3/10/03

NAVY 44 BIB
INTERIM CHANGE 3-1

This interim change to the Third Edition updates the Boat Information Book (BIB) for the NA-44. IC 3-1 incorporates the following changes:

- Modification of the Forestay and the Backstay.
- The Ship's Service Alternator has been relocated from the PORT side of the engine, to the STBD side at the mounting pad vacated by the AC compressor removal.
- All boats have been fitted with the TECNAUTICS Coastal12 refrigeration system. This eliminates the engine driven compressor.
- Shore Powered 12 vdc Battery charger has been relocated from the head compartment, (under the sink), to the Nav Station, under the Nav desk.
- The Ship's Service Rotary Selector Switch is to be placed in either the BOTH, (GUEST mfg), or ALL, (PERCO mfg), position for normal operations.
- Incremental introduction of the AGM (GELL MATT) battery, 100KW Alternator for Ship's Service Bank and higher capacity voltage regulator.
- NA44 fleet has two Glow-Plug configurations.

Procedure:

1) Remove and replace the following pages:

    1-11/12
    1-29/30
    1-31/32
    1-39/40
    1-41/42
    1-49/50
    1-51/52
    1-65/66
    3-33/34
    3-39/40
    4-7/8
    4-9/10
    4-11/12
    4-13/14
    4-15

2) Record IC 3-1 entry in the "Interim Change Summary" table in the front of the BIB.

Table 1-1, Rod Rigging

ITEM	SIZE	MATERIAL	QUANTITY
Upper Shroud	-17	NAVTEC 22-13-5	2
Vertical Shroud	-30	NAVTEC 22-13-5	2
Middle Shroud	-12	NAVTEC 22-13-5	2
Lower Shroud	-12	NAVTEC 22-13-5	4
Forestay *	-22	NAVTEC 22-13-5	1
Backstay *	-22	NAVTEC 22-13-5	1
Inner Forestay (Collapsible)	1/4" Dia	1x19 Stainless Steel Rod	1
Running Backstay (Collapsible	1/4" Dia	1x19 Stainless Steel Rod	2

The ends of the Forestays and Backstays have been cut off to remove the areas of high stress fatigue and a new end has been fashioned using the Cold Rolled process. In order to regain the length lost in this process a toggle has been added to the bottom of the forestays. A toggle and a shackle have been added to the backstay.

NOTE

Use a large screwdriver or a bilge pump handle as a pry bar.

3. Pull/pry the SS Alternator outward to exert tension on the belt.
4. Maintain pressure on the alternator and tighten the lower sliding bracket bolt and the top mounting bracket.
5. Check the belt tension and readjust as necessary.
6. Repeat the procedure for the Engine Start Alternator.

4-2.3.3 REPLACEMENT OF THE FRESH WATER PUMP.

The fresh water pump requires loosening the dual purpose alternator/fresh water pump drive belts for both the Engine Start and the Ship's Service Alternator.

Before starting this procedure ensure that the following are on hand.

- 3/4-inch open-end wrench.
- 1/2-inch open-end wrench.
- Pry bar.
- Replacement placement Water Pump, Part No. Westerbeke 016423.

NOTE

Inspect the replacement pump. If the double pulley is not mounted on the spare, contact a qualified mechanic.

1. Shutdown the Engine.
2. Loosen the top mounting bolt for the Ship's Service Alternator using a 3/4-inch wrench on the top mounting bolt and a 1/2-inch wrench on the lower sliding bracket bolt. Remove the belt from the water pump pulley.
3. Repeat the procedure on the Engine Start Alternator.
4. Using a ½-inch socket wrench, remove the four retaining bolts on the pump housing and remove the pump and the end plate spacer (accounting for all missing parts and/or pieces).

NOTE

Carefully clean surfaces to ensure gouging or scarring does not occur to the engine block end plate, or the pump housing.

5. Clean both sides of the spacer end plate and the gasket mating surface on the engine block removing all traces of the old gasket and gasket sealant.
6. Apply non-hardening gasket sealant to both sides of the gasket serving the end plate spacer and the mating surface on the engine block. Position the replacement pump assembly against the engine block.

7. Thread in the four retaining bolts until hand tight while holding the pump assembly in place.
8. Using a ½-inch socket with extension, evenly tighten down the four retaining bolts by tightening in a diagonal pattern. Check and re-tighten all bolts in a clockwise order. DO NOT OVERTIGHTEN.

PROCEDURE FOR THE SS ALTERNATOR.

9. Return the belts to the pulley and use the pry bar on the SS Alternator to put tension on th drive belt.
10. Maintain pressure on the alternator and tighten the lower adjustment arm, and the top mounting bracket.
11. Check drive belt tension and readjust as necessary.
12. Repeat STEPS 9 THRU 11 for the Engine Start Alternator.
13. Check engine coolant, (50/50 coolant/water mixture), and add as required.

sure the impeller blades are bent in the same direction as they were before they were removed. This will allow the impeller to turn clockwise without distorting the blades.

6. Apply a coating of non-hardening gasket sealant to the cover plate and gasket mating surfaces. Install cover plate with gasket, hand thread the four screws and use a blade screwdriver to tighten down evenly for a snug fit.
7. Open Engine Intake seacock.

4-2.3.2 ADDING COOLANT TO THE CAPTIVE SYSTEM.

WARNING

NEVER OPEN THE EXPANSION TANK WHEN ENGINE IS HOT, AS THERE IS DANGER OF BURNS FROM ESCAPING STEAM. FILL ONLY WHEN SYSTEM IS COOL.

Before starting this procedure ensure that the following are on hand:

- 50/50 mixture of antifreeze/water solution.

1. Open the fill cap on the expansion tank.
2. Fill the expansion tank with a 50/50 mixture of antifreeze and water.
3. Close the cap on the expansion tank and make sure the hose between the expansion tank and the recovery tank is properly connected.

4-2.3.3 ADJUSTING AND/OR **REPLACING** THE FRESH WATER PUMP DRIVE BELTS.

The fresh water pump has a double pulley attached to its drive shaft to accommodate two drive belts. One is the same drive belt that drives the port alternator. The other is the same drive belt that drives the starboard alternator. The procedure for **replacing** the belt is inserted in this procedure where applicable as annotated with **Replacing the drive belt (bold print).** Drive belts should have no more than 1/2-inch of play.

Before starting this procedure ensure that the following are on hand:

- 3/4-inch wrench.
- 1/2-inch wrench.
- Pry bar.
- Replacement Drive Belts.

NOTE

Drive Belt sizes may not be substituted, they must beon of the following:

FSN 3030-529-0350
WESTERBEKE PART #33361
COMMERCIAL AX46

1. Shutdown the engine.
2. Loosen the top mounting bolt for the Ship's Service Alternator using a 3/4-inch wrench and a 1/2-inch wrench on the lower sliding bracket bolt. If only adjusting drive belt tension skip Belt Replacement Procedures and go to step 3.

PROCEDURE FOR REPLACING A DRIVE BELT.

Ship's Service Alternator Drive Belt.

SS1. Disconnect the 3/4-inch raw water pump inlet hose placing the hose in an upward position to minimize spillage of raw water.

SS2. Slide the alternator inboard and remove the defective belt.

NOTE

The Engine drive shaft has a double pulley mounted on it. The drive belt for the Ship's Service Alternator drive belt traps the belt for the Engine Start Alternator drive belt.

SS3. DO NOT replace the Ship's Service drive belt at this time of the Engine Start Alternator belt must also be replaced. It will only be in the way.

Engine Start Alternator Drive Belt.

ES1. Remove the SS Belt from the pulley to allow access to the ES belt.

ES2. Loosen the ES Alternator to remove the defective belt.

ES3. Replace the ES drive belt.

ES4. Now replace the SS drive belt.

3. Reconnect water pump inlet hose.

3. Hydraulic Oil (petroleum base).
    - Hydraulic oil type 2135
      NSN 9150-00-985-7236
      Mil Spec 11-17672.
    - Comparable commercial hydraulic oil
    - Chevron 2135th
    - Richfield Eagle oil, light
    - Gulf 2135H
    - Texaco MS2135H
    - Standard 2135th
    - Sinclair MS2135TH
4. Winch grease, teflon, super lube PTFE (Supplied by Sail Craft Support).

4-13 TROUBLESHOOTING

1. Refer to equipment manufacturer's manuals for guidance in troubleshooting equipment. Each boat is provided with the manual for the particular make and model of equipment installed onboard.

End of Chapter 4.

4-10 ELECTRICAL SYSTEM

CAUTION

Electrical power from the batteries is a perishable commodity. A rule of thumb is, "If you don't need it, TURN IT OFF".

Once the vessel is underway, the only available electrical power is provided by the Ship's Service Battery Banks, and the Engine Start Battery Bank. Periodic inspection and maintenance is essential, not only for maximum battery life, but for crew safety while underway.

WARNING

ALL SAFETY PROCEDURES MUST BE STRICTLY ADHERED TO WHILE WORKING ON THE BATTERIES.

NOTE

A incremental change to the NA44's includes equipping then with an AGM, Glass MAT, cell structure type batteries. While checking the electrolyte it is not required on these batteries all other aspects of routine maintenance apply.

Periodic inspection and maintenance includes, but is not limited to the following:

1. Check battery cell electrolyte levels.
2. Inspect condition of the battery boxes. Under the Nav Station seat for the Ship's Service batteries, and in the storage cutout behind the engine port side for the Engine Start Battery.
3. Inspect and clean battery casings.
4. Check and clean battery terminal connections.
5. Check wire condition at the terminal lugs.
6. Check that storage batteries maintain a charged condition.

NOTE

The 120 vdc battery charger has been moved from under the sink in the head compartment to the void under the Nav Station. Access is from the knee hole area.

