Sea Ray

Owner's Manual

510 Fly

Manual Part Number: MRP 2139855

WELCOME

Congratulations on becoming the new owner of a Sea Ray® Boat, the world's most prestigious manufacturer of boats. We welcome you into our worldwide and ever-expanding family of boating enthusiasts.

This Owner's Information Packet will provide important information about features of your boat and should be kept on board your Sea Ray®.

For years of trouble-free boating, take the time to carefully review the information in this package and really get to know your boat. **Have everyone who will operate your boat read the Owner's Manual.**

The Owner's Information Packet contains the following:

- **Sea Ray® Owner's Manual**

The Sea Ray Owner's Manual contains important operating and safety information, as well as reminding you about your responsibilities as a boat owner/operator.

- **Model Specific Owner's Manual**

The Model Specific manual contains information specific to your model.

- **Original Equipment Manufacturer (OEM) Information**

The OEM Information of your Owner's Information Packet contains information provided by the individual systems manufacturers of equipment installed on your boat. Examples include the engine, engine control and electronics equipment. Throughout the Owner's Manual you will be referred to information provided by manufacturers of specific systems.

For a complete library of all Sea Ray manuals including owners, systems, accessories, and options please visit www.searay.com. There you will be able to view all Sea Ray manuals and any items that are not included in this manual.

Because your purchase represents a substantial investment, we know you will want to take the necessary measures to protect its value. We have outlined a program for proper operation, periodic maintenance and safety inspections. We urge you to follow these recommendations. If you have questions which are not fully covered by the Owner's Information Package, please consult your authorized Sea Ray® Boats dealer for assistance.

Thank You For Selecting A Sea Ray®!
Bon Voyage

Information in this publication is based upon the latest product specifications available at printing. Sea Ray® Boats, Inc. reserves the right to make changes at any time, without notice, in the colors, equipment, specifications, materials and prices of all models, or to discontinue models. Should changes in production models be made, Sea Ray® is not obligated to make similar changes or modifications to models sold prior to the date of such changes.

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Sea Ray Boats, Inc. 2600 Sea Ray Blvd., Knoxville, TN 37914
Please visit www.searay.com for a complete library of all Sea Ray Owner's and Accessory Manuals.

Note: Not all accessories shown in pictures or described herein are standard equipment or even available as options. Options and features are subject to change without notice.

Table of Contents

This publication does not contain component or accessory manuals. Please visit www.searay.com for a complete library of all Sea Ray Owner's and Accessory Manuals

1. This Manual

The material here and in the rest of the Owner's Information Packet:

- Gives you basic safety information;
- Describes the fundamentals of boat use;
- Describes the features of your boat;
- Describes the equipment on your boat;
- Contains service and maintenance information.

You must learn to safely operate this boat as well as read, understand and use the information contained in this package.

What these manuals do not give you is a course in boating safety, or how to navigate, anchor, or dock your boat. Operating a power boat safely requires more skills, knowledge, and awareness than is necessary for a car or truck.

2. Your Responsibilities

For your safety, the safety of your passengers, other boaters and people in the water, you must:

- Take a boating safety course;
- Get instruction in the safe and proper handling of your boat;
- Understand and follow the "Rules of the Road";
- Learn how to navigate;
- Register:

  You must register this boat in the state where it will be used most frequently, many states require additional registration when an out-of-state boat is used within their boundaries.

  Contact state boating authorities or any marine dealer for registration requirements.

3. Safety/Warning References

Explanation of Safety/Warning References

The most important aspect of boating is safety. Although every effort is made to address the numerous issues regarding the safe usage of your boat, it is strongly recommended that you avail yourself to the training and knowledge available through boating safety courses, etc.

Safety Precautions

The precautions below appear throughout this manual and are mounted at key locations throughout your boat. These precautions must be observed when operating or servicing your boat. Learn to recognize the degree of precaution and understand the explanations of safety prior to reading this manual. These precautions are not all-inclusive. Always use common sense in the operation of your boat.

- Do not remove or obstruct any safety label.
- Replace any label which becomes illegible. Replacement safety labels can be obtained by calling your dealer.

⚠ DANGER

DANGER - Immediate hazards which WILL result in severe personal injury or death if the warning is ignored.

⚠ WARNING

WARNING - Hazards or unsafe practices which MAY result in severe personal injury or death if the warning is ignored.

⚠ CAUTION

CAUTION - Hazards or unsafe practices which could result in minor injury, product or property damage if the warning is ignored.

NOTICE

Information which is important to proper operation or maintenance, but is not hazard related.

4. Sources of Information

In North America, contact one of the following for boating courses:

- U.S. Coast Guard Auxiliary
- U.S. Power Squadron
- Canadian Power and Sail Squadrons
- Red Cross
- State Boating Offices
- Yacht Club

Contact your dealer or the Boat/U.S. Foundation at:
1-800-336-2628

Outside of North America, contact your boat dealer and/or your governmental boating agency for assistance.

A book that provides a comprehensive background in boating is **Chapman - *Piloting, Seamanship and Small Boat Handling***, by Elbert S. Maloney, published by Hearst Marine.

5. Dealer Responsibilities

In addition to a pre-delivery check and service of the boat, your dealer is to give you:

- A description and demonstration of the safety systems, features, instruments and controls on your boat;
- An orientation in the general operation of your boat;
- An "In Service Check List" form completed by you and the dealer after your inspection of the boat;
- A review of all warranty information and how to obtain warranty service;
- The Owner Information Package.

If you do not receive all of these materials, or have any questions, contact your dealer.

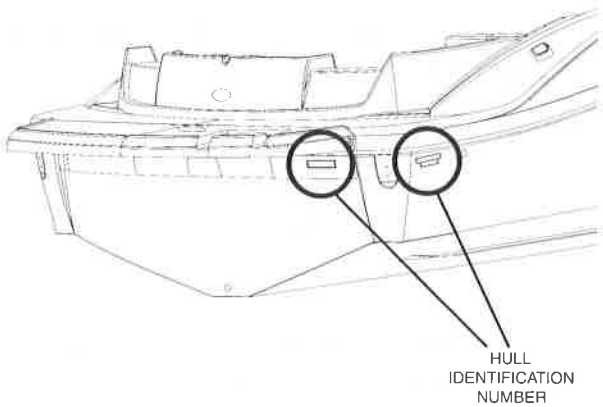
6. Warranties

Your boat comes with several warranties. Each component and/or system on your boat has its own warranty that will be found with the specific information and manual for that component. These are included with your Owner's Manual Packet. The Sea Ray® Express Limited Warranty is on the warranty information sheet and in this manual. Please locate and read the individual warranties.

7. Hull Identification Number (HIN)

The "Hull Identification Number", (Fig. vi.1) will be located either on the starboard side of the transom, or on the aft, starboard side of the gunwale, and is your boat's most important identifying factor. This number must be included in all correspondence and orders. Failure to include it creates delays. Also of vital importance is the engine serial number and part number when writing about or ordering parts for your engine. Refer to the Engine Operator's Manual for location of engine serial number and record it for future reference.

Hull Identification Number Location (Fig. vi.1)



8. Manufacturer's Certification

As a boat manufacturer, Sea Ray® builds their products to guidelines established under the Federal Boat Safety Act of 1971. The Act is promulgated by the United States Coast Guard who has authority to enforce these laws on boat manufacturers that sell

products in the United States. Sea Ray® ensures that all of its products comply with these laws.

The National Marine Manufacturers Association (NMMA) provides Sea Ray® with a third party certification. The NMMA is an organization that represents the marine industry and assists manufacturers, boat dealers, marinas, repair yards and component suppliers in areas of legislation, environmental concerns, marine business growth and state and federal government agency interaction. The third party certification that Sea Ray® participates in, uses the well known Standards and Recommended Practices of the American Boat and Yacht Council (ABYC).

Sea Ray® Boats participates extensively in the American Boat and Yacht Council which is a nonprofit organization that develops and publishes voluntary standards and recommended practices for boat and equipment design, construction, service and repair. We utilize all applicable ABYC standards in the construction of your Sea Ray® boat.

Finally, Sea Ray® sells their products world wide and as such must conform to the various rules and regulations required by other countries. Most notably, are the ISO standards in Europe which require the application of the Common European (CE) mark. This mark, much like the NMMA certification here in the US, gives you the boat owner specific information concerning your craft.

9. Prep, Service, Parts and Repair for Your Boat

Sea Ray® advises that all rigging, installation, and prep work on any Sea Ray® product be done by an authorized dealer at the authorized dealer's location.

When your boat needs service, parts or repair, take it to an authorized Sea Ray® dealer. To find a dealer in your area contact Sea Ray® via the internet at www.searay.com (international customers please visit international.searay.com).

To find repair and parts facilities for the equipment installed on your boat, refer to the section or manual for that component.

If a problem is not handled to your satisfaction:

1. Discuss any warranty-related problems directly with the service manager of the dealership or your sales person. Give the dealer an opportunity to help the service department resolve the matter for you.
2. If a problem arises that has not been resolved to your satisfaction by your dealer, contact Sea Ray® via the internet at www.searay.com and the appropriate customer service information will be provided to you.

10. International Requirements

Depending on your boat's original destination, the vessel and its systems may have been constructed in accordance with standards and specifications published by various international authorities such as:

- Construction Standards for Small Vessels - Canada
- Recreational Craft Directive and applicable ISO Standards - European Union
- AS/NZ 3004 Electrical Installations - Australia/ New Zealand

Further information concerning these requirements may be obtained from your local dealer.

11. Warranty Information

You will find information regarding the Sea Ray® warranty following the introduction. A warranty information card is also included in the owner information packet. If for some reason this information is missing, contact your Sea Ray® dealer.

INTRODUCTION

ABOUT YOUR LIMITED WARRANTY

Sea Ray® offers an express Limited Warranty on each new Sea Ray® purchased through an authorized Sea Ray® dealer. A copy of the Limited Warranty was included in your owner's manual package. If for any reason, you did not receive a copy of the Limited Warranty, please contact your local dealer for a replacement copy. This is a summary of several provisions of the Limited Warranty. Please read the Limited Warranty, which is the controlling document.

Under the Limited Warranty, Sea Ray® covers: (a) structural fiberglass deck or hull defects which occur within ten (10) years of the date of delivery; (b) parts founds to be defective in factory material or workmanship within one (1) year of the date of delivery; (c) laminate blisters resulting from defects in factory material or workmanship for five (5) years on a prorated basis.

Sea Ray®'s obligation under the Limited Warranty is limited to repair or replacement of parts that are judged defective by Sea Ray® and does not include transportation, haul out, or other expenses. The foregoing is the **sole and exclusive** remedy provided by Sea Ray®.

The Limited Warranty does not cover engines, stern drives, controls, propellers, batteries, trailers, or other equipment or accessories carrying their own individual warranties, nor does the Limited Warranty cover engines, parts or accessories not installed by Sea Ray®. The Limited Warranty does not cover cosmetic gel coat finish. Boats used for commercial purpose are excluded from coverage. **See the Sea Ray® Limited Warranty for other exclusions.**

SEA RAY® EXPRESSLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS. NEITHER SEA RAY® NOR THE SELLING DEALER SHALL HAVE ANY RESPONSIBILITY FOR LOSS OF USE OF THE BOAT, LOSS OF TIME, INCONVENIENCE, COMMERCIAL LOSS OR CONSEQUENTIAL DAMAGES.

The unexpired term of the limited warranty may be transferred to a subsequent owner upon the new owner's request, except this limited warranty will not transfer to any subsequent owner of a boat which has been salvaged or resold after declaration of a total loss or a constructive total loss, i.e., the cost of repair exceeds the value of the boat. The new owner can submit this request, free of charge, via the searay.com website or through a local authorized Sea Ray Dealer where processing fees may be applied. Sea Ray reserves the right to reject any warranty transfer request for a boat that has been damaged, neglected, or otherwise previously excluded from warranty..

Thank you for your decision to buy a Sea Ray®.

The Sea Ray® Limited Warranty is subject to change at any time at Sea Ray's discretion. The information contained herein is general information about the Limited Warranty for the owner's general knowledge, but does not alter or amend the terms of the Limited Warranty.

1. Passenger Locations/Stability

⚠ WARNING

Wet decks are slippery.

You can be seriously injured if you slip and fall.

Wear slip resistant footwear secured to your feet and hold on to rails or boat structure.

⚠ WARNING

Boat motion can be erratic.

You can fall overboard or be injured by hitting something in or on the boat.

All persons must be in cockpit area or cabin and be prepared for sudden boat movement.

Use front or bow deck area only during anchoring, mooring or emergencies.

When persons are on the working deck area, for anchoring, mooring, or in emergencies, they must be holding on and be positioned so as to prevent falling. In bad weather and/or rough water, if it is essential to be on deck, persons should be closely tied to cleats, railing stanchions or other securely fastened boat hardware.

Your boat was manufactured to specific stability and flotation standards for the capacity shown on the certification plate. Any increase from the recommended load capacities will put your boat in jeopardy of capsizing, swamping and/or sinking.

In Addition:

• Stability may be substantially reduced if equipment is added above the deck.

• Stability is substantially reduced by loose fluids or weight within the hull. Keep bilge area as dry as possible, and close all openings, hatches and windows in rough weather.

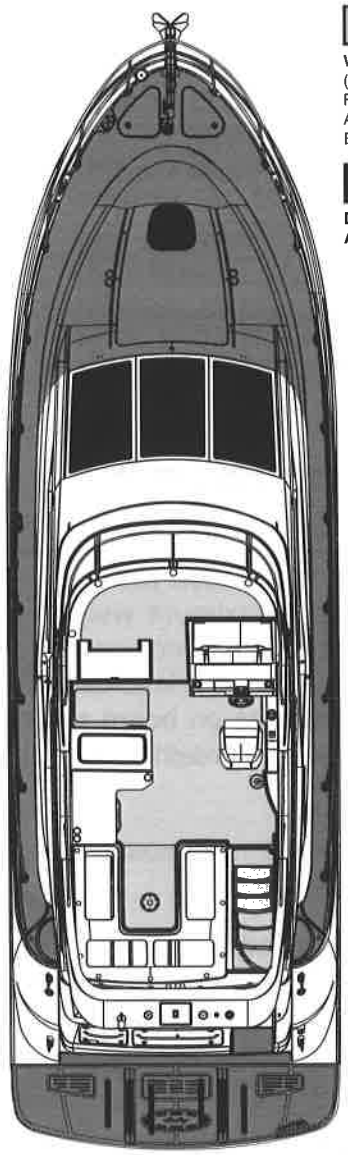
⚠ WARNING

Distribute passengers and gear as uniformly as possible from front to rear and left to right.

The manufacturer's load rating is the maximum allowed under calm conditions.

Reduce boat loading if weather, water or other conditions are adverse.

Passenger Locations
(Fig. 1.1)



ACCOMMODATION DECK
(DECK AREA INTENDED FOR OCCUPATION DURING NORMAL OPERATION)

WORKING DECK
(DECK AREA INTENDED FOR OCCUPATION DURING ANCHORING, MOORING AND EMERGENCY OPERATION ONLY

DO NOT STAND OR WALK ON THIS AREA.

⚠ DANGER

Rotating propellers can injure or kill you.

Shut off engine when persons are in water near boat, or on swim platform or ladder.

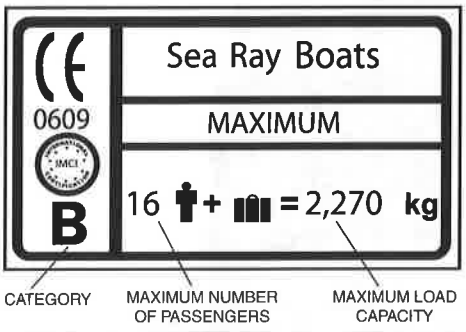
2. Load Capacity

⚠ DANGER

Never carry more weight or passengers than indicated on the certification plate, regardless of weather or water conditions.

The boat can capsize, swamp or sink.

Capacity Plate (international certification) (Fig. 2.1)



If present the capacity information plate, located near the helm indicates maximum weight and number of persons your boat can handle under calm sea conditions. Do not exceed the load capacities stated. The number of people on board must be reduced if you go out in poor weather and rough water.

The type of capacity plate will vary dependant upon the local governing authority.

- United States – The United States Coast Guard only provides specific numbers for passenger capacity or cargo weight for recreational vessels up to 20', (6.1 meters). NMMA provides capacity for boats under 26' (7.9 meters).
- Canada – Transport Canada only provides specific numbers for passenger capacity or cargo weight for recreational vessels up to 6 meters (19.7').
- Australia – The Australian Transport Council provides specific numbers for passenger capacity and cargo weight for all recreational vessels.
- European Union – CE regulations provide specific information for passenger capacity and cargo weight for all recreational vessels.

3. Design Category

There are four design categories of boats based upon their ability to withstand wind and sea or water conditions:

A. Ocean
Wind speed: above 40 knots (46 mph)
Wave height: above 4 meters (13 feet)
Boat may be used for extended ocean voyages.

B. Offshore
Maximum wind speed: 40 knots (46 mph)
Maximum wave height: 4 meters (13 feet)
Boat can be used offshore, but not for extended ocean voyages.

C. Inshore
Maximum wind speed: 27 knots (31 mph)
Maximum wave height: 2 meters (6.5 feet)
Boat use is limited to coastal waters, large bays, estuaries, lakes and rivers.

D. Sheltered waters
Maximum wind speed: 15 knots (18 mph)
Maximum wave height: 0.5 meters (1.5 feet)
Boat use is limited to small lakes, rivers and canals.

⚠ DANGER

DO NOT ATTEMPT TO BOAT IN SEVERE WEATHER CONDITIONS

DEATH OR SERIOUS INJURY CAN OCCUR

GET TO SHORE BEFORE THE WEATHER TURNS BAD

The wind speed and wave height specified as the upper limit for your category of boat does not mean that you or your passengers can survive if your boat is exposed to these conditions. It is only the most experienced operators and crew that may be able to operate a boat safely under these conditions. You must always be aware of weather conditions and head for port or protected waters in sufficient time to avoid being caught in high winds and rough water. Do not take chances!

4. SAFETY LABEL LOCATIONS

SAFETY LABEL LOCATIONS
(FIG. 3.1)

A

⚠ DANGER
STAY CLEAR OF MOVING PARTS

B

⚠ DANGER
SUNPAD SHOULD NOT BE USED WHILE VESSEL IS UNDERWAY

C

SLING

D

Save Our Seas

It is illegal to dump plastic trash anywhere into the ocean or navigable waters of the United States. Violation of these requirements may result in civil penalty up to $25,000 and fine of $50 000 and imprisonment up to five years. Regional, state and local restrictions on garbage, discharge amy also apply.

PLASTIC-Includes, but is not limited to: plastic bags, styrofoam cups and lids, six pack holders, utensils, straws, milk jugs, egg cartons, synthetic fishing nets, ropes, lines, and bits of plastic degradeable plastics.
GARBAGE-Means paper, rags, glass, metal, crockery, generated in living spaces aboard the vessel that are normally cast (trash), and all kinds of food, maintenance and cargo-associated waste. "Garbage" does not include fresh fish or fish parts, dishwashes and gray water.

INSIDE 3 MILES
(and in U.S. Lakes, Rivers, bays and Sounds)
PLASTICS
DUNNAGE, LINING AND PACKING MATERIALS THAT FLOAT
ANY GARBAGE EXCEPT DISHWATER/ GRAYWATER/FRESH FISH PARTS

3 TO 12 MILES
PLASTICS
DUNNAGE, LINING AND PACKING MATERIALS THAT FLOAT
ANY GARBAGE NOT GROUND TO LESS THAN ONE SQUARE INCH

12 TO 25 MILES
PLASTICS
DUNNAGE, LINING AND PACKING MATERIALS THAT FLOAT

OUTSIDE 25 MILES
PLASTICS

DUNNAGE- Material used to block and brace cargo, and is considered a cargo associated waste.
DISHWATER-Means the liquid residue from the manual or automatic washing of dishes and cooking utensils which have been precleaned to the extent that any food particles adhering to them would not normally interfere with the operation of automatic dishwashers.
GRAYWATER-Means drainage from a dishwasher, shower, lavatory, bath, and washbasin, and does not include drainage from toilets, urinals, heads/sinks and cargo spaces.

E

NOTICE
EXHAUST FAN MUST BE ON WHEN USING COOKING APPLIANCES

F

⚠ WARNING
Carbon Monoxide (CO) can cause brain damage or death.
Carbon monoxide can be present in the cabin.
Signs of carbon monoxide poisoning include nausea, headache, dizziness, drowsiness, and lack of conciousness.
Get fresh air if anyone shows signs of carbon monoxide poisoning.
Get fresh air if carbon monoxide detector alarm sounds.
Carbon monoxide detector must be functioning at all times.

G

⚠ WARNING
DO NOT LEAVE BOAT UNATTENDED WITH THE DOCKSIDE WATER HOSE CONNECTED. DOCKSIDE WATER SHOULD BE CONNECTED DURING PERIODS OF HEAVY WATER USAGE ONLY.

H

⚠ DANGER
TO AVOID THE RISK OF SERIOUS INJURY OR DEATH SHUT OFF ENGINE WHEN NEAR SWIMMERS OR PRIOR TO USING SWIM PLATFORM AND BOARDING LADDER.

I

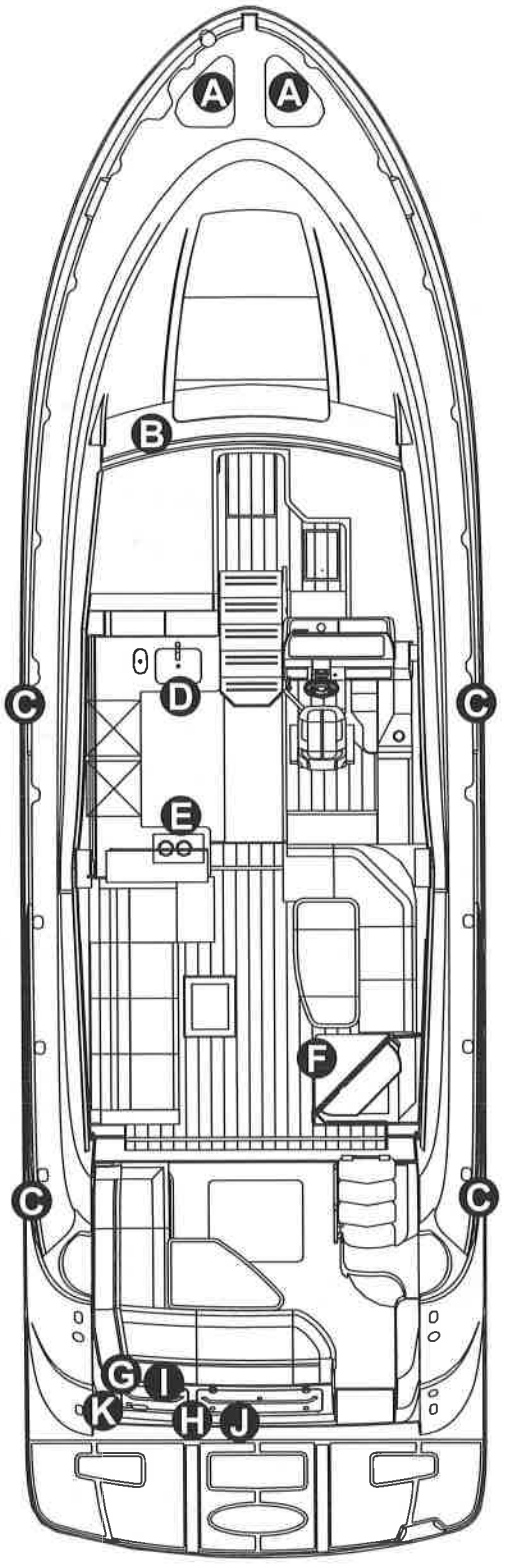
FRESH WATER

J

PLATFORM MAXIMUM CAPACITY
1000 lbs / 454 Kg

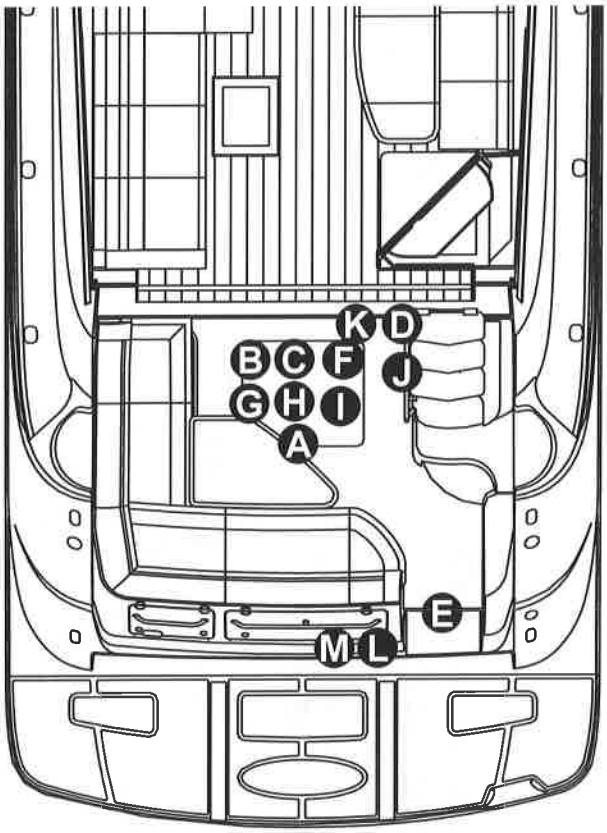
K

LINE 1



Safety Label Locations

Safety Label Locations
(Fig. 4.1)



A

⚠ CAUTION

PRIOR TO TOWING VESSEL:
- LOCK PROPELLER SHAFT(S) TO PREVENT DAMAGE TO SHAFT SEAL AND TRANSMISSION BEARINGS.
- CLOSE SEACOCKS ON NON-OPERATING ENGINES TO PREVENT SEA WATER INGESTION.

B

⚠ DANGER

STAY CLEAR OF MOVING PARTS
WHILE ENGINE IS RUNNING

C

NOTICE

FIXED FIRE EXTINGUISHING SYSTEM MUST

BE SUITABLE FOR GROSS COMPARTMENT

VOLUME OF 1000 CU FT.

D

⚠ WARNING

DOOR MUST BE SECURED
WHILE VESSEL IS UNDERWAY

E

⚠ DANGER

TRANSOM DOOR MUST BE
CLOSED AND SECURE WHEN
ENGINE IS RUNNING

F

NOTICE

THIS BOAT IS EQUIPPED WITH AN OPTIONAL DIRECT OVERBOARD DISCHARGE VALVE. DISCHARGING OF SEWAGE DIRECTLY OVERBOARD IS FOR USE WHERE APPROVED ONLY

G

⚠ WARNING

LEAKING FUEL IS A FIRE AND EXPLOSION HAZARD. INSPECT SYSTEM REGULARLY. EXAMINE FUEL TANKS FOR LEAKS OR CORROSION AT LEAST ANNUALLY

H

NOTICE

CHECK BATTERY CELL FLUID LEVEL APPROXIMATELY EVERY 4 WEEKS AND MORE OFTEN IN SUMMER AND HOT ZONES.

I

DISCHARGE OF OIL PROHIBITED

THE FEDERAL WATER POLLUTION CONTROL ACT PROHIBITS THE DISCHARGE OF OIL OR OILY WASTE INTO OR UPON THE NAVIGABLE WATERS OF THE UNITED STATES OR THE WATERS OF THE CONTIGUOUS ZONE IF SUCH DISCHARGE CAUSES A FILM OR SHEEN UPON OR A DISCOLORATION OF THE SURFACE OF THE WATER OR CAUSES A SLUDGE OR EMULSION BENEATH THE SURFACE OF THE WATER. VIOLATORS ARE SUBJECT TO A PENALTY OF $5,000.

J

⚠ DANGER

UNPLUG SHORE POWER AND
TURN OFF GENERATOR
BEFORE REMOVING COVER

THIS TAG IS LOCATED ON:
BLOCK HEATER, GENERATOR, CONVERTER, MAIN BATTERY CHARGER/CONVERTER, BATTERY EQUALIZERS & ALL A/C JUNCTION BOXES

K

⚠ WARNING

RUNNING BOAT WITH DOOR OPEN COULD INDUCE EXHAUST FUMES INTO CABIN. SEE OWNERS MANUAL FOR INSTRUCTIONS CONCERNING CARBON MONOXIDE.

L

⚠ DANGER

Carbon Monoxide (CO) can cause brain damage or death.

Engine and generator exhaust contains odorless and colorless carbon monoxide gas.

Carbon monoxide will be around the back of the boat when engines or generators are running.

Move to fresh air, if you feel nauses, headache, dizziness or drowsiness.

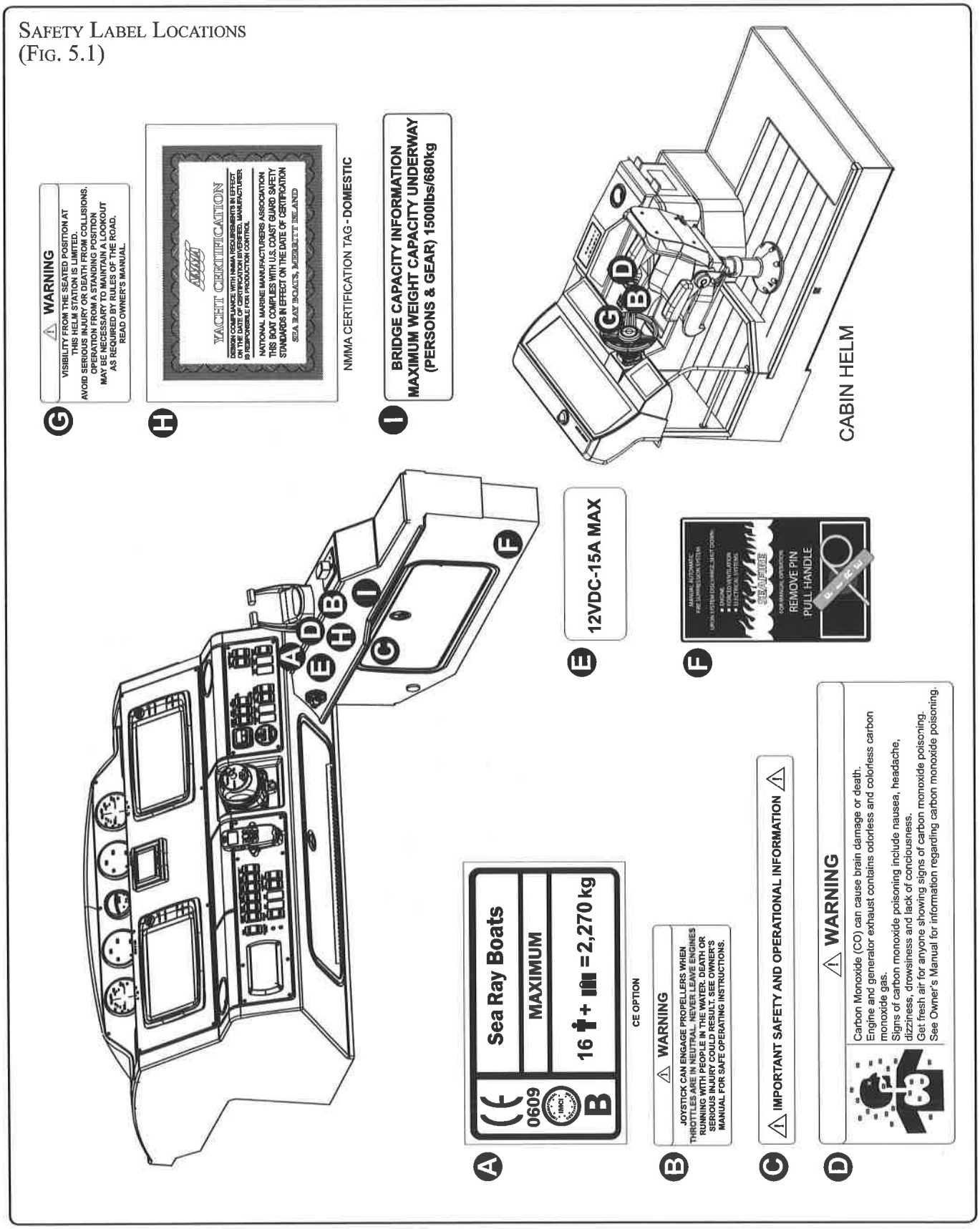
M

⚠ WARNING

PLATFORM MAY CRUSH OR PINCH HANDS OR OTHER BODY PARTS. TO AVOID INJURY, TURN OFF SWIM PLATFORM MAIN SWITCH AND UNPLUG TETHERED REMOTE WHEN NOT IN USE.

Safety Label Locations

Safety Label Locations
(Fig. 5.1)



Safety Label Locations

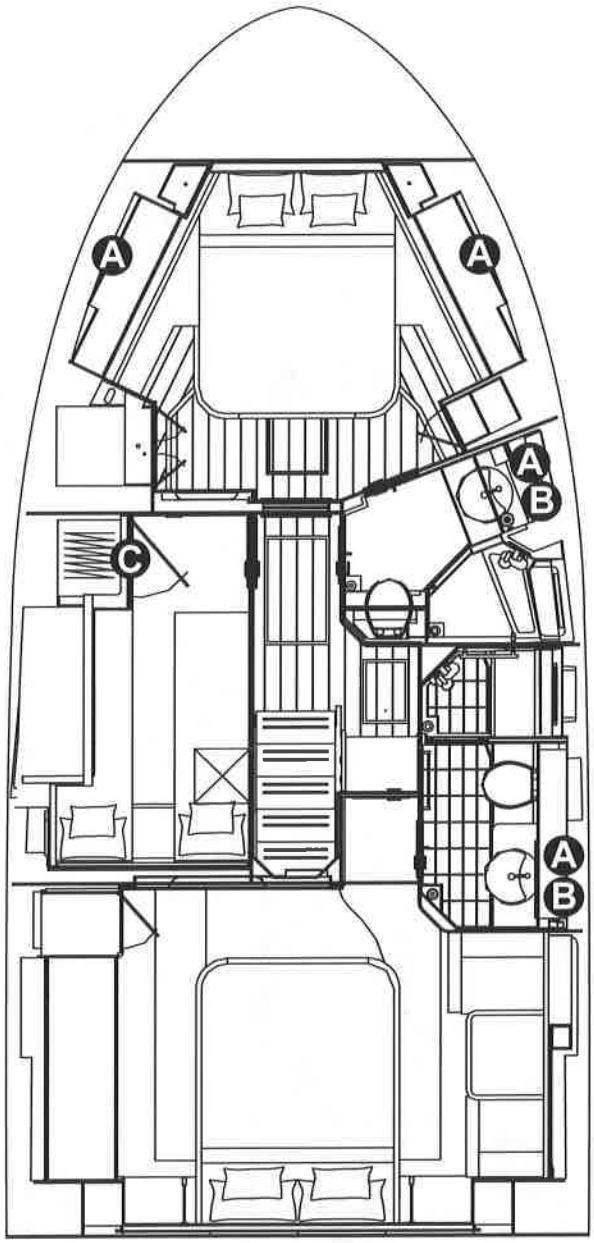
Safety Label Locations
(Fig. 6.1)

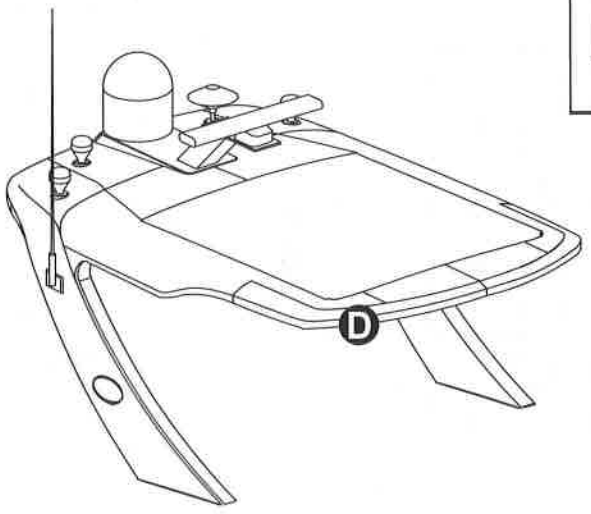
WATERTIGHT CLOSURE
KEEP SHUT WHEN UNDERWAY **A**

⚠ DANGER
LEAVING WINDOW OPEN COULD
INDUCE EXHAUST FUMES
INTO CABIN RESULTING IN SEVERE
PERSONAL INJURY OR DEATH. **B**

12VDC-15A MAX **C**

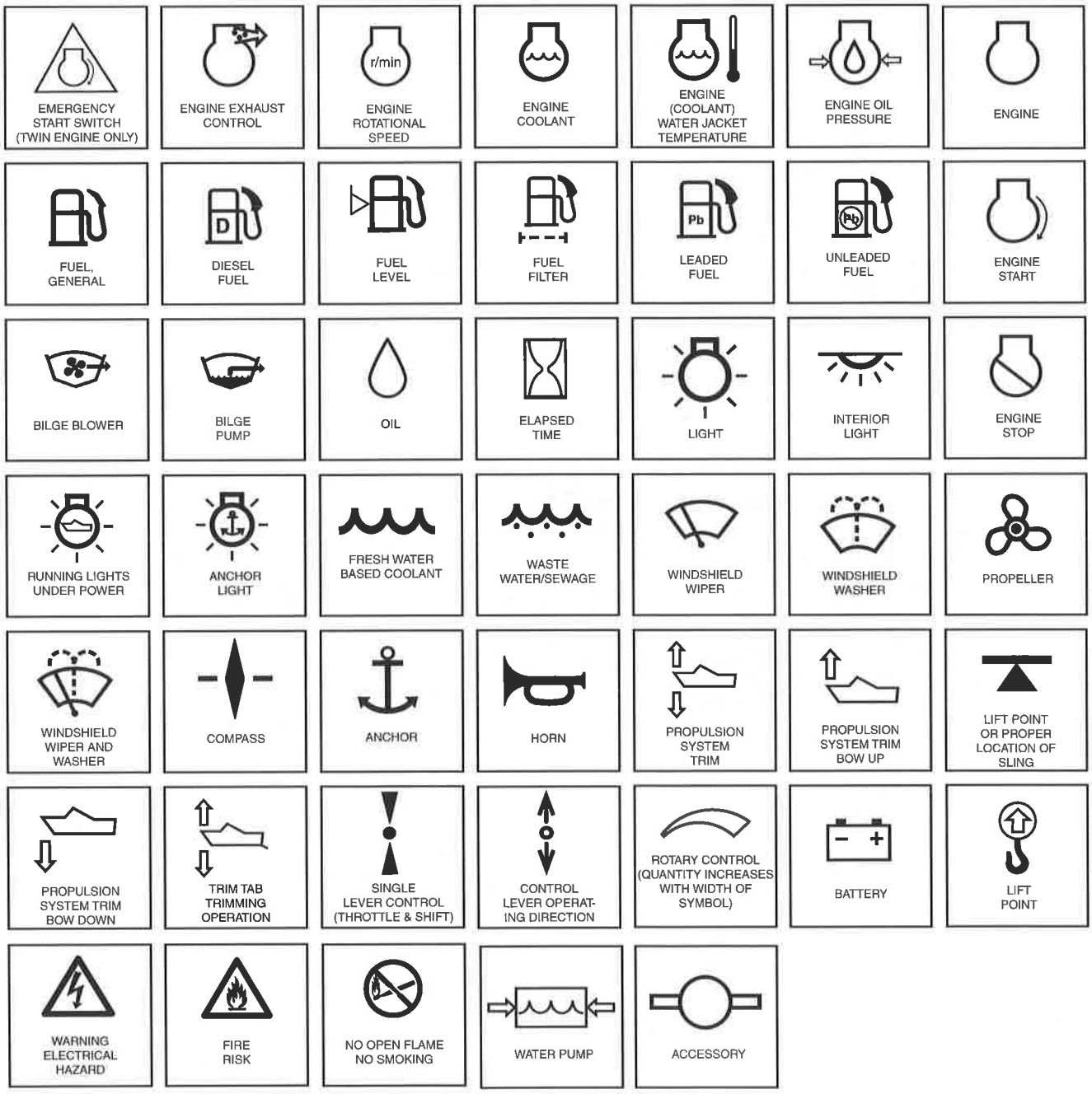
⚠ DANGER
DO NOT CLIMB UPON OR
STORE EQUIPMENT ON HARDTOP **D**





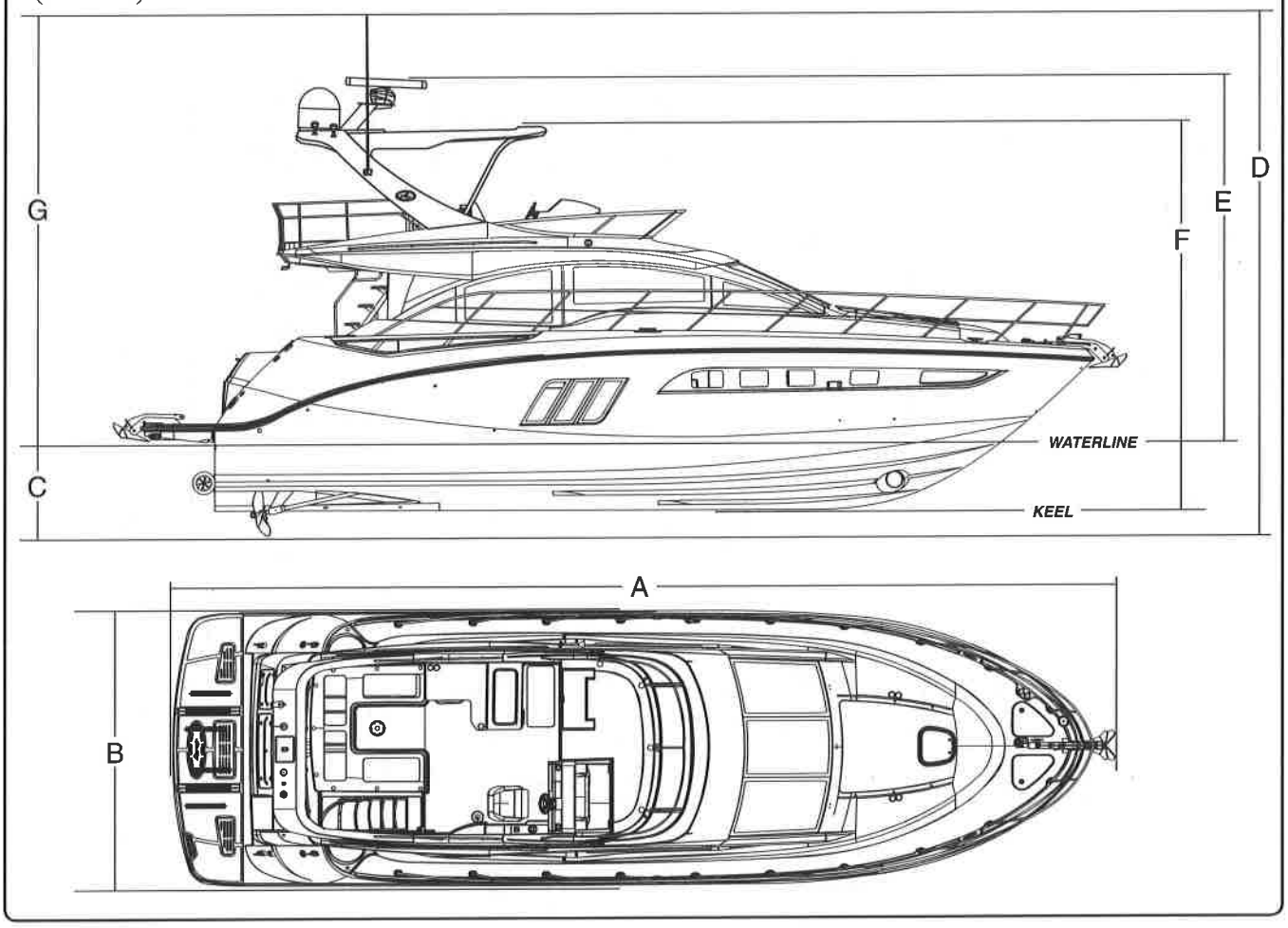
5. Key to Symbols on Controls and Prints

These symbols may be found on your controls and gauges and/or used in this owner's manual. This page is to help you understand what the symbols mean.



6. Basic Boat Dimensions and Clearances

Boat Dimensions and Clearances
(Fig. 8.1)



510 FLY SPECIFICATIONS

(A) Overall Length With Std. Swim Platform	50' 9⅞"	15.49 m
(B) Beam	15' 3⅞"	4.67 m
(C) Draft (Standard)	55"	139.7 cm
(Zeus)	50"	127 cm
Dry Weight (Standard)	46,500 lbs.	21,092 kg.
(Zeus)	47,800 lbs.	21,682 kg.
Fuel Capacity	500 gal.	1,893 liters
Fresh Water Capacity	130 gal.	492 liters
Holding Tank	68 gal.	257 liters
Deadrise	17°	

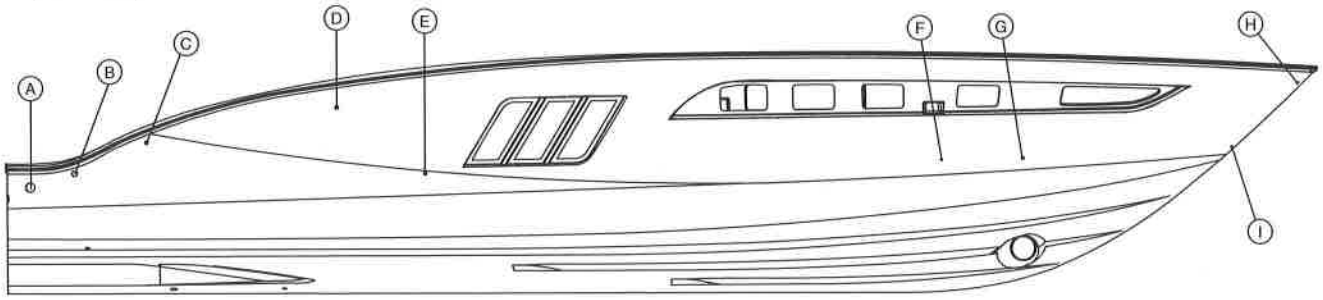
HEIGHT DIMENSIONS

(D) Overall Height	24' 4⅝"	7.43 m
(E) Waterline to top of Radar	19' 10⅛"	6.05 m
(F) Keel to top of Arch	20' 4½"	6.21 m
(G) Waterline to top of Antenna	22' 10⅜"	6.97 m

NOTE - DIMENSIONS CAN VARY DEPENDING ON LOAD AND RUNNING CONDITIONS.

