

Freedom 33 (part 2) Table of Contents

Freedom Yachts Freedom 33

Freedom 33 MK II Specifications

Freedom 33 – AFT, Cockpit, Cat Ketch

Freedom 33 MK II Layout II.9A. Sail Settings

The Freedom Rig

Freedom 33 Diagram

Freedom 33 Commission Information

First Original Freedom 33 Manual

 Part I. Commissions

 Part II. General Information

 Part III Maintenance

 Part IV. Winter Storage – For those not able to enjoy your freedom year around

 Part V. Other Information

Second Original Freedom 33 Manual

 Part I. Commissions

 Part II. General Information

 Part III. Maintenance

 Part IV. Winter Storage

ISOMAT Boom Reefing

Inventor

Installation Instruction

Freedom Yachts

FREEDOM 33

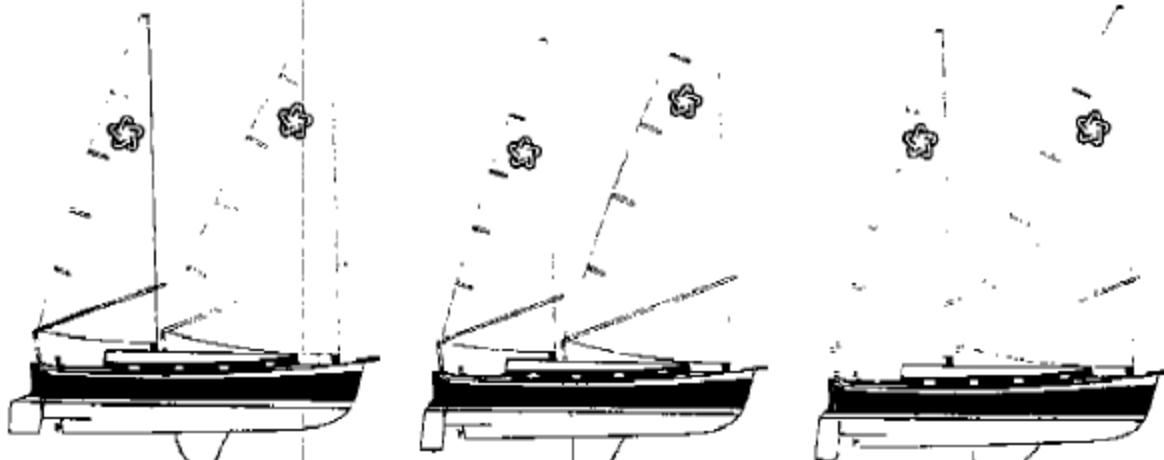
The Freedom 33 is well on its way to becoming a cruising classic, with over 100 sold between Europe and the United States. Based on a number of requests, we have now developed two keel versions. The deep keel draws 6' and the shallow keel draws 4' 1". The principal performance difference is that the deep keel will sail slightly better to windward.

Also available is a taller rig for lighter wind areas. The original Freedom 33 rig was designed for serious offshore sailing, and a number of successful passages across the Atlantic and through the Bermuda Triangle attest to its practicality. However the addition of the deep keel assures a stability gain that will permit a taller rig—which should be significantly quicker in light airs.

In terms of interiors, the keel version obviates the need for a centerboard trunk, and thus opens up the main cabin considerably.

I expect that the deep-keel, tall-rig version should markedly increase the already fine sailing speed of the Freedom 33. Obviously those sailing in shallow waters will continue to prefer the centerboard version for its shoal draft capabilities.

Garry Hoyt



CENTERBOARD
STANDARD RIG

DEEP KEEL
TALL RIG

SHALLOW KEEL
STANDARD RIG



FREEDOM 33 MK II SPECIFICATIONS *

LOA	33' 0"	Sail Area-Main	324 sq. ft.
LWL	30' 0"	Mizzen	192 sq. ft.
Beam	11' 0"	Total	516 sq. ft.
Draft-Board up	3' 6"	Headroom	6' 1"
Board down	6' 0"	Tankage-Water	83 gals.
Draft-fixed keel	4' 6"	Fuel	25 gals.
deep keel	5' 6"	Hot Water	6 gals.
Displacement	12,000 lbs.	Waste	10 gals.
Lead Ballast	3,800 lbs.		
Engine	Yanmar 3GM 22.5 H.P. Diesel		

The Freedom 33 is available as a centerboard, shoal or deep fixed keel, cat ketch with wishbone booms and wraparound sails. She is a J. Paris design commissioned by Garry Hoyt.

HULL

Gelcoat finished, hand laminated fiberglass with Contourkore^R reinforcement. Laminate is engineered to provide high strength in critical areas. The core adds strength without undue weight and thermal and acoustical insulation. The laminate has a minimum modulus of 1.0×10^6 and a minimum tensile strength of 12,000 lbs. per square inch.

DECK

A similar hand laminated, cored, fiberglass construction is used in the deck. Heavy reinforcing is built in for deck hardware. Molded in non-skid areas are available in several colors. Custom teak decks are available as an option. The cockpit is integral with the deck and is provided with a large scupper draining through the transom.

* SPECIFICATIONS, OPTIONS AND PRICES SUBJECT TO CHANGE WITHOUT NOTICE

FREEDOM 33 MK II SPECIFICATIONS

Page Two

SAIL CONTROL

A Barient #23 self-tailing winch controls the main and mizzen halyards and outhauls. Each line passes through a sheet stopper. Hangers are provided for all tails. A Barient #23 self-tailing winch raises the centerboard, reefs both sails, and controls the main sheet. The main and mizzen sheets have a 4:1 tackle with cam cleat, mounted on the cabin top for the main and on the traveller for the mizzen.

TOE RAIL

Full length custom slotted aluminum extrusion. The toe rail and deck flange are thru-bolted to the hull flange using 5/16" stainless steel bolts at 4" intervals. The deck is further bonded to the hull using 3M #5200 flexible sealant.

VENTILATION

Overhead hatches are provided for the fore cabin (20" X 20"), the main cabin (24" X 24"), the galley (16" X 16"), and the head (9" X 9"). Nine, 5 X 12, screened, opening ports, provide additional ventilation and light.

BLOCKS, FITTINGS, RUNNING RIGGING

Blocks and fittings are predominately Schaefer, Nicro-Fico, and Harken. Running rigging includes halyards, sheets, outhauls and reef lines for main and mizzen.

MOORING CLEATS AND CHOCKS

10" forward and 8" midship cleats with chocks fitted into toe rail. 8" mooring cleats aft.

PROPANE TANKS

Two 8 lb. capacity tanks are located in a vented compartment built into transom.

COMPANIONWAY HATCH

Formed translucent hatch slides into a fiberglass sea hood with water channels for drainage.

FREEDOM 33 MK II SPECIFICATIONS**Page Three****LIFELINES AND PULPITS**

Stainless steel bow and stern pulpits with double lifelines run through 24" high stainless steel stanchions.

BOARDING GATE

Starboard gate with pelican hook and braced stanchions are standard.

SPARS

Carbon fiber one piece construction, with patented rotating masthead fitting, for free setting of the sails. Height is 41' tapered from 8-3/4" diameter at base to 4" diameter at the top. Wishbone booms are of fabricated aluminum and are fitted with outhaul, and all necessary reefing hardware.

STEERING GEAR

Edson pedestal steering with 32" wheel drives bronze rudder quadrant. Steering cables are readily accessible under teak grating in cockpit. Ritchie SP-5 binnacle compass is mounted on the pedestal and comes with a cover. A pedestal brake is provided. The emergency tiller fits the rudder head and stows in the cockpit locker for ready access.

INTERIOR

Joinery of ash and oak colored woods is custom formed to graceful curves throughout. Cabin sole is teak and holly. Satin varnish finish is standard. Overheads are white, foam backed vinyl. Hull ceilings are finished with cedar battens.

Forecabin - 6'7" long V-berths with insert and cushion. Stowage shelves are provided above each berth and storage lockers below. Hanging lockers are fitted with rattan fronts for ventilation.

REEDOM 33 MK II SPECIFICATIONS**Page Four**

Head - Raritan Marine Toilet with overboard bypass for use offshore; is plumbed to 10 gallon holding tank. A 14" diameter stainless steel sink drains overboard via a thru hull located well inboard to prevent flooding when heeled. Telephone type shower, teak grate and separate sump with electric pump are standard. Ventilation is through porthole and deck hatch.

Main Cabin - To port is a 6'7" long "L" shaped dinette which may be converted to a double berth. Storage lockers are provided outboard to starboard with open storage and adjustable combination book or spirits container to port. To starboard is a 7' long settee which converts to a single berth. Handrails are installed full length, on both sides of the main cabin for ease of movement while under way. A center island, which houses the trunk in the centerboard model, provides extra counter surface.

Navigation - Chart table measures 40" X 32", with chart storage under. Outboard of table are double shelves for instruments and reference books. Navigator's seat is at the forward end of a 6'5" long quarter berth.

Galley - 10" deep stainless steel sink with pressure hot and cold water and manual back up pump. Three burner LPG stainless steel gimballed stove with oven. Safety bar mounted inboard of stove. The 7 cu. ft. ice box has an acrylic sliding shelf. Adjacent to sink is a 3 cu. ft. dry storage bin. Lockers with sliding doors run the full length of the galley.

MECHANICAL AND ELECTRICAL

Engine - A Yanmar 22.5 hp. three cylinder diesel drives a 16" X 9 RH two blade bronze propellor, flexible coupling, interior adjustable stuffing box, and 1" diameter stainless steel shaft. Removable engine box panels give complete access to engine and machinery spaces. Lead sandwich engine room insulation is standard. Engine is mounted with flexible mounts.

FREEDOM 33 MK II SPECIFICATIONS

Page Five

Exhaust is muffled with a water lift type silencer, exiting at the transom. Engine instrumentation is recessed into cockpit and includes warning lights for temperature, oil pressure, and voltage with a guage for the tachometer. Primary and secondary fuel filters are standard, as is a clean out port in the 25 gallon aluminum fuel tank located under the cabin sole.

ELECTRICAL. - Two 90 amp hour heavy duty batteries are standard with a selector switch which may be changed while the engine is running without damage to the 35 amp alternator. Also included is a diode network which apportions charging rate to each battery. 12V DC power distribution is through a Bass modular panel with battery condition meter and circuit breakers. All wiring is 14 guage or larger stranded copper run through non-metallic conduits with junction boxes to covered terminal blocks. Navigation lights conforming to marine standards, include steaming and masthead light. Five Swivel reading lights, three overhead domes, and a flourescent fixture in the head provide interior illumination.

PLUMBING - All apertures below water line are fitted with bronze flanged thru hull fittings installed in specially reinforced laminate, with bronze 90° throw sea cocks. Hoses below water line are double clamped with stainless worm drive clamps. Fresh water tanks are FDA approved polybutylene.

DOCK EQUIPMENT - (4) ½" X 30' nylon docking lines
(2) 8" X 20" inflatable fenders

Miscellaneous - (2) Barent lock-in type winch handles
(1) 1" X 48" teak flag staff w/base

FREEDOM 33

AFT
COCKPIT
CAT KETCH

LOA 33'

LWL 30'

BEAM 11'

DRAFT 4'

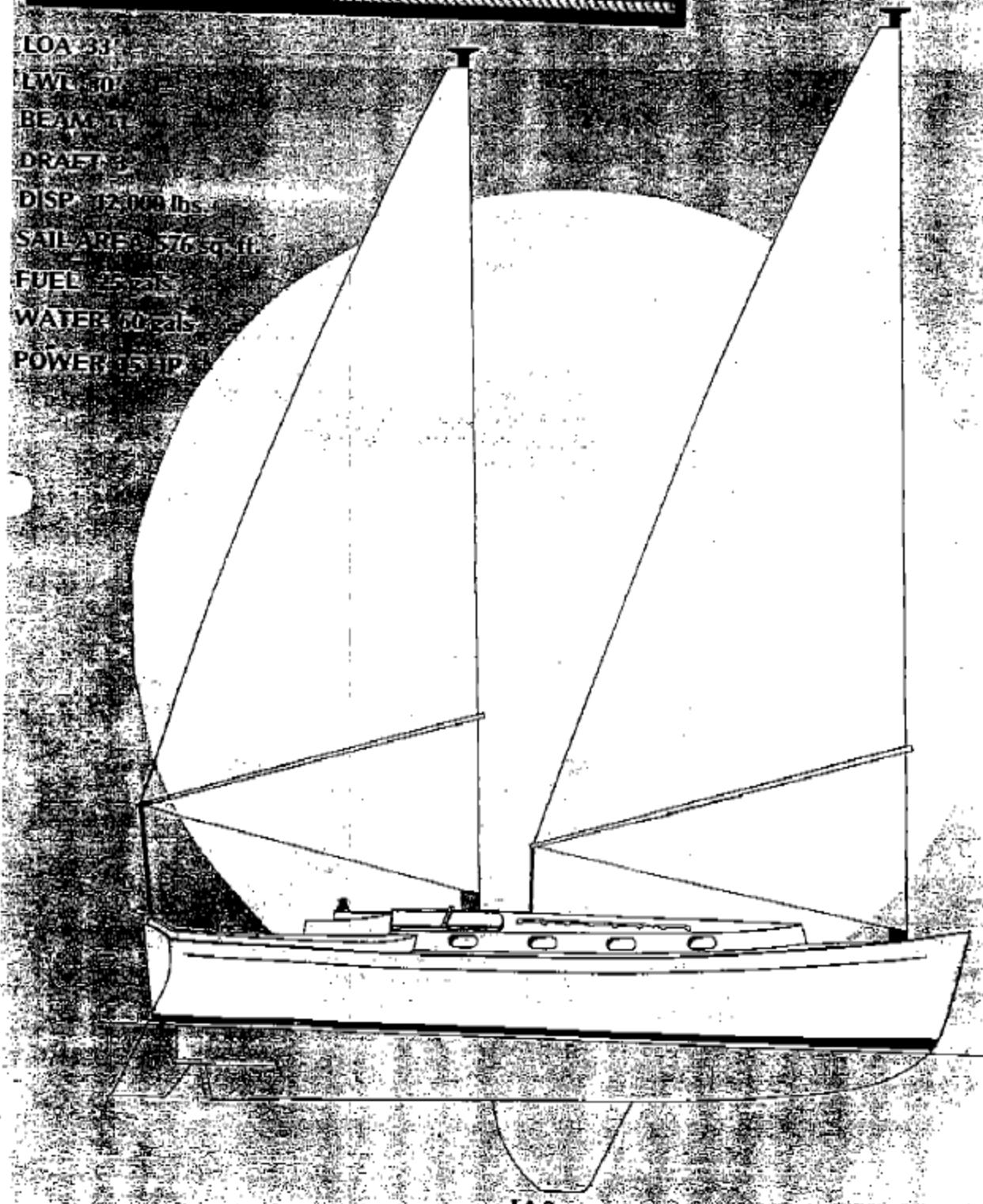
DISP 12,000 lbs.

SAIL AREA 576 sq ft

FUEL 200 gal

WATER 300 gal

POWER 45 HP



IA3

Freedom 33

AFT COCKPIT CAT KETCH OUTLINE SPECIFICATION

GENERAL DESCRIPTION

The Freedom 33 is an unusually roomy, comfortable, seaworthy and fast shoal draft cruising yacht. The rather traditional appearing hull is designed to perform without regard to rules and combined with a highly sophisticated centerboard (which is comparable to a fixed keel) will amaze most knowledgeable sailors.

On deck the spacious cockpit is laid out to accommodate large groups in safety and comfort with unusually extensive protection by an optional wide dodger. The forward deck areas are clear and uncluttered. The cat ketch rig with free-standing masts, wishbone booms, and wrap-around sails has been taken from the well proven Freedom 40.

Below deck the F 33 features a spacious double cabin forward with hanging locker and full headroom. The head features vanity, full shower, and an unusual degree of privacy. The main cabin has a complete galley and large lounging area with some subtle but significant features. And as a bonus, there is a private double aft cabin.

CONSTRUCTION: One piece hand laid-up fiberglass hull with balsa core. Fiberglass balsa core deck with bolted joint to hull. Fiberglass centerboard and rudder. Choice of hull colors.

DECK HARDWARE: Teak cap rail, house trim, grab rails. Mooring cleats and chocks. Bow rail and lifelines. Forward deck locker. Three Lexan hatches. Eight port lights. Built in cockpit seat lockers. Boomkin

MACHINERY: Yanmar diesel, 15 HP, controls, alarms, stainless steel shaft, two blade prop, 25 gal. fuel tank. Pedestal steering with 30" wheel and emergency tiller.

PLUMBING: Sixty gallon water tank, six gallon stainless steel water heater, Par pressure set piped to galley, head sink, shower. Sinks drain overboard. Hand pump for shower sump with emergency bilge connection. Henderson bilge pump in cockpit. Manual toilet with 15 gallon holding tank and bypass.

ELECTRICAL: Two 90 amp . hr. batteries with selector switch. 35 amp alternator. Circuit breaker panel with voltmeter. One set navigation lights. Cabin lights in each compartment with 4 berth lights. Four spare circuits.

FORWARD CABIN: Vee berths with removable filler between. Hanging locker forward. Small lockers p/s. Mattresses with choice of colors.

HEAD: Fiberglass one-piece liner for easy maintenance. Sink with stowage area. Shower pan with sump and curtain track.

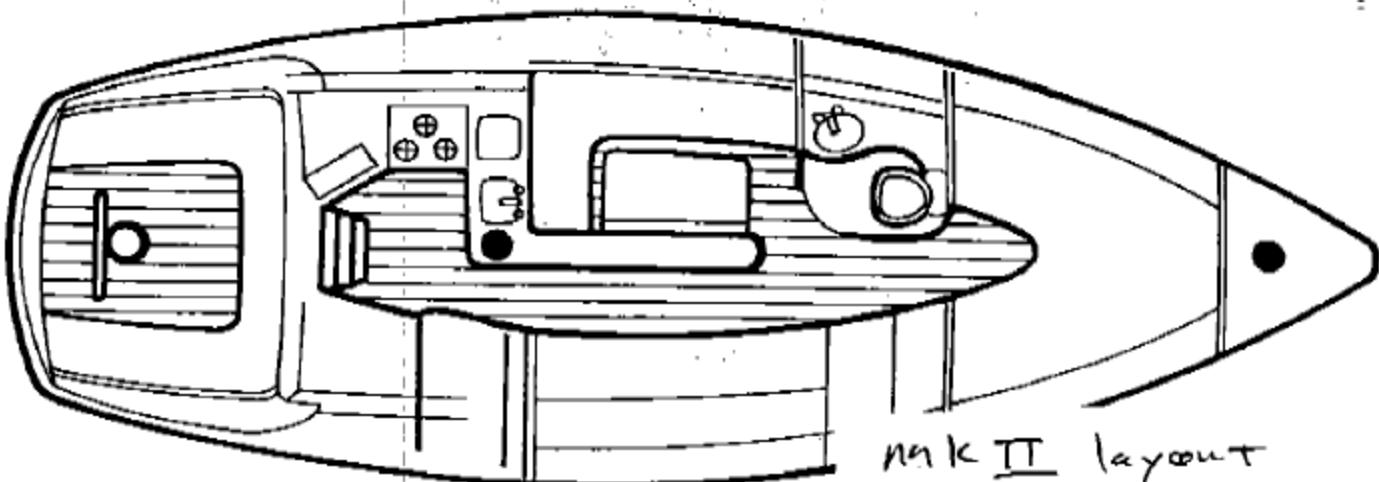
MAIN CABIN: Dinette with cushions - choice of colors. Galley with s/s sink, gimballed propane stove, ice box, counters, dish rack, etc. Bureau converts to stand-up chart table. Hanging locker.

AFT CABIN: Two berths with mattresses - choice of color. Built-in lockers and/or shelves.

INTERIOR FINISH: All teak trim. Vinyl overhead and hull liner. Teak veneer major bulkheads. Formica counters. Teak and holly sole.

RIG: Two fiberglass unstayed masts 42' long with wishbone booms. All rigging required to sail including halyards, spare halyards, topping lifts, running backstays, sheets, outhauls, reef lines, downhauls. Barient 27 self-tailing winch on cabin top. Centerboard hoisting gear.

EQUIPMENT: 20 lb. Danforth anchor, 125' of 5/8" nylon rope, 10' of $\frac{3}{4}$ " galvanized chain. Ensign staff and holder. Three 5 lb. fire extinguishers. Four 45' docklines. Four life jackets. Compass. Two inflatable fenders.



MK II layout

LOA 33'
LWL 30'
BEAM 11'

Freedom 33®

Draft 3'6"
DISP 12,000 lbs.
SAIL 516 sq. ft.

Pound for pound this is the best sailing Freedom yet. Winner of the cruising division at Antigua Race week, and of the prestigious Isle of Wight Race against 1000 other yachts, this is a cruising boat that really moves. The key to the extra speed is the Freedom Rig, which now features standard carbon fiber spars, plus a patented mast head fitting which dramatically improves mast tip performance. Special development work has increased the efficiency of the wraparound sail, while still maintaining the single handed simplicity which characterizes all Freedom Yachts. The low center of effort of the Cat Ketch Rig means this boat can carry full sail up to 30 mph of breeze, without the need to reef. Reefing itself can be done in less than a minute. Yet easily set staysails rapidly expand the basic sail area for light winds, or extra off wind speed.

