

STANDARD BOAT DIMENSIONS

HULL DIMENSIONS

LOA	33' 0"
LWL	27' 6"
Beam	11' 4"
Draft-Deep	6' 2"
Shoal	4' 8"
Displacement	10,800 lbs.
Ballast-Deep	4,475 lbs.
Shoal	4,750 lbs.

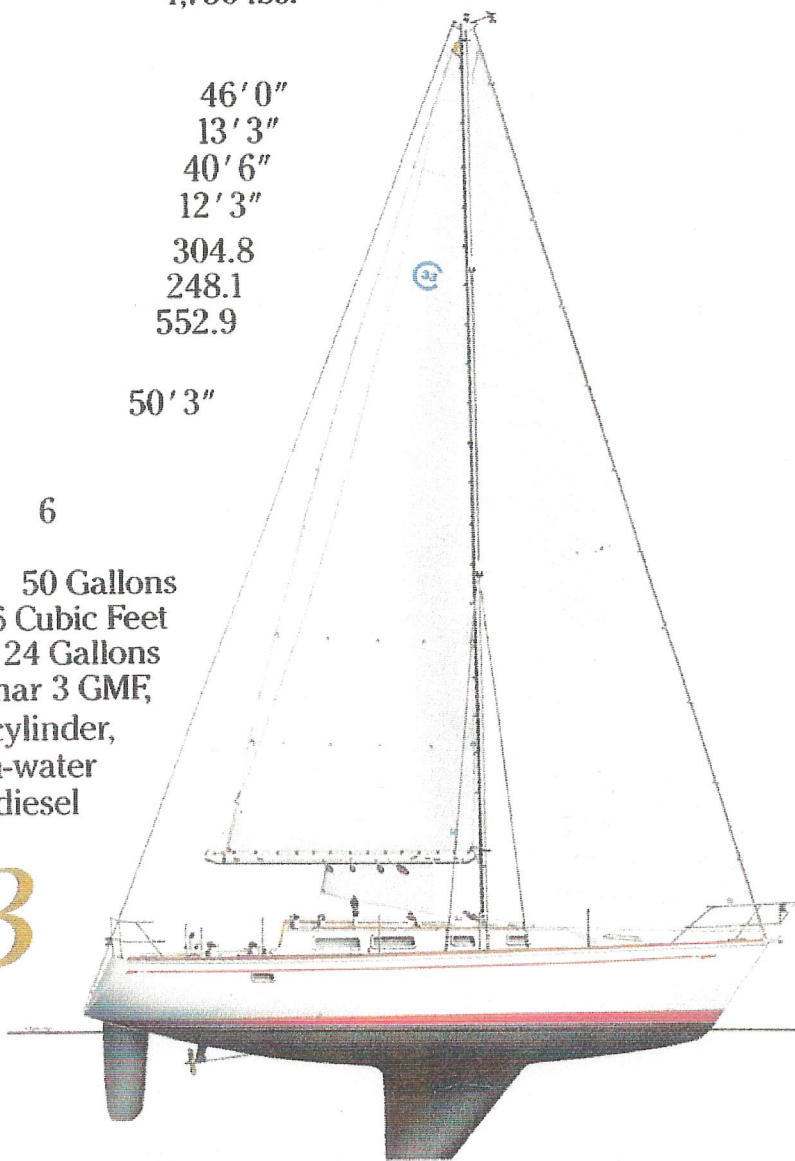
RIG DIMENSIONS

I	46' 0"
J	13' 3"
P	40' 6"
E	12' 3"
100% Foretriangle	304.8
Mainsail Area	248.1
Total	552.9
Mast Height Above DWL	50' 3"

MISCELLANEOUS

- Berths 6
- Fresh Water Capacity 50 Gallons
- Icebox Capacity 6 Cubic Feet
- Fuel Capacity 24 Gallons
- Engine Yanmar 3 GME,
27 HP, 3 cylinder,
fresh-water
cooled diesel

CAL 33





C O N G R A T U L A T I O N S

In choosing your new yacht from the CAL line, you have selected one of the best values in today's sailboat market. The design and construction of this yacht reflect years of experience and knowledge gained in the building of over 10,000 boats during the past 26 years.

Your boat was designed by C. R. Hunt Associates from whose design boards came the 12 meter Easterner, the Concordia Yawl, the 110 and 210, Bertram and Boston Whaler powerboats, as well as the Cal 22, 24, and 44. This design team is well known for their excellent performing cruising yachts, and we feel they have maintained their high standards in the CAL 33.

The use of aluminum, stainless steel, teak wood, and fiberglass all combine to produce a yacht that has much lower maintenance requirements than those in the past. However, it is vital that the necessary maintenance procedures be performed faithfully.

This manual is designed to familiarize you with your boat. The location and function of each system onboard will be outlined to help make any adjustments or maintenance procedures more easily undertaken.

Lear Siegler Marine reserves the right to change specifications without notice, and this manual may not reflect all such changes. Since we are always striving to improve our product, modifications

and improvements are constantly in process and, therefore, it is possible that your boat may contain features different from those enumerated in this manual. It is impractical to revise this manual for each such modification. It is our policy to make improvements whenever it is appropriate without waiting for corresponding updates in our manual. Please contact your dealer, if you have any questions.

Full information on optional equipment may not be contained herein. Contact the option manufacturer or your CAL boat dealer for more information. Parts orders can be placed through your local CAL dealer, or by calling 617-675-0418 (our direct Parts Department line). Certain situations may arise where we may refer you to a local ship's store or parts manufacturer for hardware. This will be to insure you the fastest service possible.

BE SURE TO READ AND UNDERSTAND THIS MANUAL AND ALL OTHERS INCLUDED WITH YOUR BOAT BEFORE OPERATING ANY OF THE BOAT'S SYSTEMS.

In addition to information contained in this manual, there are certain federal, state, and local regulations pertaining to safe and legal operation of pleasure craft that you should familiarize yourself with. Local governmental agencies and boating groups can help you become aware of these regulations. Additionally, be sure to read and understand the accompanying Safety Information Sheet.

Have Fun, and Good Sailing!

LEAR SIEGLER MARINE

C O N T E N T S

IMPORTANT SAFETY INFORMATION

LIMITED 1-YEAR WARRANTY/LIMITED 30-DAY WARRANTY FOR COMMERCIAL USE

INTRODUCTION

I GENERAL

- Cal 33 Specifications
- Cal 33 Docking Plan
- Sail Plan
- Arrangement Plan
- Dealer's Responsibilities
- Owner's Responsibilities
- Safe Boating Information
- Float Plan
- Coming Aboard Checklist
- Going Ashore Checklist
- Glossary

II COMMISSIONING

- Commissioning
- Pre-Launch Check List
- Post Launch Check List
- Commissioning Notes
- Rigging Dimensions
- Running Rigging Specifications
- Running Rigging (Optional Equipment)
- Standing Rigging Specifications
- Rigging and Tuning the Mast
- Upper and Intermediate Shrouds
- Isomat Spar Systems
- Mast Boot, Wedge, and Pin Instructions
- Chainplate Rods
- Bottom Coatings
- Boat Storage

III OPERATION

CONSTRUCTION DETAILS AND GENERAL INFORMATION

- A. Hull
- B. Deck
- C. Interior
- D. Keel
- E. Rudder
- F. Plumbing and Electrical
 - Water System Drawing
 - Electronics Panel
 - Bonding System
 - Electrical System
 - Electrical Fixtures Drawing
 - Combo Panel Drawing
 - Refrigeration Installation Drawing
- G. Engine Installation
 - Engine Operating Instructions
 - Alignment of Engine to Shaft
 - Stuffing Box

C O N T E N T S

- III OPERATION - Continued
 CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued
- G. Engine Operating Instructions - Continued
 - Basic Rules for Battery Care and Maintenance
 - Flooding of Engine with Water
 - Fueling Procedures
 - Fuel System Drawing
 - H. Holding Tank/Waste System
 - Head System Drawing
 - I. Hull-to-Deck Joint
 - Hull-to-Deck Drawing
 - J. Steering
 - K. Thru Hulls and Shut Off Valves
 - Thru-Hull Locations Drawing
 - L. Sail Care
 - M. Interior Maintenance
 - N. Exterior Maintenance
 - O. Periodic Maintenance

IV MANUALS

GENERAL

GENERAL

Cal 33 Specifications

Hull Dimensions

LOA	33'0"
LWL	27'6"
Beam	11'4"
Draft - Deep	6'2"
- Shoal	4'8"
Displacement	10,800 lbs.
Ballast - Deep	4,475 lbs.
- Shoal	4,750 lbs.

RIG DIMENSIONS

I	46'0"
J	13'3"
P	40'6"
E	12'3"
100% Foretriangle	304.8 sq. ft.
Mainsail Area	248.1 sq. ft.
Total	552.9 sq. ft.
Mast Height Above DWL (In normal trim conditions.)	50'3"

MISCELLANEOUS

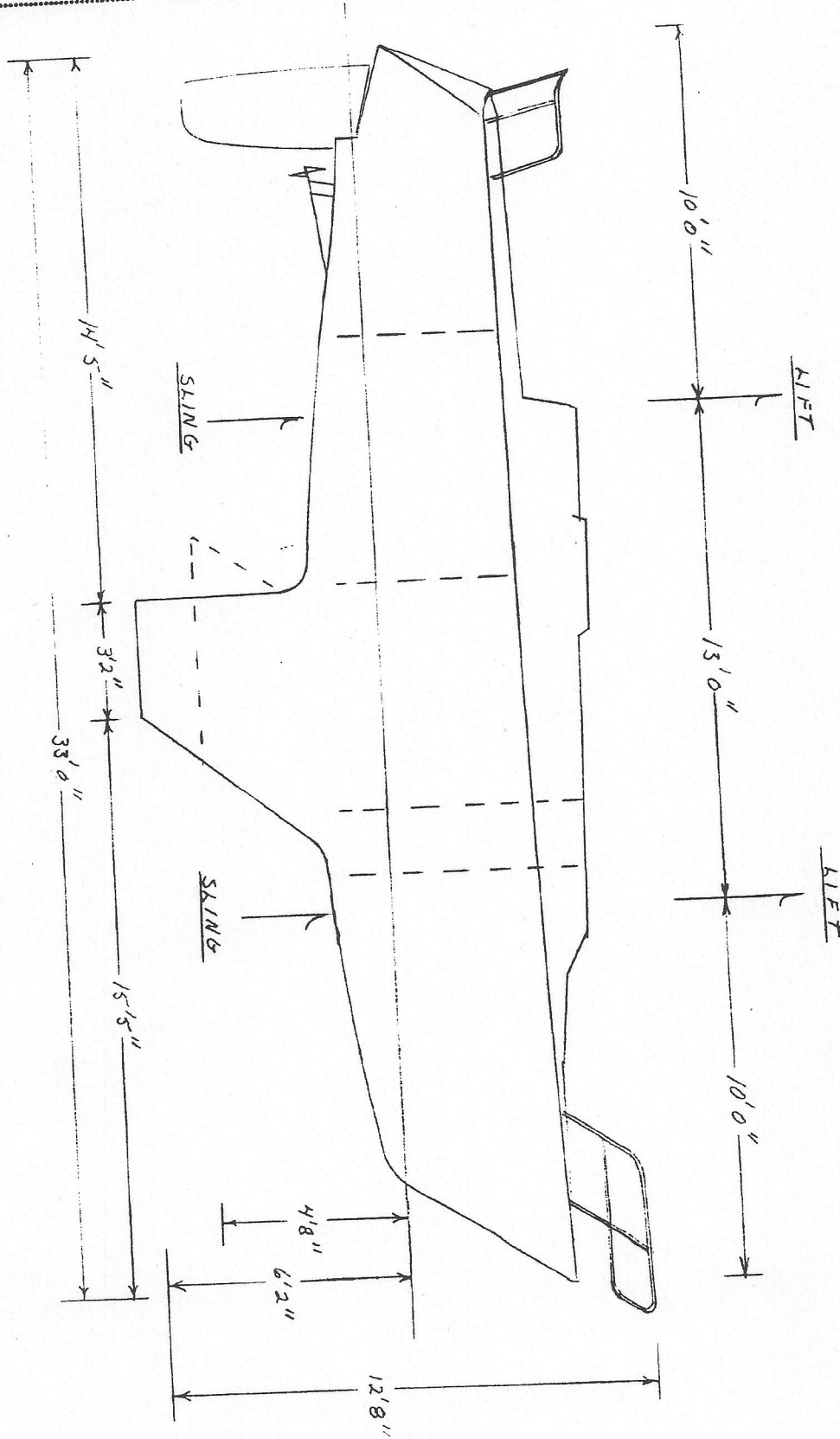
o Berths	6/7
o Fresh Water Capacity	50 Gallons
o Icebox Capacity	6 Cubic Feet
o Fuel Capacity	24 Gallons
o Engine	Yanmar 3GMF, 22 HP, 3 cylinder, fresh-water cooled diesel
o Propeller Dimensions	16 x 15 x 1 1/4 RH
o Propeller Shaft Dimensions	1 1/4 Standard Taper
o Cutlass Bearing Dimension	1 1/4 x 4
o Reduction Gear	2.36:1

CONSTRUCTION

Hull	Molded fiberglass - bi-directional
Deck	Molded fiberglass with balsa core. High stress areas have balsa core replaced with marine-grade plywood.

JPF DATE 4/3/85 SUBJECT Cal 33 Docking Plan
DRAWN BY DATE

SHEET NO. OF
JOB NO.



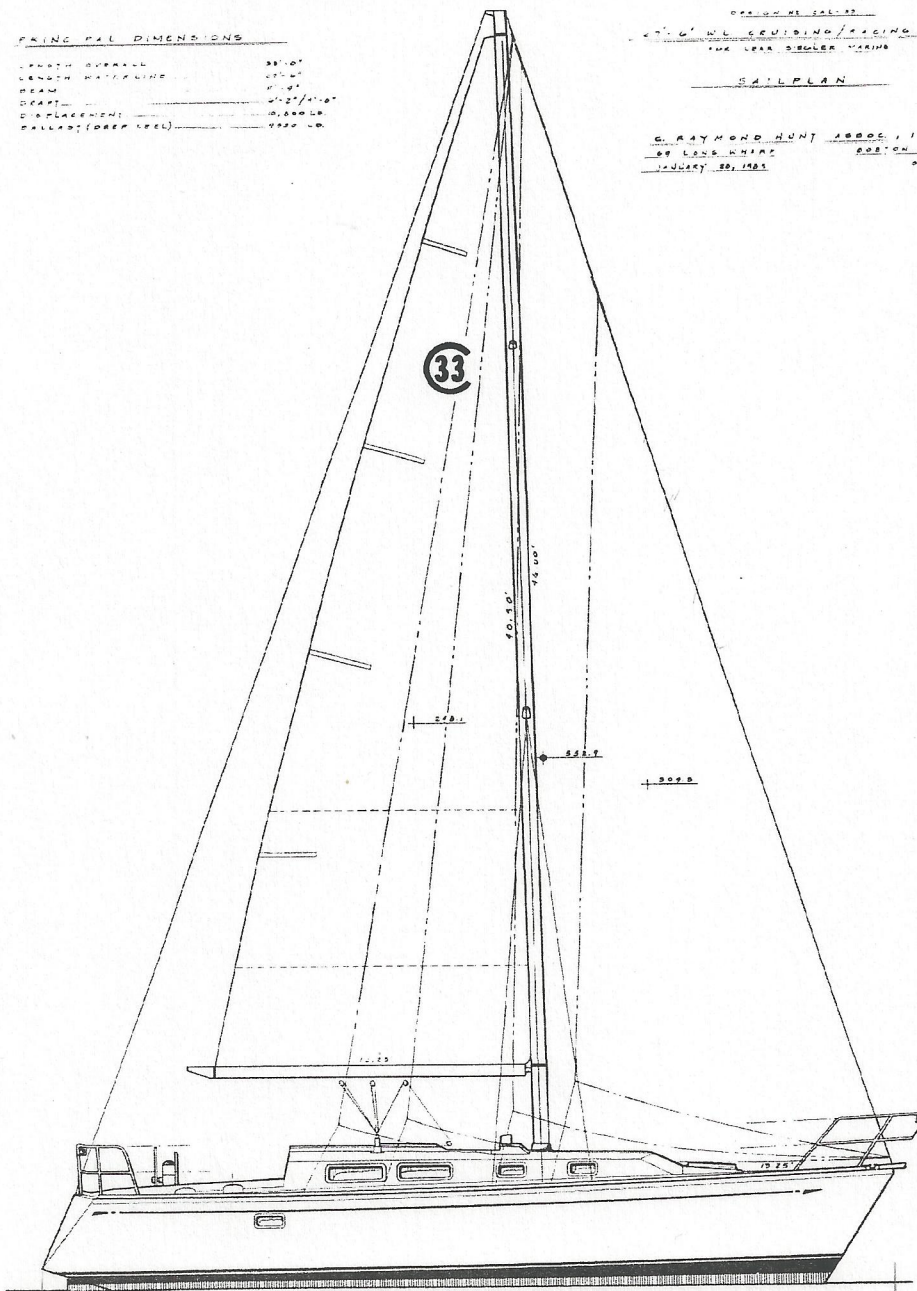
PRINCIPAL DIMENSIONS

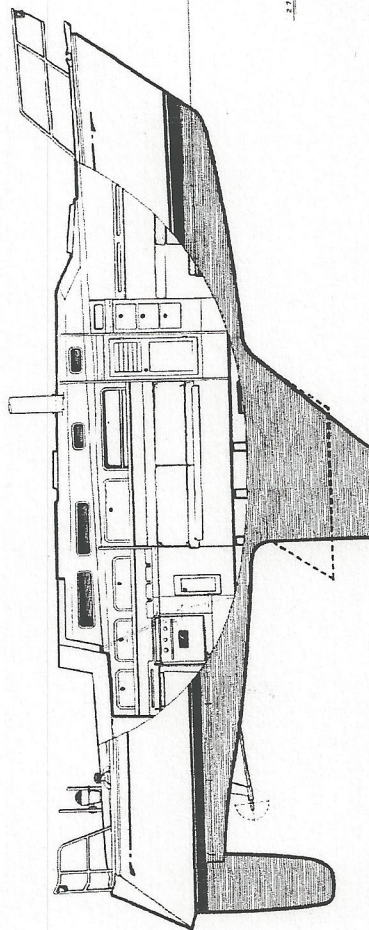
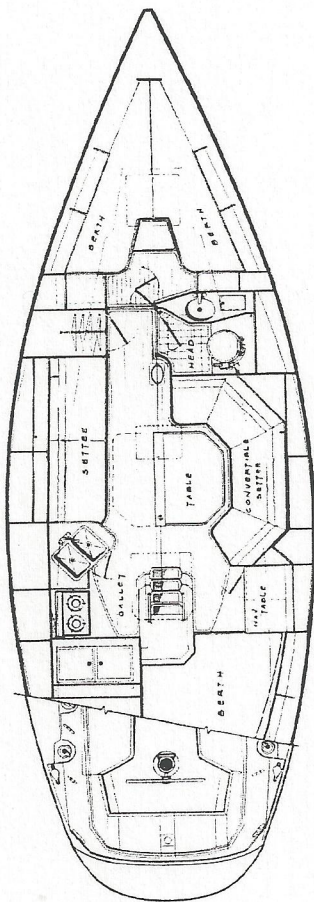
LENGTH OVERALL 33'-0"
 LENGTH WATERLINE 27'-0"
 BEAM 6'-0"
 DRAFT 5'-2" / 11'-0"
 DISPLACEMENT 2,500 LB
 BALLAST (DEEP KEEL) 1,500 LB

