

California
YACHTS

Cruiser's Manual



WARRANTY CLAIM PROCEDURE

1. The dealer must fill out the warranty claim report and send it to:

Marshall Boat Co.
1402 Morgan Circle
Tustin, CA 91680

2. In case of an emergency, the dealer can call the plant and talk to an authorized person concerning the problem. Then an authorized amount may be approved, with a written report from the dealer to follow.
3. MARSHALL BOAT CO. will not pay a dealer's warranty claim unless the work and the amount has been previously authorized in writing. It is, therefore, the dealer's responsibility to secure the written authorization prior to submitting a warranty claim for payment.
4. The warranty registration certificate and the commissioning report must be in the boat file before any claim will be paid.
5. MARSHALL BOAT CO. will not accept nor pay any warranty claim submitted by anyone other than an authorized dealer or an owner, when prior authorization from an officer of the company has been obtained.
6. All warranty claims must be submitted by the dealer in writing on a MARSHALL BOAT CO. warranty claim report, within 30 days of the incident that precipitated such claim.
7. All authorized warranty claims will be paid within 30 days by check or credit memo.
8. It is the joint responsibility of the commissioning dealer and the new owner to review the boat invoice and to ascertain that all new items listed are delivered and are in the same condition and of the same quality as specified. Have your dealer "walk you through" all systems of your boat and explain their component parts and functions.
9. The launching and commissioning record is a point-by-point checkoff sheet of the steps required to commission your boat and will be found on the next page. It facilitates any back ordering necessary and assures that all pre-delivery warranty work has been accomplished. After going over all points of this checkoff sheet with your dealer, please sign next to your dealer's signature and make sure that the checkoff sheet is returned to MARSHALL BOAT CO.

It is very important that you fully understand the warranty procedure and you read all of the cards provided for stove, heads, refrigerators, etc., to understand the time limits and procedures for repair or replacement of such equipment.

Californian YACHTS

I. FORWARD

With the purchase of your new CALIFORNIAN you became a member of a large fraternity of CALIFORNIAN owners. Welcome aboard!

Over the years that CALIFORNIANS have been produced, we have maintained personal contact with most of the owners and users of our yachts. Information from them has been extremely useful in the continual upgrading of our product. This information, and the application of new technologies developed in the marine and related industries, is reflected in your yacht's design and construction. We believe that your yacht represents one of the finer vessels currently being produced and, we believe she will satisfy your expectations.

Marshall Boat Co. is committed to producing and marketing the best value in power yachts available in the world. While each person's concept of value varies, factors generally considered are quality of design and workmanship, performance, safety, aesthetics, purchase price and RESALE VALUE. The weighing of these factors will differ by each individual. We therefore welcome your assessment of our product. Your ideas and comments are welcome.

We wish you many happy days of cruising.

MARSHALL BOAT CO.

II. PURPOSE & SCOPE OF OWNER'S MANUAL

The purpose of the owner's manual is to provide you with the following information:

1. General operating procedures for your yacht and factory installed systems.
2. General maintenance procedures.
3. Specifications, drawings and schematics of components and systems.

We encourage you to read the owner's manual and then read the various equipment manuals. This will provide you with an understanding of the basics and a knowledge of where to locate specific details.

Marshall Boat Co. continually upgrades its products. Every effort is made to update the owner's manual to reflect these changes and the manual is believed to be current at the time of printing. If, however, you find a discrepancy between the manual and your yacht, consult your dealer before operating the system in question.

III. COMMISSIONING

The initial commissioning is extremely important. In addition to putting the yacht into service, the following functions are served.

1. Shipping damage is revealed. The trucking company is liable for shipping damage. They require prompt notification of any claims against them.
2. Parts shortages are also revealed. Marshall Boat Co. boxes loose gear and provides a checklist. We occasionally make errors. It is more convincing to us that the error is ours if we are notified within a couple of days after the yacht has been delivered, rather than a few weeks later.
3. Quality defects are revealed. Your yacht is thoroughly checked at the plant. However, overland travel often causes leaks and other problems, which are difficult to detect by visual inspection alone. Also, we occasionally miss something. As with claims of short shipments, early notification to the factory adds credibility to the claim of a quality defect.
4. Perkins or Caterpillar checkout service is performed. This is **extremely important**. Your engine representative will check and put your warranty into effect. If at all possible you should plan to be present during the checkout, so that the engine representative can familiarize you with the engine.

The following instructions should be performed during the initial commissioning. Detailed procedures are described in the respective sections of this manual.

COMMISSIONING INSTRUCTIONS

- A. Inspect hull, deck, rudder, propeller and shaft for shipping damage.
- B. Inventory all loose gear and report shortages or damaged parts.
- C. Install thru-hull fittings for owner and/or dealer supplied equipment.
- D. Paint bottom. For maximum anti-foulant life, a full second coat of bottom paint is recommended.
- E. Launch and inspect all underwater fittings for leaks.
- F. Fill fuel, water and search for leaks. **Caution: Be sure to bleed hot water heater before turning on the 110V element. The element will burn out immediately if energized in a dry or partially filled tank.**
- G. Check oil and water level in engine and generator.
- H. Complete installation of owner or dealer supplied equipment.
- I. Check battery condition and re-charge, if necessary.
- J. Perkins or Caterpillar delivery checkout service.
- K. Check operation of all systems and equipment.
- L. Check all doors and drawers for proper movement and secure latching.
- M. Water test deck, fittings and ports and search for leaks.
- N. Sea trial.
- O. Recheck for leaks in interior plumbing systems (fuel, water, and waste) and exterior hardware.
- P. Clean interior and exterior of yacht thoroughly.

MAINTENANCE PROCEDURES FOR YOUR NEW "CALIFORNIAN"

- MAINTENANCE CHECK-OUT CHECK !
- 1) CHECK ALL UNDERWATER FITTINGS
 - 2) ENGINE ALIGNMENT, CHECK IF THE COUPLING
should be DISCONNECTED before removing
from the WATER
 - 3) 2 COATS ALSO 2 COATS WATER LINE
 - 4) check WATER

I. FINISHES

A. Fiberglass

The exterior surface of all of the fiberglass components on your yacht is polyester gel coat. Californian Yacht uses only the best grade marine gel coats available. The base resin is isophthalic and/or NPG type which offers the best combination of initial gloss, resistance to weathering effects, and resistance to cracking and blistering. The pigments are carefully selected for color stability, color purity, and resistance to color float. All of the formulations include ultra-violet inhibitors and acrylic monomer which further reduce the effects of weathering.

Even the best gel coats are not totally immune to the elements. As a general rule, you should treat the gel coat surfaces of your yacht as you would your car's finish. The following procedures will maximize the useful life of the gel coat:

After every outing rinse off the deck and topsides with fresh water.

At frequent intervals wash all fiberglass surfaces with a mild detergent or car wash solution. Use a sponge or towel on the high gloss areas. A brush may be used on non-skid areas. Always rinse thoroughly with fresh water.

Apply wax to the glossy areas at least once a year and more frequently if the yacht is in southern waters. Do not apply wax to non-skid surface areas or the textured portions of the cabin top. A good grade automotive wax specially formulated for fiberglass surfaces may be used. Follow the instructions on the can.

If the wax contains cleaners, extreme care must be taken if a power buffer is used. The cleaners are often abrasive which may remove some of the gel surface. Holding a power buffer too long in one spot, particularly on sharp radii, can result in "going through" the gel.

The preferred procedure is to use a wax with cleaners and to buff by hand with turkish towels. This method is a bit more work, but it results in removal of surface oxidation without risking excessive gel coat removal.

If the surface becomes dull due to lack of routine care or aging, it can often be restored by hand buffing with an automotive rubbing compound such as Dupont Number 7 followed by a coat of wax. The compound will remove some of the gel coat. Extreme care must be taken so as not to penetrate the gel layer. The factory applies gel at a thickness of 18 to 25 mils (paint films are generally 1 to 4 mils), and gel coats normally provide full hiding power at thicknesses as low as 8 to 10 mils. Thus, there is some margin for gel coat removal without adversely affecting the appearance of the surface.

If rubbing compound does not restore its gloss, the surface may be sanded with 320 grit paper, then sanded with 400 grit paper, polished with rubbing compound or polishing compound, and finally waxed. This procedure can result in substantial gel removal and requires extreme care. Generally, this remedy should be undertaken by a yard experienced in fiberglass repairs. Even then, you should be prepared for the possible need to paint if the operator goes too deep in some areas.

Fiberglass surfaces may be painted, and there are several types of paint specifically formulated for resurfacing gel coated substrates. For the ultimate in gloss and weather resistance, we recommend a top quality two-part urethane (e.g., Dupont Imron available at paint stores). Two-part epoxies also provide glossy and durable finishes, but they may chalk with aging.

Scratches, nicks, or other surface damage which cuts deeply into the gel or penetrates to the laminate should generally be repaired by a competent yard. If you choose to do this work yourself, contact the factory for recommended procedures.

CAUTION: Gel coats resist most chemicals, but they are **not** resistant to strong caustics, strong oxidizing compounds, or some halogenated compounds. Materials which should be kept away from gel surfaces include:

- Paint remover containing sodium hydroxide or methylene chloride
- Bleaches containing chlorine
- Cleaners containing chlorine or hydroxides
- Methylene chloride or carbon tetrachloride solvents
- Chloro-bromomethane fire extinguishers

CAUTION: Abrasive cleaners should not be used for routine cleaning operations, since they result in gel coat removal and may leave scratches.

B. High Pressure Laminate Surfaces

The mica surfaces require only occasional cleaning with a mild detergent. Household cleaners/waxes such as Pledge may be used and will mask scratches that may occur. Do not use strong abrasive cleaners on mica, as they may dull the surface.

C. Upholstery Fabrics

The fabric in your yacht is of your selection. Care should be taken in cleaning of the different cushion fabrics. Type of fabric used in your yacht can be ascertained from your dealer.

D. **Bottom Paint**

The key to a good bottom job is close adherence to the instructions on the paint can. Do not shortcut the cleaning or priming operations. Apply the recommended number of coats of paint and launch within the recommended time after painting. Because the materials are expensive and bottom preparation is hard and dirty work, there is always the temptation to do a little less than the paint manufacturer asks for. But remember, premature failure will require re-doing the job and the additional expense of a haul-out.

The expected life of anti-foulant will vary significantly with water temperature, water salinity, local harbor conditions, the relative amount of use the yacht gets, and the particular owner's definition of the amount of growth that constitutes a need for removal. Under average conditions you can expect to run six to twelve months between renewals.

Before repainting the bottom, it is necessary that all marine growth is removed, that the bottom is thoroughly sanded, and that the bottom is absolutely dry. At least twenty-four hours should be allowed after hauling to assure dryness. If, in scraping off the marine growth the paint is removed down to the gel, be sure the gel is thoroughly sanded so that all gloss is removed. If the gel itself is penetrated, seal with polyester resin or gel coat before painting. If applying the paint, follow the instructions on the can.

CAUTION: The sanding dust from anti-foulant paint is toxic. A face mask, goggles, rubber gloves, and suitable protective clothing should be worn during sanding operations. After sanding wash up thoroughly and clean dust from your tools.

It is also advisable to wear an organic vapor cartridge mask and goggles while applying the paint. Wash up thoroughly after painting.

E. **Lexan and Plexiglass**

Portlights on the Californian 30, only, are Lexan polycarbonate. The Venturi on all CALIFORNIANS are plexiglass. Both materials are extremely tough and have the advantage over glass of resistance to shattering if broken. However, both materials exhibit lower chemical resistance and abrasion resistance than glass. As a result, care is needed in cleaning these materials.