The skillful advice of N.A. Jay Paris helped create a particularly efficient centerboard for the

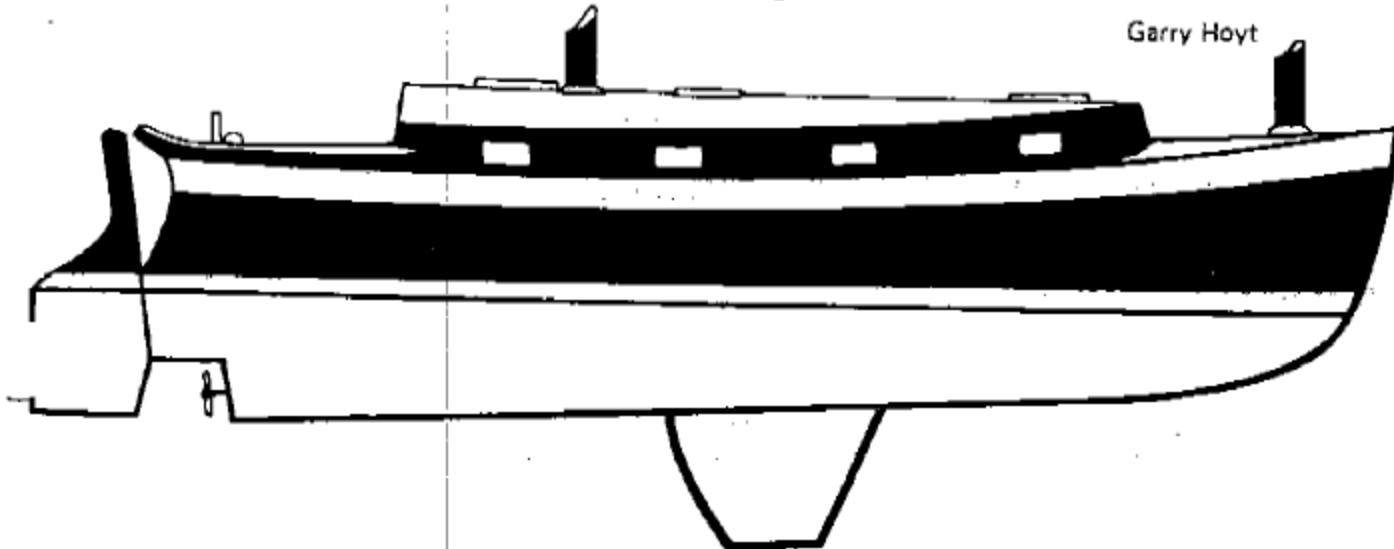
Freedom 33, minimizing slot drag while optimizing lift.

Down below, extensive experimentation has yielded a layout which utilizes the centerboard trunk to form a dining and lounging module.

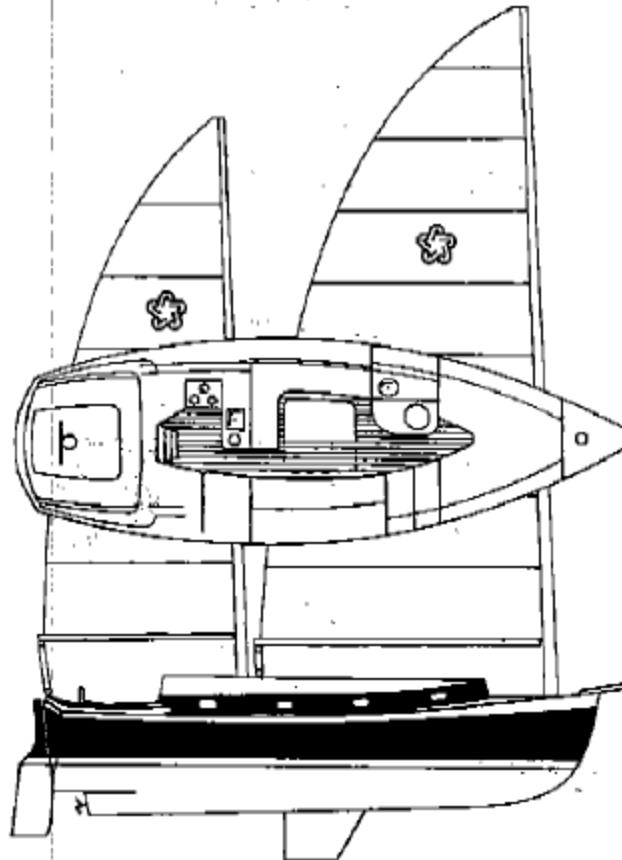
The head (with shower) is sensibly positioned, and the master cabin forward has closed door privacy. A full fledged navigation table is opposite the "U" shape galley, and the 20 hp diesel is easily accessible behind the companionway steps. Everything you need for comfortable cruising is here, harmonized with an oak and ash interior for an airy, spacious feel.

This is a boat you can singlehand across the bay or around the world. She will go to windward with the best of the cruising boats, and offwind she'll walk away from anything her size. A comfortable cruising boat does not have to be slow, and one test sail on the 33 will convince you this is the way to go.

Garry Hoyt



FREEDOM ★ 33



LOA 33'0"
 LWL 30'0"
 Beam 11'0"
 Draft:
 Shoal 4'6"
 Deep 5'6"
 Centerboard Up 3'6"
 Centerboard Down 6'0"

Sail Area	621 Sq. Ft.
Displacement	12,000 lbs.
Ballast	3,800 lbs.
Engine	22.5 hp diesel
Fuel	25 gallons
Water	83 gallons

The Freedom 33 is a cruising cat ketch of unusual comfort and speed. It is available with a centerboard, or shallow keel, or deep keel. There is also a tall rig version for light wind areas. A proven performer, the 33 has been across the Atlantic and the Pacific, and has won a variety of cruising races, including the 1982 CORT series in the Caribbean.

Now the addition of fully battened sails further improves both the performance and convenience of sailing this sea tested performer. Hull and deck construction is hand-laminated fiberglass with balsa core. There is 6'1" headroom through out the cabin and all berths are 5'6". Interior

joinery is handcrafted in ash with oak or teak trim. Teak and holly sole. All sail controls lead aft so that one need not leave the cockpit to hoist, reef or douse sails. Blocks and fittings are predominately Schaefer and Nicro-Fico. The freestanding masts are specially constructed in carbon fiber for strength and lightness, and the booms are aluminum. Edson wheel steering and emergency tiller are standard. Bow and stern pulpits are stainless steel, with double life lines and aluminum toe rails. The addition of easily set staysails significantly increases offwind speed. This boat can easily be handled by one person or a couple.

Garry Hoyt

Freedom Yachts International Inc. • 49 America's Cup Avenue, Newport, RI 02840 • (401) 847-7475
Builder: Tillotson-Pearson Inc. • Bend Boat Basin • Rte. 114 • Melville-Newport, RI 02840 • (401) 683-3500

II.9.A. SAIL SETTINGS

NOTE: The settings listed below are all approximate. Experience with your Freedom will result in optimum performance. TPI assumes NO liability for the following information.

Apparent Wind angle/Point of sail	Main sail setting	Mizzen setting	Stay sails - If used	Notes
40-45° Close Hauled	60% of distance from centerline to rail	Approx 18° to leeward of Centerline	None	Do not over trim main. Keep slot between main and mizzen open. Do not plough - keep boat speed up
55-60° Close Reach	Over rail	Approx 3° to leeward of Centerline	Small Blade staysail.	Trim sails for least heam and maximum sheet post speed
80-100° Beam Reach	Approx 3° outside rail	Centerline	Large reacheser tacked to forward end of track.	Sheet to mizzen boom end
100-110° Close broad reach	Basted just short of point of luff	Point of luffing	Large reacheser - tacked in vicinity of second lifeline stanchion aft on weather side.	Sheet to mizzen boom end.
130-160° Free broad reach			Flasher-tack to middle of stay-sail tack-alleet to mizzen boom end.	

II.9.A. SAIL SETTINGS - CONTINUED

Apparent Wind angle/Point of sail setting	Mainsail Mizzen Setting	Staysails - if used	Notes
160-180° Running	Gybe Boom to weather side	Ease to approximately perpendicular to center-Plasher tack in vin- line of vessel	Care should be exercised to prevent main from gybing.

NOTE - Anytime a sail
is sheeted from the end
of a boom, the sheet
must run through a block
attached at deck level to
achieve a proper lead to
a winch. Upward pres-
sure on winch drums may
cause failure of winch.

Block should be located
directly outboard of miz-
zen mast.

II.9.A. RAISING AND LOWERING SAILS

Always slack theouthaul before raising or lowering a sail. Friction
between the sail and the mast will be reduced, and the sail will function
and last longer.

GENERAL CHARACTERISTICS OF SAIL TRIM:

Raising the main (forward sail) will cause the boat to head off the wind. Easing the mizzen
(aft) sail will lessen weather helm (tendency of boat to head into the wind).

II.9.B. SHORTENING SAIL:

In general, the sequence of shortening sail for upwind and close reaching is:
 A. Reef Main C. reef Mizzen
 B. drop Main D. drop Main
 Sea conditions, and helm require alteration to the above, and experience with your
 freedom is advised. Be sure to practice tacking with the mizzen lowered, as the
 handling of the boat will be altered without sail area aft to help the boat turn into the
 wind.

The FREEDOM RIG

EXPLAINED BY JOHN OAKLEY



You get this:



Instead of this:



Diag A

Diag B

Miss Alfred Marks one of 3 Freedom rigged yachts entered in the Observer/Europe I Transatlantic Race and one of only 8 all female crewed entrants.

When I first saw the Freedom 40, about 4 years ago, I thought what a magnificent looking boat, but I must admit I did have my doubts about the rig because I was used to using finely tuned, aluminium spars. Or was it that I just disliked the look of that large unstayed mast? Anyway, any doubts that I had were soon removed when Fairways loaned me a 33 for the 1980 Round the Island race, which we won. I was utterly taken aback; how could such a large comfortable hull go so fast? So I had another look at the rig and remembered that if you move the mast away from the leading edge of a sail the efficiency will reach heights previously unknown. Well the wrap around sail does just that; it uses the mast as the leading edge of an aerofoil and the leeward section of the sail has a greater curvature to it than the windward surface which gives it its perfect aerofoil section. (See diagram A).

Sailing with this rig one finds that it is really efficient from 3 knots of wind right up to 33 knots (in the summer). This range of wind can be catered for without reefing; as the wind increases, one eases out the sheet until the wishbone ends are over the side of the boat, (like you would a Finn or an OK or Laser dinghy). In fact, you can feather the boat going to windward. Once you reach a wind strength when you have to reef it is a very simple matter as it is like a Jiffy reef on an ordinary mainsail (see diagram B). Incidentally at the London boat show we were practising reefing a Freedom Mizzen (which is quite a big sail) and we eventually got the time down to 6.5 seconds. Admittedly this was in no wind, but it just shows how easy it is to do it.

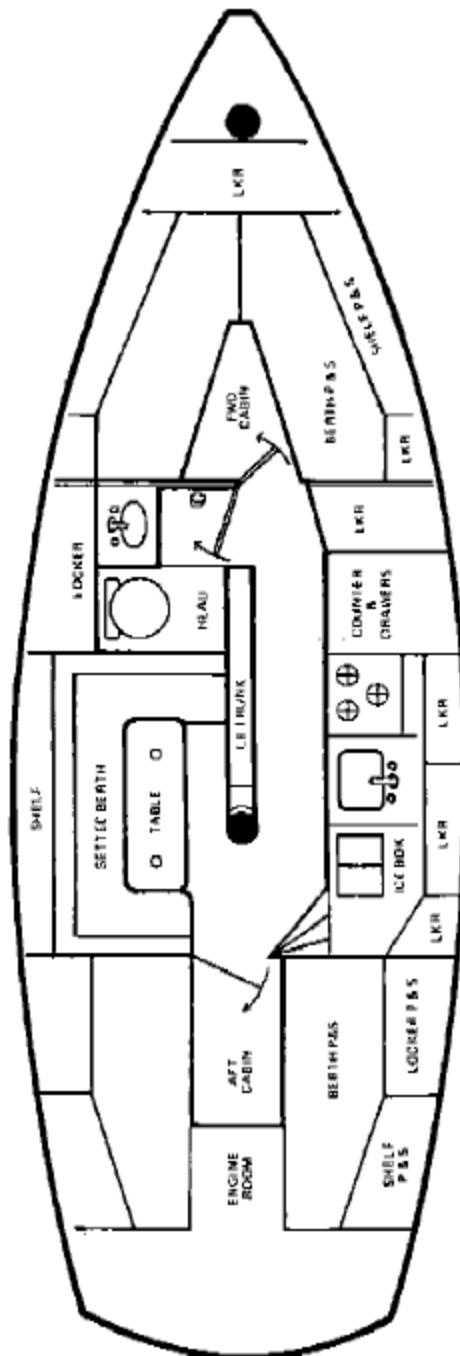
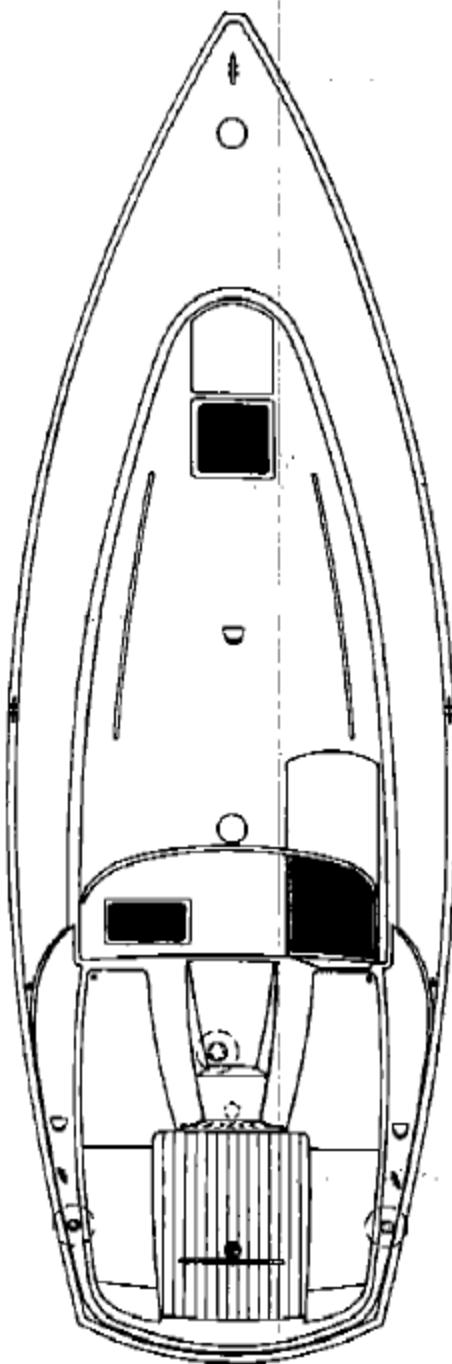
The Freedom rig allows you to do things that are impossible with a conventional rig. As an example, you can come into your mooring with the wind aft of the beam without lowering

the sails; you simply ease out the Mainsheet and Mizzen sheet until the wishbones are forward of the mast and flapping. You can also leave the mooring in this manner. You can gybe without first having to pull in the mainsheet, I have gybed all standing in +0 knots, although I blinked waiting for the visual crash of the boom reaching the shrouds. But with the Freedom rig there is no noise at all, all that happens is that it ends on the other side of the boat just flapping with no weight on the Mainsheet at all. Then it is a very simple matter of just pulling in the Mainsheet until you start sailing again.

When reaching or running you have the Mizzen out on one side and the Mainsail out on the other. In fact, reaching it is well worth letting the Mainsail go forward of the mast on the windward side, rather like reaching with a spinnaker up when the spinnaker boom goes almost up against the forestay. In between the Mizzen mast and the Main mast you set a Mizzen Staysail which really is the only extra sail you need on board.

I think that the most noticeable thing about the whole rig is that when it is blowing how quiet it is on board and down below; there is no howling of the wind in the rigging, there is no drum effect on the hull through pumped up backstays and tight shrouds, there is no slackening of headsails or winding of Genoa sheets, there is no flapping of slides in their tracks — just the noise of the water against the hull.

Performance wise against a conventional boat below 10 knots of wind to windward, when the other boats can set large light weather Genoas, the Freedom rig barely holds its own. Once the wind is over 10 knots however, going to windward, then there is no trouble what so ever and off the wind in any wind strength there is absolutely nothing of similar size that will stay with it.



OPTIONS:

Fiberglass bow sprit with anchor roller
50 Amp alternator and extra battery
110V shore connection, panel, 4 receptacles,
water heater element, trickle charger
Hand pump at galley sink
Cockpit dodger
Boarding ladder mounted on transom
Engine acoustically insulated
Painted name & sailport - standard paint
Painted name & sailport - gold leaf
Launch and commission

ELECTRONIC OPTIONS:

VHF Radio-Modar Nautilus 440
Modar Triton 55/75
Instrument Packages -
Datamarine \$100KL Knotmeter, \$200DI
Depth, CL100 Log, LX360 apparent
wind and wind speed

Datamarine \$100KL Repeater,
LX360 AWI-WS repeater
Brooks & Gatehouse Hornet Knotmeter,
log, amplified direction, wind direction,
wind speed
Brooks & Gatehouse Knotmeter and
wind speed repeaters
Lorans - Micro Logic ML120
ML220
SCL option
Texas Instrument TI900N

SAILS:

Main & Mizzen-5 oz. dacron-one reef
Sail covers
Large staysail-1.6 oz. dacron
Medium staysail-4 oz. dacron
Staysail gear
(Price of sails subject to sailmaker increases)

TERMS:

20% with contract - 40% hull molded
40% on delivery.

ESCALATION All prices are subject to escalation based on builder's cost increases. Final price of boat will not be increased by more than the Producers Price Index increases for the time from May 1, 1979 until the contract delivery date. Producers Price Index is published monthly by the Bureau of Labor Statistics.

TILLOTSON — PEARSON & HENRY, INC.

Bend Boat Basin
Melville, Newport, R.I. 02840
401-683-3503

FREEDOM 33COMMISSIONING INFORMATION

This information should be reviewed prior to preparing the Freedom 33 for delivery. We recommend that a copy of the enclosed information be available for the commissioning personnel as a reference, and informational aid when preparing a boat for delivery.

INDEX:

- A. Freedom 33, Commissioning Guide..... Pg. 1 - 4
- B. Freedom 33, Block List Pg. 5
- C. Freedom 33, Line List Pg. 6 - 7
- D. Freedom 33, Boom Hardware, Drawing Pg. 8
- E. Freedom 33, Mast Stepping, Drawing Pg. 9
- F. Freedom 33, Reefing System, Drawing..... Pg. 10

FREEDOM 33 COMMISSIONING GUIDEPrepare Boat For Launching

1. Install propellor, nut, cotter pin, and zinc
2. Install speedometer transducer
3. Touch up bottom paint, if required
4. Close all seacock
5. Install lifelines
6. Install wheel & check operation of steering

Launching And Start-up

1. Launch boat and check for leaks
2. Open engine seacock. Check engine and transmission oil.
3. Start engine, check exhaust for cooling water, check transmission operation, check fuel filter for air bubbles, check stuffing box.

Stepping Masts

1. Supplies needed for stepping masts:

- A. Mast wedges
- B. Mast collar bolts and nuts
- C. R.T.V.
- D. 2 Coins for steps
- E. 3/8" drill bit and drill
- F. 9/16" wrench and socket
- G. Hammer
- H. Caulking gun, tongue depressors, rags, and liquid soap ,

2. Prepare boat for stepping masts

- A. Remove mast hole covers and clean around edges for a good seal.
- B. Tie back electrical wires to prevent damage
- C. Check that mast step is clear and place coin in step
- D. Position booms over mast holes proper side up. (Reef cleat 14 to port)

3. Rig masts for stepping (Procedure is the same for both masts)

A. Install blocks as follows:

1. Main mast
 - a. Main halyard - 07-03 on rotating crane
 - b. Spare halyard - 05-05 on padeye
 - c. Topping lift - shackle to crane
 - * d. Uphaul- bolt padeye thru eyesplice to mast 9' above deck
Leave in shop

2. Mizzen masts

- a. Mizzen halyard - 07-03 on rotating crane
 - b. Staysail halyard - 05-05 on padeye
 - c. Topping list - shackle to crane
 - d. Backstay - on mizzen only - shackle to padeye
 - * e. Uphaul - bolt padeye thru eyesplice to mast 9' above deck
Done in shop
 - B. Rig halyards, secure to mast
(on main mast-use red lines; mizzen blue)
 - C. Install flag halyards, topping lifts, boom uphauls, and backstays. Secure to halyards near butt end of masts.
 - D. Install radio antenna and wind instrument senders
 - E. Slide deck collar up mast approx. 8' and tie or tape to prevent sliding when mast is stepped.
 - F. Fish electrical wires out of mast thru hole below deck level, and tape to mast to prevent damage when stepping mast.
4. Lifting masts: a lifting line approximately 60' in length is required to lift masts (See commissioning details for lifting example)
5. Step masts, making sure that masts go thru boom before into deck hole. Once masts is fully in step, crane may be removed. When both masts are stepped boat may be moved to slip.
- A. Position masts by rotating by hand and align mastheads w/ centerline of boat.
 - B. Check fit of wedges and trim if necessary.
 - C. Apply liquid soap to wedge and drive into deck level.
 - D. Use plenty of caulking and bolt down.
 - E. Pin masts at step using (2) 3/8" bolts tapped into mast.

Set-up Running Rigging

1. Halyards

- A. Main halyard runs thru Schaefer 05-05 on centerline aft of collar and leads aft thru inboard set of fairleads.
- B. Main outhaul runs thru Schaefer 05-04 at forward port corner collar then back to cockpit thru fairlead.
- C. Mizzen halyard runs thru Schaefer 05-04 on centerline aft of collar and aft to cockpit.

- D. Mizzen outhaul runs thru Schaefer 05-44 at forward port corner of collar then aft to cockpit.
- E. Mizzen staysail halyard thru Schaefer 05-44 on port corner of collar and aft to cockpit.

2. Sheets

- A. Install on main boom Harken 028 block and on deck Harken 030 reave mainsheet and run back to cockpit.
- B. Install on mizzen boom Harken 028 block and on traveler car Harken 042. Reave sheet and run to cockpit.

3. Install sails

- A. Lay sail out on deck with the two clews aft, tack forward and head to one side.
- B. Take one clew around front of mast and inside boom
- C. Loop both clews together using empty eye in outhaul, lead line thru, block (11), masteye (6), & tie to block (9). Shackle empty eye in outhaul tackle (5) to block (9). Lead thru block (8) & back twice then forward thru masteyes (6), turning block (4) & down to deck.
- D. Install batten and tie leech tie lines.
- E. Run boom lash from padeye (3) thru gromments in sail to other side of boom & back tie thru empty eye.
- F. Run halyard bridle thru both sides of headboard and secure tightly to both sides with overhand knot.
- G. Raise sail until boom is level and secure uphaul to lash at this point.
- H. Continue raising sail until halyard is at full height.
- I. Secure one end of downhaul, run thru sail and secure.
- J. Lower sail and furl in shockcord on boom.