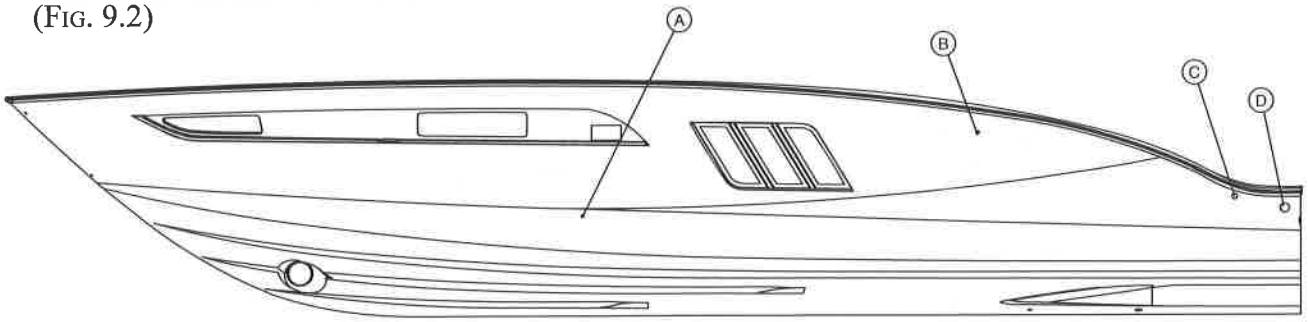
7. Function and Location of Through-Hull Cutouts

Starboard Through-Hull Cutouts (Fig. 9.1)



- (A) STBD EXHAUST PORT (ZEUS)
- (B) STBD COMMON DRAIN
- (C) WASTE TANK VENT
- (D) STBD FUEL TANK VENT
- (E) STBD AFT A/C DRAIN
- (F) WATER HEATER DRAIN
- (G) FWD A/C DISCHARGE
- (H) ROPE LOCKER HATCH DRAIN
- (I) ROPE LOCKER FLOOR DRAIN

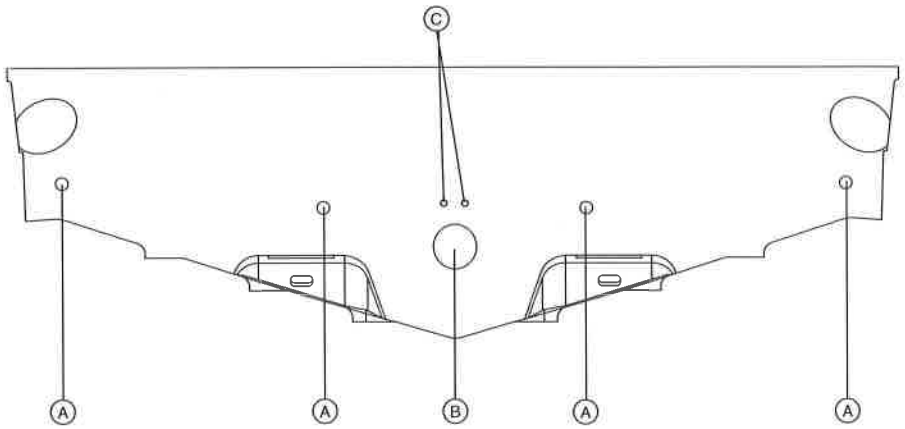
Port Through-Hull Cutouts (Fig. 9.2)



- (A) WASHING MACHINE DISCHARGE
- (B) PORT FUEL TANK VENT
- (C) COMMON DRAIN
- (D) PORT EXHAUST (ZEUS)

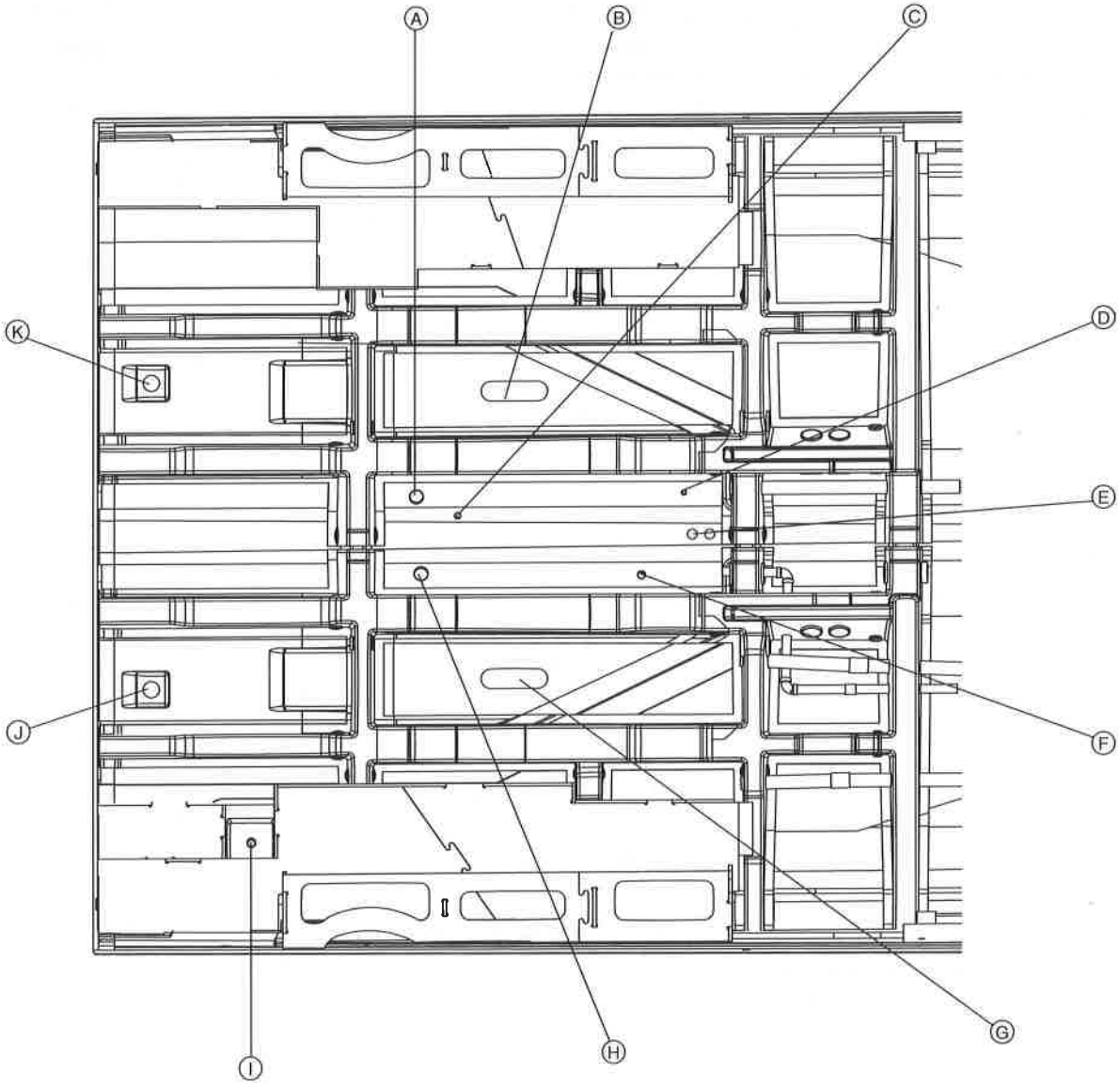
Transom Through-Hull Cutouts (Fig. 9.3)

- (A) UNDERWATER LIGHTS
- (B) STERN THRUSTER, OPT.
- (C) ZINC LOCATION



Function and Location of Through-Hull Cutouts

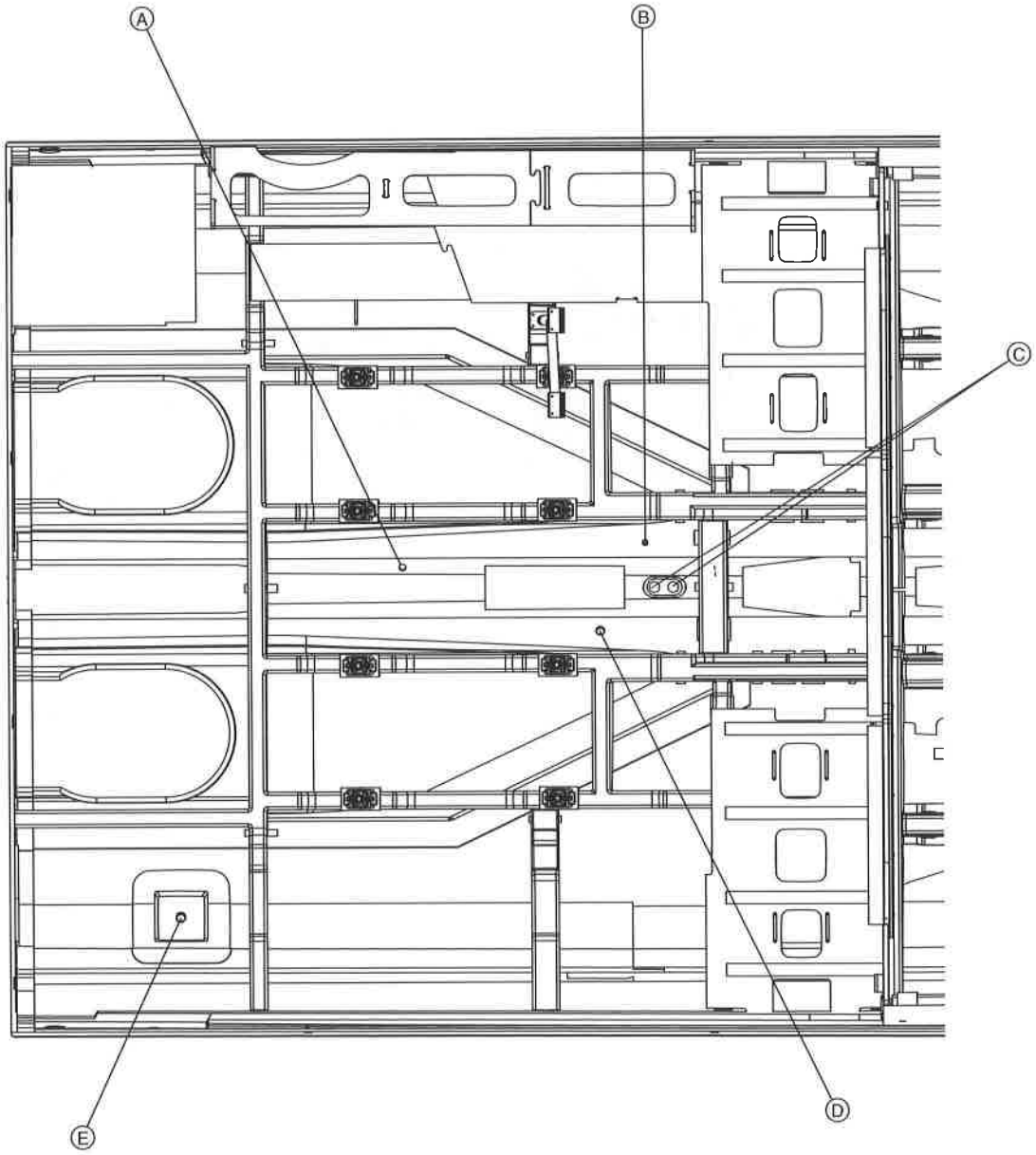
Bilge Through-Hull Cutouts, V-drive
(Fig. 10.1)



- (A) PORT ENGINE COOLING INTAKE
- (B) PORT ENGINE PROP SHAFT TUBE
- (C) GENERATOR WATER INTAKE
- (D) SEAKEEPER WATER INTAKE
- (E) FWD AND AFT TRANSDUCER
- (F) AIR CONDITIONING WATER INTAKE
- (G) STBD ENGINE PROP SHAFT TUBE
- (H) STBD ENGINE COOLING INTAKE
- (I) MACERATOR DISCHARGE
- (J) STBD RUDDER
- (K) PORT RUDDER

FUNCTION AND LOCATION OF THROUGH-HULL CUTOUTS

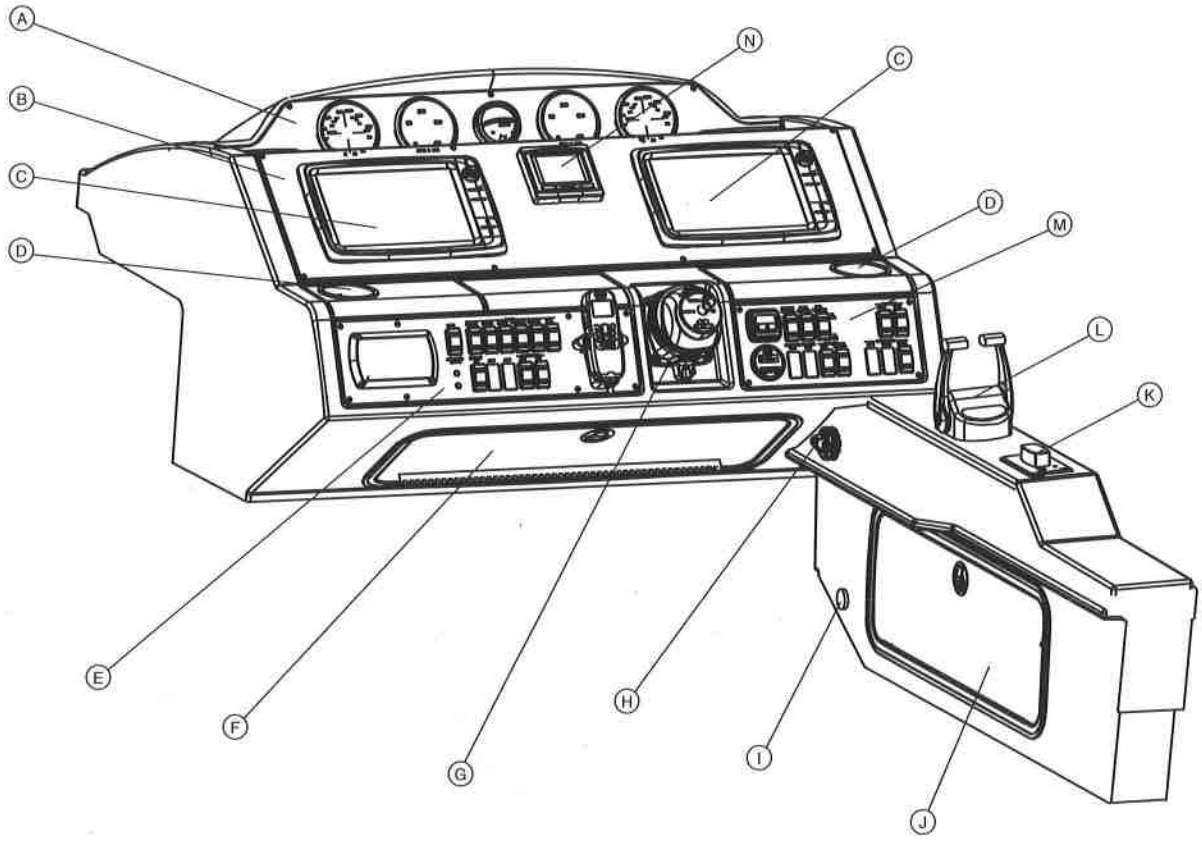
BILGE THROUGH-HULL CUTOUTS, ZEUS
(FIG. 11.1)



(A) GENERATOR WATER INTAKE
(B) SEAKEEPER WATER INTAKE
(C) TRANSDUCERS
(D) AIR CONDITIONING WATER INTAKE
(E) MACERATOR DISCHARGE

8. Bridge Control Station Layout

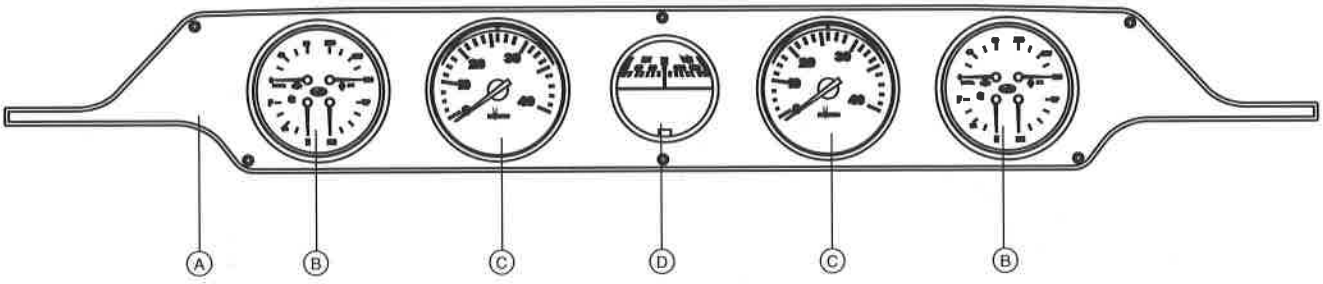
Bridge Control Station Layout
(Fig. 12.1)



(A) INSTRUMENT PANEL
(B) ELECTRONICS PANEL
(C) NAVIGATION DISPLAY
(D) DRINK HOLDER
(E) PORT SWITCH PANEL
(F) GLOVEBOX
(G) STEERING ASSEMBLY
(H) SAFETY SWITCH WITH LANYARD
(I) COURTESY LIGHT
(J) STORAGE / FUSE ACCESS
(K) BOW/STERN THRUSTER CONTROL
(L) SHIFT/THROTTLE CONTROL
(M) STARBOARD SWITCH PANEL
(N) VESSEL VIEW

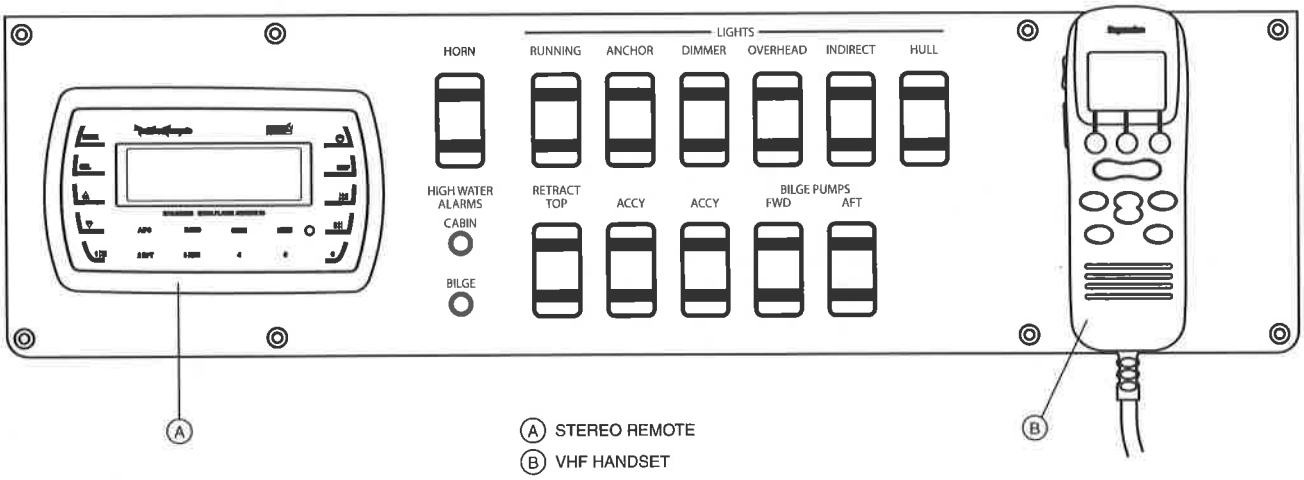
Bridge Control Station Layout

Bridge Control Station Layout, Instrument Panel
(Fig. 13.1)



(A) INSTRUMENT PANEL
(B) 4 IN 1 GAUGE (FUEL/VOLT/OIL PRESSURE/TEMPERATURE)
(C) TACHOMETER
(D) COMPASS

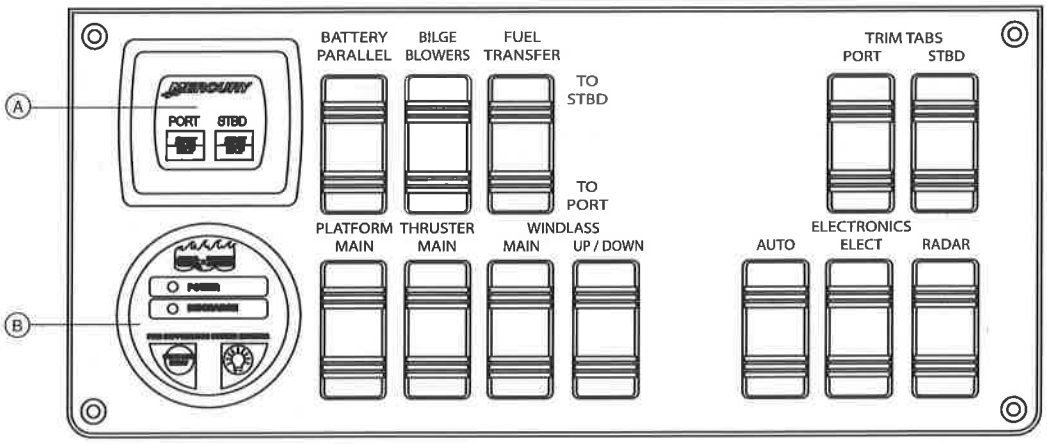
Bridge Control Station Layout, Port Switch Panel
(Fig. 13.2)



(A) STEREO REMOTE
(B) VHF HANDSET

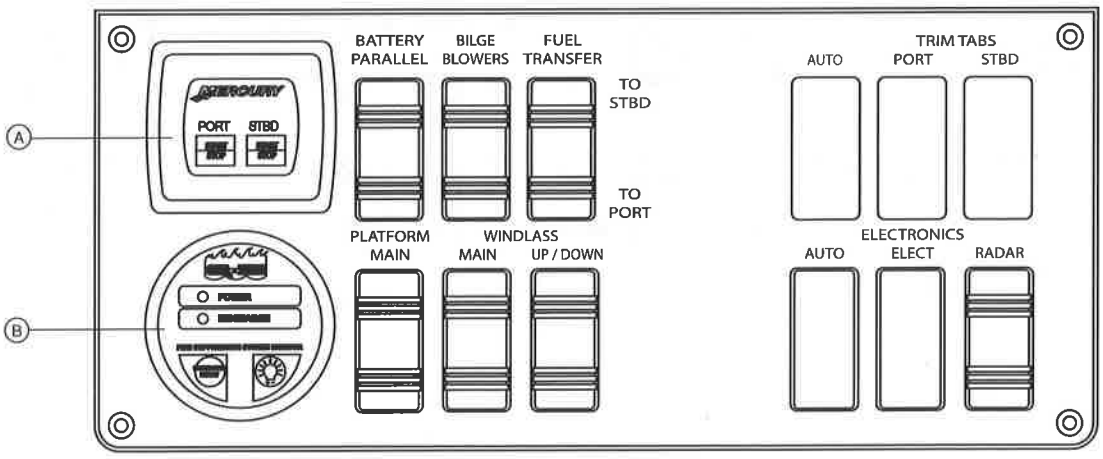
Bridge Control Station Layout

Bridge Control Station Layout, Starboard Switch Panel (V-Drive) (Fig. 14.1)



(A) IGNITION SWITCH
(B) FIRE EXTINGUISHING SYSTEM DISPLAY

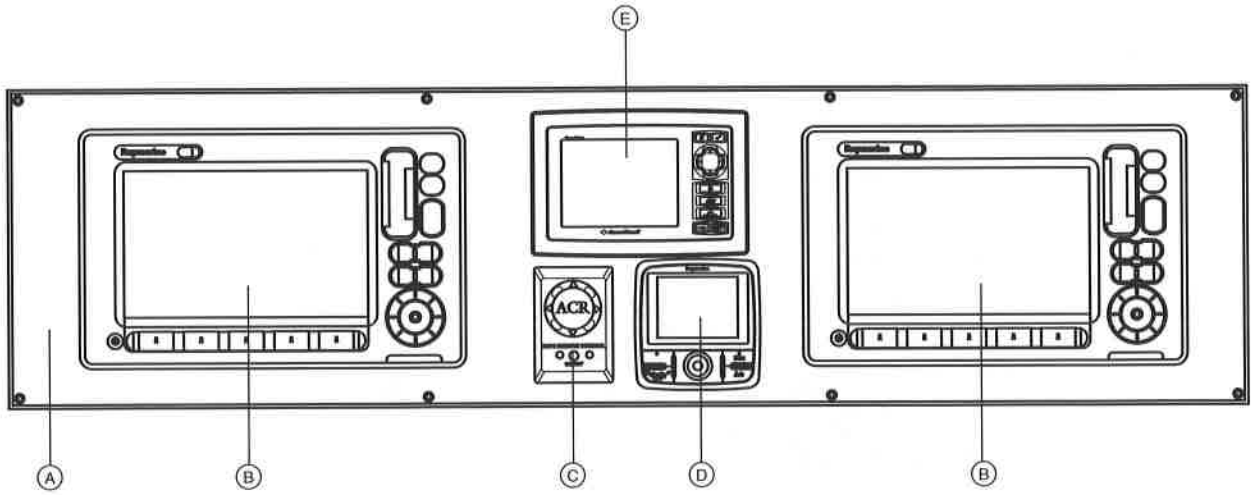
Bridge Control Station Layout, Starboard Switch Panel (Zeus) (Fig. 14.2)



(A) IGNITION SWITCH
(B) FIRE EXTINGUISHING SYSTEM DISPLAY

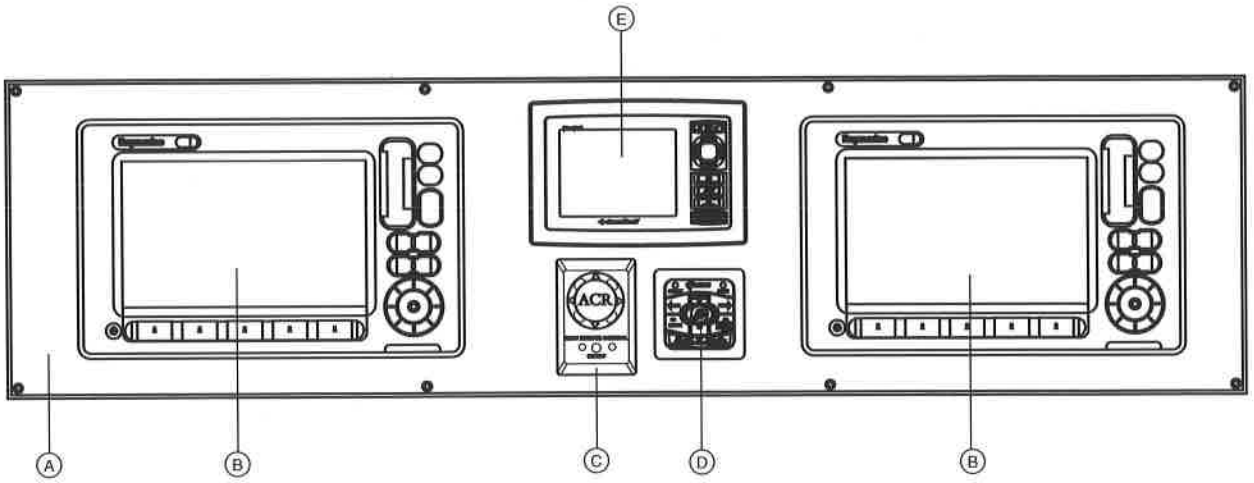
BRIDGE CONTROL STATION LAYOUT

BRIDGE CONTROL STATION LAYOUT, ELECTRONICS PANEL (V-DRIVE)
(FIG. 15.1)



(A) ELECTRONICS PANEL
(B) NAVIGATION DISPLAY
(C) SPOTLIGHT CONTROL PAD
(D) AUTO PILOT DISPLAY
(E) VESSEL VIEW

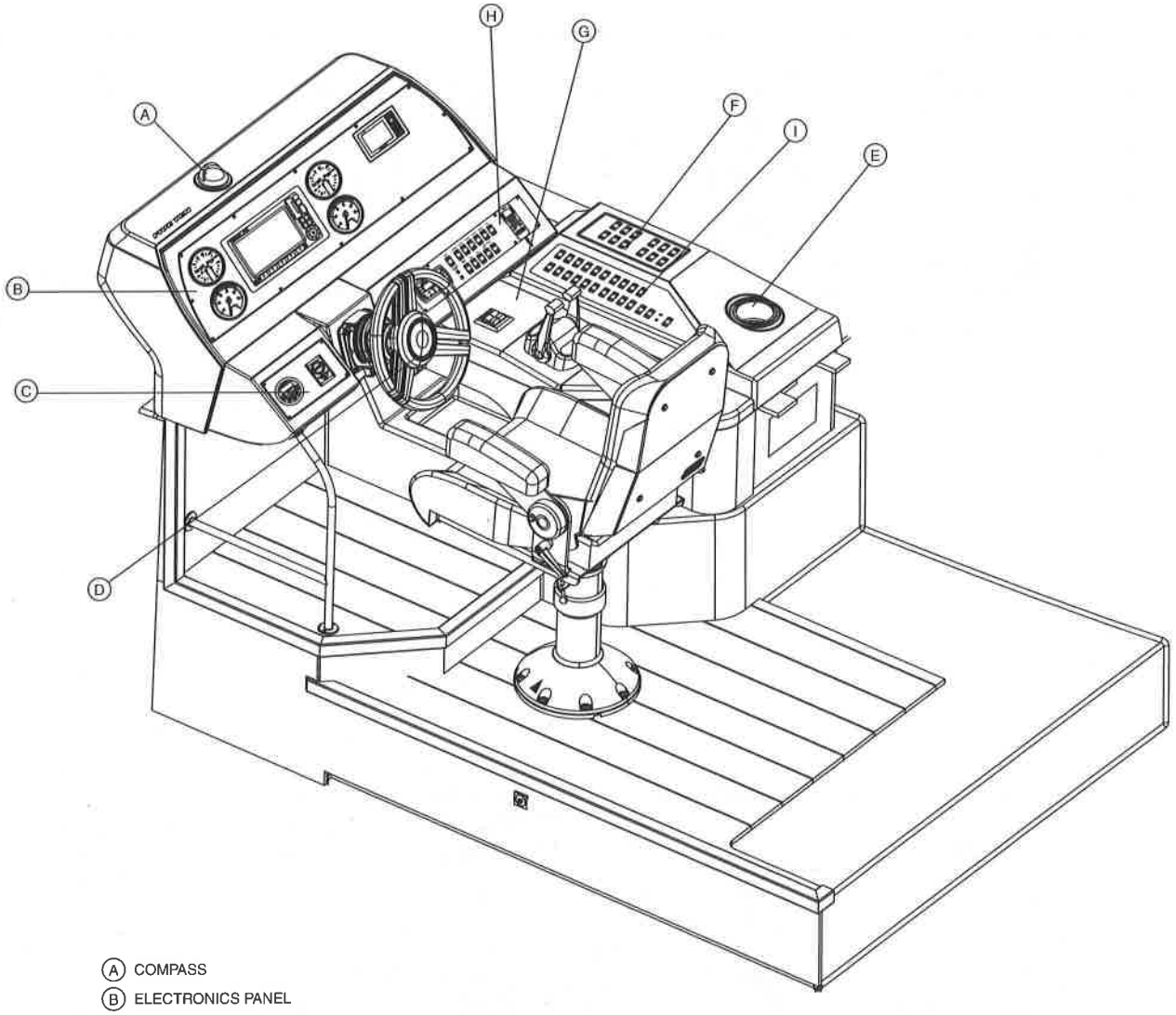
BRIDGE CONTROL STATION LAYOUT, ELECTRONICS PANEL (ZEUS)
(FIG. 15.2)



(A) ELECTRONICS PANEL
(B) NAVIGATION DISPLAY
(C) SPOTLIGHT CONTROL PAD
(D) ZEUS CONTROL PAD
(E) VESSEL VIEW

9. Lower Control Station Layout

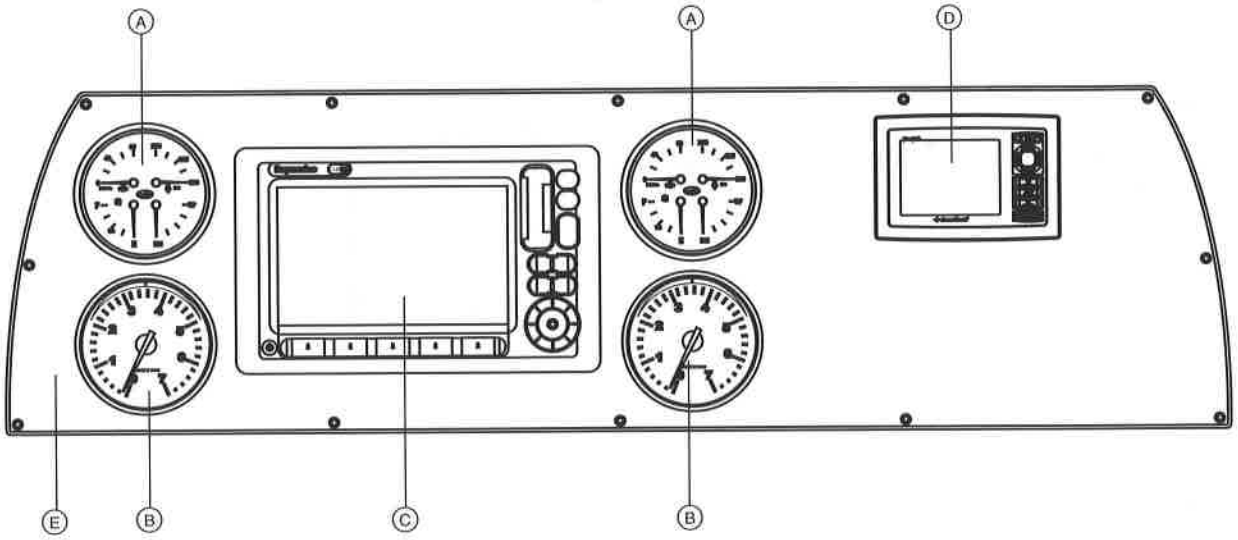
Lower Control Station Layout
(Fig. 16.1)



(A) COMPASS
(B) ELECTRONICS PANEL
(C) PORT CONTROL PANEL
(D) STEERING WHEEL
(E) DRINK HOLDER
(F) BREAKER PANEL
(G) THROTTLE BOX
(H) STARBOARD CONTROL PANEL
(I) SWITCH PANEL

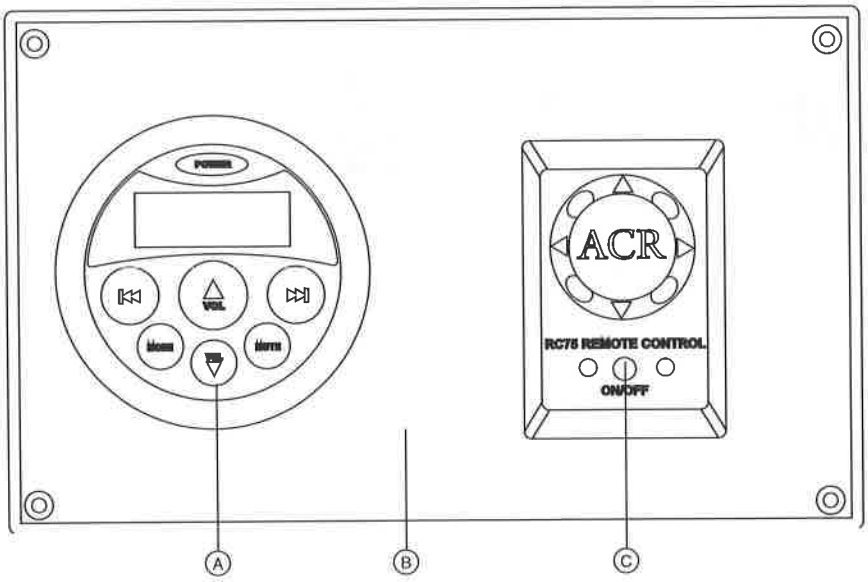
LOWER CONTROL STATION LAYOUT

LOWER CONTROL STATION LAYOUT, ELECTRONICS PANEL (FIG. 17.1)



(A) 4 IN 1 GAUGE (FUEL/VOLT/OIL PRESSURE/TEMPERATURE)
(B) TACHOMETER
(C) NAVIGATION DISPLAY
(D) VESSEL VIEW
(E) LOWER ELECTRONICS PANEL

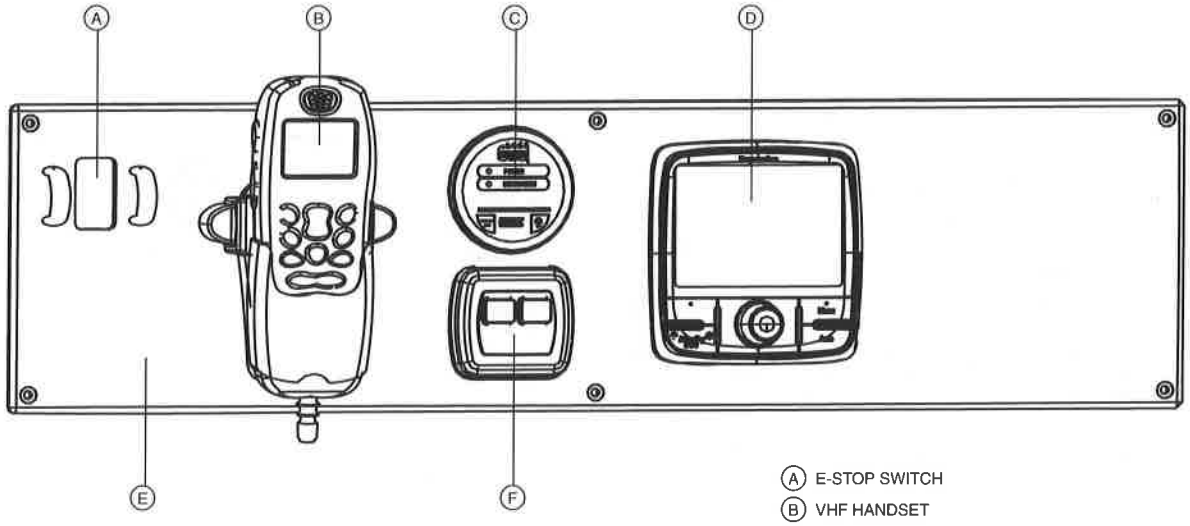
LOWER PORT CONTROL PANEL (FIG. 17.2)



(A) STEREO REMOTE
(B) LOWER PORT CONTROL PANEL
(C) SPOTLIGHT CONTROL PAD

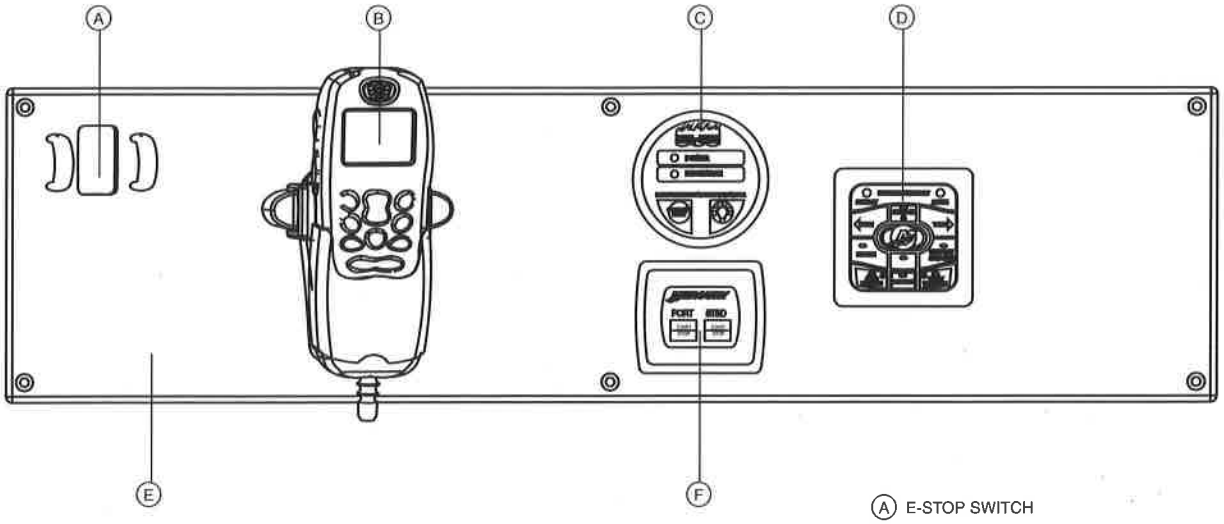
Lower Control Station Layout

Lower Starboard Control Panel, V-Drive (Fig. 18.1)



- (A) E-STOP SWITCH
- (B) VHF HANDSET
- (C) FIRE EXTINGUISHING SYSTEM DISPLAY
- (D) AUTO PILOT
- (E) LOWER CONTROL PANEL, STARBOARD
- (F) ENGINE START/STOP SWITCH

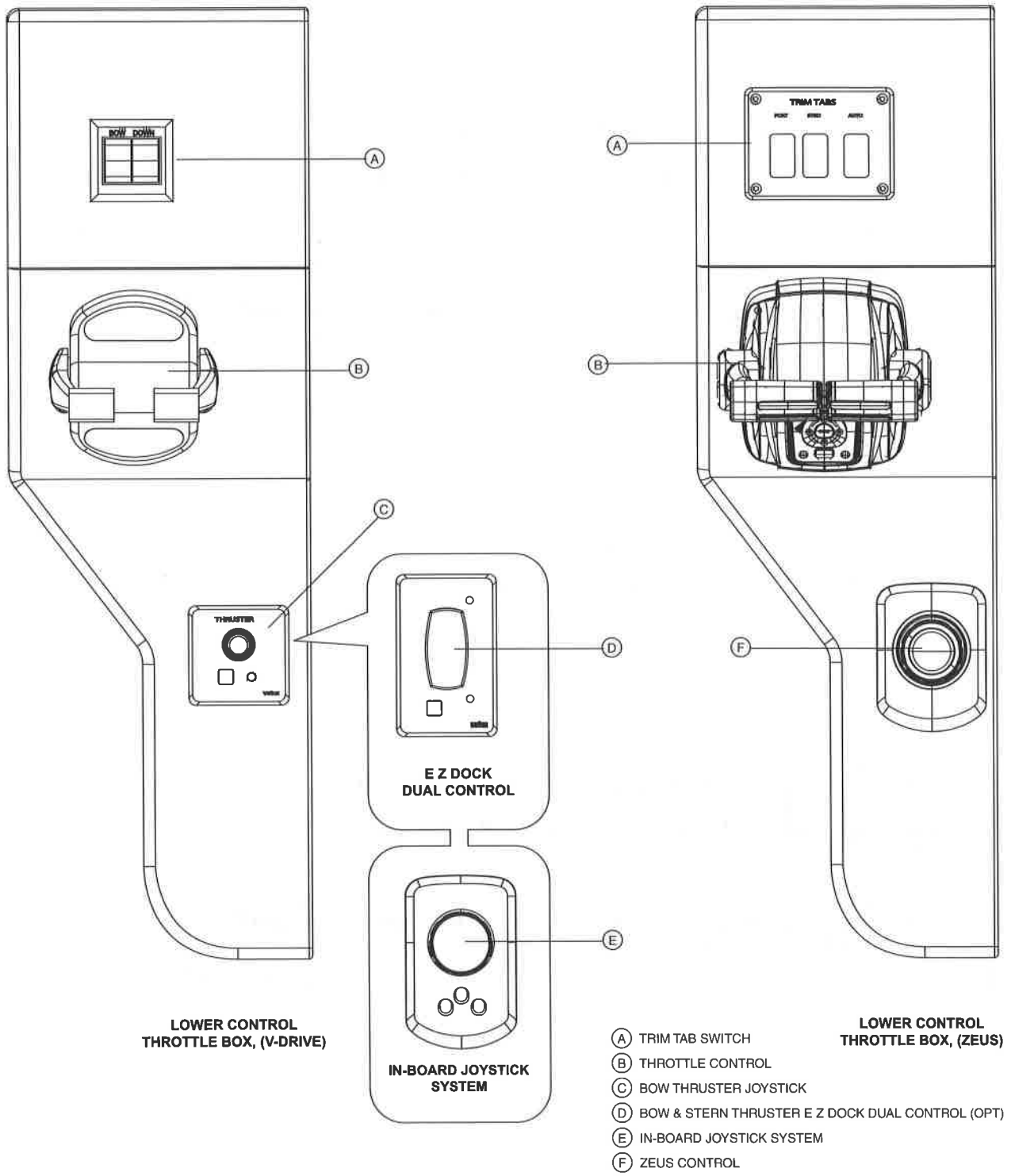
Lower Starboard Control Panel, Zeus (Fig. 18.2)



- (A) E-STOP SWITCH
- (B) VHF HANDSET
- (C) FIRE EXTINGUISHING SYSTEM DISPLAY
- (D) ZEUS CONTROL PAD
- (E) LOWER CONTROL PANEL, STARBOARD
- (F) ENGINE START/STOP SWITCH

Lower Control Station Layout

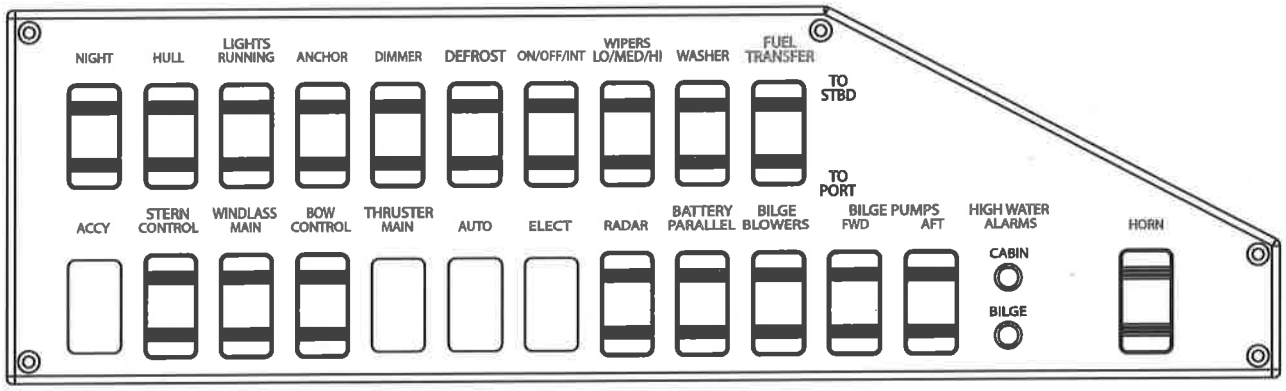
Lower Control Throttle Box
(Fig. 19.1)



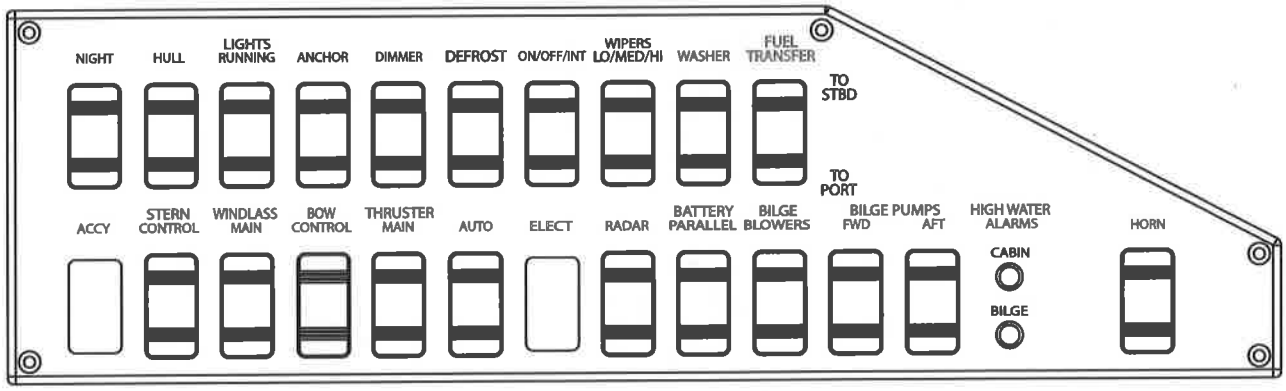
(A) TRIM TAB SWITCH
(B) THROTTLE CONTROL
(C) BOW THRUSTER JOYSTICK
(D) BOW & STERN THRUSTER E Z DOCK DUAL CONTROL (OPT)
(E) IN-BOARD JOYSTICK SYSTEM
(F) ZEUS CONTROL

Lower Control Station Layout

Lower Control Station Layout, Starboard Switch Panel (V-Drive)
(Fig. 20.1)

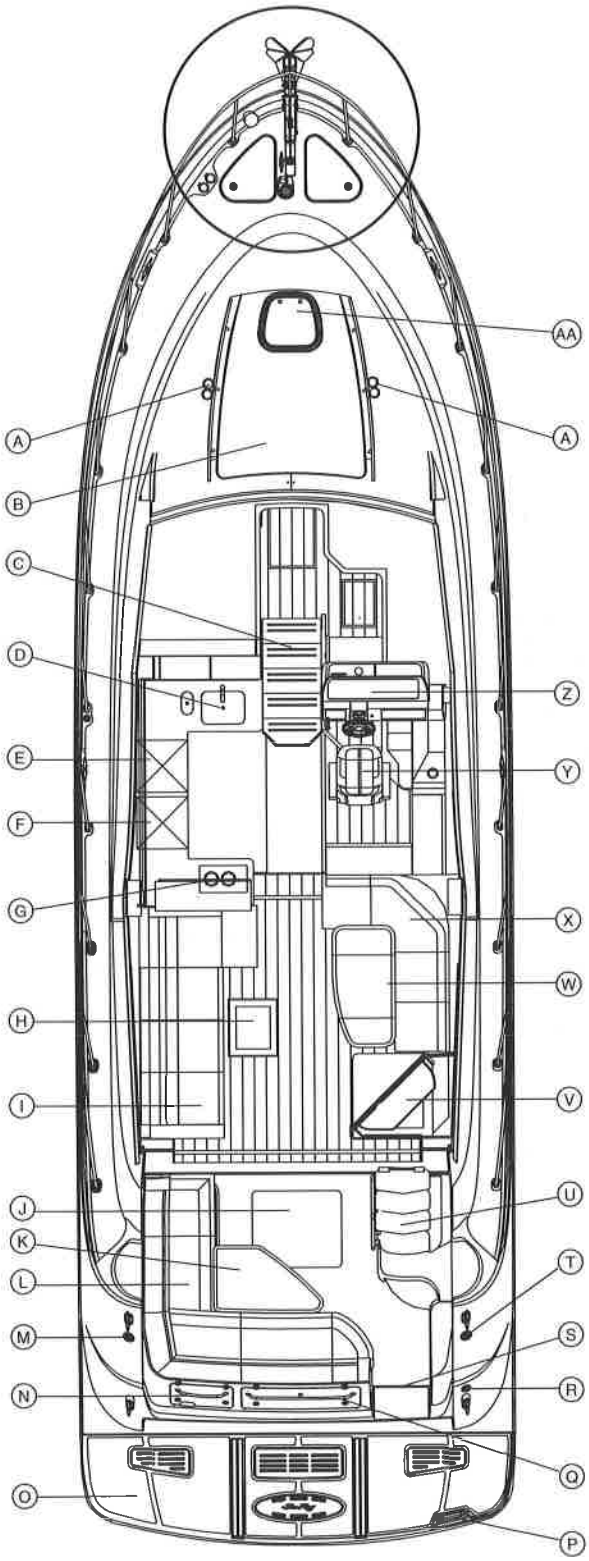


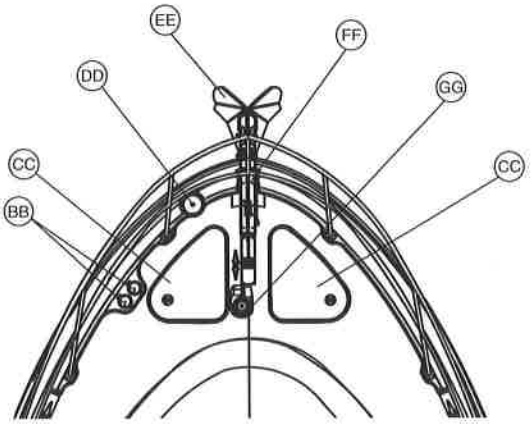
Lower Control Station Layout, Starboard Switch Panel (Zeus)
(Fig. 20.2)



10. Deck Layout

Mid Deck Layout
(Fig. 21.1)

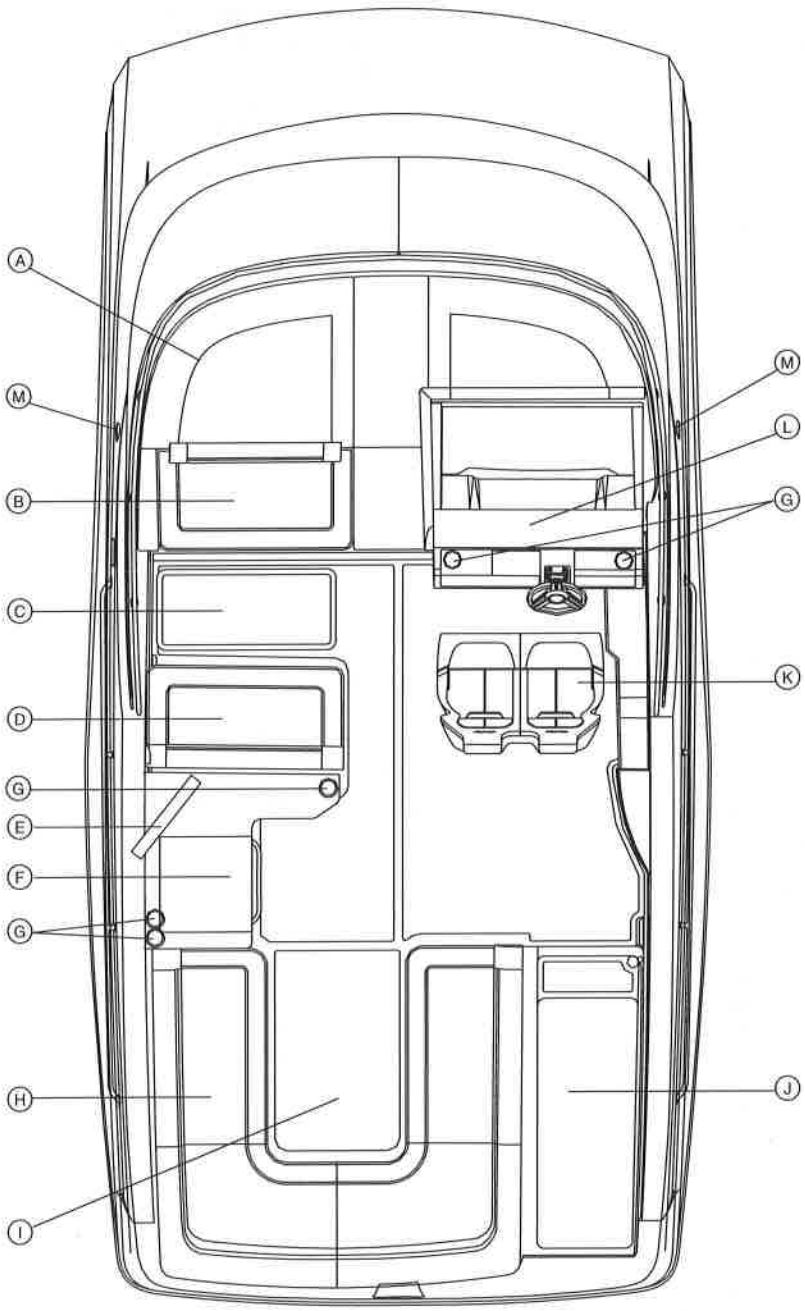




- (A) DRINK HOLDERS
- (B) SUNPAD
- (C) STEPS TO CABIN
- (D) GALLEY SINK
- (E) FREEZER
- (F) REFRIGERATOR
- (G) STOVE
- (H) SALON OTTOMAN
- (I) SALON L-SHAPED SEATING
- (J) ENGINE HATCH
- (K) COCKPIT TABLE
- (L) COCKPIT L-SHAPED SEATING
- (M) PORT FUEL FILL
- (N) SHORE POWER/WATER ACCESS
- (O) SWIM PLATFORM
- (P) PULL OUT SWIM LADDER
- (Q) TRANSOM STORAGE
- (R) WASTE PUMP OUT
- (S) TRANSOM DOOR
- (T) STARBOARD FUEL FILL
- (U) STEPS TO SALON
- (V) TELEVISION
- (W) DINETTE TABLE
- (X) DINETTE SEATING
- (Y) HELM SEATING
- (Z) CONTROL STATION
- (AA) DECK HATCH (EMERGENCY EXIT)
- (BB) WINDLASS FOOT PEDALS
- (CC) BOW LOCKER
- (DD) SPOTLIGHT
- (EE) ANCHOR
- (FF) ANCHOR CHUTE
- (GG) WINDLASS

11. Bridge Layout

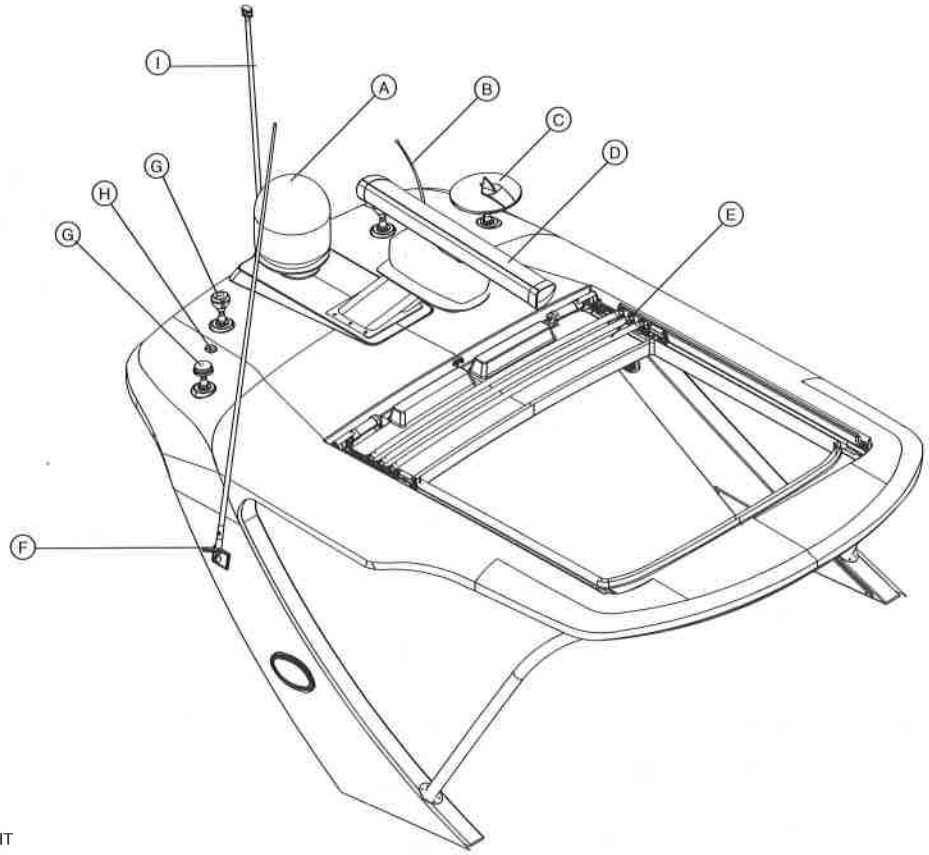
Bridge Layout
(Fig. 22.1)



(A) SUNPAD
(B) PORT AFT FACING SEATING
(C) TABLE
(D) PORT FORWARD FACING SEATING
(E) TELEVISION
(F) GRILL
(G) DRINK HOLDERS
(H) U-SHAPED SEATING
(I) TABLE
(J) STEPS TO MID DECK
(K) BRIDGE HELM SEATING
(L) CONTROL STATION
(M) NAVIGATION LIGHTS, PORT & STARBOARD

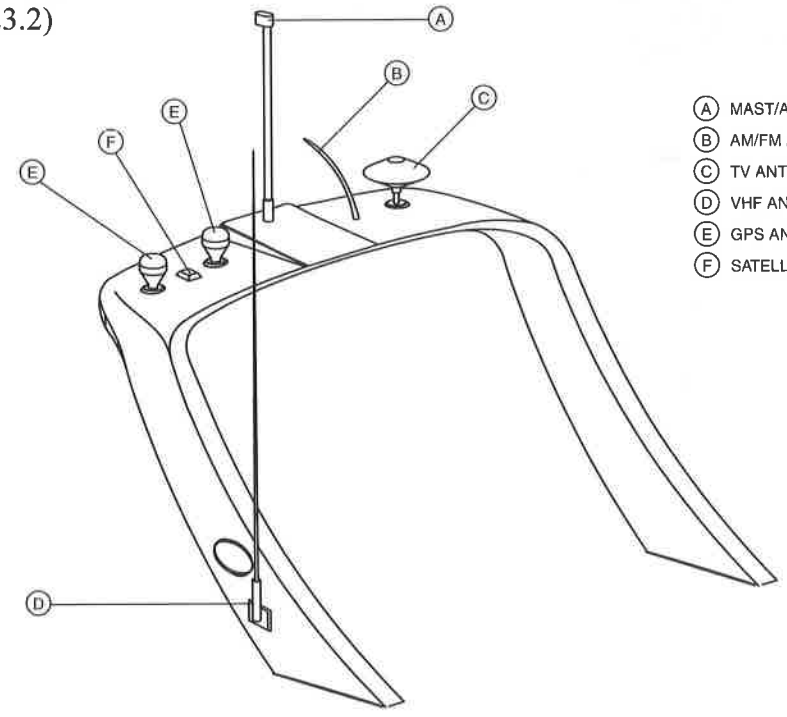
12. Hardtop & Arch Layout

Hardtop Layout (Fig. 23.1)



- (A) DIGITAL SATELLITE ANTENNA
- (B) AM/FM ANTENNA
- (C) TV ANTENNA
- (D) RADAR
- (E) RETRACTABLE SUNROOF
- (F) VHF ANTENNA
- (G) GPS ANTENNA
- (H) SATELLITE RADIO ANTENNA
- (I) MAST COMBO NAVIGATION LIGHT

Arch Layout (Fig. 23.2)



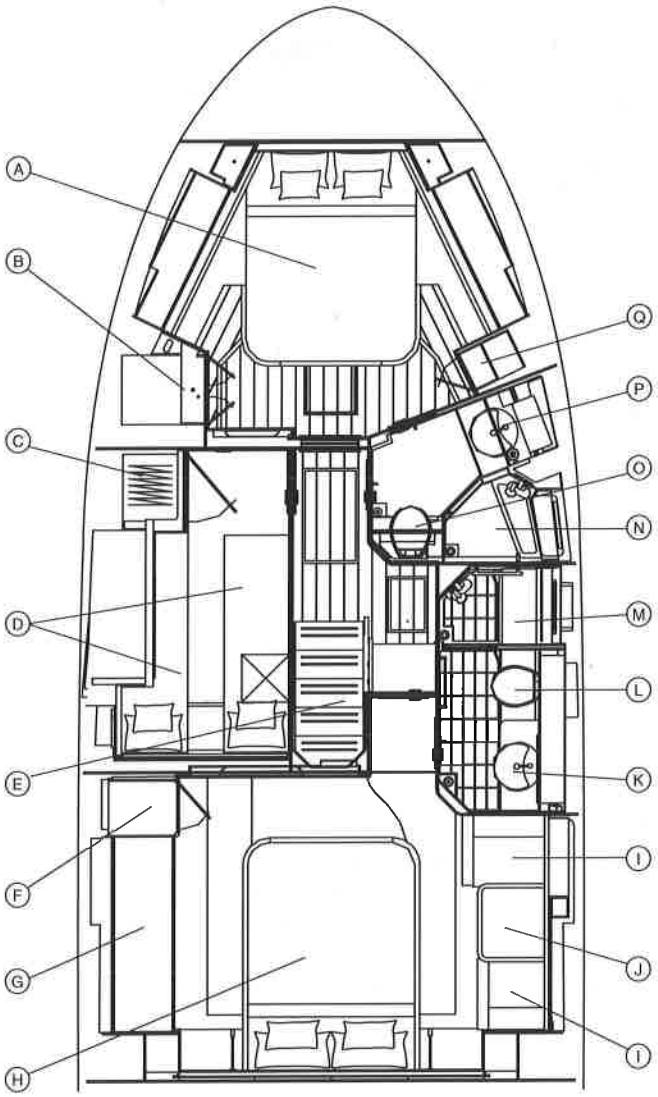
- (A) MAST/ANCHOR COMBO NAVIGATION LIGHT
- (B) AM/FM ANTENNA
- (C) TV ANTENNA
- (D) VHF ANTENNA
- (E) GPS ANTENNA
- (F) SATELLITE RADIO ANTENNA

13. Cabin Layout

Cabin Layout
(Fig. 24.1)

⚠ DANGER

SLEEPING ON A BOAT REQUIRES AN OPERATING CARBON MONOXIDE DETECTION SYSTEM IN EACH ENCLOSED SLEEPING LOCATION.



