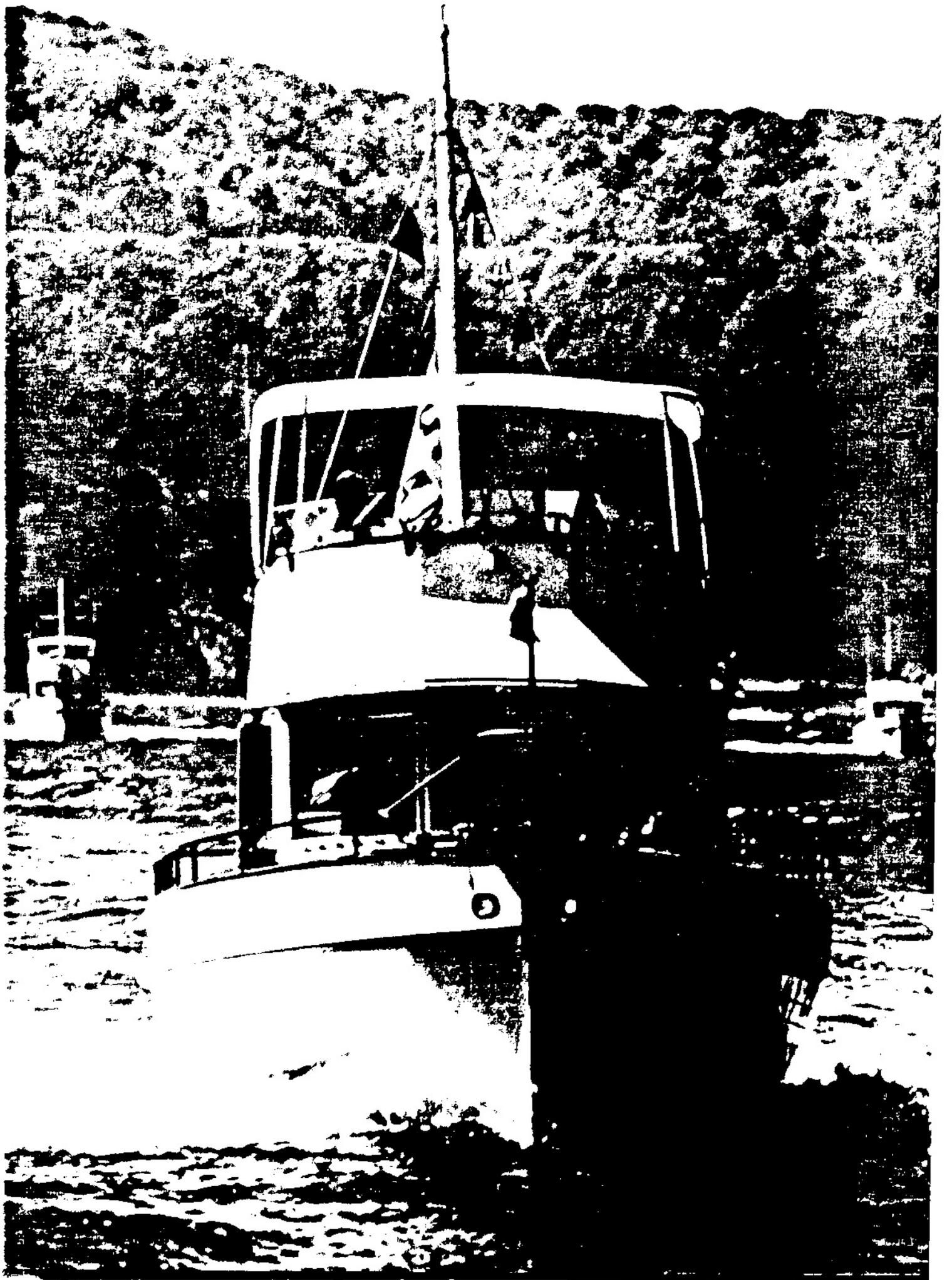


LADY NELSON

Table of Contents

	SECTION
INTRODUCTION	
NOTIFICATION OF PURCHASE	
GENERAL SPECIFICATIONS	
MECHANICAL SYSTEMS	A
PLUMBING SYSTEMS	B
ELECTRICAL SYSTEMS	C
GENERAL MAINTENANCE	D



GRAND BANKS

HULL NO. 488

WE TAKE GREAT PLEASURE IN WELCOMING you to the ever growing fleet of GRAND BANKS diesel cruisers.

Since their introduction, these boats have made extensive cruises on inland waters and the far seas of the world and we are sure that your Grand Banks will give you many hours of pleasurable and reliable cruising.

We have a genuine interest in following the history of all our boats and we ask you to keep in touch with your dealer so that we may learn of the experiences that you have had with the boat and so that you, in turn, may receive the owners' Newsletter which gives news of interest concerning the boats and their owners.

AMERICAN MARINE(S) PTE. LTD.
26 JALAN TERUSAN
JURONG TOWN
SINGAPORE 22.

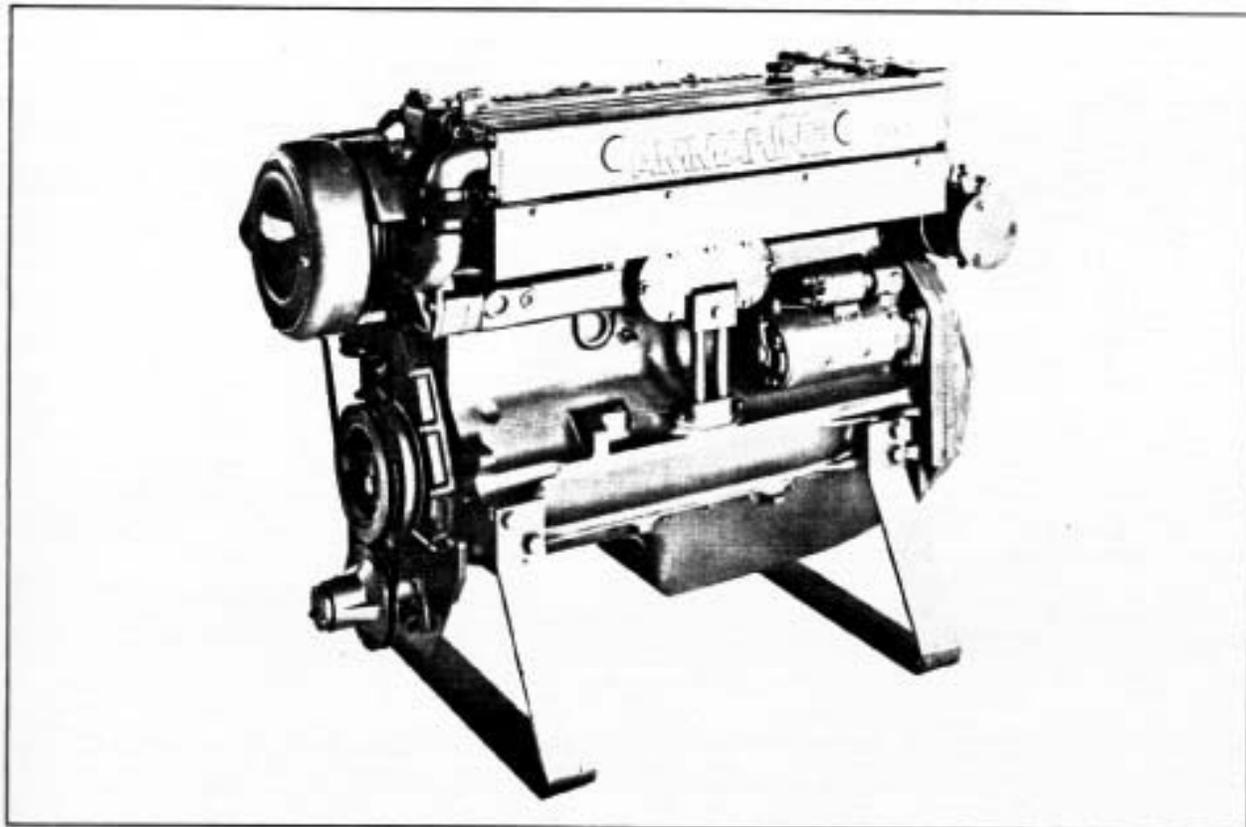
General Specifications

L.O.A	41'10"	12.75m
L.W.L	40'6"	12.34m
BEAM	13'7"	4.15m
DRAFT	4'2"	1.27m
DISPLACEMENT	34,000 lbs.	15,422kg
WATER	245 US gal.	929 litres
FUEL	650 US gal.	2,460 litres
ENGINE	Ammarine 404 Diesel Delivering 107 Shaft Horsepower	
SHAFTS	14'4" long	1 1/2 Aluminum Bronze
PROPELLERS	24" X 21.5"	
BEARINGS	1 1/2' x 2" x 6" Rubber	

MAST HT TO WATER LINE

22'-6"

A



Engine and Transmission

INTRODUCTION

Your boat is equipped with an Ammarine 404 heavy-duty marine diesel incorporating many modern features to render long-term, economical and dependable service.

Adherence to the service schedule will ensure your engine's optimum output and long life.

The Ammarine 404 is one of the heaviest diesel engines in the industry. A heavily constructed one-piece, gray-iron cylinder block with deep thick-ribbed skirts provides superior engine rigidity. The heavy structural integrity renders a relatively quiet, vibration-free level of operation.

Advanced engineering concepts make the Ammarine 404 exceptionally clean in appearance. The lube oil and fresh water passages are internal, eliminating exterior hose chafe and resultant leaks. The engine oil cooler is built into the fresh water cooling system, contributing to the clean, compact appearance. The exhaust manifold is fresh water cooled and neatly jacketed, reducing manifold surface temperatures. A unique barrel-type thermostat allows full circulation of coolant during critical warm-up periods, eliminating hot spots and contributing to long engine life and dependability.

These features and many others distinguish the Ammarine 404 as a unique heavy-duty marine diesel utilizing time-proven diesel engineering concepts.

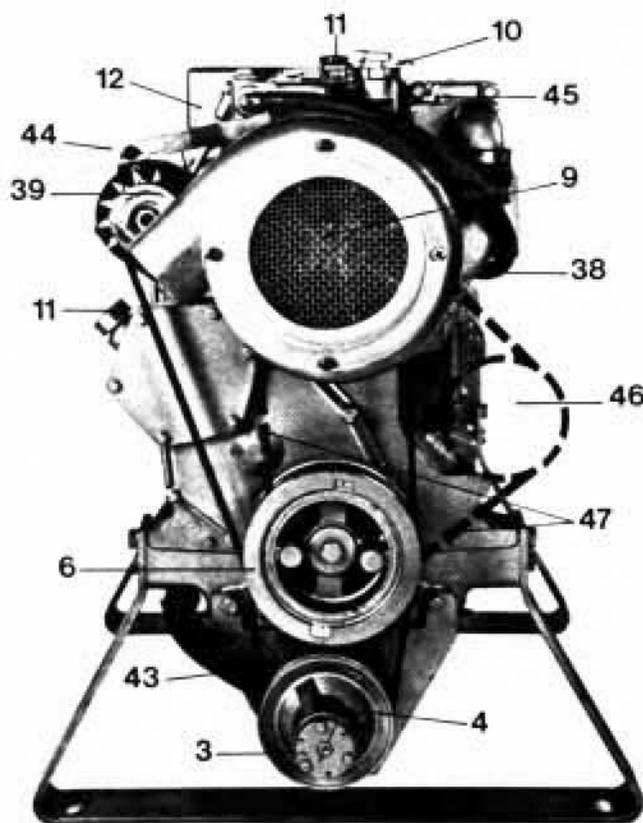
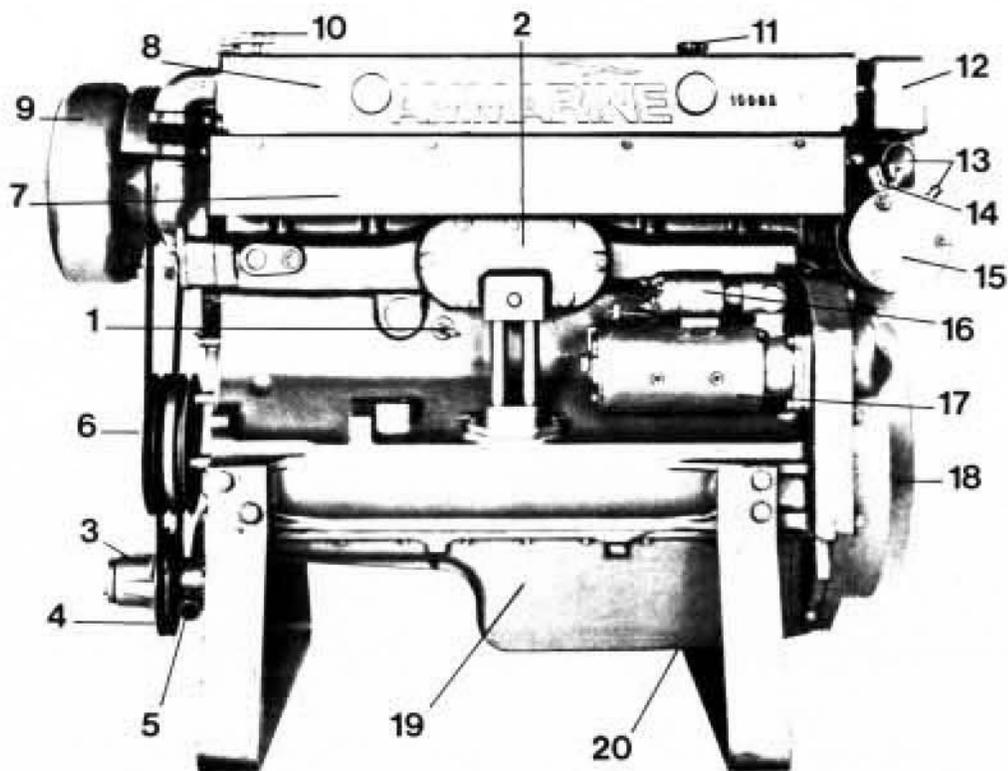