4. Reefing System

- A. Attach blocks as follows:
 - * 1. 05-05 on padeye (15)
 - 2. 05-04 on boom end with NF537 shackle ~~in this shackle~~
 - 3. 05-05 on "D" rings inside sail
 - 4. 05-05 on mast collar stb corner aft
- B. Dead end reef pennant to boom by leading end thru padeye (12). around boom & thru eye on other end of pennant.

Freedom 33 Commissioning Guide

K - 1/81

- C. Run pennent thru sail, block on side of boom & block on end of boom.
- D. Lead pennent between two plys of sail, above clews, to block on "D" rings, down to deck & back to cockpit stopper thru fairleads.

FREEDOM 33 BLOCKS

<u>STOCK #</u>	<u>QTY.</u>	<u>OEM #</u>	<u>DESCRIPTION</u>	
C10004	✓ 2	SCH 07-03	Halyard Block	
R1029	✓ 2	SCH 05-05	Halyard Block	
R1029	✓ 2	SCH 05-05	Halyard Block	
R6071	✓ 6	SCH 05-04	Outhaul Block	
R2014	✓ 3	SCH 05-44	Outhaul Block	
R4067	✓ 2	SCH 05-54	Outhaul Block	
R7035	✓ 1	Harken 034	Main Sheet Block	
R7008	✓ 2	Harken 028	Sheet Block	
R7009	✓ 1	Harken 042	Mizzen Sheet Block	
R4022	✓ 4	SCH 93-02	Downhaul Shackles	
should be ✓ present at SPT-	R6012	✓ 2	SCH 05-09	Staysail Blocks
R1029	✓ 6	SCH 05-05	Reef Block	
R6071	✓ 2	SCH 05-04	Reef Block	
R4062	✓ 2	SCH 35-01	Backstay Tackles	

R.L. - 1/81

FREEDOM 33 LINE LIST

Main Halyard	1	P/N
1) R7020	105'	7/16" Red Yacht Braid, Empty Eye/ Whip
2) R7020	2½'	7/16" Red Yacht Braid, Whip/Whip
Mizzen Halyard	1	P/N
1) R7019	80'	7/16" Blue Yacht Braid, Empty Eye/ Whip
2) R7019	2½"	7/16" Blue Yacht Braid, Whip/Whip
Spare Main Halyard	1	P/N
1) R7020	105'	7/16" Red Yacht Braid, Splice To (2) /Whip
2) R6049	1	SCH 45-05, Splice To (1)
Staysail Halyard	1	P/N
1) R7019	80'	7/16" Blue Yacht Braid, Splice To (2) /Whip
2) R6049	1	SCH 45-05, Splice To (1)
Main Sheet	1	P/N
1) R2019	100'	7/16" White, Splice To (2)/Whip
2) R6049	1	SCH 45-05, Splice To (1)
Mizzen Sheet	1	P/N
1) R2019	82'	7/16" White, Splice To (2)/Whip
2) R6049	1	SCH 45-05, Splice To (1)
Uphaul c/n mngt	2	P/N
1) Z120-02	12'	5/16" White, Empty Eye/Whip
Downhaul	2	P/N
1) R2019	10'	7/16" White, Empty Eye/Whip
Flag Halyard	②	P/N
1) R1026	70'	1/8" Dacron Cord Hot Knife/Hot Knife

Freedom 33 Line List

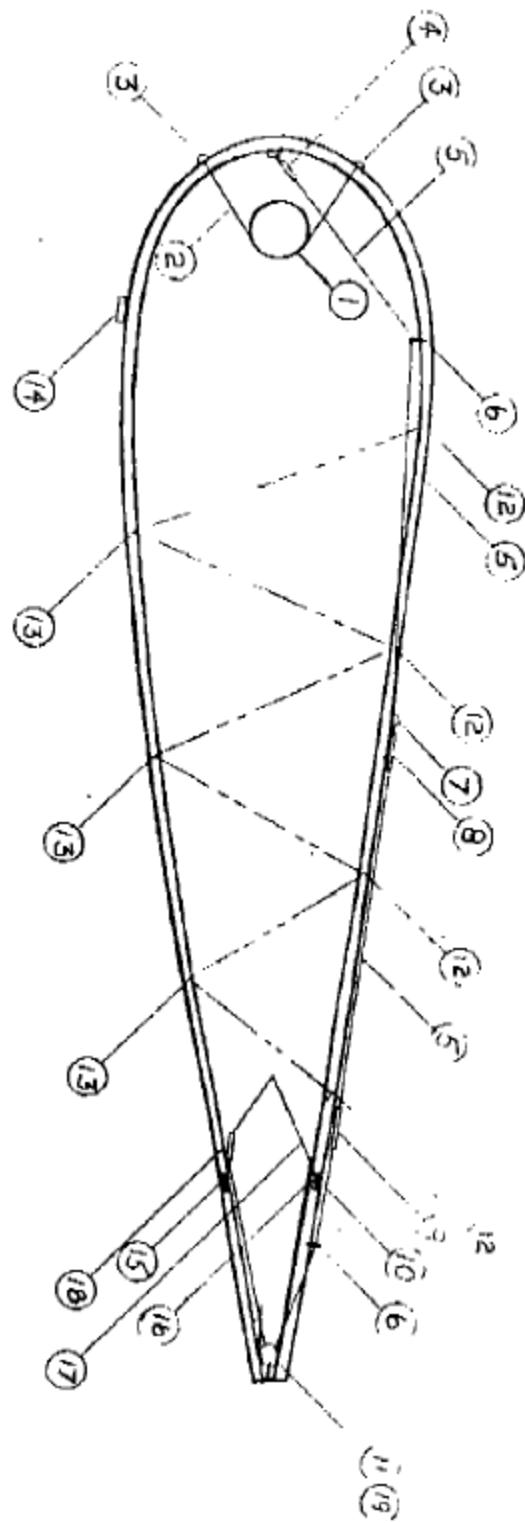
RI - 1/81

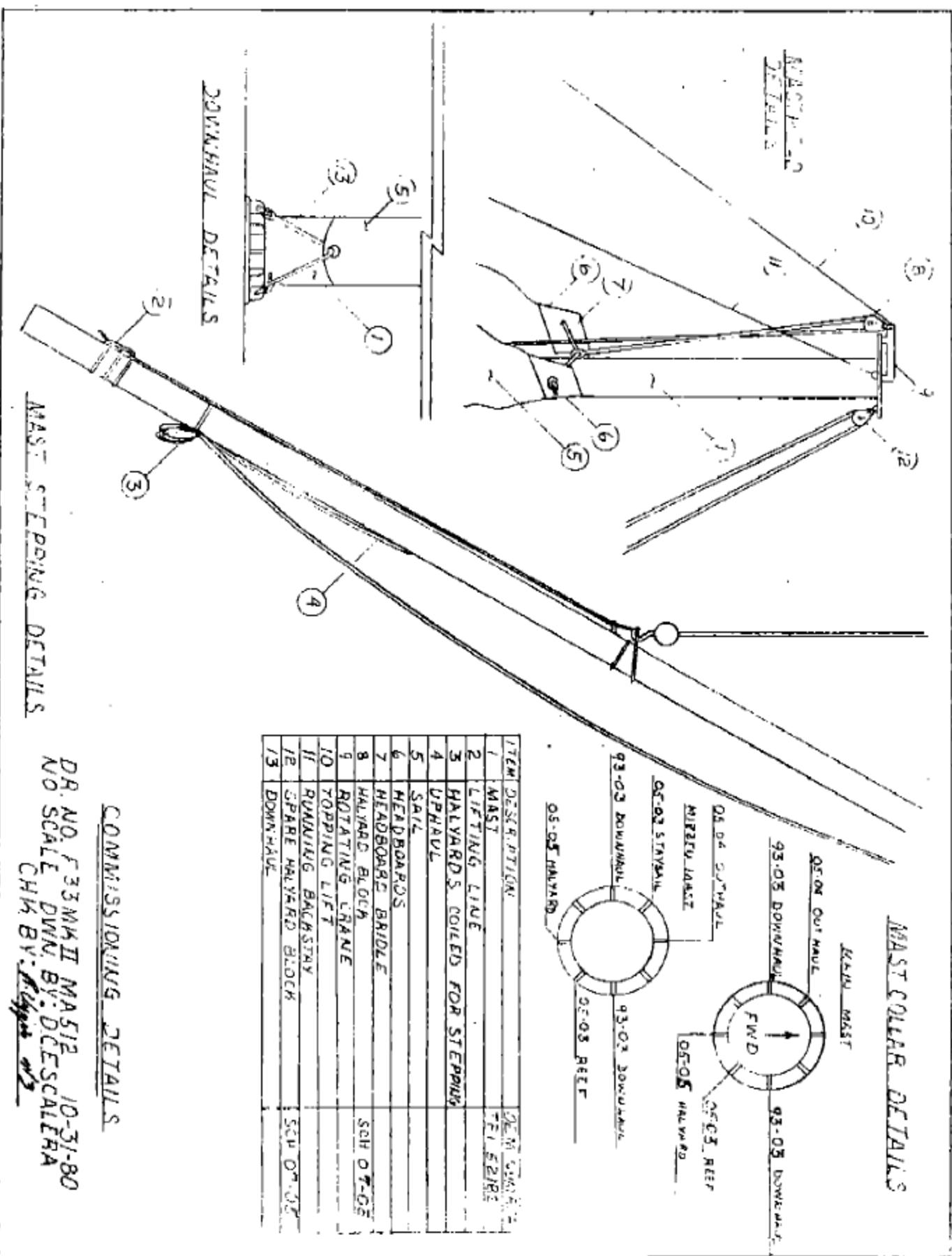
<i>Main Topping Lift</i>	1	P/N
1) OP7019	33'	1/8" X $\frac{1}{4}$ ", (7X7) PVC Coated
2) Z120-01	12'	$\frac{1}{4}$ " White, Empty Eye/Whip
3) E110-16	1	1/8" Marine Eye, Shackle To (2)
4) E110-18	1	1/8" SS Thimble
5) Z110-12	2	1/8" Nico Press
6) R6072	3	SCH 93-12 Shackles
<i>Mizzen Topping Lift</i>	1	P/N
1) OP7019	30'	1/8" X $\frac{1}{4}$ " (7X7) PVC Coated
2) Z120-01	12'	$\frac{1}{4}$ " White Empty Eye/Whip
3) E110-16	1	1/8" Marine Eye Shackle To (2)
4) E110-18	1	1/8" SS Thimble
5) Z110-12	2	1/8" Nico Press
6) R6072	3	SCH 93-12 Shackles
<i>Mizzen Runners</i>	(2)	P/N
1) OP7019	35'	1/8" X $\frac{1}{4}$ " (7X7) PVC Coated
2) E110-16	1	1/8" Marine Eye, Shackle To (6)
3) E110-18	1	1/8" SS Thimble
4) Z110-12	2	1/8" Nico Press
5) R6072	2	SCH 93-12 Shackles
		SCH 35-01
<i>Main Reef Line</i>	1	P/N
1) Z120-03	90'	3/8" White, Whip/Whip
<i>Mizzen Reef Line</i>	1	P/N
1) Z120-03	70'	3/8" White, Whip/Whip
<i>Boom Lash</i>	(2)	P/N
1) Z120-03	8'	3/8" White, Empty Eye/Whip
<i>Outhaul I</i>	(2)	P/N
1) R2019	7'	7/16" White, Empty Eye/Whip
<i>Outhaul II Main</i>	1	P/N
1) R9008	82'	3/8" Green Yacht Braid, Empty Eye/Whip
<i>Outhaul II Mizzen</i>	1	P/N
1) R9008	45'	3/8" Green Yacht Braid,Empty Eye/whip

NOTE: MIZZEN BOOM SHOWN
MAIN BOOM RIGGED IN SIMILAR
MANNER

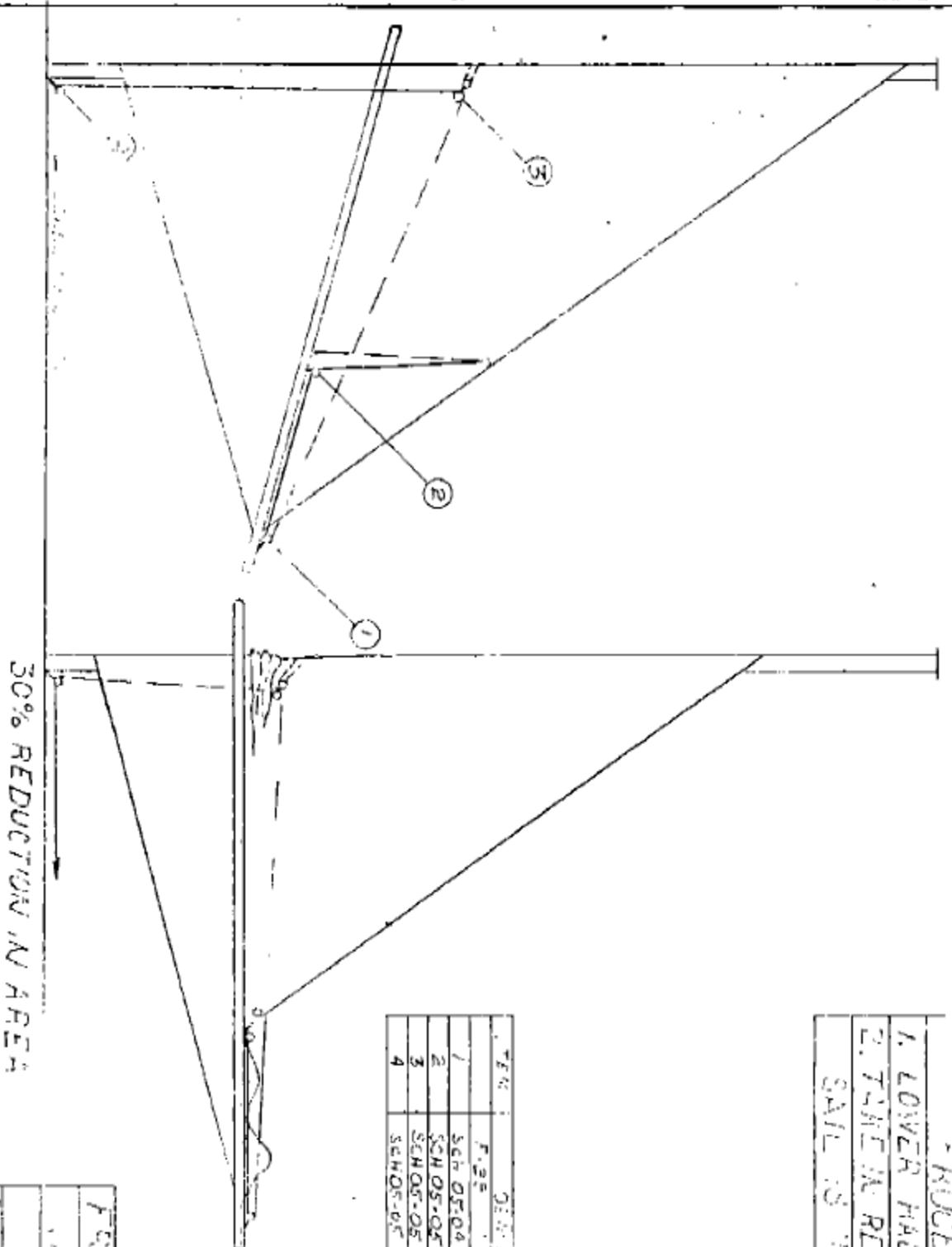
ITEM	DESCRIPTION	ITEM NUMBER
1	MAST	TPI 52102
2	BOOM LASH	TPI
3	BOOM LASH PADYE	SCH 7B-03
4	FORWARD TURNING BLOCK	SCH 06-04
5	OUTHAUL TACKLE LINE	TPI R 9008
6	MAST EYE FAIRLEAD	SCH 92-03
7	WEEDED TAB	
8	OUTHAUL TACKLE BLOCK	SCH 05-04
9	OUTHAUL TACKLE BLOCK	SCH 05-04
10	OUTHAUL LINE	TPI
11	AFT OUTHAUL TURNING BLOCK	SCH 06-04
12	SHOCK CORD PADYE	SCH 7B-03
13	SHOCK CORD HOOD	WC 257
14	CLEAT	WC 14052
15	REEF PADYE	SCH 7B-03
16	REEF PADYE	SCH 7B-03
17	REEF LINE	SCH 05-05
18	REEF BLOCK	SCH 05-05
19	REEF TURNING BLOCK	SCH 05-04

FREEDOM 33	
BOOM HARDWARE	
DR. NO.	F 33 MHZ MAST
DATE:	10-30-80
TILLOTSON-PEARSON INC.	
DEND DIAH LASHIN	
MELVILLE, NEWPORT, R. I. 02840	





Pg. 10



30% REDUCTION IN AREA

FREIGHT REFFING		
ITEM	SIZE	SIZE
1	SCB 05-05	SCB 05-05
2	SCB 05-05	SCB 05-05
3	SCB 05-05	SCB 05-05
4	SCB 05-05	SCB 05-05

1/10

RODE
1. LOWER HATCH TO MARS.
2. TIE UP REEF LINE FROM
3. SAME AS PREV.

CONTENTS

	PAGE
I. COMMISSIONING	1
I.1. BEFORE LAUNCHING	1
I.2. STEPPING MASTS	1
I.3.A. SAIL HALYARD	2
I.3.B. TOPPING LIFT	2
I.3.C. RUNNING BACKSTAYS	2
I.3.C.1. Caution on RUNNING BACKSTAYS	2
I.3.D. HOISTING SPAR	2-3
I.3.E. COMPLETION OF SPAR INSTALLATION	3-4
I.4. INITIAL SAIL ADJUSTMENT	4
I.4.A. DOWNHAUL	4
I.4.B. OUTHAUL	4
I.4.C. BOOM LASH	4
DRAWINGS & TABLES	
COMMISSIONING DETAILS - FREEDOM YACHTS	5
I.A. MASTHEAD DETAIL	5
MAST STEPPING DETAIL	5
DOWNHAUL DETAIL	5
I.B. MIZZEN & MAIN SHEETING	6
TYPICAL MAST STEP	6
TYPICAL MAST PARTNER	6
I.C. FREEDOM REEFING SYSTEM	7
I.D. FREEDOM 28 & 33 BOOM PRINCIPAL HARDWARE	8
I.E. FREEDOM 40 & 44 BOOM PRINCIPAL HARDWARE	9
I.F. FREEDOM 33 LOCATION OF LINES	10
I.G. FREEDOM 40 LOCATION OF LINES	11
I.H. FREEDOM 44 LOCATION OF LINES	12
I.I. FREEDOM 33 BLOCK LIST	13
I.J.K. FREEDOM 33 LINE LIST	14
I.L. FREEDOM 40 BLOCK LIST	15
I.M.N. FREEDOM 40 A/C LINE LIST	16

CONTENTS (CONTINUED)

	PAGE
I.O. FREEDOM 44 BLOCK LIST	17
I.P.Q. FREEDOM 44 LINE LIST	18
II. GENERAL INFORMATION	19
II.1. THE RESPONSIBILITY OF YOUR DEALER	10
II.2. FUELING	20-21
II.3. DIESEL ENGINE-GENERAL	21-22
II.3.A. ENGINE OPERATION	22
II.3.A.1. TO START ENGINE	22
II.3.A.2. TO STOP ENGINE	22-23
II.3.B. ENGINE FRESH WATER COOLING SYSTEM	23
II.3.C. SAFETY PRECAUTIONS WITH DIESEL ENGINES	23-24
II.3.D. EXHAUST SYSTEM	24-25
II.3.E. ADJUSTMENT OF PROPELLOR SHAFT STUFFING BOX	25
II.3.F. FIGURE II.3.D.	26
II.3.G. FUEL TANK	25
II.4. ELECTRICAL SYSTEM	27
II.4.A. SHOREPOWER SYSTEM	27-29
II.4.A.1. BATTERY CHARGERS	29
II.4.B. LIGHTNING PROTECTION	29-30
II.5. PLUMBING	30
II.5.A. FRESH WATER SYSTEM	30-31
II.5.B. WATER HEATER	31
II.5.C. HEAD	30
II.5.C.1. "Y" VALVE	31
II.5.C.2. HOLDING TANK	31-32
II.5.C.3. OPTIONAL RECIRCULATING HOLDING TANK	32
II.6. STEERING SYSTEM	32-34

CONTENTS (CONTINUED).

	PAGE
II.6.A. COMPASS	34
II.6.B. EDSON PEDESTAL MAINTENANCE	33
II.7. STOVE	34
II.7.A. TYPICAL OPERATION ROUTINE	35
II.7.B. CAUTION	35-36
II.8. GENERAL	36
II.8.A. INTERIOR CUSHIONS	36
II.8.B. LIFELINES	36
II.8.C. DECK HATCHES	36
II.8.D. PORTLIGHTS	37
II.8.E. ANCHOR ROLLER FITTING	37
II.9. SAIL SETTINGS	38-39
II.9.A. RAISING & LOWERING SAILS	39
II.9.B. GENERAL CHARACTERISTICS OF SAIL TRIM	39
II.9.C. SHORTENING SAIL	39
DRAWINGS:	
II.A. FREEDOM 33 WATER SUPPLY SYSTEM	40
II.B. FREEDOM 33 HEAD AREA PLUMBING	41
II.C. FREEDOM 40 FRESH WATER SYSTEM	42
II.D. FREEDOM 40 PLUMBING INLETS	43
II.E. FREEDOM 40 FUEL SYSTEM SUPPLY	44
II.F. FREEDOM 44 FRESH WATER SYSTEM	45
II.G. FREEDOM 44 DRAINAGE	46
II.H. FREEDOM 33 WIRING DIAGRAM	47
III. MAINTENANCE	49
III.1. GENERAL	49
III.2. FINISHES	49

CONTENTS (CONTINUED)

	PAGE
III.2.A. FIBERGLASS	49
III.2.B. BOTTOM PAINT	49
III.2.C. EXTERIOR TEAK	49
III.2.C.1. CAUTION ON TEAK OILS	49
III.2.D. INTERIOR WOOD	50
III.2.E. DECK HARDWARE	51
III.2.F. WINCHES	51
IV. WINTER STORAGE - FOR THOSE NOT ABLE TO ENJOY YOUR FREEDOM YEAR AROUND	51
IV.1. SAILS, SHEETS, AND LINES	51
IV.2. ENGINE AND FUEL SYSTEM	51
IV.3. BATTERIES	51-52
IV.4. HEAD	52
IV.5. FRESH WATER SYSTEM	52
IV.6. BILGES	52
IV.7. VENTILATION	52
IV.8. WINTER COVER	52-53
IV.9. CRADLE	53
IV.10. STORING OF MASTS	53
V. OTHER INFORMATION	54
V.1. WARRANTY	54

I. COMMISSIONING**I.1. BEFORE LAUNCHING:**

Check that the engine and head(s) have been de-winterized, and that all drain plugs are in place. Check all hose clamps and tighten as necessary. The engine fresh water cooling system is filled with permanent anti-freeze solution at the factory. Check for evaporation and add more anti-freeze solution if required.

