Challenger Yacht Corporation
1401 Dock Street • Terminal Island, California • (213) 831-8803

# OWNER'S MANUAL

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MESSAGE FROM THE PRESIDENT OF CHALLENGER YACHT CORPORATION

Dear New Challenger Owner:

We realistically, perhaps modestly or immodestly, know that your Challenger is one of the most well-built sailboats being constructed in America today. By well-built, we mean that the finest available quality of wood, fiberglass, fastenings, machinery, plumbing and wiring were used in her construction.

Your Challenger is a complicated, sophisticated piece of equipment that required three major goals be satisfied during her construction and engineering. First, she had to be built to withstand the violence of wind and sea...this we did, "in spades". Second, she had to have the aesthetic workmanship in her construction that would cause you to buy her...and you did. Third, the sophisticated systems that give you the luxury and comfort of a "home", had to be working and dependable...and they are; we know because we thoroughly checked them. Ostensibly then, we've covered all the "bases" and have built the perfect yacht for you but...have we really?

When you first considered buying your Challenger the answer was probably "yes, Challenger is the best". When you actually purchased her it was still "yes". But wait until you've owned and sailed her for a month. You could call us every dirty name your station in life commands and the poor dealer who sold you your Challenger, could suddenly become your personal enemy. Why?

You will discover during this first month of owning this or any new sailboat, that there are some deck or window leaks; that there is sawdust or some workman's screwdriver in the bilge; that there is a scratch on the hull; that a piece of rigging doesn't fit right; and probably that your interior varnish has two runs in it. If you're a highly experienced yachtsman and this is your "nineteenth" new boat, you'll squirt some G.E. Polyseamseal into the leaks, you'll hose down your bilge, you'll repair the hull scratch the next time you haul-out, you will add a toggle to the short piece of rigging or send it back to the factory for a new piece, and you'll touch up the varnish runs when you have a chance. If you've owned several new "cars" but this is your first new boat, you'll scream bloody murder for the "service department" and threaten to sue everyone if your first call doesn't receive immediate response.

Seriously, Challenger stands behind our new boats better, we feel, than any manufacturer does in the U.S. Send us a faulty part that isn't covered by its own manufacturer's warranty and we'll send you a replacement part, immediately and at no charge. THIS APPLIES ANY PLACE IN THE WORLD, AT ANY TIME, EVEN IF THE PART FAILED BECAUSE OF NO FAULT OF OURS, AND AS LONG AS YOU OWN OUR BOAT! The hull structure of course, carries an unconditional ten year guarantee, no matter who owns her. Yes, your

Challenger is covered in warranty by a written guarantee but more important, we morally believe in our products and we conscientiously go beyond the written statement with honest support for her, and when you really need it. We don't however, have a General Motors type "service department". We know there will be bugs in your new Challenger and we hope we've covered most of them in our Owner's Manual, or that the manufacturers information on parts we installed will explain how to deal with them. Yes, you will have several minor but irritating problems with ours or any new boat, that at times will tax your patience. Buy yourself some simple hand tools, put on your old denims and start putting check offs on the list of new-boat problems you're sure to compile. Ask your dealer for advice and consider that "you must become a seaman sometime". Correct the small problems yourself with the least fuss and bother and you'll know your boat better, you'll have the friendliness and cooperation of your dealer always, and we at the factory will respect you as a yachtsman. If there is a real problem, then call on us or your dealer for sure...we're here to help, when and if you really do need us.

I look forward to a pleasant and long term relationship between you and the factory and I hope that you receive as much pleasure from your new Challenger, as we here at the factory took pride in building her.

Good sailing,

Howard D. Stern
President

Note: Due to present and projected materials shortages, we do not guarantee that materials described herein or pictured in the brochures, were used in the construction of your boat. However Challenger as always, does use the best materials available, and we know that your boat is the quality product you expect from us.

1. GENERAL

Your Challenger Yacht has been carefully designed and constructed to offer the best standard of value in the industry. Please read the following instructions so that you will be able to take fullest advantage of her features. Keep in mind that in the final analysis, it is your ability to understand, maintain and use your Challenger in a seamanlike manner, that will give you the greatest happiness and utility from owning her. The umbilical cord between manufacturer, dealer and yourself is severed when you take posession of your new yacht, except in an area called "warranty", which you'll find generally deals with the very least important areas of long term ownership of a fine sailing yacht.

2. EQUIPMENT LIST

When your Challenger is delivered, your detailed equipment description is contained on your original Dealer Purchase Order. You should carefully check off each item of equipment that has been supplied against this Purchase Order. Retain this list for future reference. The Challenger brochure describing your boat should be carefully reread and retained to further familiarize you with your own Challenger.

3. MANUFACTURER INSTRUCTIONS

Read all manufacturers instructions for the equipment aboard your new Challenger. Be thoroughly familiar with the operation of all equipment. Maintain the equipment as specified in the instructions. This applies particularly to the engine. Nothing on whose function you depend should be neglected. ALL EQUIPMENT ON BOARD REQUIRES SERVICING, MAINTENANCE AND OCCASIONAL ADJUSTMENT. DO NOT ATTEMPT TO USE SUCH EQUIPMENT UNTIL AFTER YOU HAVE READ INSTRUCTIONS CAREFULLY AND THOROUGHLY.

All manufacturers instructions for your Challenger will be in a large envelope placed inside the boat. All equipment not manufactured by Challenger carries its own guarantee and replacement equipment or parts are ordered directly from the equipment manufacturer. Instructions and warranty papers include manufacturer's directions for returning faulty parts or equipment to them.

## 4. OWNERS CERTIFICATE

OWNER'S NAME _____

ADDRESS _____

_____

TELEPHONE _____

NAME OF YACHT _____

REGISTRATION/DOCUMENTATION NUMBER _____

CHALLENGER _____: HULL NUMBER _____

DATE YACHT ACQUIRED _____

DEALER FROM WHOM YACHT WAS PURCHASED:

_____

_____

_____

Complete this document and mail to factory IMMEDIATELY upon receipt of your Challenger to activate the Warranty. Date above must coinside with date of delivery of Yacht to dealer from factory.

MAIL TO:
Department S-1
Challenger Yacht Corporation
1401 New Dock Street
Terminal Island, California 90731

## 5. COMMISSIONING AND WARRANTY

Every Challenger yacht and the equipment which accompanies it has been carefully tested before departure from the factory. Precautions have been taken to make sure that your boat and the equipment reach you in good condition. Spars and booms have been wrapped. Movable parts have been securely lashed to safeguard them in the over-the-road trip to the launching site and items to be attached and assembled at destination have been tagged or taped for easy identification. (Remove gum from such tape with paint thinner if necessary).

Your new Challenger yacht has also been thoroughly factory tested for water leaks at the deck to hull joint, windows, hatches, handrails, and all deck-fittings and was found to be watertight. It is almost guaranteed however, that after truck shipment some of the fastenings, fittings, and certainly the windows will require resealing. It is also assured that after some hard sailing, your windows, rails, etc. will again develop minor but irritating leaks. You will feel the real joys of "boat ownership", by having to tend to this customary type of maintenance yourself. Boat Life Life-Chaulk or G.E. Polyseamseal are excellent to reseal when it becomes necessary. It is a part of normal maintenance, even on a quality vessel like a Challenger, to expect your boat to work as you own her and for you to make minor adjustments, repairs and attend to minor leaks.

It is the joint responsibility of the commissioning dealer and the new owner to review the boat invoice and to ascertain that all items listed are delivered. HAVE YOUR DEALER "WALK YOU THROUGH" ALL SYSTEMS ON YOUR BOAT AND EXPLAIN THEIR COMPONENT PARTS AND FUNCTIONING.

Challenger's ten year warranty covering all new boat hulls is thoroughly explained in your Warranty Agreement inside the Brochure. Please study the terms of the entire Warranty. Fill out the Owner's Certificate herein, then sign and return it to us to activate the Warranty Claim Procedure below, as all warranty work must go through your local dealer and will be honored by the factory, ONLY if the appropriate procedure is followed.

### WARRANTY CLAIM PROCEDURE

It is important that the procedure listed below be completed step by step by the dealer, BEFORE Challenger will reimburse the dealer for warranty claims:

1. IN CASE OF AN EMERGENCY AT SEA ONLY, call the plant as soon as convenient, at (213) 831-8803, concerning the problem. We may authorize a specific dollar amount to settle that particular type of warranty claim. Collect calls are not accepted.

2. Challenger will not pay any warranty claim unless the work and the amount have been PREVIOUSLY authorized by the plant in writing. It is the dealer's responsibility to secure that written authorization PRIOR TO DOING ANY WORK, or submitting a warranty claim for payment.

3. Challenger will not accept, nor pay any warranty claim submitted by anyone other than an authorized Challenger dealer.

4. All warranty claims must be submitted by the dealer in writing within 30 days of the incident that precipitated such claim.

5. All authorized warranty claims will be paid within 60 days by check or credit memo.

6. The following schedule is the dollar basis on which Challenger pays warranty claims:

   a. Maximum labor rate allowed must not exceed $10.00 per hour.
   b. Materials used, if not supplied by Challenger, will be reimbursed for at their wholesale net cost.
   c. Defective parts manufactured by Challenger will be replaced immediately upon receipt of the defective part by the plant, freight prepaid. If defective part is not returned to plant, a new part will not be sent out by Challenger.

7. Equipment not manufactured by Challenger carry their own warranty and such defective, or non functioning equipment should be returned directly to their manufacturer, not to Challenger.

8. Warranty does not extend to clean-up of any area of any boat, at any time. It is your dealer's responsibility to deliver a clean boat to you but please remember, he sees your yacht as a yachtsman does, not as a "maid" would.

## 6. SPARS RIGGING AND SAIL GEAR

One of the most rewarding activities connected with sailing is tinkering with your boat's rigging and hardware. The best skippers always seem to be looking aloft at the sails and then thinking about new fittings, or new ways of improving old ones. In this way a person acquires a thorough understanding of how and why every piece of sailing equipment works, plus how to repair and maintain it. As sailors, we too are constantly trying to achieve better and easier boat performance, thus the gear that we install is constantly being improved. What we hope to accomplish in this section is to give you the background information for setting up your boat in the beginning, for normal sailing conditions.

When you need more help and information, please consult your local dealer. He is prepared to assist you.

- CAUTION -

When placing new hardware in any position on mast or deck, avoid cutting wires, or striking electrical fixtures.

## STEPPING THE SPARS

First, before stepping the spars, carefully attach the standing rigging to the mast(s) per its labeled designation, INCLUDING ALL HALYARDS and BOOM TOPPING LIFT. Fully open the turnbuckles. Check the mast lights to MAKE SURE they operate. Put mast boot and mast ring on the mast BEFORE stepping it.

Step the mast and connect the turnbuckles to the chainplates. Adjust rigging tension by tightening the turnbuckles.

Do not sail the boat unless all cotter pins and rigging are IN PLACE. WIRE RIGGING WILL STRETCH and for this reason, check the tension on all rigging periodically and adjust as necessary. Occasionally a piece of rigging is sent with a Challenger which is too long or too short. If too long, check first to see if it has been mislabeled by the factory, or if you are trying to install it where it doesn't belong. If it is in fact too long, return it with a corrected measurement to the factory for a replacement. If too short, purchase a toggle at your local marine hardware store and send us the bill. Remember, the rigging WILL STRETCH after use of the boat.

## RUNNING RIGGING

All the running rigging will be labeled and shipped in the rigging box inside the boat. The ends of all running rigging should be whipped or taped to avoid unravelling after continous use.

When the mast is stepped, install the boom on the mast and connect the boom lift from the masthead. Connect the main sheet boom blocks to the main sheet tangs at the center or aft end of the boom and the main sheet deck block to the main sheet deck eye (or main sheet traveller eye, if installed). Lead the main sheet through its blocks and secure, using the cleat on the deck.

After stepping the mizzen mast, you must go up the mast in a boatswains chair to install the triatic stay between the mainmast and mizzen mast.

## ALUMINUM SPARS

The surface of your ALUMINUM SPARS is protected from corrosion by a natural film of aluminum oxide, or the white paint, or the gold paint if you ordered it. Unfortunately, in time, dirt, salt, and chemical contaminants will break through any protective film, causing it to appear grimy, scratched, or unsightly. To prevent adherence of these materials, coat the surface of your spars with a good automotive paste wax or a commercial protective coating. A good hosing with fresh water helps, and ALWAYS keep the halyards tied away from the mast. Besides protecting the aluminum oxide or painted surface, it does away with the din created by halyards slapping against the mast which makes any anchorage sound like a tin can factory.

If the spars are painted at the factory and are either scratched in shipment, or are scratched when the boat is commissioned, a small can of enamel spray paint matched to the mast color will touch-up such scratches effectively. As they weather, the touched-up mast areas will blend in nicely.

Periodically take a trip aloft to check the entire rig. Look for signs of chafe and check all nuts, bolts, screws, cotter keys, blocks, and masthead sheaves. MAKE SURE the spreader tips are well covered with tape or leather to protect the sails from chafe and tearing. Take along a rag and bucket of fresh water to clean the rigging and mast on your way UP. A clean rig means clean sails! On you way DOWN, re-apply whatever protective coating you have decided to use on the mast and your work aloft is done..until the next time!

The halyards, sheets and guys, along with all rope and wire splices, should be carefully checked before and after each sail for wear. Wire rigging must be examined for broken strands and signs of frayed sections. Particularly close scrutiny should be given to those sections which rest on sheaves. When sails are lowered, be especially careful not to pull down hard on the wire halyard. What happens is that the Nicropress thimble, which forms the loop for the dacron halyard tail, is jammed into the masthead sheaves and sheave spacer plates, causing dangerous chafe on the wire and dacron tail. The lines supplied with your boat are Dacron, and have little stretch and wear very well if not abused. Sheets and vangs often lead where they will rub together or chafe on lifelines. By adjusting leads or by applying inexpensive chafing gear, expensive damage may be prevented. When not in use, running rigging should be tied away from the mast or neatly coiled and hung in regular locations where it can readily be found. Frayed ends should be burned and whipped while chafed eye splices may be re-spliced, following the instructions available from Samson Cordage Works, 470 Atlantic Avenue, Boston, Massachusetts, 02210. All blocks, sheaves, turnbuckles, and winches used in conjunction with running rigging should be lubricated periodically with a light grease such as "Lubriplate", or sprayed with a protective film such as "WD-40".

MAST THRU THE DECK SEAL

All Challenger masts are stepped thru to the keel and go through the deck. The following procedure is used for setting the mast collar and sealing the mast at the deck. If you un-step the mast, or for any reason this seal is broken, we recommend that you follow the same procedure using the same material, or materials of equal quality. Make sure you wait long enough for the sealants to properly cure BEFORE you start water testing with a high pressure hose.