ILLUSTRATION NO. 1

ILLUSTRATION NO. 3

1. Fresh water drain
2. Engine lube oil cooler
3. Raw water pump
4. Raw water pump pulley
5. Raw water intake
6. Crankshaft drive pulley
7. Air intake manifold cover (filter underneath)
8. Exhaust and intake manifold
9. Engine room exhaust fan
10. Fresh water reservoir fill cap
11. Oil fill cap
12. Fresh water reservoir
13. Transmission oil outlets
14. Sea water outlet
15. Heat exchanger for transmission lube oil and engine fresh water
16. Starter motor solenoid
17. Starter motor
18. Flywheel housing
19. Oil pan
20. Oil pan drain plug
21. Oil filter drain
22. Oil filter
23. Engine oil pressure sender
24. Engine oil dipstick (counter rotating engine)
25. Engine oil dipstick location (standard rotation engine)
26. Tachometer drive

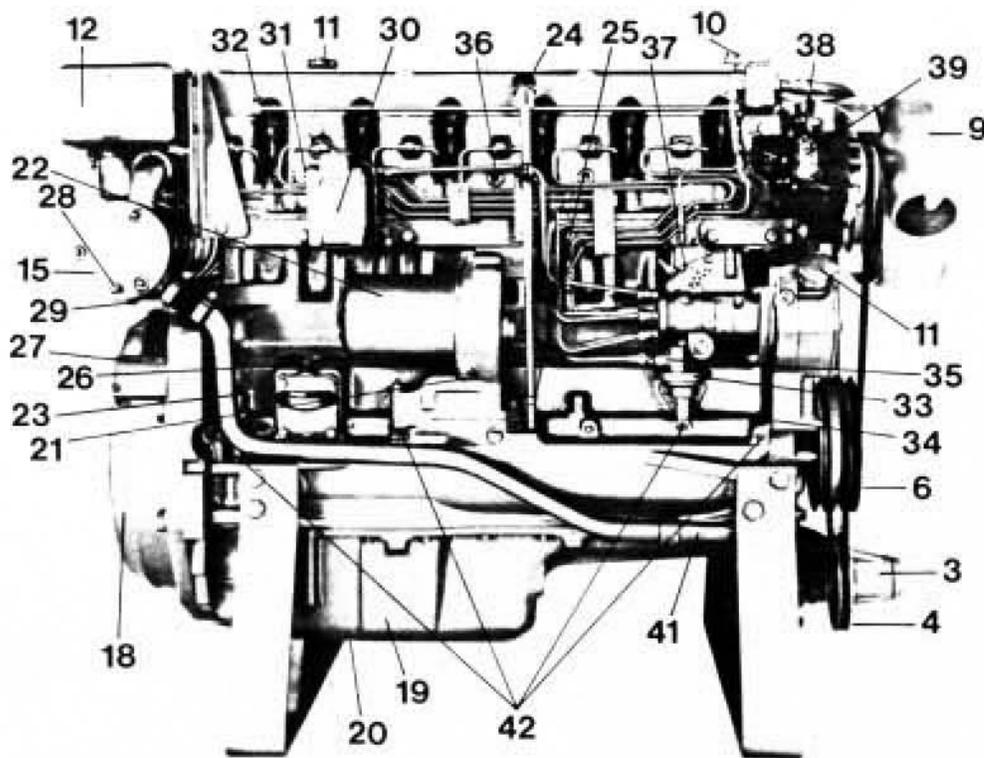
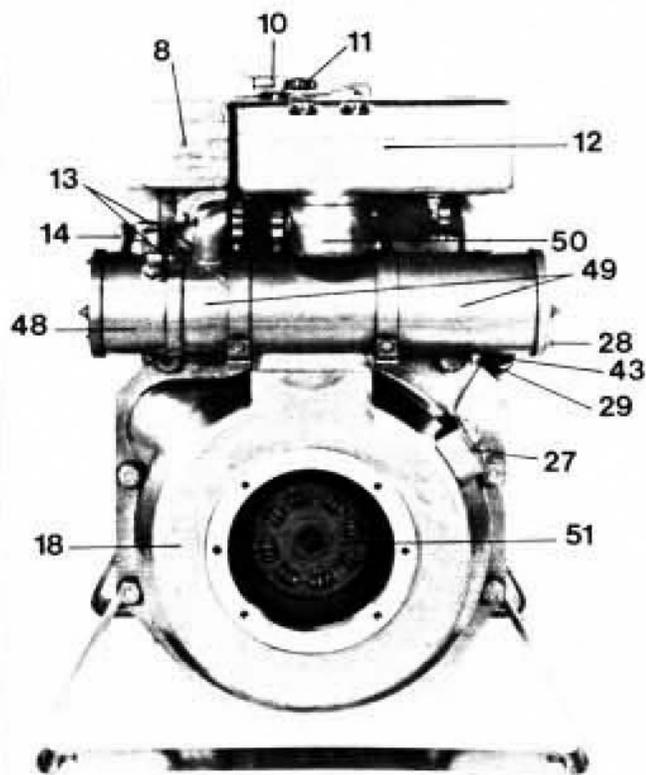


ILLUSTRATION NO. 2

ILLUSTRATION NO. 4

- 27. Timing inspection plate
- 28. Sea water drain plug and zinc
- 29. Heat exchanger drain
- 30. Final fuel filter
- 31. Final fuel filter bleed screw
- 32. Fuel return line
- 33. Fuel transfer pump
- 34. Fuel priming pump lever
- 35. Fuel supply line connection
- 36. Engine water temperature sender
- 37. Stop control
- 38. Crankcase breather hose
- 39. Alternator
- 40. Oil fill
- 41. Copper tube, raw water to heat exchanger
- 42. Oil pressure outlets
- 43. Laminated hose from raw water pump to heat exchanger
- 44. Alternator adjusting arm
- 45. Exhaust manifold vent
- 46. Alternator position (opposite rotation engine)
- 47. Alternator belt positions (opposite rotation engine)
- 48. Transmission lube oil heat exchanger inside
- 49. Engine fresh water heat exchanger inside
- 50. Thermostat housing
- 51. Transmission drive plate



DESCRIPTION OF THE ENGINE

COOLING SYSTEM

The engine is fresh water cooled. The fresh water is in turn cooled by sea water in a heat exchanger. The engine lubricating oil cooler is built into the block and is integrated with the fresh water system. The transmission oil is cooled by sea water in a heat exchanger. The fresh water and transmission lube oil heat exchangers are both built into a long cylindrical housing at the rear of the engine utilizing the same raw water source. The fresh water heat exchanger contains a zinc pencil to protect it against electrolytic action. This pencil should be checked for condition every 100 hours of engine time. See illustration No. 2 for location of zinc pencil.

The fresh water recirculation system has a special barrel-type thermostat located directly underneath the fresh water reservoir.

FUEL SYSTEM

A mechanical fuel pump supplies fuel through a filter to the injection pump. This filter, called a final filter, should be replaced every 100 hours. See illustration No. 2 for location. Two Fram fuel filters purify the fuel before it reaches the mechanical fuel lift pump. One filter is a water separator while the second filters other impurities from the diesel fuel.

Fuel is drawn from the top of the fuel tanks by means of a fuel pick-up valve which extends down to the bottom of the tank. The fuel shut-off valves are also on top of the fuel tank and are accessible from the deckhouse through access panels cut in the sole inside the L-settee and portside cabinet at the aft end of the deckhouse.

If your engine runs out of fuel, it will be necessary to bleed the system of air bubbles.

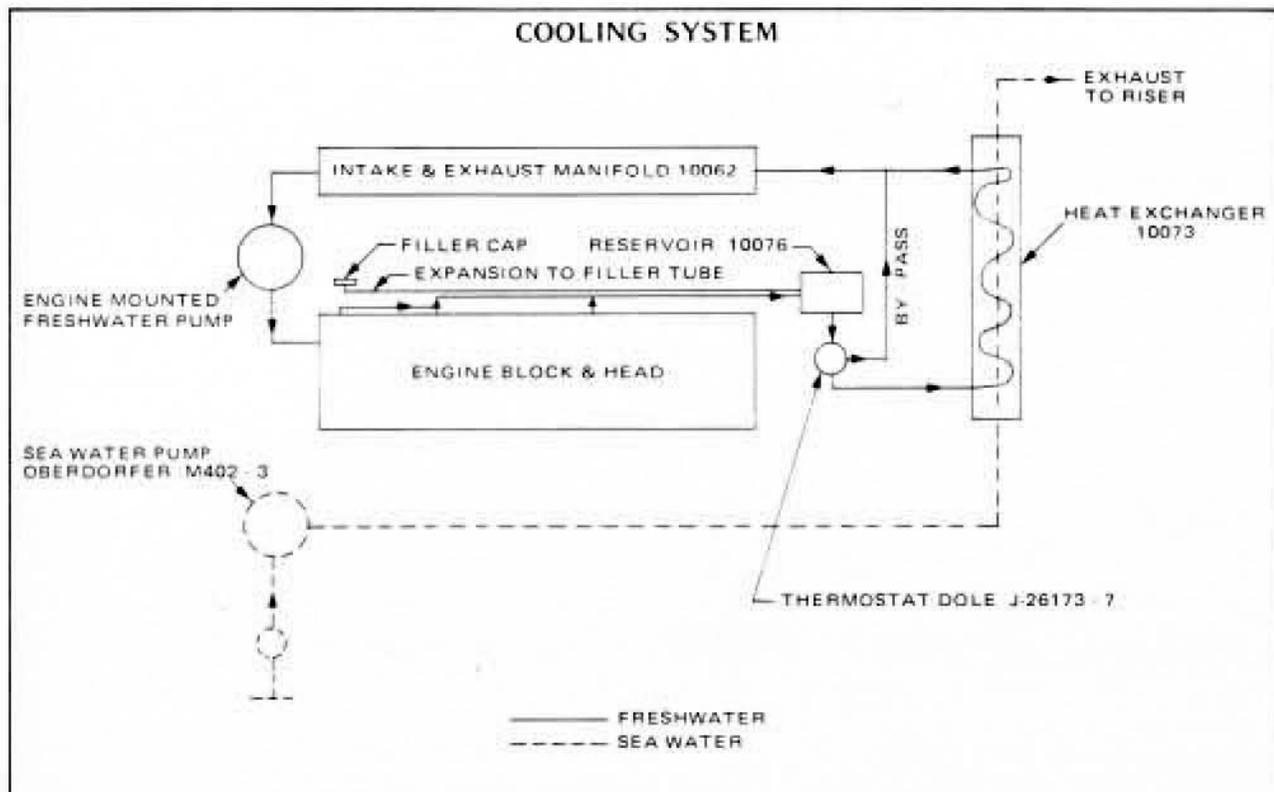
To bleed the system:

1. Close the fuel valve on any empty tank. Open the shut-off valve at the tank that has fuel in it and also the cross-connect isolation valve. Set the return valves to desired tank.
2. Open bleed screw located at the top of the forward side of the final filter. See illustration No. 2 for exact location.
3. Work the lever on the fuel priming pump until bubble-free fuel runs from the bleed screw. If the handle feels as if it has no pressure during the pumping stroke, the engine has probably stopped with the fuel lift pump on top of its cam lobe. Briefly crank the engine with the starter motor to correct this situation.
4. If the Fram priming filters were completely drained after the engine ran out of fuel, considerable hand-priming time can be saved if the filters are filled with fuel using a cup and a funnel. Also, if the batteries are well charged or, on a single engine boat, or engine is running satisfactorily than the fuel system can be bled by following the above procedures and turning the engine over with the starter.
5. Do not run the engine until the hand fuel pump lever has been pushed fully down. Operating the engine with the lever in the "out" position will damage the fuel lift pump.

TRANSMISSION

Borg-Warner "Velvet Drive" transmissions are standard equipment. These units have a hydraulically actuated clutch. The oil used for this purpose is Type "A", suffix "A" automatic transmission fluid which is satisfactory for use in any climate. Transmissions should be filled or topped off through the screw plug located adjacent to the selector lever. The dipstick for checking oil levels is attached to this fill plug.

If a twin engine boat is being run on one engine, the unused transmission should never be allowed to freewheel for more than a few minutes. The unused shaft must be prevented from rotating or the transmission can get very hot and cause damage to internal components.



PRE-START CHECKS

Check the engine and transmission lube oil levels.

Check the coolant level by topping off the cooling system through the pressure cap located on top of the forward end of the engine.

Check for excessive water in the bilge.

The battery disconnect switch in the engine room should be left on at all times. This switch (there are two switches on twin engined boats) disconnects all batteries from the boat's electrical system. Never turn this switch off while engines are running.

STARTING THE ENGINE

Double-check the gearshift control lever to be sure the transmission is in neutral. Move throttle control to approximately $\frac{1}{4}$ throttle. The red battery selector switch on the electrical panel near the helm governs only the service electrical system and has nothing to do with the engines. Turn engine circuit breaker to "on" position. This will actuate the low oil pressure alarm buzzer. Press the starter switch and throttle back to idle as soon as the engine has started. The low oil pressure alarm will shut off as soon as oil pressure reaches a normal minimum. If the alarm has not shut off within ten seconds, turn the engine off and determine the cause of the low oil pressure situation. Start the second engine in the same sequence as the first.

Make a visual check of the boat by taking a turn around the deck. Look for lines that may foul the propeller when you are backing out, look for swimmers in the water, look at your fenders to be sure that the lines to which they are attached will not foul on any part of the dock, and take a look over the stern to be sure exhaust water is flowing from the exhaust outlet.

The prudent skipper will make a quick visual inspection of his engine room to see that loose equipment is stowed and will double-check the engines to see that all systems are operating properly.

Your engine will normally require approximately 15 minutes to warm up. Do not exceed 1600 rpm until the water temperature has reached 180 degrees F.

STOPPING THE ENGINE

If you are at cruising speed and decide to cut your engine for any reason, always ease the throttle to idle speed. Put the gearshift lever in neutral after you have throttled back all the way and allow the engine to idle for a minute before shutting down the engine.