4-11 REFRIGERATOR

All NA44's have been equipped with the NAVTRONIC COASTAL 12 refrigeration system. This is a completely 12 vdc system. The engine run compressor has been eliminated.

4-11.1 CLEANING THE REFRIGERATOR

Maintenance of the box includes washing of the inside surfaces and pumping out the ice box bilge to remove spills and melted ice water.

1. Use the telephone showerhead spigot in the galley to rinse the box periodically.
2. Use a solution of commercial biodegradable soap and fresh water to thoroughly clean, and wipe down all interior and exterior surfaces of the box.
3. Open the GALLEY SINK DRAIN seacock.
4. Use the foot pump, (the outboard one at the base of the sink cabinet), to remove liquid residue. (See Figure 1-42. Refrigeration System for component locations).
5. The box should be left clean and dry after use, with the doors pinned open with the barrel bolts in the galley area.
6. If the refrigerator drain foot pump should malfunction, see the Whale Gusher MK III foot pump maintenance procedures.

4-12 LUBRICATION

1. Lube Oil, Standard Navy Stock
   - Type 9250, SAE 30 HD
     NSN 9150-00-181-8229
     MilSpec 9250601L
     Codes 54161
   - Comparable commercial lube oil
   - Chevron, Delo 400, SAE 30
   - Union 76, Truck motor oil SAE 30
   - Any good grade SAE
   - Multi Vis oils SAE 10W30 may be Substituted.
   - API Service Grade CC or CD

dirt from the compass and housing using a damp soft cloth.

CAUTION

Before leaving the boat, ensure that no Ferrous (magnetic) metal is near the compass as this will tend to deviate the compass and provide erroneous readings.

4-6 WINCHES.

The NAVY 44 has twelve (12) Barient two-speed winches which are thru-bolted to the deck. The winches on deck are exposed to salt spray and airborne pollutants and must be periodically cleaned and re-lubricated.

CAUTION

Never use grease on the pawls or pawl springs. The pawls should be lubricated with light machine oil.

Clean all parts with a petroleum solvent. Any parts showing damage or excessive wear must be replaced. During the assembly process, all gears and bearings should be lightly greased.

4-7 MARINE HEAD

General maintenance and overhaul on the head should be done periodically to insure proper operation. During normal use, the following preventive maintenance measures will ensure proper functioning of the head:

1. Make sure seacocks are open, turn freely and are free of leaks.

NOTE

Wilcox Crittenden has a commercial produce SEALUBE that is specifically meant for lubrication of their marine heads.

2. Apply light machine oil to the piston rod and bearings for easier pumping.
3. Ensure packing nut is just tight enough to prevent leakage.

CAUTION

Do Not use oil solvents, solutions or alcohol in the marine head - it will ruin valves.

4. If pumping action becomes stiff, pour a pint of water soluble lubricant or vegetable oil into the bowl and stroke twice to allow lubricant to enter the pump cylinder only, and not overboard. If possible, allow the lubricant to stand for 24 hours before pumping out.
5. If the head fails to function properly, the valves may be restricted or damaged. Disassembly of the water closet may be necessary to inspect the cause of the malfunction. Figure 3-7. Marine Head, Parts Breakdown, and Table 3-6. Parts List will assist in assembly and disassembly of the marine head.

4-8 WATER SYSTEM

Water tanks should be regularly flushed and inspected by competent medical authority.

1. During winter layup, the water tanks are filled with potable anti-freeze. Spring fitting out required that the system be flushed to eliminate the "safe", but awful tasting, water.
2. Lift the cabin sole panels in the galley area to gain access to the 23 gallon day tank. Disconnect the water feed lines from each of the 70 gal saddle tanks. Gravity will empty the tanks.
3. Run the pressure water system, and the manual system to drain the water out of the day tank.
4. Spray the inside of the 70 gal tanks with a garden hose to rinse out the winter water.
5. Run the pressure water spigot in the galley, and in the head to flush the lines out.
6. Re-connect the feed lines to the day tank.
7. Fill the 70 gal tanks.

4-9 BILGE SYSTEM

CAUTION

Visually inspect bilges for trash, oil, etc. Clean if necessary and pump slowly. .

NOTE

This procedure can be performed with the boat in the water since the rudder post stuffing box is normally above the water line.

1. Using a ½-inch open-end wrench to loosen and remove the bolts holding the retaining ring in place.
2. Pry out the old packing gland.
3. Use the old packing gland for an approximate measure for the length of the replacement.
4. Insert the new gland using the same rotation pattern as that observed in the removal of the old gland material.
5. Replace the retainer ring and tighten the retainer bolts evenly.

4-5 COMMUNICATIONS AND ELECTRONIC EQUIPMENT.

Continuous satisfactory operation of the communications and electronic equipment is dependent on the care and maintenance performed on each equipment. The following simple maintenance steps will help to avoid equipment failure.

1. Always keep the equipment as clean as possible. Wipe off dirt and dust during post-operation procedures.
2. Check all hardware and cable connections for tightness.
3. Check for evidence of any corrosion on the equipment, cable connections and connectors. Clean as required. If the equipment does not come on when the power is turned on, proceed as follows:
   - Ensure the breaker is not switched off at the switchboard panel.
   - Check for a blown fuse. Refer to Table 4-3 for the location and size of fuses for the communications and electronic equipment.
4. Ensure the power supply connection on the unit is tight. If the equipment is not working properly or the display gives inaccurate or faulty information, check all the connections at the unit and the antenna terminals.

NOTE

Only qualified technicians should perform repairs on communications and electronic equipment.

4-5.1 REPLACEMENT OF FACSIMILE RECORDING PAPER.

See Technical Manual for procedure.

4-5.2 SAILING PERFORMANCE INSTRUMENT, (SPEEDO).

WARNING

SEAWATER WILL FLOOD INTO THE BOAT WHEN THE UNDERWATER UNIT IS REMOVED. THE PLUG SHOULD BE PUT IN PLACE IMMEDIATELY. ADROIT HAND COORDINATION IS REQUIRED.

The sailing performance instrument requires no routine maintenance other than care of the underwater impeller unit. The impeller must be kept free from marine growth. A stiff nylon brush should be used to clean the impeller.

1. Unscrew the locking ring-nut and loosen the impeller unit for an easy withdrawl.
2. With the dummy plug in hand, draw out the impeller unit, and quickly replacing it with the dummy plug.
3. Screw in the locking ring-nut.
4. Clean the impeller paddlewheel.
5. Use the reverse procedure to replace the paddlewheel.

The sealing ring under the ring-nut should be kept liberally greased.

4-5.3 MAGNETIC COMPASS.

The magnetic compass is a delicate instrument which with some care requires little or no maintenance. The compass must be properly compensated at all times to ensure correct readings while underway. After having been underway on the craft, wipe off any sea spray or dirt from the compass and housing using a damp soft cloth.

4-3 REFRIGERATION COMPRESSOR.

The refrigeration system that required an engine mounted compressor hs been removed. This section is retained for numerical continuity of the paragraphing for the chapter.

4-4 STEERING SYSTEM

The steering system should be checked and maintained periodically to ensure proper operation. Steering failure can be extremely hazardous, particularly under heavy wind and sea conditions. In conjunction with pre-underway procedures, the following should be performed on the steering system.

1. Check the tension of the wire rope from the pulleys to the radial drive. Adjustment of the wire rope tension is done on the eyebolts located below the radial drive using two ½-inch open-end wrenches.

WARNING

An active test on the steering system can be hazardous to the inspection party below. Keep hands clear of the wire rope and pulleys. If slack tension is not readily apparent, use a long metal object, such as a wrench handle or hammer, to pull on the wire rope observing the amount of play. DO NOT OVERTIGHTEN!

2. Wire rope tension inspection is preferably done while another crewmember slowly turns the steering wheel, "Hardover", in each direction. The wire rope should never be slack to the eye under a static condition.
3. Inspect the stuffing box and around the rudderpost for visible leads or signs of wear.

CAUTION

Do Not over-tighten the packing gland on the Stuffing Box. If moderate tightening does not stop a static leak, the packing gland needs to be replaced.

4. Inspect the rudder post for leaks at the stuffing box. If any leakage is noted, gradually tighten the packing gland bolts, ½ turn at a time. The stuffing box is located directly below the circular quadrant. If the leak cannot be stopped when moderate tightness has been achieved, replace the packing gland.
5. Check the turning sheaves that change the direction of travel of the wire rope from the quadrant up through the deck to the wheel pedestal. Use a strong flashlight to inspect the housing for cracks.
6. Check and lubricate the crosswire pulley bearings with a light coat of machine oil. Excessive wear on the bearings should be reported immediately.

NOTE

The internal mechanism of the steering pedestal (sprocket, chain and bearings), should be inspected and lubricated once a year. The wire rope should be replaced every five (5) years.

7. Check bolt tightness throughout the system, to include the pedestal base, steering wheel hub, pulley base, and rudder stops. Tighten as necessary.

4-4.1 REPLACING THE RUDDER POST PACKING GLAND

Before starting this procedure ensure that the following are on hand:

- 2-1/2-feet of 3/8-inch packing gland material.
- ½-inch open-end wrench.

Engine Start Alternator Drive Belt.

ES 1. Remove the SS Belt from the pulley to allow access to the ES belt.
ES 2. Loosen the ES Alternator to remove the defective belt.
ES 3. Replace the ES drive belt.
ES 4. Now replace the SS drive belt.

Reconnect the 3/4-inch water pump inlet hose.

NOTE

Using a large screwdriver or bilge pump handle as a pry bar.