Inspect all thru hull connections, and open valves.

Mark propeller shaft with fixed prop vertical and folding prop with blades opening horizontally. For best sailing speed, set shaft to this position while sailing. Never leave engine out of gear and allow the shaft to rotate while sailing.

Install fully charged batteries or be sure batteries are charged.

Check engine and transmission oil level.

When picking up boat, note proper location for straps, and mark rail so that the straps can be easily positioned upon haul out. Be especially carefull that the aft strap does not contact the propeller shaft, as the shaft will be bent.

I.2. AFTER LAUNCHING:

Immediately check bilge for water, inspecting each thru hull fitting carefully.

When the engine is initially started, check that water is coming out the exhaust. If water does not come out the exhaust, check that the engine water thru hull is open and not blocked, then check the water pump impeller.

After engine has run in gear for several hours, adjust the packing at the shaft stuffing box. Avoid over tightening - it should drip a little water.

Check engine alignment.

I.3. STEPPING MASTS:

- Note - the procedure is similar for both main and mizzen masts.

Prior to hoisting mast, install halyard blocks, halyards, and lifts. Refer to the list of blocks and running rigging for details of the system used on each model.

I.3.A. SAIL HALYARD:

Note that the sail halyard leads through its halyard block so the two ends which attach to the sail's headboards are on the outward side of the block. The running end will lead inside the sail, between the headboards, and outside the lash to the collar block.

I.3.B. TOPPING LIFT:

The end of the wire topping lift with a Nicopressed eye is shackled to the socket on the halyard block, or to a separate attachment point on the masthead crane aft of the halyard block. The lashing line for the topping lift is shackled to the marine eye on the other end of the boom, and be tied back on itself.

I.3.C. RUNNING BACKSTAYS - MIZZEN ONLY:

The end of the each mizzen runner with a Nicopressed eye is shackled to a pad eye on the underside of the masthead, one port and starboard. Rope tackles are provided which run between the lower end of the wire runners and the deck attachment point.

I.3.C.1. RUNNING BACKSTAYS - CAUTION:

ANY TIME A STAYSAIL IS USED, A RUNNING BACKSTAY MUST BE IN PLACE AND TENSIONED.

I.3.D. HOISTING SPAR:

Refer to diagram labeled: "Commissioning details - Freedom Yachts" Pg. 1.

I.3.D. HOISTING SPAR (CONTINUED)

Because Freedom spars lack hardware to which to attach a lifting line, hoisting the spar must be done by a skilled rigger. One procedure is to pass a lifting line twice loosely around the spar, to which a crane hook may be attached. Tie the free end of the line with a bowline back around the standing part of the line. The standing end of the line can be lead down the spar to a position about 10' from the butt, and secured with a series of half hitches. Care must be exercised in lifting the spar that the half hitches remain tight, and do not slip as they accept the weight of the spar. As with any crane load, personnel should not place themselves in a position which would result in injury if the load falls.

Prior to hoisting a spar, be sure the aluminum deck collar is in place over the mast partner aperture, and that the wishboom is encircling the mast partner aperture, with the wishboom right side up.

I.3.E. COMPLETION OF SPAR INSTALLATION:

After the spar is stepped, rotate the spar to align the mast-head exactly fore and aft in the vessel. A tape measure used between the end of the wire portion of the running backstays and the toe rail on each side of the vessel will indicate the athwartships orientation of the mast as the wedge is driven in.

The wedges have been prefitted at the factory. If considerable additional trimming is required call the factory.

The wedges must be driven and/or cut so the top of the wedge ends up flush with the top of the deck. Use extreme care in driving the wedges to avoid hitting the spar, which can be damaged by a careless hammer blow.

After wedge is fully driven, caulk the seam between the deck and wedge and wedge and spar. Then bolt deck collar down, with caulking under the bolts. Do not use caulking with a high amount of adhesive quality (like 3M #5200) as the adhesive will make removal of the collar and wedge difficult.

NOTE: DO NOT SUBSTITUTE other mast wedges than the plastic wedges shipped with the boat. The use of any other wedges will void all warranties of the spars.

To complete the installation, the mast must be pinned to the mast base. To facilitate this procedure, holes have been pre-drilled and tapped in the mast base. Carefully drill 7/16" holes into

I.3.D. HOISTING SPAR (CONTINUED):

the mast through the tapped holes in the base, being careful not to abrade the threads. Run the bolts provided through the tapped holes, and into the mast.

The lightning grounding wire exiting from the mast should be attached to the mast base using the bolt provided for this purpose.

I.4. INITIAL SAIL ADJUSTMENT:

(refer to diagrams for terminology)

To obtain the performance potential of the Freedom rig, some adjustments will be required on the first few outings. These adjustments can be made at anchor, but underway is preferable. Adjustments are facilitated by having at least three people on board. Adjustments are similar for both sails. Read full adjustment procedure before making any adjustments.

I.4.A. DOWNAUL:

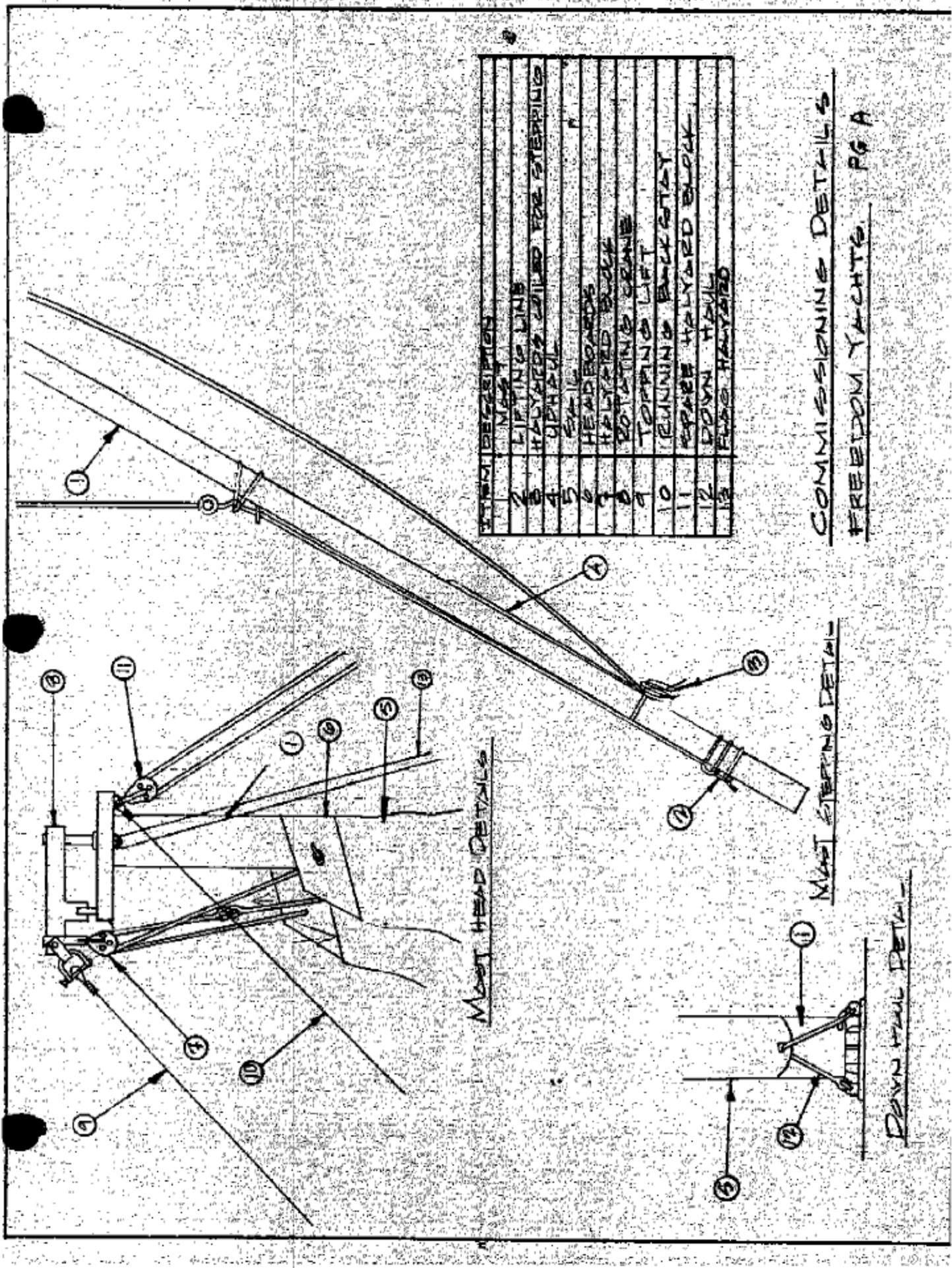
Hoist sail so the headboards are just below the masthead crane. Tension the downhaul line as much as possible by hand, and mark the height of the lower edge of the sail skirt on the mast. Lower halyard partially, and re-tie the downhaul so the skirt is 4" lower on the mast than the mark. The extra length of the boist with the downhaul tied as above will allow luff tension to be controlled solely by the halyard which leads conveniently to the cockpit.

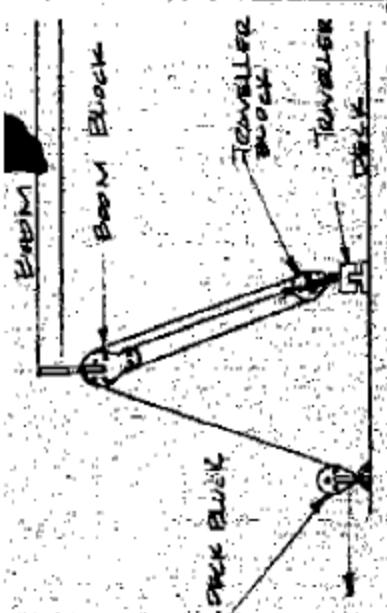
I.4.B. OUTH AUL:

Once the downhaul is set, the outhaul may be adjusted. Tension the outhaul line leading to the cockpit slowly while observing the outhaul tackle system on the boom. Proper outhaul adjustment allows the sail to be flattened so that it does not touch the leeward side of the wishboom while sailing up wind, and does not form a deep "pocket" aft of the mast on the windward side of the sail. If the outhaul tackle blocks run into each other before the sail is adequately tensioned, release the outhaul and retie the line running from the clew of the sail to the aft outhaul block so the extended length of the tackle is longer. Retest the outhaul.

I.4.C. BOOM LASH:

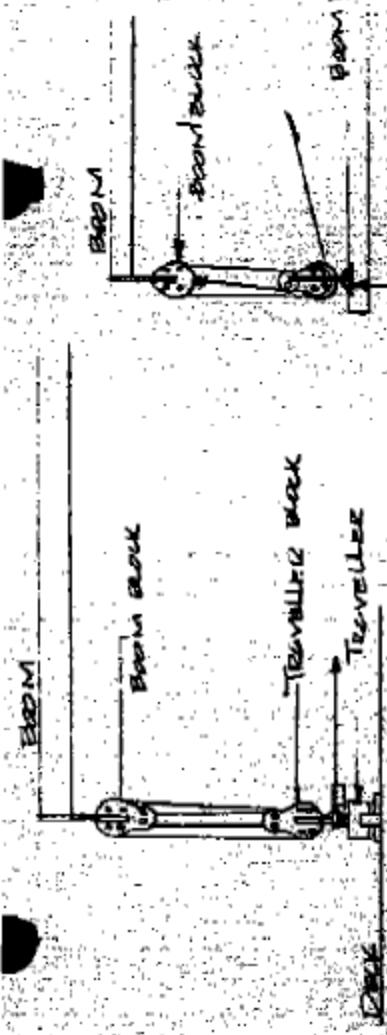
If the sail runs into the end of the boom before it is sufficiently flattened for upwind work, the boom can be moved aft relative to the mast by adjustment of the boom lash. To adjust boom lash, slacken outhaul and lower the sail. Hold the front side of the wishboom up, and untie the uphaul from the lash. Re-tie the lash to force the boom farther aft. Resecure uphaul, hoist sail, and check operation of outhaul.



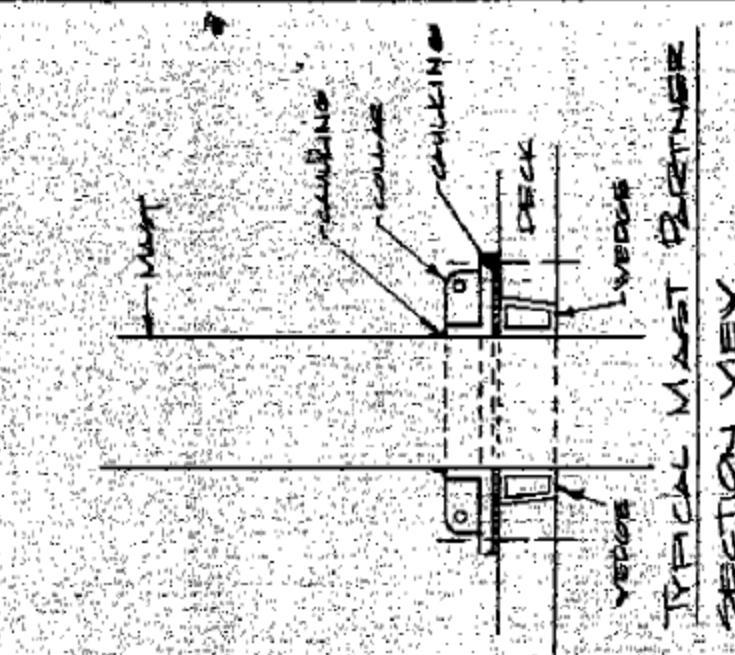


FREEDOM 39, 40, 44 MAIN SHEET

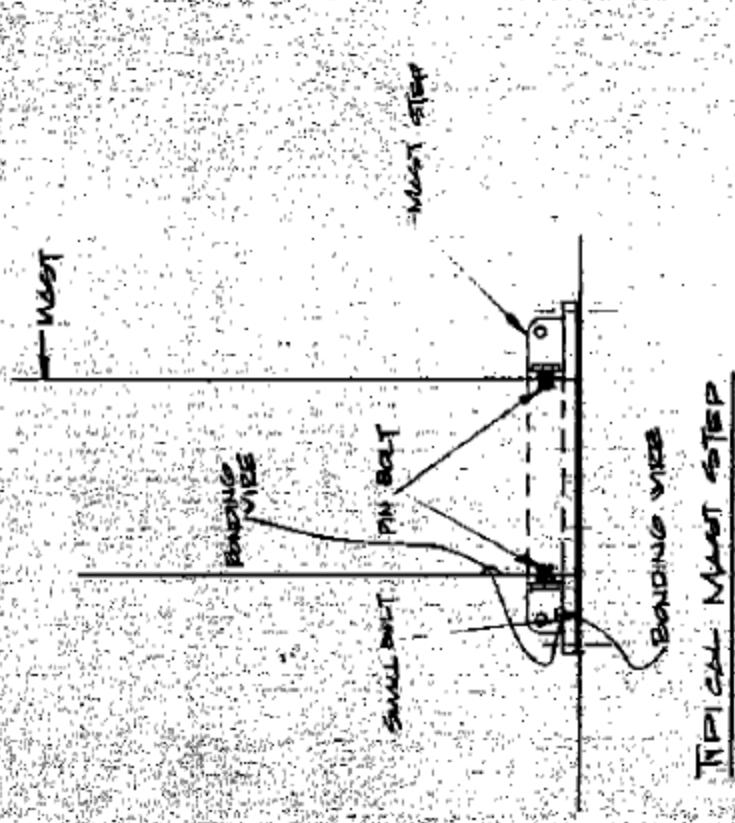
PAPER
FREEDOM 40 NIZZEN SHEET



FREEDOM 39, 44 NIZZEN SHEET



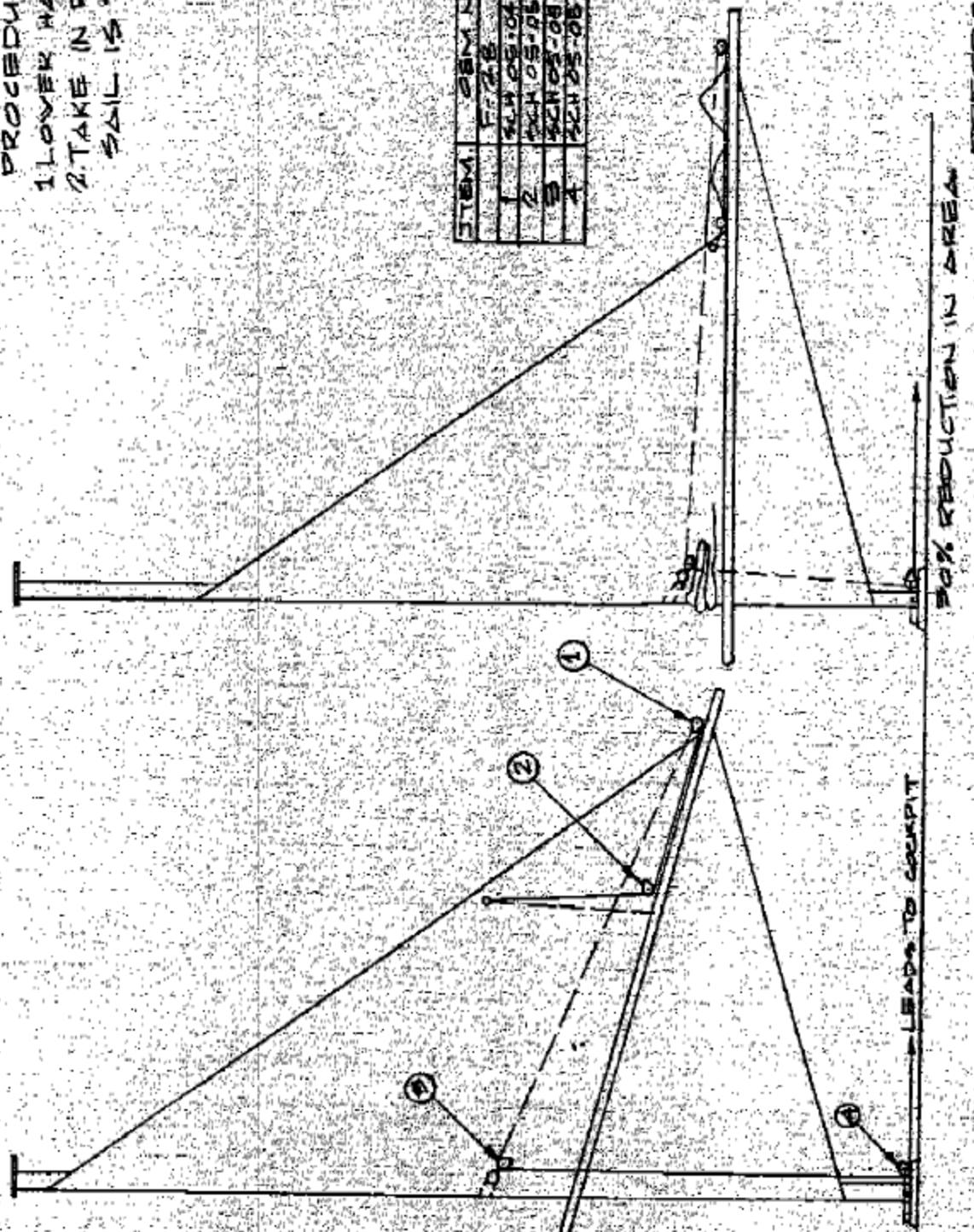
SECTION VIEW



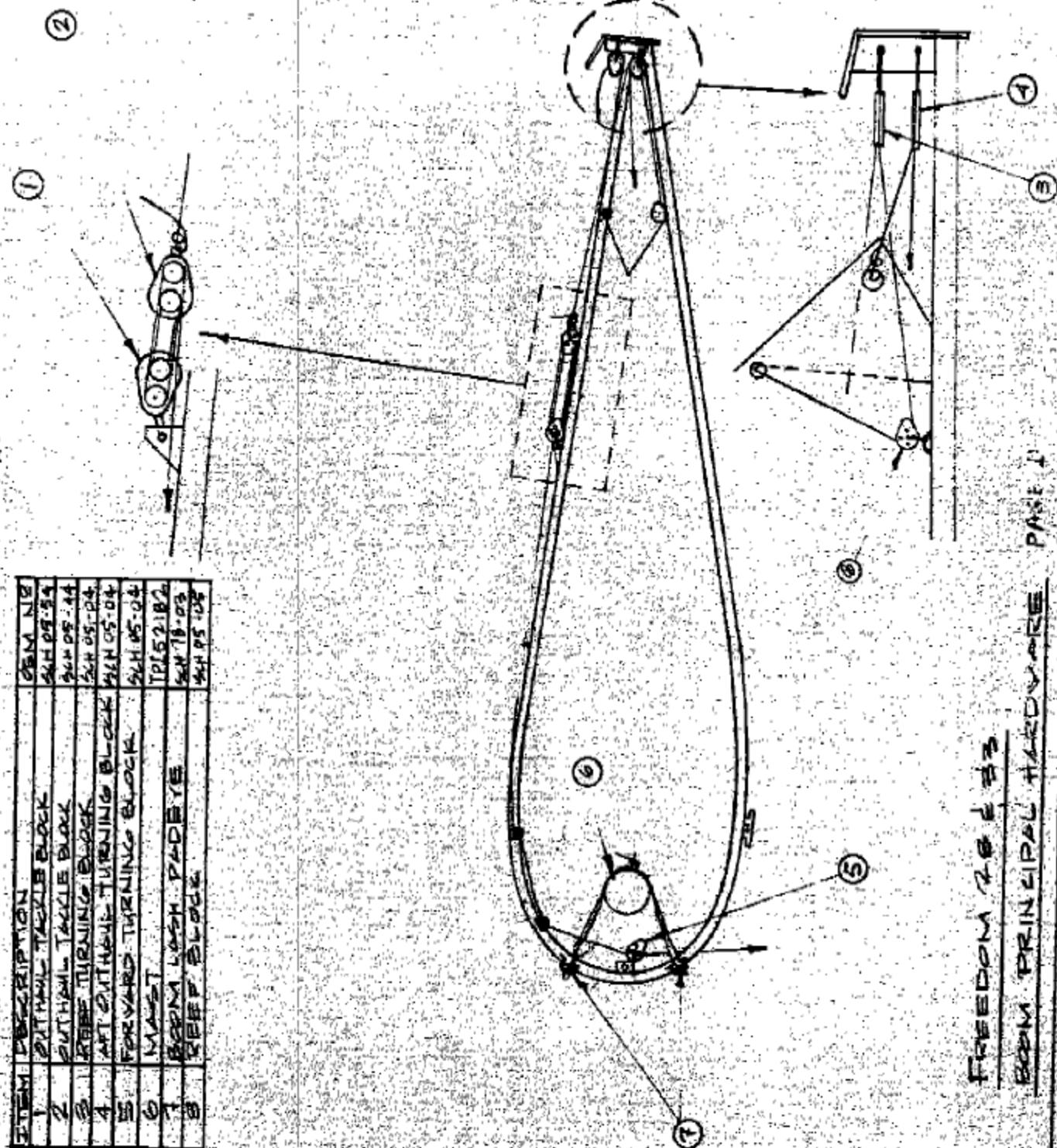
SECTION VIEW

PROCEDURE
1 LOWER HAWK TO MARK
2 TAKE IN REEF LINE UNTIL
SAIL IS TIGHT

ITEM	ITEM NUMBER	E-28	E-38	E-40
1	42-1	05-04	42-105-04	05-05
2	42-1	05-05	42-105-05	05-06
3	42-1	05-06	42-105-06	05-07
4	42-1	05-07	42-105-07	05-08