Activate the stop device located on the instrument panel and allow the oil pressure alarm to sound before you turn off the engine circuit breaker. This is recommended as a check for the alarm system to ensure that it is operative.

OPERATING THE ENGINE

No break-in period is required since full break-in procedures have been completed at the factory. You may operate your engine at full throttle the first day, although a maximum cruising rpm of 2000 is recommended for optimum efficiency and fuel consumption.

Maximum rpm may vary depending upon condition of the bottom, propellor condition, etc. If you cruise at 200 rpm under the maximum available rpm, a long engine life will be ensured.

All gauges, which are accurate to within plus or minus 10% plus the thickness of the needle, should be monitored on a regular basis. The maximum water temperature is 212 degrees F, and normal operating temperature is 190 degrees F under full load. An alarm will sound if the temperature exceeds 212 degrees at which time the engine should be shut down.

The oil pressure should not fall below 15 psi. If the pressure falls below the desired minimum level, the alarm will sound at which time the engine should be shut down.

TRANSMISSION FLUID

Type "A" transmission fluid should be used. Do not use transmission fluid additives.

FUELS

Number 2 diesel fuel is recommended although the use of number 1 fuel will not harm your engine. You may expect a lower horsepower output, however, when you use number 1 diesel fuel.

Many fuel additives are available as fuel tank fungus growth inhibitors. This additive is recommended for use in your diesel fuel tanks. Many gas docks and most airports world-wide carry this product.

LUBRICATING OIL

Use lubricating oil with the viscosities that appear on the following chart. Never use crankcase flushing liquids, i.e., kerosene or paraffin compounds. Do not use engine lube oil additives.

AIR TEMPERATURE	SINGLE VISCOSITY OIL	MULTI-VISCOSITY OIL
32 F +	SAE 30	not recommended
-10 F to 32 F	not recommended	SAE 10W-30

Fuel System

TANKS

Each tank has a deck fill, overboard vent, supply pick up tube and handhole clean out plate. Located at the top of each tank is a fuel shutoff valve.

The port tank valve is accessible through a hatch inside the locker or settee beside the companionway steps leading from the main to the aft cabin. The valve for the starboard tank is accessible through a hatch inside the aft end of the main saloon settee.

FUEL SUPPLY SYSTEM

On twin engined boats each engine is piped to run off its own set of tanks. A cross connection has been provided in the system with an isolation valve. This valve should normally be kept "closed". It should only be opened to provide fuel for both engines from one tank or one engine from both tanks. When supplying fuel from one tank only, the opposite fuel tank valve must be "closed".

A mechanical fuel lift pump on the engine supplies fuel through a filter to the injection pump. This filter is the final filter and should be replaced every 100 hours. Two fuel filters purify the fuel before it reaches the engine mechanical fuel lift pump. One filter is a water separator while the second filters other impurities from the diesel fuel.

If a diesel engine should run out of fuel, it is necessary to bleed the air from the fuel system before the engine can be restarted. Number 2 diesel fuel is recommended. Fuel level may be checked by sounding the tanks.

BLEEDING THE FUEL SYSTEM

1. Close the fuel valve on any empty tank. Open the shut-off valve at the tank that is to be used.
2. Open bleed screw located at the top of the forward side of the final filter.
3. Work the lever on the fuel priming pump until bubble-free fuel runs from the bleed screw. If the handle feels as if it has no pressure during the pumping stroke, the engine has probably stopped with the fuel lift pump on top of its cam lobe. Briefly crank the engine with the starter motor to correct this situation.
4. If the Fram priming filters were completely drained after the engine ran out of fuel, considerable hand-priming time can be saved if the filters are filled with fuel using a cup and a funnel. If the batteries are well charged the fuel system can also be bled by following the above procedures and by turning the engine over with the starter.
5. Do not run the engine until the hand fuel pump lever has been pushed fully down. Operating the engine with the lever in the "out" position will damage the fuel lift pump.

FUEL RETURN SYSTEM

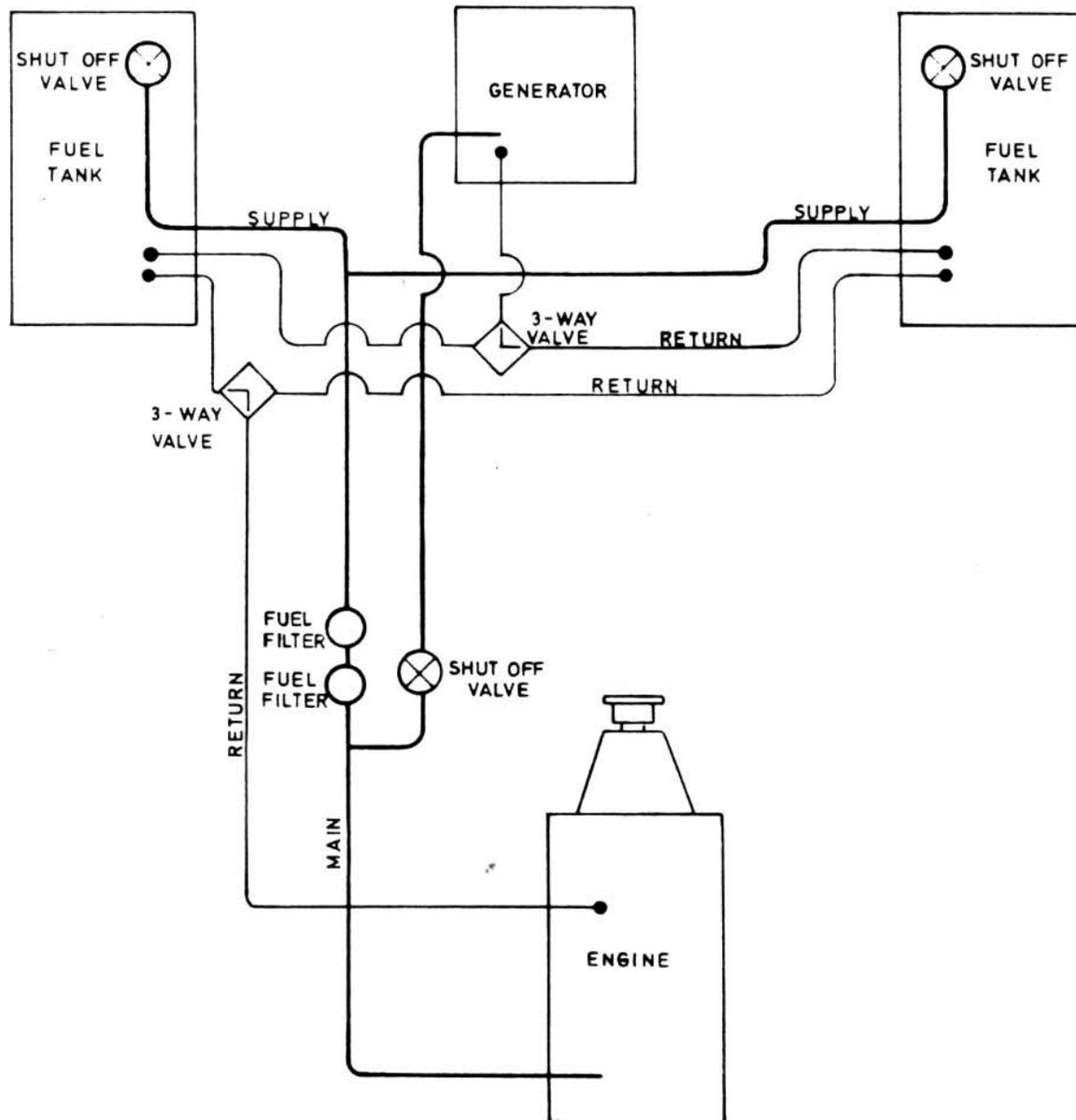
The fuel pump on a diesel engine supplies more fuel than is actually required for combustion. The excess is returned to the fuel tanks through a fuel return line. The fuel return should always be valved to the same tank from which the supply is being drawn unless it is intended to return the fuel to another tank. By no means should the fuel return line be blocked. If it does not have free flow, the engine will start but not run.

Fuel return path is indicated by the 90° markings on each fuel return selector valve.

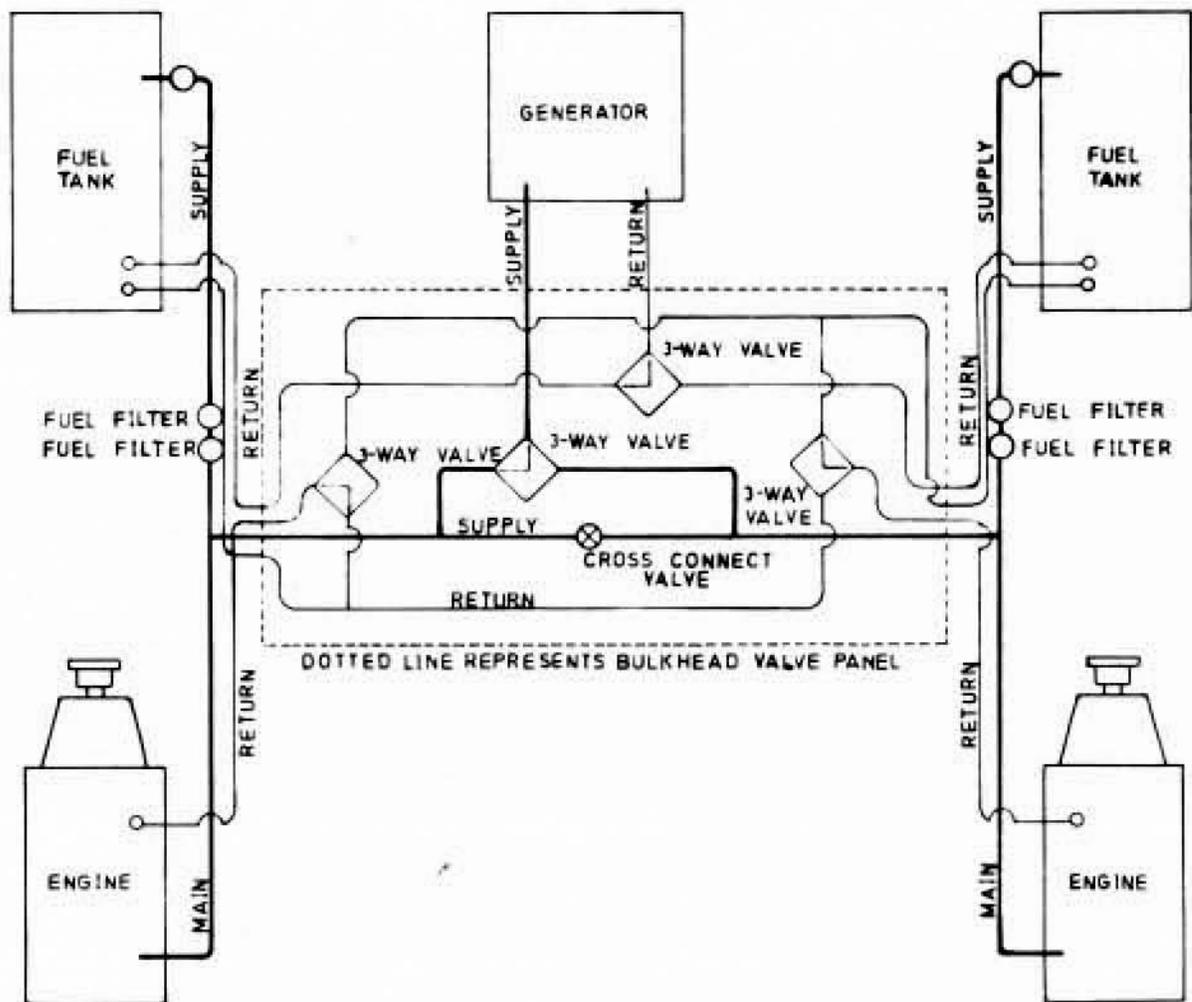
LOAD SENSITIVE ENGINE GOVERNOR

The fuel injection pump on your engine is equipped with a load sensitive governor. The governor's function is to maintain the rpm as set by the operator. If you open the throttle to 2,000 rpm for cruising and then either load or unload the boat, bend a prop, get into rough seas, etc., the governor will increase or decrease the fuel supply to the engine automatically in order to maintain the 2,000 rpm. Going up the frontside of a large wave it will increase fuel to maintain rpm; rushing down the backside of a wave, it will decrease fuel to maintain rpm; if one engine loses power the governor on the other engine automatically increases the fuel supply to maintain rpm under the increased load condition.

Single Engine Fuel System



Twin Engine Fuel System



Propulsion System

SHAFT ALIGNMENT

To check the shaft alignment first remove the bolts from the shaft coupling at the transmission. Using a feeler gauge of about 0.003" thickness slide the coupling faces together by hand and, while supporting the weight of the shaft and coupling, check that the gap between the faces of the two halves of the coupling is the same all the way around. If it is not, move the engine by adjusting the engine mountings until proper alignment is obtained.

It is impossible to line up a bent shaft. If it is aligned in one position and then rotated through 180°, it will again show misalignment. The vibration caused by misaligned shafts will not physically damage the boat but if not corrected, will accelerate wear on the shaft bearings.

NOTE: Check shaft and engine alignment only when the boat is afloat.

SHAFT LOGS & STUFFING BOXES

Attached to the shaft logs are the stuffing boxes. The attachment is made using a short length of flexible hose which allows a small amount of misalignment without excessive wearing of the stuffing box packing. The stuffing box is packed with braided flax packing which is held in place with the packing nut. If the stuffing box is leaking excessively, it should only be necessary to loosen the lock nut. Tighten the packing nut by hand and then retighten the lock nut. Do not tighten the packing nut excessively or the shaft may become scored. The stuffing box should drip slowly as the packing material is water lubricated.

