

# HUNTER OWNER'S MANUAL

## TABLE OF CONTENTS

<b>INTRODUCTION</b>	<b>Page</b>
▶ Warranty Registration Form .....	1
▶ Hunter Warranty .....	2-4
▶ Brief History .....	5
▶ Glossary of Sailing Terms .....	6-9
▶ Explanation of Symbols and Labels .....	10
 <b>GENERAL HANDLING AND OPERATION</b>	
▶ Safe Boating Tips .....	11-12
▶ Pre-Departure Checklist .....	13
▶ Float Plan .....	14
▶ After Sailing Checklist .....	15
▶ Docking and Anchoring .....	16
▶ Diesel Engine and Motoring .....	17-18
▶ Electrical System .....	18-19
▶ Cooking Stove .....	20
▶ Toilet .....	20
▶ Pumps .....	21
▶ Water System Operation .....	21
▶ Waste Discharge .....	22
▶ Environmental Considerations .....	23
 <b>MAINTENANCE</b>	
▶ Instructions for Preparation for Bottom Painting .....	24
▶ Engine, Transmission, and Drivetrain .....	25-26
▶ Steering System .....	27
▶ Electrical Systems .....	27
▶ Plumbing Systems .....	28
▶ Fuel System .....	28
▶ General Care .....	28-29
▶ Fabric Care .....	29
▶ General Hardware Maintenance .....	29
▶ Electrolysis and Galvanic Protection .....	30
▶ Teak Care .....	31
▶ Storage/Winterization .....	32-33

## TABLE OF CONTENTS CONTINUED

DESCRIPTION OF MODEL	Page
‣ Certification Details .....	34
‣ Builder's Information Plate .....	35
‣ Profile with Rig and Sail Dimensions.....	36
‣ Dimensions, Capacities, etc .....	37
‣ Deck Plan and Hardware .....	38
‣ Deck Hardware Parts Listing .....	39-40
‣ Interior Plan .....	41
‣ Running Rigging Deck Plan .....	42
‣ Mainsheet Rigging .....	43
‣ Reef Rigging and Instructions .....	44-45
‣ Running Rigging Specifications .....	46
‣ Rig Description .....	47
‣ Standing Rigging Plan .....	48
‣ Spreader Details .....	49
‣ Standing Rigging Specifications .....	50-51
‣ Rig Tuning Instructions .....	52-53
‣ Spinnaker Details .....	54
‣ Engine Compartment Layout .....	55
‣ Shaft and Propeller Drawing .....	56
<hr/>	
<b>SYSTEMS AND CIRCUITS</b>	
‣ Potable Water System .....	57
‣ Waste Water System .....	58
‣ Bilge Pumping System .....	59
‣ Locations of Through-Hulls, Seacocks, and Valves .....	60
‣ Fuel System .....	61
‣ LPG System .....	62
‣ Electrical Drawings for 110v or 220v System .....	63
‣ Electrical Drawings for 12v System .....	64
‣ Battery Switch and Shorepower Connection .....	65
‣ Exhaust System .....	66
‣ Steering System .....	67
‣ Rudder and Shaft .....	68
‣ Emergency Tiller .....	69
‣ Anchoring Arrangement .....	70

## TABLE OF CONTENTS CONTINUED

### EQUIPMENT MANUALS AND INFORMATION

- ▶ Engine Manual
- ▶ Knotmeter and Depthsounder (except 280)
- ▶ VHF Radio (except where not provided)
- ▶ Compass Information
- ▶ Stereo Manual (except 280 & 29.5)
- ▶ Furling System Manual
- ▶ Dutchman Sail Flaking Manual (except 280 & 29.5)
- ▶ Marine Rigging Guide
- ▶ Winch Maintenance Manual
- ▶ Steering Maintenance Guide
- ▶ Sailmaker Information
- ▶ Water Strainer
- ▶ Bilge Pump
- ▶ Toilet Manual
- ▶ Stove Manual
- ▶ Hot Water Manual
- ▶ Microwave Manual (except where not provided)

**Other:**

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Welcome To

# THE HUNTER MARINE FAMILY

Congratulations on your new sailing yacht manufactured by Hunter Marine. We have engineered and constructed your boat to be as fine a yacht as any afloat. In order to get the best performance and most enjoyment from your boat you should be familiar with its various elements and functions. Please take the time to study this manual and its recommendations for your sailing pleasure.

We stand behind the quality of your boat with a warranty which you should also review. To insure your warranty is valid, please fill out the attached card and send it to us within ten (10) days of the purchase date. Section 15 of the U.S. Federal Boat Safety Act requires first owners to be registered. The warranty data should also be recorded in the space below for your own reference.

This manual has been compiled to help you to operate your craft with safety and pleasure. It contains details of the craft, the equipment supplied or fitted,

its systems, and information on its operation and maintenance. Please read it carefully, and familiarize yourself with the craft before using it.

If this is your first craft, or you are changing to a type of craft you are not familiar with, for your own comfort and safety, please ensure that you obtain handling and operating experience before assuming command of the craft. Your dealer or national sailing federation or yacht club will be pleased to advise you of local sea schools, or competent instructors.

**PLEASE KEEP THIS MANUAL IN A SECURE PLACE, AND HAND IT OVER TO THE NEW OWNER WHEN YOU SELL THE CRAFT.**

You also need to fill out and mail the warranty cards on your diesel auxiliary, stove, head, electric water pump and other accessories. These are enclosed in the manufacturers' manuals which are included with your owner's manual.

## OWNER INFORMATION CARD

**HULL IDENTIFICATION NUMBER IS ON THE STARBOARD AFT SIDE OF THE HULL OR TRANSOM  
THIS NUMBER MUST BE GIVEN IN ALL NECESSARY COMMUNICATIONS.**

HULL NO.		DATE DELIVERED TO OWNER
YACHT NAME		
OWNER NAME		
STREET ADDRESS		
CITY	STATE/COUNTRY	ZIP CODE
HOME PORT		
ENGINE MODEL	SERIAL NO.	PROPELLER SIZE
DEALER	PHONE	
STREET ADDRESS		
CITY	STATE/COUNTRY	ZIP CODE

A copy of *Chapman's Piloting, Seamanship and Small Boat Handling* is provided with your Hunter Marine boat as part of the standard equipment. Any questions regarding the meaning of terminology used in this manual may be referenced in your *Chapman's*.

# HUNTER MARINE LIMITED WARRANTY

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## LIMITED ONE YEAR WARRANTY

Hunter Marine warrants to the first-use purchaser and any subsequent owner during the warranty period, that any part manufactured by Hunter will be free of defects caused by faulty workmanship or materials for a period of twelve (12) months from

the date of delivery to the first-use purchaser under normal use and service. During this period, Hunter will repair or replace any part judged to be defective by Hunter.

## LIMITED FIVE YEAR HULL STRUCTURE AND BOTTOM BLISTER WARRANTY

Hunter warrants to the first-use purchaser and any subsequent owner during the warranty period that the hull of each boat will be free from structural defects in materials and workmanship for a period of five (5) years from the date of delivery to the first-use purchaser under normal use and service.

This limited warranty applies only to the structural integrity of the hull and the supporting pan/grid or stringer system. Hulls, pan/grid or stringers modified in any way or powered with engines other than the type and size installed or specified by Hunter are not covered by this limited warranty. The obligation of Hunter under this limited warranty is limited to the repair or replacement of hulls, that it determines to be structurally defective. This is your sole and exclusive remedy.

Hunter also warrants to the first-use purchaser and any subsequent owner during the warranty period that the boat will be free from gel-coat blistering on underwater surfaces of the hull, excluding the keel and rudder, for a period of five (5) years from the date of delivery to the first-use purchaser under normal use and service. During this period, Hunter will

supply or reimburse an authorized Hunter dealer for all of the parts and labor required to repair a blistered underwater surface of the hull. The labor cost reimbursement will be based on the Labor Allowance Schedule established by Hunter from time to time. However, if the repair is performed by a non-Hunter dealer, the repair cost must be authorized by Hunter in advance and be based on a reasonable number of hours as determined by Hunter. Transportation, hauling, launching, bottom paint, storage, dockage, cradling rental, rigging and derigging, or other similar costs will not be paid by Hunter. It is recommended that the repair be done during a seasonal haul out for service or storage.

The following circumstances will void the bottom blister limited warranty:

(1) If the gel-coat has been sanded, sand-blasted, or subjected to abrasion or impact.

(2) If the instructions provided in the Hunter Owner's Manual are not followed according to Hunter's required bottom preparation procedures.

## RESTRICTIONS APPLICABLE TO WARRANTIES

These limited warranties do not cover:

(1) Paint, window glass, gel-coat, upholstery damage, plastic finishes, engines, engine parts, bilge pumps, stoves, blowers, pressure water pumps, propellers, shafts, rudders, controls, instruments, keels and equipment not manufactured by Hunter. Any warranty made by the manufacturer of such items

will be, if possible, given on to the first use purchaser.

(2) Problems caused by improper maintenance, storage, cradling, blocking, normal wear and tear, misuse, neglect, accident, corrosion, electrolysis or improper operation.

# HUNTER MARINE LIMITED WARRANTY

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## RESTRICTIONS APPLICABLE TO WARRANTIES (continued)

THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY AND ALL OTHER REMEDIES AND WARRANTIES EXPRESSED AND IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS. SOME STATES OR COUNTRIES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. THE PURCHASER ACKNOWLEDGES THAT NO OTHER REPRESENTATIONS WERE MADE TO HIM OR HER WITH RESPECT TO THE QUALITY AND FUNCTION OF THE BOAT.

ANY CONSEQUENTIAL DAMAGES WHICH MAY BE INCURRED ARE EXCLUDED AND JUDGED DEFECTIVE BY HUNTER. SOME STATES OR COUNTRIES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE OR COUNTRY TO COUNTRY.

## WARRANTY REGISTRATION

These limited warranties shall not be effective unless the Hunter Warranty Registration Form and Pre-Delivery Service Record, which are furnished with each new boat, are filled out completely and returned to Hunter within fifteen (15) days of delivery. Responsibility for sending the completed Registration Form remains with the dealer.

Return to the Warranty Registration Form to Hunter, signed by both Dealer and Owner, is critical. Warranty coverage cannot be initiated until the completed form is received at Hunter.

All repairs and/or replacements will be made by an authorized Hunter dealer, or at the option of Hunter, at the Hunter plant. If the repairs are of such a nature that the warranty work must be performed at the Hunter plant, transportation costs to and from the Hunter plant shall be paid by the owner. The labor cost reimbursement will be based on a Labor allowance Schedule established by Hunter and where not applicable, on a reasonable number of hours as determined by Hunter. Any repairs and replacements must be approved in advance by an authorized Hunter service representative.

## TRANSFER OF LIMITED WARRANTIES

Limited warranties will be transferred to a subsequent purchaser of the boat if:

(1) A notice of the transfer of ownership of the boat is given by the subsequent purchaser in writing to Hunter within thirty (30) days of the transfer.

(2) The notice shall include the name, address and telephone number of the subsequent purchaser,

the date of purchase, the hull number and the name of the seller of the boat.

Hunter will mail to the subsequent purchaser notice of the expiration dates of the limited warranties. The transfer of the ownership of the boat will not extend the expiration dates of the limited warranties.

# HUNTER MARINE LIMITED WARRANTY

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## EPOXY BARRIER COAT

Should a customer wish to have an epoxy barrier coat applied to his hull, example Interlux Interprotect 1000, 2000 or West Systems or Vc Tar, this will not void the Five Year Blister Warranty.

Hunter Marine refers to epoxy barrier coatings as mentioned above, not epoxy primer paints.

If an epoxy barrier coat is applied to a Hunter vessel, it must be registered with the Warranty Department prior to application of the product. If the dealer applies bottom paint only, sanding will not be allowed and the no sanding system must be used.

## CUSTOMER SATISFACTION SURVEYS

During the first year of ownership, the first purchaser will receive two Customer Satisfaction Surveys - the first (CSS#1) will be received shortly after taking delivery and focuses on the dealer's ability to sell and commission the boat, and the Owner's initial satisfaction. The second survey (CSS#2), nine to ten

months into ownership, "measures" dealer service capability and allows the owner to evaluate most of the boat's functional systems and characteristics. Both surveys are dependent upon receipt of the first purchaser's Warranty Registration Form.

## HUNTER MARINE'S OWNER AND FOUNDER

# WARREN R. LUHRS

### BRIEF HISTORY

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Born in 1944 in East Orange, New Jersey, Warren R. Luhrs' ancestry goes back to his great-grandfather, Henry, who helped pioneer railroading and clipper ships in America, and to his great-uncle, John, who helped build the famous St. Petersburg-to-Moscow railroad for Czar Alexander II.

Henry Luhrs owned shares in twenty-two different ocean-going vessels - barks, brigs and schooners - and was principal owner of the bark, *Sophia R. Luhrs*, named after his wife. He was also a partner with Albert Sprout, who managed a shipyard in Melbridge, Maine, where the *Sophia R. Luhrs* was built.

The Luhrs' family sea tradition was carried on during the great depression by Warren Luhrs' father, Henry, who worked at a small boat manufacturer in Morgan, New Jersey, and later started his own company. When war broke out in Europe, the Coast Guard asked Henry Luhrs to repair their boats and install ice sheathing on their bows.

After World War II, Henry built 27-foot fishing boats and in 1948 began to construct custom-built pleasure craft. He then turned to skiffs and in 1952 incorporated as Henry Luhrs Sea Skiffs. He constructed lap strake sea skiffs using assembly-line techniques. Henry personally "shook down" his prototypes with family trips up the Hudson River to Lake Champlain.

The sea skiff is a class of boat which has been very popular, owing to its seaworthiness. It features a sharp bow, which reduces pounding in surf or choppy seas, and a hull whose forward section is rounded

below the water line to increase stability in rough water or a following sea. Such skiffs can either be smooth-sided or of lapstrake construction.

Henry Luhrs' basic philosophy was to emulate the late Henry Ford in building an inexpensive boat for the average man, thus enabling him to enjoy the luxury of boating. He was both designer and engineer, creating innovative and progressive new models. He designed the change in the line of the bow from straight to curved at a time when all boats were being built with the straight square effect. It is believed he was also the first designer-builder to popularize a small boat with a fly-bridge.

In 1960, Luhrs acquired the Ulrichsen Boat Company, Marlboro, New Jersey. It was here, too, that the Luhrs' Alura fiberglass Division was located. In 1965, Henry sold his company to Bangor Arrostock Railroad, which was to become the recreational conglomerate, Bangor-Punta. It was also during this period that Silverton of Tom's River, New Jersey was purchased by John and Warren Luhrs.

Today, Warren R. Luhrs and his brother John, own Hunter Marine Corporation, Silverton Marine Corporation, Mainship Motor Yachts and Luhrs Fishing Boats with its Alura division. Hunter Marine produces sailboats while the other companies produce powerboats.

In January of 1996, Warren and John transferred a portion of the Luhrs Group to its employees through an ESOP program.



# GLOSSARY OF SAILING TERMS

## A

**Aback:** describes a sail when the wind strikes it on its lee side.

**Abaft:** towards the boat's stern.

**Abeam:** at right angles to the *center-line* of the boat.

**Aft:** at or near the stern.

**Amidships:** the center of the boat, *athwartships* and fore and aft.

**Anti-fouling:** a poisonous paint compound used to protect the underwater part of a hull from marine growths.

**Apparent wind:** the direction and speed of the wind felt by the crew. It is a combination of *true wind* and that created by the movement of the boat.

**Astern:** behind the boat; to go astern is to drive the boat in reverse.

**Athwartships:** at right angles to the fore and aft line of the boat.

## B

**Back:** when a wind backs, it shifts anticlockwise.

**Back a sail:** to sheet it to windward so that the wind fills on the side that is normally to *leeward*.

**Backstay:** a stay that supports the mast from aft and prevents its forward movement.

**Ballast:** extra weight, usually lead or iron, placed low in the boat or externally on the keel to provide stability.

**Ballast keel:** a mass of ballast bolted to the keel to increase stability and prevent a keel boat from capsizing.

**Batten:** a light, flexible strip fed into a batten pocket at the *leech* of the sail to support the *roach*.

**Beam:** 1, the maximum breadth of a boat; 2, a transverse *member* which supports the deck; 3, on the beam means that an object is at right angles to the *center-line*.

**Bear a way:** to steer the boat away from the wind.

**Bearing:** the direction of an object from an observer, measured in degrees true or magnetic.

**Beat:** to sail a *zigzag course* towards the wind, *close-hauled* on alternate *tacks*.

**Belay:** to make fast a rope around a *cleat*, usually with a figure-of-eight knot.

**Bend:** 1, to secure a sail to a *spar* before hoisting; 2, to moor a boat; 3, a sleeping place on board.

**Bight:** a *bend* or loop in a rope.

**Bilge:** the lower, round part inside the hull where water collects.

**Block:** a pulley in a wooden or plastic cas, consisting of a *sheave* around which a rope runs. It is used to change the direction of pull.

**Boot-topping:** a narrow colored stripe painted between the bottom paint and the *topside* enamel.

**Bottlescrew:** see Rigging screw.

**Broach:** when a boat *running* downwind slews broadside to the wind and *heels* dangerously. It is caused by heavy following seas or helmsman's error.

**Broad reach:** the point of sailing between a beam *reach* and a *run*, when the wind blows over the *quarter*.

**Bulkhead:** partition wall in a boat normally fitted *athwartships*.

## C

**Caulk:** to make the seams between wooden planks watertight by filling with cotton, oakum or a compound.

**Cavitation:** the formation of a vacuum around a propeller, causing loss in efficiency.

**Center-board:** a board lowered through a slot in the *keel* to reduce *leeway*.

**Center-line:** center of the boat in a fore and aft line.

**Center or effort (COE):** the point at which all the forces acting on the sails are concentrated.

**Center of lateral resistance (CLR):** the underwater center of pressure about which a boat pivots when changing *course*.

**Chain pawl:** a short lug which drops into a toothed rack to prevent the anchor chain running back.

**Chain plate:** a metal plate bolted to the boat to which the *shrouds* or *backstays* are attached.

**Chart datum:** reference level on a chart below which the tide is unlikely to fall. Soundings are given below chart datum. The datum level varies according to country and area.

**Chine:** the line where the bottom of the hull meets the side at an angle.

**Cleat:** a wooden, metal or plastic fitting around which rope is secured.

**Clevis pin:** a locking pin through which a split ring is passed to prevent accidental withdraw.

**Clew:** the after, lower corner of a sail where the foot and *leech* meet.

**Close-hauled:** the point of sailing closest to the wind; see also *beat*.

**Close reach:** the point of sailing between *close-hauled* and a beam *reach*, when the wind blows forward of the *beam*.

**Close-winded:** describes a boat able to sail very close to the wind.

**Coamings:** the raised structure surrounding a *hatch*, cockpit etc., which prevents water entering.

**Cotter pin:** soft, metal pin folded back on itself to form an eye.

**Course:** the direction in which a vessel is steered, usually given in degrees: true, magnetic or compass.

**Cringle:** 1, a rope loop, found at either end of a line of *reef* points; 2, an eye in a sail.

## D

**Dead run:** running with the wind blowing exactly aft, in line with the *center-line*.

**Deviation:** the difference between the direction indicated by the compass needle and the magnetic *meridian*; caused by object aboard.

**Displacement:** 1, the weight of water displaced by a boat is equal to the weight of the boat; 2, a displacement hull is one that displaces its own weight in water and is only supported by buoyancy, as opposed to a planing hull which can exceed its hull, or displacement, speed.

**Downhaul:** a rope fitted to pull down a sail or spar.

**Draft:** the vertical distance from the *waterline* to the lowest point of the *keel*.

**Drag:** 1, an anchor drags when it fails to hole; 2, the force of wind on the sails, or water on the hull, which impedes the boat's progress.

**Drift:** 1, to float with the current or wind; 2, US the speed of a current (rate UK); 3, UK: the distance a boat is carried by a current in a given time.

# GLOSSARY OF SAILING TERMS

**Drogue:** a sea anchor put over the stern of a boat or life raft to retard *drift*.

**Drop keel:** a retractable *keel* which can be drawn into the hull, when entering shallow waters and recovering on to a trailer.

## E

**Eye of the wind:** direction from which the true wind blows.

## F

**Fair:** well-faired line or surface is smoother with no bumps, hollows or abrupt changes in direction.

**Fairlead:** a fitting through which a line is run to alter the direction of the lead of the line.

**Fathom:** the measurement used for depths of water and lengths of rope. 1 fathom = 6 ft. = 1.83 m.

**Fid:** a tapered tool used for *splicing* heavy rope and for sail-making, often hollow.

**Fiddle:** a raised border for a cabin table, chart table etc., to prevent objects falling off when the boat *heels*.

**Fix:** the position of the vessel as plotted from two or more *position lines*.

**Forestay:** the foremost stay, running from the masthead to the stemhead, to which the headsail is hanked.

**Freeboard:** vertical distance between the *waterline* and the top of the deck.

## G

**Genoa:** a large headsail, in various sizes, which overlaps the mainsail and is hoisted in light to fresh winds on all *points of sailing*.

**Gimbals:** two concentric rings, pivoted at right angles which keep objects horizontal despite the boat's motion, e.g. compass and cooker.

**Go about:** to turn the boat through the *eye of the wind* to change *tack*.

**Gooseneck:** the fitting attaching the boom to the mast, allowing it to move in all directions.

**Goosewing:** to boom-out the headsail to *windward* on a *run* by using a *whisker pole* to hold the sail on the opposite side to the mainsail.

**Ground tackle:** general term used for anchoring gear.

**Guard rail:** a metal rail fitted around the boat to prevent the crew falling overboard.

**Gudgeon:** a rudder fitting. It is the eye into which the *pintle* fits.

**Guy:** a steadying rope for a spar; a spinnaker guy controls the fore and aft position of the spinnaker pole; the foreguy holds the spinnaker pole forward and gown.

**Gybe:** to change from one *tack* to another by turning the stern through the wind.

## H

**Halyard:** rope used to hoist and lower sails.

**Hank:** fitting used to attach the *luff* of a sail to a stay.

**Hatch:** an opening in the deck giving access to the interior.

**Hawse pipe:** see Navel pipe.

**Head-topwind:** when the bows are pointing right into the wind.

**Headfoil:** a streamlined surround to a *forestay*, with a groove into which a headsail *luff* slides.

**Heads:** the toilet.

**Headway:** the forward movement of a boat through the water.

**Heave-to:** to *back* the jib and lash the tiller to *leeward*; used in heavy weather to encourage the boat to lie quietly and to reduce *headway*.

**Heaving line:** a light line suitable for throwing ashore.

**Heel:** to lean over to one side.

## I

**Isobars:** lines on a weather map joining places of equal atmospheric pressure.

## J

**Jackstay:** a line running fore and aft, on both sides of the boat, to which safety harnesses are clipped.

**Jury:** a temporary device to replace lost or damaged gear.

## K

**Keel:** the main backbone of the boat to which a *ballast keel* is bolted or through which the *centerboard* passes.

**Kicking strap:** a line used to pull the boom down, to keep it horizontal, particularly on a *reach* or *run*.

## L

**Lanyard:** a short line attached to one object, such as a knife, with which it is secured to another.

**Leech:** 1, the after edge of a triangular sail; 2, both side edges of a square sail.

**Leehelm:** the tendency of a boat to *bear away* from the wind.

**Lee shore:** a shore on to which the wind is blowing.

**Leeward:** away from the wind; the direction to which the wind blows.

**Leeway:** the sideways movement of a boat off its *course* as a result of the wind blowing on one side of the sails.

**Lifeline:** a wire or rope rigged around the deck to prevent the crew falling overboard.

**Limber holes:** gaps left at the lower end of frames above the *keel* to allow water to drain to the lowest point of the *bilges*.

**List:** a boat's more or less permanent lean to one side, owing to the improper distribution of weight, e.g., *ballast* or water.

**Log:** 1, an instrument for measuring a boat's speed and distance travelled through the water; 2, to record in a book the details of a voyage, usually distances covered and weather.

**Luff:** the forward edge of a sail. To luff up is to turn the boat's head right into the wind.

**Luff groove:** a groove in a wooden or metal spar into which the *luff* of the headsail is fed.

**Lurch:** the sudden roll of a boat.

## M

**Marlin spike:** a pointed steel or wooden spike used to open up the strands of rope or wire then splicing.

**Mast Step:** the socket in which the base of the mast is located.

**Measured mile:** a distance of one nautical mile measured between buoys or *transits/ranges* ashore, and marked on the chart.

**Member:** a part of the skeleton of the hull, such as a *stringer* laminated into a fiberglass hull to strengthen it.

# GLOSSARY OF SAILING TERMS

**Meridian:** an imaginary line encircling the Earth which passes through the poles and cuts at right angles through the Equator. All lines of longitude are meridians.

**Mizzen:** 1, the shorter, after-mast on a *ketch* or *yawl*; 2, the fore and aft sail set on this mast.

## N

**Navel pipe:** a metal pipe in the foredeck through which the anchor chain passes to the locker below.

**Noon sight:** a vessel's latitude can be found, using a sextant, when a heavenly body on the observer's *meridian* is at its greatest altitude. The sight of the sun at noon is the one most frequently taken.

## O

**Off the wind:** with the *sheets* slacked off, not *close-hauled*.

**One the wind:** *close hauled*.

**Outhaul:** a rope used to pull out the foot of a sail.

**Overall length (LOA):** the boat's extreme length, measured from the foremost part of the bow to the aftermost part of the stern, excluding bowsprit, self-steering gear etc.

## P

**Painter:** the bow line by which a dinghy, or *tender*, is towed or made fast.

**Pintle:** a rudder fitting with a long pin which slips into the *gudgeon* to form a hinged pivot for the rudder.

**Pitch:** 1, the up and down motion of the bows of a boat plunging over the waves; 2, the angle of the propeller blades.

**Point of sailing:** the different angles from the wind on which a boat may sail; the boat's *course* relative to the direction of the wind.

**Port:** the left-hand side of a boat, looking forward (opp. of *starboard*).

**Port tack:** a boat is on a port tack when the wind strikes the port side first and the mainsail is out to *starboard*. A boat on the port tack gives way to a boat on a *starboard tack*.

**Position line/line of position:** a line drawn on a chart, as a result of taking a bearing, along which the boat's position must i.e.. Two position lines give a fix.

**Pulpit:** a metal *guard rail* fitted at the bows of a boat to provide safety for the crew.

**Pushpit:** a metal *guard rail* fitted at the stern.

## Q

**Quarter:** the portion of the boat midway between the stern and the beam; on the quarter means about 45 degrees *abaft* the beam.

## R

**Rake:** the fore and aft deviation from the perpendicular of a mast or other feature of a boat.

**Range:** 1, see *Transit*; 2, of tides, the difference between the high and low water levels of a *tide*; 3, the distance at which a light can be seen.

**Rating:** a method of measuring certain dimensions of a yacht to enable it to take part in handicap races.

**Reach:** to sail with the wind approximately on the *beam*; all sailing points between running and *close-hauled*.

**Reef:** to reduce the sail area by folding or rolling surplus material on the boom or *forestay*.

**Reefing pennant:** strong line with which the *luff* or *leech cringle* is pulled down to the *boom* when reefing.

**Rhumb line:** a line cutting all *meridians* at the same angle; the *course* followed by a boat sailing in a fixed direction.

**Riding light to anchor light:** an all-round white light, usually hoisted on the *forestay*, to show that a boat under 50 ft. (15m) is at anchor. It must be visible for 2 mls. (3km).

**Rigging screw:** a deck fitting with which the tension of *standing rigging*, e.g. *stays*, *shrouds*, is adjusted.

**Roach:** the curved part of the *leech* of a sail which extends beyond the direct line from head to *clew*.

**Run:** to sail with the wind *aft* and with the *sheets* eased well out.

**Running rigging:** all the moving lines, such as *sheets* and *halyards*, used in the *setting* and *trimming* of sails.

## S

**Scope:** the length of rope or cable paid out when *mor anchoring*.

**Scuppers:** holes in the *toe rail* which allow water to drain off the deck.

**Seacock:** a valve which shuts off an underwater inlet or outlet passing through the hull.

**Seize:** to bind two ropes together, or a rope to a *spar*, with a light line.

**Serve:** to cover and protect a *splice* or part of a rope with twine bound tightly against the lay.

**Serving mallet:** tool with a grooved head, used when serving a tope to keep the twine at a constant and high tension.

**Set:** 1, to hoist a sail; 2, the way in which the sails fit; 3, the direction of tidal current or steam.

**Shackle:** a metal link with a removable bolt across the open end; of various shapes: D, U.

**Sheave:** a grooved wheel in a *block* or *spar* for a rope to run on.

**Sheet:** the tope attached to the *clew* of a sail or to the boom, enabling it to be controlled or *trimmed*.

**Shrouds:** ropes or wires, usually in pairs, led from the mast to *chain plates* at deck level to prevent the mast falling sideways; part of the *standing rigging*.

**Sloop:** a single-masted sailing boat with a mainsail and one head sail.

**Spar:** a general term for any wood or metal pole, e.g., mast or boom, used to carry or give shape to sails.

**Spindrift:** spray blown along the surface of the sea.

**Spinnaker:** a large, light, balloon-shaped sail set when *reaching* or *running*.

**Splice:** to join ropes or wires by unlaying the strands and interweaving them.

**Split pin:** see *Cotter pin*.

**Spreaders:** horizontal struts attached to the mast, which extend to the *shrouds* and help to support the mast.

**Stall:** a sail stalls when the airflow over it breaks up, causing the boat to lose way.

**Stanchion:** upright metal post bolted to the deck to support *guard rails* or *life-lines*.

**Standing part:** the part of a line not used when making a knot; the part of a rope which is made fast, or around which the knot is tied.

**Standing rigging:** the shrouds and *stays* which are permanently set up and support the masts.

# GLOSSARY OF SAILING TERMS

---

**Starboard:** right-hand side of a boat looking forward (opp. of *port*).

**Starboard tack:** a boat is on the starboard tack when the wind strikes the starboard side first and the boom is out to *port*.

**Stay:** wire or rope which supports the mast in a fore and aft direction; part of the *standing rigging*.

**Steerage way:** a boat has steerage way when it has sufficient speed to allow it to be steered, or to answer the helm.

**Stem:** the timber at the bow, from the keel upwards, to which the planking is attached.

**Sternway:** the backward, stern-first movement of a boat.

**Stringer:** a fore and aft *member*, fitted to strengthen the frames.

## T

**Tack:** 1, the lower forward corner of a sail; 2, to turn the boat through the wind so that it blows on the opposite side of the sails.

**Tacking:** working to windward by sailing *close-hauled* on alternate *courses* so that the wind is first on one side of the boat, then on the other.

**Tack pennant:** a length of wire with an eye in each end, used to raise the tack of a headsail some distance off the deck.

**Tackle:** a purchase system comprising of rope and *blocks* which is used to gain mechanical advantage.

**Tang:** a strong metal fitting by which *standing rigging* is attached to the mast or other spar.

**Tender of dinghy:** a small boat used to ferry stores and people to a yacht.

**Terminal fitting:** fitting at the end of a wire rope by which a *shroud* or *stay* can be attached to the mast, a *tang* or a *rigging screw/turnbuckle*.

**Tide:** the vertical rise and fall of the oceans, caused principally by the gravitational attraction of the moon.

**Toe rail:** a low strip of metal or moulding running around the edge of the deck.

**Topping lift:** a line from the masthead to a *spar*, normally the boom, which is used to raise it.

**Topsides:** the part of a boat's hull which is above the *waterline*.

**Track:** 1, the *course* a boat has made good; 2, a fitting on the mast or boom into which the slides on a sail fit; 3, a fitting along which a *traveller* runs; used to alter the tension of the *sheets*.

**Transit:** two fixed objects are in transit when seen in line; two transits give position *fix*.

**Traveller:** 1, a ring or hoop which can be hauled along a *spar*; 2, a fitting which slides in a *track* and is used to alter the angle of the *sheets*.

**Trim:** 1, to adjust the angle of the sails, by means of *sheets*, so that they work most efficiently; 2, to adjust the boat's load, and thus the fore and aft angle at which it floats.

**True wind:** the direction and speed of the wind felt when stationary, at anchor or on land.

**Turnbuckle:** see *Rigging screw*.

## U

**Under way:** a boat is under way when it is not made fast to the shore, at anchor or aground.

**Uphaul:** a line used to raise something vertically, e.g., the spinnaker pole.

## V

**Veer:** 1, the wind veers when it shifts in a clockwise direction; 2, to pay out anchor cable or rope in a gradual, controlled way.

## W

**Wake:** the disturbed water left *astern* of a boat.

**Waterline:** the line along the hull at which a boat floats.

**Waterline length (WL):** the length of a boat from *stem* to *stern* at the *waterline*. It governs the maximum speed of a *displacement hull* and affects a boat's *rating*.

**Weather helm:** (opp. of *lee helm*).

**Weather side:** the side of a boat on which the wind is blowing.

**Wetted surface:** the area of the hull under water.

**Whisker pole:** a light pole used to hold out the *clew* of a headsail when *running*.

**Winch:** a mechanical device, consisting usually of a metal drum turned by a handle, around which a line is wound to give the crew more purchasing power when hauling taut a line, e.g., a *jib sheet*.

**Windage:** those parts of a boat which increase *drag*, e.g., *rigging*, *spars*, crew, etc.

**Windlass:** a *winch* with a horizontal shaft and a vertical handle, used to haul up the anchor chain.

**Windward:** the direction from which the wind blows; towards the wind (opp. of *leeward*).

## Y

**Yawl:** a two masted boat with a *mizzen* stepped *aft* of the rudder stock/post.

# EXPLANATION OF SAFETY PRECAUTIONS

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This book contains safety precautions which must be observed  
when operating or servicing your boat.  
Review and understand these instructions.



## **DANGER**

Denotes an extreme intrinsic hazard exists which would result in high probability of death or irreparable injury if proper precautions are not taken.



## **WARNING**

Denotes a hazard exists which can result in injury or death if proper precautions are not taken.



## **CAUTION**

Denotes a reminder of safety practices or directs attention to unsafe practices which could result in personal injury or damage to the craft or components.

# SAFE BOATING TIPS

## BE PREPARED

Take a safe boating course. In the U.S., contact your local Coast Guard office for information. Outside the U.S., contact your local Boating Industry for details.

Carry all safety equipment required by the laws that apply to your area. Requirements are generally available from the Coast Guard or your local Boating Industry.



### WARNING

As the owner of the craft, obtaining and maintaining necessary safety equipment is your responsibility. For more information about equipment required, contact your local boating authorities.

## MINIMUM RECOMMENDED SAFETY EQUIPMENT

- Required life saving equipment including life vests and throwables
- Required fire extinguishing equipment
- First Aid kit
- Emergency Position Indicating Radio Beacon (EPIRB)
- Manual bailing device
- Anchor with sufficient line and/or chain
- Flashlight with good batteries
- Binoculars
- VHF radio
- Navigational charts for the appropriate areas
- Flares
- Fog bell
- Noise emitting device
- Radar reflector
- Sufficient food and water provisions
- Auxiliary starting battery
- Spare fuses and bulbs
- Sunglasses and sunblock
- Blanket

The required safety equipment you must have on board may vary by region or body of water. Therefore, please check with the local boating authorities prior to leaving on your trip for a safety examination.

## LIFE JACKETS

A life jacket may save your life, but only if you wear it. Keep jackets in a readily accessible place — not in a closed compartment or stored under other gear. Remove them from their packaging, if so provided. In addition, throwable floatation devices must be immediately available for use.



### WARNING

**LIFE SAVING HAZARD:** It is especially important that children, handicapped people and non-swimmers wear a life jacket at all times. Children and non-swimmers need special instruction in the use of life jackets.

## FIRE EXTINGUISHERS

Approved fire extinguishers are required on most boats, therefore check with your local authorities. All passengers should know the location and operating procedure of each fire extinguisher. Fire ex-

tinguishers are normally classified according to fire type. Be familiar with what type of fire extinguishers are on board.

# SAFE BOATING TIPS

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## FLARES

Most boats operating on coastal waters are required to carry approved visual distress signals, therefore check with your local authorities as to which type are required.



### WARNING

**FIRE/EXPLOSION HAZARD;** Pyrotechnic signaling devices can cause injury and property damage if not handled properly. Follow manufacturer's directions regarding the proper use of signaling devices.

## DRUGS AND BOATING

Do not drink alcohol while boating. The combination of noise, sun, wind and motion all combine to produce fatigue on the water. The effects of alcohol are greater on the water than on land.



### WARNING

**IMPAIRED OPERATION HAZARD;** Operating any boat while intoxicated or under the influence of other drugs is both dangerous and illegal. Impaired vision or judgment on the water may lead to accidents and personal injury.

## BEFORE GETTING UNDERWAY

- Leave a Float Plan (example included).
- Perform a Pre-Departure Checklist (example included).
- Check the weather. Do not venture out if the weather is, or will be, threatening.

## WHILE UNDERWAY

- Keep a good lookout. This is especially true of sailboats. Keep a watch to leeward under the headsail. Keep away from swimmers, divers, and skiers.
- Know and obey local boating laws.
- Respect bad weather, and be prepared for quickly changing conditions.



### WARNING

**COLLISION HAZARD;** Use extra caution in shallow water or where underwater/floating objects may be present. Hitting an object at speed or severe angle can seriously injure people and damage your boat.

# PRE-DEPARTURE CHECKLIST

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- ☐ Check bilge for excess water
- ☐ **Check weather conditions and tides**
- ☐ Check food supply
- ☐ Foul weather gear
- ☐ Linen, sleeping bags
- ☐ Fuel
- ☐ Water
- ☐ Sunscreens and sunglasses
- ☐ Tools
- ☐ Docking and anchor gear
- ☐ Check radio operations
- ☐ Navigation charts and instruments
- ☐ **Float plans to a friend or Coast Guard** (*See next page*)
- ☐ Fuel for stove
- ☐ Cooking and eating utensils
- ☐ Check battery water level
- ☐ Oil level, tight Vp-belts
- ☐ Check for loose electrical connections in engine compartment
- ☐ Secure tools or any loose equipment in engine compartment so as not to get fouled in engine
- ☐ AC systems off; electrical cord stowed
- ☐ Doors and drawers secured
- ☐ Check steering lock to lock
- ☐ Check mast for rigging irregularities and tightness
- ☐ Halyards and sheets are clear and ready to run
- ☐ No lines or other obstructions near the propeller or bow
- ☐ Anchor ready to run
- ☐ Check lifelines for tightness
- ☐ Turn on fuel and water lines
- ☐ Stow all loose gear
- ☐ Open engine cooling water intake thru-hull valve



# FLOAT PLAN

1. Name of person reporting and telephone number:

2. Description of boat:

NAME	TYPE	
MAKE	LENGTH	REGISTRATION #
HULL COLOR	STRIPE COLOR	DECK COLOR
OTHER DISTINGUISHING MARKS		

3. Persons aboard: NUMBER

NAME	AGE	PHONE #
ADDRESS		
NAME	AGE	PHONE #
ADDRESS		
NAME	AGE	PHONE #
ADDRESS		

4. Engine: TYPE H.P. FUEL CAPACITY

5. Safety Equipment: ☐ PFDs ☐ Flares ☐ Mirror ☐ Flashlight  
☐ Food ☐ Water ☐ EPIRB ☐ Raft/Dinghy

6. Radio: TYPE FREQUENCIES

7. Trip Expectations:

DEPARTING AT (APPROX. TIME)	ON (DATE)	FROM (LOCATION)
GOING TO (LOCATION)	RETURNING (DATE)	IN NO EVENT LATER THAN (TIME & DATE)

8. Automobile: LICENSE # STATE

MAKE	COLOR	PARKED AT
------	-------	-----------

9. If not returned by \_\_\_\_\_, call the Coast Guard or:

at: \_\_\_\_\_

# AFTER SAILING CHECKLIST

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When leaving your Hunter at the dock for more than a short time, it is a good idea to review the following checklist to make sure everything is in order.

This will help protect the various parts of your boat and add considerably to their attractiveness and usable life.

- ☐ Flake or furl mainsail and cover, or remove and bag.
- ☐ Remove and stow all portable deck hardware such as snatch blocks, winch handles, etc.
- ☐ Secure the boom to the topping lift and set it firmly amidships with the mainsheet purchase. (It is also a good idea to rig a line from the steering wheel or tiller to a convenience cleat to keep the rudder from swinging back and forth with the motion of the water or employ the wheel brake if so equipped.
- ☐ Attach the shackle ends of all halyards to convenient fittings and take up slack. Find a location leading away from the mast to keep the halyard from slapping the mast.
- ☐ Coil and stow all lines in line lockers
- ☐ Cover the winches and steering pedestal when leaving the boat for several days or more.
- ☐ Close all fuel lines and seacocks.
- ☐ Switch off the electrical system.
- ☐ Pump out the bilge.
- ☐ Check air vents, secure ports and hatches, swab the deck, and clean deck stainless, particularly if you have operated in saltwater.
- ☐ Make a final check of mooring lines, chafing gear, fenders, etc.

# SAFE BOATING TIPS

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## DOCKING

Docking your boat should be handled carefully to avoid potential damage. Under normal wind and water conditions, the following considerations should be made:

1. Whenever possible, your approach should be made against the prevailing wind and current to assist in stopping the boat. Where these conditions are contrary, the strongest should be used to determine approach.

2. Approaching the dock: Dock lines and fenders should be at ready, loose gear stowed and decks cleared. Determine the direction of wind and current, and, once you decide which side of the boat will be against the dock, rig dock lines and fenders

on the appropriate side. One dock line should be attached to the bow cleat, another to the stem cleat opposite the side that will lie against the dock.

*NOTE: If the boat is to lie against a piling, rig a fender board across two or more fenders.*

3. Tying up: Attach bow and stern lines to dock, hauling boat in with fenders against dock. Rig crossing spring lines to limit motion forward and aft. Be sure to allow some slack in all lines to compensate for tidal activity if present. Never use bow rail, stern rail or stanchions to secure vessel, even for brief periods. For other types of moorings, or for abnormal wind or water conditions, consult your *Chapman's* or other approved boating guide.

## ANCHORING

Your Hunter comes with an on-deck anchor well and a Danforth type anchor as standard equipment. The anchor is selected to suit the size and weight of your boat under normal anchoring conditions, and provides its best holding characteristic in muddy or sandy bottoms.

When anchoring, pay particular attention to the scope of your anchor rode (i.e., the relationship between the depth of the water and the length of the rode). A good rule of thumb is to allow a scope of about 7:1 (a rode seven times as long as the vertical distance from the bow to the bottom). A helpful aid is to mark the rode every 20 feet or so with knots or other types of indicators. Before dropping anchor, make sure the bitter end is secured to the cleat in the anchor well.

Also, be sure to consider wind direction, currents, mean low tide depths and other local conditions when anchoring, as well as the positions of any boats already anchored nearby.



### CAUTION

**Anchoring in unusual water and/or weather conditions will require additional precautions. Consult your *Chapman's* or other approved guide for suggestions.**

To weigh anchor, motor or sail (under main only) forward slowly. When at a point directly above the anchor, a quick tug should free it from the bottom. Take care not to damage the topsides when hauling.

# SAFE BOATING TIPS

## DIESEL ENGINE

An engine owner's manual is supplied with your boat and should be read thoroughly. The manual contains technical specifications, running instructions and a maintenance schedule on lubricants and fluids. For long engine life, follow routine maintenance schedules.

You should check engine oil, transmission fluid and coolant levels. Water, rust, scale and dirt will cause serious damage to the injectors on diesel engines. You should check your filters frequently and change when necessary. Check fuel line connections for proper tightness.



### WARNING

**EXPLOSION/FIRE HAZARD** - Fuel system connections that are too loose or too tight can leak, resulting in fuel loss, environmental pollution and explosion/fire hazard.



### DANGER

**EXTREME HAZARD:** Carbon monoxide gas (CO) is colorless, odorless and extremely dangerous. All engines and fuel burning appliances produce CO as exhaust. Direct and prolonged exposure to CO will cause **BRAIN DAMAGE** or **DEATH**. Signs of exposure to CO include nausea, dizziness and drowsiness. Refer to **BOATING SAFETY** for more information.

When you start your engine, run it a minimum of 15 minutes to bring it up to operating temperature. This insures that any condensation is evaporated. Your engine should "run-out" at 3/4 throttle at least once a month to clean out carbon buildup and moisture.

## FUELING YOUR DIESEL ENGINE



### WARNING

#### EXPLOSION/FIRE HAZARD

- Store flammable material in safety-approved containers. Keep containers in a locker designed by the boat manufacturer for that purpose. Never store flammable material in a non-vented space.
- Observe "No-Smoking" while fueling.
- Run exhaust blower at least 4 minutes before starting engine. Check bilge and engine compartment for fumes.
- Keep ventilation system free of obstructions. Never modify the vent system.
- Fill less than rated capacity of tank. Allow for fuel expansion.
- If fuel enters bilge, do not start engine. Determine cause and severity. Contact a knowledgeable marine service to remove fuel. Do not pump bilge overboard. Contact Coast Guard for additional advice. (*See Environmental Considerations - Fuel & Oil Spillage.*)
- Inspect fuel system regularly for leaks.



### CAUTION

Follow engine manufacturer's recommendations for types of fuel and oil. Use of improper products can damage the engine and void the warranty.

Notice: Use fresh fuel. Fuel that has been in a tank too long can form gum and varnish, which may affect performance.

Inspect diesel fuel filters regularly. Diesel fuel must be kept as clean as possible.