3. Pull/pry the SS Alternator outward to exert tension on the belt.
4. Maintain pressure on the alternator and tighten the lower sliding bracket.
5. Check the belt tension and readjust as necessary.

4-2.4.2 REPLACEMENT OF ALTERNATORS

This part of the procedure is identical to the replacement of drive belts and is included here for continuity.

Before starting this procedure ensure that the following part is on hand:

- WESTERBEKE PART NO. 24684.

1. Shut down the engine.
2. Loosen the top mounting belt for the desired Alternator using a 3/4-inch wrench on the top bracket, and a ½-inch wrench on the lower sliding bracket bolt. When the drive belt is loose, remove it from the alternator.

NOTE

Use a large screwdriver or a bilge pump handle as a pry bar.

3. Pull/pry the SS Alternator outward to exert tension on the belt.
4. Maintain pressure on the alternator and tighten the lower sliding reacket bolt and then the top mounting bolt.
5. Check the belt tension and readjust as necessary.

In the unlikely event that BOTH alternators need replacement, repeat the procedure to the other alternator.

4-2.5 STARTER

The starter is mounted on the PORT side of the engine. Access is through the removable panel in the head compartment.

Before commencing on this procedure, ensure that the following part is on hand:

- WESTERBEKE PART NO. 30593.

1. De-ENERGIZE the electrical system by switching the Engine Start Selector Switch to OFF.
2. Remove any cooling hoses, fresh water/raw water, that would restrict access to the starter.
3. Tag the electric wires and the respective starter terminals and disconnect them.
4. Remove the two retaining bolts using a socket and extension. Remove the defective starter.

Install the replacement starter reversing the order of removal.

5. Replace the two retaining bolts using a socket and extension.
6. Install the electric wires according to their tagged positions.
7. Replace any cooling loses removed to gain access room.
8. Turn the Engine Start Selector Switch to ON.
9. Turn ON the engine alarm at the Switchboard.
10. Ensure that the T-handle is down.
11. Ensure that the transmission button is OUT.
12. Crack the throttle.
13. Test the starter.
14. Shut down the engine when successful test has been completed.

Table 3-5. Electrical Charging Procedures

(a) **SHIPS SERVICE - Sailing** **With Out Engine Running**

1. Place the SS battery selector switch in position "BOTH".
   CHARGING IS NOT POSSIBLE. Engine must be started to charge.

NOTE

Placing the SS Selector Switch in the "BOTH" position will place an equal demand on both banks when the engine in Not running. When the engine in started the SS alternator will charge both banks equally. If an unbalanced condition is displayed on the System Voltage Scanner. Attempt to determine which bank has a fault.

2. When the SS battery rotary selector switch is in BOTH or ALL, bank #1 and bank #2 are on line because they are now in parallel. **Engine must be started to charge.**
3. When the SS battery rotary selector switch is in **OFF** there is no power being delivered by the SS system. **Even with the engine running charging would not occur.**

(b) **SHIPS SERVICE** **With Engine Running**

1. When the SS battery switch is in the BOTH or ALL position, Both SS banks are providing power.
2. BOTH of the SS banks will be charged.
3. Using the SYSTEM VOLTAGE SCANNER feature of the Electrical Switchboard, see Fig 3-6.
   a. Set the POWER switch to ON. This activates the SYSTEM VOLTAGE monitor panel.
   b. Set the BANK switch to either "2" or "3". "2" monitors BOTH of the SS banks. "3" adds the Engine Start Battery to the cycle. Selecting "4" will cause fault light to illuminate, (there is no bank 4).
   c. Note the voltage indication as the BATTERY BANK light cycles from 1 to 4. The voltage shown will be the condition of that bank.
   d. When charging with the engine, 14.4 V(output voltage from the alternator),should be displayed when fully charged.
   e. When charging with the a.c. charger, 13.8 (output voltage from the a.c. charger), should be displayed when fully charged.
   f. Place the "FAULT LOCK" switch to the "ON" position. If a fault should occur, the "FAULT" light on the panel will illuminate. The "BATTERY BANK" light will cease to cycle through all banks and will lock onto the faulty bank.
   g. When charging is terminated, a minimum of 12.6V should be indicated for the bank charged. A reading of 13.8 is max capacity.

(c) **START BATTERY - Sailing** **With Out Engine Running**

1. When the START BATTERY master rotary selector switch is in the **OFF** position, the ENGINE START battery is neither on line to provide power, **nor can it be charged.**
2. When the START BATTERY master rotary selector switch is in the ON position the engine can be started.

(d) **START BATTERY** **With Engine Running**

1. When the START BATTERY master rotary selector switch is in the ON position the START BATTERY is on line to provide power and be charged. Power is also available to the engine alarm circuit breaker on the switchboard panel, however, the engine alarm switch on the main switchboard must also be in the "ON" position to activate the alarm.

TABLE 3-4. D.C. LOAD ANALYSIS

Item	AMPS
1. NAV (lo) deck level lights with Compass light on	6*
2. Mastmounted light	
Deck light	4
Bow light	4
Tricolor	3
Anchor	3
3. Cabin lights Port - 7 lights + 1 fan	8
4. Cabin lights Stbd - 7 lights + 3 fans	11
5. Spotlight (outlet)	5
6. Instrument lights	1
7. Fresh water pump	6
8. Salt water pump	6
9. D.C. Reefer	6.8
10. LP Gas control panel	1
11. Bilge pump	15
12. Engine blower	5
13. MSD pump	20
14. Engine Alarms	.25
15. Bilge Alarm	.25
Total WITH NAV lo (3 bulbs, one for each nav color)	107.95
*NAV Lo and NAV Hi cannot both be used simultaneously, therefore max load is with NAV Hi (1 bulb) =	98.15

ELECTRONICS

1. ICOM VHF Stby	1.2	TRANSMITTING	6.3
2. SEA 222 HF	2.5		17
3. FURUNO fax	1.2	RECORDING	2.2
4. NORTHSTAR LORAN			.8
5. B&G HYDRA 330 SYSTEM			.66
6. RADAR R20X			4.2
7. NORTHSTAR BPS RECEIVER			.32
SUB-TOTAL ELECTRONICS			31.48
ALL ELECTRIC/ELECTRONIC SYSTEMS			========
GRAND TOTAL			132.63*
* MAX CONSUMPTION			101.95+31.48=133.43

BATTERY INFORMATION

SHIP'S SERVICE BANKS
Either the - Rolls 12 V Series 4000
Part No.- T-12-136
Or the AGM (glass matt") batteries

ENGINE START BATTERY
136 Amp Hour at 20 HR rate
6-7 AMP per hour for 20 Hr.

ENGINE START BATTERY
TYPE - M-27

105 Amp Hours
150 Cranking Amps

Table 3-2, OPTIMUM TARGETS

This table has been prepared with the following variables as inputs:
VTW = TRUE WIND VELOCITY
BTW = TRUE WIND ANGLE
VAW = APPARENT WIND VELOCITY BAW = APPARENT WIND ANGLE
V = BOAT SPEED
VMG = VELOCITY MADE GOOD
HEEL = HEEL ANGLE IN DEGREES
REEF= % OF SAIL AREA REMAINING
FLAT = % OF FULL DRAFT REMAINING
CL = COEFFICIENT OF LIFT

VTW	BTW	VAW	BAW	V	VMG	HEEL	REEF	FLAT	CL
8.0	45.7	12.30	26.2	5.617	3.923	12.7	1.0	1.0	1.978
	52.0	12.53	28.7	6.171	3.799	13.0	1.0	1.0	1.981
	80.0	11.15	41.7	6.974	1.211	15.5	1.0	1.0	2.344
	110.0	8.51	59.1	7.060	-2.414	8.2	1.0	1.0	3.684
	143.4	4.76	100.4	5.446	-4.375	1.6	1.0	1.0	2.109
10.0	44.9	14.72	26.3	6.300	4.461	18.7	1.0	.9370	1.853
	52.0	14.74	29.2	6.879	4.235	20.3	1.0	1.0	1.962
	80.0	13.13	45.6	7.491	1.301	13.1	1.0	1.0	1.946
	110.0	9.94	64.6	7.612	-2.603	12.4	1.0	1.0	2.665
	145.7	5.81	107.6	6.348	-5.241	2.0	1.0	1.0	1.904
12.0	42.8	16.81	25.9	6.567	4.818	21.9	1.0	.806	1.594
	52.0	16.60	30.0	7.214	4.441	24.8	1.0	.916	1.816
	80.0	14.77	48.1	7.834	1.360	17.5	1.0	1.0	1.918
	110.0	11.25	69.2	8.001	-2.736	17.0	1.0	1.0	2.641
	157.8	6.28	134.8	6.489	-6.008	1.2	1.0	1.0	1.115
14.0	41.4	18.77	25.8	6.724	5.047	24.4	1.0	.700	1.384
	52.0	18.34	30.9	7.414	4.565	27.7	1.0	.816	1.619
	80.0	16.23	49.9	8.090	1.405	22.0	1.0	1.0	1.892
	110.0	12.42	72.9	8.304	-2.840	21.7	1.0	1.0	2.614
	165.8	7.24	152.3	6.921	-6.711	.9	1.0	1.0	.664
16.0	40.5	20.65	25.8	6.829	5.194	26.5	1.0	.614	1.214
	52.0	20.00	31.6	7.549	4.647	30.1	1.0	.730	1.449
	80.0	17.50	51.2	8.284	1.439	26.5	1.0	1.0	1.870
	110.0	13.44	76.0	8.545	-2.923	26.2	1.0	1.0	2.585
	170.9	8.55	163.1	7.339	-7.246	.7	1.0	1.0	.379
20.0	39.9	24.19	26.2	6.957	5.339	30.0	.993	.495	.966
	52.0	23.21	33.1	7.707	4.745	32.4	.955	.649	1.176
	80.0	19.58	52.8	8.530	1.481	34.1	.990	1.0	1.803
	110.0	15.09	81.0	8.902	-3.045	34.0	1.0	1.0	2.521
	174.0	11.64	169.8	8.084	-8.040	.9	1.0	1.0	.205

3-5.7 ELECTRICAL POWER MANAGEMENT

The navy 44 has A 12 vdc electrical system. It is provided through three banks of batteries. The battery banks are: Ship's Service Bank, (SS) #1, Ship's Service Bank #2. and Engine Start Bank. Both SS Banks have two batteries each. The Engine Start Bank is one battery.