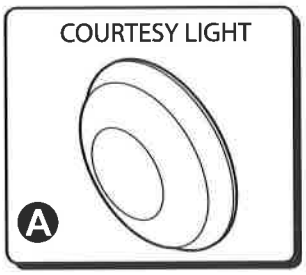
- (A) GUEST STATEROOM BUNK
- (B) GUEST STATEROOM STORAGE
- (C) THIRD STATEROOM HANGING LOCKER
- (D) THIRD STATEROOM BUNK
- (E) STEPS TO MID DECK
- (F) MASTER STATEROOM CLOSET
- (G) MASTER STATEROOM STORAGE
- (H) MASTER STATEROOM BUNK
- (I) MASTER STATEROOM SEATING
- (J) MASTER STATEROOM TABLE
- (K) MASTER HEAD SINK
- (L) MASTER HEAD
- (M) MASTER SHOWER
- (N) GUEST SHOWER
- (O) GUEST HEAD
- (P) GUEST SINK
- (Q) GUEST STATEROOM STORAGE

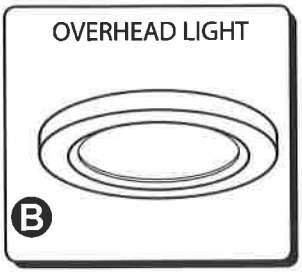
14. Lighting Layout

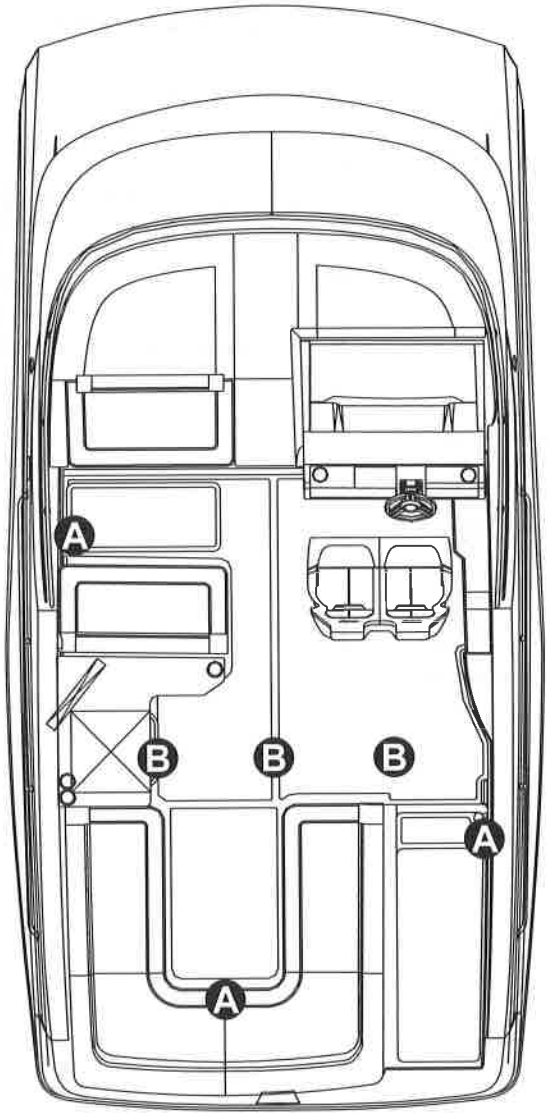
Bridge Lighting
(Fig. 25.1)

NOTICE

LED lights DO NOT have replacement bulbs. All other bulbs can be replaced with a maximum 10 watt bulb, Exception: Closet bulbs to be a maximum of 5 watts.



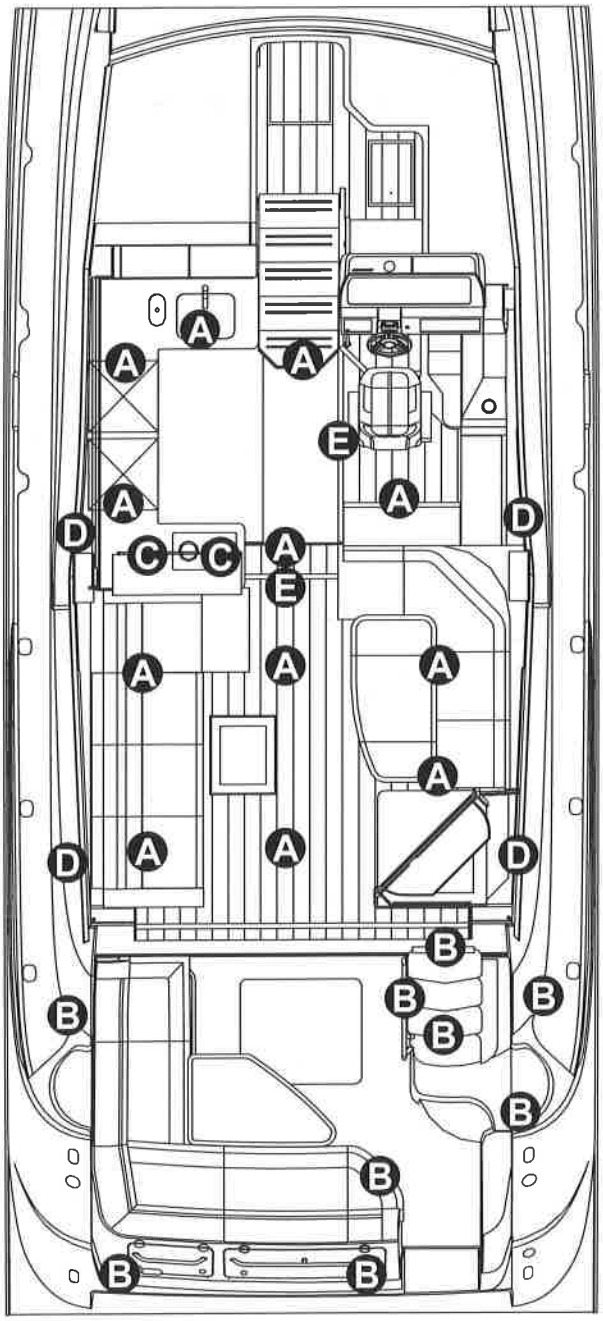


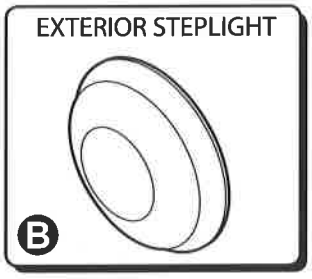


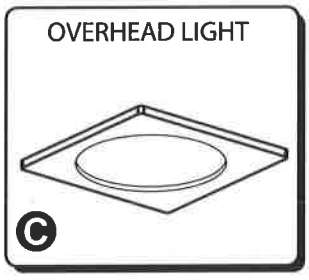
Lighting Layout

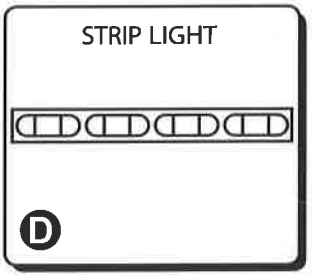
Mid Deck Lighting
(Fig. 26.1)

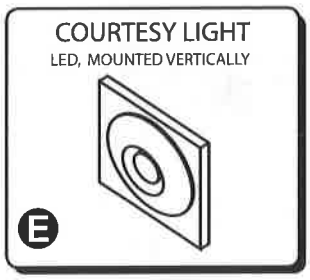
NOTICE
LED lights DO NOT have replacement bulbs. All other bulbs can be replaced with a maximum 10 watt bulb, Exception: Closet bulbs to be a maximum of 5 watts.









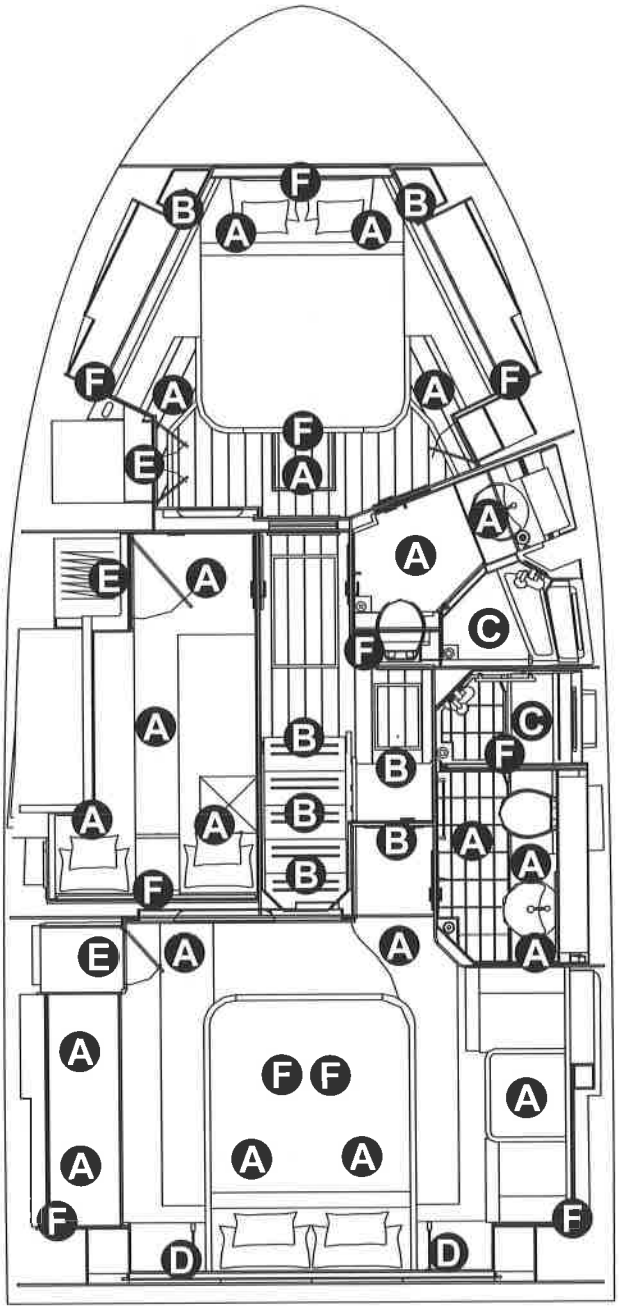


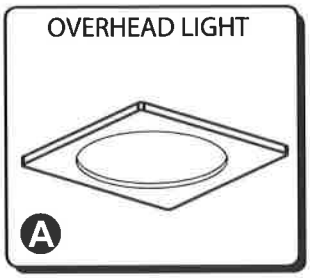
Lighting Layout

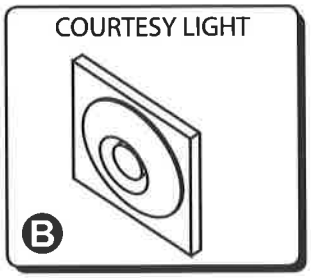
Cabin Lighting
(Fig. 27.1)

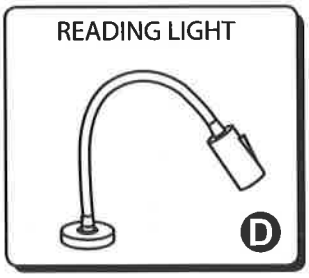
NOTICE

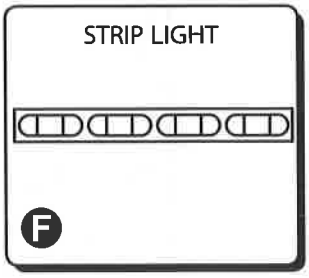
LED lights DO NOT have replacement bulbs. All other bulbs can be replaced with a maximum 10 watt bulb, Exception: Closet bulbs to be a maximum of 5 watts.





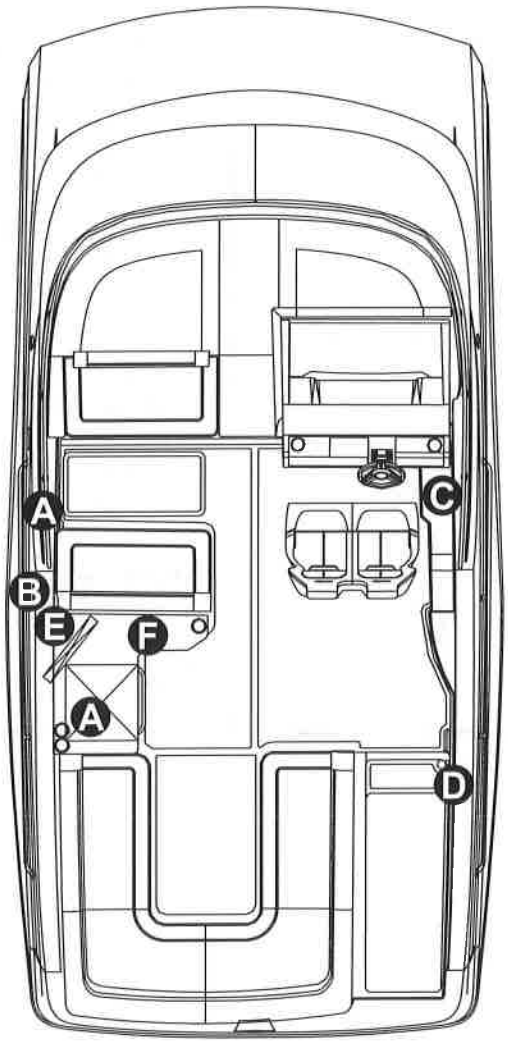


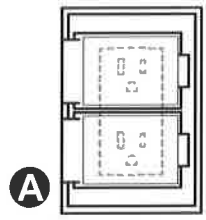


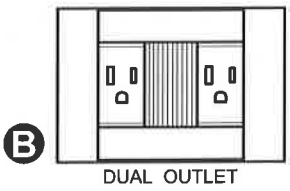


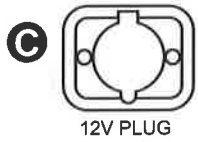
15. Switch and Receptacle Layout

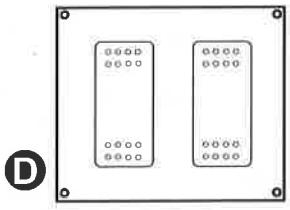
Bridge Switches and Receptacles
(Fig. 28.1)

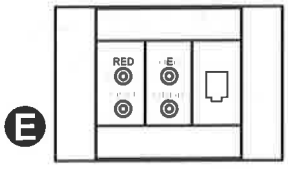


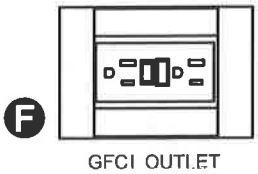






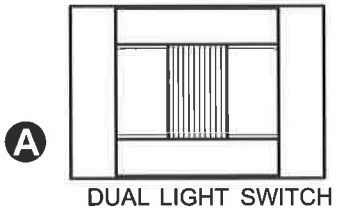


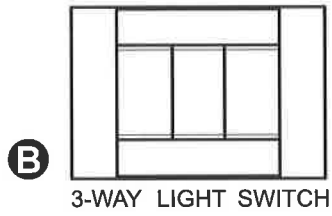


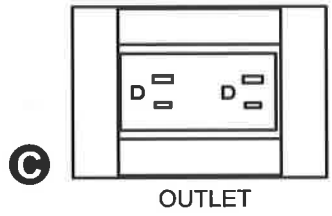


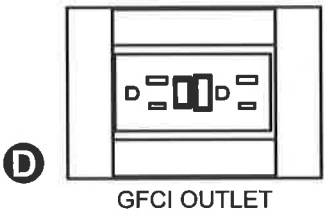
Switch and Receptacle Layout

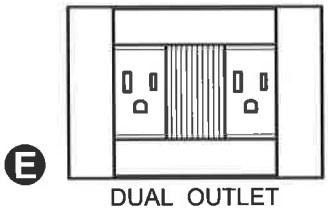
Mid Deck Switches and Receptacles
(Fig. 29.1)

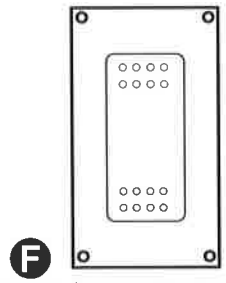


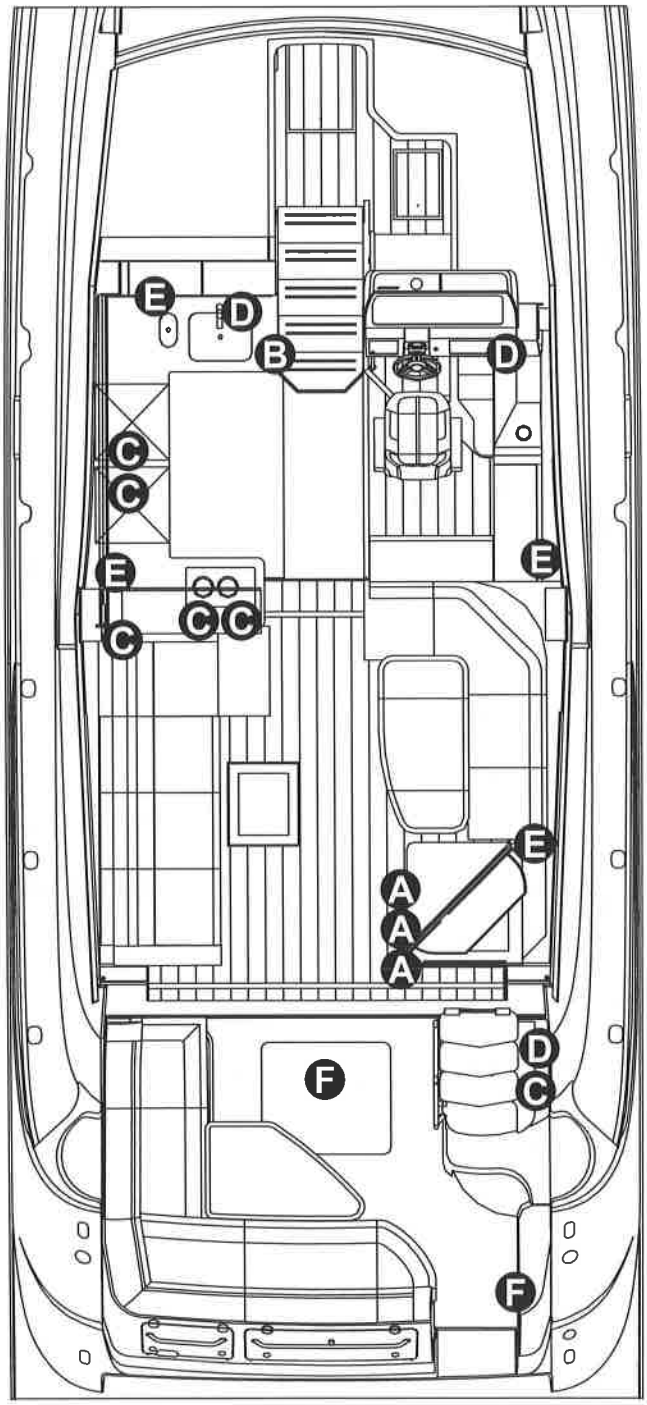






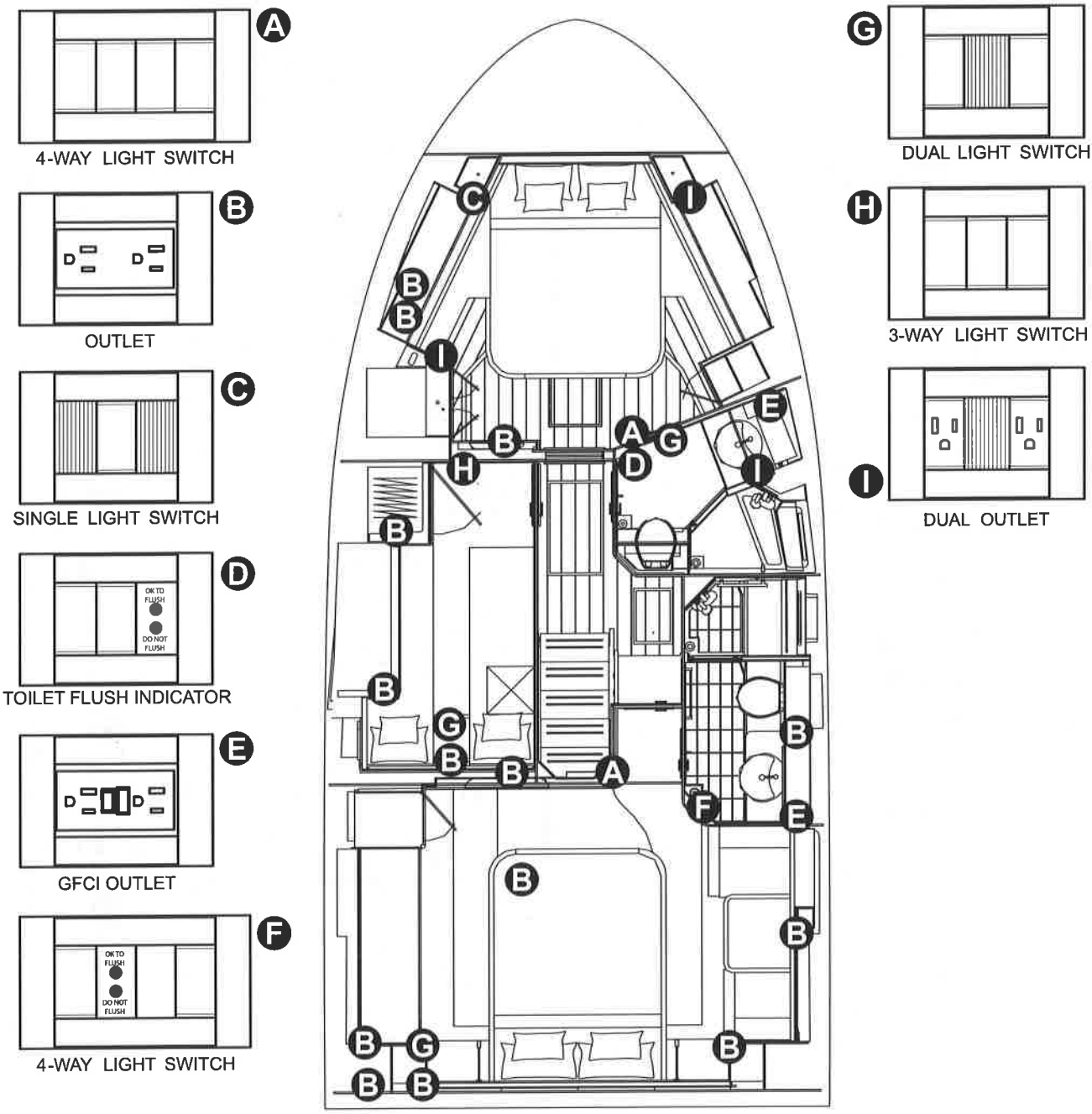






Switch and Receptacle Layout

Cabin Receptacles
(Fig. 30.1)



16. Cleats/Lifting/Storage

Cleats must not be used for lifting the boat; they are intended for docking or mooring use only.

When lifting the boat always keep the bow higher than the stern to drain the exhaust lines and to prevent water from running forward through the manifold and into the engine where it can become trapped. It may seem expedient to lift only the stern when changing a propeller, but this can result in water entering the engine cylinders, causing hydrostatic lock and resulting in possible engine failure. Even a small amount of water in the engine can cause rust and is to be avoided.

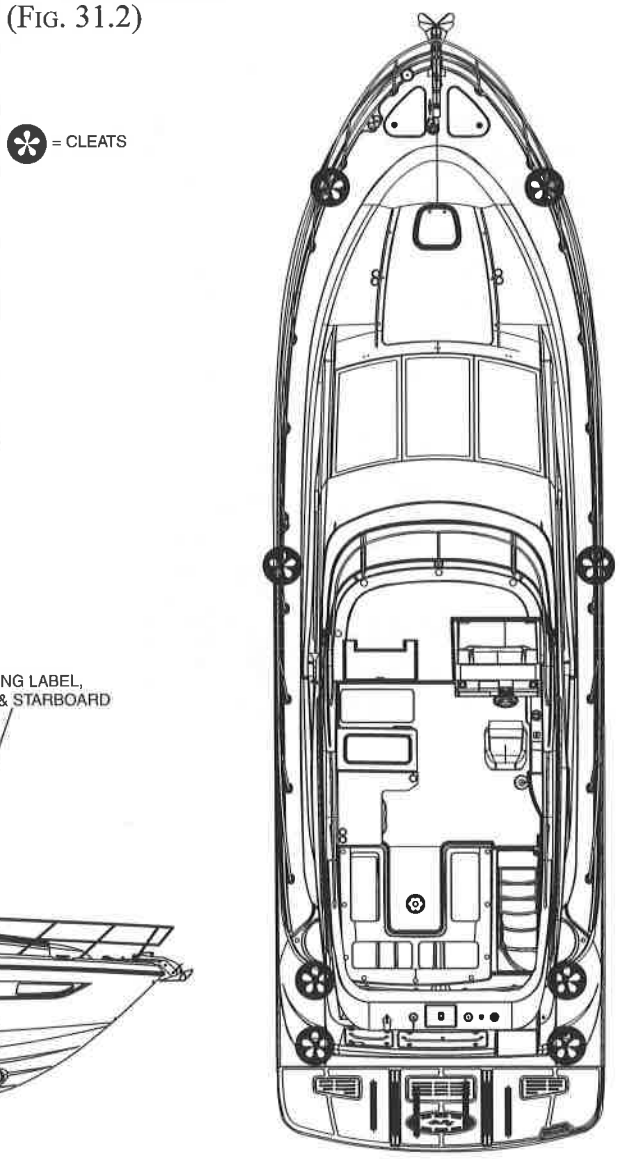
With fiberglass boats, severe gelcoat crazing or more serious hull damage can occur during launching and hauling if pressure is created on the gunwales by the slings. Flat, wide belting-type slings and spreaders long enough to keep pressure from the gunwales are necessary. Cable-type slings should be avoided. Do not place the slings where they may lift on the propeller shaft or other underwater fittings. The slings should be placed directly over the sling tags imprinted on the deck to assure the least amount of stress on the hull.

Never hoist the boat with an appreciable amount of water in the bilge. Fuel and water tanks should preferably be empty, especially if of large capacity.

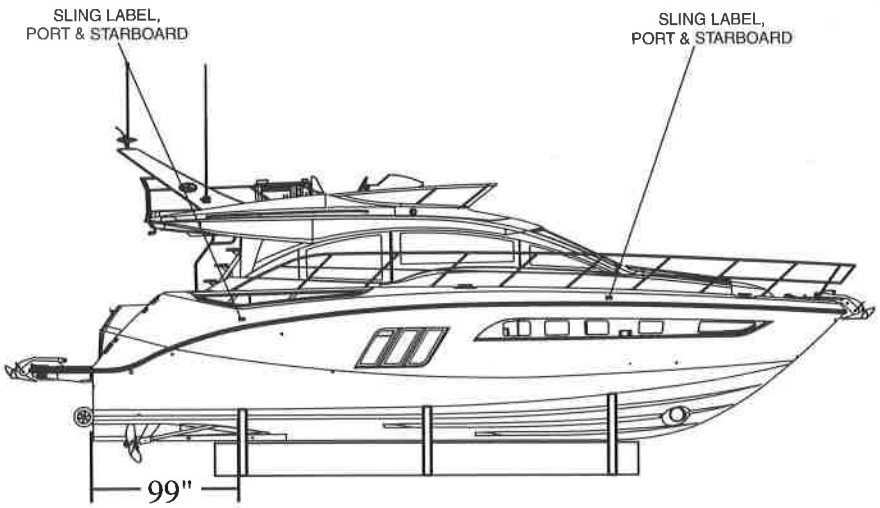
Supporting the Boat

A cradle is the ideal support for the boat whenever it is not in the water. Properly designed and constructed, it will provide support at the proper points, which is essential to avoid stress on the hull. Boat placement on the cradle should line up as closely as possible to the sling tags on the side of the deck. Do not rest boat on underwater fittings.

Cleat Locations
(Fig. 31.2)

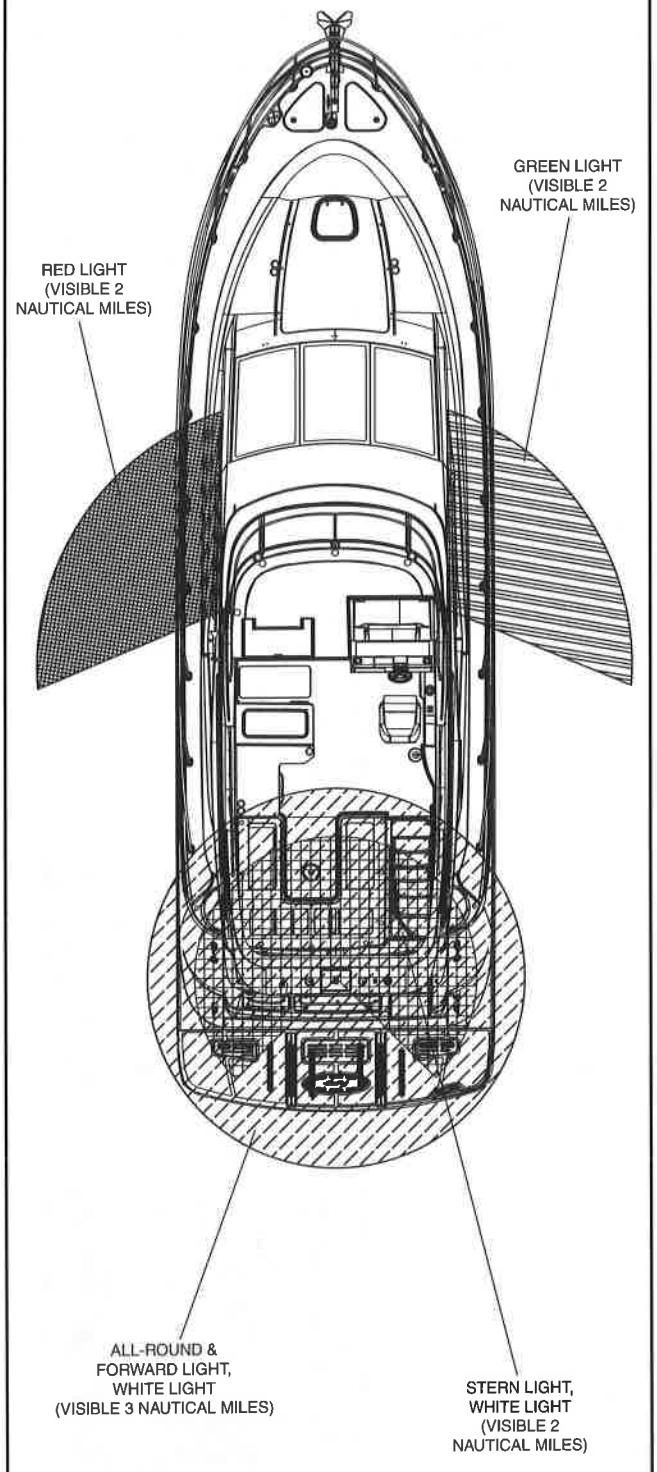


Proper Lifting and Storage
(Fig. 31.1)



17. Navigation and Anchor Lights

Navigation and Anchor Lights Layout (Fig. 32.1)

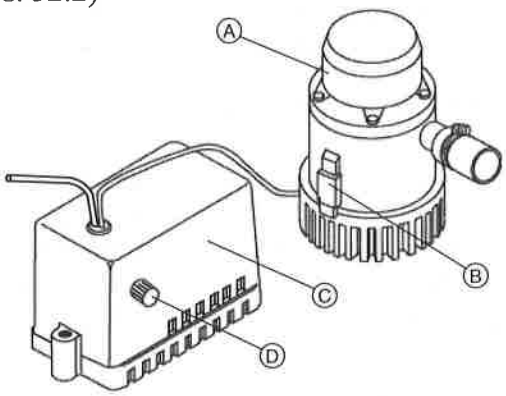


18. Console Dimmer

There is a DIMMER control switch located on the control station switch panel which controls the intensity of the switch panel lights. The switch panel lights are energized when the navigation running lights are turned on. The gauge lights intensity is controlled by the SmartCraft™ Systems Monitor.

19. Bilge

Typical Bilge Pump and Float Switch (Fig. 32.2)

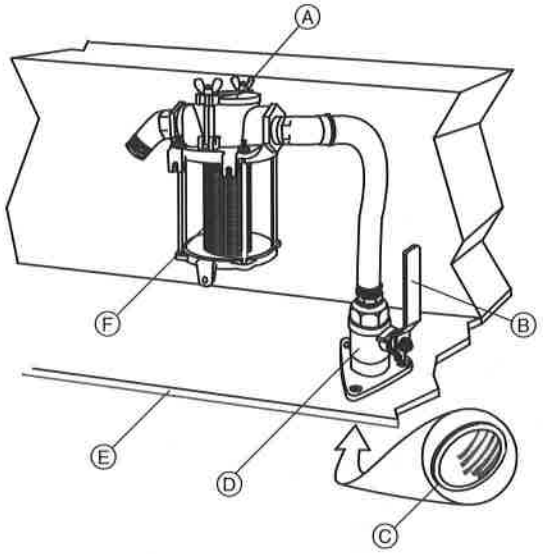


Ⓐ BILGE PUMP
Ⓑ LOCK TAB
Ⓒ FLOAT SWITCH
Ⓓ KNOB TO MANUALLY TEST FLOAT SWITCH AND PUMP

⚠ WARNING

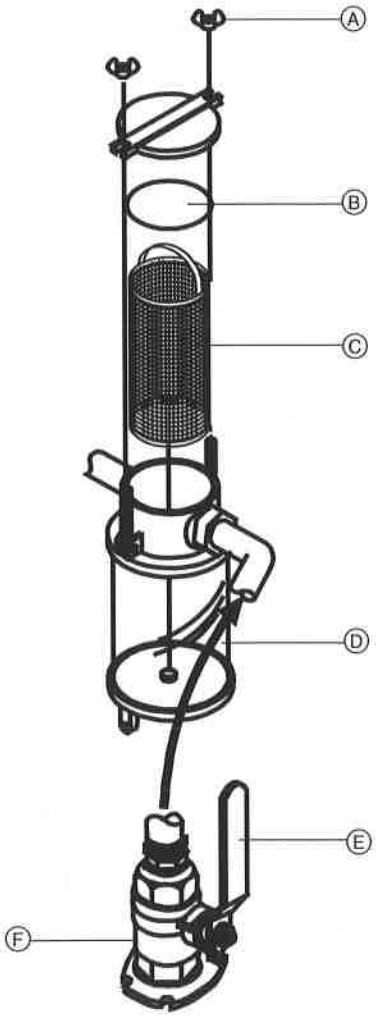
Do not allow obstructions to interfere with the Bilge Blower or Ventilation Intake operation. Engine performance may be adversely affected.

Seacock & Strainer Installation (typical) (Fig. 33.1)



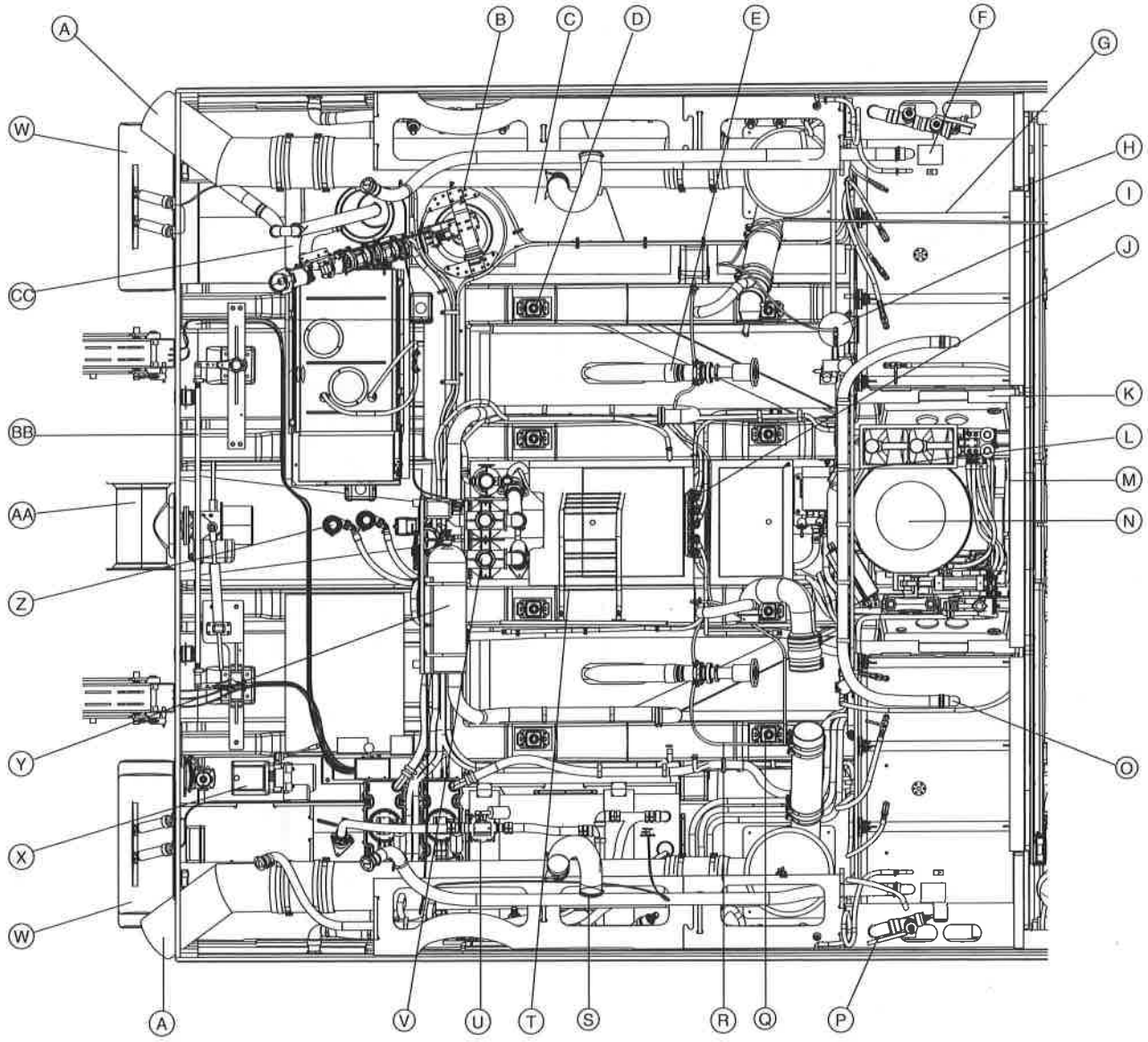
Ⓐ STRAINER
Ⓑ SEACOCK HANDLE (OPEN POSITION)
Ⓒ SEA WATER INTAKE
Ⓓ SEACOCK
Ⓔ BILGE FLOOR
Ⓕ STRAINER SCREEN

Seacock & Strainer (Fig. 33.2)



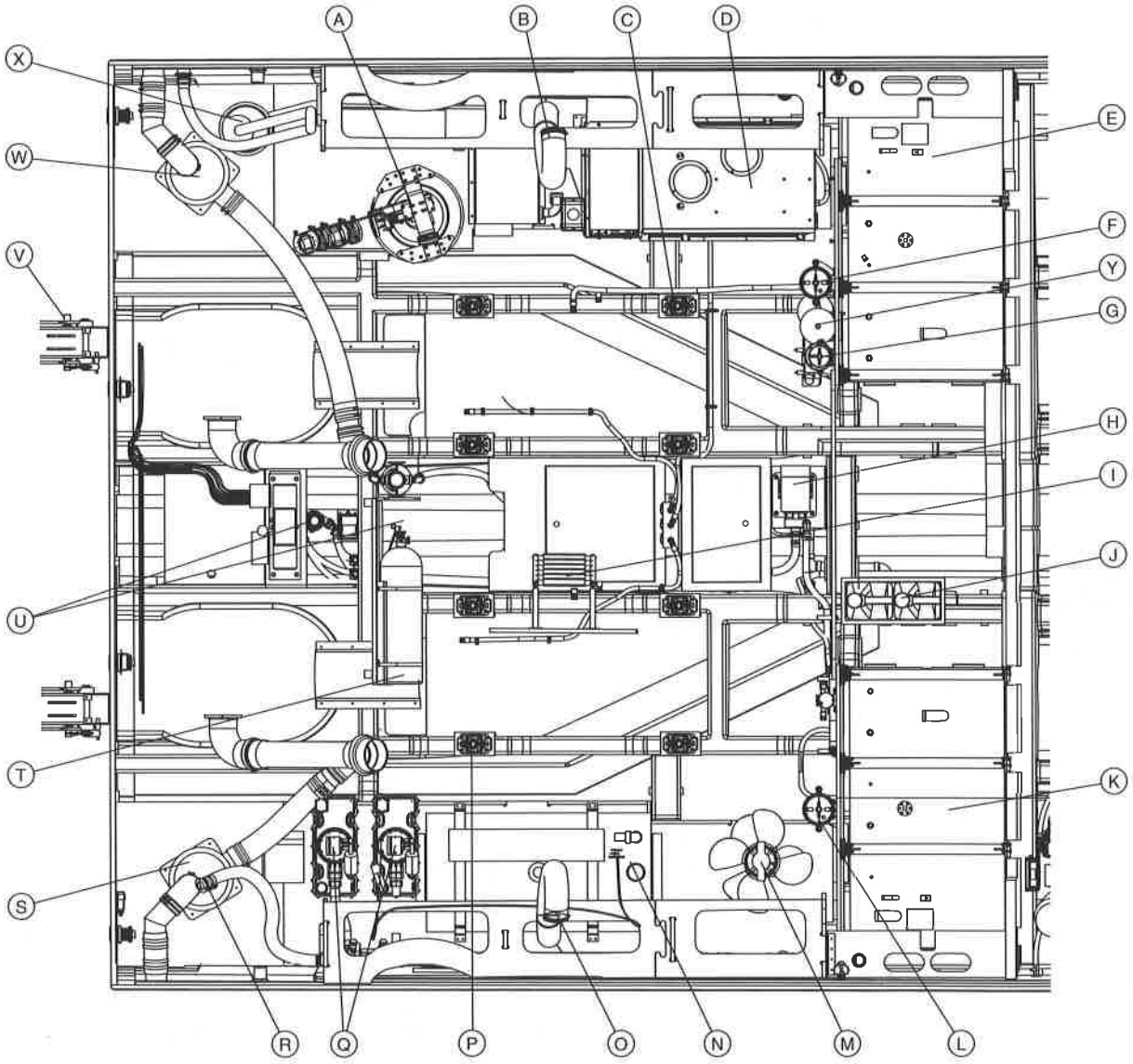
Ⓐ WING NUT
Ⓑ O-RING
Ⓒ SCREEN
Ⓓ STRAINER
Ⓔ HANDLE
Ⓕ SEACOCK

Bilge Layout, V-drive
(Fig. 34.1)



- (A) EXHAUST
- (B) CABLE MASTER
- (C) 240/60HZ SHORE POWER COMPONENTS
- (D) PORT ENGINE
- (E) SHAFT LOG TUBE & SHAFT SEAL
- (F) FUEL SYSTEM
- (G) FUEL TANK INSULATION
- (H) ENGINE BULKHEAD FOAM INSULATION
- (I) HORN
- (J) OIL EXCHANGE SYSTEM
- (K) V-DRIVE BATTERIES
- (L) BILGE AIR CONDITIONING COMPONENTS
- (M) FWD BILGE COMPONENT BOARD
- (N) GYRO SYSTEM, OPT.
- (O) FUEL SYSTEM
- (P) DRAINAGE SYSTEM
- (Q) STARBOARD ENGINE
- (R) PACKING SEAL COOLING LINE ROUTING
- (S) BILGE BLOWER
- (T) BILGE LADDER
- (U) WASTE SYSTEM
- (V) ENGINE STRAINER & SEACOCK
- (W) TRIM TAB
- (X) SWIM PLATFORM PUMP & LIFT OPT
- (Y) FIRE EXTINGUISHER
- (Z) BILGE PUMP (2000GPH) & FLOAT INSTALLATION
- (AA) STERN THRUSTER, OPT
- (BB) STEERING SYSTEM
- (CC) GENERATOR

Bilge Layout, Zeus
(Fig. 35.1)



- (A) CABLEMASTER
- (B) PORT BILGE BLOWER
- (C) PORT ENGINE
- (D) GENERATOR
- (E) PORT FUEL TANK
- (F) PORT ENGINE FUEL FILTER
- (G) GENERATOR FUEL FILTER
- (H) AIR CONDITIONING SYSTEM
- (I) BILGE ACCESS LADDER
- (J) 5 GAL JERRY JUGS (OIL)
- (K) STARBOARD FUEL TANK
- (L) STARBOARD FUEL TANK FILTER
- (M) SPARE PROPELLERS
- (N) WASTE SYSTEM HOLDING TANK
- (O) STARBOARD BILGE BLOWER
- (P) STARBOARD ENGINE
- (Q) WASTE TANK VACUUM GENERATORS
- (R) WASTE SYSTEM DECK DISCHARGE
- (S) STARBOARD ENGINE EXHAUST
- (T) FIRE EXTINGUISHING SYSTEM
- (U) BILGE PUMP (2000GPH) AND FLOAT SWITCH
- (V) SWIM PLATFORM ASSEMBLY
- (W) PORT ENGINE EXHAUST
- (X) GENERATOR EXHAUST
- (Y) FUEL TRANSFER PUMP

20. Engines

The engines are the heart of your Sea Ray. Proper attention to and maintenance of your engines will assure you of many hours of pleasurable, safe boating and will prevent unnecessary engine problems. Sea Ray® strongly urges you to fully comply with the manual provided by the engine manufacturer. Follow the recommended maintenance and warranty schedule in your Engine Operator's Manual included in the owner's package. **When washing down, or at any other time, take care that water does not enter the air inlets.** Water entering the air inlets when the engines are not operating may go directly into the cylinders, resulting in rust and possibly internal engine damage.

REFER TO THE ENGINE OWNER'S MANUAL FOR OPERATING INSTRUCTIONS AND WARRANTY INFORMATION.

