stuffing Box:

All models have solid stainless steel propeller shafts. The E-37 has a 1½" diameter shaft.

The propeller shaft is supported at the inboard, or engine end, by the shaft coupling. A square key is used to prevent turning of the shaft in the coupling. In addition, a stainless steel bolt with locking nut passes through the coupling and shaft to prevent backing out of the shaft in reverse.

The shaft passes through the hull at the stuffing box. Water tightness is ensured by the packing material in the stuffing box. A slight dripping, say three or four drops per minute, under power is normal and desirable. Always tighten the packing nut (farthest forward) by hand, never with a wrench. The locking nut (aft) can be wrench tightened against the packing nut to lock the system in position. It is important to never over tighten this stuffing box as excessive twisting loads will be placed on the rubber hose between the stuffing box and shaft log. In extreme cases where the stuffing box would be virtually locked to the shaft by over tightening, the rubber hose could be ripped apart allowing sea water to enter.

The packing material should be changed annually to ensure trouble-free service. Packing of the proper size is available from most marine hardware stores. The E-37 takes 3/16" square packing. Cut packing in three or four

individual rings, rather than a long spiral, to prevent binding on the rotating shaft.

The prop shaft on the E-37 is supported at the aft end by a cutlass bearing in a cast bronze strut. The strut is heavily fiberglassed to the hull inside and out and is through bolted with two stainless steel bolts. Additionally, it is electrically bonded to ship's ground (see electrical system description) to minimize electrolysis problems.

All cutlass bearings can be removed for replacement by loosening the allen head set screws and either driving the bearing out from one end or, in difficult cases, sawing it into three lengthwise sections with a hacksaw blade and prying them out. The replacement bearing should be a light drive fit. Light hammer taps should be sufficient to drive in place. Sand or lathe turn the outside of a replacement bearing to obtain the proper fit. Replace the allen screws when in place.

6.4) Shaft Alignment:

All new Endeavour yachts are shipped with the shaft coupling disconnected to ensure that alignment is performed after delivery. All molded fiberglass boats will change shape slightly when launched, causing the relation-

ship between the engine and propeller shaft to change. It is essential to align the shaft coupling only after launching, especially with new boats.

Alignment is checked in the following manner:

- A) Remove the bolts on the shaft coupling.
- B) Slide the couplings together by hand.
- C) Use a feeler gage or paper-thin metal sheet to check that the gage is gripped with equal friction completely around the circumference of the coupling faces.
- D) If the feeler gage does not pull evenly around the entire coupling, the engine is misaligned. This is corrected by adjusting the mounts on all four corners of the engine.
- E) Once even spacing is measured all around the flange, rotate the shaft 180° . If a significant mismatch occurs, your shaft is bent and must be straightened or the coupling face is out of square with the shaft centerline and must be machined to correct.
- F) Replace bolts and evenly tighten.

6.5) Propellers:

The standard propeller supplied with all Endeavour models is a solid bronze, two-bladed type. It has a tapered shaft end and is held in place with two locking

nuts and a cotter pin. A square key locks the propeller to the shaft preventing any rotational slippage of the prop.

The hydraulic transmission on the diesel engine in the E-37 cannot be locked and the propeller will free wheel at any gear shift position. According to the engine manufacturer, this will not cause damage but the slight noise from the rotating shaft may be an annoyance to you. A commercially available prop shaft lock can be fitted to correct this and is highly recommended if long range cruising is anticipated.

The E-37 props available are: standard, 17 x 17 L.H. two blade; and optional, 17 x 16 L.H. three blade.

6.6) Removal of Propellers:

A wheel puller or prop puller is required. This is available from automotive or marine hardware dealers.

To remove a propeller, proceed as follows:

- A) Remove the cotter pin and shaft nut.
- B) Leave the propeller retaining nut in place but installed about one or two turns loose from the tight position (to protect the threads). The puller shaft should bear directly on the end of the propeller shaft or on the propeller retaining nut. If it bears on

the propeller retaining nut, a spacer of brass, aluminum, or copper should be used to protect the nut. The puller must be installed straight and centered carefully so that its maximum effectiveness can be realized. Place the claws of the wheel puller behind the propeller hub.

While pulling the hub, it is often a help if the propeller hub is tapped with a composition hammer. If the propeller has been on for some period of time, some effort may be required to remove it.

6.7) Installation of Propellers:

Ensure that the bore of the propeller is free from dirt and corrosion and the end of the shaft is clean. The keyways of the propeller and shaft must be free from burrs. Place the propeller on the shaft with the keyways in the shaft and propeller in line. The key should fit snugly at the sides with a .01" minimum clearance at the top. Do not force the key in as this may cause the propeller to be forced off center. The propeller, the locking nut, and the cotter pin are then assembled on the shaft. Check to ensure that the propeller is correctly aligned.

6.8) Propeller Alignment:

Install the propeller completely as to be used. Clamp a piece of thin metal or wood on the propeller strut or skeg to touch one blade edge of the propeller. Rotate the shaft and the propeller by hand. Any variance in the track will be indicated by either a gap between the next blade or the blade striking the indicator. If the propeller is so indicated to be out of line, it should be checked and balanced by a yacht marine yard familiar with this type of work.

6.9) Exhaust System:

In Perkins engines, a water pump draws water through the intake port and circulates it through a heat exchanger, where it is pumped into the muffler and overboard through the exhaust port. The salt water in the heat exchanger lowers the temperature of the engine coolant circulated through the engine block by means of the normal engine water pump. This coolant is 50% ethylene glycol (anti-freeze) and 50% fresh water and protects the system to approximately -34°F. The ethylene glycol should be used at all times to help prevent corrosion in the engine.

7. ENGINE CONTROLS

7.1) Description:

The engine controls for your boat consist of throttle and gear shift levers mounted on the starboard and port side of the steering pedestal, respectively. The instrument panel is located in the forward end of the footwell on the 37.

The instrument panel consists of a combination keyed ignition switch and start switch, a toggle switch for panel lights, a momentary push button for engine stop, gauges for amperage, cooling water temperatures, and oil pressure, a visual warning device that lights for low oil pressure or high water temperature, plus an electric tachometer for engine RPM.

The E-37 has an additional remote mounted start button located on the side of the footwell opposite the steering pedestal. This operates only with the ignition switch turned on. This switch is provided for more convenient start up or emergency re-start situations.

The blower is activated from the master electrical panel below. It is recommended that your blower be operated continuously during engine operation to circulate fresh air to the engine. It is not necessary, however,

to run the blower prior to starting as diesel fuel vapors do not pose an explosion hazard.