Battery power is a limited resource that requires close management. While the batteries can be recharged using the engine mounted alternators, frugal management of electrical power will ensure that power is available for necessary usage. When operating under sail the batteries are not being charged, only depleted. The battery can be recharged by turning the engine ON. With the introduction of the TECHNAUTICS COASTAL 12 refrigeration system an increased charging time will be required to bring the system back to a comfortable operating level. Table 3-4 is a D.C. System Load Analysis to aid in proper management. A good rule of thumb is "If you don't need it, turn it off".

NOTE

It is recommended that the Rotary Selector Switch for the Ships Service Battery Banks, (Upper rotary switch on the face of the NAV seat), be placed in the BOTH position for normal operations. While underway under sail, engine OFF, both banks will be evenly depleted. Charging with the engine ON, will result in simultaneous, even, demand/charging of both banks. Use the System Voltage Scanner, (SVS) to monitor the condition of each bank.

3-5.7.1 ELECTRICAL SYSTEM LINEUP.

1. **Place the ENGINE START bank rotary switch to the ON position. This energizes the engine starting system.**
2. **Place the SS battery selector switch to the BOTH position. This energizes both banks simultaneously. Depletion through use without the engine on will be balanced. Charging will be balanced when the engine is running.**
3. **The NORMAL position for the alternator switches on the Electrical Switchboard is the ON position. They only need to be turned off in an emergency.**
4. **Ensure that the SS ALT and START BATTERY ALT circuit breakers located at the ELECTRICAL SWITCHBOARD are in the ON position.**

3-5.7.2 BATTERY POWER SOURCE AND CHARGING PROCEDURE.

Battery power source and charging capability is determined by the position of the master rotary battery switch for the ENGINE START bank and the master rotary battery switch for the SS BANKS. The batteries can be charged either using shoreside 120 VAC power or by running the engine and charging with the two alternators installed. Table 3-5 contains the procedures for drawing electrical power or charging either the ENGINE START bank or the SS banks with the source as indicated. Use the System Voltage Scanner to monitor charging. See Figure 3-6. System Voltage Scanner.

3-5.8 FRESH WATER MANAGEMENT.

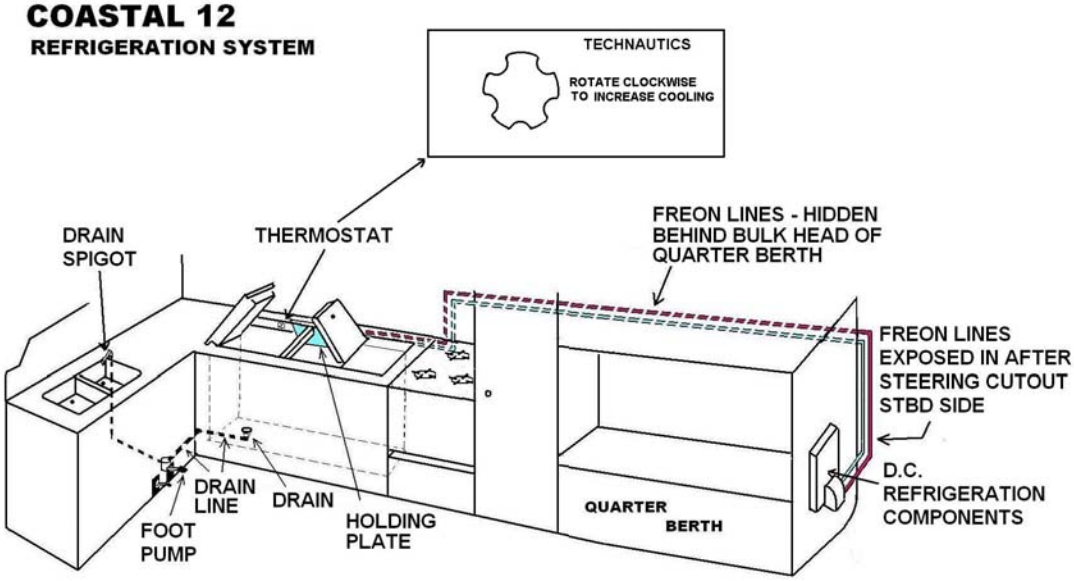
With only 163 gallon of fresh water this limited resource must be managed frugally on long passages. Water is stored in two 70 gal. Tanks, one under each settee berth in the main cabin, and one 23 gal tank (day tank) located beneath the floorboard in the galley.

3-5.8.1 WATER TANKS.

Ensure that the selector valves for both the PORT and STBD 70 gal tanks are in the CLOSED position. Water will now be drawn from the 23 gallon day tank. When the spigot spits air, the day tank is empty.

1. **Open the gate valve for one of the 70 gallon tanks.**
2. **Fill the day tank.**

TECHNAUTICS
COASTAL 12
REFRIGERATION SYSTEM



1-7.11.2. REFRIGERATOR

The NA 44 is equipped with a two door, top opening, 8.1 cubic foot refrigerator located in the galley countertop, starboard side. All boats now have the TECHNAUTICS COASTAL 12, a completely 12 vdc system. The compressor unit is located on the afterside of the bulkhead at the foot of the quarterberth. The holding plate is located in the refrigerator (reefer} compartment. A thermostat locate inside the aftermost door of the reefer controls the temperature of the reefer box. This system draws power from SS battery banks thru the SS rotary battery switch.

At pier side, shore power can be applied to the boat and the A.C. battery charger, relocated under the NAV Station, can be energized using the switch on the Switchboard Panel, (lower left corner of the panel), to charge the batteries while they are cooling the reefer. At sea the reefer can be charged using the 12 vdc. switch located on the D.C. portion of the Switchboard Panel. A longer charging time will be experienced with the new refrigeration system. Close monitoring of the SS Battery Bank condition, referring to the System Voltage Scanner (SVS), is recommended.

A thaw drain line leads from the bottom of the reefer compartment to the STBD Whale Gusher MK III foot pump located on the front face of the galley sink at floor level. The other foot pump is for the manual fresh water system.

1-7.11.3 GALLEY SINK

A double stainless steel sink is mounted in the countertop of the galley and is fitted with three spigots. The main spigot, is a Grohe G-1/2 31 634, fitted with a six foot hose allowing the spigot to be pulled out of the sink receptacle as a telephone shower head. A selector lever in the top of the spigot selects direct flow or spray. The left know, (blue knob), controls pressure fresh water. The other, (red knob), controls fresh water supplied by the PORT Whale Gusher Mk III foot pump located on the front face of the sink compartment at floor level. The other two spigots are (2) Fynspray WS6 swiveling spouts: one for the reefer drain, (STBD side of the sink), and one for pressure sea water, (port side of sink)..

THE REMAINDER OF THIS PAGE IS BLANK DUE TO ELIMINATION OF THE OLD GRUNERT REFRIGERATION SYSTEM.