For general cleaning, a turkish towel dampened with a mild detergent solution is recommended. If the surface dirt is gritty, flush first with water. **Never** use abrasive cleaners on either material. **Never** use acetone or other keytone solvents on either material.

Minor scratches can be removed by hand buffing with jewelers rouge or cleaners specifically formulated for plastics. (Aircraft or motorcycle service centers are good sources for these cleaners.) Some scratches can be removed by hand buffing with toothpaste and water.

F. Teak

There are several options open to you on maintaining teak. Your choice will depend on your preference in the aesthetic appearance of the bright work and the amount of time and/or money you are willing to devote to bright work maintenance.

Some of the alternatives are described below.

1. *Leaving teak untreated:*

Teak contains a natural oil which is one of the reasons it is so durable in a marine environment. As it ages, however, the oil exudes to the surface and disappears. (Direct sunlight speeds up the process.) When teak weathers, it takes on a silver gray color which many find attractive. The disadvantage of weathered teak is that the grain raises, and there is a tendency for the teak to check and split. Periodic cleaning with commercially available teak cleaners, such as Teak-Brite, will restore the original color and improve the aging characteristics of the teak.

2. *Oiling teak:*

Periodic oiling of the teak will help maintain the golden brown teak color and greatly increase the resistance to checking and splitting by replenishing the natural oil in the teak. Special oils (e.g., Teak-Brite Sealer and Watco Teak Oil) have been formulated for finishing teak. These are generally preferred over Boiled Linseed Oil, because they contain toxicants for mildew resistance and other additives. Boiled Linseed Oil may be used on teak, but more frequent cleaning and re-oiling may be required.

The general procedure is to clean the teak (see above) and sand if necessary, then apply oil liberally with a rag. Re-apply oil until it is no longer absorbed into the surface. Allow oil to penetrate for 15 to 30 minutes and then wipe off with turkish towel. Rub in the direction of the grain. Be sure to observe any special instructions on the can label.

3. *Varnish teak:*

A varnish finish provides the best protection for the teak, and most people agree that a varnish greatly enhances the appearance of the teak. The drawbacks to varnishing teak are the high initial cost (labor content) in obtaining a first-rate job and the comparatively high maintenance effort needed. Exterior varnished teak will normally require a new coat of varnish every four months, and interior joiner work will require recoating at least every two years. If the varnish fails (peels, yellows, crazes, etc.) before recoating, extensive sanding is required and often the entire finish must be removed and redone.

The main forces which work against a good varnish job on teak are dust, moisture, grain in the wood, and the natural oil in the teak. Their effects and avoidance techniques are discussed briefly below:

- a. *Dust* — Varnish must be sanded between coats, and the sanding dust must be removed before recoating. Wipe all sanded surfaces with tack cloths, and then thoroughly vacuum the surrounding areas before varnishing. Brushes must be thoroughly cleaned, and the varnish should be strained before using. Varnish remaining in the can after completing a coat should be discarded. This eliminates dust accumulation in the can and eliminates the problems of surface skinning in the can. Varnishing must be done on a still day.
- b. *Moisture* — Moisture will cause varnish to blush and/or lift. Be sure all surfaces are absolutely dry before varnishing. Do not apply varnish when the humidity is high or rain is forecast within 16 hours after application.
- c. *Grain* — Teak has a sharply defined grain which will telegraph through several coats of varnish if the preparation is incomplete. The teak should be block sanded to a 150 grit finish. Take care on the panel surfaces not to penetrate the veneer, but strive to obtain a smooth surface everywhere. For best results, a "past wood filler" or "filler stain" (Petit and Interlux both offer easy-to-use materials) should be used to fill the grain. Follow the instructions on the can to the letter.
- d. *Natural Oil in the Teak* — The natural oil in the teak exudes to the surface with aging. This helps protect unvarnished surfaces. It can destroy varnished surfaces by causing lifting. To minimize the risk of lifting, wash all teak surfaces to be varnished with acetone prior to the initial sanding.

Use plenty of acetone and change wiping rags frequently.

CAUTION: Acetone is extremely flammable. Be sure area is well ventilated and that all potential sources of spark or open flame are eliminated before using acetone. Do small areas at a time. Then allow the area to clear itself of vapors before continuing.

A thorough discussion of varnishing techniques is beyond the scope of this manual. Prior to tackling the job of varnishing your yacht, you should talk to experienced varnishers. Read the various publications issued by varnish manufacturers, and by all means follow the instructions on the can to the letter. Listed below are the steps that will be required to get a top quality finish. The listing is useful as a checklist of the major steps to be undertaken:

- Wash teak with acetone
- Sand to 150 grit finish
- Fill grain with filler stain
- Apply sealer coat — sand lightly
- Apply three to seven coats of varnish, sanding between coats with 150 grit paper.
- Apply last coat. If a satin finish is desired, use satin varnish for last coat or apply high gloss varnish and rub with pumice and boiled linseed oil.

G. Mahogany Joinerwork

The wood on the inside of your boat has been carefully sanded and sealed. Then three coats of varnish has been applied with a final sanding and a liquid wax for the final finish.

Should you decide to revarnish any interior surface, the area must first be sanded thoroughly to remove any wax, then a coat of satin varnish should be applied. After it has dried, the surface should be sanded with a 600 wet-and-dry paper and rewaxed with a good type furniture polish.

II. ENGINE: PERKINS DIESEL

A. Please consult your engine manual for detailed procedures. **The engine manual must be followed exactly to obtain maximum engine life and to keep your warrant in effect.** The following sections summarize the maintenance requirements described in the manual and are intended as general information only.

1. *Break-in Period:*

During the first twelve hours of operation, the engine should not be run at maximum RPM. At twelve hours, the following service should be performed.

- a. Change engine oil and filter.
- b. Tighten cylinder head nuts in correct sequence to torque.
- c. Reset valve clearance and check oil feed to rockers.
- d. Check belt tension.
- e. Check all external nuts, set screws, etc., for tightness.
- f. Check shaft coupling alignment.
- g. Check fuel, oil, and coolant levels and look for leaks.
- h. Adjust idle speed, if necessary.

2. *Before each outing:*

- a. Check coolant level.
- b. Check engine oil level.
- c. Check transmission oil level.
- d. Look for evidence of leaks under engine.

3. *Every 150 hours or 3 months (whichever occurs first):*

- a. Change engine oil and filter.
- b. Check drive belt tensions.
- c. Clean air intake.
- d. Clean motor trap.
- e. Look for evidence of leaks.

4. *Every 450 hours or 12 months (whichever occurs first):*

- a. All steps under item (3) above.
- b. Change final fuel filter element.
- c. Check hoses and clips.
- d. Drain and clean fuel tank.
- e. Change gearbox oil.
- f. Service atomizers.

5. *Every 2,400 hours:*
 - a. Have Perkins representative examine and service proprietary equipment such as starter, generator, etc.
 - b. Adjust valve tip clearances.

6. *Bleeding the fuel system:*
 - a. Check fuel tank shut-off to be "ON."
 - b. Check fuel filter for sediment or water by opening drain plug on bottom. Replace plug.
 - c. Follow routing of hose from fuel filter to engine lift pump, inspecting hoses as you go. On the engine pump, you will find a lever which allows you to manually operate the diaphragm inside against spring tension. It may be necessary to turn the engine over with the starter slightly to allow the pump arm to relax against the camshaft. This allows more stroke with the manual lever you are operating.
 - d. Follow the fuel line from the pump to the engine fuel filter and locate the vent plug on top. Loosen plug two or three turns.
 - e. It is advisable to have some large rags on hand to catch oil that will be expelled from this point in the course of bleeding.
 - f. Begin operating the manual lever. This may take several minutes as the filters will need to fill up (as well as the lines). Operate the manual lever until fuel flows freely from the filter plug with no sign of air bubbles.
 - g. Loosen the two bleed screws on the injection pump (the head locking screw and the governor vent screw).
 - h. Operate pump again, until fuel flows freely with no bubbles.
 - i. Retighten the vents beginning with the lowest point (the filter, the head locking screw, and the governor vent screw).
 - j. Wipe up any spills at this time.
 - k. Slacken the union nut of the injection nozzles.
 - l. Move throttle to full RPM and check to see if the "STOP" control is in "RUN" position.
 - m. Crank engine with starter motor until fuel flows from each injector. **NOTE:** Do not run starter motor continuously. It normally takes 30 to 60 seconds of cranking to completely bleed the injector lines. Twenty seconds of cranking with about a two minute rest between periods will be easier on the starter, motor, and battery than steady cranking.
 - n. Retighten injector lines, wipe spills.
 - o. Reset throttle position and proceed with normal start-up.
 - p. Allow sufficient running time to recharge battery.

B. Drive Train

1. *Engine Alignment:*

The propeller shaft of your CALIFORNIAN is corrosion resistant, stainless "sealoy" supported by a main strut and intermediate strut (42' only) going through the shaft log, then the engine.

The shaft is checked for accuracy initially at the factory during installation and is carefully aligned to the engine with the hull being properly supported and level. At this time, the shaft log is bonded to the hull, and the position of the shaft is adjusted. The coupling to the engine is checked again for alignment by the commissioning dealer or agent prior to delivery of the boat. This alignment check should be made periodically, since the action of a rough sea could possibly change the shape of a boat enough to disturb engine alignment. If after the first rough water experience the alignment has not changed, it is usually only necessary to make the check once per season. The coupling should always be disconnected before the boat is lifted out of the water, and alignment will then be necessary.

The alignment is considered acceptable if there is a gap less than .0005" per inch of face diameter of the coupling (.002" for a 4" coupling, .0025" for a 5" coupling). The feeler gauge is inserted between the flanges at four points 90 degrees apart. Then check again keeping the engine coupling stationary and rotating the shaft coupling 90 degrees at a time. This checks the squareness of the coupling face to the shaft center line. The engine alignment is adjusted by raising and lowering the adjusting nuts at each mount. To make lateral adjustment, loosen the mounting pad screws which anchor the engine to the bed. You will note there are slots in the mount pad which allow a reasonable amount of adjustment side-to-side.

After adjusting and retightening all mount screws and lock nuts, double check the alignment.

In the absence of a feeler gauge the alignment can be checked fairly accurately with a strip of paper. Insert the paper between the two halves of the outer flange and rotate both together 360 degrees. The paper should remain in place through the complete turn.

Upon completion of the engine alignment, tighten all bolts. Each bolt should fit in with a loose fit. To force any one bolt will cause the shaft to pull out of line.

2. *Transmission:*

The Perkins engine is equipped with a Borg Warner "Velvet Drive" hydraulic transmission. The transmission is a hydraulically operated "Multiple Disc"

type clutch. The fluid used in this unit is Type "A" automatic transmission fluid (ATF) which can be obtained at any auto supply or service station.

The dip stick filler cap is on the port side of the transmission. It should be read immediately after stopping the engine to get an accurate check, as a certain amount will normally drain back from the oil cooler and lines. The dip stick assembly need not be threaded into the case to be gauged. It need only be inserted into the case until the cap or plug rests on the surface of the oil filler hole. Changing of the oil is recommended each season. The drain plug on the starboard side contains an oil screen which should also be cleaned at this time.

The position of the control lever on the transmission must be checked periodically, and an occasional lubricant applied to the external moving parts. The lever on the transmission, when in "FORWARD" should cover the letter "F" on the case casting. It is located in its proper position by the poppet ball. The control should be checked also in neutral and reverse. The manufacturer's warranty is cancelled if the shift lever is modified or if the linkage has insufficient travel in both directions.