OFFSHORE RACING
 47' 0" WL CRUISING/RACING SLOOP
 TWO LEAF SLOPER MASTING

SAIL PLAN

G. RAYMOND HUNT ASSOC., INC.
 89 LONG KNIGHT BOSTON, MA
 JANUARY 20, 1985





1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 841. 842. 843. 844. 845. 846. 847. 848. 849. 850. 851. 852. 853. 854. 855. 856. 857. 858. 859. 860. 861. 862. 863. 864. 865. 866. 867. 868. 869. 870. 871. 872. 873. 874. 875. 876. 877. 878. 879. 880. 881. 882. 883. 884. 885. 886. 887. 888. 889. 890. 891. 892. 893. 894. 895. 896. 897. 898. 899. 900. 901. 902. 903. 904. 905. 906. 907. 908. 909. 910. 911. 912. 913. 914. 915. 916. 917. 918. 919. 920. 921. 922. 923. 924. 925. 926. 927. 928. 929. 930. 931. 932. 933. 934. 935. 936. 937. 938. 939. 940. 941. 942. 943. 944. 945. 946. 947. 948. 949. 950. 951. 952. 953. 954. 955. 956. 957. 958. 959. 960. 961. 962. 963. 964. 965. 966. 967. 968. 969. 970. 971. 972. 973. 974. 975. 976. 977. 978. 979. 980. 981. 982. 983. 984. 985. 986. 987. 988. 989. 990. 991. 992. 993. 994. 995. 996. 997. 998. 999. 1000.

DEALER'S RESPONSIBILITIES

Your Cal boat dealer is a professional. He can provide you with the service and expertise that will help you to enjoy your Cal. Rely on him for assistance in selecting any additional equipment you may need and in seeing that it is properly installed.

The dealer has inspected the boat upon arrival at his yard. When the boat is commissioned, he will check all the systems and equipment and correct any problems that may arise. Should there be any defects covered by the Cal warranty, the dealer will correct them as soon as possible and file any warranty claims with Lear Siegler Marine. All warranty matters must be handled by an authorized Cal dealer.

Should you need any parts for your Cal product, contact your local dealer. He can obtain quick delivery from Cal. By utilizing his assistance, you can be assured of receiving the proper parts and of proper installation as well.

Lear Siegler Marine assumes no liability for damage incurred in transit.

OWNER'S RESPONSIBILITIES

Your Cal boat is covered by our Limited 1-Year Warranty for one year after commissioning by the original retail customer, but in no event later than two years from the date of shipment by Lear Siegler Marine. Always refer to our Limited Warranty for complete warranty information. Within 30 days of taking delivery of your boat, fill out the warranty registration card and return it to Lear Siegler Marine. The U. S. Coast Guard requires that all manufacturers keep records of people who have purchased their products. This is necessary in case a defect notification or product recall is needed. The only way Lear Siegler Marine can maintain these files is to have you send in the completed card. If you have any questions or comments, please include these with the card. We will get back to you.

When you sell your Cal product, please drop us a note with the hull number, your name, and the name and address of the new owner.

It is important that you contact your dealer as soon as possible when product defects are noted. This will assure prompt service and prevent the problem from worsening.

Thoroughly check your ship's paper file to insure that all manuals and warranties for your optional or additional equipment are provided.

FOR SAFE BOATING

(Reprinted by Permission of U.S. Coast Guard)

BE PREPARED

Take a Safe Boating Course from the Coast Guard. You can call 800-336-BOAT for information on courses in your area.

Carry all safety equipment required by Federal and State law. Federal requirements are discussed in "Federal Requirements for Recreational Boats" which can be acquired from U.S. Coast Guard, Office of Boating, Public, and Consumer Affairs, Washington, D.C., 20593. State requirements will come from your local State Boating Administration. The Coast Guard also recommends: a first-aid kit, a pump or bailer, a transistor or weather radio, extra fuel, a paddle, anchor and line, and extra drinking water, also, if not a requirement, flares.

Get a Coast Guard Auxiliary Courtesy Examination. This is a free, confidential, safety inspection. Call your local Coast Guard Auxiliary for details.

Be familiar with the use of distress signals and PFD's.

AVOID FIRES

Handle fuels carefully.

Read the engine owner's manual for proper fuel-system maintenance.

Inspect your engine's fuel system periodically.

Heed fire extinguisher regulations and keep them in good condition.

FOR SAFE BOATING - Continued

While refueling:

- a. Fill portable tanks on the dock.
- b. Tie the boat securely.
- c. Extinguish cigarettes and all flames on the boat. Turn off all engines and electrical equipment.
- d. Keep the hose nozzle in contact with the fuel can.
- e. Wipe up all fuel spillage.
- f. Ventilate the engine and fuel compartment.
- g. Check boat for fumes.

BEFORE GETTING UNDERWAY

Leave a float plan: An example of a float plan follows.

Check the weather: Do not venture out, if the weather threatens.

WHILE UNDERWAY

PFD's should be worn by children and non-swimmers at all times.

Everyone should wear them, if conditions become hazardous.

Do not operate a boat, if intoxicated, fatigued, or stressed.

These human factors cause 50% of all boating accidents.

Keep a good lookout: This is especially true of sailboats. Keep a watch to leeward under the headsail.

Keep away from swimmers, divers, and skiers.

Obey State and Federal laws. Know your local laws and "rules of the road".

FOR SAFE BOATING - Continued

Respect Bad Weather: Try to get to shore, if the weather turns bad. Get and carry a radio with a NOAA "weather band" on FM 162.40-162.55 MHZ.

IF TROUBLE OCCURS

Radio for help. Use the emergency VHF Channel; i.e., 156.8MHZ.

Put on PFD's immediately.

Stay with the boat. In cold water, huddle together to prevent hypothermia.

FLOAT PLAN

Make copies of this page and use one before each trip. Fill it out and leave it with a reliable person, who will notify the Coast Guard or other rescue organization, if you fail to return on time. DO NOT FORGET TO CANCEL THE FLOAT PLAN UPON YOUR RETURN.

FLOAT PLAN

1. Name of person reporting and telephone number _____

2. Description of Boat: Type _____ Hull Color _____
Deck Color _____ Stripe Color _____ Registration # _____
Length _____ Name _____
Make _____ Other Distinguishing Marks _____

3. Persons Aboard Number _____
Name _____ Age _____ Address & Phone _____
Name _____ Age _____ Address & Phone _____
Name _____ Age _____ Address & Phone _____

4. Engine Type _____ H.P. _____ Fuel Capacity _____

5. Safety Equipment: PFD's _____ Flares _____ Mirror _____
Flashlight _____ Food _____ Water _____ EPIRB _____
Raft or Dingy _____

6. Radio _____ Type _____ Frequencies _____

7. Trip Expectations: Leave at _____ From _____
Going to _____. Expect to return by _____
and in no event later than _____

8. Automobile License No. _____ State _____
Color and Make of Car _____ Parked at _____

9. If not returned by _____, call the Coast Guard or _____

Phone Numbers _____

COMING ABOARD

Here's a checklist approach for your crew:

- _____ Check bilge for excessive water.
- _____ Check weather conditions and tides.
- _____ Check food supply.
- _____ Foul weather gear.
- _____ Linen, sleeping bags.
- _____ Fuel.
- _____ Water.
- _____ Sun screens and sunglasses.
- _____ Tools.
- _____ Docking and anchor gear.
- _____ Check radio operations.
- _____ Navigation charts and instruments.
- _____ Float plans to a friend or Coast Guard.
- _____ Fuel for stove.
- _____ Cooking and eating utensils.
- _____ Check battery water level.
- _____ Oil level, tight V-belts.
- _____ Check for loose electrical connections in engine room.
- _____ Secure tools or any loose equipment in engine room so as not to get fouled in engine.
- _____ AC systems off, electrical cord stowed.
- _____ Doors and drawers secured.
- _____ Check steerling lock to lock.
- _____ Check mast for rigging irregularities and tightness.
- _____ Halyards and sheets are clear and ready to run.

COMING ABOARD - Continued

- _____ No lines or other obstructions near the propeller or bow.
- _____ Anchor ready to run.
- _____ Check lifelines for tightness.
- _____ Turn on fuel and water lines.
- _____ Stow all loose gear.

GOING ASHORE

- _____ Sails dry and stowed.
- _____ Fuel lines and water lines turned off.
- _____ Bilge pumped dry.
- _____ Wallet, jewelry, and other valuables are not left onboard.
- _____ Battery switch off.
- _____ Charger on. (If applicable.)
- _____ Hatches and ports locked.
- _____ Topsides clean.
- _____ Appropriate thru-hulls closed.
- _____ Clean interior of food and rubbish.
- _____ Fenders in place.
- _____ Halyard secured away from mast.
- _____ Dock lines secured.
- _____ Loose gear stowed.
- _____ Sails furled and covered.
- _____ All covers in place.
- _____ Main companionway locked.
- _____ Check in with whomever kept your float plan.

GLOSSARY

AFT - In the neighborhood or direction of the stern.

BATTEN - A thin wooden or plastic strip placed in a pocket in the leech of a sail to help hold its form.

BLOCK - Pulley consisting of a frame in which is set one or more sheaves or rollers. Ropes are run over these rollers.

BOOM - Spar at the foot of the mainsail.

BOOM VANG - Tackle secured to the bottom of the boom about 3' aft of the gooseneck. The other block attaches to an eye at the base of the mast. The vang's purpose is to keep the boom steady and horizontal while sailing.

BOW - The forward part of a boat.

CENTERBOARD - A keel-like device that can be hoisted or lowered in a trunk that acts as a keel in shoal-draft boats.

CENTERBOARD PENDANT - Line used to raise and lower centerboard.

CHAINPLATES - Strips of metal fastened to the boat's hull, near the deck line to take the stress of stays.

CLEAT - A fitting to which ropes are made fast.

CLEVIS PIN - A small stainless steel pin that has a hole in one end for a cotter pin and is used to secure stays to chainplates and mast fittings.

CLEW - The aftermost lower corner of a sail.

COCKPIT - An open area lower than a boat's deck where the occupants sit.

COTTER PIN - A straight or circular split metal pin used to hold a clevis pin in place.

DOWNHAUL - A device used to tighten the luff of a sail.

FAIRLEAD - An eye used to lead line in the direction desired.

GLOSSARY - Continued

FOOT - The lower edge of a sail.

GOOSENECK - A metal device that secures the boom to the mast.

GUDGEON - A metal socket attached to the transom to receive the pintle of the rudder.

GUNWALES - The upper edge of a boat's side, where it meets the deck.

HALYARD - A line for hoisting (or raising) the sails.

HEAD - The upper corner of a sail.

HEADBOARD - The fitting at the head of a sail with a hole in it to receive the main halyard.

HEADSTAY - The foremost stay on a sailboat. A jib is set on a headstay.

HULL - Main body of a boat.

JIB - A triangular sail set forward of the mast.

JIB SNAPS - Small fittings that are attached to the luff of a jib, which secure the jib to the headstay.

JIBE - The action of the mainsail when shifting from one side of the boat to the other, when heading down wind.

LEECH - The after edge of a sail.

LEEWARD - Away from the wind.

LINE - The common expression for a rope in use.

LUFF - The forward edge of a sail.

MAINSAIL - The principal sail on the main mast.

MAINSHEET - The line used to trim a mainsail.

MAST - An aluminum tube designed to stand on end so as to support a boom, plus one or more sails.

MASTHEAD - The top of the mast.

GLOSSARY - Continued

MASTHEAD FITTING - The fitting at the top of the mast.

MAST STEP - A metal fitting that holds the base of the mast in position.

OUTHAUL - A line used to haul the clew of a sail out to the end of the boom.

PINTLES - Pins on the forward side of a boat's rudder, designed to rest in and pivot on the gudgeons secured to the transom.

PORT - The left side of a vessel facing forward.

REEFING - To reduce a sail by rolling or folding up part of it.

RIGGING - The wire supporting the spars is called standing rigging (stays or shrouds) and the ropes used in setting and trimming sails are known as running rigging (halyards and sheets).

RUDDER - A vertical plate attached to the stern of a boat, used in steering it.

SELF-RESCUING - A feature which enables the crew to right and sail away a boat which has capsized.

SHACKLE - A U-shaped piece of metal with a pin across the open ends.

SHEET - A rope used to trim a sail.

SHROUD - Same as a stay.

SLACK - The opposite of taut. Slack away or off - to pay out.

SLOOP - A one-masted vessel with two or more sails.

SPAR - A mast, a boom etc.

SPREADERS - Aluminum tubes that project from a mast in a traverse direction in order to keep a stay at proper tension and to help hold the mast erect.

GLOSSARY - Continued

STARBOARD - The right side of a boat, facing forward.

STAY - A length of wire used to support a spar.

STEMHEAD FITTING - The fitting nearest the bow on the deck where the headstay attaches.

STEP - To step a mast is to set it in position.

STERN - The after part of a boat.

TABERNACLE - A fitting designed so that the mast can be lowered when passing under obstructions; also facilitates stepping and unstepping the mast.

TACK - The lower forward corner of a sail.

TILLER - A piece of wood connected with the rudder head. By this the rudder is moved as desired.

TOPPING LIFT - A wire and/or rope that attaches to the top of the mast and fastens to the end of the boom. Its purpose is to hold the end of the boom up when the mainsail is lowered.

TRIM - To trim sails. To put them in correct relation to the wind by means of sheets.

TRUNK - A centerboard housing.

TURNBUCKLE - A device used to maintain correct tension on rigging.

WINDWARD - Toward the wind.

COMMISSIONING

COMMISSIONING

Your CAL Yacht dealer will supervise the commissioning and testing of your new boat. His knowledge and experience will insure that all systems and components will function properly when the boat is delivered to you. Please be sure to go over all systems with him, so that you understand their operations and safety features.

We have included some guidelines and instructions in this section to aid you and your dealer.

PRE-LAUNCH CHECK LIST

1. All thru-hull valves operational, closed and tightened. _____
2. Accessory thru-hulls installed and tightened. _____
3. Diesel: Propeller in place; 2 nuts and cotter pin installed. _____
4. Sacrificial Zinc installed on shaft. _____
5. Batteries secure, filled, and charged. _____
6. Rigging installed on spar; cotter pins spread and taped. _____
7. Masthead sheaves free to rotate; lubricated. _____
8. Mast lights working. _____
9. All required safety equipment on board. _____

NOTE: THIS IS A BASIC PRE-LAUNCH CHECK LIST. THERE ARE MANY OTHER ITEMS WHICH CAN AND SHOULD BE CHECKED BY THE COMMISSIONING PERSONNEL.

POST-LAUNCH CHECK LIST

1. All thru hull valves open and water tight. _____
2. Shaft aligned to .003" tolerance. _____
3. Engine shaft packing nut tightened. (See Stuffing Box under Engine Operation Instructions.) _____
4. Engine and gearbox levels checked. (Refer to Engine Manual.) _____
5. Fuel tank filled and system checked for leaks. _____
6. Engine operates and passes water thru exhaust. _____
7. Engine controls operate correctly and checked for tight nuts, bolts, and spread cotter pins. _____
8. Mast stepped and mast collar installed. _____
9. Mast tie rod turnbuckle hand tight and pinned. _____
10. Turnbuckles attached; cotter pins spread and taped; rigging tuned. _____
11. Boom and running rigging installed. _____
12. Chainplate tie rods tight. _____
13. Water tank filled. (See Note 2 - Water Heater.) _____
14. Faucets work and lines checked for leaks. _____
15. Stove fuel tank filled; system checked for leaks. (Refer to Propane Stove Instructions, if applicable.) _____
16. Electrical equipment operational. (See Note 1 for Shore Power System.) _____
17. Steering gear operational. _____
18. Rudder shaft greased. _____
19. Bilge pump operational. _____
20. Toilets operational; hoses secure. _____
21. Deck hardware checked for leaks. _____
22. Recheck all thru-hulls and hose clamps. _____
23. Warranties and manuals delivered to owner. _____
24. Warranty card sent to Lear Siegler Marine. _____

COMMISSIONING NOTES

Note No. 1

If your CAL Yacht is supplied with a 110V AC shore-power system, it will have a control panel with a main breaker (30 amp) and separate breaker switches for the outlets and water heater. In addition, there are both audible (buzzer) and visual (light on panel) reverse-polarity indicators. With all switches off, attach the power cable to the power inlet on the boat. Next, connect the power cable to the dockside outlet. WARNING: IF THE POLARITY INDICATORS LIGHT AND/OR SOUND, DISCONNECT THE CORD IMMEDIATELY. THIS INDICATES A REVERSE POLARITY SITUATION WHICH IS DANGEROUS. SEVERE INJURY OR DEATH MAY RESULT. DIAGNOSE AND CORRECT THE PROBLEM BEFORE PROCEEDING.