# SAFE BOATING TIPS

## STARTING YOUR DIESEL ENGINE

1. Visually check engine compartment to see that the throttle linkage, shifting controls, electrical connections and fuel lines are properly secured.
2. *Before each start* check oil in engine and transmission.
3. Insure that engine shut-off cable is properly secured and operating.
4. Place the shift lever in the neutral position. Pull out the button beside the shift lever to disengage the shift. On single lever controls, lift the collar under the shift lever knob and move the lever forward to advance the throttle for neutral warm-up.
5. Insert the starter key and turn to the "on" position.
6. Press the starter button and hold until engine starts, then release. The buzzer and/or light should then go off. **Press the starter button no longer than 5 seconds continuously.**
7. Allow cold engine to warm up a minimum of five minutes.
8. When warm-up is completed, return the hand le-

ver to neutral position, and push the button back in to re-engage the shift. The shift is ready for shift and throttle operation.

9. Check that the lube oil pressure warning light and the charge lamp go off. If any of the warning lamps do not go off above 1,000 rpm, the engine is malfunctioning and should be stopped immediately. Consult your nearest engine dealer.

**NOTE:** To stop engine at any time, pull "engine stop" lever all the way out.



### CAUTION

Follow engine manufacturer's recommendations for types of fuel and oil. Use of improper products can damage the engine and void the warranty.

## MOTERING YOUR DIESEL ENGINE

Upon departure, remember to unplug the shorepower. When the engine is warm, but prior to releasing the dock lines, move the shift lever to forward and to reverse to insure that it engages properly. To increase RPMs, push throttle lever forward and pull back to decrease RPMs.

**IMPORTANT:** When sailing, it is best to start the engine before the sails are lowered. This way, it is still possible to maneuver if the engine should not start.



### CAUTION

Your rigging will conduct electricity. Always check for overhead high tension wires before proceeding. Once clear, you may increase your speed in a reasonable and safe manner as desired.

## ELECTRICAL SYSTEM

Your Hunter is fitted with an electrical system designed for both AC and DC. While in port, you can operate any tool, appliance or other device designed to function on regular house current simply by plugging your dockside power cord into a convenient outlet on shore and turning your AC main breaker on.



### WARNING

**ELECTROCUTION HAZARD:** If polarity is reversed, **DO NOT** use the shore power source. Immediately turn off the power source and disconnect the shore power cord. Reversed polarity is a dangerous and potentially lethal condition which may cause shock, electrocution, or death.

# SAFE BOATING TIPS

## ELECTRICAL SYSTEM (continued)

To minimize shock hazard, connect and disconnect cable as follows:

1. Turn off the boat's shore connection switch before connecting or disconnecting shore power cable.
2. Connect shore power cable at the boat first.
3. If polarity warning indicator is activated, immediately disconnect cable and have the fault corrected by a qualified electrician.
4. Disconnect shore power cable at shore outlet first.
5. Close inlet cover tightly.

**DO NOT ALTER SHORE POWER CABLE CONNECTORS.**

**Storage:** Your shore power cable set is intended for use outdoors. To prolong the life of the set, store indoors when not in use.

**General:** The metallic parts of your cable set 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 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 re-use.

### **WARNING**

Do not allow your dockside power cord to come in contact with the water. Never operate any AC power tool or other electrical equipment while you or the device are in contact with the water, as this may cause electrocution resulting in shock or death.

When leaving port, disconnect the dockside power cord and turn the main DC breaker on. This allows

you to use the ship's lights and other equipment designed to operate on direct current. Keep in mind that your DC power source is a 12-volt battery, just as with your automobile, and it must be charged regularly by operating the engine (or by running the battery charger, if you have that option installed). Unless a state of charge is maintained, there may not be enough power to operate the starter motor. Dangerous situations can result if the engine cannot be started when needed.

Make a regular visual check of batteries to insure proper water level and inspect terminals for signs of corrosion. If your boat sits for long periods without use, it is often a good idea to remove the batteries and attach them to a trickle charger to keep them fully charged and ready to use.

### **WARNING**

**EXPLOSION/FIRE HAZARD** - Ensure adequate ventilation of battery to prevent buildup of gases, especially hydrogen.

### **WARNING**

#### **WHEN CHARGING THE BATTERY:**

- Battery electrolyte contains sulfuric acid. Protect your eyes, skin and clothing. In case of contact, flush thoroughly with water and get prompt medical attention, especially if your eyes are affected.
- Batteries generate hydrogen gas which can be highly explosive. Do not smoke or allow flames or sparks near a battery, especially during charging.
- Charge the battery in a fully ventilated place.

# SAFE BOATING TIPS

## COOKING STOVE

LPG is a popular choice in cooking fuel aboard sailboats. LPG is an explosive gas however, and should be treated with great care. Please refer to the stove manual for detailed instructions.



### WARNING

#### EXPLOSION/FIRE/ASPHYXIATION HAZARD

- Open flame cooking appliances consume oxygen. This can cause asphyxiation or death.
- Maintain open ventilation.
- Liquid fuel may ignite, causing severe burns.
- Use fuel appropriate for type of stove.
- Turn off stove burner before filling.
- Do not use stove for comfort heating.

#### FIRE/ASPHYXIATION HAZARD

Use special care with flames or high temperatures near urethane foam, if used in construction of your boat. Burning, welding, lights, cigarettes, space heaters and the like can ignite urethane foam. Once ignited, it burns rapidly, producing extreme heat, releasing hazardous gases and consuming much oxygen.

## TOILET

**IMPORTANT;** When not in use, lever must be left in the “dry” position to prevent flooding.

Before using, place the lever in the “wet” position and pump slowly to partly fill and wet the inside of the bowl. Return to “dry” position.

After using, return the level to the “wet” position for flushing and pump until the bowl is thoroughly cleaned. Continue with several more full strokes to flush discharge lines. Return lever to the “dry” position and pump slowly until bowl is empty.

#### NOTICE:

- There is a possibility of being fined for having an operable direct overboard discharge of waste in some waters. Removing seacock handle, in closed position, or other means must be used to avoid fine.
- It is illegal for any vessel to dump plastic trash anywhere in the ocean or navigable waters of the United States.



### CAUTION

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

# SAFE BOATING TIPS

## PUMPS

All pumps should be checked frequently to insure proper operation. This is an especially important regular maintenance item since functioning of a pump could save your vessel from serious damage at some future time.

**Bilge pump** — Inspect all hoses for chafing and dry rot. See that the hose clamps are tight. Check the the bilge pump impeller area is clean and free of obstructions. Inspect electrical wiring for corrosion. Make sure float switch moves freely and is making an electrical connection.



### WARNING

**SINKING HAZARD** - Ensure proper bilge pump operation.



### CAUTION

Run pump only as long as necessary to remove water. Running dry can damage pump motor.

## WATER SYSTEM OPERATION

Fill fresh water tank at deck fill. The tank filler cap will be marked "water". When tank is full, water will back up through the vent hose and exit through a vent located on the side of the hull.

To activate the water system, flip the "water pressure" switch on the electrical panel. This will start the pump and pressurize the system. When the pressure builds, the pump will shut off. With continued use of fresh water the pressure in the system is reduced, automatically restarting the pump. Make sure there is water in the system while pump is in operation to prevent damage to the motor.

The water heater operates either on 120 or 240 volts AC or when the engine is running. To obtain hot water from the engine, it must run a minimum of one-half hour.

Pressure water pumps are the demand type. Once the circuit breaker switch is on, opening the faucet will produce water flow.

**NOTE:** Intermittent operation of the freshwater pump while all faucets are closed usually indicates a leak somewhere in the lines. Trace the lines to locate the leak and repair.

To operate shower, turn on hot and cold faucets until desired temperature is reached, while shower head is retracted at sink. Pull the shower head out and use. The faucets must be turned off to prevent system drainage.

Opening the faucet will allow the pump to empty the tank. Flushing the tank and lines will be necessary for winterization. Refer to Maintenance & Winterization section for more information.



### CAUTION

Run pump only as long as necessary to remove water. Running dry can damage pump motor.



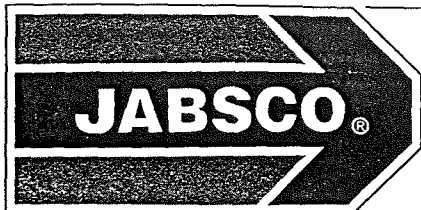
# SAFE BOATING TIPS

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## WASTE DISCHARGE

The Hunter is equipped with a head waste holding tank, hose lines, and thru-hull fittings for either overboard discharge, using the standard equipped handpump, or deck pumpout at dockside. Tank levels will be indicated on the gauge located below the main electrical panel. Familiarize yourself with the

locations of the deck pumpout, overboard discharge thru-hull, and vent locations pictured in the Waste Water System section, as well as your local boating regulations concerning the overboard discharge of raw sewage.



## Model 45510-1000

### TWO POSITION Y-VALVE

#### FEATURES

- Corrosion Resistant Polyester and Stainless Construction
- Includes Stainless Steel Locking Ring to secure valve in Holding Tank position
- Ideal for Marine Sewage and Bilge Pumpout Systems
- Full Port Openings

#### SPECIFICATIONS

Ports:	1-1/2" ID Hose
Body Material:	Polyester
Shipping Weight:	1.1 lb (0,5 kg)
Mounting:	No. 10 Screw (4)

#### APPLICATION

The Jabsco Y-Valve was designed for installation in on-board sewage handling systems and bilge evacuation systems.

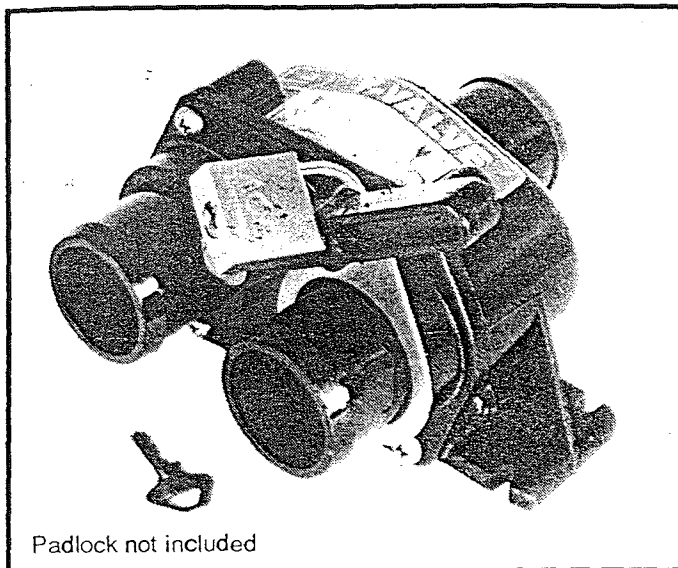
**SEWERAGE SYSTEMS:** Current U.S. Coast Guard Marine Sanitation Regulations allow the boat operator to discharge untreated human waste when outside the 3 mile coastal limit. When the Y-Valve is installed in the holding tank discharge line (diagram 1), it allows the operator to choose between pumpout through a deck fitting or directly through the seacock.

IT IS IMPORTANT TO NOTE THAT IT IS ILLEGAL TO DISCHARGE SEWAGE EFFLUENT THAT IS NOT TREATED TO U.S. COAST GUARD STANDARDS WITHIN THE 3 MILE COASTAL LIMIT. IT IS NOT ILLEGAL TO HAVE A SYSTEM THAT ALLOWS OVERBOARD DISCHARGE OF UNTREATED SEWAGE INSTALLED ON BOARD A BOAT AS LONG AS OVERBOARD SYSTEM IS NOT USED WITHIN THE 3 MILE COASTAL LIMIT.

*Be environmentally responsible. Do not discharge waste in discharge restricted areas. Do not discharge bilge water contaminated with oil or fuel.*

When the Y-Valve is installed in the marine toilet discharge line (diagram 2) it allows the operator to choose between storing the toilet discharge effluent in the holding tank, or discharging directly overboard (when legal).

**BILGE SYSTEMS:** For boats with 2 separate bilge areas, the Y-Valve allows the operator to pump out either bilge section with only one pump. By simply selecting the appropriate valve selector lever either of the 2 bilges can be evacuated. (Diagram 3.)



Padlock not included

Model 45510-1000

#### INSTALLATION

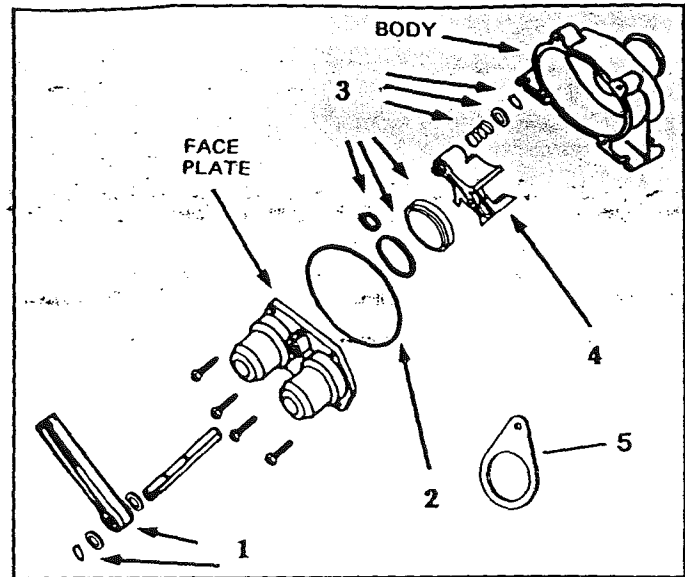
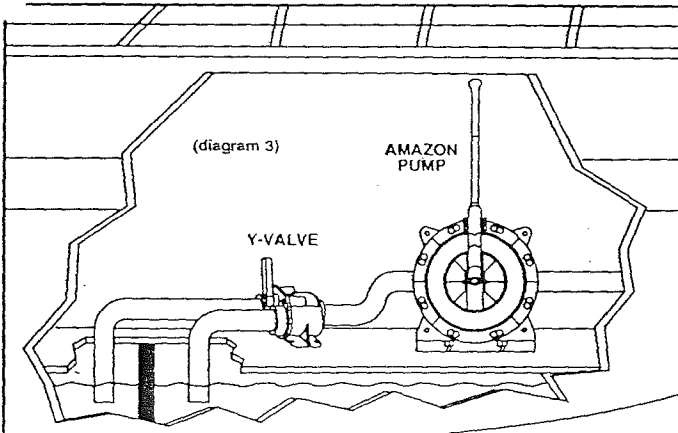
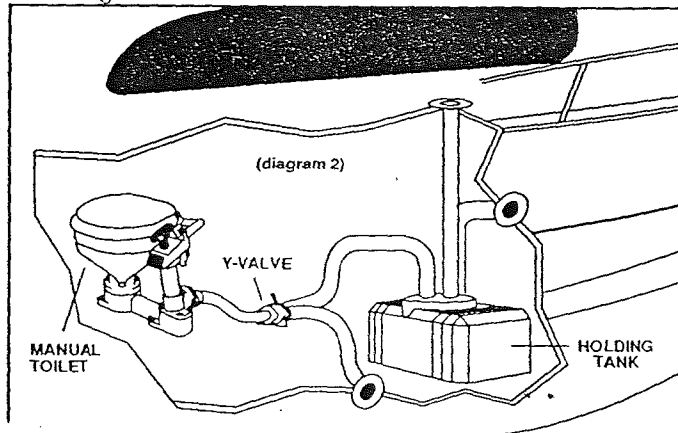
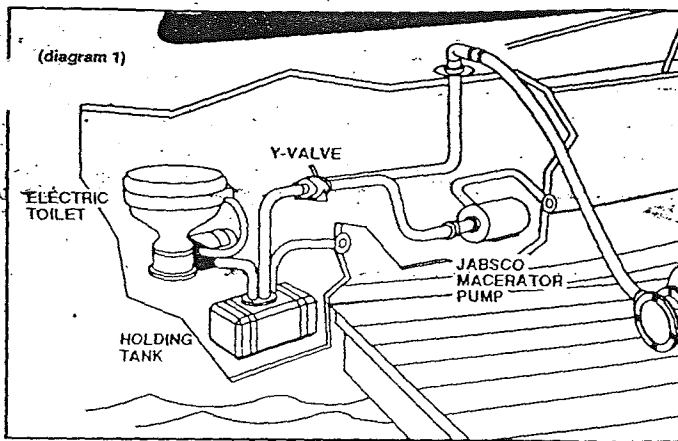
Lay out the system that the Y-Valve will be installed in so that all hoses can be installed without sharp bends, kinks or loops that trap fluids. After choosing a convenient, accessible location for the Y-Valve, be sure that there is adequate room to swing the selector lever. Mark locations for mounting screw holes. Be sure to choose a mounting location which is as flat as possible to prevent damage to the Y-Valve from mounting on uneven surfaces. Fasten the Y-Valve using #10 stainless steel fasteners. Before connecting hoses to the Y-Valve, position the selector lever locking ring on the port that is to be connected with the waste holding tank. This will allow the valve to be secured in the holding tank position with either a small padlock or wire seal when operating in no-discharge zones. Attach inlet and outlet hoses to the appropriate ports and secure with stainless steel band clamps.

It is recommended that all hoses used in waste systems should be the heavy, non-collapsible fabric reinforced hose. Vacuum cleaner type hose and vinyl hoses will collapse under the vacuum of a dockside pumpout system, or will allow sewer gas to permeate into the boat. All hoses should be double clamped with stainless steel band type clamps. Generally, sealing compounds are not necessary when making hose connections.

#### OPERATION

The Y-Valve is designed with a simple and positive diverter mechanism. When choosing the discharge hose system to use, simply orient the selector lever on the Y-Valve over the hose desired to be open to flow. When selecting the particular hose for flow, be sure that the lever is securely positioned against the positive stop. This will prevent bypass into the hose that has been chosen to be shut off. When fitted with a selector lever locking ring, the lever may be secured in the holding tank position by inserting a small padlock\* (with 1/4" or smaller shackle) through the hole in the locking ring and the hole in the selector lever.

\* padlock not included



## PARTS LIST

Key	Description	Part Number	Qty.
1	Selector Lever <sup>1</sup>	45559-0000	1
2	O-Ring Gasket	45559-0001	1
3	Valve Seal	45559-0002	1
4	Mechanism <sup>2</sup>	45559-0003	1
5	Locking Ring <sup>3</sup>	45507-0001	1

<sup>1</sup> Includes Shaft Spring Retainer

<sup>2</sup> Includes Seal Disk and O-Ring, Shaft O-Ring, Shaft Spring, Shaft Snap Ring

<sup>3</sup> To update an old style Y-Valve, order both a locking ring and selector lever-part numbers 45507-0001 and 45559-0000.

## MAINTENANCE

If the Y-Valve becomes damaged or clogged with debris during service, it will be necessary to disassemble the unit. Empty all hoses and the Y-Valve of waste liquids and thoroughly flush the system with clean water. Re-flush the system with a water and bactericide mixture and flush again with clean water.

Remove all hoses from the Y-Valve and remove the Y-Valve to an area where it can be conveniently disassembled.

Remove the 4 screws located on the face plate. Remove face plate and shaft/handle assembly from body. Remove all debris from the valve and inspect for damaged components.

If any parts of the shaft/handle, or port seal assembly need to be replaced, the shaft/handle assembly must be disassembled. DO NOT REMOVE THE RETAINING RING AT THE SPRING END OF THE SHAFT. Remove the retaining ring at the handle end of the shaft. SLIDE the handle and washers off the shaft and slide shaft and swivel block out of the bore in the face plate. Replace all damaged parts and reassemble items on the shaft. The spring must be compressed to allow the retainer ring to snap into the slot on the shaft. Reassemble the Y-Valve and reinstall in the waste system.

CHECK SYSTEM FOR LEAKS.

THE PRODUCT DESCRIBED HEREIN IS SUBJECT TO THE JABSCO ONE YEAR LIMITED WARRANTY, WHICH IS AVAILABLE FOR YOUR INSPECTION UPON REQUEST.

# ITT Jabsco

A unit of ITT Fluid Technology Corporation

U.S.A. ITT Jabsco, 1485 Dale Way, P.O. Box 2158, Costa Mesa, CA 92628-2158; Tel: (714) 545-8251; Fax: (714) 957-0609

UNITED KINGDOM  
ITT Jabsco  
Hoddesdon, Herts.

CANADA  
ITT Fluid Products  
Guelph, Ontario

JAPAN  
NHK Jabsco Co., LTD.  
Yokohama, Kanagawa

GERMANY  
Mintec, GmbH  
Norderstedt

# ENVIRONMENTAL CONSIDERATIONS

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## FUEL AND OIL SPILLAGE

The spilling of fuel or oil into our waterways contaminates the environment and is dangerous to wildlife. Never discharge or dispose of fuel or oil into the water as it is prohibited and you could be fined. Two common, accidental types of discharge are — overfilling the fuel tank, and pumping contaminated bilge water into the sea.



### WARNING

**EXPLOSION/FIRE/POLLUTION HAZARD:** Fill fuel tank to less than rated capacity. Overfilling forces fuel out the tank vents which can cause explosion, fire, or environmental pollution. Also, allow for fuel expansion.

## DISCHARGE AND DISPOSAL OF WASTE

Waste means all forms of garbage, plastics, recyclables, food, wood, detergents, sewage, and even fish parts in certain waters. We recommend that you bring back everything you take out with you for proper disposal ashore.

Your marine toilet holding tank must, in many areas, be pumped out by an approved pump-out facility, normally found at marinas.

## EXHAUST EMISSIONS

Hydrocarbon exhaust emissions pollute our water and air. Keep your engine properly tuned to reduce

emissions and improve performance and economy.

## ANTI-FOULING PAINTS

The use of anti-fouling paints is common for boats kept in the water. Be aware of environmental regulations that may govern your paint choice. These regulations may affect which paint may be used, and also the application or removal. Contact your local boating authorities for information.



### WARNING

**EXPLOSION/FIRE/ HAZARD:** Ventilate when painting or cleaning. Ingredients may be flammable and/or explosive.

## CLEANING CHEMICALS

Cleaning chemicals should be used sparingly and not discharged into waterways. Never mix cleaners and be sure to use plenty of ventilation in enclosed areas. Do not use products which contain phosphates, chlorine, solvents, non-biodegradable or petroleum based products.

Common household cleaning agents may cause hazardous reactions. Fumes can last for hours, and chemical ingredients can attack people, property and the environment.

# INSTRUCTIONS FOR PREPARATION FOR BOTTOM PAINTING

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## WARNING!

Do not use any sanding, sandblasting or other abrasive preparation of the bottom as this will void your hull blistering warranty. More information on the warranty is available in this owner's manual.

## BOTTOM PAINTING

Choose a bottom paint system that suits the environment in your area.

Follow the procedure recommended by the manufacturer of the paint, while making sure not to void

the Hunter Hull Blistering Warranty. The procedure for preparing for and painting the bottom varies between paint manufacturers, but should always include dewaxing, etching and sometimes priming of the surface.

## EPOXY BARRIER COAT

Sanding of the gel-coat bottom surface will be permitted should a customer wish to have an epoxy barrier coat applied to the hull, (example Interlux Interprotect 1000, 2000, West System or VCTar). This will not void the five Year Blister Warranty.

Hunter Marine refers to epoxy barrier coatings as mentioned above, not epoxy primer paints.

If an epoxy barrier coat is applied to a Hunter vessel, it must be registered with the Warranty Depart-

ment prior to application of the product. If the dealer applies bottom paint only, sanding will not be allowed and the no sanding system must be used.



### WARNING

Cleaning agents and paint ingredients may be flammable and/or explosive, or dangerous to inhale. Be sure to use adequate ventilation, and appropriate safety clothing (gloves, safety glasses, respirator, etc.).

# ENGINE, TRANSMISSION and DRIVETRAIN

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## ENGINE

Follow the fuel and lubrication requirements in the Engine Manual. Check the engine oil level before and after operation and use quality motor oil (refer to Engine Manual). Be certain the proper amount of oil is in the crankcase at all times.

**Engine Alignment:** The engine should be aligned by experienced marine service personnel. Final alignment should be done after launching, with all normal gear aboard. A description of the procedure follows:

The coupling flanges must come together evenly at all points, a feeler gauge is used to check the gap. If adjustment is necessary, the engine is tilted up or down and/or side to side until the flanges meet equally. Severe vibration will result from misalignment and can cause strut bearing and shaft damage. Alignment should be checked again after several weeks of use. Routine checks of coupling bolts are a must to ensure they are tight.

### **Shaft alignment:**

1. Separate the coupling, move the shaft end back

to clear the pilot in the center.

2. Establish the shaft in the center of the shaft log by raising the shaft until it touches the top of the log — note position — lower the shaft until it touches bottom of the log — note position — repeat side-wise and locate shaft in the center; block shaft in this position, using a block of wood under the shaft packing gland.

3. Now, adjust the engine mounts to allow the pilot on the coupling halves to slip together without moving shaft up, down, or sideways.

4. Adjust the engine mounts as necessary until a 0.004" feeler gauge will not enter anywhere along the edge of the flange between the faces.

5. Tighten the locks on the adjustable mounts.

6. Recheck coupling with feeler, readjust if necessary.

7. Check stuffing box (allow to drip 3 to 5 drops per minute).

Any questions or problems concerning the engine, please contact the U.S. distributor, Mack Boring at (201) 964-0700, or your local Yanmar service agent.

## TRANSMISSION

Follow the lubrication requirements of the Engine Manual. The oil level should be checked immediately after operation.

## STUFFING BOX

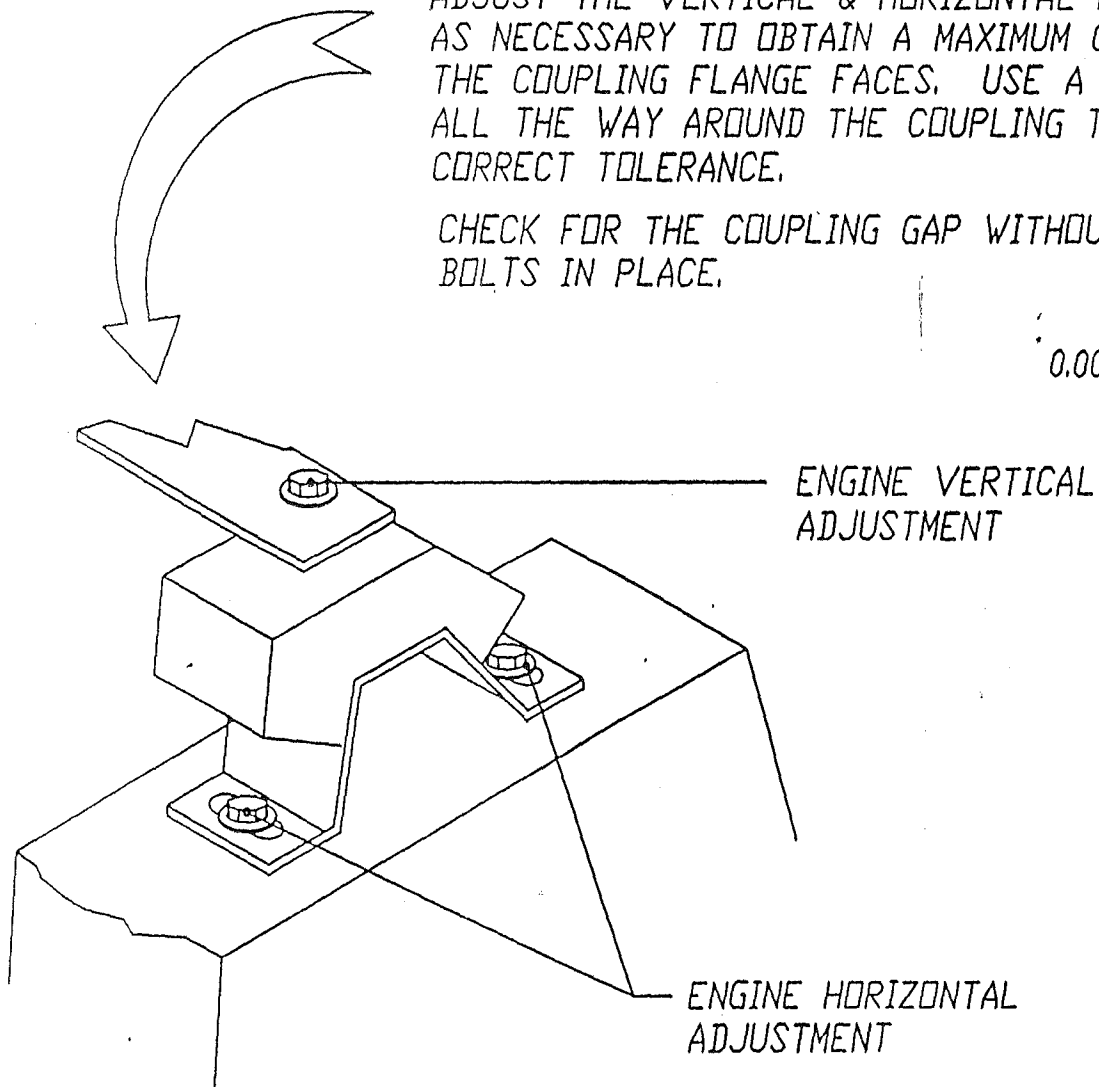
The stuffing box is held to the stern bearing by a rubber hose secured with hose clamps. (See the Shaft and Propeller section) The clamps should be tight and no water should leak from this location. While underway a slight drip from the stuffing box at the shaft exit is necessary (three to five drops a minute) and is normal.

To adjust, loosen the locknut, tighten the gland nut one quarter turn, and retighten the lock nut. If excessive water flow persists after adjustment, replace the packing with 3/16" (or 5mm) square flax packing and then adjust as above.

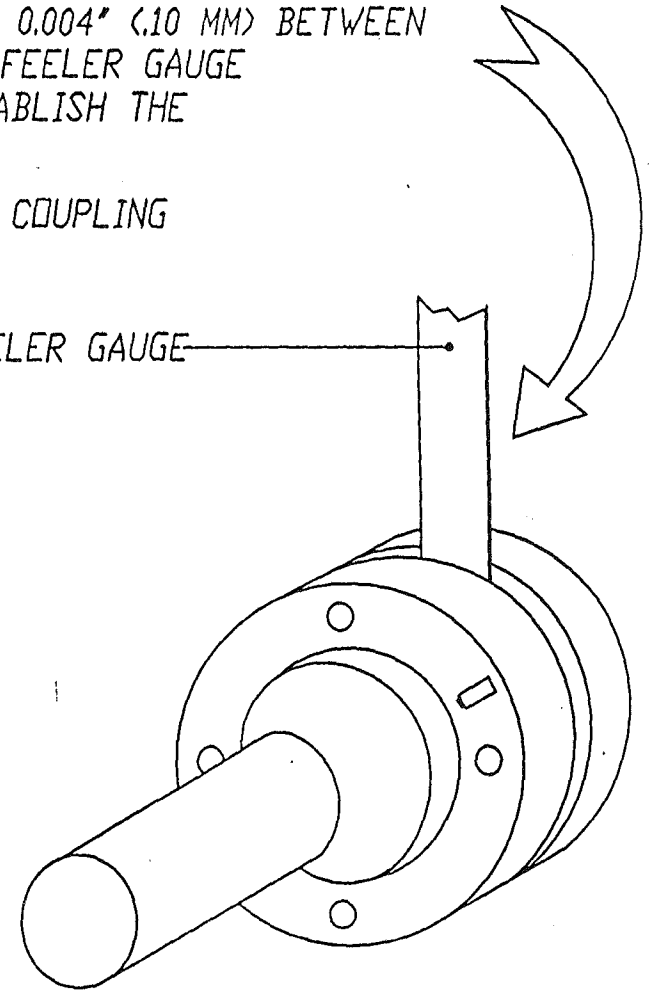
**NOTE:** Some models use a packless sealing system. Page 56 or Pages 56A, B, C reflects the type of stuffing box used on this model.

ADJUST THE VERTICAL & HORIZONTAL ENGINE MOUNTS  
AS NECESSARY TO OBTAIN A MAXIMUM GAP OF 0.004" (0.10 MM) BETWEEN  
THE COUPLING FLANGE FACES. USE A 0.004" FEELER GAUGE  
ALL THE WAY AROUND THE COUPLING TO ESTABLISH THE  
CORRECT TOLERANCE.

CHECK FOR THE COUPLING GAP WITHOUT THE COUPLING  
BOLTS IN PLACE.



0.004" FEELER GAUGE



HUNTER 

H336 ALIGNMENT DIAGRAM H33A2630

## STEERING

Refer to the manufacturer's instructions for maintaining pedestal steering system. Cables should be routinely inspected for proper tension. Lightly oil all cables.



### WARNING

**CONTROL HAZARD** - Inspect and maintain steering system regularly. An improperly maintained system may fail, causing sudden loss of steering control, resulting in personal injury and property damage.

## ELECTRICAL SYSTEMS

The electrical system is a 12-volt, negative ground installation, plus a shore power system of either 110V or 240V. The owner should inspect batteries, terminals and cables weekly for signs of corrosion, cracks, and electrolyte leakage. Battery terminals are to be kept clean and greased. Refer to separate instructions on batteries, wiring diagram, and electronics.



### WARNING

**SHOCK/FIRE HAZARD** - Replace breaker or fuse with same amperage device. Never alter overcurrent protection.



### WARNING

#### SHOCK/FIRE HAZARD

- Disconnect electrical system from its power source before performing maintenance. Never work on the electrical system while it is energized.
- Electrical appliances must be within the rated amperage of the boat circuits.
- Observe boat carefully while the electrical system is energized. The only electrical components which can be left unattended are the automatic bilge pump, fire protection and alarm circuits.
- Only a qualified marine electrical technician may service the boat's electrical system.



### CAUTION

- Turn off engine before inspecting or servicing battery.
- Disconnect battery cables before working on electrical system to prevent arcing or damage to alternator.



## PLUMBING SYSTEMS

All pumps should be checked frequently to insure proper operation. This is an especially important regular maintenance item since proper functioning of a pump could save your vessel from serious damage in the future.

Inspect all hoses for chafing and deterioration. See that hose clamps are tight. Check that the pump impeller area is clean and free of obstructions.

Inspect electrical wiring for corrosion. Make sure float switches move freely and are making an electrical connection.

The owner should become familiar with the layout

of the water and waste systems by walking through the boat with the diagrams provided in this manual. It is especially important that the owner knows all thru-hull valve locations and inspects for leaks frequently. Refer to plumbing diagrams in Specifications and Technical section of this manual.

General Thru-hull List (varies from boat to boat — see diagrams in Systems and Circuits section).

- 1) Engine cooling system
- 2) Galley sink
- 3) Head sink
- 4) Head toilet (water intake)
- 5) Holding tank discharge
- 6) Scupper drains

## FUEL SYSTEM

The owner should inspect the condition of fuel lines for cracks or leaks. A primary source of fuel-related problems is water in the system. The owner should use only well maintained fueling facilities and make sure fuel fill caps are tightly secured after filling. Check and maintain fuel filters periodically. Refer

to your Engine Manual for additional information. Periodically, add biocide to prevent bacteria and fungi from contaminating diesel fuel which may contain some water. Carefully follow manufacturer's instructions and clean filters regularly.

## GENERAL CARE

### CLEANING FIBERGLASS SURFACES:

Fiberglass surfaces should be cleaned regularly. Normal accumulations of surface dirt can be removed simply by occasional rinsings with water. If your boat is operated in salt water, more frequent rinsing will be required. To remove stubborn dirt, grease or oil, use a mild detergent and a soft brush. Rinse with clean fresh water. Avoid the plexiglass companionway slider, windshield, deck hatches and fixed ports when using a deck brush, since these surfaces can scratch.

It is a good idea to wax the fiberglass once or twice a year to maintain a deep, glossy appearance. Your

local marine supply should be able to provide an appropriate wax.



### WARNING

Cleaning agents and paint ingredients may be flammable and/or explosive, or dangerous to inhale. Be sure to use adequate ventilation, and appropriate safety clothing (gloves, safety glasses, respirator, etc.).

### CLEANING ACRYLIC:

Use only mild soap and water to clean acrylics. Do not use products containing solvents such as ammonia, which is found in many window cleaners.



### CAUTION

Use care when cleaning acrylic. Dry cloth and many glass cleaners will scratch. Solvents will attack the surface.

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## GENERAL CARE (continued)

### Sail Care

Sunlight is a sail's worst enemy, so **cover the main sail when not in use.** (An ultraviolet guard, fitted down the leech of a roller headsail, will protect the exposed part from the weathering effect of the sun and from dirt and grit). Mildew, which discolors, is prevented by storing sails dry and by hand washing twice a season. Check all sails regularly for chafe, particularly where they chafe on deck fittings or rigging, at reef points, batten sleeves and the foot of

the headsail. Sail batten pockets should be inspected on a regular basis.

To stow the mainsail, start at the leech and flake it on to the boom, left and right, in about 18-in. (46-cm) folds, while pulling the leech aft. Secure with a sail tie and continue to the luff. Lash to the boom with sail ties or shock cord.

### FABRIC CARE

**Vinyl:** Clean with mild soap and water. Wipe with vinyl or upholstery cleaner monthly, and especially before and after storage.

**Leather:** Mild soap and water. Blot dry. Do not scrub as this will stretch and scratch. Wipe with leather cleaner/oil to preserve and help prevent cracks before and after storage.

**Fabric:** Blot dry. Do not machine wash. Use only mild soap and water. Wipe with a clean white cloth. If stain persists, dry clean. Be sure to treat cleaned

surfaces with Scotch Guard. Stretched or loose covers may be steam cleaned. If foam is removed they will restuff easier if wrapped with thin plastic.

**Storage:** Cover with airflow fabric to reduce dust built up. Do not use plastic as this will cause cushions to sweat and mildew.

**Cushions:** If wet, prop cushions vertically to promote airflow around each cushion. Cushions can be cleaned by most dry cleaners. **Dry clean only.**

### GENERAL HARDWARE MAINTENANCE

Check all fittings regularly to be sure screws are tight. Occasionally lubricate (use silicone lubricants) all moving parts on such fittings as blocks, turnbuckles and cam cleats, as well as the locking pins of snatch blocks, track slides, spinnaker poles, etc. Inspect cleats and fairleads for roughness and smooth

with fine grained emery paper if necessary. Also, replace any missing or damaged cotter pins in turnbuckles and shackles, and either tape them or use protective covers manufactured for that purpose. Grease winches a minimum of once yearly.

# MAINTENANCE

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## ELECTROLYSIS AND GALVANIC PROTECTION

Salt water allows electric current to flow from anodic to cathodic material. Any two metals from two components, and their relative positions in the galvanic rating table, will determine which loses material (the anode) and which remains largely undisturbed (the cathode). The rate of wear is determined by the distance apart on the galvanic table of two metals. Thus a sacrificial zinc anode is often fitted to the underwater area of a boat to attract any destructive currents away from bronze or steel propeller shafts, for example.

It is not enough to know that your boat does not suffer from electrolysis: a newcomer in the adjacent

marina berth may start a too-friendly association with metal components on it. An easy place to fit an anode is on the propeller shaft, or covering the propeller nut. The anode should not be painted because this will only defeat the purpose.

To prevent electrolysis in sea water, the difference between the voltage of two adjacent metals should not exceed 0.20V. Zinc and carbon steel, for example, used together, risk corrosion, while lead and active stainless steel are compatible. Metals with a high voltage corrode faster and need a larger area to diffuse the electrochemical reaction.

# TEAK CARE

---

Teak wood is a high quality, extremely durable wood with a high oil content. In order to help you protect the original beauty of your teak interior, we have sealed the beauty of your interior with a 3 to 4 coat finish system of high quality Seafin Teak Oil, manufactured by *Dalys* (wood finishing products). This material is a penetrating oil that dries to a low sheen to seal and protect the wood from moisture and

weathering. It creates a durable, nonslip surface to repel water and resist wear. It won't chip, peel or blister. It reduces work and maintenance cost because it is easy to maintain and repair. With proper maintenance it will outlive urethane varnish on interior and even exterior surfaces. (Floor, bulkheads, trim wood and furniture).

## MAINTENANCE

When oiled surfaces require renewing, simply wipe the surface area free of loose dirt, dust or other contaminants. Dampen a cloth with the Seafin Teak Oil

and wipe on. Let stand for 5-15 minutes, then polish dry. If your dinette table has an epoxy finish, simply clean with furniture polish.

## REPAIRS

When woodwork is damaged from scrapes or abrasions that go into or thru the finish, take the following steps:

1. Take 180 to 200 grit wet/dry sand paper to smoother out rough spots.
2. Wipe clean of dust and dirt with a clean rag. Note — before applying oil, wood surface must be dry.
3. Wipe or brush on oil, allow to penetrate 5-15 minutes while surface is still wet.
4. Sand until smooth with a 400A wet/dry sandpaper.
5. Wipe dry with a clean rag. Allow 8-12 hours drying time.

6. Apply second coat, sand, repeat above procedure.

This process may be repeated as many times as needed to bring damaged area back up to its original finish. If you have trouble with getting the same sheen, you may apply with a completely dampened/rung out cloth, a very light coat over this area and/or whole surface area to get an even sheen.

*Dalys*  
3525 Stoneway North  
Seattle, WA 98103  
(206) 633-4200

# STORAGE/WINTERIZATION

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## IMPORTANT

Winter storage is recommended to be done in one of the following three ways; either: 1) by blocking the boat via a cradle; or 2) with chained stands on level ground; or 3) by storing the boat in the water with a bubbler system to prevent icing. Damage to your boat, including engine misalignment caused by twisting, is not covered by the warranty.

### SAILS

Sails should be properly folded and stowed in a dry, well ventilated place. Many sailboat owners send their sails back to the sail manufacturer at the end of each season. The sailmaker will check the stitching and sailcloth for wear and store the sails until the start of the next season.

### ELECTRICAL

Remove battery from boat. (Refer to Engine Manual) and charge. It is a good idea to also remove the electronics (radio, radar, etc.) and store in a safe place.

### CUSHIONS

Cushions should be removed and stored at home if possible. If not, prop them vertically to promote air-flow around each cushion. *Dry Clean Only!*

### HATCHES

Tenting the deck during storage will help prevent ice from forming and damaging hatches and deck fittings. The installation of a passive vent will help with ventilation while the boat is in storage.

### WATER SYSTEM

Open a faucet and allow the pump to empty the tank. Then add approximately two gallons of nontoxic antifreeze solution to the tank and repeat the pumping out procedure.

A second method is to disconnect the hoses at the pump, allowing them to drain. Find the lowest point in the system and disconnect the fitting. Open all faucets to allow the lines to drain. If possible, use a short piece of hose on the faucet to blow through the lines to clear all water. A diluted solution with baking soda will help freshen the system.

### WATER HEATER

Open valve and drain fully. Leave valve open during lay-up time.

### TOILET AND HOLDING TANK

Drain and flush toilet. Using non toxic antifreeze in a 50/50 mixture with water, pump through toilet and into holding tank.

### OUTBOARD ENGINE

Take it home and store it in a safe place. Be very careful storing the gas tank as the gasoline is very flammable. Refer to "Engine Manual" for specific maintenance schedule.

### INBOARD ENGINE

#### Winterizing Fresh Water Cooled Diesel Engines Step

1. Drain crankcase and transmission and refill with fresh lubricant as specified in owner's manual. Change oil filters.
2. Drain and clean all fuel filters and change elements, gaskets and seals. Bleed all air from fuel systems.
3. Start engine and bring up to operating temperature. Slowly remove the radiator cap on expansion tank. Using an antifreeze hydrometer, check the antifreeze for proper protection (add antifreeze to lower the freezing point of the antifreeze solution). If the antifreeze solution is dirty, more than 2 years old, or weak it should be completely drained and replaced with proper mixture of permanent antifreeze and water.
4. Close the sea cock, remove the raw water pick up hose from the raw water pump and immerse one end into a 5 gallon bucket of antifreeze solution. Start engine and run till antifreeze solution comes out exhaust stack or until bucket is empty. Attach the raw water pick up hose to the raw water pump. Tighten all clamps. **Note: This procedure bypasses the sea strainer to prevent antifreeze from crystallizing sea strainer which warranty will not cover.**
5. Loosen water pump and alternator belts to lessen tension on belts during winter.
6. For engines equipped with a hand crank - pull compression release levers and turn engine slowly with the hand crank. Slowly pour about 2 ounces of engine oil into the intake pipe or manifold while hand cranking the engine. This will allow for a thin coat of oil on the valves

# STORAGE/WINTERIZATION (continued)

and upper cylinder. **DO NOT USE** the starter to turn engine or serious engine damage may result.

7. Tape the openings of the intake and exhaust manifolds with duck tape to help prevent corrosion of the upper cylinder during lay up.

8. Scrape all rust or corrosion from exposed metal parts and surfaces. Scrub all metal surfaces with detergent and rinse thoroughly. Paint any bare metal.

9. Place a dust cover over engine. Do not leave the engine exposed to rain and sea breeze.

10. Disconnect the battery cables, remove the battery from the boat. Clean the terminal ends and battery with a solution of baking soda and water, rinse thoroughly with clean water. Apply a light coat of grease on the terminal end of the battery and cables. Store the battery in a cool dry place. Use a trickle charger to keep battery charged.

Do not charge battery near any open flame or in a confined area.

**CAUTION:** Wear safety goggles and rubber gloves to protect your eyes and skin.

## Winterizing Raw Water Cooled Diesel Engines Step

1. Drain crankcase and transmission and refill with fresh oil as specified in owner's manual. Change oil filters.

2. Close sea cock, remove raw water pick up hose from water pump, attach a 4-foot length of hose to water pump and immerse in a 5 gallon bucket of antifreeze solution. Remove hose from engine or manifold that leads to exhaust elbow. Attach about a 4-foot length of hose and immerse one end in the bucket of antifreeze solution. Start engine and run until water begins to warm up (about 3 to 5 min.) and thermostat opens. Stop engine. Replace hose that leads to exhaust elbow. Start engine and let run till water comes out exhaust pipe. Stop engine, remove hose from water pump to bucket, attach hose from sea cock to water pump and tighten all hose clamps. **Note:** This procedure bypasses the sea strainer to prevent antifreeze from crystallizing sea strainer, which warranty will not cover.

