OWNER'S MANUAL

CAPE DORY YACHTS
INCORPORATED

28 POWER

SECOND EDITION — DEC., 1989

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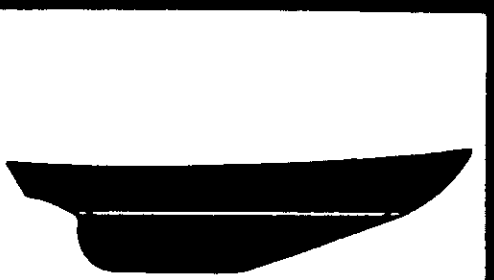

CAPE DORY

28 POWER CRUISER
FLYBRIDGE CRUISER
OPEN FISHERMAN
280 SPORT

DEAR CAPE DORY OWNER,

Welcome Aboard!

We appreciate the confidence you have shown in our product by the purchase of your new Cape Dory 28. With proper care and maintenance, your C-28 will provide you with many years of enjoyable boating.

This manual has been prepared to assist you in getting to know the Cape Dory 28. It covers all models available; Cruiser, Flybridge Cruiser, Open Fisherman and 280 Sport.

Please review the material carefully, as a sound knowledge of the various systems will make your boating easier, safer and more enjoyable.

Any questions that you may have that are not answered by this manual should be addressed to your Cape Dory Dealer or to Cape Dory Customer Service here at the factory.

We hope that you will find this manual useful and informative.

Happy Boating!

Sincerely,

Andrew C. Vavolotis
President
Cape Dory Yachts, Inc.

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LIST OF PLANS AND SCHEMATICS (cont'd)

NOTE: Drawings may show optional equipment.

1.a. DESCRIPTION

The Cape Dory 28 is based on a seakindly traditional "Down East" lobster boat style hull form with a full keel for directional stability and protection for the prop and rudder.

The boat is available in 4 models: Cruiser, Flybridge Cruiser, Open Fisherman, and 280 Sportsman. The 280 is built with a lower sheer line than the other 3 versions.

1.b. COMMISSIONING

Cape Dory Dealers are chosen because they are knowledgeable professionals. It is the dealers' responsibility to insure that the boat is commissioned properly. As the owner bears the cost of launching and commissioning, they have the right to expect a thorough and professional job.

The Commissioning Check List is provided to assist the owner and the dealer with the first launching of a new boat. In subsequent years, it can be used as a reference each time the boat is to be recommissioned.

Before the boat is launched, it is recommended that the owner read the entire manual. It will provide useful information that could save time in the future.

The boat has been inspected as thoroughly as possible before leaving the factory, but further adjustment to the engine and systems may be required when the boat is brought into service.

Every attempt has been made to remove construction debris during the final inspections, but some may still be found during commissioning.

Remember to return the appropriate copy of the Dealers Commissioning Check List to the factory as soon as possible.

1.c. CAPE DORY YACHTS

DEALER'S COMMISSIONING CHECKLIST

Model _____Hull Identification No._____

Owner's Name and Address_____

_____

Dealer_____

Date Sold_____Date Launched_____

Refer to Owner's Manual for Installation details and Systems Information.

	DATE	INITIALS	RECEIVING RECORD:
1.	_____	_____	All items on receiving checklist received in good order. Dealer should notify factory within ten (10) days of receipt, of any shortages or damaged goods.
			PRE-LAUNCH CHECKLIST:
2.	_____	_____	Visually check underwater hull surface for any damage sustained during trucking or handling.
3.	_____	_____	Through hulls are all tight and clear of any foreign objects.
4.	_____	_____	Seacocks and valves all closed. Hose clamps tight.
5.	_____	_____	Check propeller nut and "Perry" nut for tightness. Record propeller information below: Diameter _____inches Pitch _____inches Rotation _____left or right hand No. of Blades_____(3 or 4)
6.	_____	_____	Rudder moves freely when helm(s) is (are) turned and stop lanyard is secured and functional.
7.	_____	_____	Rudder and propeller shaft stuffing box packing adjusted. (inspect to make sure packing is properly installed.)
8.	_____	_____	Bottom under cradle poppets or bulkheads sanded, primed, and painted (Cape Dory recommends that a fresh coat of anti-fouling paint be applied to entire underbody prior to launching.)
9.	_____	_____	Bilge dry

10. _____ _____ Manual bilge pump connections okay and handle on board.

11. _____ _____ Electric bilge pump connections okay. Pump operates with switch in 'Manual' position; battery selector switch and D.C. circuit turned on.

12. _____ _____ Check deck and hull for any chips on gelcoat.

13. _____ _____ Flybridge installed correctly. All rails and ladder installed and secured.

POST-LAUNCH CHECKLIST:

14. _____ _____ Immediately after launching, check bilge for water. If water is present, check all through hulls and stuffing box. Determine the source of any leaks.

15. _____ _____ Open seacocks one at a time and check for leaks. Check for proper drainage.

16. _____ _____ Check stuffing boxes. The propeller stuffing box should drip water slowly, approximately one drop every ten seconds while shaft is turning to ensure that the bearing and packing gland are lubricated by water. The rudder shaft stuffing box should not weep at all except in rough conditions.

17. _____ _____ Check wheel steering system for proper operation.

18. _____ _____ Remove emergency tiller access trap. Install tiller and check for proper operation.

19. _____ _____ Check battery water level and charge level.

20. _____ _____ Check electrical system operation. Check operation of battery switch, voltmeter, circuit breakers, cabin lights, and all other electrical equipment. Check for blown fuses.

21. _____ _____ Test 110 volt shore power system. Inspect shore power cord. Refer to section 4.e.in the Owner's Manual before testing.

22. _____ _____ Fill water tanks and inspect operation of all pumps and drains. Inspect entire system for leaks. Install shower head and test hot water heater (be sure heater is full of water before turning on circuit breaker) on boats equipped with a pressure water system.

23. _____ _____ Check head and holding tank operation

24. _____ _____ Check bilge pump operation
25. _____ _____ Check sump pump operation (if installed)
26. _____ _____ Fill engine fuel tank
27. _____ _____ Inspect engine fuel tank guage for proper operation.(if installed)
28. _____ _____ Fill stove fuel tank(s). Inspect for leaks and test operation of the stove. Refer to the stove manufacturers literature for operation instructions.
29. _____ _____ Check navigation lights and mast light for proper operation.

ENGINE START-UP CHECKLIST:

30. _____ _____ Review Engine Owner's Manual.
31. _____ _____ Check engine and transmission oil level and condition.
32. _____ _____ Check belt tension on all belt driven components.
33. _____ _____ Check that cooling water intake seacock is open.
34. _____ _____ Check to see that all clamps on exhaust hose are tight.
35. _____ _____ Check water level and antifreeze in the expansion tank.
36. _____ _____ Check engine mount fasteners for tightness.
37. _____ _____ Check transmission bolts for tightness.
38. _____ _____ Check shift and throttle cable connections.(Check Flybridge controls if applicable)
39. _____ _____ Remove shipping disc (plywood) from coupling and connect.
40. _____ _____ Check prop shaft alignment using a feeler guage - .002" gap between flanges maximum - NOTE: Alignment should be checked several times during the first season. See Owner's Manual Section 3.d.
41. _____ _____ Check coupling fasteners for tightness.
42. _____ _____ Check prop shaft set screws, and see that they are wired in place.
43. _____ _____ Check engine compartment for fuel vapors. Run blower.
44. _____ _____ Start engine according to the manufacturer's recommendations. Failure to start may be due to air in the fuel lines on diesel engines. Refer to engine manual for bleeding directions, if necessary.(See also Section 3 of Owner's Manual)

45.	_____	_____	Immediately after engine starts, check to see that water is coming out of the transom exhaust port(s).
46.	_____	_____	Check guages and/or warning lights.
47.	_____	_____	Check entire system for water, oil, fuel, or exhaust leaks. NOTE:Sealers and paints may burn off as engine heats up the first few times.
48.	_____	_____	Check throttle and shift operation. Adjust cables as required to ensure proper engagement of transmission.
49.	_____	_____	Recheck stuffing boxes.
50.	_____	_____	Report any unusual noises or vibrations to the factory immediately. Do not continue to run engine if any are present.
51.	_____	_____	Operate engine in and out of gear. Allow to run long enough to check engine for possible overheating problems.
52.	_____	_____	Check operation of engine panel guages.
53.	_____	_____	Check operation of flybridge controls and panel. IMPORTANT: DO NOT TURN KEY TO START POSITION AT EITHER ENGINE PANEL ON FLYBRIDGE CRUISER OR SINGLE STEERING STATION BOATS WITH ENGINE RUNNING. DAMAGE COULD RESULT TO THE STARTER.

MISCELLANEOUS CHECKLIST

54.	_____	_____	Interior appointments complete. All movable items operating properly (ie: table, helmseats, lift-out berths, traps, etc.)
55.	_____	_____	Recheck all through hulls, seacocks, hose clamps, hoses, and stuffing boxes.
56.	_____	_____	Water test ports and hatches.
57.	_____	_____	Optional equipment installed and operational.
58.	_____	_____	Owner's packet, ship's papers, and ignition keys given to owner. Be certain to read all manuals to familiarize yourself with the proper operation and maintenance of all systems.

59. _____ _____ Checklist (Warranty Registration) ready for mailing to factory.

OWNER_____DEALER_____

DATE_____TO INSURE PROPER WARRANTY REGISTRATION, RETURN CHECKLIST WITHIN SEVEN DAYS OF LAUNCHING TO:

Cape Dory Yachts, Inc.
160 Middleboro Avenue
East Taunton, MA 02718

1.d. OWNER'S RECORD

Yacht Name_____Home Port_____

Hull Identification Number_____

Dealer Name_____Address_____

Salesman_____Delivery Date_____

Date Commissioning Checklist/Warranty returned to CDY_____

****

Owner's Name_____

Address_____

State Registration/Documentation_____

Engine Model & Serial Number_____

Head Model & Serial Number_____

Stove Model Number & Serial Number_____

Propeller Size and Rotation_____

The Cape Dory 28 is identified by a hull identification number (HIN) on the starboard corner of the transom. This identifies the number of the hull and supplies government officials with additional information concerning the builder, and the year of manufacture. There is also a builder's plate with the hull number. In addition, there are serial numbers on the engine(see the engine manufacturer's owner's manual) and on some of the accessory equipment which may be installed.

Cape Dory recommends that these important numbers are recorded and copies kept of them at home and onboard. These numbers and an accurate description of property and gear onboard, could be essential to their recovery, in the event of theft.

Marking an inconspicuous place such as the inside of a locker, underside of a door or drawer, with a social security number, initials or other unique "brand" could aid in the prompt identification of property, should the need to do so ever arise.

1.e. CAPE DORY OWNER'S ASSOCIATION

The Cape Dory Owner's Association was formed as the company grew from its original beginnings in 1964 as a sailing dory builder. Cape Dory owners would gather for regattas, races and picnics in summer and during the frostbite season in the winter months. As the Cape Dory line expanded, more and more activities took place.

In the late 1970's, Cape Dory began the construction of rugged commercial fishing boats as a companion line to the now well established sailboat models.

The boats were well received. Following on from the commercial boats was the idea of combining the ruggedness of the fishing boat with high quality finish of the sailboats. The result was the Cape Dory 24 Trawler. A seakindly, rugged full-keel Cruiser of unique charm.

The need for a larger power cruiser with increased performance and accommodation, of the same rugged construction and high quality finish saw the development of the Cape Dory 28.

Today, the Cape Dory Owners' Association is national in scope, and includes both sail and power boat owners in its membership. The Association publishes a newsletter which contains interesting as well as helpful information.

If you are a Cape Dory owner, and are not receiving the newsletter, please write to us and we will enroll you immediately. We need to know your name, address and the model and hull number of your Cape Dory.

1.f. CUSTOMER SERVICE

The Cape Dory Yachts Customer Service Department has been established to provide technical information and a replacement parts ordering service for Cape Dory Owners.

Please do not hesitate to contact us with any questions or comments on your boat. We appreciate any suggestions that you might have to improve the product.

We suggest that you place any parts orders through your Cape Dory Dealer, but will be happy to accommodate you for special orders. Whenever you make an order, please provide the dealer or Cape Dory with your hull number and an accurate description of the part.

Situations may arise when we will be referring you to local marine stores or marine hardware manufacturers. Our intent in these cases is to provide you with the fastest and least expensive service.

Through our customer service department, we strive to maintain our reputation for product quality and excellent service.

Sincerely,

Edmund Correia

Edmund Correia
Customer Service Department

1.g. WARRANTY NOTIFICATION PROCEDURES

Cape Dory Yachts is very proud of its "track record" of minimum warranty problems. After commissioning, an owner should not expect problems to develop. However, should assistance be required, contact the Cape Dory Dealer from which the boat was purchased.

Cape Dory Dealers are knowledgeable professionals familiar with the boats and capable of answering most of the questions that may arise. The dealer will communicate any problems or inquiries directly to Cape Dory so that an expeditious and satisfactory solution can be arrived at.

Dealers are not, however, authorized by Cape Dory to consent to repairs or the replacement of parts without the express written approval of Cape Dory.

Cape Dory Yachts offers a written limited warranty.

Federal Laws requires that a written warranty contain certain information and statements.

Cape Dory pledges to provide a product that is as defect free as possible. Cape Dory will continue its policy of standing behind its products and maintaining the goal of continual improvement.

1. h. **CAPE DORY YACHTS, INC.**

160 Middleboro Avenue
East Taunton, Massachusetts 02718
(617) 823-6776

Limited Warranty

1. Cape Dory Yachts, Inc. (Cape Dory) warrants all yachts and parts manufactured by it to be free from defects in material and workmanship under normal use and service for a period of twelve (12) months from the date of delivery to the original purchaser. This Limited Warranty is extended to the original purchaser of the yacht, and is not extended to any subsequent purchaser.

2. This Limited Warranty applies only to those components of the yacht manufactured or built by Cape Dory. It specifically does not extend to paints, gel coats, anodized finishes and other surface coatings, wooden parts which may split, crack or check (due to climatic factors over which Cape Dory has no control) and all accessories, and installed equipment not manufactured by Cape Dory, including without limitation engines, engine parts, instruments and controls, pumps, batteries, steering hardware, upholstery, and plumbing equipment. Any warranty made by the manufacturer of such items will, if possible, be passed on to the purchaser. This Limited Warranty does not extend to yachts used for commercial purposes or those which have been altered or subjected to negligence or misuse.

3. To validate this Limited Warranty, the "Dealer's Commissioning Checklist" must be mailed to Cape Dory, 160 Middleboro Avenue, East Taunton, Massachusetts 02718 as soon as possible after the commissioning date. In order to obtain performance of any warranty obligation, the owner must report within fifteen days of its discovery any claim in respect of defects in material or workmanship to an authorized Cape Dory dealer. Cape Dory or its authorized representative may make an inspection within a reasonable length of time after receipt of notice of a claim. When a warranty claim is valid, Cape Dory or its authorized representative will repair or replace the defective component part free of charge. Cape Dory may require a yacht or any part thereof to be returned to the factory, its dealer or representative for examination, transportation charges prepaid. Cape Dory neither assumes nor authorizes any person to assume for it any liability or expense in the replacing of parts or correction of defects in a yacht within the warranty period, except when such expense is authorized in advance and in writing by Cape Dory.

4. ***Exclusion of Warranties: This Limited Warranty is in lieu of all other express warranties, and shall expire twelve months from the date of delivery to the original purchaser. Any implied warranty, including the warranty of merchantability and fitness for a particular purpose, is limited to the duration of this limited warranty.***

5. Cape Dory does not under any circumstances assume responsibility for any consequential damages incurred including without limitation expenses for transportation and travel, telephone, lodging, loss or damage to personal property or loss of revenue.

6. Cape Dory reserves the right to improve its products through changes in design and material without incurring any obligations to incorporate such changes in units already completed or in the hands of dealers or purchasers.

7. Some states do not allow limitations on how long an implied warranty lasts or the exclusion of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

SECTION 2 - CONSTRUCTION:

2.a. HULL

The same construction system is used for the hulls of all models.

The hulls are laminated in one piece to optimize structural integrity, not molded in 2 halves and joined together at a later stage. Only the highest quality materials available are used. The hull mold has removeable sections in the area of the propeller aperture to enable the skeg, which supports the bottom of the rudder, to be molded integrally with the rest of the hull. The skeg is filled solid with resin and glass fibers to increase its strength.

The thickness of the hull varies depending on the structural requirements, but in general, increases from approximately 3/8" at the sheer line to 3/4" at the bottom of the keel.

2.b. DECK

The decks of all models are constructed using the same high quality gelcoats, resins and glass reinforcing materials as the hulls.

The deck units of all models are stiffened with end-grain balsa wood coring in the sidedecks, foredecks, forward coachroof area and cockpit sole.

The washrails around the cockpits of all models are made using a solid fiberglass laminate.

2.c. DECK/HULL JOINT

The deck to hull joint is shown in drg. no. 4.12 at the end of this manual. The deck molding is fitted over the hull in the form of a 'hat box' style joint. The mating surfaces of the hull and deck are liberally coated with Sikaflex (polyurethane bedding compound) prior to fitting. Once the deck has been lowered onto the hull, the joint is completed by through bolting a heavy rigid vinyl rubrail with 1/4" - 20 flat head bolts on 8" centers. The stem on the Cruiser and Open Fisherman models is protected by a cast bronze fairing at the forward end of the rubrail.

2.d. WHEELHOUSE ROOF & HEADLINERS

The wheelhouse roof is of balsa cored fiberglass construction. It is attached to the wheelhouse by means of a flange on to which it is bedded with polyester putty and mechanically fastened with stainless steel screws.

The wheelhouse headliner in the Cruiser model consists of foam backed perforated vinyl fabric glued to panels of marine plywood, which are screwed to wood battens attached to the underside of the roof.

The headliner in the forward section of the Cruiser and Open Fisherman is a separate fiberglass molding bonded to the deck before it is attached to the hull.

The 280 Sport model does not receive a headliner. The underside of the deck part being faired and gelcoated.

2.e. FLYBRIDGE (Flybridge Cruiser Only)

The flybridge is built as a one piece fiberglass molding with end-grain balsa wood and plywood coring in certain areas for stiffening. The inside surfaces are faired and gelcoated.

2.f. FLYBRIDGE INSTALLATION

Bed flybridge flange inway of bolts in clear silicone which will provide for easier removal in future than with more adhesive bedding materials.

Secure flybridge to roof with 1/4"-20 round head bolts. These bolts are screwed into 1/4" aluminum plates, that are pre-tapped, fastened to the underside of the wheelhouse roof inside the headliner. Insure flange drains are kept clear of caulking.

Connect steering, engine controls, engine panel and additional electronics and check that all are functioning correctly before putting to sea. The rails and ladder should be installed and firmly secured.

DO NOT exceed the rated flybridge loading of 450 lbs. as this could adversely effect the stability of the boat in extreme conditions. (See drg. no. 4.14)

2.g. RUDDER

The rudder consists of two fiberglass half shells completely filled with a reinforced polyester compound. Imbedded in the blade is the shaft and backbone fabrication. The rudder shaft is 1-1/4" diameter 304 stainless steel. The upper end of the shaft is machined to accept the emergency tiller. The blade is reinforced on the leading edge by a layer of bi-directional fiberglass applied over the seam and faired with polyester putty.

The gudgeon bolted to the skeg, which supports the lower end of the rudder shaft, is of cast bronze. Boats up to hull #40 are fitted with a stuffing box style gudgeon with a

packing gland. Boats from hull #41 onwards are fitted with a plain cast bronze socket style gudgeon.

The bronze rudder port located where the rudder shaft enters the hull acts as a bearing and stuffing box. The rudder port must be removed from the boat to unship the rudder. (See drg. no. 4.15)

SECTION 3 MECHANICAL SYSTEMS

3.a. PROPELLER SHAFT & STERN TUBE

The stern tube of the C-28 is a heavy wall fiberglass tube bonded into the aft part of the keel and projecting into the propeller aperture. Water lubricated shaft bearings are housed in the stern tube, and secured in place with set screws, which are wired to prevent them backing out.

Up through hull number 29 the stern tube houses shaft bearings at either end and the stuffing box is water injected. These boats are fitted with 1-1/4" dia. Aquamet 19 propeller shafts.

The forward bearing is lubricated by waste raw water (salt water) from the engine cooling system (NOTE: some boats are not fitted with water injection.)

Boats from hull number 30 onwards are equipped with 1-1/2" dia. Aquamet 19 propeller shafts. The stern tubes on these boats have a single water lubricated bearing at the aft end. These boats are not fitted with water injected stuffing boxes. (See drg. no. 4.16)

3.b. PROPELLER

The C-28 is equipped with an 18" diameter, 3-bladed Michigan Wheel "Dyna-Jet" (or equivalent) propeller of right-hand rotation. Some boats are fitted with 4-blade "Dyna Quad" propellers. The high strength cast bronze propellers require no maintenance, but should be checked each season for any 'nicks', 'dings' or signs of corrosion, particularly at the tips of the blades. A damaged propeller will cause shaft vibration and loss of performance. If in doubt, have the propeller trued and balanced by a competent reconditioning shop.

3.c. PERRY NUT and BONDING SYSTEM

The propeller is secured on the shaft with a "Perry Nut", jam nut combination. The jam nut located directly aft of the propeller is 7/8"-9, 18-8 stainless steel 1/2" thick for 1-1/4" propeller shafts (up to hull no. 29), and 1-1/8"-7 by 5/8" thick for 1-1/2" propeller shafts (hull no. 30 onwards). The "Perry Nut" once tightened, is secured in

place by a stainless steel cotter pin passing through a slot in the side of the "Perry Nut" and a hole in the end of the shaft.

The "Perry Nut" is mainly zinc (grey metal). It offers corrosion protection to the underwater metal parts of the boat. All underwater hardware made of metal (bronze, stainless steel) is bonded together (connected by #8 bare copper wires) inside the boat. When two different metals are placed together in salt water, they act like a battery. A small electrical current will flow between the two, causing the less noble (more likely to corrode) to oxidize, in effect to start corroding away. Zinc is less noble than all metals commonly used for marine hardware. The bonding system enables the "Perry Nut' zinc to corrode away in lieu of other fittings and protect the shafting, propeller, rudder shaft and metal through hulls.

3.d. SHAFT ALIGNMENT

Boats are shipped from the factory with the propeller shaft flange disconnected from the engine gearbox flange with a plywood "shipping disc" placed between the two and held in place with nylon ties. This is done to prevent any load being placed on the shaft assembly due to the boat moving in transit.

During commissioning (See Commissioning Check List) the "shipping disc" must be removed, the coupling bolts inserted, and the shaft alignment checked using a feeler guage.

The shaft must be aligned with the boat in the water. Remove the "shipping disc" and pull the propeller shaft up to the engine gearbox until the two flanges are mated together.

The propeller shaft flange has a centering lip that fits inside the gearbox flange and will prevent the two from parting due to the weight of the shaft even without the coupling bolts in place.

Some resistance will be felt in moving the shaft due to the packing in the stuffing box assembly. The packing nut should not be removed during alignment as water can come into the boat through the stern tube.

To align the shaft, use a .003" feeler guage to check the clearance around the entire perimeter of the interface between the propeller shaft flange and the gearbox flange. Adjust the engine mounts to reduce the gap between the two flanges to .003" or less. Insert and tighten coupling bolts, at 180 degrees intervals. Re-check bolt tightness after ten to fifteen hours of operation.

3.e. FUEL SYSTEM - GASOLINE

The layout of the gasoline fuel system on the C-28 varies with each model, however, the basic arrangement is the same.

The gasoline tanks are constructed from welded aluminum and are fitted with fill hose, vent and pick-up connections. The tanks are grounded by a black #8 wire.

Fuel is drawn from the tanks by the engine mounted electric fuel pump. At the tank fuel line connection is an anti-siphon valve, required by Federal Law, the purpose of which is to prevent gasoline from siphoning out of the tank in the event of a break or rupture in the distribution line.

Fuel is carried to the filter by U.S.C.G. Type 'A' flexible fuel hose, colored either red or black. At the inlet side of the Fram filter is a shut-off valve or selector depending on the arrangement. The shut-off should be closed when servicing the filter.

The fuel line running from the filter outlet to the engine fuel pump is also U.S.C.G. Type 'A'.

The operator should check ALL fuel line connection hose clamps for tightness on a regular basis. The entire fuel system must be liquid and vapor tight at all times. Gasoline fumes mixed with air are highly volatile. Gasoline fumes are heavier than air and will settle in the lowest point of the boat, the keel/bilge area. A gasoline vapor/air mixture can be detonated by the slightest spark.

Any odor of gasoline must be investigated immediately. SAFETY must be of primary importance. The occupants must be protected until any problems are corrected. If the operator can smell the presence of gasoline, then a potentially hazardous condition already exists.

Fuel systems are shown in the Plans and Schematics at the end of this manual.

3.f. FUEL SYSTEM - DIESEL

The diesel fuel system is similar to the gasoline but with the addition of return lines from the engine to the tank(s). The diesel engine does not use the total amount of fuel supplied by the pump, the excess being returned to the tank from which it was drawn. It is important that the pick-up and return lines run to the same tank.

It is important that no air be allowed to enter the diesel fuel system. Air in the diesel fuel system will cause the engine to stop or not run at all. Consult the Engine Owner's Manual for further information.

Fuel systems are shown in the Plans and Schematics at the end of this manual.

3.g. ENGINE OPERATION

Before starting the engine for the first time, the operator should read the engine Owner's Manual carefully.

Check the engine compartment for the following:

ANY FUEL LEAKS

ANY WATER LEAKS from engine or hull

ANY OIL LEAKS

ANY ODOR OF GASOLINE, DIESEL FUEL OR LP GAS in the bilge areas. (Note: Type of fuel(s) present depend on individual boat's systems)

ANY LOOSE PIECE OF GEAR interferring with the engine belts, carburetor linkage or gearbox shift linkage

CHECK the OIL LEVELS in the engine and gearbox, fill if necessary

CHECK the level in the engine fresh water COOLING SYSTEM, top off if necessary

CHECK the operation of the THROTTLE and SHIFT CONTROLS by moving the levers at the console and observing the linkage movement on the engine. (Check flybridge engine controls if fitted)

SET the shift lever to NEUTRAL

SET throttle lever to IDLE or just above. DO NOT start with throttle wide open.

OPEN the engine raw water intake seacock

Turn on the main battery switch and run the engine compartment blower if fitted.

Blowers fitted to boats powered by gasoline engines should be run for at least 4 minutes prior to starting the engine, and should also be run when the boat is operating below cruising speed.

Blowers fitted to diesel powered boats can be used to control the temperature level in the engine compartment. It is suggested that they are run for at least 5 minutes after the engine has been shut down.

The procedure for starting the engine should be followed as explained in the Engine Owner's Manual.

Immediately following engine start-up, monitor the engine panel guages closely. Make sure that the oil pressure guage and the voltmeter show normal values and that any engine alarms are quiet. If abnormal values are indicated or any alarm can be heard, shut the engine down IMMEDIATELY and find the cause of the problem. Check the exhaust pipe(s) at the transom and make sure that water is coming out with exhaust gas.

When running normally underload, the water temperature should be 167-194 degrees F on Volvo engines, 165-185 degrees on Chryslers and 180-195 degrees F on Westerbekes.

Follow the engine manufacturer's recommendations for hot start procedures (diesel engines only).

3.g.i STARTING PROBLEMS - DIESEL

Below is a list of some of the problems that could occur when starting a diesel engine. The list is intended as a guide to the operator. If there are any doubts as to the seriousness or extent of a problem, consult a qualified marine diesel mechanic.

PROBLEM	REMEDY
ENGINE WILL NOT TURN OVER	
1. Battery master switch not turned on.	Turn battery master switch to '1' position or '2' or 'ALL' (See "Electrical Section")
2. Battery or batteries totally discharged.	Charge batteries. Check electrolyte level.
3. Defective starter switch.	Check wiring connections and contacts for loose terminals and corrosion. Clean and repair as necessary.
4. Seizure in moving parts.	Repair
5. Electrical circuit overload.	Reset circuit breaker on engine (see Engine Owner's Manual). Determine reason for overload.
ENGINE TURNS OVER BUT FAILS TO START	
1. Engine is too cold	Use glow plug "PREHEAT" button.
2. Defective glow plugs	Inspect, replace if necessary

3. No fuel reaching engine	a) Make sure fuel shut-off valve is in open position (lever is parallel to fuel line) b) Fuel tank is empty. Sound tank or read fuel guage. Fill as necessary c) Blocked fuel filter. Check and replace element as necessary. d) Water or air in fuel. Check fuel filter/water separator.
ENGINE STALLS	
1. Fuel tank empty	Refill. Bleed fuel line if necessary.
2. Fuel filter blocked	Clean or replace element
3. Fuel not reaching engine	Make sure shut-off valve is in open position. Check blocked fuel line. Check for disconnected fuel hose. Check for blocked fuel tank vent.
4. Fuel contains air	Tighten fuel line connections and purge air from system (consult Engine Owner's Manual for method)
5. Blocked exhaust line	Check exhaust system and clean obstruction.

NOTE: Diesel engines with twin fuel tanks MUST have the PICK-UP and RETURN lines switched to the SAME tank.

3.g.ii STARTING PROBLEMS - GASOLINE ENGINE

During the first few hours of operation, the engine may give off fumes due to the burning off of, paint, excess hose sealant or other impurities on the engine surface. If these do not disperse after several hours of running, contact the Cape Dory Dealer and have the problem checked.