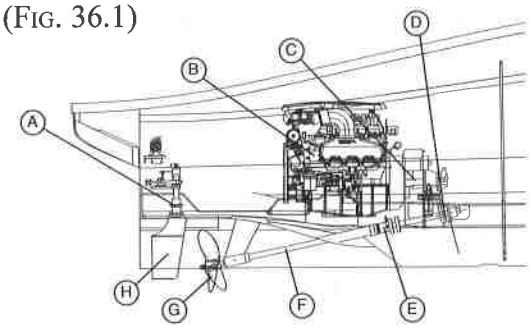
The engines are warranted directly by the engine manufacturer, not by Sea Ray®.

The propulsion system on the 510 Fly is inboard engines with a conventional prop shaft in a v-drive transmission system or a Zeus.

V-Drive System

The V-drive system incorporates inboard engines with an angled transmission that allows the drive shaft to pass through the hull under the engine.

V-Drive
(Fig. 36.1)

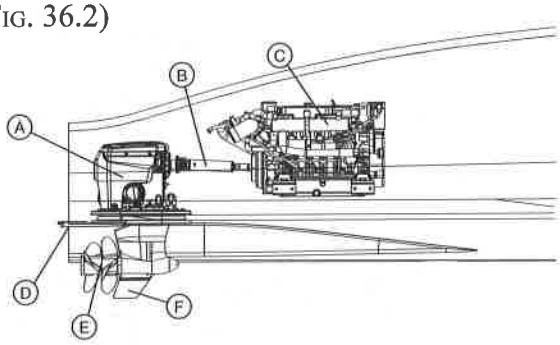


Ⓐ RUDDER STUFFING BOX
Ⓑ ENGINE
Ⓒ TRANSMISSION
Ⓓ SHAFT COUPLING
Ⓔ SHAFT LOG & STRONG SEAL
Ⓕ SHAFT
Ⓖ PROPELLER
Ⓗ RUDDER

Zeus Pod System

The Zeus Pod propulsion system incorporates a pod drive with counter-rotating stainless steel, rear facing propellers and a through hub exhaust. Independent vectoring for each drive delivers improved high-speed handling.

Zeus Pod Drive System
(Fig. 36.2)



Ⓐ DRIVE UNIT
Ⓑ DRIVE SHAFT
Ⓒ ENGINE
Ⓓ TRIM TAB
Ⓔ COUNTER-ROTATING PROPS
Ⓕ SKEG

21. Joystick Control System (Zeus drive system)

The joystick provides an intuitive driver interface to maneuver the vessel. Operating the vessel with the joystick is well suited for close quarter operations and when docking. The joystick causes the computer control system to automatically calculate the steering angle of each drive, the throttle level, the proper shift and clutch slip percentage to push or rotate the boat in a direction corresponding to the joystick movement or twist. For example, if you move the joystick sideways, the computer control system applies a thrust to the boat in the sideways direction.

The following illustrations give some limited examples of the basic responses to inputs from the joystick. The joystick is proportional, which means that the farther from the center the joystick is moved, the more thrust is applied to the boat in that direction, up to a maximum of 1800 engine RPM.

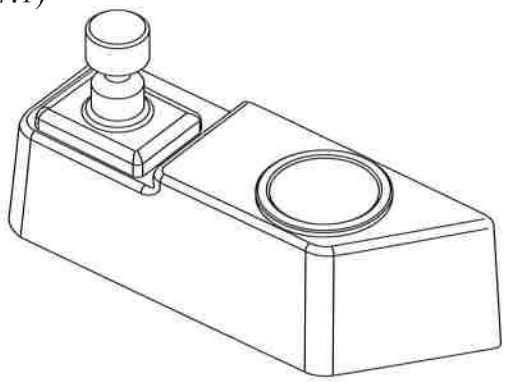
To maneuver the boat with the joystick:

1. Move both Shift/Throttle levers to the neutral position.

2. Move the joystick in the direction that you want the boat to move, or twist the joystick in the direction that you want the boat to rotate. The joystick can be moved and rotated at the same time. Use gentle joystick movements until you gain comfort with the thrust response.

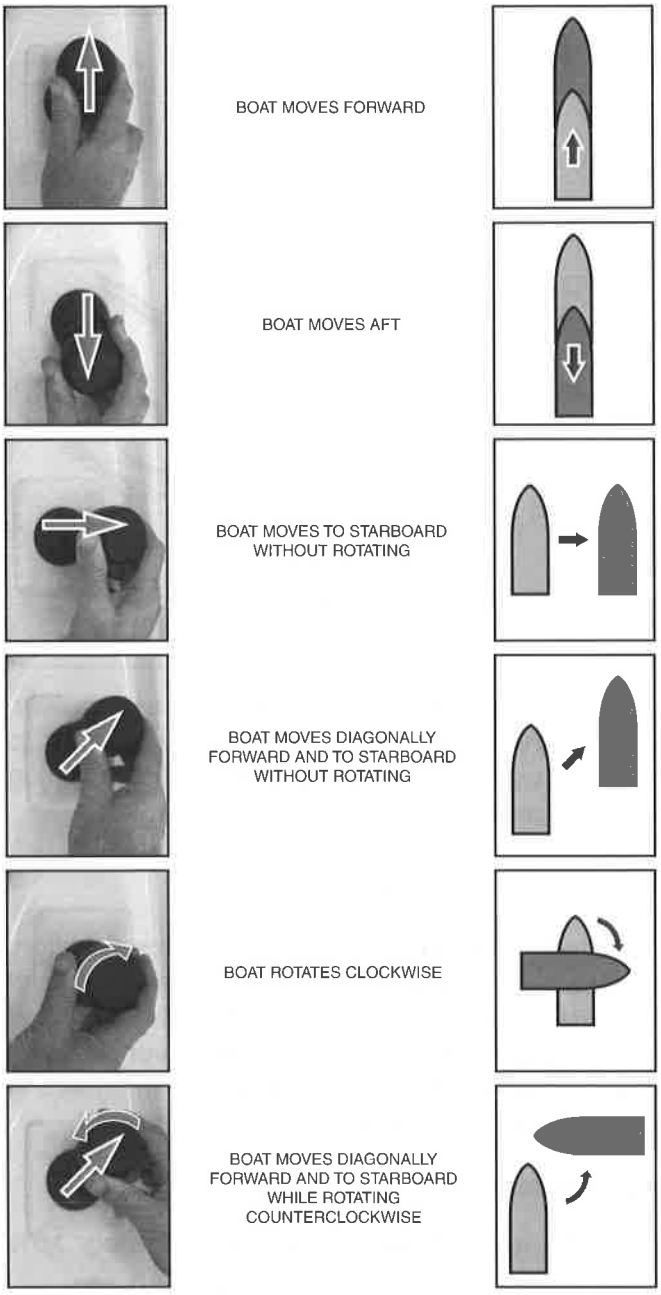
NOTE: To prevent drive engagement resulting from unintended movement of the joystick while the engines are running, press the "THROTTLE ONLY" button.

Zeus Stern Drive Control
(Fig. 37.1)



⚠ WARNING

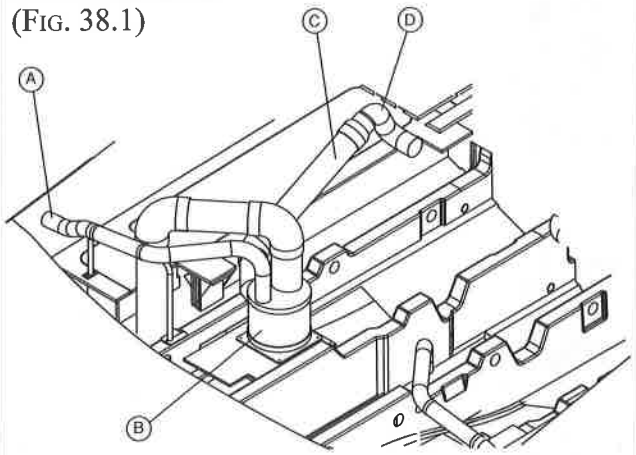
JOYSTICK CAN ENGAGE PROPELLERS WHEN THROTTLES ARE IN NEUTRAL. NEVER LEAVE ENGINES RUNNING WITH PEOPLE IN THE WATER. DEATH OR SERIOUS INJURY COULD RESULT. SEE OWNER'S MANUAL FOR SAFE OPERATING INSTRUCTIONS.



22. Engine Exhaust System

The exhaust system on Sea Ray® boats with inboard engines is designed so that water from the raw water cooling system enters the exhaust system through elbows (engine side) where water and exhaust are mixed. Water and exhaust are then pumped through the mufflers and then overboard through the exhaust outlet. **Make sure water is flowing from the exhaust outlets while the engines are operating.** Prior to every boat use, examine the exhaust system fittings to ensure tightness.

Engine Exhaust
(Fig. 38.1)



Ⓐ EXHAUST ELBOW
Ⓑ MUFFLER
Ⓒ EXHAUST TUBING
Ⓓ RISER

A drain plug is located on each bypass muffler. When servicing or winterizing, remove the plug to drain the water out of each muffler. Replace the plug after all water has drained from the muffler.

23. Fuel System

The quality of the fuel is very important for satisfactory engine performance and long engine life. Fuel should be clean and free of contamination. Your fuel tanks should be kept full of fuel whenever possible. This will reduce the amount of water condensation and reduce the possibility of contamination.

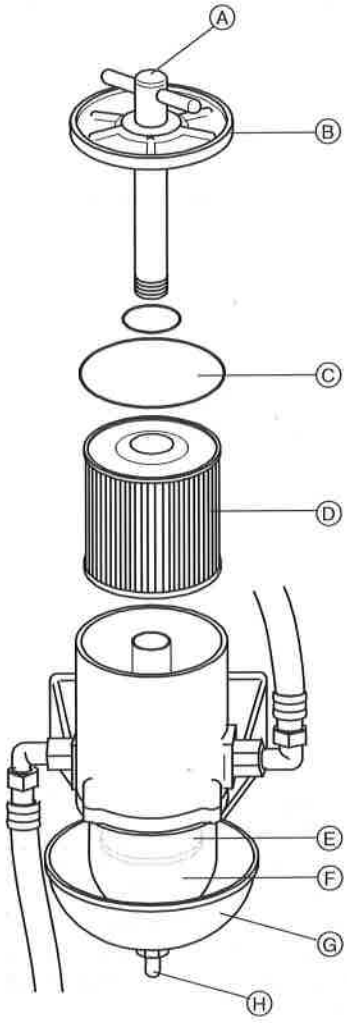
Recommended Fuel: #2 Diesel Fuel

Note: In rough seas, allow approximately 15% reserve when planning fuel consumption.

The 510 Fly has two (2) aluminum fuel tanks with a capacity of 250 gallons (946 liter) each, for a total capacity of 500 gallons (1,893 Liters).

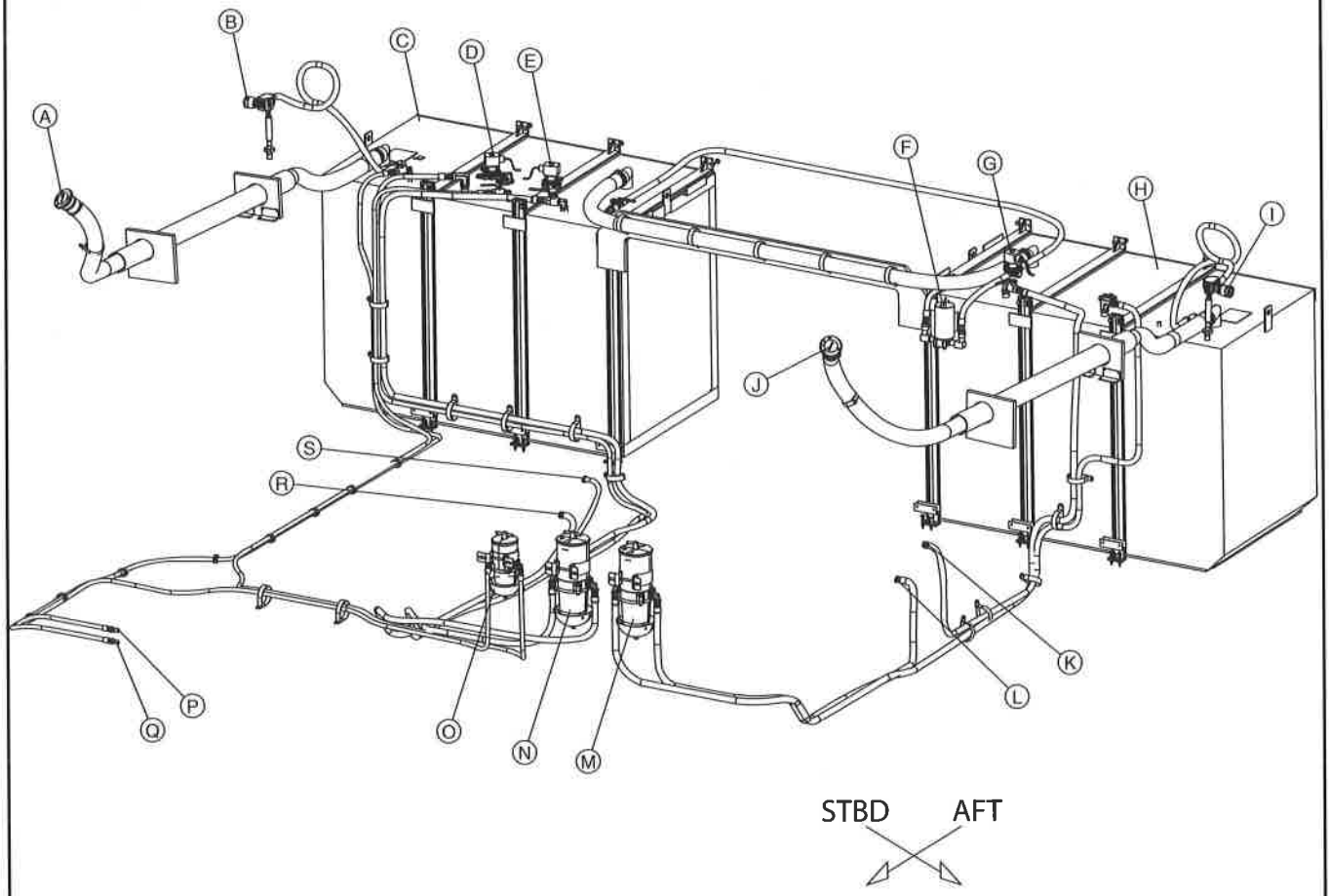
Your boat is equipped with fuel tank vents for each tank which serves as a pressure/vacuum release and safety overflow. The thru-hull fitting has a flame arrester, making it imperative that you keep the screen clean and in excellent repair. Replace the screen immediately if it becomes damaged or displaced. Periodically check the vents to assure that they are not clogged.

Racor® Fuel Filter
Fig. 38.2



Ⓐ T-HANDLE
Ⓑ LID
Ⓒ RUBBER SEAL
Ⓓ FILTER ELEMENT
Ⓔ TURBINE
Ⓕ SEE-THRU BOWL
Ⓖ HEAT DEFLECTOR
Ⓗ DRAIN PLUG

Fuel System
(Fig. 39.1)



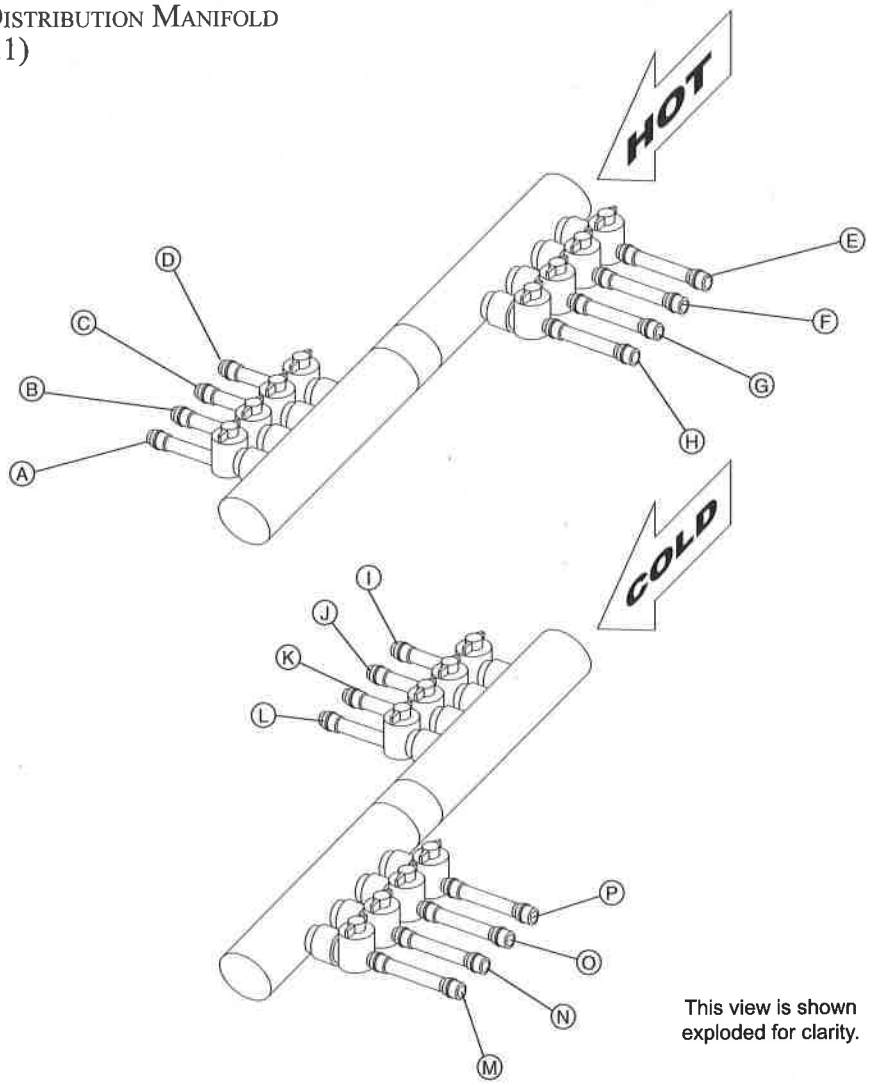
- (A) FUEL FILL, PORT
- (B) FUEL VENT, PORT
- (C) FUEL TANK, PORT
- (D) GENERATOR FUEL PICKUP
- (E) FUEL PICK UP, PORT
- (F) FUEL TRANSFER PUMP
- (G) FUEL PICKUP, STARBOARD
- (H) FUEL TANK, STARBOARD
- (I) FUEL VENT, STARBOARD
- (J) FUEL FILL, STARBOARD
- (K) ENGINE FUEL FEED, STARBOARD
- (L) ENGINE FUEL RETURN, STARBOARD
- (M) ENGINE FUEL FILTER, STARBOARD
- (N) GENERATOR FUEL FILTER
- (O) ENGINE FUEL FILTER, PORT
- (P) GENERATOR FUEL FEED
- (Q) GENERATOR FUEL RETURN
- (R) ENGINE FUEL RETURN, PORT
- (S) ENGINE FUEL FEED, PORT

24. FRESH WATER SYSTEM

The fresh water system on your boat consists of one (1) 130 gal. (492 liter) tank, dockside water inlet, 24v water pump, distribution manifold (w/ shutoff valves), 240v 20 gal. (75.7 liter) water heater, 4 faucets (galley, aft head, forward head and bridge wet bar), and 3 fresh water washdown spigots (transom, bilge, and bow rope locker).

The water distribution manifold is located under the cabin floor in the forward stateroom and is accessed by lifting the hatch

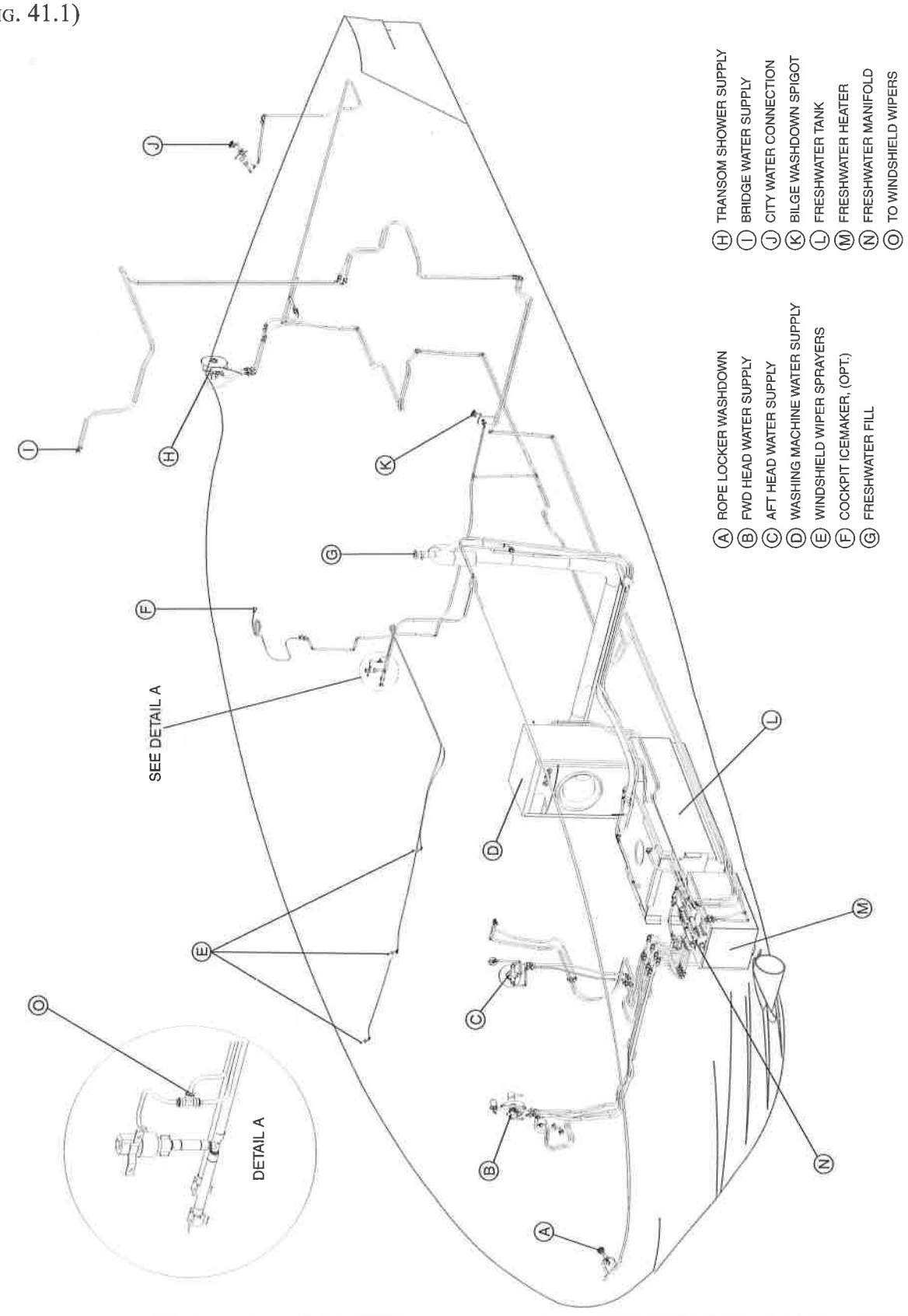
WATER DISTRIBUTION MANIFOLD
(FIG. 40.1)



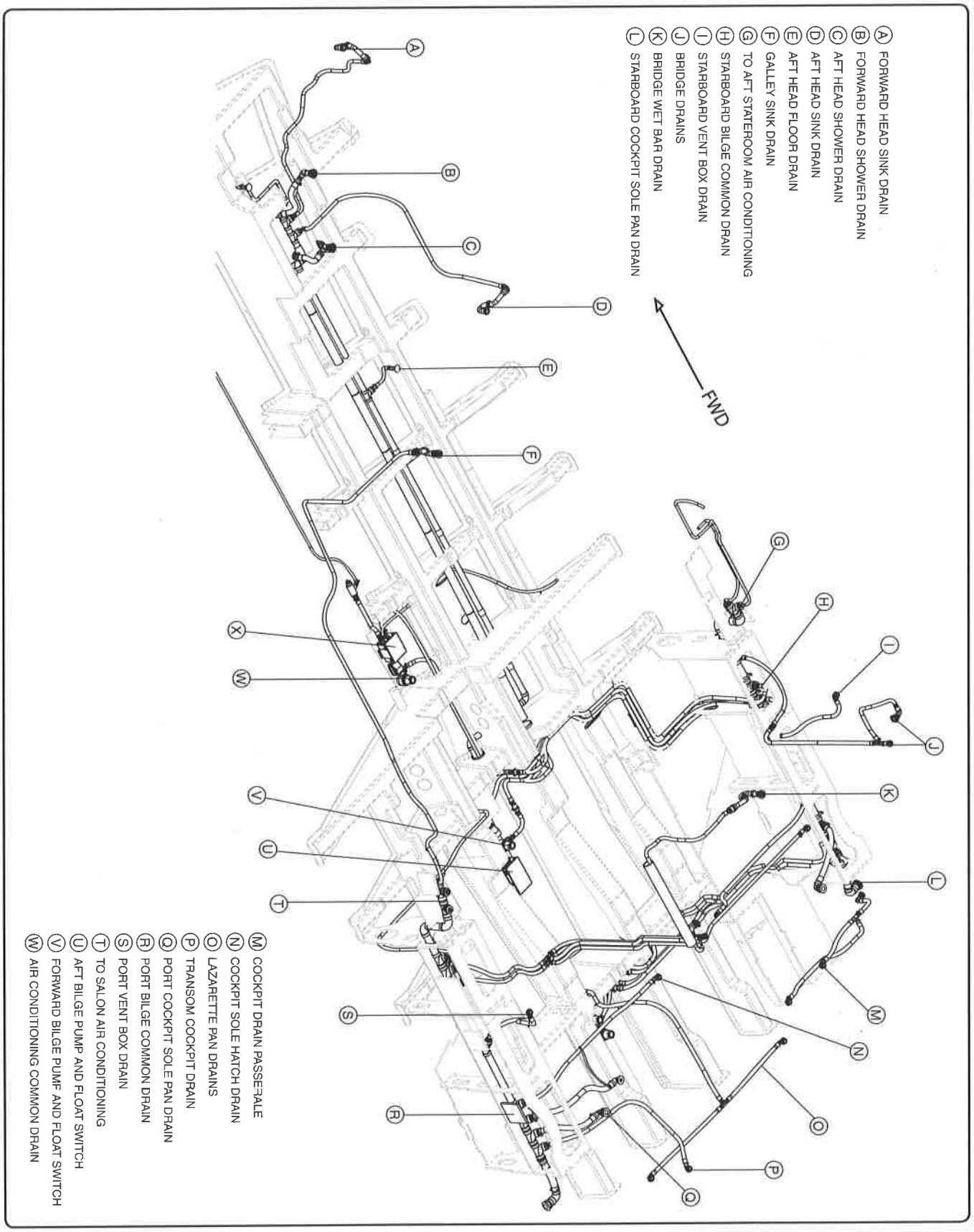
This view is shown exploded for clarity.

- (A) TO FORWARD HEAD SINK
- (B) TO FORWARD HEAD SHOWER
- (C) TO AFT HEAD SINK
- (D) TO AFT HEAD SHOWER
- (E) TO WASHER
- (F) TO GALLEY SINK
- (G) TO BRIDGE WET BAR
- (H) TO TRANSOM SHOWER
- (I) TO AFT HEAD SHOWER
- (J) TO AFT HEAD SINK
- (K) TO FORWARD HEAD SHOWER
- (L) TO FORWARD HEAD SINK
- (M) FROM CITY WATER
- (N) TO TRANSOM SHOWER
- (O) TO GALLEY SINK & BRIDGE WET BAR
- (P) TO WASHER

Freshwater System Layout
(Fig. 41.1)



25. Gray Water System



26. WASTE SYSTEM

A. REQUIREMENTS FOR OPERATORS

NOTICE

There is a possibility of being fined for having an operable direct overboard discharge in some waters. Close waste discharge seacock and remove handle or take other measures to avoid fine.

The Environmental Protection Agency (EPA) standards state that in freshwater lakes, freshwater reservoirs or other freshwater impoundments whose inlets or outlets are such as to prevent the ingress or egress by vessel traffic subject to this regulation, or in rivers not capable of navigation by interstate vessel traffic subject to this regulation, marine sanitation devices certified by the U.S. Coast Guard installed on all vessels shall be designed and operated to prevent the overboard discharge of sewage, treated or untreated, or of any waste derived from sewage. The EPA standards further state that this shall not be construed to prohibit the carriage of Coast Guard-certified flow-through treatment devices which have been secured so as to prevent such discharges. They also state that waters where a Coast Guard certified marine sanitation device permitting discharge is allowed include coastal waters and estuaries, the Great Lakes and interconnecting waterways, freshwater lakes and impoundments accessible through locks, and other flowing waters that are navigable interstate by vessels subject to this regulation (40 CFR 140.3).

⚠ CAUTION

Do not flush facial tissue, paper towels or sanitary napkins in head. Such material can damage waste disposal system and the environment.

B. MACERATOR DISCHARGE PUMP WITH SEACOCK INTERLOCK SYSTEM

If equipped, the optional macerator gives the boat operator the means of discharging the holding tank contents directly overboard through a seacock in the bottom of the hull. This is available in conjunction with the dockside pump out.

Since direct overboard discharge is prohibited in many areas, the macerator seacock is normally closed. The macerator seacock is equipped with a system interlock switch which prevents the operation of the macerator when the macerator seacock is closed. The light on the DISCHARGE PUMP switch on the DC Distribution Panel will be lighted when the macerator is operational. If the light is not lighted, it is visual confirmation the macerator seacock is closed and that the macerator cannot be operated. Check that the macerator seacock handle is in the open position and the light on the switch is lighted before operating the macerator.

TO OPERATE THE MACERATOR:

1. Turn ON the DISCHARGE PUMP breaker on the salon DC distribution panel and open the waste discharge seacock located on the bilge floor.
2. Operate DISCHARGE switch at the WASTE SYSTEM CONTROL area on the main distribution panel.
3. When tank is empty, turn the switch to OFF and close waste discharge seacock.

NOTE: Turn OFF discharge pump to prevent accidental discharge.

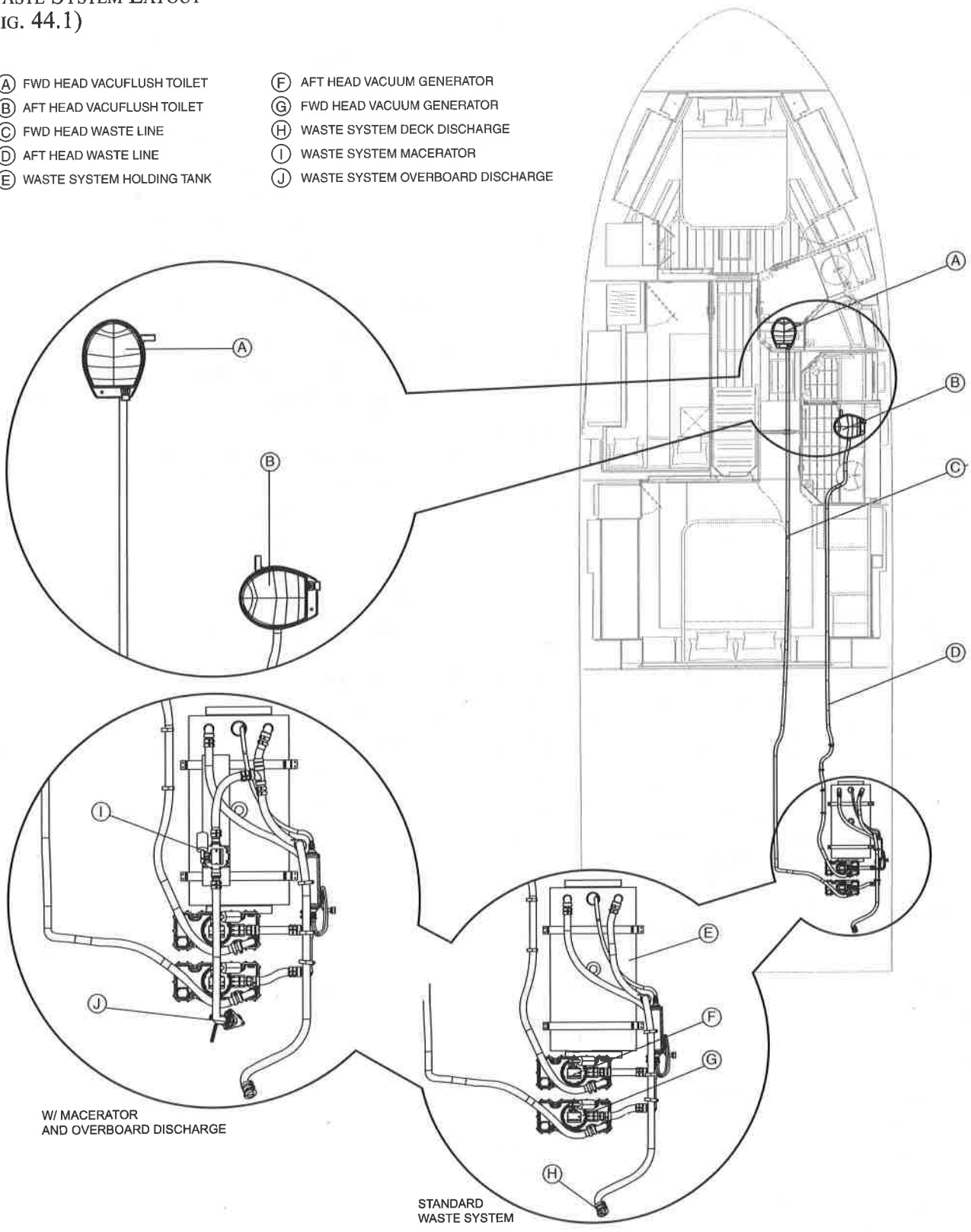
MAINTENANCE

Prior to each use and at regularly scheduled intervals, cycle the macerator seacock handle open and shut to ensure proper operation of the seacock

Waste System Layout

Waste System Layout (Fig. 44.1)

Ⓐ FWD HEAD VACUFLUSH TOILET
Ⓑ AFT HEAD VACUFLUSH TOILET
Ⓒ FWD HEAD WASTE LINE
Ⓓ AFT HEAD WASTE LINE
Ⓔ WASTE SYSTEM HOLDING TANK
Ⓕ AFT HEAD VACUUM GENERATOR
Ⓖ FWD HEAD VACUUM GENERATOR
Ⓗ WASTE SYSTEM DECK DISCHARGE
Ⓘ WASTE SYSTEM MACERATOR
Ⓙ WASTE SYSTEM OVERBOARD DISCHARGE



27. AUTOMATIC FIRE EXTINGUISHER SYSTEM

AUTOMATIC FIRE EXTINGUISHER
(FIG. 45.1)

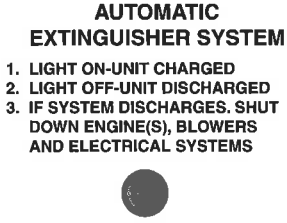
Your boat may be equipped with an automatic fire extinguisher system located aft of the engine. In the event of a fire, the heat sensitive automatic head will release the extinguishant as a vapor, totally flooding the area in fire-killing concentrations.

IF ACTUATION OCCURS, IMMEDIATELY SHUT DOWN ALL ENGINES, POWERED VENTILATION, ELECTRICAL SYSTEMS AND EXTINGUISH ALL SMOKING MATERIALS. DO NOT IMMEDIATELY OPEN THE ENGINE COMPARTMENT!! THIS FEEDS OXYGEN TO THE FIRE AND FLASHBACK COULD OCCUR.

Allow the exinguishant to "soak" the compartment for at least fifteen (15) minutes and for hot metals or fuels to cool before cautiously inspecting for cause of fire. Have portable extinguishers at hand and ready. Do not breathe fumes or vapors caused by the fire.

A. GASOLINE ENGINE BOATS

AUTOMATIC FIRE EXTINGUISHER INDICATOR LIGHT
(FIG. 45.2)



The system indicator light is wired to the ignition and is turned ON when the ignition is turned ON. The indicator light, located on the control station starboard panel, indicates to the helmsman when the unit has discharged. Under normal circumstances, when the ignition is ON the charge indicator light is ON. If the unit discharges, the light will go OFF.

B. DIESEL ENGINE BOATS

AUTOMATIC FIRE EXTINGUISHER INDICATOR LIGHT
(DIESEL ENGINE)
(FIG. 45.3)

The system indicator and switch module (ENGINE SHUTDOWN AND OVERRIDE SYSTEM) operates similarly to the indicator light for the gas engine boats. The module also incorporates an engine shutdown switch with override system. When the system discharges it will shutdown the engine.

C. MANUAL FIRE EXTINGUISHING SYSTEM PULL HANDLE

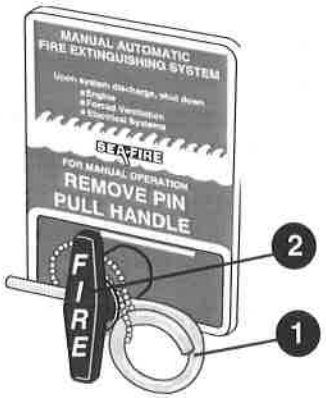
Located in the cockpit, the manual fire extinguisher system allows the operator to manually activate the automatic extinguisher in the engine room. Early detection and use of the manual override system will reduce fire damage by eliminating the time necessary for heat in the engine room to rise to a temperature necessary to activate the automatic fire extinguisher.

TO OPERATE:

MANUAL FIRE EXTINGUISHING SYSTEM
PULL HANDLE (FIG. 45.4)

TO MANUALLY ACTIVATE THE ENGINE ROOM FIRE EXTINGUISHER:

1. PULL PIN
2. PULL HANDLE



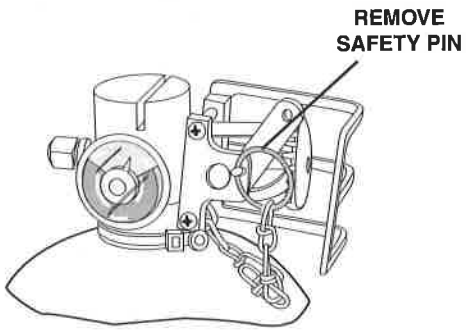
located at the helm

1. Pull pin securing the handle.
2. Pull red FIRE handle quickly and briskly.

D. Safety Pin

The safety pin is used on boats equipped with the Manual Fire Extinguishing System Pull Handle. The safety pin, located at the neck of the extinguisher bottle in the engine room is for shipping and transfer of the bottle only. The pin MUST be removed in order to manually operate the system.

Engine Room Fire Extinguisher
(Fig. 46.1)



NOTE: THE MANUAL SYSTEM WILL NOT OPERATE IF SAFETY PIN IS INSTALLED.

28. Carbon Monoxide Monitor

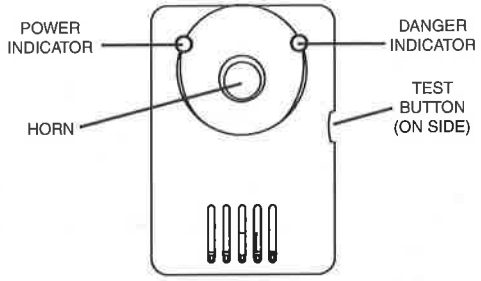
Your boat is equipped with carbon monoxide (CO) monitors in the cabin and enclosed berths or staterooms. The CO monitor is an electronic instrument that detects carbon monoxide. When there is a buildup of CO in the cabin, the monitor will alert the occupants by flashing a DANGER light and sounding an alarm. The CO monitor is powered through a breaker on the Main Distribution panel in the galley.

It is important that you read and understand the CO monitor information and operating instructions. It is extremely important that you become familiar with the CO monitor and its functions.

Testing the CO Monitor

Test the monitor on your boat at manufacturers required intervals by pushing the TEST button on the side of the unit. If the unit is operating correctly both audible and visual warning indicators will be activated.

Carbon Monoxide Monitor
(Fig. 46.2)



⚠ CAUTION

This detector will only indicate the presence of carbon monoxide gas at the sensor. Carbon monoxide may be present in other areas.

⚠ DANGER

Actuation of the CO monitor indicates the presence of carbon monoxide which can be FATAL.

EVACUATE THE PREMISES IMMEDIATELY. DO A HEAD COUNT TO CHECK THAT ALL PERSONS ARE ACCOUNTED FOR. CALL THE NEAREST FIRE DEPARTMENT AND ASK THEM TO DETERMINE THE SOURCE OF CARBON MONOXIDE. DO NOT REENTER PREMISES UNTIL IT HAS BEEN AIRED OUT AND THE PROBLEM IS CORRECTED.

⚠ CAUTION

To reduce the risk of carbon monoxide poisoning, test the monitor operation when not in use for 10 days or more.

End of Life signal

Your CO detector may be equipped with an End Of Life (EOL) signal indicating the sensor used in the unit has reached the end of its service life and must be replaced. The signal is activated from a timer that will run for 4 years, 11 months from the date of manufacture. Depending on your monitor, the EOL signal indicator varies, so check the unit's operation manual for further information and instructions.

The EOL signal can be reset for a period of 72 hours (3 days) for a total of up to 30 days. After this time, the unit will continuously signal EOL and will no longer detect CO and MUST BE REPLACED! DO NOT DISCONNECT THE ALARM UNTIL YOU HAVE A REPLACEMENT ALARM AVAILABLE TO

INSTALL! REMOVING THE LITHIUM BATTERY WILL CAUSE THE UNIT TO SIGNAL EOL PERMANENTLY!

29. SmartCraft™

The Smartcraft System, located at the helm, provides a comprehensive boat information center. This system allows the boat operator to monitor a wealth of critical operational information which is displayed clearly and instantly at the helm on the LCD display.

Smartcraft System (Fig. 47.1)

The system monitors water temperature and depth, engine trim, boat speed, steering angle, system preventive maintenance reminders, and systems diagnostics. In addition the system can be integrated with the boat's GPS, if equipped, to provide up to the minute course, speed, and fuel-to-destination information.

NOTE: The detailed information listed which is standard on some models may be optional on others, or may not be available on some models based on engine and system configurations.

Refer to the SmartCraft™ owner's manual in the owner's package for all SmartCraft™ operating instructions.

System Calibration (For First Time Use)

Before using SmartCraft™ System View for the first time the system must be calibrated.

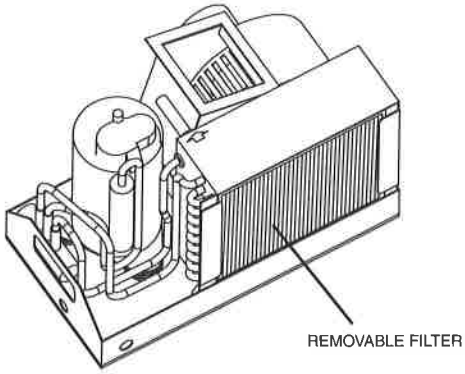
If this has not been done by your dealer refer to the System Calibration section of the SmartCraftTM System View Owner's Manual.

30. Air Conditioning & Heating

The air conditioning/heating system in your Sea Ray® is of the size and capacity best suited for the size of your boat.

The system is fitted with a return air filter that should be cleaned once a month. To remove the air filter for cleaning, slide filter out of the compressor/ blower unit.

Typical Air Conditioning Compressor/ Blower (Fig. 47.2)



The system is cooled to maintain optimal operating temperature by a raw water pump. The pump draws water through a seacock in the bilge and filters it through a sea water strainer. The sea water strainer should be inspected and cleaned frequently. The water passes through the air conditioning/heating unit, then flows overboard.

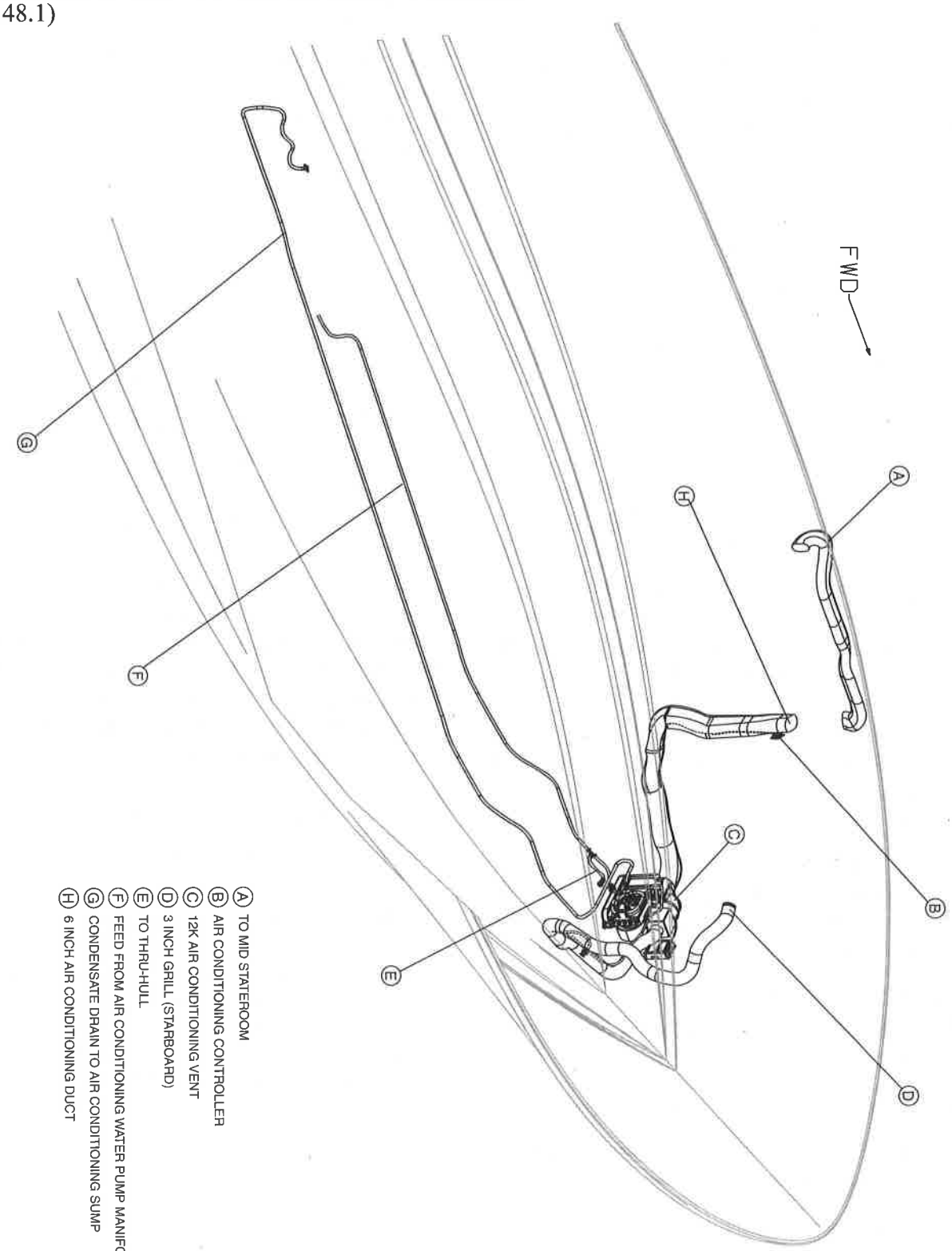
To Start System:

1. Make sure the seacock for the cooling pump is open.
2. Turn ON the AIR CONDITIONER circuit breaker on the Main Distribution panel.
3. Follow the instructions in the Air Conditioner/ Heater manual for control pad operation.

REFER TO OWNER'S MANUAL PACKAGE FOR INSTRUCTIONS AND WARRANTY INFORMATION.

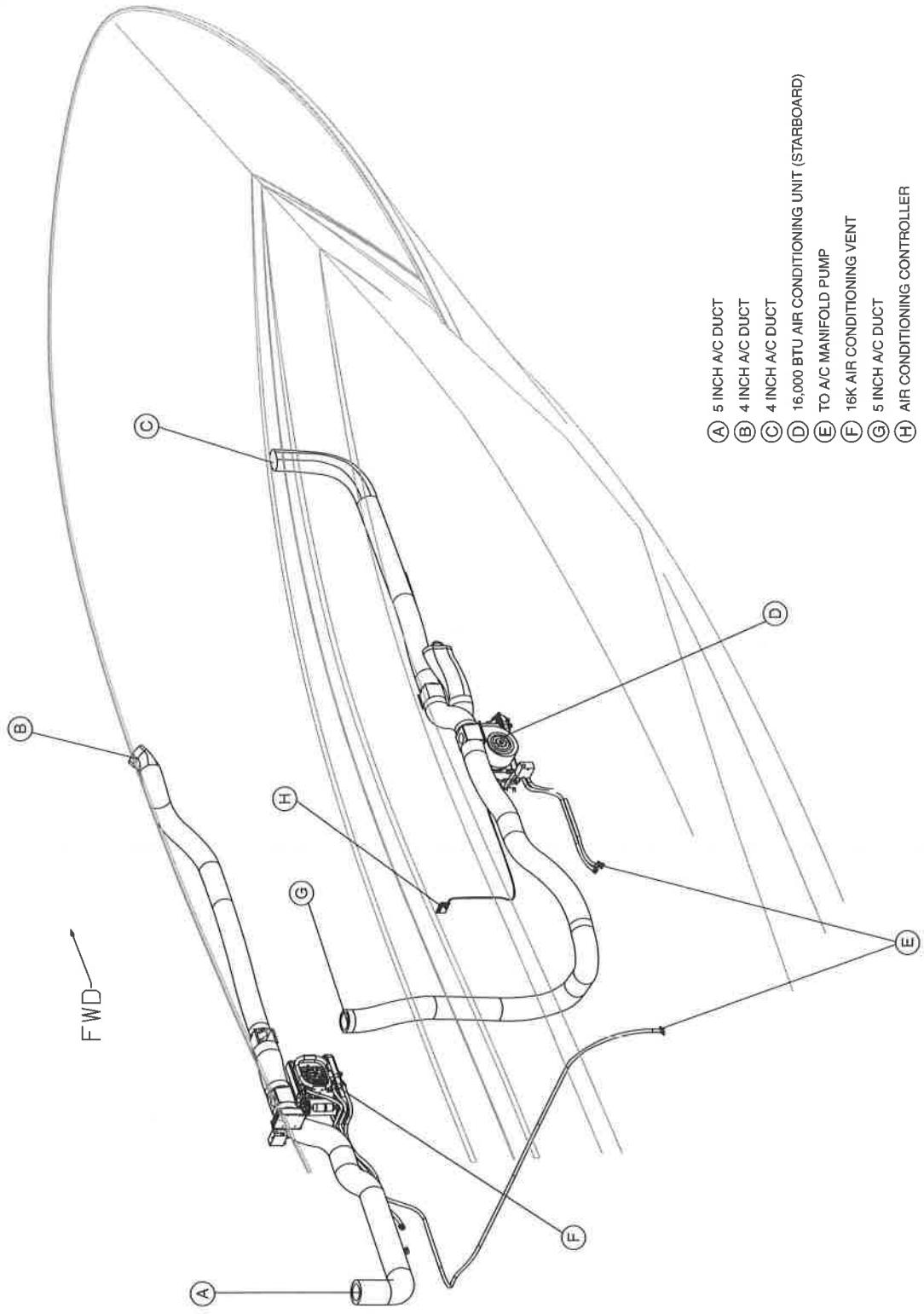
Air Conditioning System Layout

Air Conditioning System Layout, (Forward Stateroom)
(Fig. 48.1)



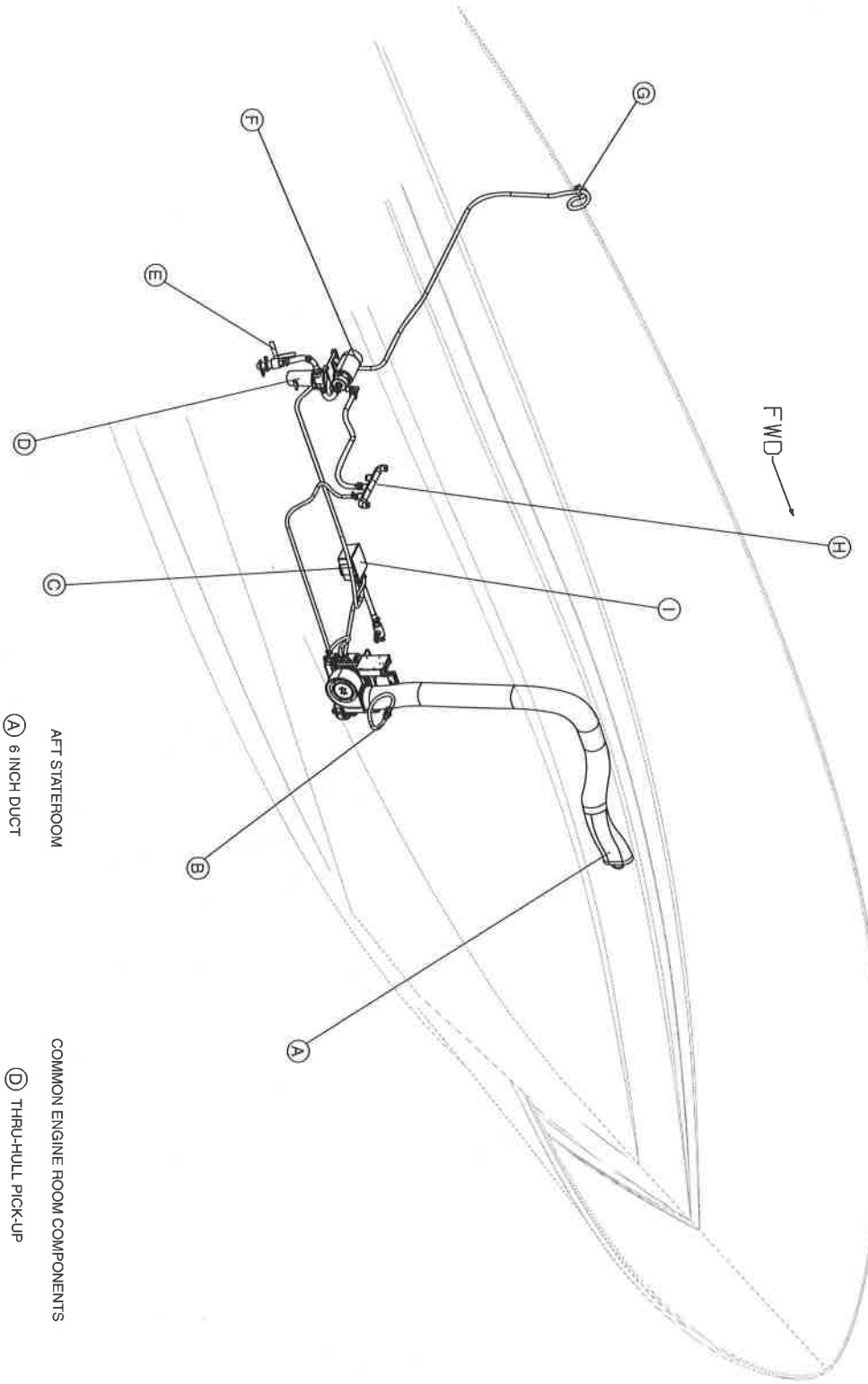
Air Conditioning System Layout

Air Conditioning System Layout, (Salon)
(Fig. 49.1)



Air Conditioning System Layout

Air Conditioning System Layout, (Aft Stateroom)
(Fig. 50.1)



30. Bow/Stern Thrusters

The Bow Thruster located under an access panel in the floor of the forward stateroom is electrically driven and gives the operator more maneuverability of the bow. The Stern Thruster, if equipped is located on the transom of the boat.