REPACKING THE STUFFING BOX

If the stuffing box still leaks after tightening down on the packing nut, the packing should be replaced. To repack, unscrew the packing nut and remove the old packing. New packing should be wound around the shaft in separate rings with enough rings installed to nearly fill the stuffing box packing nut. The ends of each ring should touch and the joints should be staggered with the ends, 180° from each other. The packing nut is then moved toward the stuffing box over the packing and screwed on the stuffing box gland. Tighten the packing nut sufficiently so that water is just slowly dripping from the gland then tighten the lock nut.

PROPELLERS

Information on the propellers installed may be found in the general specifications. The port, or single engine, propeller is left-handed and the starboard is right-handed when viewed from aft of the stern.



PORT



STARBOARD

PROPELLER REMOVAL

Prior to reinstalling a propeller, the taper on the shaft should be lightly coated with a suitable preparation to prevent "seizing" on the shaft. If the propeller is coated with STP oil additive, it will usually stay clean for up to 3 months, helping the boat to maintain its performance.

Where propellers with recessed hubs are fitted, the recesses should be packed with waterproof grease before the nuts are put on.

Care should be taken when installing a propeller, to ensure that it seats properly and is not keybound. To check this the propeller should first be slid up the taper without the key installed and the point on the shaft reached by the forward end of the propeller marked with a pen or pencil. The propeller should then be removed and reinstalled with the key in place. The propeller should reach the same position as previously marked. This procedure is important to prevent imbalance and vibration.

Steering and Control System

The sprocket on the saloon wheel shaft is connected to the rudder quadrant by means of a chain and cable system. The fly bridge wheel shaft is connected to the saloon wheel shaft utilizing a stainless steel cable. In the unlikely event of a steering failure at the flying bridge, the lower station steering should be checked before assuming that the failure affects the entire system.

An emergency tiller has been provided and, if required, it should be fitted through the deck-plate in the cockpit and onto the squared shaft of the starboard rudder stock. It may also be necessary to disconnect the steering cables at the quadrant.

The chain and cable used in the steering system is many times stronger than necessary; therefore, after the first 100 hours of operation it is likely no further adjustment will be necessary. However, periodic greasing, oiling and visual checking is necessary. If adjustments are made, be sure to keep cables and chains in equal tension. Failure to equalize tension causes excessive friction in the steering system.

B



Potable Water System

WATER TANK

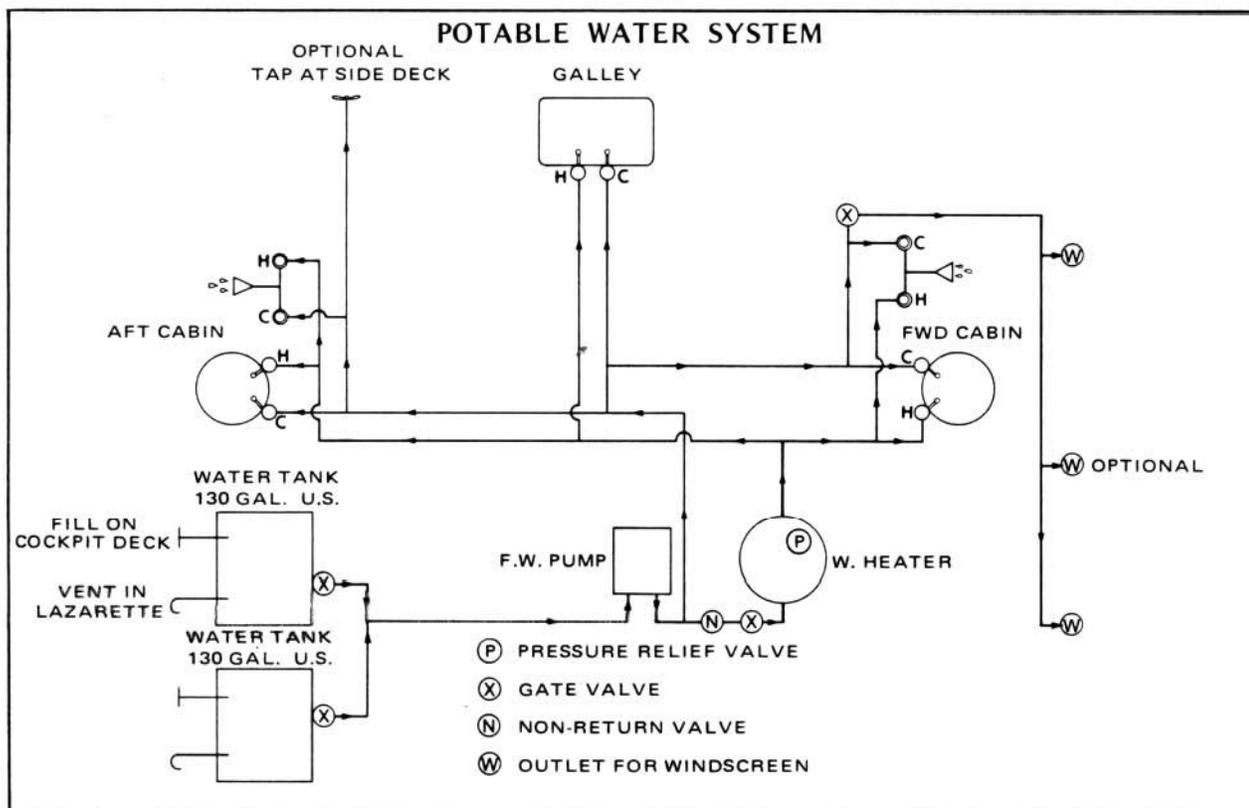
TYPE	2 stainless steel tanks
CAPACITY	117 U.S. galls each (444 litres) each
LOCATION	lazarette
FILL	on afterdeck, marked "water"
VENT	inside bulwarks at transom
SUPPLY VALVE	at tanks in lazarette

WATER PRESSURE PUMP

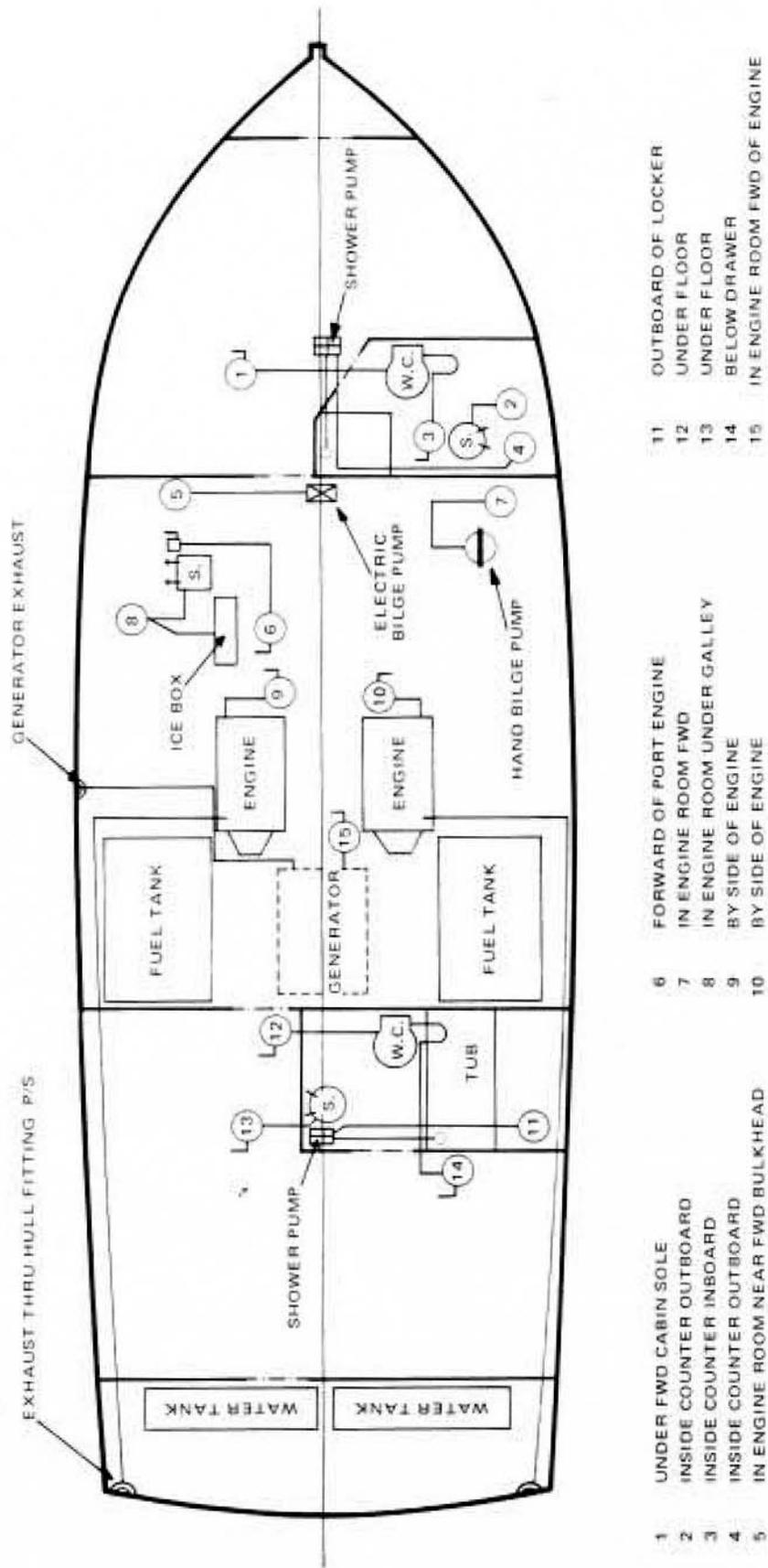
TYPE	diaphragm
LOCATION	engine room near hot water heater
ACCESS	through main saloon engine hatch
OPERATION	switch and priming button are on DC panel

WATER HEATER

CAPACITY	8 U.S. gallons (26 litres)
LOCATION	outboard of port engine in engine room
ACCESS	through main saloon engine hatch
OPERATION	120 volt electrical element fed from AC panel or engine heat. (NOTE: The engine will not get hot enough while idling at anchor to heat the water.)



Thru-Hull Location



Bilge and Sanitary System

SHOWER SUMP PUMPS

The forward pump is in the engine room on the forward bulkhead starboard side. It discharges through the starboard topside above the waterline without a seacock.

The aft pump is in the engine room on the aft bulkhead and discharges through the starboard topside above the waterline without a seacock.

The main shower sump pump circuit breaker is on the DC panel with a local push/pull switch in each toilet compartment. Both switches must be "on" to operate the pump.

FORWARD TOILET COMPARTMENT

The toilet pickup seacock is below the sole inside the cabinet next to the water closet. The toilet discharge seacock is in the engine room, on starboard side above the waterline and has no seacock.

AFT TOILET COMPARTMENT

The toilet discharge seacock is below the hatch inside the cabinet next to the water closet. The toilet pick up is under the same cabinet.

The basin drain discharges through the starboard topside above the waterline and has no seacock.

BILGE PUMP

The electric bilge pump is located beneath the engine room deck plates at the forward engine room bulkhead. Circuit breaker and manual/auto switch are on the DC panel. It discharges through the topsides above the waterline and has no seacock.

HOLDING TANK

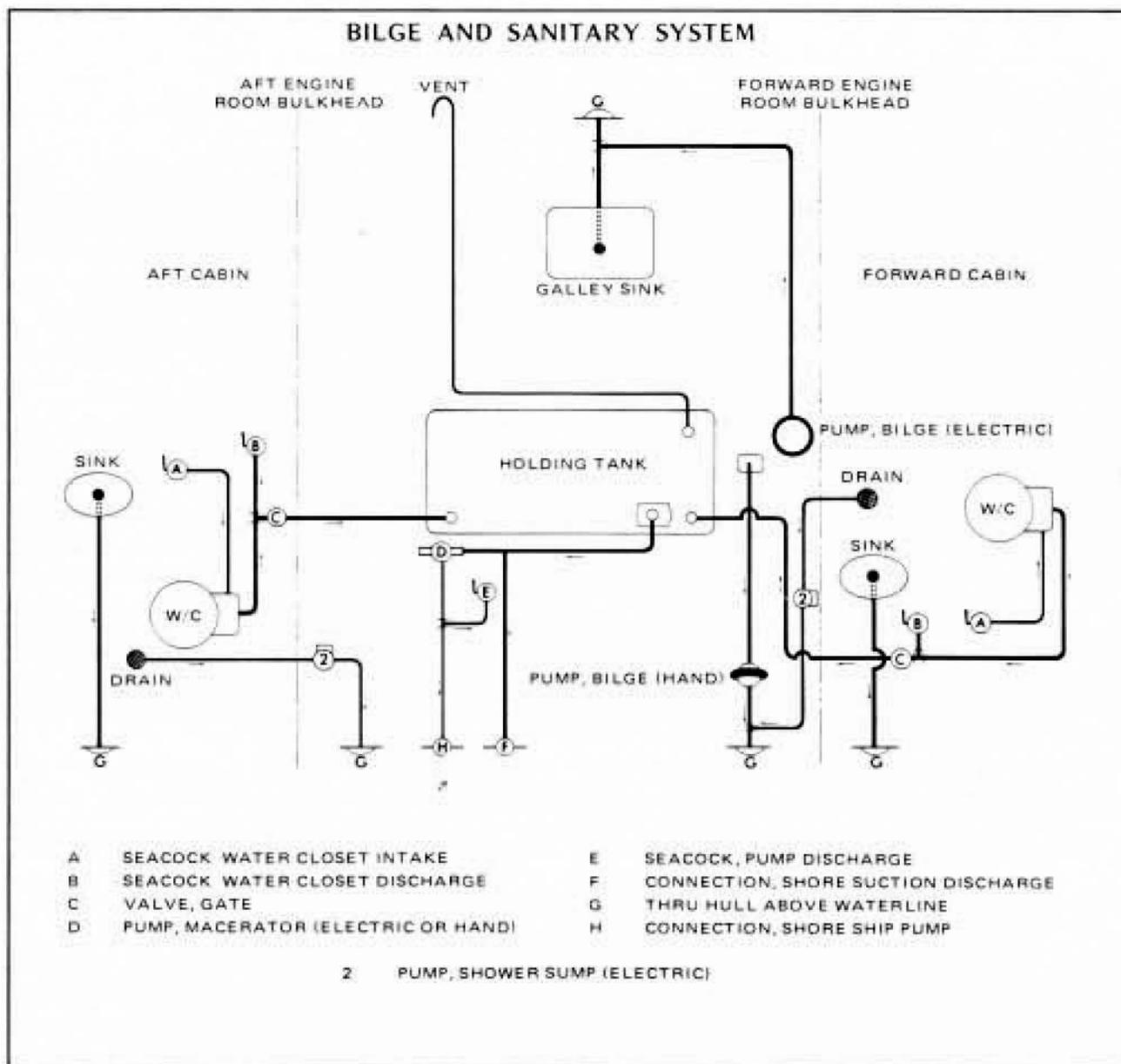
The holding tank is located in the engine room between the inboard longitudinal stringers. The tank receives waste from the forward and aft toilets. It discharges to shore on the starboard side by operation of the ship's macerator pumps or by shore vacuum facilities.