PROBLEM	REMEDY
ENGINE WILL NOT TURN OVER	
No electrical power to starter	Check battery. Clean terminals and tighten clamp bolts.

Battery not fully charged	Test battery electrolyte. Top off with distilled fresh water if necessary. Charge if required.
Starter switch defective	Replace switch
Fault in wiring	Inspect and test circuit
Faulty starter	Check for loose brush holder, worn or corroded brushes or corrosion on the commutator. See Engine Manual for test procedure.
STARTER TURNS - DOES NOT ENGAGE	
Damaged flywheel teeth or ring gear	Replace damaged parts.(see Chrysler Distributor or Dealer)
Armature shaft rusted, dirty or dry, due to lack of lubrication	Clean, test, lubricate
ENGINE TURNS OVER, WILL NOT START	
Dirt & moisture in electrical system	Clean ignition wires, distributor cap and coil connections.
Cracked distributor cap	Replace
Burned distributor rotor	Clean or replace
Dirty or corroded contact points	Clean or replace distributor cap
Condensor failure	Replace
Fouled spark plugs	Clean, check gap, replace if necessary. Check carburetor, check adjustment, mixture may be too rich.
No fuel reaching engine	Check fuel level in tank. Turn fuel shut-off to on position. Check for fuel line blockage and clean. Check fuel filter for blockage, clean or replace element as required.
Ignition coil failure	Replace coil

ENGINE STOPS	
No fuel reaching engine	See above
Broken connection in ignition system	Check contacts and wiring
Propeller fouled	Turn off ignition and clear propeller
Engine seized due to over-heating from lack of engine coolant or oil	Contact Chrysler Distributor or Dealer

Additional "Troubleshooting" information can be found in the Engine Manual.

3.h. ENGINE ZINCS

Zinc anodes in the raw water side of the engine cooling systems will waste away from contact with sea water. These should be checked regularly and replaced if necessary. Always carry at least one spare zinc on board.

Consult the Engine Owner's Manual for the location of cooling system zincs.

3.j. ENGINE CONTROLS

The twin-lever engine control is mounted to starboard of the helm, in the top of the console. The inboard lever (black knob) is the gear shift. Pushing the lever all the way forward will shift the transmission into forward. Pulling the lever all the way aft will engage reverse gear. The transmission is in neutral when the lever is vertical and a slight detent is felt. The transmission should not be shifted into forward or reverse with engine RPM's more than about 100 RPM's above idle. DO NOT attempt to start the engine with the transmission in gear.

The outboard lever (red knob) is the throttle. In the all the way aft position, the engine will be at idle. To open the throttle and increase the engine RPM's, push the throttle lever forward. DO NOT apply excessive force to either the throttle or the shift lever as damage could result to the cables. It is good practice to check, on a regular basis, all cable clamp bolts and connections for tightness, and to insure that the cable ends are free of obstructions.

The upper ends of the cables can be reached by removing the chrome cover of the engine control. The cover is held in place by two small screws, one on each side of the cover. On Flybridge models with a second set of controls, the cables from the upper station terminate at the lower station engine

controls. When either set of controls are operated, the other will move. Keep control levers clear from obstructions at all times.

4.a. STEERING SYSTEM

The C-28 is fitted with a mechanical rotary steering system. The wheel is connected to a helm unit mounted in the steering console. When the wheel is turned, motion is transmitted to the rudder tiller by a single push-pull cable housed inside of a protective conduit. The rudder tiller, aft end of the steering cable, and stop lanyard are accessible through the trap in the aft end of the cockpit.

The steering system requires little maintenance. Once a season the aft end of the steering cable should be disassembled and regreased.

To disassemble, disconnect the cable from the tiller arm. Loosen the bolts on the clamp block, so that the support tube is free. Back off the large hex nut that locks the support tube in place. Remove black rubber boot and support tube. Turn wheel to give full port helm, ie: the cable is all the way aft. Pull end of cable (stainless steel rod) to expose inner cable guide tube (stainless steel). Clean and regrease inner guide tube with Phil-Lub 66 or other good quality water proof grease. Re-assemble and check helm movement. Adjust support tube location in clamp to give equal movement port and starboard. Initially, the support tube hex nut should be approximately 1-1/4" forward of the clamp block.

An emergency tiller is provided. Disconnect the steering cable from the tiller arm if the loss of steering is due to a seized cable or helm unit, before using the tiller. (See drg. no. 4.15)

4.b. ELECTRICAL SYSTEM

12 VOLT D.C. (Direct Current)

All C-28 models are equipped with a 12 volt D.C. negative ground electrical system.

The system is powered by a 100 AMP/HR 12 volt battery (boats may be equipped with an optional second battery) which is (are) located in the engine compartment. Batteries are housed in impact resistant, non-corroding plastic cases and firmly secured in place by a nylon strap.

Batteries are controlled by the battery selector switch located in the face of the wheelhouse settee to port on the Cruiser model, in the galley area of the Open Fisherman, and in the engine compartment of the 280 Sport.

This switch acts as a master disconnect as well as selecting battery #1 (single battery installation), battery #2 or Batteries #1 and #2 together. It is good practice with a 2 battery system, to keep one for engine starting, and the other for supplying the systems.

CAUTION: Never turn the battery switch to the OFF position while the engine is running. Serious damage to the alternator will result.

The electrolyte level in the batteries should be checked regularly. Top off with distilled fresh water as required. Keep the terminals free from corrosion and tight on the battery posts.

The batteries are charged while the engine is running by the engine driven alternator. Check wiring connections and belt tension regularly.

4.c. DISTRIBUTION PANELS

The boats individual electrical circuits are controlled by a distribution panel mounted in the steering console or in the area of the helm.

Power is supplied from the common terminal on the battery switch to the panel by a single red #8 wire. This feed wire is provided with over-current protection by a 50-60 AMP fuse located in a line fuse holder at the battery switch. Always carry spare fuses.

To activate a circuit, first turn the battery switch to the #1, #2 or ALL position(depending on the number of batteries).

The circuit to be used can now be activated by the panel switch.

If the required circuit fails to function, check the following:

* Make sure battery switch is ON
* Make sure there is power to the panel by checking other circuits ie: cabin lights
* Is the fuse blown or circuit breaker tripped. (Before replacing fuse or reseting circuit breaker, determine cause of the problem)
* Make sure of good contact of all wiring connections
* The accessory may be faulty. Inspect light bulbs, etc.

When adding additional electrical equipment, make sure that:

* The circuit breaker or fuse in the panel is of the correct rating

* The device is 12 volt D.C. negative ground

* If the device has a separate ground, that this is correctly connected

* If there is any question as to the method of installation, consult a qualified marine electrician

Some panels are fitted with 50 AMP main panel breakers. This breaker provides over-current protection to the panel itself. The main panel breaker can also be used to shut down all D.C. circuits, in the event of an emergency or when leaving the boat. The main breaker must be 'ON' before branch circuits can be used.

4.d. COLOR CODING: 12 VOLT D.C. WIRING

Wiring in the C-28 follows the BIA recommended color coding system (shown below). Occasionally due to manufacturing constraints, there may be some deviation from the specific color coding sequence.

COLOR	ITEM	USE
Dark Green(DkGr)	Bonding System	Bonding Wires-if insulated
Black (B)	Ground	Return, Negative Mains
Red (R)	Main Power Feeds	Positive Mains
Yellow w/Red Stripe (Y/R)	Starting Circuit	Starting Switch to Solenoid
Yellow (Y)	Generator or Alternator Field	Generator or Alternator Field to Regular Field Terminal
	Bilge Blowers	Fuse or Switch to Blowers
Dark Gray(GY)	Navigation Lights	Fuse or Switch to Lights
	Tachometer	Tachometer Sender to Guage

Brown (Br)	Generator Armature	Generator Armature to Regulator
	Alternator Charge Light	Generator Terminal/ Alternator Auxiliary Terminal to Light to Regulator
	Pumps	Fuse or Switch to Pumps
Orange (O)	Accessory Common Feed	Ammeter to Alternator or Generator Output and Accessory Fuses or Switches Distribution Panel to Accessory Switch
Purple (Pu)	Ignition Instrument Feed	Ignition Switch to Coil and Electrical Instruments
Dark Blue(Dk Bl)	Cabin and Instrument Lights	Fuse or Switch to Lights
Light Blue(Lt Bl)	Oil Pressure	Oil Pressure Sender to Guage
Tan	Water Temperature	Water Temperature Sender to Guage
Pink (Pk)	Fuel Guage	Fuel Guage Sender to Guage

When adding additional wiring for accessories, it is recommended that no single conductor should be smaller than No. 14 AWG and the temperature rating of the conductor should be at least 105 degrees C. Major electrical installations or servicing should be performed only by a qualified marine electrician.

The battery switch should be turned to the OFF position when leaving the boat for an extended period of time.

4.e. 115 VOLT A. C. (Alternating Current)

The A.C. system on the C-28 is an option, and operates on 115 volt, 60 cycle current. Power from a 30 AMP shore service source is supplied to the boat by means of a shore power cord, which connects to the recepticle located in the cockpit well.

The A.C. control panel is located in the forward face of the helm console on the Cruiser and in the aft part of the

galley overhead in the Open Fisherman. 115 volt A.C. is not available on the 280 Sport.

The main circuit breaker on the panel must be in the OFF position prior to connecting the shore power cord.

Immediately after connecting the shore power cord to a 30 AMP, 115 volt, 60 cycle A.C. shore supply, check the reverse polarity indicator light. (Reverse polarity exists when the black 'hot' wire and normally grounded white 'neutral' wire are reversed, i.e. the black wire is connected to ground and the white is ungrounded). If it is on, IMMEDIATELY DISCONNECT the shore power cord and determine the source of the problem as serious electrical shock hazards may exist, even if the main circuit breaker is off. The boat's wiring is of the correct polarity when it leaves the factory. If the wiring has not be altered, the reverse polarity condition is in the shore supply source, and the problem should be brought to the attention of the system operator.

If, after connecting the shore power cord to the shore supply and the reverse polarity light does not come on, the system is safe to operate.

Turn on the main circuit breaker at the top of the panel and then select the branch circuit needed.

CAUTION: Before turning on the HOT WATER HEATER, insure that the tank is full of water. Permanent damage will result from operating the heater element with tank empty or only partially full. To check that the hot water heater is full, open the hot water side of the pressure water faucet until there is a continuous flow of water. Check that the heater supply shut-off valve in the pressure water system is open. (see "Plumbing System" section)

4.f. PLUMBING SYSTEM

i) FRESH WATER TANK(S)

All tanks used in the C-28 are made from molded non-corrosive polyethylene and are one-piece seamless construction. Clean-out access covers are made of clear plastic so liquid levels are easily visible.

A list of fresh water tanks used on the various models of the C-28 is shown below.

BOAT MODEL	TANK CAPACITY	LOCATION
Cruiser	45 Gals.	Aft end of engine compartment
Cruiser	95 Gals(Opt)	Engine compartment portside
Open Fisherman	40 Gals.	Cabin under 'V' berth
280 Sport	24 Gals.	Cabin under 'V' berth

If water is left standing in tanks for an extended period of time, it may adopt an unappetizing odor and appearance. If flushing the tank does not eliminate this problem, a mild solution of baking soda may be used. After letting the baking soda stand for several hours, the tank and water system should be flushed thoroughly before refilling with fresh water.

Each tank is equipped with a deck fill and vent with the exception of the 280 Sport. The 'V' berth tank on this model is filled through the inspection port.

ii) PRESSURE WATER SYSTEM

Cruiser and Open Fisherman models are equipped with an automatic, on demand, fresh water system. To activate the system, turn on the D.C. circuit marked "Pressure Water" at the D.C. panel (see Electrical Section). Once the system is switched on, the pump draws water from the tank and maintains a pre-set pressure. The opening of a faucet causes a slight decrease in pressure which is sensed by the pump's pressure regulator. The pump starts to run until the faucet is shut off allowing the pressure to be built back up in the system.

The system is fitted with an in-line filter located on the suction side of the pump. This filter prevents small particles of debris from reaching the pump. It should be inspected and cleaned periodically. To disassemble, remove the phillips head screw and pull clear bowl plastic away from the body. Clean the wire mesh screen and reassemble.

On the pressure side of the pump, the hot and cold water systems are separated. A 'T' fitting is located close to the pump on the pressure side, enabling the pump to supply pressure water to both systems. The 'hot' side of the 'T' fitting has a check valve to prevent hot water from backing into the cold water side and a manual shut-off valve to isolate the hot water system for maintenance purposes, etc.. Boats that are not fitted with hot water tanks, do not have fittings or hoses beyond the shut-off valve.

iii) NON-PRESSURE WATER SYSTEM

Some boats have been fitted with manual pumps only. The manual system has no shut-off valves in the lines and only requires water in the tanks to operate.

iv) SHIPPING NOTE

Boats shipped from the factory between September 15 and April 15 will have had their fresh water systems winterized with non-toxic antifreeze which is usually red in color. Boats shipped between April 15 and September 15 will not have had the system winterized.

Boats with winterized fresh water systems will have the shut-off valve leading to the hot water tank closed. Only the cold water side of the system would have been tested at the factory.

The antifreeze must be flushed out before the hot water side of the system is filled.

v) TROUBLESHOOTING PRESSURE WATER SYSTEM

The table below lists most of the usual problems.

PROBLEM	PROBABLE CAUSE
Pump motor does not operate	Pressure water circuit turned off. Battery switch turned off. Disconnected wires at pump. Fuse is blown.(where applicable) Water in pump head is frozen. Terminals corroded.
Pump runs, no water	Empty water tank. Kinks in suction side-hose from tank. Air leaking into inlet hose. Inlet filter is blocked. Outlet hose is blocked or disconnected.
Pump runs, water "sputters"	Air in lines, check all air is bled from lines and water heater. Air leaks on suction side of pump. Check all hose clamps.
Pump cycles on and off with faucets closed	Leaks in hoses. Internal leak in pump allowing water to escape from high pressure side to low pressure side.

vi) GREY WATER DRAINAGE

a) SHOWER SUMP

The optional shower on the Cruiser and Open Fisherman models drains in a sump box through a copper drain tube located in the aft inboard corner of the head compartment.

The sump box is reached through access traps in the cabin sole, inboard of the head door, and under the companionway steps. The sump box is fitted with a turn-tight plug which when removed, allows the collected water to flow into the bilge. The water can then be discharged using the manual or electric bilge pump.

Some boats are equipped with an optional electric shower sump pump. The pump is controlled by a switch on the D.C. panel and/or illuminated water-proof switch in the head compartment. Waste water is pumped directly overboard via a hose to a through-hull located in the hanging locker. This pump is NOT automatic and must be turned on and off manually. The pump should not be run for extended periods of time with sump box empty. The sump box should be flushed regularly with bilge cleaner.

The ice box drain also runs to the sump box via a P.V.C. hose connected to a delrin drain in the bottom of the ice box.

4.g. HEAD SYSTEM

i) PORTABLE TOILET

Refer to the manufacturer's instructions on how to use the portable toilet. Insure that the toilet is always secured to the head platform with the 2 side clasps and hold down brackets.

DO NOT use abrasive type cleaners or petroleum products in the bowl area. These products will damage the flush valve seals.

NOTE: Portable toilets are legally acceptable for use in vessels not having permanently installed toilets, as determined by U.S. Coast Guard Regulations. However, some states and the Canadian province of Ontario do not permit portable toilets.

ii) MARINE HEAD WITH HOLDING TANK

The system on the Cruiser model consists of a permanently installed hand operated marine head with a 24

gallon polyethelene holding tank under the 'V' berth. The holding tank is emptied via a deck pump-out fitting. The deck plate is marked 'WASTE' and is located on the starboard side of the fore deck adjacent to the anchor well.

The Open Fisherman has a 15 gallon polyethelene holding tank under the 'V' berth.

Refer to the head manufacturer's instructions on use of the marine toilet. It is recommended that a minimum amount of flushing water be used on each cycle to make maximum use of the holding tanks capacity.

The holding tanks have 3" diameter access covers on top for inspection and clean out. The use of deodorizing chemicals sold specifically for recirculating toilet systems is recommended to control odor.

The head intake seacock is located in the head compartment under the vanity. This seacock should be kept closed at all times other than when operating the toilet.

The marine head system should be winterized by draining all water from the bowl, pump, connecting hoses and holding tank and adding "Winterguard" type non-toxic antifreeze. (See drg. no. 4.3)

iii) OVERBOARD DISCHARGE

In an overboard discharge system, a 'T' is placed in the deck pump-out line. From the 'T', a hose runs to a flush mounted, manually operated diaphragm pump in the top of the port side 'V' berth. The discharge hose then continues from the pump to a vented loop and finally overboard through a seacock located in the head area under the waterline.

iv) 'Y' VALVE

A 'Y' Valve is used in conjunction with an overboard discharge installation, to isolate the holding tank and pump waste material directly overboard.

Direct overboard discharge of waste from a marine head is only legal in certain situations. Consult the local United States Coast Guard office or Environmental Protection Agency (EPA) office in the area which the boat is operated for local regulations. Generally, discharge is not permitted in lakes, rivers or coastal waters within 3 miles of the shoreline. Toilet system schematics are shown at the end of the manual.

4.h. BILGE PUMPS

i) MANUAL BILGE PUMP - CRUISER

The Whale GP-8 manual bilge pump is located in the salon aft on the starboard side just forward of the sliding door. It is operated with a removeable handle by pumping with an up and down motion. The location of the handle should be known to all on board and should be ready for use at any time.

The pump suction hose runs to the bilge area under the propeller shaft. It is white colored reinforced 1-1/2" Beckson hose. The lower end is fitted with a strainer which must be kept clear at all times.

The discharge hose runs from the outlet side of the pump to a Delrin through hull located above the waterline on the starboard side.

The pump is designed to pump water containing a variety of debris, but can become clogged by excessive solid matter. If the pump should fail to prime itself after several strokes, check to see that the pick-up hose is positioned properly, then check the pump body for debris. To inspect the pump body, the rubber diaphragm may be removed by loosening the stainless steel clamp. Inspect the pump body for foreign material and gently lift the intake and outlet flapper valves to determine that they are clear. Reassemble the pump and continue pumping. Another problem that could cause the pump not to prime is a chafed hose. This problem can be checked by holding your hand over the end of the hose to see if suction is felt while pumping.

Check all hose clamps regularly for tightness.

ii) ELECTRIC BILGE PUMP

The Rule 800 electric bilge pump is located in the keel cavity at the aft end of the engine compartment. It is attached to a fiberglass bracket together with an automatic float switch. The fiberglass bracket is held in place by screws, screwed into the aft end of the engine drip pan. These fastenings must be removed to pull out the pump. The discharge hose is 3/4" reinforced P.V.C. and runs from the pump to the Delrin through hull located above the waterline on the port side.

To operate the pump, turn the battery switch to #1 (see "Electrical" Section) and the D.C. panel switch to "Auto" or "Manual" position.

In the "Manual" mode, the pump will run continuously. In the "Auto" mode, the pump operation is

controlled by the float switch. As the water level rises in the bilge, the float part of the switch rises and activates the switch causing the pump to run. As the water level drops, the float switch returns to the off position and the pump stops. The pump should be checked regularly for debris in the intake and cleaned if necessary.

SECTION 5 - MAINTENANCE - EXTERIOR

5.a. FIBERGLASS

Fiberglass is one of the most maintenance-free materials utilized today in boat construction. If given proper care and treatment, the gelcoat surface will look new for years. If not maintained, it will eventually turn to a flat, chalky texture.

Wash the exterior fiberglass surfaces of the boat several times each season with a mild soap and plenty of warm fresh water. Rinse liberally with fresh water. After the boat is dry, use a good quality fiberglass cleaner in paste or liquid form; follow this process with a wax or polish prepared for marine use. A fiberglass cleaner with a very gentle abrasive in it may help remove minor scratches and surface wear. Be careful, as the continued use of cleaners containing abrasives will gradually erode the gelcoat surface. Marine wax will fill small scratches and provide a glossy finish. A wax that does not contain silicone is recommended as it tends to get into the gelcoat and is almost impossible to remove should the boat be painted at a later date. Do not wax non-skid surfaces.

Stubborn stains may be removed with fiberglass cleaner in some instances. Difficult stains may be worked out with judicious use of a very mild abrasive powder such as Bon Ami. Tar and petroleum stains may be removed with careful application of acetone. (Acetone is a powerful and EXTREMELY FLAMMABLE solvent which is available in most paint and hardware stores. Follow the manufacturer's directions on the container.)

Stress or "spider cracks" are a common occurrence on the fiberglass boats of even the most careful boatbuilders and boat owners. Most of the time, these cracks are limited to the gel coat surface and are of cosmetic considerations only, not structural. If there is any doubt as to the seriousness of a crack, consult your dealer. Cosmetic repairs to gelcoated surfaces are not difficult, and can be accomplished by a reasonably handy person with a little practice and study. Structural fiberglass repairs should only be undertaken by qualified personnel.

Minor repairs of the gelcoat surfaces may be done by the owner using one of the following basic methods. Consult

a local fiberglass repair facility for more detailed instructions.

i) SURFACE IMPERFECTIONS: On imperfections that do not penetrate the gelcoat, sand them out with No. 320 wet and dry sandpaper. Finish with 400 and 600 grit paper and hand buff with a fine rubbing compound.

ii) DEEP SCRATCHES AND FLAWS: (exposed fiberglass) Thoroughly clean the damaged area with acetone to remove dirt, grease, or wax. Tape off the damaged area with masking tape. Thicken a small amount of matching gelcoat with cabosil to obtain a putty-like consistency. Thoroughly mix a small amount of hardener into the gel putty. A tablespoon quantity of gel putty will require ONE DROP of hardener to cure into a hard plastic in mild temperatures. Adjust the amount of hardener to suit your needs. Over-catalyzing results in a rubber-like substance, never permitting a complete cure.

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

CAUTION: Clean hardener (MEKP type) must be handled with care. If a spill occurs, immediately flush skin or eyes with plenty of water for at least 15 minutes and contact a physician. Read product data and safety information before using.

Be careful to discard uncured, mixed gelcoat material. Once hardener is added, a chemical reaction takes place that generates heat. Large quantities can become VERY hot. Submerge material in water until cured for maximum safety.

iii) NON-SKID IMPERFECTIONS: Repair of the non-skid is similar to that of deep imperfections. Add small amounts of non-skid grit and dab the gelcoat on with the end of a brush with short a stippling motion.

iv) GELCOAT MEASELS: Below the waterline it is possible for water to get beneath the gelcoat and cause it to measel. This occurrence is rare and usually takes the form of small circular blemishes less than 1/4" in diameter. Cape Dory Yachts uses the latest materials and techniques to combat this phenomenon. It is not within our ability to guarantee that measels will not occur due to the very nature of the materials used. Contact the factory for the latest recommended repair practices and advice. A successful repair is difficult and time consuming and the services of an expert repair facility is advised. To minimize the potential of measels forming, the following guide lines should be

followed: Never sand the bottom gelcoat off. Do not use pumice stones or coarse sandpaper when preparing the bottom for new bottom paint; this will cause deep scratches in the gelcoat surface and increase the chance for water passing into the laminate. Gelcoat is a barrier coating required to protect the boat's laminate, not merely a cosmetic finish.

5.b. BOTTOM PAINT

The under bodies of all models are finished with one coat of Petit Polypoxy epoxy primer and two coats of Petit Unepoxy anti-fouling.

Blue Bottom - Petit Unepoxy 1222 Blue Atlantic Formula

Brown Bottom - Petit Unepoxy 1522 Brown Atlantic Formula

An additional coat of anti-fouling should be applied before the boat is launched. The application directions for the anti-fouling are described on the container. The entire under body should be lightly sanded and wiped down with a suitable solvent prior to painting.

Particular attention should be paid to the areas underneath the cradle poppets.

DO NOT paint propeller, "Perry Nuts", shafts or ground plates.

Insure chemically compatibility before changing the anti-fouling paint.

5.c. BOOT TOP

The boot top paint is made by International Paints. It is a single pack Alkyd Enamel.

Blue - Interlux Endeavour Blue No. 16

Brown - Interlux Dado Brown No. 246

Follow the directions on the paint containers. Sand and wipe with solvent before re-coating.

5.d. COVE STRIPE AND LOGO

The house side cove stripe is a self-adhesive plastic tape. Clean with fresh water and mild soap solution. DO NOT use acetone as it will dull the surface and possibly loosen it from the house side.

The logo is also self-adhesive and should be cleaned using the same method.

Cape Dory Yachts can provide replacement tapes and logos which may be purchased through the Customer Service Department.

5.e. TEAK

Exterior teak is hand finished with Penta Var Charter Oil.

Exposure to sunlight and drying conditions will gradually dry out the wood and it will turn grey. This change will be accelerated in warmer climates. Teak that is not maintained will eventually split and the grain will lift.

Exterior teak should be cleaned and oiled regularly. A number of teak cleaning and sealing products are available in most locations. The best product available in a particular locale can usually be advised by a local boatyard, or marine retailer.

Teak can also be varnished. Apply between three to six coats initially and another at mid season. Follow manufacturer's directions for the varnish to be used (use only quality marine varnish).

5.f. BRONZE: (Golden/yellow colored fittings)

All bronze deck hardware is polished for ease of maintenance.

In a salt air environment, the surface of the bronze will tarnish, turning green, if left un-maintained. Polishing with a bronze cleaner will maintain the original color. Domestic metal cleaner such as "Twinkle" will also serve to maintain bronze fittings. The fittings are not affected if allowed to tarnish.

5.g. STAINLESS STEEL: (Silver colored)

Bow rails, flybridge rails, foot rests, steering wheels, vents (some models), handrails, stern rails, swim platform brackets and ladders are made from stainless steel. Although the metal has excellent resistance to corrosion, it is not totally rustproof. Occasionally, surface oxidation or rusting will be seen. This is mainly superficial and can be removed with metal polish and frequent fresh water rinsing to remove any salt deposits.

5.h. PORTS & HATCHES

Wash with fresh warm water and rinse well to remove salt deposits.

DO NOT use solvents or abrasive cleaners on the glazing materials. Clean with an acrylic cleaner if necessary.

5.j. WHEELHOUSE WINDOWS: (Cruiser)

The frames of these windows are aluminum with either a clear annodized or grey painted finish.

The frames can be cleaned with fresh water and a mild soap solution. Application of a boat wax to the frames will provide some protection against salt spray. DO NOT use solvents on the frames as damage to the finish could result.

The glazing material is 1/4" tinted tempered glass.

Clean the glass with a domestic window cleaner such as "Windex".

5.k. WINDSHIELD: (Open Fisherman)

The glazing material is 1/4" safety glass and can be cleaned with "Windex" or other domestic window cleaner.

5.l. WHEELHOUSE WINDOWS: (280 Sport)

Windows in these models are made from abrasion resistant acrylic sheet. They can be cleaned using fresh soapy water, "Windex" or other domestic window cleaner.

5.m. VINYL SEATS

Clean regularly with good quality vinyl cleaner such as Boat Life 'Vinyl Cleaner'.

SECTION 6 - MAINTENANCE: Interior

6.a. TEAK

The standard boat has an oiled interior. Rubbing the wood periodically with a fine bronze wool when oiling will help produce a smooth satin surface. Many excellent teak oils are available as well as other household products such as "Liquid Gold".

Some finishes have a wax base such as the Minwax products. Repeated use of this type product builds up a

finish with a very smooth surface. Care should be exercised, however, when using these products as oiling or varnishing at a later date may not be possible due to the layer of wax that has accumulated.

6.b. ASH CEILING

Ash ceiling is finished with sealer at the factory. It can be varnished or waxed with a good quality furniture polish.

6.c. FABRIC HULL LINER

Clean with a good quality spray type upholstery shampoo. Follow the manufacturer's directions.

6.d. CUSHIONS

Cloth covered interior cushions are made from several different materials depending on color and style. The cushion covers should be dry cleaned or cleaned with an upholstery shampoo of the spray foam type.

Vinyl interior cushions should be cleaned with a commercial vinyl upholstery cleaner. Follow the manufacturer's instructions regarding the use of these products. To prevent the growth of mildew beneath vinyl cabin cushions, elevate them when leaving the boat to allow air to circulate. Remove traps on boats so equipped, so that lockers will be aired. Use Scotchguard as a protective coating for your fabrics.

6.e. CURTAINS

Generally, the curtains supplied have a content of 77% cotton and 23% acetate and, therefore, should be dry cleaned.

6.f. SINKS AND STOVES

Stainless steel sinks and stoves may be cleaned with any stainless steel cleaner according to the manufacturer's instructions or with a non-abrasive cleaner and soft cloth or sponge.

6.g. HEAD

The plastic seat and vitreous china bowl of the head should be cleaned with a non-abrasive cleanser and sponge or soft cloth.

6.h. PLASTICS

Clean the mirrors and all plastic surfaces in the boat with an anti-static cleaner and in the case of plastic mirrors with fine non-abrasive cloth.

6.j. BILGE

Dirt, hair, etc. should not be washed into the bilge during any cleaning process as these may plug the bilge pump strainer and prevent it from functioning when needed. Use a dust pan to collect dirt, etc. when cleaning the cabin sole of the boat.

6.k. LOCKERS

Raise covers of lockers when leaving the boat to permit good ventilation and prevent mildew, should they contain moisture. Remove excess moisture which may have collected in lockers with a sponge.

SECTION 7 - WINTERIZING

The following recommendations apply to a boat that will be dry stored.