1. After a thorough cleaning of the mast, mast collar and deck, use a generous amount of either PRC-7000, Silastic 732, or DuPont Imron sealant between the mast boot and deck. Then screw the mast collar into position using #14 x 1" SS flat head sheet metal screws with finish washers.

2. After the mast is stepped, wedge or pull it into a position so that an equal space is left all the way around between the mast collar and the mast.

3. Inside the boat, close off the bottom of the gap with masking tape. Pour a generous amount of sealant all the way around between the mast and the mast boot before taping off the top of the mast boot.

4. Using Minnesota Mining's #471-2" wide plastic vinyl tape, tape the boot top to the mast. After the sealant cures, remove the masking tape and fit the two piece interior mast trim, using #14 x 2" SS oval head wood screws and finish washers.

5. Check for leaks by using a high pressure hose to spray water around the mast boot. The mast boot's top should extend about 4" above deck.

MAST TUNE

UNDER NO CIRCUMSTANCES SHOULD ANY OF THE RIGGING BE SET UP "BAR TIGHT". FOR ALL SAILING CONDITIONS WE RECOMMEND THAT THE MAST(S) HAVE AN AFT RATE OF ABOUT $10^{o}$ TO $12^{o}$ , WITH THE RIGGING HAND "FIRM". IT IS VERY IMPORTANT THAT A KNOWLEDGEABLE PERSON WHO UNDERSTANDS THIS CONCEPT, OVER-SEES THE INITIAL TUNING OF THE MAST AND RIGGING.

You should be able to stand facing the mast, reach out and pull on any stay and see the mast move in that direction. With a light pull or push by hand at chest height, this dockside starting point will have stays of equal tension with about 1" to 2" of play in the uppers and 2" to 3" of play in the lowers. The backstay and headstay should be of equal tension and have no play in them. With double lowers, the Aft lowers will be looser than the forward lowers by about 1" of play. With intermediate shrouds, the tension should be between that of the uppers and lowers.

The final tuning of the mast should take place while sailing to windward in a medium breeze of 8 to 10 knots. Sighting along the backside of the mast from deck level will indicate what further turnbuckle adjustment needs to be made to the WINDWARD side of the mast. The top of the mast SHOULD NOT "hook" to windward. In a medium breeze the mast should be straight and this is normally accomplished by taking up on the lower shrouds. ALWAYS TACK, and then make the turnbuckle adjustments on the new, windward side, for further correction. After a few tacks, the mast should be straight!

Remember, THERE WILL BE additional stretch of the rigging, especially after the first sail in a strong breeze. In windy conditions it is actually desirable to have the mast a smooth, even curve from head to deck. The intermediates play an important part in controlling the upper mast section and this will be especially noticeable in stronger wind conditions. After a few more sails in strong breezes, the rigging should be checked again for tune as stretch will occur for several months. A mast need not be tight in the mast hole thru the deck. Some slack for movement adds strength to your stick in heavy winds.

## CARE OF RIGGING

Salt water will gradually stiffen Dacron line. Hosing with fresh water or soaking in warm soapy water will make the line soft and flexible again. Always keep lines stowed systematically and ready for immediate use. The threads on turnbuckles should be kept greased so that they can be turned freely when adjustment is required. A plastic boot over the turnbuckles will keep the lubricant on the turnbuckle and off anything else; this will also eliminate the need for chafe tape.

Why is my stainless steel rusting? Basically it is a galvanic action and you can prevent it with a cleaning rag. If you keep the stainless hardware on your boat free of marine growth and polished, it will last longer and look better. Saltwater sailors must hose off with fresh water after a hard, wet sail; and a rub down with a chamois helps. For a complete explanation on stainless steel in non-technical language, read John Fisher's non-technical language in an excellent article in the January, 1972 "Boating" magazine.

## BACKSTAYS

TOO MUCH TENSION ON THE BACKSTAY IS PROBABLY THE PRIME REASON FOR MAST AND RIGGING FAILURE. It has been found that tension in the backstay can increase 150% to 200% due to the wind load on the headsail and dynamic loading due to heavy seas. Tension can easily be applied far beyond that which is necessary or safe. The tension on a shroud or stay should not exceed 25% to 30% of the cable's breaking strength at the outside limit. Below are the breaking strengths, in pounds, for 1 x 19 stainless steel wire cable as supplied by the factory:

| | | |
|---|---|---|
| 3/32" = 1,200 | 3/16" = 4,700 | 9/32" = 10,300 |
| 1/8 " = 2,100 | 7/32" = 6,300 | 5/16" = 12,500 |
| 5/32" = 3,300 | 1/4 " = 8,200 | 3/8 " - 17,500 |

## GENOA GEAR

The trend in modern yacht design has been to smaller mainsails and larger jibs or "Genoas". Usually any sail that overlaps the mast is considered a Genoa and is identified by the amount of this overlap. Thus, if the distance from the face of the mast to the bow ("J" on the sail plan) is 10 feet and a line 15 feet distant (LP was drawn parallel to the headstay) then any Genoa with a clew on that line, would be a "150% Genoa". What is extremely important to realize is that these large sails can concentrate very high loads. For example: in 25 knots of wind, a Genoa is subjected to a pressure of about 4 pounds per square foot, or ONE TON for a 500 square foot Genoa. Hence, the gear must have high-safe working loads.

Since the above load could easily be transmitted to one spot at any given time, ALL of the Genoa Gear has been designed and prepared to accept those extreme loads. The track is thru bolted and all blocks are oversize. All other fittings are of the best possible design and strength FOR THE JOB INTENDED. Most fitting failures occur from improper usage, usually by

trying to use a light or cheap fitting instead of the proper factory recommended one. If loads are expected to come close to the SAFE WORKING LOAD of the block, then the next size larger MUST BE USED. Please remember that if a line turns back on itself, then the load on that block is almost DOUBLED.

JIB ROLLER FURLING

This optional item is described here to draw your attention to the fact that the factory installed Jib Roller Furling IS NOT DESIGNED FOR REEFING THE JIB. Experience has shown that the jib will have a poor shape and can be badly stretched out of shape and torn, if an attempt is made to use it partially furled. What we have here is a convenient way to quickly furl ANY HEADSAIL from the cockpit. It is extremely important that when the jib is hoisted, IT SHOULD NOT BE HANKED ONTO THE STAY. Only the upper strap should be around the headstay. This prevents the halyard from twisting and also gives a fair lead into the jib halyard block.

BOOM VANG

A boom vang will hold the boom horizontal when off the wind, thus keeping the mainsail flat and from bouncing around in light winds and/or a chop. The factory installed boom vang if ordered, is rigged from the boom to a bail at the base of the mast so it does not have to be removed when gybing. This is an added safety feature, since if an accidental gybe were to take place, the boom would swing over without lifting up and allowing the leech of the mainsail to catch on the leeward spreader. Keep the boom vang slack when going to weather and when on the wind, set it up tight enough to flatten the mainsail without allowing the leech to "cup" or "hook" inwards.

7. CHOICE OF SAILS

The traditional "starter set" is a mainsail and working jib. In place of the working jib, some skippers prefer a #3 genoa which is a slightly larger sail and more likely to be appropriate in sailing areas where moderate winds predominate. A #1 or 150% genoa, generally one of the largest genoas used is strongly recommended for inclusion in any basic equipment list, except in sailing areas where moderate to strong winds can be counted on. Challengers are stiff boats and usually can carry larger headsails than other boats of comparable size, in equal wind conditions.

CARE OF SAILS

Sails should be folded for storage whenever possible. If you leave the mainsail on the boom, always remove the battens and then flake it down carefully, with one person at each end of the sail so that the flakes are smooth and wrinkle free before putting on the sail cover. Proper folding will help keep wrinkles out of sails and will prolong the life of the chemical fillers in the cloth which hold stretch to a minimum.

On a long cruise it is sometimes difficult to fold large headsails, so just stuff them loosely into their sail bags. After the cruise, one of the first jobs is to wash off any salt water, dry the sails and then fold these headsails by flaking them down in alternate folds, starting with the foot, with creases running parallel to the foot.

Once each year, spread the sail on a soft surface, such as a good lawn, and go over it lightly with a very mild detergent and a very soft brush. Pay attention to your sails and if any tears, rips, or worn spots appear on the corners, slides, or headboard, or stitching begins to chafe or has been caught and pulled to pucker the sail, make a note of the damage and its location. Many small tears and worn spots can be covered with tape until it is convenient to take the sail to a sailmaker for a professional repair job. (Non-porous white Johnson's adhesive tape is good.) Any rip at the edge of the sail, such as at the leech or foot of a genoa, must be fixed immediately. Tears here can spread quickly through the entire sail. Small holes in spinnakers can be covered with "Ripstop" and sewn until it is convenient to deliver to the sailmaker for a proper repair job.

## 8. PLUMBING SYSTEMS

We have attempted to keep your plumbing system as simple as possible, especially where thru-hull fittings are concerned. Whenever possible, water discharge is above the waterline. You should become quite familiar with this system and constantly check it to keep fresh water in your tanks and sea water outside of your hull.

In areas where below freezing temperatures are anticipated, the ENTIRE PLUMBING SYSTEM MUST BE DRAINED. It is extremely important for about one quart of a "permanent type" anti-freeze to be pumped into the ENTIRE MARINE TOILET. This is accomplished by removing the hose intake and pumping the anti-freeze through the system until it starts to run out the thru-hull opening. The thru-hull is now closed, the intake hose is reattached, and your marine toilet has been "winterized" until recommissioning. The addition of anti-freeze would be a good practice with other accessories, where water may sit or collect during a freeze.

### THRU-HULLS AND THRU-HULL VALVES

All below the waterline thru-hull fittings are equipped with GATE VALVES. These valves turn CLOCKWISE to CLOSE and COUNTER CLOCKWISE to OPEN. When leaving your boat for extended periods of time, safe practice dictates closing ALL of the valves EXCEPT those for the COCKPIT SCUPPERS. Periodically open and close all valves to make sure they are working properly. At this time, check all hose clamps that might be getting loose and replace any defective hose as well. It is a good idea to open any GATE VALVE all the way and then close the valve a quarter turn. In this manner, anyone can immediately tell if a valve is open or not. Open valves are sometimes broken by people trying to pry them further open, thinking they are closed. WE CANNOT OVER-EMPHASIZE THE IMPORTANCE OF THESE FITTINGS AND THEIR CARE.

We also suggest you tag all thru-hull valves with their purpose after familiarizing yourself with your Challenger.

When the boat is hauled each year, all valves should be lubricated with water pump grease. If this is not done, THEY WILL BECOME INOPERATIVE.

Check the condition of hoses and connections especially when you first take possession of your Challenger. Vibration from shipping OFTEN work loose clamps, hoses, valves, or plumbing fittings.

MARINE TOILET

DO NOT ATTEMPT TO OPERATE TOILET WITH VALVES CLOSED. Valves may be left open when persons are aboard but should be closed at other times because the toilet is an open loop and a failure of the toilet check valve could flood the boat. Operating the toilet is simple but guests should receive instructions when they board. After several months in the water, calcium deposits will gather on the salt water pickup outside the hull and such calcium should be chipped away. If this isn't done, salt water will not flow into toilet bowl for flushing.

AFTER USING

Raise lever and pump until bowl is cleaned. Continue with at least 15 more full strokes to flush discharge anti-syphon loop. Depress lever and pump slowly until bowl is empty. The Y valve under the heads' sink compartment will allow refuse into your Holding Tank if you have ordered one, instead of allowing the refuse to go overboard.

IMPORTANT

WHEN NOT IN USE, LEVER ON HEAD OUTBOARD OF PUMP HANDLE MUST BE LEFT IN DEPRESSED POSITION TO PREVENT FLOODING OF BOAT. WHEN LEAVING BOAT FOR AN EXTENDED PERIOD, IT IS ADVISABLE TO CLOSE BOTH THIS AND THE THRU-HULL VALVE. DO NOT PUT ANYTHING THAT HASN'T BEEN "EATEN FIRST" INTO THE TOILET BOWL, AS THE VALVES CAN BE EASILY PLUGGED.

Periodically add a small amount of liquid detergent and pump it through the system to lubricate the internal valve mechanism.

HOLDING TANK

The optional Holding Tank is pumped overboard by depressing the "macerator" switch on your electric panel. When you hear the macerator motor sporadically whine, your holding tank is empty. A periodic filling and emptying of the holding tank with fresh water thru the "Deck Siphon" will keep it cleaner. If you let the macerator pump continue to whine, it will quickly burn itself out. The holding tank may also be emptied by sucking out the refuse thru the "deck siphon."

GALLEY SINK

The stainless steel sink drains to a thru-hull directly below, with its own gate valve. In hard sailing conditions, when the boat is heeled and the sink is on the LEE SIDE, keep this valve CLOSED, or the sink may fill and water could be splashed into the interior.

ICE BOX

Your ice box is insulated with a foamed-in-place layer of polyurethane foam and should retain low temperatures over extended periods of time. SINCE THE ICE BOX DRAINS INTO THE BILGE, IT IS ADVISABLE TO CHECK THE BILGE BEFORE AND AFTER ALL OUTINGS.

MARINE REFRIGERATOR/FREEZER

The constant amp drain on these units is low but each time a door is opened, the "start-up" drain is high. So, open the doors as seldom as possible. The refrigerator/freezer automatically will switch over to 110 Volt A.C. if your Shore Power is plugged in, and you have a Battery Charger aboard, and the 110 switch is on, on your electric panel. Otherwise, the units operate automatically from your 12 Volt Batteries, i.e., at sea. CAREFULLY read the instruction booklet in the unit and the unit will give you long, trouble-free service. NEVER use a sharp instrument to back out the ice cube trays, should they be difficult to remove. One puncture in the wall of the tray compartment will release all of the freon in the unit and you then can throw the entire refrigerator away. Clean the inside of the unit with baking soda; NEVER harsh chemicals. These are marine units and will operate up to a 30° angle of heel.

HEAD SINK

The situation here is the same as the GALLEY SINK, EXCEPT that the Marine Toilet intake VALVE must be open for drainage.

FRESH WATER TANKS

Water tanks used on Challenger yachts are high impact linear polyurethene. There is no "taste" in these tanks' construction. If water is left for long periods in any tank however, it will become stale. For this reason, any water remaining in the tanks for long periods should be pumped out.

Tanks are best cleaned by filling with a solution of baking soda and leaving overnight. After cleaning, flush out with fresh water. Please note that when your boat is delivered, there will be no water aboard. The switch on your electric panel marked "fresh water", must be depressed before your optional Pressure Water System will operate. There is a "Y" valve at your pressure water pump, which when the lever is raised will empty the aft water tank; when it is depressed it will empty the forward water tank and when it is in the center, will draw water from both tanks simultaneously into your water system.