Inspect the control cables for sharp bends and signs of damage, chafing or corrosion. Check the lock nuts at the adjustments for tightness at both ends. Lubricate the moving parts with a spray lubricant or light grease.

3. Stuffing Box:

CHECK FROM TIME TO TIME

The stuffing box provides a seal for the propeller shaft at the inner end of the shaft log. It is connected to the shaft log with heavy wall hose, double clamped at each end. This flex hose allows the stuffing box to maintain alignment with the prop shaft without creating excess wear of the packing due to misalignment or vibration.

The packing used is wax impregnated $\frac{1}{4} \times \frac{1}{4}$ square flax.

When the shaft is turning, it is normal to have a slight leakage at the seal. This acts as a coolant, as well as a lubricant, to protect the seal and shaft surface. Should excessive leakage be apparent, release the lock nut and tighten the packing nut slightly and retighten the lock nut. Restart engine and check again with shaft turning.

When it becomes necessary to replace the packing, loosen the lock nut, back off the packing gland nut, and slide it forward on the shaft. Remove all the old packing and replace it with three rings of new packing. Stagger the ends of each ring so as not to provide a path for water to leak through.

Do not wind one continuous strip spirally around prop shaft to make a seal.

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

Back off the packing nut until the shaft feels free and reset the lock nut. Recheck for proper leakage. **Be sure the lock nut is secure**, as operating the boat in reverse could cause the packing gland to screw off the stuffing box, allowing water into the boat.

III. ELECTRICAL SYSTEM

A. Preventive Maintenance

Electrical systems are adversely affected by moisture and a salt-air environment. Preventive maintenance consists of protecting the system from the elements and periodic inspection for damage created by the elements.

There are numerous aerosol spray products available for moisture-proofing terminals and connections. RTV Silicone can also be used. The silicone provides a more permanent seal, but is more difficult to remove should you wish to disconnect the wiring. If RTV Silicone is used, it should be a transparent grade so that the connection will be visible through the sealant.

Periodically check all wire harnesses and connections for secure fastening, cleanliness and any signs of physical damage or corrosion. All terminals should be clean and bright at their mating surfaces. A dirty or corroded contact area will cause resistance, and, depending on the load attempting to pass through, generate heat. This, in turn, increases resistance and will eventually burn the terminal with a resulting failure of the circuit. Battery drainage and possible electrolysis problems will occur prior to the circuit failure. Thus, it is extremely important that connections be kept clean. Correct any problems detected in the inspection.

CAUTION: Do not perform any maintenance or repair functions on a "live circuit." Be certain that the battery switch is off when working on the 12-volt system and the 110-volt main breaker is off when working on the 110-volt system. It is also a good practice to remove all metal jewelry (rings, watches, wristbands, etc.) when working near the batteries or on any electrical component.

B. Repair

Refer to the schematics shown in the last section of the Owner's Manual when trouble-shooting and repairing electrical system problems.

IV. WAGNER 700 SERIES — HYDRAULIC STEERING

A. Final System Bleeding

WAGNER is a **Positive Displacement** hydraulic system (see description below). It is as close as one can get to a perfect "mechanical" linkage between helm(s) and rudder with no "slack" or "play," when the system is properly filled and bled. The less air in the lines or system, the better it is. This is why attention and care to running the lines, filling/bleeding is so vital.

A "first" or "once around" filling as covered above is normally not enough. Aside from air bubbles that may be entrapped in lines, air is introduced into the oil from pouring and pumping. This "emulsified" air slowly comes out of solution with time, forming larger bubbles which must be bled from the system 24 to 48 hours later. This really final bleeding may not seem to release much air, but it is quite important.

When the system is completely filled there will be $3\frac{1}{3}$ wheel turns Hardover to Hardover (HO/HO) with the standard cylinder and $5\frac{1}{3}$ with the large cylinder. Up to $3\frac{3}{4}$ or $5\frac{3}{4}$ turns will give acceptable steering depending on load requirements. The action becomes more "spongy" and less responsive as loads increase, when air remains in system. **AVOID AIR—THIS APPLIES TO ANY HYDRAULIC SYSTEM.**

In either single or dual station installations, after initial filling, hold helm(s) firmly hard over—one at a time—for three to five minutes. This holds the lock valve open and allows any air to slowly rise in the lines and escape through the helm pump mechanism into the reservoir or thermal expansion chamber and be vented to the atmosphere. **Repeat** in the opposite direction.

In cases where there is a high point aft at the cylinder, where installation of a normal natural rise of lines from Ram to Helm Pump is not possible and bleeder valves have been installed at ram, after about one minute with one or either helm pump HO in both directions during above operation, crack **both** bleeder valve each time. This obviously will release any air naturally trapped in the valve head (remember it is a high point) and serves that purpose.

Where no bleeders are installed, it is more difficult to remove air in aft **high** section. Fittings must be "cracked" as helm is being rotated from HO to HO which is a messier, two-man job. With bleeders one man can handle it, by leaving wheel in HO position while he goes aft to crack valves with very little oil being lost.

It is a good plan to repeat this intermediate part of the filling procedure, two to three times the first day of filling, every two to three hours. (Three times in one day not nine times).

Less and less air will naturally be removed each time as the system becomes "firmer." Remaining air will naturally be vented from the system with normal steering operations of the vessel. Only air in "high" spots that has not been released by same form of "forced" venting will continue to cause trouble.

In extreme cases where high spots **cannot** be avoided, the lines can be filled or charged from a filling supply under 20-30 lbs. pressure, by filling lines at helm end (open ram end) and filling line, blowing air out (like air with water in a garden hose) and then closing fitting at ram end when ram has moved its full travel (see paragraph on initial filling of system) and no more air escapes. This is a tedious, messy job, however, it can be done and is very effective.

It is advisable to test the system for leaks by exerting constant heavy pressure in both HO positions from all helm pumps. Heavy loading on the pump(s) and resultant hydraulic pressure cannot cause any damage to the system if all instructions have been followed.

Please note: During HO conditions, under pressure, "slippage" in the pump will occur but is normal. The design is such that at high pressures—1,000 lbs. plus—oil bypasses slowly in the pumping chambers. This is characteristic of all hydraulic systems, but usually at lower pressures than WAGNER equipment is capable of.

All WAGNER pumps are capable of easily generating over 1,000 PSI, if needed. As a matter of course, you will note all torque ratings are at 1,000 PSI for 70° and 90° rudder angles—the condition where the most force is needed. Sizing is such that normal steering operating pressures rarely exceed 600 lbs. with average steering being accomplished from 50 lbs. to 250 lbs.

When the system is totally filled—all air removed—oil level in single or upper helm pump should be just barely covering pistons as viewed through vent hole. This is approximately ¾" down from casing top with pump horizontal and at ambient outside temperature. This will allow adequate space for thermal expansion, normally. If vessel is filled in northern latitude and goes to tropics or there is a long line run through a particularly "hot" engine room, a change in oil level may be necessary.

B. General Information

Positive Displacement means that when the lines and pump(s) are properly filled, the reservoir acts only as a thermal expansion chamber for the oil. It is a reserve for oil in case of leaks until a leak can be secured should it occur. There is **never** any pressure in the reservoir (pump casing) unless the vent hole in the filler cap became accidentally plugged and expansion occurs. In no way does it contribute to pumping action, which is independent of reservoir in the WAGNER system. This is the reason why these helm pumps are so efficient.

The pump itself, six pistons riding against an angled drive plate pumping in consecutive order with rotations, push "X" amount of oil down one line and drive the ram at the pressure required for the steering load at the minute of turning of the wheel. The **same** volume of oil returns through the other line into the pump at relatively no pressure. (Remember oil, like water, is incompressible.) When wheel rotation stops, lock valve closes and any pressure in line due to rudder load has **no** effect on pump or wheel. Opposite wheel rotation causes same result. Three (3) cubic inches of oil **out** gets three (3) cubic inches **back**.

This fact explains why flexible lines—all of which are expandable to some extent—called "ballooning"—can only be tolerated in short sections, i.e. to facilitate ram swing or movement. In short, if a line can expand or "balloon" under pressure and take a volume of oil greater than can be returned to the pump through the other line—remember oil can't get past the ram piston—the system then becomes "loaded," causing residual pressure in the "charged" line when rotation is reversed and steering gets STIFF.

The Lock Valve operates automatically at very low pressure by oil **flow** in the forward direction. It closes or returns to LOCK position when **flow** stops. This allows pump (helm) to feel no effect from torque or loading whether it be a rudder, I.O. or outboard. It also allows multiple station operation with no effect on other station.

**OPERATING PROCEDURES
FOR YOUR NEW
"CALIFORNIAN"**

I. ENGINE

A. Pre-Starting Check Off

It is advisable to use a pre-start checklist, as even the most experienced skipper can overlook an important detail that may evolve into an unpleasant or costly mishap. The checklist will vary, as each owner may have optional equipment that will require attention at this time.

The following procedures are offered to help you develop your checklist:

1. Check fuel level.
2. Open fuel shut-off valve.
3. Check engine oil and transmission.
4. Check for signs of fuel or oil leakage.
5. Check engine coolant level.
6. Open sea water intake to engine (gate valve).
7. Check bilge, shaft log area.
8. Check battery switch "ON."
9. Turn on "BLOWER."

B. Starting Procedures

1. Set controls in neutral.
2. Check operation of "STOP" control.
3. Advance throttle slightly—approximately $\frac{1}{4}$.
4. Turn ignition switch to "ON" and operate "STARTER." **Note:** Generators are equipped with "PRE-HEAT." Check engine manual for instructions.
5. Operate engine about 1,000 RPM. Check immediately for oil pressure reading.
6. Check for water discharge.
7. Check ammeter for "charge" indication.
8. Allow engine to reach normal operating temperature and observe any tendency to continue to rise.
9. A final visual check of the engine room is recommended, as the engine is warming up.
10. Check forward and reverse operation at idle speed before "casting off" lines.

C. Engine Operation

Run engine at speeds as recommended in engine manual. Always reduce engine RPM to "idle" before shifting, and make throttle adjustments gradually.

2. Observe engine instruments periodically.

3. Avoid long periods of maximum RPM, as well as extended "idle" periods.

Always run engine long enough to reach normal operating temperature, as short runs cause excess engine deposits and sludge formation of oil.

Handwritten note:
Check 2 1/2 hrs. max.
normal temp.

4. Become familiar with the sound of your engine at its cruising speeds, and note any vibration characteristics. When an abnormal sound or vibration occurs, reduce RPM and make a quick check of instruments and conditions. Have problem checked as soon as possible.

5. Observe ammeter readings periodically; and as battery becomes charged (low charge rate), you may switch over to the #2 battery. **CAUTION:** Do not turn battery switch to "OFF" position while engine is running. To do so will damage voltage regulators and possibly destroy diode rectifier in the alternator. It is advisable to reduce RPM to idle, if possible, while switching batteries to prevent unnecessary surge on the system.

The alternator should not be charged at maximum for long periods of time, any more than an engine should. If this occurs, it is advisable to allow a cooling off period at 10 minute intervals, switching to the "charged" battery or operating at lower RPM's.

D. Engine Shutdown

1. Allow the engine to idle for a few minutes before stopping and check instruments for proper readings.
2. Push "STOP" control and hold until engine stops, release to normal position.
3. Turn "OFF" ignition switch and blower.
4. Close fuel valve and seacock if boat is to be left unattended.
5. Visually check engine room and bilges for leakage.