REFERENCE BATTERY SECTION FOR INFORMATION ON THE ABSORBED GLASS MAT (AGM) BATTERIES INSTALLED WITH THIS OPTION.

REFER TO OWNER'S MANUAL PACKAGE FOR INSTRUCTIONS AND WARRANTY INFORMATION.

31. Refrigerator & Freezer

The refrigerator/freezer unit is located in the galley. The unit is supplied power by the REFRIGERATOR/ FREEZER breaker on the salon 120 volt AC main distribution panel. To operate dockside, connect the shore power system, turn the MAIN breaker(s) ON. Then turn the REFRIGERATOR/FREEZER breaker on the AC main distribution panel ON.

⚠ CAUTION

Do not cover refrigerator/freezer vents.

Cockpit Ice Maker

If equipped, the cockpit ice maker is located in the cockpit wet bar. To operate, turn ON the REFRIGERATOR/FREEZER breaker on the salon 12 volt DC distribution panel.

To Start Ice Maker:

1. Make sure water tank is full.
2. Turn "FRESH WATER PUMP" breaker ON.
3. Turn ON ice maker switch, located at the bottom of the unit. Allow unit to cycle several times before using ice.

REFER TO OWNER'S MANUAL PACKAGE FOR INSTRUCTIONS AND WARRANTY INFORMATION

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1. DC SYSTEM

The 12 volt direct current (DC) electrical system (similar to that in your car or truck) derives its power from the batteries. Batteries are kept charged by the engine-driven alternator or the battery charger/ converter which must be powered by shore power. The battery voltage is indicated by the voltmeter on the helm panel (on the SmartCraft™ System Tach) and on the main distribution panel located in the cabin. The batteries supply power to the circuit breakers on the main DC breaker panel. This panel contains the breakers which supply power to the subpanels and fuse blocks at the control station and salon.

The negative terminal of each bank of batteries is attached to the main DC negative bus which in turn connects to the negative ground studs of the propulsion engines and the generator. This "negative ground system" is the approved system for marine DC electrical systems.

Ask your dealer for a careful analysis of DC power needs on your boat. It may be necessary to add batteries or auxiliary charging methods to supply adequate power for any additional accessories you wish to install.

⚠ DANGER

DO NOT USE JUMPER CABLES IN THE ENGINE COMPARTMENT.

They can cause an explosion from sparks.

⚠ DANGER

A battery will explode if a flame or spark ignites the free hydrogen given off during charging.

Never use an open flame or strike sparks in the battery area.

2. BATTERIES

The batteries installed in your boat have been selected for their ability to furnish starting power based on engine starting requirements, as well as their ability to power the DC accessories attached to the electrical system.

The following tables describe the recommended marine batteries to install in your boat. All batteries in a battery bank should be of the same type, age, and rating.

Standard:

Application	Volts	CCA	RC	QTY
PORT BANK	12	1400	430	1
STBD BANK	12	1400	430	1

Option:

Absorbed glass matt (AGM) batteries are supplied in the main port and starboard battery banks when the gyroscope option is installed. They are also installed with the thruster and inverter options. These are the best batteries to provide long life and deep cycle capabilities. While there is no need to check fluid levels with AGM batteries, the need to maintain charge levels is still necessary. Due to the unique nature of these batteries, it is not recommended to replace them with standard batteries. The following table describes the recommended AGM batteries to install in your boat. All batteries in a bank should be of the same type, age, and rating.

Application	Volts		Amp-Hour	QTY
PORT BANK	12	EnerSys SBS 190	190	1
STBD BANK	12	Odyssey PC 1800	190	1

The battery trays and battery cabling installed at the manufacturing facility will indicate the quantity of the batteries needed in your boat. Installing the minimum size battery listed above will insure that the battery bank will be sized appropriately.

COLD CRANKING AMPS (CCA) - a rating used in the battery industry to classify a battery's ability to start an engine in cold temperatures. The rating is the number of amps a fully charged battery can deliver at 0° Fahrenheit for 30 seconds, while maintaining a voltage of at least 7.2 volts, for a 12 volt battery.

RESERVE CAPACITY (RC) - is a battery industry rating, defining a battery's ability to power a vehicle with out a charging device to replenish the battery. The rating is the number of minutes a battery at

80° Fahrenheit can be discharged at 25 amps and maintain a voltage of 10.5 volts for a 12 volt battery.

BATTERY BANK - one or more batteries connected together in series or parallel to provide the sufficient Cold Cranking Amps, Reserve Capacity, or Voltage needed to meet engine and calculated boat loads.

⚠ CAUTION

To prevent arcing or damage to the alternator, always disconnect battery cables before doing any work on the engine's electrical system.

A. To remove the battery cables:

1. Turn off all items drawing power from the battery.
2. Turn off the "converter" breaker at the main distribution panel.
3. Turn the battery switches to the OFF position.
4. Remove the negative cable first, then the positive cable.
5. With a clean rag, remove grease and dirt from the top surface of the battery.
6. To replace the cables, first replace the positive cable, then the negative.

B. Battery Maintenance

- Check the fluid levels in the cells approximately every 4 weeks, and weekly in summer and hot zones.
- The fluid level must be between the lower and upper markings.
- Replenish only with distilled water. Do not use metal funnel.
- Coat battery terminal clamps with silicone grease. Keep battery clean and dry.

Battery life is shortened if it is drained to 20 percent (11.6v) charge before recharging, or if left in a discharged state (less than 12.4v) for days. It is recommended that a battery not be discharged more than 50 percent (approx. 12.2v). If the battery does become run down, recharge it as soon as possible.

Running the engine to recharge the battery may not be effective. The alternator only creates charging power at higher engine speeds, so simply idling or trolling will not generate enough power to recharge the battery.

If you need to charge a battery, use only a battery charger designed to charge automotive/marine batteries. Use charger only when battery is disconnected from the boat's electrical circuit. Follow the charger instructions.

The boat is equipped with dockside power, generator, and an AC/DC converter/battery charger. Keep the battery charger on when shore power or generator is available. This will keep the batteries properly charged and allow use of the DC powered equipment on board without draining the battery.

C. Long Term Battery Storage & Maintenance Recommendations

When a boat is not going to be used for a long period of time (more than 3 weeks) then steps should be taken to ensure that the batteries are properly maintained to mitigate low voltage issues in the future.

A battery "maintainer" (smart charger) should be in use anytime the boat is not operational to maintain the batteries. Primarily this is done through shore power and the onboard AC/DC converter/battery charger, but a dedicated battery maintainer can be used directly to a battery if warranted (i.e., boat not equipped with shore power, shore power unavailable, etc.). Be sure the battery maintainer is matched to the battery technology in use (sealed lead acid, absorbed glass mat, etc.) and is only used on the appropriate number of batteries.

Adequate ventilation is always a consideration when batteries are being charged due to the production of O_2 and H_2 (oxygen and hydrogen), even with sealed batteries. Regardless of where the batteries are located, ensure there is sufficient ventilation where a battery is being charged.

If the boat is on a trailer, or is being hauled out and placed in dry storage, (i.e., boat rack or blocks) one should consider physically disconnecting the batteries from the boat and placing them on a maintainer. The batteries could be left in the boat but electrically disconnected from the boat if the batteries are easily accessible for maintenance,

the ventilation is sufficient, and temperatures do not drop below freezing (0°C/32°F).

If the boat is being placed onto a boat rack where accessibility is not possible, or the battery compartment temperatures are expected to drop well below freezing (i.e., less than -10°F), the batteries should be removed from the boat and placed in suitable dry storage with maintainers connected and adequate ventilation. While fully charged batteries can withstand hard freezing temperatures, the idea is to increase the life of the batteries by minimizing unnecessary stresses.

In all cases the battery voltage, specific gravity and the water level should be monitored periodically during storage.

D. Recommissioning

Sometimes a battery may get left off a maintainer. It is paramount to give it a full charge before attempting to embark on a voyage. Most batteries will take 48-96 hours to fully charge depending on chemistry, technology, depth of discharge, capacity of maintainer, and general health of the battery.

When preparing to restore batteries back to operation within the boat, it is paramount to test the batteries to ensure they are fully functional. There are two primary aspects to consider - State of Charge (SOC) and State of Health (SOH). A good test device will determine if a "surface charge" is giving a false indication of a good charge state. SOH is not as common as SOC but does indicate remaining useful life of the battery. A test device measures the internal resistance over a frequency range to give you a SOH reading. While it would be prudent to replace a battery if SOH is less than 50 percent, do not put a battery into service that has less than 30 percent SOH. A battery load tester is a general indicator of a battery's ability to provide a cranking current, but it is not as accurate as actual SOC and SOH readings.

Another item of consideration is the quality of the connections being made to the batteries. Inspect for corrosion and poor terminal connections (crimp, corrosion, strand breakage, etc.) prior to restoring batteries to full operation. As required, ensure battery cells have adequate electrolyte fluid levels (**use only distilled water and no metal funnels**) and use a silicone grease on the battery post terminals.

3. Main Battery Switches & Solenoids

NOTICE

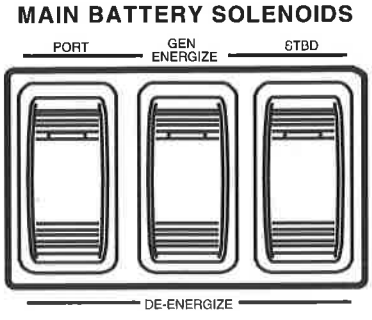
For safety and convenience the following items are not shut off by the battery switches: Bilge pumps, Sump pumps, Stereo memory, Impressed current cathodic protection, Engine control modules, and Battery charger inputs. These items need constant power to perform their task.

The battery solenoids isolate all battery power to the boat, with the exception of the equipment listed in the NOTICE above. The battery solenoids also provide a positive disconnection of the battery to protect against starter engagement and battery rundown.

There are two sets of battery solenoid switches for the 12 volt DC systems. One is located in the Main Disconnect Enclosure or on the DC Breaker Panel located on the engine room component board, and one is located on the DC distribution panel in the cabin. The switches control the battery solenoids which are located in the Main Disconnect enclosure.

If you are leaving the boat for more than two hours and the boat is not connected to shore power which is maintaining the batteries, turn the battery switch(es) to the OFF position.

Battery Solenoid Switches (Main DC Breaker Panel) (Fig. 55.1)



⚠ CAUTION

The switch should never be turned off while the engine is running to avoid damage to the alternator. Switching between batteries should also be avoided while the engine is running unless the switch has been specially designed for this purpose

4. DC POWER DISTRIBUTION

Power is fed from the batteries to the main DC Breaker Panel. This panel feeds power to the Control Station Panel, Electronic Fuse Block, the DC Distribution Panel, the Cabin Fuse Block, and devices located in the bilge.

A. MAIN DISCONNECT ENCLOSURE

The Main Disconnect Enclosure located in the bilge contains the Main Battery Disconnect solenoids and the control switches for these solenoids. This enclosure also contains the main breaker feeds for the Main DC Breaker Panel, swim platform, windlass and gangplank if installed.

B. MAIN DC BREAKER PANEL

The Main DC Breaker Panel, located in the bilge, contains the blower and extinguisher modules, and the main breaker and branch breaker feeds. The main breaker feeds are for the control station panel, electronic fuse block and the DC Main Distribution Panel.

The branch feeds are for the:

- Bilge Pumps
- Sump Pumps
- Oil Change Pump
- Engine Power
- Battery Charger
- Horn Compressor
- Cable Master
- Stereo Memory
- Mercathode®
- Hull Light
- Accessories

C. DC DISTRIBUTION PANEL

The DC Distribution Panel, located in the cabin, contains the branch breaker feeds for:

- Lighting
- Head System
- Fresh Water System
- Stereo/Entertainment Systems
- 12V Receptacles
- Power Vents
- DC Refrigerator/Freezers

D. CONTROL STATION BREAKER PANEL

The control station breaker panel, located under the helm, contains the branch breaker feeds for

- Lighting
- Windshield Wiper/Washer (Lower Helm Only)
- Trim Tab
- Horn
- Navigation Lights
- Fuel Transfer Pump
- Spot Light
- Defroster Relay (Lower Helm Only)
- Hull Lights
- Skylight (Hard Top Option)

E. ELECTRONIC FUSE BLOCK

The electronic fuse block, located under the helm contains the branch feeds for all navigational electronics.

5. FUSES AND BREAKERS

In the event it becomes necessary to replace a fuse or an electrical breaker, REPLACE THE FUSE OR BREAKER ONLY WITH A FUSE OR BREAKER OF THE SAME VOLTAGE AND CURRENT RATING. The amperage and voltage rating are marked on the fuse or breaker. It is recommended that you carry spare fuses and breakers. Refer to individual component user manuals for the proper fuse and breaker sizes.

⚠ WARNING

Use of higher amperage fuses or breakers is a fire hazard.

Use fuses and breakers having the same amperage rating as the original or as specified.

If a fuse or breaker is replaced with one of lower amperage, it will not be sufficient to carry the electrical load of the equipment it is connected to and will cause nuisance failures.

Conversely, if a fuse or breaker is replaced with one of higher amperage, it will not provide adequate protection against an electrical malfunction and could create a possible fire hazard. A fuse or breaker must have a voltage rating equal to or greater than the voltage where it is to be installed.

Some of the various types of fuses and breakers used on your boat are as follows:

Fig. 57.1 is an automotive-type blade ATO/ATC fuse shown being used in an in-line fuse holder.

(FIG. 57.1)

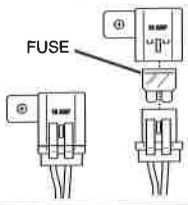
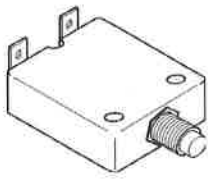


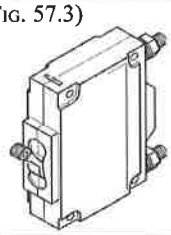
Fig. 57.2 is a thermal breaker. If it trips, the pin will pop out. Push the pin back in to reset.

(FIG. 57.2)



Figures 57.3 and 57.4 are magnetic breakers. If they trip, the toggle or rocker will switch to the OFF position. Simply switch them back to the ON position to reset.

(FIG. 57.3)



The cover on Fig. 57.4 protects it from accidentally being turned off. It can be turned off by inserting a small screwdriver in the slot on the rocker switch.

(FIG. 57.4)

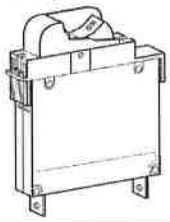


Fig. 57.5 is used to protect high amperage equipment. It is found in the bilge and cockpit. It can be reset by pressing the lever back into the slot.

(FIG. 57.5)

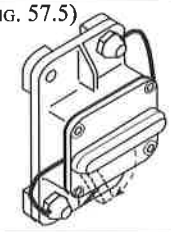
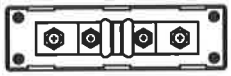


Fig. 57.6 is a current limiting ANL type and if blown must be replaced.

(FIG. 57.6)

Fig. 57.7 is a Class T type fuse and if blown must be replaced.

(FIG. 57.7)



6. AC SYSTEM

NOTE: Actual usage of equipment will depend on the amperage output of the power source available.

⚠ DANGER

EXTREME HAZARD – Swimming near a boat operating on AC electrical system can lead to severe shock and death. Never swim or allow swimming when AC system is in use.

The AC System distributes the power for all the boat's AC equipment and accessories. It is very important to know and understand where the power originates and how it is distributed to the different voltage equipment.

Line voltage (or Phase Voltage) from the shore power is shown by the voltmeter on the main distribution panel (Fig. 58.1-C). The amperage being

used by the onboard equipment is shown by the ammeters on the main distribution panel (58.1-E). The main breakers, or branch breakers, may trip if there is a surge in line voltage, an electrical storm or an on board system overload (Fig. 58.1-A). The main breaker interrupts the hot feed in the AC circuit to prevent equipment damage due to internal overloads and external surges.

A. 120/240 VAC 60 Hz Split Phase (Standard System)

⚠ CAUTION

Never operate 120V shore power at less than 100 V, or 240V shore power at less than 208V unless equipped with a battery transformer.

The 120/240 VAC wiring installed on Sea Ray® boats consists of three (3) or four (4) color-coded wires. The black and red wires are the "hot" feed, white is the common, or neutral, and the green wire is the ground. All branch breakers and switches for AC equipment are installed on the "hot" wire.

B. 230 Volt / 50 Hz Wiring (Optional System)

⚠ CAUTION

Never operate 230V shore power at less than 208 V.

The 230V/50Hz wiring installed on Sea Ray® boats consists of three (3) color-coded wires. The brown wire is the "hot" feed, light blue is the common, or neutral, and the green wire is the ground. All branch breakers and switches for AC equipment are installed on the "hot" wire.

7. Shore Power

A. Shore power Cords

Sea Ray® Sport Yachts are equipped with a 240V/50A shore power cord for hookup to dockside power. The cord is extended or retracted by a Cablemaster™ cable real system. NOTE: Cablemaster™ is not offered on 230V/50Hz systems.

Your boat may be equipped with a second 120V/50A shore power cord connection to provide power to run additional accessories when extra shore power is needed. Plug the cord into the inlet at the stern of the boat and then to the appropriate power receptacle on the dockside pedestal. Follow the dual shore cord placard that is supplied with boat when the option is chosen.

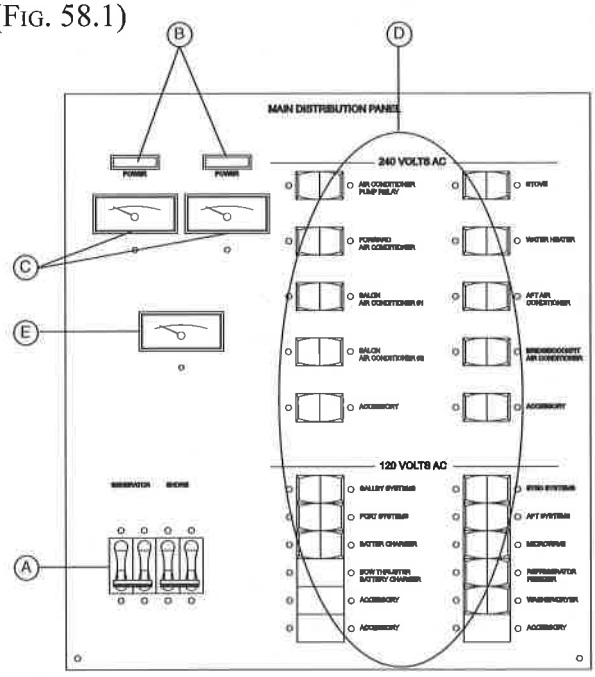
B. Main Shore Power Breaker Box

The 120V/240V main shore power breaker(s) are located in the bilge. The breakers must be on to operate the shore AC Power system.

C. Main Distribution Panel

The Main Distribution Panel typically located in the salon, distributes the power to the boat's AC equipment. It contains the meters that measure voltage and current, the main breakers that feed power coming from the shore or generator, and the branch breakers that distribute the power to the equipment.

Main Distribution Panel (MDP) (Fig. 58.1)



Note: The power panel on your boat may not look exactly like this one.

D. To Connect and Turn on Shore Power

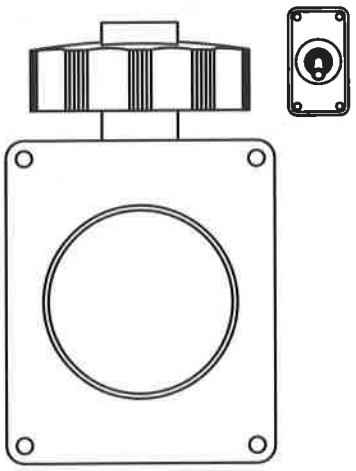
1. **At the Main Distribution Panel**

a. Turn OFF equipment breakers (Fig. 58.1-D)
b. Turn OFF main AC breaker (Fig. 58.1-A)

2. **On the Boat**

a. **240V/60Hz**

Shore Power Receptacle
(Fig. 59.1)



The boat is supplied with a Cablemaster™ System (Fig. 59.1). One end of the shore cord is attached permanently to the boat. Refer to the owner's manual package for detailed instructions on how to use the Cablemaster™ system. Use the Cablemaster™ remote or the control toggle switch located next to the inlet to extend enough cable to reach the Dock Power box.

230V/50Hz:

Dry off the shore power cord receptacle on your boat. Dry off the ends of the shore power cord, and spray a moisture repellent into the receptacle and cord ends.

Plug the cord end into the boat receptacle (Fig. 59.2). Turn clockwise to lock. Thread the locking ring onto the boat receptacle to prevent accidental unplugging.

b. The AC Main Shore Power Breaker, in the bilge, must be ON at all times to operate the shore AC power system.

3. On the Dock

a. Turn OFF Dock Breaker (Fig. 59.2-A).

b. Wipe the outlet dry, spray moisture repellent into the receptacle, then plug the other end of the power cord into the outlet box on the dock (Fig. 59.2-B).

c. Turn ON Dock Breaker (Fig. 59.2-A).

⚠ CAUTION

It is imperative that the shore power outlet is dry before plugging into the dock power inlet.

⚠ CAUTION

Route and tie the power cord from the boat to the dockside power outlet box to prevent persons tripping over it.

⚠ CAUTION

Shore power cord should be secured or routed to avoid laying or falling into water and to avoid stress on shore power plug and inlet.

⚠ CAUTION

The use of extension shore power cords is not recommended. Excessive power cord extensions can cause a voltage drop and may prevent some devices from operating correctly.

4. On the Boat

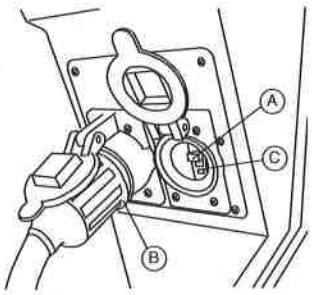
a. POWER Light ON. (Fig. 58.1-B)

(Reverse polarity indicator is not necessary as boat is equipped with an isolation transformer).

b. Turn ON the main AC breaker on the MDP (Fig. 58.1-A).

120/240V or 230 Volt Main Distribution Panel (MDP):

Dock Power Box
(Fig. 59.2)



c. Verify proper system voltage (Fig. 58.1-C).
(240 Volt System: 208V to 250V)
(230 Volt System: 208V to 240V) (International)

d. Turn ON desired Equipment Breakers (Fig. 58.1-D).

B. To Disconnect Shore Power

1. At the Main Distribution Panel

a. Turn OFF equipment breakers (Fig. 58.1-D).

b. Turn OFF main AC breaker on the MDP (Fig. 58.1-A).

2. On the Dock

a. Turn OFF the dockside breaker (Fig. 59.2-A).

d. Disconnect the dockside end of the power cord (Fig. 59.2-B).

3. On the Boat

120/240V 60Hz:

a. Clean the cord and spray end with moisture repellent.
b. Using the Clablemaster™ remote or toggle switch, retract the cord into the housing (Fig. 59.1).
c. Close the cover.

For 230V/50Hz:

a. Disconnect the power cord from your boat receptacle (Fig. 59.1).
b. Clean the power cord, spray the cord ends with moisture repellent, and store the cord in a dry location on board.

You must keep the shore power cord and the plug ends clean and dry. This is especially necessary if your boat is used in salt water. Always clean and spray your cord ends with moisture repellent before using and before storing the cord.

C. Isolation Transformers

Your boat is equipped with an isolation transformer on the shore power line. This device isolates the boat power from shore power via the magnetic coupling of the transformer. In addition if you have purchased the optional boosting transformer, you can use your boat at marinas that offer 208V single phase without having issues of low voltage.

A boat equipped with an isolation transformer will not have a reverse polarity light on the panel. Instead you will have green lights to indicate that power is available at the line side of the main breakers on the main Distribution Panel (MDP).

The green conductor of the shore power is connected to shield of the Isolation Transformer located in the engine compartment. The shield separates the primary (input) and secondary (output) sides of the transformer and keeps the primary side from shorting to the secondary side. A second ground wire is connected to the case of the transformer and it is this wire that connects to the Common Neutral/Grounding Bus located behind the MDP. The ground and neutrals from all sources (i.e., transformers, inverters, and generators) are connected to this Common Neutral/Grounding Bus.

The transformer acts as a new power system isolating the boat from direct contact with the power coming from the shore. This is beneficial as it supplies proper polarization, eliminates corrosion issues occurring due to current on the ground wire, and provides a measure of personal protection as it reduces the possibility of stray in water current. Because the boat is isolated from shore, care must be taken to prevent a direct return path to ground. The TV Coax has an isolator installed to prevent the TV antenna from grounding the AC system to shore.

A boat equipped with the optional Boosting Isolation Transformer will boost the output voltage to 240VAC when the input voltage drops below 208VAC.

REFER TO THE OWNER'S MANUAL PACKAGE FOR INSTRUCTIONS AND WARRANTY INFORMATION.

D. Maintenance for Shore Power Cable and Shore Power Inlet

⚠ WARNING

Disconnect the power cable from power source before performing maintenance.

The metallic parts of your cable and inlet are made to resist corrosion. In salt water environment, life of the product can be increased by periodically wiping the exposed parts with fresh water, drying and spraying with a moisture repellent.

A soiled cable can be cleaned with grease-cutting household detergent. A periodic application of vinyl protector will help both ends and cable maintain their original appearance.

In case of salt water spray or immersion: Rinse plug end and/or connector end thoroughly in fresh water, shake or blow out excess water and allow to dry. Spray with a moisture repellent before reuse. Keep shore power inlet protector cover in place when not in use.

NOTICE

Pre-start generator prior to getting underway as there is a possibility that it will not pick up water if started underway. Make sure the MAIN GENERATOR breaker is OFF and there is no load on the generator before starting it.

8. STARTING THE GENERATOR

Sea Ray® strongly urges you to fully comply with the manual provided by the generator manufacturer. The generator is warranted separately by the generator manufacturer, NOT Sea Ray®. Follow the recommended maintenance and warranty schedule in your Generator Operator's Manual included in the Owner's Manual Package. Generator abuse or improper maintenance may adversely affect claims made under generator manufacturer separate warranty.

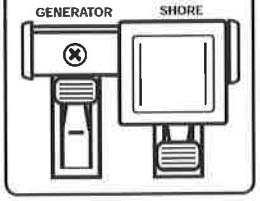
⚠ WARNING

DO NOT run the engine or generator in an enclosed area, such as a closed boat house, as there is the possibility of buildup and inhaling of carbon monoxide.

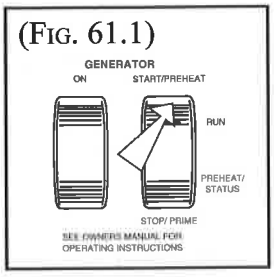
(Remote control switches are located on the main distribution panel or local switches on the generator.)

1. Check fuel tank levels.
2. Check oil and coolant levels. See Generator Operator's Manual for proper readings.
3. Check generator for coolant drain plug installation.
4. Open the generator seacock.
5. Run the bilge blowers for at least four minutes before starting and continuously any time the generator is running. **If fuel fumes are detected, do not start the generator until the source of fumes is determined and corrected and the bilge area is safely ventilated.**
6. Turn ON the battery solenoid.
7. Press the "ON" switch (Fig. 61.1). Supplies power to Auto Fire Extinguisher and Systems Monitor on helm to monitor generator.
8. Depress and hold the "START/PREHEAT" switch. The starter motor will run, thereby cranking the generator engine.
9. Release the "START/PREHEAT" switch when generator starts.
10. Check generator exhaust (port) to verify that water is flowing. If not, shut generator down and refer to your Generator Operator's Manual.

(FIG. 61.2)



(FIG. 61.1)



REFER TO THE GENERATOR MANUAL FOR YOUR BOAT IN THE OWNER'S MANUAL PACKAGE.

9. SHIFTING FROM SHORE POWER TO GENERATOR POWER

The following instructions cover only Sea Ray® Sport Cruisers with a conventional hard wired electrical system.

1. Turn all AC systems and branch circuit breakers OFF. Turn main breakers on the main distribution panel OFF. (Fig. 58.1-A & D)
2. Start the generator.
3. Slide the source select shuttle mechanism on the main distribution panel to expose the GENERATOR breaker(s) and turn it ON (Fig. 61.2).
4. Turn the individual system breakers ON (Fig. 58.1-D).

10. STOPPING THE GENERATOR

1. Prior to generator shut down turn OFF all AC equipment and breakers including main breakers (Fig. 58.1-A&D) and allow the generator to run a few minutes to cool down.
2. Stop the generator by pressing the bottom of both generator switches or pressing the stop switch on the generator (Fig. 61.1).

REFER TO THE GENERATOR MANUAL FOR YOUR BOAT IN THE OWNER'S MANUAL PACKAGE.

11. BATTERY CHARGER/CONVERTER

The battery charging unit located on the bilge component board is fully automatic and is designed specifically for the marine environment. The high frequency characteristic has allowed these chargers to achieve a huge size and weight reduction over previously used equipment. Commonly called maintainers, high frequency or smart chargers, these units bring a new sophistication to the battery charger field.

⚠ WARNING

Never block air circulation through the unit. Never store any gear on top of the units.

NOTICE

Leave the converter running at all times to maintain the 12 volt system voltage.

12. Ground Fault Interrupter Receptacle (GFI)

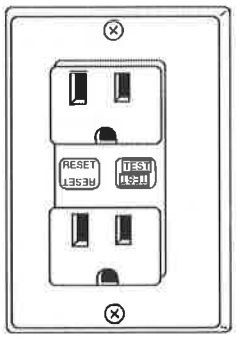
At least one ground fault interrupter receptacle is installed in the boat. Please read and understand the CAUTION block for GFI receptacles.

The GFI receptacle is designed to protect people from the line-to-ground shock hazards which could occur from defective power tools or appliances operating from this device, or from down-line outlets protected by it. It does not prevent line-to-ground electric shock, but does limit the time of exposure to a period considered safe for otherwise normally healthy persons. It does not protect persons against line-to-line or line-to-neutral faults.

⚠ CAUTION

Persons with heart problems or other conditions which make them susceptible to electric shock may still be injured by ground faults on circuits protected by the GFI receptacle. No safety devices yet designed will protect against all hazards or carelessly handled or misused electrical equipment or wiring.

GFI Outlet
(Fig. 62.1)

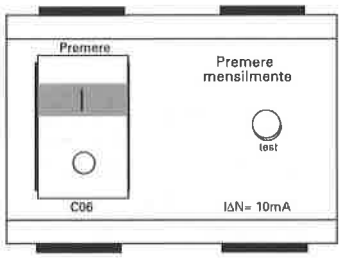


The GFI receptacle does not protect against short circuits or overloads. This is the function of the circuit breaker.

International Receptacle

If equipped, all readily accessible 220V outlets are protected by a Residual Current Circuit Breaker (RCCB). This current breaker includes a test switch to verify proper operation. Its function is similar, but not identical to the 120V GFI.

RCCB Outlet
(Fig. 62.2)



REFER TO OWNER'S MANUAL PACKAGE FOR INSTRUCTIONS AND WARRANTY INFORMATION.

13. Inverter (Optional)

Your boat may be equipped with a 120V AC inverter. The inverter provides power to 120V AC outlets throughout the boat and to the microwave oven in the galley. Power to these systems from the shore power connection or generator passes through the inverter.

⚠ WARNING

ELECTRICAL SHOCK HAZARD

If vessel is equipped with a DC to AC power inverter, in addition to disconnecting all AC power to the vessel, disconnect inverter DC input before servicing vessel's electrical systems.

The inverter automatically detects the presence of external AC power and switches between the inverter and charger modes. If AC power is available from the shore power connection or generator, the inverter passes that power to the connected systems as well as to its internal battery charger to recharges its dedicated battery bank. If no AC power is available, or if the power from the shore power or generator are interrupted, the inverter switches to draw power from its dedicated battery bank and to supply power to the connected AC systems.

The DC power side of the inverter is protected by a battery switch and fuse located under the hatch in the aft stateroom bunk. The AC side of the inverted is protected by a circuit breaker on the MDP. A control panel display unit is also located at the MDP. This control panel display unit provides information on the condition of the inverter/charger and provides the ability to turn the unit ON and OFF.

NOTE: WHEN LEAVING THE BOAT FOR AN EXTENDED PERIOD OF TIME WITHOUT EXTERNAL AC POWER, THE INVERTER MUST ALSO BE TURNED OFF IN ORDER TO SHUT OFF POWER TO THE CONNECTED AC SYSTEMS, AND KEEP FROM DEPLETING THE INVERTER BATTERIES.

REFERENCE BATTERY SECTION FOR ADDITIONAL INFORMATION.

REFER TO OWNER'S MANUAL PACKAGE FOR THE COMPLETE SET OF INVERTER OPERATING INSTRUCTIONS AND WARRANTY INFORMATION.

14. ELECTRICAL SCHEMATICS

This owner's manual contains electrical schematics and wiring harness illustrations for your boat. These electrical schematics were generated by electrical CAD designers at the engineering division for technical reference and service technicians. Sea Ray® does not recommend that you attempt to work on the boat's electrical system yourself. Instead, we recommend that you take your boat to your authorized Sea Ray® dealer for service. Sea Ray® reserves the right to change or update the electrical system on any model at any time without notice to the consumer and is NOT obligated to make any updates to units built prior to changes.

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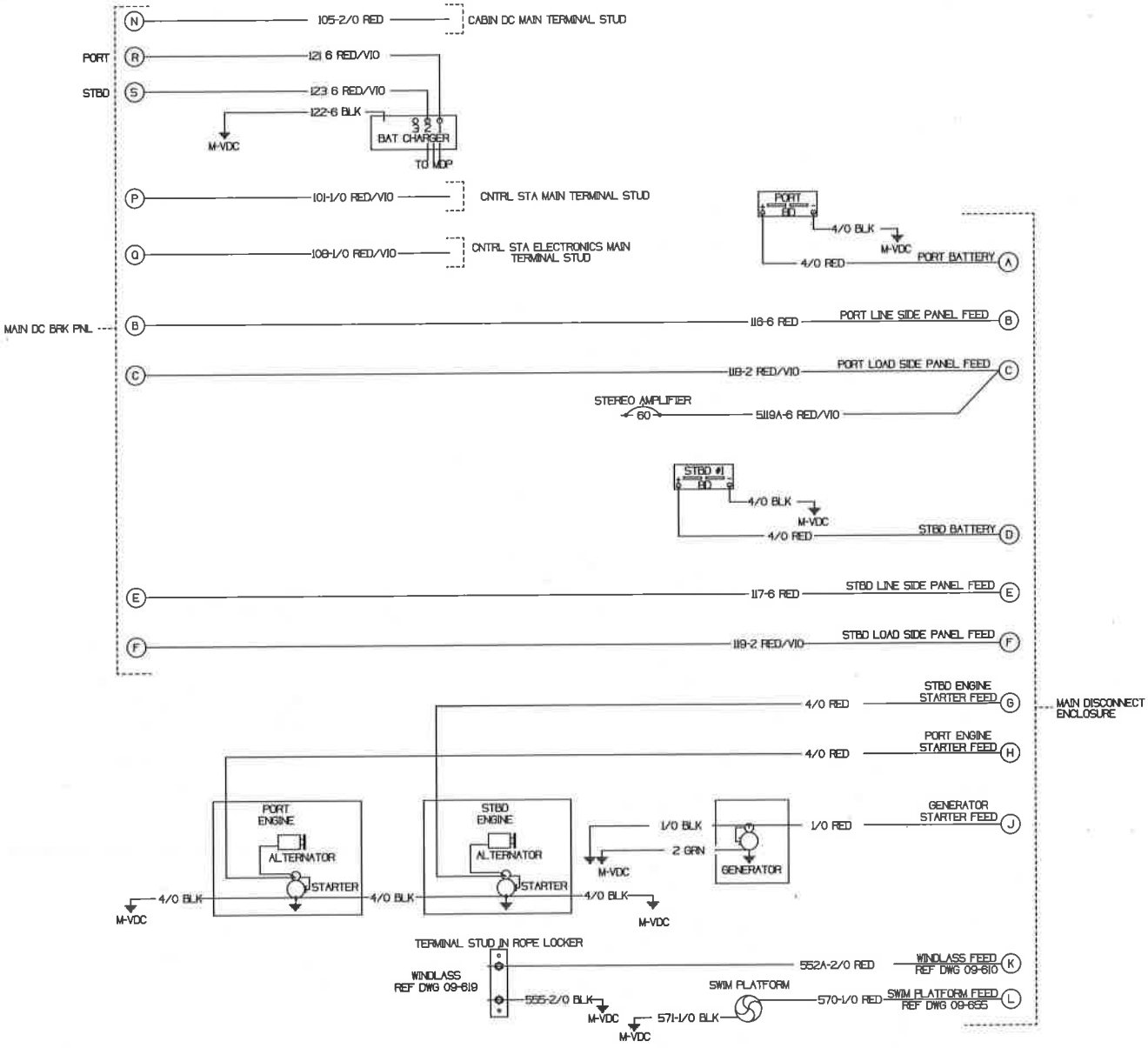
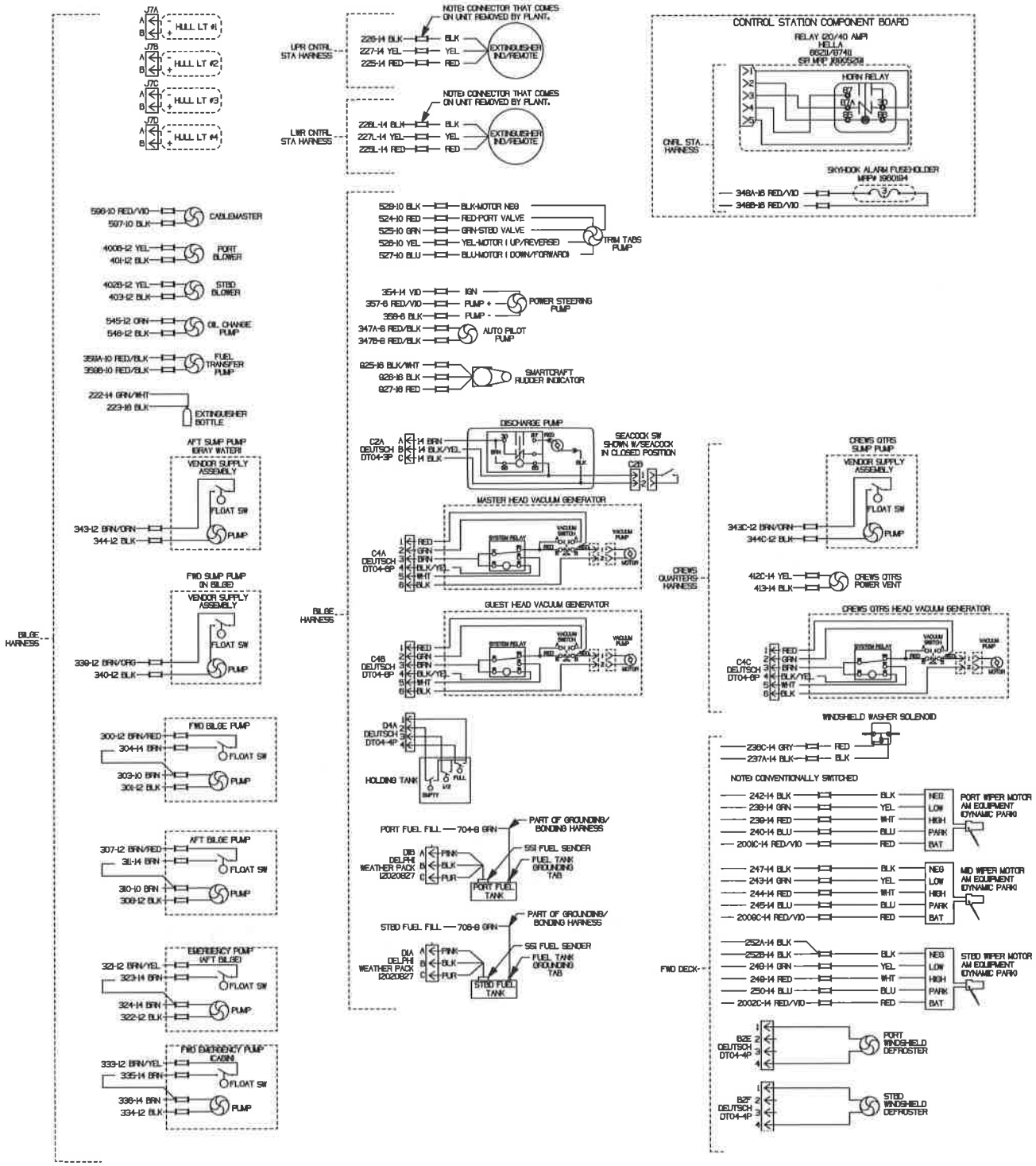
DC Wiring Schematic V-Drive
Drawing No. 09-601 (1 of 8)
(Fig. 65.1)



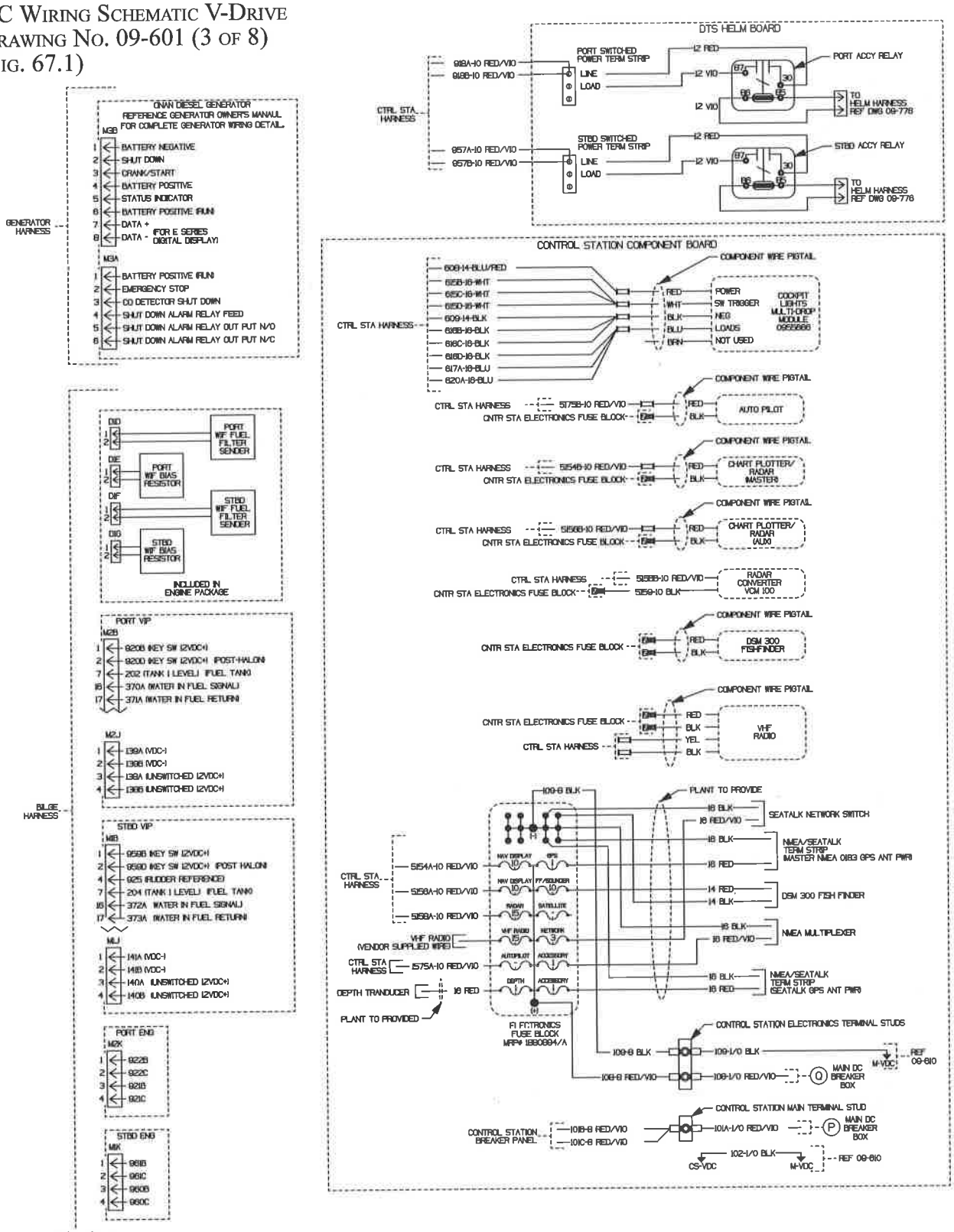
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC WIRING SCHEMATIC V-DRIVE
DRAWING NO. 09-601 (2 OF 8)
(FIG. 66.1)



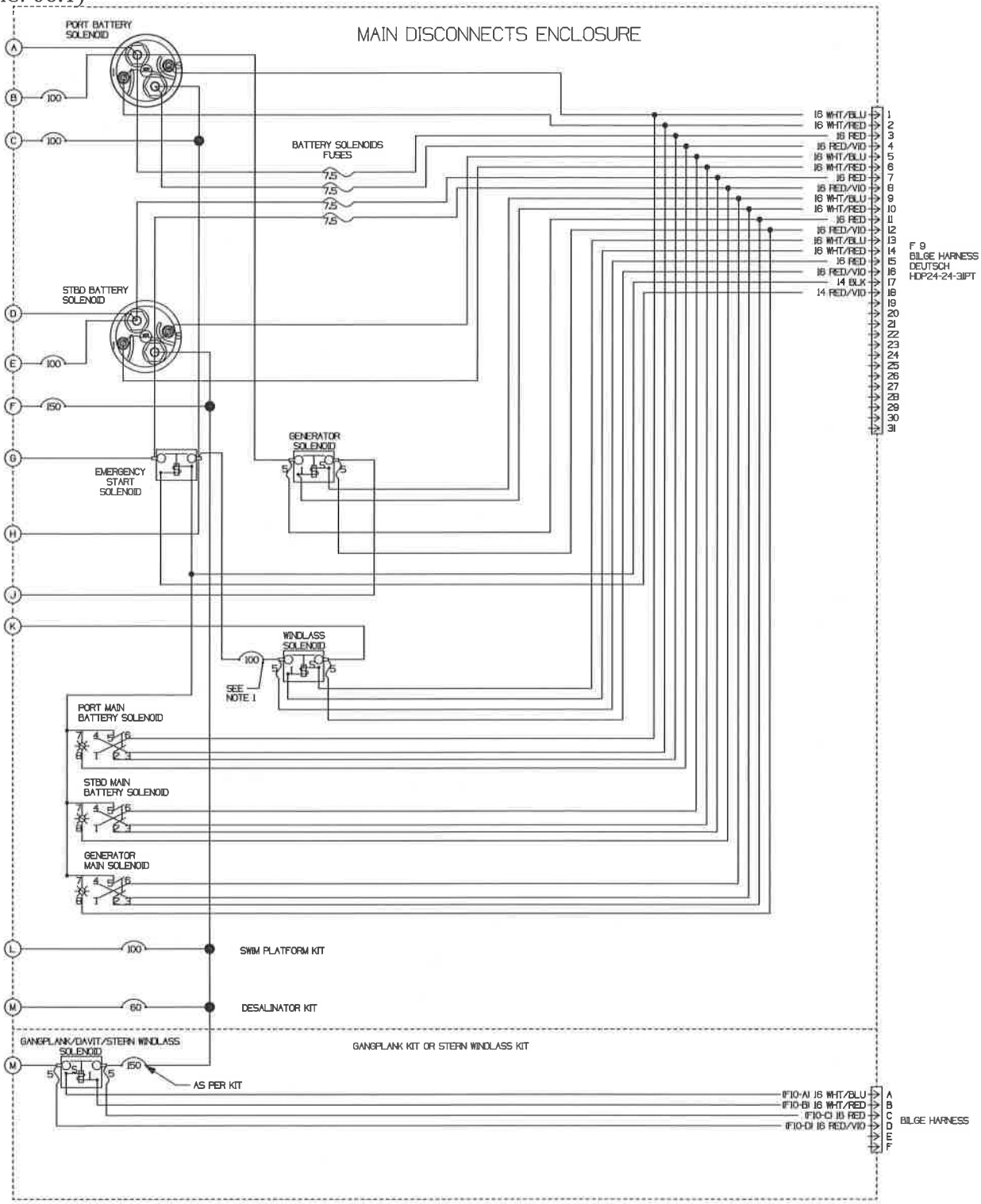
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC WIRING SCHEMATIC V-DRIVE DRAWING NO. 09-601 (3 OF 8) (FIG. 67.1)