If the boat is to be stored in the water, adequate precautions must be taken against water freezing in the engine, bilge and plumbing systems.

7.a. BLOCKING THE HULL

The weight of the boat must be taken on the keel. The purpose of the cradle poppets or jack stands, used in place of a cradle, are to balance the boat in an upright position.

Before hauling out, the boatyard should be familiar with the location of any transducers projecting from the hull below the waterline so that they are not fouled by lifting straps.

7.b. COCKPIT SCUPPERS

If the boat is to be left uncovered, the cockpit scuppers should be free and clear to operate, to allow rain to flow out. (Cape Dory Yachts recommends that boats be covered or stored inside during lay-up periods)

7.c. ICE BOX

Clean thoroughly, dry and leave open to allow for air circulation.

7.d. REFRIGERATOR

Defrost, clean thoroughly, dry and leave door open to allow air to circulate.

7.e. STOVE

Clean thoroughly including burners and cover.

7.f. ELECTRICAL SYSTEM

Remove batteries from the boat and store in warm, dry location. Completely charge before storing or leave on trickle charge.

The balance of the electrical system requires little maintenance. It is recommended that each light bulb be removed and the light fixtures given a spray of water disperant such as "WD-40" or "CRC" or similar products. The main switch and D.C. panel can also be treated in the same way.

7.g. PLUMBING SYSTEMS

i) PORTABLE HEAD

Empty top tank and holding tank. Insure all water is cleaned from flush pump. A small amount of water can remain in the top tank, but will be harmless during winter storage. Lubricate flush valve seals with Dow Corning Silicone Spray or paste lubricant. The portable head can also be removed from the boat.

ii) MARINE HEAD WITH HOLDING TANK

Drain all water from bowl, pump and connecting hoses. Pump toilet dry, loosen hose clamps and remove drain plug. After draining, replace the drain plug and retighten the hose clamps.

The holding tank should be left empty. Flush system with mixture of non-toxic antifreeze and water prior to hauling.

iii) FRESH WATER SYSTEM

Pump tank as dry as possible. Add non-toxic water system antifreeze. (CAUTION: DO NOT use automotive antifreeze such as "Prestone" or other poisonous substances) Pump this solution through the entire fresh water system and drain.

7.h. ENGINE

Follow directions in Engine Owner's Manual for winterizing the engine.

Disconnect engine cooling water intake and make sure no water remains in line. Reconnect line and secure hose clamps. Remove the drain plug in the muffler(s) and drain.

7.j. FUEL TANKS

Fuel tanks are best left empty. Partially filled tanks are likely to be contaminated by condensation. Tanks that are left full will mean old fuel in the system at the start of the next season, and possible gum deposits which will effect the running of the engine.

7.k. BOAT COVERS

The boat should be stored under cover or in a shed when ever possible. Teak trim will fare far better and the boat will not be subjected to the pressure of freezing water.

If the boat is to be stored outside, Cape Dory recommends the use of a light colored heat reflecting cover fitted and vented so as to allow adequate air circulation.

Attaching a cover to the topsides with adhesive tape should be avoided. One or two ports may be left open to allow air to circulate in the interior.

SECTION 8 - SAFETY

8.a. SAFETY GEAR

The US Coast Guard requires that certain safety equipment be carried on board at all times (i.e.: personal and throwable flotation devices, fire extinguishers, visual distress signals, etc.) Consult a local US Coast Guard facility to find out what equipment is required and have it aboard and properly stowed before the boat is used for the first time.

It is highly recommended that the following items be kept aboard: (not all of these items are required by the US Coast Guard.)

a. An anchor and rode of the appropriate size and design

b. First Aid Kit

c. Compass

d. Personal Flotation Devices - the US Coast Guard requires that an approved Life Preserver for each person on board be carried.

e. Visual Distress Signals - These are required by the US Coast Guard to be carried on all boats 16 feet or more in length and by all boats during night operation.

f. Life Raft

g. Flashlights

h. Up-to-date Charts - The US Coast Guard is constantly improving the aids to navigation by changing buoy locations, numbers, configurations, etc.. These changes are reported in the respective US Coast Guard District's Local Notice to Mariners, and are on display at all NOAA chart distributors. Before embarking on any trip, make certain the latest editions of the charts are onboard and that each chart has been updated to reflect all of the recent changes.

i. Fire Extinguishers - Fire aboard any boat is a serious hazard. It is important to take adequate precautions against fire and to well prepared to extinguish a fire quickly and thoroughly. US Coast Guard approved fire extinguishers of the appropriate type and size should be installed where they are easily accessible (near where fires are most likely

to occur - engine, fuel tanks and galley). The extinguishers should not be located where fire might prevent their use. At least one extinguisher should be installed in a cockpit locker (reachable from outside the cabin) and at least one extinguisher should be installed in the cabin. It is recommended that a permanently installed fire extinguishing system such as the "Fireboy" Halon System be installed in all gasoline powered boats.

8.b. FUELING PRECAUTIONS

a. Appropriate safety precautions are important before, during, and after fueling. Before fueling the first time, be familiar with the instructions provided by the engine manufacturer.

b. Fuel docks should be approached at REASONABLE speed without wake. Observe posted speed limits and instructions. Be considerate of others using the docks, and watch for a dockmaster or hand who may give instructions. Maintain control of the boat at all times and have dock lines ready for use before approaching in the event that these are unavailable at the dock. Use bow, stern, and spring lines to properly secure the boat, together with several suitable fenders for protection.

c. Close and secure all hatches and ports.

d. FORBID SMOKING while taking on fuel or while on or near fuel docks. Completely extinguish all smoking materials well in advance of approaching the dock; DO NOT recommence smoking until the boat is well clear of the dock after fueling, and conditions aboard are safe to do so.

e. Extinguish any open flames onboard and see that all equipment (e.g.: engine, stove, cabin heater, radios, and lights - both oil lantern and electrical lights) which may generate heat or sparts of any kind are turned OFF. Turn off all switches for branch circuits so that there are no live electrical circuits. The MAIN SWITCH should also be turned off AFTER the engine is stopped.

f. If possible, crew members not involved in fueling should leave the boat.

g. An adequate fire extinguisher (USCG approved for Class B fires) should be readily available in case of an emergency.

h. Be certain that the correct fuel (diesel or gasoline) is pumped into the appropriate tank. Errors of this type do occur and will result in serious engine damage if not immediately detected and corrected. If you are in an unfamiliar fuel dock, you may want to pour a sample of the fuel in a glass for a visual and small check to ensure that it is diesel or gasoline. Avoid using gasoline with high alcohol content. Use regular leaded gasoline ONLY in gasoline engines.

i. Be certain that you are putting fuel in the fuel tank. Note the approximate amount required to fill the tank by either looking at the fuel level guage on the tank or using a dipstick.

j. Remove fuel deck plate cover. Maintain contact between the nozzle of the fuel hose and fill pipe rim to prevent generation of static electricity sparks.

k. Fill slowly to about 95% of capacity; DO NOT OVERFILL (allowance must be made for thermal expension of fuel without overflow).

l. Replace and secure fill deck plate cover after fueling. Carefully clean any spillage. Check fuel tank vents overflow. Check below decks and in the bilge for fumes or leakage. If fumes or leakage are present, adequately ventilate and clean areas completely BEFORE PROCEEDING.

m. Open all ports and hatches fully for ventilation.

n. Do not fuel during electrical storms; avoid fueling at night or in rough water, except in emergencies when extreme caution must be exercised.

8.c. WEATHER FORECASTS

The US Coast Guard has discontinued the display of weather signals at its stations. However, the National Oceanic and Atmospheric Administration (NOAA) continuously broadcasts a regularly updated weather report on VHF weather channels WX-1 and WX-2 (162.40 and 162.55).

Good seamanship requires attention to the weather forecast before leaving port and while underway. Make it a practice to check the weather broadcasts on a regular basis in case there are changes in the forecast.

8.d. BOATING ORGANIZATIONS

Every boater was once a beginner. Very few were born into boating families and learned at their parents' knees. Therefore, it is to everyone's benefit that there are several fine nonprofit organizations that are ready to teach interested persons everything from basic seamanship and piloting to celestial navigation.

Two of these organizations are as follows:

United States Power Squadron
U.S.P.S. Headquarters
1504 Blue Ridge Rd.
P.O. Box 30423
Raleigh, NC 27622
(919) 821-0281

United States Coast Guard Auxiliary: U.S.C.G. Auxiliary Stations are listed in the White Pages of telephone books under United States Government-Transportation Department.

PARTS LIST

In the interest of faster and more efficient service, Cape Dory has developed a list of the more important equipment and manufacturers. We produced this list so that the Cape Dory owner will be able to go directly to the original vendor for replacement parts.

Additional parts and service information is provided by the Customer Service Department of Cape Dory Yachts, Inc.. Contact can be made through the mail or by calling (617) 823-6776.

CHRYSLER GASOLINE V-8, MZ60, 275 H.P.

ITEM DESCRIPTION	PART NUMBER
Raw Water Pump Impeller	SH10615
Raw Water Pump Cover 'O' Ring	SH12231
Alternator Belt	4267343
Water Pump Belt	4027313
Spark Plugs	RN 9 YC
Thermostat	4142885
Thermostat Gasket Kit	4142888
Engine Oil Filter	3549957
Fine Fuel Filter	4142597
Distributor Cap	4142817
Distributor Rotor	4142818
Dual Ballast Resistor	3874767
Fuel Pump	3745414
Fuel Pump Gasket	3577870

Volvo TAMD diesel

Item description	Part Number	
	40B	41A/41B
On-board kit	7938435-0	858632-3
Crank case air filter	875850-0	876069-6
Engine oil filter	471034-9	471034-9
Turbo air filter	463505-8	858488-0
Fine fuel filter	838593-2	838593-2
Fuel pump strainer kit	273663-5	273663-5
Impeller kit	875660-3	875593-6
Cooling system zinc	800476-4	838929-8
Cooling system zinc	804107-1	
Drive belt set	958359-2	958359-2

PARTS LIST cont'd.

WESTERBEKE 100, 6-CYLINDER DIESEL

ITEM DESCRIPTION	PART NUMBER
Engine Oil Filter (including Gasket)	32874
Engine Oil Filter Gaster	32873
Thermostat	32872
Heat Exchanger Zinc	11885
Alternator Belt (51 AMP Alternator)	32977(2 required)
Sea Water Pump Belt	16446
Sea Water Pump	11353
Alternator (51 AMP, 12V DC with Regulator)	24684
Alternator (90 AMP, 12V DC with Regulator)	30735
Impeller and Gasket Kit (SW Pump)	11907
Fuel Filter	24363
Fuel Pump (12V DC)	24831
Fuel Pump Filter Element	30548

ITEM DESCRIPTION	MFG.PART #	VENDOR
BOTTOM PAINT		
Antifouling Brown	1522	Pettit Paint Company
Boot Top Dado Dk Brown	Int. 246	International Paint
Antifouling Blue	1222	Pettit Paint Co.
Boot Top Endeavour Blue	Int. 16	International Paint
ELECTRICAL		
Battery-12 Volts-100 AMP	XJ-35M-100	Surrette
Dome Light(Bulb 12V 15CP)	10-1252	Bass Products
Swivel Light(Bulb GE1142)	10-2162	Bass Products
Panel - 12V DC & Chrysler Instruments	----	Control Engineering,Inc
Panel - 12V DC W/Volvo Engine Panel	----	Olson Industries
Panel - Open Fisherman	----	Olson Industries
Panel - 280 Sport	----	Olson Industries
Panel - 110 Volt A.C.	----	Lorco Marine, Inc.
Mast Light - Cruiser (short)	33570-002	Aqua - Signal
Mast Light - Cruiser (long)	33570-007	Aqua - Signal
Mast Light - Open Fish.	33570-002	Aqua - Signal
Mast Light - 280 Sport	33570-002	Aqua - Signal
Nav. Light - Stbd. Side	33572-002	Aqua - Signal
Nav. Light - Stbd. Side	33571-002	Aqua - Signal
Mast Light Bulb (all models)	904-00384	Aqua - Signal
Side Light Bulb	904-00384	Aqua - Signal
Nav. Light-Pulpit Mount	33512-302	Aqua - Signal
Nav. Light-Pulpit (bulb)	904-00200	Aqua - Signal
Cockpit Lights	10-1962	Bass Products
Cockpit Light Bulb	57	Bass Products

ITEM DESCRIPTION	MFG.PART #	VENDOR
Courtesy Light	10-1962	Bass Products
Courtesy Light Bulb	57	Bass Products
Flourescent Light	1846AL	A & B Industries
Fluorescent Light Bulb	1850GL	A & B Industries
Battery Switch	8501	Perko, Inc.
Panel Feed Fuse Holder	HEJAA	Baynes Electric
Panel Feel Fuse (Buss)	SC50	Baynes Electric
Panel Feel Waterproof Boot	1A0512	Baynes Electric
Blower	36740-0000	ITT Jabsco Products
Windshield Wiper(Cruis)	391	Gem Products
Windshield Wiper(O.F.)	380	Gem Products
PORTS & HATCHES		
Hatch-Cruiser, Plastic	195	Gray Enterprises
Hatch-Open Fish, Plastic	195	Gray Enterprises
Hatch - 280 Sport	N2039-103	Bomar
Hatch - Aluminum, Cruiser & Open Fish.	N2039-103	Bomar
Opening Port - White Plastic	POWC-1-2 (5x12)	Beckson Mfg. Co.
Opening Port - White Plastic, Small(280)	POWC-2-1 (4x10)	Beckson Mfg. Co.
Opening Port - Bronze	P579	Spartan Marine Products
WINDOWS		
Aluminum Frame-Cruiser	-----	Florida Marine Tanks
Plastic Frame - 280	-----	Go Industries
HOT WATER HEATER		
Hot Water Heater	RGE	Raritan Engineering Co.
Heating Element	WH1A	Raritan Engineering Co.
Safety Valve	WH3	Raritan Engineering Co.
Heat Exchanger	HE	Raritan Engineering Co.
Thermostat	WH2	Raritan Engineering Co.
PLUMBING		
Manual Bilge Pump	BP9064	Imtra
Galley Pump	37220-0010	ITT Jabsco Products
Pressure Water Pump (electric)	220-213-34	Shurflo
Electric Bilge Pump	800	Rule Industries
Electric Sump Pump	450	Rule Industries
Pressure Water Filter	36400-0000	ITT Jabsco Products
Fawcet-Head Compartment	21-J-73	Bristol Products
Shower All	23-9959-S	Bristol Products

ITEM DESCRIPTION	MFG.PART #	VENDOR
TANKS		
40 Gal. Bow	1-6692	Kracor, Inc.
24 Gal. Bow	2-6256	Kracor, Inc.
19 Gal. Holding Tank	4074/2-6735	Kracor, Inc.
45 Gal. Water Tank	1-6672	Kracor, Inc.
95 Gal. Water Tank	1-6690	Kracor, Inc.
Aluminum Fuel Tanks	----	Florida Marine Tanks
TOILETS		
Sani Pottie (portable)	944	Mansfield Plumbing Prod
Groco Marine Head	Model HE	Gross Mechanical Lab.
STEERING SYSTEM		
Wheel	152-18-111	G. G. Schmitt Co.
Bulkhead Helm Unit (used on Flybridge also)	SH-5000	Teleflex Marine Systems
Bezel Kit (used on Flybridge also)	SB 27267	Teleflex Marine Systems
Cable Assembly	SSC 72-19'	Teleflex Marine Systems
Clamp Block	SA27017	Teleflex Marine Systems
Spent Travel Tube	SA35680	Teleflex Marine Systems
Steerer Clevis Kit	SA27314	Teleflex Marine Systems
Steerer Support Tube (St./St.)	SA27275	Teleflex Marine Systems
Dual Steerer Cable	SC81-A-10/B-19	Teleflex Marine Systems
ENGINE CONTROLS		
Twin Lever Assembly	CH 5015	Teleflex Marine Systems
Shift Cable (Lower Station)	3300CC/A5797-15'	N.W. Controls, Inc.
Throttle Cable (Lower Station)	3300CC/A5797-16'	N.W. Controls, Inc.
Shift Cable (Flybridge)	3300CC/A5797-10'	N.W. Controls, Inc.
Throttle Cable (Flybridge)	3300CC/A5797-10'	N.W. Controls, Inc.

VENDOR ADDRESSES

A & B Industries (415) 924-1300	415 Tamal Plaza 200 Tamal Vista Blvd. Corte Madera, CA 94925
Aqua - Signal (312) 232-6425	33 W. 480 Fabyan Pkwy. Suite 105 W. Chicago, ILL 60185
Bass Products (617) 744-7003	50 Grove St. Salem, MA 01970
Baynes Electric Supply 1-800-242-0911	900 W. Chestnut St. Brockton, MA 02403
C. E. Beckman (617) 994-9676	11-35 Commercial St. New Bedford, MA 02740
Beckson Manufacturing Co. (203) 333-1412	Box 3336, 165 Holland Ave. Bridgeport, CT 06605
Bomar (603) 826-5794	Box 314, So. West St. Charlestown, MA 03603
Bristol Products Corp. (518) 237-3300	100 Mohawk St. Cohoes, NY 12047
Chrysler Marine Engines	Marine Division, Chrysler Corp. 151 Industrial Drive Beaver Dam, WI 53916
Control Engineering (305) 639-1002	633 Pam Lem St. Cocoa FL 32926
Convenience Marine Prod.,Inc. (616) 454-8337	FIREBOY Halon Systems Division 100 Commerce Ave., S.W. Grand Rapids, MI 49503
DiPetro-Kay 1-800-243-1786	914 Cromwell Ave. DiPetro Kay Drive Rocky Hill, CT 06067
Florida Marine Tanks (314) 624-5926 (Tanks)	Highway 114 East P.O. Box 369 Dexter, MO 63841
Florida Marine Tanks (305) 620-9030 (Windows)	16480-84 NW 48th Ave. Hialeah, FL 33014
Gem Products 1-800-874-4506	24A Industrial Loope Orange Park, FL 32073

Gray Enterprise (813) 885-2182	7211 Anderson Rd. Tampa, FL 33614
Go Industries (714) 642-1194	629 Terminal Way Costa Mesa, CA 92627
Gross Mechanical Lab. (301) 796-5242	7240 Standard Drive Hanover, MD 21076
Hansen Marine Eng. (617) 631-3290 (Westerbeke Engines)	P.O. Box 1106 Tioga Way Marblehead, MA 01945
Imtra (617) 391-5660	151 Mystic Ave. Medford, MA 02155
International Paint Co. (201) 686-1300	P.O. Box 386 2270 Morris Ave. Union, NJ 07083
ITT Jabsco Products (714) 545-8251	1485 Dole Way Costa Mesa, CA 92626
Kracor, Inc. (414) 355-6335	5625 W. Clinton Ave. P.O. Box 23667 Milwaukee, WI 53223
Lorco Marine, Inc. 1-800-343-0810	17 Tinker Ave. Grenier Ind. Airpark Londonderry, NH 03053
Mansfield Plumbing Products 1-800-321-9886	Mansfield Manitary Big Prairie, OH 44611
Michigan Wheel	Michigan Wheel Division Dana Corporation 1501 Buchanan Ave., S.W. Grand Rapids, MI 49507
N.W. Controls, Inc. (215) 287-7871	Shelly Rd., P.O. Box 325 Harleysville, PA 19438
Ocean Engineering, Inc. (203) 488-4552	232 Branford Rd. North Branford, CT 06471
Olson Industries 1-800-221-4521	P.O. Box 5935 Asheville, NC 28813
Pettit Paint Co., Inc. (201) 625-3100	36 Pine St., P.O. Box 378 Borough of Rockaway, NJ 07866
Raritan Engineering Co. (609) 825-4900	P.O. Box 1157, 530 Orange St. Milville, NJ 08332

Rule Industries (617) 281-0440	Cape Ann Industrial Park Gloucester, MA 01930
Shurflo (219) 294-7581	1740 Markle St. Elkhart, IND 46514
G. G. Schmitt Co. (717) 394-3701	1001 Ranck Mill Rd. Lancaster, PA 17602
Spartan Marine Products (617) 823-6779	160 Middleboro Ave. E. Taunton, MA 02718
Surrette Storage Batt Co. (617) 745-4444	P.O. Box 3027 Salem, MA 01970
Teleflex Marine Systems (215) 495-7011	640 North Lewis Rd. Limerick, PA 19468
Volvo Penta	See U.S. Dealer Directory or/DiPetro-Kay 914 Cromwell Ave. DiPetro Kay Drive Rocky Hill, CT 06067
J. H. Westerbeke Corp. (617) 588-7700 (Westerbeke Engine)	Avon Industrial Park Avon, MA 02322

APPENDIX 3 - TECHNICAL INFORMATION

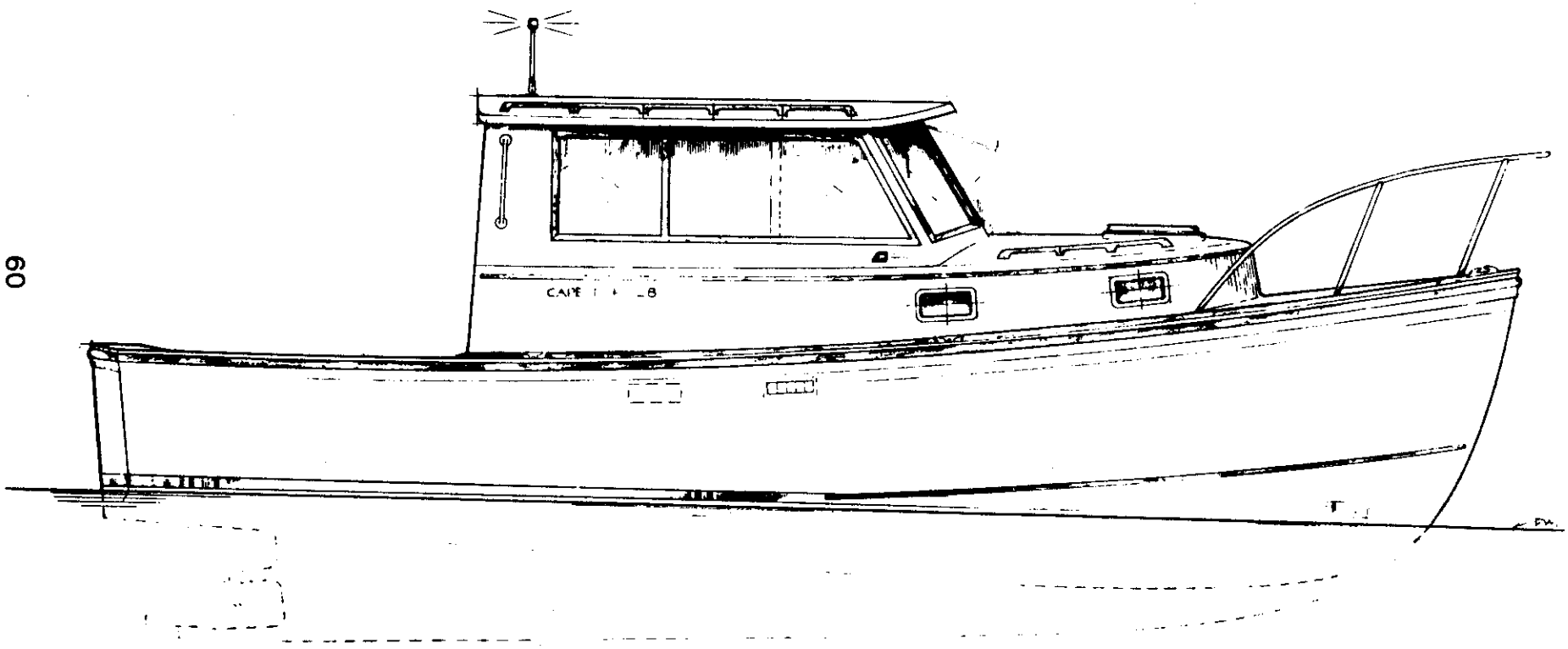
MODEL	CRUISER	FLYBRIDGE CRUISER	OPEN FISHERMAN	280 SPORT
DIMENSIONS:				
Length Over All*	28'9"	28'9"	28'9"	27'10"
Length On Deck	27'11"	27'11"	27'11"	27'10"
Length On Waterline	25'11"	26'0"	25'10"	25'9"
Beam Maximum	9'11"	9"11"	9'11"	9'11"
Draft	2'10"	2'11"	2'9"	2'8"
Displacement **	8000 lbs.	8500 lbs.	7000 lbs.	6500 lbs.
Clearance above WL	8'3"	11'0"	8'0"	7'4"
CHARACTERISTICS:				
Pounds Per Inch Immersion	987 lbs.	1000 lbs.	963 lbs.	950 lbs.
Moment to Trim 1"	1580'/lbs.	1613'/lbs.	1515'/lbs.	1480'/lbs.
TANK CAPACITIES:				
Fuel ***	95 Gals (120 Gals)	95 Gals (120 Gals)	120 Gals	63 Gals
Fresh Water ***	45 Gals (95 Gals)	45 Gals (95 Gals)	40 Gals	24 Gals
Holding	24 Gals	24 Gals	15 Gals	N.A.
Hot Water(Optional)	6 Gals	6 Gals	6 Gals	N.A.

* Includes bow pulpit except for 280 Sport. Add 1'5" for swim platform if fitted.

** Light Ship condition, tanks empty. Displacements are approximate.

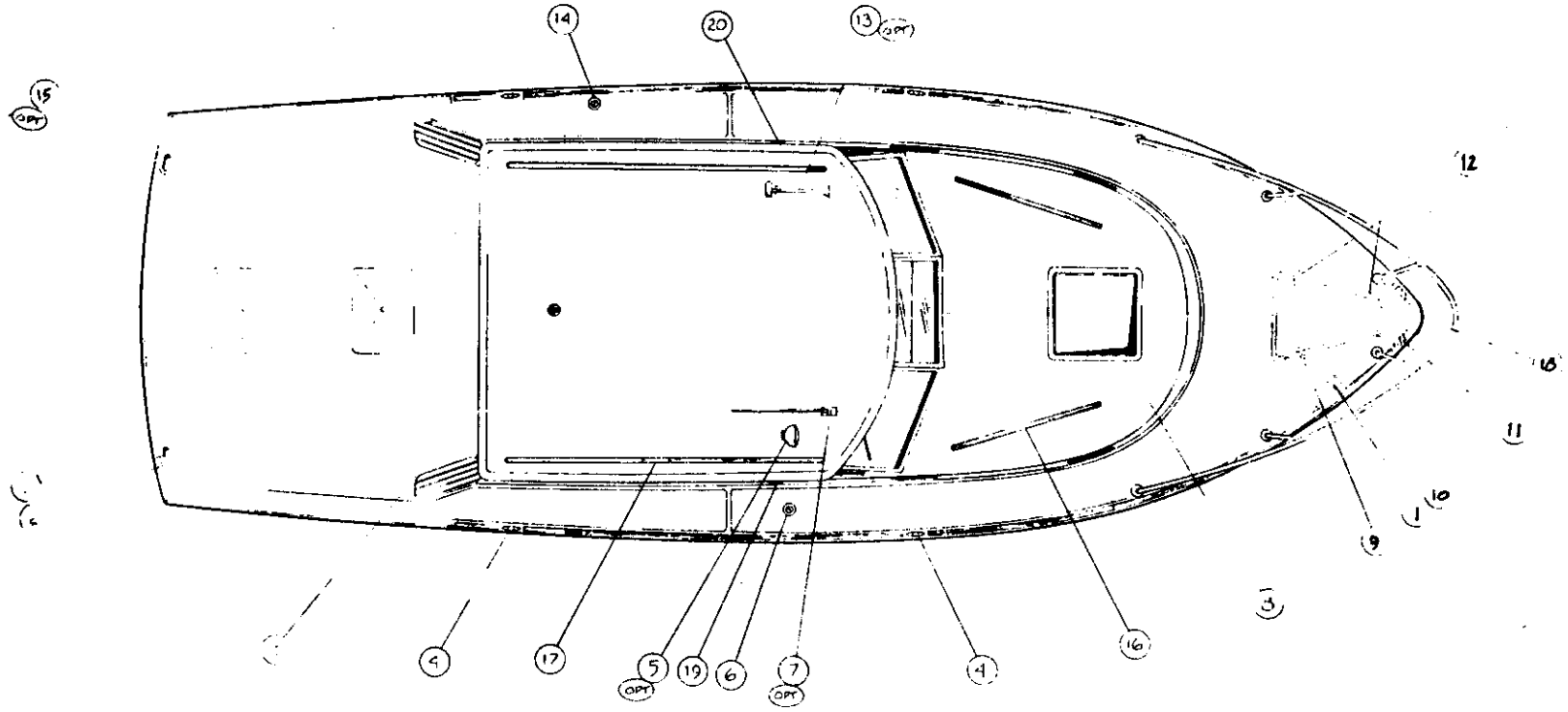
***Optional tank capacities shown in parenthesis.