OPERATION OF WATER CLOSET (S)

1. Conventional use: (pumping water closet overboard)
Open B discharge seacock
Close C valve to tank
2. Holding tank use:
Seacock . . . A toilet intake must always be open
Close B discharge seacock
Open C valve to tank

WASTE DISPOSAL FROM HOLDING TANK (S)

1. To shore facility: (using shore facility vacuum pump)
Close E pump discharge seacock
Open F cap and connect shore pump
2. To shore facility with ships pump: "D"
Close E pump discharge seacock
Open H cap and connect discharge hose and start pump
3. To overboard: (discharging overboard with ships pump "D")
Open E pump discharge seacock and pump



C

Electrical System

120 VOLT AC ELECTRICAL SYSTEM

120 VOLT AC SUPPLY

AC supply is provided either from the shore via the 50 amp shore connector on the port houseside or from the optional generator located in the engine room. When a generator is installed, the AC supply required is selected by the white and black rotary selector switch mounted horizontally on the starboard side of the console. Without the generator the AC panel governs input from a shore power source.

All AC power in the boat is 120 volt. When local shore supplies are 240 volt, a transformer can be installed to step the shore supply down to 120 volt.

A light on the AC panel will come on whenever there is AC power at the panel whether it is provided from the shore or from the generator. The reverse polarity warning light comes on only if the shore power is incorrectly connected with polarity reversed. Should this happen, the supply line should be disconnected and reversed immediately.

Before being connected to the single pole circuit breakers for distribution, the AC current is switched through a double-pole master circuit breaker. This circuit breaker must be on before the AC circuits can be operated.

ICE MAKER

After draining, the ice maker needs priming with a cupful of water in the ice tray before it will function.

GENERATOR (optional)

The starting and stopping control buttons for the generator are located on the AC panel. These buttons will not work unless the circuit breaker on the same section of the panel is "on".

A separate battery for starting the generator is located in the engine room and is connected through the generator disconnect switch mounted on the master switch and paralleling solenoid panel. **DO NOT OPEN** this switch while generator is operating.

Consult the generator owner's manual for generator service and operational instructions.

ELECTRIC WATER HEATER

The water heater operates on the AC supply either on shore power or generator. A 20 amp circuit breaker protects the circuit. Water heater temperature is adjustable at the thermostat located on the hot water heater.

WARNING: Make sure water is in the tank and the potable water pump is "on" prior to operating the hot water heater.

12 VOLT DC ELECTRICAL SYSTEM

Your boat's electrical system is 12 volt direct current with negative ground. Two 165 ampere hour (20 hour rate) batteries are located in the engine room as potential for the service system. A 140 ampere hour (20 hour rate) battery is installed with a generator.

MASTER BATTERY DISCONNECT SWITCHES

Battery disconnect switches are located on the forward engine room bulkhead. With the exception of the automatic bilge pumps, all DC electrical circuits will be dead including alternators and instruments when these switches are "off". The battery disconnect switches are "on" when the handles are in the vertical position.

NOTE: Do not turn switch to "off" position while the engines are running. Switching while engines are running may damage the alternator.

BATTERY PARALLELING

Both batteries are automatically paralleled when either starter button is operated. The paralleling solenoids are located on the back of the battery disconnect switch panel.

BATTERY SELECTOR SWITCH

This switch enables power for the service system to be drawn from either or both batteries. Power from this red battery selector switch is distributed to all DC circuits through circuit breakers. The "all" position on the red battery selector switch should only be used if the operator intends to draw power from both batteries at once or, in the case of twin equipped boats, if both batteries are to be charged when only one engine is running.

NOTE: Under normal circumstances, the battery selector switch does not affect battery charging as each engine automatically charges its own starting battery.

BATTERY CARE

To ensure long battery life, the battery should be checked at regular intervals to determine the state of charge. At this time it should be checked to ensure that the level of the electrolyte is above the battery plates. To determine the state of charge a hydrometer reading should be made of each cell. Hydrometer readings are an indication of the strength of the sulphuric acid in the battery. For example, a fully charged battery will have a specific gravity of approximately 1.280 (a weight of 1.28 times that of pure water) at 70° F - 21° C. The specific gravity readings for typical various states of charge are given in Table 1. Hydrometer readings should be made prior to adding distilled water, as the addition of distilled water will temporarily cause inaccurate specific gravity readings.

TABLE 1

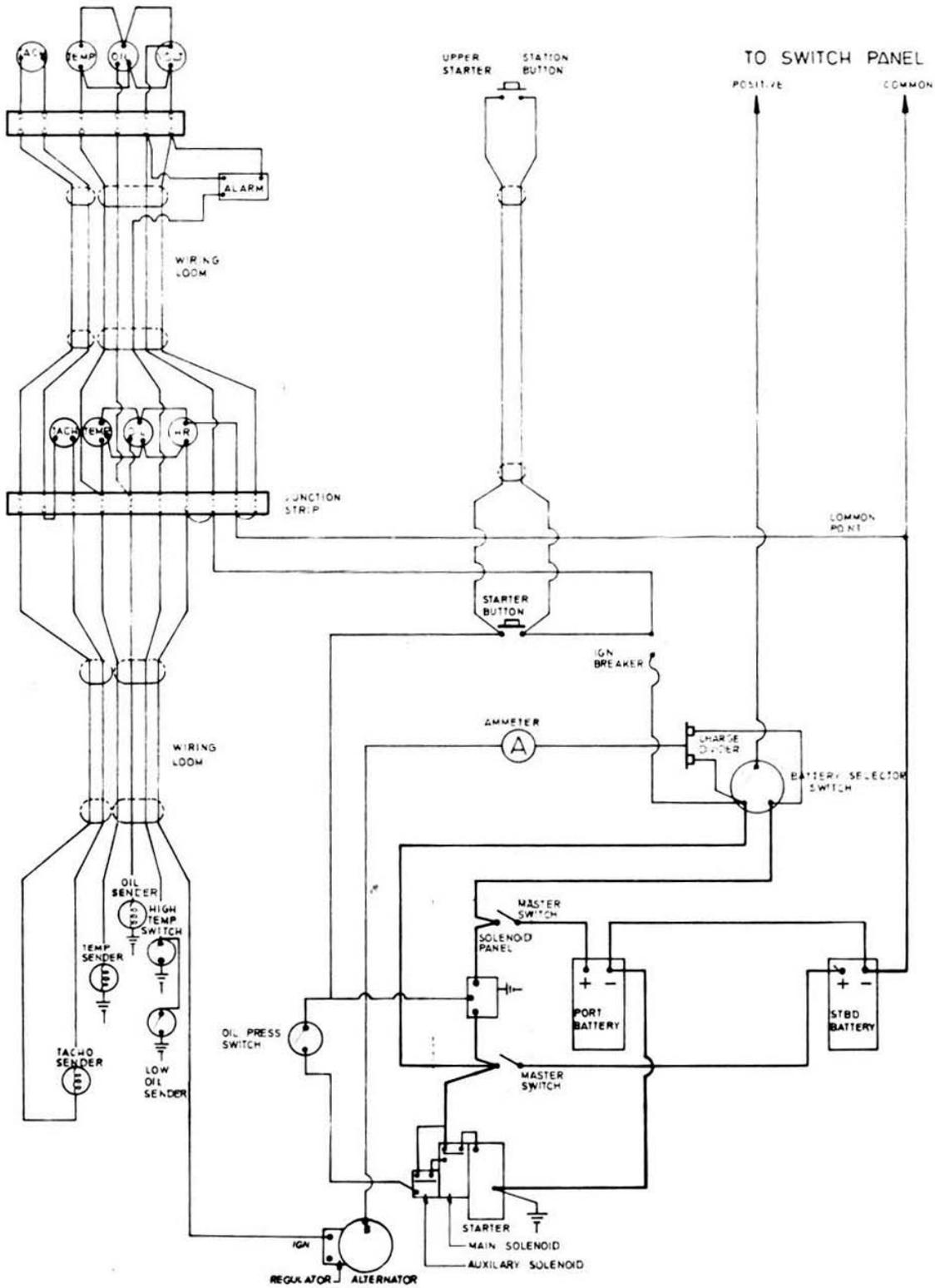
State Of Charge:

The best indication of state of charge or discharge is the specific gravity of the acid in the cell. Typical values are given below.

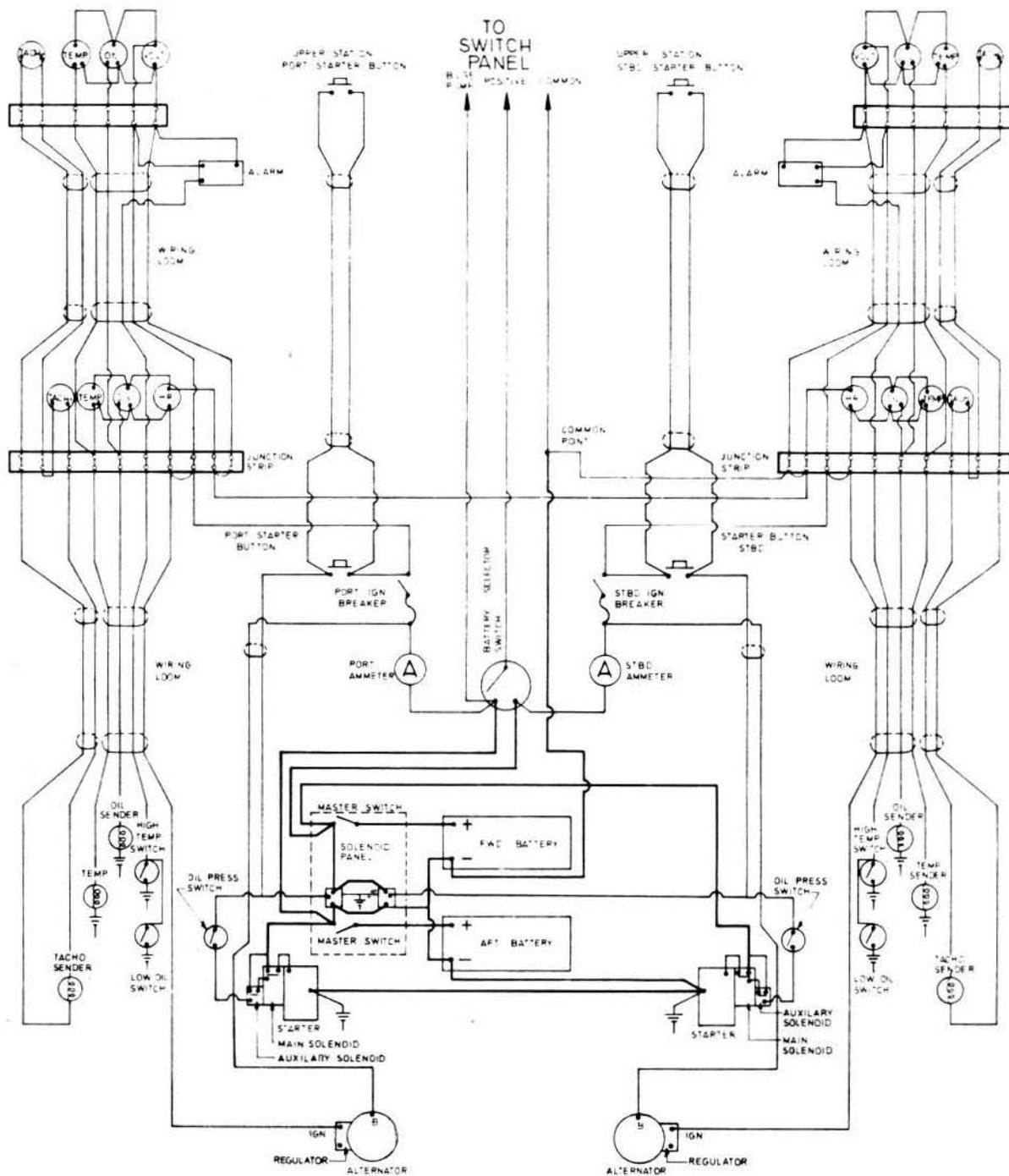
HYDROMETER READING AT TEMPERATURE

CONDITION OF CELL	10° C	16° C	21° C	27° C	32° C	38° C	43° C
	50° F	60° F	70° F	80° F	90° F	100° F	110° F
Fully Charged	1 · 288	1 · 284	1 · 280	1 · 276	1 · 272	1 · 268	1 · 264
Half Discharged	1 · 208	1 · 204	1 · 200	1 · 196	1 · 192	1 · 188	1 · 184
Fully Discharged	1 · 118	1 · 114	1 · 110	1 · 106	1 · 102	1 · 098	1 · 094