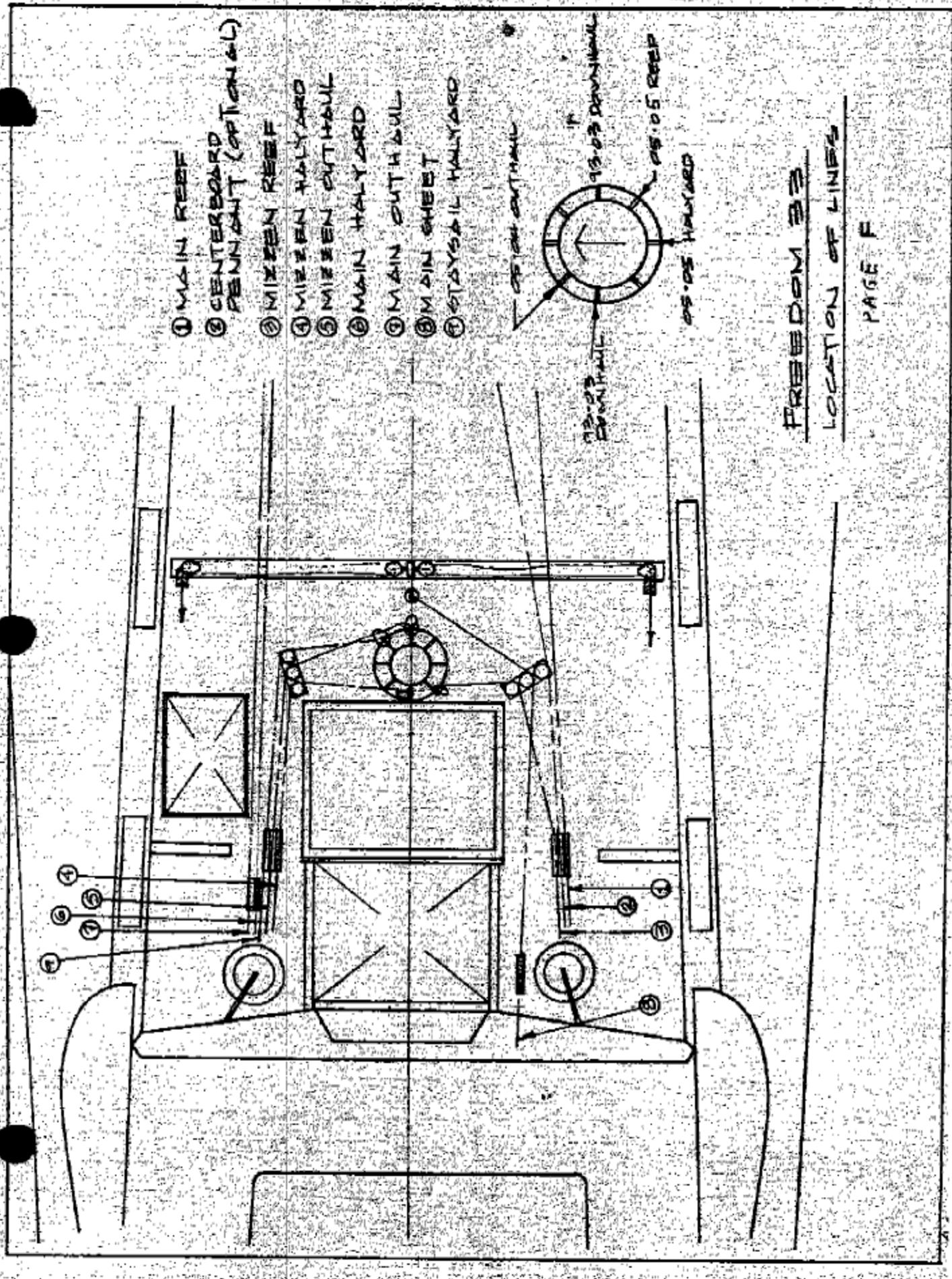


ITEM	DESCRIPTION	C/N NO.
1	BUTTERFLY VALVE BLOCK	SCH 05-04
2	BUTTERFLY TURBINE BLOCK	SCH 05-04
3	FREE TURNING BLOCK	SCH 05-04
4	ANTI COUNTER TURNING BLOCK	SCH 05-04
5	FORWARD TURNING BLOCK	SCH 05-04
6	MAST	TP152-182
7	BOOM LASH PADDLE	SCH 78-03
8	REEF BLOCK	SCH 95-03



FREEDOM 2004

BOOM PRINCIPLE HARNESS PAGE 1



F-33 BLOCK LIST

Stock #	Qty	MFGR/ Part #	Description
R10207	2	Schaefer 07-23	Halyard crane block
R1029	2	Schaefer 05-05	Halyard collar block
R1029	4	Schaefer 05-05	Staysail & spare halyard block
R7008	1	Harken 028	Mainsheet boom block
R10206	1	Harken 006	Mainsheet traveller block
R10205	1	Harken 005	Mainsheet deck block
R6071	2	Schaefer 05-04	Outhaul boom end block
R4067	2	Schaefer 05-54	Outhaul tackle block
R2014	2	Schaefer 05-44	Fixed outhaul tackle block
R6071	2	Schaefer 05-04	Outhaul forward lead block
R1029	2	Schaefer 05-05	Outhaul collar block
R6071	2	Schaefer 05-04	Boom end reef block
R1029	2	Schaefer 05-05	Side boom reef block
R1029	2	Schaefer 05-05	Forward turning reef block
R1029	2	Schaefer 05-05	Reef collar block
R4022	4	Schaefer 93-02	Down haul shackles
R7008	1	Harken 028	Mizzen sheet boom block
R7009	1	Harken 042	Mizzen traveller block
R6072	2	Sch. 93-12	Bosse end, topping lift shackles
R6072	6	Sch. 93-12	Topping lift shackles
R6072	4	Sch. 93-12	Running backstay shackles

5-27-DCE
6/4/04

NOTE: Freedom Yachts reserves right to substitute equipment for that listed herein without prior notice.

6-3-81 DCE

6/19 11:33am

FREEDOM 33 LINE LIST

Main Halyard

1) R7020

2) R7020

Mizzen Halyard

1) R7019

2) R7019

Spare Main Halyard

1) R7020

2) R6049

Staysail Halyard

1) R7019

2) R6049

Main Sheet

1) R2019

2) R6049

Mizzen Sheet

1) R2019

2) R6049

Uphaul

1) Z120-02

Downhaul

1) R2019

Flag Halyard

1) R1026

Main Traveler Lines

1) R6033

2) R6072

1

77' 7/16" Red Yacht Braid Whip/Whip, Splice
Empty Eye in Center

67'

7/16" Red Yacht Braid, Whip/Whip

1

70' 7/16" Blue Yacht Braid Whip/Whip, Splice
Empty Eye in Center

45'

7/16" Blue Yacht Braid Whip/Whip

1

105' 7/16" Red Yacht Braid Splice to (2)/Whip

1

SCH 45-05, Splice to (1)

1

80' 7/16" Blue Yacht Braid Splice to (2)/Whip

1

SCH 45-05, Splice to (1)

1

100' 7/16" White Splice to (2)/Whip

1

SCH 45-05, Splice to (1)

1

82' 7/16" White Splice to (2)/Whip

1

SCH 45-05, Splice to (1)

2

12' 5/16" White, Empty Eye/Whip

2

10' 7/16" White, Empty Eye/Whip

2

70' 1/8" Dacron Cord Hot Knife/Hot Knife

2

14' 3/8" Red Yacht Braid Whip/Empty Eye

1

Schaefer 93-12 Shackle

Freedom 33 Line List

Main Topping Lift	1	
1) OP7019	33'	1/8" X $\frac{1}{4}$ " (7X7) PVC Coated
2) Z120-01	12'	$\frac{1}{4}$ " White, Empty Eye/Whip
3) E110-16	1	1/8" Marine Eye, Shackle To (2)
4) E110-18	1	1/8" SS Thimble
5) Z110-12	2	1/8" Nico Press
6) R4072	3	SCH 93-12 Shackles
Mizzen Topping Lift	1	
1) OP7019	30'	1/8" X $\frac{1}{4}$ " (7X7) PVC Coated
2) Z120-01	12'	$\frac{1}{4}$ " White, Empty Eye/whip
3) E110-16	1	1/8" Marine Eye Shackle To (2)
4) E110-18	1	1/8" SS Thimble
5) Z110-12	2	1/8" Nico Press
6) R6072	3	SCH 93-12 Shackles
Mizzen Runners	2	
1) OP7019	32'	1/8" X $\frac{1}{4}$ " (7X7) PVC Coated
2) E110-16	1	1/8" Marine Eye, Shackle To (6)
3) E110-18	1	1/8" SS Thimble
4) Z110-12	2	1/8" Nico Press
5) R6072	4	SCH 93-12 Shackles
	1	SCH 35-01
Main Reef Line	1	
1) Z120-03	90'	3/8" White, Whip/Whip
Mizzen Reef Line	1	
1) Z120-03	70'	3/8" White, Whip/Whip
Boom Lash	2	
1) Z120-03	10'	3/8" White, Empty Eye/Whip
Outhaul I	2	
1) R2019	7'	7/16" White, Empty Eye/Whip
Outhaul II-Main	1	
1) R9308	82'	3/8" Green Yacht Braid, Empty Eye/Whip
Outhaul II Mizzen	1	
1) R9308	45'	3/8" Green Yacht Braid,Empty Eye/

II. GENERAL INFORMATION

II.I. THE RESPONSIBILITY OF YOUR DEALER

The Freedom dealer from whom you bought your yacht is an expert at his profession. He knows boats, understands your needs and wants to serve you. His reputation is on the line every time he offers a boat for sale and one of the prime reasons he is a Freedom dealer is his awareness that Freedom Yachts will provide a level of performance, an elegance of decor and a quality of construction of which he and his customers can be proud.

Before shipment from the factory, your boat was carefully inspected and thoroughly checked out.

Should you receive delivery at any location other than the dealer's place of business, your dealer is still responsible for inspection and any required warranty service. Further, it is the responsibility of your dealer to ensure that all equipment agrees with the inspection report, a copy of which is included with every boat.

Your dealer is responsible for processing claims against the transportation company for any loss or damage during shipment. Should you notice any loss or damage of this sort, please notify your dealer immediately, because neither the carrier nor the factory can accept responsibility for reports later than thirty days after delivery.

It is also the responsibility of your dealer to assist you in obtaining service and to process claims under the warranty for the period of the warranty.

He invites you to ask his assistance in all matters pertaining to your new Freedom Yacht.

II.2. FUELING

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

1. Approach the fueling dock at a reasonable speed to eliminate waves and insure control of your boat. Have consideration for others who may be taking on fuel and provisions.
2. Properly secure boat to dock using bow, stern, and spring lines.
3. Close all hatches and ports.
4. DO NOT SMOKE.
5. SHUT OFF ALL EQUIPMENT . . . ENGINE, GENERATOR, MASTER BATTERY SWITCH, STOVE, CABIN, HEATER, RADIOS, LIGHTS, ETC.
6. If practicable, all personnel not involved in fueling should leave the boat.
7. Keep a fire extinguisher handy.
8. Remove fuel fill plug and clean threads of both plug and deck plate carefully so no dirt falls into filler aperture.
9. Place the nozzle of the fuel hose in the fill pipe. Keep it in contact with the deck plate rim to avoid a static electric charge.
10. Fill slowly. DO NOT OVERFILL. Marine fuel expands with an increase in temperature. Therefore, fill only to approximately 95% capacity.
11. If you cannot see the fuel pump, ask the attendant or a crew member to call out the gallonage.

II.2. FUELING (CONTINUED):

12. 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 SITUATION BEFORE PROCEEDING.
13. Open all hatches and ports to facilitate ventilation.
14. Only after you are totally satisfied that no potentially dangerous condition exists, leave the fuel dock. Be considerate of your fellow yachtsman.
15. In the event of serious spillage, STOP FUELING IMMEDIATELY. Replace fill plate, notify attendant so he may warn others and wash down thoroughly until all traces of fumes or fuel have disappeared.
16. Do not fuel during electrical storms.

NOTE: In Remote areas, be sure the check fuel before filling tank(s) to be sure it is water free, clean, diesel oil. Once contaminated by dirt, water, or gasoline, the tank(s) can be difficult to clean.

II.3. DIESEL ENGINE-GENERAL

The most common cause of trouble with a diesel engine 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. The procedure only takes five minutes after you are acquainted with what to do, but can be exasperating to the uninitiated.

Diesel engines generate considerable heat. Always let the engine idle for a minute or two before shutting down.

II.3. DIESEL ENGINE-GENERAL (CONTINUED)

As with any engine, do not shift from forward to reverse at high engine RPM. Keep engine gear shift lever in Reverse position while sailing. The Engine Manufacture's owner's manual contains a wealth of information about the engine. Take time to read the manual BEFORE you need the information due to a malfunction.

II.3.A. ENGINE OPERATION:**II.3.A.1. TO START ENGINE:**

- A. Battery switch must be on.
- B. Be sure gear shift is in neutral.
- C. Advance throttle to approximately 1/4 position.
- D. PREHEAT - if engine so equipped.
If engine has not been started for some time, or in cold weather, use "preheat" switch on engine control panel in cockpit to facilitate starting. The ignition breaker must be in ON position for preheat to be effective.
- E. Turn key switch to the ON position, (if so equipped), or turn ignition breaker on and depress starter button until engine starts.
- F. If engine starts, check oil pressure, ammeter charge rate and discharge of cooling water. It may be necessary to momentarily speed up the engine to cause a charge to be shown on the ammeter and the tachometer to be functional. Let engine warm up at a fast idle, perhaps 20% above minimum idle speed.

II.3.A.2. TO STOP ENGINE:

- A. Pull stop knob and hold it until engine dies, then push knob back.

II.3.A.2. TO STOP ENGINE (CONTINUED):

B. ONLY AFTER ENGINE HAS STOPPED - Shut off key switch or ignition breaker. Turning off the switch while the engine is operating will NOT stop the engine, and may damage the alternator. Be sure to shut off the switch after the engine has stopped, as leaving the switch on will maintain a flow of current to the alternator.

II.3.B. ENGINE FRESH WATER COOLING SYSTEM:

The engine utilizes a closed cooling system 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 using air to cool a contained liquid. The filler cap for the fresh water (closed) cooling system is located on the top of the engine manifold, and looks like a radiator cap. Use the same precautions in removing the cap from a hot engine as are appropriate for the radiator cap on an automobile. Check the level in the manifold frequently. If additional liquid is needed, the liquid should be anti-freeze and fresh water mixture.

If the fresh water system is drained, or has a substantial leak, an air lock may develop in the fresh water cooling system, especially on boats having the water heater option. 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 Northern latitudes 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 lay-up.

II.3.C. SAFETY PRECAUTIONS WITH DIESEL ENGINES:

The National Fire Prevention Association and the United States Military both agree that the flash point of Grade #1 diesel fuel is 100 degrees fahrenheit. The flash point of Grade #2 diesel fuel is 125 degrees fahrenheit.

Diesel engines used in the marine industry today operate with very high exhaust temperatures. The result is that any defect in the cooling water to the exhaust line can cause excessive buildup of heat, which in turn could create a fire. The volume of cooling water can easily be restricted by a blockage of the flow of water anywhere within the system, thereby creating potential fire hazard.

II.3.C. SAFETY PRECAUTIONS WITH DIESEL ENGINES (CONTINUED):

After a diesel engine has been stopped it continues to emit a tremendous quantity of heat. This is normal considering the temperatures that the engine must operate at in order to combust the fuels. If this heat emission elevates the temperature in the engine compartment above the flash point of the diesel fuel, then there is an extreme potential fire hazard.

Because there are numerous switches and electrical connections adjacent to and in the engine compartments of most yachts, any spark and short-circuit from this wiring combined with the heat factor and presence of diesel fumes may cause a potentially disastrous fire.

II.3.D. EXHAUST SYSTEM:

Your boat is equipped with a water lift principle muffler. This system cools the engine exhaust as it exits from the engine, reducing heat build-up, and exhaust noise.

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 occurrence or over heating.

There will always be a little water in the bottom of the water lift "pot". In Fall decommissioning, the pot should be drained using the drain plug, or anti-freeze should be added to the pot so that the residual water will not freeze.

If the engine should lose compression from sticking valves, bad piston rings, or other causes, and is cranked for a prolonged period, engine cooling water may build up in the pot. In this very unlikely situation, the cooling water intake should be shut off to prevent flooding the engine, or the drain on the pot opened.

Before engine cooling water is injected into the exhaust elbow, it runs up to a point above waterline, where an anti-syphon valve admits air to the line when the engine is off, to prevent syphoning. Especially if operating in dirty water, the anti-syphon valve may clog, and fail to admit air at engine shut down. Check the operation of the anti-syphon frequently.

II.3.E. ADJUSTMENT OF PROPELLER SHAFT STUFFING BOX:

Where the propeller shaft exits the hull, a packing gland is necessary to prevent ingress of water. The assembly is sketched in figure II.3.E.1. The basic assembly is a large nut forward on the assembly which retains the packing inside the nut. A thin lock nut is behind the large nut to prevent the large nut from turning with the shaft.

Two large wrenches are necessary for adjustment of the stuffing box. Be certain that the proper size wrenches are purchased for your vessel. If proper wrenches are not available, arc-joint pliers (Channellock is one popular brand) may be used with care.

If the stuffing box is leaking more water than a drop every 5 to 20 seconds while the shaft is rotating, and a drop every 20-40 seconds with the shaft stopped, the unit may be adjusted to reduce the water ingress to these levels.

Hold the large forward nut, and back off the thin nut perhaps one turn or less. Tighten the forward nut to the aft nut very snugly. Run engine in gear and check for water leakage. If still present, repeat the procedure. If over tightened, the stuffing box will heat up and may even burn the packing. It is better to have the stuffing box leak a little than be too tight.

When further tightening of the nut does not give proper results, the packing should be replaced. To replace packing, unscrew the large nut totally off, and slide it up the shaft. Use an ice pick or equal to remove the old packing. Wrap two turns of new square packing around the shaft, making each turn its own unit, beveling the ends as shown in figure II.3.E.2. Replace the large nut, and tighten as above.