NOTE: Check engine "hours" for maintenance scheduling (see Engine Manual).

READ AND USE YOUR ENGINE MANUAL.

II. ELECTRICAL SYSTEM

It is important to remember that the D.C. electrical system in a boat is not the unlimited source of power that one is accustomed to in the home. The battery is a rechargeable storage cell. You can only take out of it what you have put into it, for a limited period of time. There is generally an overabundance of electrical equipment drawing from the battery, and it is not intended to supply all these fixtures at one time.

A. Batteries

The battery requires periodic attention to terminal connections, electrolyte level, and secure fastening. The use of an hydrometer is an inexpensive and accurate measure of the battery's condition. Specific gravity measurements of the electrolyte should read between 1.275 and 1.280 on a normally "charged" battery. All cells should read relatively equal; any one cell that has a noticeably low reading is an indication of a bad cell, and the battery should be replaced. The electrolyte (acid) level should be maintained to cover the plates in the battery. Add distilled

water as necessary to maintain that level. Excessive need of water is an indication that the charging rate is too high. A check of the charging voltage should not read over 15.5 volts.

Exercise care is required in using an hydrometer, as well as all operations around the battery, due to the corrosive nature of sulfuric acid. It is a good practice to have a solution of baking soda around to clean up spills or drippings before they can damage anything. Flush with fresh water. Baking soda is excellent for cleaning around batteries, provided the solution is not allowed to get into the cells. After cleaning the battery post and cable connections, a light coat of grease, Permatex, or special spray paint is an effective means of controlling further corrosion.

B. **Alternator**

The next most critical point in the electrical system is the alternator. Its job is to maintain the battery's charge and cover the demands on the electrical system while the engine is running. The alternator converts mechanical energy into electrical energy, and the drive belt is its only link. This is normally the only periodic attention the alternator will need, maintenance-wise. With the engine stopped, the drive pulley on the alternator **should not be able** to be turned by hand. Belt tension may seem tight enough, but the pulley may still slip if the belt is glazed or oily. When checking or tightening the alternator and its connections, it is advisable to turn off the battery switch. This prevents accidental "shorting" of the output terminal which is "live" even when the engine is at rest.

C. **Starter**

The engine starter motor is the most demanding load that will be placed on the electrical system and is not fused or protected by an overload device. Therefore, it is wise to make periodic checks on the connections at the starter and solenoid switch for tightness and cleanliness. Do not allow tools or other metal objects to come into contact with these connections while the battery is "ON."

D. **Battery Switch**

The main battery switch connects either or both batteries to the engine circuit and the D.C. switch panel, which serves the boat's interior circuits. **Do not switch to "OFF" position with engine running.** "BOTH" position is intended for emergency or extended engine cranking ability. Continuous running in the "BOTH" position when the batteries are in a low state of charge can cause overload and possible damage to the engine alternator.

E. **Electrical Panel**

The A.C.-D.C. breaker panel is located in the main salon. This panel is equipped with high quality circuit breakers.

The D.C. ammeter monitors the amount of current drawn from the battery, and the voltmeter gives an indication of the battery's condition.

The voltage reading may be interpreted as follows:

		Battery Condition
Engine off & Electrical System under minimal or no load	Below 11 volts	Very low
	11-12 volts	Low
	12-13 volts	Well charged
Engine running fast idle or above	13-13.5 volts	Low charge rate
	13.5-15.5 volts	Normal charge
	15.5 volts	Excessive voltage
	or higher	(Voltage regulator defective, replace or adjust)

The voltage readings should be taken in either battery position, not in "BOTH." Start your engine on the highest charge battery and allow time for the battery to return to its full charge state before putting it on reserve. When switching over to the other battery, be sure not to switch through the "OFF" position. This would damage the regulator and possibly the alternator diodes. The "BOTH" position is for emergency or extended cranking periods and should not be used to charge two batteries at the same time. This could overload the charging circuit if the batteries are low.

The automatic bilge pump switch may be left in the "AUTO" position, and the pump will come on whenever there is sufficient water in the bilge to activate the float switch. The manual position allows the pump to run continually overriding the float switch, until the switch is returned to the center "OFF" position.

Running Lights	10 amp	Bilge Pump	7.5 amp
Bow Light	2 amp	Blower	10 amp
Foredeck Light	7.5 amp	Instrument Light	7.5 amp
Masthead Light	2 amp	Compass	2 amp

F. A.C. 110 Volt Shore Power System

The A.C. system is a three-wire shore-grounded circuit. The shore power inlet is rated at 30 amps and is mounted on the starboard side of the cabin.

The main circuit breaker is located in the panel. This, in turn, feeds the A.C. breaker panel. For reasons of safety, it is recommended that all appliances used aboard be equipped with a three-wire grounded cord.

The hot water heater is connected to a breaker on this panel, but also has a high temperature reset button built into the heater. Before applying power to the water heater, always be sure the heater has been filled by turning on one of the hot

water faucets long enough to get a steady flow. An empty hot water heater will burn out the heating element before the temperature reset button can break the circuit.

The proper procedure for connecting shore power to the boat safely is as follows:

1. Turn ship's main breaker to "OFF."
2. Turn receptacle on dock to "OFF," if possible.
3. Connect cable to power inlet on boat first (to prevent handling a "live" power line and possibly coming in contact with water).
4. Route the cable in such a way as to prevent strain on either connector, allowing for the rise and fall of the tide, and to prevent chafing.
5. Connect to dockside receptacle and turn shore switch on.
6. Turn on ship's main breaker.

Disconnect Procedure:

1. Turn off ship's main breaker.
2. Turn off dockside power and disconnect cord.
3. Replace all weather-tight caps on receptacles.

The owner must be aware of the hazards of using high voltage A.C. aboard ship and should maintain this system in safe condition.

Don't take chances handling A.C. equipment in wet weather or while washing down topsides. Caution guests and children about hazards, and do not use any equipment that does not function properly or is suspected of being defective.

G. Battery Charger Option

The battery charger, or converter, as it is also referred to, is connected to the feed or "output" side of the main battery switch. This allows you to select either or both batteries to be put "on the line" for charging when the engine is at rest. It also insures that, when the battery switch is "OFF," all circuits are positively disconnected from the batteries during an emergency shutdown.

Do not turn the battery charger on when the battery switch is in the "OFF" position. This could possibly feed the ship's circuits without the back-up support of the batteries. It could also cause premature failure of electrical equipment in the boat, if the regulator section of the charger should fail, allowing high voltage into the system.

The charger is protected by a circuit breaker on the A.C. panel. Be sure all the related circuits are "OFF" when opening the charger cabinet for service. READ your manual supplied by the manufacturer.

H. **A.C. Generator Option**

The A.C. generator option presently being installed is an Onan 3 KW or Onan 7.5 KW diesel powered unit. It is advisable to read owner's manual provided with the unit and become familiar with the checkpoints and operation before starting this unit for the first time.

Normal start up checks should include the following steps:

1. Check oil and water.
2. Open sea water cooling gate valve.
3. Open exhaust through hull gate valve.
4. Check main generator circuit breaker(s) "ON."
5. Check fuel shutoff valve at tank for "ON."

Generator Starting:

1. Hold pre-heat switch on for 15 seconds.
2. Hold start switch on until unit begins to run. Starter will automatically disengage when engine reaches running speed.
3. Release both switches.
4. Turn ship-shore power switch to "GEN" position.
5. Observe A.C. voltage and frequency on meter panel, check for water discharge at generator exhaust port.
6. A.C. power is now available at main panel.

The generator is protected with cut-off switches for high temperature and/or low oil pressure. Refer to your Onan manual for trouble-shooting procedures, and to the wiring diagrams in your boat owner's manual.

The generator system has a separate fuel system from the tank to the unit, which includes an in-line fuel/water separator, fuel tank shutoff. The return line is connected to a tee fitting with the main propulsion engine's return line at the tank.

The sea water cooling system is also independent of the main system with its own gate valve and sea strainer.

Winterizing procedures will be found in the Onan owner's manual. The fresh water cooling system can be protected with an ethylene glycol type antifreeze and is recommended for all season use.

III. FUEL SYSTEM

The standard fuel tank on your CALIFORNIAN is of welded steel construction, mounted in the engine room or under the aft bunks. The fuel shutoff valve is mounted either on the side or rear of the tanks.

A mounted fuel filter-water separator is provided in line between the engine and tank. Check periodically for water accumulation at this point by removing bottom plug and draining into a container. Replace the element at least once each season or as required by manufacturer's recommendations. There is also a final fuel filter on the engine itself which should be changed at intervals specified in your engine manual. The quantity of fuel in the tanks can be gauged by the use of a dip stick, through the deck fill plate. The dip stick, though slightly inconvenient, is still the most accurate and reliable method to use.

The fuel tank and fill-deck plate are grounded by a wire under the deck. Although diesel fuel is considered relatively safe, safe fueling practices are always recommended:

- A. Turn off heaters and galley equipment.
- B. Extinguish all cigarettes, pipes, etc.
- C. Stop engine and turn battery switch to "OFF."
- D. Close all hatches and ports to prevent entry of fumes.
- E. Do not attempt to take on fuel in rough water or inclement weather, as water might enter through the deck plate.
- F. Avoid fueling after dark or in poorly lighted areas.
- G. Maintain continuous contact between the nozzle and the deck plate fitting to eliminate the possibility of static electric discharge while filling.
- H. Take on only gallonage anticipated by dip stick reading. Do not overfill to point where fuel remains in fill hose.
- I. Wipe up or wash down spills after replacing and tightening deck plate cap.
- J. Open all hatches, air bilges, and operate blower before starting engine or relighting galley stove. Turn batteries "ON."
- K. See engine manual for "bleeding" procedures.

Another note worth mentioning is to acquire your fuel from a reliable source. A diesel engine requires clean fuel; **water** and **dirt** being its worst enemy. Keep a clean and tight fuel system, and you will have a most reliable engine.

REQUIRED SAFETY EQUIPMENT

The yacht owner should reference the U.S. Coast Guard and/or the controlling body and codes for his area of operation. The following information is listed for your convenience, but should not be misconstrued as complete.

Navigation Lights

Per U.S.C.G. International rules, Inland rules, or governing codes for operational area.

Life Preservers

Shall be of approved type. Class 3 vessels, if not carrying passengers for hire, shall carry an approved life preserver (Type I, II, or III) for each person on board plus one Type IV (buoyant cushion, life ring buoy, or throwable special purpose water safety buoyant device) available to be thrown. Storage of the above equipment shall be so placed as to be readily accessible. **NOTE:** Work vests (Type V) are not acceptable as part of the above requirements.

Fire Extinguishing Equipment

Shall be of an approved type. The Class 3 vessel requires three Type B-1 extinguishers (1¼ gals., foam; 4 lbs. carbon dioxide; or 2 lbs. dry chemical), or one Type B-1 plus one Type B-11 (2½ gals. foam; 15 lbs. carbon dioxide; or 10 lbs. dry chemical) extinguishers; if the vessel has no fixed fire extinguishing system in the machinery space. It requires two Type B-1 or one Type B-11 extinguishers if a fixed fire extinguishing system is installed in the machinery space.

Ventilation

Ventilation of machinery spaces containing the engine and/or tanks shall be accomplished with a minimum of one air intake duct, and one exhaust duct. The exhaust duct shall extend from the atmosphere to the lower portion of the bilge. The intake duct shall be installed so as to extend at least to the midpoint to bilge and to the atmosphere. The cowls shall be such that displaced fumes cannot be recirculated. The vents should not be closed at any time.