3. Loosen water pump and alternator to lessen tensions on belts during winter.

4. Drain and clean all fuel filters and change elements, gaskets and seals. Bleed all air from fuel systems.

5. Pull compression release lever and turn engine slowly with hand crank. Slowly pour about 2 ounces of engine oil into the intake pipe or manifold while engine is turning. **DO NOT USE** the starter to turn engine or serious engine damage may result.

6. Tape the openings of the intake and exhaust manifolds with duck tape to help prevent corrosion of the upper

cylinder during lay up.

7. Scrape all rust or corrosion from exposed metal parts and surfaces. Scrub all metal surfaces with detergent and rinse thoroughly. Paint any bare metal.

8. Place a dust cover over engine. Do not leave the engine exposed to rain and sea breeze.

9. Disconnect the battery cables, remove the battery from the boat. Clean the terminal ends and battery with a solution of baking soda and water, rinse thoroughly with clean water. Apply a light coat of grease on the terminal end of the battery and cables. Store the battery in a cool dry place. Use a trickle charger to keep battery charged. Do not charge battery near any open flame or in a confined area. **CAUTION:** Wear safety goggles and rubber gloves to protect your eyes and skin.

## DEPARTURE FROM THE BOAT

The check list for leaving a boat unattended is very important because items overlooked often will not be remembered until you are far from the boat and corrective actions are impractical or impossible. Primary choices for this list are items relating to the safety and security of the unattended craft—turning off fuel valves, the proper settings for electrical switches, pumping out the bilge and leaving the switch on automatic (or arranging for periodic pumping out). Other departure check list items are securing ports, windows, hatches, and doors.

## ROUTINE MAINTENANCE

Routine maintenance check lists should include items based on how much the boat is used (usually in terms of engine hours) and on calendar dates (weekly, monthly, or seasonal checks). Typical of the former are oil level checks and changes, and oil and fuel filter changes.

On a calendar basis the lists should note such matters as electrolyte levels in storage-batteries, pressure gauges on dry-chemical fire extinguishers, and all navigation lights. Check the operation of automatic bilge alarms or pump switches by running water into the boat. Periodically close and open sea cocks several times to ensure their free and easy operation in case they are needed in an emergency. Equipment and supplies carried on board for emergencies should be inspected for any signs of deterioration.

# CERTIFICATION DETAILS

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## **CE CERTIFIED**

Your Hunter has been manufactured in the United States and has been certified by IMCI to be in compliance with the relevant parts of the Recreational Craft Directive 94/25/EC from the European Parliament. The CE mark means your craft meets or exceeds all current International Organization for Standardization (ISO) standards and directives in effect at the time of manufacture. The builder's plate (copy provided on page 35 of this manual), affixed to your boat, describes various parameters involved in the design of your boat. Please refer to it regularly when operating your boat.

~Following are the Design Categories, established by the Recreation Craft Directive, which is to be considered a guideline of use application as per the Directive's criteria. This criteria is NOT established by Hunter Marine Corporation, and the category assigned is only a reference to the assigned category. The safety of the captain and crew of any vessel is not measurable by such categories, and you should not interpret these categories as an indication of your safety in such conditions. The skill of the captain and crew, together with proper preparation, appropriate safety equipment for the given conditions, and a well maintained vessel are critical to safe sailing.

### **CE CRAFT DESIGN CATEGORIES**

**Category A - "Ocean":** Craft designed for extended voyages where conditions experienced may exceed wind force 8 (Beaufort Scale) and include significant wave heights of 4 m, for vessels that are largely self-sufficient.

**Category B - "Offshore":** Craft designed for offshore voyages where conditions up to and including wind force 8 and significant wave heights up to and including 4 m may be experienced.

**Category C - "Inshore":** Craft designed for voyages in coastal waters, large bays, estuaries, lakes and rivers, where conditions up to and including wind force 6 and significant wave heights up to and including 2 m may be experienced.

**Category D - "Sheltered waters":** Craft designed for voyages on small lakes, rivers and canals, where conditions up to and including wind force 4 and significant wave heights up to and including 0.5 m may be experienced.

*For additional information, contact:* International Marine Certification Institute (IMCI)  
Treves Centre, rue de Treves 45  
1040 Brussels, Belgium  
FX: (32) 2238-7700

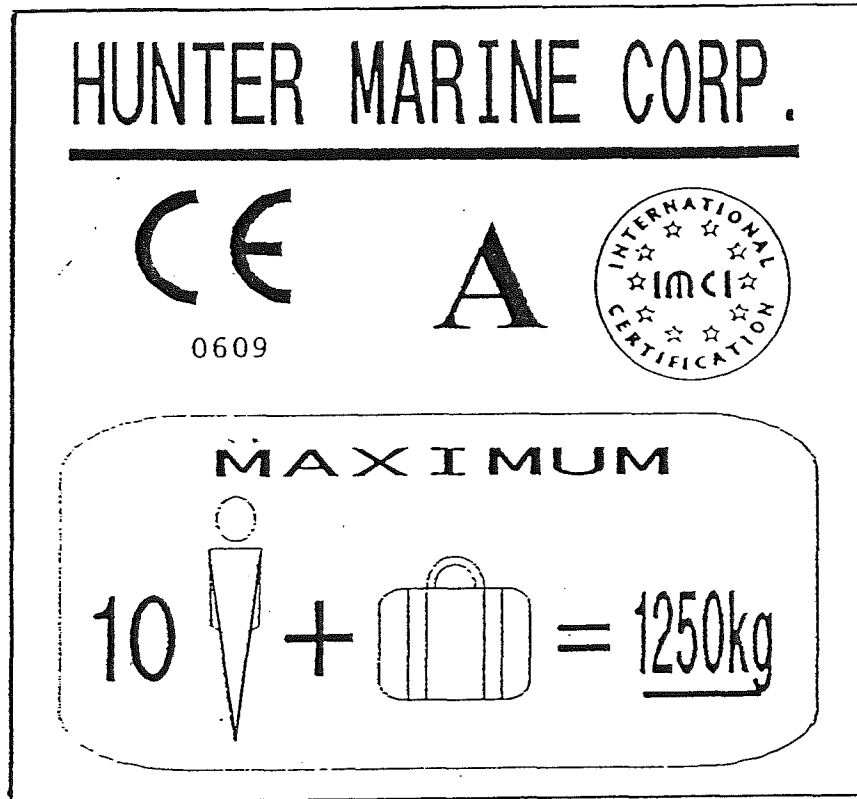
## **NMMA CERTIFIED**

Your Hunter has been judged by the National Marine Manufacturers Association (NMMA) to be in compliance with the applicable federal regulations and American Boat and Yacht Council (ABYC) standard and recommended practices in effect at the time of manufacture.

*For additional information, contact:* National Marine Manufacturers Association  
200 E. Randolph Dr., Suite 5100  
Chicago, IL 60611  
PH: (1) 312-946-6200 FX: (1) 312-946-0388

# BUILDER'S INFORMATION PLATE

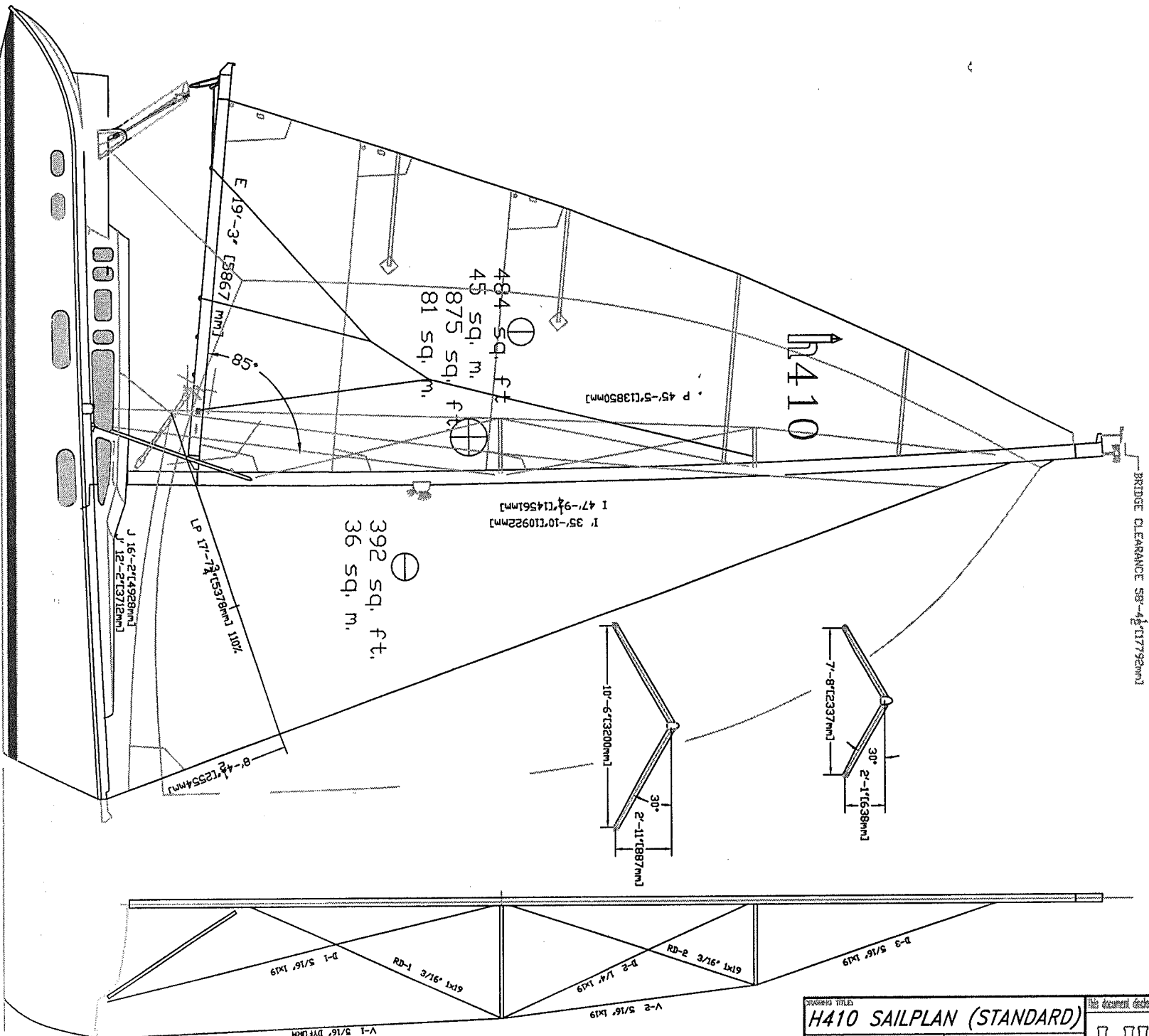
## H410



LIGHT SHIP DISP. = 9,186 kg (20,210 lbs)  
FULL LOAD DISP. = 11,166 kg (24,565 lbs)  
SINK @ FULL LOAD DISP. = 73mm (2.89")

Each Hunter 410 model with the CE Mark is and will continue to be identical to the individual unit of that model which was officially inspected and approved.





DRAWING TITLED		
H410 SAILPLAN (STANDARD)		
DRAWING NO.	4108036A	REVISION NO.
ENGINEERING DEPT.		NONE
DATE	6/3/97	

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**HUNTER**

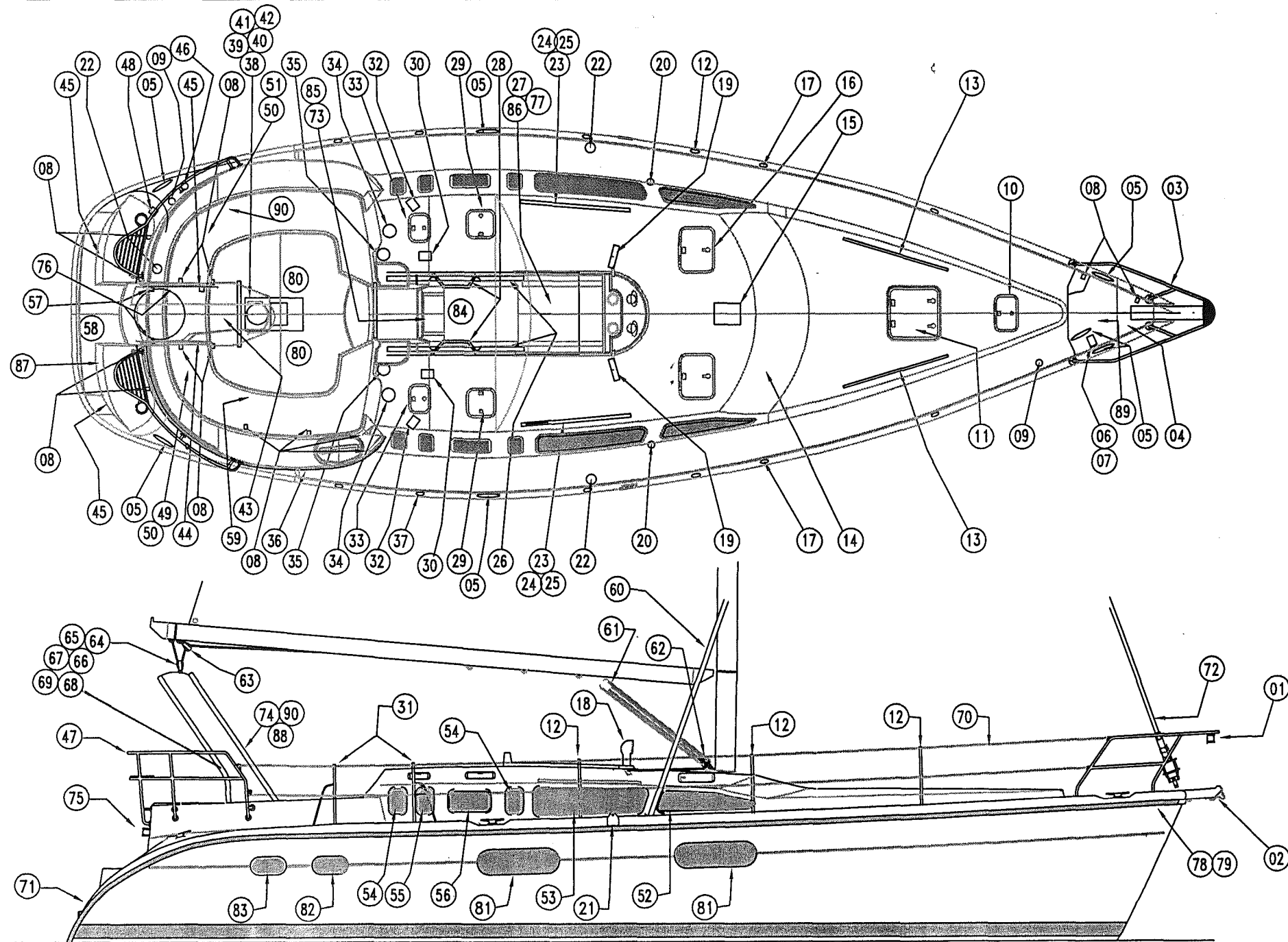


## DIMENSIONS, CAPACITIES, ETC.

---

### HUNTER 410

Length overall (LOA) .....	40'8"	12.40m
Length of waterline (LWL) .....	37'10"	11.54m
Beam (max) .....	13'10"	4.21m
Draft (shoal/deep).....	5'6'4"	1.52/1.93m
Displacement .....	20,000 lbs	9,072 kg
Ballast (shoal keel) .....	7,400 lbs	3,360 kg
Ballast (deep keel) .....	6,700 lbs	3,042 kg
Sail Area (100% triangles) .....	823 sq ft	76.46 sq m
Sail Area (actual w/standard sails).....	875 sq ft	81.29 sq m
I .....	47'9.5"	14.57m
J .....	16'2"	4.93m
P .....	45'5"	13.84m
E .....	19'3"	5.87m
Mast height (from waterline).....	58'4.5"	17.79m
Headroom .....	6'6"	1.98m
Water capacity .....	147 U.S. gal.	556 liters
Holding tank capacity .....	45 U.S. gal.	170 liters
Fuel tank capacity .....	51 U.S. gal.	193 liters
LPG tank capacity .....	10 lbs.	4.54 kg
Battery capacity .....	Dealer supplied	
Electrical voltages .....	See Electrical Drawings	
Inboard engine .....	50 hp	37.3 kw
Maximum loading .....	10 people	570kg luggage
Lifting points .....	Indicated by "Sling" labels on hull	



DRAWING TITLE: <b>H410 STANDARD DECK HARDWARE LAYOUT</b>		This document describes information for which HUNTER MARINE CORP. has proprietary rights.	
DRAWING NO. <b>41020009</b>	REVISION NO. <b>NONE</b>	<b>HUNTER</b> 	
ENGINEERING DEPT.	DATE <b>6/25/97</b>		

1	BOW LIGHT			EL0344	1	ON BOW RAIL
2	BOW ROLLER	41020002	SOUTHCOAST		1	
3	BOW RAIL			HW2417	1	CARRY OVER FROM P450
4	ANCHOR LOCKER LID		HUNTER		1	FIBER GLASS LID
5	4 BOLT CLEAT		NORTH/JUDD 14051		7	(3) ON BOW, (2) STERN, (2) SPRING
6	ANCHOR WELL LID LATCH		SOUTHCOAST	HW4481	1	
7	ANCHOR WELL LID STRIKER PLATE			HW2192	1	CARRY OVER FROM 40.5
8	HINGE		GEM	HW4172	14	
9	DECK PLATE -- WASTE			PL1140	2	TYP.
10	HATCH COAST 20		LEWMAR	HW0083	1	IN FORWARD HEAD
11	HATCH COAST 80		LEWMAR	HW0084	1	FORWARD CABIN
12	STANCHIONS AND STANCHION BASES		SOUTHCOAST	HW1752	6	CARRY OVER FROM 310/340
13	HANDRAILS -- 48"			HW2440	2	ON FORWARD CABIN TOP
14	WINDSHIELD		VIPLEX		1 SET	FROM TEMPLATE
15	MAST STEP	41020013			1	FOR Z-SPARS 601
16	HATCH COAST 30		LEWMAR		2	NEW PART FOR US
17	PAD EYE		SCHAEFER	HW0853	2	CARRY OVER FROM P450
18	DORADE VENT			HW4856/HW4856A	2 SETS	TYP.
19	HALYARD TURNING BLOCKS		HARKEN	HW0346	2	3 SHEAVE TURNING BLOCK STANDARD
20	LOWERS CHAINPLATE	41020008			2	
21	UPPERS CHAINPLATE	41020007			2	
22	DECK PLATE -- WATER			PL1130	3	
23	JIB TRACKS		SCHAEFER	HW0317	2	CARRY OVER FROM P450
24	JIB CAR		SCHAEFER	HW0217	2	CARRY OVER FROM P450
25	JIB TRACK ENDS		SCHAEFER	HW0215	2	CARRY OVER FROM P450
26	SLIDER TRACKS		BOMAR	HW0145	1 SET	CARRY OVER FROM 40.5
27	SEA HOOD		HUNTER		1	FIBER GLASS PART
28	COMPANIONWAY HAND RAILS			HW2330	1 SET	CARRY OVER FROM 40.5
29	HATCH COAST 10		LEWMAR	HW0014	2	
30	SHEET STOPPER		SPINLOC	HW1265	2	XT/3
31	GATE STANCHIONS			HW1736	4	CARRY OVER FROM P450
32	JIB SHEET TURNING BLOCK		SCHAEFER	HW0277	2	
33	HATCH COAST 03		LEWMAR	HW0013	2	
34	JIB SHEET WINCH		LEWMAR	HW2522	2	48 CST
35	HALYARD WINCH		LEWMAR	HW2521	2	44 CST
36	4" ALUMINUM CLEAT			HW0985	1	JIB FURLING LINE
37	SPRING LOADED BLOCK		SCHAEFER	HW0267	1	JIB FURLING LINE
38	STEERING SYSTEM		EDSON		1	EDSON DEVELOPMENT FROM 310/340 SYSTEM
39	PEDESTAL GUARDS			HW2315/HW2121	1 EACH	CARRY OVER FROM 376
40	BUTT HINGE			HW4218	4	STEERING CONSOLE
41	HOOK/EYE LATCH			HW4360	2	STEERING CONSOLE
42	CONSOLE		HUNTER		1	CARRY OVER FROM 376
43	QUADRANT COVER		HUNTER		1	NEW FIBERGLASS PART
44	ENGINE SHUT OFF			HW3634		
45	RUBBER LATCH				4	(2) HELM SEAT, (2) SWIM LOCKERS
46	DECK PLATE -- FUEL			PL1126	1	
47	STERNRAIL	41020032			1 PAIR	FIRST HAS BEEN PROTOTYPED
48	SHORE POWER INLET			LG0100	1	
49	STBD GULLWING LID		HUNTER		1	FIBERGLASS PART

REVISED TITLE

## H410 STANDARD DECK HARDWARE LIST

REVISION NO.

4108039

REVISION NO.

NONE

DESIGNED BY

ENGINEERING DEPT.

DATE

8/1/97

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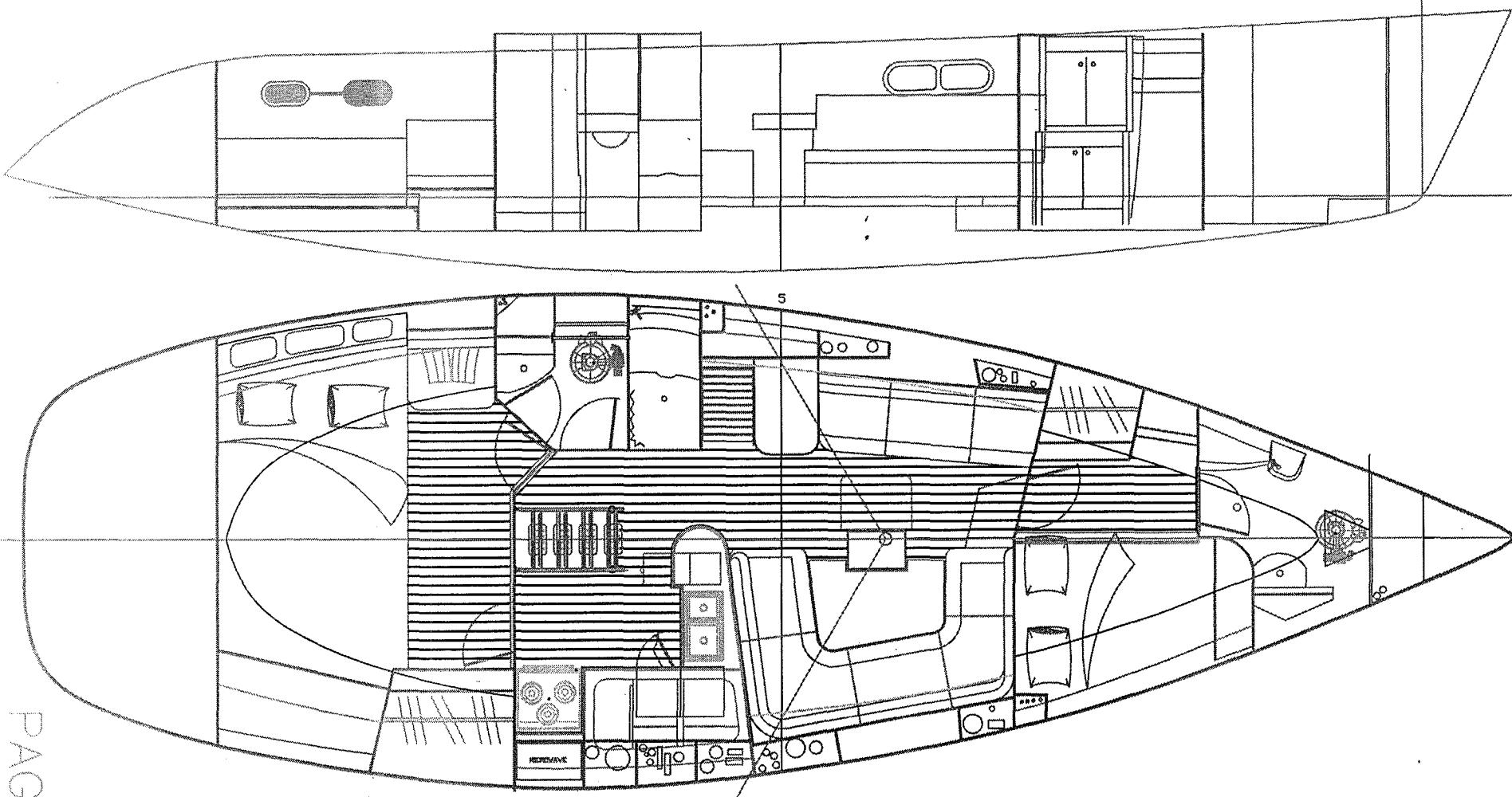
HUNTER 

50	GULLWING HANDLE			HW2318	2	CARRY OVER FROM 310/340
51	PORT GULLWING LID		HUNTER		1	FIBERGLASS PART
52	FWD SIDE DECK LIGHT (PT. & STBD.)		NORTH FLORIDA GLASS	TEMPLATE	1EA	PATTERNED BY J.O.
53	MID SIDE DECK LIGHT (PT. & STBD.)		NORTH FLORIDA GLASS	TEMPLATE	1EA	PATTERNED BY J.O.
54	SIDE DECK OPENING PORT		LEWMAR	HW0043	4	SIZE 00
55	SIDE DECK FIXED PORT		NORTH FLORIDA GLASS	TEMPLATE	2	PATTERNED BY J.O.
56	SIDE DECK OPENING PORT		LEWMAR	HW0083	2	SIZE 20
57	HINGE			HW4175	2	FOR HELMSEAT
58	SWIM LADDER		WINDLINE	HW0457	1	CARRY OVER FROM 310/340
59	MANUAL BILGE PUMP			PL0371	1	
60	STRUTS	41020028	HUNTER		2	SAME TUBE AS 310/340 W/ 1/2" THREADED STUD
61	UPPER VANG BLOCK		SCHAEFER	HW0232	1	CARRY OVER FROM 376
62	LOWER VANG BLOCK		SCHAEFER	HW0264	1	CARRY OVER FROM 376
63	MAINSHEET BLOCK ON BOOM		HARKEN	HW0345	1	
64	MAINSHEET BLOCK ON TRAVELER CAR		HARKEN	HW0344	1	
65	TRAVELER BAR		HARKEN	HW0351	1	
66	TRAVELER END CAPS		HARKEN	HW0343	2	
67	TRAVELER CONTROL BLOCKS		HARKEN		2	HARKEN 566
68	OVER THE TOP BLOCKS		SCHAEFER		4	506-40
69	TRAVELER CAR		HARKEN	HW0340	1	WITH HARKEN 1515 CONTROL BLOCKS
70	LIFELINES	41020031		HW4102	1	
71	TRANSOM GRAB HANDLE			HW2404	2	
72	PROFURL B35-m				1	SAME SYSTEM AS 376 DIFFERENT LENGTH
73	PINBOARD TRACKS		HUNTER		2	MILL PART
74	TRAVELER CLEAT		HARKEN 365		2	MOUNTED ON ARCH
75	STERN LIGHT			ELQ389	1	MOUNTED ON STERN RAIL
76	COCKPIT SHOWER			PL0189	1	UNDER HELM SEAT
77	SOLAR PANEL				1	
78	RUBRAIL				88'	SAME STYLE AS P450
79	RUBRAIL INSERT				88'	SAME STYLE AS P450
80	CONSOLE LEAFS		HUNTER		2	MILL PART
81	HULL SIDE LARGE FIXED WINDOWS		NORTH FLORIDA GLASS		3	
82	HULL SIDE SMALL FIXED WINDOWS		NORTH FLORIDA GLASS	PX0297	2	TYPICAL
83	HULL SIDE OPENING PORT		LEWMAR	HW0074	2	
84	COMPANIONWAY SLIDER		HUNTER		1	MILL PART
85	PINBOARDS		HUNTER		3	MILL PART
86	SOLAR PANEL TRIM RING		HUNTER		1	FIBERGLASS PART
87	STBD SWIM SEAT LOWER TRIM		HUNTER		1	FIBERGLASS PART
88	THRU DECK ACCESS PLATE			HW0045	1	DP40-W, ARCH BASE STBD SIDE
89	U-BOLT			HW5512	1	3/8" x 2" WITH NUTS, MOUNTED IN ANCHOR WELL
90	ENGINE PANEL			HW3379	1	YANMAR 'C', MOUNTED IN ARCH ON PORT SIDE


DRAWING TITLE: <b>H410 STANDARD DECK HARDWARE LIST CONT.</b>	
DRAWING NO. 4108040	REVISION NO. NONE
DESIGN BY ENGINEERING DEPT.	DATE 8/1/97

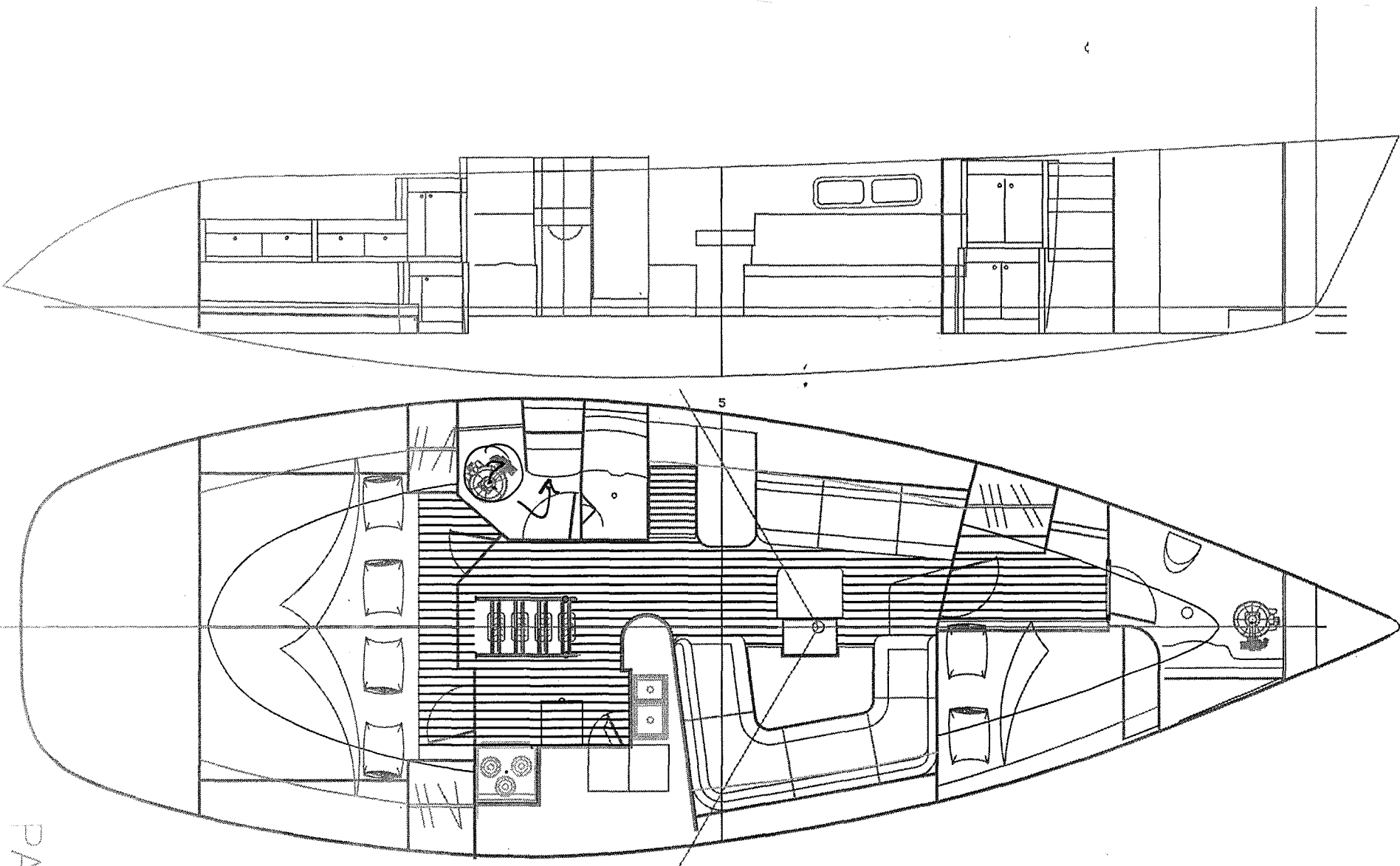
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PAGE 41A

DRAWING TITLE: <b>H410 ACCOMMODATION PLAN (STD)</b>		THIS DOCUMENT DISCLOSES INFORMATION FOR WHICH HUNTER MARINE CORP. HAS PROPRIETARY RIGHTS.	
DRAWING NO. <b>4108041A</b>	REVISION NO. <b>NONE</b>	<b>HUNTER</b> 	
DRAWN BY <b>ENGINEERING DEPT.</b>	DATE <b>6/3/97</b>		

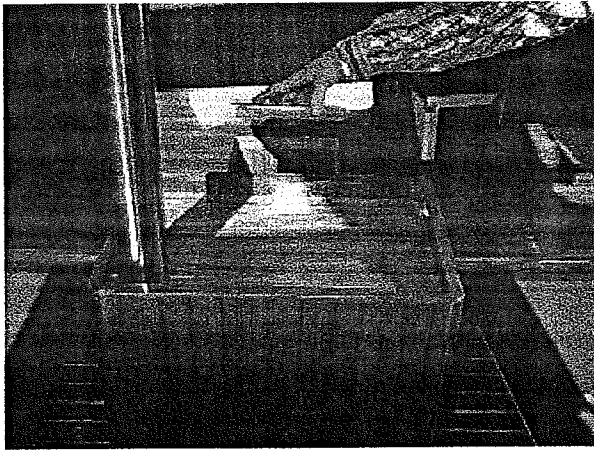


PAGE 41B

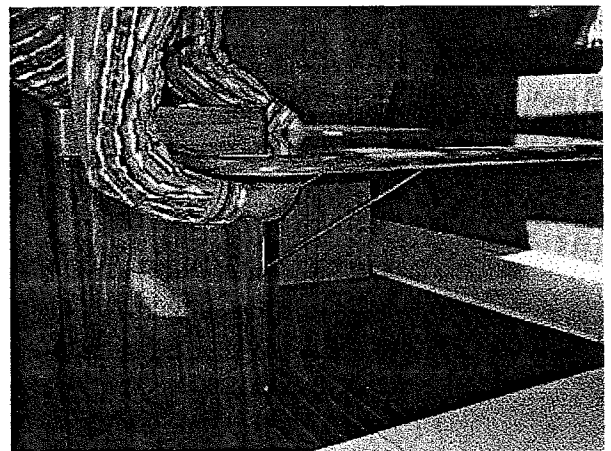
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DRAWING NO. <b>4108041B</b>	REVISION NO. <b>NONE</b>	<b>HUNTER</b> 	
DRAWN BY <b>ENGINEERING DEPT.</b>	DATE <b>6/3/97</b>		



## ***H410 DINETTE TABLE OPERATION***



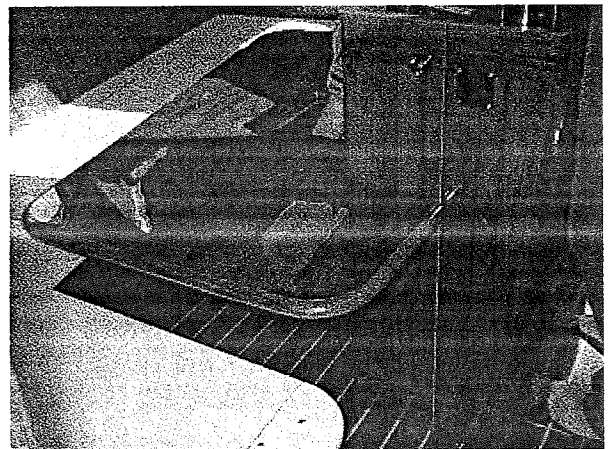
***PHOTO #1***  
***1A. REMOVE STORAGE BOX LID***



***PHOTO #2***  
***2A. HOLD HANDLE IN STORAGE BOX AND  
RELEASE BARREL BOLT UNDER AFT  
END OF TABLE.***



***PHOTO #3***  
***3A. CHANGE HANDS ON HANDLE AND  
RELEASE BARREL BOLT UNDER FWD.  
END OF TABLE.***



***PHOTO #4***  
***4A. LOWER TABLE UNTIL IT RESTS  
UPON SETTEE TOP.***

## STANDARD RIG

### NOTES: LINE RUNS

- ① OPT. SPINN. HALYARD (BLACK)  
(DISREGARD #1 IF SPINN. OPTION NOT CHOSEN)
- ② JIB HALYARD (RED)
- ③ REEF #2 (RED FLECK)
- ④ REEF #1 (GREEN FLECK)

## FURLING RIG

### NOTES: LINE RUNS

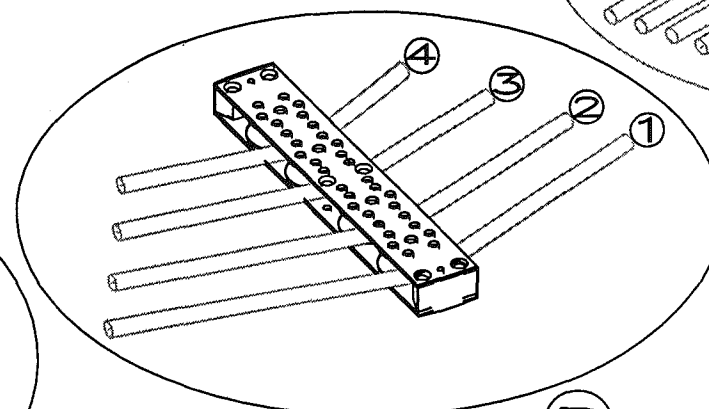
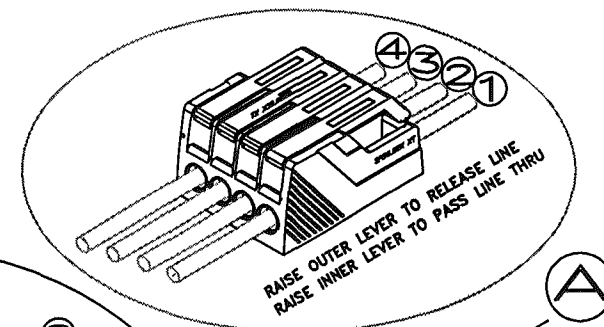
- ① OPT. SPINN. HALYARD (BLACK)  
(DISREGARD #1 IF SPINN. OPTION NOT CHOSEN)
- ② JIB HALYARD (RED)
- ③ MAIN OUTHAUL
- ④ MAIN FURLING

### NOTES: SHEET STOPPER

OPTIONAL QUAD SHEET STOPPER SHOWN  
STD. MODEL IS TRI STOPPER  
(QUAD) SPINLOCK XT HUNTER # HW1267  
(TRI) SPINLOCK XT HUNTER # HW1265

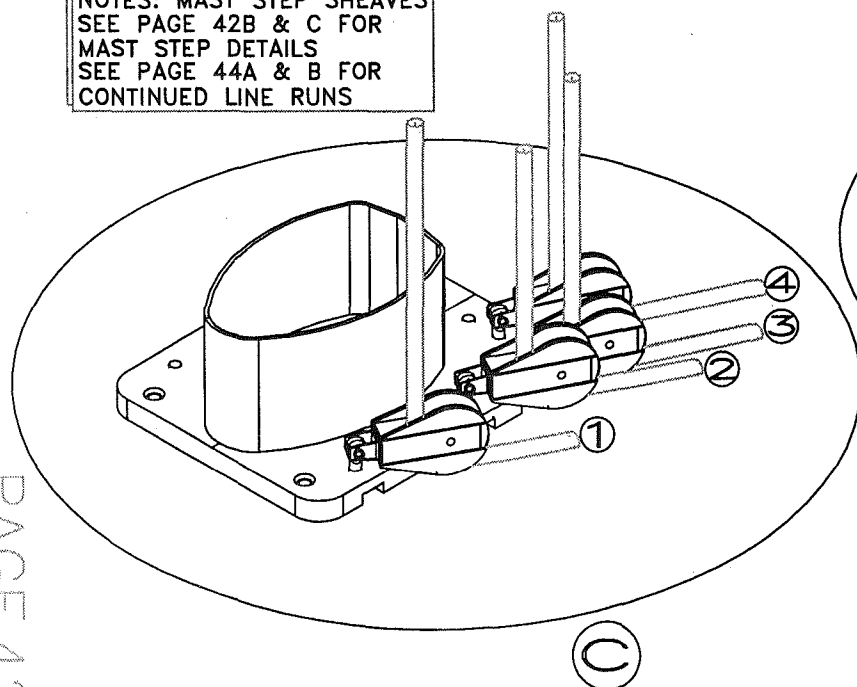
NOTES: MAST STEP SHEAVES  
SEE PAGE 42B & C FOR  
MAST STEP DETAILS  
SEE PAGE 44A & B FOR  
CONTINUED LINE RUNS

FORWARD PORT



### NOTES: ORGANIZER

OPTIONAL QUAD ORGANIZER SHOWN  
STD. MODEL IS TRI ORGANIZER  
(QUAD) SPINLOCK XT HUNTER # HW0347  
(TRI) SPINLOCK XT HUNTER # HW0346



DRAWING TITLE: <b>H410 PORT RUN, RIG &amp; MAST STEP DETAIL</b>			
REVISION NO.	4108042A-1	REVISION NO.	NONE
DATE:	6/26/97	DATE:	6/26/97
ENGINEERING DEPT.			