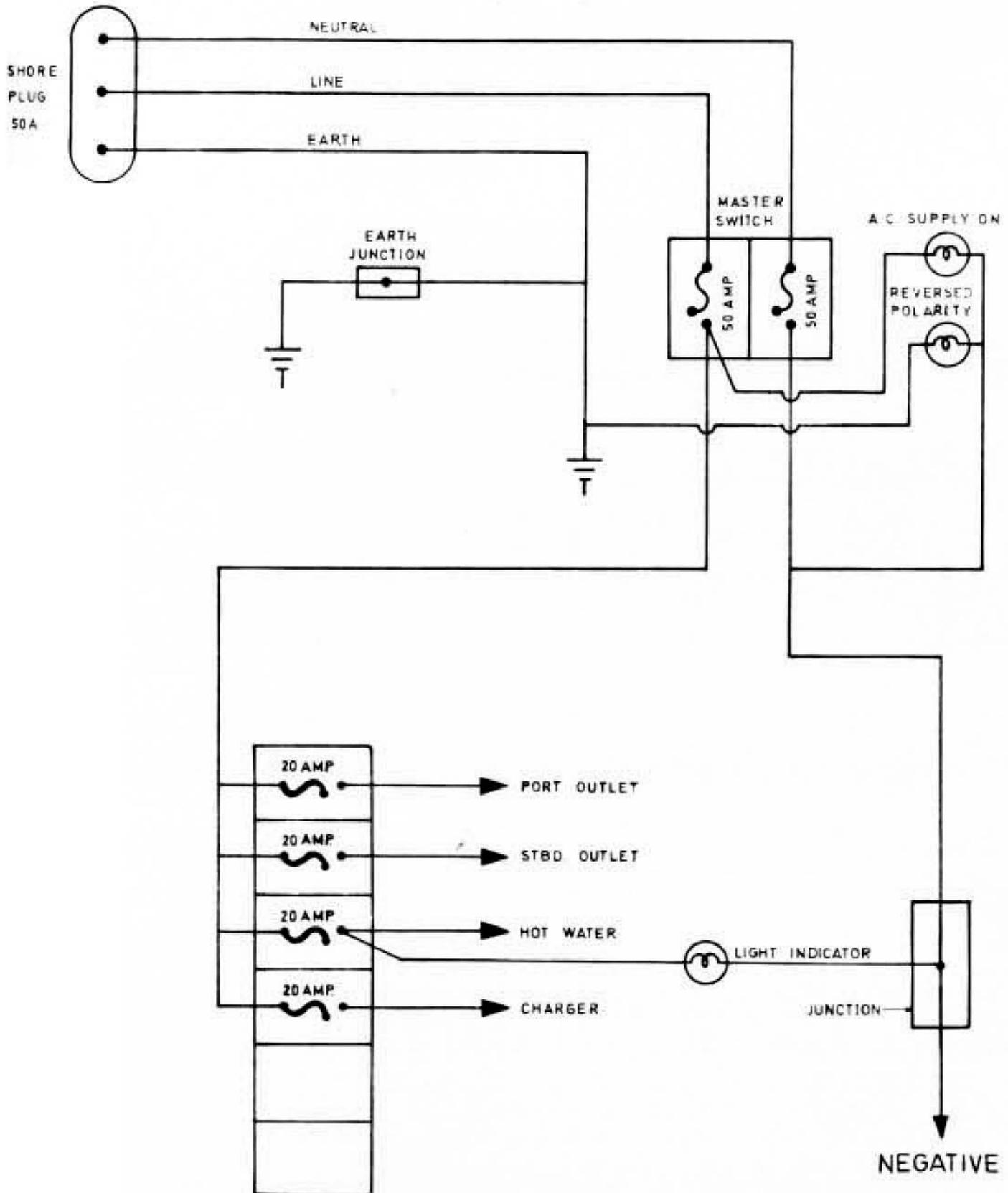
Single Engine DC Schematic



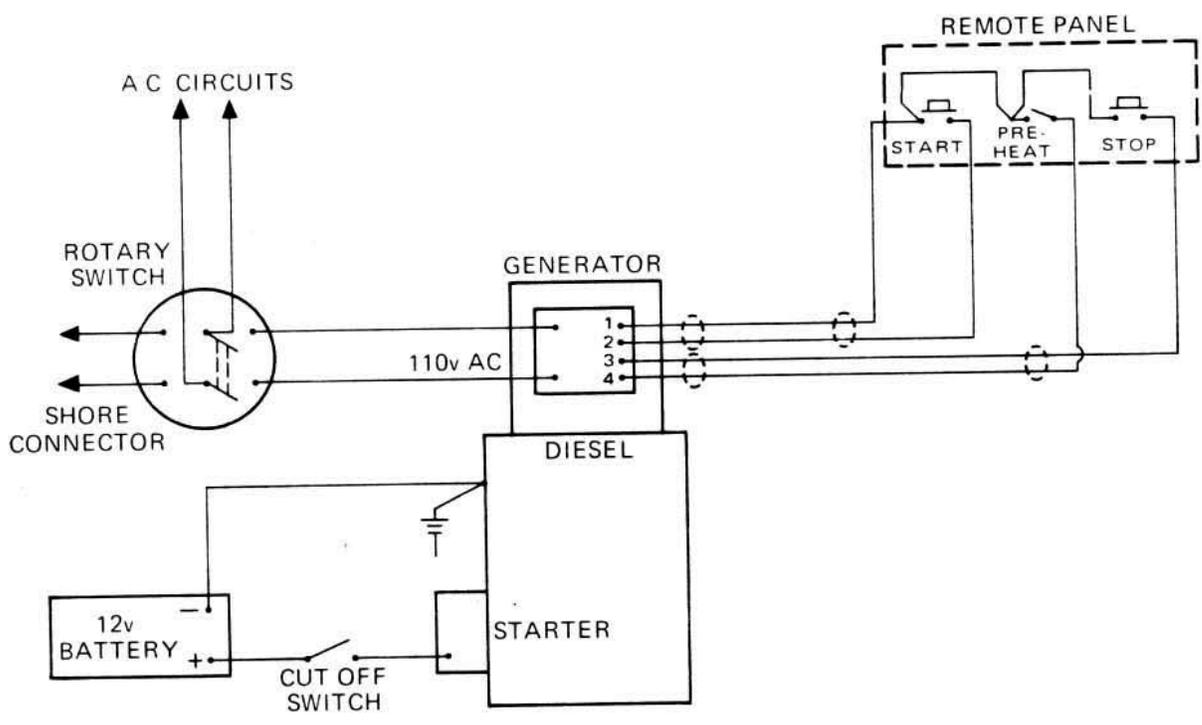
Twin Engine DC Schematic



A.C. SCHEMATIC GB 32, 36, 42



Generator Schematic



CABLE MARKER CODE NUMBERS

These code numbers apply to wiring systems installed in boats with Hull Numbers starting with GB32-560, GB36-495, GB42-489.

D.C. CIRCUITS

<u>Code Number</u>	<u>Circuit</u>	<u>Code Number</u>	<u>Circuit</u>
0	D.C. NEGATIVE	25	WINDLASS
1	PORT STARTING OR SINGLE ENGINE STARTING	26	D.C. OUTLET
1001	PORT ALTERNATOR OR SINGLE ENGINE ALTERNATOR	27	GENERATOR START
2	STBD STARTING	28	GENERATOR HEAT
2002	STBD ALTERNATOR	29	GENERATOR STOP
3	PORT WIPER	<u>OPTIONAL</u>	
4	CENTRE WIPER	41	HOLDING TANK
5	STBD WIPER	42	RADIO
6	HORN MOTOR BREAKER	43	RADAR
7	HORN MOTOR	44	DEPTH SOUNDER
8	HORN BUTTON	45	AUTO PILOT
9	RUNNING LIGHTS	46	SALT WATER PUMP
10	ANCHOR LIGHT	47	ELECTRIC HEAD
11	FWD LIGHTS		
12	AFT LIGHTS		
13	BILGE PUMP		
14	BILGE PUMP SWITCH		
15	DRAIN PUMP MOTOR		
16	DRAIN PUMP SWITCH		
17	F.W. PUMP		
18	F.W. PUMP PRIMING		
19	SPREADER LIGHT		
20	BLOWER		
21	BLOWER SWITCH		
22	CHARGER POS. 1		
23	CHARGER POS. 2		
24	CHARGER POS. 3		

A.C. CIRCUITS

<u>Code Number</u>	<u>Circuit</u>	<u>Code Number</u>	<u>Circuit</u>
01	A.C. NEUTRAL		
02	A.C. EARTH		
30	ONAN		
31	SHORE		
32	PORT OUTLET		
33	STBD OUTLET		
34	HOT WATER		
35	CHARGER		
<u>OPTIONAL</u>			
36	FRIDGE		
37	FREEZER		
38	ICEMAKER		
39	OVEN		
40	AIRCON		

Instrumentation

TACHOMETER

This instrument indicates the engine speed in revolutions per minute. Cruising rpm varies with conditions. (For information on proper operating rpm, refer to the section on operating the engine, page 9).

AMMETER

This instrument shows the charge rate of the alternators. It is located at lower steering station only. NOTE: When batteries are fully charged the charging rate drops back to between 3 and 5 amps.

OIL PRESSURE

The oil pressure gauges, located at the lower and upper steering stations, read in pounds per square inch. The normal pressure when cruising at 1800 rpm is approximately 40 psi. When the engine is idling at 700 - 850 rpm the pressure will drop to 20 psi. If the pressure should drop below 15 psi, stop engine and check for cause even if the alarm does not sound.

WATER TEMPERATURE

The temperature gauges for the fresh water cooling system are located at the lower and upper steering stations. The normal operating water temperature should be 180° - 190° F. An engine should be allowed to warm up gradually and should not be run at full cruising rpm until normal operating temperature has been reached. Recommended is 10 minutes at 1000 rpm, 15 minutes at 1500 rpm.

HOURMETER

This instrument, located at the lower steering station, registers engine operating hours.

ALARM SYSTEM

The alarm buzzer, located at the upper steering station, sounds when the water temperature approaches 212° F or when the oil pressure drops below 15 psi. The oil pressure switch is the sensor which causes the alarm to sound when an engine starting circuit breaker is switched "on" but the engine is not running.

If the alarm sounds when an engine is running, the engine should be stopped at once and the cause investigated.

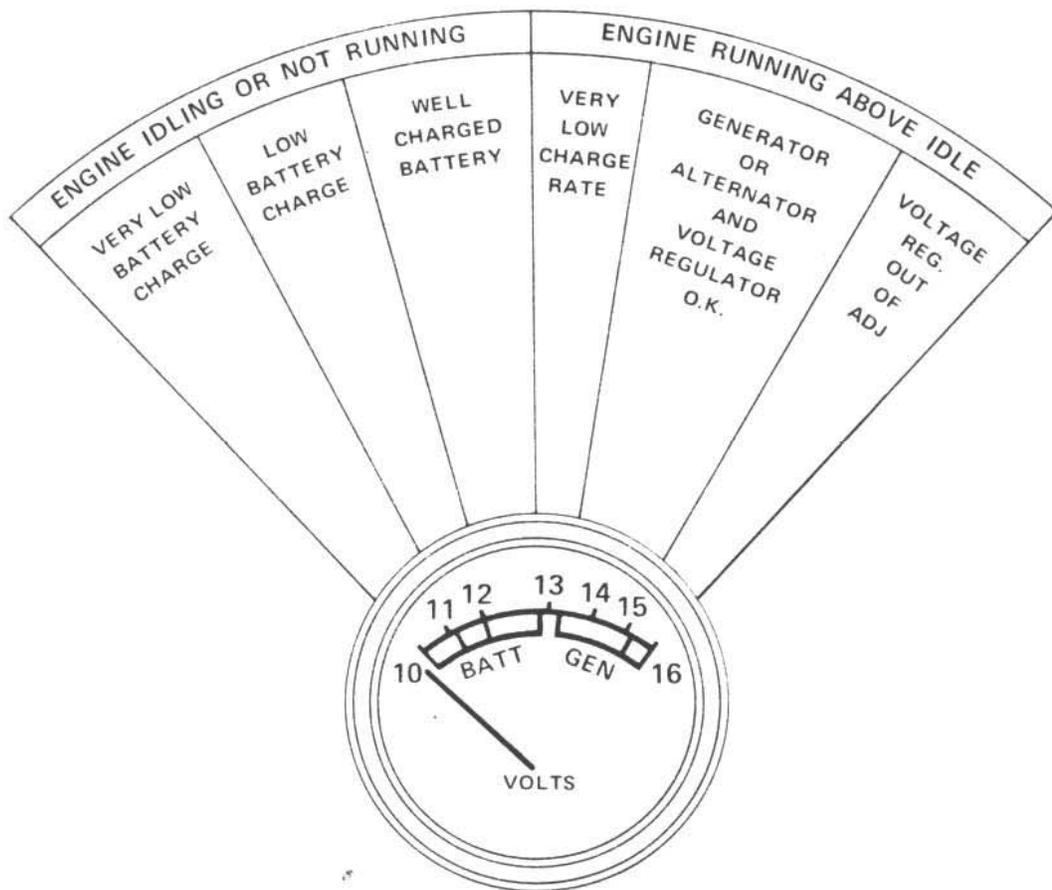
NOTE: The alarms will not operate if the engine circuit breaker is switched "off". The engine circuit breaker should always remain "on" when the engine is running.

VOLTMETER

This instrument, located at the upper steering station, shows the condition of the battery, also shows the level of regulated voltage being produced by the alternator while the engine is running. A reading of between 12 and 13 indicates the battery is well charged. If reading is at the extremes of 10 or 16, check cause.

Actual battery voltage is read before or after operating the engine. A constant reading in red segments on face dial indicates a need for a complete check of either battery or generating system.

The voltage regulator is compensated to permit the generating system (alternator) to produce more charging voltage during cold weather. Therefore, the voltmeter will show higher readings during cold weather than it will in warm weather.



Voltmeter

ENGINE CIRCUIT AND ALARMS

The instruments, alarms and instrument panel lights are connected to the engine circuit. If the engine breaker switch is turned off while the engine is operating, the engine will continue to run, but the alarms or instruments, will not operate.