Your tanks should be good for the life of the boat, whereas your plumbing hoses will require replacement periodically and should be checked for leaks at the end of each season.

Care must be taken so that the AIR VENT in the transom is not plugged, or it will be impossible to pump water from any tank.

When an Optional additional Fresh Water Tank is installed as suggested above, it will normally be located under the forward berths or under the cockpit. The same type fill-cap fills both tanks and the same transom vent vents both tanks. Where the discharge lines for the two tanks come together, there will be a "T". Normally the forward tank would be kept empty except when fitted for periods of extended living aboard. If there is a forward tank, usually it will empty FIRST. IF YOUR TANKS ARE COMPLETELY EMPTY, BE SURE TO TURN OFF "FRESH WATER" ON YOUR ELECTRICAL PANEL, OR THE WATER PRESSURE SYSTEM WILL KEEP PUMPING UNTIL THE PUMP BURNS ITSELF OUT.

FRESH WATER HAND PUMP AND SINK

This high output, lever-type hand pump has a ball check valve to hold the vacuum on the return stroke. If the pump fails to operate after three or four strokes, first check the water tank and the air vent hole in the transom. Tank FULL and vent CLEAR? If difficulty is still experienced, disconnect the intake hose at the pump and blow through to the tank to clear any possible blockage. Also check the hose, as it could be kinked or have some heavy object squashing it closed. If the hose is clear and the pump still does not deliver water, disassemble the PUMP AND LOOK FOR PARTICLES BLOCKING THE INTERNAL CHECK VALVE. Follow the same procedure with the optional Pressure Water System, if that system isn't working.

BILGE PUMPS: MANUAL & ELECTRIC

Every boat should be equipped with at least one MANUAL BILGE PUMP, if for no other reason than to get rid of melted ice water. If you have this optional pump it is normally mounted in the starboard side of the cockpit. Just put the handle in and pump!

This pump is mounted to be operable with all cockpit seats and hatches and all cabin hatches and companionways closed. The pump must be operable from the cockpit and this makes sense for ocean cruising. With a boat load of water, and more expected at any moment, you don't want to be opening hatches, or trying to get below to operate a bilge pump!

The factory installed optional AUTOMATIC ELECTRIC BILGE PUMP is connected to a switch on your Electric Control Panel, which in turn is connected to its own Float Switch in the bilge. In order to have your Electric Bilge Pump operate AUTOMATICALLY, neither your Master Switch, nor the Accessory "Bilge Pump" Switch need be "on" but water in the bilge must be high enough to raise the float more than two inches. The PUMP works manually also, by depressing the switch on the electric panel.

This is probably the most important safety device you could have on board, for as long as the battery is charged, excess bilge water will automatically be pumped overboard.

All factory installed bilge pumps have the pick-up hose strainer base secured to the bilge. There is an inspection plate above this strainer for access because it easily becomes clogged and needs cleaning, especially when the boat is new. Also note that the pick-up line is a wire reinforced, or 4-ply neoprene hose, to prevent collapsing caused by the suction action of the pump. Clear plastic hose is used for the discharge line. The pick-up in the bilge must be cleaned quite OFTEN, or the Automatic Bilge Pump WILL NOT OPERATE.

HOT AND COLD PRESSURE WATER SYSTEM WITH SHOWER

This hot water system is operated either by running the inboard engine, or on 110 Volt A.C. Shore Power. You will note there is a plug on the hot water tank which must be plugged into the mating connector, which connects it to the INTERNAL 110 Volt A.C. system, through a circuit breaker on the Accessory Control Panel marked "WATER HEATER".

DO NOT TURN SWITCH "ON" UNLESS THERE IS WATER IN THE SYSTEM, AS THE HEATING ELEMENT WILL BE BURNED OUT IF THE TANK IS EMPTY.

When filling the system for the first time, or refilling an empty system, you will have to bleed the air out of ALL WATER LINES. This is accomplished in the following manner:

1. Fill water tanks and turn ON ship's electrical system.
2. Turn ON the PRESSURE PUMP by activating the switch on the Electrical Control Panel.
3. Starting at the Galley Sink, turn ON the HOT WATER FAUCET. Expect nothing but air for the first few minutes as the Hot Water Heater must be filled before water will flow from the faucet.
4. As the Water Heater approaches full, water will start to pop and spurt from the faucet. Turn the FAUCET OFF.
5. Now turn the faucet ON and OFF slowly, with one hand under the spout. This will keep water from splashing about while the last bit of air is being removed from the heater and the galley sink hot water lines.
6. When a solid stream of water is flowing from the spout, turn the faucet OFF. The pressure pump will continue to run, and upon reaching about 25 psi will automatically shut off.
7. Now repeat this same procedure for the Galley Sink Cold Water Faucet, both faucets in the Head, and the Shower.
8. The system is now completely primed so top off the water tanks to replace the water that is now in the system.

The PRESSURE PUMP is a 12 Volt D.C. unit that will start automatically when the pressure drops to 18 psi and will continue running until the pressure has been brought up to 25 psi. If the pump starts running wild,

your problem is:

1. Out of Water - - - - Fill system or switch Tanks at Y-valve
2. Leak in Lines - - - - Check plumbing and hose clamps
3. Air Lock - - - - Bleed system and check filters

Heat up time with ELECTRICITY will take about an hour from 110v power and with engine water temperature at 180 F., about two hours.

Note that the SHOWER drains into the bilge and the AUTOMATIC BILGE PUMP automatically pumps it overboard. This will serve as the shower sump unless there is a special switch mounted adjacent to the shower for this purpose.

9. BASIC CIRCUIT BREAKER ELECTRICAL SYSTEM

The Master Power Control Panel features integrated, simplified controls and circuit breaker protection to permit safe and efficient operation of your boat's electrical equipment. All panel components have been carefully selected for their proven performance in marine applications. The basic panel is of a bakelite plastic which is inherently corrosion resistant and is doubly protected to optimize resistance to the effects of the marine environment.

Electrical current is directed from a 12 volt, 105 amp (210 amp for diesel) battery or batteries, through the Master Power Control Panel for engine starting, battery charging, and accessory loads.

While the standard installation is one battery, many owners do considerable cruising and "living aboard", so a second battery may be added to meet these additional electrical requirements. Panel selection of "BAT 1" or "BAT 2" determines which of the two batteries will be utilized for engine starting and subsequent charging. The battery is charged by the alternator on the engine. The Shore Power, when ordered, is connected directly to the Battery Charger thru the shore plug connector. DO NOT CONNECT ADDITIONAL 115 V. EQUIPMENT TO THE SYSTEM. Do not disconnect the battery when running an engine equipped with an alternator, since this will damage the diodes on the alternator. The fuses that protect all circuits are easily replaceable without tools. Spare fuses and bulbs should be on board at all times.

When a dual battery system is installed, the engine runs off one battery; cabin lights and all accessories run off the other. The result is that the engine starting battery is always ready for use, regardless of the drain imposed by cabin lights, etc. when cruising. Battery selection is by means of the Selector Switch on the electrical panel, which automatically connects the two battery systems, ONLY when the engine alternator is charging, or when the Battery Charger is on. If "all" is switched to on your electric panel, both battery banks are discharging against whatever drain of power is in use.

## OPERATION OF CIRCUIT BREAKER ELECTRICAL SYSTEM

Accessory loads may be selected as desired by indexing the appropriate panel breakers "ON", so current may flow from the switched battery to the accessory. A branch circuit overload will cause the accessory 110v circuit breaker to "trip", i.e., the breaker will automatically open the circuit and its handle will flip to the "OFF" position. After correction of the fault, the breaker may be manually indexed "ON". If fuses keep blowing out on the 12 volt switches, either your load on the fuse is too great, or there is a short in that circuit.

## 110 VOLT SHORE POWER

When a shore power cord is plugged into your optional Shore Power plug in the cockpit, a Circuit Breaker Switch on your Electrical Panel brings 110 volt AC current to the duplex outlets below. If there is any short or improper connection in the system, the Circuit Breaker Switch will "trip", i.e., the breaker will automatically open the circuit and its handle will flip to the "OFF" position. After correction of the fault, the breaker may be manually indexed "ON" and your 110 volt AC appliances will work again. Be sure that all 110 volt AC appliances, other than lamps, have adequate grounds, or the moist atmosphere and wet feet can really increase the shock potential. We recommend at least a 20 amp shore power cord, when you purchase one. 115v electrical power can be used on a boat for galley stoves, battery charges, water heaters, refrigerators, air conditioning and small appliances.

For safety reasons, the shore power cord should be a three wire connection. All outlets below supplied by Challenger have a grounding receptacle and 110 Volt electrical equipment used is grounded. If you are blowing 110 Volt fuses, it usually is because your dock power supply is inadequate. CHECK IT FIRST to see if you have overloaded it, should the 110 Volt breaker switch turn to "off". (The average dockside available power is only 15 amps - a 110 Volt heater alone takes 12 amps, average.)

Water is heated on a Challenger using a heat exchanger from the engine, or by 110 Volt power, or both.

The RUNNING LIGHTS switch activates the recessed red and green lensed lights forward and the white, 12 point stern light aft. The COMPASS LIGHT connection for the cockpit is also on this switch. When under sail at night, these are the only lights that should be shown, except for the shining of a white light on the sails if you feel there is a real need for greater recognition.

The WHITE STERN LIGHT takes a GE-68 type bulb while a GE-90 bulb should be used for the RED PORT LIGHT and a GE-94 bulb for the GREEN STARBOARD LIGHT. It is important that a stronger bulb be used with the darker lenses, or visibility of the lights will be considerably less than the required one mile.

THE BOW LIGHT switch is for the 20 point white light on the mast and is to be used in conjunction with the running lights WHEN UNDER POWER OR WHEN MOTOR SAILING. It also serves as a quick way of illuminating the jib at night to check its trim and in emergency cases when recognition is important. This light will use a GE-68 bulb if replacement is necessary.

The cabin lights have their own individual switches, but must be activated by the CABIN LIGHT switch on the Master Power Control Panel. The bulb for these round dome incandescent lights is a W-1141. If the cabin lights start getting dim, this is fair warning that the battery needs a charge or is getting old.

Periodically check all wires, connections, and terminals for loose connections which may cause electric sparks or power loss. This is especially important with the engine wires. When leaving the boat, FIRST TURN OFF THE ENGINE, THEN INDEX THE MASTER SWITCH TO OFF! ALWAYS! Most electric wiring may be readily examined by removing the uppermost plank of your cabinside's strip planking.

BATTERY CARE

The batteries on your boat are of the lead acid type and consist of lead plates immersed in a solution of a diluted sulphuric acid. When measured by a hydrometer, the solution in a fully charged battery will have a specific gravity of approximately 1.280. A discharged battery will indicate about 1.150 on a hydrometer. You should never allow your batteries to stand idle in a discharged condition. However, overcharging batteries will also shorten their life.

For these reasons, you MUST check the condition of your batteries periodically using a hydrometer. Charge them as necessary to bring them to a fully charged condition. The batteries on all Challenger yachts are in an accessible location so that this can be done without difficulty. If you remove you batteries, be sure you replace them securely. The separate cell "Lasser" batteries used exclusively in Challengers, allows one to replace a burned out cell without replacing the entire bank of batteries. Extra cells may be obtained from the factory.

OPTIONAL "DIGITAL INDICATOR PANEL" WITH BATTERY CONDITION INDICATOR

This type of "indicator" or "meter" is technically referred to as a "Suppressed Zero Voltmeter". Note that calibrations do not start at zero but provide a full scale reading from red, to yellow, to green, depending on the meter. When in the red, the battery charge is so low that terminal voltage readings are meaningless. Approximate voltage range interpretations are as follows:

Red - - - - - Very low battery charge
Yellow - - - - - Low battery charge
Green - - - - - Well charged battery

It is important for you to understand that the reading on the Battery Condition Indicator Dial is indexed from the TEST SWITCH POSITION, only if the MASTER SWITCH is on. When the Master Switch is in the "Both" position, then the Battery Condition Indicator Dial will indicate BOTH BATTERY CONDITIONS. When the Master Switch is in either the "Off" "BAT 1" or "BAT 2" position, the meter will read the condition of the battery TOWARDS which you index the Test Switch.

The black readout panel will light up on the Digital Indicator Panel showing "E", "1/4", and "1/2", or on earlier Panels, "E", "1/4", "1/2", "3/4", and "F". When the appropriate switch is depressed under this black readout panel (and your Master Switch is "ON"), the last level in the line of lit numbers, indicates the level of that tank. On certain units, "1/2" shows that the tank is "full". On other units "3/4" or "F" indicates "full". As you become accustomed to your own boat, you will recognize which reading means "full" on your boat. There is a small sensor inside each tank in your boat which when agitated, shorts the circuit in effect and causes the panel to light appropriately. The Holding Tank however, often gets refuse stuck on the sensor which causes a "full" reading when in fact, the tank is less than full. Flushing the Holding Tank with fresh water thru the deck siphon, often frees the sensor of refuse. If you hear the macerator whining sporadically, YOUR HOLDING TANK IS EMPTY, NO MATTER WHAT THE DIGITAL INDICATOR PANEL INDICATES IS THE LEVEL OF THAT TANK...WHEN THE MOTOR "WHINES", IT IS BURNING OUT.

Before you call the factory for a new Digital Indicator Panel because yours doesn't register correctly, get accustomed to the Panel in your boat. It is seldom that the Panel ever needs replacement, but rather, needs familiarization with its operation.

MASTER SWITCH (on the Electrical Panel)

Check the condition of both batteries, then select the STRONGEST BATTERY FOR ENGINE STARTING. Index the Master Switch to the strong battery, (operate the BLOWER FOR FIVE MINUTES if a gas engine) and then start your engine. If you have a diesel engine, LEAVE THE BLOWER ON WHILE THE ENGINE IS RUNNING. It will usually require about 15 to 30 minutes of engine running time to bring the starting battery back up to charge. Check the ammeter in the cockpit to assure that charging is normal and when the selected starting battery has been restored, it is placed on reserve by switching to the other battery so subsequent charging and assessory loads will be confined to this second battery. It is a GOOD PRACTICE TO BRING THE FIRST SELECTED BATTERY UP TO FULL CHARGE BEFORE PUTTING IT ON RESERVE AND CHANGING TO THE SECOND BATTERY.

Use the Master Switch in "BOTH" position ONLY for emergency starting when both batteries are low, or for "top off" charging when both batteries are near full charge. When both batteries are completely charged, transfer to either battery, keeping one battery always in reserve. This is especially important when you realize that there is no way to start your inboard engine with a dead battery.

NEVER MOVE THE MASTER SWITCH TO "OFF" WHILE THE ENGINE IS RUNNING OR THE ALTERNATOR DIODES WILL BE BURNED OUT.