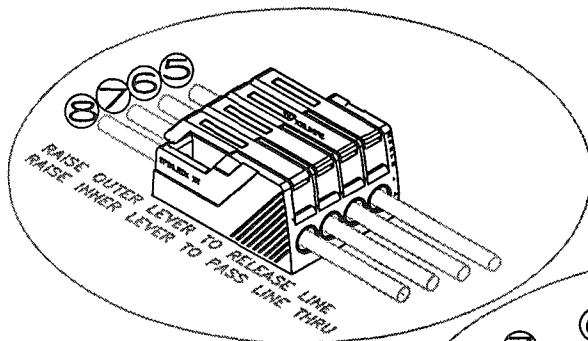
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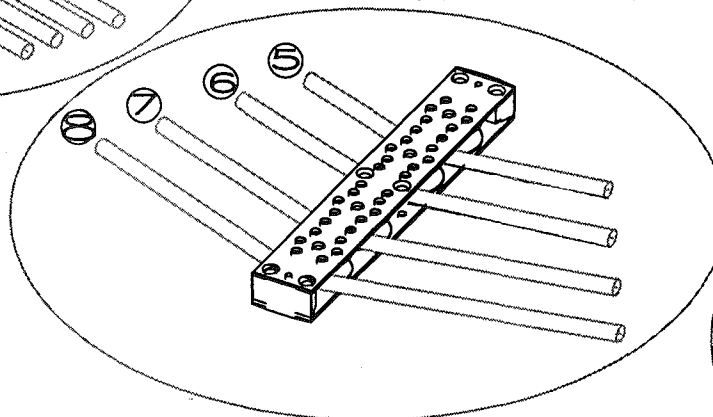
# NOTES: LINE RUNS

- ⑤ VANG (WHITE)
  - ⑥ MAINSHEET (BLUE FLECK)
  - ⑦ MAIN HALYARD (BLUE)
  - ⑧ OPT. STAYSAIL HALYARD (GREEN)
- (DISREGARD #8 IF STAYSAIL OPTION NOT CHOSEN)

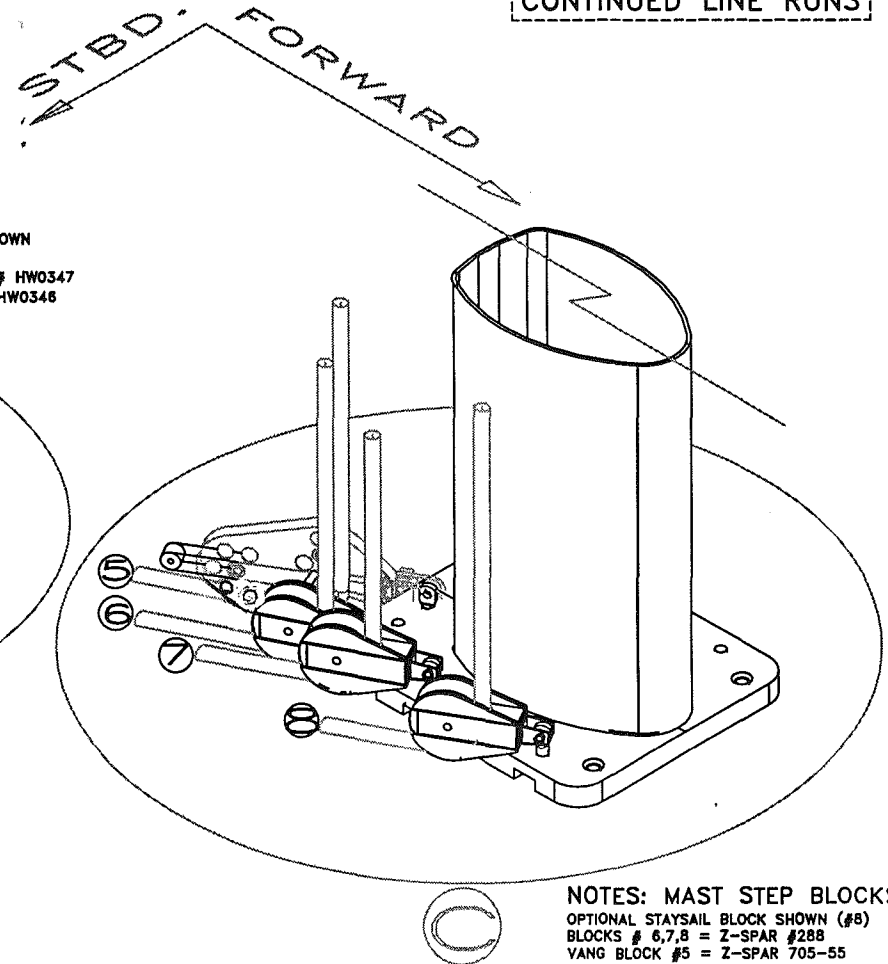
NOTES: SHEET STOPPER  
 OPTIONAL QUAD SHEET STOPPER SHOWN  
 STD. MODEL IS TRI STOPPER  
 (QUAD) SPINLOCK XT HUNTER # HW1267  
 (TRI) SPINLOCK XT HUNTER # HW1265



NOTES: ORGANIZER  
 OPTIONAL QUAD ORGANIZER SHOWN  
 STD. MODEL IS TRI ORGANIZER  
 (QUAD) SPINLOCK XT HUNTER # HW0347  
 (TRI) SPINLOCK XT HUNTER # HW0346



SEE PAGE 44 FOR  
 CONTINUED LINE RUNS



NOTES: MAST STEP BLOCKS  
 OPTIONAL STAYSAIL BLOCK SHOWN (#8)  
 BLOCKS # 6,7,8 = Z-SPAR #288  
 VANG BLOCK #5 = Z-SPAR 705-55

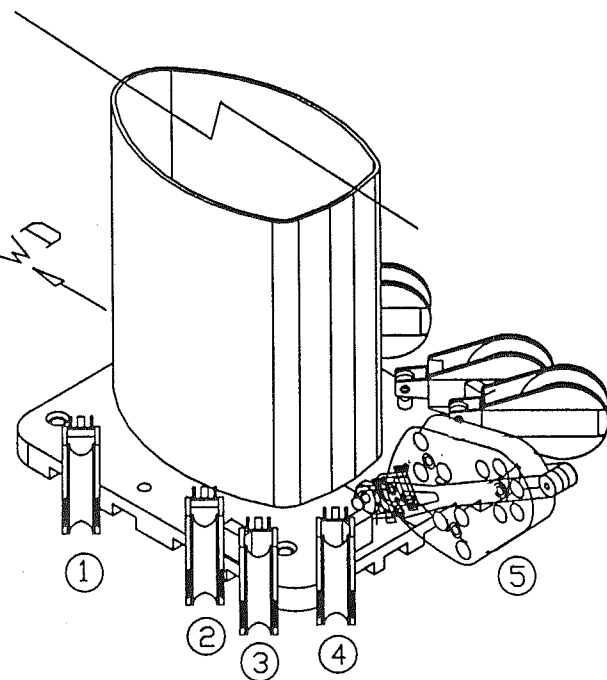
STBD. RUNNING RIGGING DETAIL

DRAWING TITLE <b>H410 STBD.RUN. RIG &amp; MAST STEP DETAIL (STD.)</b>	
DRAWING NO. <b>4108042A-2</b>	REVISION NO. <b>NONE</b>
ENGINEERING DEPT.	DATE <b>6/10/97</b>

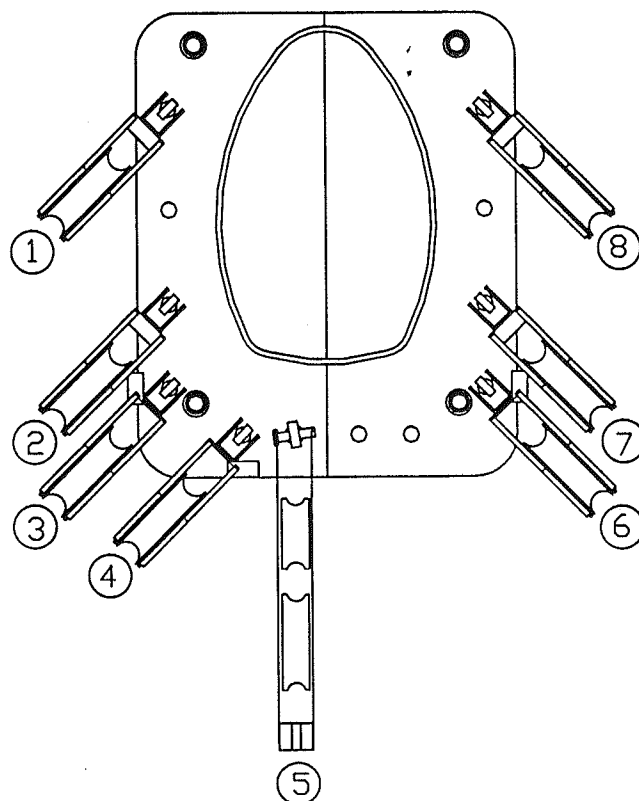
HUNTER

- ① SPINN. HALYARD (OPTIONAL) Z-SPAR #288
- ② JIB HALYARD, Z-SPAR #288
- ③ REEF #2, Z-SPAR #288
- ④ REEF #1, Z-SPAR #288
- ⑤ VANG LINE, Z-SPAR #705-55
- ⑥ MAINSHEET, Z-SPAR #288
- ⑦ MAIN HALYARD, Z-SPAR #288
- ⑧ STAYSAIL HALYARD (OPTIONAL) Z-SPAR #288

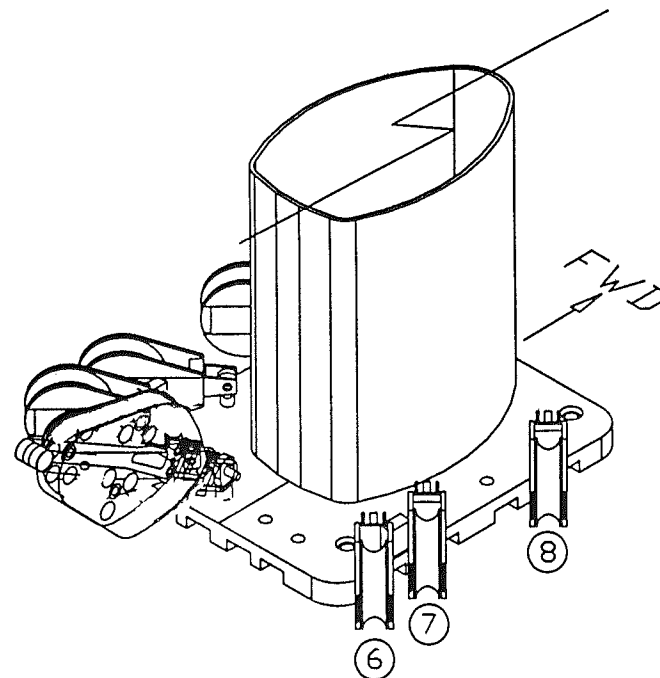
FWD



PORT VIEW



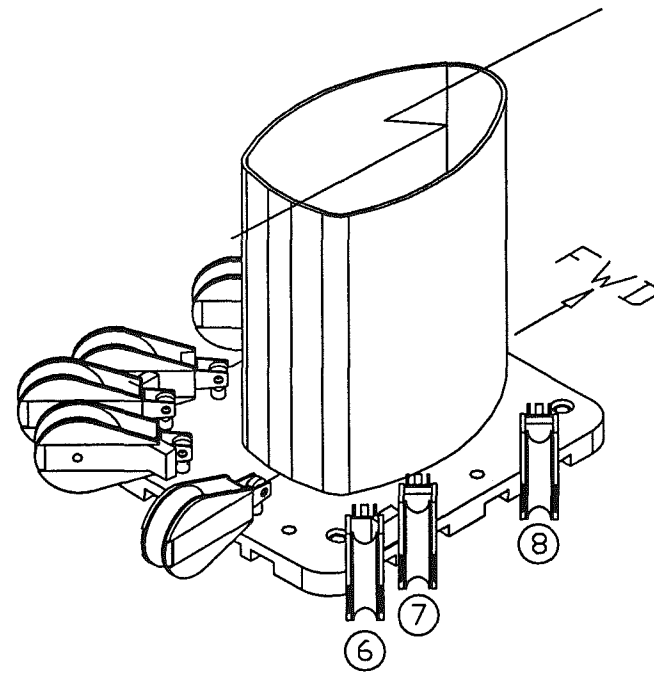
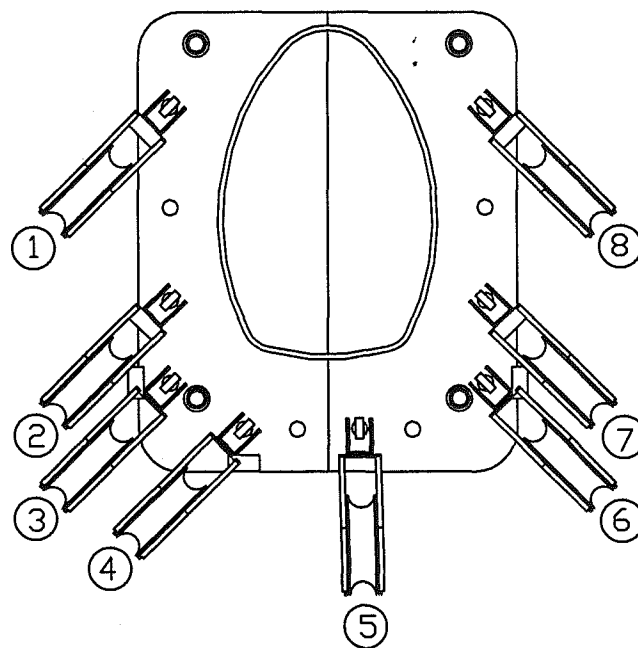
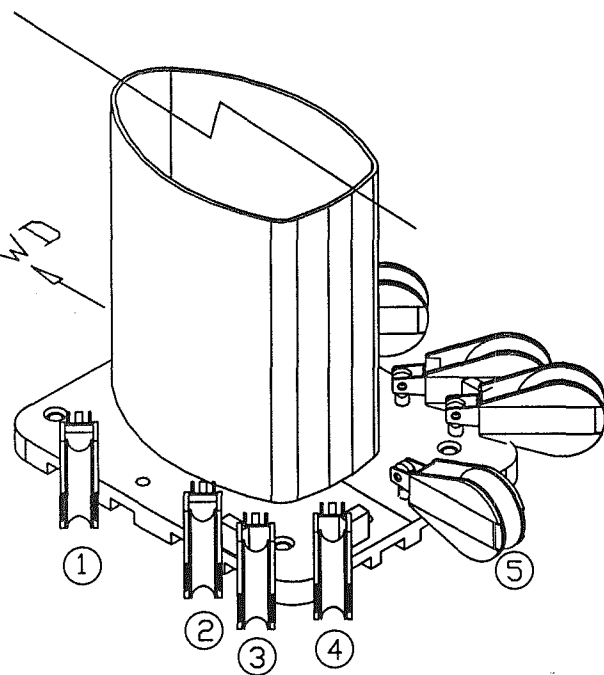
PLAN VIEW



STBD. VIEW

- ① SPINN. HALYARD (OPTIONAL) Z-SPAR #288
- ② JIB HALYARD, Z-SPAR #288
- ③ FURLING LINE Z-SPAR #288
- ④ DUTHAUL Z-SPAR #302
- ⑤ VANG LINE, Z-SPAR #302
- ⑥ MAINSHEET, Z-SPAR #288
- ⑦ MAIN HALYARD, Z-SPAR #288
- ⑧ STAYSAIL HALYARD (OPTIONAL) Z-SPAR #288

FWD



MAST

BOOM

UPPER VANG SHEAVE  
SCHAEFFER #705-45

VANG BALE

- ① FROM SHEET STOPPER (SEE PAGE 42A) AROUND LOWER MAST STEP SHEAVE (Z-SPAR) AS SHOWN
- ② FROM LOWER MAST STEP SHEAVE, AROUND UPPER BOOM SHEAVE AS SHOWN
- ③ FROM UPPER BOOM SHEAVE AROUND LOWER MAST STEP SHEAVE AS SHOWN
- ④ FROM LOWER MAST STEP SHEAVE, AROUND UPPER BOOM SHEAVE AS SHOWN
- ⑤ FROM BOOM SHEAVE AS SHOWN TO MAST STEP SHEAVE AS SHOWN
- ⑥ FROM MAST STEP SHEAVE AS SHOWN TO BOOM SHEAVE BECKET

LOWER VANG SHEAVE  
SCHAEFFER #705-55

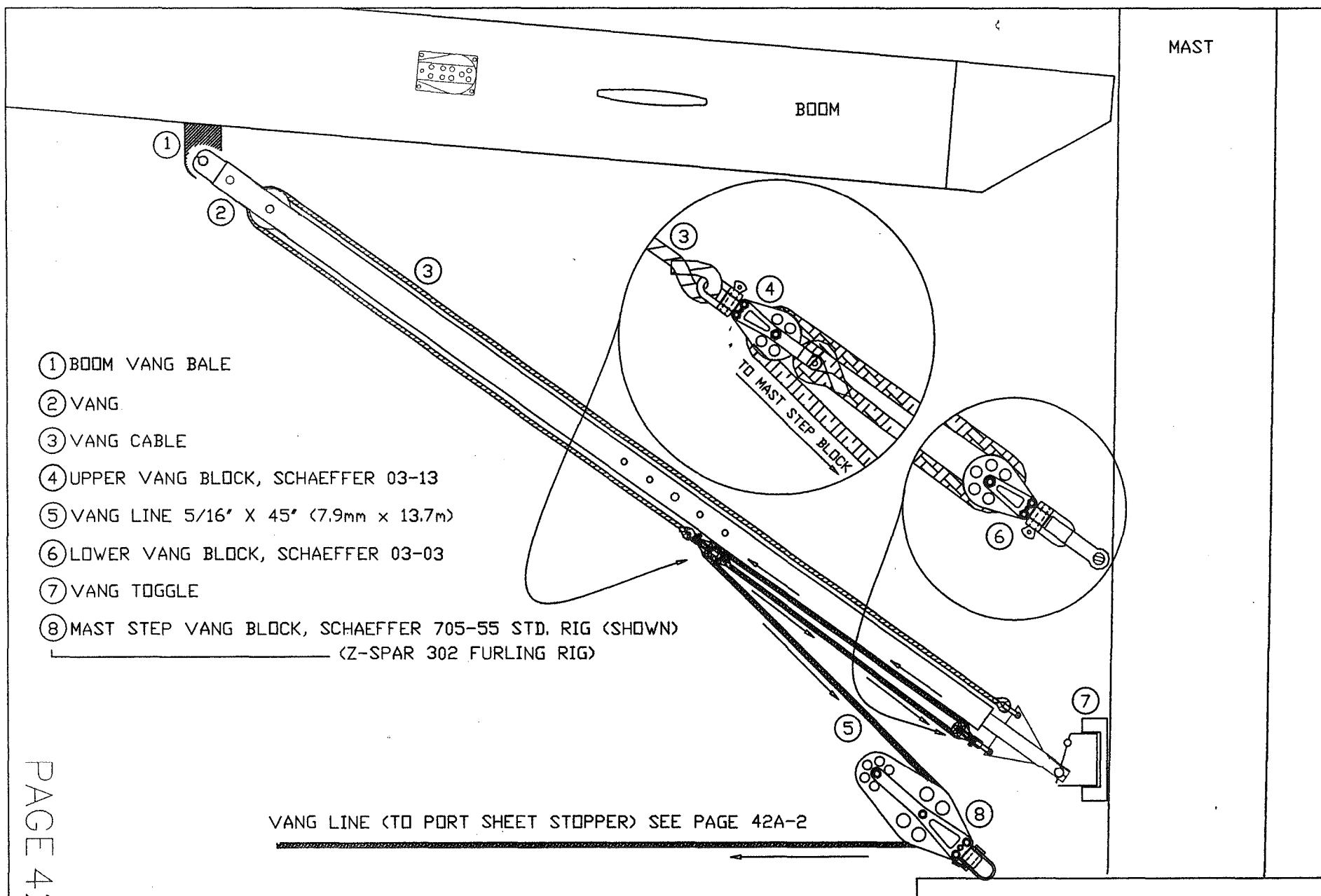
LOWER VANG SHEAVE  
Z-SPAR #302

NOTE: THIS SHEAVE ACTUALLY MOUNTED  
TO MAST STEP, SHOWN HERE FOR CLARITY.

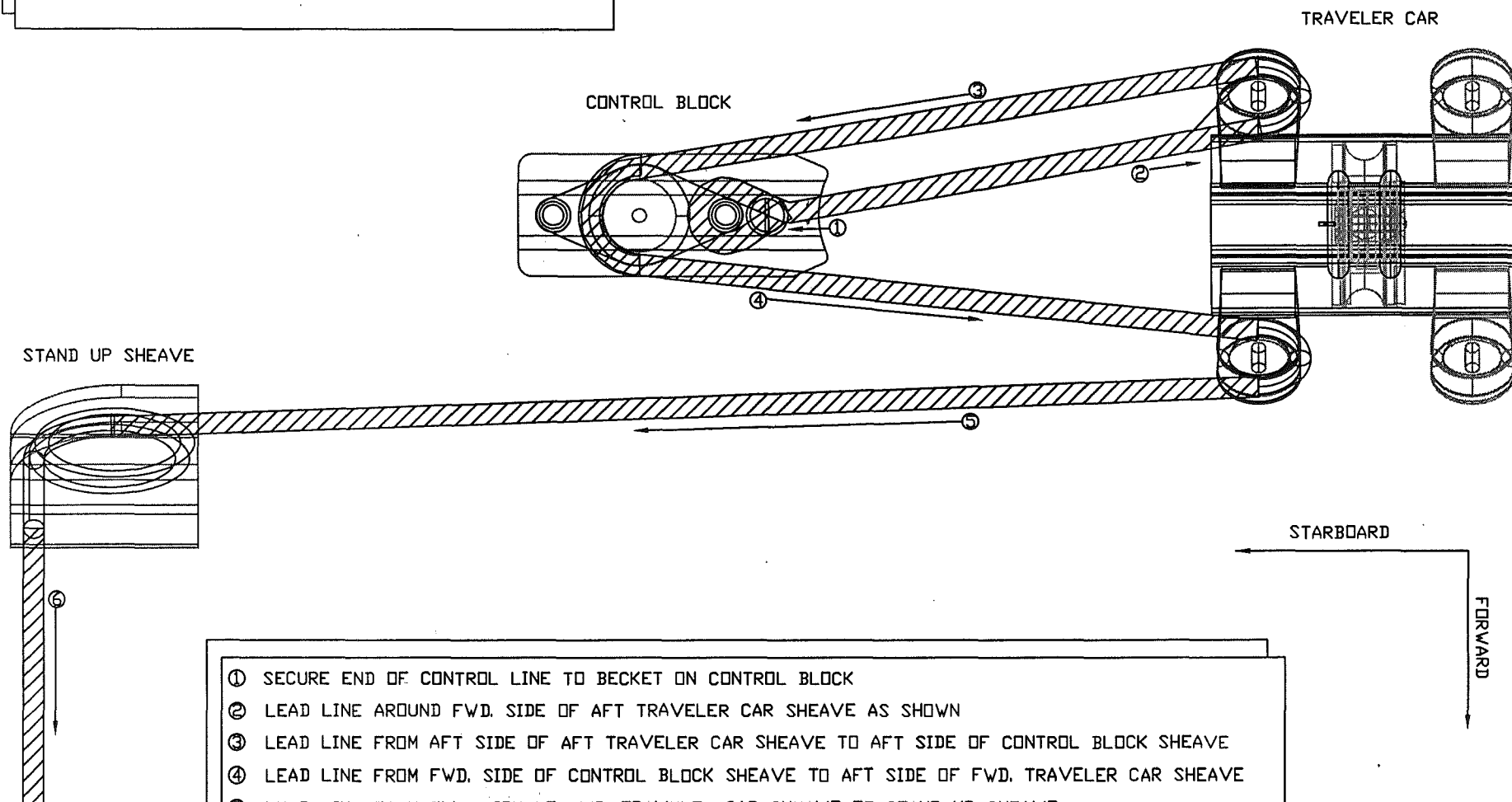
DRAWING TITLE: <b>H410 VANG DETAILS (STANDARD)</b>	
DRAWING NO. <b>4108042D</b>	REVISION NO. <b>NONE</b>
DRAWN BY <b>ENGINEERING DEPT.</b>	DATE <b>6/26/97</b>

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**HUNTER**



NOTE: ARCH & TRAVELER BAR NOT SHOWN FOR CLARITY.  
STARBOARD SIDE SHOWN, PORT SIDE IS MIRROR IMAGE  
SEE FOLLOWING PAGE FOR MORE DETAILS



- ① SECURE END OF CONTROL LINE TO BECKET ON CONTROL BLOCK
- ② LEAD LINE AROUND FWD. SIDE OF AFT TRAVELER CAR SHEAVE AS SHOWN
- ③ LEAD LINE FROM AFT SIDE OF AFT TRAVELER CAR SHEAVE TO AFT SIDE OF CONTROL BLOCK SHEAVE
- ④ LEAD LINE FROM FWD. SIDE OF CONTROL BLOCK SHEAVE TO AFT SIDE OF FWD. TRAVELER CAR SHEAVE
- ⑤ LEAD LINE FROM FWD. SIDE OF FWD. TRAVELER CAR SHEAVE TO STAND UP SHEAVE
- ⑥ LEAD LINE AROUND STAND UP SHEAVE THEN DOWN THRU ARCH AND AROUND LOWER SHEAVE TO CAM CLEAT

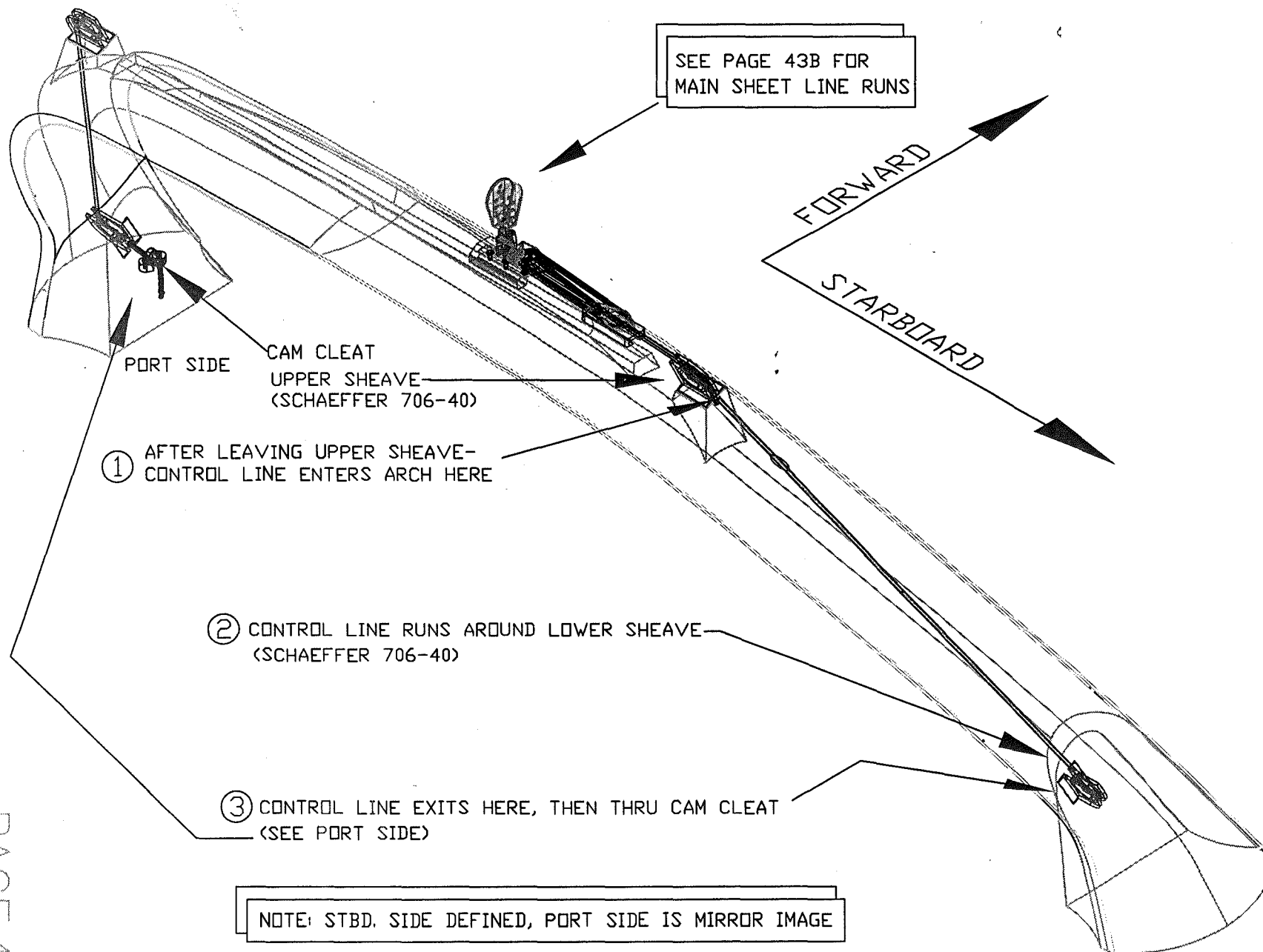
DRAWING TITLE:  
**410 STANDARD ENDBOOM MAINSHEET TRAVELER**


DRAWING NO. <b>4108043A-1</b>	REVISIONS PAGE <b>NONE</b>
DRAWN BY <b>ENGINEERING DEPT.</b>	DATE <b>6/18/97</b>

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DRAWING TITLE: <b>H410 TRAV. CONTROL LINE DETAILS</b>		This document contains information for which HUNTER MARINE CORP. has proprietary rights.	
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DRAWN BY: ENGINEERING DEPT.	DATE: 6/20/97		

STANDARD MAINSHEET PURCHASE (ENDBOOM)

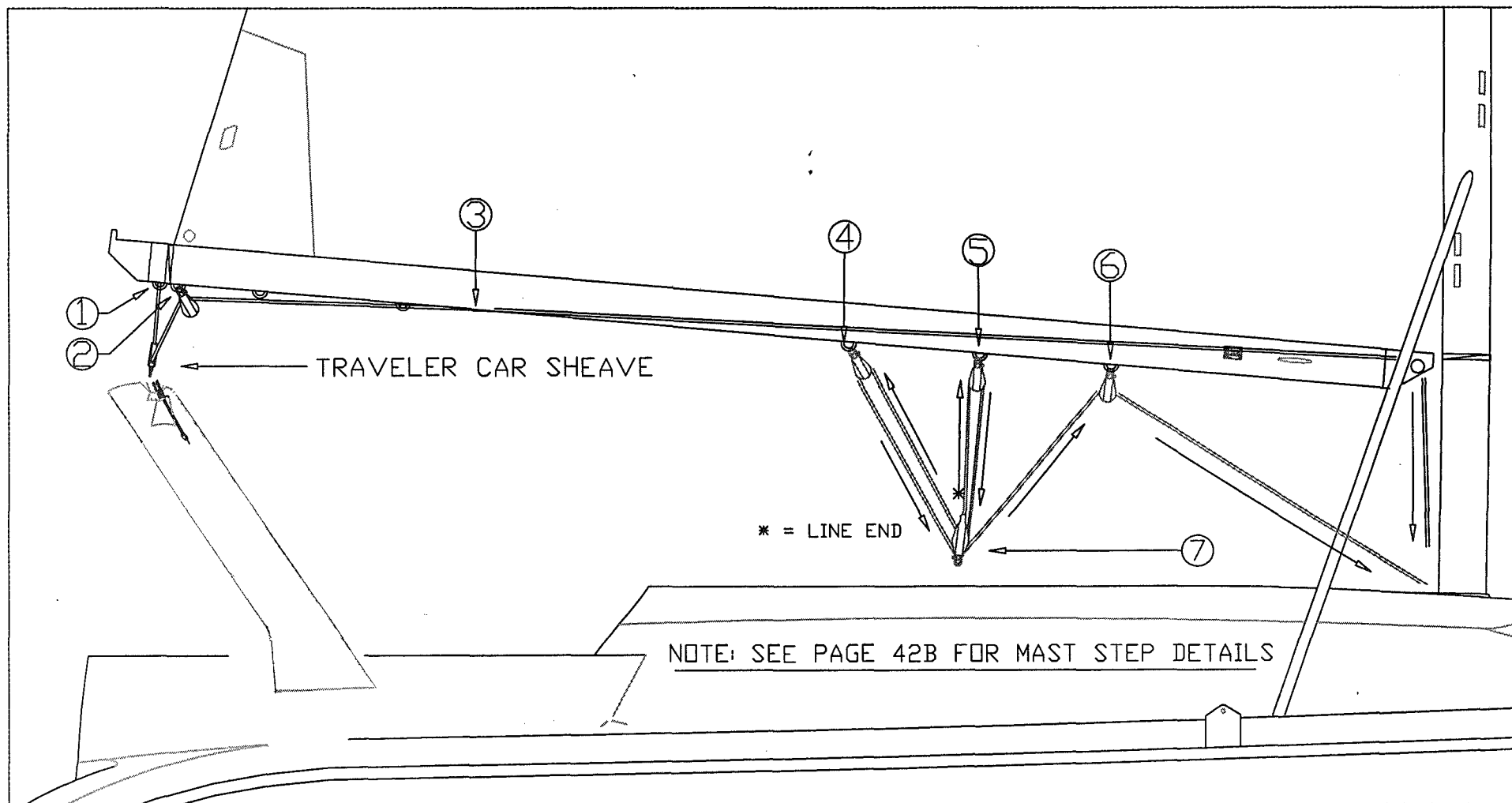
- ① BALE, MAINSHEET END
- ② BALE, MAINSHEET BLOCK
- ③ EXIT, MAINSHEET

SEE PAGE 43A-1 & 2 FOR ENDBOOM TRAVELER DETAILS

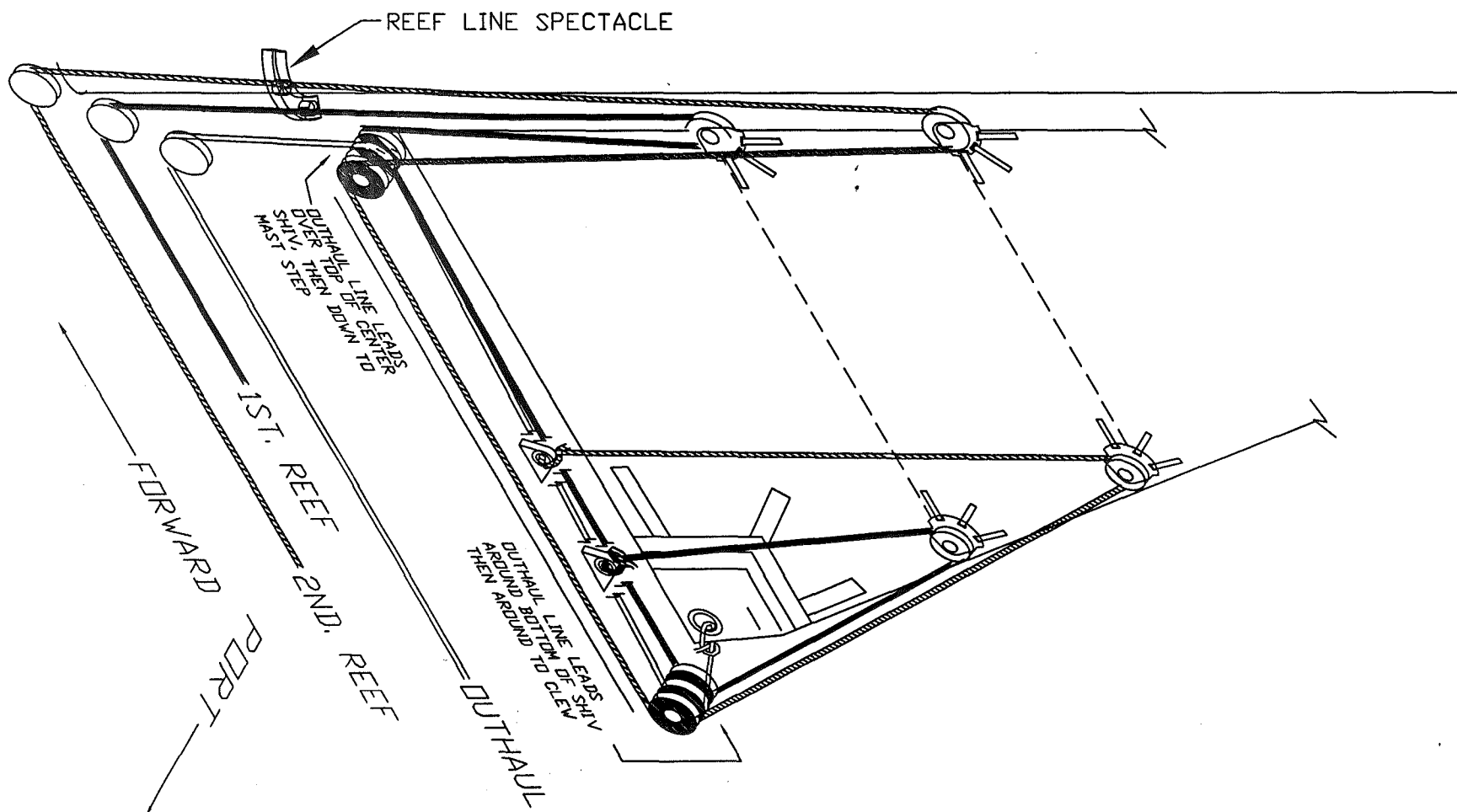
OPTIONAL MAINSHEET PURCHASE (MIDBOOM)


- ④ BALE, MIDBOOM MAINSHEET AFT BLOCK
- ⑤ BALE, MIDBOOM MAINSHEET MID BLOCK
- ⑥ BALE, MIDBOOM MAINSHEET BLOCK FWD.
- ⑦ MIDBOOM MAINSHEET TRAVELER BLOCK

SEE PAGE 43A-3 FOR MIDBOOM TRAVELER DETAILS



SEE PAGES 42A OR 42B FOR  
FOR MAST STEP SHIV LOCATION



DRAWING TITLE <b>H410 BOOM &amp; REEF LAYOUT</b>		This document discloses information for which HUNTER MARINE CORP. has proprietary rights.	
DRAWING NO. <b>4108044</b>	REVISION NO. <b>NONE</b>	<b>HUNTER</b> 	
ENGINEERING DEPT.	DATE <b>8/1/97</b>		

## REEFING

1. *Release tension on vang.*
2. *Ease main sheet out a couple of feet.*
3. *Wrap main halyard on winch.*
4. *Open main halyard clutch.*
5. *Ease main halyard down while simultaneously pulling in on both reef lines.*
6. *When desired reef tack is about a foot above the boom, lock off the main halyard.*
7. *Put desired reef line on the winch and tension until the tack and clew are in the positions shown in the photos below.*
8. *Tension main halyard until horizontal wrinkles are gone from the luff of the sail.*
9. *Adjust main sheet and vang to suit your desired course.*
10. *Pull in extra line from the reef you are not using just to straighten up.*

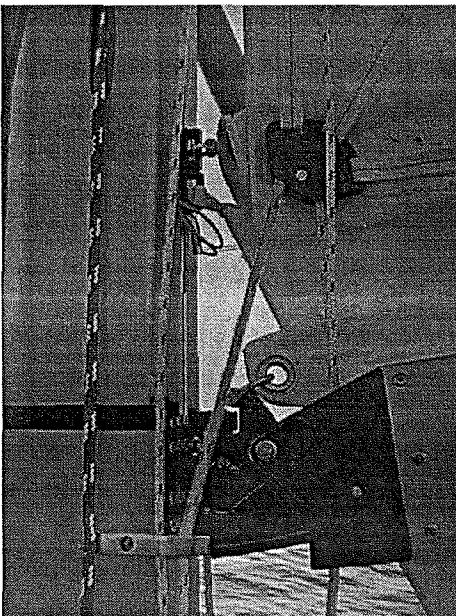


Figure 1 Reef 1 Tack Fitting

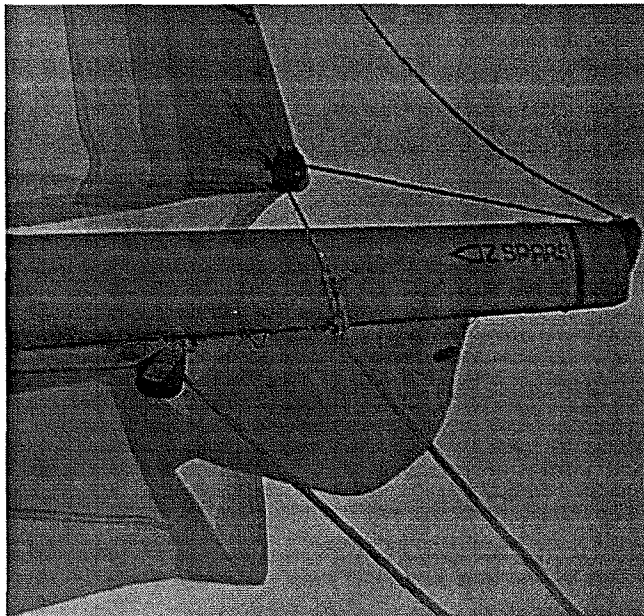



Figure 2 Reef 1 Clew Fitting

## UN-REEFING

1. *Ease tension on vang and mainsheet.*
2. *Release reef line clutches.*
3. *Wrap main halyard on winch and tension until reef is removed.*
4. *Readjust mainsheet and vang to suit course.*

# RUNNING RIGGING SPECIFICATIONS

BOAT: HUNTER 410			FILE NAME: PR5066		REVISION: A					
BY: KJC			DATE: 8/13/97 ADJUST LENGTHS, NO SHACKLES IN LAZY JACKS, MAKE EYES IN LJ LINES LARGER, ADD VANG							
CHECKED BY:			DATE: MAKE MAINSHEET 1/2" DIA							
OPT/STD		ITEM	QUANTITY	LINE SIZE	LINE TYPE	COLOR	END 1	LENGTH		END 2
1	STD	MAIN HALYARD	1	7/16" (11mm)	XLS EXTRA	BLUE	HEADBOARD SHACKLE	36.1 m	118 ft	BARE
2	STD	JIB HALYARD	1	7/16" (11mm)	XLS EXTRA	RED	EYE	35.9 m	118 ft	BARE
3	STD	MAIN TRAVELER LINE	2	5/16" (8mm)	LS	WHITE	SMALL EYE	7.9 m	26 ft	BARE
4	STD	MAINSHEET	1	1/2" (12.5mm)	XLS	BLUE FLECK	SMALL EYE	24.3 m	80 ft	BARE
5	STD	REEFING LINE #1	1	7/16" (11mm)	LS	GREEN FLECK	BARE	22.9 m	75 ft	BARE
6	STD	REEFING LINE #2	1	7/16" (11mm)	LS	RED FLECK	BARE	32.7 m	107 ft	BARE
7	STD	JIB SHEET	2	1/2" (12.5mm)	LS	RED FLECK	BARE	12.2 m	40 ft	BARE
8	OPT	CRUISING SPINN. SHEET	2	7/16" (11mm)	LS	BLACK FLECK	BARE	28.0 m	92 ft	BARE
9	OPT	SPINNAKER HALYARD	1	7/16" (11mm)	XLS	BLACK	SNAP SHACKLE NF11000s	35.9 m	118 ft	BARE
10	OPT	STAYSAIL HALYARD	1	7/16" (11mm)	XLS	GREEN	SNAP SHACKLE NF11000s	29.0 m	95 ft	BARE
11	STD	VANG	1	7/16" (11mm)	LS	WHITE	SMALL EYE	15.2 m	50 ft	BARE
12	OPT	STAYSAIL SHEETS	2	7/16" (11mm)	LS	GREEN FLECK	BARE	10.9 m	36 ft	BARE
13	STD	LAZY JACK WIRE	2	1/8" (3.2mm)	PLASTIC COATED 7x7 WIRE	WHITE	EYE & THIMBLE, SMALL SHACKLE	5.5 m	18 ft	EYE & THIMBLE, HARKEN 125 OR EQUIVALENT
14	STD	FIXED LAZY JACK LINE	2	3/8" (9.5mm)	LS	WHITE	EYE	6.3 m	21 ft	EYE
15	STD	ADJUSTABLE LAZY JACK LINE	2	3/8" (9.5mm)	LS	WHITE	SS THIMBLE SPLICED	8.5 m	28 ft	BARE

DRAWING TITLE: <b>H410 RUNNING RIG SPECS. (STD)</b>			This document describes information for which HUNTER MARINE CORP. has proprietary rights.			
DRAWING NO. <b>4108048A</b>	REVISION NO. <b>NONE</b>	<b>HUNTER</b> 				
DESIGN DEPT. <b>ENGINEERING DEPT.</b>	DATE <b>6/3/97</b>					

FURLING MAST RUNNING RIGGING SPECIFICATIONS										
BOAT: HUNTER 410			FILE NAME: PR5061		REVISION:					
BY: KJC			DATE: 8/13/97		CHANGE MAINSHEET TO 1/2", ADJUST LENGTHS					
CHECKED BY:			DATE:							
OPT/STD	ITEM	QUANTITY	LINE SIZE	LINE TYPE	COLOR	END 1	LENGTH		END 2	
1 STD	MAIN HALYARD	1	7/16" (11mm)	XLS EXTRA	BLUE	EYE	36.0 m	118 ft	BARE	
2 STD	JIB HALYARD	1	7/16" (11mm)	XLS EXTRA	RED	EYE	35.9 m	118 ft	BARE	
3 STD	MAIN TRAVELER LINE	2	5/16" (8mm)	LS	WHITE	SMALL EYE	7.9 m	26 ft	BARE	
4 STD	MAINSHEET	1	1/2" (12.5mm)	LS	BLUE FLECK	SMALL EYE	24.4 m	80 ft	BARE	
5 STD	BOOM TOPPING LIFT	1	3/8" (9.5mm)	LS	WHITE	BARE	30.5 m	100 ft	BARE	
6 STD	JIB SHEET	2	1/2" (12.5mm)	LS	RED FLECK	BARE	12.1 m	40 ft	BARE	
7 OPT	CRUISING SPINN. SHEET	2	7/16" (11mm)	LS	BLACK FLECK	BARE	30.9 m	101 ft	BARE	
8 OPT	SPINNAKER HALYARD	1	7/16" (11mm)	XLS	BLACK	SNAP SHACKLE NF11000s	35.9 m	118 ft	BARE	
9 OPT	STAYSAIL HALYARD	1	7/16" (11mm)	XLS	GREEN	SNAP SHACKLE NF11000s	28.9 m	95 ft	BARE	
10 OPT	STAYSAIL SHEETS	2	7/16" (11mm)	LS	GREEN FLECK	BARE	10.9 m	36 ft	BARE	

## H410 B&R RIG WITH STRUTS DESCRIPTION

The B&R rig, utilized on the Hunter 410, eliminates the need for a backstay to allow for a more efficient mainsail shape. Fixed backstays are commonly being designed out of today's performance-oriented boats to allow the mainsail to incorporate a full roach design - a more aerodynamic shape both for racing and cruising performance.

To accomplish this, the B&R rig has 30 degree swept spreaders, creating 120 degrees between each rigging point. This tri-pod arrangement has excellent strength for sailboat rigs, and has been used for years to support huge radio towers.

The latest advancement to the B&R rig is the addition of mast struts. These struts stabilize the lower section of the mast, allowing compression loads to be spread, reducing the point loading at the mast base. They also create a strong point for the boom and spinnaker pole loadings. The struts function also allow us to use a smaller mast section reducing weight aloft to decrease the heeling and pitching moments, making for a more comfortable ride. Additionally, they provide a secure handhold when going forward.

The struts perform an important structural function, **therefore never sail your boat without the struts properly fitted.** If your 410 is equipped with the in-mast furling option, the mast is a larger section size and the struts are not utilized.

Additional support is given to the B&R rig (and is unique to it) with the addition of reverse diagonal rigging.

For example, the diagonals that you see beginning by the top of the mast strut, ending at the tip of the spreader, supports and stabilizes the upper section of the mast as it creates a triangle with the upper shroud.

The B&R rig is designed to be pre-bent to further add rigidity to the mast section and eliminate the need for adjustable rigging (like backstay adjusters). This design should prove more reliable than a rig with adjustable backstays or runners, as there is less chance for error.

The large main, small jib, sail plan on the 410 also eliminates the need for large overlapping headsails (genoas), as the driving power comes from the much improved shape and size of the mainsail. This allows for an easier tacking small jib, creating good performance and more comfortable sailing as it is less work for the crew.

As the large main is creating additional mainsheet and leech loading, Hunter has included a cockpit arch whereby the mainsheet and leech loads are directed to the strong part of the boom (the outboard end) and is located at the heaviest loading point of the mainsail. The cockpit arch serves additional safety and comfort functions as handholds and cockpit canvas attachment points. (Note: this does not apply to mid boom sheeting option.)

B&R rigs have been used on thousands of sailboats, and we are proud to incorporate this successful design on your new Hunter.