It is strongly recommended that any appliances used on board be wired with three-wire grounded plug. If you intend to use any ungrounded appliances, have a ground fault interrupter installed in the electrical system to protect you from accidental shock.

Note No. 2

If your CAL Yacht is equipped with a water heater, it will be installed to operate off both the engine cooling system and the 110V AC electric system. Before switching the 110V system on, be sure the water-heater tank is filled. Open the valve in the inlet water line, and be sure the check valve is installed with the arrow pointed toward the water heater. Operate the pressure-water system until you get a steady stream through the hot-water faucets.

WARNING: FAILURE TO FILL THE WATER HEATER BEFORE SWITCHING ON THE 110V CIRCUIT WILL RESULT IN DAMAGE TO THE HEATING ELEMENT.

RIGGING DIMENSIONS

The following table shows the critical dimensions and materials used for the standing and running rigging on your Cal yacht.

In the event you should need to replace any of the rigging, you can order the materials through your Cal dealer. If this is not convenient, this table will allow you or a local rigger to obtain the proper materials.

The standing rigging measurements are the overall length of the stay, from the center of the hole in the upper terminal to the end of the swaged stud. If using a different turnbuckle than supplied by Lear Siegler Marine, be sure to allow for possible length difference. We would strongly recommend actually measuring any standing rigging before replacing, to assure 100% accuracy.

All running rigging should be checked periodically for chafe or damage and replaced, when necessary. If excessive wear is noted on running rigging, check all blocks and sheaves to be sure they are free to rotate and are properly aligned.

All standing rigging should be inspected for cracks in the swages, proper installation or cotter pins, and wear on clevis pins. Replace any damaged or suspect rigging.

As you may have noticed on some sailboats, the swaged ends of the shrouds will ooze rust, and in severe cases, the swage will split. One way to prevent this problem is to heat up the swaged section and place a bar of beeswax against the 1 x 19 stainless steel wire. As it melts, the beeswax will run into the swaged section, sealing it from the elements.

RUNNING RIGGING SPECIFICATIONS

CAL 33

| Title | Size | Type | Length | A End | B End | Extra Info. |
|------------------------|------|-----------------|--------|------------|-------------------|-------------|
| Main Halyard | 3/16 | 7 x 19 SS | 51' | 390-J 3/8 | Tailsplice | |
| | 7/16 | XLS Blue Fleck | 50' | Tailsplice | Whip | |
| Jib Halyard | 3/16 | 7 x 19 SS | 51' | NF 11000S | Tailsplice | |
| | 7/16 | XLS Green Fleck | 50' | Tailsplice | Whip | |
| Main Sheet | 1/2" | XLS Blue Fleck | 54' | Eye | Whip | |
| Genoa Sheet | 1/2" | XLS Green Fleck | 45' | Whip | Whip | Two |
| Topping Lift | 1/4" | XLS | 39'6" | Eye | Eye with 01-05 SH | |
| Traveler Control Lines | 1/4" | XLS Blue Fleck | 14' | | | |

With Hull No. 23.

4-18-85

CAL 33
RUNNING RIGGING
(Optional Equipment)

| <u>Quantity</u> | <u>Item</u> | <u>Type and Size</u> |
|-----------------|-------------------|---|
| 1 | Jib Halyard | Same as standard, except white braid |
| 1 | Spinnaker Halyard | 101' 7/16 Red Fleck Yacht braid with snap shackle |
| 1 | Pole Lift | 73' x 3/8 Red Fleck Yacht braid with snap shackle |
| 1 | Foreguy | 45' x 3/8 Red Fleck Yacht braid with snap shackle |
| 1 | Pole Car Control | 30' x 3/8 Red Fleck Yacht braid |
| 2 | Spinnaker Sheets | 66' x 3/8 Red Fleck Yacht braid with snap shackle |

STANDING RIGGING SPECIFICATIONS

CAL 33

| Title | Size/Const | PCL | Fitting A | Fitting B | Raw Cable/
Rod Length | Extra |
|------------------|------------|-----------|-------------------------------|---------------------|--------------------------|----------------------|
| Headstay | 9/32 | 47'6" | NG II B & E
1/2" DJ TOG-ME | MER
7854-9-16-16 | | PCL ME/TBL
46'10" |
| Backstay | 9/32 | 49'1" | NG II Stem
2" CUP | 7854-9-16-16 | | |
| Cap | 1/4" | 46'5 1/2" | STEM
1" & 2" CUP | MER
7884-8-16 | | |
| D2 | 1/4" | 33'5" | STEM
1" CUP | 7884-8-16 | | |
| Forward
Lower | 1/4" | 18'7 1/2" | STEM
1" & 2" CUP | 7884-8-16 | | |
| Aft
Lower | 1/4" | 18'9 1/2" | STEM
1" & 2" CUP | 7884-8-16 | | |

PCL: Pin Center Length: From bearing of ball and cup to pin in turnbuckle with turnbuckle 2/3 open.

NOTE: WHEN REPLACING ANY RIGGING, BE SURE TO MEASURE THE ACTUAL BOAT BEFORE CUTTING NEW RIGGING.

With Hull No. 32.

RIGGING AND TUNING THE MAST

1. RIGGING THE MAST

Installation of the standing and running rigging should be performed by your CAL Dealer or his agent, as they are most knowledgeable of the way your CAL mast is rigged. Elsewhere in this booklet are rigging lengths and dimensions to help in any replacement that may be needed. We also strongly recommend that you measure any rigging before replacing it, to assure accuracy.

All sheaves should be checked for free movement and all tangs for correct lead angle before the mast is stepped. Tape any sharp edges.

2. STEPPING THE MAST

Stepping the mast on a boat of this size is not a job for amateurs and should only be done by professionals with the correct equipment. Your CAL Dealer can perform this service or recommend a competent professional.

Be sure to check all cotter pins, clevis pins, and the spreader base and end fittings to be sure that they are secure. Be sure the upper shrouds are wired where they pass over the spreader tip. Be sure to slip the mast boot over the mast.

Check all mast lights prior to stepping the mast. Be sure all turnbuckles are fully open.

Step the spar through the deck and onto the mast step. Be careful not to pinch the wires during the stepping. ALWAYS KEEP ANY PART OF YOUR BODY OUT FROM UNDER THE MAST DURING STEPPING.

RIGGING AND TUNING THE MAST - Continued

2. STEPPING THE MAST - Continued

The mast step was set at the factory to provide proper mast rake. The mast step is adjustable, and the mast rake can be changed, if necessary, by loosening the mast step bolts and sliding the step fore or aft.

All stays and shrouds should then be attached and the mast wedges inserted. The wedges should keep the mast in the center of the mast collar. Next, tighten the headstay, backstay, and upper shrouds to a hand-tight condition. For now, leave the lower shrouds slack. Adjust the headstay and backstay to achieve a straight spar. This can be checked by sighting up the mast track of the spar. Next, tighten the upper shrouds to get the mast straight athwartships. To check athwartships straightness, measure with the main halyard the distance from the masthead to the aft lower shroud chainplate. If the distances on each side are within one inch, the mast is satisfactorily straight. Finally, tighten the lower shrouds no more than hand tight.

Final tuning must be accomplished while sailing. In a light (6-8 knots) breeze, adjust the shrouds to achieve a straight spar on either tack.

PRIOR TO SAILING, BE SURE TO INSTALL THE TIE-ROD TURNBUCKLE FROM MAST TO THE DECK. Attach the turnbuckle to the pad eye on the underside of the deck - just aft of the mast. Open the turnbuckle to $2/3$'s of its maximum length. Attach the mast tang to the turnbuckle, and position the tang on the aft face of the mast. Mark the fastener holes, drill and tap the mast

RIGGING AND TUNING THE MAST - Continued

2. STEPPING THE MAST - Continued

and install the tang.

Tighten the turnbuckle hand tight. Do not overtighten, as this will cause a deck depression. When sailing, check to see that the deck is not flexing. After checking turnbuckle tightness, insert cotter pins. Periodically, check the tie-rod for adequate tension. This tie-rod prevents deck flexing, caused by halyard and rig loads.

Care should be taken not to overtighten the rigging. Some slack in the leeward shrouds is normal, when sailing in moderate (8-10 knots) winds.

The rigging will need adjustment after a few sails to compensate for any wire stretch. Be sure to install cotter pins in all the clevis pins and turnbuckles, and bend them over and tape them.

Final tuning for best performance will depend on local sea and wind conditions and the cut and set of your sails. Consult your dealer or your sailmaker for advice.

DANGER: WHEN HAULING, LAUNCHING, AND SAILING NEAR LOW OVER-HEAD WIRES, YOU MUST BE VERY CAREFUL THAT THE MAST NOT TOUCH THE WIRES. THE MAST COULD CONDUCT HIGH VOLTAGE ELECTRICITY TO THE PEOPLE ON BOARD AND CAUSE SEVERE BURNS OR DEATH. THE BOAT'S LIGHTNING GROUND SYSTEM WILL NOT PROTECT YOU FROM THE HIGH VOLTAGE POWER FROM POWER LINES.

UPPER AND INTERMEDIATE SHROUDS

PLEASE NOTE: When installing the upper and intermediate shrouds on the CAL 33, the intermediate shroud goes through the forward hole of the upper spreader base and the forward hole in the lower spreader tip to the forward of the two middle chainplates. The upper shroud goes from the masthead through the forward hole in the upper spreader tip, then through the aft hole in the lower spreader tip to the aft of the upper middle chainplate.

ATTENTION: DO NOT CROSS THE UPPER SHROUDS IN THE MASTHEAD.

UPPER AND INTERMEDIATE SHROUDS

PLEASE NOTE: When installing the upper and intermediate shrouds on the CAL 33, the intermediate shroud goes through the forward hole of the upper spreader base and the forward hole in the lower spreader tip to the forward of the two middle chainplates. The upper shroud goes from the masthead through the forward hole in the upper spreader tip, then through the aft hole in the lower spreader tip to the aft of the upper middle chainplate.

ATTENTION: DO NOT CROSS THE UPPER SHROUDS IN THE MASTHEAD.

ISOMAT SPAR SYSTEMS

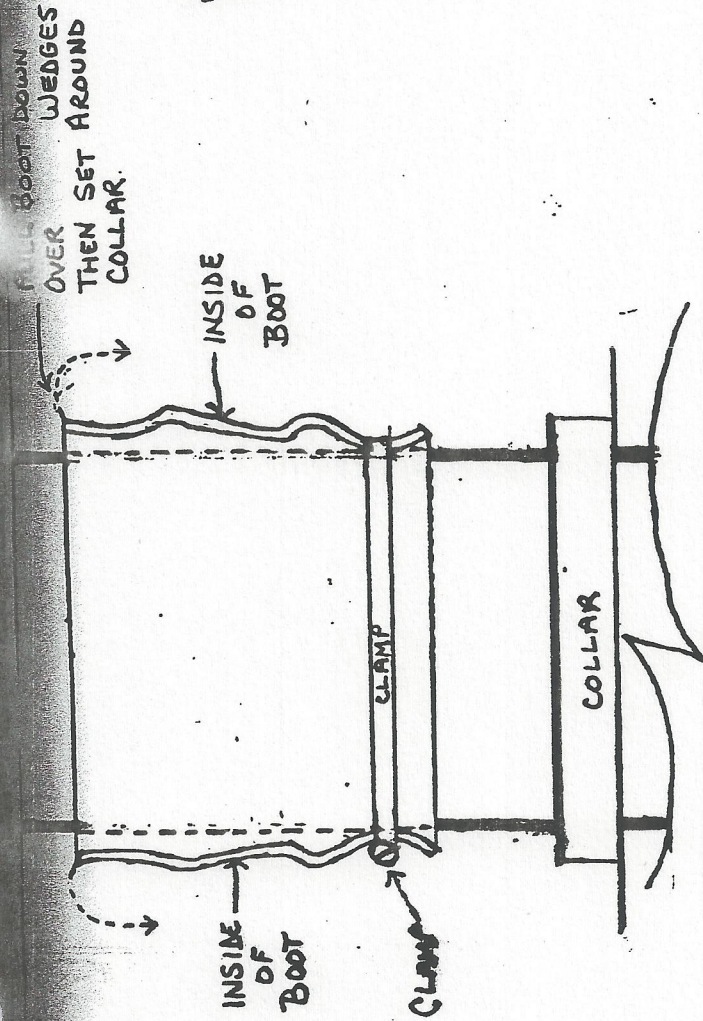
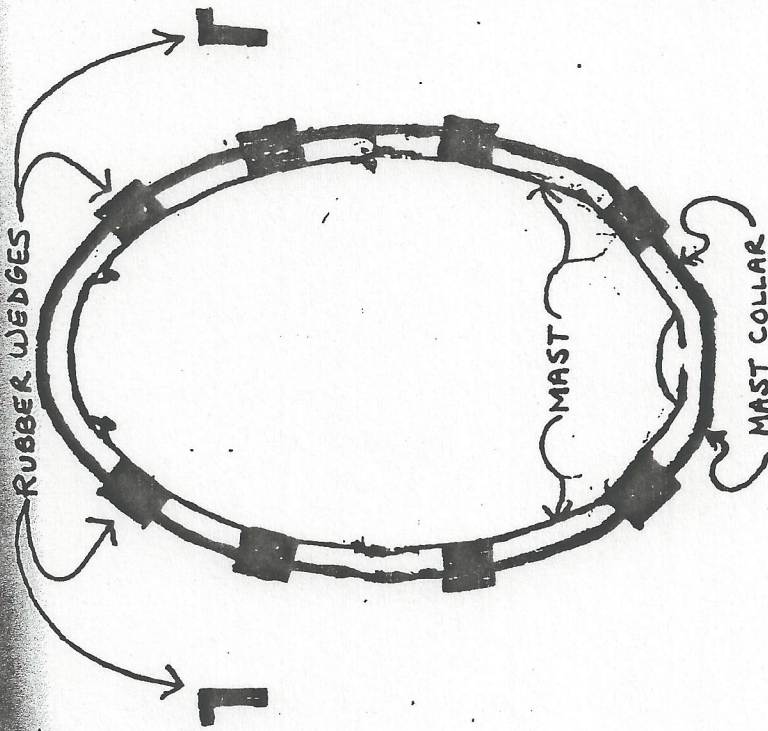
The Isomat mast/boom system on your CAL 33 is one of the most modern in the world. It is, however, slightly different in its method of rigging attachment. The upper ends of the shrouds have a ball terminal, rather than the traditional marine eye. These terminal balls have one or more stainless seats that allow the ball terminal to pivot and assume the proper angle without wearing the aluminum seat. BE SURE THAT THESE STAINLESS SEATS ARE UNDER EACH BALL TERMINAL.

Periodically, the mast and wires should be thoroughly inspected for cracks, chafe, burrs, etc. At any sign of chafe or wear on a halyard, the cause should be checked immediately. Halyards carry heavy loads, and any worn or weak unit should be replaced.

The mast is anodized to protect it, and chafe from halyards not tied away from the mast can cause the removal of the anodizing, leading to corrosion of the mast. Halyards should be carefully tied off to prevent this chafe, as well as to keep the noise of slatting halyards from annoying your neighbors.

The mast should be coated with a good wax at least once a year to ease cleaning and prevent dirt build up. The sail track in the mast and boom should be sprayed with a non-petroleum lubricant at least twice a year. A Teflon^(R) lubricant is ideal. Check all screws, nuts, bolts, etc., for tightness once a month.

Your mast also has conduit inside to run wires to the masthead. Wires must be run through these conduits or problems will arise in tangles with the internal halyards.

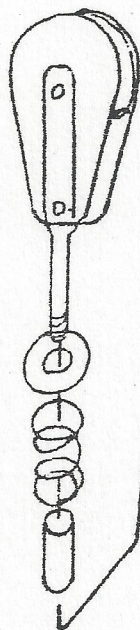
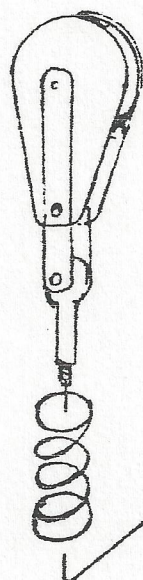


MAST BOOT AND WEDGING INSTRUCTIONS

1. Before stepping mast, slip mast boot inside out over the mast and up to gooseneck. (Smooth finish toward mast.)
2. After stepping mast, and before final tuning of the shrouds, install rubber wedges between the collar and mast.
3. The rubber boot should be clamped around the mast above the collar, then pulled down over the clamp, wedges, and set over the collar.

Mast boot and clamps

Six Wedges,
smooth side
towards mast.