LIGHTNING GROUND

If optional lightning protection has been provided, it will consist of #8 - 9 x 21 stranded wire connecting the uppers, headstay, or backstay, or backstay chainplates to a common point on the keel.

MAST HEAD LIGHT

This 32 point white light meets the international and inland rules for a light to be used when at anchor. It has a GE-68 bulb and would be activated by the masthead light switch.

SIX CONDUCTOR WIRE IN MAST

These EXTREMELY LIGHT OPTIONAL INSTRUMENT WIRES are run only for wind guides, annometers, and other mast head instruments that have a low power drain and ARE NOT TO BE USED FOR LIGHTS OF ANY TYPE. On the larger masts, these wires will be run through a 3/4" PVC pipe.

SPREADER LIGHTS

When optional Spreader Lights are installed at the factory, they are mounted on the aluminum spreaders. The light for each unit is a 4" diameter sealed beam type GE-4411 and is activated by the SPREADER LIGHT switch on the Master Control Panel.

BATTERY CHARGER

At present, the optional battery charger we install is manufactured by LEWCO Electronics, 456 No. Newport Blvd., Newport Beach, Ca., 92660, and carries a one-year guarantee by the manufacturer. This silicon diode automatic battery charger has been especially designed for marine use in converting A.C. to D.C. current. The transformers in this unit incorporate isolated primary and secondary coils to prevent electrolysis and eliminate shock on the charging lines. Both the A.C. input and the D.C. output are fused for safety, while blowers or fans have been completely eliminated - thus eliminating any excessive servicing. DO NOT SET THE DIAL ON THE CHARGER ABOVE #2 OR YOU MAY "COOK" or BOIL OUT YOUR BATTERIES. Carefully read the directions with the Battery Charger, BEFORE using it.

10. PEDESTAL STEERING

The pedestal on the optional factory installed Pedestal Steering unit is cast from a corrosion resistant alumunum which is then anodized, primed, and painted with a gloss white polyurethane enamel. All other metal parts are stainless steel or manganese bronze, thus removing any magnetic attraction from around the binnacle mounted compass, which should be adjusted by a PROFESSIONAL. Know which are the adjusting screws on the compass and then DON'T move them after they have been set. Your compass has NOT been swung, when you receive your Challenger from the factory.

The Pedestal Steering unit is virtually maintenance free but prior to your first sail, climb down below and check out the entire installation.

With someone turning the wheel from stop to stop, make sure the cables are leading properly and EVERYTHING is tightened down. Next, sea trials are in order. Check for leaks at the packing gland where the rudder post tube has been cut away to allow for the installation of the quadrant. Now look for freedom of travel in the system and the cable tension. A MODERATE amount, enough to eliminate "backlast" or "play", is recommended, as excessive tension creates added friction and makes for harder steering.

Periodically check for loosened sheaves and cable tension, especially after the first few sails. They usually need tightening, as the roller cabin seats in. Look for signs of wear or "fish hooks" on the cable and replace as necessary. Three or four times a year, depending upon the frequency of use of the boat, lightly oil the chain, pedestal shaft bearings, and sheave bearings with 3-in-one oil to complete your maintenance routine.

11. ENGINES, SHAFTS, ETC.
SAFE FUELING PRACTICES (GASOLINE)

1. Avoid fueling a boat at night or in rough water, except in an emergency.

2. Calculate the desired amount of fuel before reaching the fuel dock and order only that amount. FUEL TANKS SHOULD NOT BE FILLED TO MORE THAN 90% OF CAPACITY, TO PERMIT THERMAL EXPANSION WITHOUT OVERFLOW FROM VENT.

3. Before opening the fuel filling pipe inlet:

   a. Extinguish all open flames aboard, including galley equipment.
   b. Forbid all smoking on board or on the fuel dock. Drown all butts.
   c. Turn OFF the main switch and all branch circuit switches to be sure there is no live electrical circuit on board during fueling. (Do not turn OFF the main switch until the engine is stopped, to avoid damage to the alternator.)
   d. Tightly close all hatches, windows, doors, and ports.

4. Watch the fueling closely. Be sure that only a non-automatic, latch-open type of nozzle is used, compelling the operator's continuous hand pressure to keep fuel flowing, and that only the ordered quantity of fuel is put aboard. Insure that the operator maintains constant contact of nozzle to fill pipe.

5. When the desired quantity of fuel has been put aboard, make sure that the cap closing the inlet is tightly closed. Wash down any spills. Check the vent opening on the transom, to be sure that no fuel is being discharged at this point.

6. Open wide all hatches, doors, windows and ports.

7. If the boat is equipped with electrically operated bilge blowers, turn ON the branch circuit switches which control the circuits to these devices and then turn ON the main switch. Permit blower to operate for at least five minutes and check the ventilation cowls for odor of gasoline vapors being discharged.

8. If the boat is not blower equipped, wait at least ten minutes and check for gasoline odors in all low spaces of the boat.

9. When your personal inspection and observation assure you that there are no gasoline fumes remaining in the boat, the engine may be started and full electric service restored as desired.

IF IN DOUBT, WAIT !

For a diesel engine installation, #1, #2, #3, #4, #5 and #6 above, are applicable.

PROPELLER SHAFT ALIGNMENT

It is most important that shaft alignment be carefully checked at the time of launching by the selling dealer. The shaft and engine were carefully aligned at the factory but loading, trucking, and off loading are guaranteed to spoil this work, as will the different set the hull may take in the water. This misalignment may also occur several times after you have owned the boat and the following simple method is used to check and realign an engine and its propeller shaft.

1. Remove bolts holding the shaft coupling flange to the engine transmission flange and any flexible couplings.

2. Press coupling flanges together and check all around with feeler guages for gaps between them. Zero to nine thousanths (.009) of an inch is tolerable.

3. If a greater gap exists between the top or bottom of the couplings, adjustment can be made by raising or lowering the front or back end of the engine using the adjustable motor mounts.

4. If a greater gap exists between the sides of the couplings, adjustment must be made by slacking off the engine mount lag bolts and prying the engine to one side or the other to close the gap.

5. When tolerance is satisfactory, re-tighten anything that has been slacked off and recheck for excessive gap. If it is still satisfactory, replace bolts in shaft coupling and tighten.

Note: ALIGNMENT OF SHAFT IS NEVER COVERED BY WARRANTY.

PROPELLER SHAFT PACKING GLAND

The Propeller Shaft Packing Gland Nut has been left loose at the factory so that water could thoroughly soak the packing at the time of launching. The Packing Nut should be tightened by your dealer during launching, to eliminate any excessive dripping and the Lock Nut tightened.

When the engine is running and in gear, there should be some drops of water coming out of the gland or else the packing nut is too tight and will burn up.

If the packing needs to be replaced, be sure you get SQUARE CUT WAX IMPREGNATED FLAX PACKING and that it is NOT WOUND AROUND THE SHAFT but cut to form three single rings which are "stacked" on the shaft so that the cuts are staggered.

FUEL TANKS AND ELECTRIC FUEL GAUGE IN THE COCKPIT

Our steel fuel tanks are mounted ABOVE the keel with their fill cap on deck and vents out the transom. This installation conforms to the recommended practices set down by the American Boat & Yacht Council Project P-2-70. All fuel tanks bear an attached label in accordance with ABYC's P-2-70 recommendations - which states the following:

1. Manufacturer's name or trademark.
2. Date of manufacture - month and year.
3. Capacity in gallons.
4. Material of construction and thickness.
5. Fuel for which tank is approved or manufactured.
6. Maximum hydrostatic test pressure.

Each fuel tank has TWO FUEL CUT-OFF VALVES, one located directly on the fuel tank and another located directly on the engine with a fireproof fuel line between. This installation is in accordance with ABYC's P-2-70 recommendations.

When the valve handle is PARALLEL to the fuel line it is OPEN. When the handle is at RIGHT ANGLES it is CLOSED. When not operating the engine, BOTH OF THESE VALVES SHOULD REMAIN CLOSED.

WHEN A DIESEL ENGINE IS ALLOWED TO RUN OUT OF FUEL, AIR GETS INTO THE LINES AND INJECTORS, WHICH MAKES IT IMPOSSIBLE TO RESTART THE ENGINE WITHOUT BLEEDING IT. TO RESTART, SWITCH FROM EMPTY TANK TO FULL TANK AND BLEED PUMP AND INJECTORS IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. THEN RESTART THE ENGINE AND BLEED AGAIN.

CLOSE LEVER VALVES ON BOTH TANKS WHEN LEAVING YOUR BOAT.

The electric Fuel Tank Guage has been adjusted to read EMPTY with THREE gallons of Fuel left in the tank. This has been done by bending the float arm on the sensor so that the float sits on top of the fuel when the electric fuel guage is at the empty mark. You should never let a tank get this low for the obvious safety reasons. A partially filled gas tank can result in water condensation, which is a major cause of sticky valves in a gasoline engine. Fuel additives that reduce water condensation can be added to a gasoline tank regularly for best engine performance.

## STARTING THE ENGINE

When STARTING A GASOLINE INBOARD ENGINE, double check the specific engine manual and "Battery Condition Indicator", then:

1. Index the Master Power Switch to the strongest or starting BATTERY.
2. Run the Blower for five minutes prior to starting the engine.
3. OPEN THE ENGINE WATER INTAKE VALVE.
4. Check oil and fuel levels.
5. SHIFT LEVER IN NEUTRAL POSITION.
6. THROTTLE advanced about 1/4 and CHOKE OUT.
7. Turn on ignition switch/starter button. When engine starts:
8. Gradually PUSH IN CHOKE AND ADJUST THROTTLE TO IDLE.
9. Check OIL PRESSURE. If pressure is LOW, STOP ENGINE and check oil level.
10. If water does not begin to flow out of the TRANSOM OUTLET in 2 or 3 minutes, STOP the engine and check WATER INTAKE VALVE.
11. TURN OFF BLOWER.

The above procedure should be followed when STARTING A DIESEL ENGINE - except that you won't have the BLOWER and CHOKE to contend with, but may have a "cold weather starting" technique explained in the specific engine manual.

## RUNNING THE ENGINE

When SHIFTING into forward or reverse, the engine should not be running at more than at "IDLE".

You will find your best cruising speed between half and three-quarters throttle. In smooth water, higher speeds can be obtained with higher RPM's but fuel consumption will increase accordingly!

## SECURING THE GASOLINE ENGINE

1. Reduce RPM to IDLE, shift into NEUTRAL and turn OFF the ignition switch.

2. CLOSE the fuel shut-off valves and water intake valve.

3. To reduce the drag of a propeller while sailing, the standard, two blade solid prop should have its blades VERTICAL. You should mark and align the PROPELLER SHAFT for its proper sailing position and then shift into forward to lock.

## DIESEL ENGINE SHAFT LOCK

On a diesel engine with a hydraulic shaft, an optional shaft lock must be installed to keep the shaft from rotating. The optional factory installed item has a control handle in the cockpit which must be PULLED FULL OUT AND ROTATED INTO A LOCKED POSITION WHEN NOT IN USE. If this

control handle is released accidentally while the engine is running and in gear, or if someone forgets to pull the handle FULL OUT before starting the engine A LOUD THUMPING NOISE will be heard from the engine compartment. IMMEDIATELY STOP THE ENGINE and pull the handle full out and rotate to its locked position. DO NOT allow this thumping condition to continue as it is a built-in warning device and safety feature indicating the shaft cam is hitting the locking arm. Possible damage could occur if the noise is not recognized immediately and corrective action taken. The engine and shaft must be stopped before engaging the propeller lock. Any additional information should be obtained from the manufacturer of the stop - BIRD ENGINEERING PRODUCTS COMPANY, UPLAND DRIVE, GREENWICH, CONNECTICUT, 06830.

Note: If you do NOT have the shaft lock, YOU MUST RUN the engine for 15 minutes every 6 hours that you cruise under sail alone, or you may burn out your hydraulic transmission.

## WINTERIZATION

Boats with inboard engines that are shipped to areas that have below freezing temperatures, do not yet have the cooling system winterized. There have been some cases of the water pump impellers being damaged by certain coolants so we recommend the following brands, when you do winterize:

| | | |
|---|---|---|
| DOWGUARD | PERMA-STA | SMITH BLUE CO. |
| HUBBARD HALL | PERMAGUARD | TELAR |
| PEAK | ZEREX | PRYO-PERMANENT |

Also, remember that the water tanks, head, and water lines must be drained of water if below freezing temperatures are anticipated.

## VENTILATION

At the present time, major changes in the concepts and requirements for ventilation are being formulated. In order to meet existing safety standards as established by the Motor Boat Act of 1940, two 3" ventilator ducts with cowls and an exhaust blower have been fitted "for the purpose of properly and efficiently ventilating the bilges of every engine compartment. If you wish any additional information on this subject, please consult your local Coast Guard District Office as they will have the latest rulings and interpretations on these regulations.

## GAS ENGINE SUGGESTIONS

Follow the manufacturer's recommendations for winter haulout and spring launching. In addition, check the stuffing box packing before launching each season, and if worn, replace it. CHECK THE ZINE NUT ON YOUR PROPELLER SHAFT EVERY COUPLE OF MONTHS AND REPLACE IT as soon as it shows deterioration, if you wish to avoid electrolysis.

Always check the deck fuel fill for tightness after fueling. All Challengers are fitted with non-sparking fuel fill plates which incorporate a rubber "O" ring to promote a good seal. Fill tank slowly. Do not overfill! Marine fuels expand with an increase in temperature. Therefore, fill to approximately 95% of capacity. If fuel is spilled, secure fill cap and wash deck down thoroughly until all traces of fuel have disappeared. "Regular" fuel is fine. After the vibration to your Challenger caused during the shipping of her to you, fuel connections and clamps may have worked themselves loose. CAREFULLY check all fuel lines, clamps and the bilge for gasoline leaks when you first take posession of your Challenger.

Your engine shaft WILL ALWAYS require realigning when you receive your boat. (This was discussed in an earlier section.)

PERKINS 4-107 or 4-236 DIESEL ENGINE

Both of these diesel engines are four cylinder, four cycle, and fresh water cooled with a 12 volt 45 amp/hour alternator. Note that the 4-107 is INDIRECT injection while the 4-236 is DIRECT injection.

The basic engine is manufactured in England and assembled in the United States, using accessories and parts manufactured here, so no special or metric tools are required to service these engines. The assembled engines are distributed throughout the United States by Perkins Engines, Inc., 2417 Research Drive, Farmington, Michigan 48024. Phone (313) 477-3900. The "Quality Assurance Engine Test Run and Inspection" tag on the engine indicates its condition when it left our factory. Please note that the manufacturer of Perkins Diesel Engines requires that each new engine installation also be checked out in the water at the time of delivery to a customer by one of their local field service engineers in order for their WARRANTY TO BE VALID. A Marine Customer Delivery Report will be executed at this time and a copy will be mailed to you by your nearest Perkins representative, who must also be contacted for all warranty service.