7.2) Starting the Engine:

- 1) Turn the battery selector switch on the main electric panel to position "one", "two", or "both", depending on battery condition.
- 2) Switch engine room blower on.
- 3) Check that engine water intake valve is open and that the water strainer is unobstructed.
- 4) Check fuel level.
- 5) Check that the gear shift lever is in neutral and that throttle is slightly open. (With a Perkins engine, a cut off switch is incorporated to prevent starting if the engine is in gear.)
- 6) Turn ignition key on. Visual alarms will activate and provide a check on their operation.
- 7) Turn key or push start button to start engine.
- 8) Check lights or gauges for any problems. Visual alarms should turn off after start. Check exhaust port for proper water circulation. If oil pressure is not indicated or water is not being circulated and discharged from exhaust, shut down immediately and check engine systems.

- 9) Repeat prior checks about ten minutes after start.
If they do not indicate normal operation, shut down and check engine systems.
- 10) Always shift gears only with the throttle closed to a slow engine idle.
- 11) When running under power, frequently check your gauges to monitor engine operation. Check your fuel level to ensure adequate reserves to prevent running dry, necessitating a complete engine bleed of the fuel system upon refill.

- NOTE -

During cranking, sea water enters the lift or can-type muffler from pump. This may cause muffler to overfill and permit water to back-up into engine when cranking is stopped. Therefore, when starting engine, do not crank for longer than a total of 30 seconds (at 10 second intervals). It may be necessary to drain muffler if longer cranking is required. Check engine for cause of failure to start if draining muffler is necessary.

7.3) Stopping the Engine:

- 1) Close the throttle to a slow idle and place the gear shift in neutral. On the Perkins powered 37, push the stop button of the cockpit instrument panel.

Turn off the ignition switch when engine is stopped. It will not harm your electrical system to turn off the ignition switch and remove the key while running, but your start button/switch will then be inoperative.

- 2) If the engine is not to be used again for long periods, the water intake valve may be closed but this is normally not necessary. If severe freezing temperatures are anticipated, drain your raw water cooling system to protect the engine.
- 3) Turn off engine room blower. If finished with other power in the yacht, turn the main battery switch to "off". NEVER turn off the battery selector switch while the engine is running or you will permanently damage the engine alternator. You may switch battery selector positions from one to another while running, but not to "off".

8. ELECTRICAL SYSTEM

8.1) General:

The electrical system in your Endeavour yacht has been designed to ensure as much trouble-free operation as possible. Wiring and connections are kept as high in the interior of the yacht as practical to reduce exposure to water. Virtually all wiring and connections are accessible by removing panels from under the side decks.

All ship's wiring is plastic coated 10 gauge stranded copper with crimp type connectors used at all junctions or terminals. All D-C wiring is two wire, color coded: red (positive) and yellow (negative). Battery cables are: red (positive) and black (negative). All A-C wiring is three-wire, color coded: black (hot), white (A-C common), and green (ship's ground).

Metallic fittings (through hulls, etc.) below the water line are electrically bonded together with green plastic coated 8 gauge copper wire and connected to a common ship's ground. This is done to minimize the effect of electrolytic action when the boat is used in salt water.

8.2) Direct Current (D.C.) System:

The D.C. system in your yacht is powered by two 12-volt batteries connected in parallel to allow single

or combined use. All shipboard D.C. equipment runs from these batteries. The batteries are charged from the engine alternator only when the engine is running.

The main electrical panel has a battery selector switch that allows use of either battery, or both, and serves as the master D.C. on/off switch. A battery condition meter with a momentary toggle switch is also provided to monitor battery condition.

NEVER turn the battery selector switch to "off" while the engine is running or serious permanent damage will be done to the engine alternator.

Combination on/off and circuit breaker switches are displayed on the main electrical panel for various shipboard D.C. equipment. The amperage protection of each switch will vary depending on the service provided.

8.3) Battery Maintenance:

Frequently check the fluid level in your batteries to ensure optimum performance. Add water as required. Keep the terminals tight and coat them with Vaseline or equivalent to prevent corrosion and undo electrical resistance.

When charging your batteries with an auxiliary battery charger, first remove all the caps and disconnect the positive (red) cable.

Hydrogen gas will bubble out of each cell during charging. Hydrogen gas is lighter than air so it will dissipate, but it is highly explosive so do not smoke or create sparks near the battery when charging. Provide adequate ventilation during charging.

8.4) Alternating Current (A.C.) System:

The A.C. system in your yacht operates on 115-volt, 60-cycle alternating current. Power is supplied from a 30 ampere shore service by connecting a cord to the receptacle in the coaming side.

8.5) A.C. Shore Power:

Shipboard A.C. equipment can be operated at dockside by connecting your shore power service cord from the dock outlet to the receptacle on the coaming side. Make sure the master on/off switch on the electrical panel is in the "off" position before connecting to shore power.

- IMPORTANT -

IMMEDIATELY after connecting to shore power, check the polarity indicator light on your panel to ensure that your dockside power source is properly wired. If you cannot indicate proper polarity, IMMEDIATELY DISCONNECT THE SHORE POWER CORD and determine the source of the problem as serious electrical shock hazards may exist to

persons on board or alongside your yacht, EVEN IF THE MASTER A-C BREAKER SWITCH IS TURNED OFF.

Once proper polarity is indicated, turning on your master A.C. switch will now supply A.C. power to the other A.C. switches on the panel. The master switch is also a circuit breaker limiting the supply to 30 amperes.

All A.C. equipment can now be operated by turning on the individual A.C. switches. Each switch is also a circuit breaker with individual maximum current limitations.

On yachts equipped with hot water heaters, always make sure the heater is full of water before turning it on to prevent permanent damage to the heating coils. One can be sure it is full by operating the hot water tap on the pressure water system and observing continuous water flow.

8.6) A.C. Ship's Power (Auxiliary Generator)

If your yacht is equipped with an optional A.C. generator, you may operate A.C. equipment without a shore power connection. All controls to start and operate your generator are on the main electrical panel. Gauges monitoring the diesel performance are mounted on the generator unit. Carefully read the detailed owner's manual provided with your power plant to operate and maintain the equipment in the proper manner.

With the generator operating and with the A.C. selector switch on "ship" position, A.C. equipment may be operated in your yacht in a normal manner.

8.7) Generator Diesel:

The A.C. generator is powered by a diesel engine that operates in the same manner as your main propulsion engine. There is no manual throttle, however, as the electrical demand automatically governs throttle setting. Cooling water circulates in a closed system similar to the Perkins. Sea water removes the heat in a heat exchanger and then passes out through the generator exhaust system. Use the same precautions in generator operation that you use in operating your propulsion engine. Consult the owner's manual supplied by the manufacturer for detailed generator maintenance recommendations.