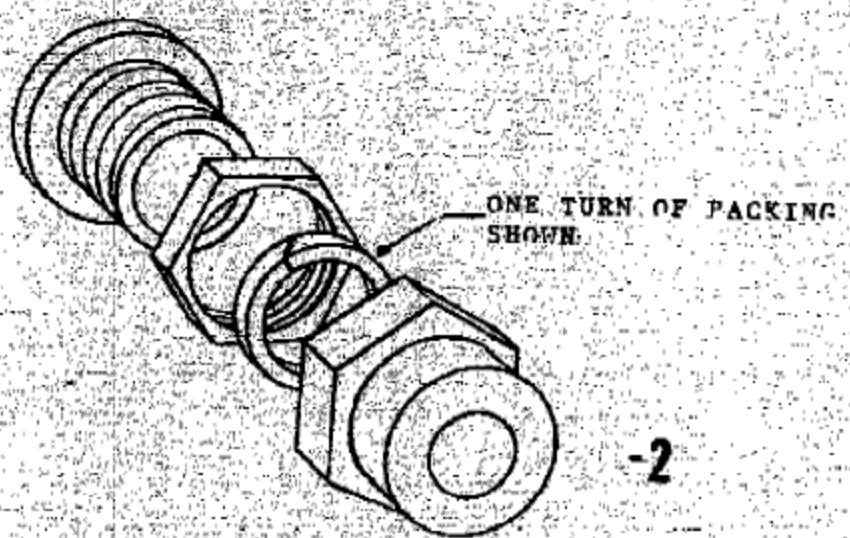
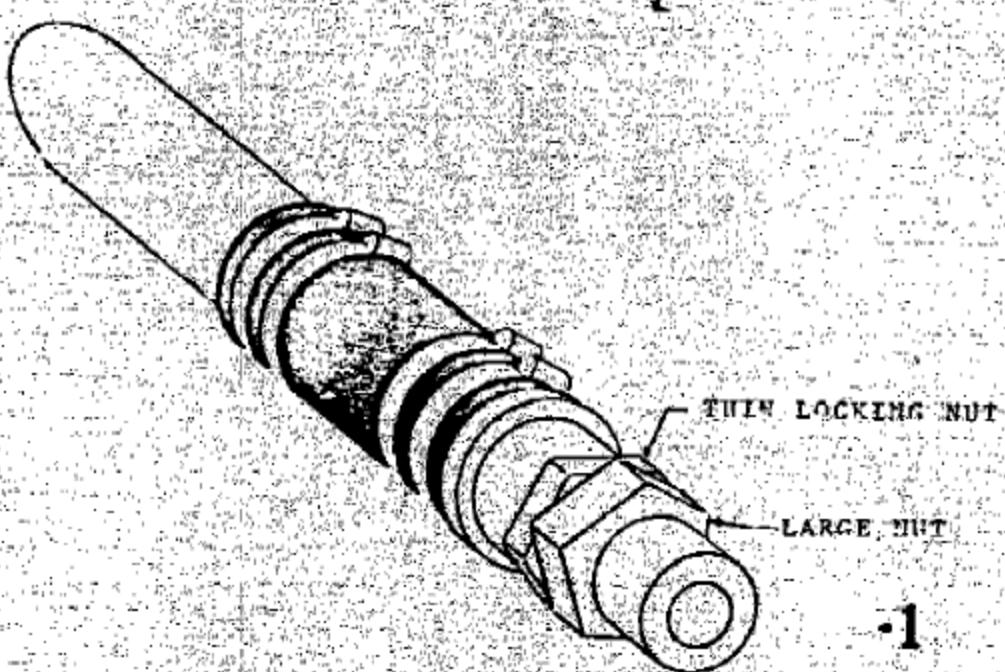
II.3.F. FUEL TANK:

Since diesel engines require bleeding after they have been deprived of fuel, it is important the shut-off valve be in the ON position (lever parallel to piping) anytime the engine is started.

The fuel tank utilizes a mechanical fuel gauge which is not a direct reflection of the fuel in the tank. When the tank is half full, the gauge will read more than 1/2, for example.

Motor sailing when the fuel tank is low on fuel may result in the engine ingesting air and consequently stopping.

II.3.E - Typical Stuffing Box



II.4. ELECTRICAL SYSTEM:

A 12V D.C. electrical system is used throughout the vessel for lighting and operation of pumps and various accessories. For any 12V current to be delivered, the following criteria must be met:

1. Charge in the battery.
2. Master switch in "Batt. 1" - "Batt. 2" - or "Both" position.
3. Master circuit breaker on the electrical panel - ON. (if vessel so equipped)
4. Circuit breaker for the individual appliance - (cabin lights, running lights, etc.) - ON.
5. Switch on the appliance (if there is one, such as cabin light) - ON.

The battery monitor installed on the electrical panel will give an indication of the charge status of the battery to which the battery selector has been turned. The battery monitor will show a high reading when the engine is on and the alternator is charging.

The amount of charge going into the batteries is shown on the Ammeter in engine panel in cockpit. Generally, this meter will show a high rate of charge as soon as the engine starts, and the charge will taper off as the batteries come up to full charge. The voltage regulator automatically regulates the amount of charge going into the batteries, and reduces the level to prevent the batteries "boiling" over as they reach capacity. For this reason, even though an engine has a 55 amp alternator, charging the batteries for an hour will NOT put a full 55 amp-hours back into the battery.

II.4.2. SHOREPOWER SYSTEM (OPTIONAL ON SOME MODELS):

The 110 volt AC shorepower system is functional only when the vessel is plugged into suitable power from shore. The cord provided has the standard end for the amperage service. Depending on the wiring in your facility, various adaptors may be required to plug the shore end of the cord in. The vessel end of the cord plugs into the inlet located inside the cockpit. The cord should be inserted with the socket holes matching those in the inlet, and turned to lock the socket. The outside ring on the cord should then be screwed into the flange of the inlet to give the cord additional protection from pulling out.

WARNING

To minimize shock and fire hazards:

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

Reprinted from ABYC Safety Standard

E-8
S-1-77

II.4.2. SHOREPOWER SYSTEM (OPTIONAL ON SOME MODELS) (CONTINUED):

The switch panel for the shorepower system is located next to the DC panel.

Functions of the panel are as follows:

Orange light: Indicates that the shore power is hooked to an active shore circuit.

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 these motors.

AC Normal and AC Reverse: These Breakers have an interlock to prevent turning them both on at once. To check polarity, make sure all circuit breakers are off and turn on AC normal breaker. The green light should go on indicating correct polarity. If the polarity is reversed the red light will illuminate. To obtain the correct polarity, turn the AC normal off, switch the interlock, and turn on the AC reverse. The green light should illuminate.

II.4.2. SHOREPOWER SYSTEM (OPTIONAL ON SOME MODELS) (CONTINUED):

Once polarity is correct, the circuit breakers for individual appliances may be activated as desired.

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

Water Heater: Supplies power to the optional water heater, if installed. Note the cautions regarding the use of electrical power to heat water contained elsewhere in this manual.

Outlet: Supplies power to the outlets placed throughout the cabin.

II.4. BATTERIES:

Batteries will last longer if they are kept charged during periods when they are not used. Be sure to check the water level in the batteries at least every two weeks. Adding water to a partially charged battery will lower the charge in the battery. Never add water to a battery which is charging, either via the engine alternator or a separate charger. Be careful in adding so that the battery acid does not splash. Never add salt water to a battery. Most boat batteries have a shortened life from improper storage during lay up periods, lack of water, and the use of "quick" chargers. Distilled water is preferable for batteries, if available.

II.4.A. BATTERY CHARGERS:

A proper marine battery charger is strongly recommended. The use of inexpensive automotive type battery chargers which do not have built in isolation transformers can cause electrolysis to the vessel. One safeguard is to disconnect the NEGATIVE battery lead from the engine when using any charger other than a high quality marine charger with built in isolation transformer.

Always ventilate the battery compartment when using a battery charger.

II.4.3. LIGHTNING PROTECTION:

II.4.3. LIGHTNING PROTECTION:

The masts are grounded to the keel and engine in accordance with industry practice. In spite of this grounding, there can be no assurance the personnel or the boat will not suffer injury if the vessel is hit by lightning.

The following are adapted from the ABYC safety standards, are suggestions only, and in no way guarantee safety.

1. If possible, remain inside a closed boat during a lightning storm. Do not contact any metallic objects inside the vessel.
2. Avoid making contact with any items connected to lightning conductive system (mast step support, etc.) and especially in a way to bridge between two of them.
3. No one should be in the water during a lightning storm.
4. If the boat has been struck by lightning, compasses and electrical gear should be checked to determine that no damage or change in calibration has taken place.

II.5. PLUMBING:**II.5.A. FRESH WATER SYSTEM:**

The vents for the water tank(s) are below decks and the overflow when the tanks are full will run into the bilge. The overflow when filling tanks can be misconstrued to be indicative of a structural leak, since the overflow water also ends up in the bilge. Tank(s) fill through separate fill fittings located on the deck. Each time a tank is filled, it is wise to wipe off threads on the center plug and those on the deck fitting to remove dirt which may prevent a good seal.

When a tank has run 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, the pressure system may have difficulty overcoming the air in the water lines. After the valves have been changed so that there is water available to the pressure pump, and the pump is turned on at the electrical panel, open a water faucet to allow air to escape. Eventually, there will be a trickle of water. When this happens, 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.

II.5.A. FRESH WATER SYSTEM (CONTINUED):

Read the caution regarding the hot water system, if vessel is equipped with horsepower.

The water in your tanks may develop a taste after a period of time. This will happen to any water in any tanks, as it grows "flat." The addition of a commercial water preservation agent such as Sudbury Aqua Fresh crystals will greatly improve the taste of water stored for a long period.

II.5.B. WATER HEATER CAUTION:

When the water heater is operating from shore power, a continuous supply of water must be available to the heater. Be certain that the pressure water pump is ON, and that the tank from which water is being withdrawn does contain water. If the electric element in the water heater is allowed to operate without water even for a few minutes, it WILL BURN OUT. Due to this potential risk, water heater elements are excluded from warranty.

Before taking a shower, check that the sump pump is operational so the shower drain water will not flood the bilge.

II.5.C. HEAD:

It is always good seamanship to close the intake and discharge seacock (if installed) for the head when leaving the vessel. Also be certain, while sailing, that the flush control valve or lever on the head is not left in the flush position to prevent the head from filling with water which will spill as the boat heels.

II.5.C.1. "Y" VALVE:

If your vessel is operated outside the territorial waters of the U.S., the "y" valve may be shifted to pump toilet effluent overboard directly. Note that this practice is illegal in U.S. waters and will result in a substantial fine. Some waters prohibit the existence of a "y" valve, and the device should be removed. Conformance with sanitation laws is an owner responsibility.

II.5.C.2. HOLDING TANK:

Your vessel is equipped with a holding tank for retention of sewage.

II.5.C.2. HOLDING TANK (CONTINUED):

Sea water is used to flush the head, and the sea water and effluent is pumped into the holding tank by pumping the toilet. A deck fitting is provided through which the holding tank may be evacuated by a shoreside pump out station.

With the standard holding tank, it is not necessary to "precharge" the tank by adding water before using the system. Be certain that the pump on the toilet is pumped several additional strokes after waste has been evacuated from the bowl to insure that the effluent is pumped through the hoses and into the tank.

If the toilet should be difficult to pump, check that the holding tank is not overly full. Trying to over fill the holding tank will injure the tank, and may force waste out the air vent fitting. The holding tank must be pumped out before winter storage, and a small amount of recreational vehicle anti-freeze added to the residual water.

II.5.C.3. OPTIONAL RECIRCULATING HOLDING TANK:

An optional arrangement allows the effluent liquid to be used to flush the toilet, which increases the number of uses of the tank. This system must be charged with chemicals before using initially, and after each pump out. The recirculating system has valves which can be used to pump the toilet with either effluent liquid or sea water.

Typical operation would be to pump sewage out of the toilet using effluent liquid, then change the valves and pump a little sea water into the bowl. Always close the sea water intake valve after use to prevent filling up the tank with sea water.

III.6. STEERING SYSTEM:

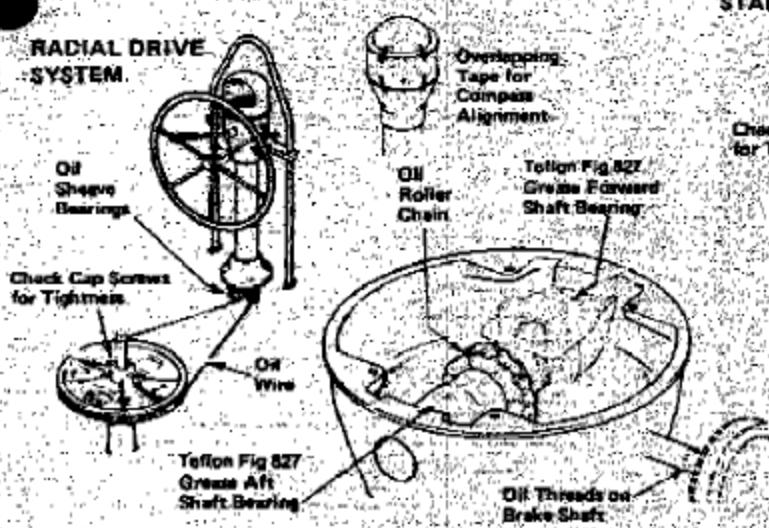
Your Vessel is equipped with an Edson pedestal steering system. Information on maintenance of this system is included elsewhere in this manual. Additionally, an emergency tiller is provided.

The emergency steering system may not allow as much rudder angle as the pedestal steering system, and the force on the tiller can be considerable, as the mechanical advantage in the pedestal system is not used. Steering with the emergency tiller may be more convenient if the steering wheel is removed from its hub. This is readily done by unscrewing the nut which holds the wheel on the hub, and pulling the wheel off the hub. Each time the steering system is inspected, check that the wheel has not seized on the hub, and can still be readily removed.

Edson**EDSON PEDESTAL MAINTENANCE GUIDE**STEERING MAINTENANCE
LUBRICATION ED-204

This guide has been prepared to assist you in the proper maintenance of your Edson Steering System. To properly maintain the moving parts in the top of the pedestal, it is necessary to remove the compass and its cylinder. For proper alignment when re-installing the compass, we recommend placing 3 or 4 lengths of tape on the pedestal and compass as shown below. Silt the tap when removing compass, align the strips of tape when re-installing the compass for visual compass realignment. Your compass MUST then be checked for accuracy. Lubrication of needle bearings should be done by squeezing Edson Fig. #827 Teflon Lubricant into the holes located on top of the bearing housings inside the pedestal bowl. Spin the wheel when squeezing the lubricant in to make sure the entire bearing is serviced. Winch grease or water pump grease can be used as an alternative, but don't let the bearings run dry. Do not over grease as it will run onto the brake pads. Oil the chain with #30 weight motor oil. Do not grease chain as it does not penetrate the links.

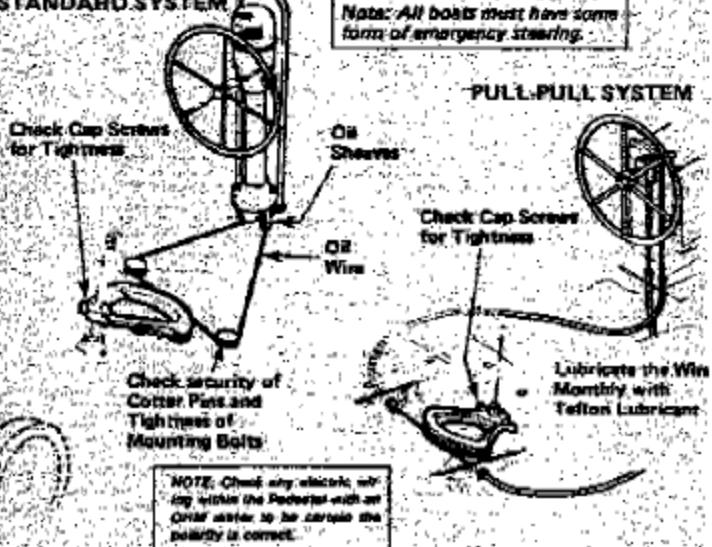
Inspect the condition of the wire, tension of the wire and lightly oil. Edson recommends placing about 5 layers of "Kleenex" on the palm of your hand, squirt oil on the tissue and lightly oil the wire. This will lubricate the strands but will also "flag" a broken or hooked strand by tearing off a small section of tissue. If you do have a wire break, replace the wire immediately. See Edson Fig. 775 wire and chain replacement kits. (Caution: Wire splinters can cause painful cuts.) Replace the wire after 5 years. If still good, keep the old wire on board as a spare. To check for proper wire tension, lock the wheel in position by using the pedestal brake, or by tying off the wheel. Cable tension is best when you cannot move the quadrant or drive wheel by hand with the wheel locked in place. Over tightening will greatly reduce the sensitivity of the system.

RADIAL DRIVE SYSTEM

It must be emphasized that all on board must be familiar with the care and operation of the Steering System and engine controls. One person must be assigned the job of maintenance and must be thoroughly familiar with the operation and intent of all the equipment. If at any time your Steering System makes strange noises or reacts differently than it has previously, you must find the causes immediately and correct the problem. Screws, nuts, bolts as well as clevis and cotter pins that are part of the steering system, engine controls, or pedestal accessories must be checked regularly for tightness and wear. Failure to inspect all steering parts, engine controls and pedestal accessories may cause loss of control or failure of the engine or steering system. All boats must have an emergency tiller or its equivalent and all on board must be familiar with its location and operation. An emergency tiller drill is just as important as a man-overboard drill and must be regularly conducted.

On a new boat and at least once a year, inspect the system when under a strong load. On a calm day and under power, go away from the other boats and with the person who is assigned the maintenance watching from below, put the wheel hard over at full throttle. The maintenance man should watch carefully for all parts of the system bending, distorting, creaking, or giving any indication of failing if placed under a heavy load for a period of time. If for any reason, something did fail or needs adjusting the day is early and you will have plenty of time. When leaving your boat at her mooring or slip, make sure that your wheel is properly tied off. DO NOT LEAVE THE STEERING SYSTEM TO FREE WHEEL.

The pedestal exterior should be cleaned with detergent and water, do not use acetone or any other strong solvents as they may damage the finish. Edson will be pleased to assist you. Call us or write us if we can help.

STANDARD SYSTEM**LUBRICATION RECORD**

component	lubricant	schedule	first year 19__	second year 19__	third year 19__	fourth year 19__	fifth year 19__
sheave bearings	#30 oil*	check and oil monthly					
pull-pull cables	Teflon Fig. 827	check and grease monthly					
wire rope	#30 oil*	check and oil annually					
roller chain	#30 oil*	check and oil annually					
pedestal shaft bearings	Teflon Fig. 827	check and grease annually					

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

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

For complete maintenance information please contact:

EdsonThe Edson Corporation
450 Industrial Park RoadTelephone (817) 955-9711
Telex 551832

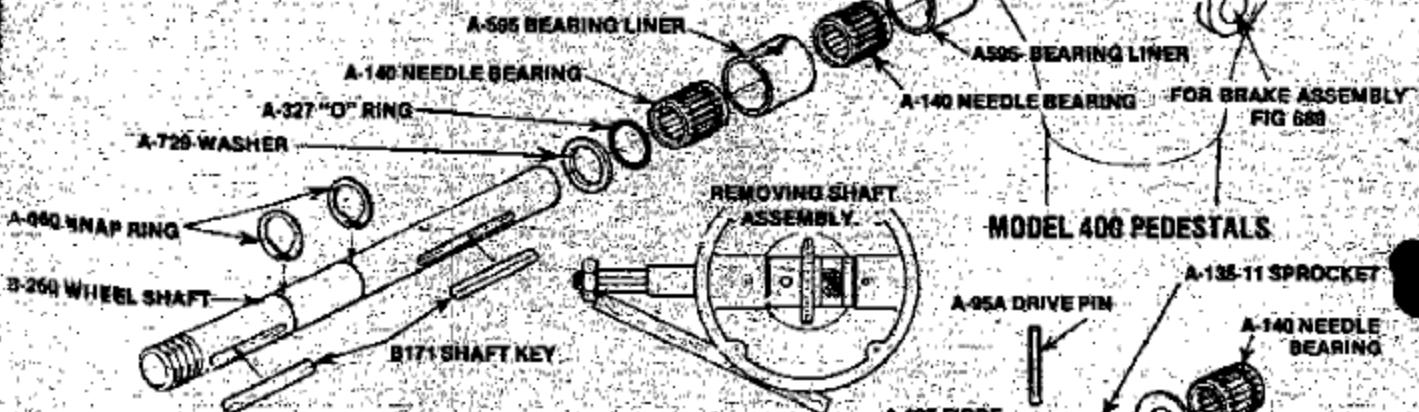
STEERING MAINTENANCE
LUBRICATION FG-204**Edson****CUSTOMER SERVICE****PARTS LIST / EDSON PEDESTAL
STEERING ASSEMBLY**

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

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

DISASSEMBLY

- With the wheel and brake assembly removed, replace the wheel nut with any standard thread $\frac{3}{4}$ " or 1" hex nut.
- Losen the steering cables and chain by backing off the take-up eyes at the Quadrant or Radial Driver, lift the chain off the sprocket and tie to the forward part of the boat.



- Align the notch in the aft fibre washer with the "V" stamped on the sprocket.
- Carefully drive the pin out of the sprocket (drive from the round end toward the grooved end).
- With a piece of wood against the $\frac{3}{4}$ " or 1" hex nut, gently tap the wheel shaft from the housing, see illustration above, be careful not to drop the shaft components into the pedestal.
- Remove sprocket, two fibre washers and forward needle bearing.
- Remove aft needle bearing and washers.
- Wipe out any dirt or old grease before reassembly.

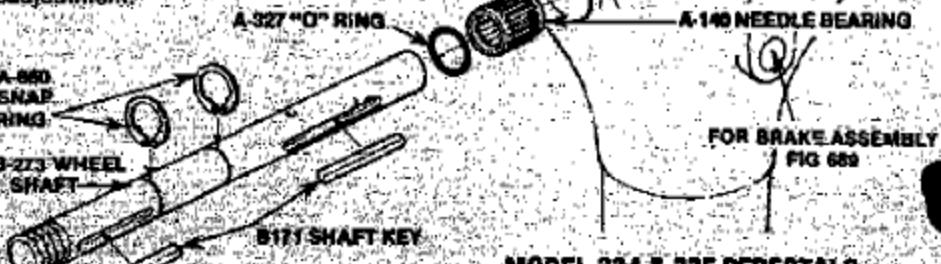
To reassemble reverse the above procedure, do not grease the bearings until reassembly is completed.

NOTE: Check your compass for possible readjustment.

ORDERING INSTRUCTIONS

When ordering spare parts give the pedestal serial number, part number, part name and quantity. Your order will be filled promptly.

If you have any question don't hesitate to call the Edson factory. We will be pleased to assist you.

**MODEL 334 & 335 PEDESTALS****CJ**

II.6. STEERING SYSTEM (CONTINUED):

Be certain to try out the emergency steering system while you are becoming acquainted with your boat, and develop the procedures necessary to rig the system quickly in the event of failure of the pedestal system.

II.6.A. COMPASS:

The compass supplied on your vessel has not been "swung" to reduce magnetic deviation and chart the remaining deviation. This is an owner obligation. Note the compass does have built-in compensating magnets, which may cause healing error.

II.7. STOVE:

The propane (L.P.) gas stove installed on your vessel will give heat comparable to a home gas stove, without the necessity of pre-heating as is required with alcohol or kerosene fuels.