Since these are high speed diesels they must use #2 or amber colored fuel. The hydraulically operated Borg Warner reverse gear box uses a "Type A" hydraulic transmission fluid.

Care must be exercised when "free wheeling" the propeller with the engine out of use, as it will be necessary to run the engine after eight hours of "free wheeling" to lubricate the gear box, as mentioned earlier. The best practice is to center the prop and keep the shaft from rotating with a manual shaft brake. There should be no oil change necessary for the Borg Warner reduction gear as it is an entirely self-contained unit. It is important to check the name plate if there is a V-drive, as one unit may use SAE 30 oil while another could use 90 weight gear oil.

The oil system of the 4-107 will initially take six quarts of SAE 30, while the 4-236 will take eight quarts. This original oil should be replaced after 25 to 50 operating hours with five quarts of SAE 30 in the 4-107 and seven quarts in the 4-236. One quart less is required on

oil changes, which should take place every 50 to 75 running hours, as a quart will remain in the lines at all times and not return to the sump. The disposable paper fuel and oil filters should also be replaced at this time. The oil pressure in a warm engine will run 30 to 50 psi with a minimum of 10 psi at idle.

During the initial break-in period of 25 to 50 operating hours the engine should not be run at over 85% of full load and speed. At the end of this period the engine can be run at maximum revs., but the best cruising speed will be about 1800 to 2200 RPM's or less. At this setting the engine will burn about 1 to 1½ gallons per hour while moving your boat at hull speed in smooth water. Naturally these two figures can only be estimates, as adverse winds and currents, along with the reduction gear and prop size, can produce considerable differences. Both engines are fresh water cooled through a seawater heat exchanger with a thermostat setting of 170° F. and normal operating temperatures from 150° to 200° F.

It is extremely important that the fresh water heat exchanger tank be full to within an inch or two of the top and the cap on tight. Also remember that the FAN BELT SHOULD BE TIGHT AT ALL TIMES. When anti-freeze is added it must be from the recommended list, to avoid possible damage to the water pump impeller.

All other information is contained in the "Handbook for Perkins Diesel Engines", or the more detailed "Workshop Manual", while replacement parts should be ordered directly from Perkins Engines, Ltd., or one of their many local dealers. Please remember to include your engine serial number with any requests. Refer all warranty claims to your local Perkins dealer. Chrysler diesel engines and most other diesel engines installed by Challenger follow much the same principles.

12. CARE OF FIBERGLASS

Challenger's fiberglass does not require any maintenance and will NEVER deteriorate structurally. However the surface of any object exposed to ultra-violet rays and weather will lose its shine and color and the gelcoat on our fiberglass is no exception. To retard this process, we recommend waxing deck and hull surfaces two times per year, with a good grade of car wax containing a U-V "screen". If this is done, the wax will take the brunt of the weathering process and your finish will always look shiny and new. If you do not wax the gelcoat, the surface will develop a chalky appearance.

Minor scratches can be buffed out. Major gouges and voids should be filled with a 2-part automobile body filler, sanded to #600 wet and dry finish and the surface then painted, or gelcoated to match the surrounding area. Crazing occurs on all fiberglass gelcoat and is of no structural meaning. The same method should be employed here, as for scratches.

The gelcoat also should be hosed with fresh water after every outing and routinely washed with a good detergent. Use a sponge on the smooth surfaces, while a stiff deck brush will be helpful on the non-skid

surfaces, followed by more fresh water to avoid streaking the topsides. Do not use abrasive cleaners as they will rapidly dull the gelcoat surface.

A power buffer for that yearly waxing will make work on the large gelcoat areas (like the hull) easier but care must be taken not to cut through the gelcoat surface, particulary at corners and edges. For power cleaning use a LIGHT abrasive cleaner such as Mirror Glaze #1, while a heavier rubbing compound such as DuPont #7 may be used when polishing by hand. After buffing, wax and polish all surfaces EXCEPT THE NON-SKID AREAS.

It is really best to discuss the proper course of action should your gelcoat be damaged, with your local dealer, or a professional who is SKILLED IN THE REPAIR OF FIBERGLASS SAILBOATS. Two excellent books are presently available that will give you the background information necessary to be knowledgeable in this area. "How to Repair Fiberglass Boats" is published by Ferro Corporation, One Erieview Plaza, Cleveland, Ohio 44114 at $3.00. Another more definitive book, "Fiberglass Boats: Construction and Maintenance" by Boughton Cobb, Jr., is available through Yachting Publishing Corporation, 50 West 44th Street, New York, New York 10036, at $3.00. Minor gelcoat touch-up and patching is not difficult. It takes a little study, practice, and if possible, help from a knowledgeable person.

13. RUDDERS, KEELS AND BOTTOM PAINTS

When your boat is not in use, the tiller or wheel should be snugly secured to prevent the rudder from moving. Constant movement of the rudder shaft in the shaft bearings and packing box will result in unnecessary wear and consequently, in excessive play or "slop". Also, a tiller banging around in the cockpit from wave and water action on the rudder, could cause considerable damage. If the rudder action is stiff, a light grease such as "Lubriplate" should be used. Each time the assembly is lubricated, also check for play at the upper and lower ends. "Nylotron" shims, easily remedy excessive play.

The bottom must be well sanded to remove all gloss from the gelcoat, before applying bottom paint, if bottom paint wasn't ordered from the factory. After sanding, when you haulout for the first time, the entire bottom must be washed with whatever is recommended by the paint manufacturer, BUT NOT ACETONE, as any residue of acetone may react with the bottom paint and CAUSE SEVERE BLISTERING.

While two coats of bottom paint are normally recommended for a good bottom job, it is a good idea to run a third coat for a distance of about 8" to 10" below the boot top. This area collects all the harbor scum and tends to get brushed harder and more often than the rest of the bottom so it can stand the extra coat!

Bottom paint will not stick to fiberglass unless the surface is etched first and this was done at the factory, if you ordered optional "Bottom Paint". Challenger uses Triple K anti fouling paint. For best results, repaint with the same paint. If the bottom was painted on your Challenger at the factory, a small can of paint is included for touching up areas in contact with the cradle when the boat is first launched. One of the most important elements in attaining speed under sail is a clean bottom. Make sure no fouling collects on yours! Most marinas have monthly bottom cleaning services available--we recommend them.

Should the above described small air bubbles ever appear in the gelcoat on the bottom of your boat, they should be ground off at the time your bottom is repainted. This is NOT a structural failure in the fiberglass and should not create undo concern.

## 14. EXTERIOR AND INTERIOR

The exterior trim is teak, one of the most durable and decorative of all hardwoods but it must be maintained to keep it from splitting and discoloring. Teak may be maintained in three ways:

1. Leaving the teak untreated and allowing it to weather naturally. Bronze wool or fine sandpaper should be used periodically to clean the surface and a commercially available preparation such as Teak-Brite should be applied to combat the dull gray appearance of naturally weathered wood and help eliminate splitting. This way your teak will have a dull grey appearance. Teak will split because of the nature of the wood. "Warranty" does not cover split teak.

2. A second way, is to help teak maintain its natural brown color by treating it regularly with a preparation such as Weldwood's "Wood Life", or "Watco"; also known as, "oiling". If the teak has been "oiled", it must be cleaned by scraping with fine bronze wool and/or heavy sanding with #80 or #100 sandpaper before oiling it.

-CAUTION-

Never use steel wool instead of bronze wool or sandpaper, when preparing the wood for such treatment. Small filaments of steel break off and cause rust spots in the teak that are very difficult to remove.

3. The third alternative for maintaining your exterior teak - varnishing - imparts the last word in a yacht finish but requires the most maintenance. However, for those who wish a "Bristol" appearance yacht, it is the only way to go! If you decide to varnish, be prepared to add at least one additional coat approximately every four months.

While the teak still has its original color and texture, (if it has not been oiled), smooth with medium grit sandpaper (#120), dust the surface carefully and seal with a good sealer such as Brolite S-94 Clear Acrylic Sealer. Make sure you select a dry warm day and do not seal or varnish much after noon, as afternoon dampness will prevent proper drying and cause your varnish job to look discolored and uneven. Allow the sealer to dry at least overnight, then smooth the raised grain with #120 paper, dust carefully, and apply the first coat of a good quality spar varnish. The second and third coats are applied with at least a day's wait in between and sanding with #120 or #180, depending upon the roughness of the grain. This will provide a minimum varnish covering for your exterior teak trim. Four or five coats are better. Sanding inbetween with #180 sandpaper and several thin coats, always results in a far superior finish than a lesser number of thicker coats. A good rub with a chamois after hosing down will keep the gloss and also lengthen varnish life.

A Challenger's interior is entirely constructed of unstained Phillipine Mahogany with a semi-gloss or "rubbed effect", varnish finish. This varnish cannot be built up adequately at our factory without the "build-up" resulting in crazing. Three coats of varnish are applied at the factory but we recommend three additional coats for that deep, all covering richness that varnishing can convey. Allow two months after delivery, for an in-depth drying of the factory varnish, before adding additional coats of varnish to your interior. "Pledge", or a similar polish will keep your varnished surfaces looking new. Before revarnishing your mahogany, BE SURE to remove any such wax build-up with thinner.

If your sole is inlaid teak and holly (or teak and clear sugar pine if holly was unavailable), "Watco" oil is on it now and recoating every few months, will keep it beautiful. A high gloss varnish on the sole will make it outstandingly beautiful! Follow same directions as "3" above if you wish your sole varnished most beautifully. (At least 3 coats of varnish are recommended.) THE OIL FINISH MUST BE THOROUGHLY REMOVED BEFORE VARNISHING.

CARE OF STAINLESS STEEL

All "stainless steel" will tarnish, stain and/or rust to varying degrees, when exposed to salt water spray and weather. This is a surface condition that can easily be removed and can to a great extent, be prevented by thoroughly washing down with fresh water after a trip. Remove any dullness with a sponge and a household cleaner such as "Comet". Use a stainless polish on any stubborn stains. If you never polish your stainless, surface rust will appear everywhere but it does not cause structural damage to the metal.

STOVES - ALCOHOL AND ELECTRIC

READ DIRECTIONS FOR LIGHTING YOUR ALCOHOL STOVE, CAREFULLY. When filling

the alcohol tank, be careful not to spill the alcohol on clothes: it will eat a hole! Pump the pressure gage up to 15 lbs to 20 lbs. Electrical stoves are convenient and present no fuel hazard but of course, a shore connection or generator is required to power them. Instructions for operation of all stoves are provided by the manufacturer and should be ADHERED TO CAREFULLY.

## 15. STERN DAVITS AND DINGHY

The optional, factory installed Stern Davits are constructed from aluminum or stainless castings and if aluminum, are painted with a white epoxy resin enamel. They can be easily removed from the bases by backing off the four cap screws. The entire installation is very straightforward but two items should be noted: It is important that the dinghy be provided with a lifting bridle fore and aft and that when the dinghy is hoisted, it bears against some rubber rail, which you must obtain for the transom or stern pulpit. When underway in a rough sea, the dinghy must be securely lashed to your boat to keep it from being damaged. If the dinghy has no cover, it must have a drain hole (with plug) to allow any rain water to drain out.

## 16. ANCHORING

The scope of an anchor rode should be 5-7 times the depth of the water. Always use a length of chain on the anchor to help it dig in and to help take up surge loads. Nylon is the best line for anchor rodes, because its elasticity will also resist surge loads but it chafes very easily and for this reason, chafe guard should be used on bow chocks. This applies equally to dock lines. Anchoring chain varies in quantity to the bottom and personal anchoring style of an Owner.

Anchors can be stowed below or in choks on deck. The anchor rode should be lead through the deck into the forepeak using the Anchor Rode Deck Pipe.

Suggested Danforth anchor sizes for Challengers are as follows:

| | |
|---|---|
| Challenger 32 | #12S |
| Challenger 35 | #12S |
| Challenger 40 | #22S |
| Challenger 42 | #22S |
| Challenger 50 | #40S |

## 17. CARPETING AND CUSHION FABRICS

The carpeting in your Challenger is "Acrilan". It is not damaged by moisture but it should be brought out on deck periodically for drying. In wet going, the carpet can be rolled up and stowed. Your interior cushion covers are "Hurculon"; a durable, treated fabric. They can be removed using the zippers provided if cleaning or repairs are required. The foam inside is not damaged by water but if it gets wet, the zippers should be opened to let air inside for drying.

## 18. WINTER STORAGE AND HAULING

The bottom of the boat should be thoroughly scrubbed immediately, when boat is hauled. This will save many hours of work later. The surface is then ready for anti-fouling paint.

All standing and running rigging, including fittings, should be carefully checked when the boat is hauled and worn parts replaced. All water must be drained from the tanks and piping, the engine, the toilet and the bilge for winter storage. The toilet and engine should be prepared for lay-up in accordance with the manufacturer's recommendations. A winter cover will protect the boat during the winter but make sure it sheds snow and ice and is secure so that it cannot damage the boat when caught by wind.

Challenger cradles are welded steel and have hull support pads which are adjustable at all pressure points. This eliminates localized stress on the hull during winter storage.

## 19. HOUSEKEEPING

You can treat everything below decks just like a home interior. Keep the boat well ventilated, especially the bilges and lockers, and watch out for dampness. Leaving a couple of 100 watt light bulbs burning below will usually take care of any sweating and reduce that "clammy" feeling, especially during the winter months or during times of damp fog. It's a good idea to leave the bunk cushions on their sides and open up the lockers if you plan to be gone for awhile. It might not look very neat but it increases ventilation and allows everything to air out. Any time things get wet with salt water, rinse off with FRESH WATER as soon as possible and let dry thoroughly. The salt crystals retain moisture and the material will always remain damp until cleaned with fresh water. Air and sunlight are wonderful cleaners - bring the vacuum cleaner aboard and get the carpet, cushions, blankets, sleeping bags, etc., up on deck in the sunshine while the vacuum picks up below. Spring cleaning should take place periodically, not annually, to keep the interior clean and bright.