BILGE PUMP

The bilge pump circuit is the only circuit connected to the live side of the battery service selector switch. Therefore, with this switch "off", the bilge pumps will operate automatically provided that the bilge pump circuit breaker and the battery disconnect switches are "on" and that the bilge pump function switches are set to "auto". The pump can also be started at any time by setting the function switch to "manual".

It is recommended that when leaving your boat the battery disconnect switch (in the engine room) be left in the "on" position, with bilge pump breaker "on" and pump switched to "auto" and the red battery service selector switch in the "off" position. In this configuration there is no DC power being supplied to any circuit in the boat except the bilge pump.

NOTE: When any additional DC electrical equipment is installed in your boat, be sure that it is wired into the panel only on the output side of the battery selector switch, and a circuit breaker is used.

POTABLE WATER PRESSURE PUMP

When first used, or whenever the pressure drops below 2 psi, the pump must be started by manually depressing priming button next to the potable water pump circuit breaker on the DC panel. It may be necessary to bleed air from the system. To do this, crack the galley sink faucet just enough to let the air out, then the button should be held down approximately 15 seconds. When the system has been bled of air and received its prime the automatic system will work.

SHOWER DRAIN PUMP

A push/pull switch at each shower location is used to control the pump, but the circuit breaker on the DC panel must also be on.

The pump should be switched on only as necessary. Allowing it to run dry for long periods may damage it.

CABIN LIGHTS

Cabin lights are controlled through circuit breakers on the panel and have individual switches on each light.

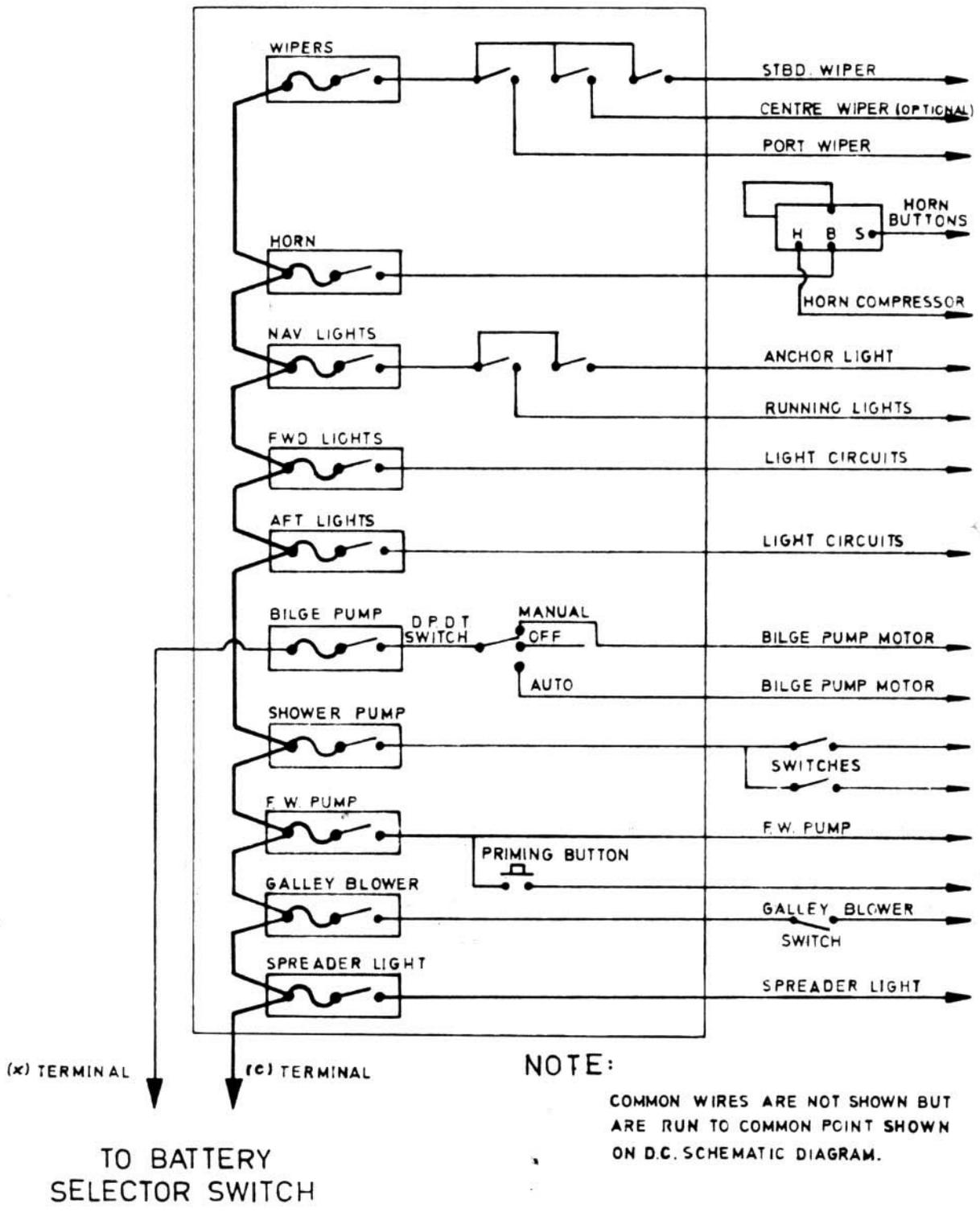
WINDSHIELD WIPERS

To operate, turn breaker to "on" position and pull out appropriate push/pull switch located on the panel near the breakers.

ALARM

The alarm buzzers are set off by low lubricating oil pressure or by high cooling water temperature. The buzzers are located behind the fly bridge console.

GB 36 & 42 SERVICE SYSTEM



D

Service and Maintenance

HAUL OUTS

Haul outs are required depending upon frequency of boat use and local conditions. When the boat is on the ways to be painted, ensure that the supports are moved so that all areas of the hull and the areas under the keel are covered with paint.

Make sure also that the basket strainers covering the intake through-hull fittings are removed, cleaned and painted with bottom paint inside and out. All through-hull fittings should be cleaned out.

Because the boat is of fibreglass construction, borers will not damage the hull; however, even the smallest amount of marine growth will have a very significant effect on the boat's speed and fuel consumption.

While the boat is out of the water, examine the following items:

1. Check for wear in the cutless bearings
2. Check the operation of all seacocks. If found to be stiff, remove the cone for cleaning and coat with petroleum jelly before replacing
3. Examine propellers and propeller keys and nuts for tightness and condition
4. Check general condition of all underwater fittings

After the boat has been refloated, be sure to check the circulation of the engine raw water cooling system by ensuring that water is flowing from the exhausts when the engines are started. If the raw water pump impellers have seen heavy service they are prone to failure during the dry out period of a haul out.

EXTERIOR MAINTENANCE

Do not allow salt water to stand on wood, metal or fibreglass for long periods of time. We recommend that you wash down your boat with fresh water before leaving her. A good coat of wax will protect the fibreglass from salt water and sun, and will make the wash down operation easier.

To restore the gloss of gel coat surface, a light buffing may be necessary after long exposure to sun and salt. For hand buffing use a slightly abrasive rubbing compound such as Dupont No. 7. Use Mirror-Glaze No. 1, or similar product, for power buffing. After buffing, the surface should be waxed.

The gel coat surface is resistant to stains. Household detergent will remove most stains that may occur. Crayon, lipstick or shoe polish can be removed with rubbing alcohol. Weak solutions of acids or alkalines such as hydrochloric acid or ammonia may reach a penetrating stain. The solutions may, however, discolor the gel coat and buffing may be required. If gloss is not restored with buffing, the area will need to have a new gel coat applied.

Hardware is preserved from salt action by protective polishes.

Varnished teak will require light sanding and new varnish periodically depending upon climate and frequency of use. Scratches and nicks in the varnish should be touched up with a spot of varnish as soon as they are discovered.

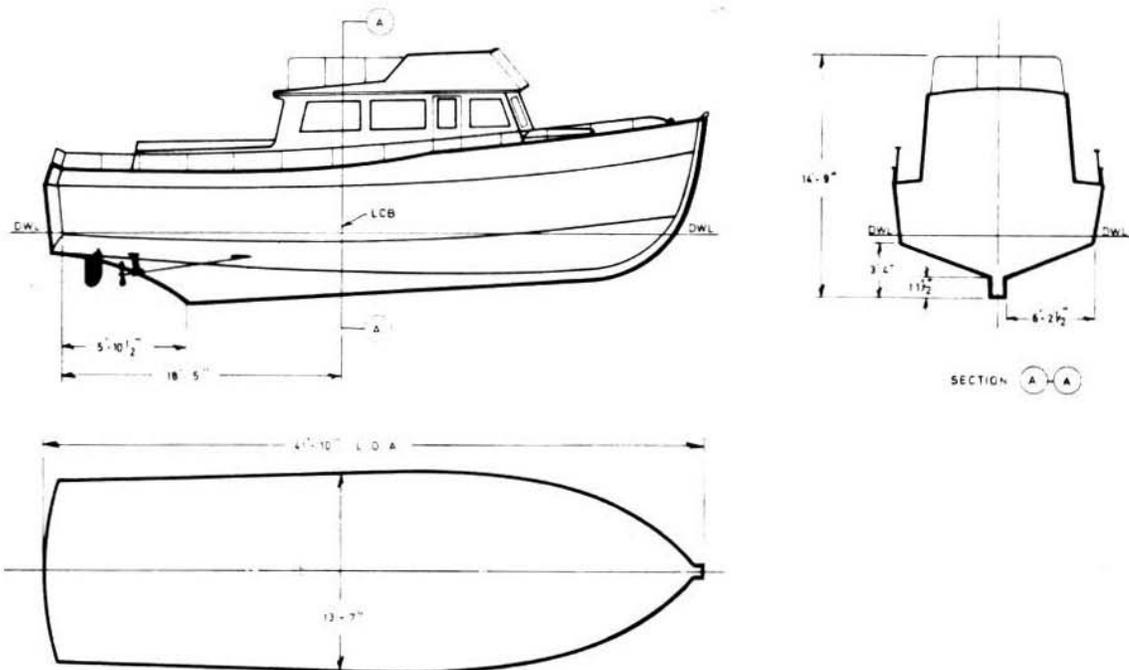
Seat cushions should never be stored wet. Use a mild soap or bleach solution for cleaning. Rinse with fresh water after cleaning.

INTERIOR MAINTENANCE

Wash mildewed areas with mild bleach solution. Drawers may need lubrication with wax if moisture causes swelling, and doors may need adjusting from time to time.

Keep the bilge dry and clean. Check all fire extinguishers yearly for proper charge.

GB42 Graving Plan



GB42 Flying Bridge Removal

If the boat has to be hauled by road or pass beneath a low bridge or tunnel when being moved from one area to another, it may be desirable for the flying bridge to be removed.

All boats are built so that this is possible. To remove the flying bridge proceed as follows:

1. Remove all teak mouldings from the base of flying bridge sides and flying bridge seats.
2. Flat head screws will now be revealed. Remove these screws. Do not take out any vertical screws.
3. Remove stainless steel handrails. The flanges on the base of the handrails are screwed into metal plates which have holes tapped into them. These metal plates are screwed in place so there is no fear that irretrievable nuts will be lost when the screws are removed.
4. Disconnect control cables, steering cables and electric wiring.
5. Fit a brace across the backs of the flying bridge seats in order to give them support.
6. Remove flying bridge by lifting off.

A drawing showing the method of attachment is included in this manual.

16. Service Onan generator per Onan Operator's Manual.
17. Check exhaust system for leaks.
18. Check drive shaft and rudder stuffing boxes for leaks. Water may drip slowly from the drive shaft stuffing box. However, if the water is coming through at a faster rate, the locking nut should be backed off and the packing nut tightened by hand until the water stops or is just dripping slowly. The lock nut should then be retightened. CAUTION: Overtightening will cause damage to your propellor shaft. Check the condition of the hoses and clamps connecting the stuffing boxes to the logs. If "O" ring stuffing boxes are installed, lubricate at the grease fitting on top of the stuffing box. If water drips at an excessive rate after lubrication, the "O" rings must be changed.

200 HOUR SERVICE

This service is to be performed every 200 hours.

1. Change transmission fluid. Drain fluid through the large plug at the bottom, starboard side of the transmission. After draining, the removable oil screen inside the drain hole should be thoroughly cleaned before refilling the transmission to the full mark. Run the engine for a few minutes to pump the fluid through the cooler. Add sufficient oil to bring the level to the full mark again.
2. Check raw water pump for impellor wear.
3. Perform all items on 100 hour service list.

400 HOUR SERVICE

This service is to be performed every 400 hours.

1. Adjust valve clearance. The engine should be stopped while checking clearance but may be either hot or cold. Clearance is .018 in., .45mm. intake; and .028 in., .70 mm. exhaust.
2. Perform all items on the 100 and 200 hour service list.

If your boat is operated less than 200 hours per year, perform all items on the 100 and 200 hours service list yearly.

Winterization should be performed by your American Marine, Ltd. dealer.

ENGINE SPECIFICATIONS AND PERTINENT DATA

BORE	4.25 in. (108 mm.)
STROKE	4.75 in. (121 mm.)
DISPLACEMENT	404 cu. in. (6.62 litres)
LOW IDLE (no load)	800 rpm
HIGH IDLE (no load)	2400 rpm
FIRING ORDER	1-5-3-6-2-4 (standard rotation)
.....	1-4-2-6-3-5 (opposite rotation)
ELECTRICAL SYSTEM	12 volt
COMPRESSION RATIO	16.3:1
OIL PRESSURE	15-50 psi
WATER TEMPERATURE	190 degrees F at full load operation
VALVE CLEARANCE (hot or cold engine, stopped)	intake .018 in. (.45 mm.)
.....	exhaust .028 in. (.70 mm.)
FRESH WATER CAPACITY	30 quarts (28.4 litres)
TRANSMISSION OIL CAPACITY	3.0 quarts (2.8 litres)
ENGINE OIL CAPACITY	17 quarts (16.1 litres) with filter change
.....	15 quarts (14.2 litres) without filter change

SERVICE RATINGS:

Single Viscosity - API Service CD/SD, MIL-L-2104 C, Series 3

Multi-Viscosity - API Service CC/SE, CC/SD or SD/MIL-L-46152

SERVICE

The following items should be checked on each occasion that you take your boat on a cruise:

1. Check engine lube oil level.
2. Check coolant level.
3. Check for water in bilge. Pump bilge and locate source if excessive water is found.
4. Check battery water level.
5. Check transmission fluid level with engine off.
6. Drive belt tension need not be checked each time the engine is started, however, it should be checked often.
7. Drain water from water separator.
8. Service electrical generating plant as per Onan Operator's Manual.