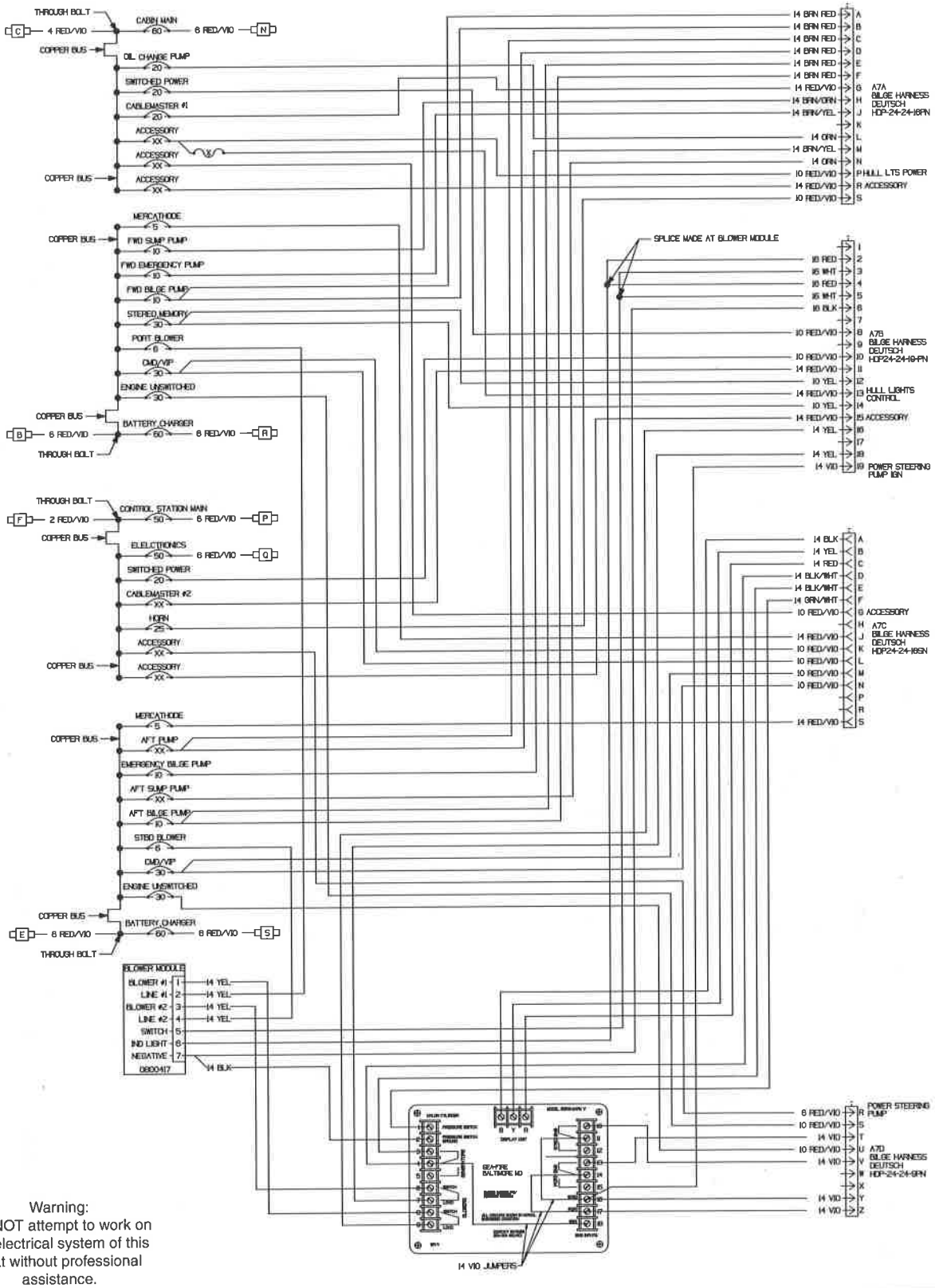
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC Wiring Schematic V-Drive
Drawing No. 09-601 (4 of 8)
(Fig. 68.1)



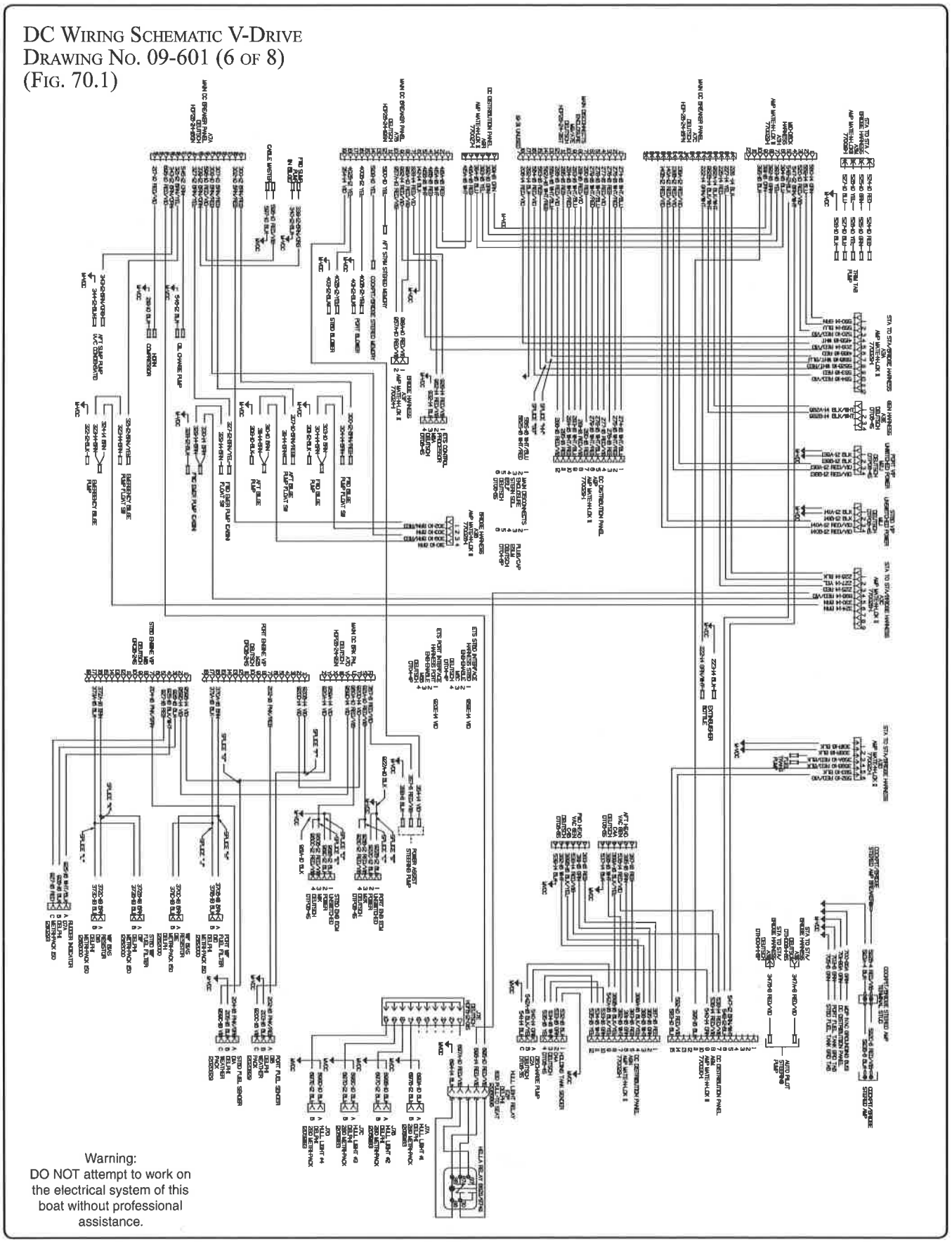
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC Wiring Schematic V-Drive
Drawing No. 09-601 (5 of 8)
(Fig. 69.1)



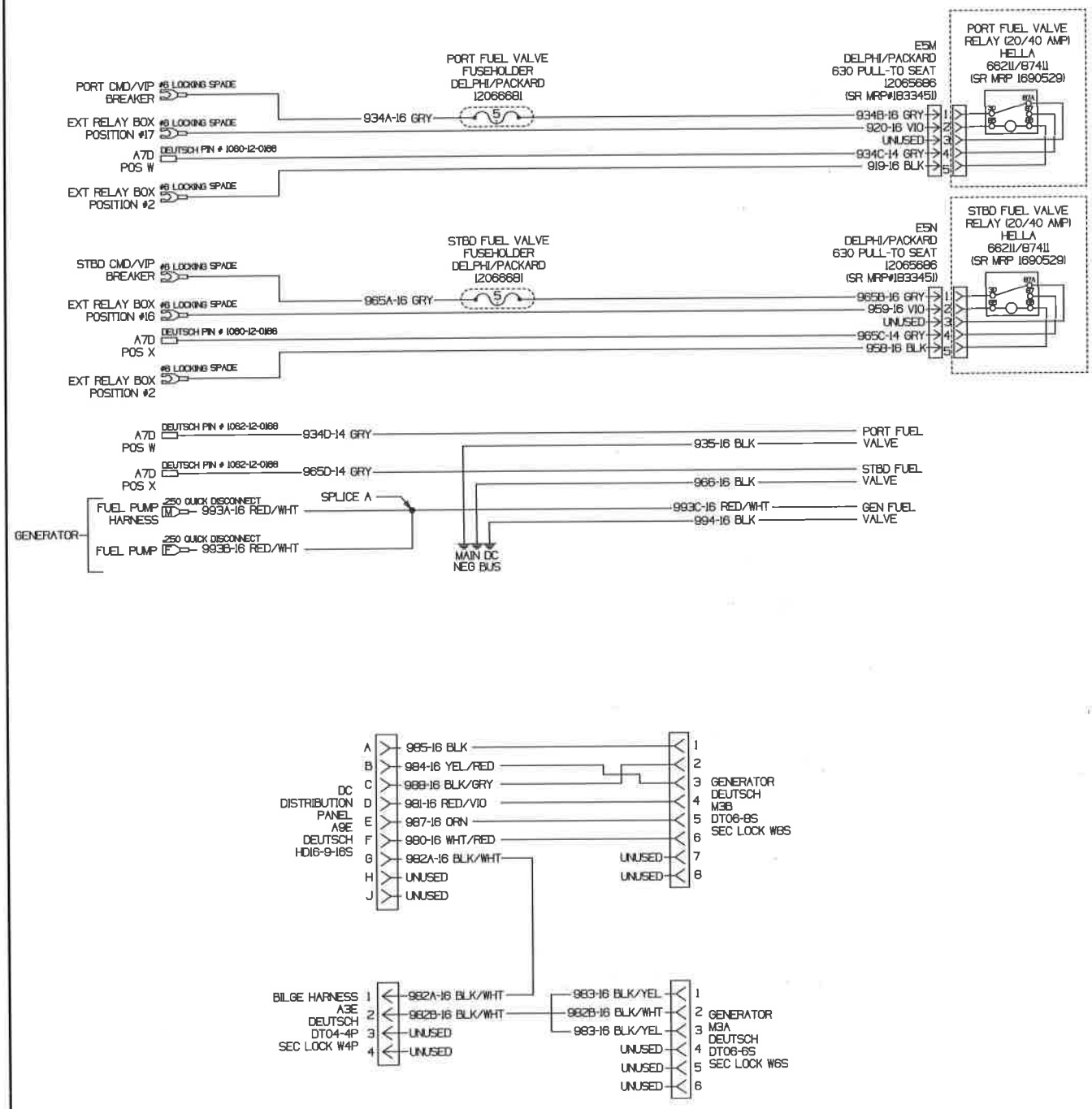
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC Wiring Schematic V-Drive
Drawing No. 09-601 (6 of 8)
(Fig. 70.1)



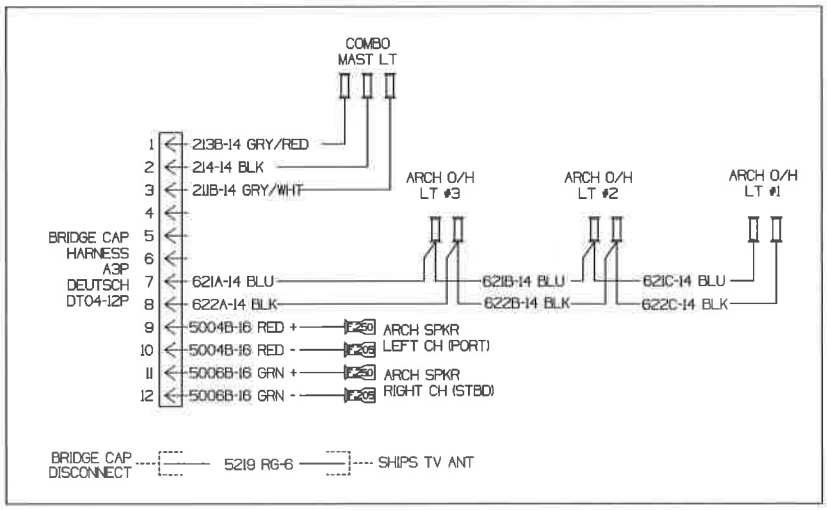
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

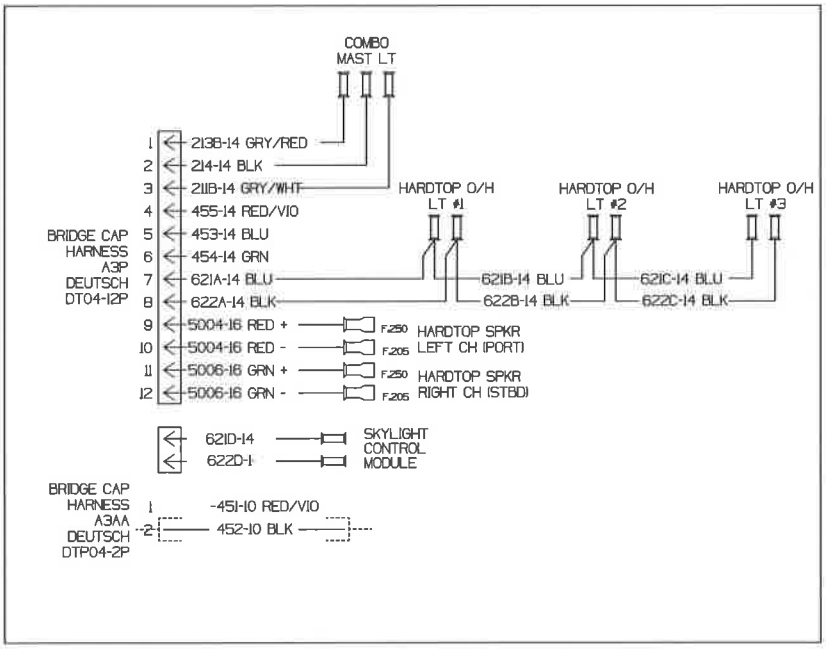
DC Wiring Schematic V-Drive
Drawing No. 09-601 (7 of 8)
(Fig. 71.1)

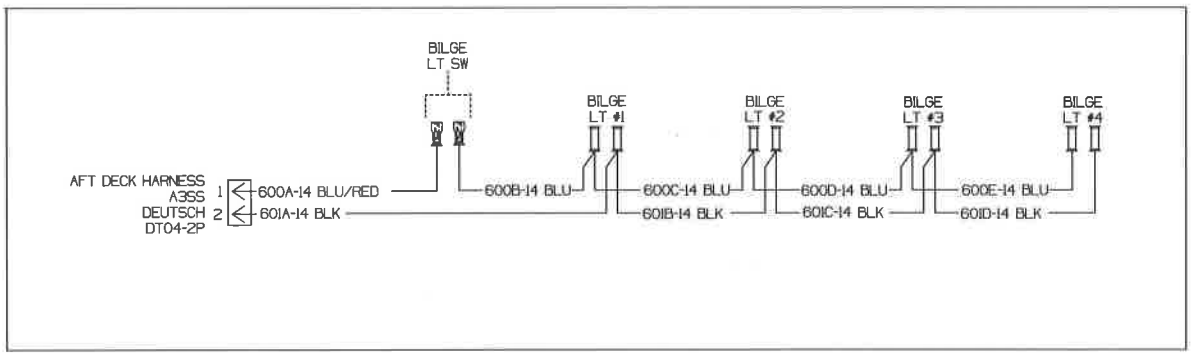


Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC Wiring Schematic V-Drive
Drawing No. 09-601 (8 of 8)
(Fig. 72.1)

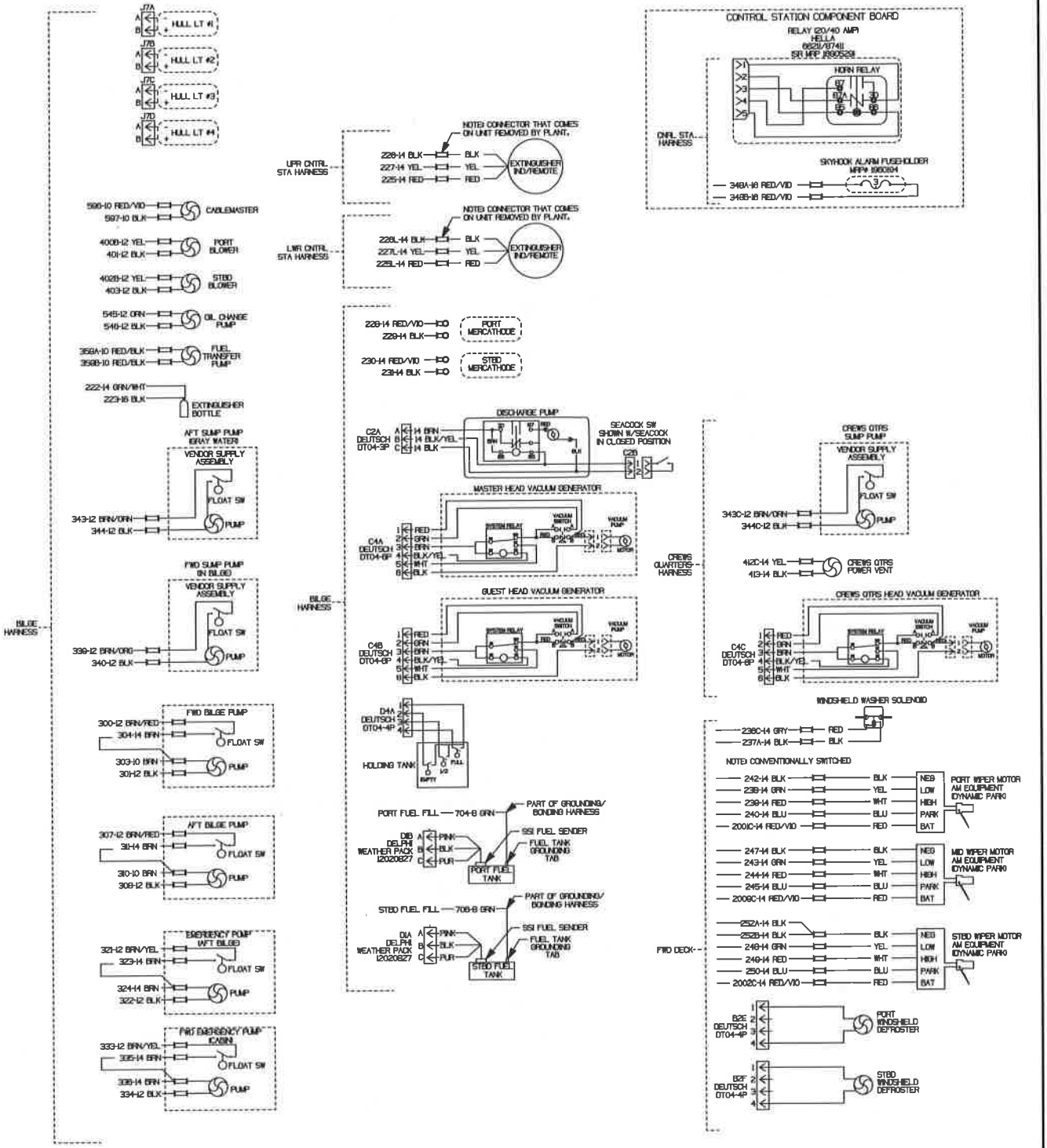






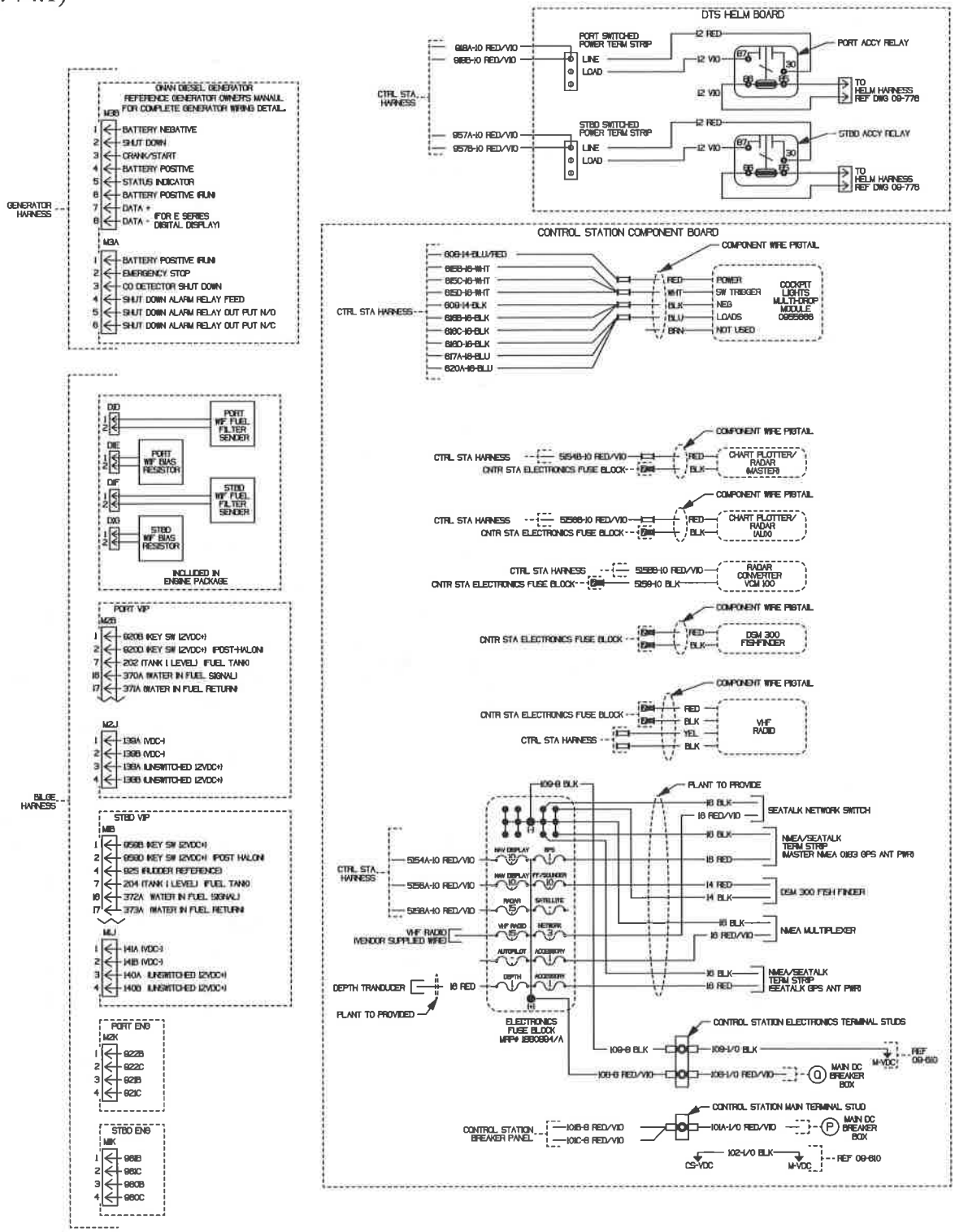
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC Wiring Schematic ZEUS
Drawing No. 09-602 (1 of 13)
(Fig. 73.1)



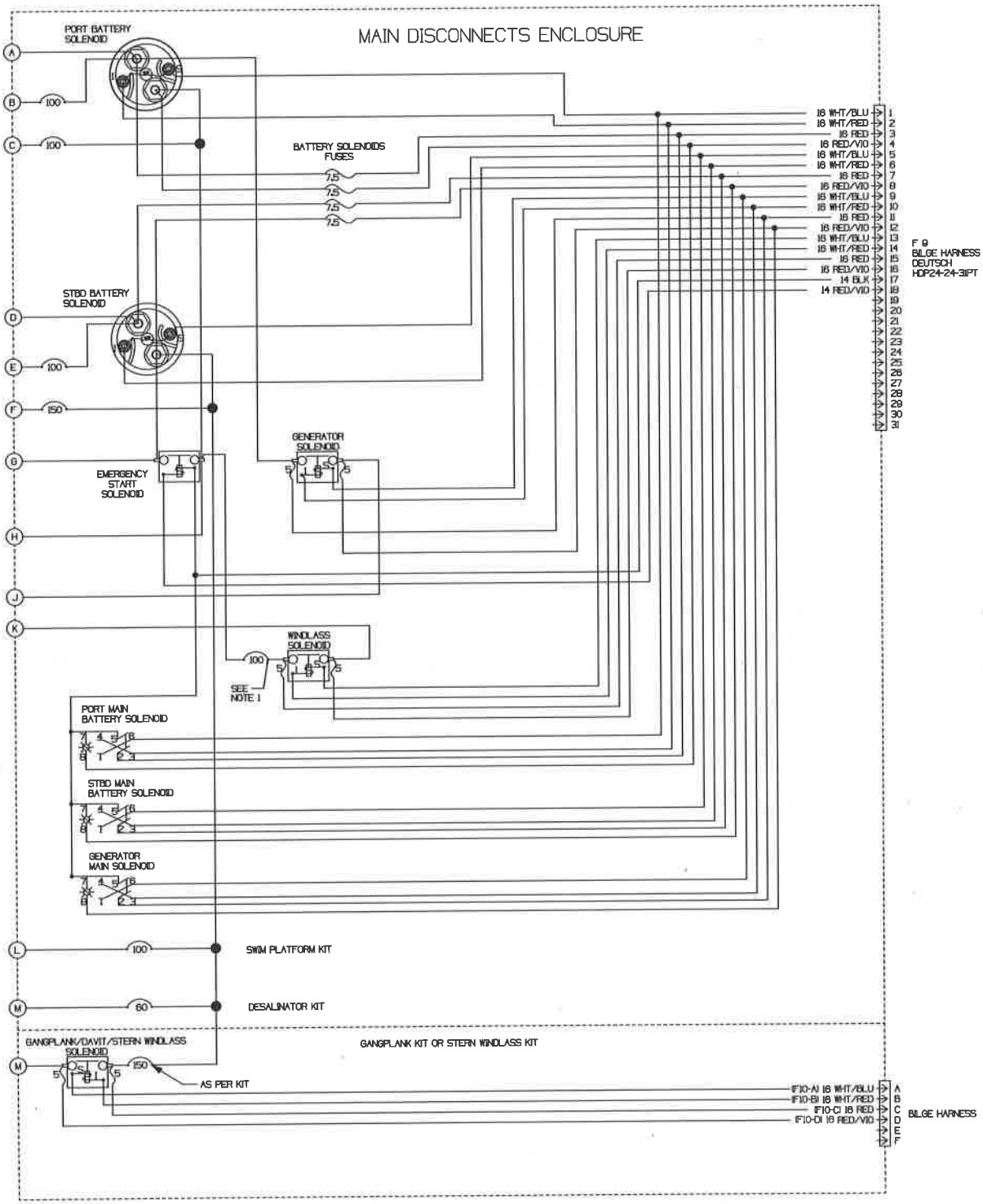
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC WIRING SCHEMATIC ZEUS
DRAWING NO. 09-602 (2 OF 13)
(FIG. 74.1)



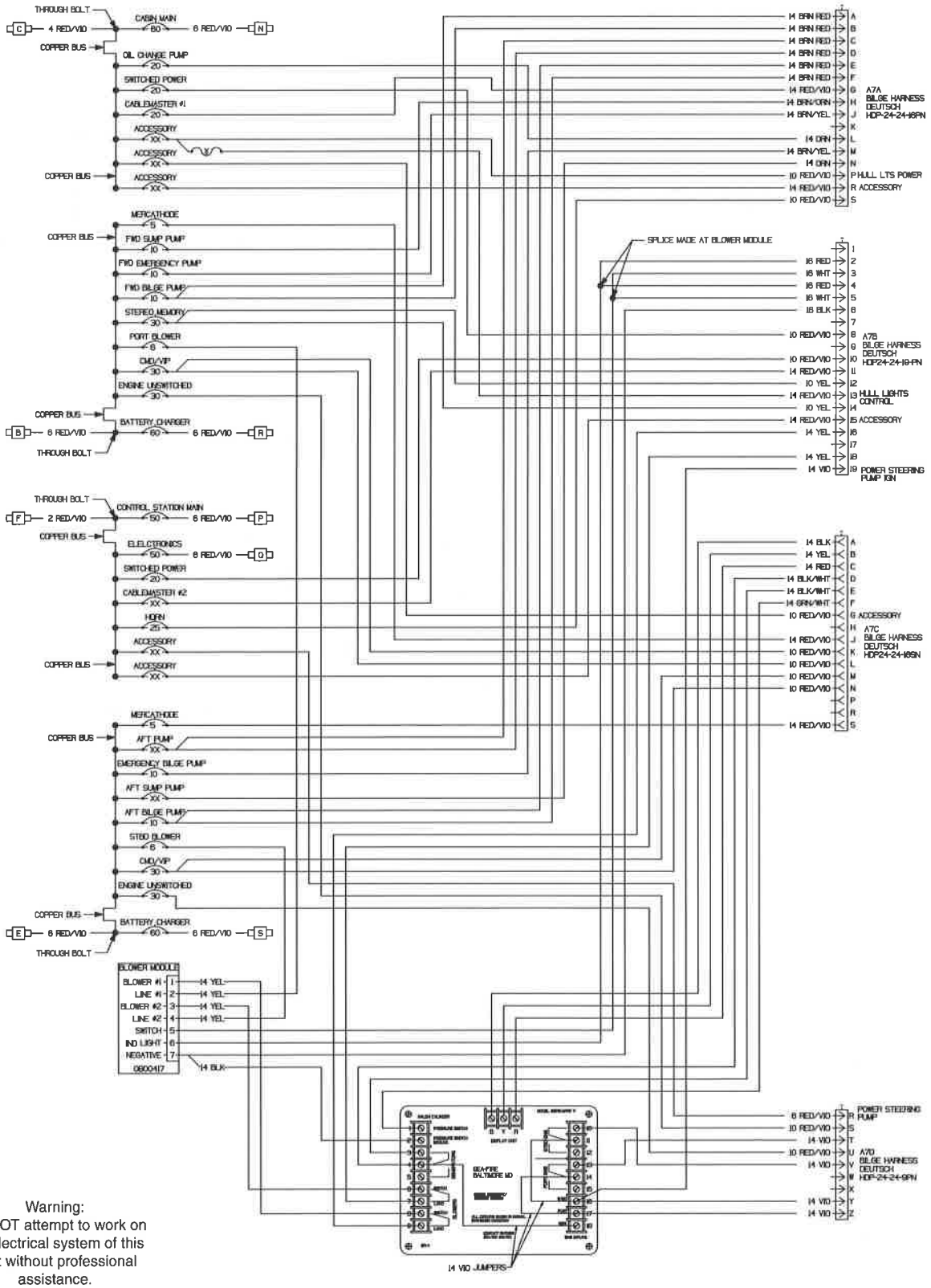
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC Wiring Schematic ZEUS
Drawing No. 09-602 (3 of 13)
(Fig. 75.1)



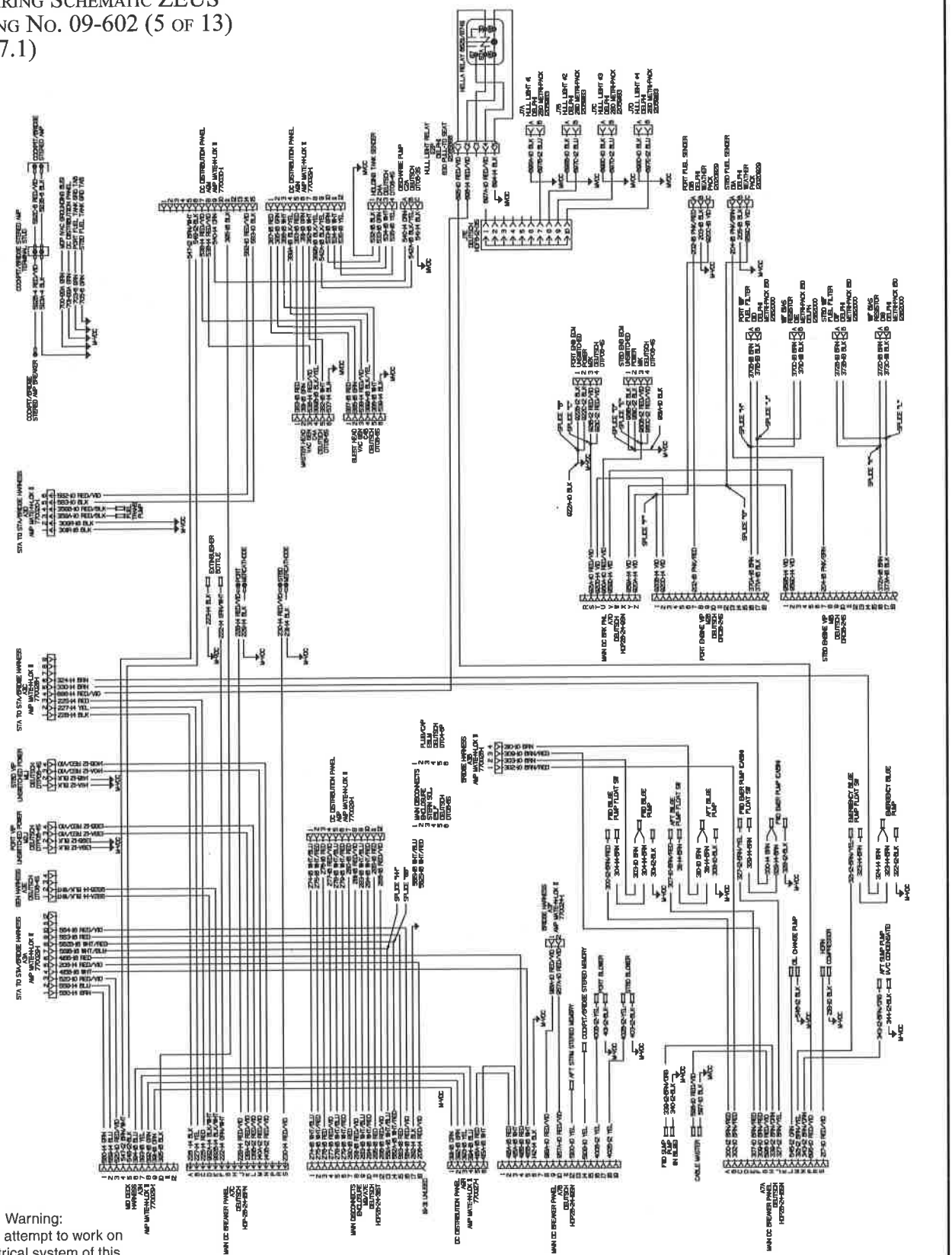
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC WIRING SCHEMATIC ZEUS
DRAWING NO. 09-602 (4 OF 13)
(FIG. 76.1)



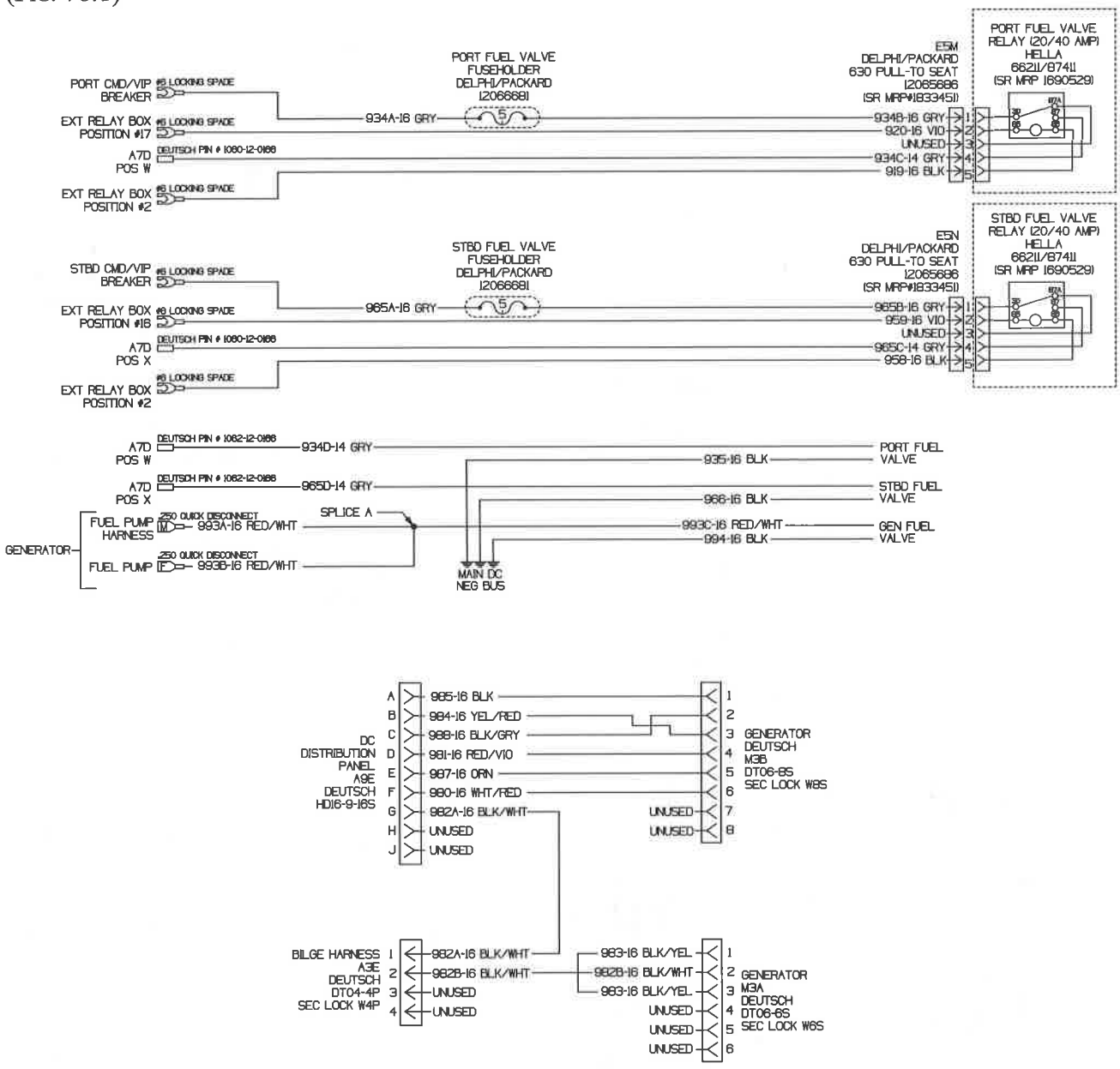
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC Wiring Schematic ZEUS
Drawing No. 09-602 (5 of 13)
(Fig. 77.1)



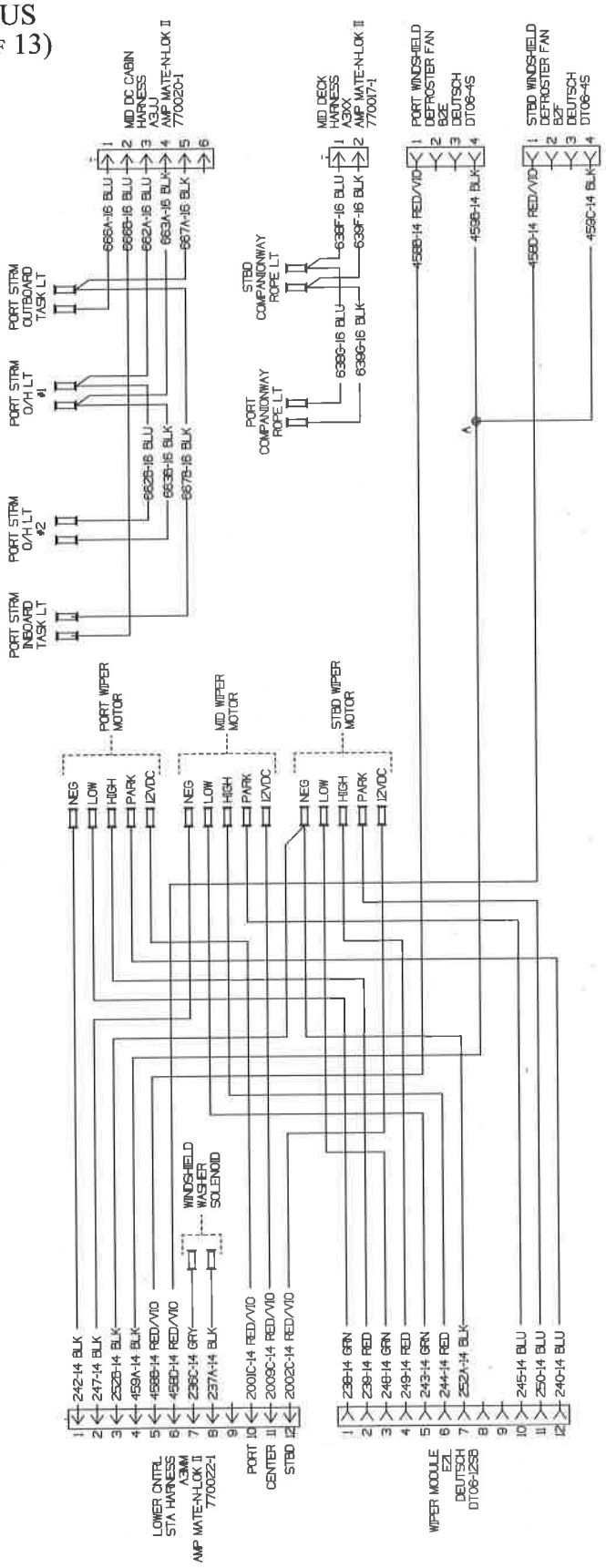
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC WIRING SCHEMATIC ZEUS
DRAWING NO. 09-602 (6 OF 13)
(FIG. 78.1)



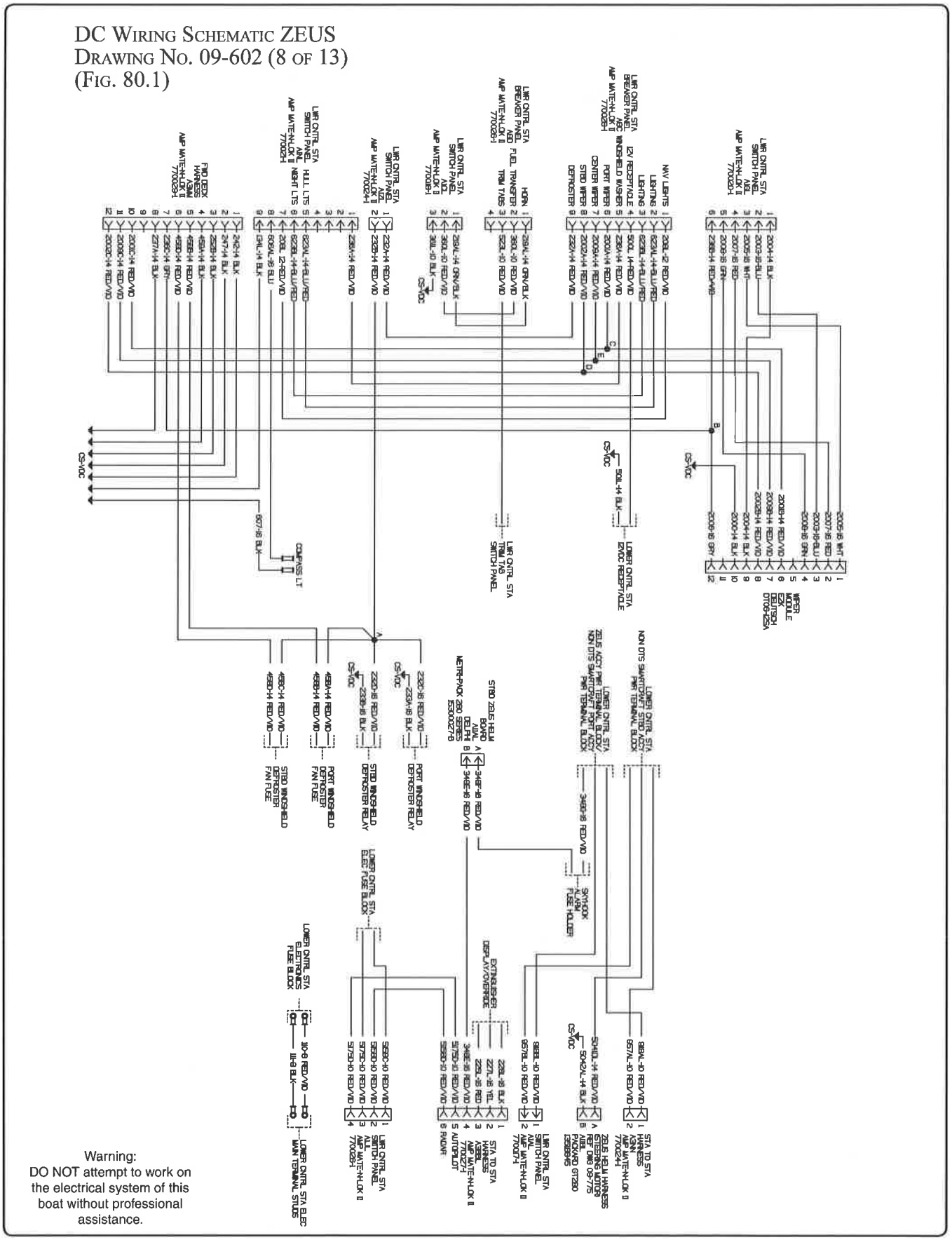
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC WIRING SCHEMATIC ZEUS
DRAWING NO. 09-602 (7 OF 13)
(FIG. 79.1)



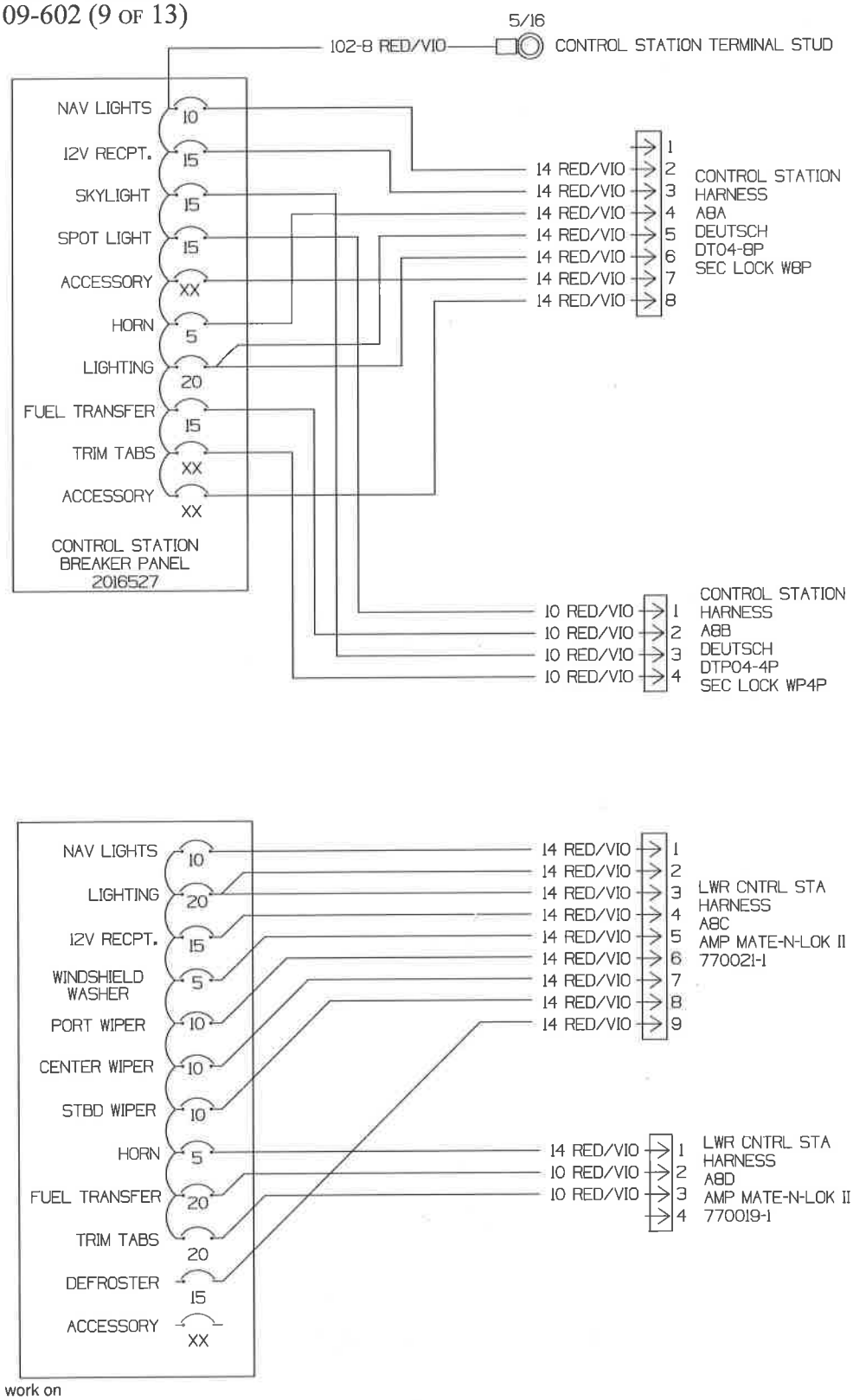
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC Wiring Schematic ZEUS
Drawing No. 09-602 (8 of 13)
(Fig. 80.1)



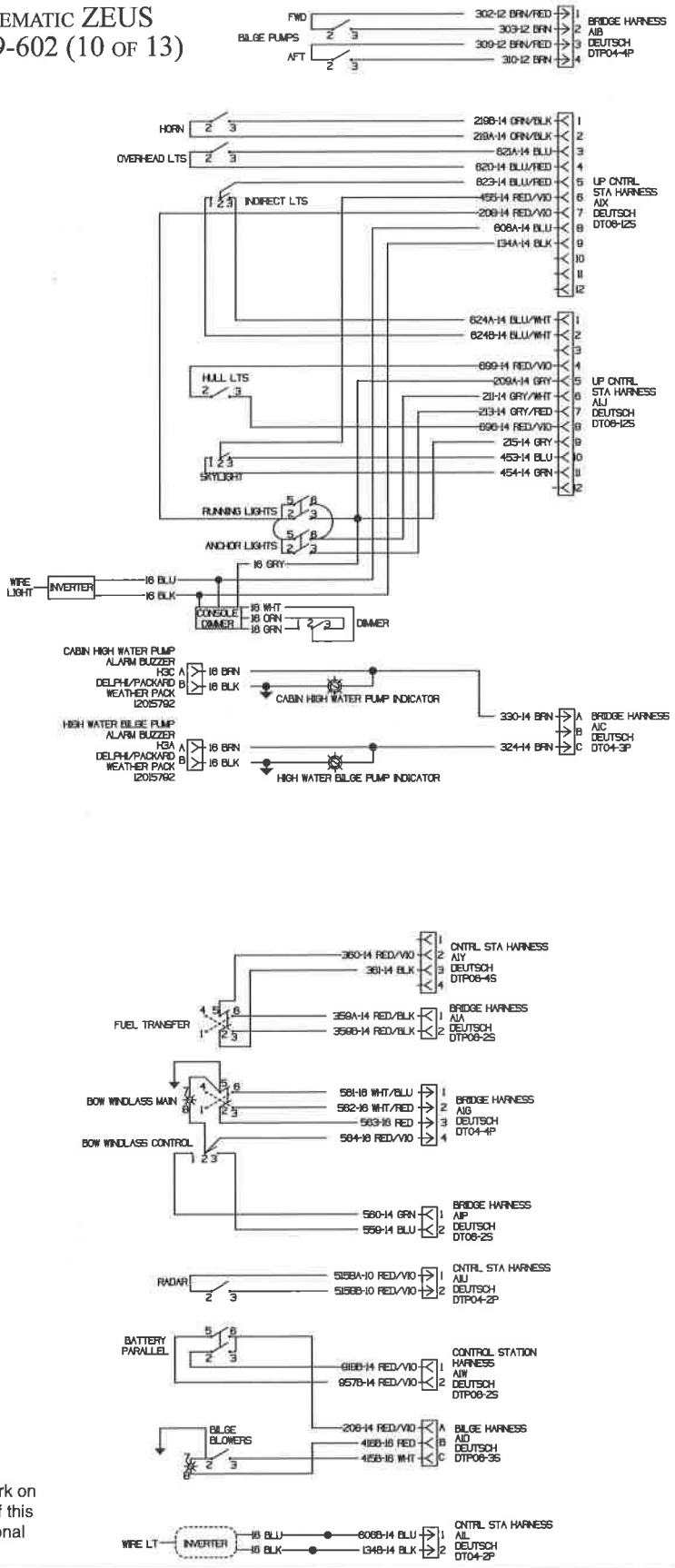
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC WIRING SCHEMATIC ZEUS
DRAWING NO. 09-602 (9 OF 13)
(FIG. 81.1)