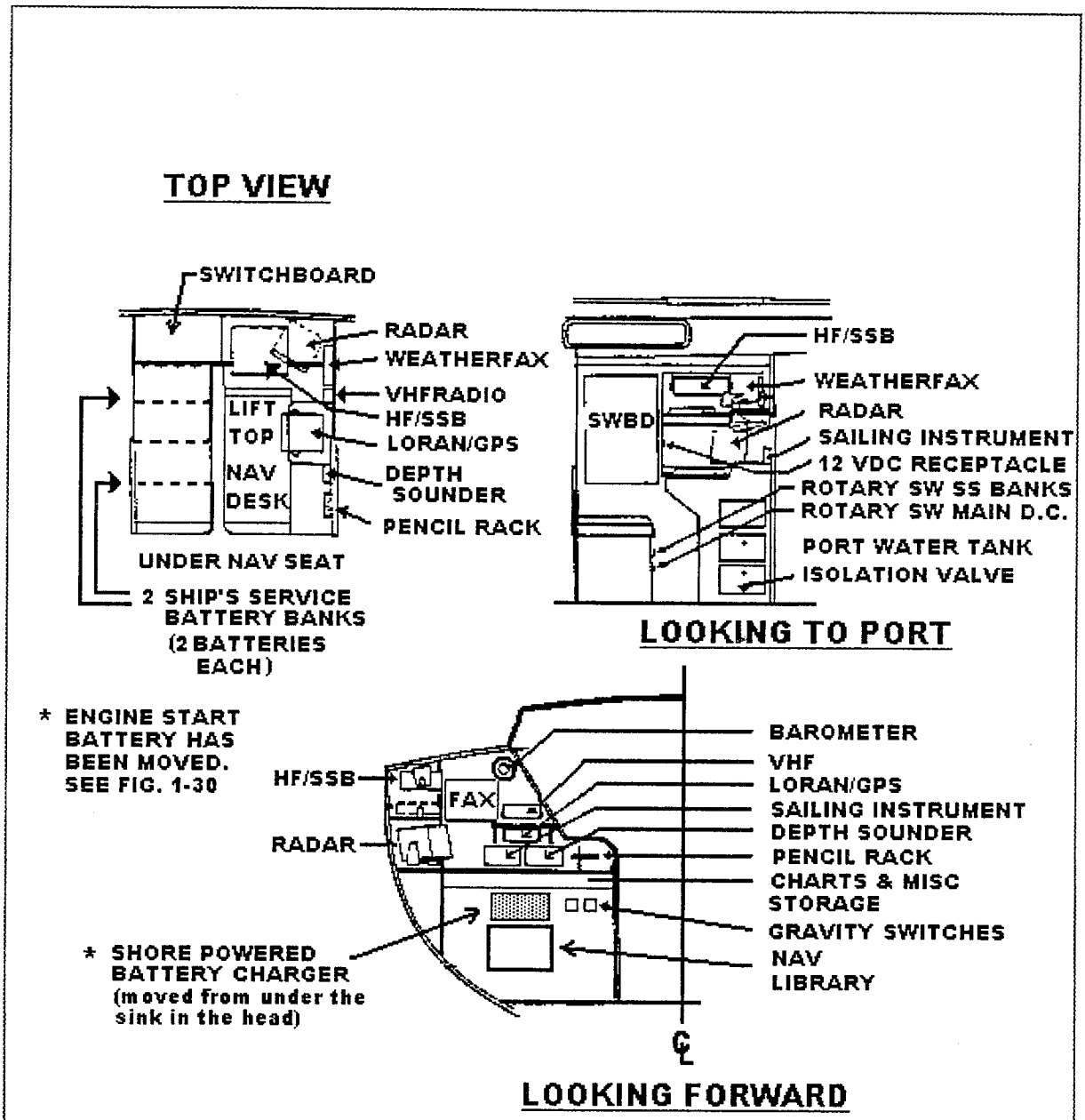


Figure 1-34. Communications and Electronics Arrengement

Table 1-3. COMMUNICATIONS AND ELECTRONIC SYSTEMS

ITEM	SYSTEM	MODEL
1.	Depth Sounder	Brooks & Gatehouse HECTA, (NA1-NA8) Brooks & Gatehouse HYDRA, (NA9-NA20)
2.	LORAN - C	Northstar 800
3.	Radar	Raytheon R20 (NA1-NA8) Raytheon R20X (NA9-NA20)
4.	HF/SSB	Stephens SEA 222
5.	VHF Radio	Icom M-100 (NA1-NA8) Icom M-120 (NA9-NA20)
6.	GPS	Northstar 941x (NA-11) Trimble Navtrac NA-2, NA-7, NA-17)
7.	Weather Facsimile	Furuno FAX 208A (every fourth boat)
8.	Sailing Instrument	Brooks & Gatehouse HORNET 4, (NA1-NA8) Brooks & Gatehouse HYDRA, (NA9-NA20)

- Aqua Signal combination masthead light and deck flood light is mounted on the forward side of the mast above the lower spreader and activated by switches on the switchboard panel "masthead" and "deck" respectively.

1-7.4 THE COMMUNICATIONS AND NAVIGATION SYSTEMS

Communications and Navigation systems are located at the navigation station inside the cabin to port and consists of a chart table, a cushioned seat, and the communications and electronic navigation systems. The navigation station includes a chart table for the storage of charts, navigation tools and publications. Communications and Electronic Arrangement, are listed in Table 1-3, COMMUNICATIONS AND ELECTRONIC SYSTEMS

1-7.4.1 NAVIGATION STATION AND CHART TABLE

The chart table is approximately 3 feet, 7 inches long by 2 feet, 2 inches wide with a hinged top to provide chart stowage underneath. The space under the Nav Station seat is used for SS Battery Banks. Rotary switches, (either Guest or Perco mfg), are mounted on the forward vertical surface such that they are easily reached by a crew member sitting at the navigation station. The electronic and navigation/communications equipment, and switchboard panel, are located on the port and forward bulkheads of the navigation station. The bilge alarm and thru-hull gravity switches for the depth sounder and speed log transducers are located below the chart table. The 120 vac battery charger has been moved from the head to the knee hole of the Nav Station. See Figure 1-34, Communications and Electronics Arrangement.

1-7.4.2 VOICE COMMUNICATIONS.

The voice communications systems installed on the Navy 44 consist of:

- A Very High Frequency (VHF) Radio for primary communication.
- High Frequency/Single Sideband (HF/SSB)

The VHF radio has all marine and weather channels pre-programmed. It can store up to 16 user selected channels. A dual watch mode is provided for monitoring Channel 16 while listening on a different channel. Four different channel scanning patterns are also provided. There are two speakers associated with the VHF radio. One located at the NAV Station, and one in the cockpit on the vertical face of the helmsman's seat. A speaker selector switch is mounted on the bulkhead above the radio with three positions: local, remote, both.
See Figure 1-35. VHF Speaker Selector Switch.

The HF/SSB radio is a Stephens SEA 222 mounted above the overhead shelf to port. It can store operator entered channels for easy access. The insulated backstay is used as the HF/SSB long wire antenna. This dual purpose antenna also services the Facsimile Receiver (FAX). A switch in the navigation station selects either the HF radio or FAX.

CAUTION

The SSB transceiver can be damaged if transmission on HF is attempted with the antenna in the FAX position.

1-7.4.3 NAVIGATION SYSTEMS.

There are multiple models for each item of navigation equipment on the Navy 44. Each boat is provided with a technical publications package that contains the operating instructions for the particular units installed. This includes the:

Depth Sounder
LORAN-C/GPS,
Radar
Weather Facsimile
Sailing Instrument

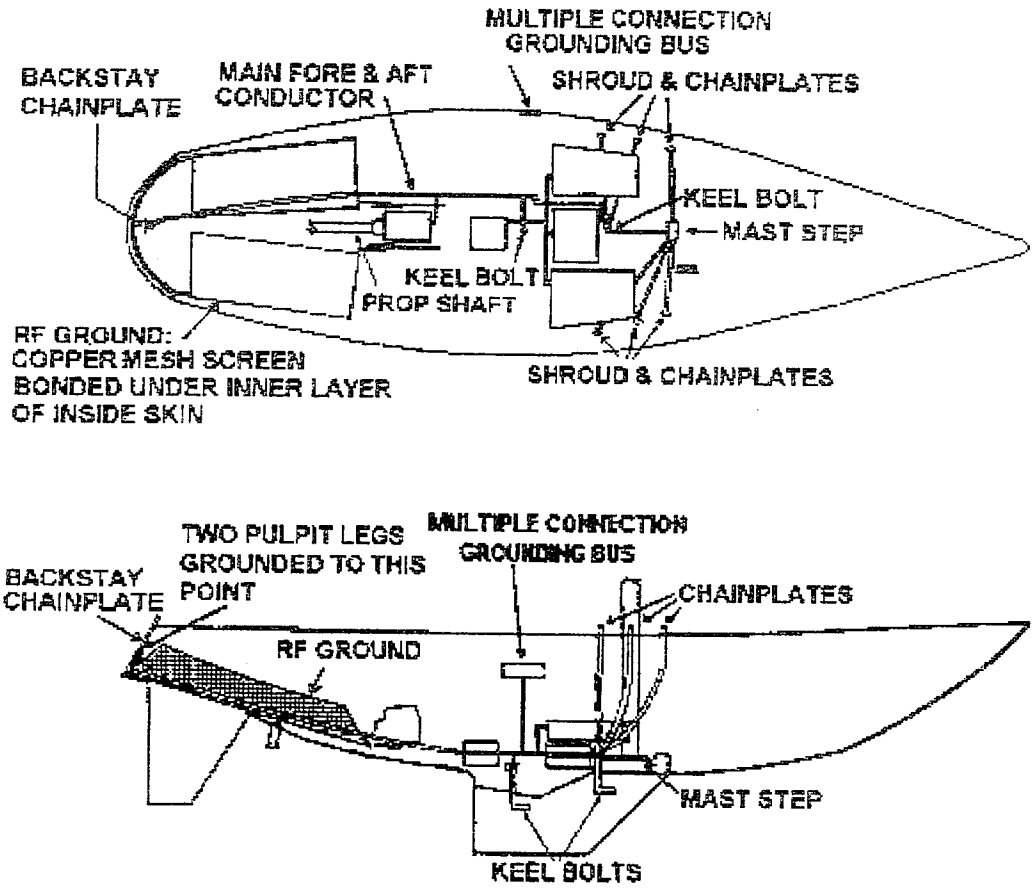


Figure 1-33. Bonding and Grounding

The entire propulsion train alignment, from the engine mounts to the propeller, is skewed about 3 degrees to starboard (from center line) to allow the shaft to be drawn out without interference from the rudder skeg.
See Figure 1-28, Stern Tube Details. See Chapter 3 for instructions for feathering and aligning the propellor.

1-7.2.8 FIRE DETECTION AND EXTINGUISHING SYSTEM

The auxiliary diesel engine compartment is fitted with a Fireboy Model 15 C.G. automatic fire extinguishing system. An indicator light is located on the main electrical distribution panel. Excessive heat in the engine compartment will automatically activate the Fireboy system.

The Navy 44 is also equipped with one (1) 5-pound CO2 and three (3) 2-1/2 pound dry chemical portable fire extinguishers. The 5-pound CO2 fire extinguisher is located by the wet locker between the head and the navigation station seat. The 2 ½ pound dry chemical fire extinguishers are bracket mounted inside the port hanging locker forward, above the galley sink, and inside the port cockpit locker.

1-7.3 THE ELECTRICAL SYSTEM

The electrical system generates, stores, and distributes 12 volts D.C. power through the battery selector switches. The system consists of two engine-driven alternators, three battery banks, a power distribution switchboard, shore power connection and junction boxes. Electrical distribution is a two-wire, negative ground, unswitched return system.