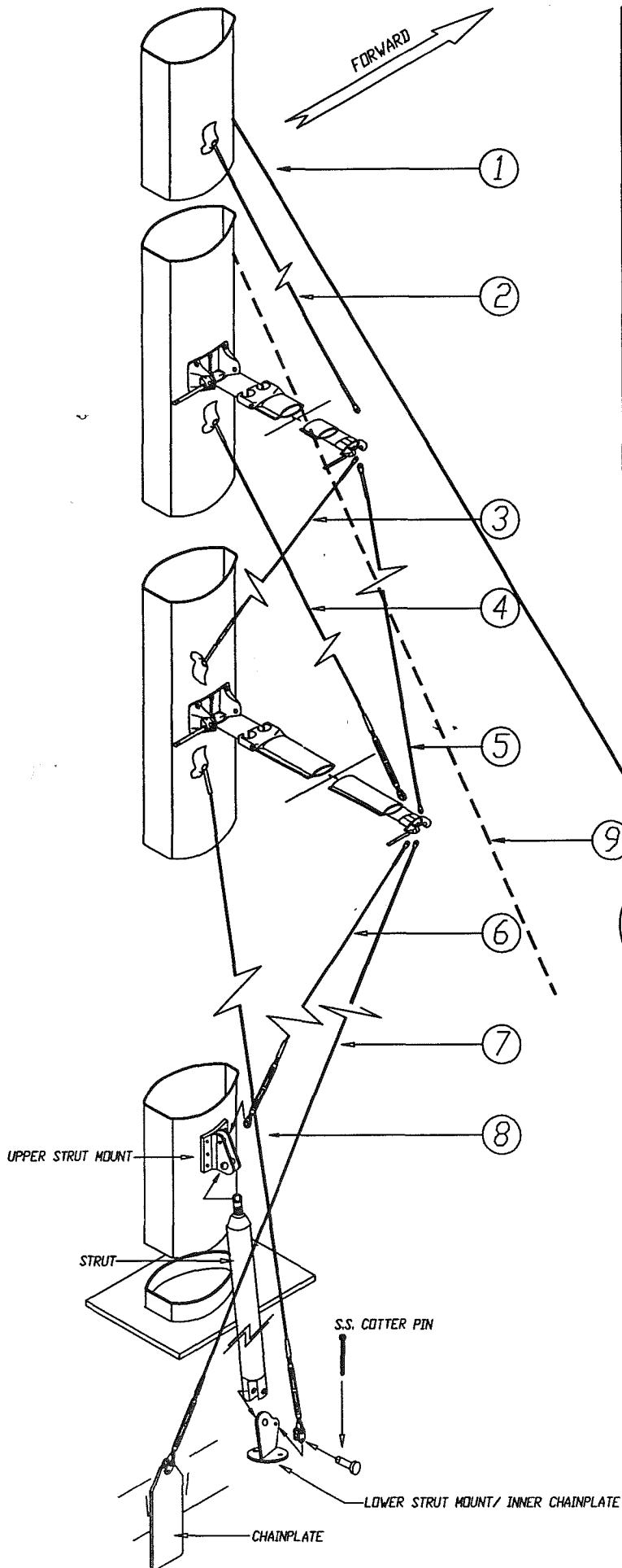
h410 STANDARD MAST STANDING RIGGING SPECIFICATIONS								
BY: KJC		DATE: 25-Jun-96		PR5065				
OPT/STD	ITEM	QUANTITY	WIRE SIZE	UPPER END	LENGTH		LOWER END	
1	STD	D3	2	5/16"(7.9mm) 1x19	STEMBALL IN BACKING SHELL	3.902 m	12 ft. 9 5/8 in.	5/16 AIRCRAFT EYE
2	STD	V2	2	5/16"(7.9mm) 1x19	5/16 x 1/2 RIGGING TOGGLE	3.953 m	12 ft. 11 5/8 in.	5/16 AIRCRAFT EYE
3	STD	D2	2	1/4"(6.4mm) 1X19	STEMBALL IN BACKING SHELL	4.115 m	13 ft. 6 in.	8-16-16 TURNBUCKLE W/EYE
4	STD	V1	2	5/16"(7.9mm) DYFORM	5/16 x 1/2 RIGGING TOGGLE	6.534 m	21 ft. 5 1/4 in.	10-20-20 TURNBUCKLE
5	STD	D1	2	3/8"(9.5mm) 1x19 Dyform	1/4 STEMBALL IN BACKING SHELL	6.353 m	20 ft. 10 1/8 in.	8-16-16 TURNBUCKLE
6	STD	UPPER DIAMOND, RD2	2	3/16"(4.8mm) 1x19	3/16", MARINE EYE	4.102 m	13 ft. 5 1/2 in.	6-10-10 STEMBALL TURNBUCKLE IN BACKING SHELL
7	STD	LOWER DIAMOND, RD1	2	3/16"(4.8mm) 1x19	3/16", MARINE EYE	4.540 m	14 ft. 10 3/4 in.	6-12-12 TURNBUCKLE W/ JAW TOGGLE
8	STD	INNER FORESTAY	1	1/4"(6.4mm) 1X19	STEMBALL IN BACKING SHELL	12.065 m	39 ft. 7 in.	FORESTAY RELEASE LEVER
9	OPT	FORESTAY	1	5/16"(7.9mm) 1x19	5/16 MARINE EYE	14.935 m	49 ft. 0 in.	TURNBUCKLE 10-20-20, TOGGLE

DRAWING TITLE <b>H410 STANDING RIG SPECS (STD)</b>	
REVISION NO. 4108050A	REVISION NO. NONE
DRAWN BY ENGINEERING DEPT.	DATE 6/25/97

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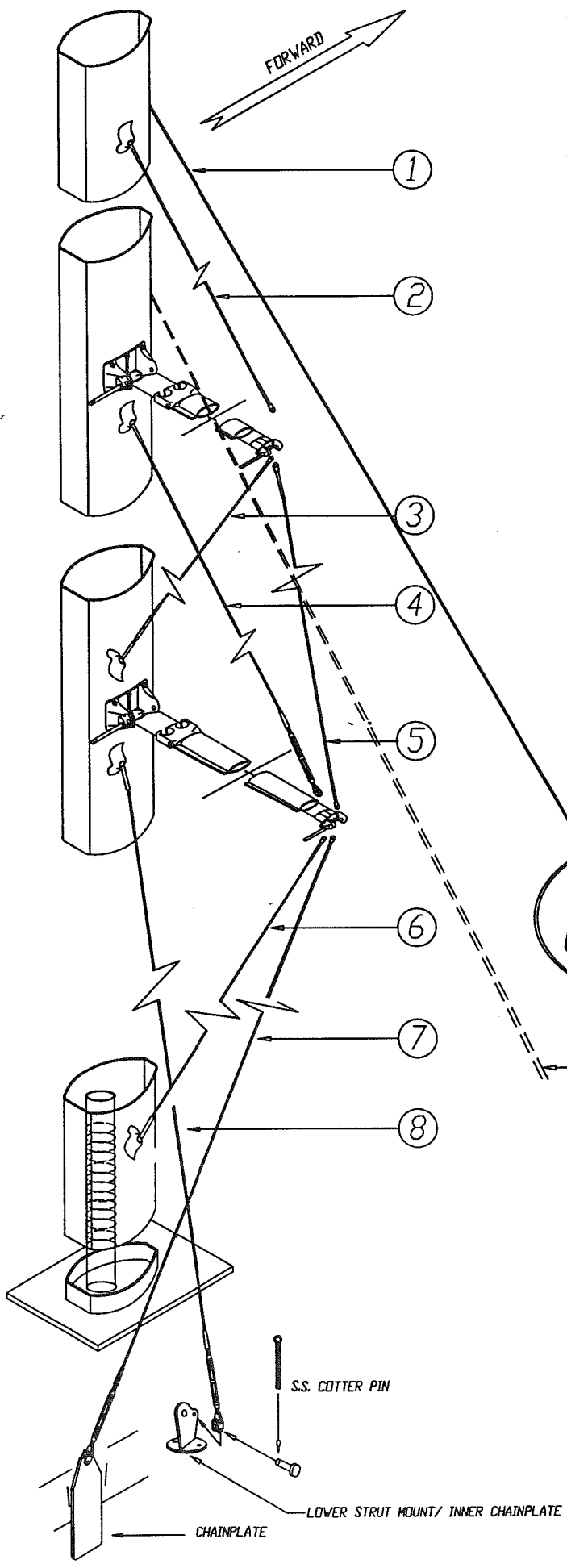


- ① FORESTAY 5/16 (7.9mm) 1 X 19
- ② D3 5/16 (7.9mm) 1 X 19
- ③ RD2 3/16" (4.8mm) 1 X 19
- ④ D2 1/4" (6.4mm) 1 X 19
- ⑤ V2 5/16 (7.9mm) 1 X 19
- ⑥ RD1 3/16" (4.8mm) 1 X 19
- ⑦ V1 5/16 (7.9mm) DYFORM
- ⑧ D1 5/16 (7.9mm) 1 X 19
- ⑨ OPTIONAL INNER FORESTAY  
(SEE PAGE 54B FOR INNER FORESTAY DETAILS)

NOTE: SEE PAGES 49A-D FOR  
SPREADER & SPREADER TIP  
DETAILS.  
SEE PAGE 50A FOR STANDARD RIG  
STANDING RIG LENGTHS.  
SEE PAGE 51 FOR FITTINGS DESC.

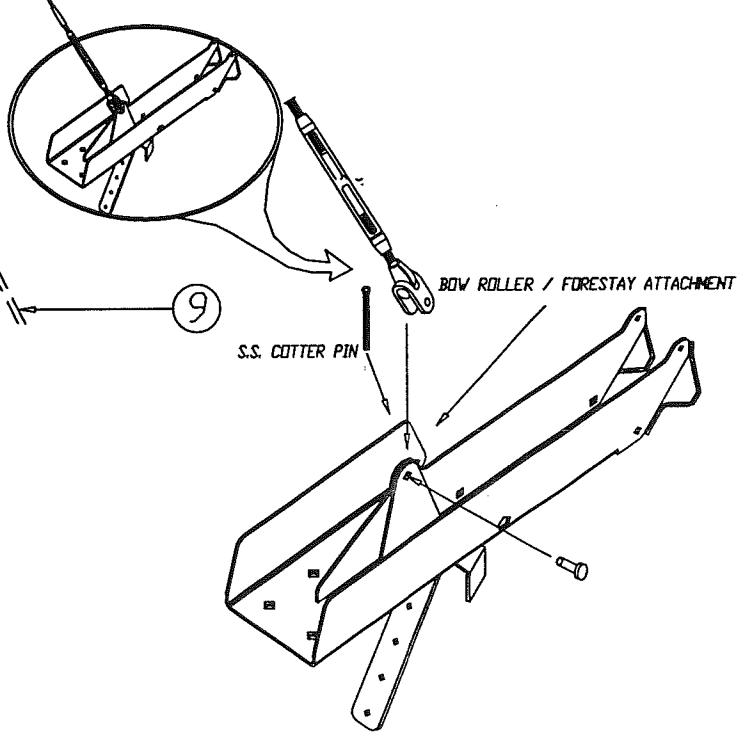
NOTE: NEVER TRY TO SAIL  
THE VESSEL WITHOUT  
THE STRUTS IN PLACE  
AND PROPERLY FASTENED  
(SEE PAGE 48B)

NOTE: IN-MAST FURLING OPTION  
USES A LARGER MAST SECTION  
AND THE STRUTS ARE NOT  
UTILIZED. SEE FOLLOWING PAGE



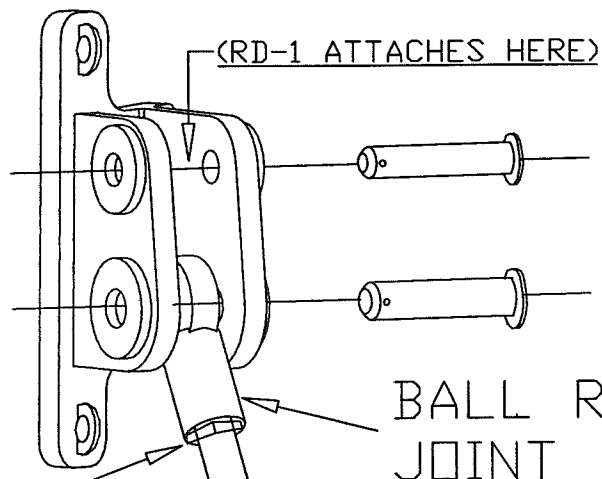
- ① FORESTAY 5/16 (7.9mm) 1 X 19
- ② D3 5/16 (7.9mm) 1 X 19
- ③ RD2 3/16" (4.8mm) 1 X 19
- ④ D2 1/4" (6.4mm) 1 X 19
- ⑤ V2 5/16 (7.9mm) 1 X 19
- ⑥ RD1 3/16" (4.8mm) 1 X 19
- ⑦ V1 5/16 (7.9mm) 1 X 19
- ⑧ D1 1/4 (6.4mm) 1 X 19
- ⑨ OPTIONAL INNER FORESTAY  
(SEE PAGE 54B FOR DETAILS)

NOTE: SEE PAGES 49A-D FOR  
 SPREADER & SPREADER TIP  
 DETAILS.  
 SEE PAGE 50B FOR FURLING RIG  
 LENGTHS.  
 SEE PAGE 51 FOR FITTINGS DESC.



NOTE: IN-MAST FURLING OPTION  
 USES A LARGER MAST SECTION  
 AND THE STRUTS ARE NOT  
 UTILIZED.

(UPPER STRUT MOUNT  
ON EA. SIDE OF MAST)



BALL ROD  
JOINT

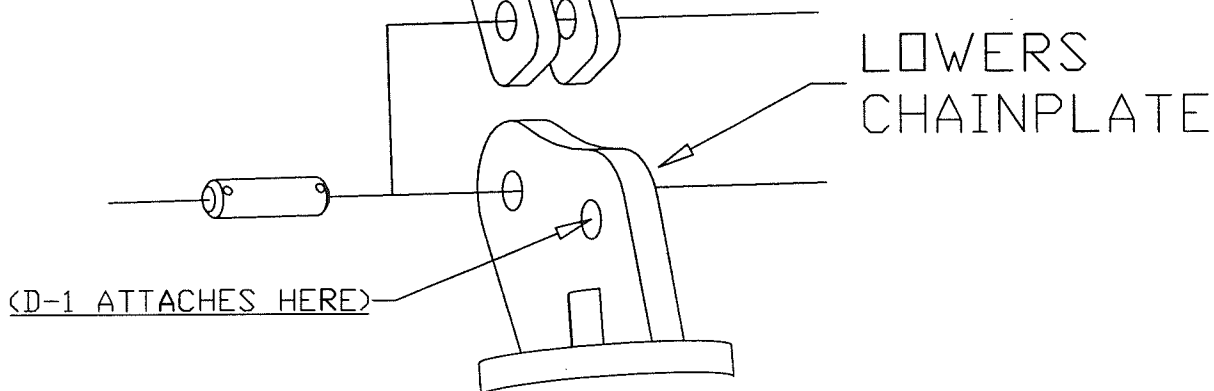
STEP TWO  
ADJUST THREADS UNTIL BALL ROD  
JOINT IS ABLE TO BE EASILY PINNED  
IN STRUT BRACKET

STEP THREE  
PIN BALL ROD JOINT AND TIGHTEN  
JAM NUT AGAINST END OF STRUT &  
BALL JOINT ROD

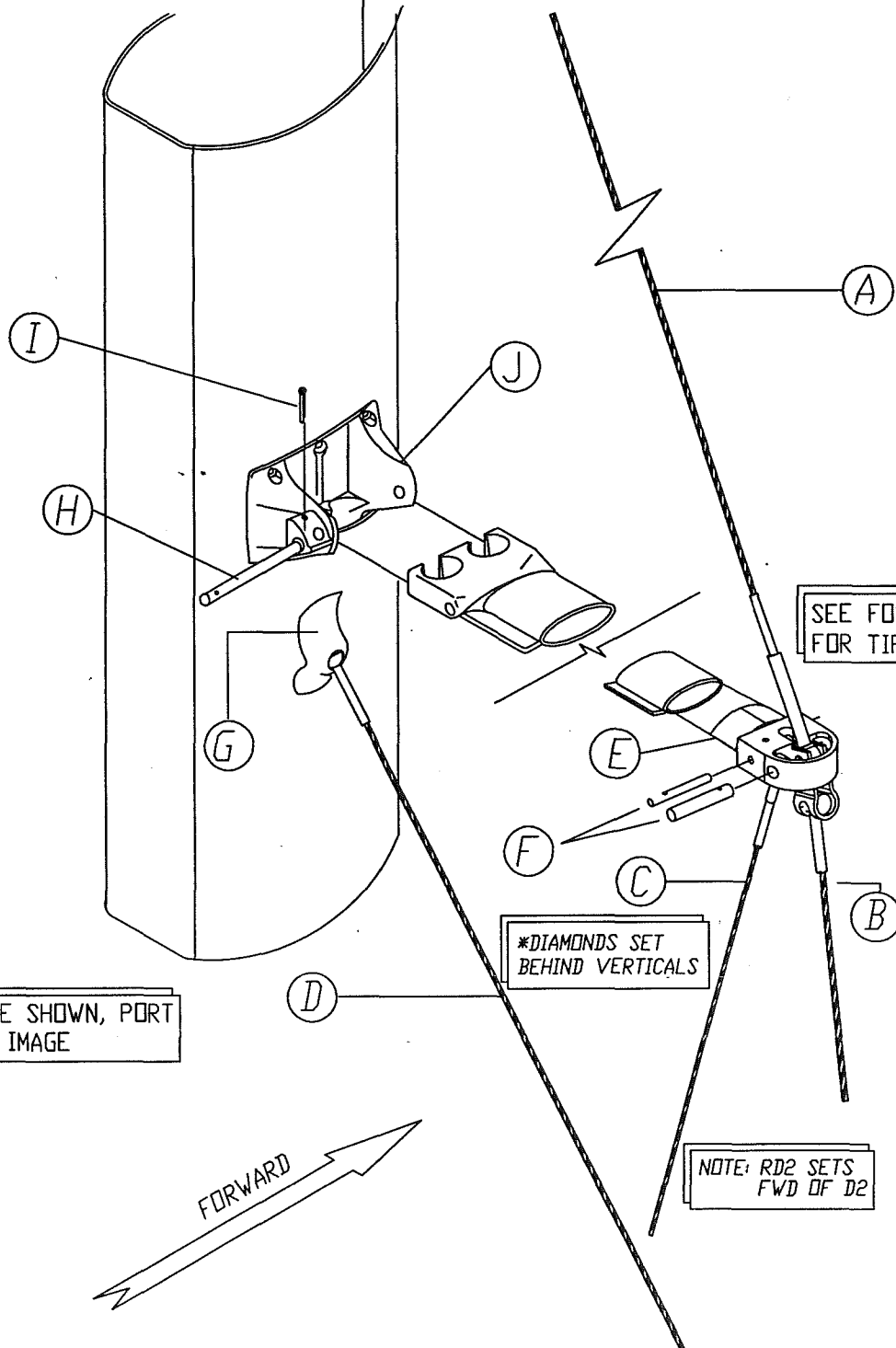
JAM NUTS

STRUT

STEP ONE  
PIN LOWER END OF STRUT  
TO CHAINPLATE AND ADD  
SPLIT RINGS



- (A) D3
- (B) V2
- (C) RD2 MARINE EYE W/ 1/2" (12.7 MM) HOLE
- (D) D2
- (E) SPREADER TIP CASTING
- (F) SPREADER TIP PINS
- (G) BACKING SHELL
- (H) SPREADER BRACKET PIN
- (I) COTTER PIN
- (J) SPREADER BASE

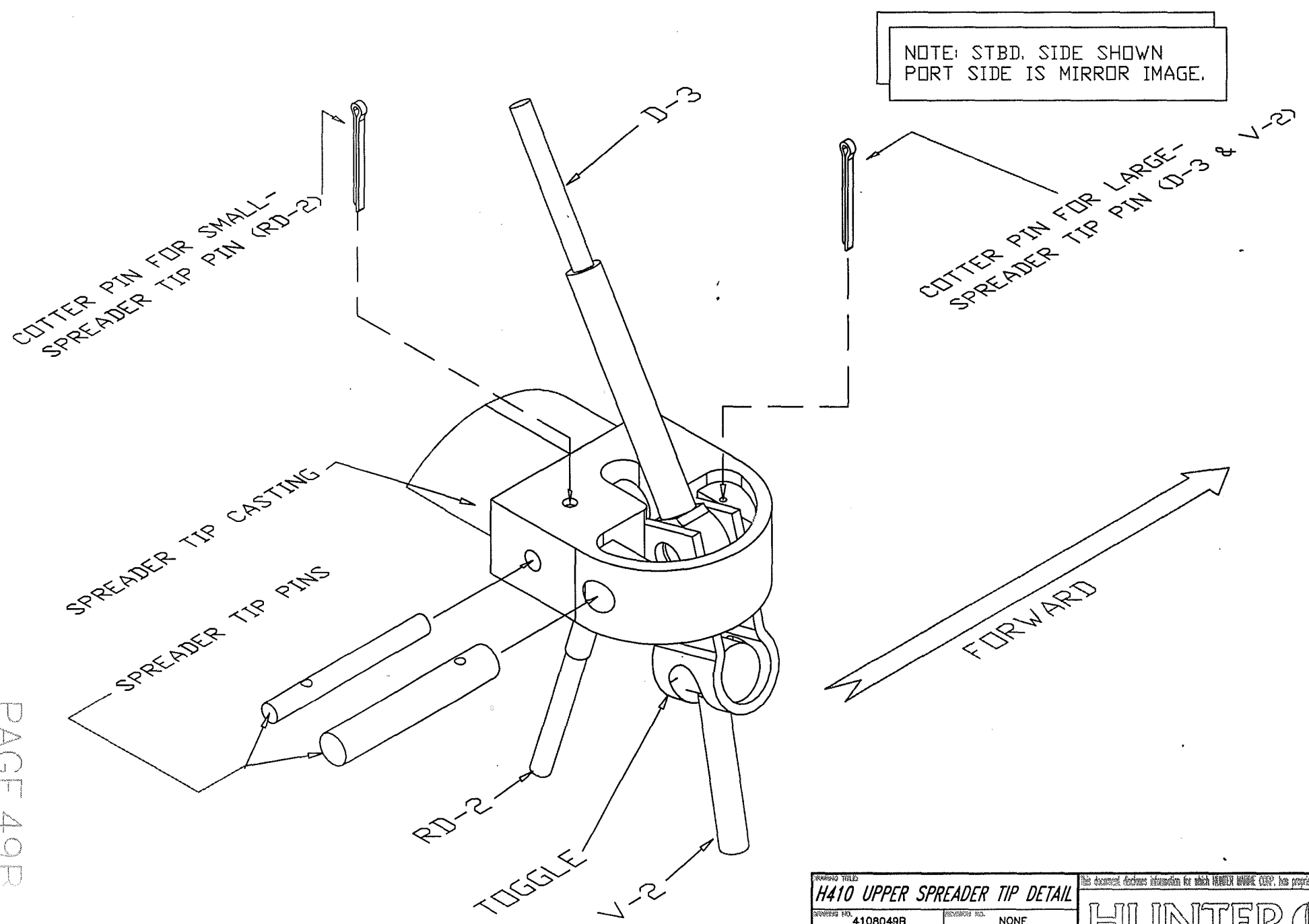



NOTE: STBD. SIDE SHOWN, PORT  
SIDE IS MIRROR IMAGE

\*DIAMONDS SET  
BEHIND VERTICALS

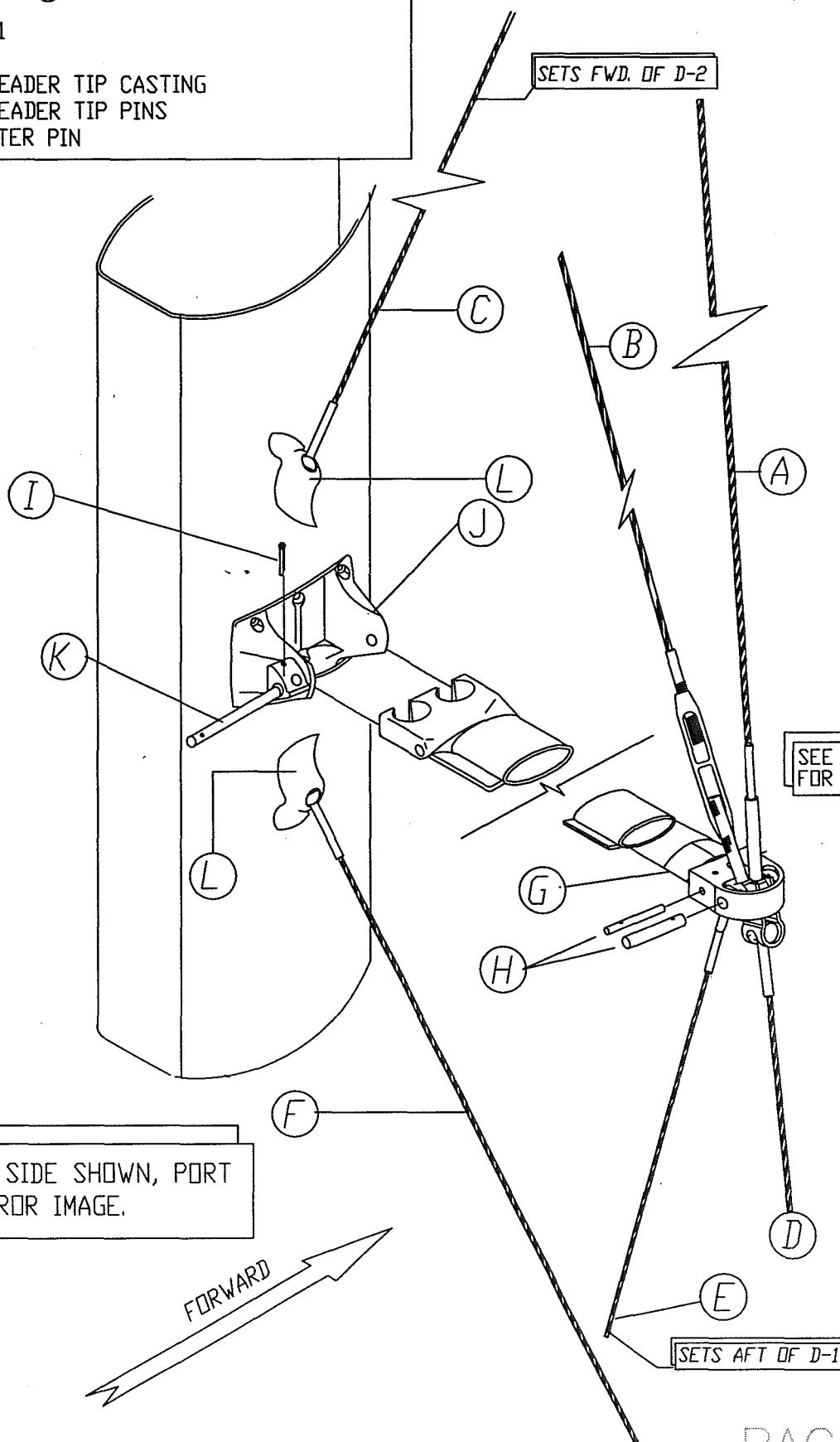
SEE FOLLOWING PAGE  
FOR TIP DETAILS

NOTE: RD2 SETS  
FWD OF D2



DRAWING TITLE <b>H410 UPPER SPREADER TIP DETAIL</b>		This document contains information for which HUNTER ENGINE CORP. has proprietary rights.	
DESIGNER NO. <b>4108049B</b>	REVISIONS NO. <b>NONE</b>	<b>HUNTER</b> 	
DRAWN BY <b>ENGINEERING DEPT.</b>	DATE <b>6/25/97</b>		

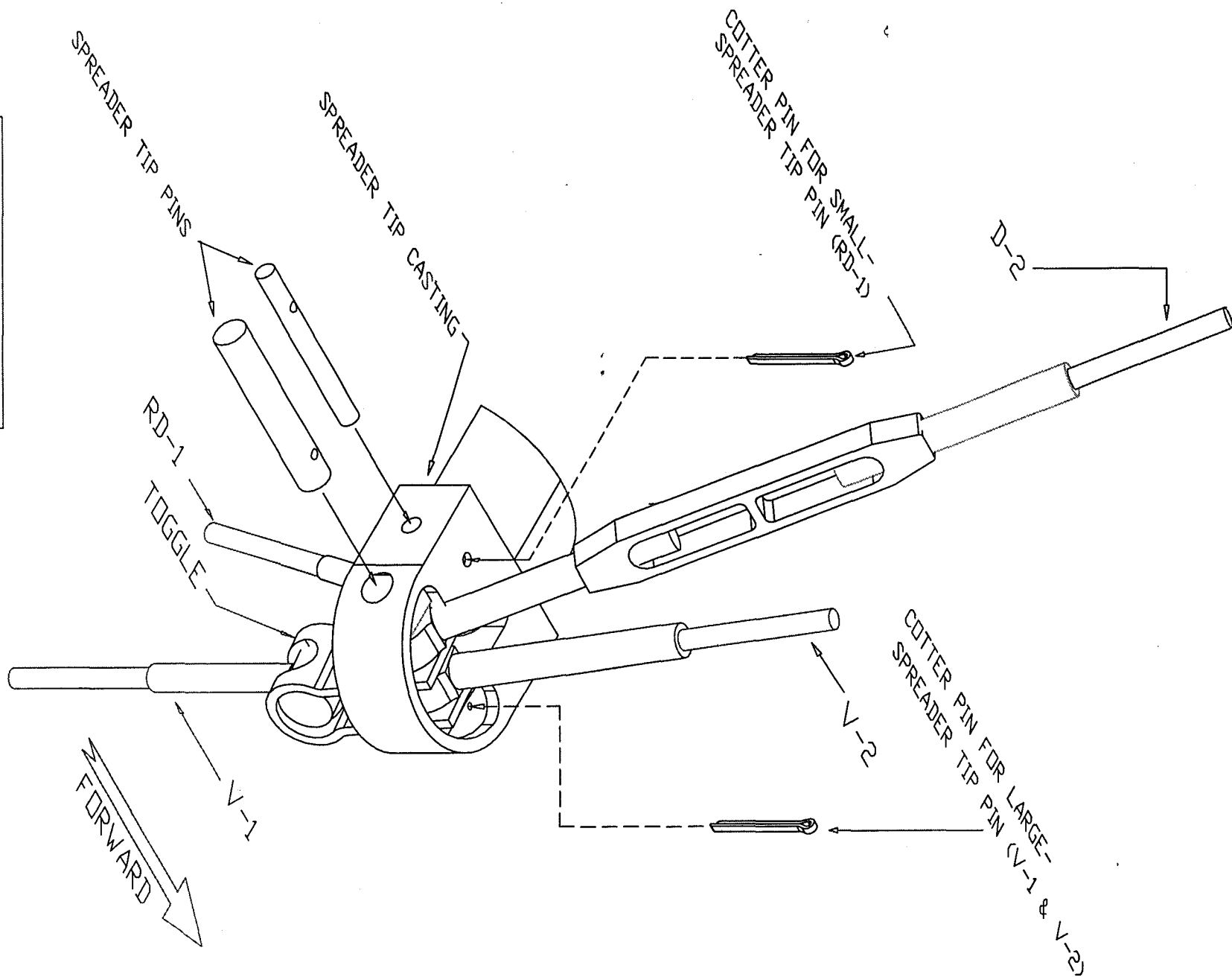
- (A) V-2    (J) SPREADER BASE BRACKET
- (B) D-2    (K) SPREADER BASE BRACKET PIN
- (C) RD-2    (L) BACKING SHELL
- (D) V-1
- (E) RD-1
- (F) D-1
- (G) SPREADER TIP CASTING
- (H) SPREADER TIP PINS
- (I) COTTER PIN




NOTE: STBD. SIDE SHOWN, PORT  
SIDE IS MIRROR IMAGE.

SEE FOLLOWING PAGE  
FOR TIP DETAILS

NOTE: STBD. SIDE SHOWN  
SIDE IS MIRROR IMAGE



DRAWING TITLE: <b>H410 LOWER SPREADER TIP DETAIL</b>		This document contains information for HUNTER MARINE CORP. has proprietary rights.	
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DESIGNED BY <b>ENGINEERING DEPT.</b>	DATE <b>6/25/97</b>		

## h410 FURLING MAST STANDING RIGGING SPECIFICATIONS

BY: KJC		DATE: 25-Jun-96 PR5062						
OPT/STD		ITEM	QUANTITY	WIRE SIZE	UPPER END	LENGTH		LOWER END
1	STD	D3	2	5/16"(7.9mm) 1x19	STEMBALL IN BACKING SHELL	4.267 m	14 ft. 0 in.	5/16 AIRCRAFT EYE
2	STD	V2	2	5/16"(7.9mm) 1x19	5/16 x 1/2 RIGGING TOGGLE	4.553 m	14 ft. 11 1/4 in.	5/16 AIRCRAFT EYE
3	STD	D2	2	1/4"(6.4mm) 1X19	STEMBALL IN BACKING SHELL	4.686 m	15 ft. 4 1/2 in.	8-16-16 TURNBUCKLE W/EYE
4	STD	V1	2	5/16"(7.9mm) DYFORM	5/16 x 1/2 RIGGING TOGGLE	5.588 m	18 ft. 4 in.	10-20-20 TURNBUCKLE
5	STD	D1	2	3/8"(9.5mm) 1x19 Dyform	1/4 STEMBALL IN BACKING SHELL	5.480 m	17 ft. 11 3/4 in.	8-16-16 TURNBUCKLE
6	STD	UPPER DIAMOND, RD2	2	3/16"(4.8mm) 1x19	3/16", MARINE EYE	4.683 m	15 ft. 4 3/8 in.	6-10-10 STEMBALL TURNBUCKLE IN BACKING SHELL
7	STD	LOWER DIAMOND, RD1	2	3/16"(4.8mm) 1x19	3/16", MARINE EYE	4.761 m	15 ft. 7 7/16 in.	6-10-10 STEMBALL TURNBUCKLE IN BACKING SHELL
8	STD	INNER FORESTAY	1	1/4"(6.4mm) 1X19	STEMBALL IN BACKING SHELL	12.065 m	39 ft. 7 in.	FORESTAY RELEASE LEVER
9	OPT	FORESTAY	1	5/16"(7.9mm) 1x19	5/16 MARINE EYE	14.935 m	49 ft. 0 in.	TURNBUCKLE 10-20-20, TOGGLE

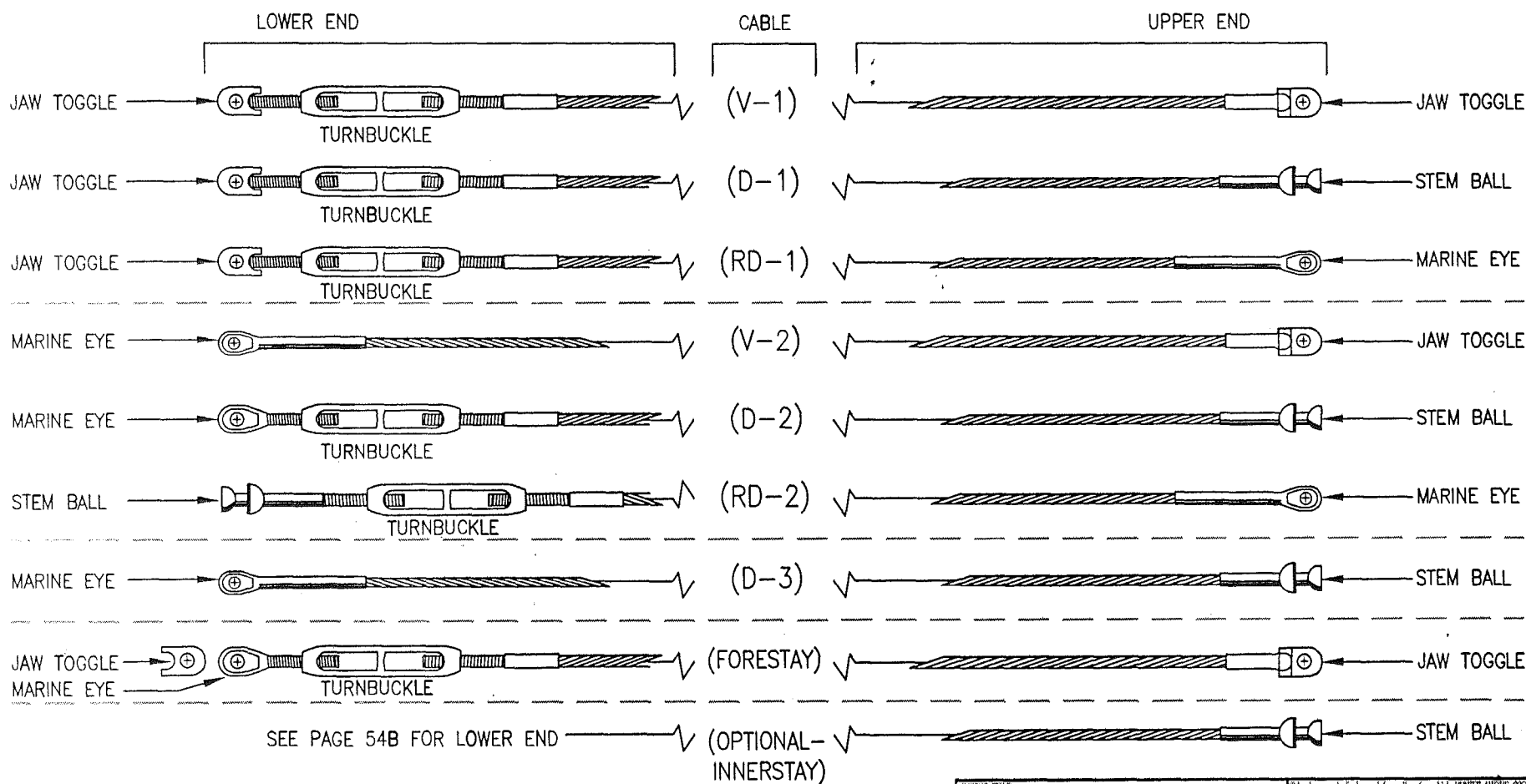
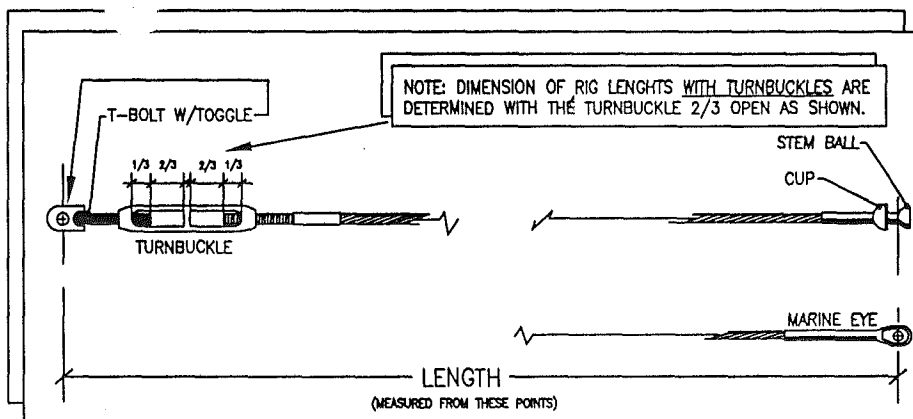
DRAWING TITLE: <b>H410 STANDING RIG SPECS (FURLING)</b>		This document contains information for which HUNTER ENGINE CO. has proprietary rights.	
DRAWING NO. <b>4108050B</b>	REVISION NO. <b>NONE</b>	<b>HUNTER</b> 	
DRAWN BY <b>ENGINEERING DEPT.</b>	DATE <b>6/5/97</b>		



NOTE: SEE PAGES 50A & 50B FOR ACTUAL RIG LENGTHS.

V = VERTICAL  
D = DIAGONAL  
RD = REVERSE  
DIAGONAL

1 = LOWER  
2 = INTER.  
3 = UPPER



DRAWING TITLE  
**H410 RIGGING LENGTHS DETAIL**

WORKING NO. 4108051

DESIGNER'S NO. NONE

ENGINEERING DEPT. DATE: 6/28/97

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# TUNING THE H410 B&R RIG

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The easiest method for tuning the B&R rig is to perform step one as follows before the mast is stepped, with it lying aft side down on two sawhorses. Begin with all rigging slack. If the mast is already stepped, loosen all the rigging, and then proceed to step one.

1. Start with all the rigging slack. Then induce the mast bend by tightening the reverse diagonals (diamonds). Measure the bend by tensioning a line or the main halyard between the masthead and the gooseneck. The maximum amount of bend should be no more than 8" (203 mm) for the standard rig and no more than 2" (50 mm) for the furling mast measured perpendicular from the aft face of the mast to the halyard at the deepest part of the bend. It can be less than that based on the sail shape and your own preference. The bend should also be evenly distributed along the mast to give a smooth shape. Keep in mind that bending a furling mast may make it more difficult to furl and will not do much to flatten the sail as in a standard rig. It is very important that the mast also be straight from side to side at this time. Tighten or loosen the reverse diagonals to achieve this.
2. Step the mast with all shrouds attached but with the turnbuckles completely loosened (if the mast was not already stepped).
3. Attach the jib halyard to a cleat on the bow to support the mast in a raked position (the masthead should be about 2-1/2' behind the step). Attach the verticals and tighten them until you can just see the hole for the cotter pin in the turnbuckle. Tighten the jib halyard until you can attach the forestay. At this point the masthead should be raked so that a weight hung on the main halyard hangs about 1' behind the mast step.
4. Use the main halyard to check that the mast is centered from side to side. Pull it tight and mark the halyard next to the verticals chainplate. Now do the same to the other side to see if the marks line up. If not, tighten and/or loosen the verticals until the marks line up. Once the masthead is centered, begin tightening the verticals until the turnbuckles are approximately half closed. While tightening the verticals you may notice the bend in the mast increasing. Now you can tighten the lowers which will tend to straighten the lower part of the mast. Be sure to tighten port and starboard sides evenly.
5. Now you should tighten the headstay until it is approximately half closed as well. This should induce the appropriate amount of headstay tension. *Never* use anything more than a pair of wrenches to tighten your rigging. If you use an extended piece of pipe on the handle of a wrench you can over tighten the rigging and do damage to the mast or rigging.
6. On the Hunter 410 it is necessary to go up the mast in a bosun's chair to tighten the number 2 diagonal shroud (D2 or intermediate shroud). Always use caution when "going aloft". You should always use a mountain climbing harness or Bosun's Chair intended for this use. Always tie into the harness with the halyard using a bowline and then secure the shackle as a back up as the knot is more reliable than a mechanical fastener. The person hoisting you aloft should keep the halyard stopper closed to prevent falls. Good communication between the two of you is also important. Tighten the D2 until it has just become tight and then add two complete turns. While at the first spreader, look up the back of the mast to see if it is straight. If not then adjust the appropriate D2 to straighten it.
7. Have the person on deck carefully lower you. They should keep the halyard wrapped at least twice around the winch and should always have one hand able to stop the halyard from running free. Once on deck look up the back of the mast and see if it is straight. If not then adjust the lowers (D1) until it is.
8. If you have the standard rig you need to attach the struts at this time. Attach the lower end of the strut to the smaller hole in the chainplate. Adjust the length by turning

## TUNING THE H410 B&R RIG

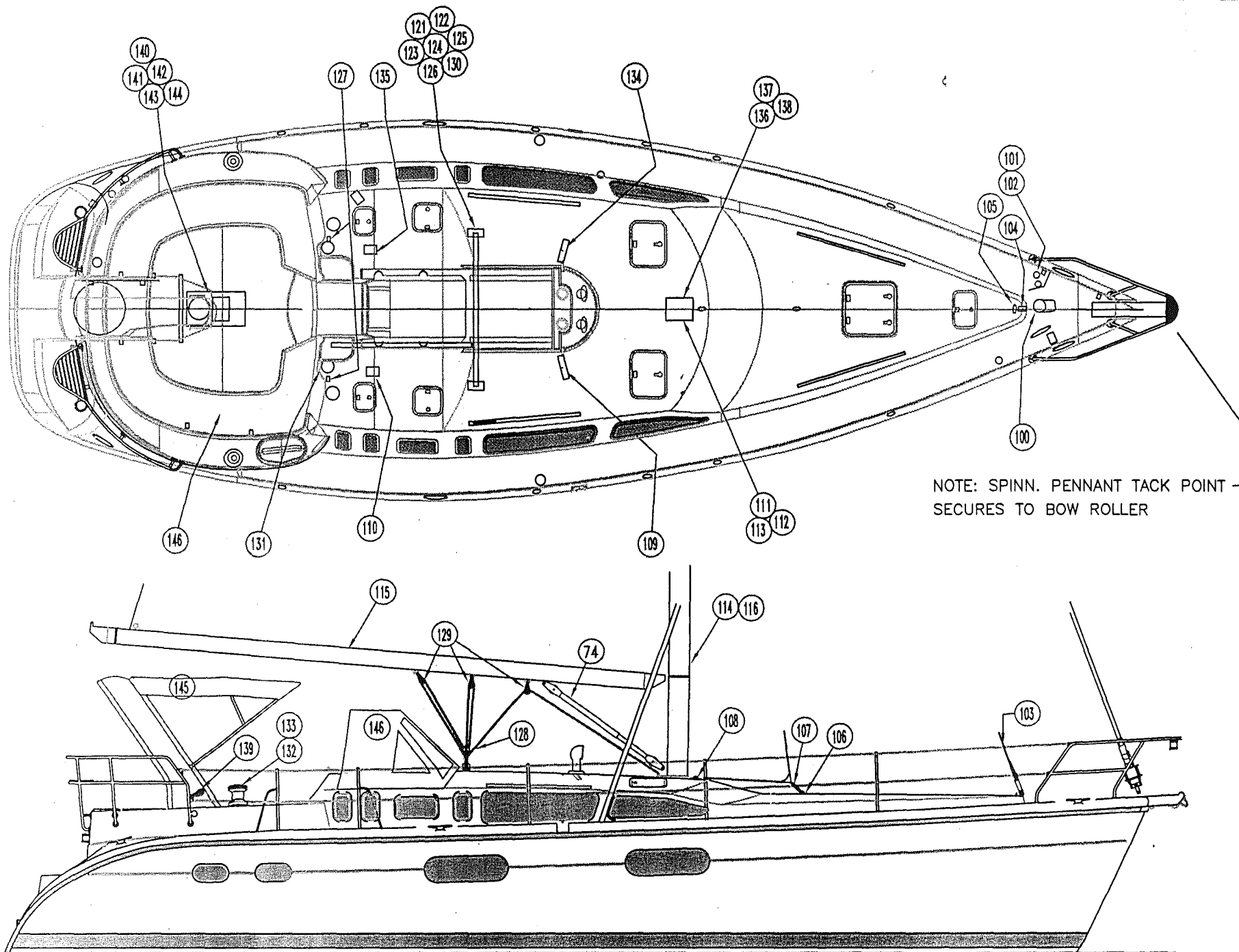
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the ball joint bearing in the upper end of the strut until the holes in the pin can be attached. It is normal to have some play between the strut and the chainplate and strut bracket

Caribbean it should be replaced every 2-3 years compared to every 10 for the great lakes. You should consult a professional rigger for advice.