4.1 CRUISER — OUTBOARD PROFILE

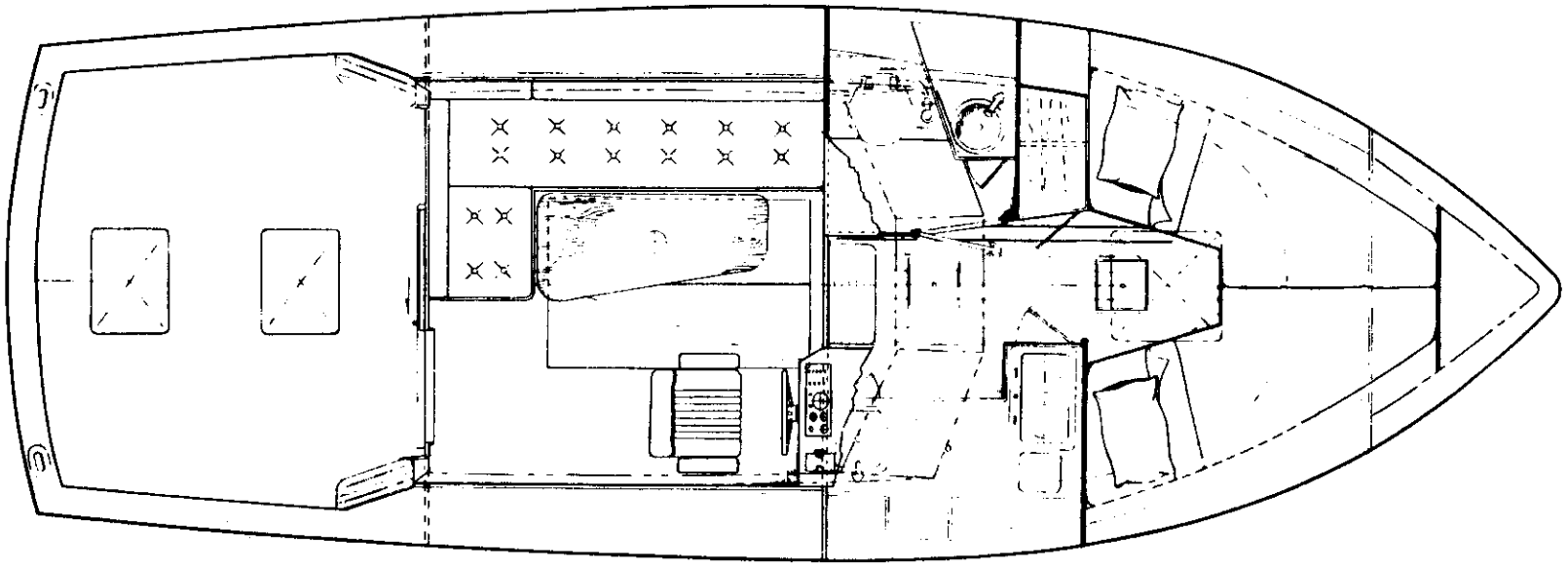


4.2 CRUISER — DECK PLAN

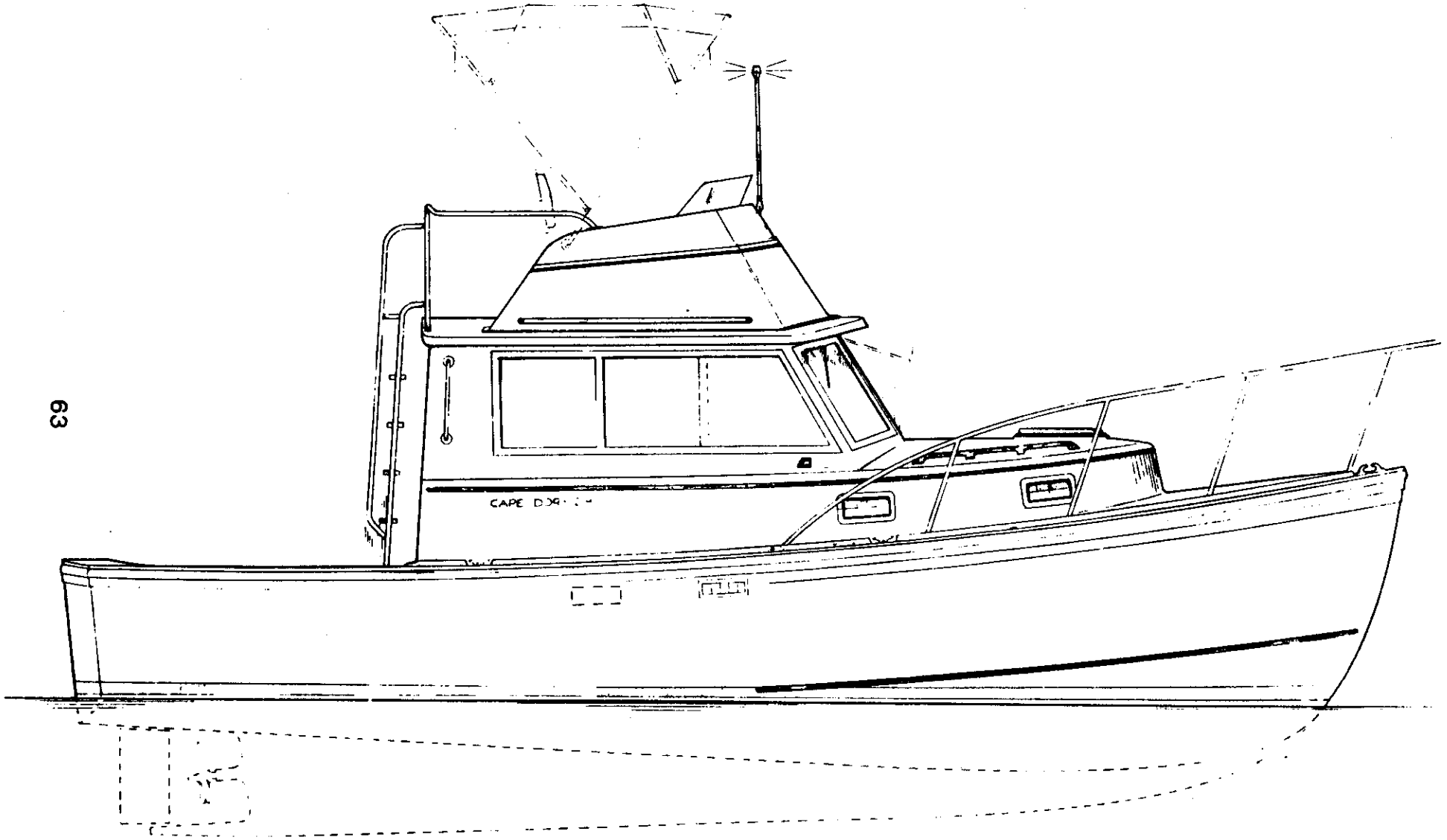
1. 8" HERRESHOFF CLEAT
2. HAWSE PIPE
3. 360 DEGREE NAV. LIGHT
4. 5" CLEAT
5. SEARCH LIGHT (OPT.)
6. FUEL FILL
7. VHF ANT. (OPT.)
8. HATCH
9. LOCKING CAM LATCH
10. BOWRAIL
11. 5" G CHOCK
12. 4" STRAP HINGE
13. HORN (OPT.)
14. WATER FILL
15. SWIM PLATFORM (OPT.)
16. 3 LOOP GRABRAIL
17. 5 LOOP GRABRAIL
18. BRONZE BOW TRIM
19. STARBOARD NAV. LIGHT
20. PORT NAV. LIGHT



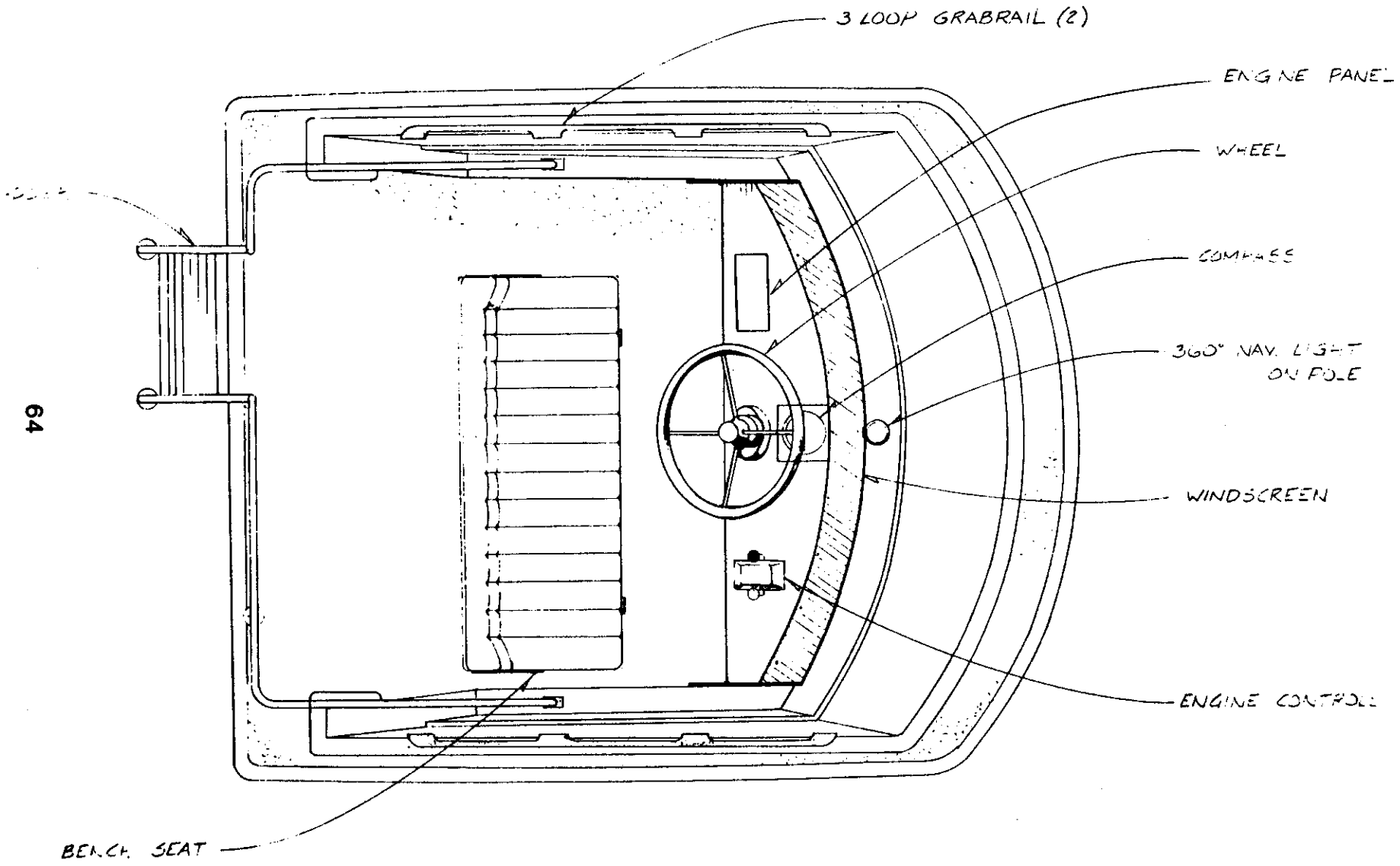
4.3 CRUISER — GENERAL ARRANGEMENT



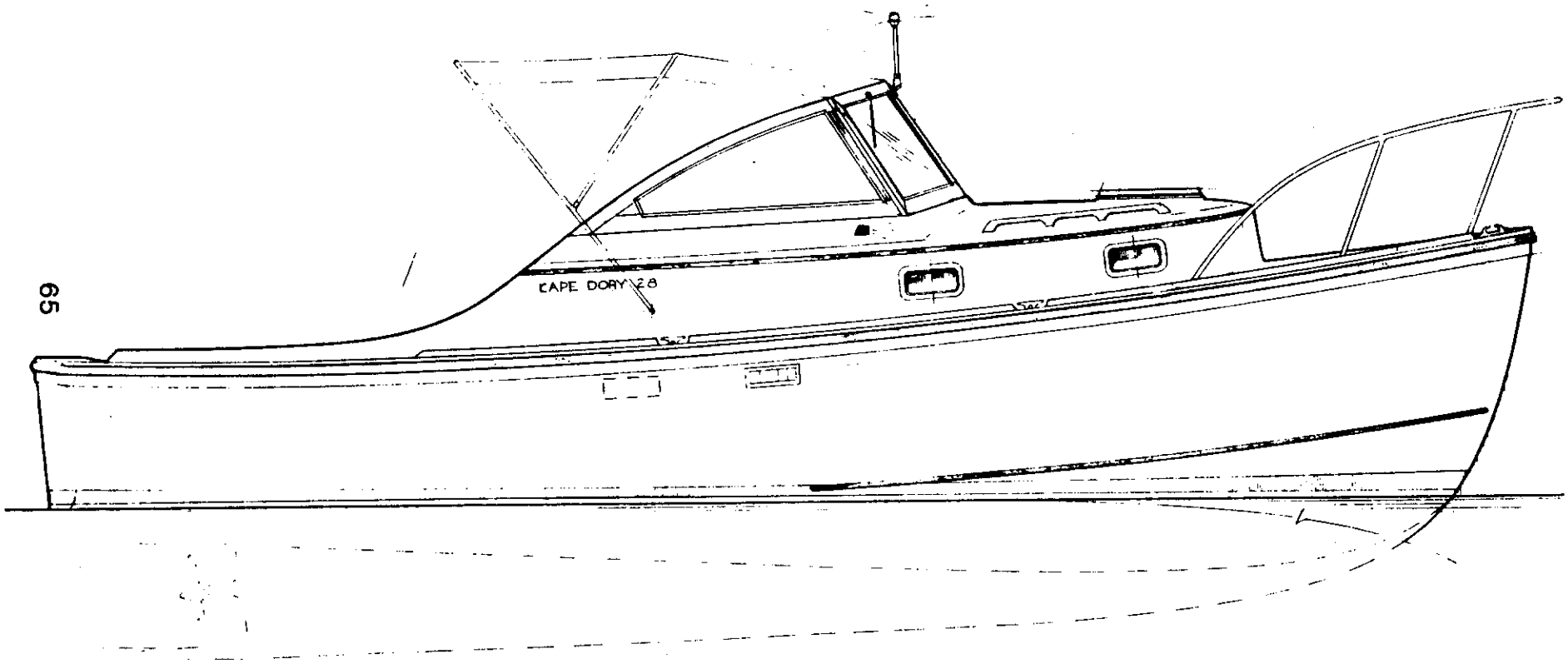
4.4 FLYBRIDGE — CRUISER — OUTBOARD PROFILE



4.5 FLYBRIDGE — PLAN VIEW

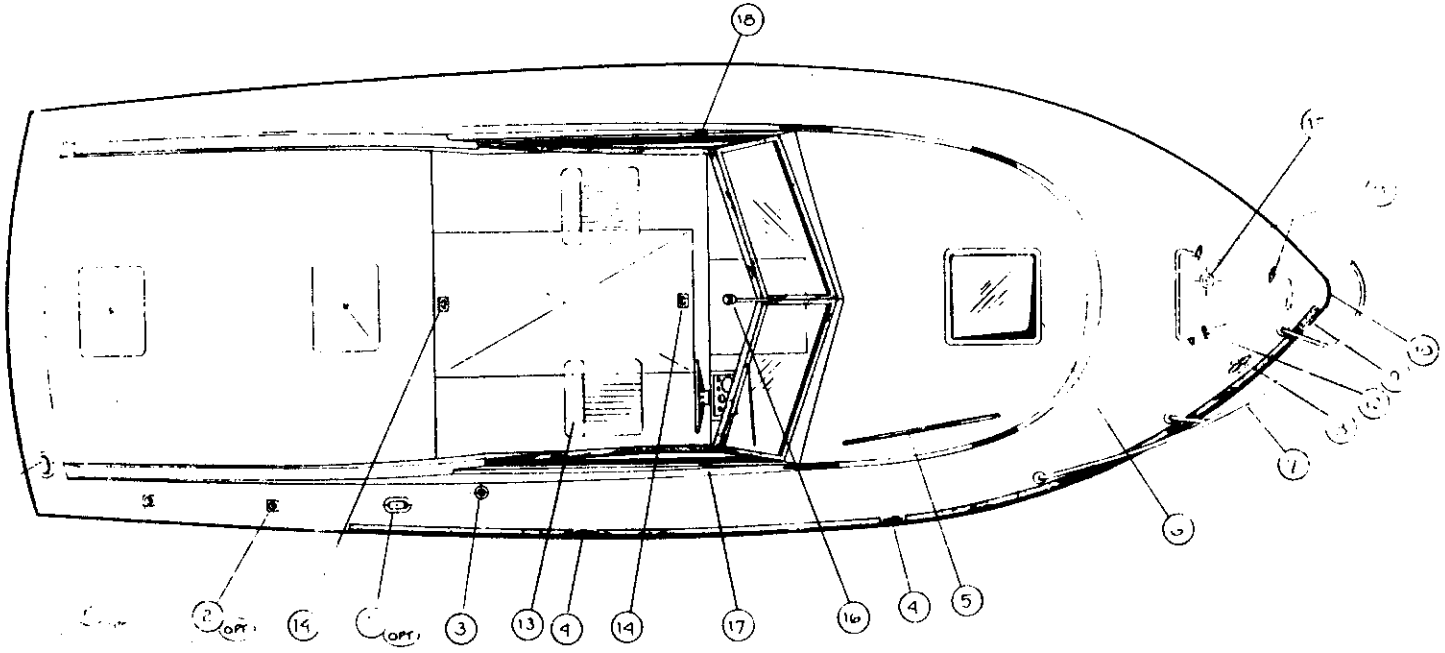


4.6 OPEN FISHERMAN — OUTBOARD PROFILE

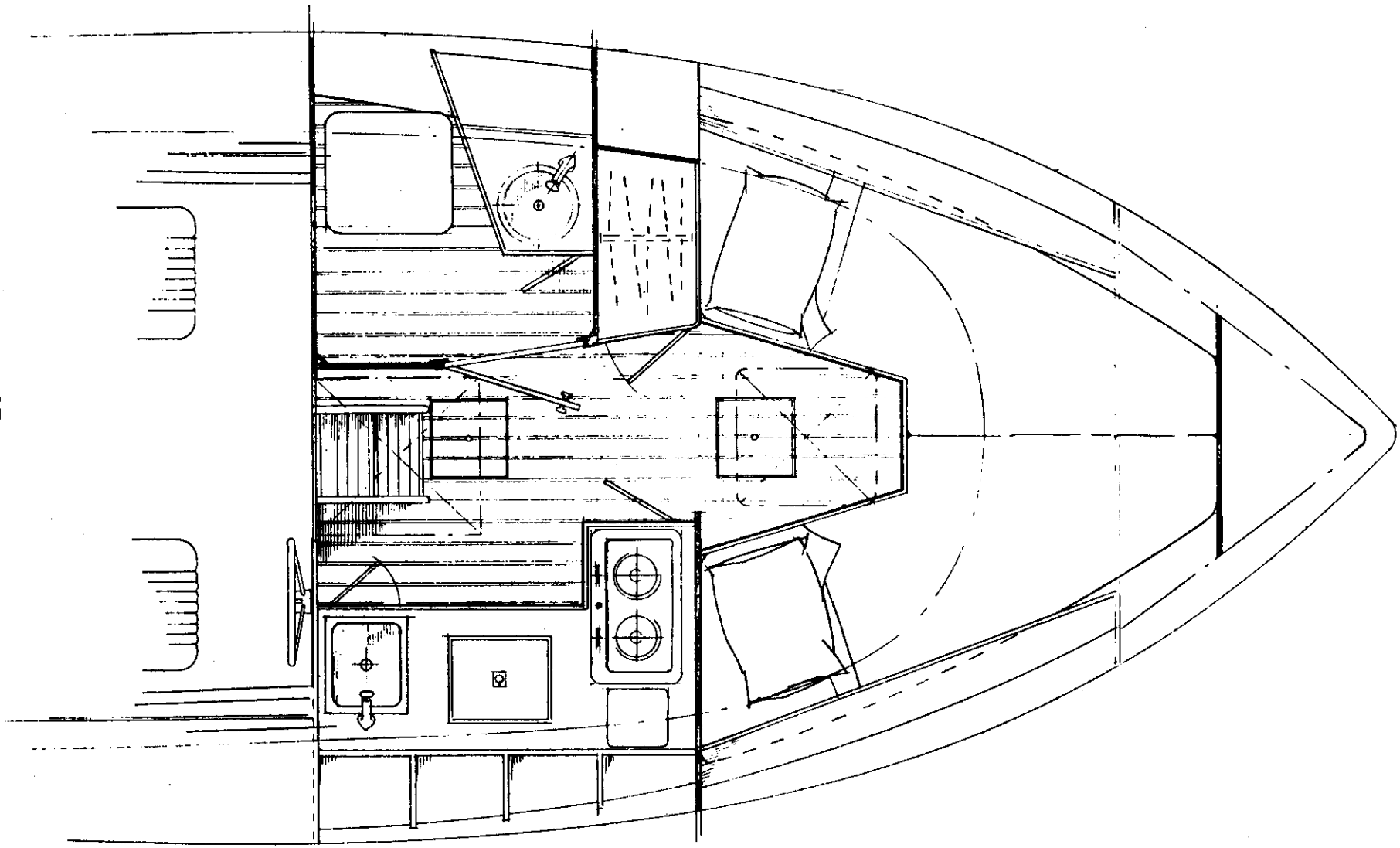


4.7 OPEN FISHERMAN — DECK PLAN

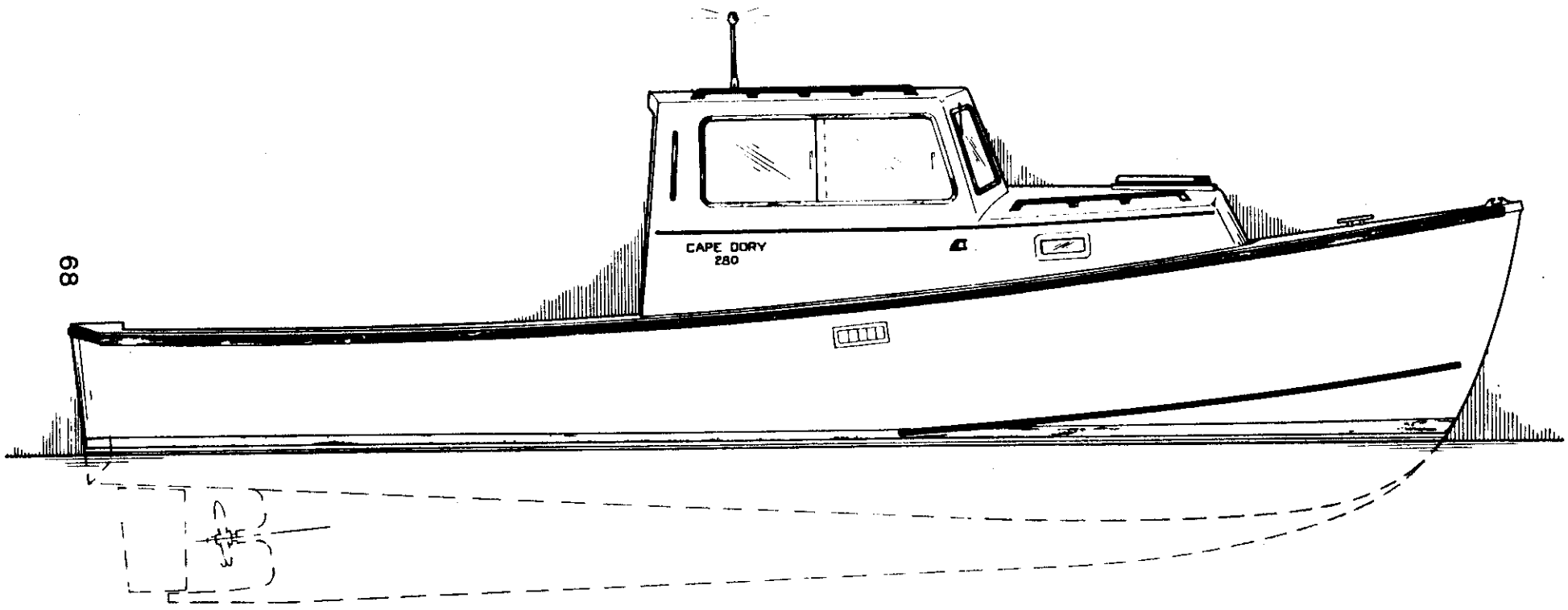
1. HAWSE PIPE
2. ROD HOLDER (OPT.)
3. FUEL FILL
4. 5" CLEAT
5. 3" LOOP GRABRAIL
6. HATCH
7. BOWRAIL
8. 8" HERRESHOFF CLEAT
9. 5" G CHOCK
10. BRONZE BOW TRIM
11. 4" STRAP HINGE
12. LOCKING CAM LATCH
13. HELMSMAN SEAT
14. FLUSH RING PULL
15. WATER FILL
16. 360 DEGREE NAV. LIGHT
17. STARBOARD NAV. LIGHT
18. PORT NAV. LIGHT



4.8 OPEN FISHERMAN — GENERAL ARRANGEMENT

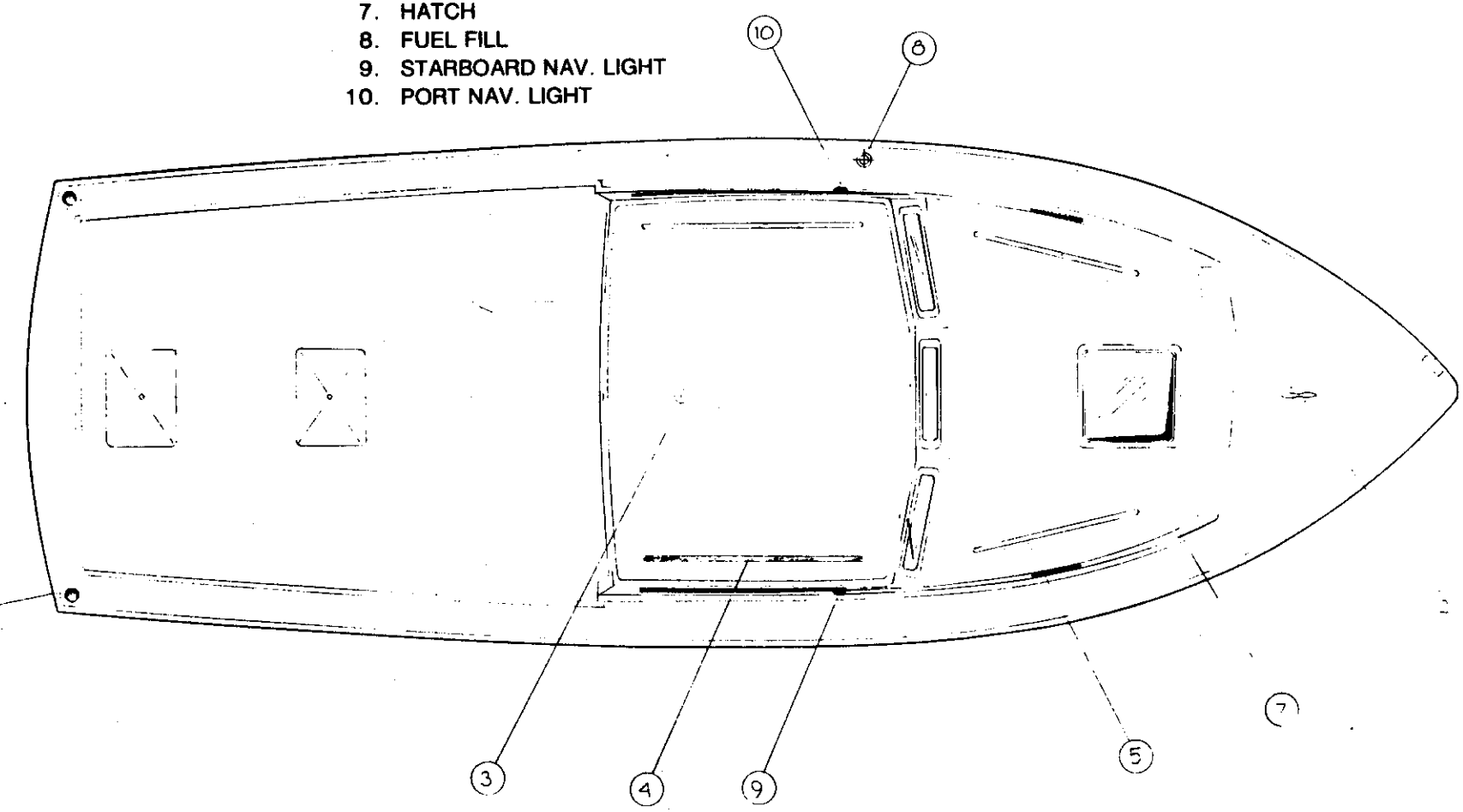


4.9 280 SPORT — OUTBOARD PROFILE

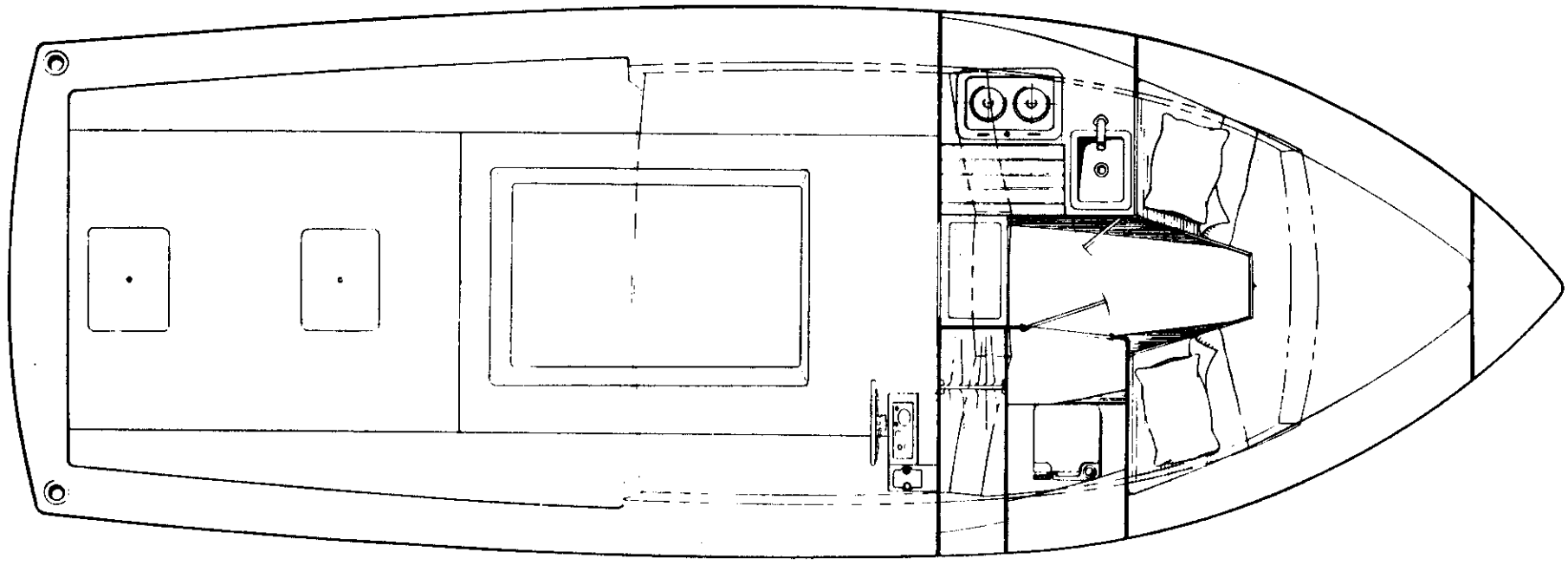


4.10 280 SPORT — DECK PLAN

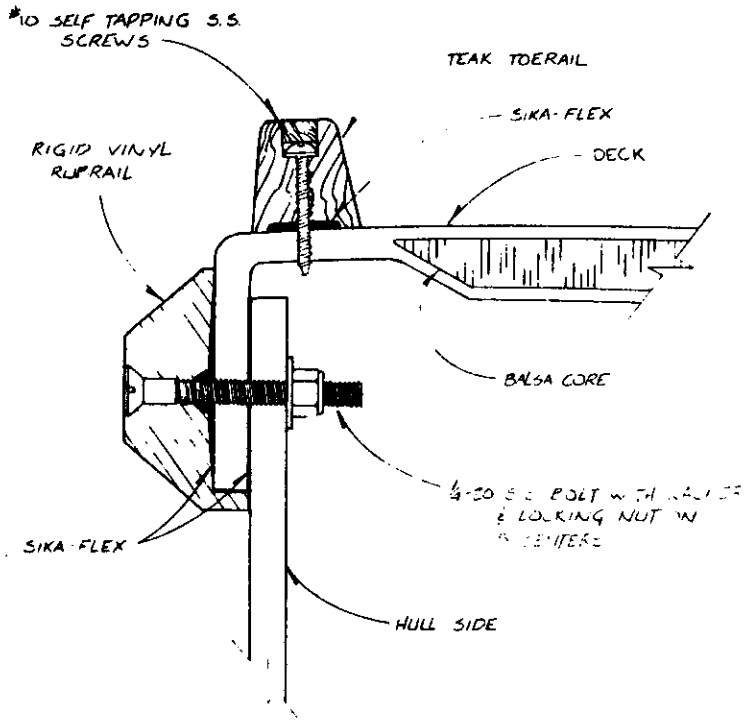
1. HAWSE PIPE
2. 8" HERRESHOFF CLEAT
3. 360 DEGREE NAV. LIGHT
4. 4 LOOP GRABRAIL
5. 3 LOOP GRABRAIL
6. PORT 5" G CHOCK
7. HATCH
8. FUEL FILL
9. STARBOARD NAV. LIGHT
10. PORT NAV. LIGHT