ENDEAVOUR 37B DECK WIRING

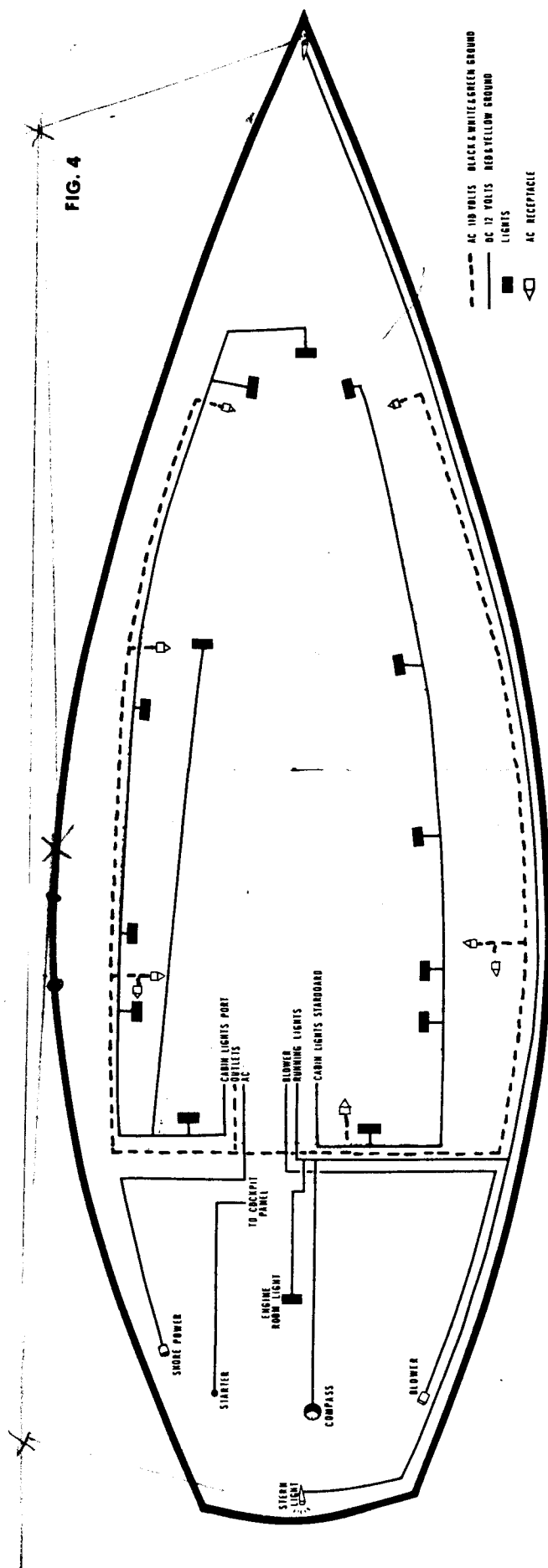
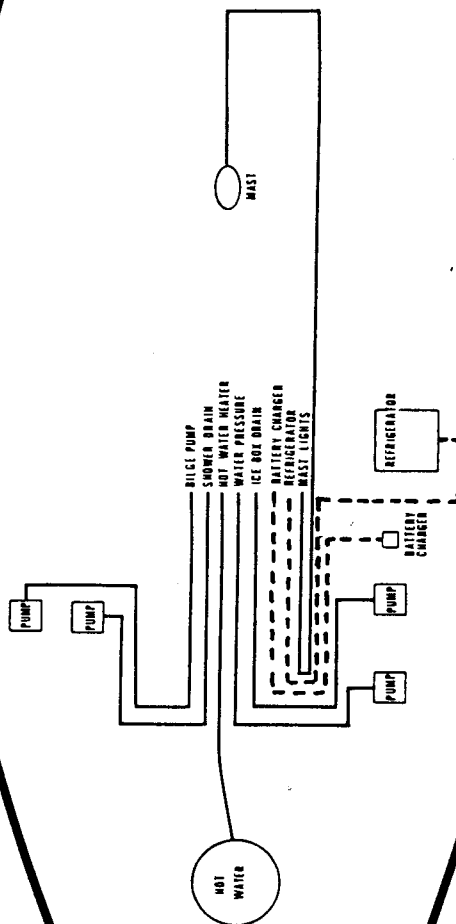


FIG. 5

The diagram illustrates the internal systems of a ship, enclosed within a hull outline. At the top, a circle labeled "HOT WATER" is connected to a network of pipes. Two "PUMP" units are shown on the left, connected to the main water line. The water line branches into several outlets: "BILGE PUMP", "SHOWER DRAIN", "HOT WATER HEATER", "WATER PRESSURE", "ICE BOX DRAIN", "BATTERY CHARGER", "REFRIGERATOR", and "MAST LIGHTS". A dashed line encloses the "BATTERY CHARGER" and "REFRIGERATOR" components. A "PUMP" unit is connected to the bottom of this dashed enclosure. To the right, a "BATTERY CHARGER" unit is shown, connected to a "REFRIGERATOR" unit. A dashed line also connects the "REFRIGERATOR" to the "BATTERY CHARGER". A "MAST" is indicated by a circle at the bottom right.

ENDEAVOUR 37B BELOW DECK WIRING



9. PLUMBING SYSTEM

9.1) Head and Holding Tank:

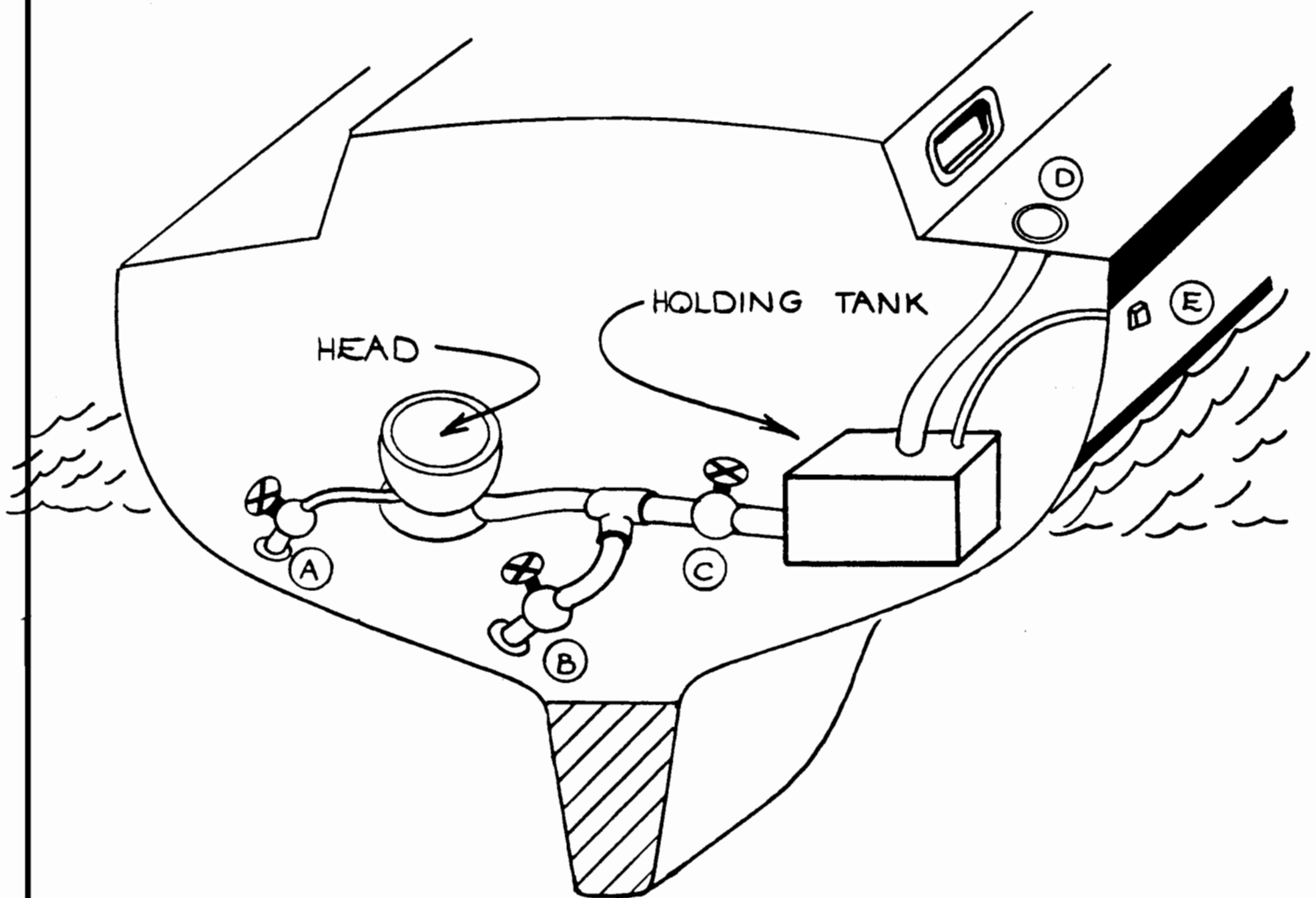
Proper operation and maintenance procedures for your head are covered in the information provided by the head manufacturer. It is important to understand and use your head properly to ensure trouble-free operation.

Government regulations require all U.S. yacht manufacturers to install a holding tank system or approved waste treatment system to prevent water pollution. All Endeavour yachts are provided with plastic holding tanks with deck pump out fittings for this purpose. However, a direct overboard head discharge bypass is provided for use in waters where discharge regulations do not apply. Figure #6 describes the head plumbing. Figure #7 describes the entire plumbing system.

9.2) Galley Oven Range:

The Endeavour 37 is equipped with either an alcohol oven range or a gas oven range. All necessary data and information is contained in the range manufacturer's manual and is not repeated here. Figures #8 and #9 describe the plumbing system for these ranges.

FIG. 6
HEAD SYSTEM

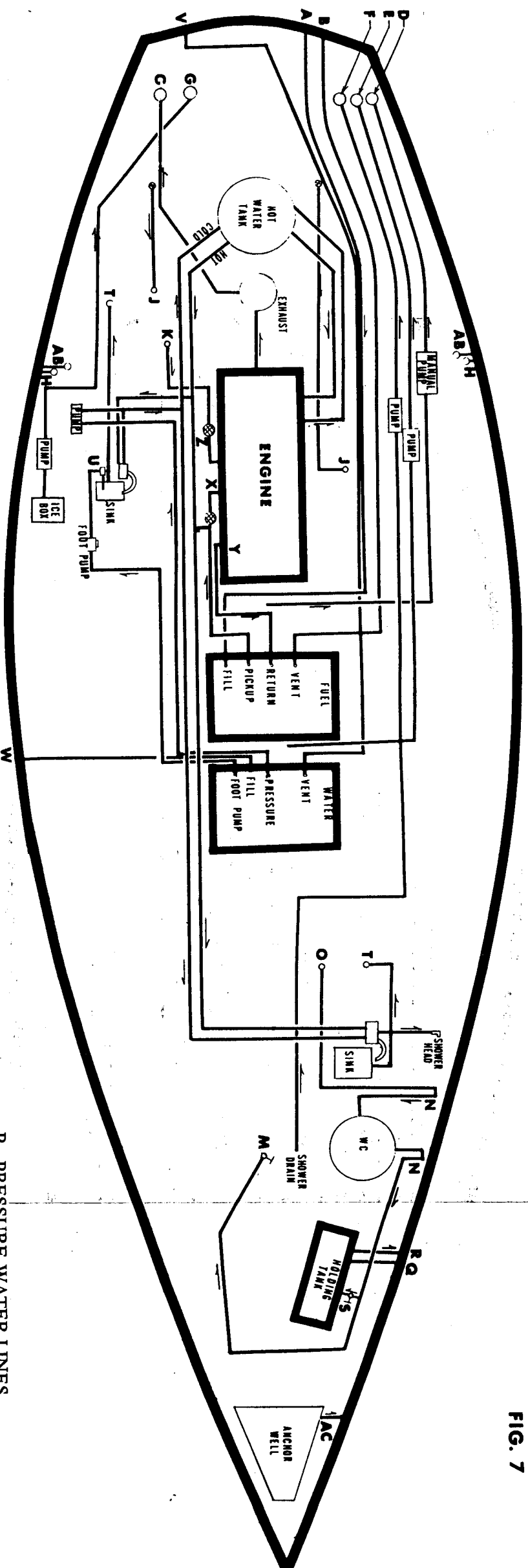


- (A) HEAD INTAKE WATER VALVE
- (B) DIRECT OVERBOARD DISCHARGE VALVE
- (C) HOLDING TANK SHUT OFF VALVE
- (D) HOLDING TANK DECK PUMP OUT PLATE
- (E) HOLDING TANK AIR VENT

- I] ALL DISCHARGE IN TANK : OPEN (A) (C) ; CLOSE (B)
- II] EMPTY HOLDING TANK : CLOSE (C) ; OPEN (D) , INSERT PUMP
- III] ALL DISCHARGE OVERBOARD : OPEN (A) (B) ; CLOSE (C)