Whistles

One power operated whistle, capable of producing a blast audible at a distance of at least one mile, and with blasts of at least two seconds duration.

Bell

If operating in water subject to the rules of the road, you must carry an efficient fog bell.

The above information is taken from the Coast Guard Publication of "Rules and Regulations for Uninspected Vessels," Subchapter C, May 1, 1970, Ref. CG-258, reflecting the minimums.

CALIFORNIAN WIRING COLOR CODES

NOTE: These colors are correct for all CALIFORNIANS, but may change at any time due to the availability of stock from manufacturers.

- | | | | |
|----|------------|---|---------------|
| 1. | Red | — | Hot |
| 2. | Black | — | Hot |
| 3. | White | — | Ground |
| 4. | Purple | — | Solenoid |
| 5. | Green | — | Ignition |
| 6. | Yellow | — | Horn |
| 7. | Dark Gray | — | Hot (Tach) |
| 8. | Light Gray | — | Ground (Tach) |

SALON

WATER TEMPERATURE:

1. White #14 from sender
2. White ground #14
3. Green Power #14 to key switch

OIL:

1. Oil sender #14 black
2. Green power #14 to key switch
3. White ground #14

AMMETER:

1. #6 black battery side
2. #6 red acg
3. #14 white ground
4. Black #14 acg to charge key switch

TACHS:

1. White #14 ground
2. Gray to both sides #14 — 34 only
3. Light gray one side, dark grey other on 38 & 42

IGNITION SWITCH:

1. Battery term to alt acg
2. Green #10 ignition side
3. Green #14 to gauges & shutoff switch
4. 2 Red #10 to sol

SHUTOFF:

1. Green #14 charge from ignition
2. 2 purple #14, one to shutoff, one to bridge

NOTE: These colors may be changed due to the availability of stock.

BRIDGE**OIL:**

1. Green #14 Power
2. White #14 ground
3. Black #14 send

WATER TEMPERATURE:

1. White #14 send
2. Green power #14
3. White ground #14

AMMETER:

1. #10 white to ground and to J box — 34
2. #10 white to ground bar on 38 & 42

START:

1. #10 green power to J box
2. #14 green power to gauge power & switch power
3. Black #10 to J box

SHUTOFF:

1. #14 green power
2. #14 purple to shutoff

INSTRUMENT LIGHTS:

1. #14 green from power
2. #14 black to instrument lights

TACHS:

1. White #14 ground
2. Brown & gray to term

HORN:

1. 14-2 black to one side, white to ground
2. Yellow #14 same term to J bar
3. #14 blue to J bar other term

HARNES

STARBOARD		PORT	
Salon-Engine	Salon-Bridge	Salon-Engine	Salon-Bridge
18"	13"	23"	15"
2 Red #6	Black #6	Like STBD	Like STBD
Pink #10	Black #6	Like STBD	Like STBD
Orange #10	Black #6	Like STBD	Like STBD
White #10	Black #6	NO	NO
White #14	Black #6	Like STBD	Like STBD
Gray #14	Black #6	Like STBD	Like STBD
Purple #14	Black #6	Like STBD	Like STBD
Brown #14	Black #6	Like STBD	Like STBD
Black #14	Black #6	Like STBD	Like STBD
Blue #14	Black #6	NO	NO
Red #14	Black #6	Like STBD	Like STBD
	Yellow #14	Like STBD	Like STBD

Two #6 white to ground bar
From bolt on starter where ground from battery goes

Red #6 to alt bottom pole — from alt side ammeter
Green #14 from alt to large pole starter
Green #10 from v reg to key switch
#6 red to large pole starter
Pink or red #10 from key to neutral switch
From neutral switch to inside term starter
Purple #14 shutoff
Black #14 oil send
White #14 water
Brown #14 center pole tach send
Gray #14 rear term

LOWER STATION — Starboard

Red #6 all lower station to alt on engine starboard start from starter to str bat side of ammeter bridge
Black #6 from bat side to bridge all

CHARTS AND DRAWINGS

The drawings which follow are for descriptive purposes only and not to scale. They are not intended to be used as construction drawings.

The location of some accessories may vary on your yacht from the drawings due to engineering changes or the particular combination of options on your yacht. Consult your dealer on any discrepancies you may discover.

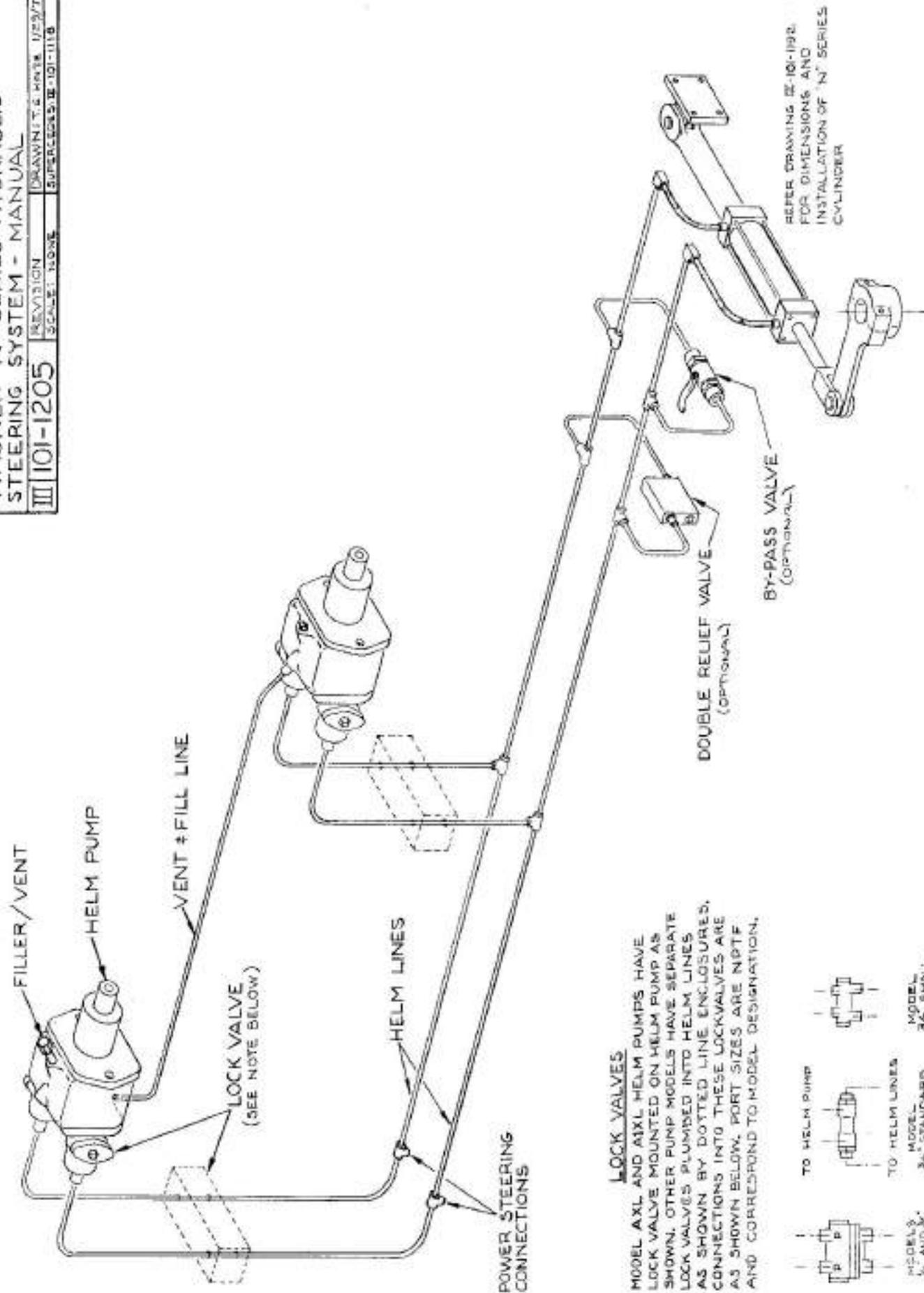
WM. E. HOUGH CO. ~ SEATTLE, WASH.