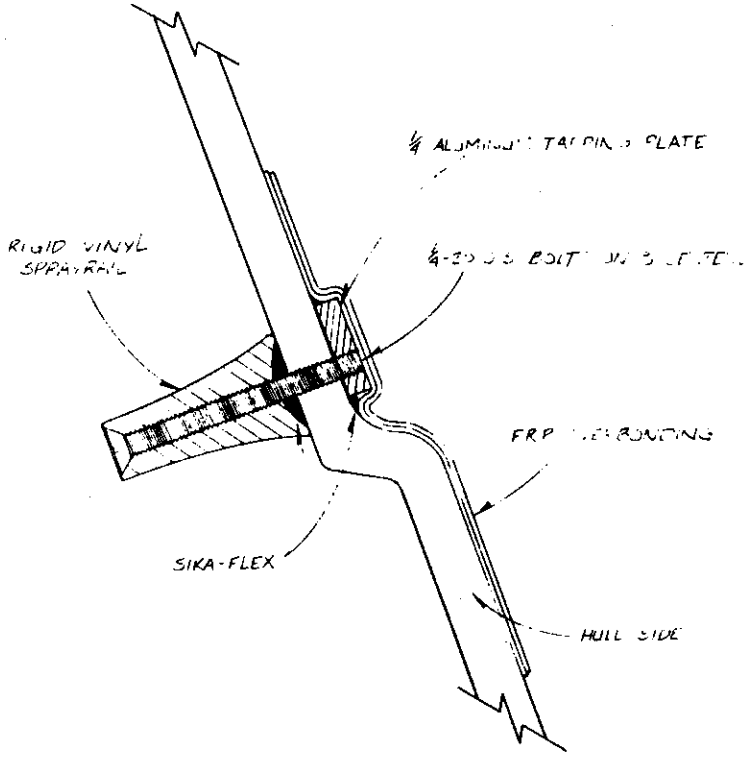
4.11 280 SPORT — GENERAL ARRANGEMENT



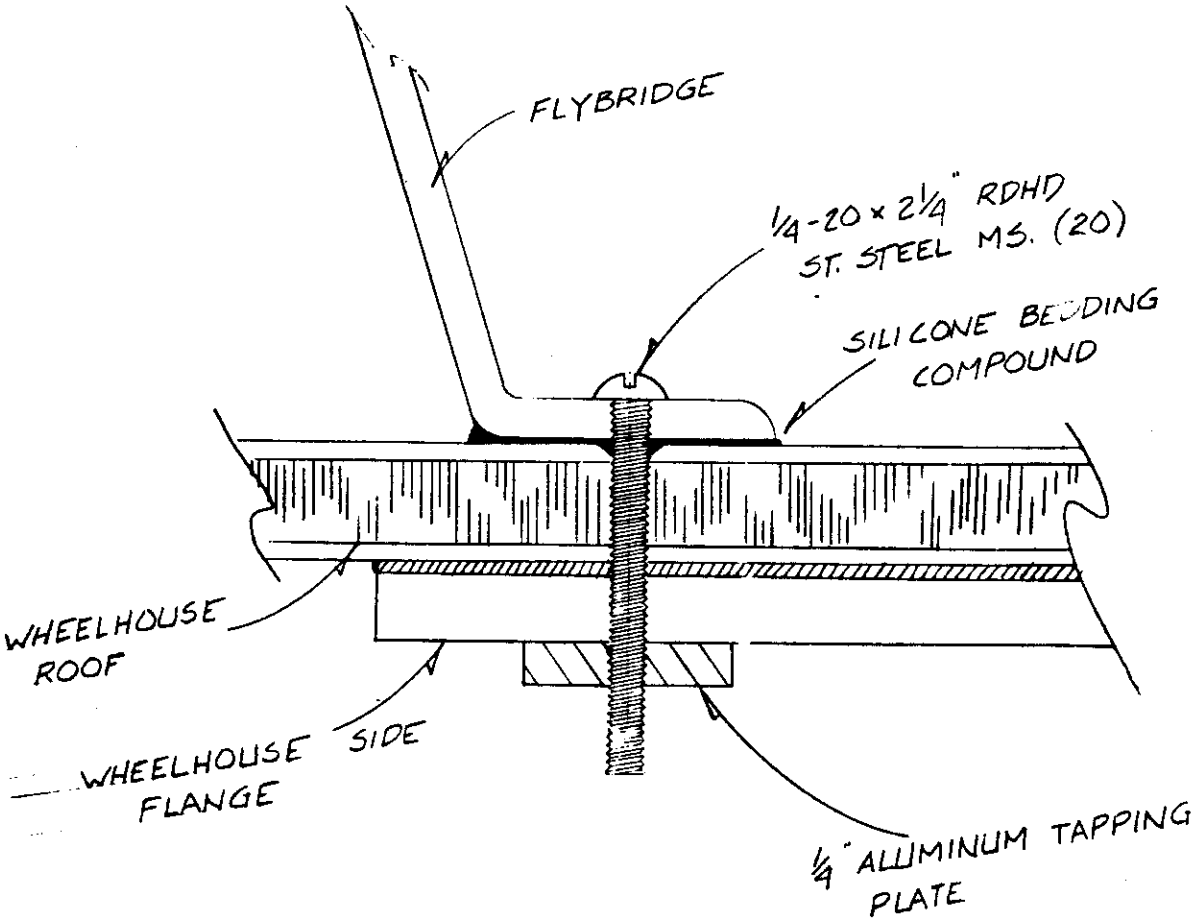
4.12 DECK TO HULL JOINT



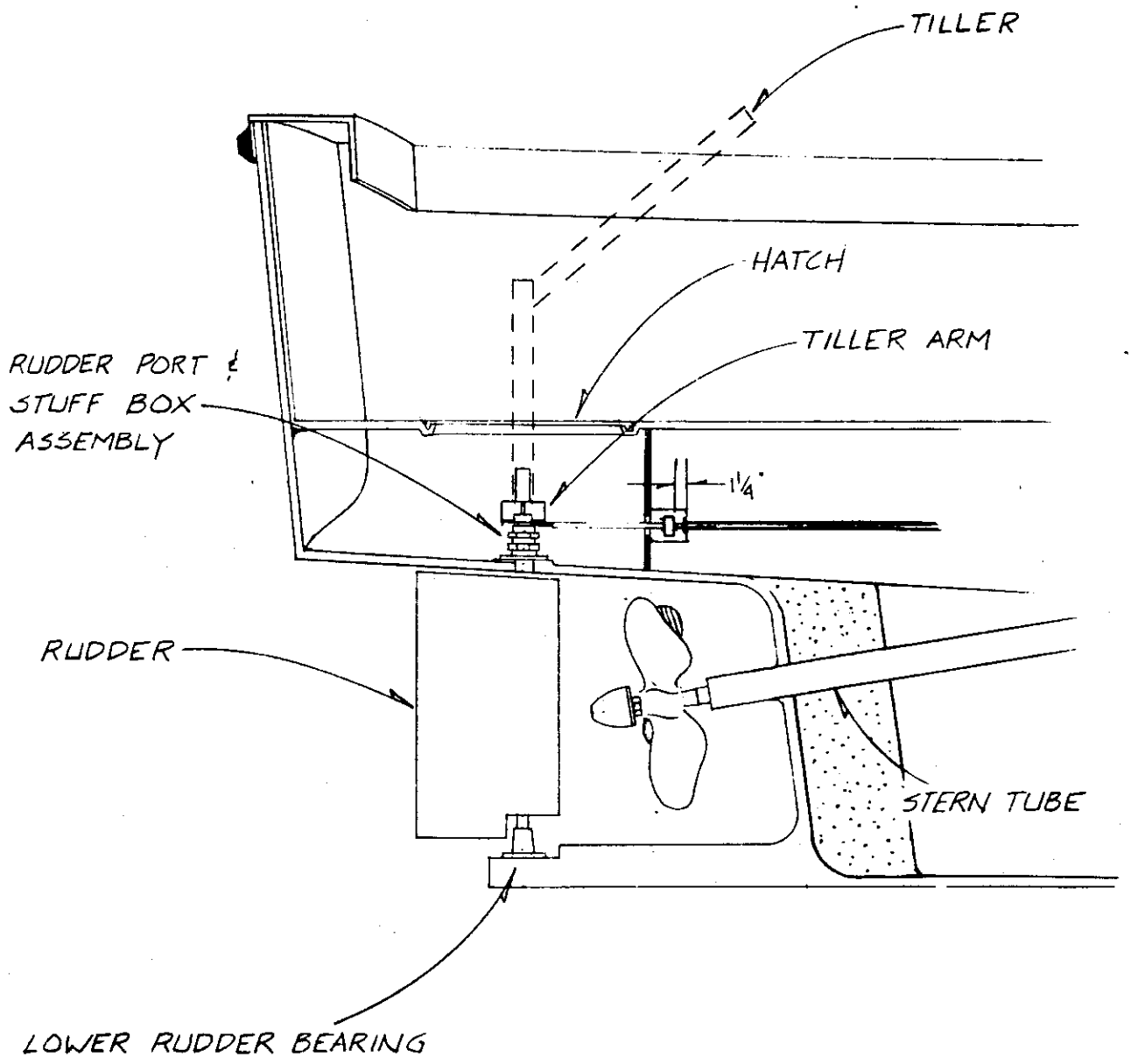
4.13 SPRAY RAIL DETAIL



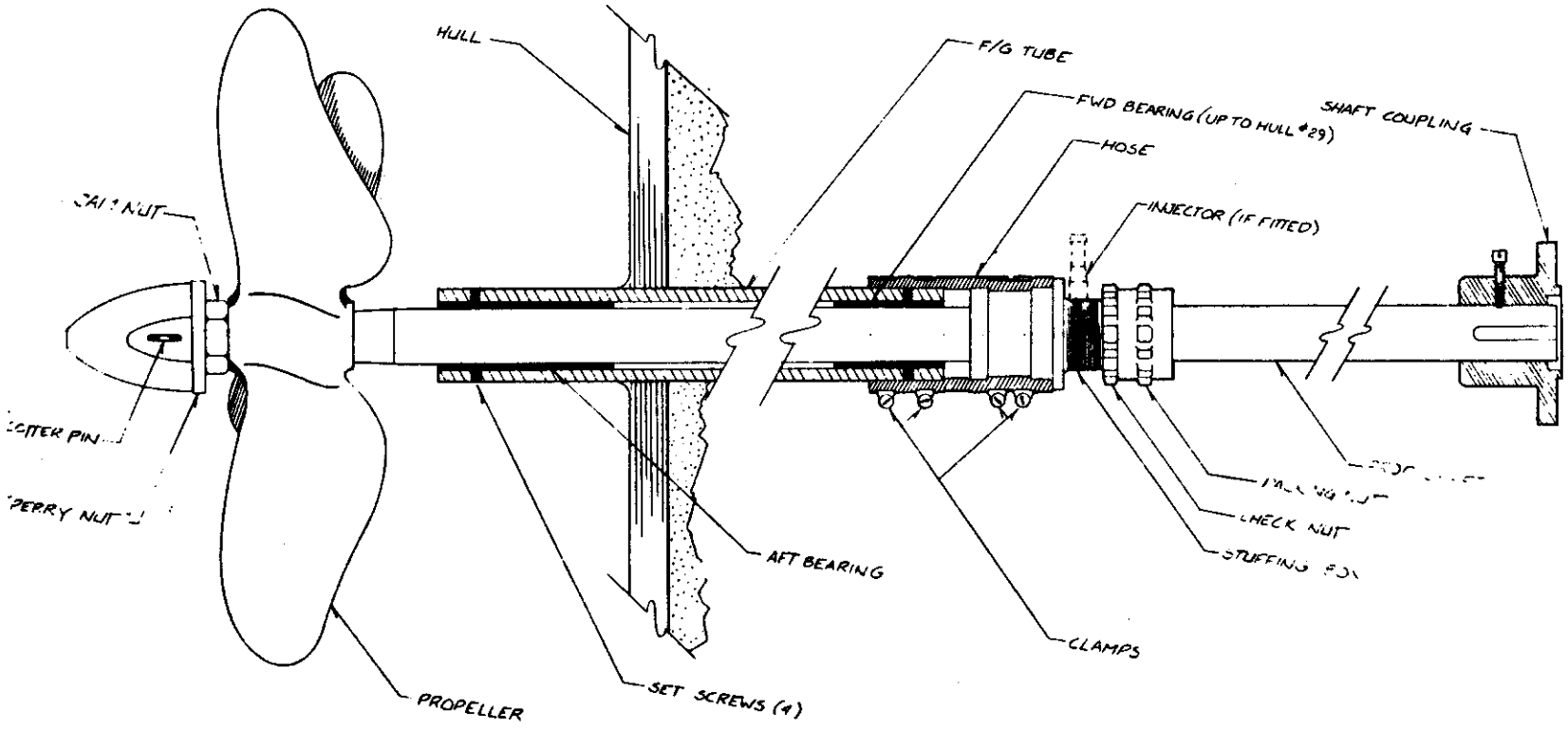
4.14 FLYBRIDGE ATTACHMENT DETAIL



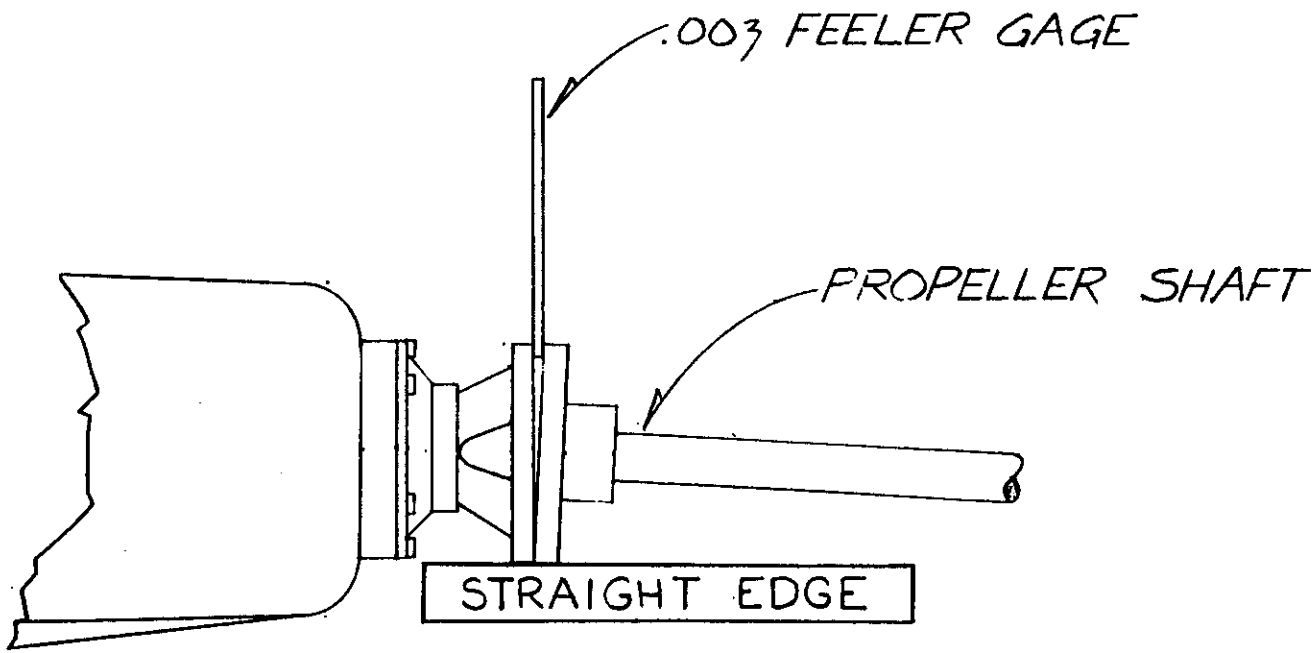
4.15 RUDDER DETAIL



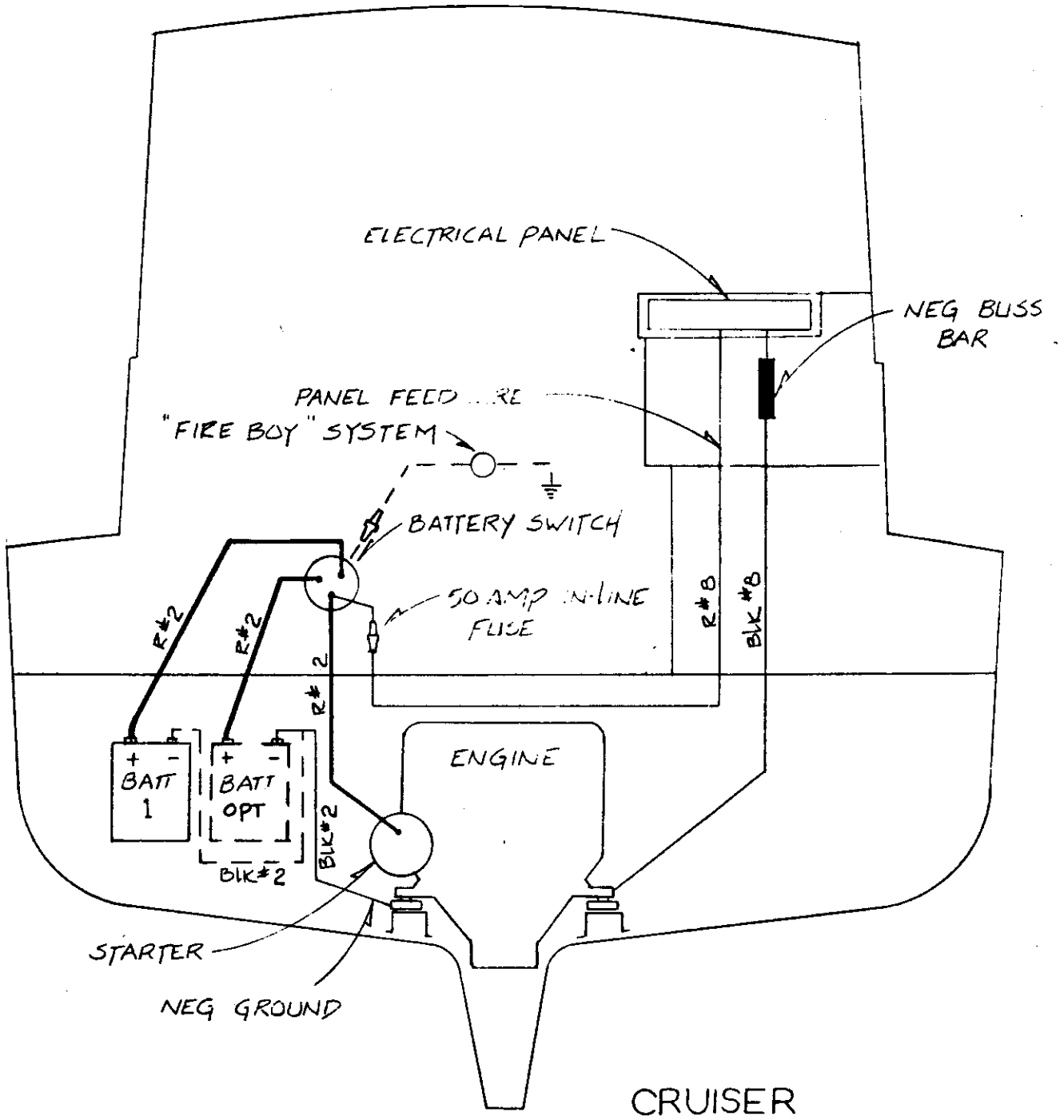
4.16 PROPELLER SHAFT DETAIL



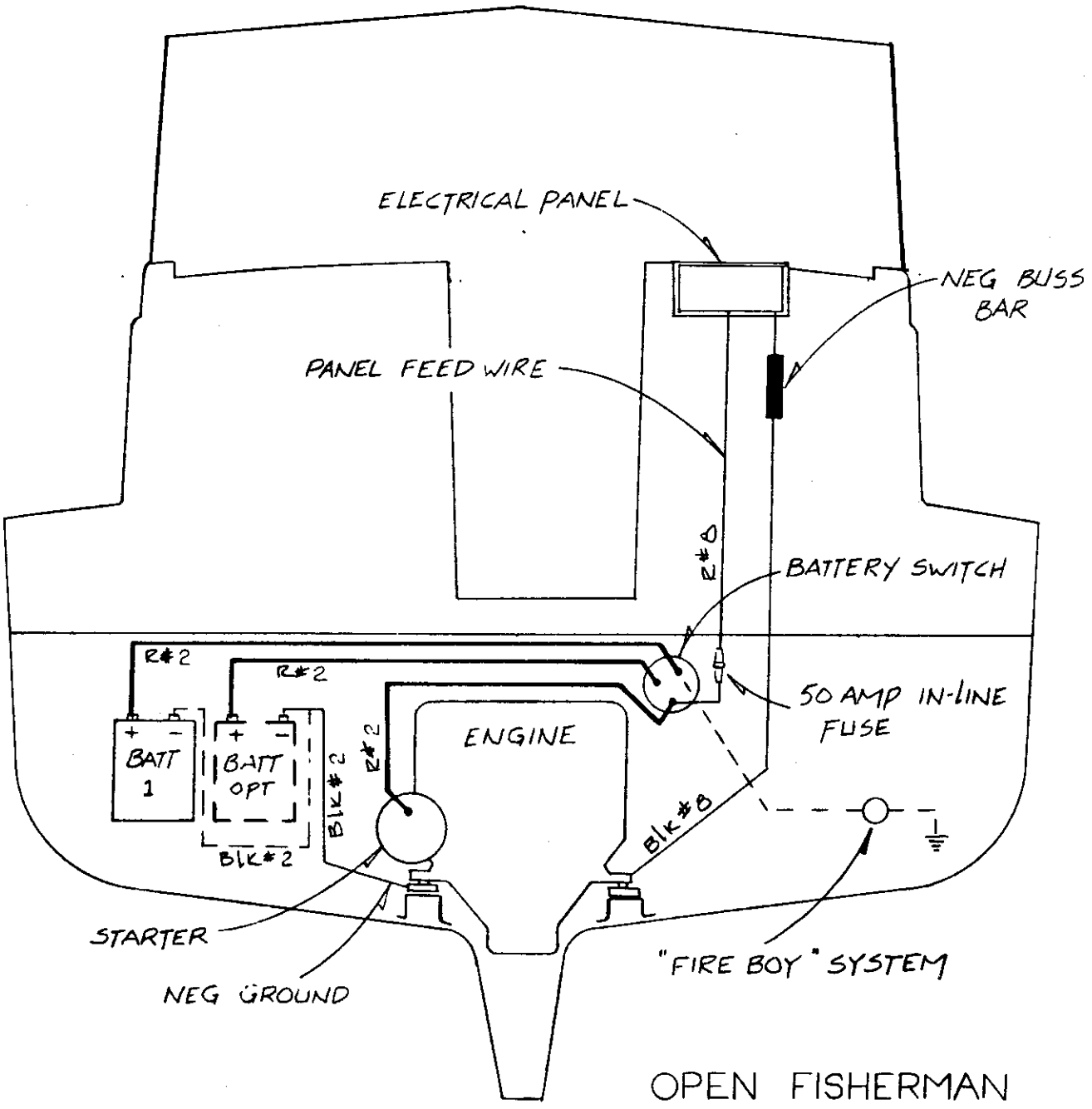
4.17 SHAFT ALIGNMENT DETAIL



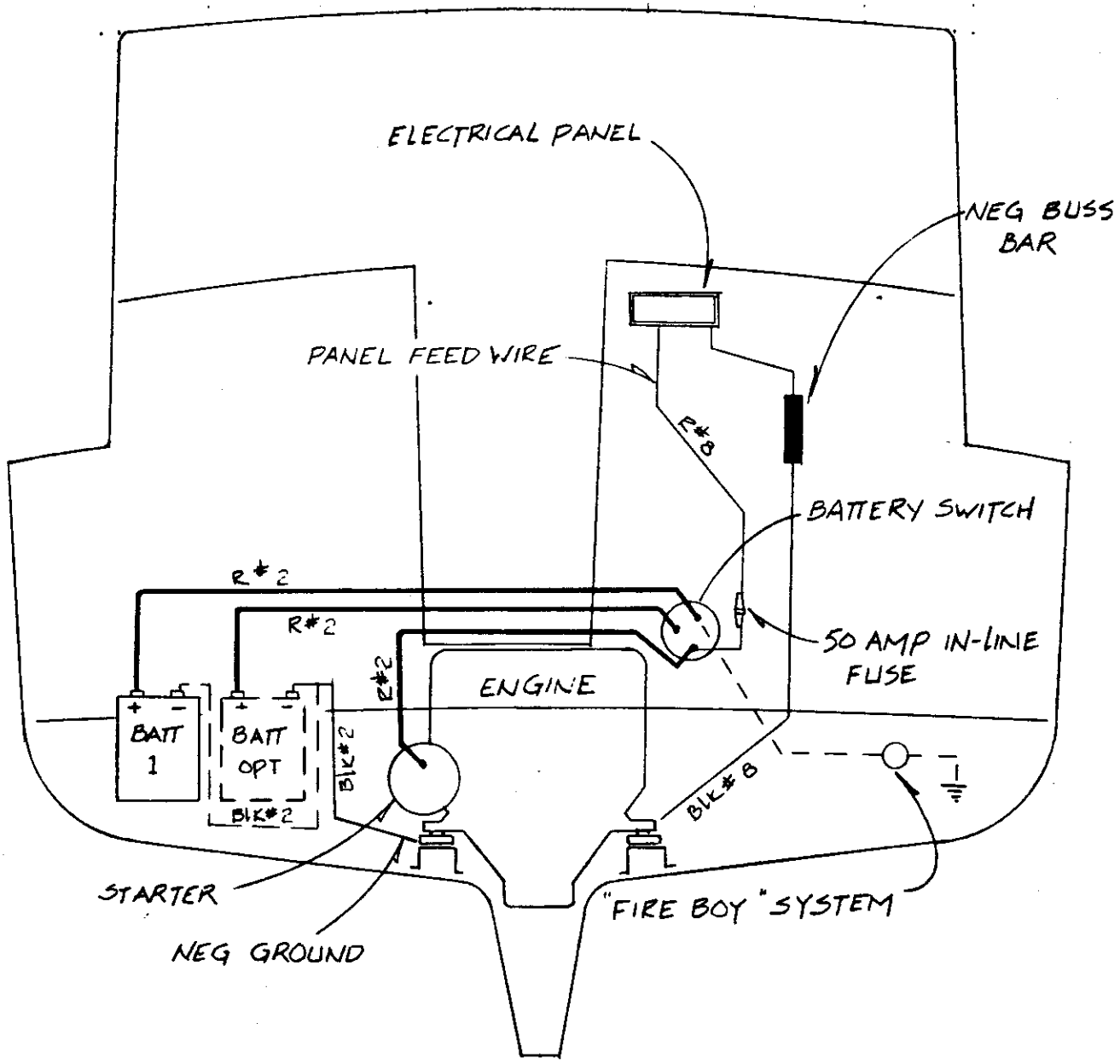
4.18 CRUISER — BATTERY WIRING SCHEMATIC



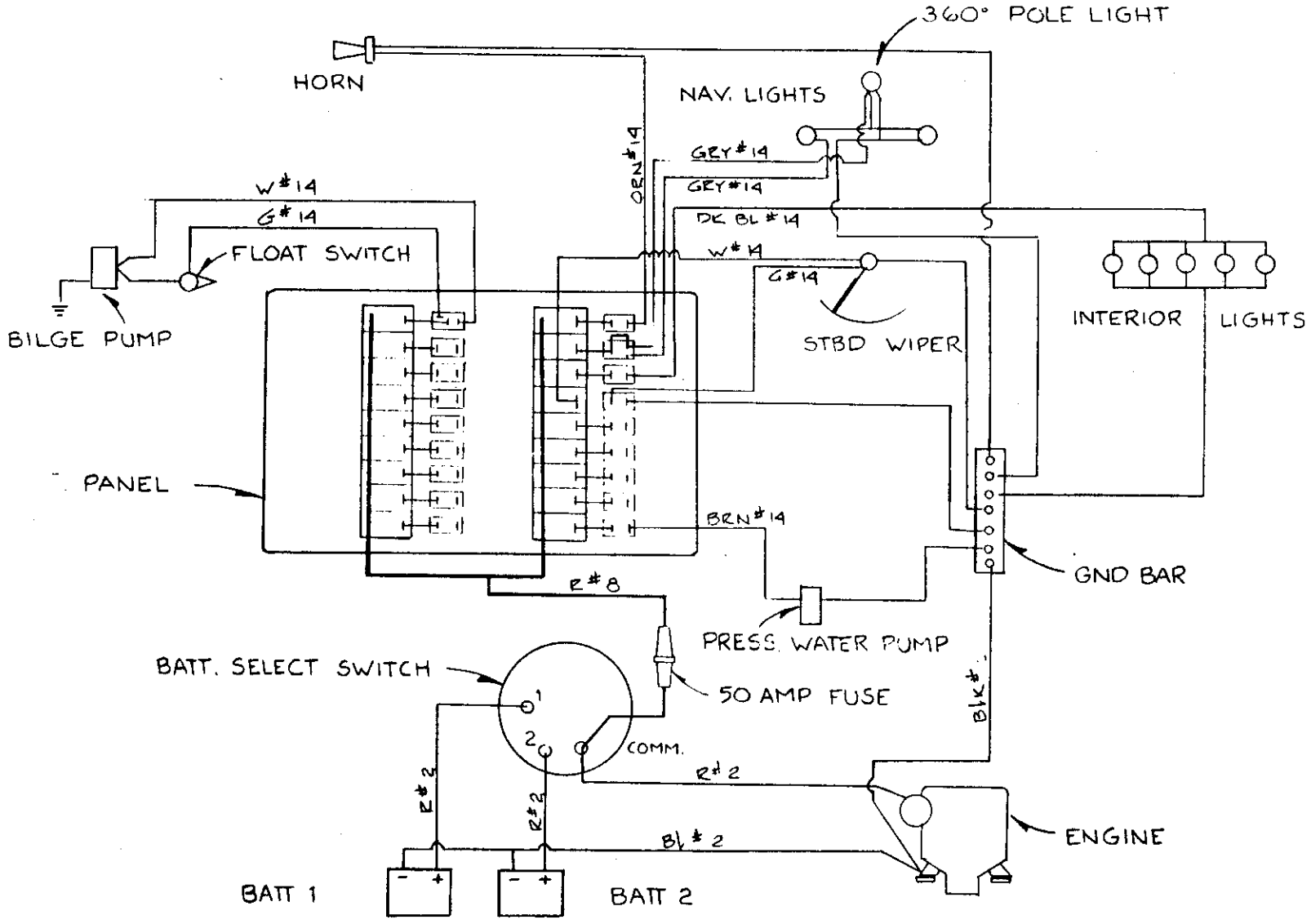
4.19 OPEN FISHERMAN — BATTERY WIRING SCHEMATIC



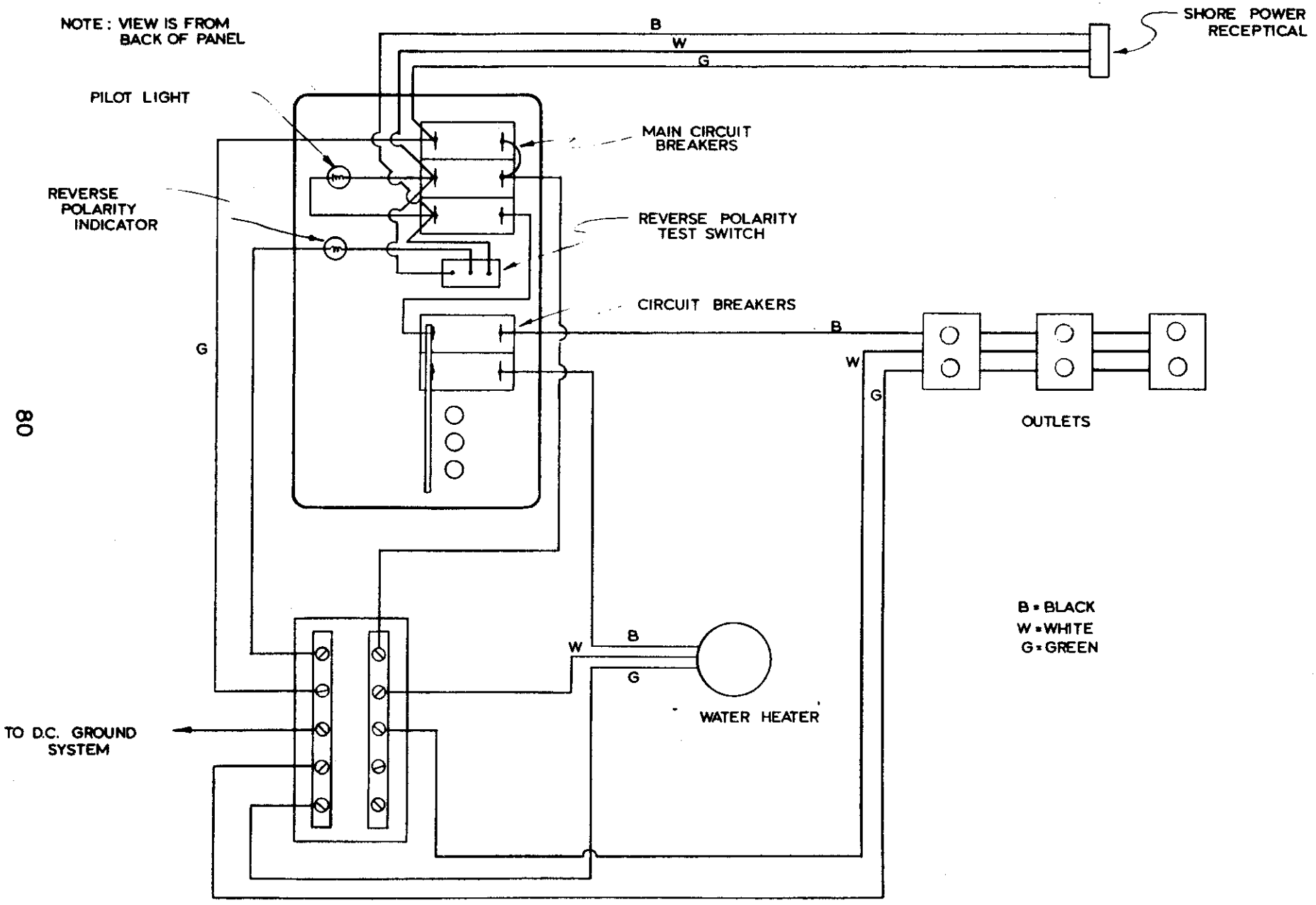
4.20 280 SPORT — BATTERY WIRING SCHEMATIC