A 120 VAC, 30 amp, 60 Hz shore power connection provides power to the 120 VAC converter/battery charger located in the head compartment under the sink. This provides power to the battery banks for charging while dockside. Power is also directed to the TECNAUTICS 12 vdc refrigeration system with a compressor located in the starboard side of the steerage compartment.

See Figure 1-29, Electrical System.

1-7.3.1 ALTERNATORS

Two 12 volt d.c. 51 amp alternators are mounted on, and driven by, the auxiliary diesel engine. The alternator field circuits are energized by lubricating oil pressure switches located on the engine. Alternators are controlled by circuit breakers mounted on the switchboard panel. The alternators supply charging current to the battery banks and are capable of operating individually or in parallel.

In the event of an alternator failure a switching circuit will make electrical output from the remaining good alternator available to the other bank providing that the battery selector switches are energized. The emergency alternator switch is located on the stbd, outside face of the engine box.

1-7.3.2 BATTERY BANKS

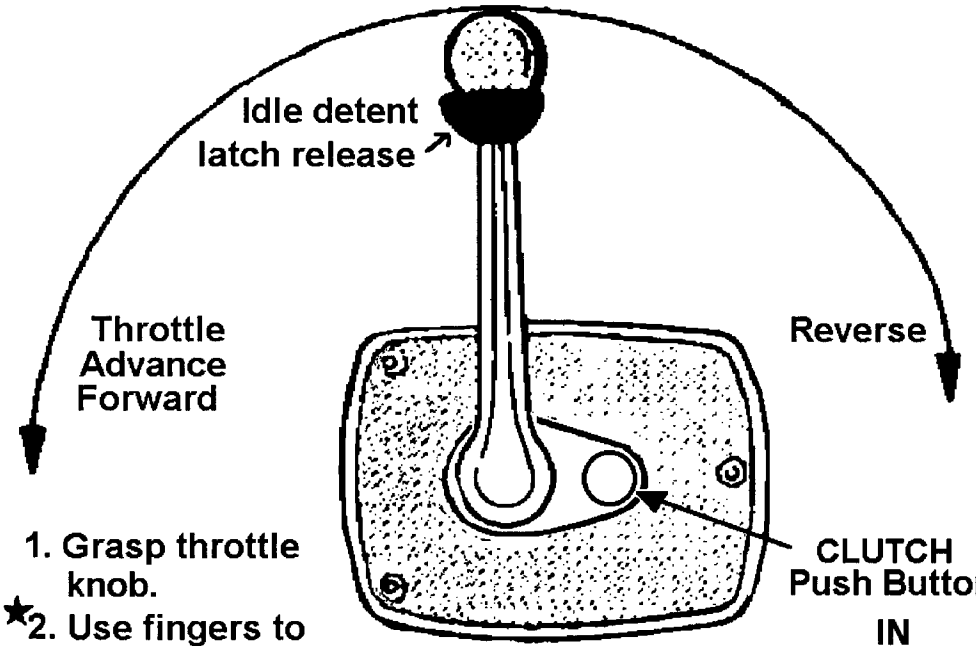
D.C. electric power is supplied from five batteries configured in three banks. Two banks are "house banks" labeled Ship Service (SS). Bank #1, (2 batteries in parallel), and Bank #2, (2 batteries in parallel). These two banks located beneath the navigation station seat are equipped with 12 volt D.C. 136 ampere hour Rolls, lead-acid type deep cycle marine batteries.

The third bank, located in the supply bin aft and to port of the engine compartment, is isolated for engine start. This battery is an M 27 high cranking amperage battery.

Both battery boxes are designed to keep the batteries from shifting in a 360 degree roll.

1-7.3.3 BATTERY BANK SELECTOR SWITCHES

Two rotary master disconnect and transfer switches are located on the front face of the navigation station seat. The lower switch is the engine start switch. It has two positions, OFF with the switch pointing down, and ON with



1. Grasp throttle knob.
★2. Use fingers to lift the idle detent latch release.
3. Move throttle in desired direction.

★ Applies to all boats - except NA 1, 2, 3, 4, 6.

Figure 1-27. Throttle

engine oil pressure sensing switch detects oil pressure equivalent to that of a running engine. This normally occurs at about 1500 RPM. A digital window in the tachometer displays Engine Hours in hours and tenths.

1-7.2.5.3 WATER TEMPERATURE

The water temperature gauge upper row, center, measures from 100 to 250 degrees Fahrenheit (40 to 120 degrees centigrade). A thermostat regulates engine temperature at 180 degrees Fahrenheit.

1-7.2.5.4 OIL PRESSURE

The oil pressure gauge located in the lower row, center , registers from 0 to 100 psi. A cold engine can register as high as 75 psi while a warm engine can be as low as 15 psi without damage. Normal oil pressure should be between 30 and 60 psi.

1-7.2.5.5 VOLTMETER

The voltmeter upper row right gauge, registers from 10 to 16 volts. An indication of 13.5 volts or higher is normal when the engine is running, because the Engine Alternator is charging the engine start battery

1-7.2.5.6 AMMETER

The ammeter, bottom right, measures rate of charging with the engine running. 30 amps is normal for a severely discharged battery. Amps will decrease to reach zero when the battery is fully charged.

1-7.2.6 ENGINE CONTROLS.

Propulsion from the auxiliary diesel engine is controlled by a single-lever Morse MV control, mounted aft on the starboard side of the cockpit. The transmission is engaged by pushing IN on the clutch button adjacent to the throttle.

Engine throttle lever.

NA-1,2,3 4, and 6 are equipped with the old style throttle lever, (without idle detent latch release). To move the engine out of the idle range, just move the throttle forward or backward to increase engine RPM.

ALL OTHER NA 44's.

To move the throttle out of the idle position, the throttle must be unlocked by pulling up on the idle detent latch release at the base of the throttle knob. The throttle lever can then be rotated forward to advance engine speed and increases thrust in a forward direction. Rearward movement of the throttle will increase engine speed and propulsion to the rear. Engaging the transmission at too high an RPM causes damage to the internal gears and will lead to transmission failure. See Figure 1-27, Throttle Control.

1-7.2.6.1 ENGINE SHUTDOWN T- HANDLE.

The ENGINE SHUTDOWN T-handle is located on the forward lower side of the helmsman's seat to starboard. Pulling UP on the T-handle shuts off fuel to the engine. The T-handle must be returned to it's normal position, (pushed DOWN), for subsequent starts. If the engine does not start, check this first.

1-7.2.7 PROPULSION SHAFTING AND PROPELLER

The propulsion shafting is 1-1/4 inch O.D. Aquamet 22 and is attached to the marine gear with a Federal Model 43A flexible coupling. The stern tube is a 2-1/4 inch O.D. by 1-1/2 inch I.D. fiberglass tube molded onto the hull.

The inboard end of the stern tube is fitted with a Spartan No. B164 Rubber Neck stuffing box. The outboard end of the shafting is supported by a cast manganese bronze strut, housing a 1-3/4- inch O.D. by 5-inch Cutlass bearing. The shaft is fitted with a streamlined zinc anode collar forward of the shaft strut. The Navy 44 is equipped with a Max Prop, 19 inch diameter by 18degree pitch, right hand, feathering propeller. This drives the Navy 44 at approximately 6 knots in calm seas.

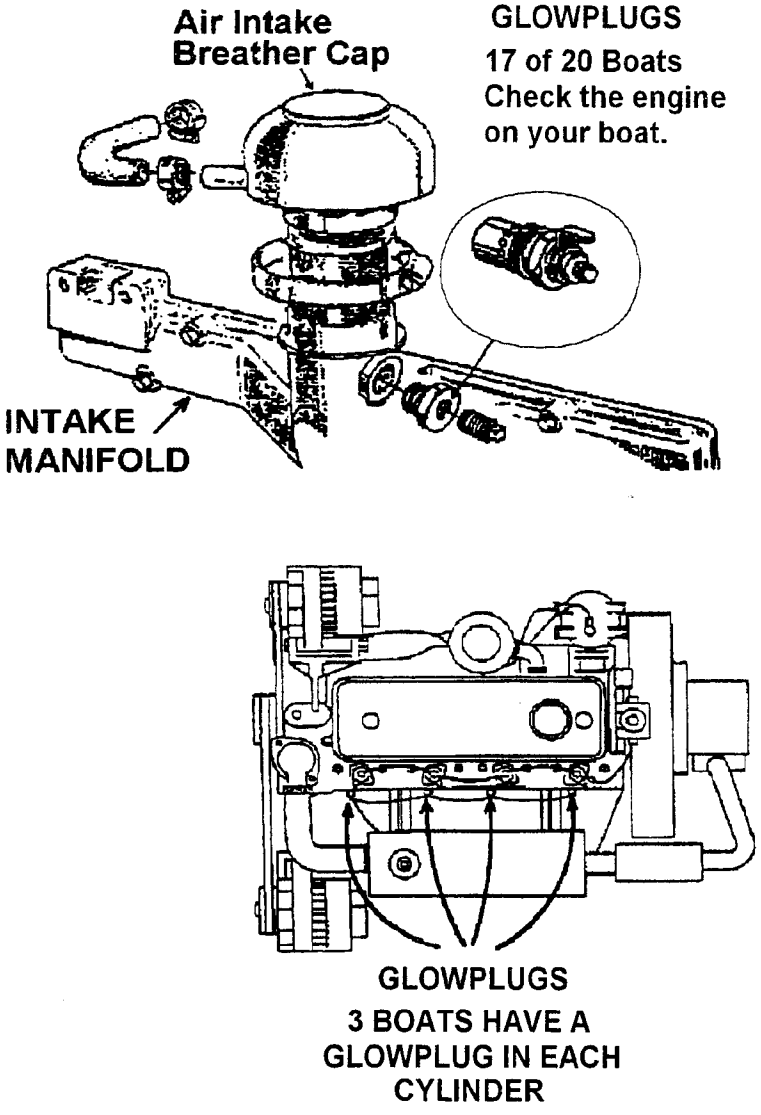
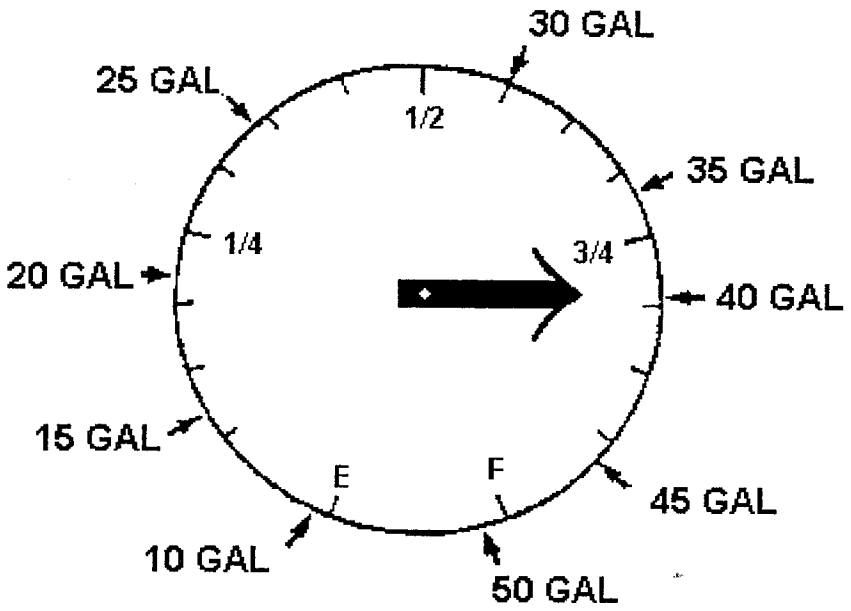