WAGNER "N" SERIES HYDRAULIC STEERING SYSTEM - MANUAL

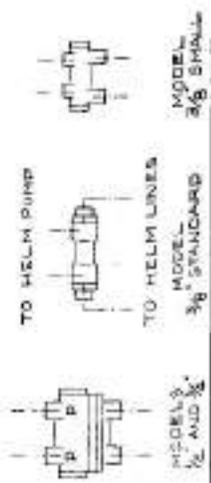
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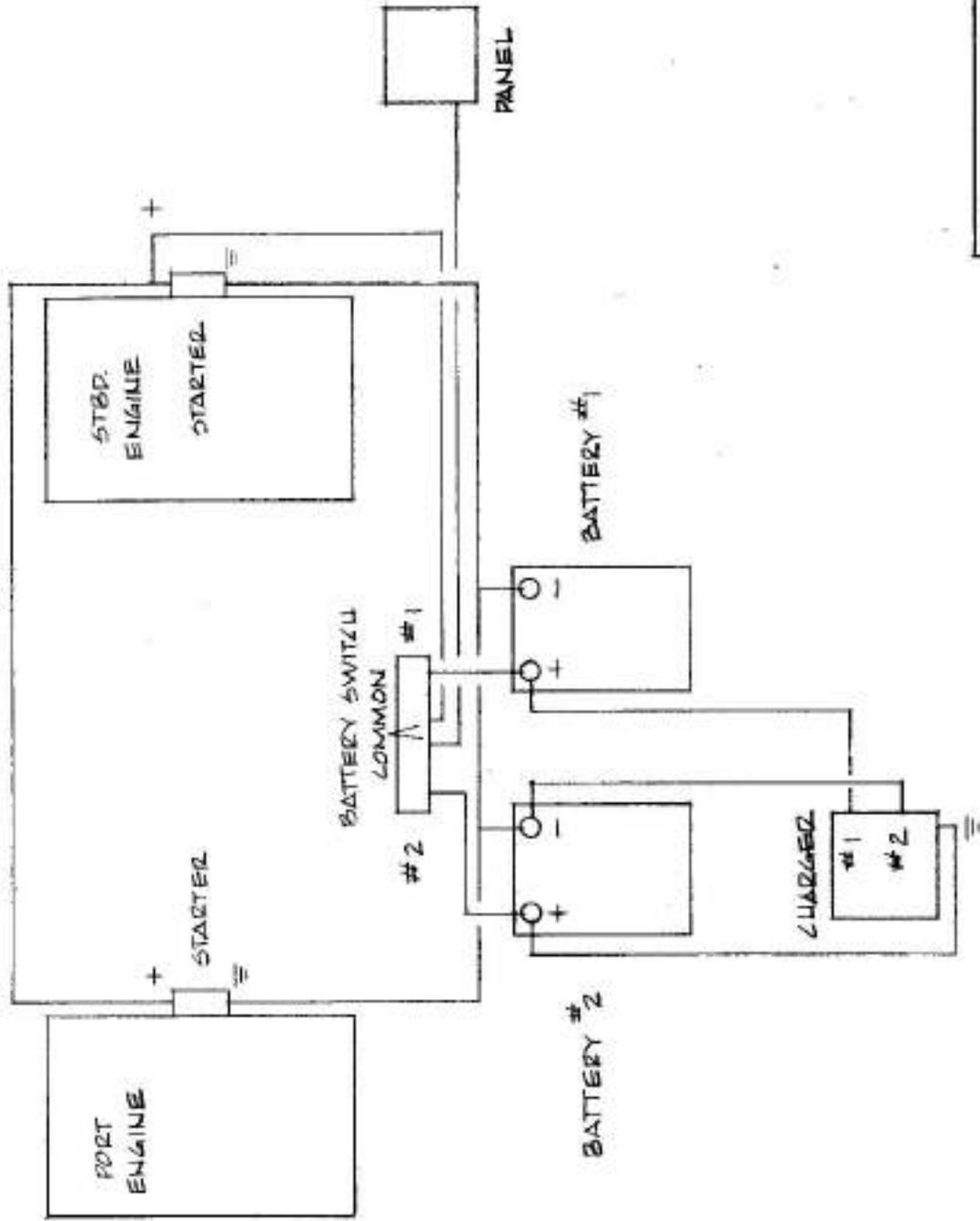
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DRAWN: T. A. HARRIS 1/29/71
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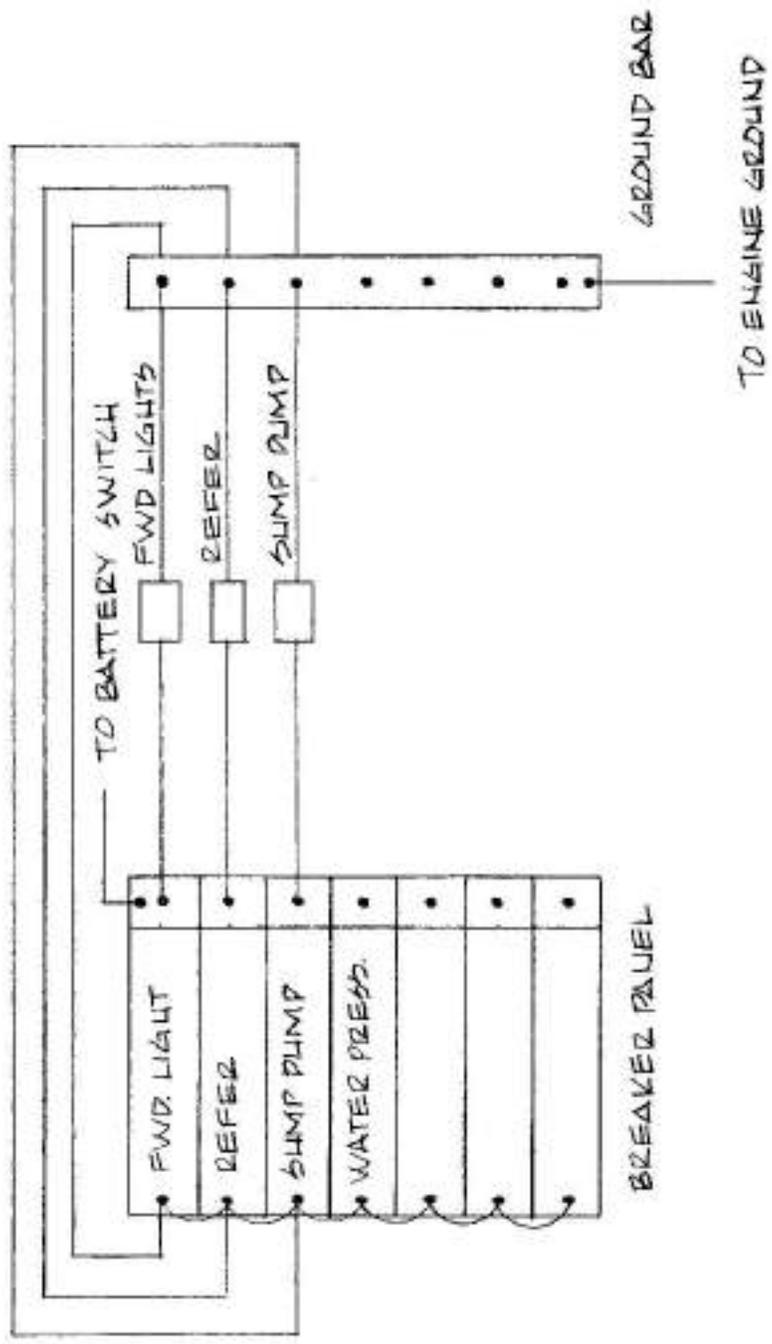


LOCK VALVES
 MODEL AXL AND AXL HELM PUMPS HAVE LOCK VALVE MOUNTED ON HELM PUMP AS SHOWN. OTHER PUMP MODELS HAVE SEPARATE LOCK VALVES PLUMBED INTO HELM LINES AS SHOWN BY DOTTED LINE ENCLOSURES. CONNECTIONS INTO THESE LOCKVALVES ARE AS SHOWN BELOW. PORT SIZES ARE NPTF AND CORRESPOND TO MODEL DESIGNATION.

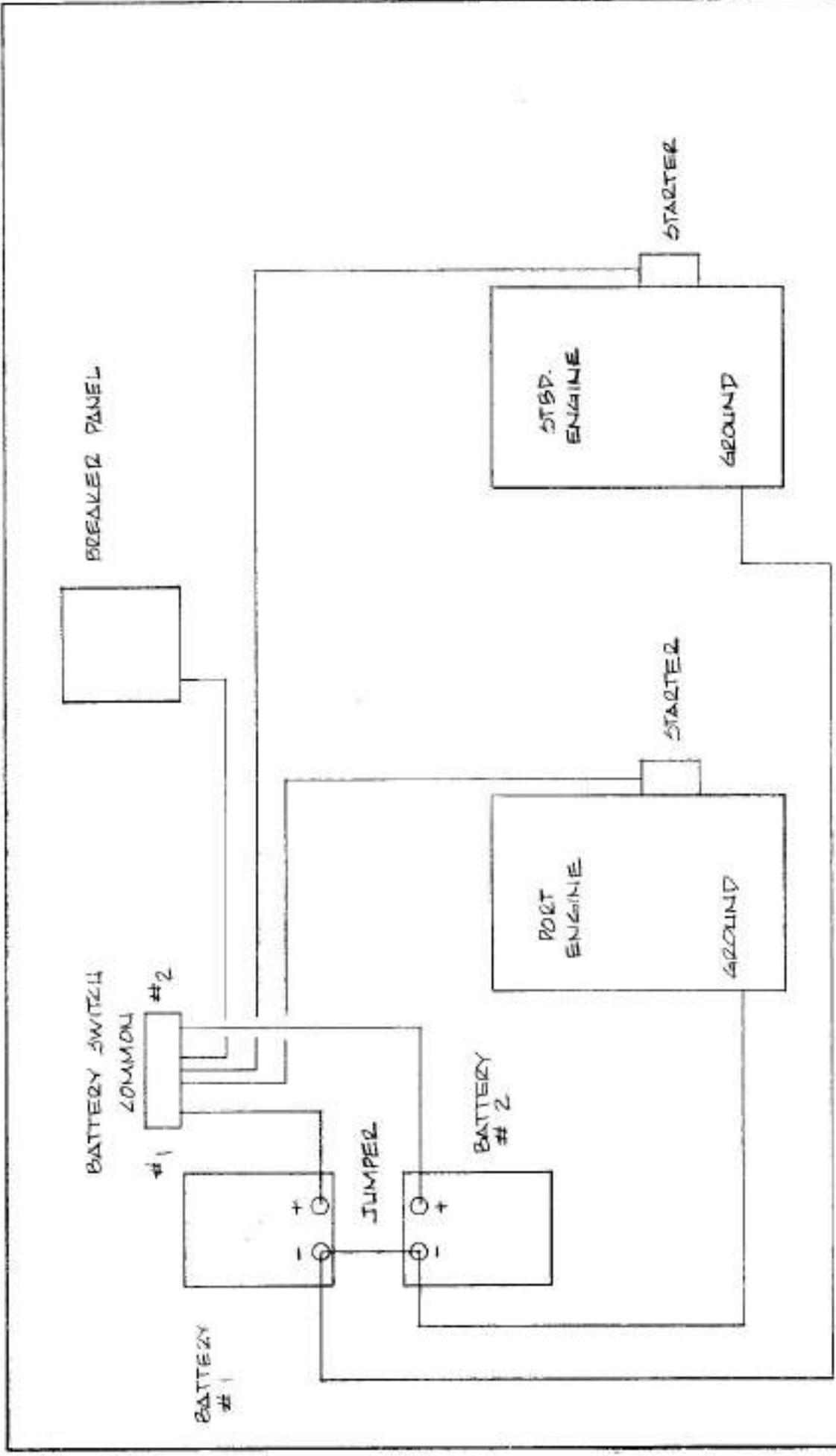




CALIFORNIA 28 #42
 MAIN 12 V SYSTEM
 MARSHALL BOAT LO.
 12 | 10 | 78
 PAGE 1 OF 5



CALIFORNIAN 38642
 12 V. DC SYSTEM
 MARSHALL BOAT CO.
 12 | 10 | 78
 PAGE 2 OF 5

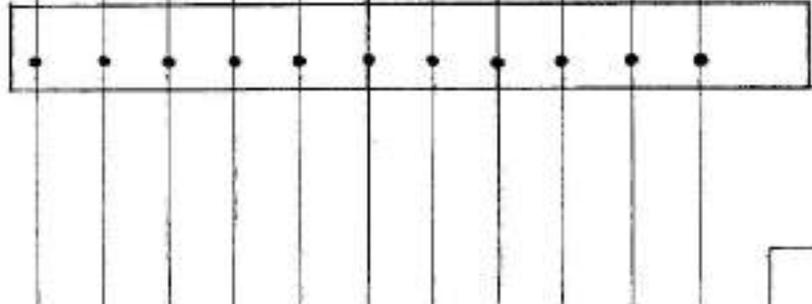


CALIFORNIAN 34
 MAIN 12 V. SYSTEM
 MARSHALL BOAT CO.
 12 | 2 | 78
 PAGE 3 OF 5

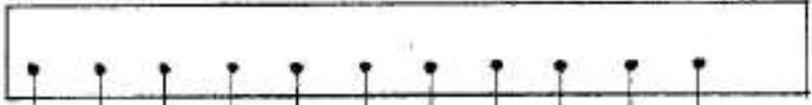
D.C. BREAKER PANEL

- WATER PUMP
- SUMP PUMP
- BILGE PUMP
- WIPEL
- HORN
- NAV. LIGHTS
- FWD. LIGHTS
- HEAD LIGHTS
- SALON LIGHTS
- ELECT. HEAD
- D.C. REFER
- D.C. MAIN