4.21 12 VOLT D.C. ELECTRICAL SCHEMATIC

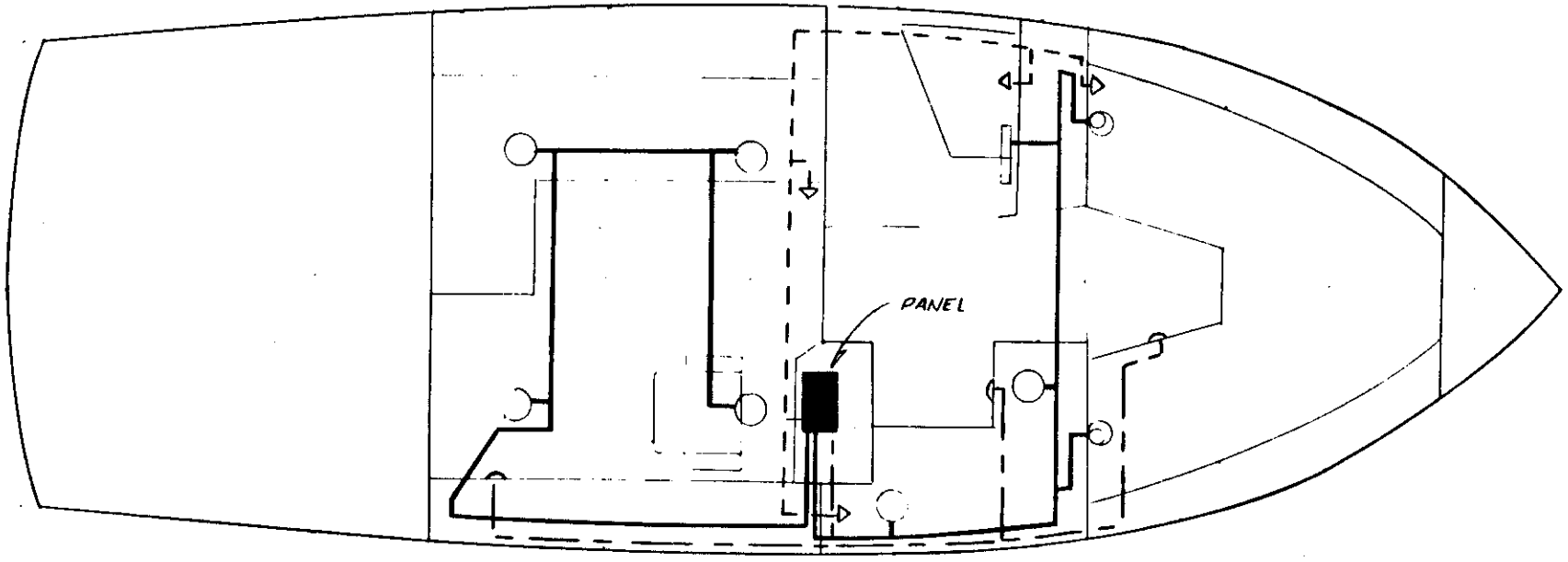


4.22 115 VOLT A.C. ELECTRICAL SCHEMATIC

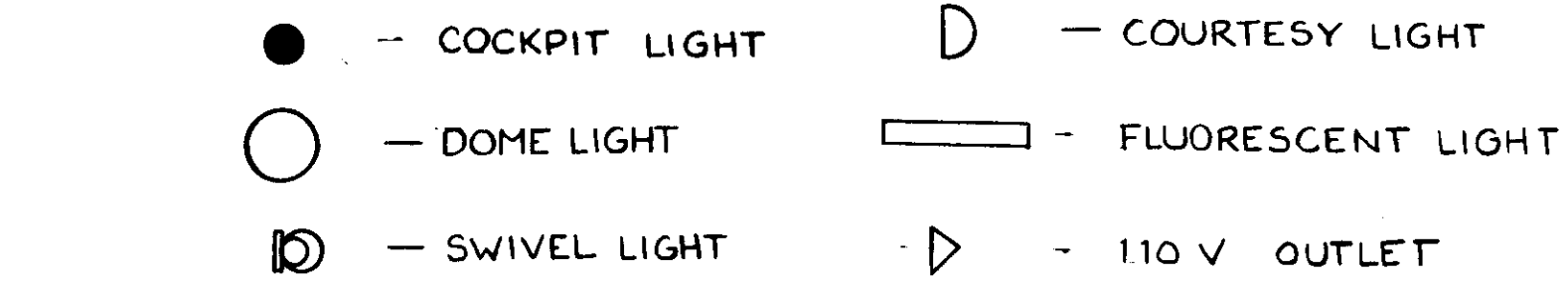


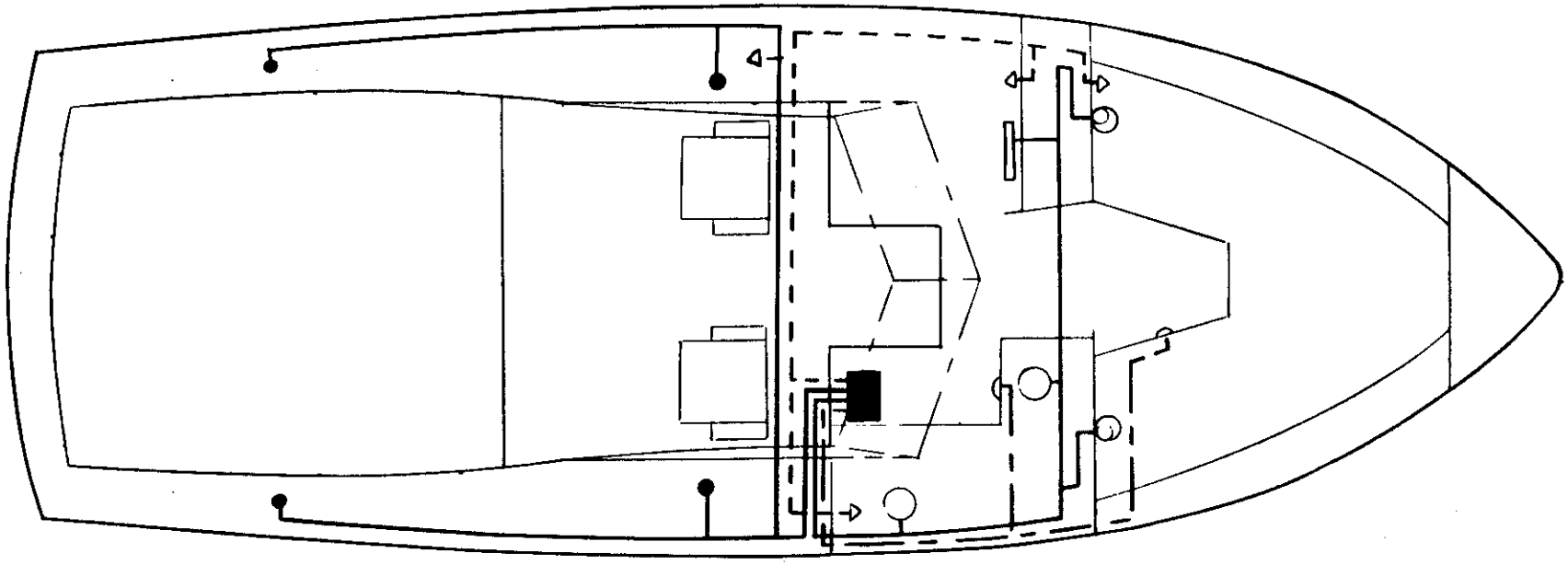
4.23 CRUISER — LIGHTING LAYOUT

- COCKPIT LIGHT
- DOME LIGHT
- SWIVEL LIGHT
- COURTESY LIGHT
- FLUORESCENT LIGHT
- 110 V OUTLET

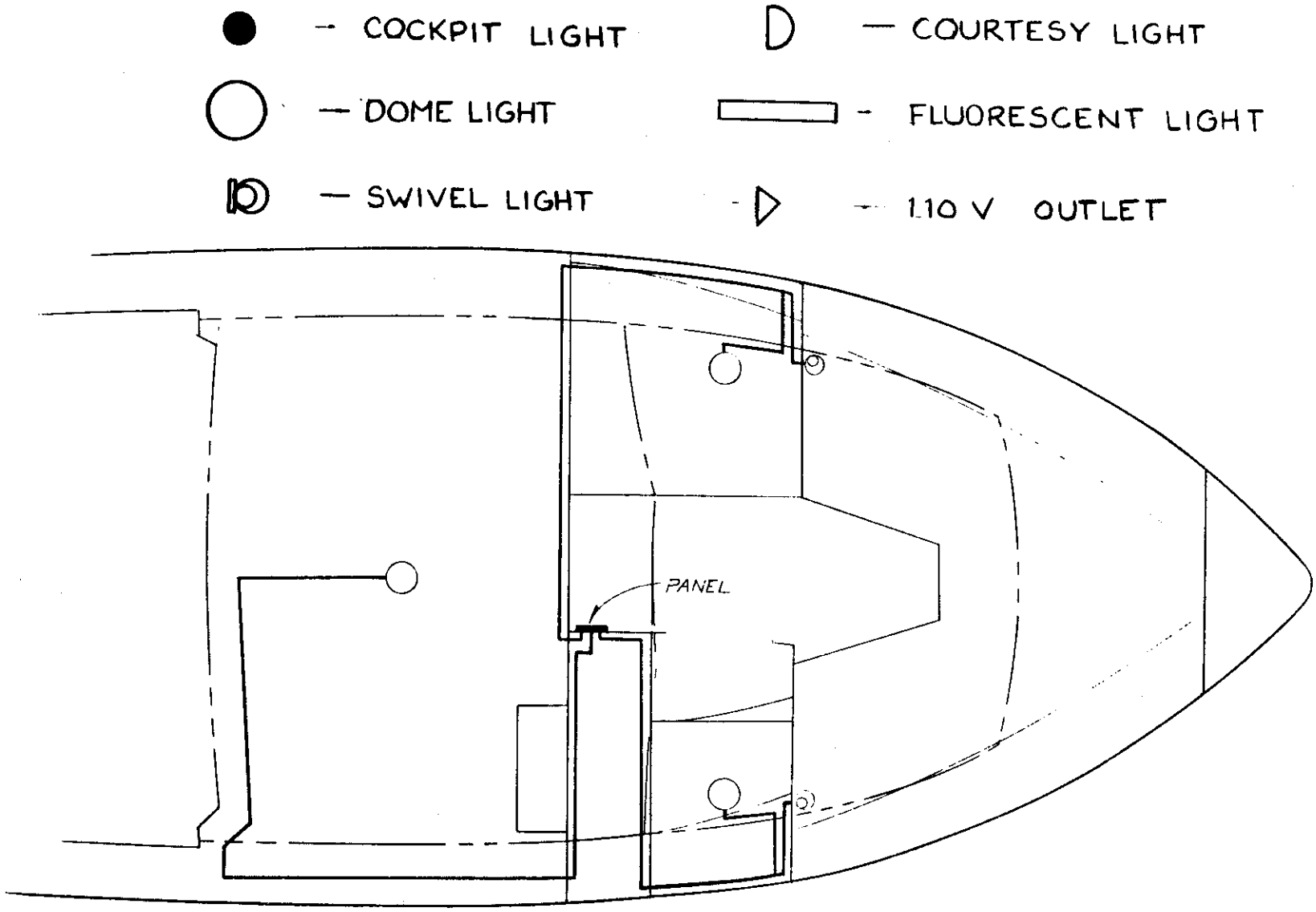


4.24 OPEN FISHERMAN — LIGHTING LAYOUT

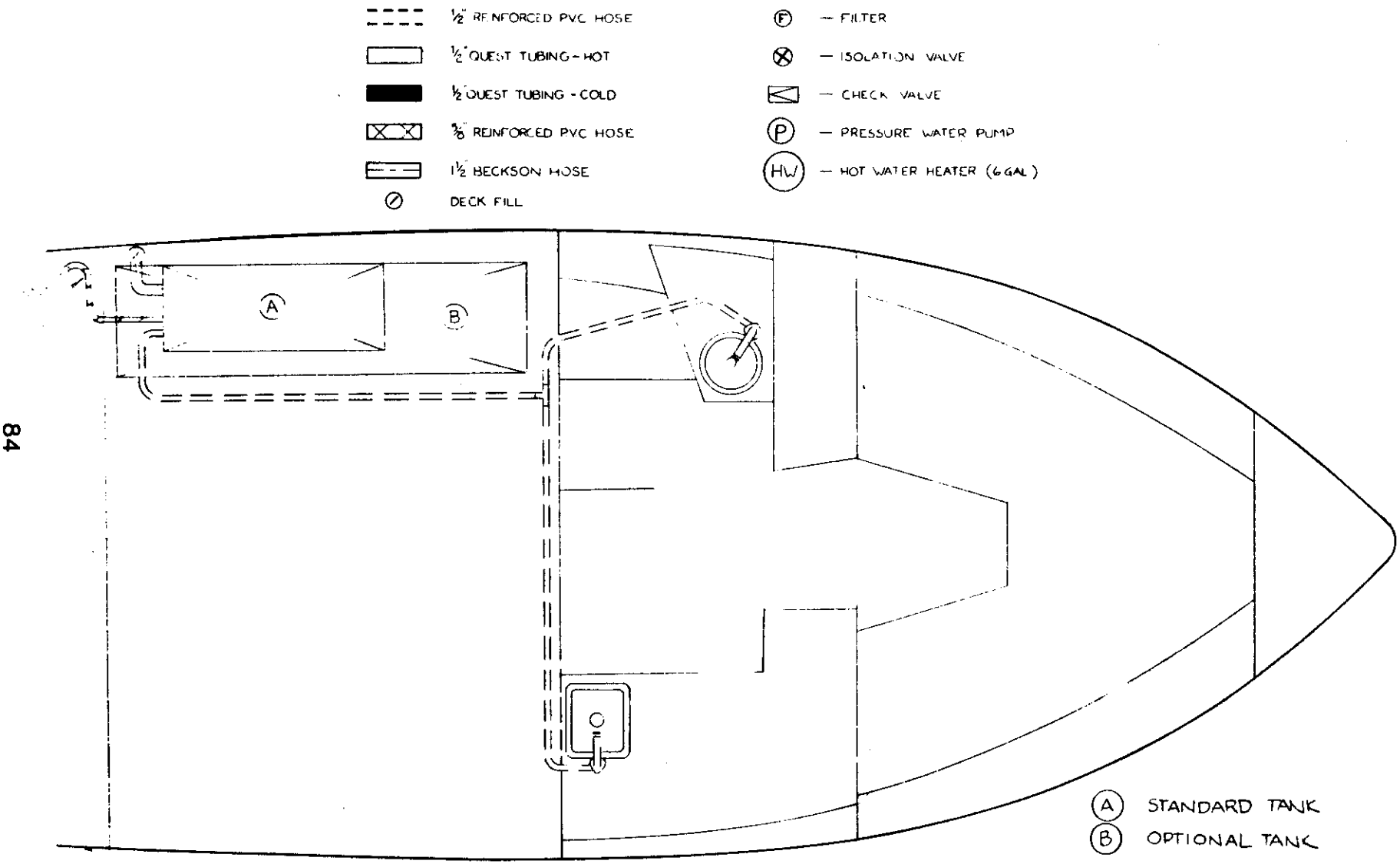




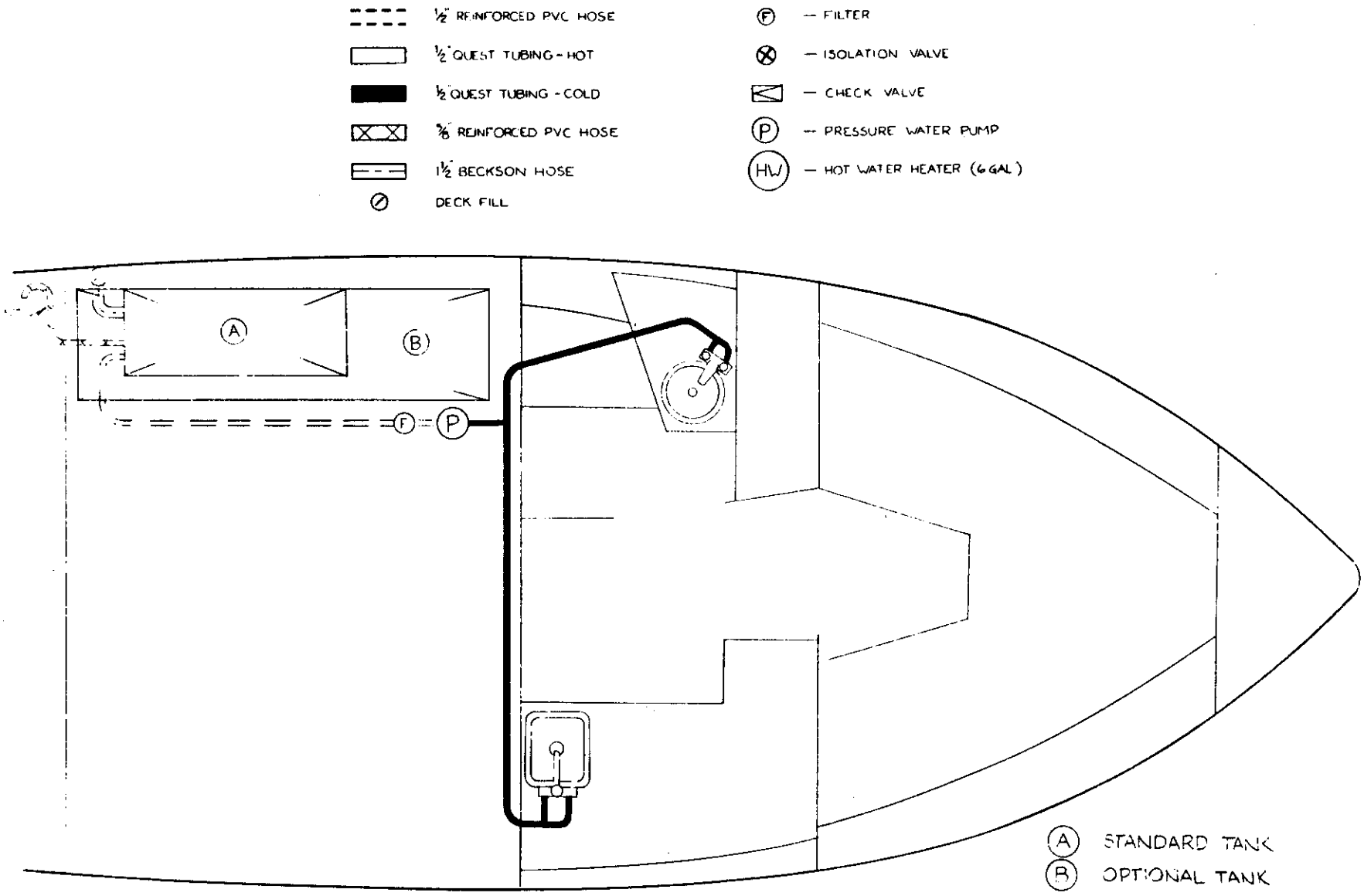
4.25 280 SPORT — LIGHTING LAYOUT



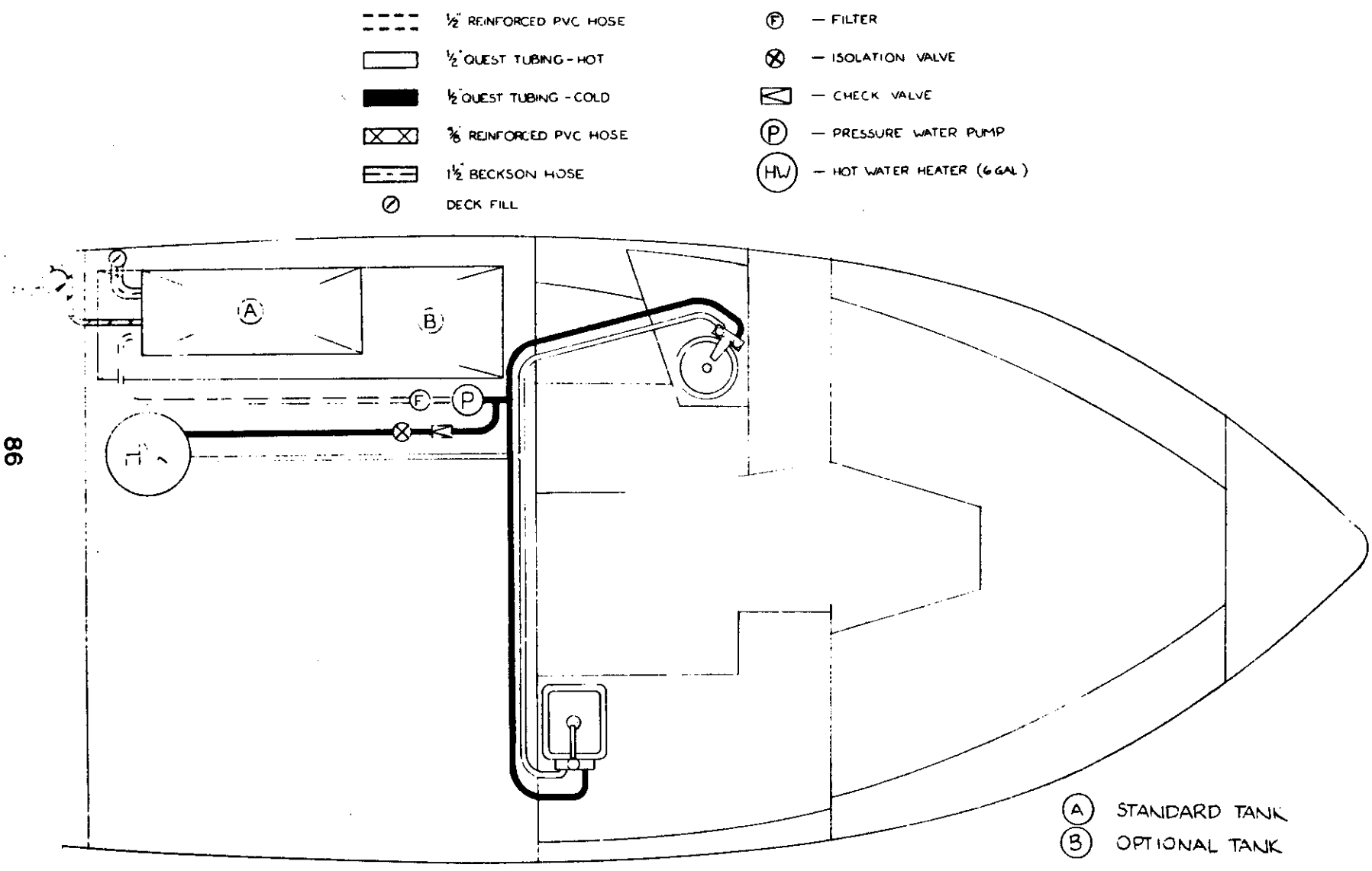
4.26 CRUISER FRESH WATER SYSTEM — NON PRESSURIZED



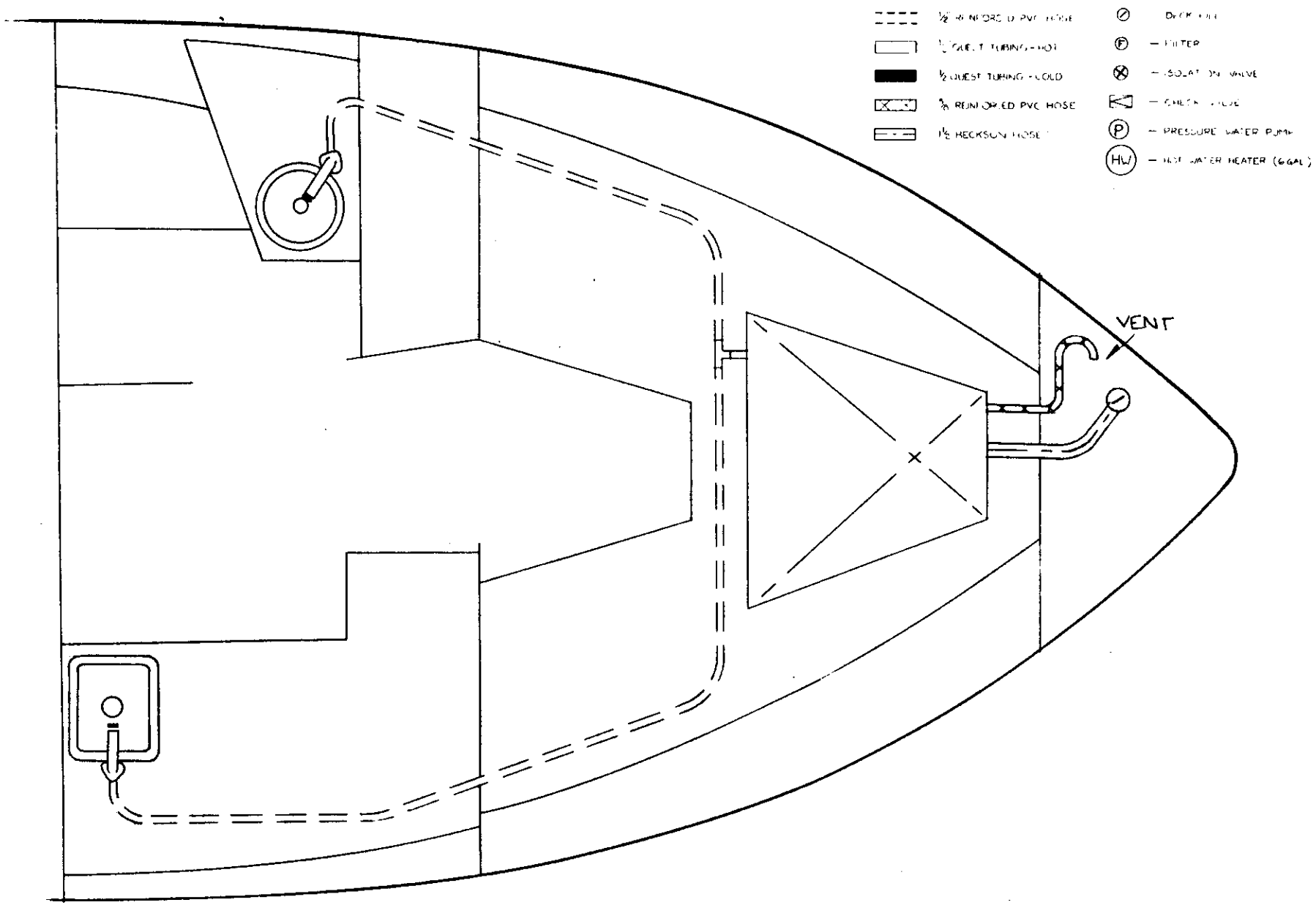
4.27 CRUISER PRESSURE WATER SYSTEM — COLD *ONLY*



4.28 CRUISER PRESSURE WATER SYSTEM — HOT & COLD



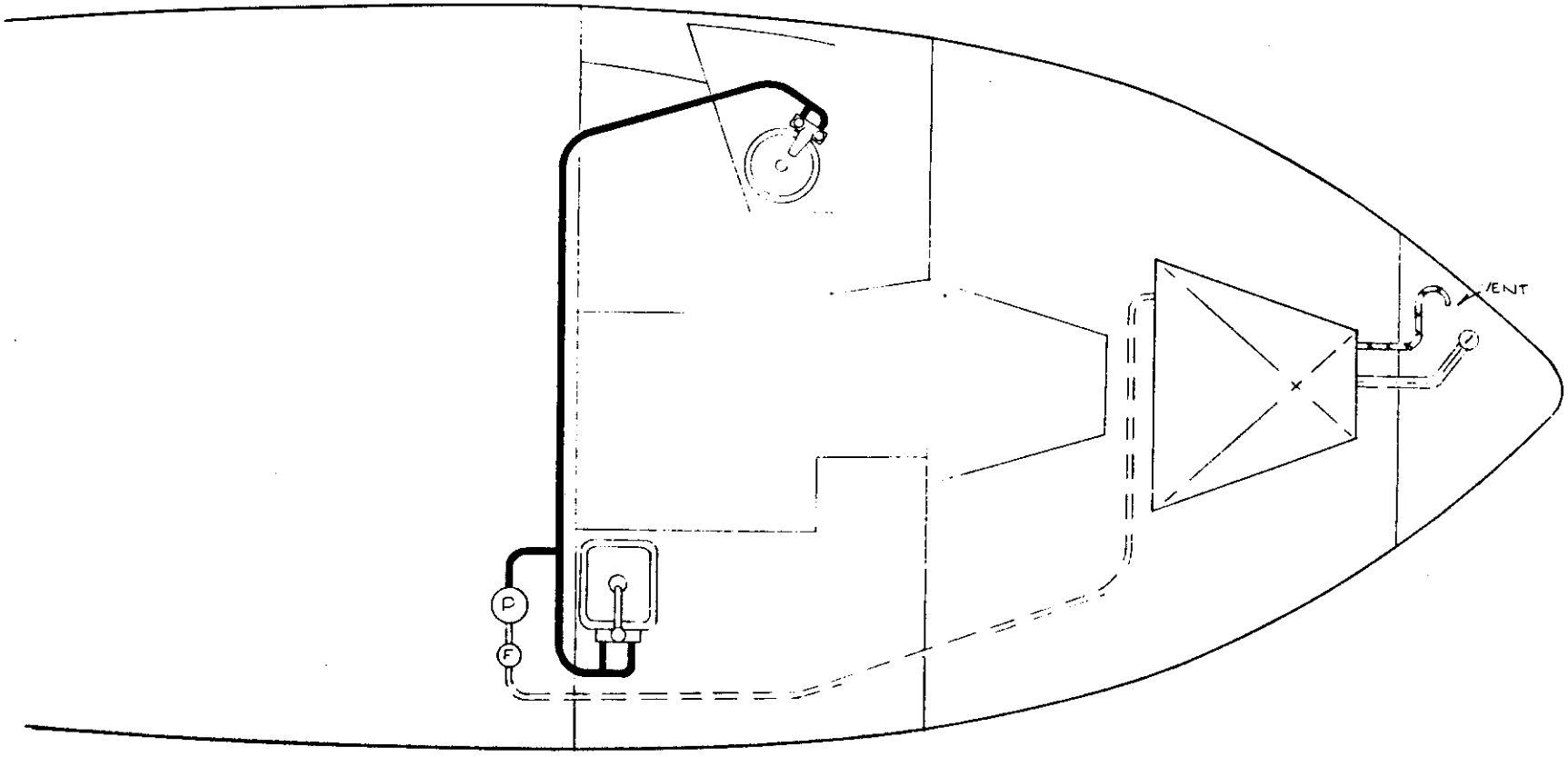
4.29 OPEN FISHERMAN FRESH WATER SYSTEM — NON PRESSURIZED