ENDEAVOUR 37B PLUMBING SYSTEM

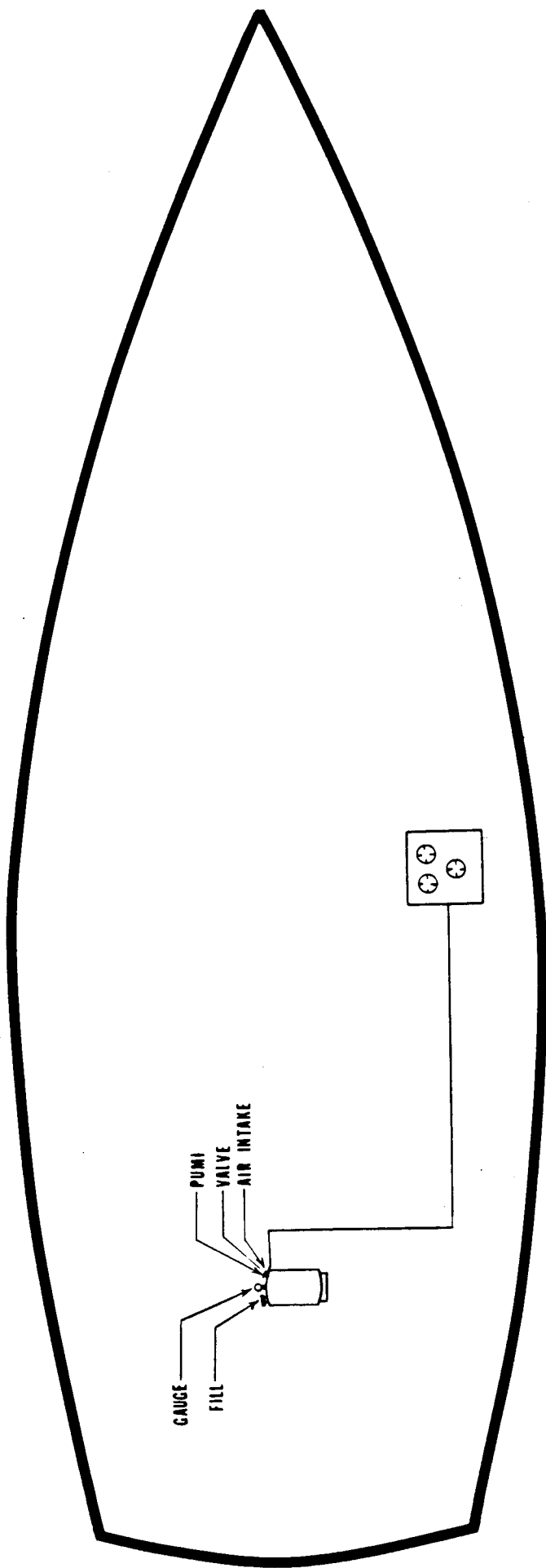
FIG. 7



- A FUEL FILL
- B FUEL TANK VENT
- C PERKINS EXHAUST
- D MANUAL BILGE PUMP DISCHARGE
- E ELECTRIC BILGE PUMP DISCHARGE
- F SHOWER DRAIN DISCHARGE
- G ICE BOX DRAIN DISCHARGE
- H DECK DRAIN
- I PRESSURE WATER PICK UP
- J COCKPIT DRAIN SEA VALVE
- K PERKINS COOLING WATER INTAKE
- L FUEL FILTER
- M SEA VALVE FOR HEAD DISCHARGE
- N ANTI-SIPHON LOOP
- O SEA VALVE FOR HEAD WATER INTAKE

- P PRESSURE WATER LINES
- Q WASTE TANK VENT
- R WASTE TANK PUMP OUT
- S WASTE BYPASS VALVE
- T SEA VALVE FOR SINK DRAINS
- U GALLEY MANUAL WATER TAP
- V WATER TANK VENT
- W WATER FILL
- X PERKINS FUEL PICKUP
- Y PERKINS FUEL RETURN
- Z SEA WATER STRAINER
- AA BYPASS/WATER HEATER
- AB COAMING LOCKER DRAIN
- AC ANCHOR WELL DRAIN

FIG. 8



**ENDEAVOUR YACHTS
ALCOHOL STOVE SYSTEM**

9'6"

**ENDEAVOUR YACHTS
LPG SYSTEM**

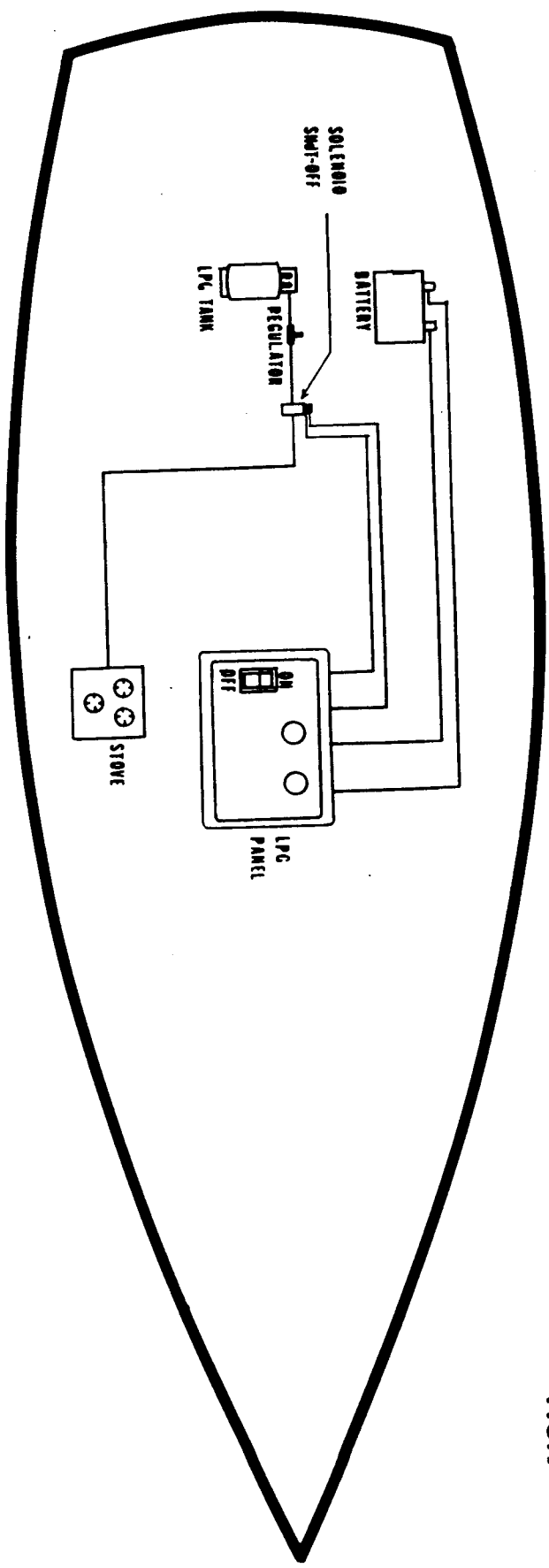


FIG.9

10. MAINTENANCE

All yachts require maintenance on a regular basis to stay in top operating condition and to keep looking their best. One should constantly check running and standing rigging, winches, engine, head, bilge, and surface finishes for telltale signs of needed maintenance.