SPECIAL 25 HOUR SERVICE

This service is to be performed by the dealer who commissioned your boat following your first 25 hours of operation.

1. Check instruments for proper operation.
2. Calibrate tachometer.
3. Torque heads, injectors and all external engine bolts.
4. Check valve clearance.
5. Check engine controls (stop device and throttle) to be sure they are not chafing.
6. Perform all items on 100 hour service.

100 HOUR SERVICE

This service is to be performed every 100 hours.

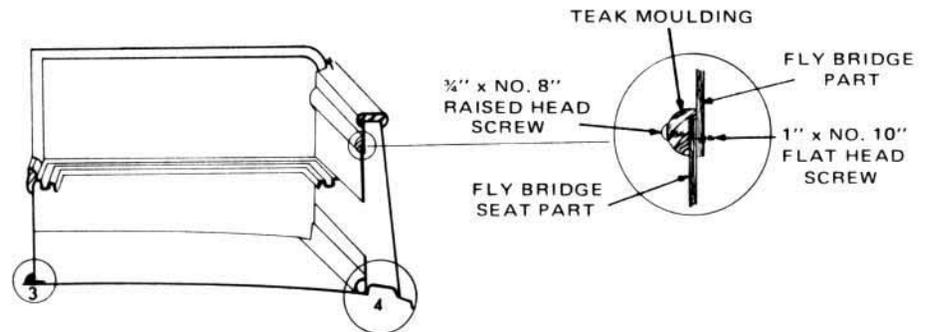
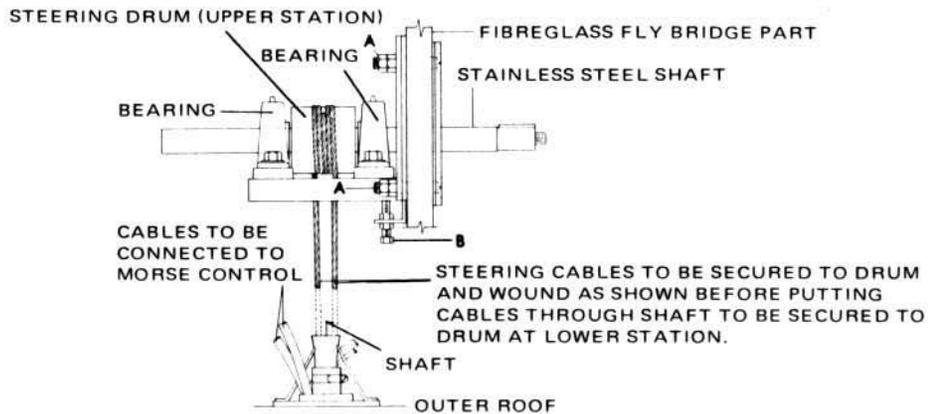
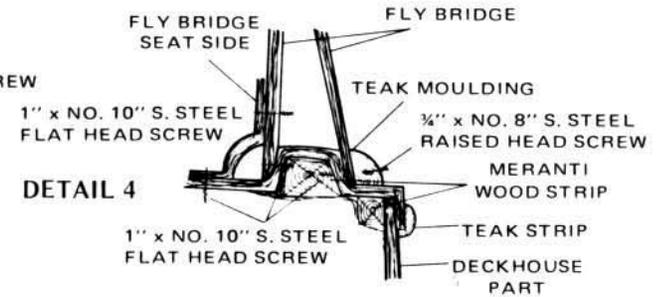
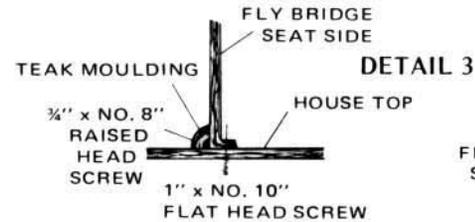
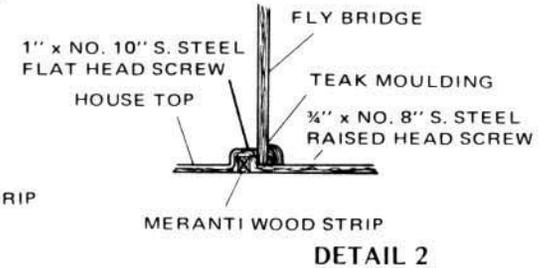
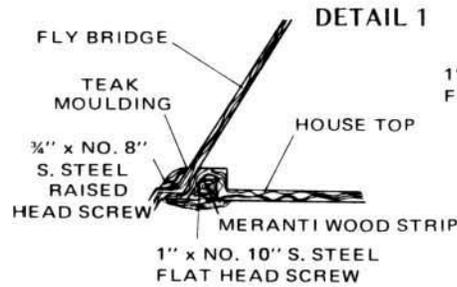
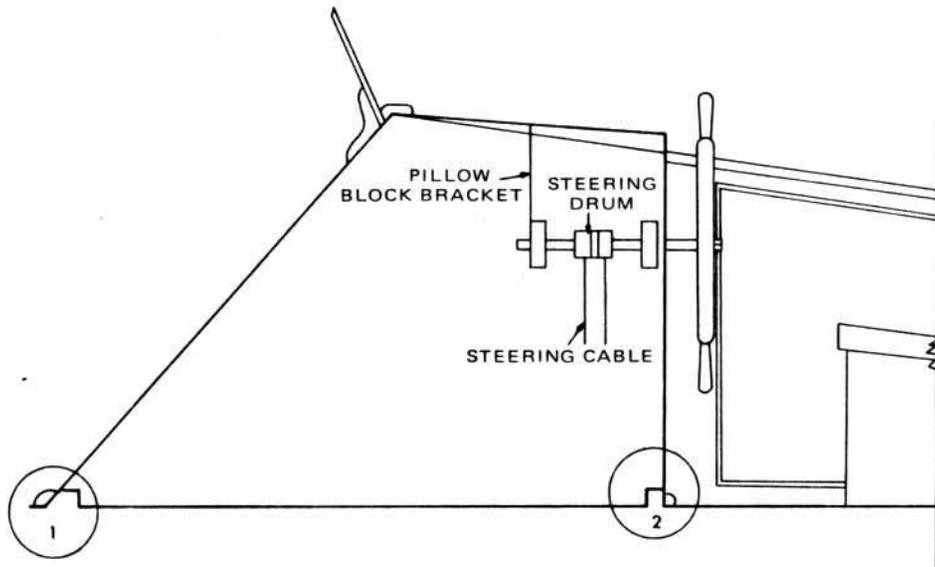
1. Check transmission gearshift cables to be sure they are not chafing; lubricate cable and fittings.
2. Check transmission for leaks; check transmission fluid level with engine off.
3. Change engine oil and oil filters; run engine and check for leaks. Oil capacity is 17 quarts, 16.1 litres when oil filter is changed and housing drained. Capacity without oil filter change is 15 quarts, 14.2 litres. Check oil level in engine crankcase.
4. Change all fuel filters. Bleed air from system after changing filters.
5. Clean air filter.
6. Check zinc in heat exchangers. See illustration No. 2 for location.
7. Inspect all seacocks and be sure they are not seized.
8. Check raw water strainer (if installed due to local conditions as a dealer option) to be sure it is not clogged.
9. Check coolant level.
10. Inspect fuel, oil and water fittings for leaks. Make sure all hose clamps are tight.
11. Check battery terminals for corrosion.
12. Check battery water level.
13. Check drive belts. If replaced, check belts within the first 10-15 engine hours for stretch.
14. Check all electrical connections on engine for tightness.
15. See that steering is free and cables have proper tension. If cables are slack, they should be tightened by adjusting the eyebolts on the quadrant. They should not be overtightened or the steering will become stiff. Check sheave and shaft bearings for ample grease.

TROUBLESHOOTING

PROBLEM	DIAGNOSIS	CORRECTION
Engine turns over but will not start	<ol style="list-style-type: none"> 1. Out of fuel 2. Dirty fuel filters 3. Stop mechanism stuck in stop position 	<ol style="list-style-type: none"> 1. Fill tanks and bleed system. 2. Change filters and bleed system. 3. Free as necessary.
Engine will not turn over	<ol style="list-style-type: none"> 1. Low battery charge or faulty connections 	<ol style="list-style-type: none"> 1. Check connections for corrosion and proper tightness.
Engine fires but will not run	<ol style="list-style-type: none"> 1. Fuel return line blocked or fuel return selector valve closed 	<ol style="list-style-type: none"> 1. Check and adjust as necessary.
Engine will not maintain cruising rpm	<ol style="list-style-type: none"> 1. Stop lever partially on 2. Dirty fuel filters 3. Air leak in fuel supply line 4. Blocked fuel shut-off valve; blocked fuel supply line to lift pump 5. Air intake filter clogged 6. Bent or fouled prop 7. Fouled bottom 	<ol style="list-style-type: none"> 1. Free as necessary. 2. Change filters. 3. Check all connections for leaks, including fuel pick-up valve. 4. Remove shut-off valves and inspect; remove hose and inspect; clean as necessary. 5. Inspect and clean as necessary. 6. Inspect and replace or clean as necessary. 7. Clean.
Overheating	<ol style="list-style-type: none"> 1. Low coolant level 2. Broken belt or incorrect belt tension on seawater pump drive 3. Intake hose to raw water pump collapsed. Sometimes rubber layers delaminate on the inside only, blocking the intake without any collapsing visible outside the hose. 4. Raw water intake system blocked at intake screen or strainer (if strainer is installed as an option due to local conditions) 	<ol style="list-style-type: none"> 1. Refill with fresh water and check for cause of low level. 2. Adjust or replace. 3. Inspect hose inside and out. Replace or clean as necessary. 4. <ol style="list-style-type: none"> a. Loosen butterfly nuts on top of strainers if installed and allow lids to lift due to water pressure. b. Close intake seacocks. c. Remove lids and take out basket strainers. d. If strainers are clean, open seacocks and check flow of water; if it appears restricted, the intake screen on outside of hull is blocked. Clean from outside of hull.

5. Broken raw water pump impellor
 6. Blocked heat exchanger or transmission oil cooler
 7. Faulty thermostat
5. Remove back of pump and inspect; replace if necessary. Be sure all broken parts are removed.
 6. Remove end plates of heat exchanger and check for foreign matter.
 7. Remove fresh water reservoir and lift out thermostat. Place thermostat in boiling water to be sure that it is opening. If not, replace with new thermostat.

Flying Bridge Removal



Conclusion

We wish to take this opportunity to again welcome you aboard as a Grand Banks owner and to thank you for reading this manual through from cover to cover. We are sure that this information will assist you in having many days of enjoyable troublefree boating.

We know that pride of ownership and the enhancement of an investment are also important for happy boating. We, therefore, strongly recommend that, in addition to the specific items of maintenance listed in this manual, a watch be kept on the general condition of the boat and its equipment.

Even a minor defect, if allowed to go unchecked, could eventually lead to a major and costly repair. If there are any uncertainties regarding service or repairs, your dealer will be happy to answer any questions regarding maintenance, service or repairs, or to supply instructions on any other equipment installed on the boat.

AMERICAN MARINE (S) PTE. LTD.

AMERICAN MARINE PRODUCTS WARRANTY

(LIMITED WARRANTY)

1. THERE ARE NO EXPRESS WARRANTIES ON PRODUCTS MANUFACTURED BY AMERICAN MARINE EXCEPT THAT the Company will through its selling Dealer replace or repair, at the Company's option, any part (except as hereinafter provided) which is proven to its satisfaction to be defective under normal use and service within twelve months from the date of delivery to the first owner if the part is returned, transportation prepaid within thirty days after the defect is discovered, to the Dealer or to such other point of manufacture as the Company may designate.
2. This warranty shall not apply to:
 - (a) The cost of removal or reinstalment of a part, or disassembly or reassembly of the unit of which it is a component.
 - (b) Paints, varnishes, gelcoats, fabrics, window, glass, mirror, and chromium plated finishes because of the varying effects resulting from different climatic and use conditions.
 - (c) Products not of the Company's manufacture. Any warranty provided by the manufacturer will be passed on to the owner if possible.
 - (d) Speeds, because they are estimated and not guaranteed.
 - (e) Parts which have been altered in a manner which has impaired the original characteristics.
 - (f) Others than the first owner.
3. THE DURATION OF ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE SHALL BE LIMITED TO AND COINCIDENT WITH THE DURATION OF THIS EXPRESS WARRANTY. The replacement or repair of defective parts as stated in this warranty shall be the sole remedy of the purchaser and the sole liability of the Dealer and the Company under this warranty and any implied warranties. THE COMPANY OR ITS DEALERS SHALL NOT BE LIABLE UNDER ANY CIRCUMSTANCES FOR INCIDENTAL, CONSEQUENTIAL OR INDIRECT DAMAGES CAUSED BY DEFECTS IN PARTS OR WORKMANSHIP OR ANY DEALY IN THE REPAIR OR REPLACEMENT THEREOF.
4. THE DEALER IS AN INDEPENDENT BUSINESS AND IS NOT THE AGENT OF AMERICAN MARINE. The Company does not authorize the Dealer, or any other person, to assume for the Company any liability in connection herewith or any liability or expense incurred in the repairing of its products other than those expressly authorized herein.
5. The Company reserves the right to improve its products through changes in design or material without being obligated to incorporate such changes in products of prior manufacture.

Please prepare the following Warranty Card and mail it immediately to American Marine (Singapore) Pte. Ltd., No. 26 Jalan Terusan, Singapore 22.