Figure 1-26. Glow Plugs

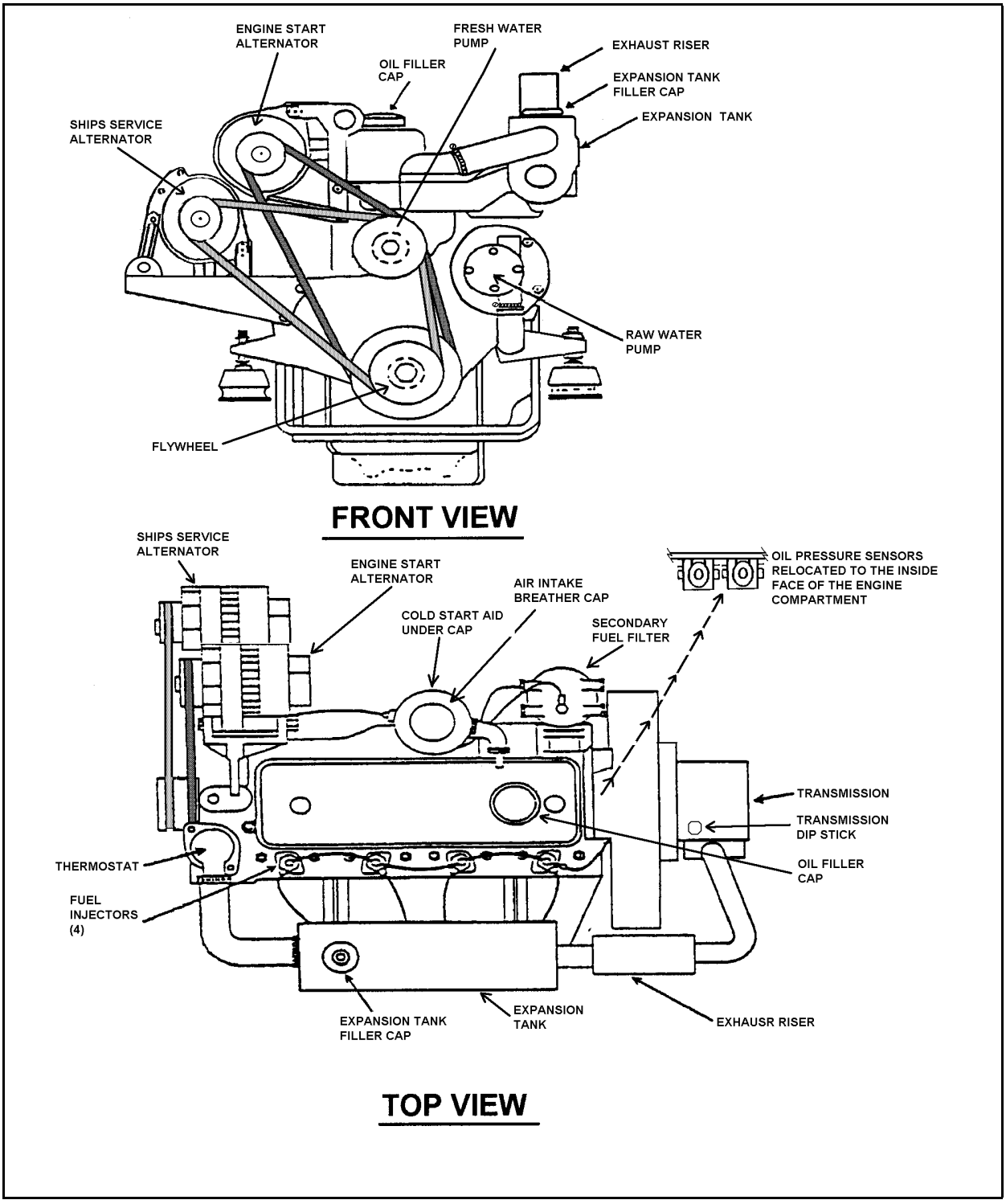
FUEL QUANTITY GAUGE

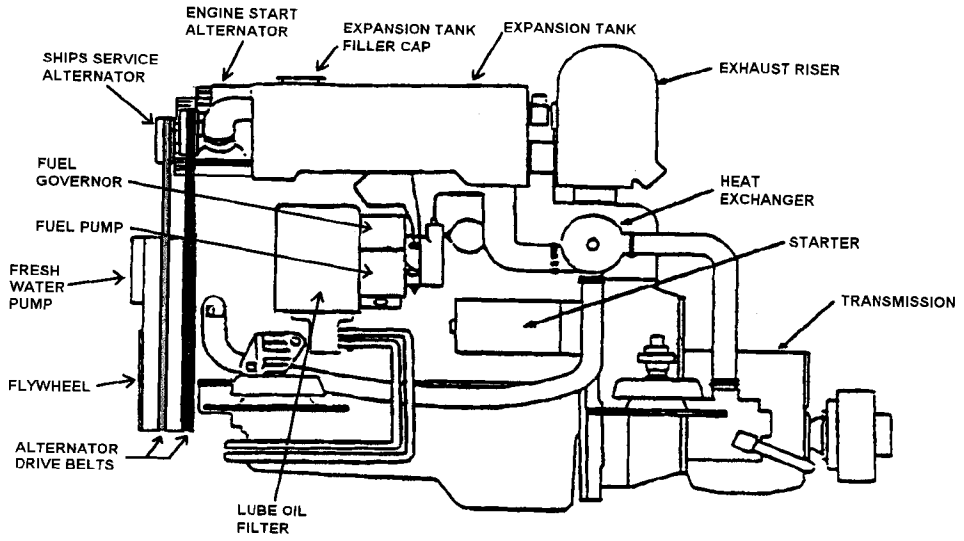


DIP STICK READINGS

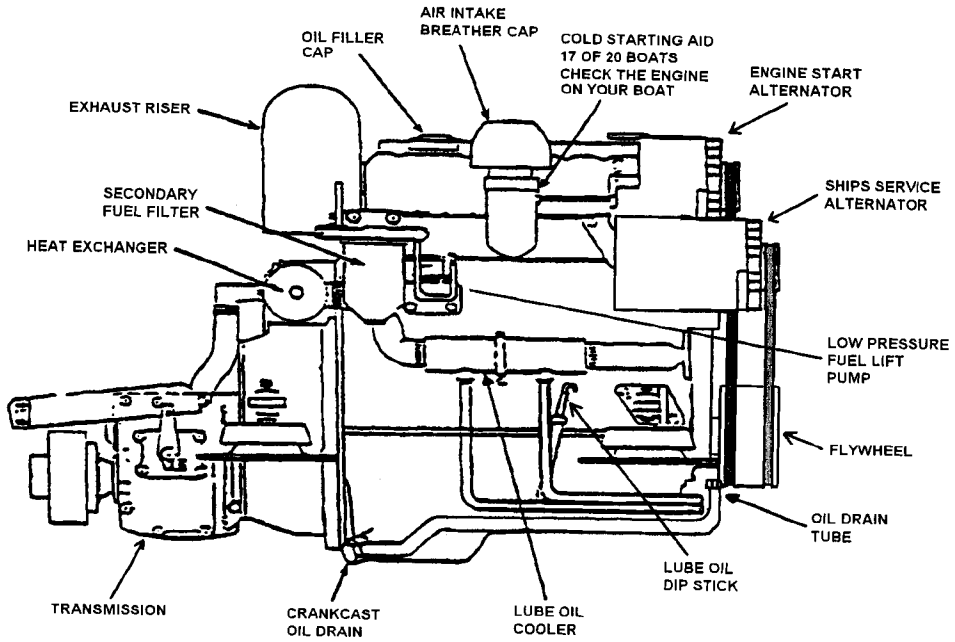
GALLONS	INCHES UP FROM BOTTOM
45	13 1/2
40	12 1/4
35	10 3/4
30	9 3/4
25	8 1/2
20	7
15	5 3/4
10	4 1/4
5	3