4.30 OPEN FISHERMAN PRESSURE WATER SYSTEM — COLD *ONLY*

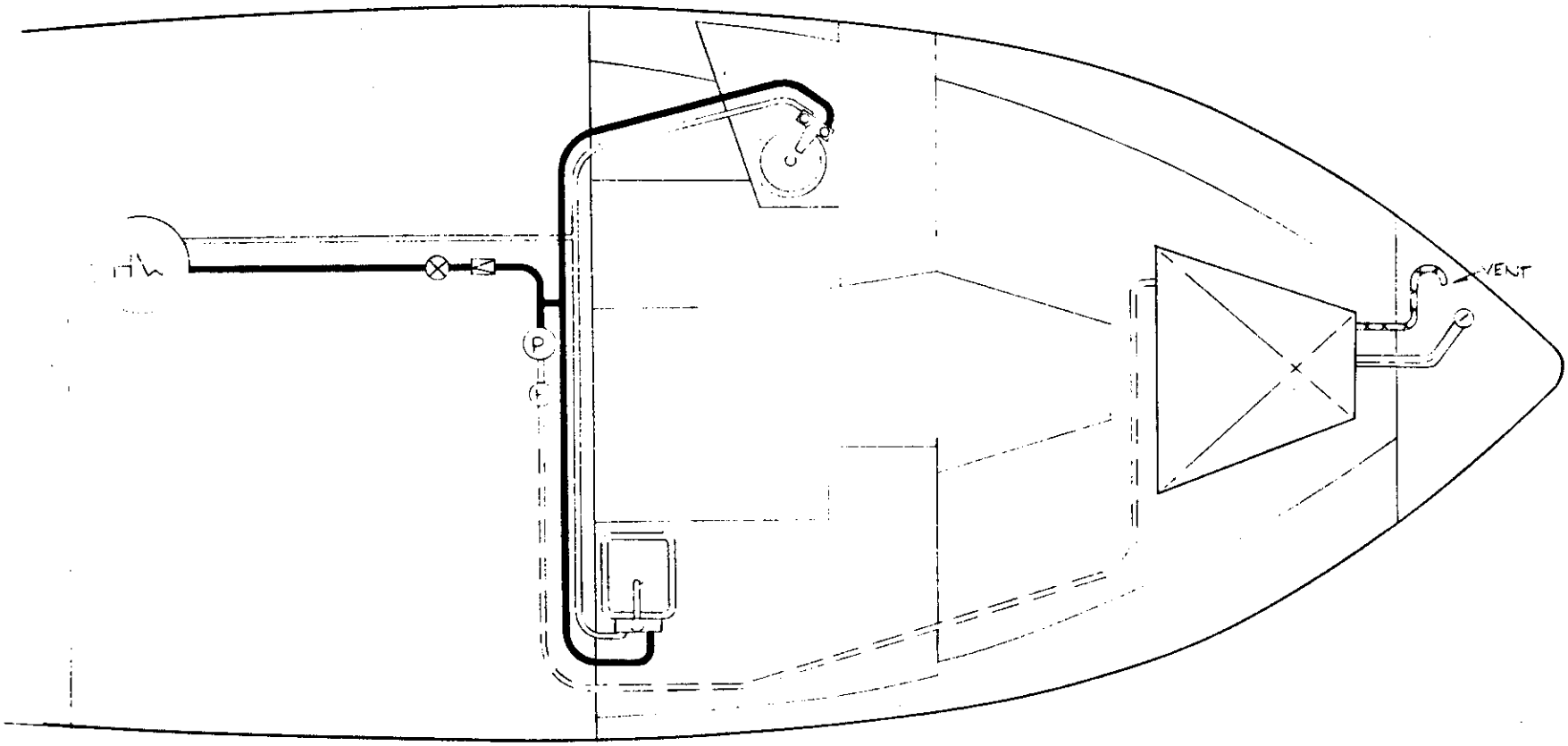
½" REINFORCED PVC HOSE
½" QUEST TUBING - HOT
½" QUEST TUBING - COLD
⅜" REINFORCED PVC HOSE
1½" BECKSON HOSE
DECK FILL

Ⓕ — FILTER
⊗ — ISOLATION VALVE
— CHECK VALVE
Ⓟ — PRESSURE WATER PUMP
HW — HOT WATER HEATER (6 GAL)

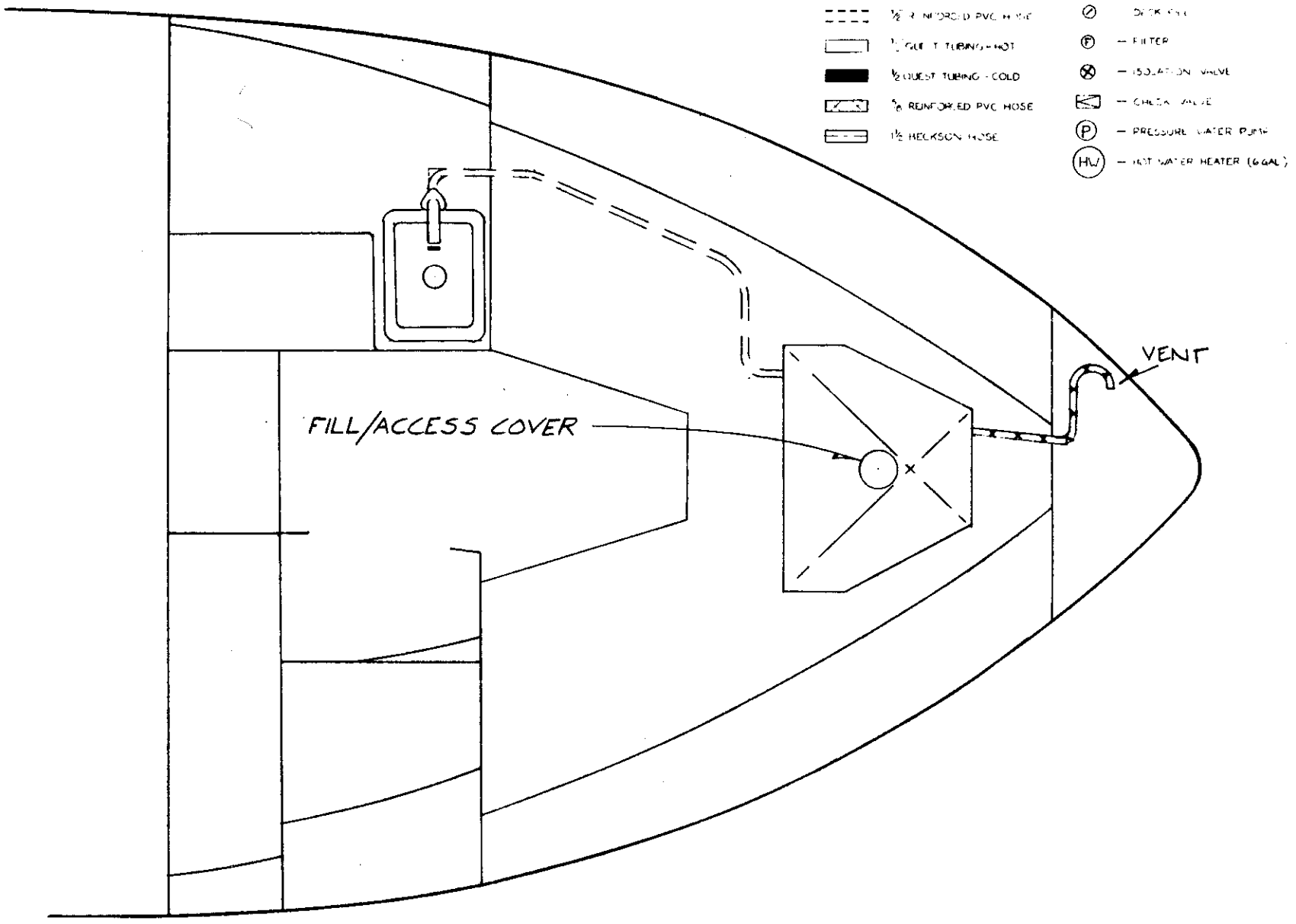


4.31 OPEN FISHERMAN PRESSURE WATER SYSTEM — HOT & COLD

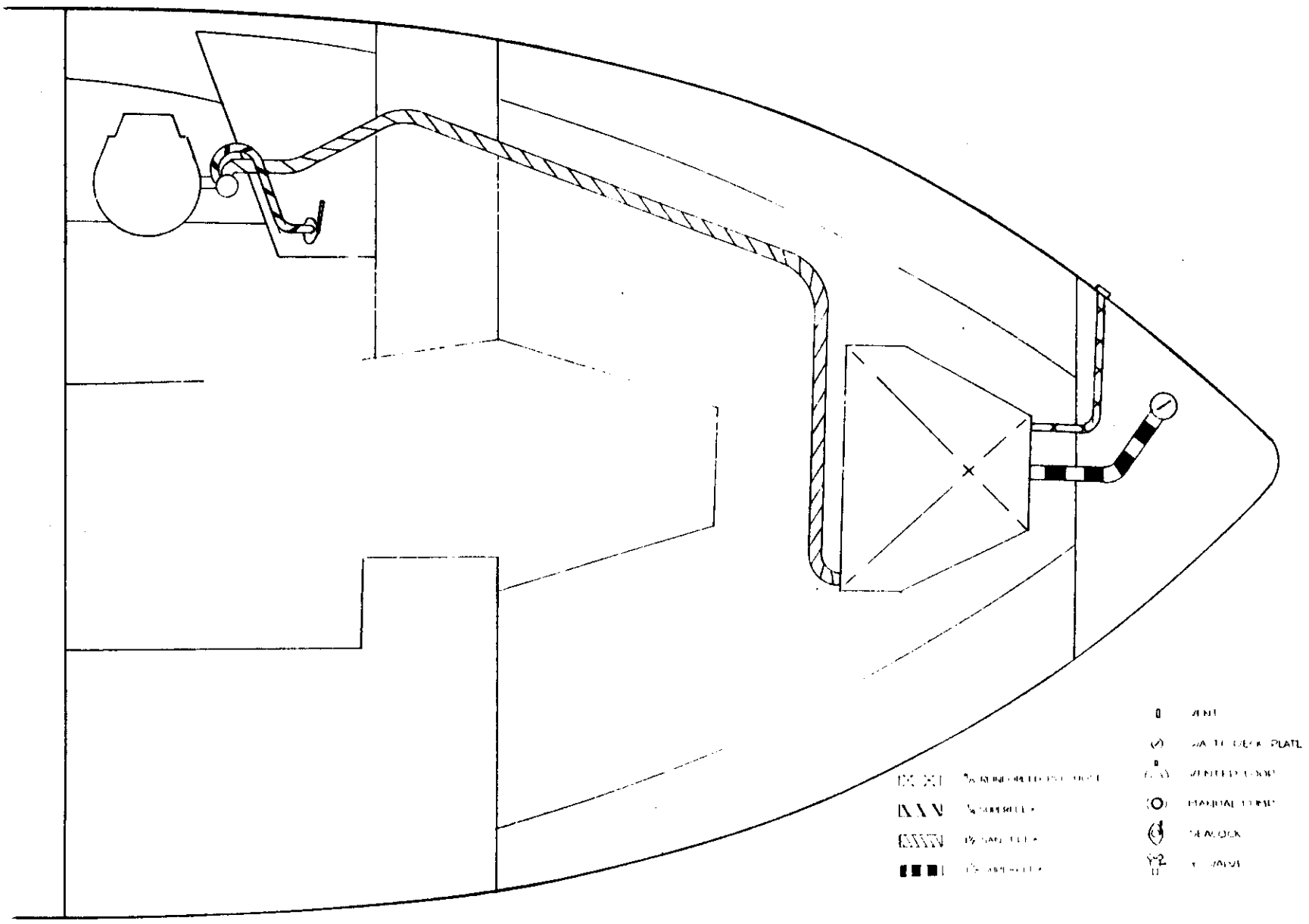
½" REINFORCED PVC HOSE
½" QUEST TUBING - HOT
½ QUEST TUBING - COLD
⅜ REINFORCED PVC HOSE
1½ BECKSON HOSE
DECK FILL
(F) — FILTER
— ISOLATION VALVE
— CHECK VALVE
(P) — PRESSURE WATER PUMP
(HW) — HOT WATER HEATER (6 GAL)



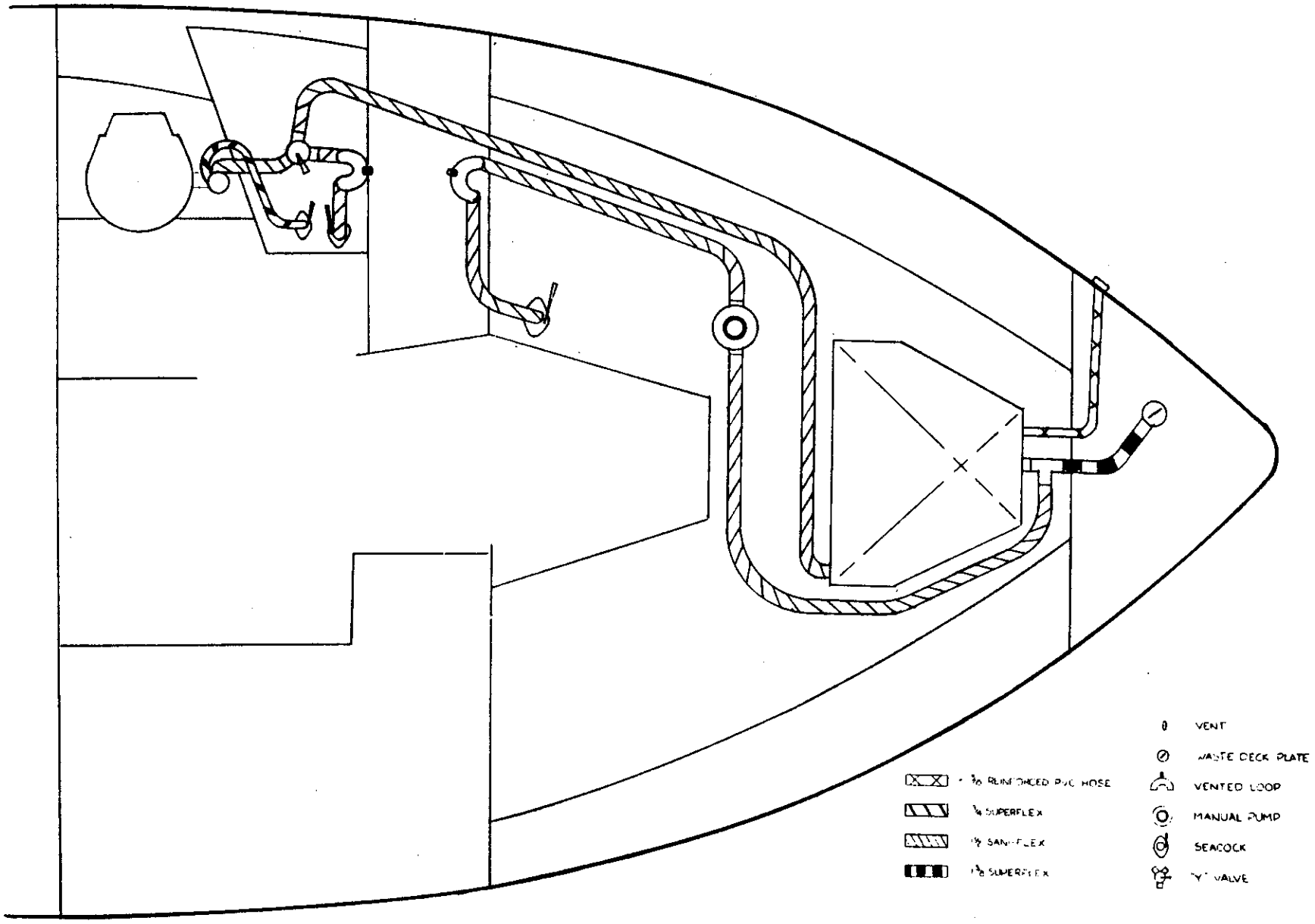
4.32 280 SPORT FRESH WATER SYSTEM



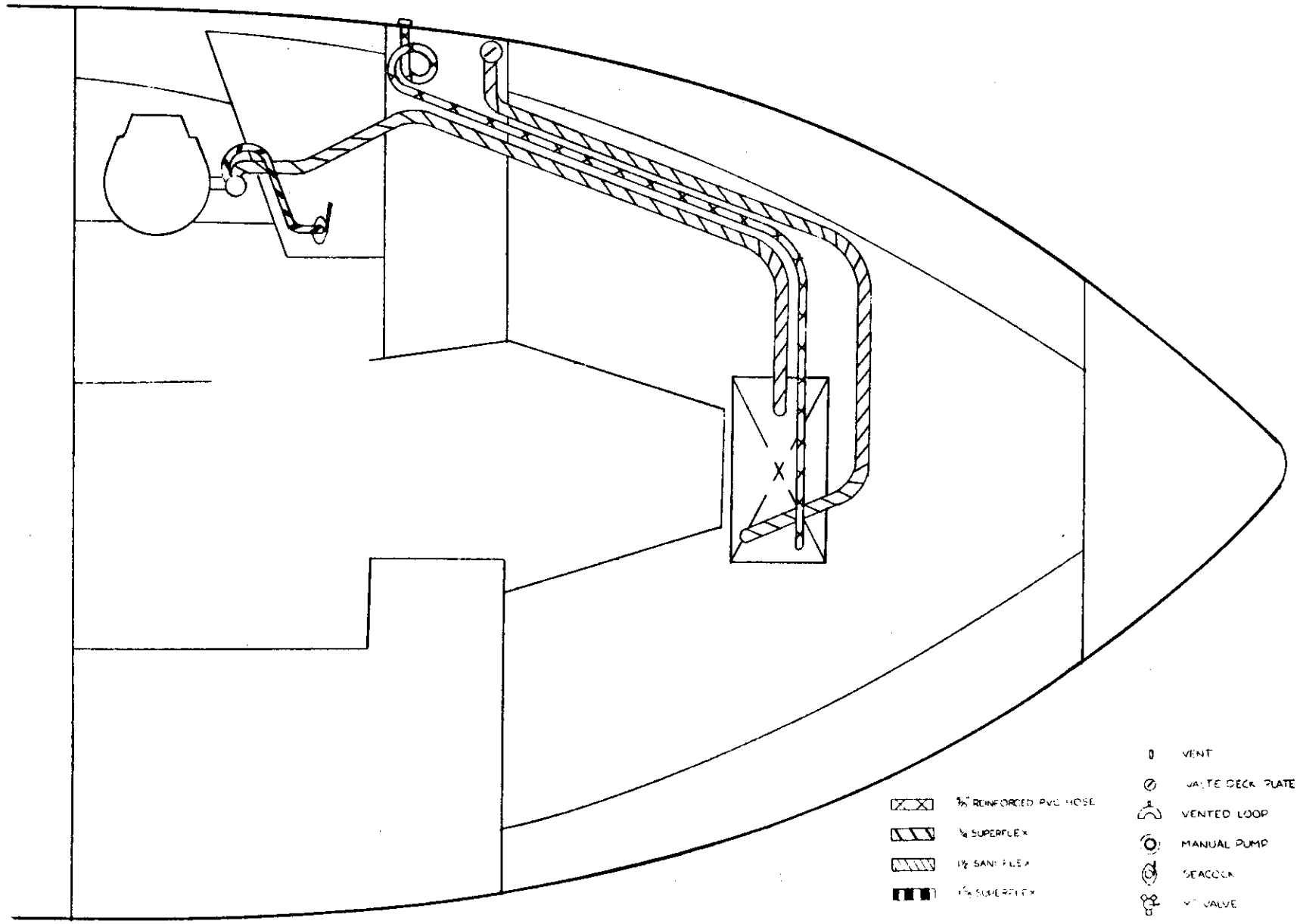
4.33 CRUISER MARINE TOILET w/HOLDING TANK