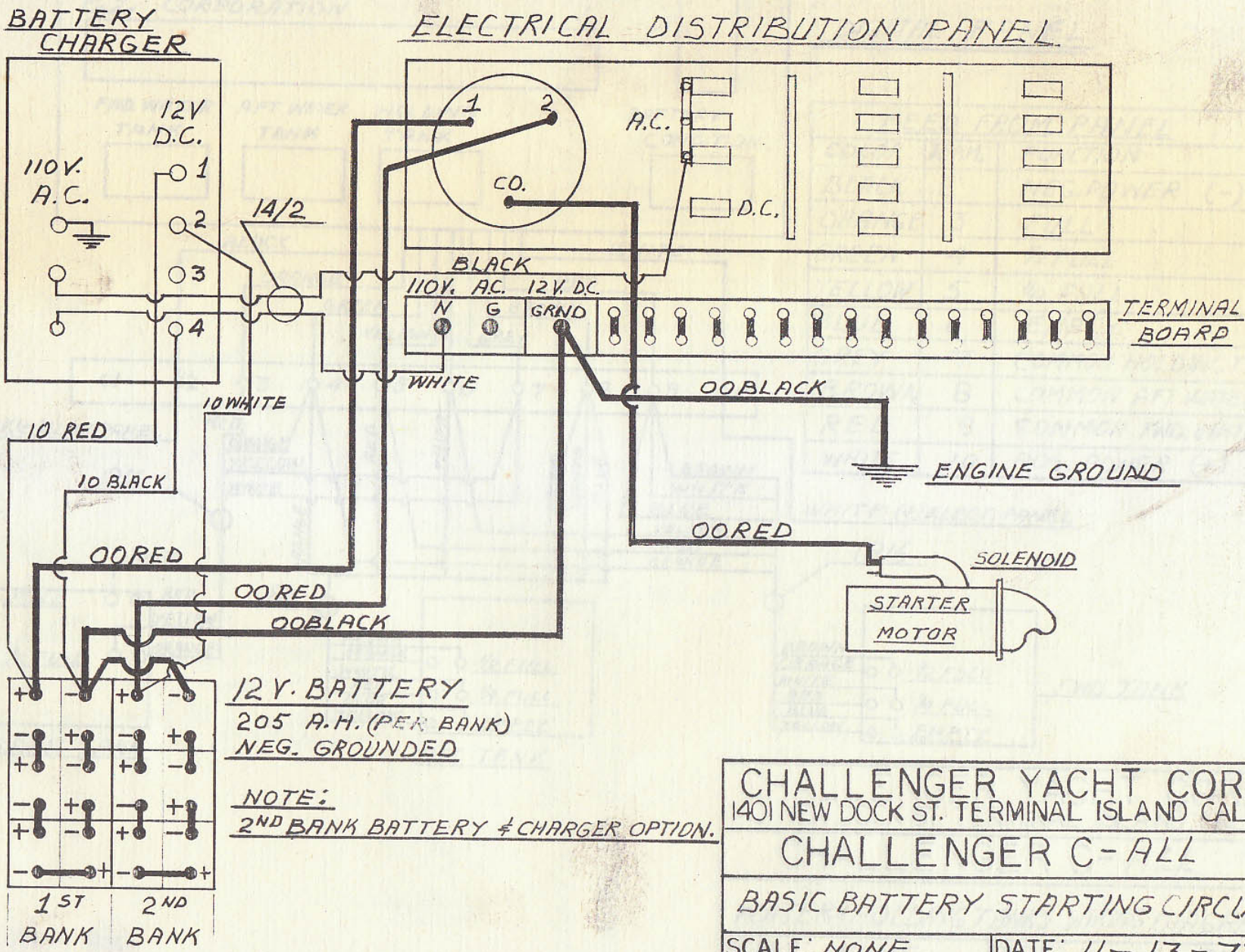
## 20. IN CONCLUSION

This Owner's Manual would have to have been many times as long as it is, to answer all of your questions and to contain all of the information we would like to impart to you about your new Challenger. Since we cannot hope to cover so much, we only hope that we have been of some assistance to you in the enjoyment of this fine sailing yacht.

We have sincerely taken great pleasure and genuine pride in building your Challenger and have enjoyed the time we've spent assembling this Owner's Manual for you as well.

Good sailing, fair winds and much happiness to you with your new Challenger and remember...we're here to help you in any way we can, should you ever need us.

The Crew
Challenger Yacht Corporation

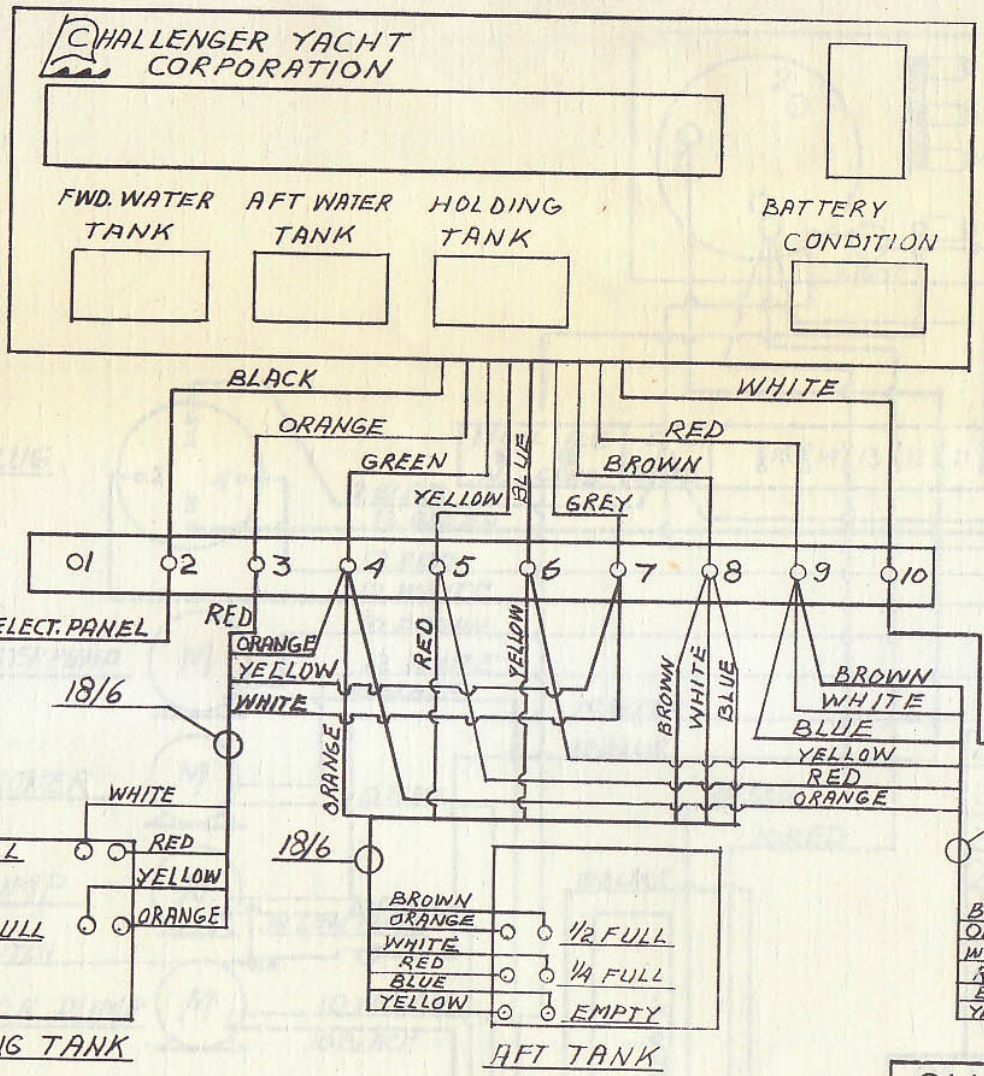



CHALLENGER YACHT CORP
1401 NEW DOCK ST. TERMINAL ISLAND CALIF.

CHALLENGER C-ALL

BASIC BATTERY STARTING CIRCUIT

| | |
|---|---|
| SCALE: NONE | DATE: 11-13-73 |
| DRAWN: A.P.LIND N.A. | NR. 07 10 01 00 |




## DIGITAL PANEL

| FEED FROM PANEL | | |
|---|---|---|
| COLOR | TERM. | FUNCTION |
| BLACK | 2 | NEG. POWER (-) |
| ORANGE | 3 | FULL |
| GREEN | 4 | 1/2 FULL |
| YELLOW | 5 | 1/4 FULL |
| BLUE | 6 | EMPTY |
| GREY | 7 | COMMON HOLDING TANK |
| BROWN | 8 | COMMON AFT WATER T. |
| RED | 9 | COMMON FWD. WATER T. |
| WHITE | 10 | POS. POWER (+) |

CHALLENGER YACHT CORP
1401 NEW DOCK ST. TERMINAL ISLAND CALIF.

# CHALLENGER C-ALL

## WATER & HOLDING TANKS WIRING DIAGRAM

| | |
|---|---|
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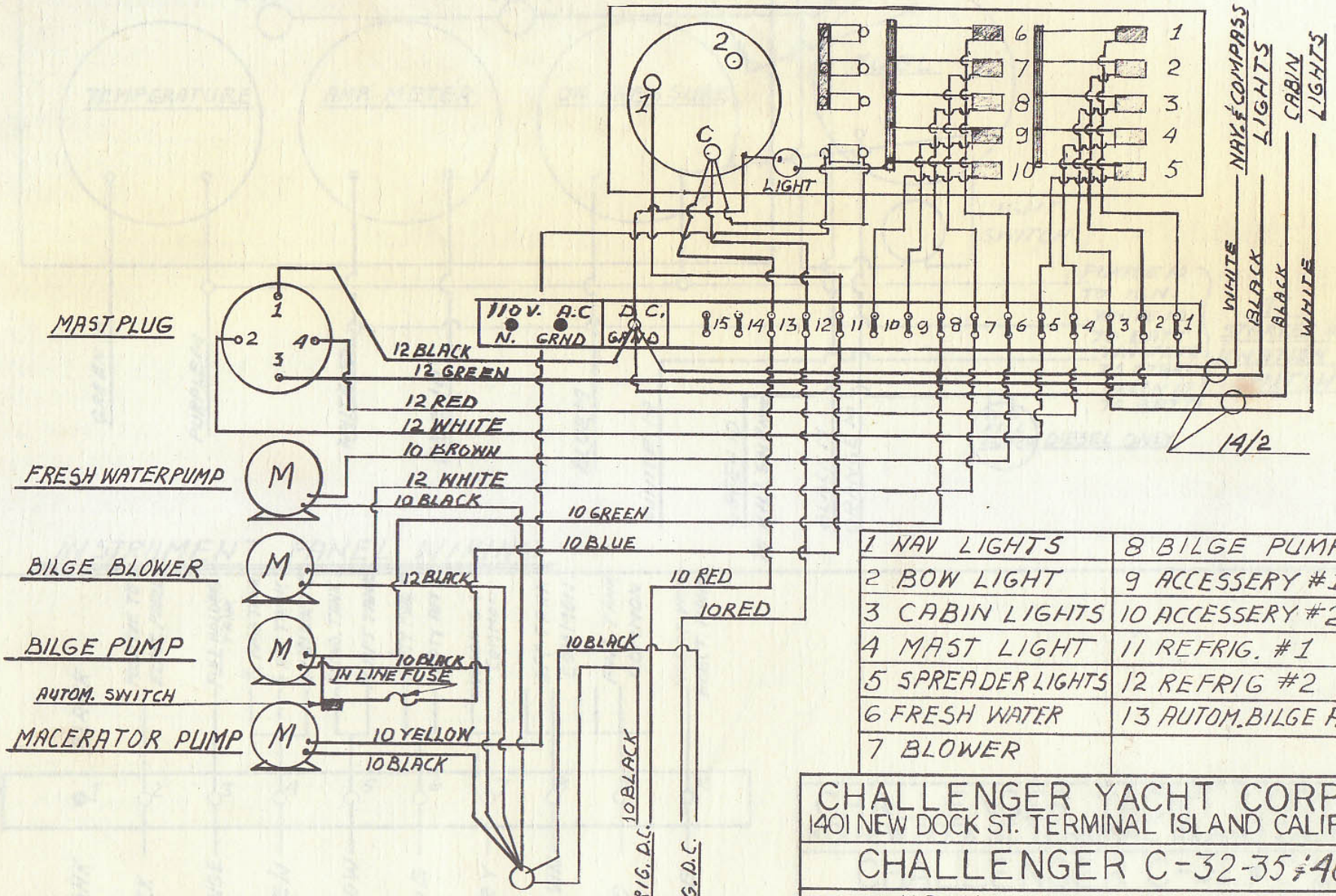
| DRAWN: A.P.LIND N.A. | NR. 07 10 02 00 |




| | |
|---|---|
| 1 NAV LIGHTS | 8 BILGE PUMP |
| 2 BOW LIGHT | 9 ACCESSERY #1 |
| 3 CABIN LIGHTS | 10 ACCESSERY #2 |
| 4 MAST LIGHT | 11 REFRIG. #1 |
| 5 SPREADER LIGHTS | 12 REFRIG #2 |
| 6 FRESH WATER | 13 AUTOM. BILGE P. |
| 7 BLOWER | |

CHALLENGER YACHT CORP
1401 NEW DOCK ST. TERMINAL ISLAND CALIF.