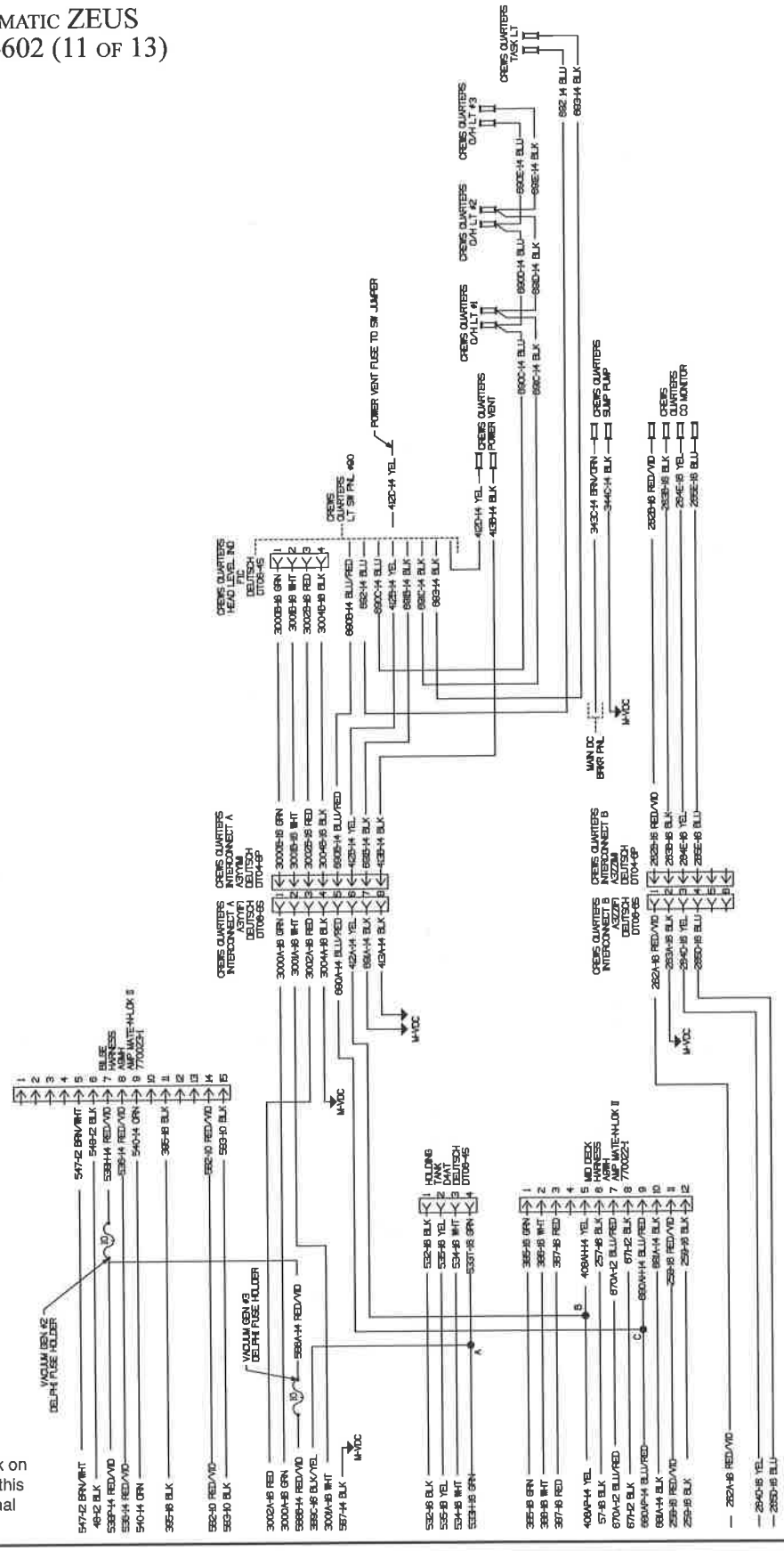
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC Wiring Schematic ZEUS
Drawing No. 09-602 (10 of 13)
(Fig. 82.1)



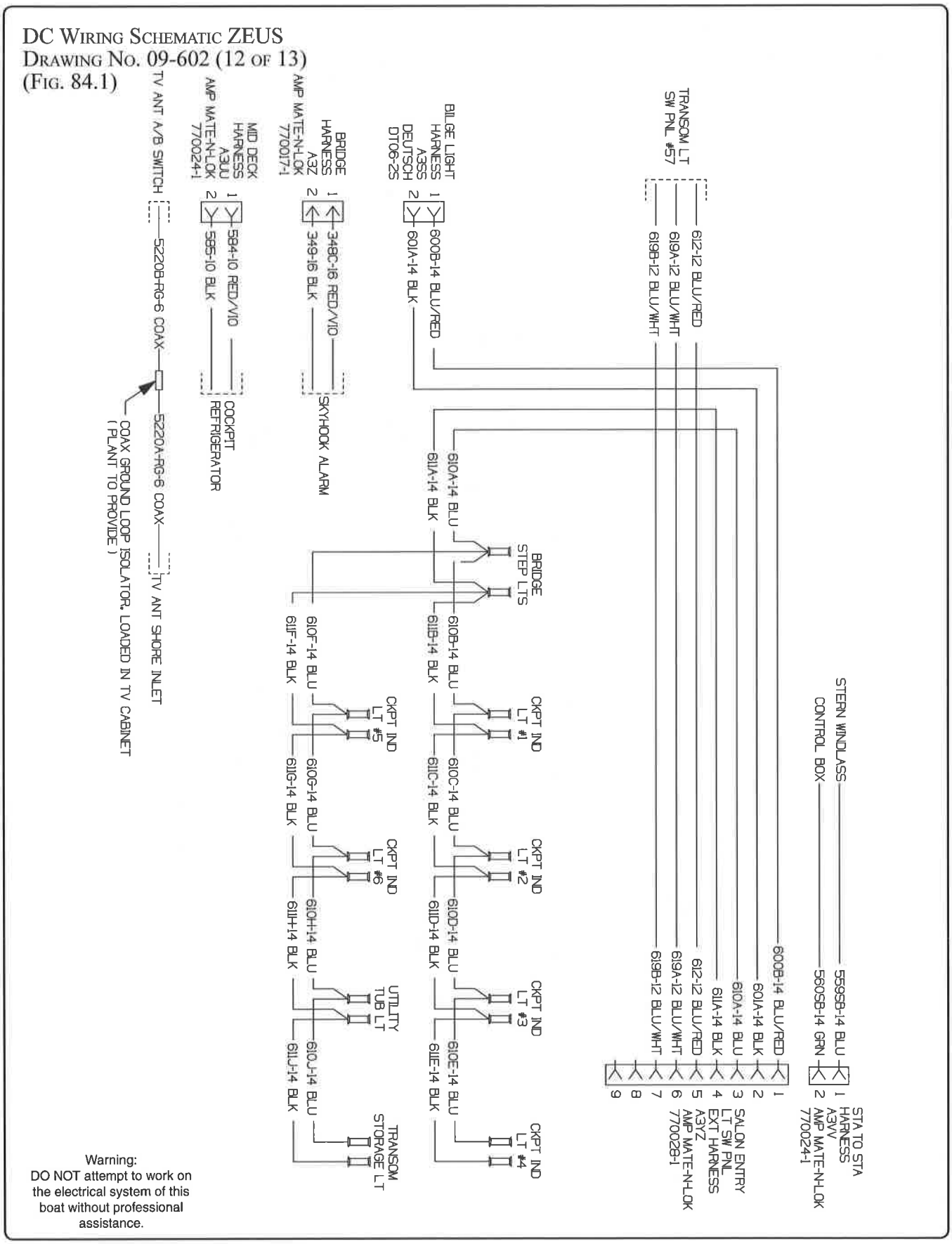
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC WIRING SCHEMATIC ZEUS
DRAWING NO. 09-602 (11 OF 13)
(FIG. 83.1)



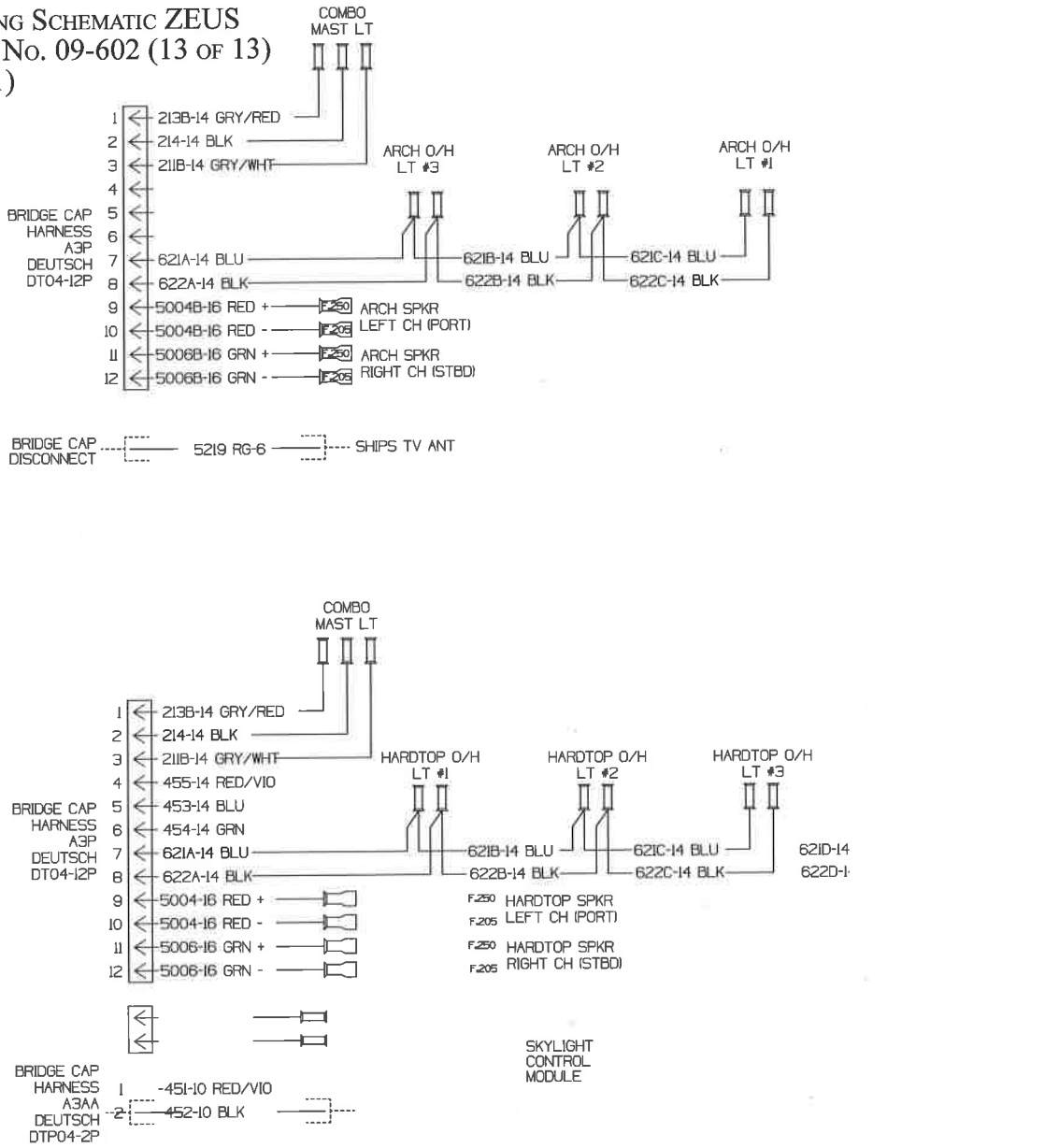
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC Wiring Schematic ZEUS
Drawing No. 09-602 (12 of 13)
(Fig. 84.1)



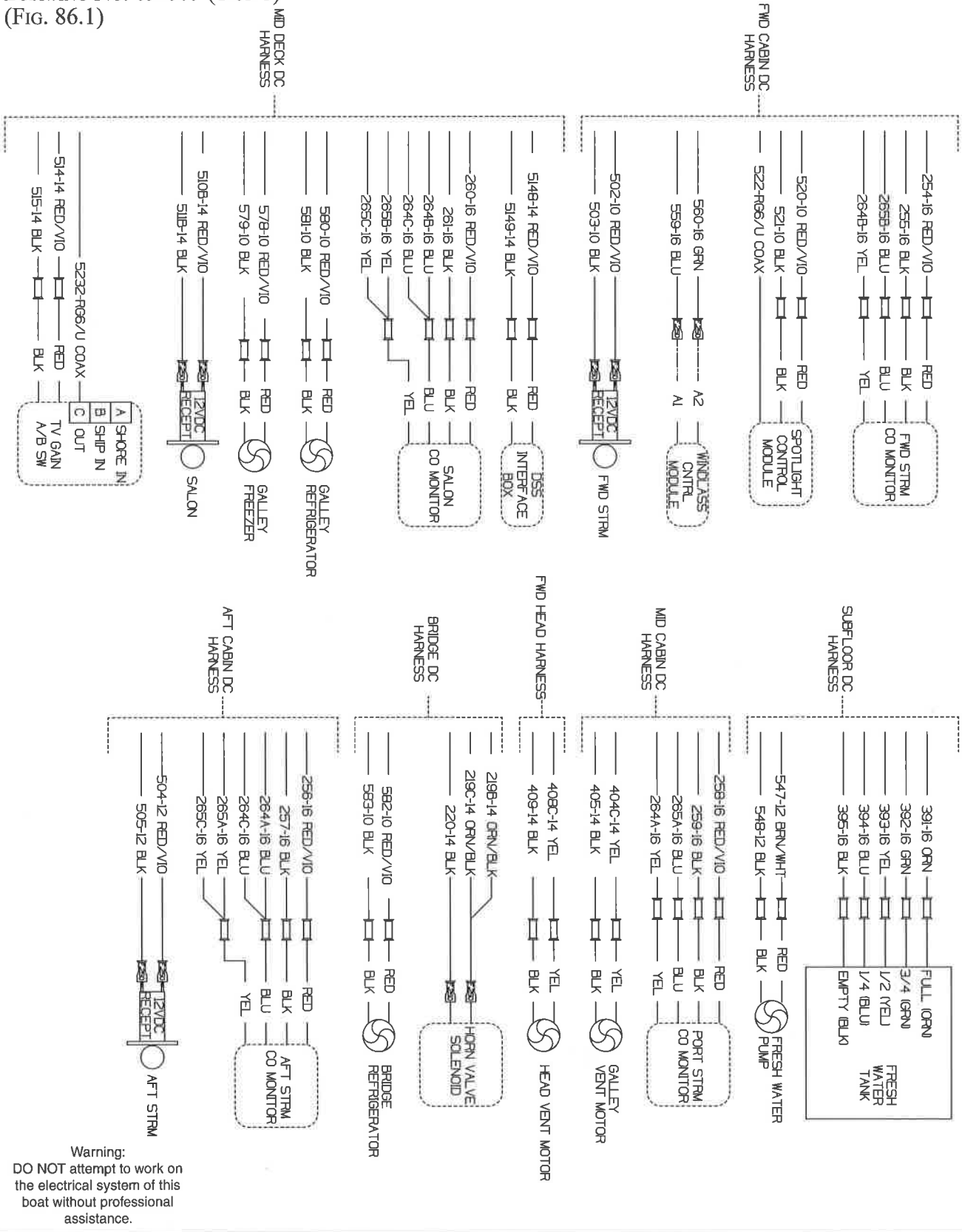
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC WIRING SCHEMATIC ZEUS DRAWING NO. 09-602 (13 OF 13) (FIG. 85.1)



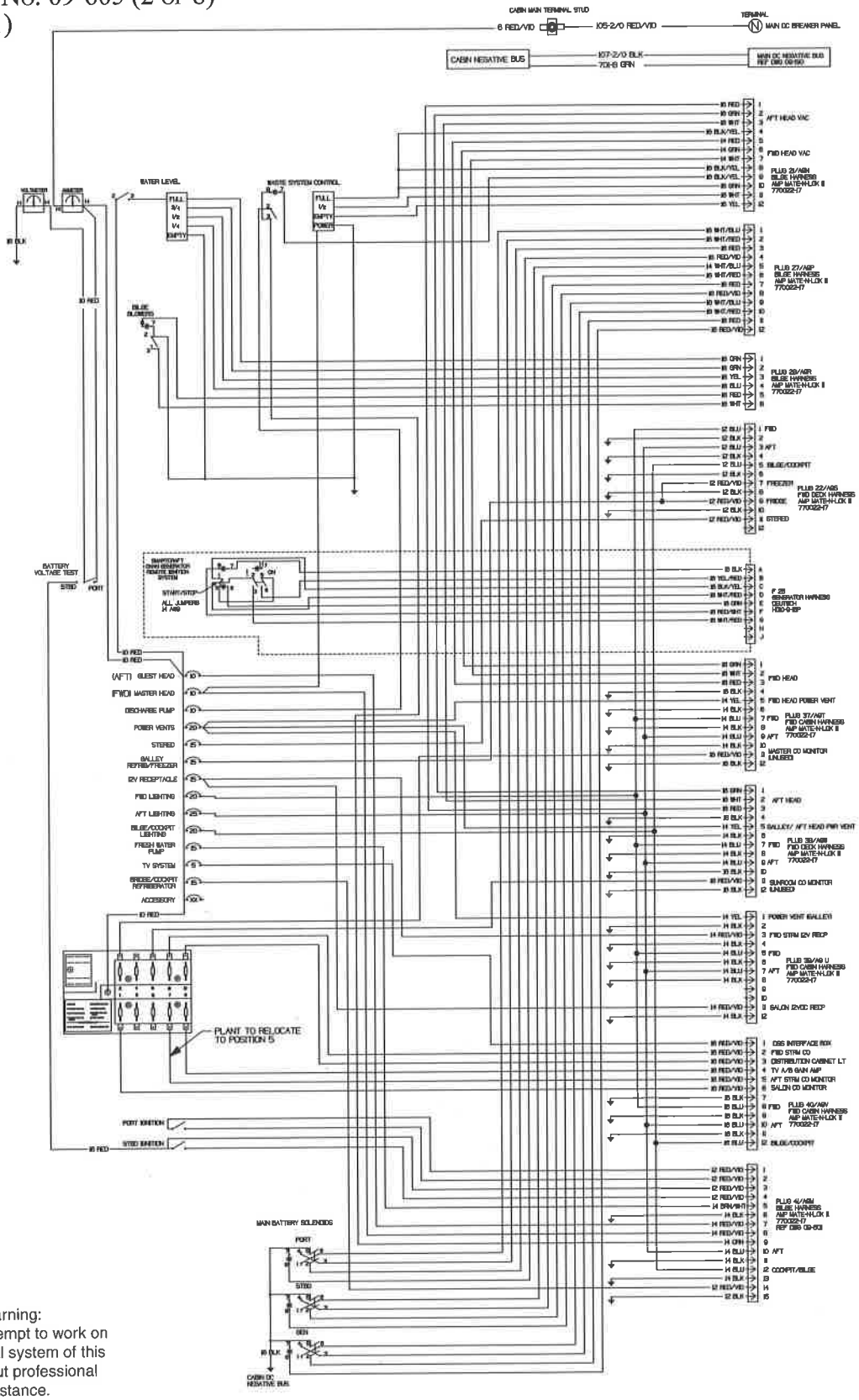
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC Wiring Schematic CABIN
Drawing No. 09-605 (1 of 8)
(Fig. 86.1)



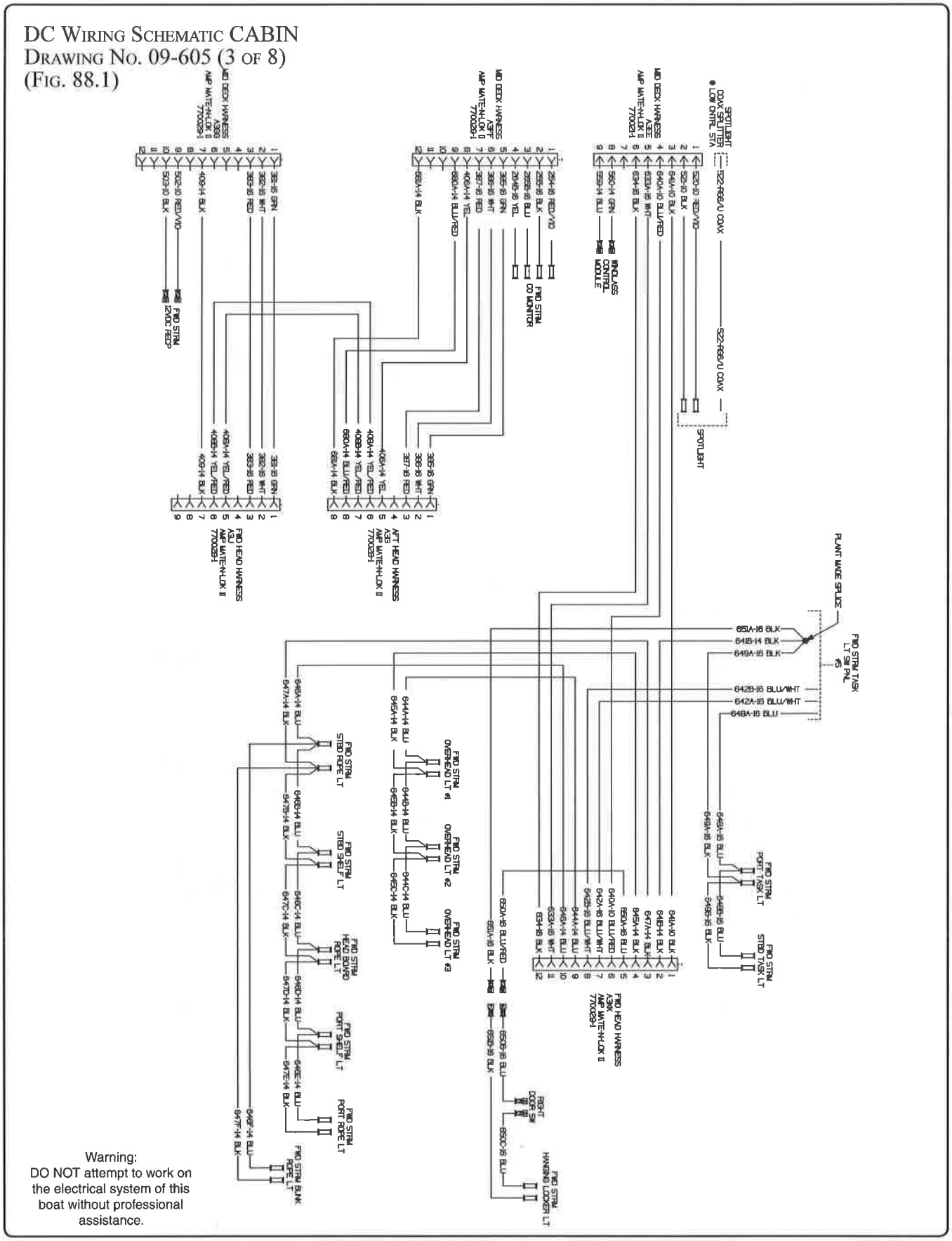
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC Wiring Schematic CABIN
Drawing No. 09-605 (2 of 8)
(Fig. 87.1)



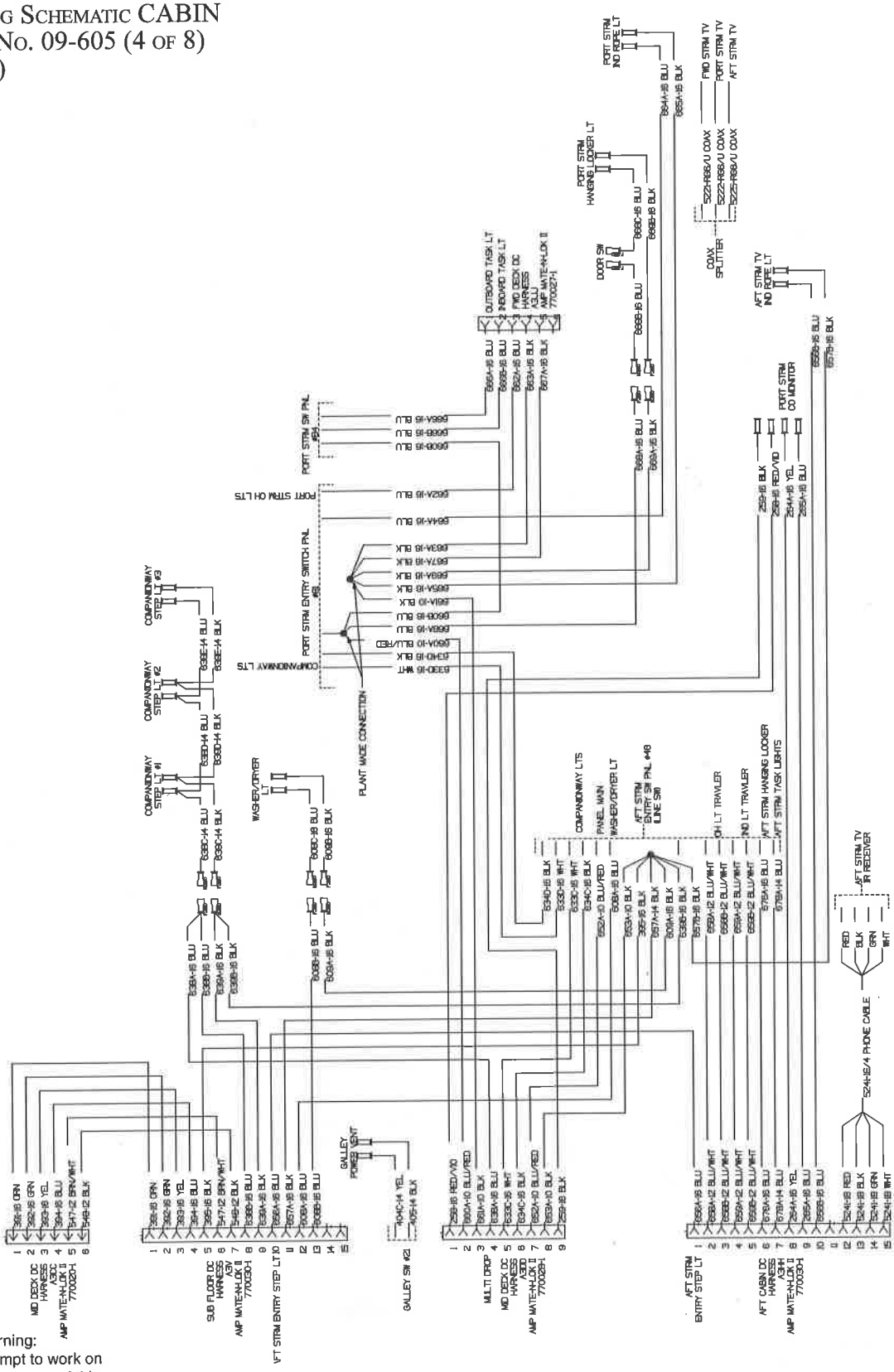
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC Wiring Schematic CABIN
Drawing No. 09-605 (3 of 8)
(Fig. 88.1)



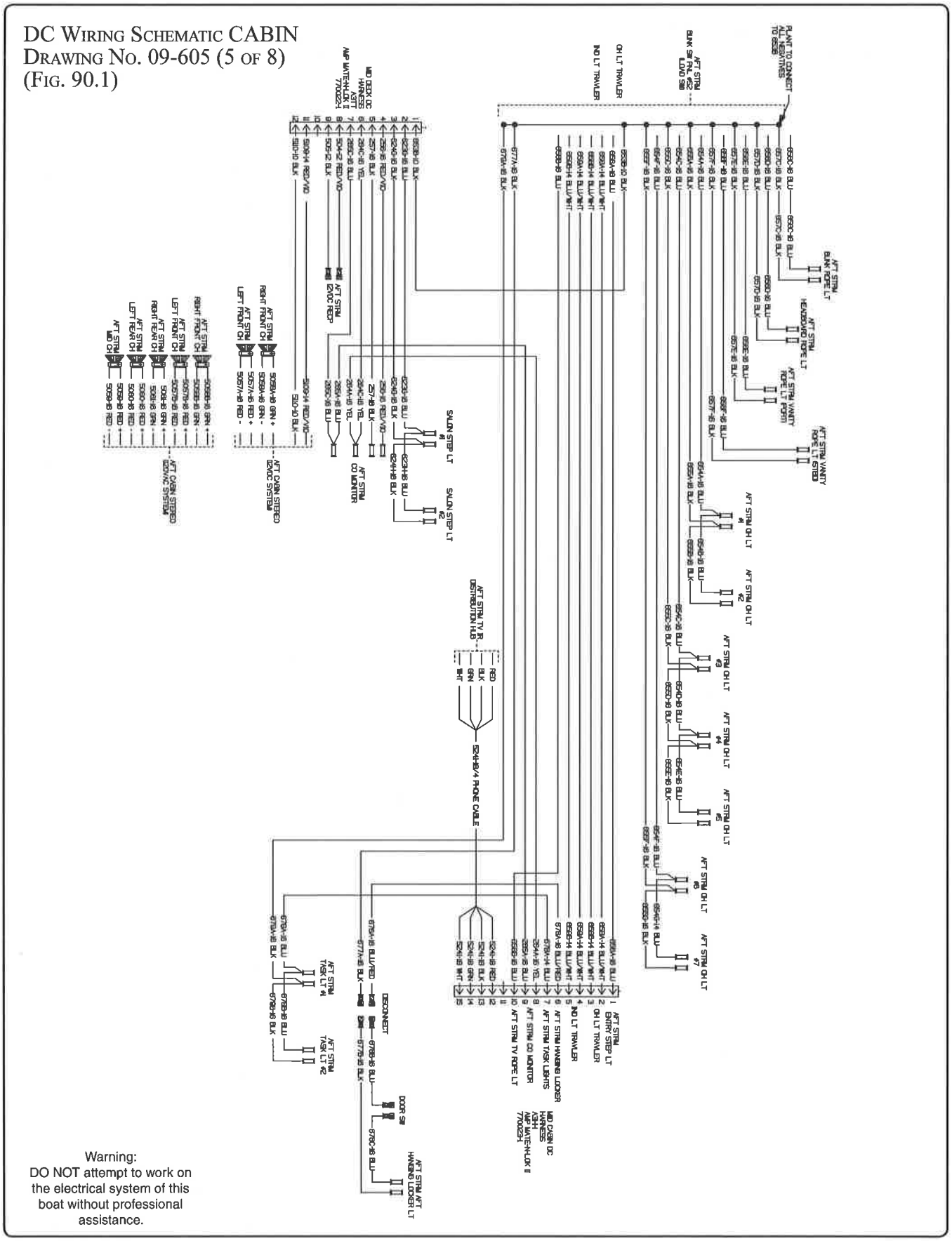
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC WIRING SCHEMATIC CABIN
DRAWING NO. 09-605 (4 OF 8)
(FIG. 89.1)



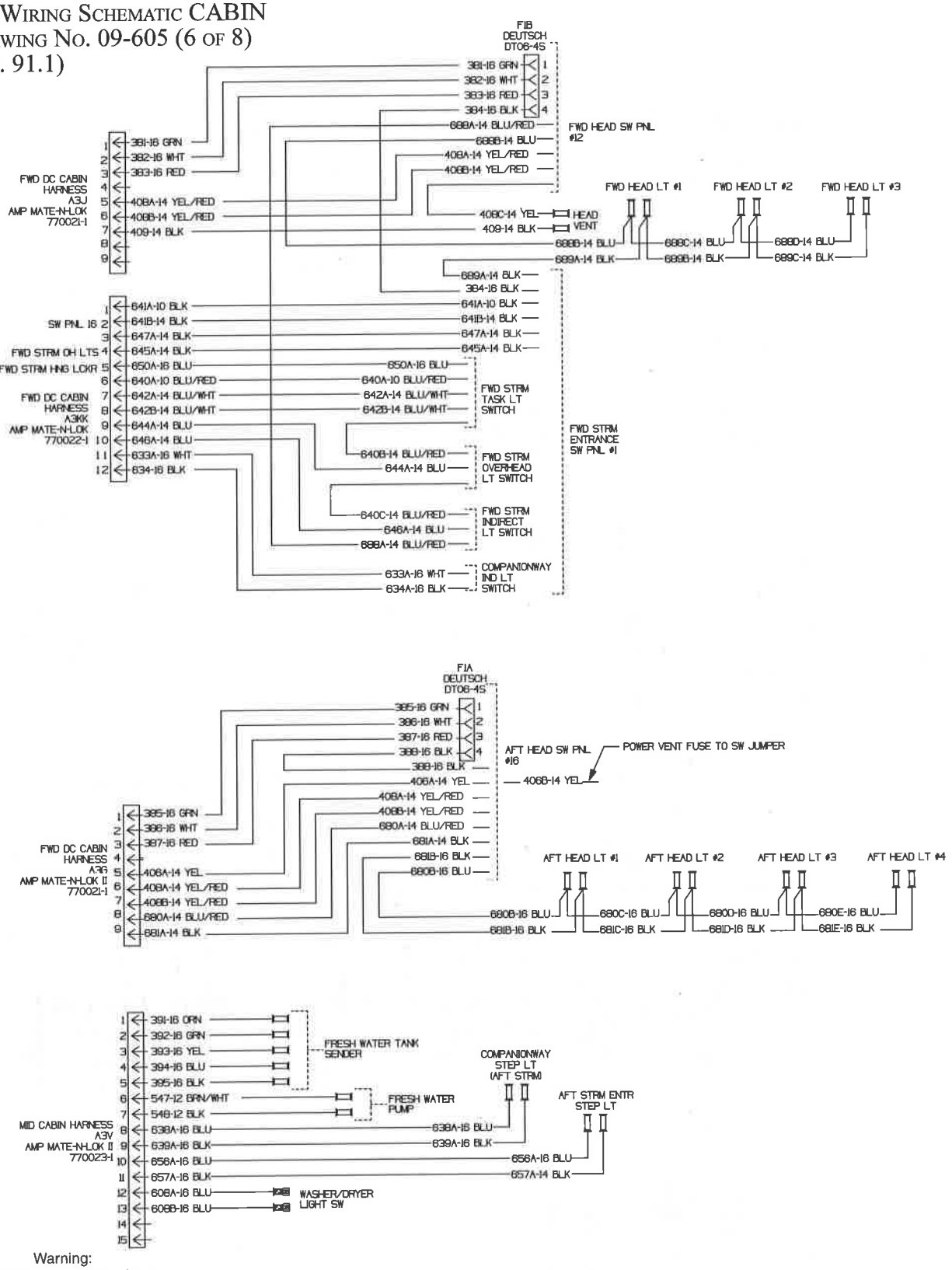
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC Wiring Schematic CABIN
Drawing No. 09-605 (5 of 8)
(Fig. 90.1)



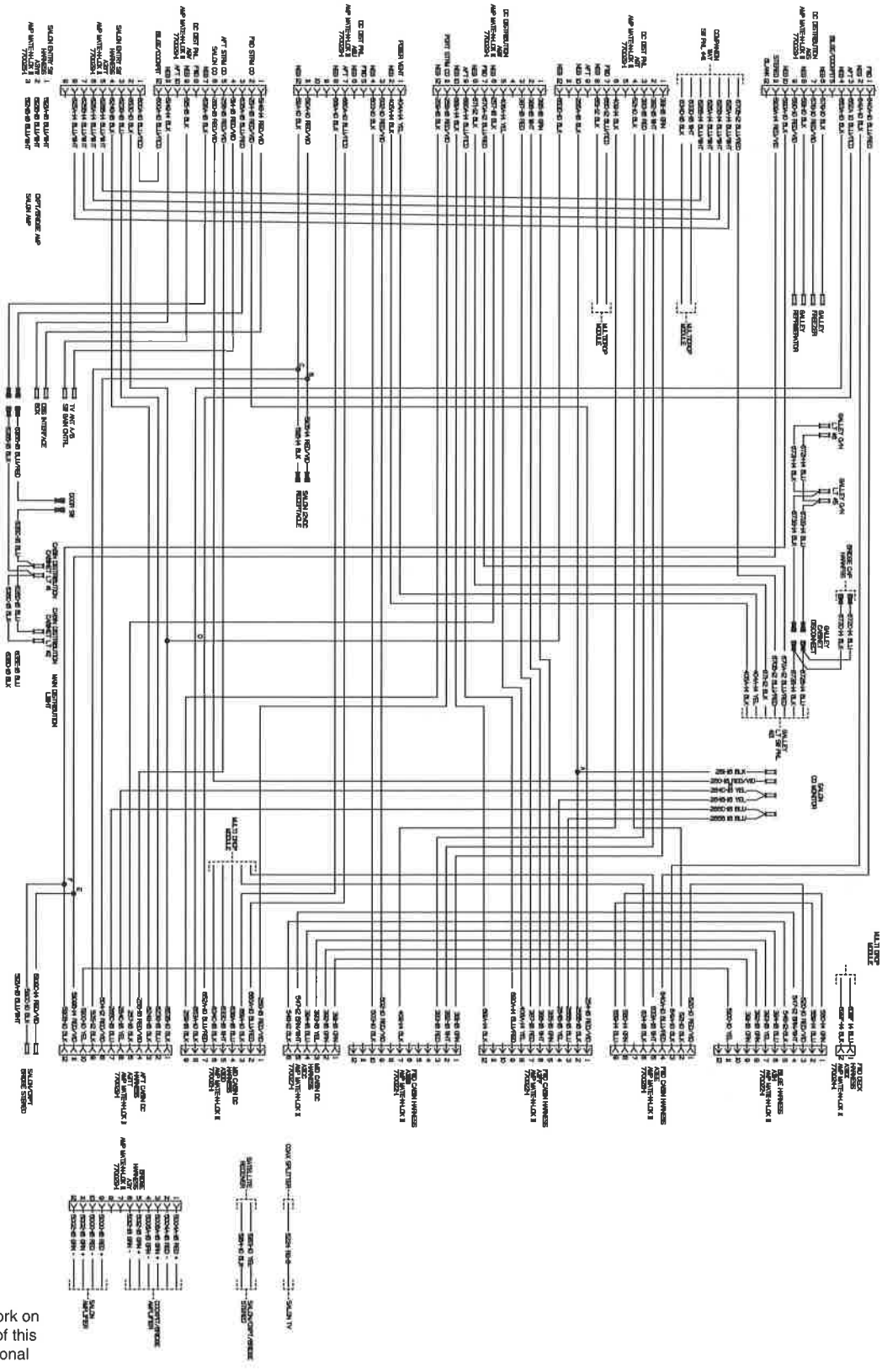
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC Wiring Schematic CABIN
Drawing No. 09-605 (6 of 8)
(Fig. 91.1)



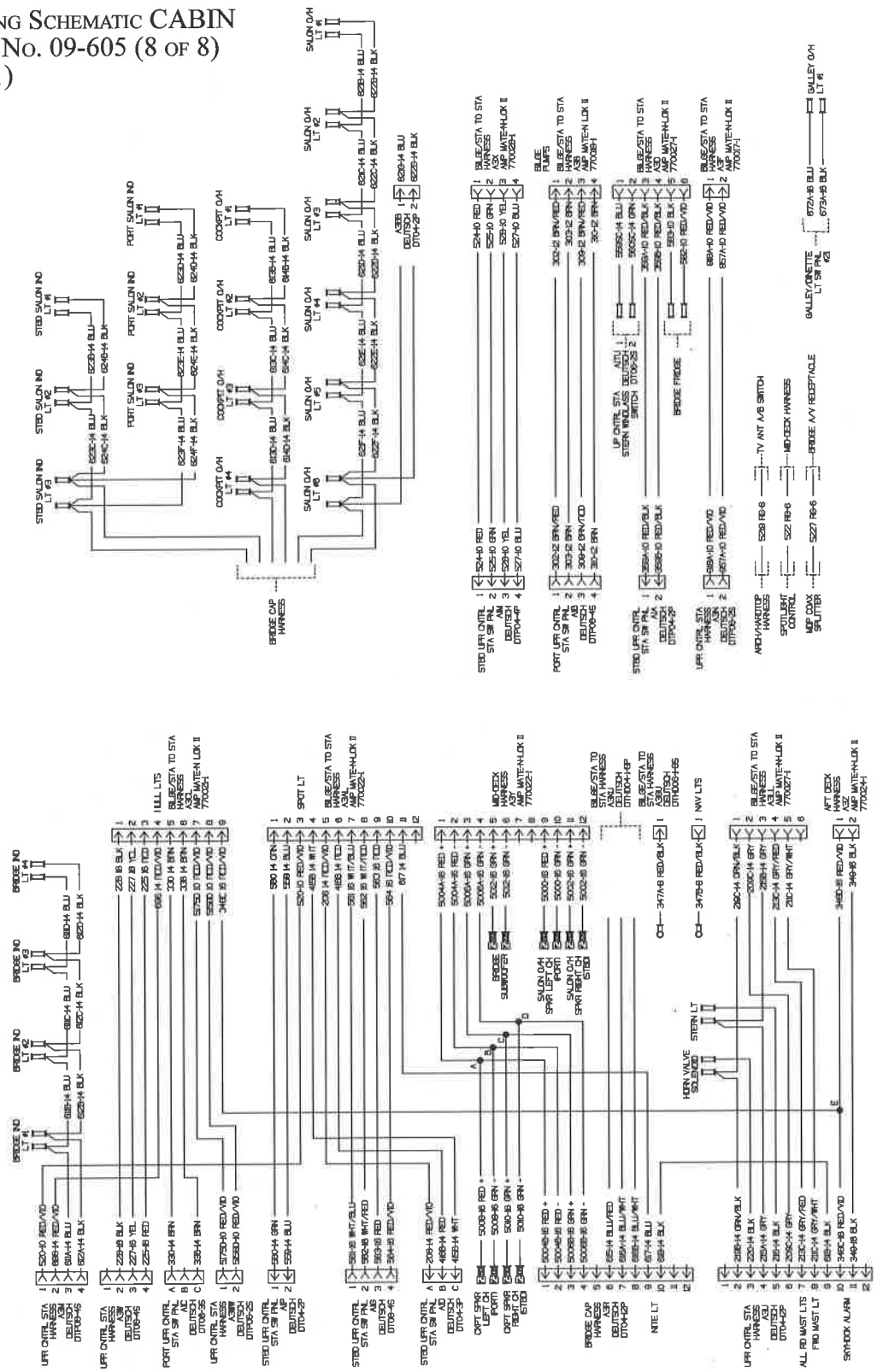
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC Wiring Schematic CABIN
Drawing No. 09-605 (7 of 8)
(Fig. 92.1)



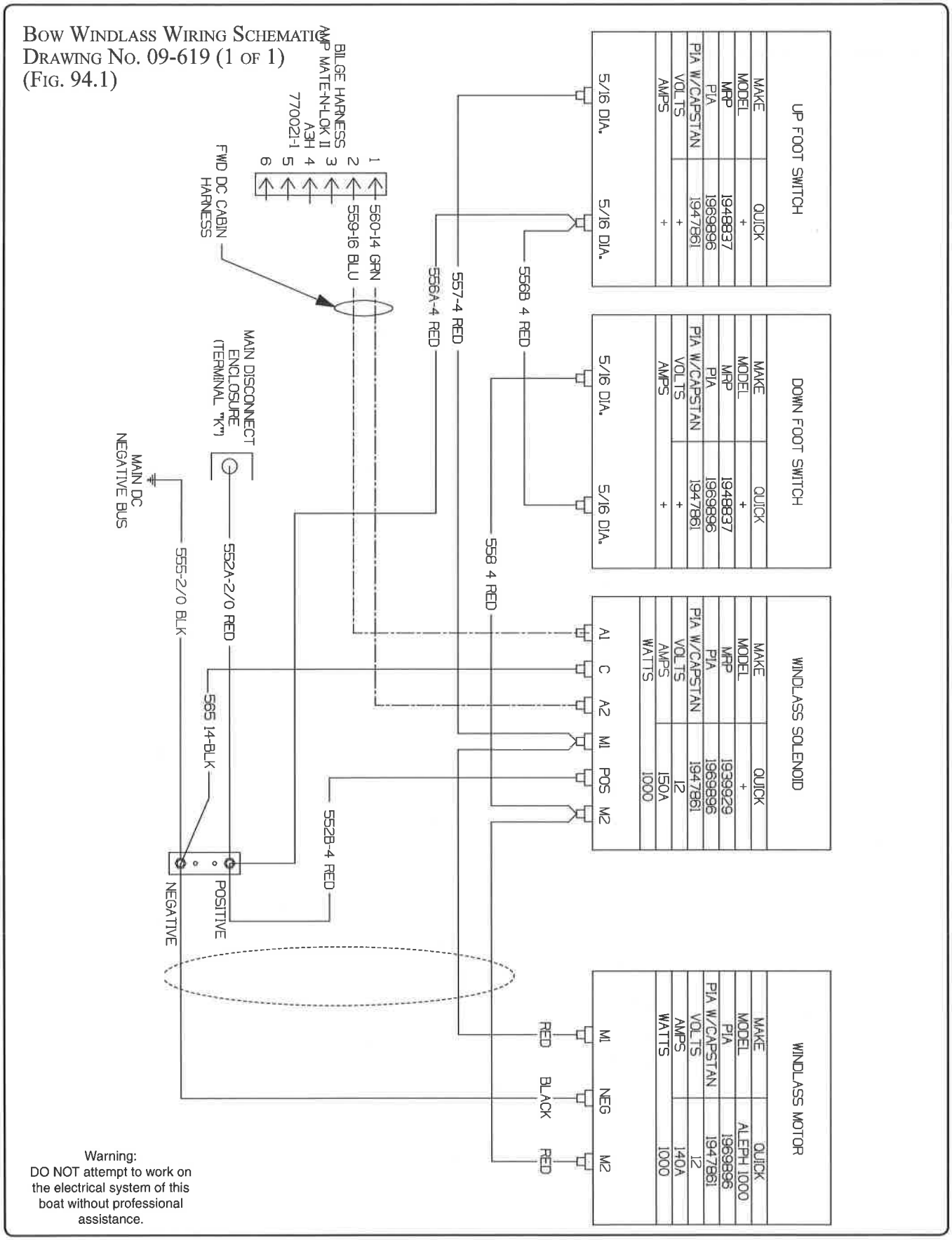
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

DC WIRING SCHEMATIC CABIN
DRAWING NO. 09-605 (8 OF 8)
(FIG. 93.1)



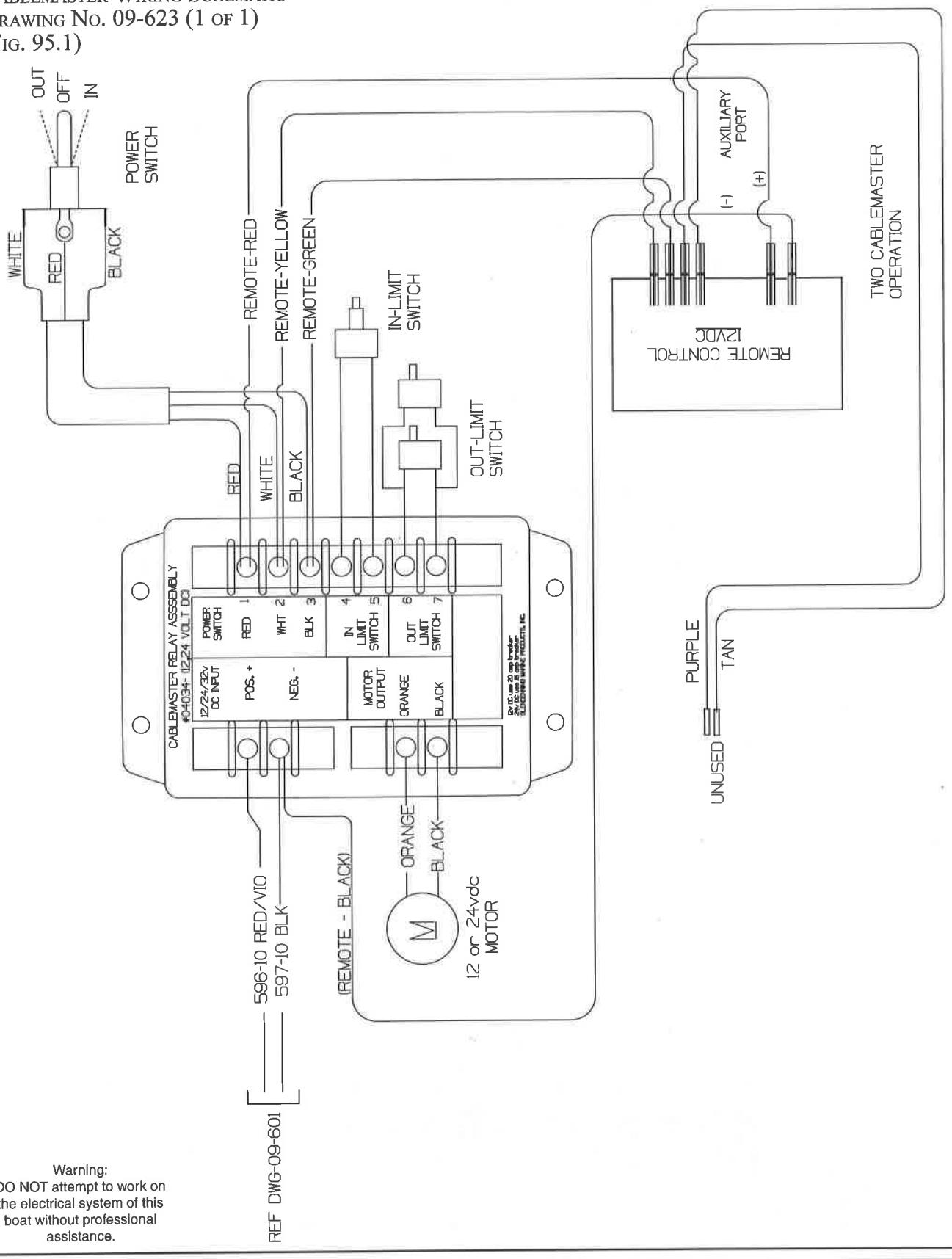
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

Bow Windlass Wiring Schematic
Drawing No. 09-619 (1 of 1)
(Fig. 94.1)



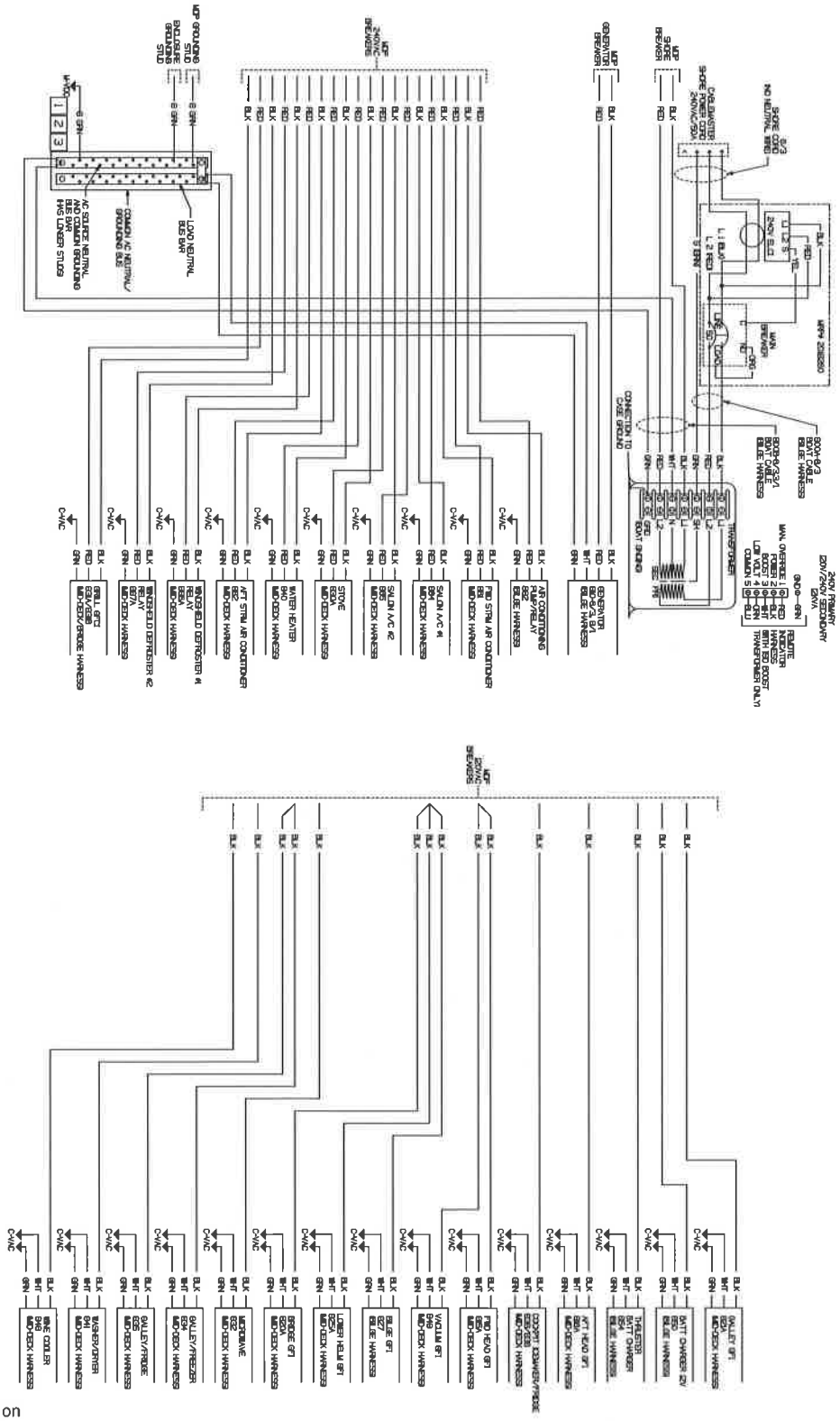
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