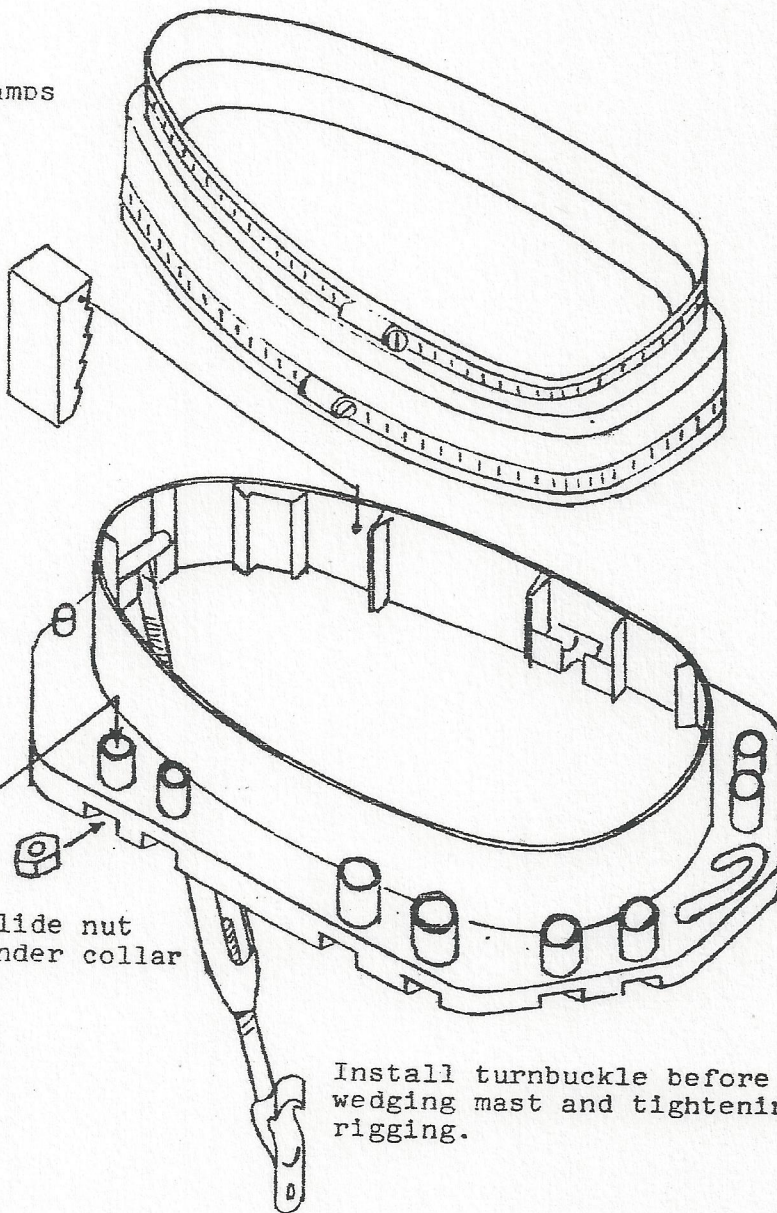


Slide nut
under collar

Install turnbuckle before
wedging mast and tightening
rigging.

Blocks may be installed in any of 14 locations.
Two sizes are available depending on size of
boat and application. Blocks are provided on
some models if required.

MAST DECK COLLAR
For Yachts with Isomat Spars



CHAINPLATE RODS

CAL 33

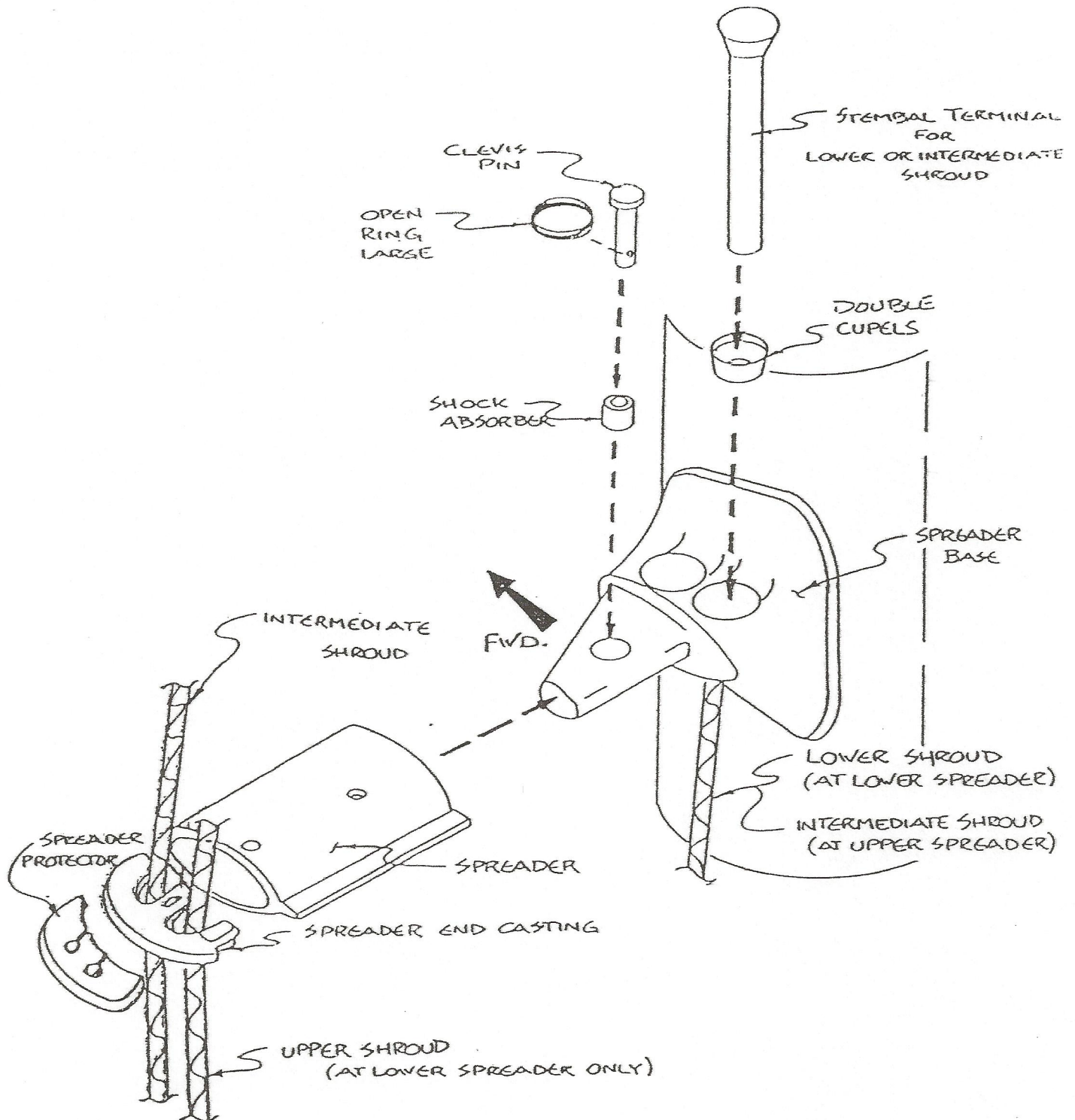
The chainplate rod system used on the shrouds of your boat is designed to carry rigging loads to the structural pan, which is fiberglassed to the hull. IT IS IMPORTANT THAT THE INSTALLATION BE CHECKED FOR PROPER ROD TENSION. The system is designed to carry rigging loads to the hull, rather than the deck.

After the boat is launched and the spar installed, but before the rigging is tightened, the rods should be taut. Pulling on the rod, at mid-height from pan to deck, you should notice a very slight deflection. If the rod is loose, it should be tightened. After final rigging and a few early sailings, recheck the rod tension. If the deck is deflecting at the chainplates, the rod needs further adjustment.

To tighten the rod, remove the cap on the pan at the base of the rod and get a wrench on the nut. Above the pan is a flat spot on the rod. Use another wrench or locking pliers to turn the rod. DO NOT OVERTIGHTEN. If the rods are too tight, with the rigging slack, the deck could be pulled down, creating a depression on deck and damage to the gelcoat surface.

The U-bolt, to which the turnbuckle attaches, is bolted through the deck to an aluminum plate that holds the top of the rod. Annually, the U-bolt should be disassembled and rebbed. When reinstalling, tighten the U-bolt nuts to a snug condition. Again, do not overtighten, or you will damage the deck finish. After reinstalling the U-bolt, be sure to check the chainplate rod tension.

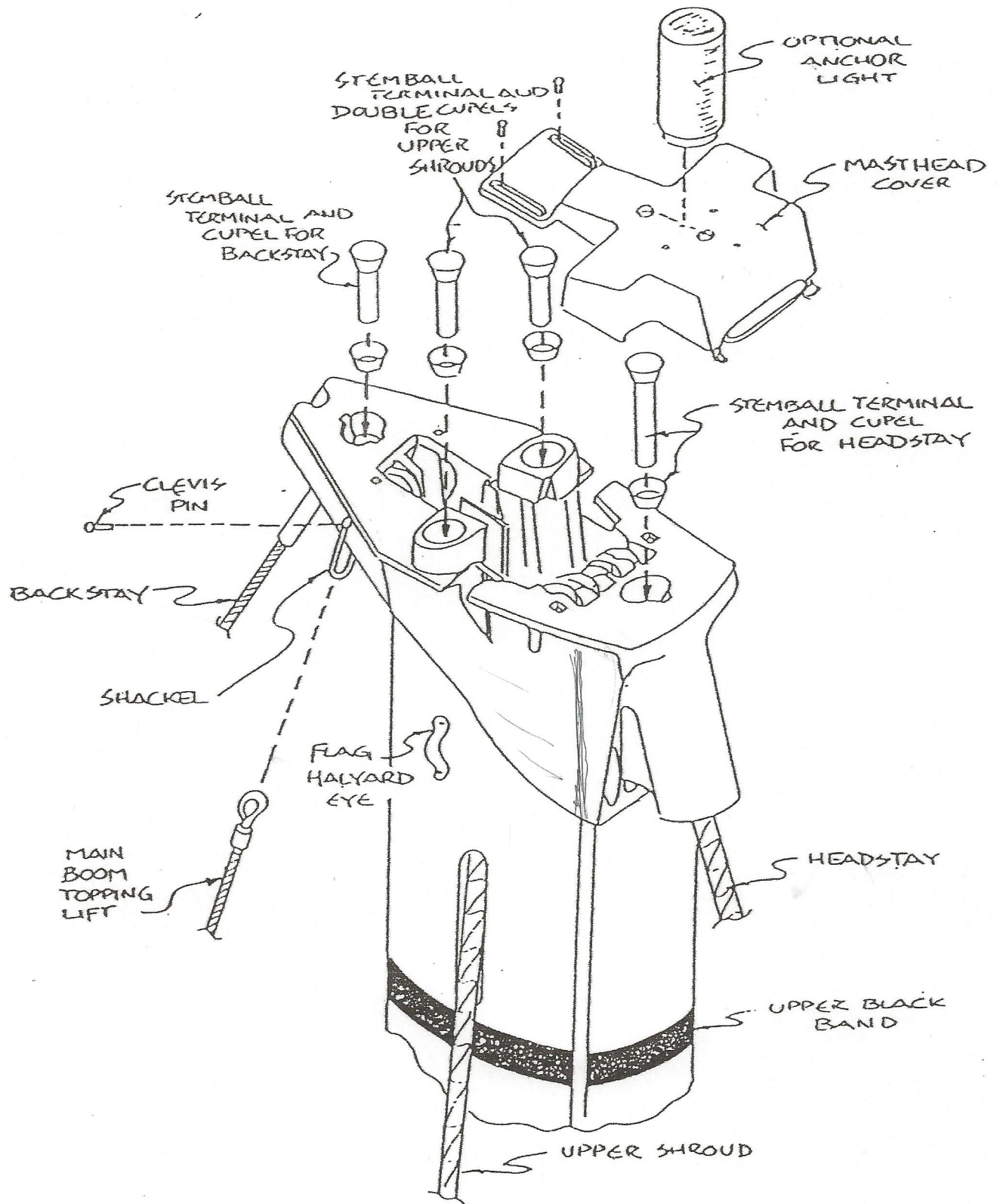
TYPICAL SPREADER INSTALLATION
ISOMAT SPAR



NOTE: LOWER END OF SHROUD TO BE SLIPPED THRU CUPEL AND SPREADER BASE

Fig. 3.1.2

TYPICAL MASTHEAD INSTALLATION
ISOMAT SPAR



BOTTOM COATINGS

Since the beginning of the fiberglass boat building industry to the present day, all manufacturers have been plagued with the problem of occasional blistering on underwater surfaces. These blisters are caused by osmotic pressure of a solvent (water), which can pass through a membrane (the gelcoat) to reach a salt (a material which will dissolve in the solvent). This can occur at any time through any gelcoat finish. Much has been written in the past few years in trade journals, chemical journals, and in the general literature discussing this problem and suggesting possible solutions. Thus far, there has been no universally accepted reason as to why this occurs in some boats and not others, nor is there a totally accepted preventive cure or fix once blisters occur.

Although gelcoat surfaces are not covered under Lear Siegler Marine's Limited 1-Year Warranty, we feel that as a manufacturer we would like to assist our customers in finding a solution to this problem. The best available information seems to indicate that coating the boat's underwater surfaces with an impermeable epoxy coating will assist in the prevention of gelcoat blisters. This epoxy should be a type that is recommended by the manufacturer for underwater use, and should be done when the boat is new, if at all possible. A boat that has been in the water may also benefit from having this epoxy put on, but it is best to be done before the boat is first launched. One product that we know of is 404/414 Epoxy by International Paint Company.

BOTTOM COATINGS - Continued

Please note we mention this product only as a help. We do not specifically endorse this product, and recommend that you contact local representatives and make your own decision as to what product to use.

Finally, Lear Siegler Marine uses the finest available materials and the best available technique in the manufacture of their product.

Gelcoat blistering is a recognized fact of life in the marine fiberglass industry, the chances of which may be reduced by the use of an impermeable barrier coat on the bottom during the initial commissioning.

BOAT STORAGE

Whenever a boat is pulled from the water, for work or storage, care must be taken to provide adequate and proper support of the hull. This is especially true of fin-keel sailboats.

It is not recommended that the weight of the boat be rested solely on the keel. Because of the small area of the keel bottom, the localized loads on the hull in the area of the keel would be severe and could result in permanent damage to the shape or structure of the boat.

If poppets are used for support, they should be located so that the pads are under the bulkheads, berth fronts or pan stringers, so that the load is dispersed (see Docking Plan). Failure to properly position the poppets could result in hull depression. Be sure to use an adequate number of supports, and locate them to prevent the boat from tipping fore or aft.

When hauling any boat with a propeller shaft, be sure to disconnect the coupling before lifting the boat. This will prevent bending of the shaft as the boat changes shape when lifted. Additionally, when hauling the CAL 33, please be sure to refer to the Docking Plan for placement of straps, slings, etc.

Do not careen (lean the boat over on its side) a fin-keel sailboat. The hull, keel, and rudder should survive any accidental groundings. However, care must be taken to keep the boat as balanced and upright as possible to prevent excessive loads.

DANGER: WHEN YOU ARE HAULING, LAUNCHING, AND SAILING NEAR LOW OVER HEAD WIRES, YOU MUST BE VERY CAREFUL THAT THE MAST NOT TOUCH

BOAT STORAGE - Continued

THE WIRES. THE MAST COULD CONDUCT HIGH VOLTAGE ELECTRICITY TO
THE PEOPLE ON BOARD AND CAUSE SEVERE BURNS OR DEATH. THE BOAT'S
LIGHTNING GROUND SYSTEM WILL NOT PROTECT YOU FROM THE HIGH
VOLTAGE POWER FROM POWER LINES.

Your CAL Dealer has cradles available, which will fit your CAL exactly. It is recommended that this cradle be used whenever possible.

OPERATION

CONSTRUCTION DETAILS AND GENERAL INFORMATION

A. HULL

The hull is hand laid up in a large female mold into which successive layers of material are laid. The mold can be rotated from side-to-side during the laminating process, allowing the workers to place the fiberglass more accurately, and also to allow better resin penetration than would be possible with an upright mold.

The exterior of the boat is an isothphalic NPG gel coat, which is sprayed into the mold after the stripe areas have been masked off. Next, the masking is removed and the stripe color is sprayed on. Next, layers of multidirectional glass fiber are laid into the mold to prevent pattern transfer from the successive layers of laminate. Finally, layers of bi-directional and multidirectional fiber are applied until the correct layup thickness is attained. The thickness will vary, depending on loads applied and will generally increase from sheer to the keel area.

The interior pan acts as a structural reinforcing member for the hull. The pan is bonded to the hull in every conceivable place, in order to make the pan and hull act as a single unit. There are also special fiberglass floors added to the keel area to give as much strength as possible to this critical area.

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

A. HULL - Continued

There are special fiberglass bosses built into the port and starboard - to act as attachment points for the Navtec chainplate rods. These transfer the rigging loads to the hull, reducing strain on the deck and reducing the need for load-carrying bulkheads.

B. DECK

The deck is hand laid up, using glass strand fibers and woven roving. The deck is balsa cored for strength and weight reduction. In areas of high stress or compression, the balsa core is replaced with either plywood core, aluminum sheet, or solid glass. The nonskid area is molded in, and the deck is gelcoated as with the hull.

C. INTERIOR

The interior main salon headliner is vinyl. The headliner can be removed in most places for access to the underside of the deck. The hull battens and teak and holly sole are all varnished. The interior teak is oiled.

D. KEEL

The keel is an external lead casting bolted to an external stub with seven 3/4" stainless steel bolts. Additionally, between the hull and keel casting epoxy is applied as a sealant and adhesive. The external lead keel is generally recognized as the best way of attaching ballast, in order to get the weight as low as possible. Also, an external lead keel provides much better impact resistance than either iron or internal ballast of any type. The keel hull joint

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

D. KEEL - Continued

carefully faired at the factory, and the keel is epoxy coated, but in time the keel will work slightly, and a small crack may occur at this joint. This is no worry, providing no severe impact or grounding has occurred, and providing that the keel bolt nuts are tight.

E. RUDDER

The rudder of the CAL 33 is composed of 2 7/8" diameter, 3/16" wall stainless steel tube, which forms the rudder stock.