# CHALLENGER C-32-35-40

WIRING DIAGRAM
DISTRIBUTION PANEL (REAR VIEW)

| | |
|---|---|
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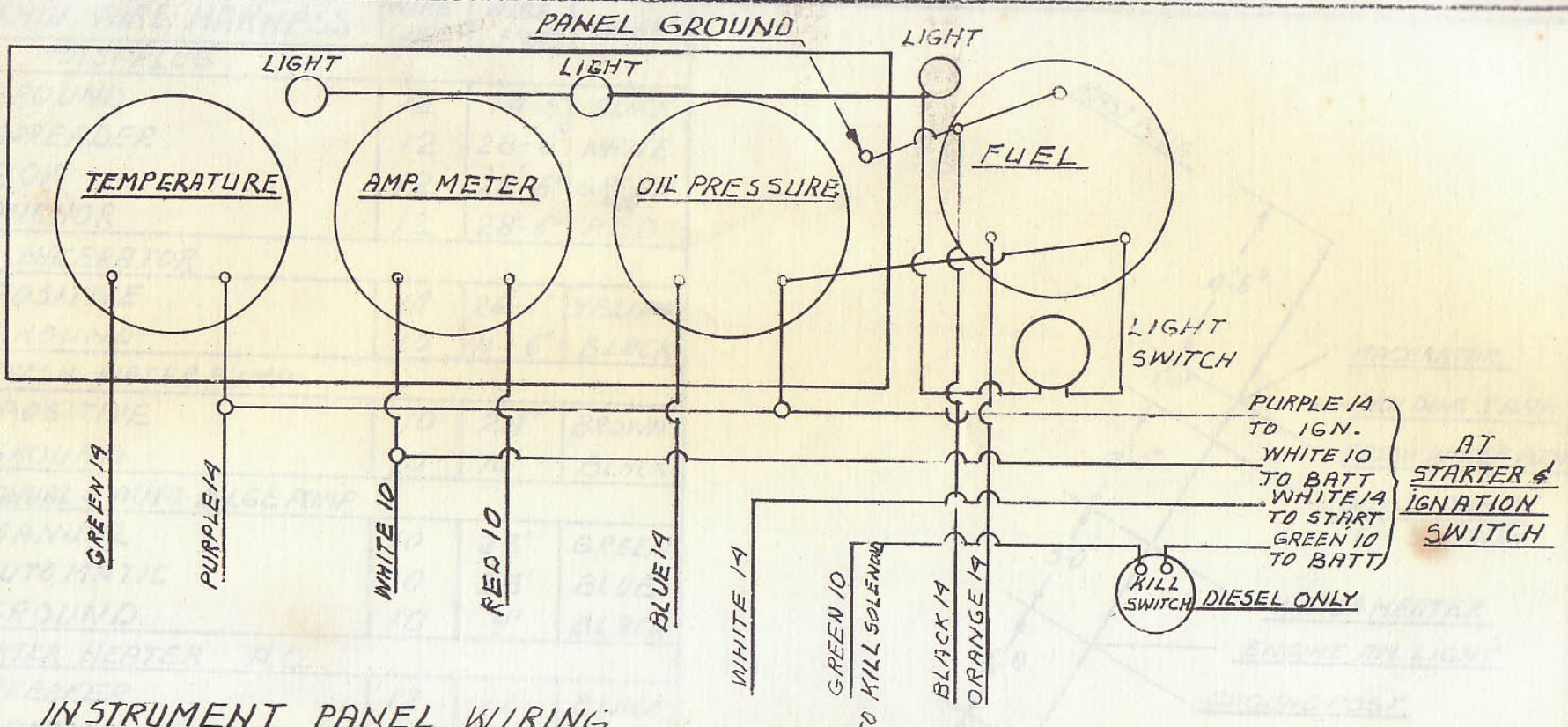
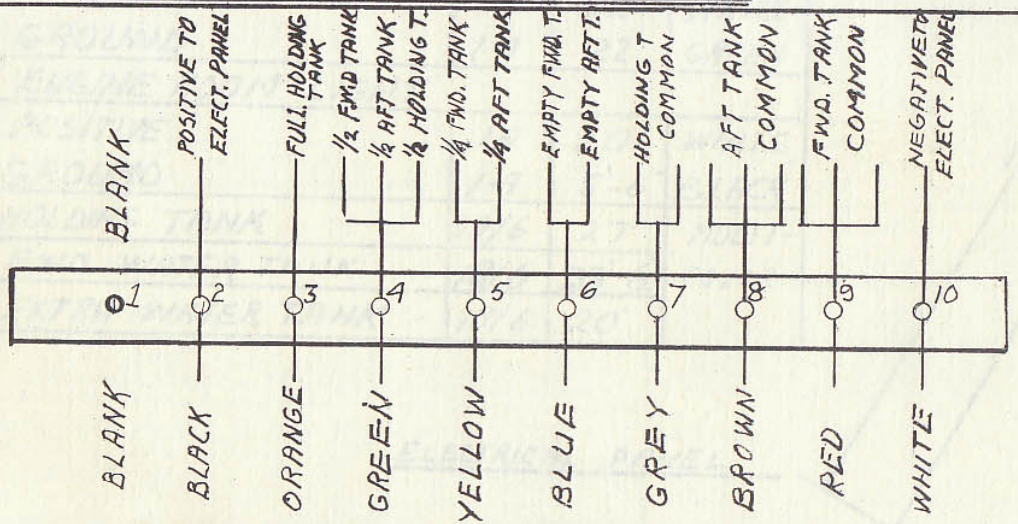
| DRAWN: A.P LIND N.A. | NR. 0-7103100 |



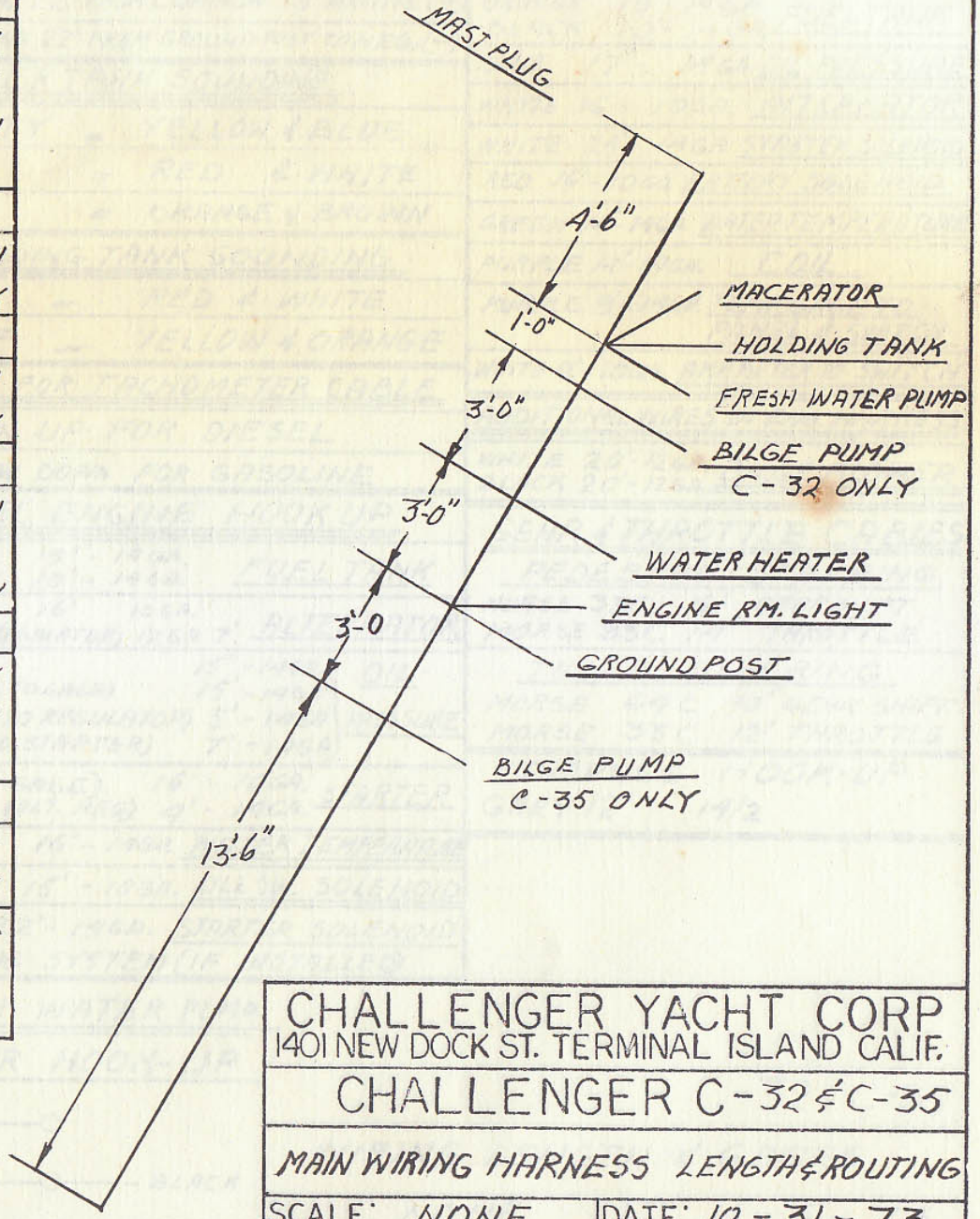

## INSTRUMENT PANEL WIRING




## DIGITAL PANEL WIRING

| | |
|---|---|
| CHALLENGER YACHT CORP 1401 NEW DOCK ST. TERMINAL ISLAND CALIF. | |
| CHALLENGER C-32 & C-35 | |
| INSTRUMENT PANEL AND DIGITAL PANEL WIRING | |
| SCALE: NONE | DATE: 11-5-73 |
| DRAWN: A.P.LIND N.A. | NR. 32 10 0400 |

| MAIN WIRE HARNESS | WIRE GAGE | WIRE LENGTH | COLOR |
|---|---|---|---|
| MAST PLUG | | | |
| GROUND | 12 | 14'-6" | BLACK |
| SPREADER | 12 | 28'-6" | WHITE |
| BOW | 12 | 28'-6" | GREEN |
| ANCHOR | 12 | 28'-6" | RED |
| MACERATOR | | | |
| POSITIVE | 10 | 26'-6" | YELLOW |
| GROUND | 10 | 11'-6" | BLACK |
| FRESH WATER PUMP | | | |
| POSITIVE | 10 | 24' | BROWN |
| GROUND | 10 | 10' | BLACK |
| MANUAL & AUTO-BILGE PUMP | | | |
| MANUAL | 10 | 23' | GREEN |
| AUTOMATIC | 10 | 23' | BLUE |
| GROUND | 10 | 9' | BLACK |
| WATER HEATER A.C. | | | |
| BREAKER | 12 | 22' | BLACK |
| COMMON | 12 | 22' | WHITE |
| GROUND | 14 | 22' | GREEN |
| ENGINE ROOM LIGHT | | | |
| POSITIVE | 14 | 20' | WHITE |
| GROUND | 14 | 5'-6" | BLACK |
| HOLDING TANK | 18/6 | 27' | MULTI- |
| FWD WATER TANK | 18/6 | 33'-6" | COLOR |
| EXTRA WATER TANK | 18/6 | 20' | |




CHALLENGER YACHT CORP
1401 NEW DOCK ST. TERMINAL ISLAND CALIF.

CHALLENGER C-32 & C-35

MAIN WIRING HARNESS LENGTH & ROUTING

| | |
|---|---|
| SCALE: NONE | DATE: 10-31-73 |
| DRAWN: A.P. LIND NA | NR. 32 10 0100 |

## TERMINAL BOARD HOOK-UPS

| | # |
|---|---|
| NAVIGATION & INSTRUMENT LIGHTS | 1 |
| BOW LIGHT | 2 |
| CABIN & ENGINE ROOMLIGHTS | 3 |
| MASTHEAD LIGHT | 4 |
| SPREADER LIGHTS | 5 |
| FRESH WATER PUMP | 6 |
| ENGINE RM. BILGE BLOWER | 7 |
| BILGE PUMP MANUAL | 8 |
| ACCESSORIES #1 | 9 |
| ACCESSORIES #2 | 10 |
| AUTOMATIC BILGE PUMP | 11 |

TERMINAL BOARD SIZE 24"x4 3/4"

| | |
|---|---|
| D.C. GROUND | 2 3/4" |
| A.C. GROUND | 6" |
| A.C. COMMON | 9" |

## BATTERY CABLE SINGLE

7' RED 0GA. POSITIVE POST TO TERM. #1
6' BLACK 0GA. GROUND TO GROUNPOST
15' BLACK 0GA. GROUNDPOST TO ENGINE GROUND
16'-6" RED 0GA. COMMON TO STARTER

## WATER HEATER HOOK-UP

BLACK 12GA. TO BREAKER
WHITE 12GA. TO COMMON
GREEN 14GA. TO GROUND

## SHORE POWER HOOK-UP

| PLUG TO PANEL | LINE RECEPT. | TO |
|---|---|---|
| 22' GREEN 12GA. | RED | GROUND |
| 22' WHITE 10GA. | WHITE | COMMON |
| 22' BLACK 10GA. | BLACK | BREAKER |

## 12 VOLTS REFRIGERATOR HOOK-UP

RED 10GA. 22' FROM COMMON TO POSITIVE (+)
BLACK 10GA. 22' FROM GROUND POST TO NEG. (-)

## WATER TANK SOUNDING

EMPTY = YELLOW & BLUE
1/4 = RED & WHITE
1/2 = ORANGE & BROWN

## HOLDING TANK SOUNDING

FULL = RED & WHITE
HALF = YELLOW & ORANGE

## ELBOW FOR TACHOMETER CABLE

SCREW UP FOR DIESEL
SCREW DOWN FOR GASOLINE

## DIESEL ENGINE HOOK UP

ORANGE 19' - 14GA.
BLACK 10' - 14GA. — FUEL TANK

WHITE 16' 10GA.
BLUE (TO REGULATOR) 12GA 7' — ALTERNATOR

| | | |
|---|---|---|
| BLUE | 15' - 14GA. | OIL PRESSURE |
| PURPLE (TO GAGE) | 15' - 14GA | |
| PURPLE (TO REGULATOR) | 5' - 14GA | |
| RED (TO STARTER) | 7' - 14GA | |

RED (TO GAGE) 16' - 10GA.
RED (TO VOLT. REG) 4' - 14GA. — STARTER

GREEN 16' - 14GA. — WATER TEMPERATURE

GREEN 15' - 10GA. — KILL SW. SOLENOID

WHITE 22' - 14GA. — STARTER SOLENOID

WARNING SYSTEM (IF INSTALLED)