10.1) Gelcoat Surfaces:

The best protection for your gelcoat surfaces is to clean them regularly with fresh water and a good detergent. Wax all smooth gelcoat surfaces with a good automotive or boat paste wax at least twice a year. Do not wax non-skid deck surfaces.

Gelcoat surfaces may stain if leaves or debris collect on deck or birds roost. Surfaces should be scrubbed frequently or have a protective cover if these conditions occur.

Minor imperfections in gel coat surfaces may be repaired by the owner using one of several methods. Some typical examples:

Shallow Scratches and Dings (not through the gel coat)

-- If a scratch is not through the gel coat into the fiberglass, it may be sanded out with 320 grit wet and dry

sandpaper used with water. Finish off with 400 and 600 grit with water and hand buff with automotive-type rubbing compound. Wax for additional luster.

Deep Scratches and Flaws (exposed fiberglass) --

Thoroughly clean the damaged area with acetone to remove dirt, grease, or wax. Tape off the area around the flaw with masking tape. Thicken a small amount of matching gel coat with talcum powder to obtain a putty-like consistency. When ready to apply the putty, thoroughly mix a small amount of the hardener into the gel putty. A tablespoon quantity of gel putty will require only one drop of the hardener to cure into a hard plastic in mild temperatures. Some experimenting will allow you to adjust the amount of hardener to suit your needs.

Apply the gel putty with a putty knife, filling the flaw slightly above the surrounding surface. Allow to harden. Sand and buff as previously mentioned for shallow scratches. Clean up hands and tools with acetone before putty hardens.

CAUTION: A) The clear hardener should be handled with great care. Flush skin or eyes with large amounts of water if accidentally splashed.

- B) Once gel coat materials have been mixed with hardener, never return to a container of unmixed material. The entire quantity would cure into a solid mass.
- C) Be careful of discarding uncured, mixed gel coat material. Once hardener is added, a chemical reaction takes place that generates heat. Large quantities can become very hot. Submerge material in water until cured for maximum safety.

Flaws in Textured Non-Skid Surfaces -- Chip away any loose material and clean area to be repaired with acetone to remove any trace of dirt or wax.

Make a thick gel putty as described in instructions for deep scratches and add hardener. Apply to surface with a stiff bristled brush dabbing gel putty in place. With experimentation and practice, a texture similar to the non-skid pattern can be created. A good quality artist brush for oil paints works well.

In extreme cases where a fairly large repair is required, say an area 2" in diameter or larger, a piece of textured vinyl matching the non-skid pattern can be pressed into wet gel putty, applied to the flaw, and then

rolled over to flatten. Coat the vinyl with paste wax before applying to facilitate removal. This vinyl fabric material is available from Endeavour Yacht on request. When the putty is cured, peel off the vinyl and blend the edges of the repair with a sharp knife. Minor touch up with gel putty around the repair edge may also be required to blend the patch.

10.2) Ports and Hatches:

The opening ports on your yacht are molded in lexan and the deck hatches are glazed with plexiglass. These materials are extremely tough but may require occasional polishing to remove surface scratches. Clean the surface with soapy water only, never an abrasive cleaser. If polishing is required to remove scratches, use a plastic polish applied with a soft cloth.

10.3) Teak:

Exterior teak trim will weather to a dull gray appearance if not oiled regularly. Always wash your teak before oiling to remove dirt and salt. A light pass with bronze wool or fine sandpaper followed by treatment with a good quality exterior teak oil three or four times a year will keep the wood looking new.

The interior teak of the Endeavour is oiled with a commercially available furniture oil, "Liquid Gold". Occasional applications of this or a similar oil will keep the interior looking like new.

CAUTION: Always dispose of your oil soaked rags with care. Spread wet cloths out to dry before placing in trash. These oils can cause spontaneous combustion in saturated cloths.

10.4) Hull Bottom:

All yachts kept in the water require protection on the underwater surfaces to prevent fouling with grass or barnacles. As a general rule, it is most economical to use the finest antifouling paint available as its cost is small compared to hauling and labor charges. Your dealer or an experienced local yachtsman should have a good recommendation.

It is important that the paint be properly applied, especially the first coat onto the gelcoat surfaces on new boats. All gelcoat surfaces on new boats have a thin film of wax that must be removed by solvent washing or, before painting, sanding. Unless a chemical primer is used that etches the smooth gelcoat surface, one should sand all surfaces to be painted to provide "tooth" for the paint.

When the boat is hauled for more than a few days, the bottom should be scrubbed down immediately upon hauling to remove any growth before it dries and hardens on the bottom. Touch up and bad spots before relaunching or recoat the entire bottom as required. Always use a paint compatible with the coating already on the bottom.

10.5) Standing Rigging:

Standing rigging, the fixed rigging supporting your mast, should be frequently checked to ensure trouble free sailing.

New rigging will occasionally form a thin layer of rust, called "rouge", especially at terminal ends. This is caused by impurities in the stainless steel surface and will not effect the strength or durability of your rigging. This rusting will eventually stop when all impurities have oxidized. Use an unchlorinated cleanser, such as Ajax, to remove this stain. Repeat if necessary. If rusting persists for more than two or three cleanings, contact your dealer.

Turnbuckles should be frequently checked to make sure cotter pins are in place at top and bottom, with ends turned back properly and taped. Check spreaders for proper angle and attachment to mast. The spreader

end where the shroud passes through should be taped to prevent chafe. Once a month or more frequently check the attachment of the upper ends of shrouds and stays at spreaders and masthead. Also inspect masthead fittings and other spar hardware.

Any rigging with cracked swedged fittings or other suspect damage should be replaced immediately to ensure peace of mind and safe operation of your yacht.

10.6) Running Rigging:

Running rigging comprises all the gear that is normally used in handling and trimming of sails such as sheets, guys, halyards, and vangs. Main and genoa halyards and stainless steel wire and are subject to heavy loads and constant flexing as they pass over the sheave at the head of the mast. This constant flexing tends to fatigue the metal over a period of time. Consequently, halyards should be examined regularly for signs of stress and breaking strands. When signs of stress appear, the only solution is to replace the halyard. Again, the end fitting on a halyard should be examined carefully. The splice between the rope and the wire tends to be a point of possible weakness and should be examined regularly. Rope halyards (used mainly for spinnakers) are not subject

to wear as severe as wire halyards but should be checked two or three times a season. The end fitting should be checked each time the boat is sailed to ensure it closes and locks easily and securely. Rope sheets tend to fray with use over a period of time and only experience will dictate when they need replacement.