Figure 1-20. Fuel Gauge Readings


ENGINE START ALTERNATOR
FRESH WATER PUMP
EXHAUST RISER
OIL FILLER CAP
EXPANSION TANK FILLER CAP
EXPANSION TANK
SHIPS SERVICE ALTERNATOR
RAW WATER PUMP
FLYWHEEL
FRONT VIEW
SHIPS SERVICE ALTERNATOR
ENGINE START ALTERNATOR
AIR INTAKE BREATHER CAP
COLD START AID UNDER CAP
SECONDARY FUEL FILTER
OIL PRESSURE SENSORS RELOCATED TO THE INSIDE FACE OF THE ENGINE COMPARTMENT
TRANSMISSION
TRANSMISSION DIP STICK
OIL FILLER CAP
THERMOSTAT
FUEL INJECTORS (4)
EXPANSION TANK FILLER CAP
EXPANSION TANK
EXHAUSR RISER
TOP VIEW



PORT VIEW



STARBOARD VIEW

Figure 1-18. Engine Side View

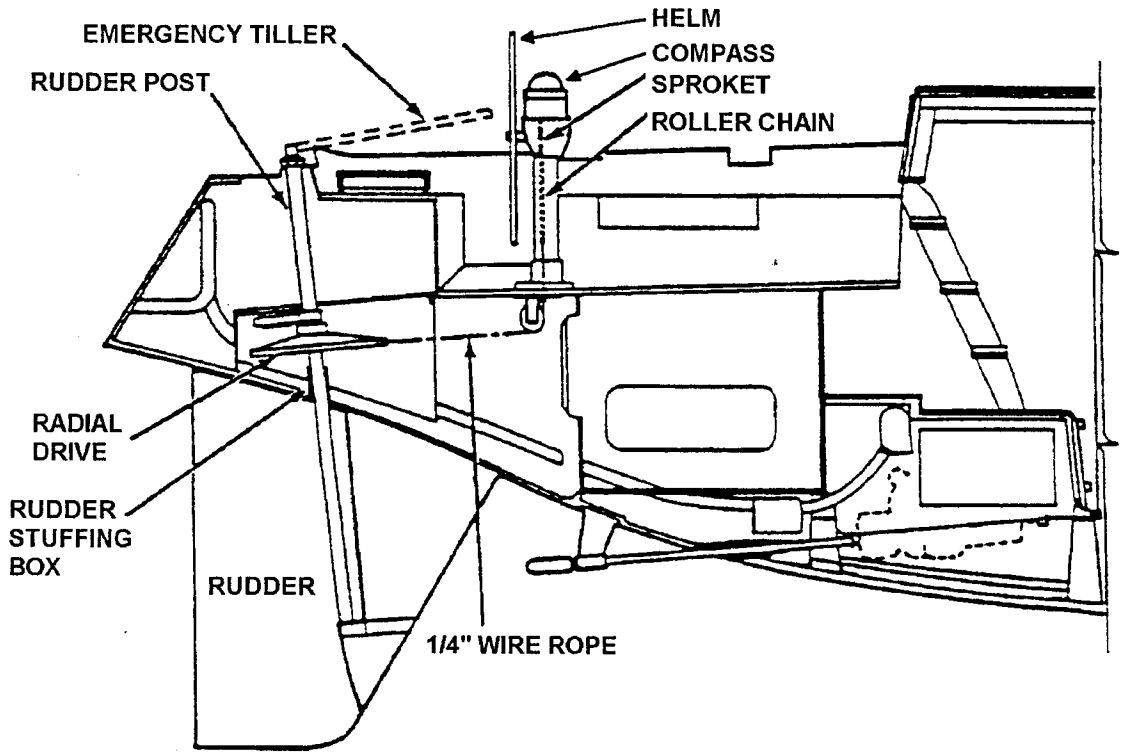


Figure 1-17. Steering (Side View)

Tuning is the process by which the standing rigging is adjusted so that the mast remains in column, directly on centerline when exposed to typical operating loads. The mast has been tuned by Small Craft Support and is not be tuned by using personnel. See Figure 1-7, Typical Turnbuckle, and Figure 1-6, Standing Rigging Front View.

1-4.5.1 STEM BALL FITTINGS

The aft lower shrouds have been retrofitted with a stem ball fitting at the upper end where they join to the mast. This allows the rod end to rotate within a machined stemball seat, thus accommodating small amounts of lateral and fore-aft play in the shroud as the mast is subjected to load. The indicator band will break loose when subjected to inordinate loads and will slide to the lower end of the shroud adjacent to the turnbuckle. This is an indication of inordinate fatigue and potential shroud failure. See Figure 1-9, Stem Ball Fitting.

1-4.6 SPREADERS

The Navy 44 Mast has two sets of aluminum spreaders which extend with a small dihedral angle from the mast at 22 feet and 40 feet above the deck for the lowers and upper sets respectively, thus the rig is referred to as a "double spreader rig". The spreaders assist the shrouds in keeping the mast in column within the fore and aft plane. See Figure 1-8.

1-4.7 THE COLLAPSIBLE INNER FORESTAY

A collapsible inner forestay, of 1/4" - 1x19 stainless steel wire, is attached to the front of the mast with as aluminum welded tang at a point 18 feet, 9 inches below the masthead. The running backstays are attached to the back of the mast at the same location. The lower end is attached to a high field lever. When set up it will lessen the flexing of the mast due to strong winds and seas. It also serves as the stay to which the Genoa staysail or the storm jib are attached. When not in use the lower end can be led through the fairlead at the base of the mast, port side, and attached to the shock chord at the padeye on the cabin top aft of the mast.

1-4.8 THE HYDRAULIC BACKSTAY TENSIONING DEVICE.

The hydraulic backstay tensioning device is used to adjust masthead position and indirectly controls the shape of the leading edge of the jib. The headstay is adjusted to compensate for wild pressure. Light winds may require no more than the 50 psi static pressure. In stronger winds more backstay pressure will be needed.

CAUTION

Maximum headstay pressure should not Exceed 4000 psi.

The tensioning device is a manually actuated hydraulic pump which applies tension to the backstay. Each of the two types of tensioners used in the Navy 44 fleet have indicator gauges, and pressure relief valves which prevent accidental application of extreme backstay pressure or the dynamic loads in excess of safe limits. Two types are used. NA1-NA8 have KRUEGER tensioners while NA9-NA20 have NAVTEC tensioners.

1-4.8.1 THE KRUEGER TENSIONER

The Krueger backstay tensioner has a sight gauge to aid in controlling the amount of tension taken on the system. It measures load exerted on the system in thousands of pounds. See Figure 1-10. Krueger Tensioner.

1-4.8.2 NAVTEC BACKSTAY TENSIONER

The NAVTEC tensioner has two scales. One end of th pointer reads pounds per square inch of pressure in the cylinder. the other end indicates the equivalent pressure exerted on the backstay in pounds x1000. See Figure 1-11. NAVTEC Tensioner.

4-2.3.5 REPLACING THE COOLING SYSTEM HEAT EXCHANGER.

Before starting this procedure ensure that you have a:

- Replacement Cooling System Heat Exchanger, part no. Westerbeke 036896.

1. Drain the fresh water (captive anti-freeze side) of all coolant.
2. Close the Engine Intake valve and drain the raw water side of the head exchanger.
3. Remove the two (2) lower retaining bolts and spacers.
4. Lift the electrical mounting plate (with switches attached) up and out of the way.
5. Remove the defective head exchanger and replace.
6. Place electrical mounting plate againt head exchanger, insert retaining bolts and spacers and tighten.
7. Fill the fresh water cooling system with 50/50 coolant/water mixture.
8. OPEN Engine Intake valve.
9. Vent the heat exchanger as necessary.

4-2.4 ALTERNATORS

The Engine Start Alternator in mounted on the highest mounting pad on the STBD forward side of the engine. The SS Alternator has been relocated from the PORT side of the engine, (assess through the head inspection panel), and mounted on the STBD side on the pad vacated by the removal of the engine driven refrigerator compressor. (See Figure 1-19. Engine (Front View).

4-2.4.1 ADJUSTING AND/OR REPLACING THE ALTERNATOR DRIVE BELTS.

The drive belts for the Alternators are the same ones that drive the fresh water pump. Procedures are repeated here for continuity.

Before starting this procedure ensure that the following are on hand:

- 3/4-inch wrench.
- 1/2-inch wrench.
- Pry bar.
- Replacement Drive Belts.

NOTE

Drive belt sizes may not be substituted, they must be one of the following:
FSN 3030-529-0350
WESTERBEKE PART NO. 33361
COMMERCIAL AX46

1. Shut down the engine.
2. Loosen the top mounting bolt for the Ship's Service Alternator using a 3/4-inch wrench and a ½-inch wrench on the lower sliding bracket bolt. If only adjusting drive belt tension, skip Belt Replacement Procedures and go to step 3.

PROCEDURES FOR REPLACING A DRIVE BELT.

NOTE

The Engine drive shaft has a double pulley mounted on it. The drive belt for the Engine Start Alternator is trapped by the drive belt for the Ship's Service Alternator drive belt.

Ship'S Service Alternator Drive Belt.

SS1. Disconnect the 3/4-inch raw water pump inlet hose placing the hose in an upright position to minimize spillage of raw water.
SS2. Slide the alternator inboard and remove the defective belt.
SS3. DO NOT replace the Ship's Service drive belt at this time if the Engine Start Alternator belt must also be replaced. It will only be in the way.