## GASOLINE ENGINE HOOK-UP

ORANGE 19' - 14GA.
BLACK 10' - 14GA. — FUEL TANK

BLUE 17' - 14GA. — OIL PRESSURE

WHITE 16' - 10GA. — ALTERNATOR

WHITE 24' - 14GA — STARTER SOLENOID

RED 16' - 10GA. — BATTERY SOLENOID

GREEN 14' - 14GA. — WATER TEMPERATURE

PURPLE 14' - 14GA. — COIL

PURPLE 9' - 14GA. — TEMP. GAGE TO PANEL & SWITCH

WHITE 9' - 10GA. — AMP. METER TO SWITCH

ADDITIONAL WIRES IN ENG. HARNESS

WHITE 20' - 12GA.
BLACK 20' - 12GA. — BILGE BLOWER

## GEAR & THROTTLE CABLES

### PEDESTAL STEERING

MORSE 33C 12' GEAR SHIFT
MORSE 33C 14' THROTTLE

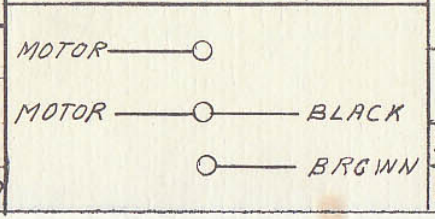
### TILLER STEERING

MORSE 64C 10' GEAR SHIFT
MORSE 33C 12' THROTTLE

## COMPASS HOOK-UP

GREY 12' 14/2

## FRESH WATER PUMP MOTOR HOOK-UP




# CHALLENGER YACHT CORP

1401 NEW DOCK ST. TERMINAL ISLAND CALIF.

## CHALLENGER C-32 & C-35

## WIRING LENGTH & GAGES

| | |
|---|---|
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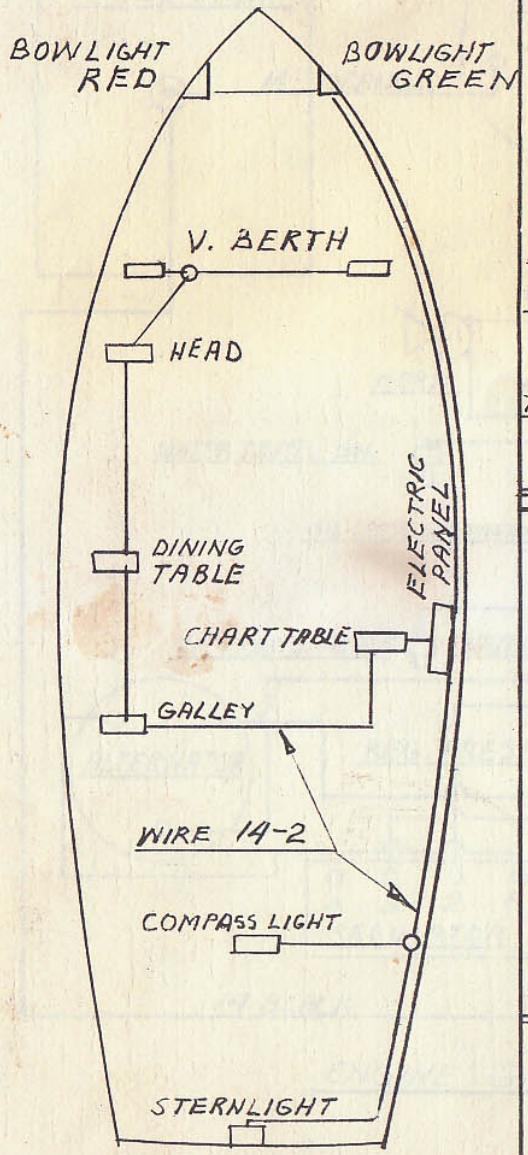
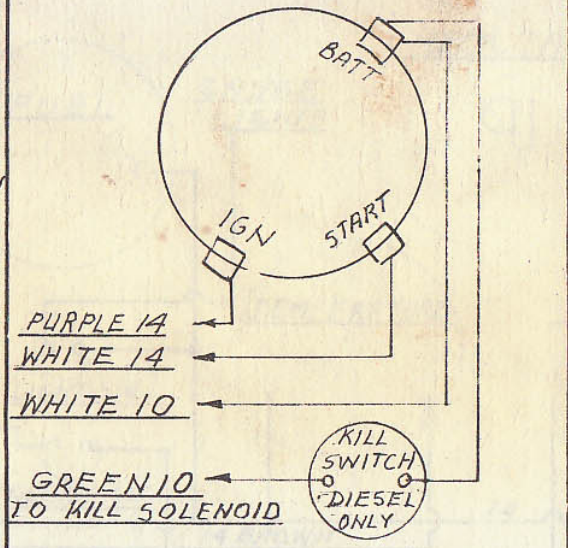
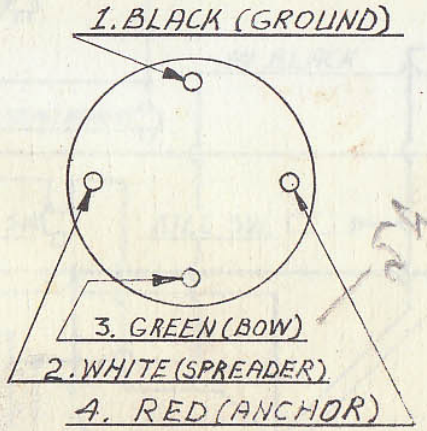
| DRAWN: A.P.LIND N.A. | NR. 32 10 0300 |



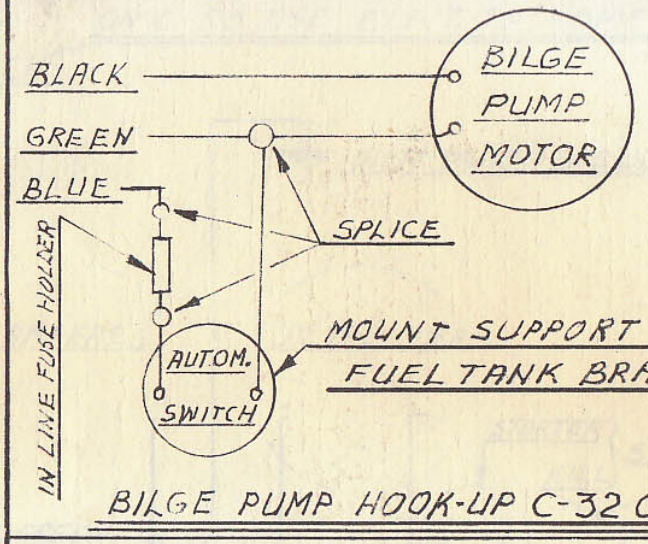

ROUTING CABIN LIGHTS & NAVIGATION LIGHTS



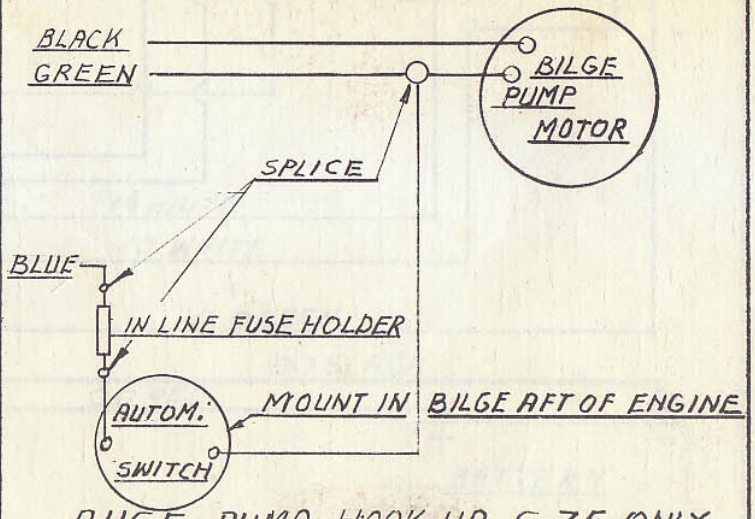

IGNITION & STARTER SWITCH




MAST PLUG HOOK-UP




BILGE PUMP HOOK-UP C-32 ONLY




BILGE PUMP HOOK-UP C-35 ONLY

CHALLENGER YACHT CORP
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# CHALLENGER C-32 & C-35

## WIRE ROUTING & HOOK-UPS

| | |
|---|---|
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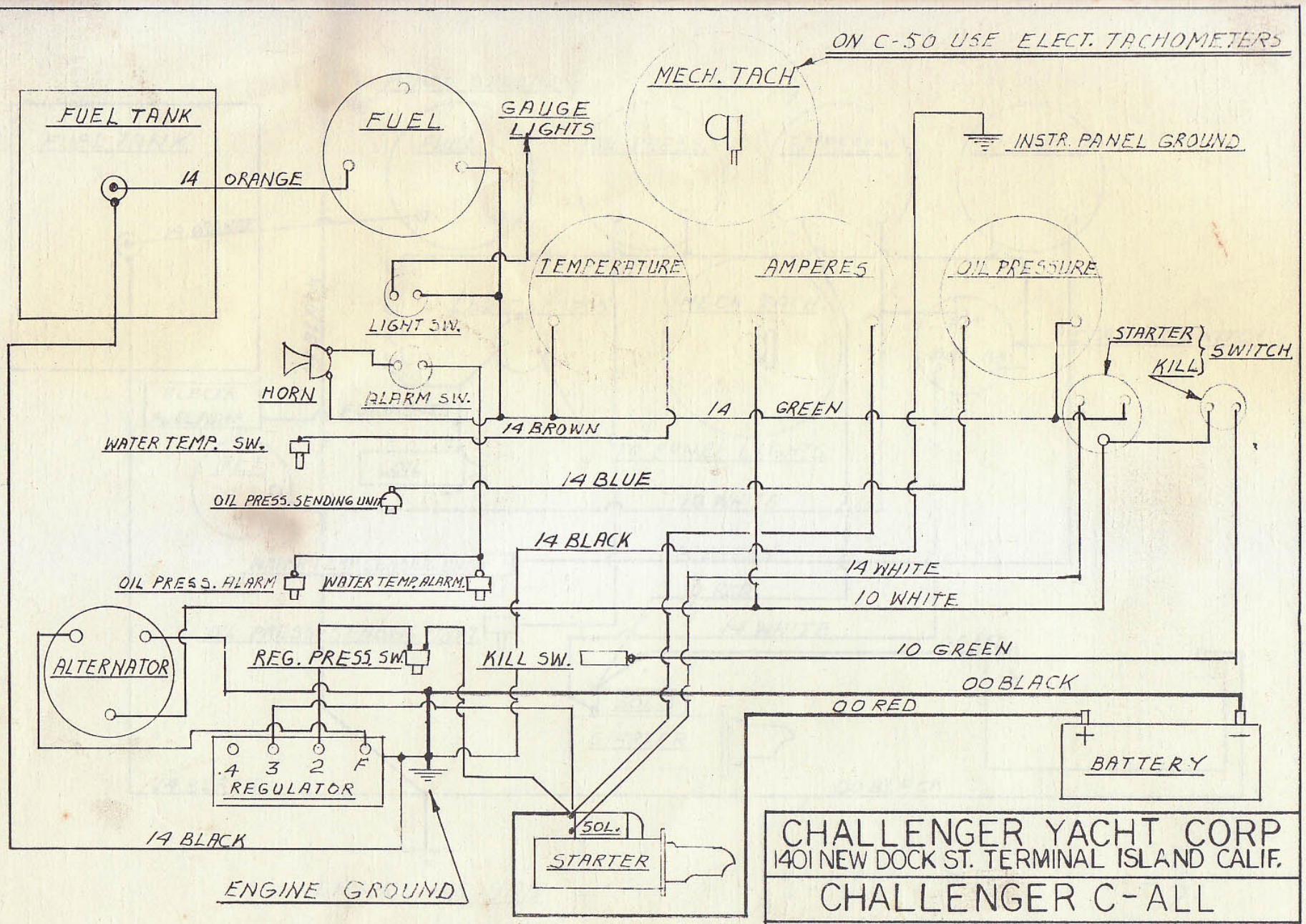
| DRAWN: A.P.LIND N.A. | NR. 32 10 02 00 |




CHALLENGER YACHT CORP
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# CHALLENGER C-ALL

## WIRING DIAGRAM PERKINS

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|---|---|
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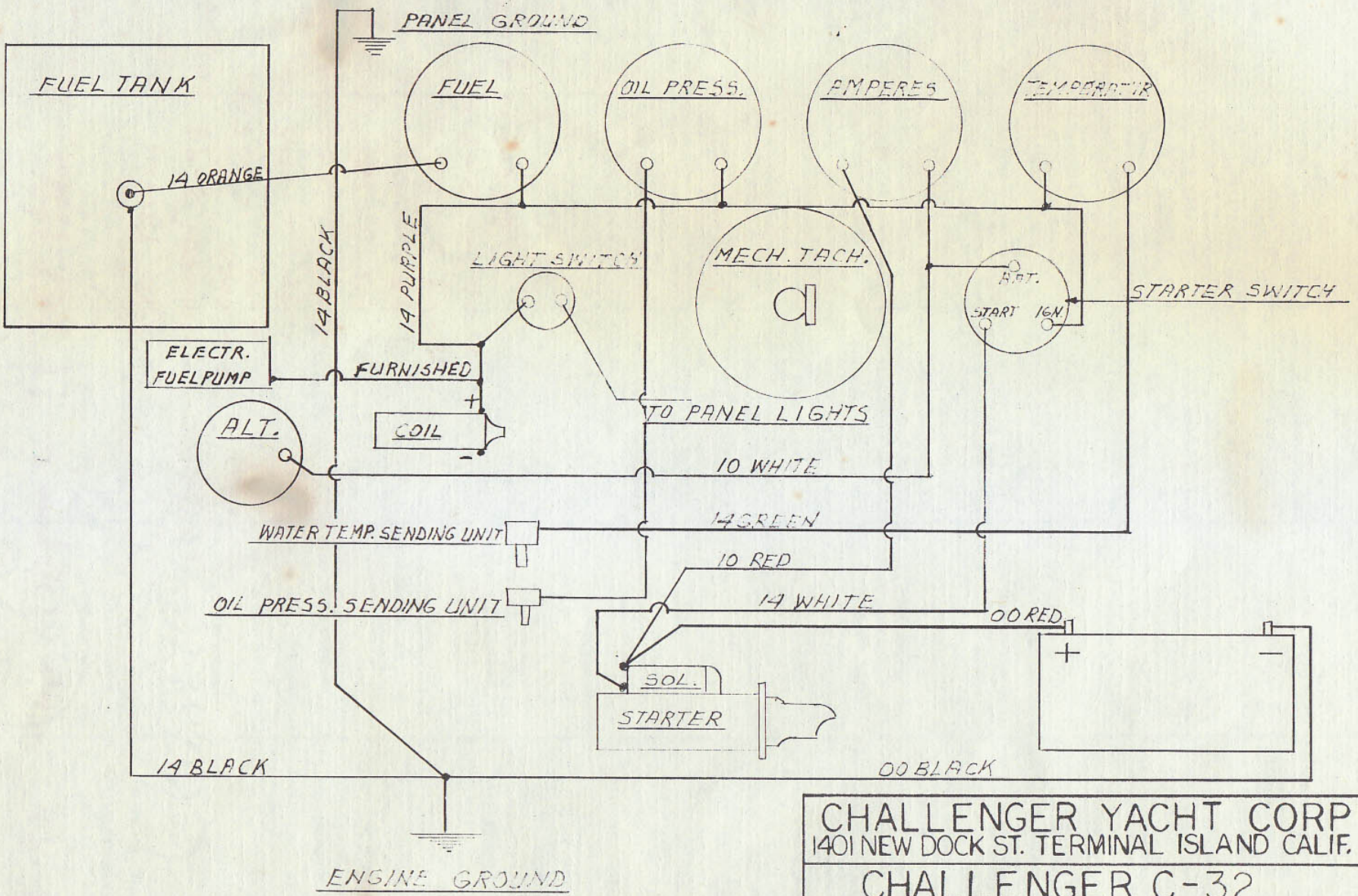
| DRAWN: A.P.LIND. N.A. | NR. 07100300 |




| CHALLENGER YACHT CORP<br>1401 NEW DOCK ST. TERMINAL ISLAND CALIF. | |
|---|---|
| CHALLENGER C-32 | |
| WIRING DIAGRAM PALMER | |
| SCALE: NONE | DATE: 1 16 74 |
| DRAWN: A.P.LIND. N.A. | NR. 32 10 05 00 |

# Challenger Yacht Corporation

1401 Dock Street • Terminal Island, California • (213) 831-8803

CHALLENGER OWNER'S MANUAL

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