9. The final test is to go sailing in 10-15 knots of wind. First, adjust the tension in the shrouds. If when sailing upwind, the shrouds on the leeward side are slack then tighten them to remove about half the slack keeping note of the number of turns. Then tack and do the same to the other side. Do this until you are happy with the tension and the leeward side does not get loose when the boat is heeled. Now sight up the mast to be sure it is still relatively straight from side to side. If it is not then adjust to appropriate rigging to correct it. For example: if the mast is straight until the upper spreader and then hooks to the windward side then you will have to revisit steps 6 and 7 above. Remember to always tighten the leeward shroud, tack and tighten the new leeward shroud the same amount. This prevents damage to the turnbuckles and is also much easier to do. Keep in mind it is also possible to have something too tight such as a diagonal shroud.
10. At this point you should have adequate headstay tension. The sails are built for about 14" of headstay sag, the bend in the standard mast should be about 1' and 4" in the furling mast and it should be nearly straight from side to side when sailing upwind. If any of these are not true then revisit the appropriate step above to correct it. If the sag in the headstay is too much then adding tension to the verticals will fix it.
11. Once the rig is tuned you should make sure to add the cotter pins to all the rigging bending back the ends and taping them to prevent snagged lines sails and fingers.

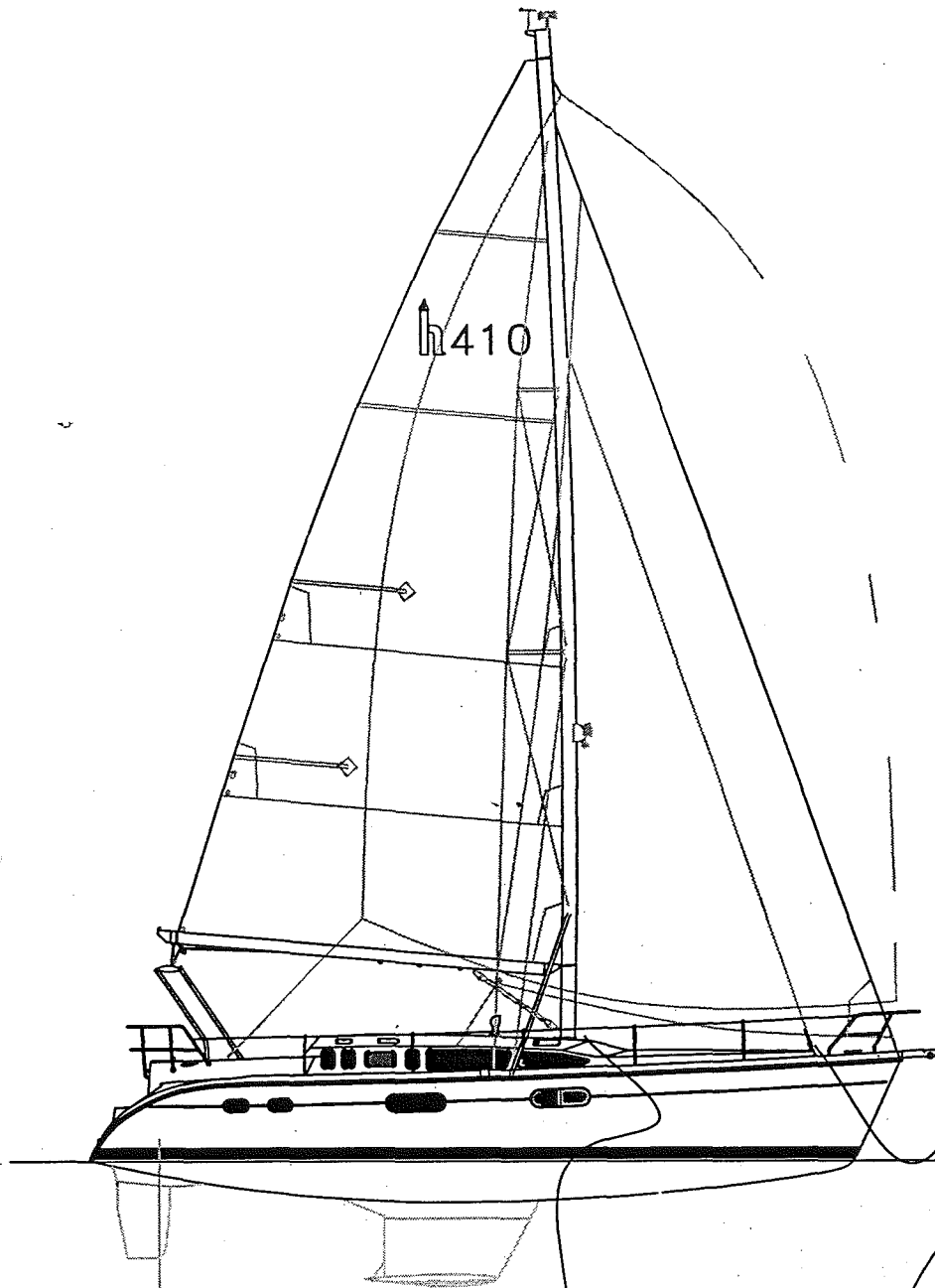
Remember that rigging, like everything else, can age. As it gets older it may need to be replaced. The frequency for which this becomes necessary depends on the climate and conditions in which the boat is sailed. For example: if you sail in the



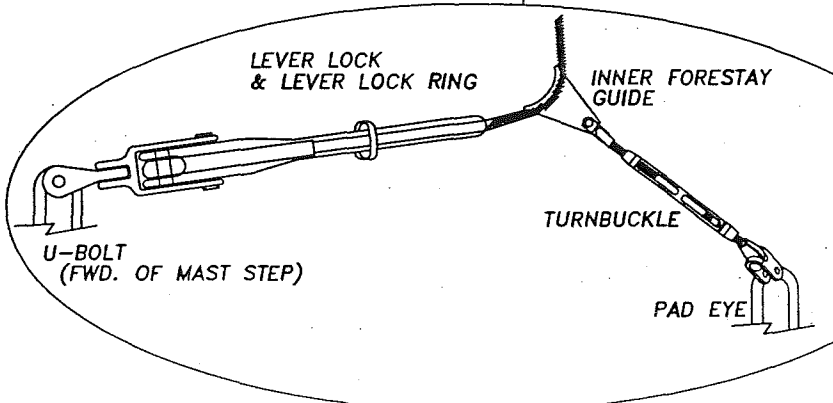
DRAWING TITLE: <b>H410 OPTIONAL SPINN. &amp; DECK HDWE.</b>	
DRAWING NO. <b>4108054A</b>	DESIGNER'S PCL. <b>NONE</b>
DESIGNED BY <b>ENGINEERING DEPT.</b>	DATE <b>8/8/97</b>

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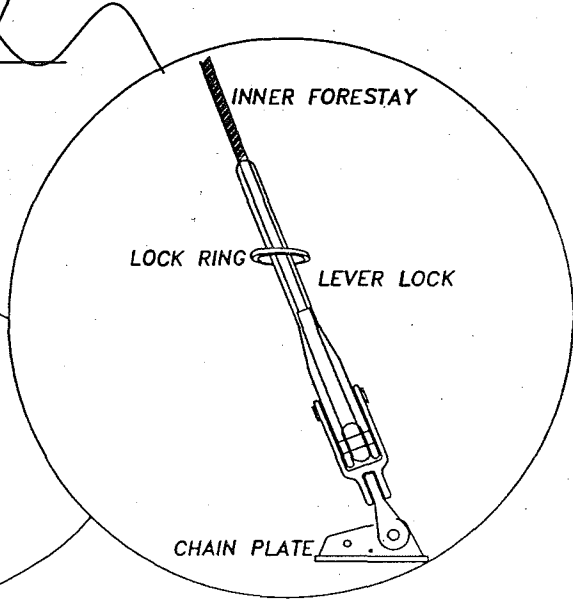
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NOTE: INSTALL LOCK RING OVER HANDLE, PRIOR TO INNER FORESTAY INSTALLATION



CONFIGURATION WHEN NOT IN USE



STAYSAIL CONFIGURATION IN USE

<b>ELECTRIC WINDLASS KIT</b>				
100	WINDLASS	SIMPSON LAWRENCE	HW3206-A	1 IN ANCHOR WELL
101	WINDLASS UP BUTTON	SIMPSON LAWRENCE		1 IN ANCHOR WELL ON PORT SIDE
102	WINDLASS DOWN BUTTON	SIMPSON LAWRENCE		1 IN ANCHOR WELL ON PORT SIDE
<b>INNER FORESTAY KIT</b>				
103	INNER FORESTAY	SECO SOUTH		1 PART OF STANDING RIGGING KIT
104	IFS CHAINPLATE 41020026	SOUTHCOAST MARINE	HW1605	1 MOUNTED BEHIND ANCHOR WELL
105	TACK PAD EYE	SCHAEFER 78-01		1 MOUNTED ACROSS BOAT BEHIND ITEM 126
106	IFS RESTRAINER PAD EYE	SCHAEFER 78-01		1 MOUNTED JUST AHEAD OF WINDSHIELD
107	IFS RESTRAINER 4462063A	KEN'S WELDING		1 ADJUSTABLE ON ITEM 128
108	DEAD END U-BOLT	EPCO	HW5512	1 TO MOUNT IFS ON AT BASE OF MAST
<b>STAYSAIL KIT</b>				
109	4 SHEAVE HALYARD ORGANIZER	HARKEN 1590	HW0347	1 STBD. SIDE - REPLACE ITEM 19
110	4 LINE STOPPER	SPINLOC XT/4	HW1267	1 STBD. SIDE - REPLACE ITEM 30
111	STAYSAIL HALYARD	SECO SOUTH	RI0236	1
112	STAYSAIL HALYARD BLOCK	Z-SPARS	RI0448	1 ON STARBOARD SIDE OF CASTING FWD.
113	STAYSAIL SHEETS	SECO SOUTH	RI0236	2 RUNNING RIGGING KIT
<b>FURLING MAST</b>				
114	MAST	Z-SPARS	PR5063	1
115	BOOM	Z-SPARS	PR5064	1
116	RUNNING RIGGING KIT	SECO SOUTH	PR5061	1
117	STANDING RIGGING KIT	SECO SOUTH	PR5062	1
<b>RIGID VANG</b>				
118	VANG	Z-SPARS		1 5' - 3' LONG WHEN OPEN
119	MAST STEP BLOCK	Z-SPARS 302		1 ON STBD. NEAR CENTER
120	VANG BRACKET & TOGGLE	Z-SPARS		MOUNTED ON MAST NEAR BASE
<b>MID-BOOM SHEETING</b>				
121	TRAVELER	HARKEN 516	HW0336	1
122	END STOPS	HARKEN 632	HW0331	2
123	CONTROL CAR - STBD	HARKEN 563		1
124	CONTROL CAR - PORT	HARKEN 563		1
125	TRAVELER CAR	HARKEN 1928	HW0332	1
126	DODGER BLOCKS	HARKEN 1892		1 PAIR
127	CAM CLEATS	HARKEN 365		2

H410 OPTIONAL DECK HARDWARE LIST	
4108054C	NONE
ENGINEERING DEPT.	8/1/97

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128	BLOCK ON TRAVELER CAR	HARKEN 1560	HW0333	1 FIDDLE BLOCK
129	BLOCKS ON BOOM	HARKEN 1540	HW0330	3 SINGLE BLOCK
130	TRACK RISER	HARKEN 1849	1 PAIR	
ELECTRIC HALYARD WINCH				
131	WINCH	LEWMAR 44EST	HW2569	1 STARBOARD SIDE INBOARD
SPINNAKER WINCHES				
132	WINCHES	LEWMAR 48CST	HW2522	2
133	PADS 41020036			2 PLASTIC ANGLE PADS
SPINNAKER KIT				
134	4 SHEAVE HALYARD ORGANIZER	HARKEN 1590	HW0347	1 PORT SIDE - REPLACE ITEM 19
135	4 LINE STOPPER	SPINLOC XT/4	HW1267	1 PORT SIDE - REPLACE ITEM 30
136	SPINNAKER HALYARD	SECO SOUTH	RIO235	1
137	SPINNAKER SHEETS	SECO SOUTH	RIO235	2
138	SPINNAKER HALYARD BLOCK	Z-SPARS	RIO449	1 PORT SIDE OF CASTING FWD.
139	SPINNAKER SHEET BLOCK	SCHAEFER 504-09	HW0289	2 STERN RAIL PORT & STBD.
AUTOPILOT				
140	AUTOPILOT	AUTOHELM 7000	ELO268	1 IN STEERING CONSOLE
141	DISPLAY	AUTOHELM		1 ON DASH OF CONSOLE
ELECTRONICS				
142	GPS	AUTOHELM ST-80		1 ON DASH OF CONSOLE
143	WIND MACHINE	AUTOHELM ST-50		1 ON DASH OF CONSOLE - WAND ON MAST
144	KNOT LOG	AUTOHELM ST-80		1 ON DASH OF CONSOLE
CANVAS				
145	BIMINI			1 MOUNTED TO ARCH FWD
146	DODGER			1 FWD OF COMPANIONWAY
CUSHIONS				
147	COCKPIT CUSHIONS		1 SET	

DRAWING TITLE: <b>H410 OPTIONAL DECK HARDWARE LIST CONT.</b>	
DRAWING NO. 4108054D	REVISION NO. NONE
DRAWN BY ENGINEERING DEPT.	DATE 8/1/97


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## ENGINE OPERATING INSTRUCTIONS:

- ① FILL DIESEL TANK WITH DIESEL FUEL
- ② CHECK ENGINE OIL LEVEL (SEE YANMAR MANUAL)
- ③ OPEN ENGINE RAW WATER PICKUP SEACOCK (SEE PAGES 60A & 60B)
- ④ TURN ON "START BATTERY SELECTOR SWITCH" (LOCATED AT NAV. STATION)
- ⑥ PUSH PRE-HEAT BUTTON (SEE YANMAR MANUAL FOR SPECIFIED TIME)
- ⑦ TURN KEY TO START POSITION, RELEASE WHEN ENGINE STARTS  
NOTE: IF ENGINE APPEARS TO HAVE TROUBLE STARTING, SEE YANMAR MANUAL
- ⑧ TO SHUT ENGINE DOWN: PUSH RED BUTTON AT KEY SWITCH PANEL  
UNTIL ENGINE STOPS RUNNING THEN TURN KEY TO OFF POSITION.

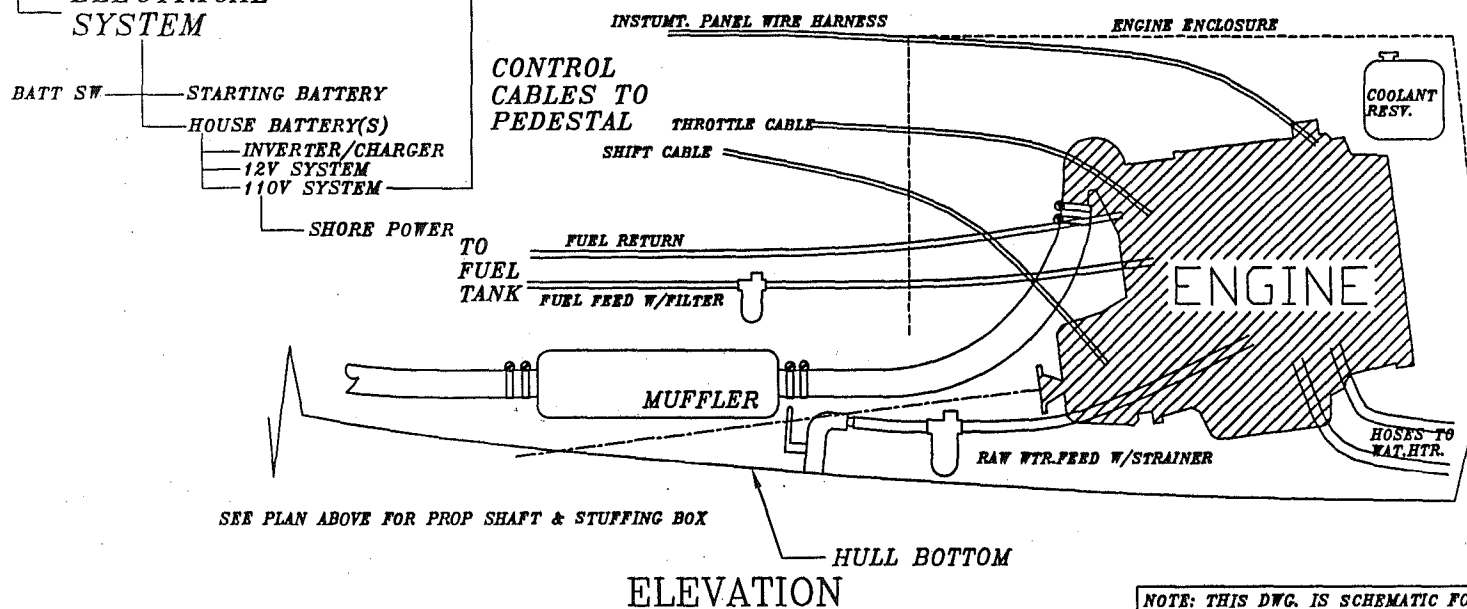
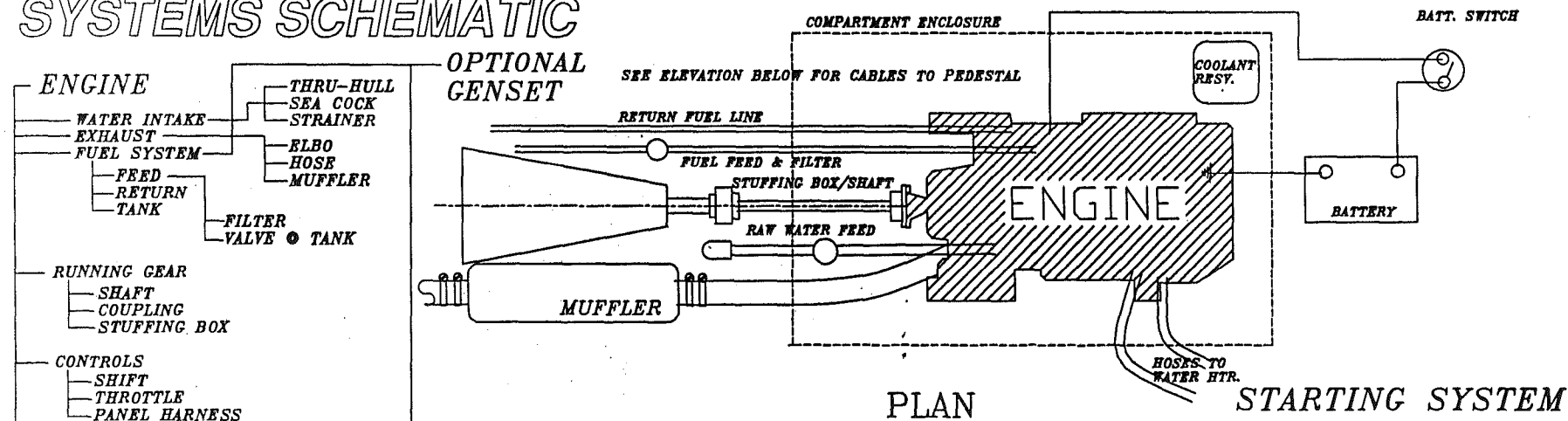
FORM NO. 4108055A		REVISION NO. NONE		DATE 7/26/97	
ENGINEERING DEPT.					

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# SYSTEMS SCHEMATIC



NOTE: THIS DWG. IS SCHEMATIC FORM  
SEE SPECIFIC SYSTEM DWGS. FOR  
BATTERIES/SWITCHES/ CHARGER ETC. LOCATIONS  
AND WIRE RUNS.

NOTE: SEE YANMAR ENGINE MANUAL FOR  
OPERATING & MAINTENANCE PROCEDURES

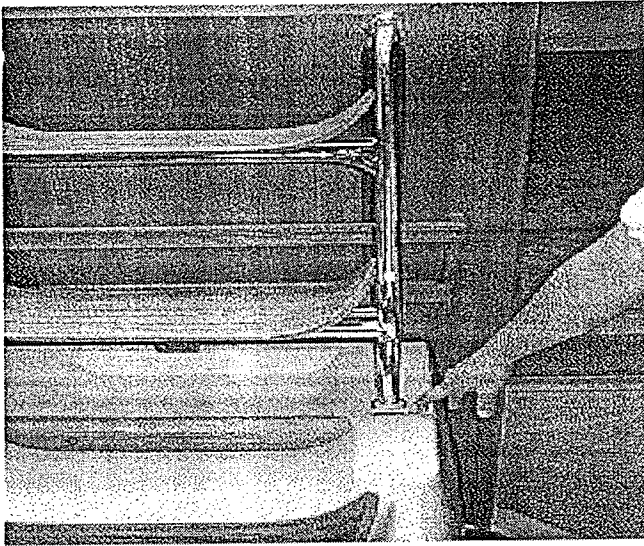
FORMING TITLE	H410 ENGINE COMPARTMENT LAYOUT
DRAWING NO.	4108055A
REVISION NO.	NONE
ENGINEERING DEPT.	6/30/97

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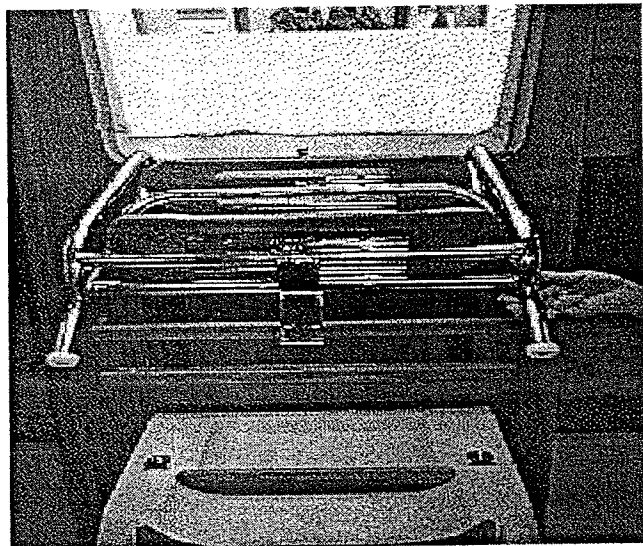
COMP. #		PROPULSION SYSTEM PARTS LIST	U.O.M.	QTY.
HW3412	150	ENGINE, 4JH2(B)E 50 HP 80AMP H43	EA	1
EL0825	300	CONDUIT 3/4" 125-0340	FT	20
KB020015	5	410 ENGINE MOUNTING COMPONENTS	CPNT	1
450130	600	HEX HD 1/2-13 X 3", S/S CAPSCREW	EA	8
450342	600	WASHER FLAT 3/8" S/S F/W	EA	8
450348	600	WASHER LOCK 3/8" S/S L/W	EA	8
HW3375H	888	COUPLING BOLTS - LONG (ENGINE)	EA	4
450348	600	WASHER LOCK 3/8" S/S L/W	EA	4
HW3410E	888	MOUNTS - 150# - (ENGINE)	EA	2
HW3410F	888	MOUNTS - 200# - (ENGINE)	EA	2
CH0052	105	CAULK 5200	TB	0.3
KB020025	5	410 ENGINE CONTROL COMPONENTS	CPNT	1
450009	600	CABLE TIES 8" BLACK W/EYE	EA	10
450008	600	CABLE TIES 15" W/O EYE BLACK	EA	6
450264	600	P/H PHIL #10 X 3/4" S/S T/A	EA	15
HW3572	150	CONTROL RIGHT HAND MV-2 BERKELEY #306950	EA	1
HW3643	150	CABLE, CONTROL, CC3300 21'	EA	1
HW3659	77	CABLE, CONTROL CC172 3300-19'	EA	1
EL0424	300	BUSS BAR #M449 - 10 GANG	EA	2
HW3379	888	PANEL, ENGINE, YANMAR "C" H450 OPTION ENG	EA	1
KB040001	5	410 ENGINE COOLING SUB ASSEMBLY	SUB	1
KB040005	5	410 WATER PICKUPS/STRAINER COMPONENTS	CPNT	1
450275	600	P/H PHIL #8 X 7/8 S/S T/A	EA	3
PL0482	250	BRASS THRU HULL FITTING 1" #65-BN7-51	EA	1
PL0497	150	STRAINER, 1" LINE 18005	EA	1
PL0497-A	150	BRACKET, STRAINER, 1" LINE 14239	EA	1
PL0548	250	HOSE CLAMP #16	EA	8
PL0661	250	BALL VALVE (1") BRASS #70-105-10	EA	1
PL0674	250	BARB, HOSE, BRASS, 1"	EA	1
PL0883	250	BARB, PIPE TO HOSE, PVC #8003 (1")	EA	2
PL1066	250	ELBOW 90 DEG. STR/ELL BR. 1"	EA	2
PL1525	250	HOSE SHIELD FLEX 1" TYPE 100-0346	FT	4
PL1525	250	HOSE SHIELD FLEX 1" TYPE 100-0346	FT	8
CO0191	560	LABEL, THRU HULL, "ENGINE PICKUP"	EA	1
CH0052	105	CAULK 5200	TB	0.1
KB040015	5	410 ANTI-SIPHON MOUNTING COMPONENTS	CPNT	1
450278	600	P/H PHIL #14 X 3/4" S/S T/A	EA	2
PL0548	250	HOSE CLAMP #16	EA	4
PL1525	250	HOSE SHIELD FLEX 1" TYPE 100-0346	FT	1
PL1525	250	HOSE SHIELD FLEX 1" TYPE 100-0346	FT	1.5
HW3352	550	SYPHON VENTED LOOP 1" X 180 DEG.	EA	1
HW3350	150	VACUUM BREAK 1/8" 28.5'30'33.5'40'45'	EA	1
KB040025	5	410 COOLING OVERFLOW MOUNTING COMPONENTS	CPNT	1
450278	600	P/H PHIL #14 X 3/4" S/S T/A	EA	2

## *H410 ENGINE BOX OPENING INST.*

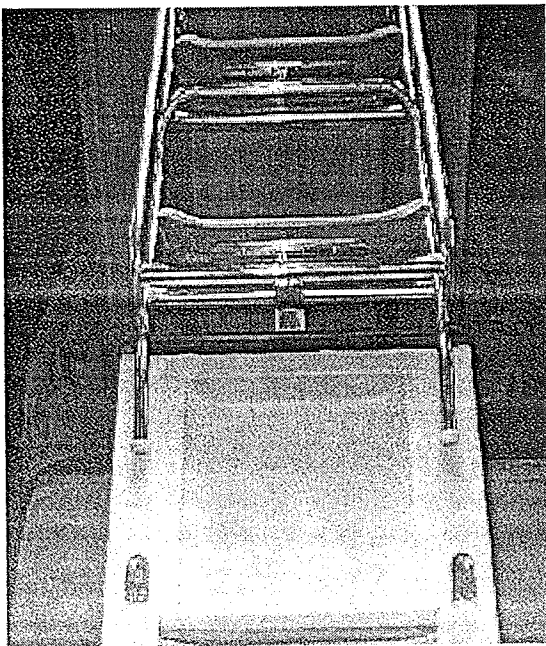


*1. REMOVE FAST PINS FROM UPPER  
COMPANIONWAY LADDER LEG BASES.*

*2. ROTATE LADDER UP, THEN OPEN BOX  
BY PULLING FWD. AND THEN...*



*3. BRING THE LADDER & BOX TOGETHER AS SHOWN  
(TOP OF BOX FITS IN BETWEEN LADDER LEGS  
AND BRACKET UNDER LOWER LADDER STEP)*



# DRIPLESS PACKING GLAND DETAIL

SEE FOLLOWING PAGES FOR DETAILED  
INSTALLATION & TROUBLESHOOTING DETAILS

BELLOWS  
DOUBLE CLAMP ON EA. END  
(CLAMPS NOT SHOWN IN THIS-  
VIEW FOR CLARITY)

S.S. ROTOR

CARBON BEARING

STERN BEARING

COOLANT  
RESV.

STRUT

PROP SHAFT 1 1/4" (32 mm)

CUTLASS BEARING  
1 1/4" X 5"  
(32mm X 127mm)

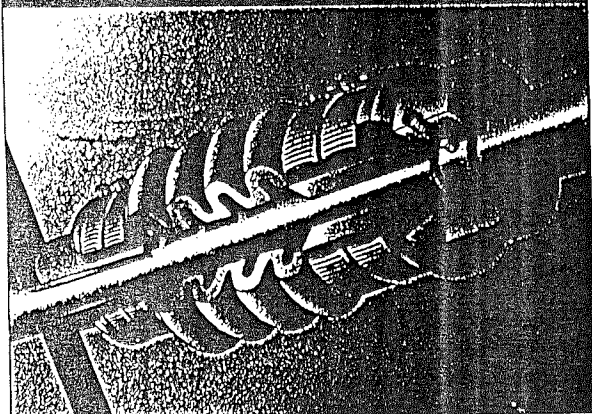
PROP  
18" X 16, R.H. 2 BLADE  
(457mm X 406 mm)

DRAWING TITLE <b>H410 PROP SHAFT &amp; STUFFING BOX DETAIL</b>	
DRAWING NO. <b>4108056A</b>	REVISION NO. <b>NONE</b>
APPROVED BY <b>ENGINEERING DEPT.</b>	DATE <b>7/14/97</b>

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# PACKLESS SEALING SYSTEM



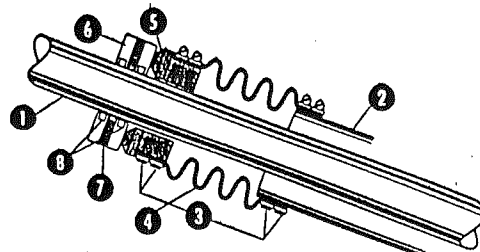
## SHAFT SEAL

### INSTALLATION INSTRUCTIONS

**For Shafts:**  
**3/4" to 3 3/4"**  
**(22mm to 90mm)**

#### STANDARD SPEED P.S.S. SHAFT SEAL:

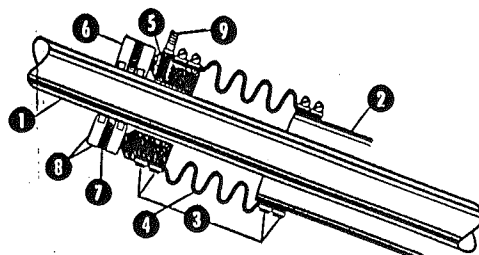
*Hull Speed Under 12 Knots.  
(Boats equipped with water injected stuffing box, use high speed.)*



- |                                   |  |
|-----------------------------------|--|
| 1 Propeller Shaft                 | 5 Carbon Graphite Flange (1)                                     |
| 2 Shaft Log (Stern Tube)          | 6 Stainless Steel Rotor (1)                                      |
| 3 Stainless Steel Hose Clamps (4) | 7 Stainless Steel Set Screws<br>(5 total / 4 for Rotor, 1 Spare) |
| 4 Reinforced Bellow (1)           | 8 Nitrile O-Rings (2 in Rotor / 2 Spare)                         |

#### HIGH SPEED P.S.S. SHAFT SEAL:

*Hull speed over 12 knots and boats with water injected stuffing box.*



- |                                   |  |
|-----------------------------------|--|
| 1 Propeller Shaft                 | 6 Stainless Steel Rotor (1)                                      |
| 2 Shaft Log (Stern Tube)          | 7 Stainless Steel Set Screws (5 total /<br>4 for Rotor, 1 Spare) |
| 3 Stainless Steel Hose Clamps (4) | 8 Nitrile O-Rings (2 in Rotor / 2 Spare)                         |
| 4 Reinforced Bellow (1)           | 9 Nylon Hose Barb Fitting  |
| 5 Carbon Graphite Flange (1)      |  |

#### READ INSTRUCTIONS THOROUGHLY

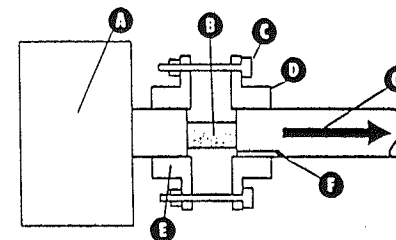
- Do not use grease or oil to slide the stainless steel rotor down the shaft.
- Do not allow petroleum based antifreeze to come in contact with face of the seal when winterizing engine.
- Install the P.S.S. Only when the boat is out of the water.
- Do not damage the carbon flange or stainless steel rotor while unpacking and handling.
- Do not tighten nylon hose barb fitting or replace with stainless or brass.

#### INSTALLATION INSTRUCTIONS:

- Unbolt the shaft coupling from the transmission coupling.
- Remove the shaft coupling from the shaft. (On most installations the coupling is fixed to the shaft by two set screws that are wired together).

Helpful hint: Removing the shaft from the shaft coupling may be difficult. The drawing below shows the use of a spacer as a press between the propeller shaft and the transmission coupling:

#### REMOVING THE SHAFT COUPLING:



- |                  |                         |
|------------------|-------------------------|
| A Transmission   | E Transmission Coupling |
| B Spacer         | F Key                   |
| C Bolts          | G Shaft                 |
| D Shaft Coupling |                         |

- Insert a spacer (with a diameter smaller than the shaft) between the shaft and transmission coupling.
- Bolt the transmission coupling and shaft coupling back together with the spacer fit between (note: this may require longer bolts). The spacer will act as a press to drive the shaft from the shaft coupling as the bolts are tightened.
- Remove the old stuffing box and rubber hose to expose the shaft log (stern tube).
  - If your boat is equipped with a bolt-on or rigid stuffing box, please refer to heading: Bolt-on or rigid stuffing boxes.
  - If your boat is equipped with a threaded stuffing box, please refer to heading: Threaded stuffing boxes.
- Slide the open end of the bellow and two hose clamps over the shaft log. The carbon flange (5) should already be securely attached to the bellow.
- Clean the shaft (1) with very fine sand paper or emery paper (400 to 600 grit), paying particular attention to the shaft keyway to make certain there are no burrs or sharp edges that could tear the O-rings.
- Make sure the O-rings (8) are positioned in the grooves of the rotor (spare O-rings are provided) and that the set screws (7) are backed out so that they do not extend into the inside bore of the rotor. Slide the stainless steel rotor (6) onto the shaft using a water soluble lubricant like dish soap to help the rotor slide easily. Do not use grease or oil!

7. Attach the shaft to shaft coupling (do not forget to secure coupling with set screws. Wire set screws together to avoid loosening).
8. Position the bellow on the stern tube so the carbon is centered around shaft (the carbon graphite flange is bored larger than the shaft to compensate for vibration or misalignment). Clamp the cuff of the bellow to the shaft log (2) with the two stainless steel hose clamps (3).
9. Slide the stainless steel rotor (6) down the shaft so it just comes in contact with the carbon graphite flange (1). Mark this "neutral" position on the shaft just in front of the stainless steel rotor with a marker or tape.
10. Using the stainless steel rotor (6), compress the bellow (4) the amount indicated on the bellow compression chart (the "neutral" mark on the shaft is used as a reference to measure the amount of compression). While keeping the bellow compressed, tighten the two set screws to secure the rotor to the shaft. Once these set screws are secured, a second pair of screws are stacked on top of the first to act as locking screws to prevent the lower screws from possibly backing away from the shaft.

#### BELLOW COMPRESSION CHART:

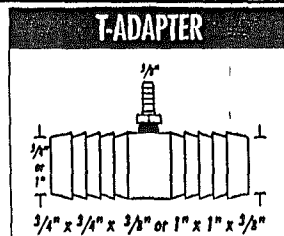
Shaft diameter	Compression amount
3/4" to 1 1/8" (22mm to 30mm)	3/4" (20mm)
1 1/4" to 2" (32mm to 55mm)	1" (25mm)
2 1/4" to 3 3/4" (60mm to 95mm)	1" (25mm)

Note: amount of compression may vary depending on motor mounts and shaft misalignment.

11. High speed seals with nylon hose barb fitting reference 11-A; Standard speed seals reference 11-B.

11-A. High speed seals with a nylon hose barb fitting require that water be plumbed into the seal to cool and lubricate the seal. There are three methods for plumbing water into the seal:

1. Remove the plug from heat exchanger and replace plug with a hose barb fitting (this plug would normally be used to drain water from the engine). Run a reinforced hose to the shaft seals nylon hose barb (3/8"). Secure both with hose clamps.
2. Cut into the exhaust line of the cooling system before hot water is discharged overboard. Fit t-adapter into line and plumb water into shaft seal nylon hose barb (3/8"), using reinforced hose. Secure all connections with hose clamps.



Note: P.Y.I. T-adapter fittings or T-adapter kits (T-adapter, 6' reinforced hose, 4 hose clamps) are available for 3/4" or 1" internal hose diameters.

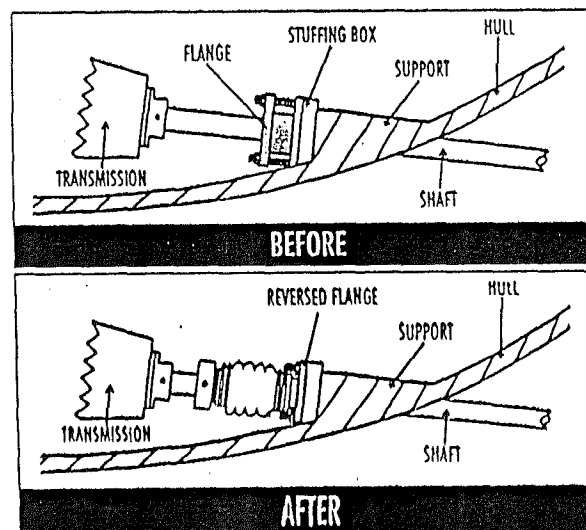
3. For keel cooled or in-line systems, water can be plumbed into the seal from an underwater scoop.

11-B. Standard speed seals. When a boat with a watertight (P.S.S.) Seal goes back in the water, there will be an air pocket trapped in the shaft log (stern tube). This air pocket must be vented when the boat is launched, so water can reach the face of the seal to help cool and lubricate it. To vent the air pocket, simply compress the bellow (push the carbon away from the stainless steel rotor with your hand) so that water fills the shaft log (stern tube). A small amount of water will enter the boat at this time and will stop as soon as you release the bellow, allowing the two faces to come back in contact.

This procedure should be done every time the boat goes back in the water and is not required with high speed seals.

#### BOIT-ON OR RIGID STUFFING BOXES:

If your stuffing box is a bolt-on or rigid type, you will need to reverse the flange that was used to compress the packing. This flange will be bolted to the face of the bolt-on stuffing box and sealed with a gasket so no water can leak through. Once reversed, the bellow can be fit over the tube that was used to compress the packing. When completed, proceed with step #4 of instructions.



#### THREADED STUFFING BOXES:

If your old stuffing box was threaded directly into the hull, you will need to cover the threads with a liquid gasket material like "form-a-gasket" to prevent the threads from cutting into the bellow. When completed, proceed with step #4 of instructions.

#### BREAK-IN PERIOD:

There is, on average, a 10 minute break-in period when the carbon graphite flange will polish the face of the stainless steel rotor. During this break-in period there will be a very fine black mist being emitted when shaft is turning at high R.P.M.s.

#### TROUBLESHOOTING:

1. Spray or mist during operation:

Dimensions provided in the bellow compression chart are an average and should act as a guide. If you should experience any spray or misting during high speed operation (after break-in period), add an additional 1/8" compression to the bellow with the rotor and repeat until the spray has stopped.

2. Dripping while not operational:

If the seal leaks when the shaft is not turning, some foreign material such as grease or oil may be prohibiting the two faces from seating properly. To clean this foreign material from the two faces, insert a clean cloth rag between the carbon graphite and stainless steel rotor and rotate it around the shaft vigorously. As you do this, water will flush both faces of any impurities. Remove the rag from the seal and the leak should stop.