Stainless steel webs are welded to the aft side of the tube to provide support to the back of the rudder. This assembly then has a rigid closed cell polyurethane foam cast around it, which is coated with fiberglass and gelcoat. The polyurethane foam makes for a lightweight rudder of nearly neutral buoyancy and great strength.

There is additional information on the rudder, provided by the manufacturer, in your owner's packet.

F. PLUMBING AND ELECTRICAL

The plumbing systems in the CAL 33 were designed for efficiency and ease of use. The boat has two plastic (17 and 33 gallon) water tanks with separate water fills. There is a selector switch under the galley sink, which determines which tank is used. In this way, one knows when a tank is empty, so that provisions can be made for refilling. (See Fresh Water System Diagram.)

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

F. PLUMBING AND ELECTRICAL - Continued

The fresh water plumbing is all semi-rigid PVC with threaded end connections. In the event of leakage at these connections, a slight tightening with an adjustable wrench should stop the seepage. (CAUTION: DO NOT OVERTIGHTEN.) The fresh water system has a self-priming pressure pump of the diaphragm type. It is recommended that a spare part kit be carried for this pump.

The electrical system and wiring are to the highest industry standards. The wiring is run (where possible) in plastic conduit to prevent abrasion and to facilitate running of accessory wires. Specifics of the 12V DC and 110V AC systems are covered elsewhere in this manual.

ELECTRONICS PANEL

Just forward of the chart table there is a cabinet with a black plastic face. A few screws allow the removal of the panel for installation of radios or electronics. Appropriate shelves or supports may be built inside the cabinet. The plastic face can be easily cut with a sabre saw.

This is an ideal location for your optional electronics, as it is convenient to the chart table, electric panel, and cockpit.

BONDING SYSTEM

In the CAL 33, all metal thru hulls, shrouds, stays, engine, mast step, propeller shaft, and strut are bonded together and to the keel with 8 AWG solid copper wire. This is in accordance with the American Boating and Yacht Council (A.B.Y.) specifications for lightning ground systems. While this

Y J.P.F. DATE 12-6-84

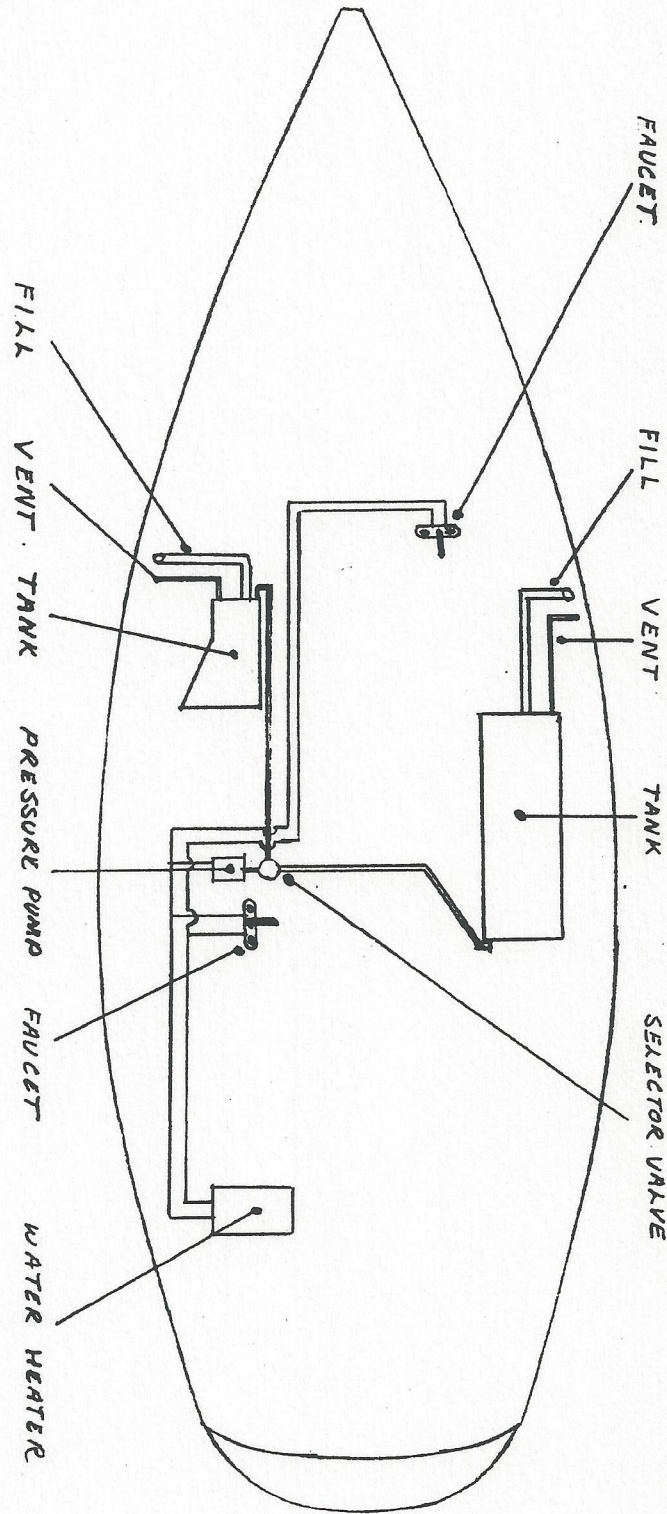
SUBJECT WATER SYSTEM

SHEET NO. OF

HRD. BY DATE

CAL 33

JOB NO.



CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

F. PLUMBING AND ELECTRICAL - Continued

system should offer added protection, we DO NOT BELIEVE THAT ANY SYSTEM CAN OFFER COMPLETE PROTECTION FROM LIGHTNING. We, therefore, recommend that you seek shelter or otherwise avoid lightning. If caught out during a lightning storm, AVOID TOUCHING any metal objects such as shrouds, stanchions, pulpit, steering gear, etc., as these may attract lightning.

THIS SYSTEM IS NOT DESIGNED TO OFFER ANY PROTECTION, IF THE MAST ENCOUNTERS HIGH-TENSION WIRES. Watch your charts carefully for wires and avoid contact with any wires!

Additionally, the bonding system may also minimize the chances of electrolysis, should any individual fitting become electrically hot for some reason. However, as electrical equipment is added to the boat, the chances of electrolysis increase. There are qualified technicians who can detect electrolysis problems, as well as instruments that can be added to the system to detect electrolysis. We recommend that the boat be periodically checked.

Finally, be sure to inspect and clean all bonding connections periodically.

ELECTRICAL SYSTEM

The CAL 33 is equipped with both 12 volt DC and 110-115 AC electrical systems as standard equipment. The wiring is run to prevent chafe or contact with water, where possible, and is supported as needed. We do recommend that you check all the connections at least once a year for corrosion, loose fittings, etc.

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

F. ELECTRICAL SYSTEM - Continued

DC - 12 VOLT SYSTEM

The DC system is powered by two 105 AH batteries located under the forward end of the starboard settee and controlled by a four-position battery switch located on the panel above the chart table. This switch acts as a master battery disconnect as well as a selector for the batteries.

Both batteries are charged by the engine alternator, which will charge both batteries - regardless of switch position; however, THE BATTERY SWITCH SHOULD NEVER BE TURNED OFF, WHILE THE ENGINE IS RUNNING - SERIOUS DAMAGE MAY RESULT.

Batteries may also be charged with the optional AC powered battery charger. The charger provided by the factory has a sensing mechanism which can tell which battery needs charging and will charge it only. When both batteries are fully charged, the charger will shut itself off.

The level of charge of the batteries can be checked with the battery condition meter located on the DC panel over the chart table. The test switch on the panel will directly connect the meter to the batteries and so indicate battery level. False readings will result, if the battery switch is in "both" when the battery condition is checked. (See Basic Rules For Battery Care.)

The four position battery switch is used to control which battery is in use by the 12V system. When the battery is on battery "1", battery one is being discharged; when the

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

F. DC - 12 VOLT SYSTEM - Continued

selector is on battery "2", battery two is being discharged; when the selector switch is on "both", then both batteries will be discharged. It is recommended that one battery be used for engine starting and one battery for domestic supply. That way, there will always be one battery available to start the engine.

The boat is wired with a negative ground.

Access to the electrical panel can be easily gained by removing the screws at the top. The hinged panel will then fold down to allow access for maintenance or new connections.

BE SURE TO DISCONNECT ALL BATTERIES AND UNPLUG THE SHORE POWER CORD BEFORE OPENING THE PANEL, OR SEVERE INJURY MAY RESULT.

110-115 VOLT AC POWER

The 110V AC Power System depends on the boat's being plugged into a 110 volt - 30 Amp shore station. The CAL 33 comes with a 50' 110V-30A shore power cord, which should be plugged into the shore station and into the 110V inlet on the boat, located inside the cockpit at the stern. CARE SHOULD BE TAKEN to support the cord at both ends and allow sufficient slack to avoid pulling (don't forget the tide)! DO NOT USE ADAPTERS TO CHANGE YOUR CORD TO ANY OTHER AMPERAGE. SEVERE INJURY OR DAMAGE MAY RESULT.

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

F. 110-115 VOLT AC POWER

The right side of the panel controls the 110V-AC. At the top is the Master-Circuit Breaker, which controls AC flow in the boat. This breaker should ALWAYS BE OFF when no 110V AC is in use, or when connecting and disconnecting the shore power cord.

There are three circuit breakers that control individual AC functions. The "outlets" breaker controls the three 110V outlets. These outlets are located aft of the icebox, under the alcove in the head, port side above drawers in the vee berth.

The "hot water heater" breaker controls the 110V element of the water heater. NOTE: ALWAYS TEST TO BE SURE THERE IS WATER IN THE SYSTEM BEFORE TURNING THIS BREAKER ON. Failure to check will result in a burn out of the water heater and possible severe damage.

The "Battery Charger" switch turns on the optional battery charger, enabling you to recharge the batteries from 110V shore power.

OPTIONAL ITEMS

BATTERY CHARGER - As stated above, this unit changes the 110V AC to 12V DC and charges the batteries. This unit is strongly recommended, if a 12V DC refrigeration system is ordered.

Remember, the boat must be plugged into shore power, the

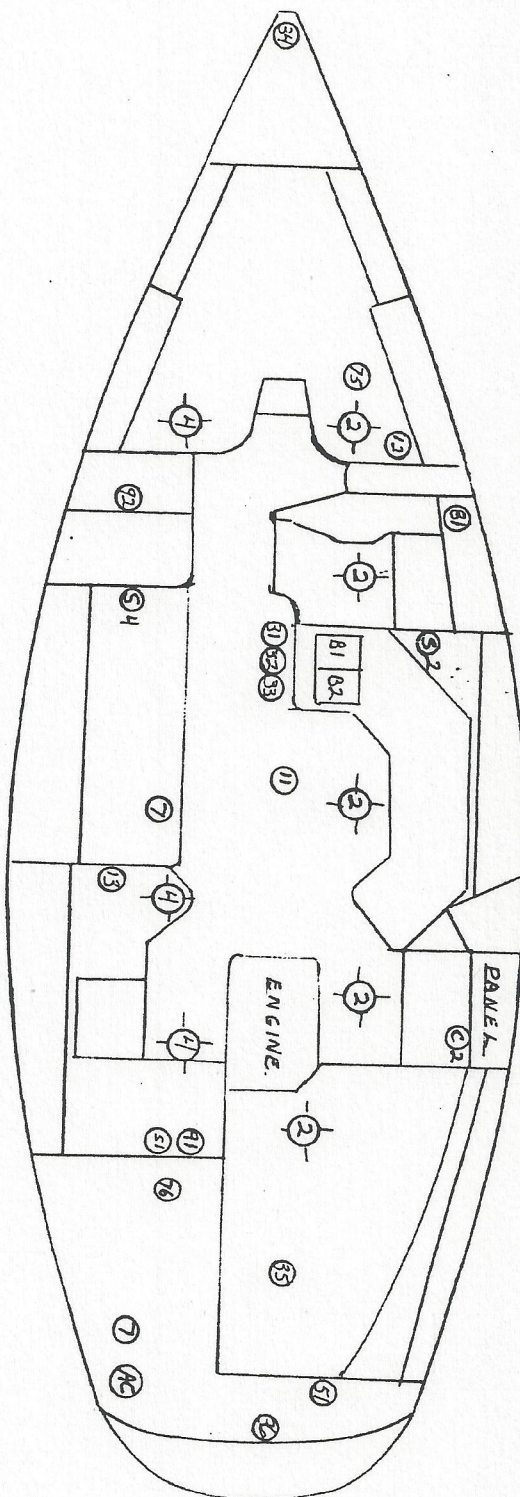
BY J.P.F. DATE 12-5-84 SUBJECT ELECTRICAL FIXTURES
 CHKD. BY DATE CA 33

SHEET NO. OF
 JOB NO.

PORT HARNESS
 4 - CABIN LTS PORT
 7 - FUEL GA. SENDER
 13 - PRESSURE WATER PUMP
 50-51 LPG SOLINOID
 35 COMPASS LT
 36 STERN LT
 91-92 AC OUTLET
 AC SHORE POWER INLET
 76 WATER HEATER

SYM BOAS: (C) CHART LT, (S) SWIVER LT, (D) DOME LT,
 B1 - BATTERY #1 B2 - BATTERY #2

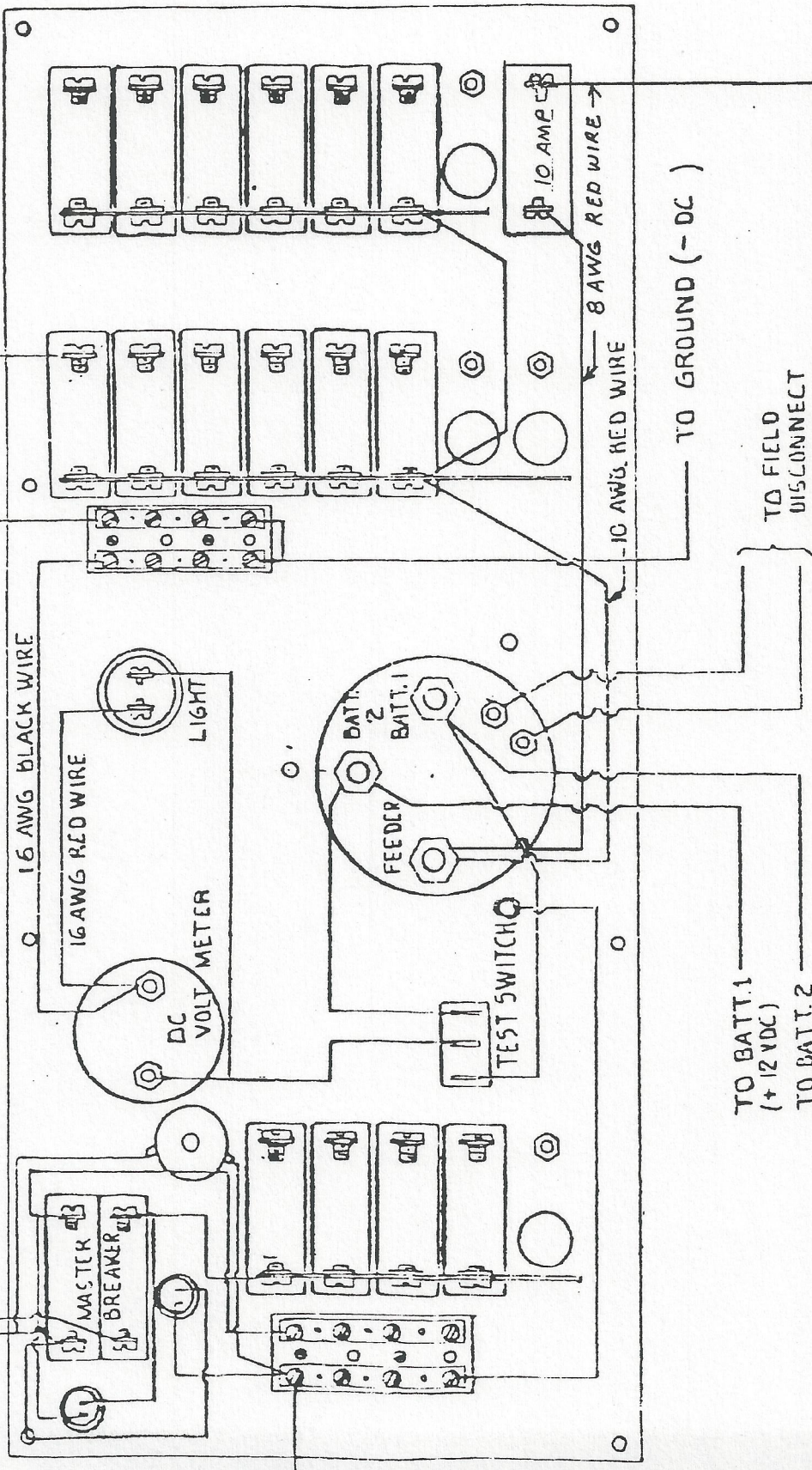
STARBOARD HARNESS
 2 - CABIN LTS STBD
 11 - ELECTRIC BICE PUMP (OPTION)
 12 - SHOWER SUMP PUMP (OPTION)
 31 - STEERING LT
 32 - SPREADER LT
 33 - ANCHOR LT
 34 - RUNNING LTS
 175 - BATTERY CHARGER (OPTION)
 81 - AC OUTLET



NOTE: WIRES FOR UNINSTALLED OPTIONS WITH NOT BE CONNECTED TO PANEL.