10.7) Lifelines, Pulpits, and Stanchions:

Lifelines, like standing rigging, should receive periodic checks. The terminal ends of the connector must be well screwed into the barrel so all the threads of the barrel are fully engaged and the lock nuts are done up tightly. This is most important as a life may depend on it. Again, check the ~~swedings~~ for signs of rust. Check pulpits and stanchions for dents or cracks at the base and ensure they are properly bolted down.

10.8) Winches and Blocks:

The installed winches on your yacht are as of high a quality as any available on the market. Most problems with winches occur due to poor or improper maintenance. Winches should be stripped down, cleaned and lubricated at least twice per season. The bolts securing the winches should be checked at least once a season. Access to the bolts supporting the winches in the cockpit may be gained

by removing the winch handle box under the winch. If it is necessary to remove a winch base and remove the bolts, the bolts should be reseated using a sealing compound such as silicone rubber.

Blocks normally require little maintenance but they should be examined regularly for damage. Never leave a snatch block open. Be sure the snatch is properly closed before applying a load to prevent the cheek of the block being hurt. Sheaves and blocks can be sprayed with a silicone lubricant to keep them running freely. The sheaves at the head of the mast should be checked before the spar goes into the boat in the spring and a couple of times during the season (this necessitates going up the spar in the bosun's chair) to ensure they are turning freely and the halyard is not cutting a groove into the sheave. All running rigging should be washed down with fresh water after sailing in salt water.

10.9) Engine:

The maintenance of your engine is covered in the Engine Manual which should be read carefully.

Please note: Once the engine is started, it should be operated until it reaches full operating temperature to prevent corrosion. This may take several minutes in cold water.

Before changing the oil, operate the engine until it reaches full operating temperature. The oil can be removed from the crank case with a crank case pump available at most marine hardware stores.

Check all fuel lines for tightness and integrity. Probably your nose is your best guide here. If you smell diesel fuel, there may be a leak somewhere in the system. A gentle tightening of the bolt at each connection in the fuel line often will solve the problem.

10.10) Power Train:

Details of shaft alignment and removal of propeller and stuffing box maintenance are given under Section #6.

10.11) Electrical Maintenance:

The electrical wiring should require little or no maintenance. Exposed terminals and connections should be checked a couple times a season and more often in a sea air environment for tightness and signs of corrosion. Exposed electric and electronic terminals can be protected with a light coating of vaseline or silicone resin coat obtainable from an electronics parts dealer.

Battery terminals must be kept clean and free from corrosion. Periodic cleaning washes away sea water, acid, and dirt that can accumulate and set up tiny circuits

that drain off amperage. Before cleaning a battery, remove it to an area that will not be damaged by acid washed off the battery. Be sure the vent caps are tight. Scrub the terminals and the top of the battery with a brush dipped in a solution of diluted ammonia or a couple of ounces of baking soda to a quart of water. Scrub until all the bubbling stops. Flush with clean water, dry, and replace the battery.

Remember--'Clean, Dry, Tight' are the three most important factors in battery and electrical connection maintenance.

Add water, preferably distilled water, to bring the electrolyte level of the battery about 1/4" to 1/2" above the level of the separators and plates, or to the bottom of the split ring. Check the battery from time to time with a hygrometer. A fully charged battery has a specific gravity reading of 1.265 or 1.270 at a temperature of 80°F. In tropical climates, batteries usually have an electrolyte with a specific gravity of 1.225 when fully charged. Before testing a battery, all the lights and electronic equipment must be turned off in the yacht so that the battery is not discharging during testing.

The domes on interior lights are held on by friction. These can be removed by gently prying the dome out.

To remove the dome bulb, push in and twist counter-clockwise. To replace, push in and twist clockwise. If corrosion is noted in the bulb socket, it can be cleaned by inserting a small stiff brush and twisting in the socket.

10.12) Upholstery:

The cushions and seat backs on your Endeavour yacht are covered with relatively stain resistant material which should ONLY BE DRY CLEANED. Cushion covers can be removed from the foam padding for cleaning. It is important that the upholstery be kept aired and that it be dried after use to prevent mold and mildew development. If the yacht is to be left for some time unused, it is advisable to stand the cushions on edge so that air can circulate around them. If there is no circulation of air in the boat, it may be of help to keep two or three shore-powered electric light bulbs burning in the boat to reduce the dampness. (these should be suspended away from flammable material such as wood, paper, vinyl, etc.) It is also advisable at such times to clean out all lockers of damp clothing and leave locker doors open.

10.13) Steering:

The manufacturer's instructions for maintaining your pedestal steering system should be followed closely. Some details are repeated here.

Lightly oil the roller chain every two months with #30 motor oil or light machine oil. Oil the sheave bearings several times each season.

Inspect and lightly oil the wire in the system. The manufacturer recommends the placing of about five layers of facial tissue in the palm of your hand, applying oil to the tissues and lightly rubbing the wire. This will lubricate the strands and 'flag' a broken or hooked strand by tearing off a piece of tissue. If there is a break in the wire, replace it immediately.

The complete system, including bolts, should be inspected thoroughly each season. Wire should be replaced every five years. Keep the replaced wire on board as a spare.

In addition to the above, an inspection should be carried out every other year with the system under a heavy load. On a calm day and away from all other boats, station a person below to observe the system. While under power, put the wheel hard over at full throttle. The person below should look for parts bending, distorting, creaking,

or any other indication of failing in the system when under a full load for a period of time. Using this test while the boat is under stress will prevent a failure when the system is really needed.

11. FITTING OUT

11.1) Prior to Launching:

- A) Clean hull surfaces and repair any damage. Wax hull surfaces above waterline. Paint all surfaces below the waterline with an antifouling paint.
- B) Check all thru hull fittings inside and out for proper operation, corrosion, or damage. Repair as necessary. Close all valves before launching.
- C) Replace all water drain plugs in engine and muffler. Check all hoses for tightness and deterioration. Repair as required. Drain and replenish fresh water cooling system, if so equipped, with 50/50 antifreeze/water mix.
- D) Check propeller shaft, strut, cutlass bearing, and rudder gudgeon for deterioration or damage. Repair or replace as required.
- E) Check steering system for proper operation. Check tension in cables, free play in fittings, and proper stop adjustment. Lubricate entire system.

- F) Check that batteries are fully charged, battery terminals are clean, and all electrical connections are secure.
- G) Examine all deck and cockpit surfaces., Repair any flaws and wax all surfaces except non-skid areas.
- H) Check all deck hardware and fittings and service all winches. Check docklines and ground tackle for wear or deterioration and repair or replace as required.