In the interest of safety it is important that the properties of liquefied petroleum gases be understood and that safe practices for their use be followed. Under moderate pressure the gasses liquefy; upon relief of the pressure they are readily converted into the gaseous state. Advantage of this characteristic is taken in their usage, and for convenience they are shipped and stored under pressure as liquids. In their gaseous state they present a hazard comparable to any flammable natural or manufactured gas, except that they are heavier than air. Although the vapors tend to sink to the bottom of an enclosed compartment into which they are released, they will diffuse throughout, and are not readily dispelled by overhead ventilation. Safety requires the prevention of escape of any liquefied petroleum gases, for when mixed with air in certain proportions they will explode if ignited.

*Reprinted from A.B.Y.C. Safety Standard #A-1-70

In addition to the manual shut off valve located on L.P. tanks, the vessel is equipped with an electrically operated solenoid valve which 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.

II.7.A. TYPICAL OPERATION ROUTINE:

1. Check that all burner (inc. oven) knobs are off.
2. Check manual valve on tank and open if necessary. Make sure selector valve is on full tank.
3. Be sure battery switch is on and 12 volt power is available to "LP solenoid" "stove".
4. Turn on circuit breaker for solenoid valve, and separate control for stove (if provided).
5. Open burner valve on stove slightly and light burner. Note - some stoves may have a device which shuts off flow of gas until burner is hot. On these stoves, an override button is provided which must be held in until burner is lighted and hot. - Refer to stove Mfr's instructions provided with vessel.
6. Never, ever, leave a lighted burner unattended. A gust of wind may blow flames out and allow gas to continue to flow from burner. L.P. gas is heavier than air and may explode.
7. If gas odor is observed, immediately open floor boards and vacate vessel. Do not do anything which may cause a spark. Do close manual valve on tank.
8. When cooking is completed:
 - A. Turn off electrical power at switch for stove, and at panel (if separate).
 - B. After flame of burner in use has gone out, turn off knob for burner. (This will purge gas from lines).
 - C. If you are leaving vessel good seamanship dictates also turning off manual valve on tank.

II.7.B. CAUTION:

1. Keep container valves closed when boat is unattended. Close them immediately in any emergency.

II.7.B. CAUTION (CONTINUED):

2. Be sure all appliance valves are closed before opening container valve.
3. Always apply lit match or other flame to burner before opening valve.
4. Close master valve on appliance whenever appliance is not in use.
5. Test system for leakage at least twice a month and after any emergency in accordance with the following procedure:

Locate leakage by application of liquid detergent or soapy water solution at the connections. Repeat test for each container in multi-container system.

NEVER USE FLAME TO CHECK FOR LEAKS.

* Reprinted from A.B.Y.C. Safety Standard A-1-70.

II.8. GENERAL**II.8.A. INTERIOR CUSHIONS:**

The fabrics used on your vessel will support combustion if exposed to fire. Therefore, be careful with open flame or high temperatures in proximity to fabrics.

II.8.B. LIFELINES:

As with any boat, do NOT attach safety harness lines to the lifelines, or stanchion base bales.

II.8.C. DECK HATCHES:

Non-skid tape is a good idea on the translucent deck hatches as they become slippery when wet. The tops of the hatches are made from plastic, which will be scratched by ground-in sand, coral, etc. If more privacy is desired, sand the inside of the hatch cover with #120 sandpaper which will "frost" the surface.

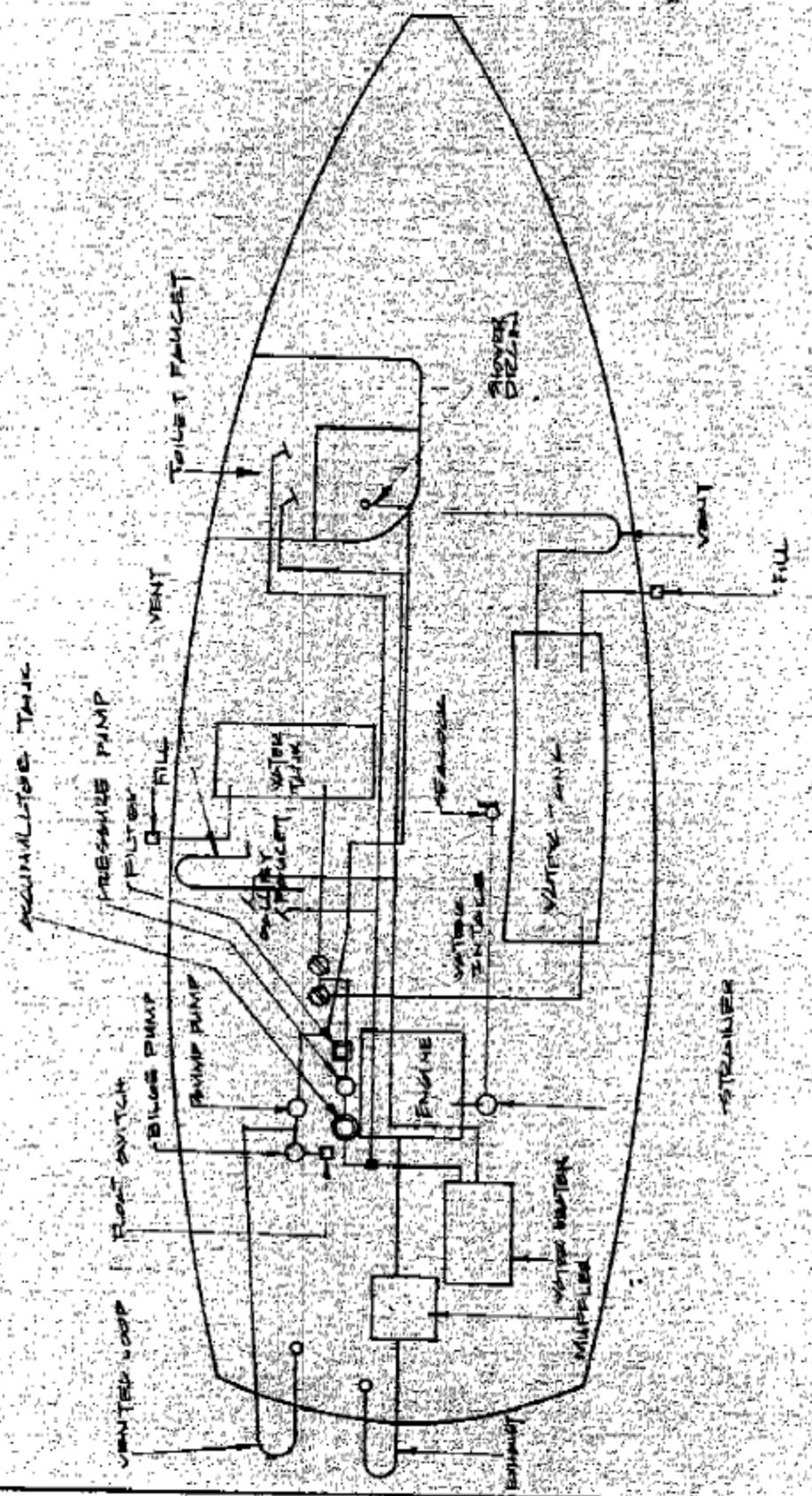
II.8.D. PORTLIGHTS:

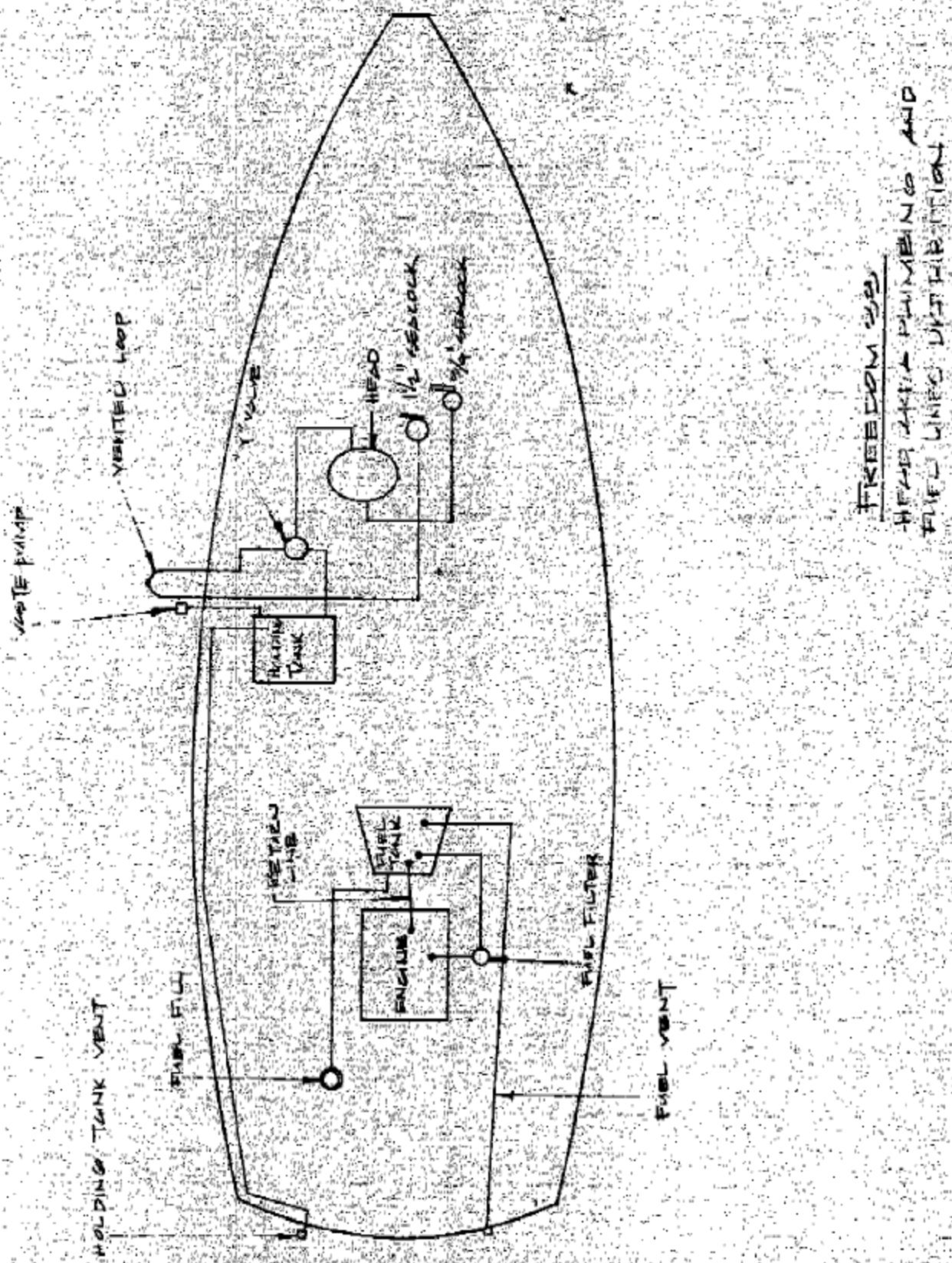
The ports are glazed with Plexiglass and Lexan, noted for its high impact resistance. Gritty cleaning agents, such as cleanser, will scratch. Use only mild soap and water to clean the ports.

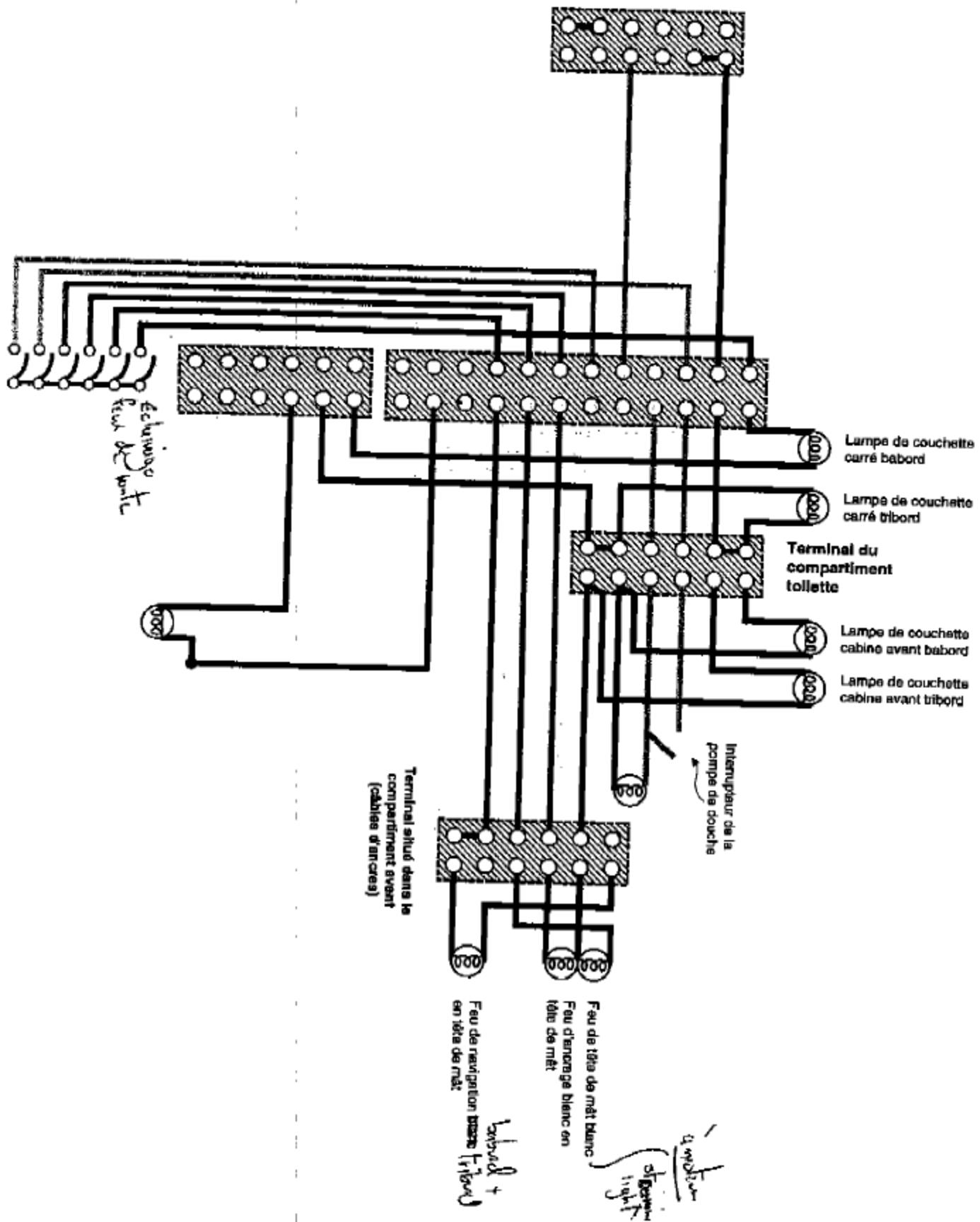
Some chemical solvents, notable Acetone, will also injure the port lights.

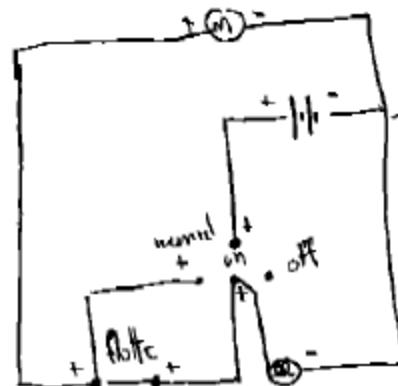
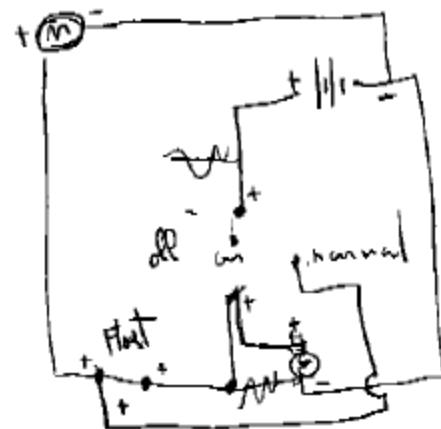
II.8.E. ANCHOR ROLLER FITTING (OPTIONAL ON SOME MODELS):

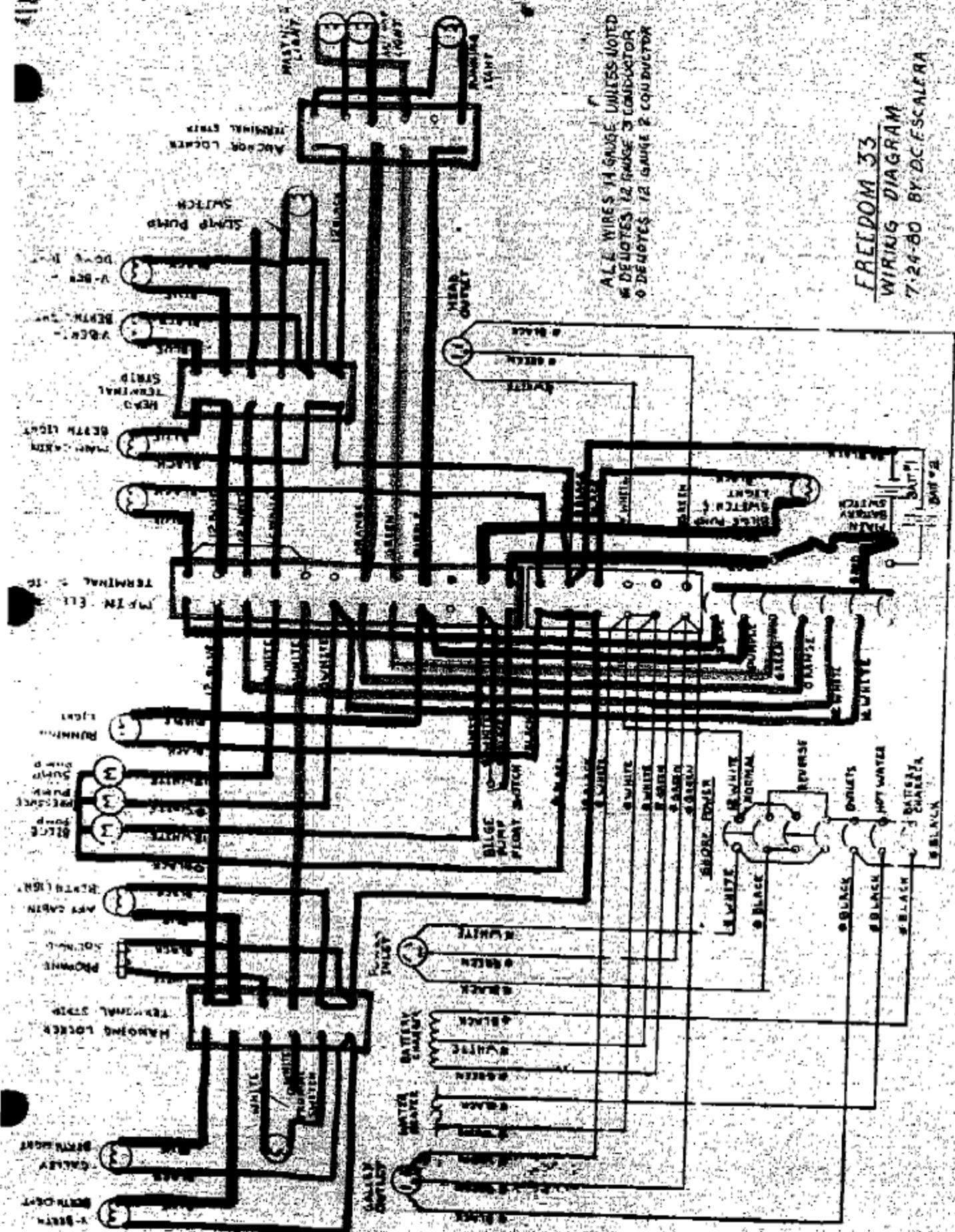
The purpose of the anchor roller/bowsprit is to provide storage for an anchor. When anchored in heavy weather, lead the anchor rode to a bow chock, NOT over the end of the bow sprit. You may wish to tie a rolling hitch around the anchor rode, and take the strain with a separate line lead through a bow chock. Also, do NOT use the bow sprit anchor roller for breaking free a stuck anchor. Be sure to securely lash an anchor stowed on the roller. The pitching movement of the bow sprit is considerable, and may loosen carelessly tied lashings.











III. MAINTENANCE

III.1. FINISHES

III.2. FIBERGLASS:

Even though fiberglass construction has vastly reduced upkeep, some attention to gelcoat surfaces is necessary to maintain the appearance of the finish. After a few years exposure with no protection, the finish may begin to fade or chalk. The twice annual application of a good commercially available wax containing an ultra-violet shield will preserve the appearance of this finish for many years. Be sure fiberglass surfaces are clean and free of salt before applying wax. So called "Miracle" waxes and "Non-Wax" waxes contain silicone. These products are very difficult to remove especially when the gel coat has faded to the point that painting is necessary for cosmetic reasons. Abrasive cleansers should not be used for general cleaning.

In the fiberglass molding process, a wax is used on the mold to prevent the part from sticking to the mold. Some of this wax will end up on the fiberglass part. Especially during the first year, the residual wax on the deck may yellow a little, as it is affected by sunlight and airborne contaminants. Eventually, normal washings will remove this wax. If more rapid removal is required, a commercial wax stripper can be applied, carefully.

III.2.B. BOTTOM PAINT:

One coat of bottom paint is applied at the factory. Generally, a second coat applied before launching will afford the best protection. Check with your dealer for a paint compatible with the factory applied paint. A non-compatible paint may lift the factory applied paint.

Bottom paint should be lightly sanded before recoating. Always wear a respirator when sanding bottom paint - it is toxic. After several coats, it will be necessary to remove the accumulation of bottom paint preferably by sanding with a rotary sponge backed pad.

III.2.C. EXTERIOR TEAK (IF NOT ORDERED VARNISHED):

If left untreated, exterior teak will discolor rapidly, turning a dull grey color. Teak is relatively open grain wood, and eventually mildew may form in the grain, resulting in a very dark color.