P.O. Box 536 • Edmonds, WA 98020  
7831 196th Street S.W. • Edmonds, WA 98026  
Phone: (425) 670-8915 • Fax: (425) 670-8918  
E-Mail: [pyi@compuserve.com](mailto:pyi@compuserve.com)

COMP. #		ENGINE PROP SHAFT SYSTEM PARTS LIST	U.O.M.	QTY.
KB030001	5	410 SHAFT INSTALLATION SUB ASSEMBLY	SUB	1
KB030005	5	410 STRUT MOUNTING COMPONENTS	CPNT	1
450070	600	F/H PHIL 3/8-16 X 3" S/S M/S	EA	4
450185	600	NUT HEX 3/8-16 S/S H/N	EA	4
450348	600	WASHER LOCK 3/8" S/S L/W	EA	4
450342	600	WASHER FLAT 3/8" S/S F/W	EA	10
HW4855	150	STRUT H-42 H-43 #SEF 4855	EA	1
CH0052	105	CAULK 5200	TB	0.2
KB030015	5	410 SHAFT THRU-HULL COMPONENTS	CPNT	1
450185	600	NUT HEX 3/8-16 S/S H/N	EA	2
450020	600	CAR HD 3/8-16 X 2" S/S C/B	EA	2
450348	600	WASHER LOCK 3/8" S/S L/W	EA	2
450331	600	WASHER NEO 3/8" S/S W/N/B 7/8 OD	EA	2
HW3062	150	STERN BEARING (2-3/8 OD)	EA	1
HW3535	150	STERN BEARING BRONZE CAST	EA	1
HW3550	150	SHAFT SEAL,DRIPLESS,H.SPEED,1 1/4X 2 3/8	EA	1
CH0052	105	CAULK 5200	TB	0.1
KB030025	5	410 SHAFT MOUNTING COMPONENTS	CPNT	1
HW4814	150	SHAFT,PROP, 1.25"X67.39" W/YANMAR CPL	EA	1
LG0225B	888	PIN,PROPELLER SHAFT FOR 1 1/4" SHAFT	EA	1
LG0225A	888	PROP. SHAFT KEY FOR 1 1/4" S/S SHAFT	EA	1
HW4859A	888	NUT - HEAVY - 1 1/4" PROP SHAFT	EA	1
HW4859B	888	NUT - JAM - 1 1/4" PROP SHAFT	EA	1
LG0280	150	PROPELLER R.H. 18 X 15 X1 1/4" H42	EA	1

## FRESH WATER SYSTEM OPERATION:

- ① FILL TANK/S WITH FRESH WATER (SEE PAGE 60A FOR FILL LOCATIONS)
- ② OPEN DESIRED MANIFOLD VALVE/S (SEE PAGE 57A FOR MANIFOLD LOCATION)
- ③ TURN ON HOUSE BATTERY SELECTOR SWITCH (SEE PAGE 64E FOR SWITCH LOCATION)  
NOTE: SOME MODELS REQUIRE A START BATTERY ONLY, IF THIS APPLIES TO YOUR MODEL, TURN THIS SWITCH ON.
- ④ TURN ON "D.C. MAIN" BREAKER ON MAIN BREAKER PANEL
- ⑤ TURN ON "WATER PRESSURE" BREAKER ON MAIN BREAKER PANEL
- ⑥ "HOT WATER" IS ATTAINABLE BASICALLY IN TWO WAYS...
  - Ⓐ BY HEATING THE WATER THRU THE DIESEL ENGINE MANIFOLD
  - Ⓑ BY SUPPLYING 110V.A.C. BY "DOCKSIDE SHORE POWER"... "INVERTER POWER"...OR GENERATOR POWER
- ⑦ TO HEAT BY "ENGINE" SEE PAGE 55 FOR ENGINE OPERATING INST.
- ⑧ TO HEAT BY "SHORE POWER"...
  - ① HOOK UP SHORE POWER CABLE/S
  - ② TURN ON A.C. MAIN BREAKER ON MAIN BREAKER PANEL
  - ③ TURN ON "WATER HEATER BREAKER" ON MAIN BREAKER PANEL
- ⑨ TO HEAT BY INVERTER POWER... SEE PAGE 63F-1 FOR INV. OPER. INST.  
THEN FOLLOW STEPS #2 & #3 UNDER "TO HEAT BY SHORE POWER"
- ⑩ TO HEAT BY "GENERATOR POWER"... SEE PAGE 63E-1 FOR GEN. OPER. INST.  
THEN FOLLOW STEPS #2 & #3 UNDER "TO HEAT BY SHORE POWER"

FORMING TITLE: <b>H410 FRESH WATER OPERATING INST.</b>		This document contains information for which HUNTER MARINE CORP. has proprietary rights.	
DOCUMENT NO. <b>4108067</b>	REVISION NO. <b>NONE</b>	<b>HUNTER</b> 	
DESIGNED BY <b>ENGINEERING DEPT.</b>	DATE <b>7/15/97</b>		



AFT H2O CMPTS. (SEE PAGE 57F)

7A=...AFT H2O TANK (51 GAL 193 L.)  
7B=...AFT H2O FILL (DECK FITTING)  
7C=...AFT H2O VENT (DECK FITTING)  
7D=...C-PIT SHOWER (PLO189)  
7E=...SHORE H2O INLET (PL1175)

AFT HEAD (SEE PAGE 57D)

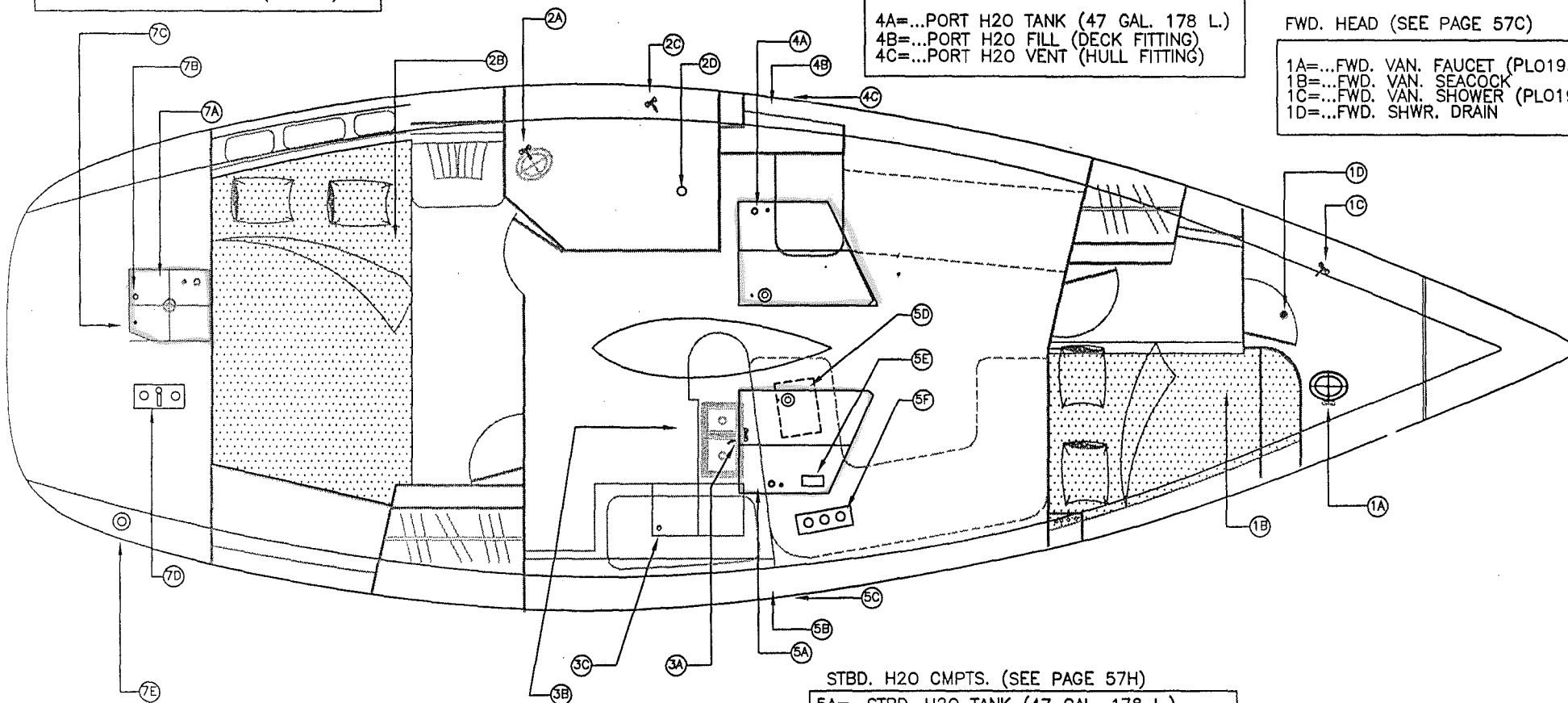
2A=...AFT VAN. FAUCET (PLO193)  
2B=...AFT VAN. SEACOCK  
2C=...AFT VAN. SHOWER (PLO192)  
2D=...AFT SHOWER DRAIN

PORT H2O TANK (SEE PAGE 57G)

4A=...PORT H2O TANK (47 GAL. 178 L.)  
4B=...PORT H2O FILL (DECK FITTING)  
4C=...PORT H2O VENT (HULL FITTING)

FWD. HEAD (SEE PAGE 57C)

1A=...FWD. VAN. FAUCET (PLO193)  
1B=...FWD. VAN. SEACOCK  
1C=...FWD. VAN. SHOWER (PLO192)  
1D=...FWD. SHWR. DRAIN



GALLEY (SEE PAGE 57E)

3A=...GALLEY FAUCET  
3B=...GALLEY DRAIN SEACOCK  
3C=...ICE BOX DRAIN

STBD. H2O CMPTS. (SEE PAGE 57H)

5A=...STBD. H2O TANK (47 GAL. 178 L.)  
5B=...STBD. H2O FILL (DECK FITTING)  
5C=...STBD. H2O VENT (HULL FITTING)  
5D=...H2O HEATER (6 GAL 23 L.) (PLO280)  
5E=...H2O PUMP (PLO301)  
5F=...H2O MANIFOLD (PLO1815 X 3)

DRAWING TITLE: <b>H410 FRESH WATER/RAIN GEN. LAYOUT</b>	
DESIGNED BY: <b>PLUMBING (8057A)</b>	APPROVED BY: <b>NONE</b>
DRAWN BY: <b>ENGINEERING DEPT.</b>	DATE: <b>7/15/97</b>

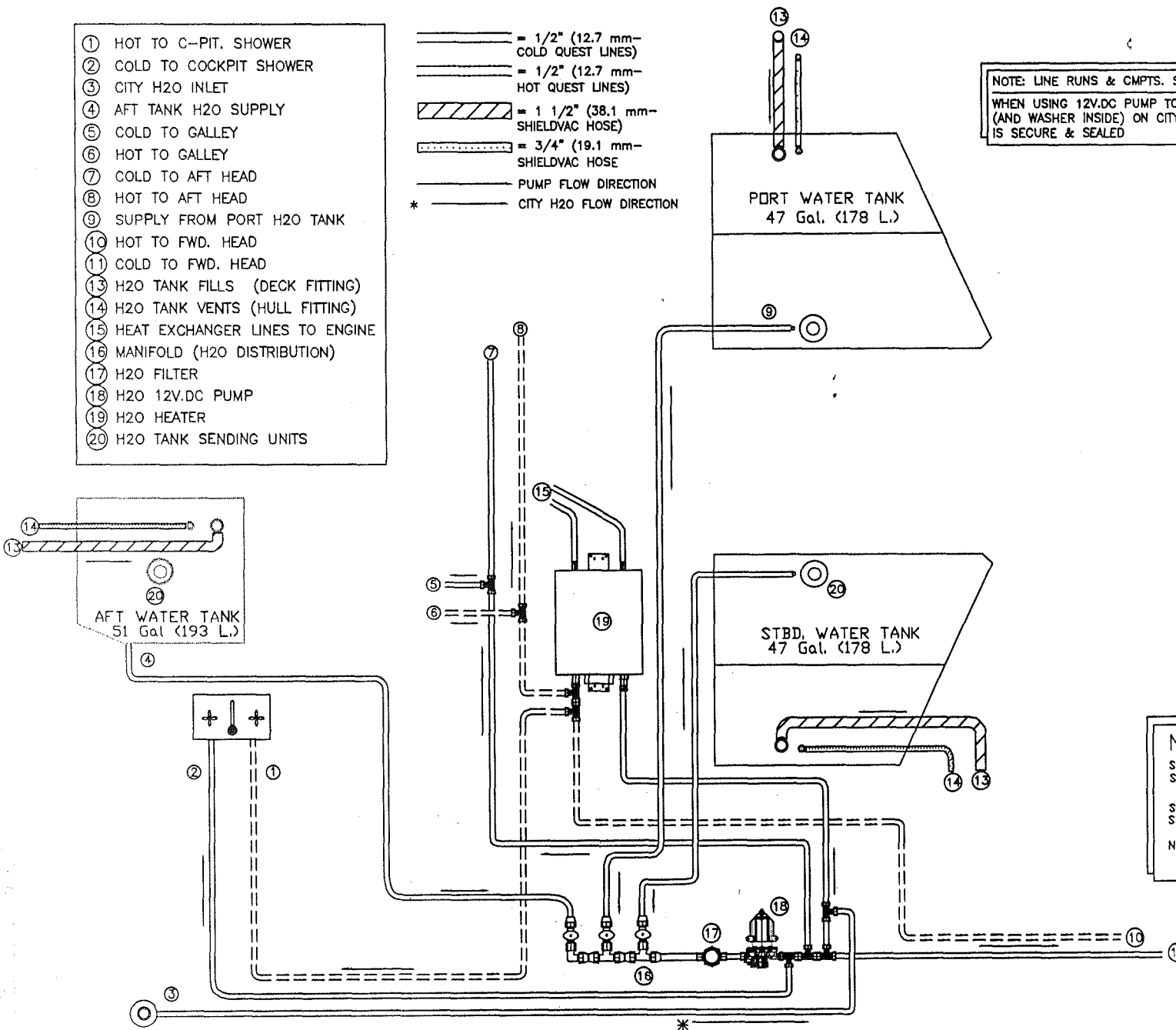
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**HUNTER**

- ① HOT TO C-PIT, SHOWER
- ② COLD TO COCKPIT SHOWER
- ③ CITY H2O INLET
- ④ AFT TANK H2O SUPPLY
- ⑤ COLD TO GALLEY
- ⑥ HOT TO GALLEY
- ⑦ COLD TO AFT HEAD
- ⑧ HOT TO AFT HEAD
- ⑨ SUPPLY FROM PORT H2O TANK
- ⑩ HOT TO FWD. HEAD
- ⑪ COLD TO FWD. HEAD
- ⑬ H2O TANK FILLS (DECK FITTING)
- ⑭ H2O TANK VENTS (HULL FITTING)
- ⑮ HEAT EXCHANGER LINES TO ENGINE
- ⑯ MANIFOLD (H2O DISTRIBUTION)
- ⑰ H2O FILTER
- ⑱ H2O 12V.DC PUMP
- ⑲ H2O HEATER
- ⑳ H2O TANK SENDING UNITS

- = 1/2" (12.7 mm—  
COLD QUEST LINES)  
 ————— = 1/2" (12.7 mm—  
HOT QUEST LINES)  
 ▨ ▨ ▨ = 1 1/2" (38.1 mm—  
SHIELDVAC HOSE)  
 - - - - - = 3/4" (19.1 mm—  
SHIELDVAC HOSE)  
 ———→ PUMP FLOW DIRECTION  
 \* ———→ CITY H2O FLOW DIRECTION

NOTE: LINE RUNS & CMPTS. SHOWN IN SCHEMATIC FORM FOR CLARITY  
WHEN USING 12V.DC PUMP TO PRESSURE SYSTEM BE SURE CAP  
(AND WASHER INSIDE) ON CITY (HOSE) HOOKUP ON STERN OF BOAT  
IS SECURE & SEALED



NOTE:

SEE PAGE 60A FOR SPECIFIC-  
SEACOCK / THRUHULL / DECK FITTING LOCATIONS

SEE PAGE 60B FOR SPECIFIC-  
SEACOCK / THRUHULL / DECK FITTING ASSEMBLY

NOT ALL CMPTS. SHOWN APPLY TO ALL MODELS

DRAWING TITLES	
HUNTER FRESH WATER SYSTEM (BASIC LAYOUT)	
DRAWING NO.	4108057B
REVISION NO.	NONE
ENGINEERING DEPT	6/30/97

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HUNTER



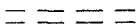
QUEST LINE TEE (1/2" 12.7 mm)



1" (25.4mm) SHIELDVAC DRAIN HOSE



3/4" (19.1mm) SHIELDVAC DRAIN HOSE



QUEST LINE HOT (1/2" 12.7mm)



QUEST LINE COLD (1/2" 12.7 mm)



SHOWER DRAIN



FAUCETS



FLOW DIRECTION



SEACOCK (SINK DRAIN, SEE PHOTO PAGE 60B)

TO SUMP BOX IN FWD. MAIN CABIN  
BILGE COMP. (SEE PAGE 59A-  
FOR MORE DETAILS)

SHOWER

FWD. HEAD

ANCHOR WELL BULK.

FORWARD

STARBOARD

V-BERTH BUNK

HOT & COLD QUEST LINES  
FROM STBD. AFT. MAIN BUNK COMP.

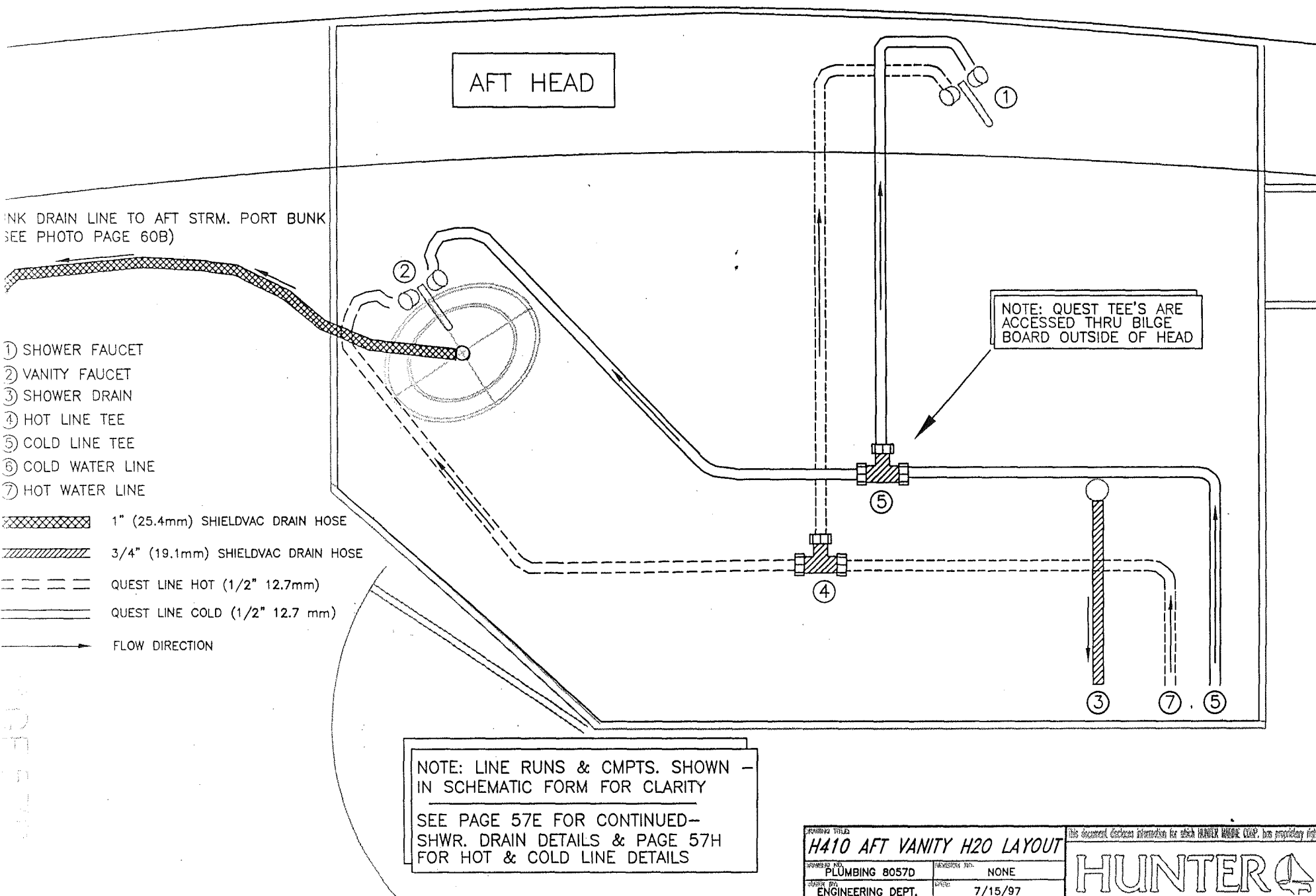
NOTE: LINE RUNS & CMPTS. SHOWN -  
IN SCHEMATIC FORM FOR CLARITY

SEE PAGE 59A FOR CONTINUED-  
SHWR. DRAIN DETAILS & PAGE 57H  
FOR HOT & COLD LINE DETAILS






DRAWING TITLE	
H410 FWD. VANITY H2O LAYOUT	
DESIGNED BY	PLUMBING 8057C
ENGINEERING DEPT.	ENGINEERING DEPT.
REVISION NO.	NONE
DATE	7/15/97

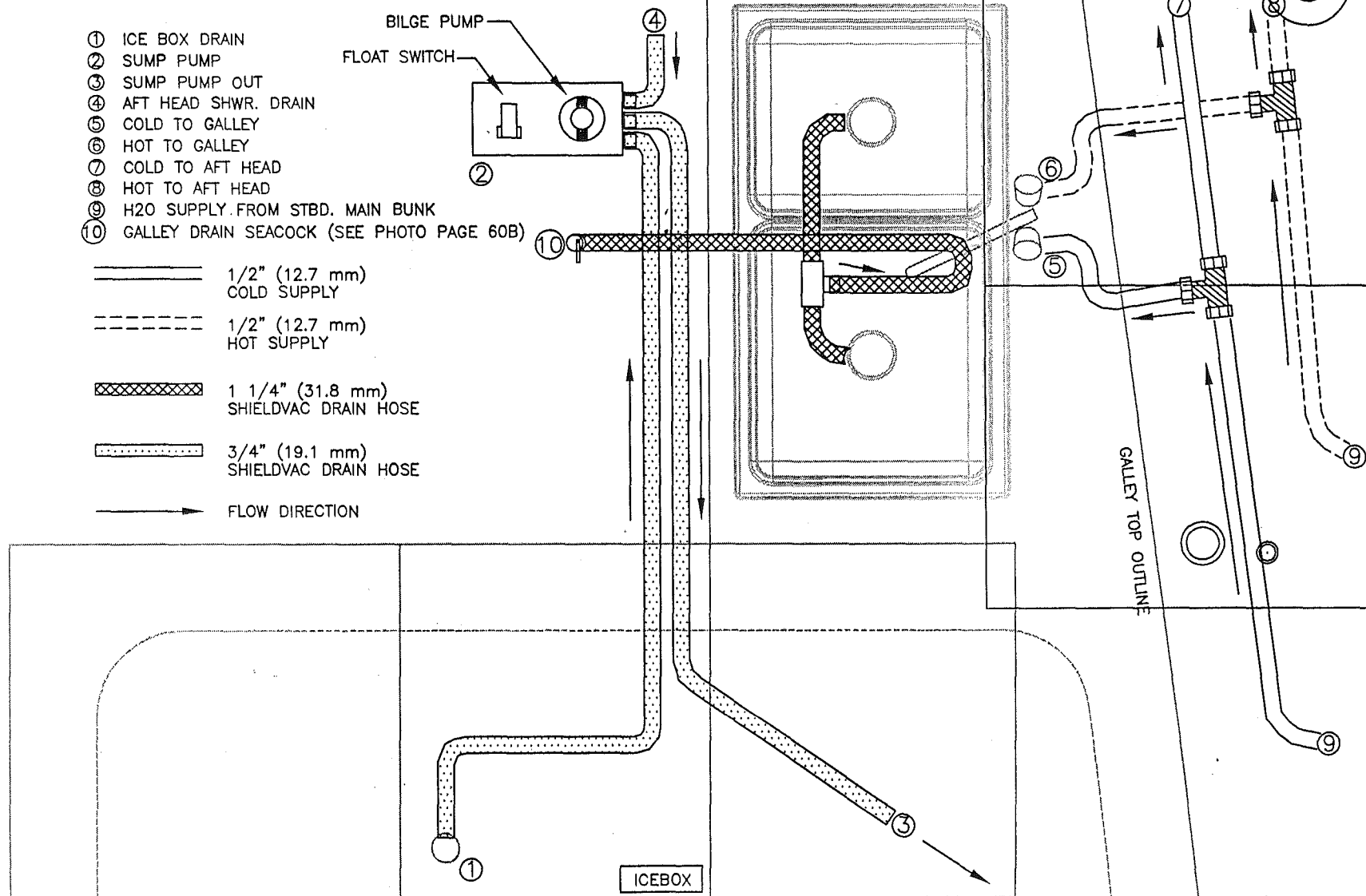
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HUNTER



- ① ICE BOX DRAIN
- ② SUMP PUMP
- ③ SUMP PUMP OUT
- ④ AFT HEAD SHWR. DRAIN
- ⑤ COLD TO GALLEY
- ⑥ HOT TO GALLEY
- ⑦ COLD TO AFT HEAD
- ⑧ HOT TO AFT HEAD
- ⑨ H2O SUPPLY FROM STBD. MAIN BUNK
- ⑩ GALLEY DRAIN SEACOCK (SEE PHOTO PAGE 60B)

-  1/2" (12.7 mm) COLD SUPPLY  
 1/2" (12.7 mm) HOT SUPPLY  
 1 1/4" (31.8 mm) SHIELDVAC DRAIN HOSE  
 3/4" (19.1 mm) SHIELDVAC DRAIN HOSE  
 FLOW DIRECTION



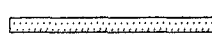



NOTE: LINE RUNS & CMPTS. SHOWN IN SCHEMATIC FORM FOR CLARITY  
SEE PAGES 57D & 57H FOR CONTINUED LINE RUNS & DETAILS

DRAWING TITLE: <b>H410 GALLEY H2O LAYOUT</b>	
DRAWN BY: PLUMBING 8057E	REVISION NO.: NONE
CHECKED BY: ENGINEERING DEPT.	DATE: 7/16/97

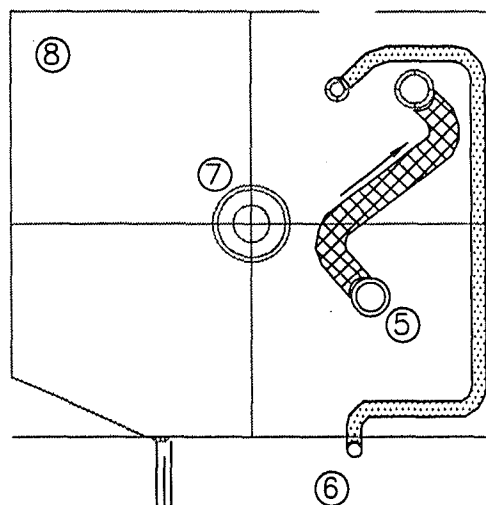
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**HUNTER** 

- ① HOT TO C-PIT SHOWER
- ② CITY H2O SUPPLY LINE
- ②A FRESH WATER HOSE CONNECTION
- ③ COLD TO C-PIT SHOWER
- ④ AFT TANK H2O SUPPLY LINE
- ⑤ AFT TANK FILL (DECK FITTING ON - AFT C-PIT COAMING)
- ⑥ AFT TANK VENT (DECK FITTING)
- ⑦ AFT TANK SENDING UNIT
- ⑧ AFT H2O TANK (51 GAL. 193 L.)
- ⑨ COCKPIT SHOWER

-  3/4" (19.1 mm) SHIELDVAC HOSE
-  1 1/2" (38.1mm) FUEL FILL HOSE
-  1/2" (12.7 mm) COLD SUPPLY
-  1/2" (12.7 mm) HOT SUPPLY

→ FLOW DIRECTION



NOTE: LINE RUNS & CMPTS. SHOWN -  
IN SCHEMATIC FORM FOR CLARITY  
SEE PAGE 57H FOR CONTINUED-  
LINE RUNS & DETAILS

AFT STRM. AFT BULK.

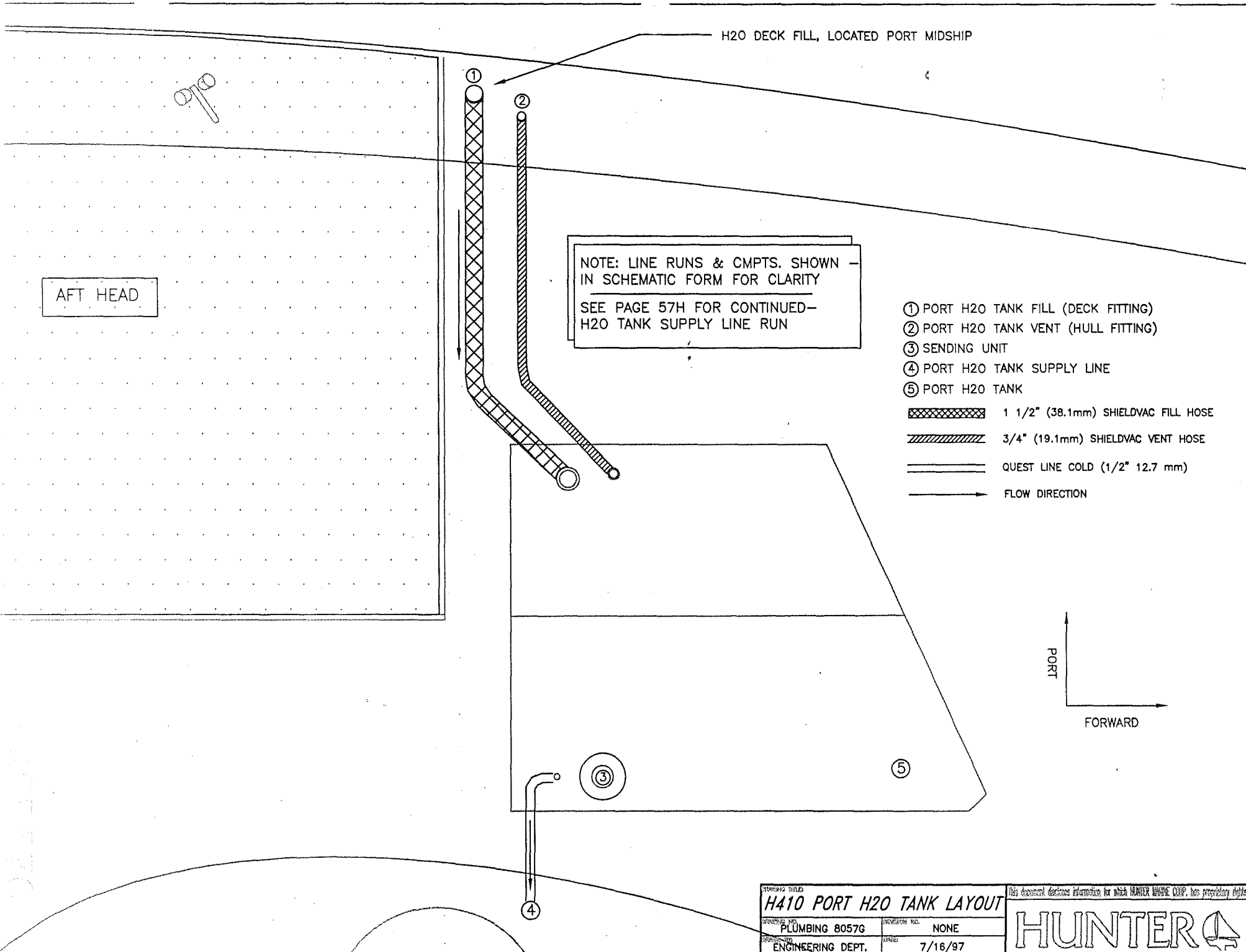
FORWARD →  
↓ STARBOARD



DRAWING TITLE <b>H410 AFT H2O CMPTS LAYOUT</b>	
DESIGNED BY PLUMBING 8057F	REVISION NO. NONE
ENGINEERING DEPT.	DATE 7/16/97

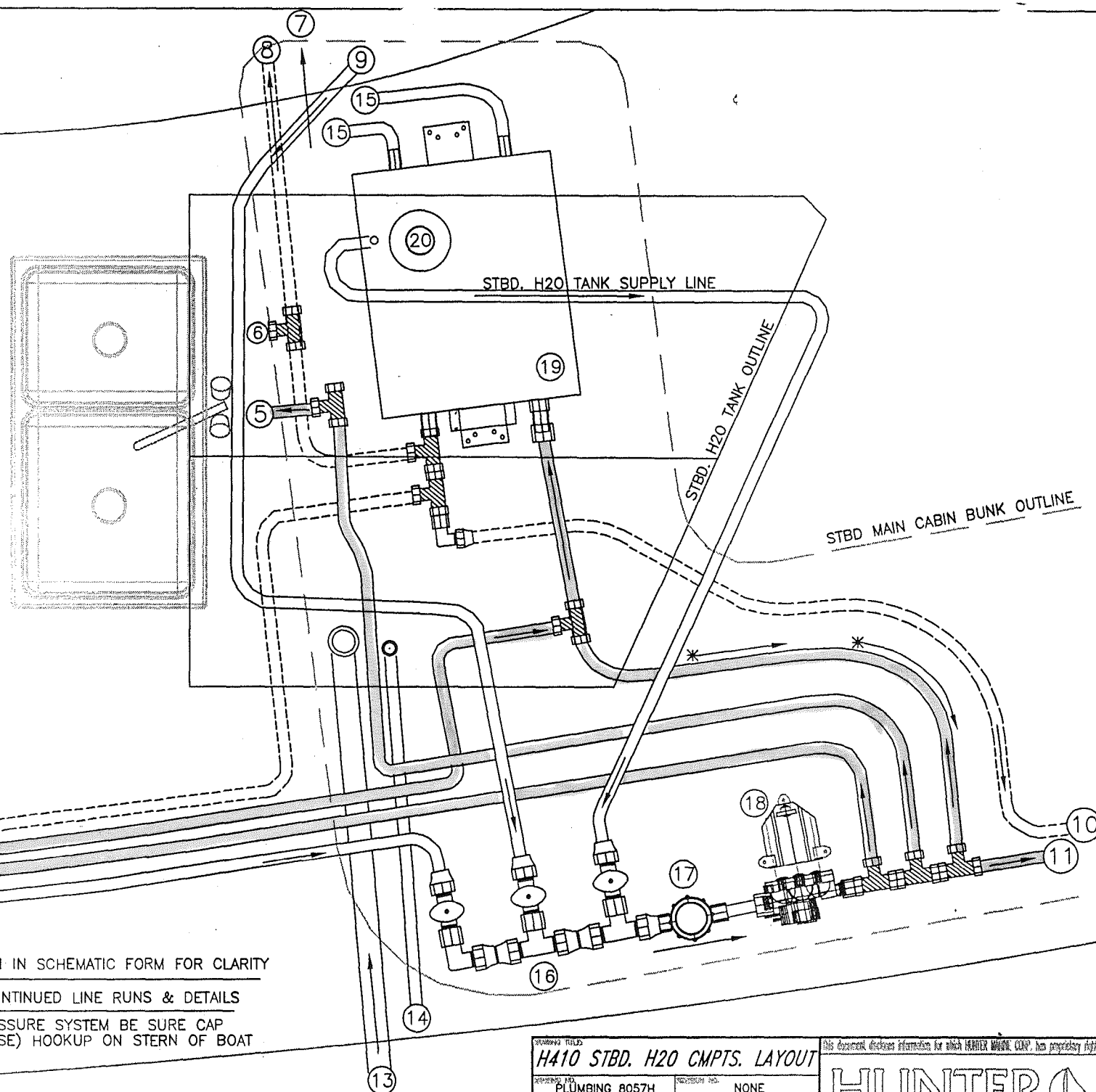
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**HUNTER** 



- ① HOT TO COCKPIT SHOWER
- ② CITY H2O SUPPLY
- ③ COLD TO C-PIT SHOWER
- ④ AFT TANK H2O SUPPLY
- ⑤ COLD TO GALLEY
- ⑥ HOT TO GALLEY
- ⑦ COLD TO AFT HEAD
- ⑧ HOT TO AFT HEAD
- ⑨ SUPPLY FROM PORT H2O TANK
- ⑩ HOT TO FWD. HEAD
- ⑪ COLD TO FWD. HEAD
- ⑬ STBD H2O TANK FILL (DECK FITTING)
- ⑭ STBD. TANK VENT (HULL FITTING)
- ⑮ HEAT EXCHANGER LINES TO ENGINE
- ⑯ MANIFOLD (H2O DISTRIBUTION)
- ⑰ H2O FILTER
- ⑱ H2O 12V.DC PUMP
- ⑲ H2O HEATER
- ⑳ STBD. H2O TANK SENDING UNIT

— = 1/2" (12.7 mm—  
COLD QUEST LINES)  
- - - = 1/2" (12.7 mm—  
HOT QUEST LINES)  
→ PUMP FLOW DIRECTION  
\* → CITY H2O FLOW DIRECTION



NOTE: LINE RUNS & CMPTS. SHOWN IN SCHEMATIC FORM FOR CLARITY

SEE PAGES 57C THRU 57G FOR CONTINUED LINE RUNS & DETAILS

WHEN USING 12V.DC PUMP TO PRESSURE SYSTEM BE SURE CAP  
(AND WASHER INSIDE) ON CITY (HOSE) HOOKUP ON STERN OF BOAT  
IS SECURE & SEALED

H410 STBD. H2O CMPTS. LAYOUT

DESIGNED BY PLUMBING 8057H	REVISIONS NONE
ENGINEERING DEPT.	DATE 7/16/97

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**HUNTER**



FRESH WATER PLUMBING PARTS LIST			U.O.M.	QTY
COMP. #				
KD010001	5	410 PLUMBING ASSEMBLY	ASSY	1
KD020001	5	410 FRESH WATER PLUMBING SUB ASSEMBLY	SUB	1
KD020015	5	410 FWD SHOWER FAUCET PLUMBING CPNT	CPNT	1
PL0192	250	FAUCET - VANITY - W/SHOWER #10-324 MD	EA	1
PL1820	250	SEATING 1/2 O.D. 500FNCR-2	EA	8
PL1825	250	TUBING 3/8 I.D. X 1/2" O.D.	FT	7
PL1825	250	TUBING 3/8 I.D. X 1/2" O.D.	FT	7
PL1830	250	TEES 1/2X1/2X1/2-1500 (T333T)	EA	2
PL1835	250	ELBOW STR. 1/2" MPT X 1/2 FPT #QSE33TF	EA	2
KD020025	5	410 FWD VANITY FAUCET PLUMBING CPNT	CPNT	1
PL0193	250	FAUCET - VANITY - W/O SHOWER #10-3000MF	EA	1
PL1820	250	SEATING 1/2 O.D. 500FNCR-2	EA	8
PL1825	250	TUBING 3/8 I.D. X 1/2" O.D.	FT	2
PL1825	250	TUBING 3/8 I.D. X 1/2" O.D.	FT	2
PL1830	250	TEES 1/2X1/2X1/2-1500 (T333T)	EA	2
PL1835	250	ELBOW STR. 1/2" MPT X 1/2 FPT #QSE33TF	EA	2
PL1065	150	ELBOW 90 DEG.STR/ELL BR. 3/4"	EA	1
KD020045	5	410 PORT WATER TANK PLUMBING COMPONENTS	CPNT	1
C00147	210	LABEL PHENOLIC "PORT WATER TANK"	EA	1
CH0052	105	CAULK 5200	TB	1
PL0520	250	FUEL VENT #503-4 (WATER)	EA	1
PL0540	250	HOSE CLAMP #10	EA	4
PL0550	250	HOSE CLAMP #24	EA	4
PL0887	250	BARB 1/2"MPTX3/4"HB SHIELDS WHITE	EA	1
PL1130	200	DECK PLATE WATER BLUE	EA	1
450225	600	O/H PHIL #10 X 3/4" S/S T/A	EA	3
PL1440	250	HOSE SHIELDVAC 1 1/2"(145-1120)	FT	7.5
PL1450	250	HOSE SHIELDVAC 3/4" (140-0340)	FT	7.5
PL1480	250	HOSE CUFFS 3/4" (142-0340)	EA	2
PL1500	250	HOSE CUFFS 1 1/2"(142-1120)	EA	2
PL1820	250	SEATING 1/2 O.D. 500FNCR-2	EA	3
PL1825	250	TUBING 3/8 I.D. X 1/2" O.D.	FT	8
PL1830	250	TEES 1/2X1/2X1/2-1500 (T333T)	EA	1
PR5092	300	SENSOR.WATER 222-12 WU-12 H-410	EA	1
EL0169-E	300	MOUNTING FLANGE, 3", FL-2	EA	1
EL0581	300	WIRE, DUPLEX, UL BOAT CABLE 16/2 BLK/WHT	FT	16
EL1020	300	TERMINAL C1614-10R 450/LB BLUE EYE	EA	2
PR5054	999	TANK, WATER PORT	EA	1
CH0081	105	FOAM FILLER CF124 (750 ML)	EA	0.5
PL0982	250	ADAPTER 1 1/2" X 1 1/2" #341513	EA	1
PL0882	250	BARB, PIPE TO HOSE PVC #8002 (3/4")	EA	1
PL0775	250	ELBOW PVC 1 1/2" SLIP X MPT	EA	1
PL1065	150	ELBOW 90 DEG.STR/ELL BR. 3/4"	EA	1





COMP. #		FRESH WATER PARTS LIST CONT:	U.O.M.	QTY.
PL0882	250	BARB. PIPE TO HOSE PVC #8002 (3/4")	EA	1
PR5015	999	HOSE, 2" BLACK STERNFLEX 16-126-2000B	FT	4
PR5015	999	HOSE, 2" BLACK STERNFLEX 16-126-2000B	FT	4
PR5015	999	HOSE, 2" BLACK STERNFLEX 16-126-2000B	FT	4
KD020055	5	410 STBD WATER TANK PLUMBING COMPONENTS	CPNT	1
C00148	210	LABEL PHENOLIC "STBD WATER TANK"	EA	1
EL0169-E	300	MOUNTING FLANGE, 3", FL-2	EA	1
450225	600	O/H PHIL #10 X 3/4" S/S T/A	EA	3
PR5092	300	SENSOR, WATER 222-12 WU-12 H-410	EA	1
PL0520	250	FUEL VENT #503-4 (WATER)	EA	1
PL0540	250	HOSE CLAMP #10	EA	4
PL0550	250	HOSE CLAMP #24	EA	4
PL0887	250	BARB 1/2" MPT X 3/4" HB SHIELDS WHITE	EA	1
PL1130	200	DECK PLATE WATER BLUE	EA	1
PL1440	250	HOSE SHIELD VAC 1 1/2" (145-1120)	FT	7.5
PL1450	250	HOSE SHIELD VAC 3/4" (140-0340)	FT	7.5
PL1480	250	HOSE CUFFS 3/4" (142-0340)	EA	2
PL1500	250	HOSE CUFFS 1 1/2" (142-1120)	EA	2
PL1820	250	SEATING 1/2 O.D. 500FNCR-2	EA	3
PL1825	250	TUBING 3/8 I.D. X 1/2" O.D.	FT	8
PL1830	250	TEES 1/2 X 1/2 X 1/2-1500 (T333T)	EA	1
EL0581	300	WIRE, DUPLEX, UL BOAT CABLE 16/2 BLK/WHT	FT	16
EL1020	300	TERMINAL C1614-10R 450/LB BLUE EYE	EA	2
PR5053	999	TANK, WATER STBD.	EA	1
CH0081	105	FOAM FILLER CF124 (750 ML)	EA	0.5
PL1065	150	ELBOW 90 DEG. STR/ELL BR. 3/4"	EA	1
PL0982	250	ADAPTER 1 1/2" X 1 1/2" #341513	EA	1
PL0775	250	ELBOW PVC 1 1/2" SLIP X MPT	EA	1
KD020065	5	410 FRESH WATER PUMB PLUMBING COMPONENTS	CPNT	1
CH0472	78	FREEZE BAN	GL	5
450260	600	P/H PHIL #10 X 1" S/S T/A	EA	3
450353	600	WASHER NEO 1/4" S/S W/N/B	EA	3
EL0660	300	WIRE BROWN SC-12 GAUGE	FT	18
EL0670	300	WIRE BLACK SC-12 GAUGE	FT	9
EL0825	300	CONDUIT 3/4" 125-0340	FT	6
EL0950	300	TERMINAL C1614-SC 400/LB BLUE BUTT	EA	2
PL0301	250	PUMP, FRESH WATER, 2088-423-244, 2.8GPM	EA	1
PL0350	250	PUMP STRAINER #36400-1010	EA	1
PL1820	250	SEATING 1/2 O.D. 500FNCR-2	EA	8
PL1826	250	COUPLING 1/2" X 1/2" C 33T/1510	EA	4
PL1835	250	ELBOW STR. 1/2" MPT X 1/2 FPT #QSE33TF	EA	2

FRESH WATER SYSTEM PARTS LIST CONT:						
COMP. #				U.O.M.	QTY.	
KD020075		5	410 FRESH WATER MAINFOLD PLUMBING CPNTS	CPNT	1	
450264		600	P/H PHIL #10 X 3/4" S/S T/A	EA	4	
PL0524		250	CLAMP DG-20	EA	3	
PL1815		250	SHUT OFF VALVE 1/2" X 1/2"	EA	3	
PL1820		250	SEATING 1/2 O.D. 500FNCR-2	EA	5	
PL1825		250	TUBING 3/8 I.D. X 1/2" O.D.	FT	3	
PL1826		250	COUPLING 1/2" X 1/2" C 33T/1510	EA	5	
PL1830		250	TEES 1/2X1/2X1/2-1500 (T333T)	EA	2	
PL1835		250	ELBOW STR. 1/2" MPT X 1/2 FPT #QSE33TF	EA	4	
PL1853		250	ELBOW 1/2" X MPT X 1/2" MPT #E33T/1501	EA	1	
PL0882		250	BARB, PIPE TO HOSE PVC #8002 (3/4")	EA	1	
PL1855		250	NIPPLE 1/2" #1504	EA	3	
KD020085		5	410 GALLEY FAUCET PLUMBING COMPONENTS	CPNT	1	
PL0110		250	SINK,NY1019-12 DOUBLE	EA	1	
PL0111		250	DRAIN, 1 1/4" NY1039-00	EA	2	
PL0112		250	SINK TAILPIECE, NY1042-01 1 1/4"	EA	2	
PL0191		250	FAUCET - GALLEY W/HANDLES - #10-3100MG	EA	1	
PL1820		250	SEATING 1/2 O.D. 500FNCR-2	EA	8	
PL1825		250	TUBING 3/8-I.D. X 1/2" O.D.	FT	9	
PL1825		250	TUBING 3/8 I.D. X 1/2" O.D.	FT	9	
PL0749		250	STREET ELBOW 90DEG BRASS 1 1/4"	EA	1	
KD020095		5	410 FRESH WATER INLET PLUMBING CPNTS	CPNT	1	
PL1175		250	FRESH WATER INLET FITTING #499-000 L-400	EA	1	
PL0656		250	CHECK VALVE 1/2"	EA	1	
PL1820		250	SEATING 1/2 O.D. 500FNCR-2	EA	2	
PL1825		250	TUBING 3/8 I.D. X 1/2" O.D.	FT	25	
PL1830		250	TEES 1/2X1/2X1/2-1500 (T333T)	EA	1	
PL1853		250	ELBOW 1/2" X MPT X 1/2" MPT #E33T/1501	EA	1	
PL1855		250	NIPPLE 1/2" #1504	EA	2	
KD020115		5	410 AFT SHOWER FAUCET PLUMBING CPNTS	CPNT	1	
PL0192		250	FAUCET - VANITY - W/SHOWER #10-324 MD	EA	1	
PL1820		250	SEATING 1/2 O.D. 500FNCR-2	EA	8	
PL1830		250	TEES 1/2X1/2X1/2-1500 (T333T)	EA	2	
PL1835		250	ELBOW STR. 1/2" MPT X 1/2 FPT #QSE33TF	EA	2	
PL1825		250	TUBING 3/8 I.D. X 1/2" O.D.	FT	6	
PL1825		250	TUBING 3/8 I.D. X 1/2" O.D.	FT	6	
KD020125		5	410 AFT VANITY FAUCET PLUMBING CPNTS	CPNT	1	
PL0193		250	FAUCET - VANITY - W/O SHOWER #10-3000MF	EA	1	
PL1820		250	SEATING 1/2 O.D. 500FNCR-2	EA	4	
PL1825		250	TUBING 3/8 I.D. X 1/2" O.D.	FT	29	
PL1825		250	TUBING 3/8 I.D. X 1/2" O.D.	FT	9	
PL1825		250	TUBING 3/8 I.D. X 1/2" O.D.	FT	2	
PL1835		250	ELBOW STR. 1/2" MPT X 1/2 FPT #QSE33TF	EA	2	

FRESH WATER PARTS LIST CONT:				
COMP. #			U.O.M.	QTY.
KD020175	5	410 COCKPIT SHOWER PLUMBING COMPONENTS	CPNT	1
450011	600	CABLE TIES BLACK, 15" W/ EYE .	EA	10
450264	600	P/H PHIL #10 X 3/4" S/S T/A	EA	10
450225	600	O/H PHIL #10 X 3/4" S/S T/A	EA	10
PL0189	250	SHOWER, STOWAWAY #48500	EA	1
PL1820	250	SEATING 1/2 O.D. 500FNCR-2	EA	8
PL1825	250	TUBING 3/8 I.D. X 1/2" O.D.	FT	25
PL1825	250	TUBING 3/8 I.D. X 1/2" O.D.	FT	25
PL1830	250	TEES 1/2X1/2X1/2-1500 (T333T)	EA	2
PL1835	250	ELBOW STR. 1/2" MPT X 1/2 FPT #QSE33TF	EA	2
KD020185	5	410 AFT WATER TANK PLUMBING COMPONENTS	CPNT	1
PR5055	999	TANK, AFT WATER	EA	1
PR5013	999	WATER SENSOR WU22	EA	1
EL0169-E	300	MOUNTING FLANGE, 3", FL-2	EA	1
450011	600	CABLE TIES BLACK, 15" W/ EYE .	EA	10
450225	600	O/H PHIL #10 X 3/4" S/S T/A	EA	3
PL0520	250	FUEL VENT #503-4 (WATER)	EA	1
PL0540	250	HOSE CLAMP-#40	EA	4
PL0550	250	HOSE CLAMP #24	EA	4
PL0887	250	BARB 1/2"MPTX3/4"HB SHIELDS WHITE	EA	1
PL1130	200	DECK PLATE WATER BLUE	EA	1
PL1440	250	HOSE SHIELDVAC 1 1/2"(145-1120)	FT	6
PL1450	250	HOSE SHIELDVAC 3/4" (140-0340)	FT	6
PL1480	250	HOSE CUFFS 3/4" (142-0340)	EA	2
PL1500	250	HOSE CUFFS 1 1/2"(142-1120)	EA	2
PL1820	250	SEATING 1/2 O.D. 500FNCR-2	EA	3
PL1825	250	TUBING 3/8 I.D. X 1/2" O.D.	FT	20
PL1853	250	ELBOW 1/2" X MPT X 1/2"MPT #E33T/1501	EA	1
EL0581	300	WIRE, DUPLEX, UL BOAT CABLE 16/2 BLK/WHT	FT	28
EL1020	300	TERMINAL C1614-10R 450/LB BLUE EYE	EA	2
PL0982	250	ADAPTER 1 1/2" X 1 1/2" #341513	EA	1
PL1065	150	ELBOW 90 DEG.STR/ELL BR. 3/4"	EA	1
PL0882	250	BARB, PIPE TO HOSE PVC #8002 (3/4")	EA	1
PL0775	250	ELBOW PVC 1 1/2" SLIP X MPT	EA	1

FRESH WATER SYSTEM PARTS LIST CONT:			U.O.M.	QTY.
COMP.				
KD040035	5	410 WATER HEATER/HEAT EXCHANGER CPNTS	CPNT	1
EL0070	300	ROMEX CONNECTOR 3/8" #20 STEEL	EA	1
EL0560	300	WIRE 14/3 MARINE POWER	FT	19
EL0950	300	TERMINAL C1614-SC 400/LB BLUE BUTT	EA	3
450278	600	P/H PHIL #14 X 3/4" S/S T/A	EA	4
PL0280	250	WATER HEATER S-600 W/HEAT EXCHANGER 6GL	EA	1
PL0540	250	HOSE CLAMP #10	EA	6
PL1527	250	HOSE SHIELDFLEX 5/8" TYPE 2091 100-0586	FT	7.5
PL1527	250	HOSE SHIELDFLEX 5/8" TYPE 2091 100-0586	FT	8
PL1820	250	SEATING 1/2 O.D. 500FNCR-2	EA	8
PL1825	250	TUBING 3/8 I.D. X 1/2" O.D.	FT	20
PL1826	250	COUPLING 1/2" X 1/2" C 33T/1510	EA	2
PL1830	250	TEES 1/2X1/2X1/2-1500 (T333T)	EA	3
PL1835	250	ELBOW STR. 1/2" MPT X 1/2 FPT #QSE33TF	EA	2
PL1855	250	NIPPLE 1/2" #1504	EA	3
HW5535	550	COPPER BLEEDER VALVE	EA	1

- ① COMM.
  - ② COMMODE RAW WATER PICKUP
  - ③ VENTED LOOP
  - ④ WASTE HOSE IN TO TANK
  - ⑤ WASTE PUMPOUT (DECK FITTING)
  - ⑥ WASTE TANK VENT (HULL FITTING)
  - ⑦ WASTE TANK SENDING UNIT
  - ⑧ MACERATOR
  - ⑨ MACERATOR DISCHARGE SEACOCK
  - ⑩ Y-VALVE
  - ⑪ Y-VALVE HULL DISCHARGE
  - ⑫ Y-VALVE DISCHARGE TO TANK (TAKES PLACE OF #4)
  - ⑬ VENTED LOOP
- NOTE: Y-VALVE CONFIGURATION FOR INTERNATIONAL MODELS ONLY.