POSITIVE D.C. JUNCTION BAR

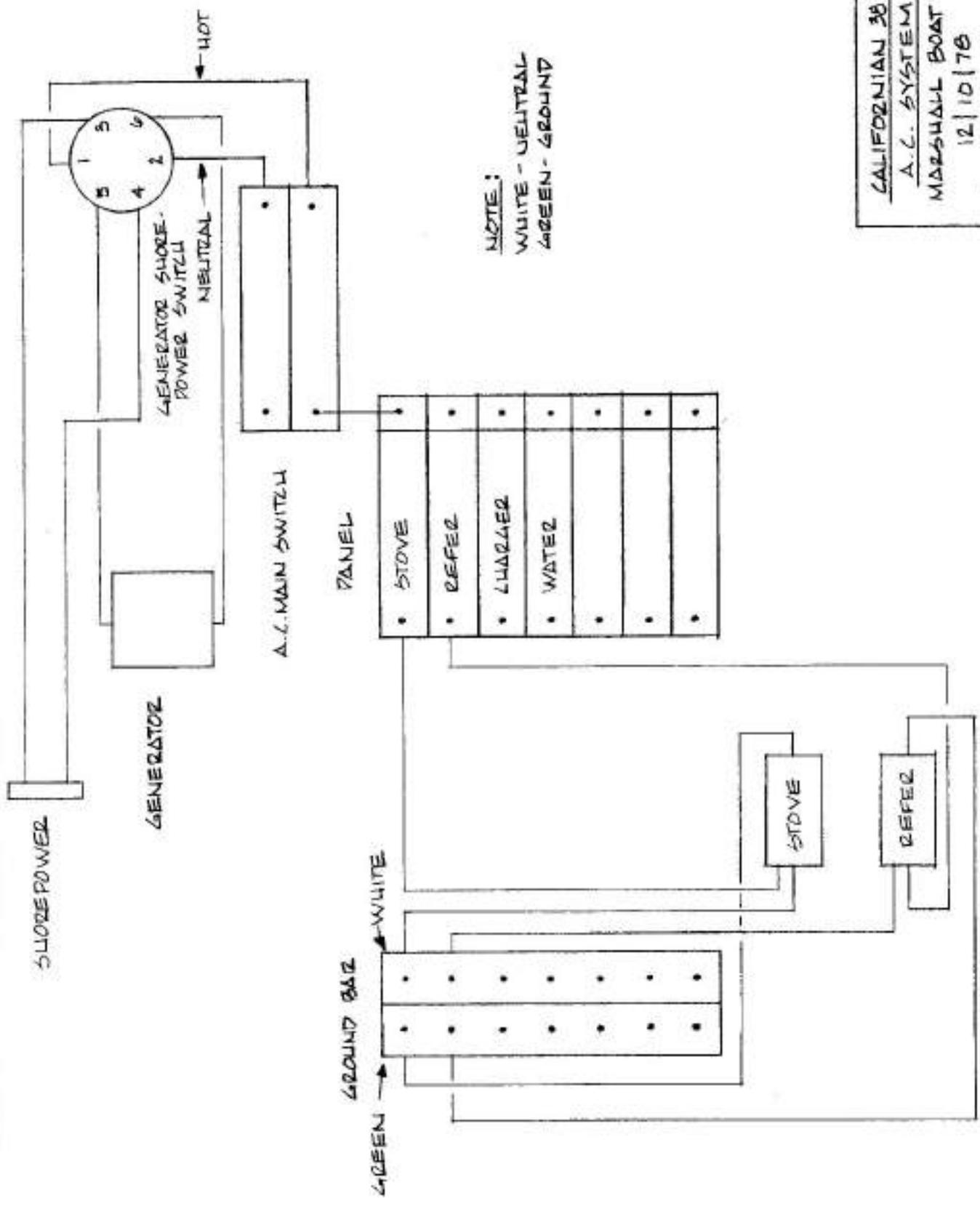


GROUND BAR



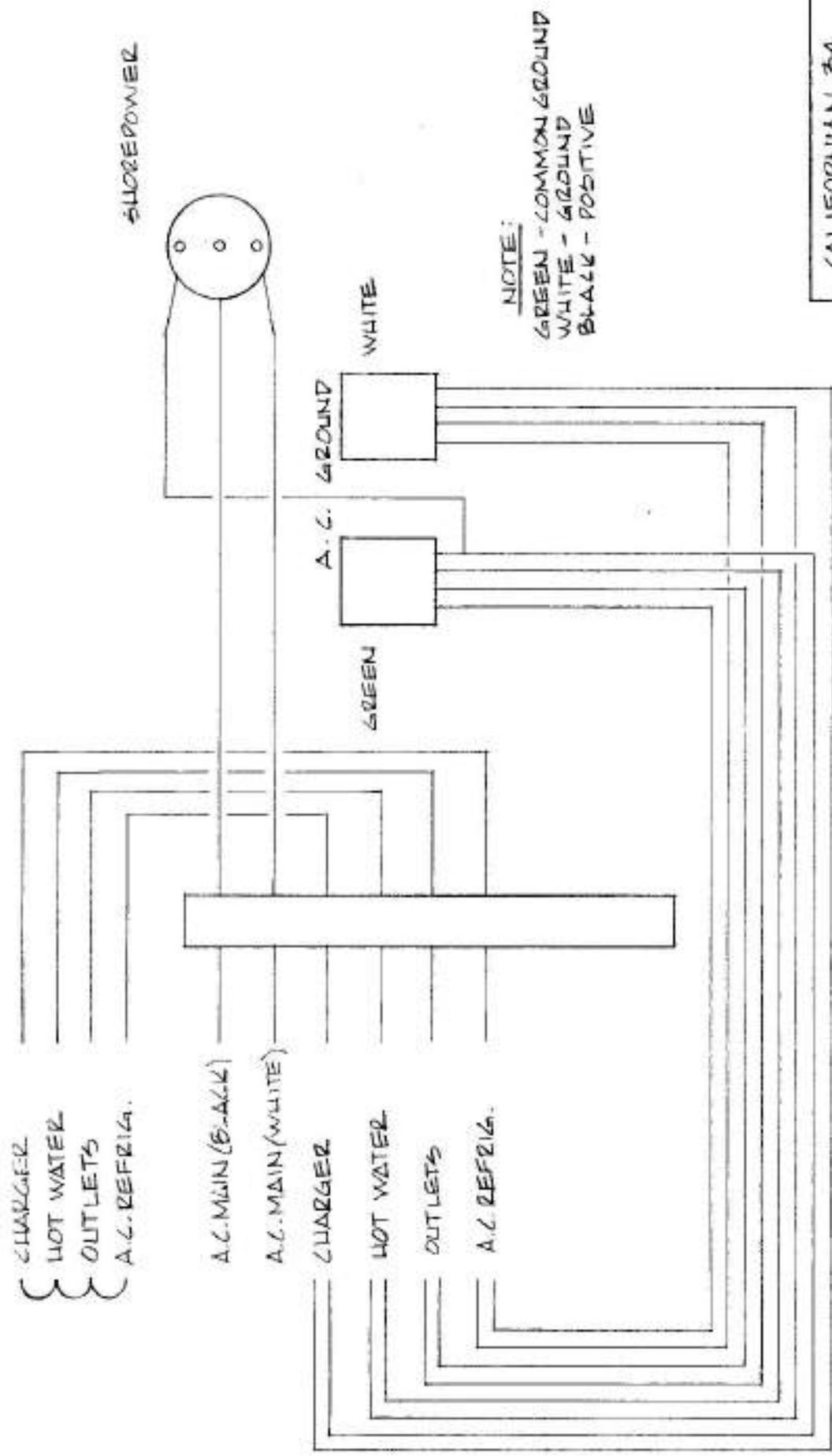
BATTERY SWITCH

CALIFORNIAN 34
12 VOLT SYSTEM
MARSHALL BOAT CO.
12/2/78
PAGE 4 OF 5

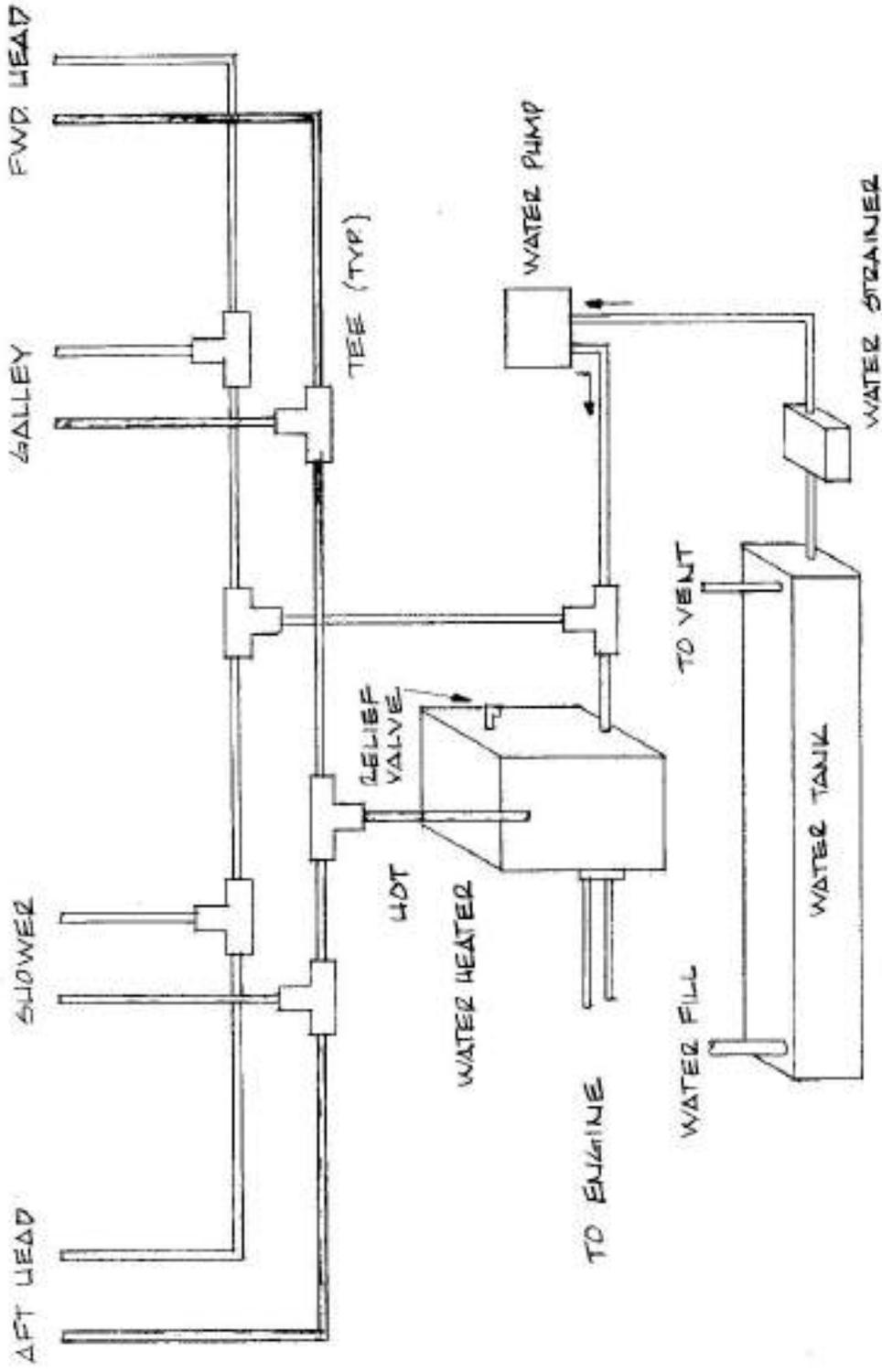


CALIFORNIAN 3842
 A.C. SYSTEM
 MARSHALL BOAT CO.
 12/10/78
 PAGE 3 OF 5

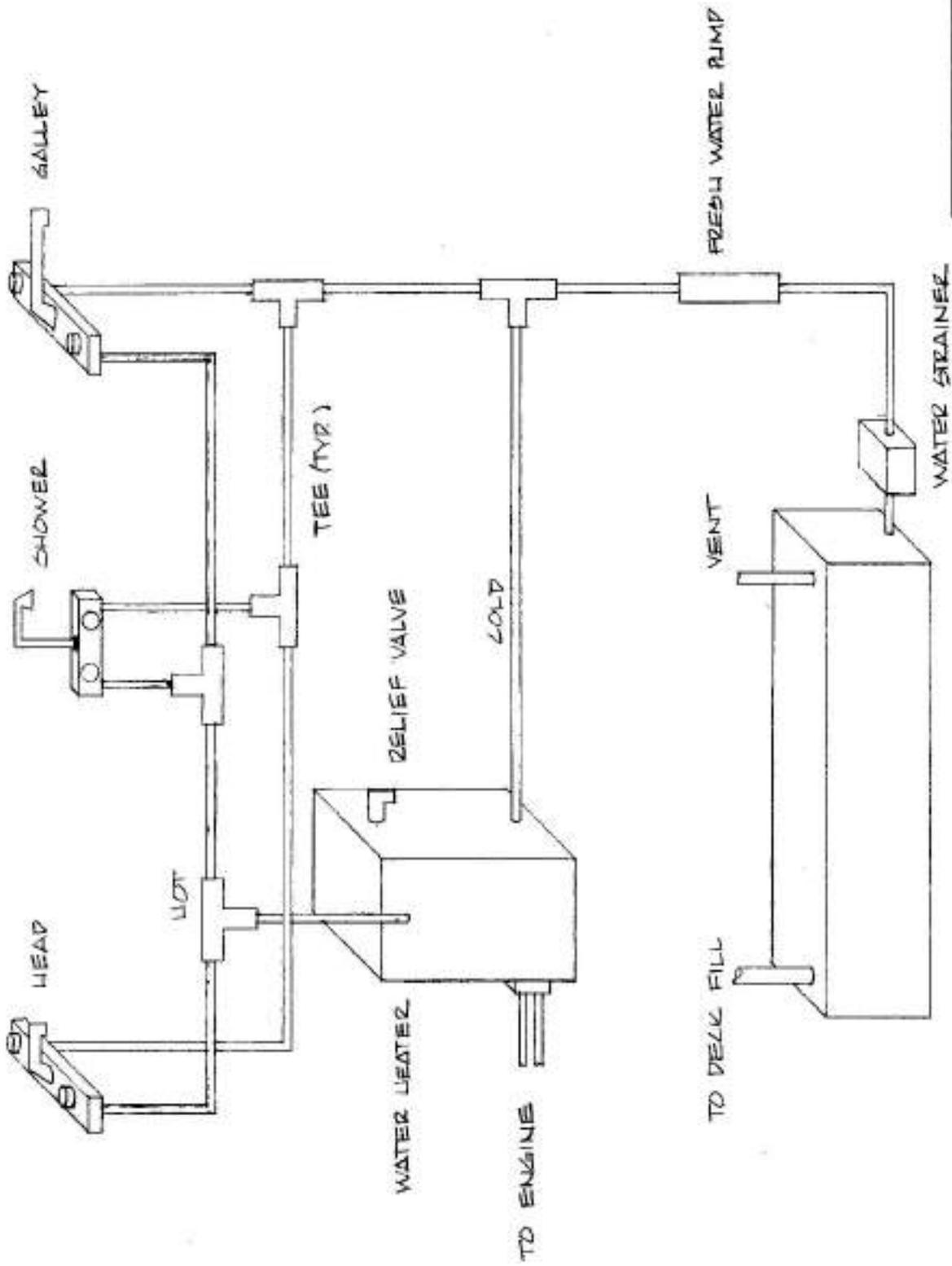
A.C. PANEL

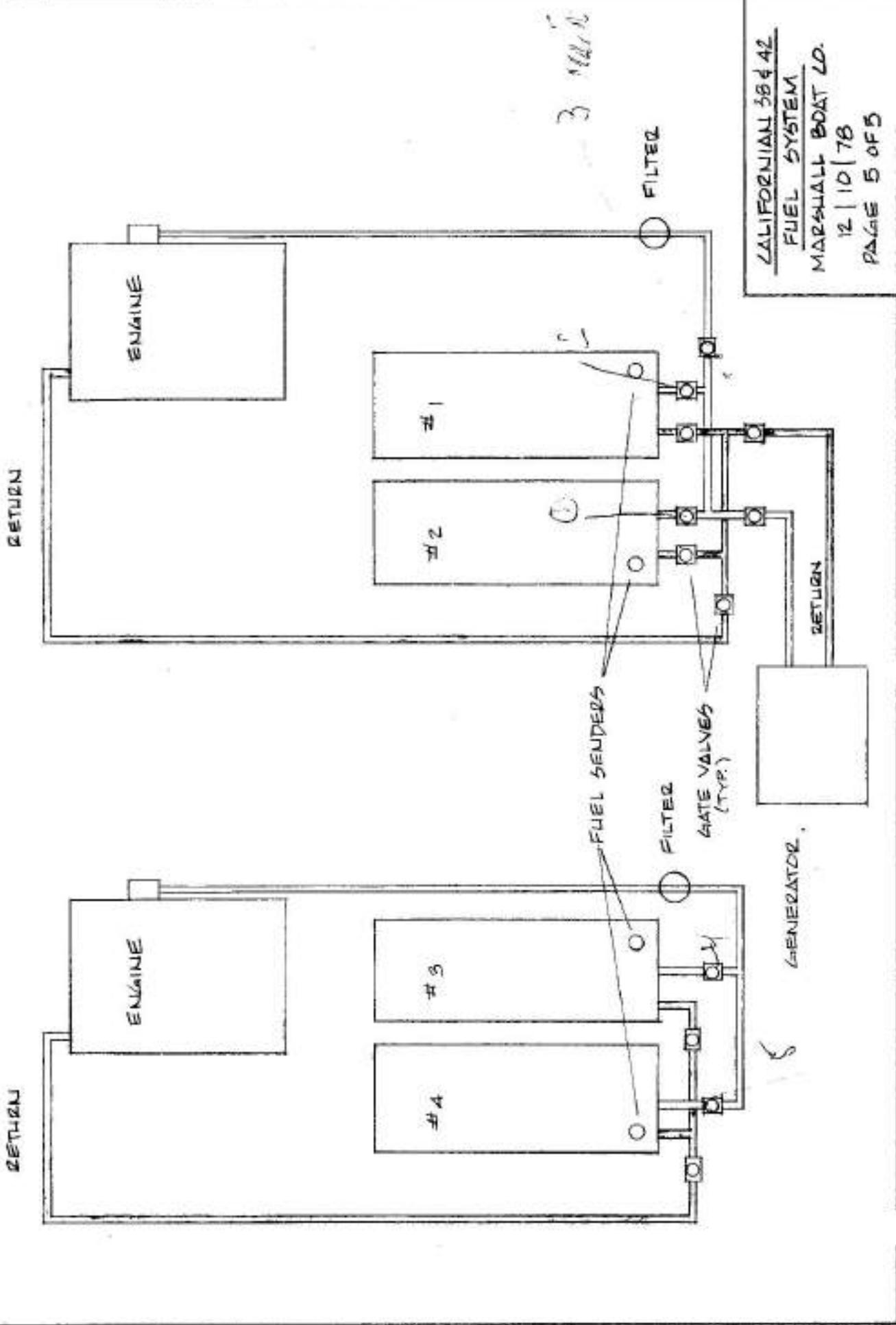


CALIFORNIAN 34