Cablemaster Wiring Schematic
Drawing No. 09-623 (1 of 1)
(Fig. 95.1)



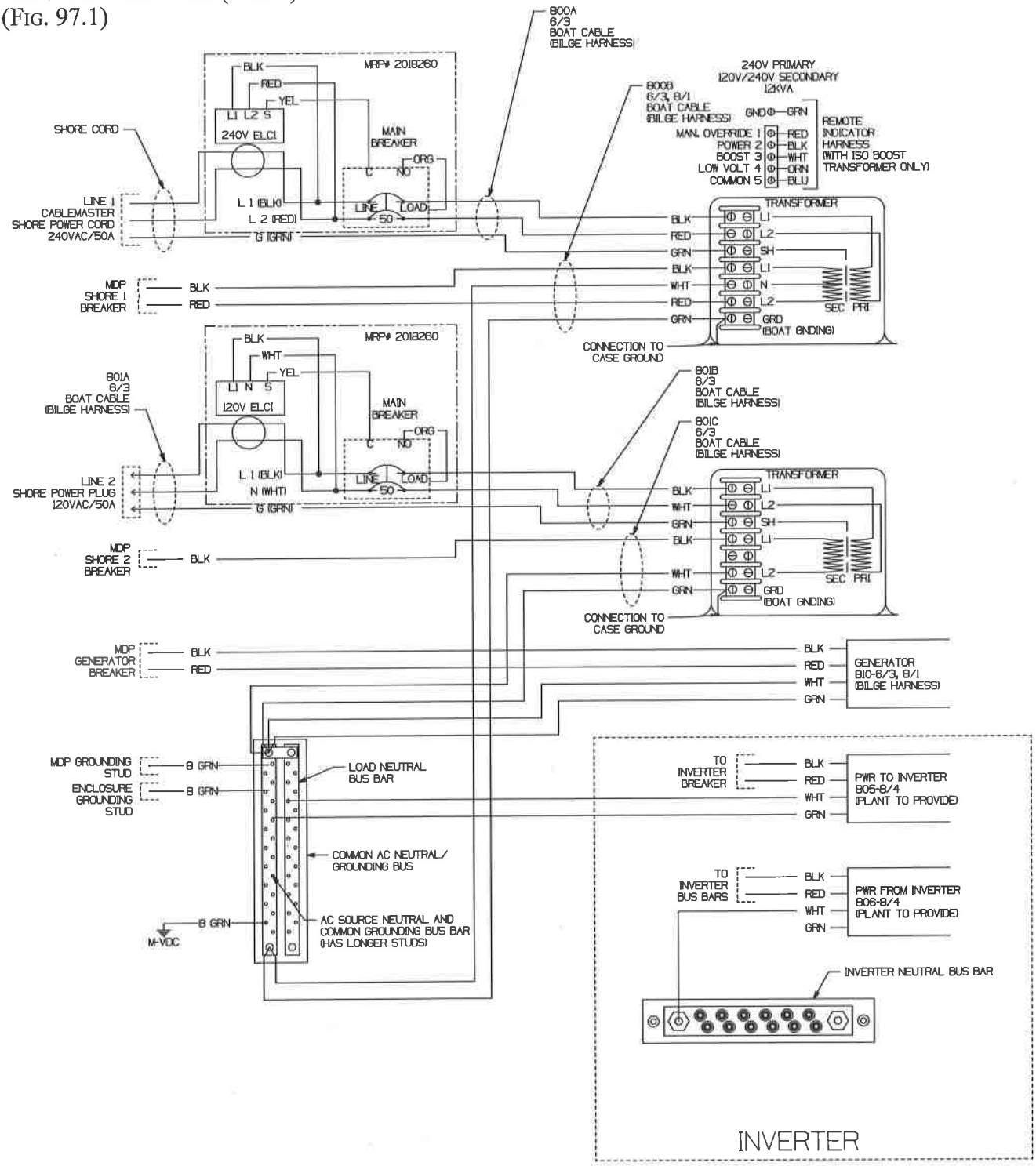
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

240VAC 60Hz AC Wiring Schematic
Drawing No. 09-632 (1 of 1)
(Fig. 96.1)



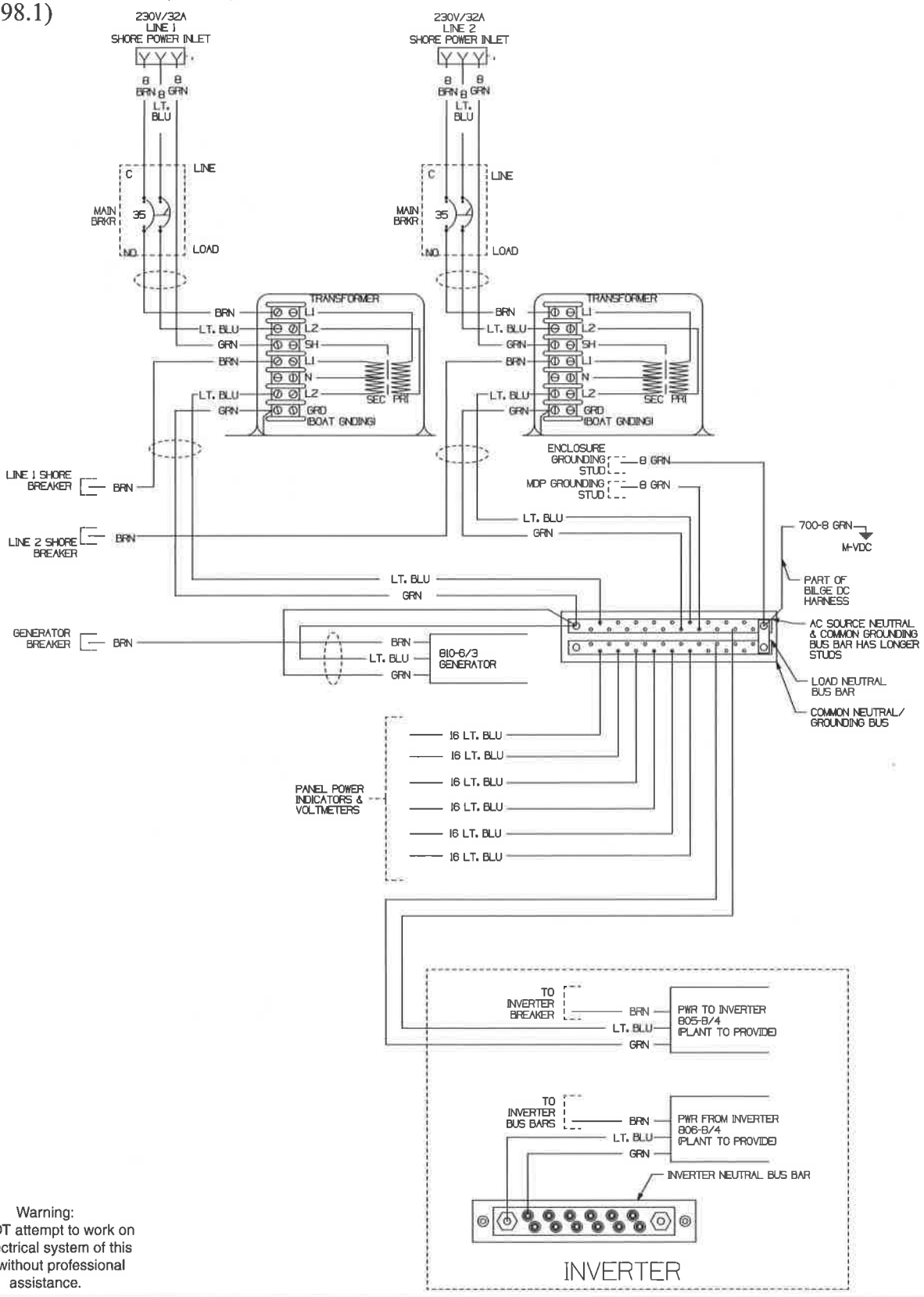
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

240/120VAC 60Hz AC Wiring Schematic
Drawing No. 09-633 (1 of 1)
(Fig. 97.1)



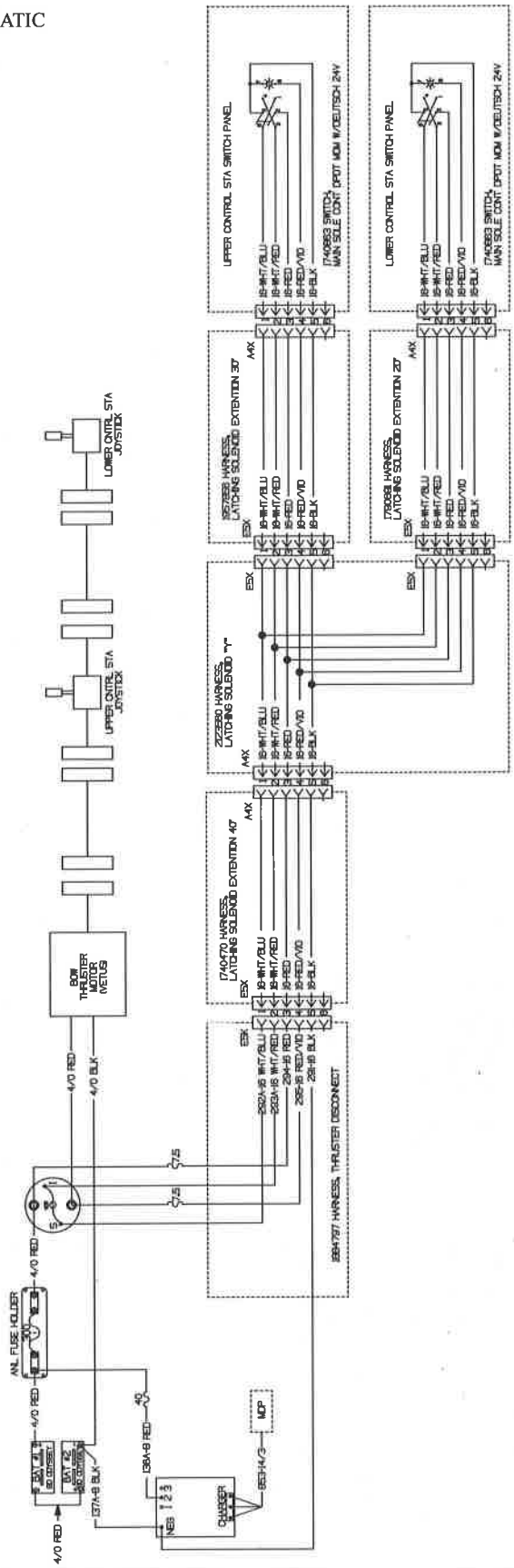
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

230VAC 50Hz AC Wiring Schematic
Drawing No. 09-633 (1 of 1)
(Fig. 98.1)



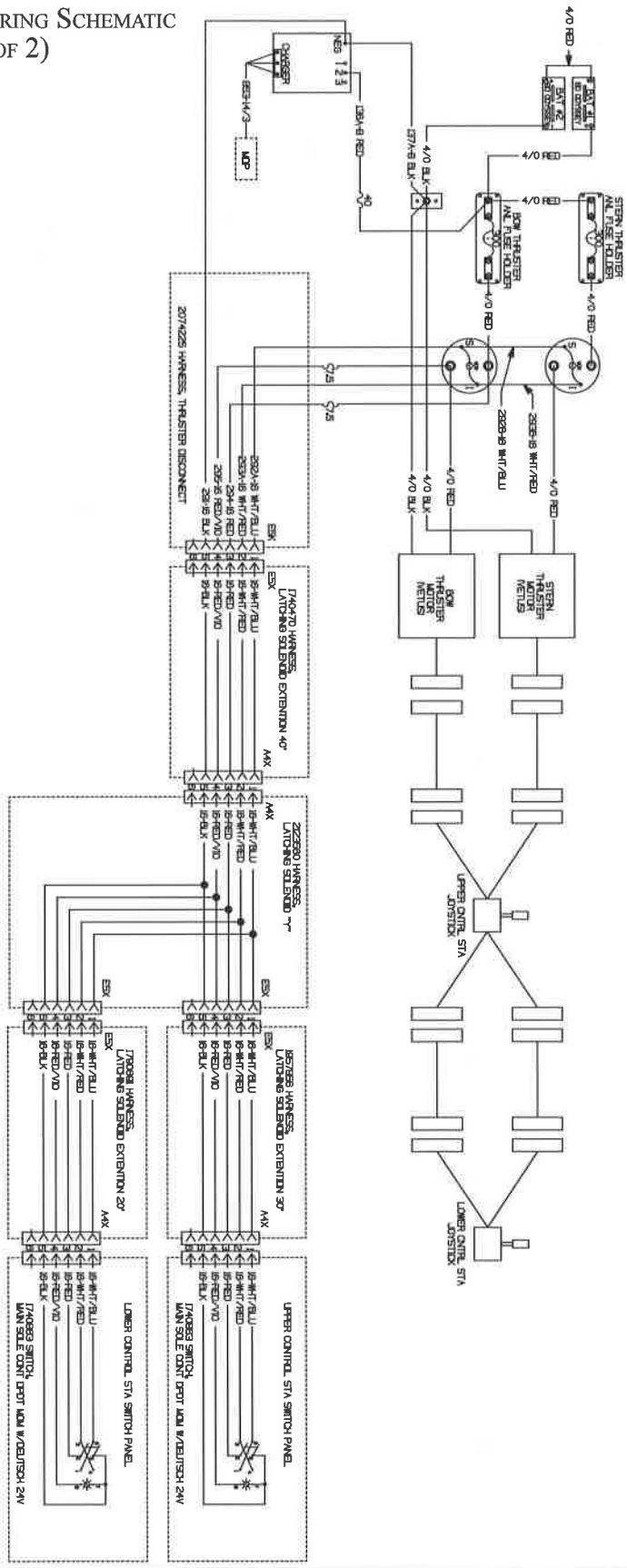
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

Bow Thruster Wiring Schematic
Drawing No. 09-651 (1 of 2)
(Fig. 99.1)



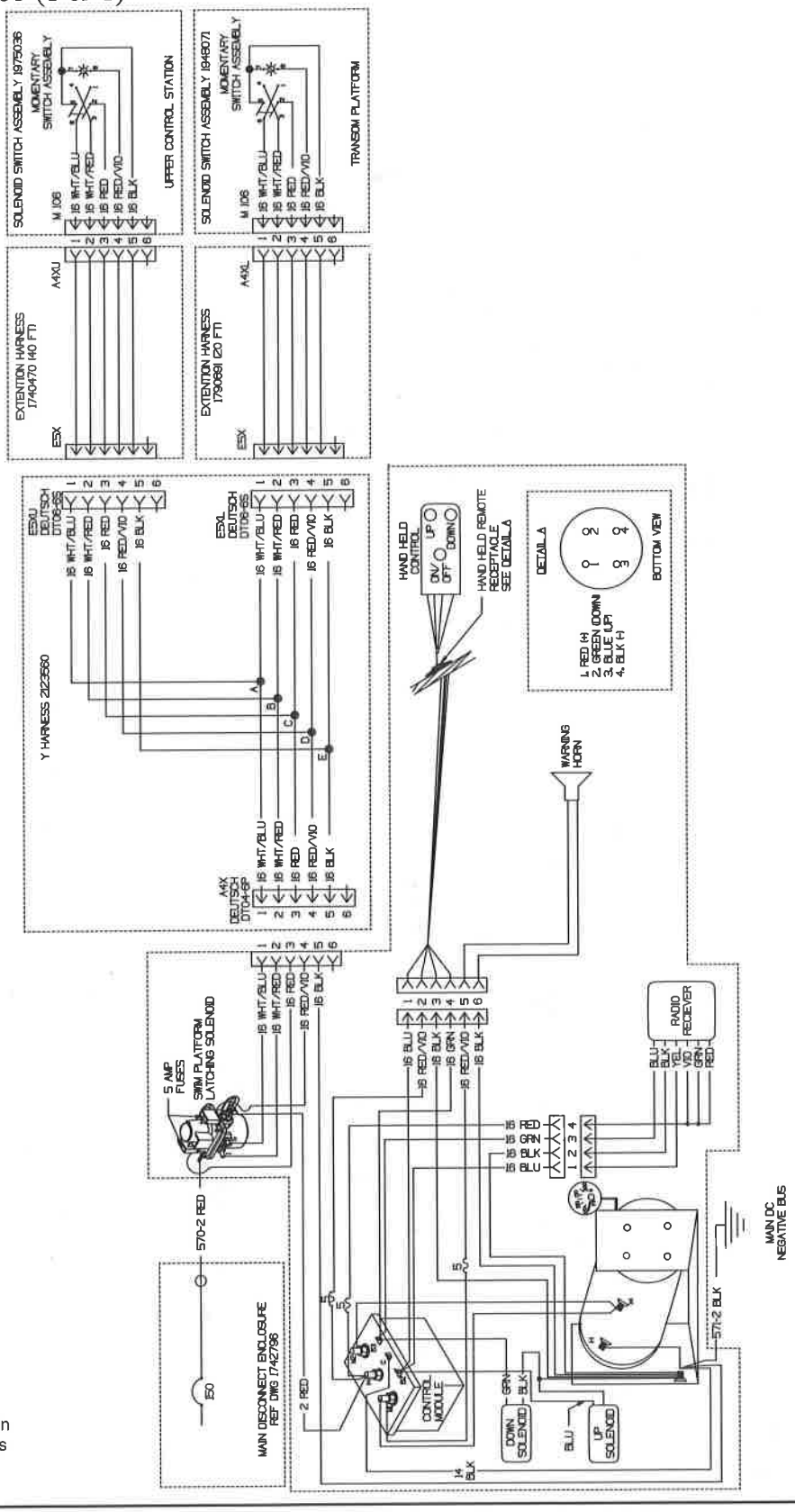
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

Bow/Stern Thruster Wiring Schematic
Drawing No. 09-651 (2 of 2)
(Fig. 100.1)



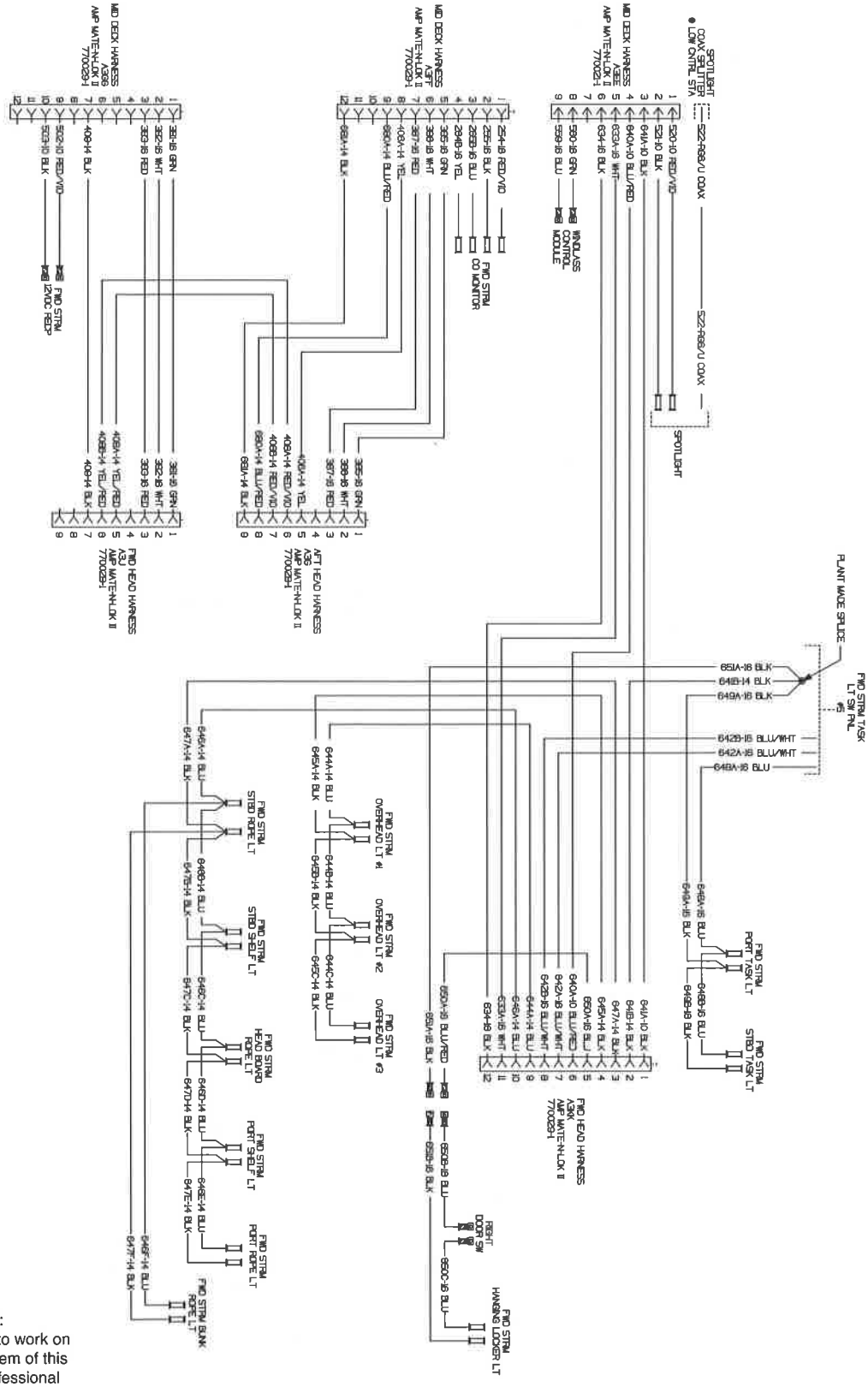
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

SWIM PLATFORM WIRING SCHEMATIC
DRAWING NO. 09-655 (1 OF 1)
(FIG. 101.1)



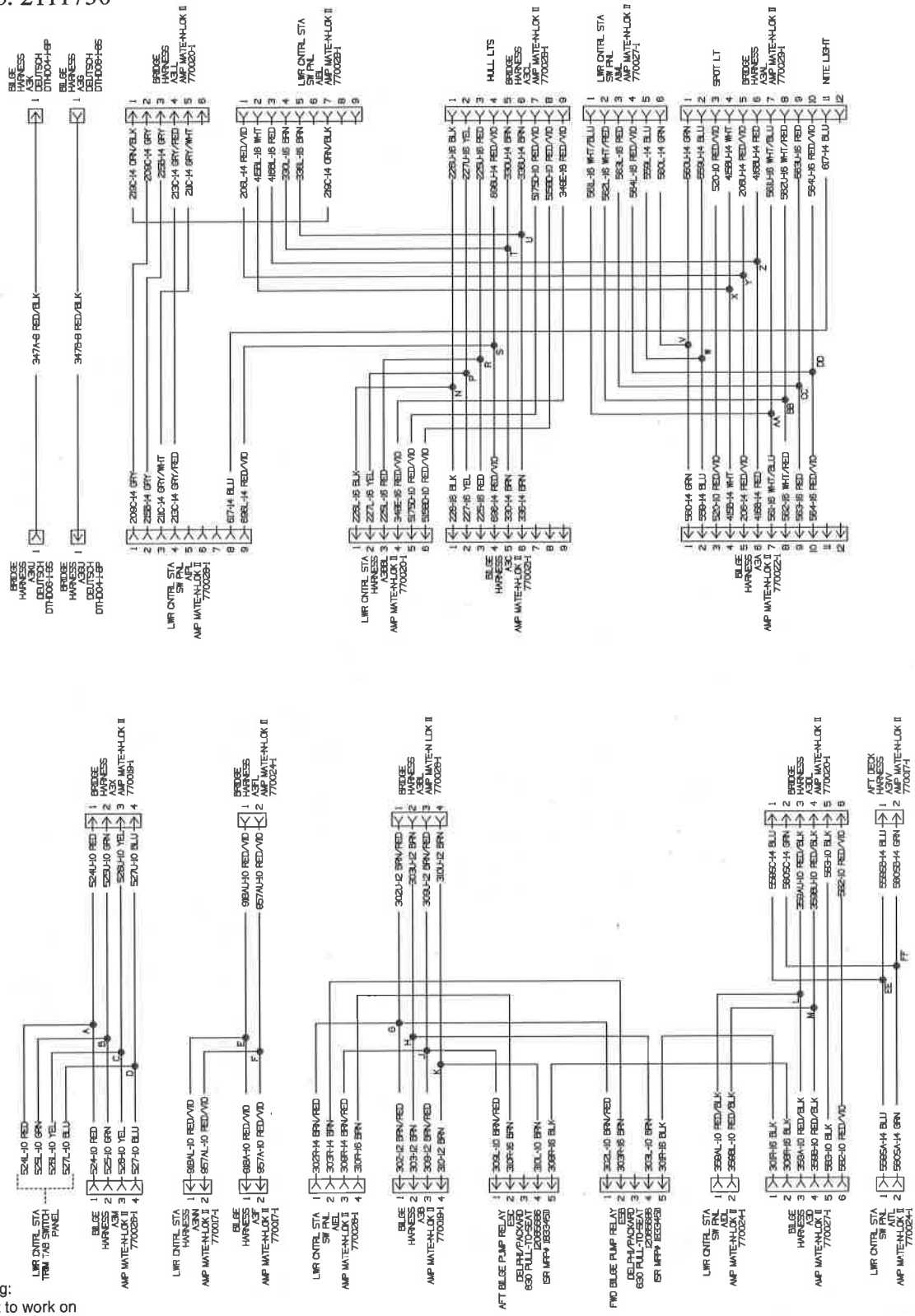
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

Forward Cabin DC Wiring Schematic
Drawing No. 2107982
(Fig. 102.1)



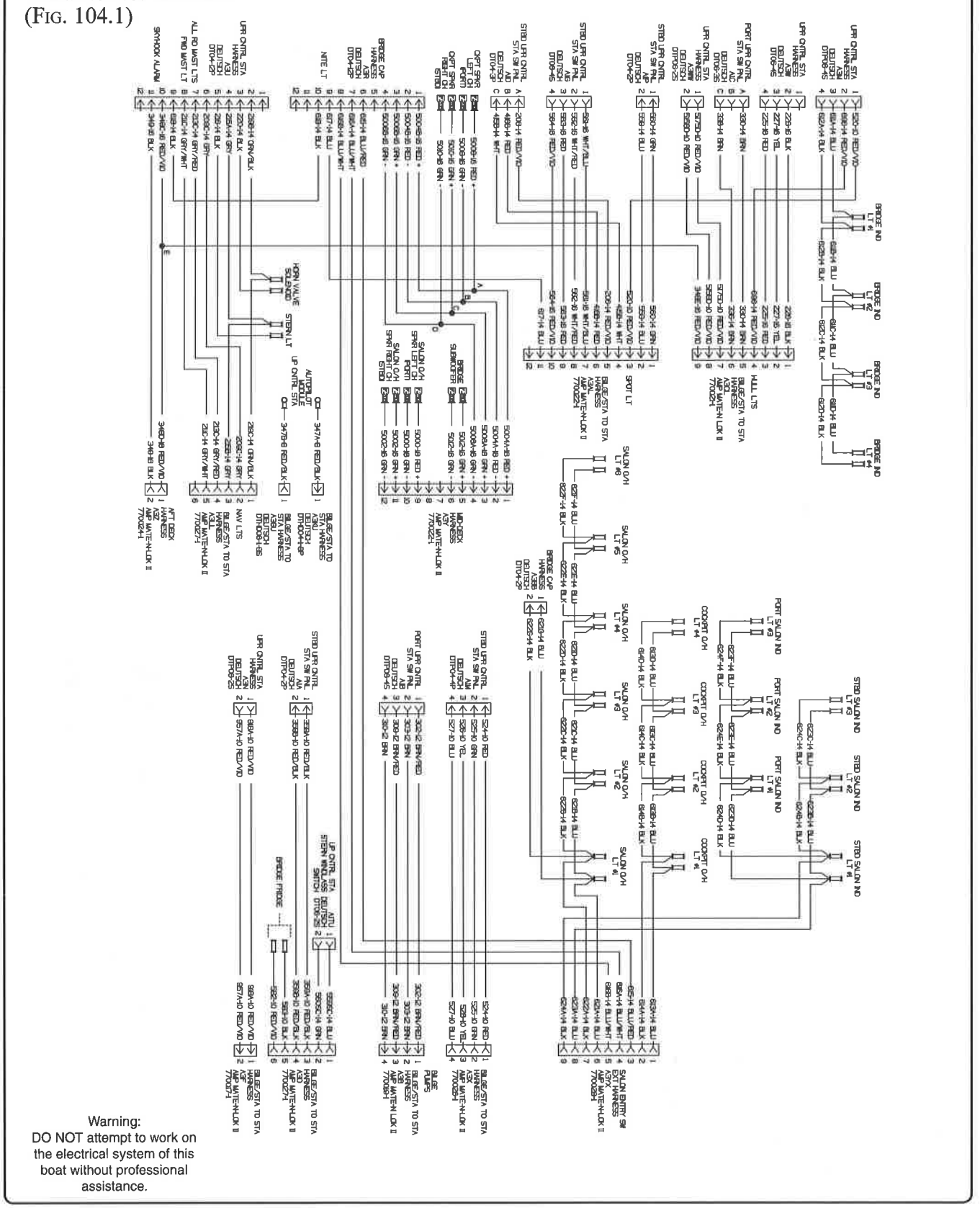
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

Bridge DC Wiring Schematic
Drawing No. 2111730
(Fig. 103.1)



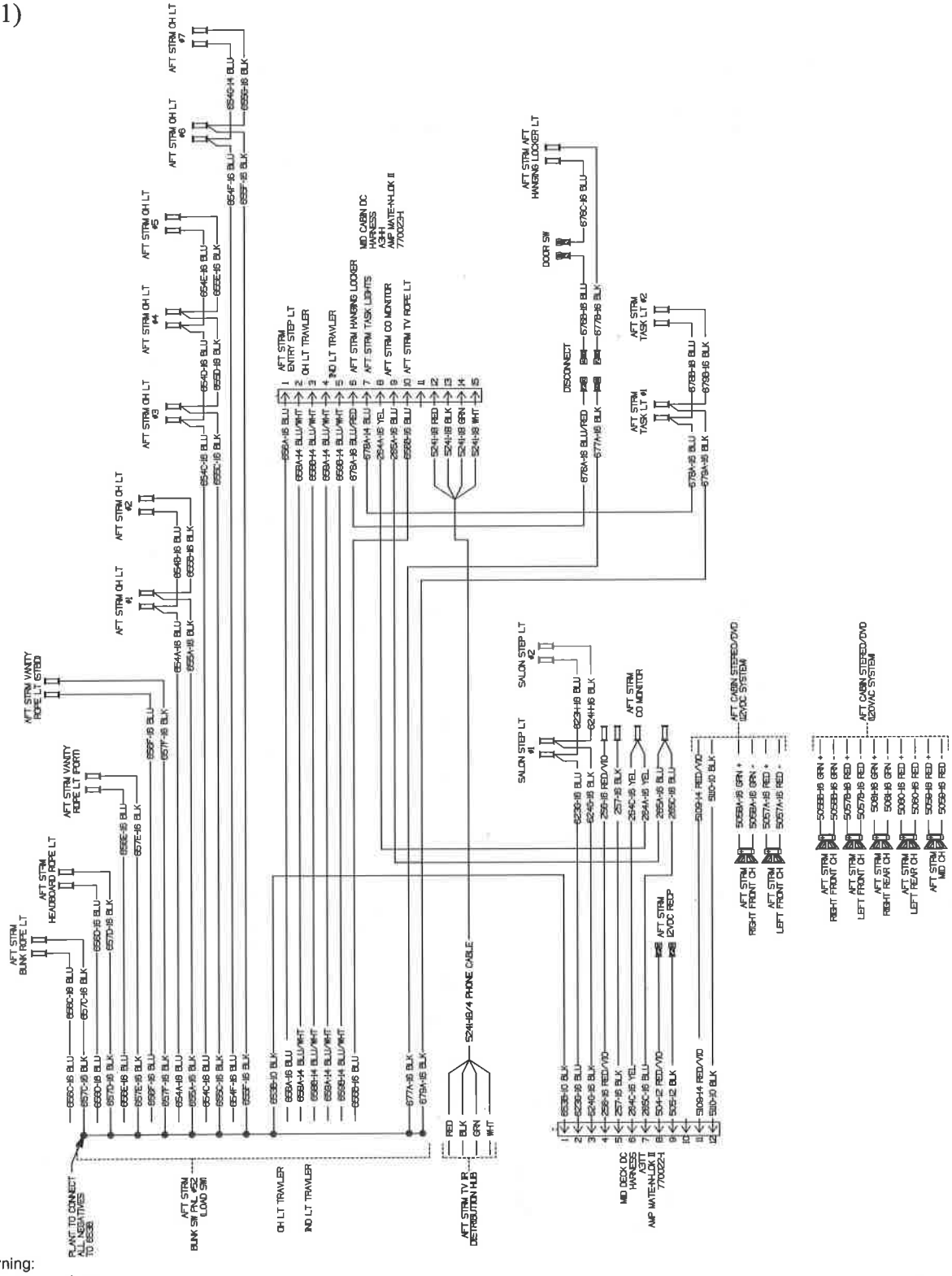
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

Aft Cabin DC Wiring Schematic
Drawing No. 2112606
(Fig. 104.1)



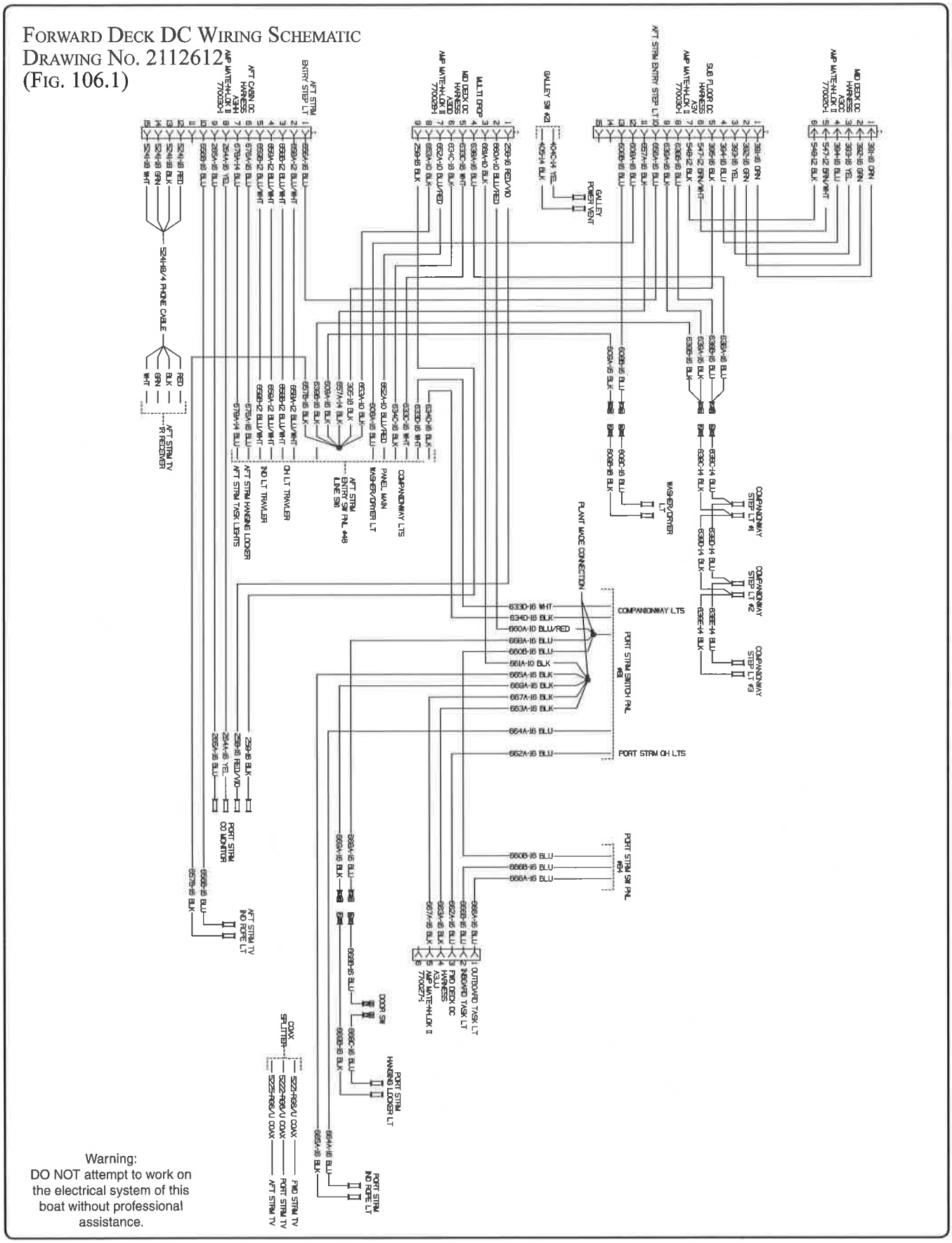
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

Mid Cabin DC Wiring Schematic
Drawing No. 2112610
(Fig. 105.1)



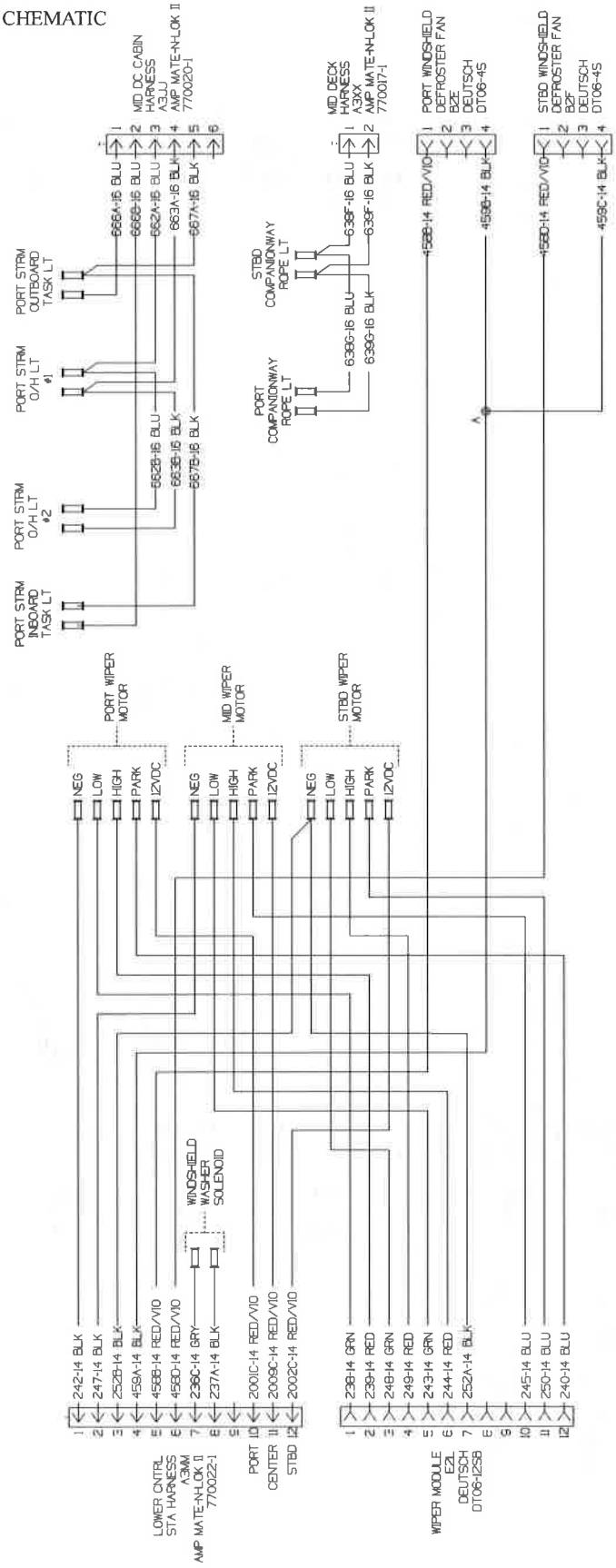
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

Forward Deck DC Wiring Schematic
Drawing No. 2112612
(Fig. 106.1)



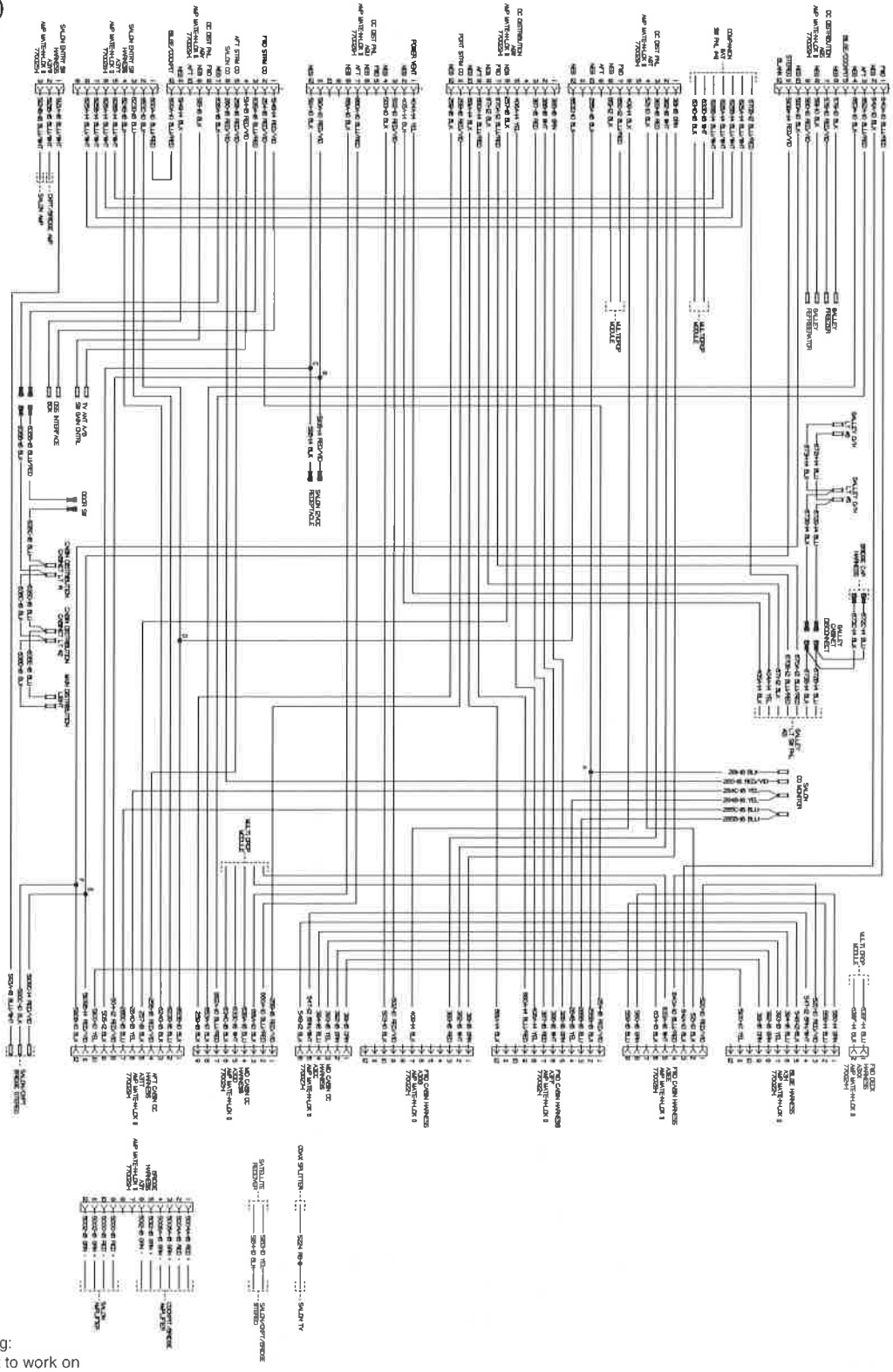
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

Mid Deck DC Wiring Schematic
Drawing No. 2112613
(Fig. 107.1)



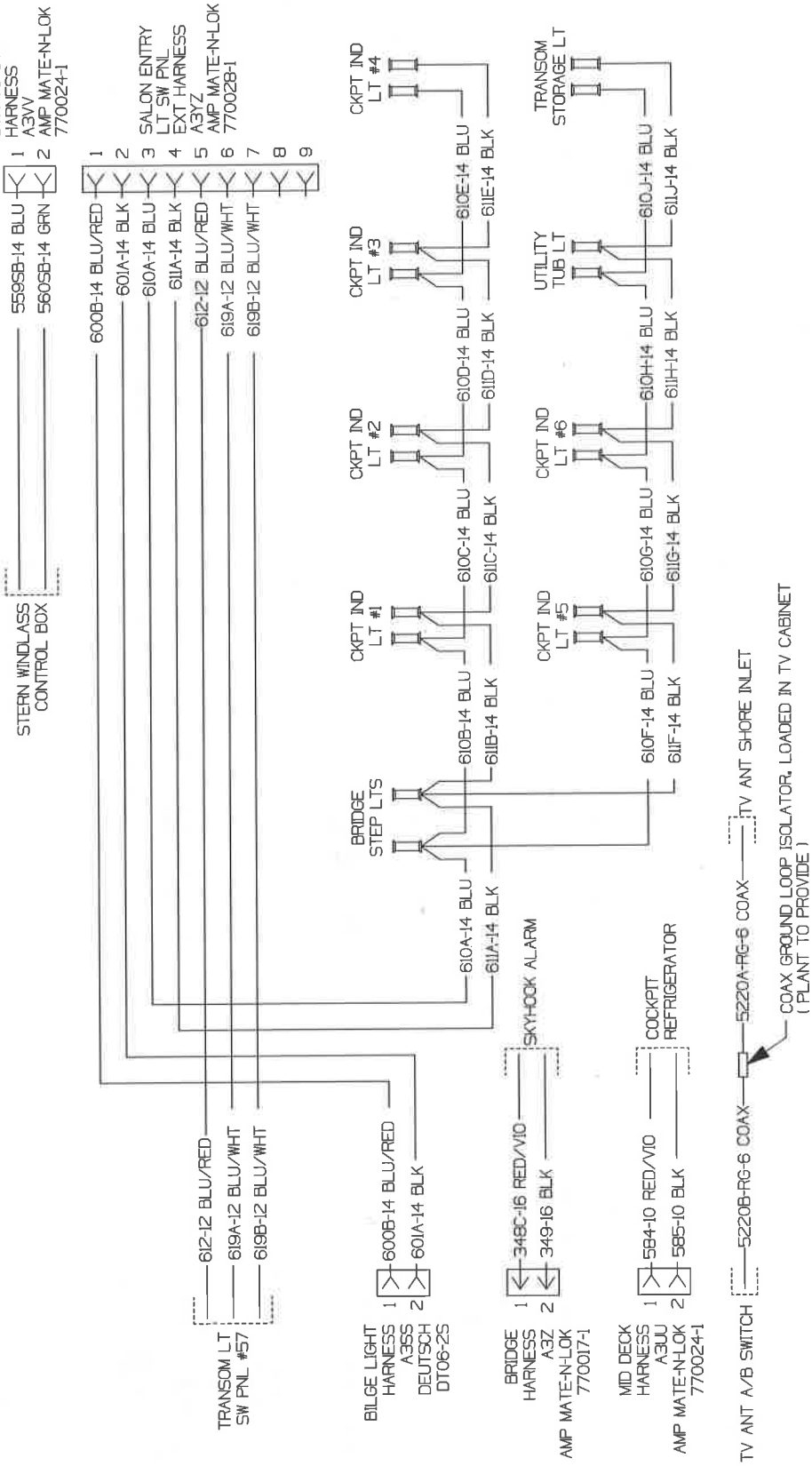
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

Aft Deck DC Wiring Schematic
Drawing No. 2113413
(Fig. 108.1)



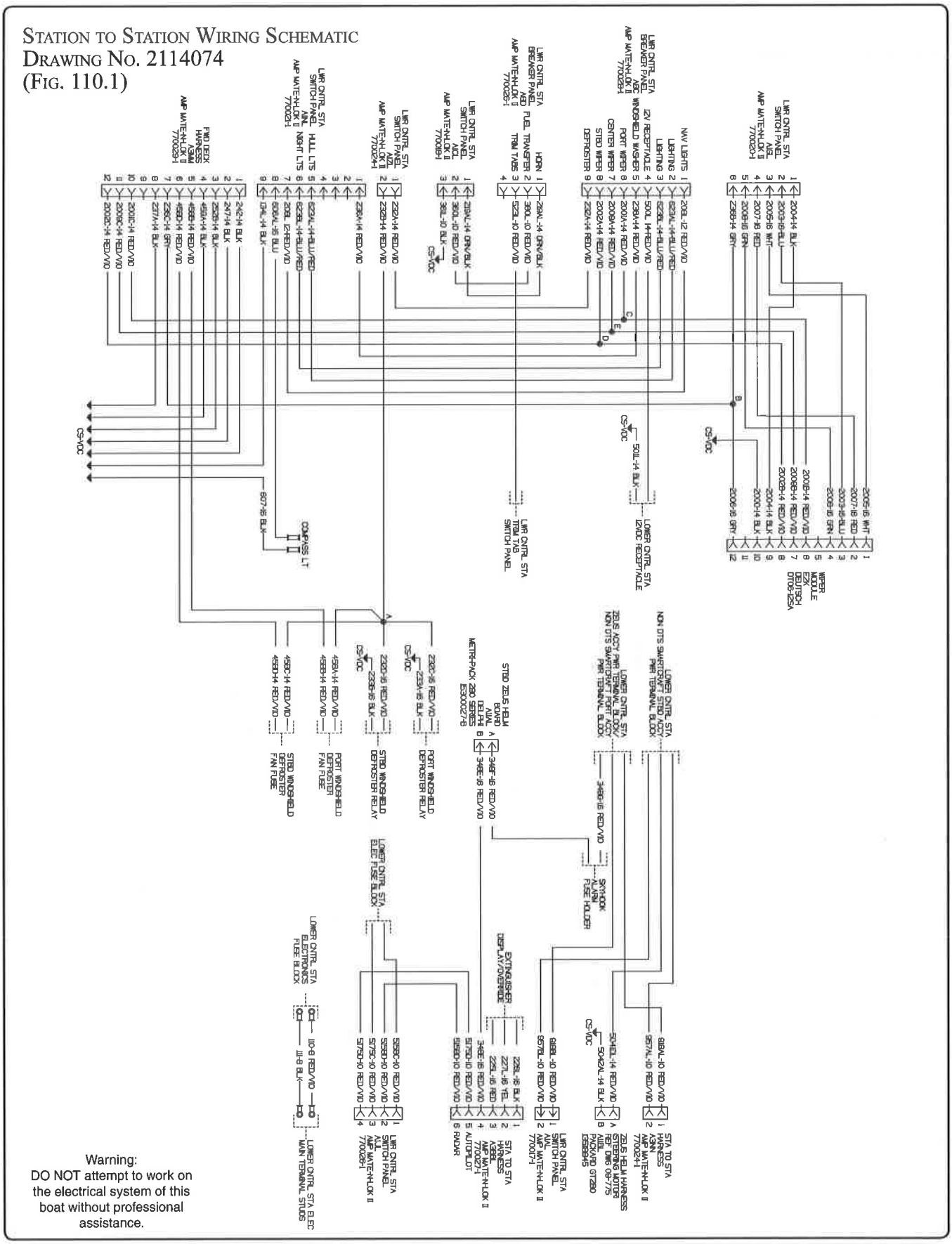
Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

Lower Control Station Wiring Schematic
Drawing No. 2114074
(Fig. 109.1)



Warning:
DO NOT attempt to work on the electrical system of this boat without professional assistance.

Station to Station Wiring Schematic
Drawing No. 2114074
(Fig. 110.1)



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