11.2) After Launching:

- A) Check all through hull fittings, gate valves, sea cocks, and the bilge to ensure that leakage is not occurring.
- B) Open the valve for the engine cooling water intake.
- C) Turn on main power switch and bilge blower.
- D) Use hand primer located at fuel pump to charge the fuel system.
- E) Start the engine. After engine has reached operating temperature, shut down and change the oil.

11.3) Stepping the Spar:

Spars are stepped by two methods, depending on a yacht's design. Some spars are stepped directly on the deck of the yacht, the imposed load being transferred to the keel by means of a support inside the yacht. Other spars go through the deck at a mast collar and are seated on a mast step located on top of the keel. The procedure for stepping the spar basically is the same for both types.

The spar first should be laid out on two or more saw horses and checked carefully. Spreaders should have the pins in place and all standing rigging pinned at the tangs. Halyards must run freely and head sheaves turn easily. Install and check running rigging. Examine halyards for wear and replace if necessary. All lights, plus any mast head wind instruments, should be checked. Main upper shrouds should be positioned in spreader ends and locked.

Tie all running rigging together and secure tightly to the spar with light line at a point that will be just above the mast collar when the spar is stepped. Tie the forestay, backstay, and two main shrouds together in a separate bundle and secure with light line to the spar at a point that will be approximately three feet above the deck when the spar is stepped.

Remove cotter pins and clevis pins from all turnbuckles and place in a container for future use. Back off all turnbuckles to the maximum. Carefully locate and secure the yacht adjacent to a crane, making sure the mast step is within the radius of the crane arm. Place the spar on saw horses adjacent to the crane.

Prepare a rope sling which will take the weight of the spar. A 10 foot line, minimum 5/8" diameter, tied in a loop will suffice. Place the loop around the spar below the lower spreaders OUTSIDE THE RUNNING RIGGING. THE FORESTAY, BACKSTAY, AND MAIN SHROUDS MUST BE OUTSIDE THE SLING. Make fast a 1/2" tie-down line to the sling, securing the other end to a winch or cleat at the bottom of the spar. This line prevents the load of the spar being carried by the spreaders when the spar is raised to a vertical position. It also facilitates pulling down the sling after the spar is stepped. Attach the lifting hook to the sling. In some instances, the crane height may not be sufficient or the sling must be positioned below the mid-point of the spar. Additional persons may be necessary to offset the weight above the sling and guide the spar into position. At least three persons should be present when stepping the spar in addition to

the crane operator. Position one person at the foot of the spar to take the weight of the foot as it is raised and to guide the foot toward the yacht. A second person should clear the rigging as the spar is beside the mast step to guide the foot of the spar into position.

Raise the spar carefully, guiding the foot toward the yacht. Position one person on the yacht; pass the foot of the spar from shore to this person. Raise the spar to an almost vertical position and guide the foot into the step located on the deck. All electrical wiring at the bottom of the spar must precede the spar through the collar. Free the forestay, backstay, and main shrouds, ensuring that all are clear of the crane lifting cable.

With the weight of the spar on the step, attach the forestay, backstay, and port and starboard main shrouds. Place the wedges around the spar at the collar to support the spar at this point. Lower the crane lifting cable sufficiently to allow the sling to be lowered and released, taking care that the sling and hook do not damage the light on the forward side of the mast.

Release lower shrouds from their lashing, connect the lower shrouds and snug up all turnbuckles. Replace clevis pins and cotter pins. To help prevent damage to

sails, insert all clevis pins fore to aft or outboard to inboard and tape over the cotter pins. Release all running rigging and lead to the appropriate blocks and winches. Proceed with tuning the spar at the dock.

(Section 4.3)

To unstep the spar, reverse the above procedure. Before removing the spar for winter storage, make a diagram of the location of the running rigging to serve as a guide when the mast is resteped. DO NOT use masking or filament tape on the spar. It is better to leave a stored spar unwrapped.

12. LAYING UP FOR WINTER STORAGE

12.1) Hauling (Slings):

The proper placement of lifting slings and supports is most important when hauling out. Improper placement could cause damage, slippage of straps, or skewed lifting angles. Slings should never be placed on the propeller shaft or strut. To prevent scratching of topsides or rubrails, it is recommended that carpet or a protective liner be placed between lifting straps and areas contacted. See Figure 10 for recommended lifting strap locations.

12.2) Cradle Support:

When hauling on a marine railway or placing the yacht in a winter storage cradle, virtually all of the yacht's weight should be on the keel. Pads or chocks for supporting the bottom of the hull should be firmly wedged or jacked in place. These side pads should not be over tightened or local deformation of the fiberglass hull could occur. The sole purpose of these pads or chocks is to prevent the yacht from falling over on its side. They are not intended, nor is it necessary for them, to carry any significant portion of the yacht's weight.

12.3) After Haul Out:

- A. Scrub down the bottom to remove any marine growth and grease. Wash down top sides and deck.
- B. All gear that may be damaged by cold or damp weather, such as clothing, batteries, books, life jackets, etc., should be removed from the yacht and placed in a warm, dry storage area.
- C. Lubricate or cover all exposed mechanical fittings to guard against ice or snow.
- D. Check all electrical and mechanical components on boat and remove those needing repair or replacement during the winter.
- E. Winterize and lay up your Diesel engine per instructions in the manufacturer's manual.
- F. Put a wooden plug in, or plastic cover over, the exhaust pipe in stern of boat.
- G. Shut off gas tank valve.
- H. Remove, clean, and dry fuel pump bowl. Return bowl to its position making sure it is installed squarely on the gasket. Tighten clamp firmly by hand.

12.4) Fresh Water System:

- A. Remove one of the hoses at the lowest point of system and allow it to drain into the bilge.
- B. Pump the bilge, cleaning it at the same time.
- C. Remove the inspection port on the top of the water tank and dry with a cloth.
- D. Place some baking soda in an open glass container and place in the tank and lay the inspection port back on.
- E. Pump sink water pumps to remove any water remaining in them.

12.5) Head and Holding Tank:

- A. Pump out holding tank and flush once or twice.
- B. Add some Elson Blue or equivalent through the deck 'waste' fittings.
- C. Clean the head bowl and pump water through.
- D. Add some antifreeze (such as Methanol) to the bowl of the head and pump it through the system.
- E. For best protection and trouble-free operation the next season, do the following: Remove the parts as

per manufacturer's instructions and clean all valves on the head.

12.6) Batteries:

Remove the batteries from the yacht, fully charge them, and store in a cool and protected area on a wooden shelf for the winter. If batteries are to remain in the yacht, make absolutely sure they are completely charged to help protect them against frost damage.

FIG. 10
LIFT STRAP LOCATION