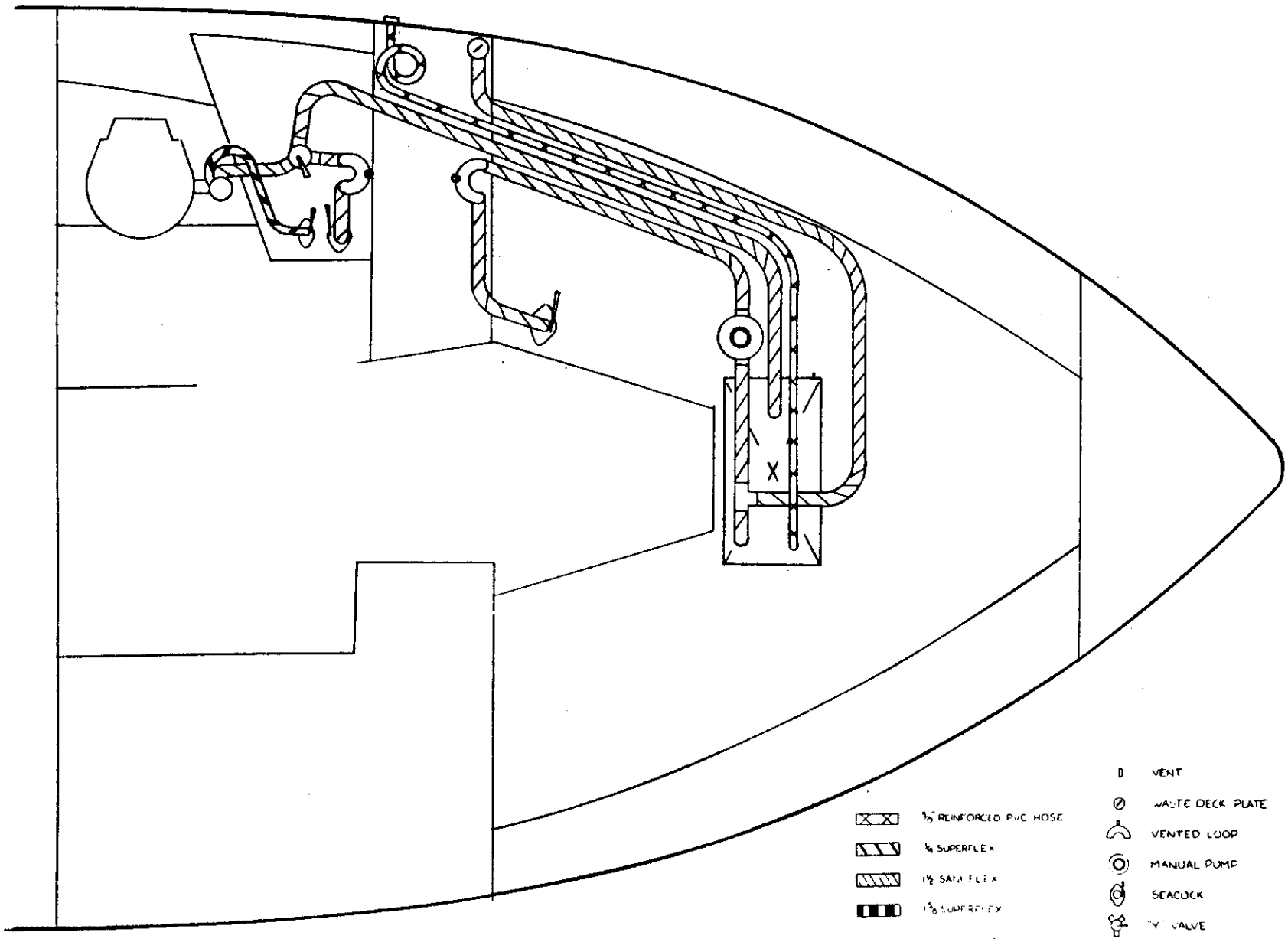
4.34 CRUISER MARINE TOILET w/'Y' VALVE AND OVERBOARD DISCHARGE



4.35 OPEN FISHERMAN MARINE TOILET w/HOLDING TANK

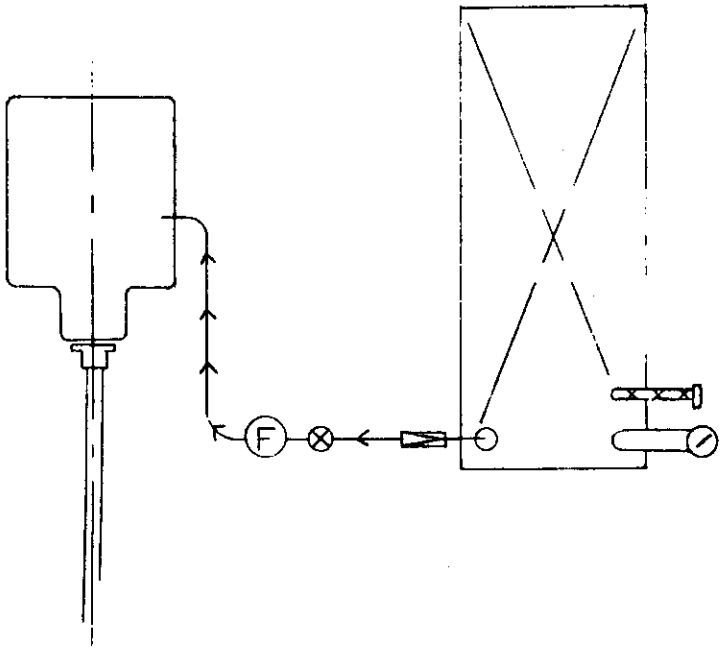


4.36 OPEN FISHERMAN MARINE TOILET w/'Y' VALVE AND OVERBOARD DISCHARGE



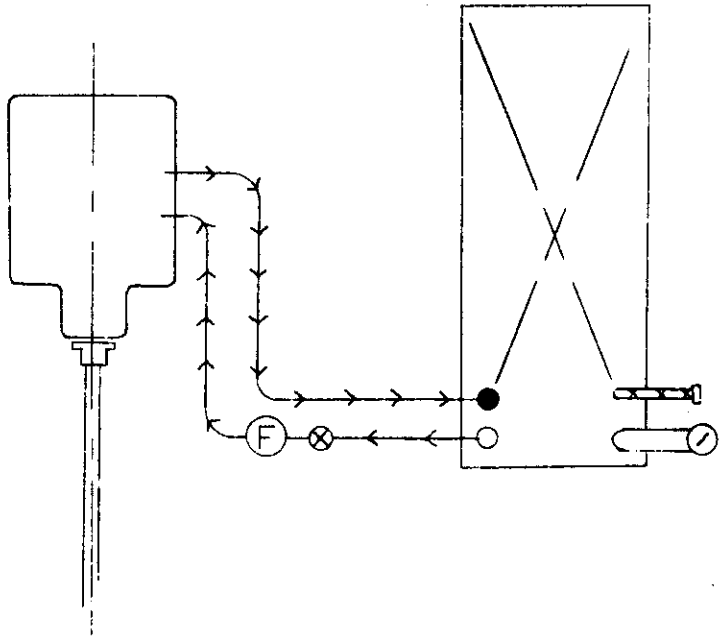
4.37 CRUISER GASOLINE FUEL SYSTEM SCHEMATIC

- $\frac{3}{8}$" TYPE 'A' FUEL LINE
- $\frac{5}{8}$" REINFORCED P.V.C. HOSE
- $1\frac{1}{2}$" TYPE A FUEL FILL HOSE
- (F) FUEL FILTER
- 3 WAY VALVE
- SHUT-OFF VALVE

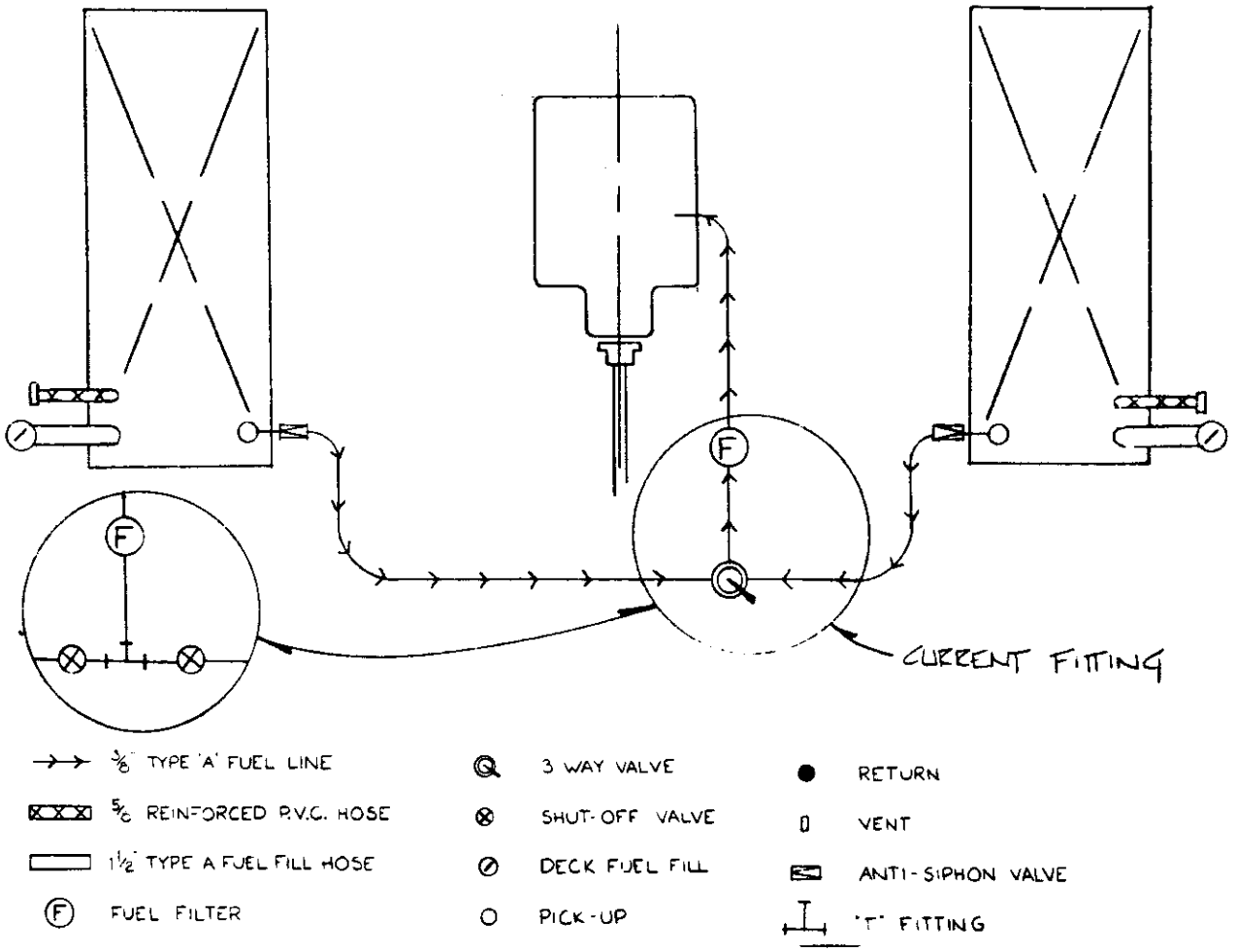


4.38 CRUISER DIESEL FUEL SYSTEM SCHEMATIC

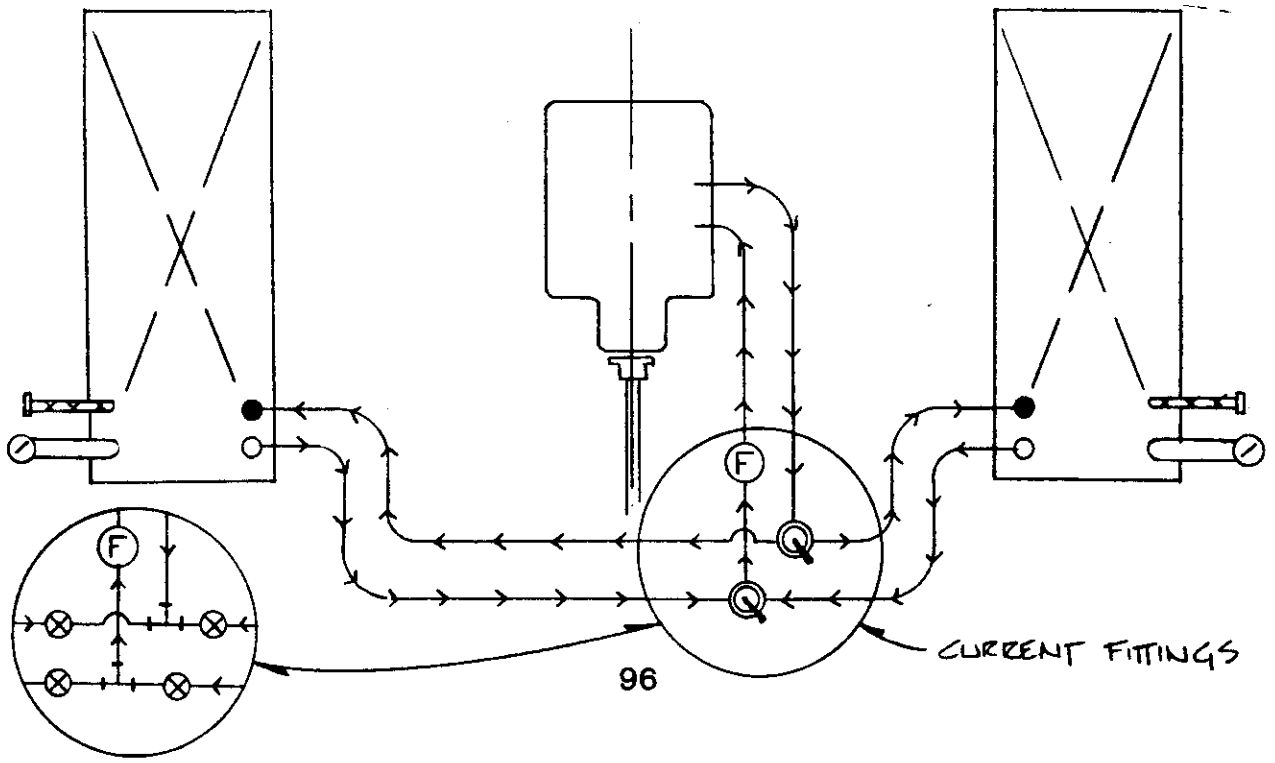
- DECK FUEL FILL
- PICK-UP
- RETURN
- VENT
- ANTI-SIPHON VALVE
- "T" FITTING



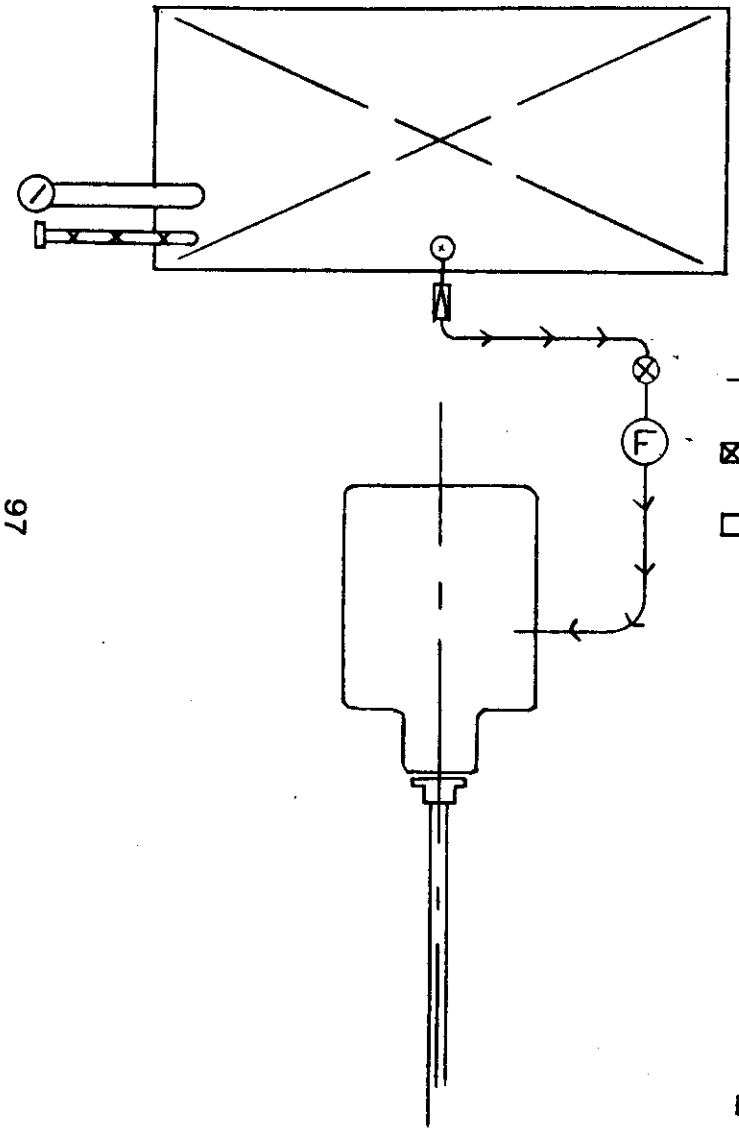
4.39 OPEN FISHERMAN GASOLINE FUEL SYSTEM SCHEMATIC



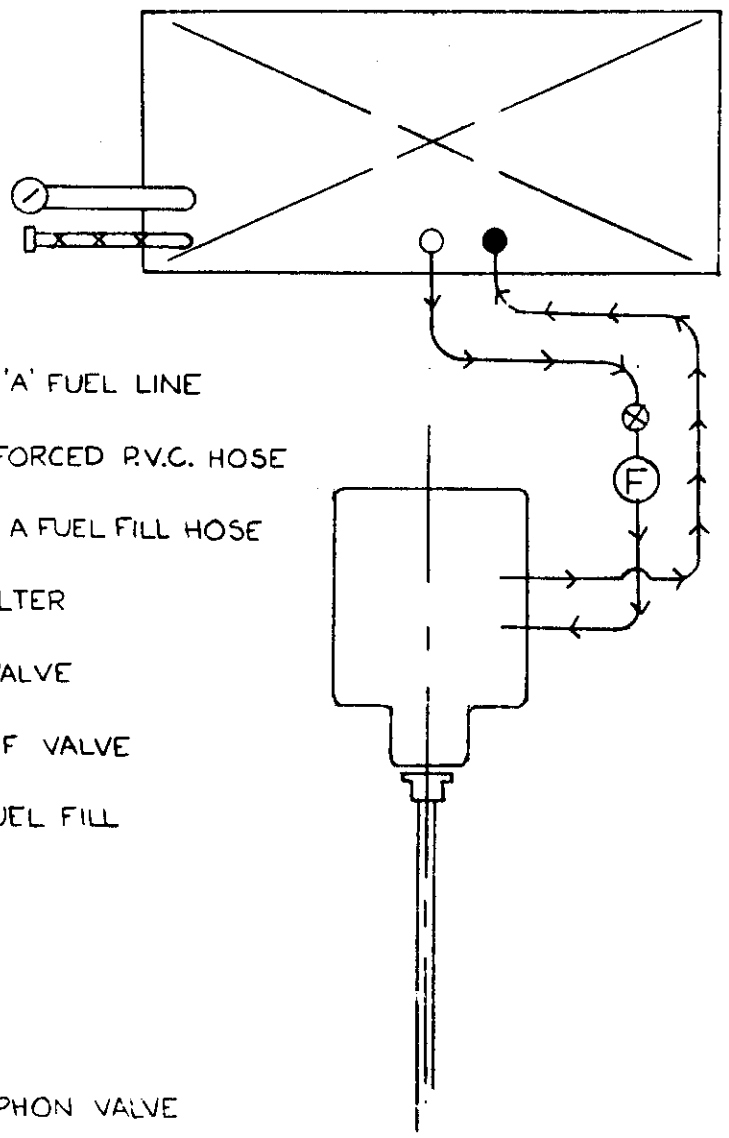
4.40 OPEN FISHERMAN DIESEL FUEL SYSTEM SCHEMATIC

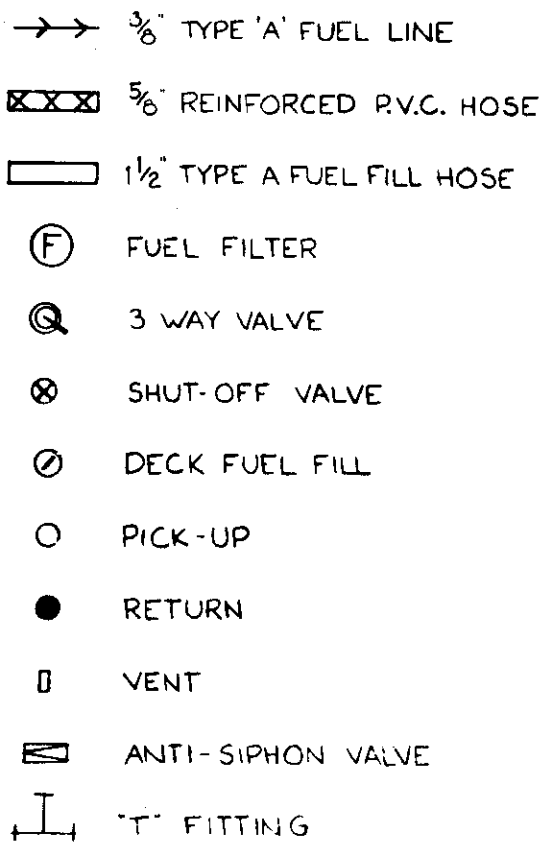


4.41 280 GASOLINE FUEL SYSTEM SCHEMATIC



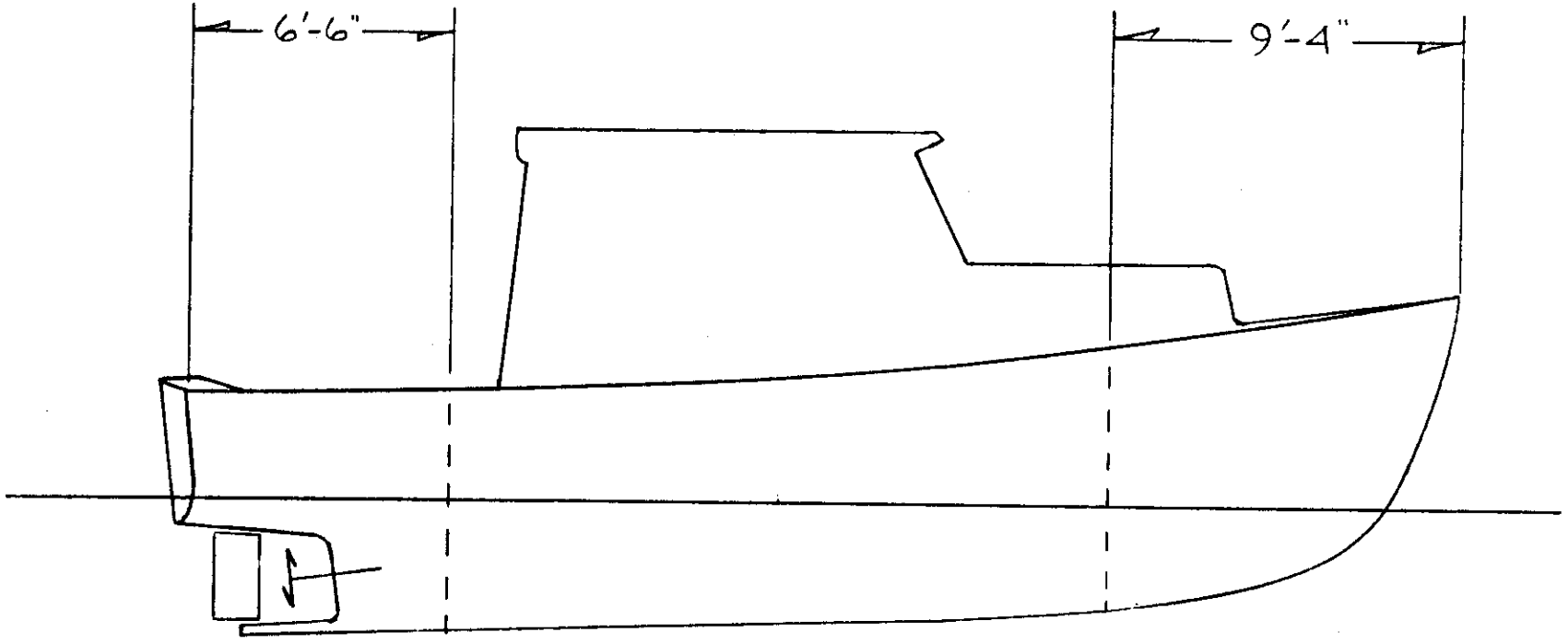
4.42 280 DIESEL FUEL SYSTEM SCHEMATIC





4.43 LIFTING SLING PLACEMENT

DIMENSIONS TAKEN AROUND SHEER



4.44 SEACOCK INSTALLATION & MAINTENANCE

With proper maintenance, your solid bronze Spartan Seacock, will provide years of adequate service.

Winterizing

Make sure if the boat is hauled during a freezing season that the water is properly drained from the seacock plug. This can be accomplished by leaving the seacock open during hauling out. If the boat is kept in the water during a freezing season there are winter drain fasteners (16) located on the sides of the valve to allow water to exit when the seacock is closed.

Caution: Water left in the seacock to freeze will distort the metal and potentially fracture the casting.

Lubrication

The Spartan Seacock is designed to be disassembled for greasing and fine tuning. (Fig. B)

1. Holding the handle[15] unscrew the jam nut[10] and flange nut[11] off the plug threads[14]. The position washer[12] can then be lifted off.

   Lightly tap the plug[14] out of the body[13] with a soft hammer or wood piece.
2. Use a grease cutting solvent to clean the valve plug[14] surface and body[13] plug housing. Note any surface gouges. These can be smoothed with fine emery cloth. Lapping compound is available from Spartan Marine Products, Inc. to aid with severe surface problems.
3. Generously apply a new skin of water pump grease on the plug[14] surface. Insert the plug in the body[13] and locate the position washer[12] properly on the end of the plug[14]. (The position washer should turn with the direction of the plug.) Screw the flange nut[11] onto the plug[14] thread and hand tighten. Follow that with the jam nut[10].
4. Tensioning the plug[14] is done by holding the handle[15] and tightening the flange nut[11]. The tension on the plug should be adequate to hold it in place when subjected to engine or other normal boat use vibration. Do not make it too tight to operate. The flange nut[11] is locked in place by seating the jam nut[10] securely next to it.

ANNUAL MAINTENANCE IS SUFFICIENT TO SUSTAIN PROPER SEACOCK OPERATION.

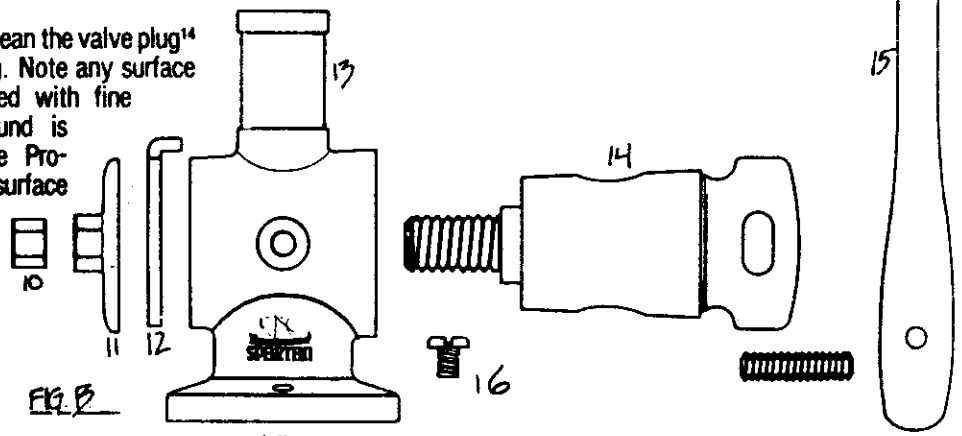


FIG. B