TO DC FUNCTION (TYPICAL)

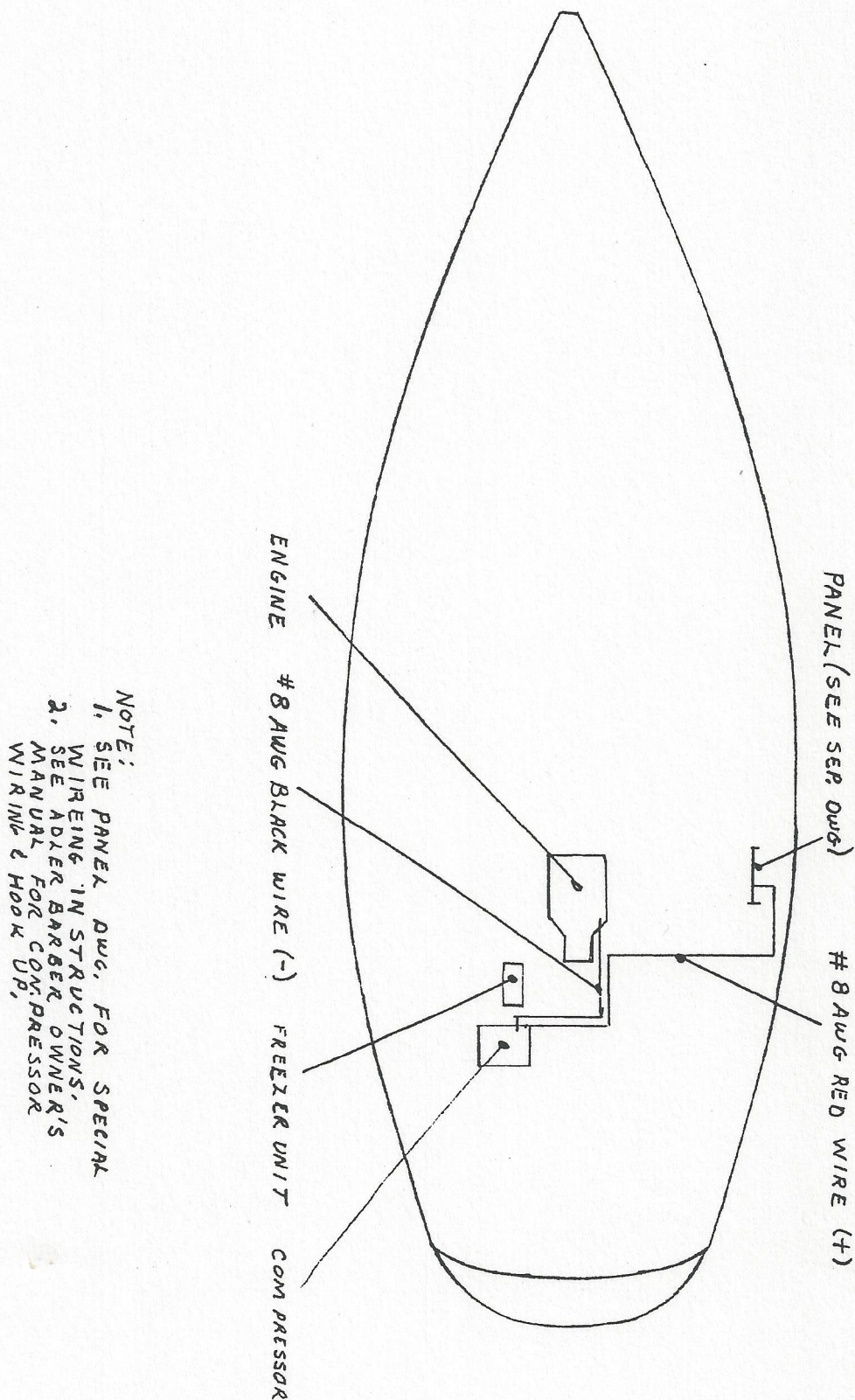
AC NEUTRAL WHITE
AC HOT BLACK



TO REFRIGERATION (OPTIONAL) →
NOTE: COMMON STRIP IS CUT SHORT
& BREAKER RECEIVES POWER DIRECTLY
FROM BATTERY SWITCH

CAL COMBO 72400 PANEL
(BLACK)

BY JPF DATE 12-14-84 SUBJECT C-33 SHEET NO. _____ OF _____
 CHKD. BY _____ DATE _____ REFRIGERATION INSTALLATION JOB NO. _____
ADLER BARBER COLD MACHINE



NOTE:
 1. SEE PANEL DWG. FOR SPECIAL
 WIRING INSTRUCTIONS.
 2. SEE ADLER BARBER OWNER'S
 MANUAL FOR COMPRESSOR
 WIRING & HOOK UP.

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

F. OPTIONAL ITEMS - Continued

BATTERY CHARGER - Continued

AC Master switch must be on, and the "Battery Charger" circuit breaker must be on for the batteries to be charged this way.

PROPANE SOLENOID - When the propane stove with oven is ordered, a 12V DC propane solenoid is installed on the bulkhead - aft of the icebox. This switch must be turned on to provide gas flow to the stove and MUST BE TURNED OFF when the stove is not in use. The battery switch must be turned on in order to use this switch. The switch shuts off the propane back in the propane locker, preventing entry of gas into the cabin (also see stove operation).

REFRIGERATION - The refrigeration is controlled by a circuit breaker on the 12V DC panel, and also by a thermostatic switch in the icebox. The refrigeration will keep the icebox cold, with minimal running each day (running time depends on your location and the temperature). Either the engine or the optional battery charger should be running while the refrigeration is on, to prevent excessive battery drain.

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

G. ENGINE INSTALLATION

The diesel engine installation in the CAL 33 is designed for accessibility and reliability. The engine is provided with both a fuel filter and an optional raw water (cooling water) strainer. Be sure and check both these filters and replace the cartridges as necessary. We recommend carrying spare filter cartridges for both these units. Your engine also has its own fuel filter mounted on the engine. Follow your engine's owner's manual for specifics.

The engine uses flexible mounts set on a fiberglass engine bed. This molded bed eliminates problems with timbers or metal in the bilges.

The fuel system (see Fuel System Diagram) utilizes a 24 gallon aluminum fuel tank located under the port settee. The fuel line is of the flexible type and has a shut off at the tank. The fuel lines on the engine are of metal and will require special tools to repair.

The exhaust system is of the wet type that is most common with small marine engines. Water is injected into the exhaust line to cool the exhaust gases and quiet the engine. The exhaust also passes through a muffler and is looped well above the waterline to prevent backflooding.

ENGINE OPERATING INSTRUCTIONS

The engine installed in your yacht has already been run and all systems tested before leaving the plant.

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

G. ENGINE OPERATING INSTRUCTIONS - Continued

Study your engine owner's manual and get to know your engine. Please check with your engine manufacturer, or his dealer, with any questions. The knowledge could be of great assistance to you. Also, some manufacturers have clinics aimed at the customer - contact them for details.

It is advisable that you follow the engine manufacturer's procedures and recommendations on run-in and maintenance.

On yachts with propeller shafts, please use the following procedure:

ALIGNMENT OF ENGINE TO SHAFT

The engine must be properly and exactly aligned with the propeller shaft. No matter what material is used to build a boat, it will be found to be somewhat flexible; and when launched, the boat hull will change its shape to a greater extent than is usually realized. It is, therefore, very important to check the engine alignment at frequent intervals and to correct any errors when they appear.

Misalignment between the engine and the propeller shaft is the source of troubles, which are often blamed on other causes. It will create excessive bearing wear, rapid shaft wear, or leakage of transmission oil through the rear seal. A bent propeller shaft will have exactly the same effect; and it is, therefore, necessary that the propeller shaft itself be perfectly straight.

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

G. ALIGNMENT OF ENGINE TO SHAFT - Continued

The engine should be moved around on the bed and supported on the screw mounts until the two halves of the couplings can be brought together without using force, and so that the flanges meet evenly all around.

Never attempt a final alignment with the boat on land. The boat should be in the water and have had an opportunity to assume its final water form. It is best to do the alignment with the fuel and water tank about half full and all the usual equipment on board and after the main mast has been stepped and final rigging has been accomplished.

Take plenty of time in making this alignment, and do not be satisfied with anything less than perfect results.

The alignment is correct when the shaft can be slipped backward and forward into the counterbore very easily and when a feeler gauge indicates that the flanges come exactly together at all points. The two halves of the coupling should be parallel within 0.003 inches.

In making the final check for alignment, the engine half of the coupling should be held in one position and the alignment with the propeller half of the coupling checked in each of four positions, rotated 90° between each position. This test will also check whether the propeller half coupling is in exact alignment on its shaft. Then, keeping the propeller coupling in one position, the alignment should be checked, rotating the engine coupling as described above.

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

G. ALIGNMENT OF ENGINE TO SHAFT - Continued

The engine alignment should be rechecked after the boat has been in service for one- to three-weeks and, if necessary, the alignment remade. It will usually be found that the engine is no longer in alignment. This is not because the work was improperly done at first, but because the boat has taken some time to take its final shape. It may even be necessary to realign at a further period. Alignment should be rechecked at least every six months.

The coupling should always be opened up and the bolts removed, whenever the boat is hauled out or moved from the land to the water and during storage in the cradle. The flexibility of the boat often puts a very severe strain on the shaft or the coupling, or both when it is being moved.

During the alignment procedure, check the set screws, which hold the propeller half coupling to the shaft. These must be tight, in contact with the shaft, and safety wired.

STUFFING BOX

The stuffing box provides a seal for the propeller shaft at the inner end of the shaft log. It is connected to the shaft log with heavy wall hose, double clamped at each end. This flex hose allows the stuffing box to maintain alignment with the prop shaft without creating excessive wear of the packing, due to misalignment or vibration. The packing used is wax, impregnated 1/4" x 1/4" square flax.

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

G. STUFFING BOX - Continued

When the shaft is turning, it is normal to have a slight leakage at the seal, about one drop per 30 seconds. This acts as a coolant, as well as a lubricant, to protect the seal and shaft surface. One should remember this leakage and pump bilges accordingly. Should excessive leakage be apparent, release the lock nut and tighten the packing nut slightly and retighten the lock nut. Restart engine and check again with shaft turning.

When it becomes necessary to replace the packing (boat should be hauled), loosen the lock nut, back off the packing gland nut, and slide it forward on the shaft. Remove all the old packing and replace it with three rings of new packing. Stagger the ends of each ring so as not to provide a path for water to leak through. DO NOT wind one continuous strip spirally around prop shaft to make a seal.

Slide the packing gland back and tighten enough to create a heavy drag on the shaft. This will seat and form the packing.

Back off the packing nut until the shaft feels free and reset the lock nut. Recheck for proper leakage when boat is returned to the water. BE SURE THE LOCK NUT IS SECURE, as operating the boat in reverse could cause the packing gland to screw off the stuffing box, allowing water into the boat.

BASIC RULES FOR BATTERY CARE AND MAINTENANCE

- 1) Check liquid level in all cells once every week or two. Add water as required. Bring liquid level to 3/8 inch above top of separators. It is much better to add water in small amounts frequently, than to put too much in and flood out the electrolyte, thus causing damage to adjacent wiring and equipment, plus loss of acid.

Generally, the local drinking water in the United States is safe for use in batteries; but to be sure, check with your battery supplier.

Add water only. Add no battery dopes, special liquid, or powders. These are harmful or useless.

- 2) Before adding water, take a hydrometer reading of one cell. (Don't use same cell each time; change around). If above 1.225 Specific Gravity, battery is sufficiently charged. If below 1.225 Specific Gravity, remove battery for bench charge. If level is too low to read, add water and take hydrometer reading the next day.
- 3) After adding water, examine hold-downs. Make certain battery is secure. Hold-downs should make a snug fit, but not necessarily the tightest fit, or the container may be forced out of shape.

Examine cables and terminals for tightness, corrosion, and wear. Corrosion occurs from the spilled electrolyte getting on metal, other than lead. Lead does not corrode. To remove corrosion, scrape or brush it off. Then immerse the part in

BASIC RULES FOR BATTERY CARE AND MAINTENANCE - Continued

- 3) an alkaline solution, such as baking soda, in the proportions of one pound soda to a gallon of water. One can tell when all the electrolyte is neutralized by observing when the bubbling stops. Wash with water, dry, and apply a prepared grease available from battery dealers.
- 4) Examine battery for broken or cracked covers, case, and cracks in sealing compound. If any of the above defects are present, remove battery at once and have repaired. Acid loss from any of the above defects will shorten battery life. Acid escaping through cracked covers or sealing compound will cause corrosion of terminals, cables, carrier, and adjacent parts.
- 5) Batteries should be recharged, if hydrometer reading is below 1.225.
- 6) DO NOT LEAVE A BATTERY ON CHARGE FOR MORE THAN 48 HOURS. STOP CHARGE when two hydrometer readings recorded two hours apart show no increase, or when terminal voltage readings recorded two hours apart show no increase.

If there is no rise in voltage or specific gravity in a period of two hours, further charging is USELESS and MAY DAMAGE BATTERY BEYOND REPAIR. Have your supplier check battery for possible acid adjustment or repair.
- 7) On this bench recharge, the specific gravity is expected to read certain values before considered serviceable for continued use. The hydrometer reading should be above 1.260.

BASIC RULES FOR BATTERY CARE AND MAINTENANCE - Continued

- 7) The full charge gravity when new was 1.270 - 1.290. If battery does not register as above, have your battery supplier inspect it. He may be able to adjust acid or make repairs.
- 8) In cold weather, do not fill cells with water and let stand without running motor long enough to allow water to mix with acid, as freezing might occur.
- 9) Spare batteries should be recharged at least every 4 or 5 weeks, in order that the Specific Gravity may be maintained at 1.240 or above.
- 10) Use a battery with sufficient ability to carry the connected load.
- 11) Wash dirt and corrosion off top of battery to eliminate intercell discharge.
- 12) Neutralize corrosion in battery box by washing with solution of baking soda, as recommended in No. 3; rinse with water.
- 13) The amount of water which is needed by the different cells will be a clue to other problems. For example, if each week the water, which was put in the previous week has been used, it is reasonable to expect that too much charging current has passed through the battery; hence, the battery charger should be checked.

BASIC RULES FOR BATTERY CARE AND MAINTENANCE - Continued

All cells in the battery should take the same amount of water. If one cell should take more than the others and does this each week, it would be expected that the container is leaking. Whether the leakage is through the bottom of the container, or from the sides of the container, can be determined by examination.

FLOODING OF ENGINE WITH WATER

Your Cal Yacht is supplied with a water-lift (wave suppressor) type muffler that under normal conditions, when the engine is not running, provides wave suppression and water storage to help keep water from flooding the engine.

NOTE: There is a direct path from the overboard exhaust port via the water-lift muffler to the engine and from the water pump to the muffler. Accidental conditions (sea) and operator error (prolonged starting attempts) can thus cause an excessive volume of water to fill the muffler and flood the engine.

UNDER SUCH ACCIDENTAL SEA AND/OR MISUSE CONDITIONS, ENGINE FLOODING MAY BE UNAVOIDABLE.

Sea Flooding:

Your Cal exhaust system is designed and installed to the highest standards, and, as stated above, could still flood under certain heavy sea conditions. The only added safety precaution you could add would be to install a rubber flap to the overboard exhaust port. This would dramatically slow the surge effect of waves hitting the port.

Operator Error:

This is a nagging source of water-in-the-engine and occurs when an operator repeatedly attempts to start an engine; i.e., he "grinds" the starter - not 2 or 3 times, but continually.

The amount of cranking time varies from engine-to-engine, factors being the amount of each piston's displacement, the water pump's capacity, and whether the battery is cranking a full R.P.M.

FUELING PROCEDURE

When preparing to fuel your boat, the following procedures should be followed to assure safety:

- A. Properly secure the boat to the dock.
- B. Turn off the engine, stove, heater, radio, lights, etc.
- C. Turn all battery switches to OFF.
- D. Close all hatches, ports, etc., to prevent entry of fumes.
- E. Maintain continuous contact between the nozzle and deck plate to prevent a static charge.
- F. Fill tank to a maximum 95% capacity to allow for expansion.
- G. Clean any spills after replacing and tightening fuel-fill cap.
- H. Before operating the engine or turning battery switch to ON, open all hatches and check for fuel leaks. Open engine room, check for fumes and allow the engine room to ventilate for 5 minutes before starting the engine.

Always be sure the fuel-fill cap is tight, to prevent water and dirt from getting into the fuel tank. Due to the disparity of fuel sources, you should check the fuel filter and water separator soon after each fueling, to check for fuel contamination. Those should be drained and cleaned, as needed. The filter elements should be replaced annually.

IN J.P.F. DATE 12-6-84

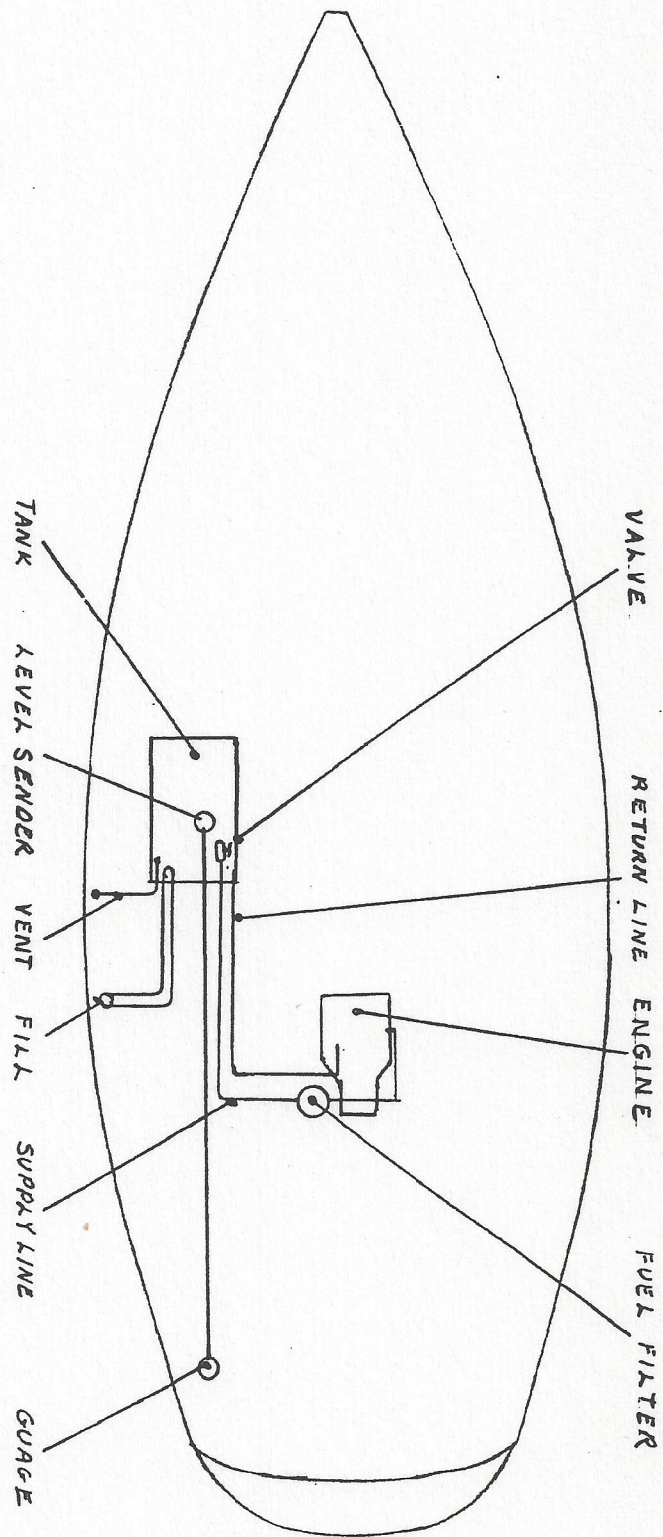
SUBJECT FUEL SYSTEM

SHEET NO. OF

CHRG. BY DATE

CAL 33

JOB NO.



CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

H. HOLDING TANK/WASTE SYSTEM

The CAL 33 has a waste system that, when properly used, meets most federal, state, and local standards. As Lear Siegler Marine cannot be aware of all local rules for localities, we recommend that you check local rules and codes.

The CAL 33 system (see Diagram) is fairly simple. In its standard form, it consists of an inlet thru-hull valve to allow flushing water into the w/c, a holding tank to contain the effluent, and a deck discharge fitting to allow removal of the waste from the holding tank at an approved discharge system. There is one holding tank with a capacity of 15 gallons. We recommend that the holding tank be pumped at every opportunity, and that waste not be left in the tank for more than 48 hours. After each emptying, be sure to use one of the many holding tank chemicals that are available. These chemicals aid in the breakdown of solids and prevent gas buildup in the tank.

Additionally, be sure to close the head inlet valve after each use, to eliminate any possibility of flooding.

OPTIONAL OVERBOARD DISCHARGE SYSTEM

The overboard discharge option enables the holding tank to be emptied directly overboard in areas where this is legal.

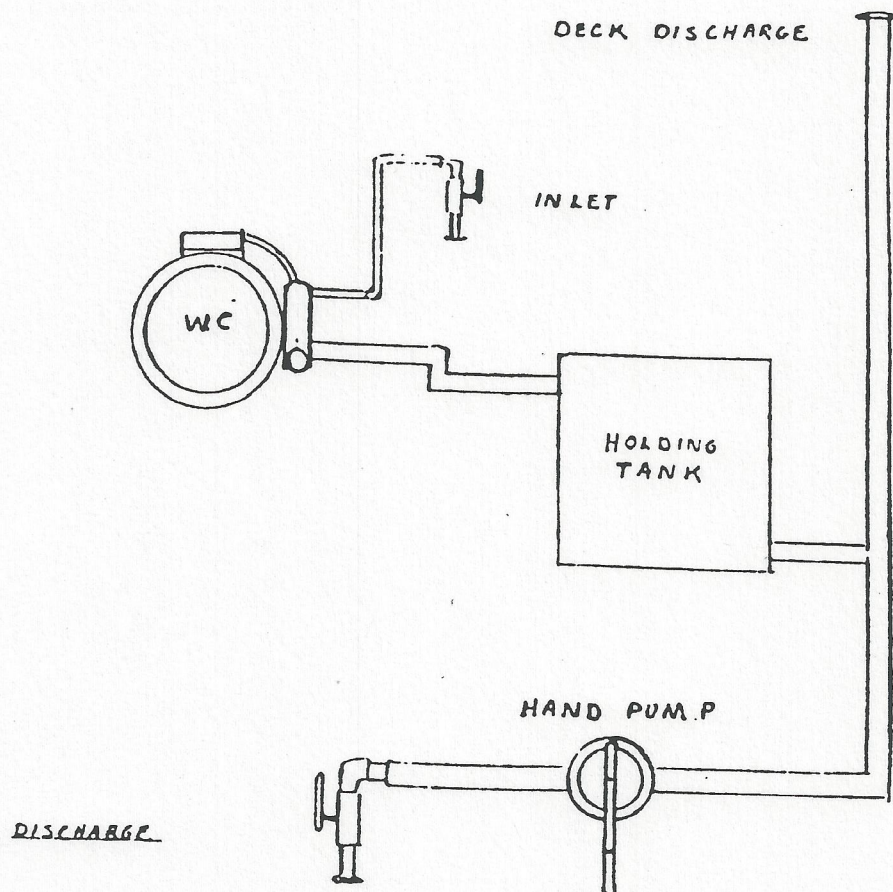
NOTE: THE DISCHARGE VALVE (see Diagram) SHOULD BE CLOSED, AND THE HANDLE REMOVED IN NO-DISCHARGE AREAS, IN ORDER TO PREVENT ACCIDENTAL DISCHARGE OF WASTE.

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

H. OPTIONAL OVERBOARD DISCHARGE SYSTEM - Continued

In areas of legal overboard discharge, the holding tank can be emptied by simply opening the discharge valve and working the hand pump until the tank is empty. After the tank has been emptied, the discharge valve should be shut and a holding tank chemical added to the head system, as in the standard unit.

CAL 33 HOLDING TANK SYSTEM W/ OPTIONAL
OVERBOARD DISCHARGE SYSTEM



NOTES:

IT IS UNLAWFUL TO DISCHARGE RAW OR
TREATED SEWAGE INTO SUCH WATERS WHERE
PROHIBITED BY FEDERAL, STATE, OR LOCAL
AGENCIES.

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

I. HULL-TO-DECK JOINT

The CAL 33 hull/deck joint is one of the strongest in the industry. It is formed by setting the deck down on an internal flange that is part of the hull. The mating surfaces are coated with the bonding material, which has unique properties in that it is slightly flexible bonding/sealant. The joint is then bolted every 6" with 1/4" stainless steel machine screws. A teak toe rail is then screwed down with #10 SS screws every 12".

This hull/deck joint system is the best on a large boat for several reasons. First, the internal flange gives rigidity to the bare hull before the deck is added. This prevents excessive movement of the hull while the internal furniture is being installed. Secondly, since the flange is internal, there is much less chance of any impact damage to the hull destroying the integrity of the hull/deck joint. Thirdly, the fasteners are all covered by a bedded teak toe rail or the plugs in the teak toe rail. This makes the hull/deck joint much less susceptible to leaks through the fasteners. Finally, the use of mechanical fasteners and a slightly flexible chemical bond allows a very slight movement here, which might otherwise crack a fiberglassed joint.

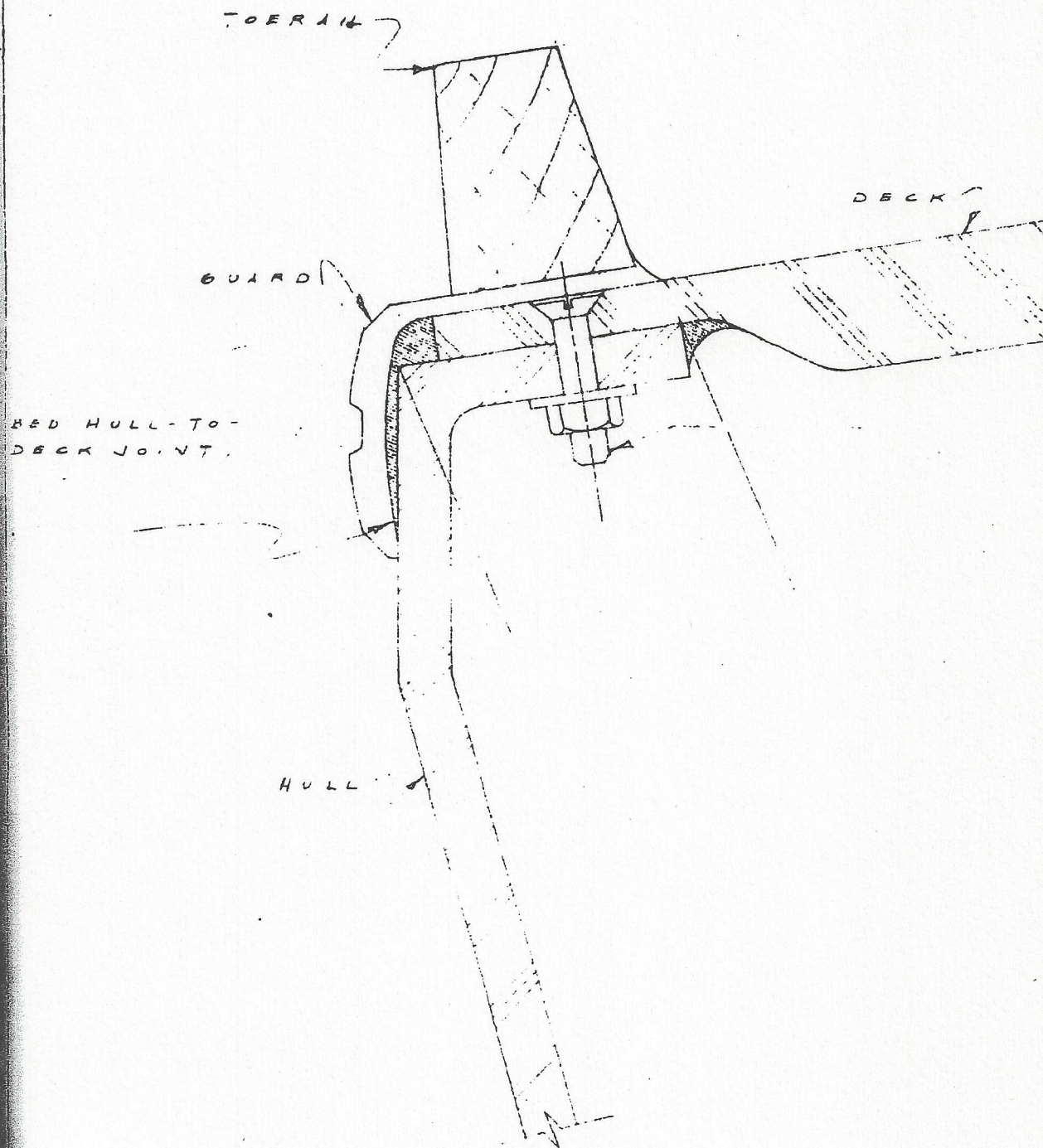
CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

J. STEERING

The pedestal steering gear on your boat has been selected and installed to give you smooth and reliable steering action. The system was designed for the CAL 33 by the manufacturer in consultation with our engineering staff. The unit should give you excellent service with minimal maintenance. A maintenance sheet from the manufacturer has been supplied in your owner's packet. Please follow the schedule carefully. Access to the cables and quadrant is from the cockpit locker and the foot of the quarter berth.

It is imperative that the steering system be inspected and lubricated at regular intervals. All sheaves in the system should be inspected for wear and alignment. A grease fitting is provided in the rudder tube for lubrication of the rudder shaft. This lubrication should be done at least twice a year. The steering cable adjustment is accomplished from the quadrant. Cable tension should be tight, but without causing excess friction. If in doubt, have a competent mechanic inspect and adjust the system. Cable tension should be checked at least once a month for the first six months, as the cable will stretch.

The CAL 33 is supplied with an emergency tiller, in the remote chance that any problem should occur with the steering system. WE STRONGLY RECOMMEND PRACTICE INSTALLING THE EMERGENCY TILLER AND STEERING WITH THE EMERGENCY TILLER in calm waters before any emergency occurs. The emergency tiller can be



TOERAIL

DECK

GUARD

HED HULL-TO-
DECK JOINT.

HULL

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

J. STEERING - Continued

installed by removing the cover plate in the middle of the helmsman's seat and installing the tiller on the top of the rudder post. The emergency tiller should be stored in an immediately accessible place.

K. THRU HULLS AND SHUT OFF VALVES

In any boat it is necessary to have some holes below the waterline for the intake and discharge of fluids. These have been kept to a minimum in the CAL 33 by allowing some lines to exit above the waterline. Since there are openings below the waterline, there must also be a reliable method of closing them, in the event of failure of a hose or fitting. These shut off valves are a vital part of your boat's watertight integrity, and careful attention must be paid to them.

Before launching and periodically throughout the season, the thru hull fittings and their valves should be thoroughly checked. The thru hull nuts should be checked for tightness, the hose clamps checked for tightness, the hose checked for defects, and the valve should be checked for proper operation.

Whenever the boat is left unattended, and whenever the connected unit is not being used, the thru hull valve should be closed! This will prevent flooding in case of a hose or fitting failure on the unit. The only exception to this is the cockpit drain thru hull valves which must be left open. The cockpit drain thru hull valves, hoses, etc., should be checked frequently.

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

L. SAIL CARE

No matter which sailmaker you or your dealer choose, there are certain things you can do to prolong the life of your sails.

Sails are cloth and should be protected from rubbing and chafe. This chafe most frequently occurs on spreaders, shrouds, and lifelines. These areas should have padding on them, or your sailmaker can attach chafe patches on the sails themselves. The sails should be checked frequently for small rips or any stitching that appears loose. Sail tape, thread, and sailmakers needles could prevent a major expense.

Ultraviolet light can break down or degrade the sailcloth. Whenever possible, the sail should be bagged or covered by sailcovers. Sailcovers should be available through your local CAL Dealer.

After use, your sails should be furled or folded. This will ensure that your sails maintain their shape for as long as possible. When the mainsail is furled, the outhaul should be slacked. Also, before furling or folding, the sails should have any salt water hosed off, and they should be dried to prevent mildew formation. Additionally, the battens should be removed when the mainsail is furled.

M. INTERIOR MAINTENANCE

While your CAL sailboat is designed to be as maintenance free as possible, there are certain chores which must be

BY LPF DATE 12-5-84 SUBJECT THRU-HULL LOCATIONS
 CHKD. BY _____ DATE _____ CAL - 33

SHEET NO. _____ OF _____

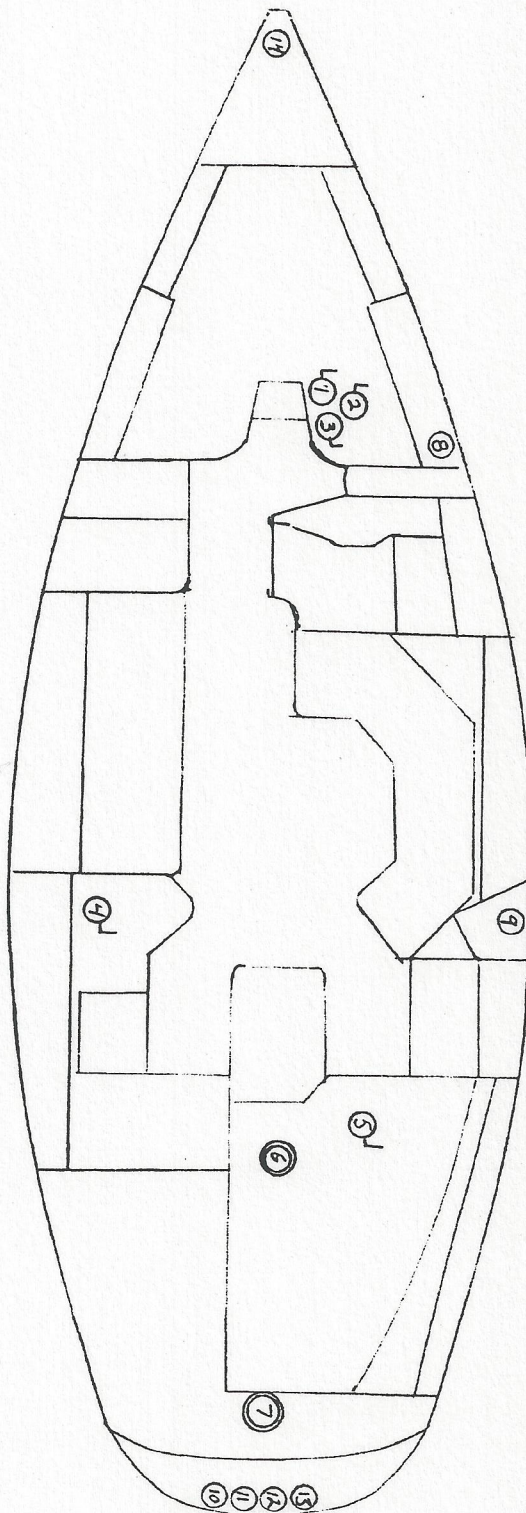
JOB NO. _____

- 1 HEAD INTAKE
- 2 OVER BOARD DISCHARGE (OPTION)
- 3 SINK DRAIN
- 4 SINK DRAIN
- 5 ENGINE INTAKE
- 6 PROD SHAFT
- 7 RUDDER SHAFT

- 8 SHOWER SUMP (OPTION)
- 9 BILGE PUMP-ELECTRIC (OPTION)
- 10 ENGINE EXHAUST
- 11 COCK PIT DRAIN
- 12 COCK PIT DRAIN
- 13 BILGE PUMP-MANUAL
- 14 ANCHOR LKR. DRAIN

SYMBOLS:

- THRU-HULL WITH VALVE
- THRU-HULL ABOVE WATER LINE.
- ⊙ STUFFING BOX



CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

M. INTERIOR MAINTENANCE - Continued

performed periodically in order to keep the boat clean. Much of this work can be done in fairly short order, and should be done on a bright, sunny day in order to ventilate the boat and air cushions, curtains, etc.