If you wish to maintain the warm brown color, the teak must be kept clean, and oiled. The grain of the teak will raise as the wood is wetted. The job of keeping up the teak will be much easier if the wood is sanded very smooth. Use sandpaper for this purpose, and be careful not to scratch the gel coat. The best routine for bringing back discolored teak is to scrub thoroughly with a teak cleaner and water, allow to dry, and sand, then apply multiple coats of a high grade teak oil. Some teak cleansers will stain the gel coat, so be sure to hose off the deck and topsides thoroughly.

A good applicator for teak oil is a small piece of a sponge, perhaps 1" square, by about 3" long, with one end tapered to allow application close to the deck without touching the gel coat. Most teak oils will stain the gel coat, and are difficult to remove, so be careful and clean up drips promptly.

III.2.C.1. CAUTION ON TEAK OILS:

Some teak oils are extremely flammable. Be sure that any rag used with teak oil are taken off the boat and disposed in proper containers for rags with flammable substances. If left in open containers, rags may spontaneously combust. Several fires have been started through combustion of teak oil soaked rags.

III.2.D. INTERIOR WOOD:

The interior wood is coated with a modern synthetic varnish. Some maintenance products contain oils and waxes which will impair a good bond of additional coats of varnish when the surfaces wear and require recoating. A cloth lightly dampened with mild soap and water will clean varnished surfaces. Before revarnishing, clean wood with a mild tri-sodium phosphate and water solution to remove grease, then sand lightly. Do not use tri-sodium phosphate or petroleum based solvents for regular cleaning, as they will dull and possibly remove varnish.

III.2.E. DECK HARDWARE:

Blocks, stoppers, etc. (excluding winches):

As frequently as possible, wash deck hardware with fresh water to remove accumulated salt and general grime. Lubricate sheaves, bearings, etc. with silicone spray (WD 40 is one popular brand). Avoid overspray on deck which will render same slippery.

III.2.F. WINCHES:

Like all fine machinery, winches do require periodic maintenance to assure their proper operation. Failure to properly maintain winches may result in their malfunction, which may cause injury.

Specific instructions for the winches installed on your vessel are included with the other manufacturer's literature. At least twice a year, winches should be disassembled, cleaned, and lubricated. Note that the gears and bearings are lubricated with grease, but pawls and pawl springs should have only light oil applied. Kits of spare parts for winches are available and we recommend you obtain appropriate kits for your vessel.

IV. WINTER STORAGE**IV.1. SAIIS, SHEETS AND LINES:**

Sails and lines should be removed at the end of each season and stored in a warm, dry place. If it is possible to dry them thoroughly, they should be rinsed with fresh water before storage.

IV.2. ENGINE AND FUEL SYSTEM:

Check the engine manual for maintenance guidance during the season and for the specific haul out procedures necessary to winterize the engine. Fill fuel tank(s) to minimize condensation and add an anti-Bacterial agent.

IV.3. BATTERIES:

If the vessel is equipped with an automatic battery charger, and a reliable power source is available, batteries may be left on charge onboard throughout the winter in latitudes below 40 degrees North. Check batteries for electrolyte level at least once per month, but add water sparingly, as

IV.3. BATTERIES (CONTINUED)

the water may freeze before going into solution with the existing electrolyte.

Preferred treatment is to remove the batteries from the vessel, and store in a heated area, recharging periodically to maintain full charge status.

IV.4. HEAD:

As with the engine, the specific procedures for preparation for winter storage and recommissioning are contained in the manufacturer's manual.

IV.5. FRESH WATER SYSTEM:

Drain all tanks in preparation for winter storage. Be sure to drain the water heater between the heater and the check valve installed in the supply line. Add an anti-freeze solution specifically designed for Marine/RV potable water systems to the residual water in the water tanks, and pump with both 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 plumbing.

IV.6. BILGE:

Be sure to pump the bilge completely dry.

IV.7. VENTILATION:

Leave the dorade vents in place and open so the boat can get air during the winter.

IV.8. WINTER COVER:

If storing outdoors, a winter cover is recommended. It can be as simple as a rectangular piece of canvas forming a tent over the boat. A ridge pole (formed by 2" x 4"'s along the centerline) several feet above the cabin top, well supported at several places along its length, is sufficient to support the center. The stanchions can be removed from their sockets, and ropes tied from the ridge pole to the stanchion sockets to help support the cover. Use carpeting to pad any areas of chafe. Lash the cover tightly to the cradle, avoiding any growths in contact with the gel coat.

IV.8. WINTER COVER (CONTINUED):

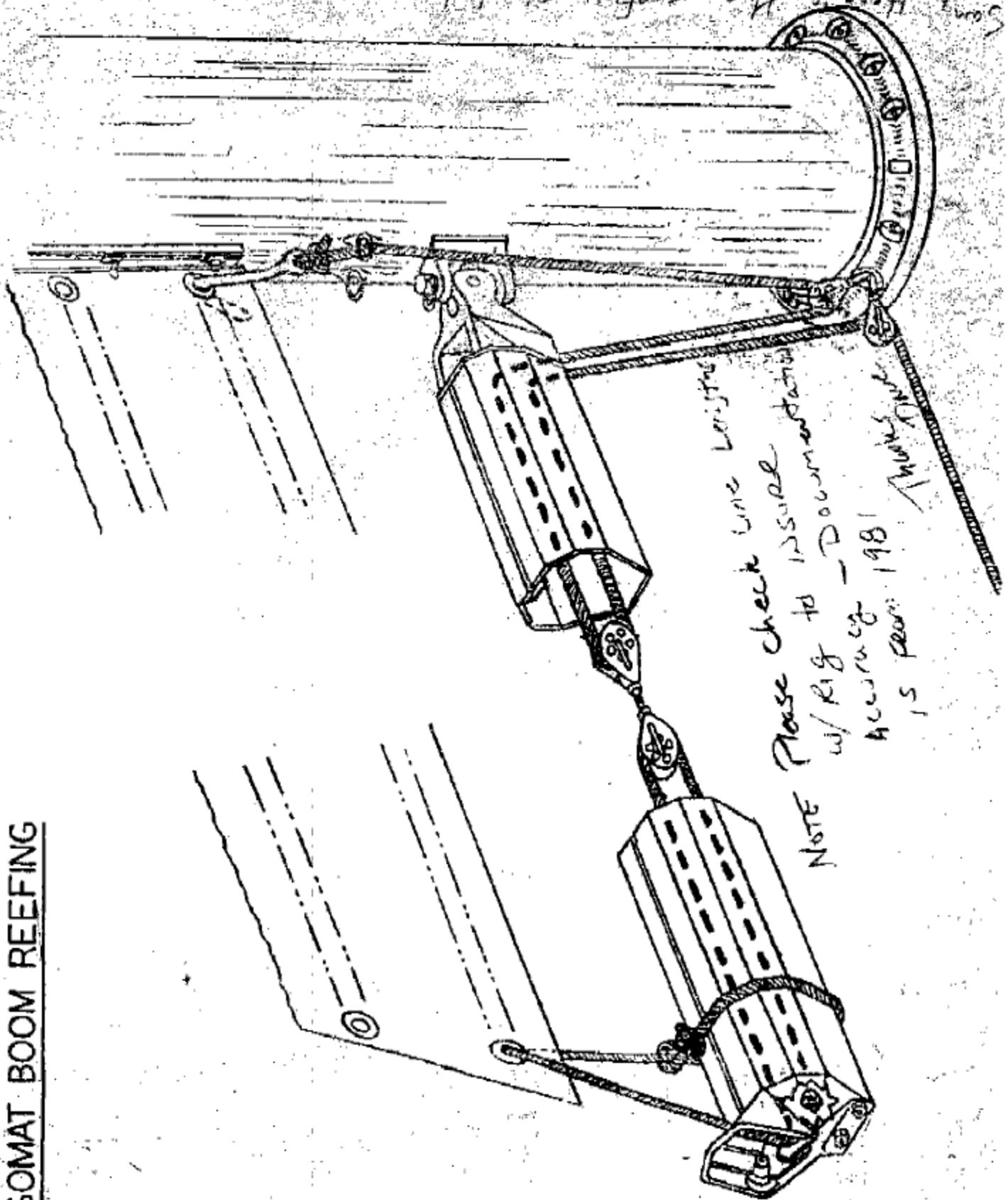
If at all possible, use a cover which does not extend partially over the gel coat. Gel coat surfaces will fade, and uneven covering with winter covers may cause color variation in topsides. Plastic covers may trap water in between the hull and the cover, causing premature failure of the gel coat.

IV.9. CRADLE:

Make sure that the boat is adequately supported and that any suspected weakness has been reinforced. The keel of the boat must rest solidly on the main beam. The vertical risers are not intended to carry the load, merely to stabilize the boat.

IV.10. STORING OF MASTS:

While carbon fiber spars are exceedingly strong along their long axis, they can be damaged by crushing of the tubular section. Always store masts so no weight is placed on top of them, on well padded supports. Do not use tape directly on the mast surface, or the paint may lift when the tape is removed. Plastic coverings can also abrade the paint coating and should be avoided.



FREEDOM 35REEFING & LAZY JACK SYSTEM DETAIL

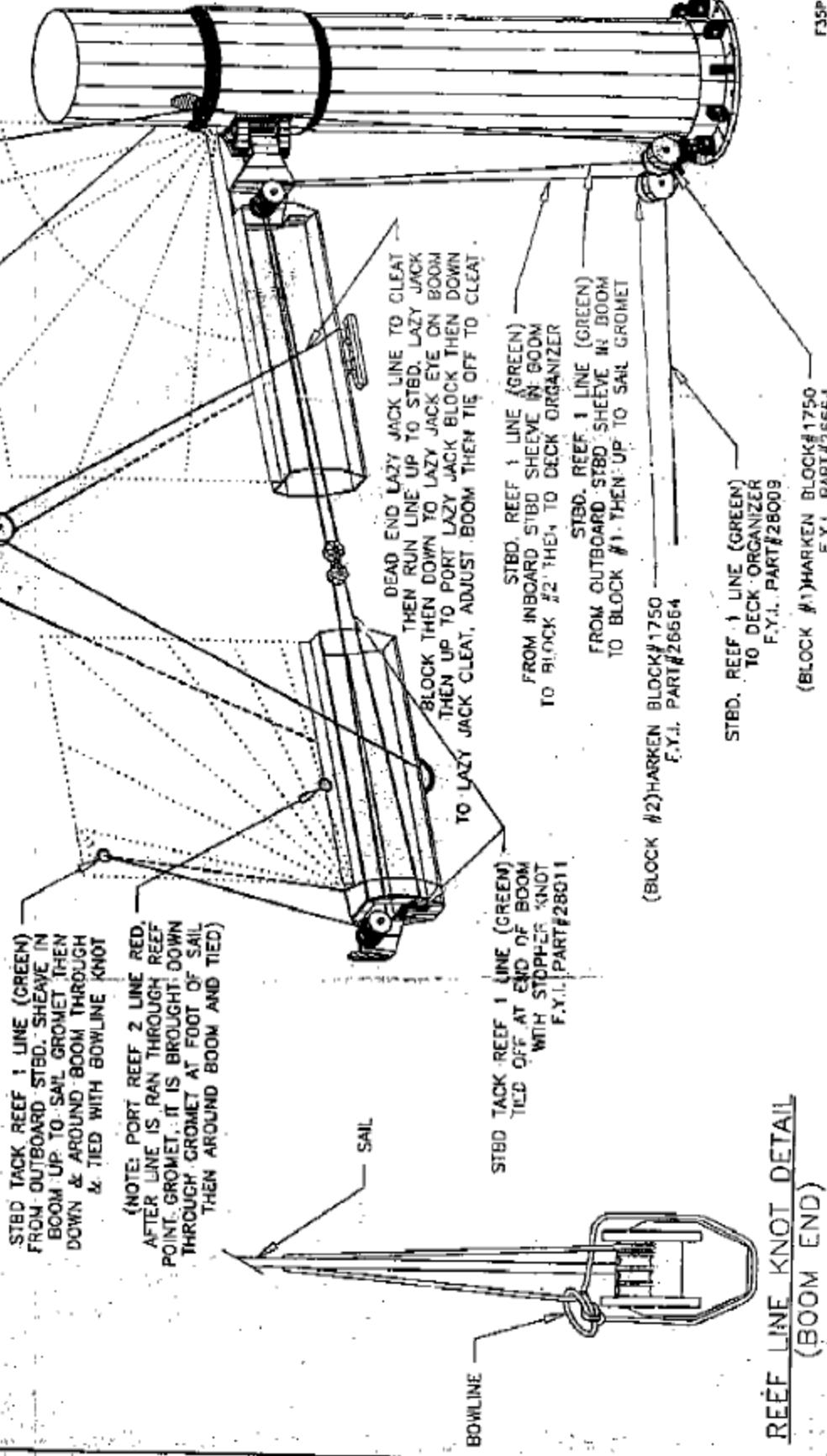
NOTES:

- 1: STBD. REEF 1 (GREEN) SHOWN ONLY
- 2: PORT REEF 2 (RED) RUNS THE SAME AS STBD. REEF 1

STBD TACK REEF 1 LINE (GREEN)
FROM OUTBOARD STBD. SHEAVE IN
BOOM UP TO SAIL GROMET THEN
DOWN & AROUND BOOM THROUGH
& TIED WITH BOWLINE KNOT

(NOTE: PORT REEF 2 LINE RED.
AFTER LINE IS RUN THROUGH REEF
POINT GROMET, IT IS BROUGHT DOWN
THROUGH GROMET AT FOOT OF SAIL
THEN AROUND BOOM AND TIED)

LAZY JACK WIRE UP TO HEADSTAY
STBD. REEF 1 LINE (GREEN)
FROM BLOCK #1 THROUGH MAST
FAIRLEAD THEN UP TO SAIL GROMET
& TIED WITH BOWLINE KNOT



F35P-DIA REEFING
PLOT SCALE: 1:10 1:12

(25' ROD TO CHAIN/HOIST) INVENTOR
4" WASTE

Department F33 ~~F33~~ Track

Entered by

Location C1

Entered by

COOKVILLE
ITEM NO.

DESCRIPTION

<u>MIZZEN HALYARD</u>		115'
ITEM	DESCRIPTION	
25254	R6045 HC-13372 400B-220 SHACKLE 1/8" KEV/DAC ARRIVED total material	
	LABOR	
	TOTAL	
<u>MIZZEN HALYARD</u>		82'
ITEM	DESCRIPTION	
25254	R6045 HC-13372 400B-220 SHACKLE 1/8" KEV/DAC ARRIVED total material	
	LABOR	
	TOTAL	
<u>SPARE MAIN HALYARD</u>		82'
ITEM	DESCRIPTION	
25022	R7020 7/16" RED YACHT BRAID	
	R6049 SCH 45-05	
	total material	
	LABOR	
	TOTAL	
<u>STAYSAIL HALYARD</u>		82'
ITEM	DESCRIPTION	
25067	R7019 7/16" BLUE YACHT BRAID	
	R6049 SCH 45-05	
	total material	
	LABOR	
	TOTAL	

Amount Forward

INVENTORY

Department: FBI TRACE DIV

Priced by

Location: CIVIC LIST (cont.)

Extended by

Called by

Examined by

Entered by

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	PRICE	UNIT	EXTENSIONS
<u>MAIN SHEET</u>						
25046 22049	3/16" WHITE					
25047	SCH 45-05					
	<u>Total material</u>					
	<u>LABOR</u>					
	<u>TOTAL</u>					
<u>MIDDLE SHEET</u>						
25046 22049	3/16" WHITE					
25047	SCH 45-05					
	<u>Total material</u>					
	<u>LABOR</u>					
	<u>TOTAL</u>					
<u>FLAG HALYZARD</u>						
25019 21026	16" DACRON CORD					
	<u>Total material</u>					
	<u>LABOR</u>					
	<u>TOTAL</u>					
<u>MAIN LAZY JACK</u>						
10123	OP 7019	18 1/4" (7x7) COATED				
25132		3/16" RED				
25047	2110-18	1/8" THIMBLES				
25046	2110-12	1/8" MICRO PRESS				
		<u>Total material</u>				
		<u>LABOR</u>				
		<u>AMT FORWARD</u>				

2 @ 23.5'

39 1/2'

4

8

INVENTORY

Ticket No.

Entered By

Department

Printed By

Location

Entered By

Printed By

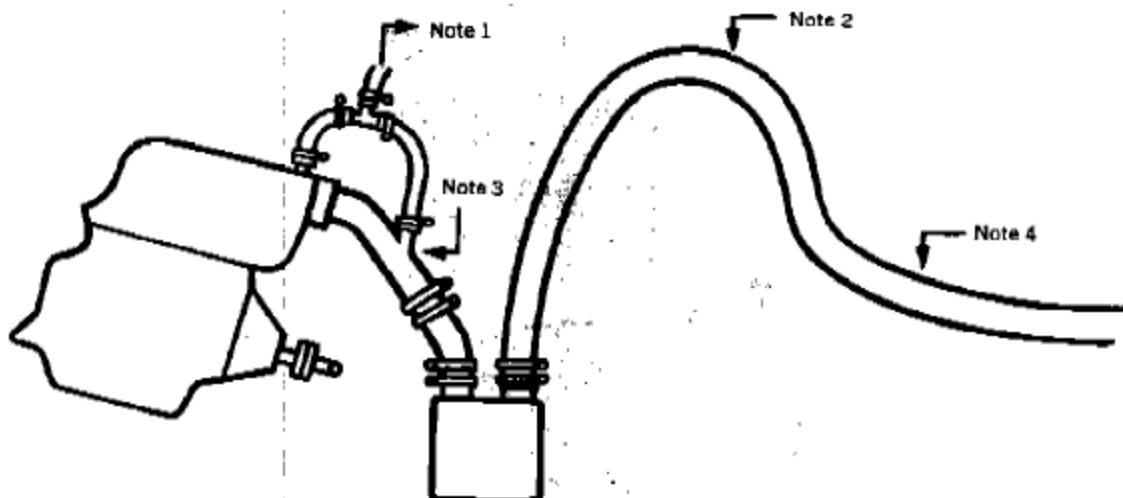
Entered By

Entered By

Entered By

ITEM NO.	DESCRIPTION	QUANTITY UNIT	PRICE UNIT	EXTENSION
<u>102274 LAZY JACK</u>				
10123	OPT019 1/4" ^{1/4"} (217) COATED	2 @	21 1/2'	
25132	1/4" RED.		28 1/2'	
25047	E110-18 ^{1/8"} THIMBLES	4		
25046	Z110-12 ^{1/8"} NICKEL PLATE	8		
total MATERIAL				
LABOR				
TOTAL				
<u>102275 RUNNERS</u>				
10123	OPT019 ^{1/8" x 1/4"} (217) PIG COATED	2		
E110-16	^{1/8"} MARINE EYE			
25047	E110-18 ^{1/8"} SS THIMBLE			
25046	Z110-12 ^{1/8"} NICKEL PLATE			
R6072	SCH 93-12 SHACKLES			
24062	SCH 35-01			
total MATERIAL				
LABOR				
TOTAL				
<u>102276 REEF LINES</u>				
25065	R9008 ^{1/8"} GREEN YACHT BRAID		75 1/2'	
25050	Z170-03 ^{1/8"} WHITE YACHT BRAID		75 1/2'	
total MATERIAL				
LABOR				
TOTAL				
Amount Forward				

INSTALLATION INSTRUCTIONS



NOTES:

1. Siphon break here for engines installed near or below water line.
2. Loop in exhaust hose should rise approximately 18" above waterline.
3. Water injection should be at least 4" below manifold outlet.
4. For even better silencing the Vernatone muffler may be installed in this portion of the exhaust line.

Correct installation and use of your VERNALIFT muffler will insure a long, troublefree life and the excellent performance of which it is capable. The instructions must be followed to validate the warranty.

1. The VERNALIFT is a "wet" marine exhaust muffler. It is designed for use in an exhaust system as appropriately recommended by ABYC (American Boat & Yacht Council) Standard P-1, except that the minimum quantity of water flow in the exhaust system should be:

$$\text{Gallons Per Minute} = \frac{\text{Engine Displacement (Cubic Inches)} \times \text{Engine RPM}}{66,000}$$

2. The VERNALIFT is designed for proper flow in one direction only. Carefully note the flow direction as indicated on the muffler.

3. There must be sufficient distance between the water injection point and placement of the VERNALIFT to allow adequate cooling of the exhaust gases. This distance will be dependent on the manner of the water injection. Maximum continuous operation of the VERNALIFT is limited

All VERNALIFT units are tested at an internal pressure several times that which would be expected in a normally operating wet exhaust system. This does not insure that the unit structure can always withstand the very high instantaneous pressures which result from a backfire condition. In the event of a backfire, it would be advisable to visually examine the entire exhaust system for any resultant damage.

to 280°F. Normally, in a reasonably designed system the temperature at the muffler will be within the range of 120°F to 185°F. Such operation will result in longer exhaust system life.

4. Connections to the VERNALIFT should be accomplished using approved marine exhaust hose of appropriate size. Do not use grease or oil to lubricate hoses when installing. Wetting the inside of hoses with water will cause them to slip more easily over the muffler pipes. A minimum of two stainless steel clamps of the worm gear type is recommended for securing the hose to the muffler. Using a screwdriver only, securely tighten all hose clamps—don't overtighten.

5. The VERNALIFT should be positioned near the longitudinal center line of the boat. This is particularly critical on sailing vessels where a substantial angle of heel can be encountered.

6. On systems where the exhaust manifold is near or below the water line, a siphon break must be employed to prevent the possibility of continuing water flow after engine shutdown.

LIMITED WARRANTY

Vernay Products, Inc., warrants every VERNALIFT Muffler unit for a period of 3 years from date of original sale by the company against defects in materials and workmanship. Since the company cannot exercise any control over the installation and application of its products, the above limited warranty is in lieu of all other express or implied warranties or warranty of merchant-

ability or fitness for a particular use or the results or effects of such use. Under no circumstances will the company be liable for any consequential damages. Its liability is limited to the supplying at no charge, of a replacement for a defective unit, upon its return to the company, as authorized, together with reasonable proof of date of original sale.