A.C. SYSTEM
MARSHALL BOAT CO.
12/2/78
PAGE 1 OF 5



CALIFORNIAN 38 & 42
 PLUMBING LAYOUT
 MARSHALL BOAT CO.
 12/10/78
 PAGE 4 OF 5





CALIFORNIAN 58442
 FUEL SYSTEM
 MARSHALL BOAT CO.
 12/10/78
 PAGE 5 OF 5

3 MAIN

RETURN

ENGINE

#1

#2

FILTER

RETURN

FUEL SENDERS

GATE VALVES
(TYP.)

FILTER

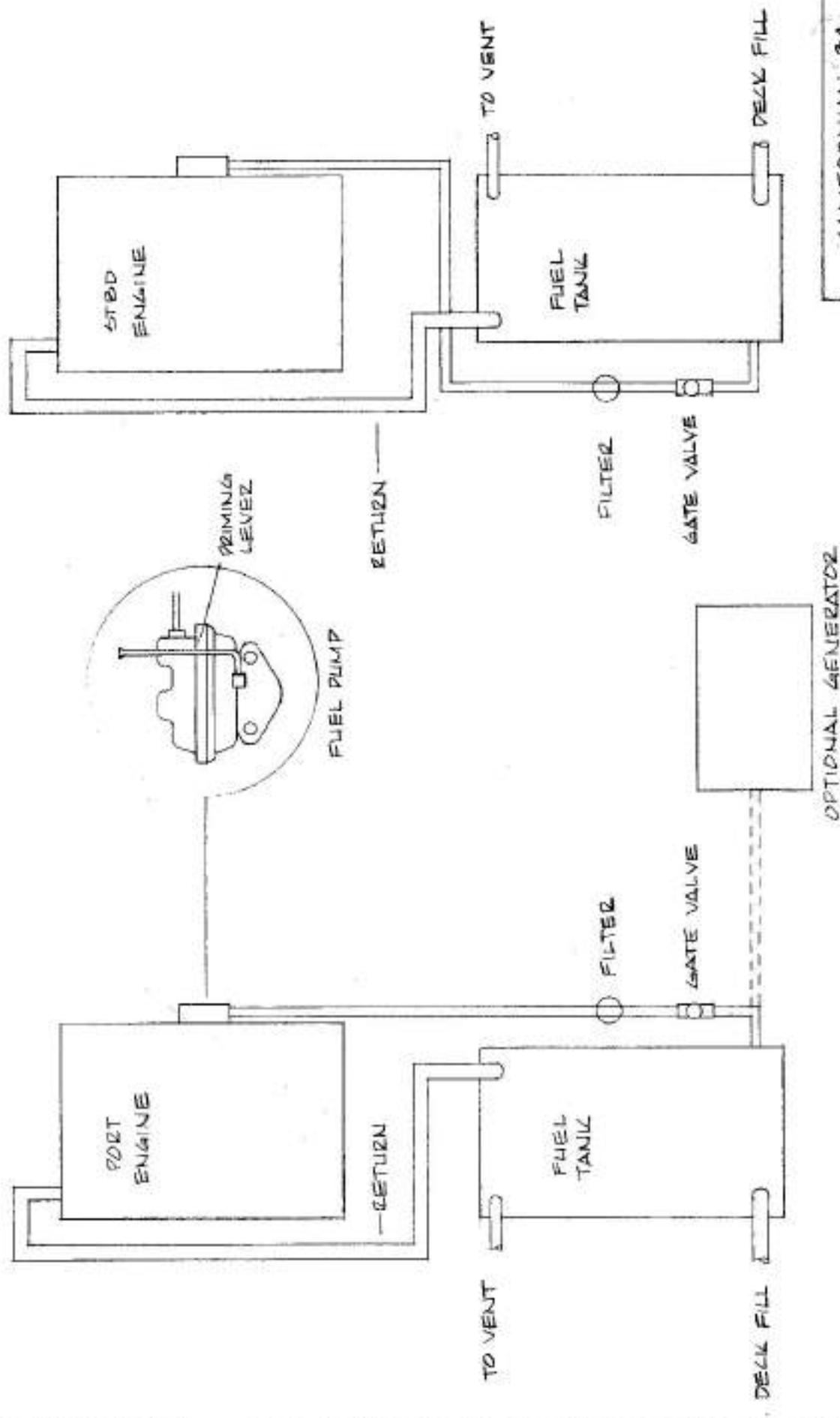
GENERATOR

ENGINE

#3

#4

RETURN



CALIFORNIAN 34
FUEL SYSTEM
 MARSHALL BOAT CO.
 12/2/78
 PAGE 5 OF 5