1. CURTAINS

The curtains should be washed once or twice a year, in order to prevent dirt and grease build-up, which encourages mildew. The curtains can be easily removed.

2. VINYL HEADLINER

The soft vinyl headliner of your yacht will collect cooking grease, smoke film, etc. It should be cleaned at least once a month with warm, soapy water. Strong cleansers are not recommended, but may be tested on an area of the headliner that cannot be seen, before general use.

3. CUSHIONS

The interior cushions are made from several different fabrics and materials. Generally, any upholstery shampoo should be safe for cleaning; but as with the headliner, one should test an area on the cushion back before going ahead with the full cushion. DO NOT DRY CLEAN OR WASH. "Scotchguard" or other fabric protector is strongly recommended, when the cushions are new and after each cleaning.

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

M. INTERIOR MAINTENANCE - Continued

4. PORTS AND HATCHES

The ports and hatches in your CAL have plastic or aluminum frames and acrylic plastic inserts. The frames should be protected with a good plastic or metal polish, and the acrylic "window" should be cleaned with warm, soapy water frequently.

DO NOT use abrasive cleaners or solvents. A plastic polish will help protect the ports. Severe scratching can sometimes be reduced with a light duty, automotive rubbing compound and polish.

Once a month the opening port or hatch gasket and gasket contact area should be cleaned thoroughly with soapy water and coated with a light coat of petroleum jelly or silicone spray. Oil the hinge and dog pins.

5. ICEBOX

Clean the icebox after each use with a bleach and water mixture to prevent mildew. Also, leave the icebox lid open, when the icebox is not in use to enable air to circulate.

Use the icebox drain pump to pump any water out of the box. DO NOT leave standing water in the icebox, as it will promote mildew and accelerate smells.

6. SINKS

Stainless steel sinks can be cleaned with any good stainless steel cleaner or with any nonabrasive cleaner. DO NOT use steel wool or bronze wool. A stainless polish will help prevent stains.

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

M. INTERIOR MAINTENANCE - Continued

7. HIGH-PRESSURE LAMINATE

The high-pressure laminate in the galley, head areas, and countertops can be cleaned with a good nonabrasive cleaner and a soft cloth. Be careful of adjacent teak surfaces. DO NOT set hot pots, plates, etc., directly on the countertop - use a hot pad. Wipe up spills promptly.

8. HEADS

The shower areas should be wiped down with a sponge after each use, and monthly with soap and water. Be sure to wash the shower curtain periodically as well, to prevent mildew buildup.

The plastic seat of the w/c and its china bowl should be cleaned once a week with hot soap and water. BEWARE of using high strength cleaners in the head, as they may damage the seals in the pump system.

9. STOVE

The standard stove/oven supplied by CAL is an alcohol, non-pressurized type. The stove owner's manual explains its use fully. Be sure to read the manual before filling or using the stove.

The stove surface should be cleaned after each use, to prevent grease buildup. Be sure to let it cool down first.

At least once a month, the stove should be removed from its gimbles and the surrounding area cleaned. Grease

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

M. INTERIOR MAINTENANCE - Continued

9. STOVE - Continued

buildup in this area can be considerable and can be a fire hazard.

The proper fire extinguisher should be kept within handy reach of the stove. Be sure you understand the fire extinguisher's operation and be sure the extinguisher is recharged at the recommended intervals.

The following precautions refer to ALL types of stoves. Refer to your owner's manual for the specific instructions for your stove.

- A. Always close all stove and fuel valves, when the stove is not in use.
- B. Never leave a lit stove unattended.
- C. Never leave pots on a hot stove.
- D. Use extreme caution when lighting the stove.

OPTIONAL PROPANE STOVE

The optional propane stove operates on pressurized LPG (Liquified Petroleum Gas) that is stored in a cylinder in the starboard lazarette locker. Propane is an explosive gas that is heavier than air, and great care should be taken with it. The storage locker is vented overboard to prevent any leaks from getting inside your boat. There is a mechanical and an electrical shut off valve on the tank, and both should be shut off when the stove is not in use. The solenoid valve

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

M. INTERIOR MAINTENANCE - Continued

OPTIONAL PROPANE STOVE - Continued

(located aft of the icebox) is a remote shut off that can be used in an emergency, as well as any time the stove is shut off.

To light the stove:

1. Open the mechanical valve on the tank.
2. Turn on the master battery switch.
3. Check to be sure all burners are turned OFF.
4. Turn on the electrical solenoid switch.
5. Light burners per stove instructions. NOTE: BE SURE TO TURN BURNERS OFF WHEN NOT IN USE.

Extra safety, when turning off the stove, can be gained by turning the solenoid switch off while the burner(s) are still lit. This will burn all gas out of the line between the tank and stove. After turning off the solenoid, the mechanical valve on the tank should be shut off.

At least once a month, the fuel line connections should be checked for leaks by smearing them with soapy water. Bubbles will show up, if there is any leak. If a leak is found, the system must be SHUT DOWN, and the leak repaired IMMEDIATELY.

The propane tank can be easily removed for refilling, but remember, when removing the tank and disconnecting the regulator:

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

M. INTERIOR MAINTENANCE - Continued

OPTIONAL PROPANE STOVE - Continued

1. Shut off the tank valve.
2. The regulator nuts have reverse thread.

10. TEAK

Your interior teak was oiled at the factory. Different areas have different types of finish. The vertical bulkheads, drawer fronts, handrails, trim, etc., were done with teak oil. The hull battens and sole were done with varnish. Varnish and oil manufacturers change periodically, so no one manufacturer can be recommended. Most varnishes and oils are compatible; but, again, we recommend that you test for compatibility in an inconspicuous area.

BE SURE TO HAVE ADEQUATE VENTILATION, WHEN USING ANY CLEANERS, OILS, PAINTS, VARNISHES, ETC.

11. BILGE

Dirt from sweeping, crumbs, etc., should not be swept into the bilge, as it may clog or jam the bilge pump strainers. At least twice a season, the bilge should be cleaned, using one of the commercially available bilge cleaners and a scrub brush. Empty the bilge after you clean it, using the manual bilge pump, as it will pass particles which may be stirred up easier than the electric pump.

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

M. INTERIOR MAINTENANCE - Continued

12. GENERAL

When leaving the boat for any period of time, be sure to raise the covers of lockers, prop up cushions, leave doors open and generally make all of the areas of the boat accessible to a smooth air flow. This will help prevent mildew and "musty" odors in a boat that is closed up for a long period.

N. EXTERIOR MAINTENANCE

1. GELCOAT

The best thing that can be done for gelcoat is to regularly wash it with detergent and water. DO NOT use an abrasive cleaner on gelcoat smooth surfaces, as it will scratch and dull them and may scratch them enough to allow water under, which could cause a blister.

Secondly, the hull and all smooth surfaces (not non-skid or places where you might step) should be thoroughly waxed at least twice a year with a good fiberglass wax. Please note that if you use a silicone wax, it may make it very difficult to do good fiberglass gelcoat repairs or to paint the boat, as the silicone gets into the gelcoat and prevents adhesion of paints and gelcoat.

Gelcoat repair can be easily done by an owner, but good gelcoat repair requires an expert. We recommend that, unless you are very experienced in gelcoat repair, you leave these repairs to an expert. Your CAL Dealer

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

N. EXTERIOR MAINTENANCE - Continued

1. GELCOAT - Continued

should be able to assist you in this. Remember, keep your boat clean and wax it twice a year, and you will prolong the life of your gelcoat.

2. MAST AND BOOM

Your mast and boom are made of a special marine aluminum that has been anodized for corrosion protection. Halyards, lines, etc., should be kept from chafing on the mast or boom for long periods, as it could remove the anodizing. Once a year the mast and boom should be waxed with a good paste wax for added protection.

Ideally, the spar should be removed from the boat once a year, so that close examination can be made of all fittings, tags, sheaves, pins, etc. At this time, the spar should be waxed and all moving parts lubricated. Check carefully for worn parts.

3. RUNNING AND STANDING RIGGING

Your running rigging is made of either low-stretch dacron line or stainless steel wire or both. The sheets, reef lines, and halyard tails are dacron, while the halyards are a combination of dacron line spliced on to stainless steel wire. All this running rigging should be thoroughly inspected for chafe at least twice a year. This inspection is especially important on a jib halyard that is used for roller furling, as the halyard sits in the same place constantly while the sail is hoisted.

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

N. EXTERIOR MAINTENANCE - Continued

3. RUNNING AND STANDING RIGGING - Continued

All sheets and halyards should be washed once a year to prolong their life by removing dirt and salt from the fibers. The sheets and reef lines should be coiled tightly and can be washed in a heavy duty washing machine with mild soap. The halyards can be messengered (tie thin string to one end) and removed from the mast, coiled, and placed in a cloth bag and washed as the sheets.

The standing rigging should be inspected once a month. All swage fittings should be inspected for cracks, and the wires should be checked for broken strands. All cotter pins, clevis pins, and turnbuckles should be checked also. REMEMBER, THE STANDING RIGGING SUPPORTS THE MAST AND SHOULD BE GIVEN CAREFUL ATTENTION.

Turnbuckles should be checked to see that they have sufficient threads exposed and that cotter pins are in place. The cotter pins in the turnbuckles should be taped to prevent snagging. Additionally, the threads should be cleaned and lubricated once a year.

The spreaders should be checked to be certain that they both have the same angle. The inboard spreader fastenings should be checked and taped. The spreader tip should be securely seized to the shroud with stainless steel seizing wire and well protected with spreader boots.

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

N. EXTERIOR MAINTENANCE - Continued

3. RUNNING AND STANDING RIGGING - Continued

Occasionally, new rigging may develop a thin layer of rust near the swages. This is caused by impurities in the dies that form the wire, adhering to the wire after the manufacturing process is completed. This oxidation will stop forming after two or three cleanings with a good stainless polish. One way to prevent rust around the swage fittings and to prolong the life of the swage fittings is to lightly heat up the swage fitting and to place a bar of beeswax on the wire, just above the fitting. As it melts, the beeswax will run into the swage and seal it.

REMEMBER, ANY defect in standing or running rigging is cause for immediate replacement of that part.

4. WINCHES, BLOCKS, TACKLES, ETC.

Winches should have a teardown and regreasing at least every six months. Follow the manufacturer's instructions, and only use a high density winch grease. Check all winch bolts for tightness at least once a month. Hose off the winch with fresh water after each sail.

Blocks and tackles should be rinsed weekly with fresh water and have a light spray with a silicone lubricant twice a year. Be sure to check bolt tightness on all blocks, especially turning blocks.

CONSTRUCTION DETAILS AND GENERAL INFORMATION - Continued

N. EXTERIOR MAINTENANCE - Continued

5. LIFELINES, STANCHIONS, BOW, AND STERN PULPITS

Do not neglect the turnbuckles, clevis pins, cotter pins, and pelican hooks on the lifelines - check them weekly. Be sure the turnbuckles and pelican hooks have enough thread and that the pelican hooks are secure. Tape or seize the pelican hooks to prevent accidental opening. It is not recommended that one hang fenders from the lifelines. A roll under a dock could put a severe enough strain on the fender to bend the stanchion.

Clean the stanchions and pulpits with soap and water periodically, and polish with a good stainless polish. Occasionally, stainless hardware will show some rusting. (See Section N. 3.). A couple of polishings should eliminate all problems. Never use steel wool on stainless, as it will leave small pieces of steel, which may cause rusting.

Clean the lifeline with a good soap and water solution to maintain a white look. Be sure to tape any cotter pins at the bow pulpit end of the lifelines to prevent tearing of sails.

Check all pulpits and stanchions for security. Tighten bolts as necessary for security and to prevent leaks.

6. TEAK

We do not recommend letting your teak "go natural," as

CONSTRUCTION DETAILS AND OPERATING INFORMATION - Continued

N. EXTERIOR MAINTENANCE - Continued

6. TEAK - Continued

this may lead to cracking of the wood. When your teak starts to get gray and dirty, it is the time to clean and re-oil. Be sure to wipe up any spilled or excess oil, as it may stain your gelcoat. BE SURE TO HAVE ADEQUATE VENTILATION, WHEN USING ANY CLEANERS, OILS, PAINTS, VARNISHES, ETC.

O. PERIODIC MAINTENANCE

The following list of items and their accompanying numbers is in no way intended to be all that should be done to your yacht. This is only a suggested general list and is not intended to override the individual manufacturer's manual. It also is not arranged in any special order. The numbers are in numerical order and not in priority order. Some numbers and their meanings may also seem redundant, and some have been mentioned previously; but, we feel it is better to be redundant than lax.

ALWAYS FOLLOW THE OWNER'S MANUAL THAT COMES WITH THE ENGINE, HEAD, ETC.

PERIODIC MAINTENANCE

| | End of
First
Week | Monthly | Winterizing | Remarks |
|------------------------|-------------------------|---------|-------------|--|
| Deck Fittings | 2,5 | | 1,4,5 | |
| Rudder Blade | | 1 | 1 | |
| Rudder Post | 6 | 1,6 | 1,4,5,6 | |
| Propeller Shaft | 1 | 1 | 1,4 | |
| Stuffing Box | 1,2,5 | 1,2 | 1,4 | |
| Zinc Anode | | 1 | 1 | Replace at least
once a year |
| Propeller | | 1 | 1,4,5 | |
| Bilges | 1 | 1 | 4,7 | |
| Cockpit Drain
Hoses | 2 | 2,5 | 2,4,5,7 | 7 Some Cockpit hoses
have low points that
hold water |
| Thru-Hull Valves | 1,2,3 | 2 | 1,4,6 | |
| Pumps | 1 | 1,2,5 | 1,4,5,7,8 | |
| Water Tanks | 2 | 2 | 1,4,7 | |
| Piping, Fresh
Water | 2 | 2 | 1,4,7 | |
| Lighting | | | 1,3,4 | 3=WD-40 or CRC |
| Battery | 1 | 1,4 | 1,4,8 | 4=Clean with baking
soda and water so-
lution |
| Water Filter | | 1,2,4 | 1,4,7 | |

1. Check condition
2. Check watertightness
3. Lubricate
4. Clean with fresh water

5. Check tightness
6. Grease
7. Drain and/or anti-freeze
8. Disconnect

PERIODIC MAINTENANCE - Continued

| | End of
First
Week | Monthly | Winterizing | Remarks |
|-----------------------------|--|---------|-------------|--|
| Fuel Filter | 1,5 | 1,5 | 1,4,5 | 4=Outside Only
Check engine owner'
manual for further
information |
| Air Filter | 1 | 1,5 | 1,5 | Check engine owner'
manual for further
information |
| Exhaust System | 1,2,5 | 1,2,5 | 1,4,5,7 | |
| Engine Mounts | 1,5 | 1,5 | 1,3,5 | |
| Mast, Boom | 1,3 | 1,3,4,5 | 1,3,4,5,6 | |
| Standing Rigging | 1,5 | 1,4 | 1,3,4,5,6 | |
| Running Rigging | 1 | 1,3,4 | 1,3,4,5,6 | |
| Winches | 1,5 | 1,3,4,5 | 1,3,4,5 | |
| Engine Alignment | 1,2 | 1,4,5 | 1,4,5 | Disconnect coupling
before hauling |
| Hose Clamps | 5 | 1,5 | 1,3,4,5 | Do not overtighten |
| Chainplates | 1,2,5 | 1,2,4,5 | 1,2,4,5 | Rebed at least
twice a year |
| Bilges | Check daily - more often, if the boat is leaking | | | |
| Stoves, Alcohol,
Propane | 1,5 | | 1,4,5 | Check supply hoses
for deterioration
every Spring. If
hose cracking is
evident, replace. |

1. Check condition
2. Check watertightness
3. Lubricate
4. Clean with fresh water

5. Check tightness
6. Grease
7. Drain and/or anti-freeze
8. Disconnect

FOSS FOAM, INC. // POLYURETHANE FOAM

YOUR FOSS FIBERGLASS & URETHANE RUDDER

The Foss Company has been producing sailboat rudders for over 20 years for most major boat companies. The fiberglass blade with its rigid urethane core makes an extremely strong, dependable rudder.

The near neutral buoyancy of your rudder helps the performance of your boat by reducing total weight, as well as reducing the moment of inertia in the stern. Near neutral buoyancy also is helpful, should the rudder ever need to be removed for steering system repairs. The boat does not need to be hauled out of the water to remove the rudder.

Tough fiberglass and urethane plastic used in the construction of your rudder is nearly indestructable. The urethane core is composed of a strong rigid closed cell urethane. Water, diesel solvents, or marine borers will not damage your rudder blade.

When you paint your rudder the first time, particular attention should be paid to the paint manufacturer's instructions for preparing the surface. Solvent washing is not enough. The rudder must be sanded heavily to remove a heavy coating of mold release. We recommend white paints be used. White is a popular color, as it is easy to see weeds and other debris which can catch on your rudder.

Surface repairs may be performed by cleaning, drying, and roughing up the damaged area and applying bondo or any similar filler with a putty knife. Should a small blister appear, it may be filled with resin or cut away and repaired. Once the patch has dried, it may be sanded smooth and painted directly with bottom paint or any coating you desire.

We do not recommend the use of dark colors on your rudder, as they generate heat when the boat is out of the water in the sun. Since the rudder is made of cellular material, this heat can cause dimensional changes and cosmetic damage. If the rudder is painted with a dark color, it should be shielded from the sun with a white wrapping when the boat is out of the water. The rudder warranty excludes damage caused by heat.

You should make periodic inspections of your rudder and look for possible damage from grounding or electrolysis.

REPRINTED FROM FOSS FOAM BULLETIN

Foss Foam, Inc.
4480 - 126th Ave. N.
Clearwater, FL 33520