-  = 3/4" (19.1 mm) SANITATION HOSE  
 1" (25.4 mm) SANITATION HOSE  
 1.5" (38.1 mm) SANITATION HOSE  
 FLOW DIRECTION

TO SWITCH PANEL

ACCESS THRU V-BTH. BUNK DOOR

FWD. STRM.

FWD. HEAD

SEACOCKS, SEE PHOTO PAGE 60B

SEE PAGE 22B FOR Y-VALVE OPER. INST.

NOTE: LINE RUNS & CMPTS. SHOWN IN SCHEMATIC FORM FOR CLARITY


DRAWING TITLE		H410 FWD. HEAD LAYOUT	
DESIGNED BY	WASTE PLUMBING 8058A	DESIGNED BY	NONE
DRAWN BY	ENGINEERING DEPT	DATE	7/21/97

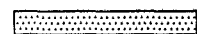



- ① COMMODE
- ② COMMODE RAW WATER PICKUP SEACOCK (SEE PHOTO PAGE 60B)
- ③ VENTED LOOP
- ④ WASTE HOSE IN TO TANK
- ⑤ WASTE PUMPOUT (DECK FITTING)
- ⑥ WASTE TANK VENT (HULL FITTING)
- ⑦ WASTE TANK SENDING UNIT
- ⑧ MACERATOR (BEHIND BACKREST)
- ⑨ MACERATOR DISCHARGE SEACOCK (SEE PHOTO PAGE 60B)

- ⑩ Y-VALVE
- ⑪ Y-VALVE HULL DISCHARGE
- ⑫ Y-VALVE DISCHARGE TO TANK (TAKES PLACE OF ④)
- ⑬ VENTED LOOP

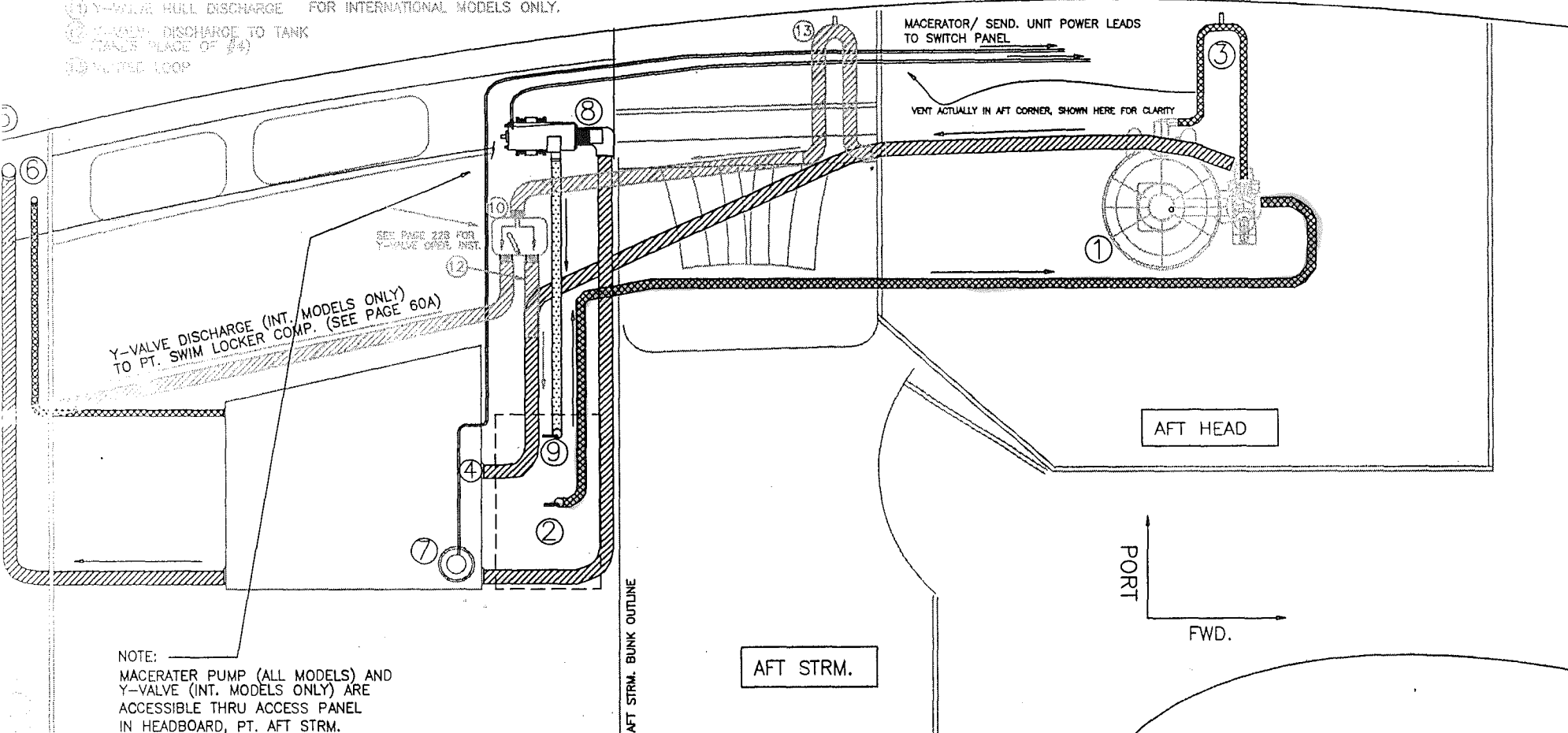
NOTE: Y-VALVE CONFIGURATION FOR INTERNATIONAL MODELS ONLY.

 = 3/4" (19.1 mm) SANITATION HOSE

 1" (25.4 mm) SANITATION HOSE

 1.5" (38.1 mm) SANITATION HOSE

 FLOW DIRECTION

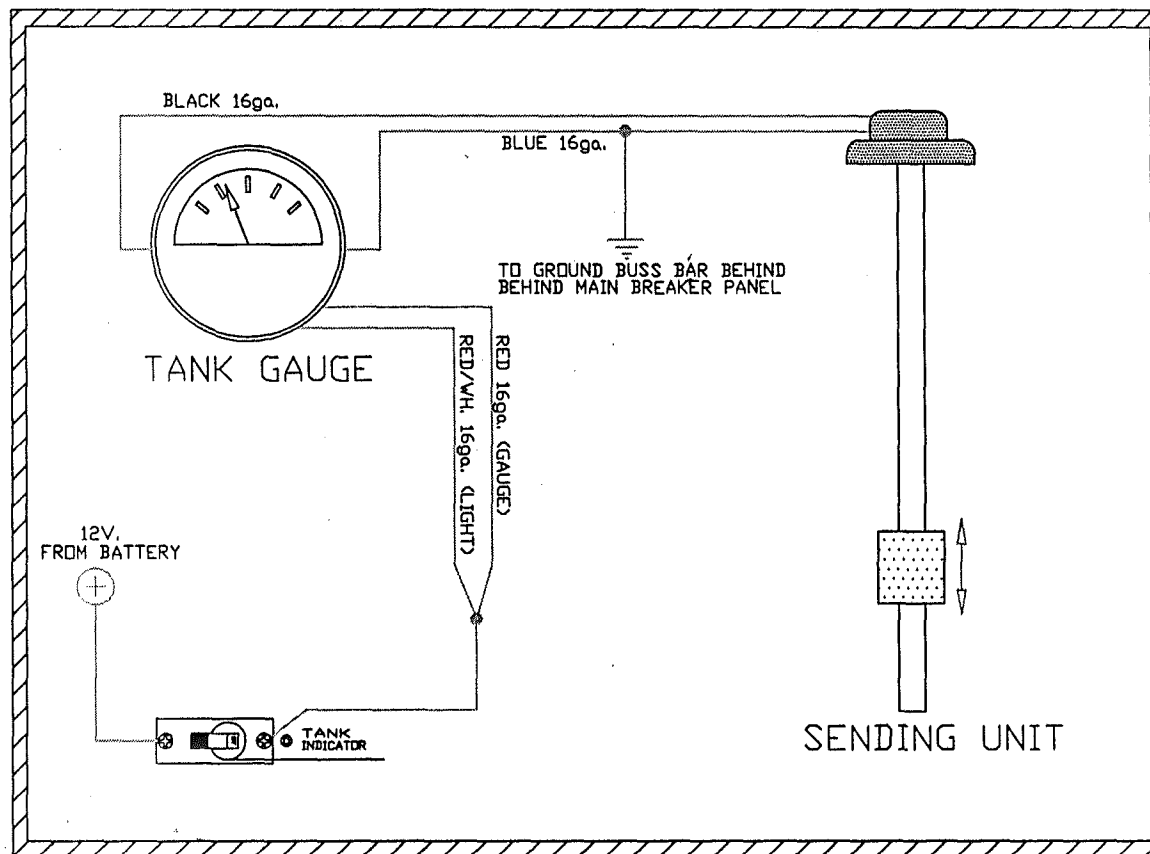



NOTE:  
MACERATOR PUMP (ALL MODELS) AND Y-VALVE (INT. MODELS ONLY) ARE ACCESSIBLE THRU ACCESS PANEL IN HEADBOARD, PT. AFT STRM.

EXCEPTION:  
ON TRI-CABIN MODELS THERE IS NO HEADBOARD AND THE SEAT IS REPLACED WITH A LOCKER SO THE MACERATOR (ALL MODELS) AND THE Y-VALVE (INT. MODELS) ARE LOCATED IN THE HANGING LOCKER.

NOTE: LINE RUNS & CMPTS. SHOWN IN SCHEMATIC FORM FOR CLARITY

DRAWING TITLE: <b>H410 AFT HEAD LAYOUT</b>		THIS DOCUMENT CONTAINS INFORMATION FOR WHICH HUNTER MARINE CORP. HAS PROPRIETARY RIGHTS.	
DRAWING NO. WASTE PLUMBING 80586	REVISION NO. NONE	<b>HUNTER</b> 	
ENGINEERING DEPT.	DATE: 7/21/97		



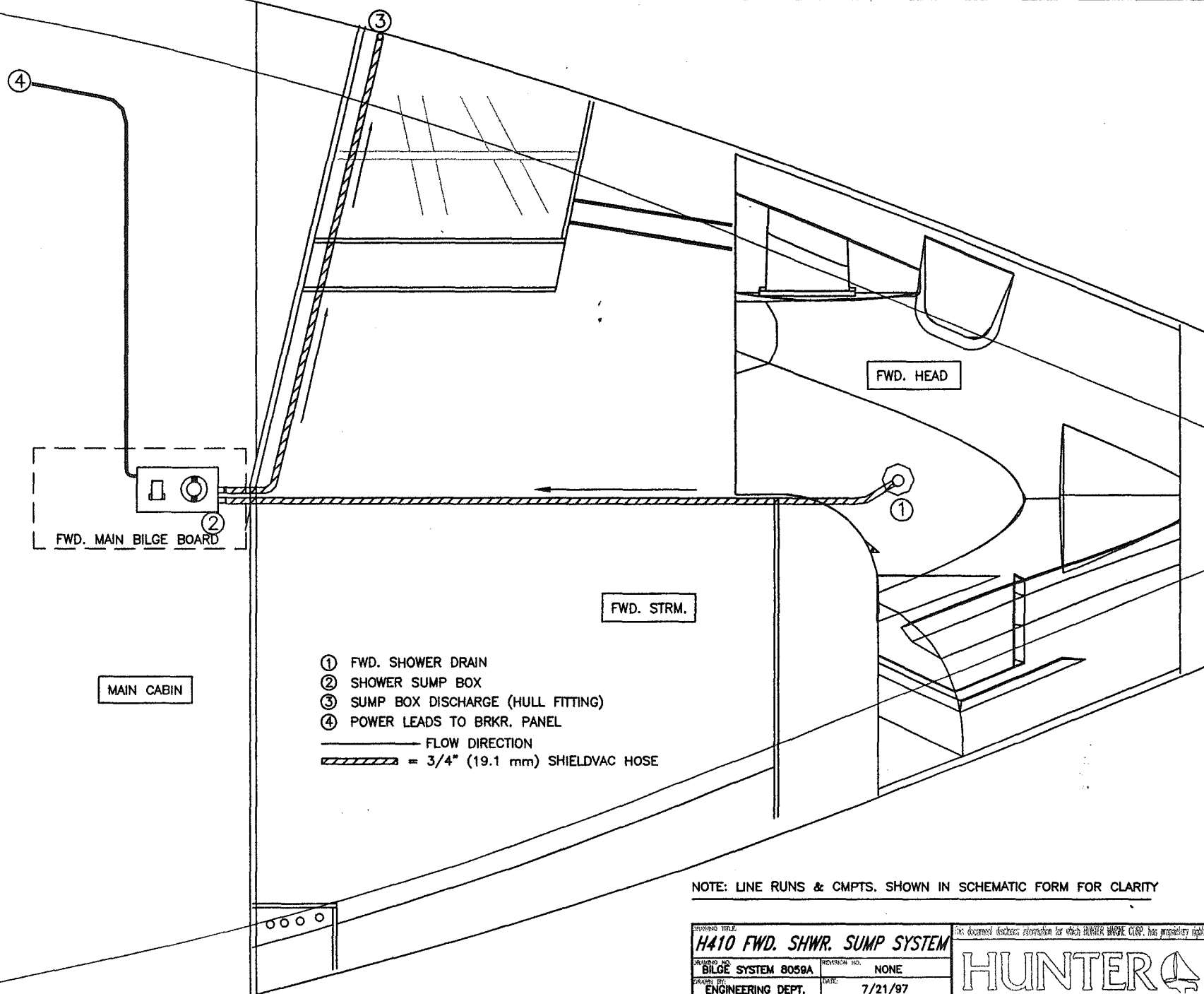
WORKING TITLE <b>H410 WASTE SENDING UNIT SCHEMATIC</b>		This document contains information for which HUNTER WASTE CORP. has proprietary rights.	
DESIGNER NO. <b>4108058C</b>	REVISION NO. <b>NONE</b>	<b>HUNTER</b> 	
DESIGNED BY <b>ENGINEERING DEPT.</b>	DATE <b>7/21/97</b>		



COMP. #		WASTE SYSTEM PARTS LIST	U.O.M.	QTY.
KD030025	5	410 FWD WASTE TANK PLUMBING COMPONENTS	CPNT	1
PR5012	999	HOLDING TANK SENSOR 16 3/4	EA	1
EL0581	300	WIRE, DUPLEX, UL BOAT CABLE 16/2 BLK/WHT	FT	29
PR5050	999	TANK, FWD WASTE TANK	EA	1
EL0950	300	TERMINAL C1614-SC 400/LB BLUE BUTT	EA	2
PL0520	250	FUEL VENT #503-4 (WATER)	EA	1
450225	600	O/H PHIL #10 X 3/4" S/S T/A	EA	3
PL0540	250	HOSE CLAMP #10	EA	4
PL0550	250	HOSE CLAMP #24	EA	8
PL0887	250	BARB 1/2" MPT X 3/4" HB SHIELDS WHITE	EA	1
PL1140	200	DECK PLATE WASTE BROWN	EA	1
PL0775	250	ELBOW PVC 1 1/2" SLIP X MPT	EA	3
PL0982	250	ADAPTER 1 1/2" X 1 1/2" #341513	EA	3
PL1452	250	HOSE, WHITE, 3/4" D. SANTI HOSE	FT	7.6
PL1601	250	HOSE, SANITATION, 1.5" LOW PREMEATION"	FT	7.5
PL1601	250	HOSE, SANITATION, 1.5" LOW PREMEATION"	FT	6.6
PL1601	250	HOSE, SANITATION, 1.5" LOW PREMEATION"	FT	3
EL0168	300	GUAGE, WASTE WATER, HTG-1	EA	1
KD030035	5	410 FWD HEAD PLUMBING COMPONENTS	CPNT	1
450151	600	HEX HD 5/16 X 1 1/2" S/S L/B	EA	4
450331	600	WASHER NEO 3/8" S/S W/N/B 7/8 OD	EA	4
PL0015	250	TOILET #29090-0000 (RIGHT HAND)	EA	1
PL0381	250	VENTED LOOP, W/VALVE, 3/4" PVC	EA	1
PL0481	250	BRASS THRU HULL FITTING 3/4" #65-BN7-50	EA	1
PL0540	250	HOSE CLAMP #10	EA	7
PL0550	250	HOSE CLAMP #24	EA	4
PL0663-A	250	BALL VALVE 3/4" #70-104-10	EA	1
PL0673	250	BARB, HOSE, BRASS, 3/4"	EA	1
PL1065	150	ELBOW 90 DEG. STR/ELL BR. 3/4"	EA	1
PL1452	250	HOSE, WHITE, 3/4" D. SANTI HOSE	FT	10
PL1452	250	HOSE, WHITE, 3/4" D. SANTI HOSE	FT	9
PL1452	250	HOSE, WHITE, 3/4" D. SANTI HOSE	FT	8.5
C00193	560	LABEL, THRU HULL, "HEAD PICKUP"	EA	1
KD030045	5	FWD VANITY SINK DRAIN PLUMBING CPNTS	CPNT	1
PL0055	250	SINK DRAIN #SW2 90DEGREE #907014	EA	1
PL1470	250	HOSE SHIELD VAC 1" (140-1000) LH	FT	6.5
PL1490	250	HOSE CUFFS 1" (100-1000)	EA	2
PL0548	250	HOSE CLAMP #16	EA	4
PL0661	250	BALL VALVE (1") BRASS #70-105-10	EA	1
PL0482	250	BRASS THRU HULL FITTING 1" #65-BN7-51	EA	1
PL0674	250	BARB, HOSE, BRASS, 1"	EA	1
C00188	560	LABEL, THRU HULL, VANITY DISCHARGE	EA	1

COMP. #		WASTE SYSTEM PARTS LIST CONT:	U.O.M.	QTY.
KD030065	5	410 AFT WASTE TANK PLUMBING COMPONENTS	CPNT	1
EL0168	300	GUAGE, WASTE WATER, HTG-1	EA	1
EL0168-C	300	SENDER, WASTE TANK, 2SECTION SH2 H43	EA	1
450225	600	O/H PHIL #10 X 3/4" S/S T/A	EA	3
PL0570	250	HOSE CLAMP #32	EA	1
PL0540	250	HOSE CLAMP #10	EA	4
PL0550	250	HOSE CLAMP #24	EA	8
PL0887	250	BARB 1/2" MPT X 3/4" HB SHIELDS WHITE	EA	1
PL1140	200	DECK PLATE WASTE BROWN	EA	1
PL1452	250	HOSE, WHITE, 3/4" D. SANTI HOSE	FT	7
EL0581	300	WIRE, DUPLEX, UL BOAT CABLE 16/2 BLK/WHT	FT	22
EL0950	300	TERMINAL C1614-SC 400/LB BLUE BUTT	EA	2
PL1601	250	HOSE, SANITATION, 1.5" LOW PREMEATION	FT	7.5
PL1601	250	HOSE, SANITATION, 1.5" LOW PREMEATION	FT	10
PL1601	250	HOSE, SANITATION, 1.5" LOW PREMEATION	FT	7.5
PR5051	999	TANK, AFT WASTE	EA	1
PL0775	250	ELBOW PVC 1 1/2" SLIP X MPT	EA	3
PL0982	250	ADAPTER 1 1/2" X 1 1/2" #341513	EA	3
PR5017	999	BRACKETS, AFT WASTE TANK	PR	1
KD030115	5	410 AFT HEAD PLUMBING COMPONENTS	CPNT	1
450151	600	HEX HD 5/16 X 1 1/2" S/S L/B	EA	4
450331	600	WASHER NEO 3/8" S/S W/N/B 7/8 OD	EA	4
PL0019	250	TOILET, 29090-0001, H280-H430 (LEFT HAND	EA	1
PL0381	250	VENTED LOOP, W/VALVE, 3/4" PVC	EA	1
PL0481	250	BRASS THRU HULL FITTING 3/4" #65-BN7-50	EA	1
PL0540	250	HOSE CLAMP #10	EA	7
PL0663-A	250	BALL VALVE 3/4" #70-104-10	EA	1
PL0673	250	BARB, HOSE, BRASS, 3/4"	EA	1
PL1065	150	ELBOW 90 DEG. STR/ELL BR. 3/4"	EA	1
PL1452	250	HOSE, WHITE, 3/4" D. SANTI HOSE	FT	11
PL1452	250	HOSE, WHITE, 3/4" D. SANTI HOSE	FT	6.5
PL1452	250	HOSE, WHITE, 3/4" D. SANTI HOSE	FT	7
C00186	560	LABEL, THRU HULL, "WASTE DISCHARGE	EA	1
KD030125	5	410 AFT VANITY DRAIN PLUMBING COMPONENTS	CPNT	1
PL0055	250	SINK DRAIN #SW2 90DEGREE #907014	EA	1
PL1470	250	HOSE SHIELD VAC 1" (140-1000) LH	FT	7.5
PL1490	250	HOSE CUFFS 1" (100-1000)	EA	2
PL0548	250	HOSE CLAMP #16	EA	4
PL0661	250	BALL VALVE (1") BRASS #70-105-10	EA	1
PL0482	250	BRASS THRU HULL FITTING 1" #65-BN7-51	EA	1

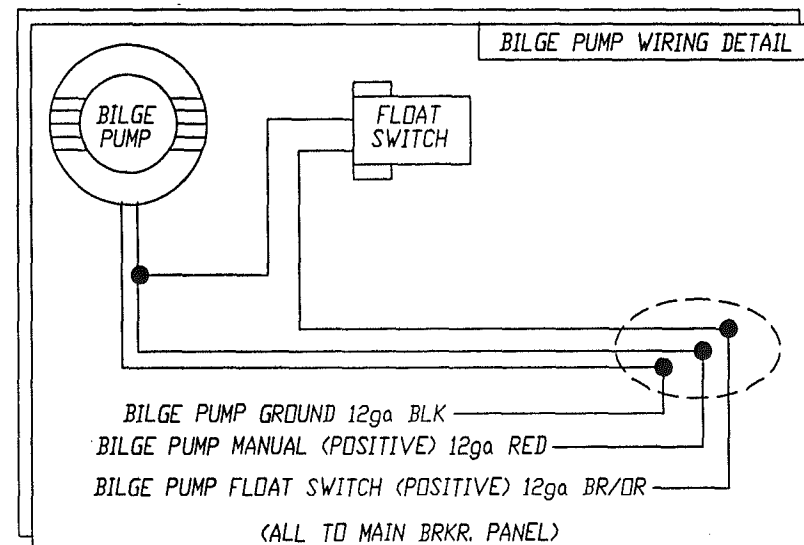
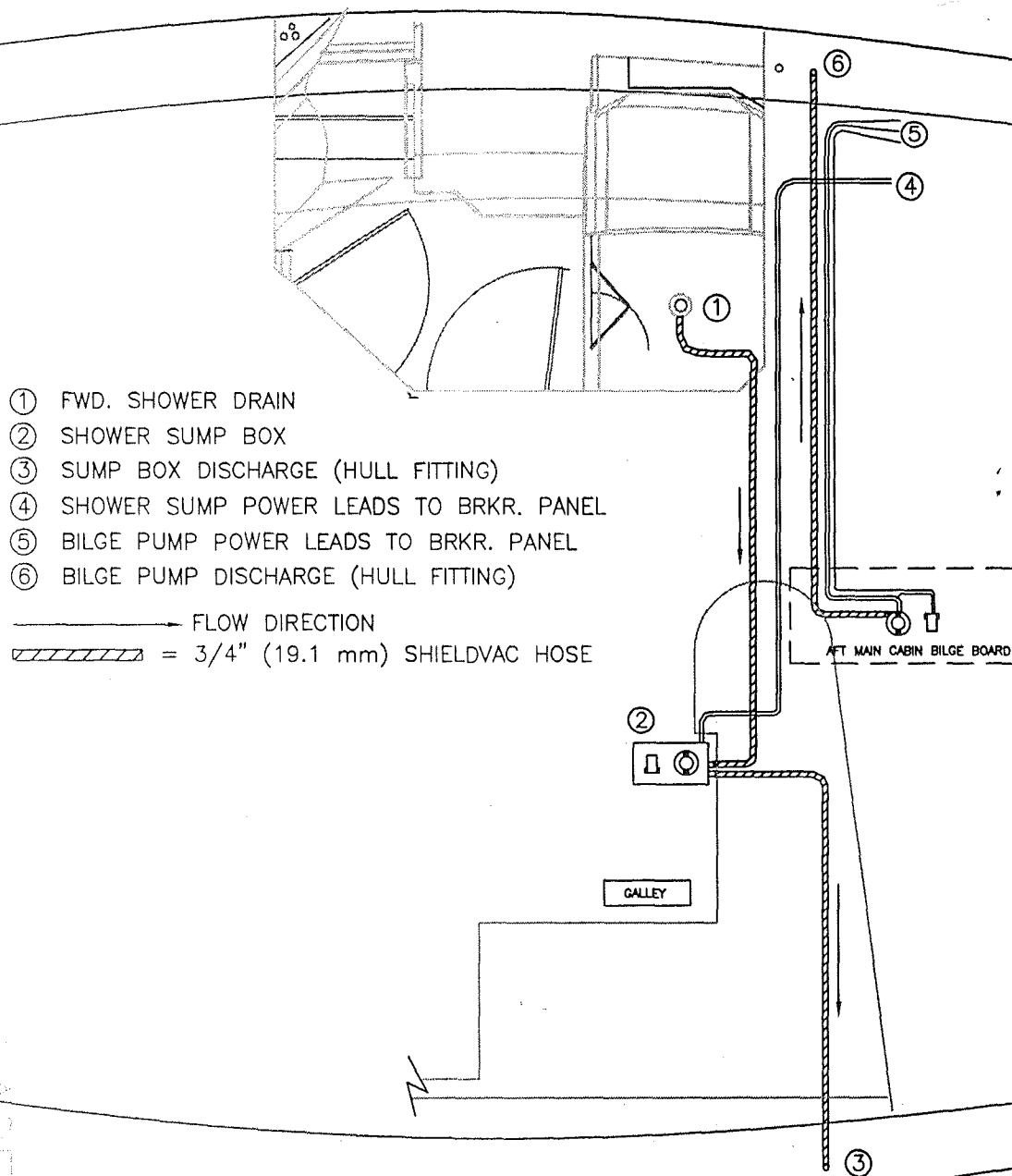
COMP. #		WASTE SYSTEM PARTS LIST CONT:	U.O.M.	QTY.
KD040025	5	410 FWD HEAD MACERATOR PLUMBING CPNTS	CPNT	1
EL0540	300	WIRE BLACK SC-10 GAUGE	FT	9.5
EL0800	300	WIRE BROWN W/WHITE STRIPE 10GA.TINN/COPP	FT	28
PL0550	250	HOSE CLAMP #24	EA	4
EL0940	600	TERMINAL C1210-SC 180/LB YELLOW BUTT	EA	2
450260	600	P/H PHIL #10 X 1" S/S T/A	EA	4
PL0328	250	PUMP MACERATOR #18590-500 L-400	EA	1
PL0482	250	BRASS THRU HULL FITTING 1" #65-BN7-51	EA	1
PL0548	250	HOSE CLAMP #16	EA	4
PL0661	250	BALL VALVE (1") BRASS #70-105-10	EA	1
PL0674	250	BARB.HOSE, BRASS, 1"	EA	1
PL1066	250	ELBOW 90 DEG.STR/ELL BR. 1"	EA	1
PL1525	250	HOSE SHIELD FLEX 1" TYPE 100-0346	FT	3
CO0189	560	LABEL,THRUHULL,"MACERATOR DISCHARGE"	EA	1
PL1601	250	HOSE,SANITATION, 1.5"LOW PREMEATION"	FT	3.5
KD040065	5	410 AFT HEAD MACERATOR PLUMBING CPNTS	CPNT	1
EL0540	300	WIRE BLACK SC-10 GAUGE	FT	12
EL0800	300	WIRE BROWN W/WHITE STRIPE 10GA.TINN/COPP	FT	28
EL0940	600	TERMINAL C1210-SC 180/LB YELLOW BUTT	EA	2
450260	600	P/H PHIL #10 X 1" S/S T/A	EA	4
PL0328	250	PUMP MACERATOR #18590-500 L-400	EA	1
PL0482	250	BRASS THRU HULL FITTING 1" #65-BN7-51	EA	1
PL0548	250	HOSE CLAMP #16	EA	4
PL0661	250	BALL VALVE (1") BRASS #70-105-10	EA	1
PL0674	250	BARB.HOSE, BRASS, 1"	EA	1
PL1525	250	HOSE SHIELD FLEX 1" TYPE 100-0346	FT	7.5
PL1066	250	ELBOW 90 DEG.STR/ELL BR. 1"	EA	1
PL0770	250	ELBOW - PVC - 1 1/2 SLIP X 1 1/2 FPT	EA	1
PL0982	250	ADAPTER 1 1/2" X 1 1/2" #341513	EA	1



DRAWING TITLE: <b>H410 FWD. SHWR. SUMP SYSTEM</b>		THIS DOCUMENT DISCLOSES INFORMATION FOR WHICH HUNTER MARINE CORP. HAS PROPRIETARY RIGHTS	
DESIGNED BY: <b>BILGE SYSTEM 8059A</b>	REVISION NO.: <b>NONE</b>	<b>HUNTER</b>	
DRAWN BY: <b>ENGINEERING DEPT.</b>	DATE: <b>7/21/97</b>		

- ① FWD. SHOWER DRAIN
- ② SHOWER SUMP BOX
- ③ SUMP BOX DISCHARGE (HULL FITTING)
- ④ SHOWER SUMP POWER LEADS TO BRKR. PANEL
- ⑤ BILGE PUMP POWER LEADS TO BRKR. PANEL
- ⑥ BILGE PUMP DISCHARGE (HULL FITTING)

→ FLOW DIRECTION  
 ▨ = 3/4" (19.1 mm) SHIELDVAC HOSE



DRAWING TITLES	
H410 AFT SHWR./ MAIN BILGE SUMP SYSTEM	
DESIGNED BY	REVIEWED BY
BILGE SYSTEM 8059B	NONE
DRAWN BY	DATE
ENGINEERING DEPT.	7/21/97

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**HUNTER**

MANUAL BILGE PUMP DISCHARGE

MANUAL BILGE PUMP

MANUAL BILGE PUMP HANDLE INSERTS INTO HOLE IN PUMP HOUSING UNDER HELMSEAT, PUMP UP & DOWN TO OPERATE

1 1/2" (38 mm) SHIELDVAC HOSE, THRU STBD. MAIN PAN BEAM, AFT TO PORT LAZ. COMP.

PORT  
FORWARD

MANUAL BILGE PUMP PICKUP IN FWD. MAIN BILGE COMP.

DRAWING TITLE: <b>H410 MANUAL BILGR PUMP LAYOUT</b>		This document contains information for which HUNTER MARINE CORP. has proprietary rights.	
DESIGNING NO. 4108059C	REVISION NO. NONE	<b>HUNTER</b> 	
ENGINEERING DEPT.	DATE 8/26/97		

		BILGE/SUMP PUMP PARTS LIST		U.O.M.	QTY.
COMP. #					
KD030205	5	410 MANUAL BILGE PUMP PLUMBING CPNTS	CPNT		1
450272	600	P/H PHIL #8 X 1/2" S/S T/A	EA		4
450209	600	O/H PHIL 10-24 X 2" S/S M/S	EA		2
450187	600	NUT LOCK 10-24 S/S L/N	EA		2
450338	600	WASHER FINISH #10 F/W S/S	EA		4
HW0891	200	SPRING CLAMP #502-1	PR		1
PL0371	250	PUMP BILGE THRU/DECK #DP3804/BP3740	EA		1
PL0500	250	NAVY PUMP STRAINER #722	EA		1
PL0550	250	HOSE CLAMP #24	EA		4
PL0550	250	HOSE CLAMP #24	EA		4
PL0714	250	BRASS NIPPLE 1 1/4" (CLOSE)	EA		1
PL1440	250	HOSE SHIELDVAC 1 1/2"(145-1120)	FT		25
PL1500	250	HOSE CUFFS 1 1/2"(142-1120)	EA		2
PL1440	250	HOSE SHIELDVAC 1 1/2"(145-1120)	FT		3
PL0880	250	THRU HULL 1 1/2" #328-8 PVC	EA		1
KD040001	5	410 COMBINED PLUMBING/ELECT. SUB ASSY	SUB		1
KD040015	5	410 FWD SHOWER SUMP PUMP/DRAIN COMPONENT	CPNT		1
EL0670	300	WIRE BLACK SC-12 GAUGE	FT		4
EL0799	300	WIRE BROWN W/YELLOW STRIPE 12GA.	FT		21
EL0826	300	CONDUIT 3/8" 125-0380	FT		5
EL0950	300	TERMINAL C1614-SC 400/LB BLUE BUTT	EA		3
450264	600	P/H PHIL #10 X 3/4" S/S T/A	EA		4
PL0039	250	COVER,DRAIN, S/S 4" W/SCREWS H280	EA		1
PL0055	250	SINK DRAIN #SW2 90DEGREE #907014	EA		1
PL0540	250	HOSE CLAMP #10	EA		2
PL0840	250	THRU HULL 3/4" 90%	EA		1
PL1450	250	HOSE SHIELDVAC 3/4" (140-0340)	FT		11
PL0335	210	SUMP PUMP, 4137-1	EA		1
PL1480	250	HOSE CUFFS 3/4" (142-0340)	EA		2
PL1470	250	HOSE SHIELDVAC 1"(140-1000) LH	FT		9
PL1490	250	HOSE CUFFS 1" (100-1000)	EA		2

		BILGE/SUMP PUMP PARTS LIST CONT:			
COMP. #				U.O.M.	QTY.
KD040045	5	410 MAIN BILGE PUMP DRAIN COMPONENTS	CPNT		1
EL0175	200	SWITCH, BILGE, AUTO.	EA		1
EL0661	300	WIRE BROWN W/RED STRIPE 12 GA	FT		17
EL0670	300	WIRE BLACK SC-12 GAUGE	FT		5
EL0798	300	WIRE BROWN W/ORANGE STRIPE 12GA.	FT		17
EL0950	300	TERMINAL C1614-SC 400/LB BLUE BUTT	EA		3
450264	600	P/H PHIL #10 X 3/4" S/S T/A	EA		15
450112	600	F/H PHIL #8 X 3/4" S/S T/A	EA		2
450012	600	CAP - SNAP (ANTIQUE WHITE) #103 12/12	EA		15
PL0545	250	HOSE CLAMP #12	EA		2
PL0590	250	BILGE PUMP #02 1500GPH	EA		1
PL0860	250	THRU HULL 1" PLASTIC #328-6	EA		1
PL1470	250	HOSE SHIELDVAC 1"(140-1000) LH	FT		16
PL1490	250	HOSE CUFFS 1" (100-1000)	EA		2
KD040075	5	410 AFT SHOWER SUMP PUMP/DRAIN COMPONENT	CPNT		1
EL0670	300	WIRE BLACK SC-12 GAUGE	FT		5.5
EL0797	300	WIRE BROWN W/BLACK STRIPE 12GA.	FT		17
EL0950	300	TERMINAL C1614-SC 400/LB BLUE BUTT	EA		3
450112	600	F/H PHIL #8 X 3/4" S/S T/A	EA		2
450273	600	P/H PHIL #8 X 3/4" S/S T/A	EA		2
PL0335	210	SUMP PUMP, 4137-1	EA		1
PL0540	250	HOSE CLAMP #10	EA		2
PL0548	250	HOSE CLAMP #16	EA		4
PL0840	250	THRU HULL 3/4" 90%	EA		1
PL1450	250	HOSE SHIELDVAC 3/4" (140-0340)	FT		9.5
PL1480	250	HOSE CUFFS 3/4" (142-0340)	EA		2
PL0039	250	COVER,DRAIN, S/S 4" W/SCREWS H280	EA		1
PL0840	250	THRU HULL 3/4" 90%	EA		1
PL1470	250	HOSE SHIELDVAC 1"(140-1000) LH	FT		5.5
PL1490	250	HOSE CUFFS 1" (100-1000)	EA		2
PL0055	250	SINK DRAIN #SW2 90DEGREE #907014	EA		1



- ① ANCHOR WELL DRAIN\*
- ② FWD. WASTE TANK VENT\*
- ③ FWD. WASTE TANK DISCHARGE\*\*\*
- ④ FWD. HEAD RAW WATER PICKUP\*\*
- ⑤ FWD. VANITY SINK DRAIN\*\*
- ⑥ FWD. HEAD MACERATOR DISCHARGE\*\*
- ⑦ FWD. SHOWER SUMP DISCHARGE\*
- ⑧ FWD. AIR COND. DISCHARGE\*
- ⑨ REFRIGERATION DISCHARGE\*
- ⑩ DEPTH TRANSDUCER
- ⑪ KNOT (SPEED) TRANSDUCER
- ⑫ MAIN BILGE PUMP DISCHARGE\*
- ⑬ PORT H2O TANK VENT\*

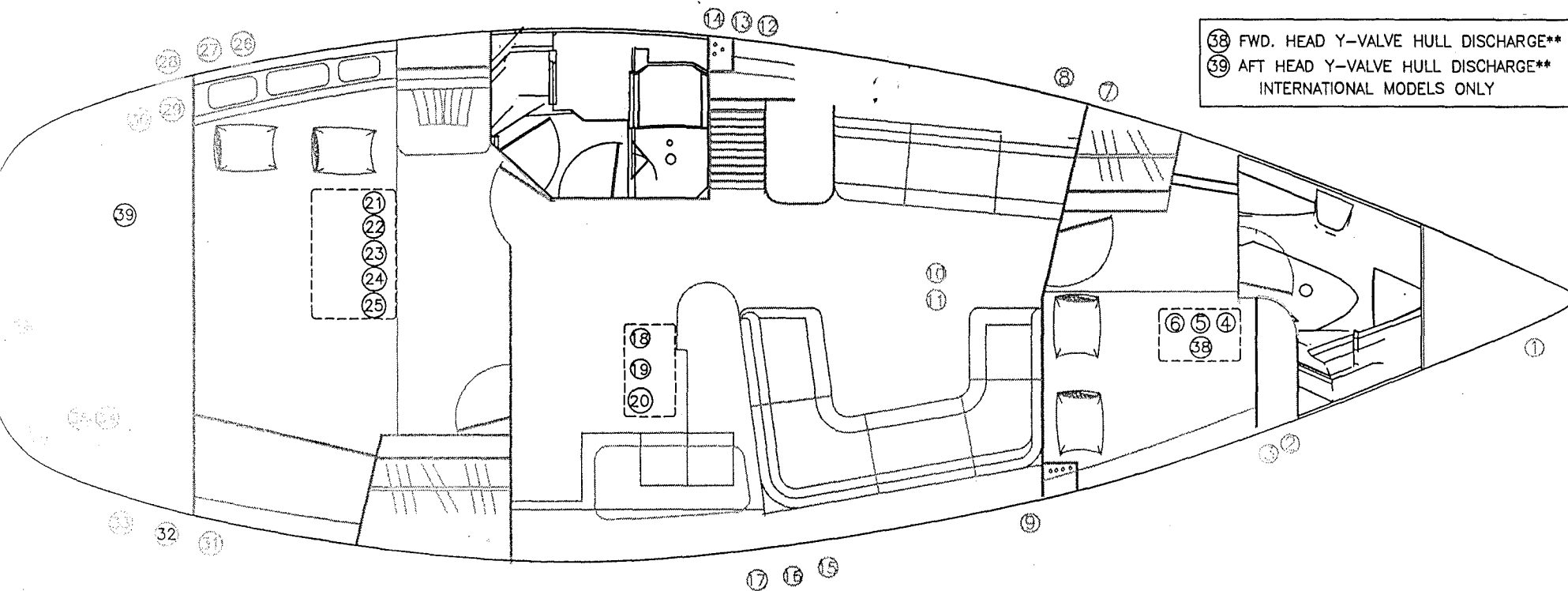
- ⑭ PORT H2O TANK FILL\*\*\*
- ⑮ AFT SHOWER SUMP DISCHARGE\*
- ⑯ STBD. H2O TANK VENT\*
- ⑰ STBD. H2O TANK FILL\*\*\*
- ⑱ AIR COND. PICKUP (BOTH UNITS)\*\*
- ⑲ REFRIGERATION PICKUP\*\*
- ⑳ GALLEY SINK DRAIN\*\*
- ㉑ AFT HEAD MACERATOR DISCHARGE\*\*
- ㉒ AFT VANITY SINK DRAIN\*\*
- ㉓ AFT HEAD RAW WATER PICKUP\*\*
- ㉔ GENERATOR RAW WATER PICKUP\*\*
- ㉕ ENGINE RAW WATER PICKUP\*\*

- ㉖ PORT ARCH DRAIN\*
- ㉗ AFT WASTE TANK VENT\*
- ㉘ FUEL TANK VENT\*
- ㉙ FUEL FILL\*\*\*
- ㉚ AFT WASTE TANK DISCHARGE\*\*\*
- ㉛ STBD. ARCH DRAIN\*
- ㉜ L.P.G. COMPARTMENT DRAIN\*
- ㉝ AFT AIR COND. DISCHARGE\*
- ㉞ AFT H2O TANK FILL\*\*\*
- ㉟ AFT H2O TANK VENT\*
- ㊱ ENGINE EXHAUST
- ㊲ GENERATOR EXHAUST

HULL FITTING =\*

SEACOCK =\*\*

DECK FITTING =\*\*\*



- ㉟ FWD. HEAD Y-VALVE HULL DISCHARGE\*\*
  - ㊱ AFT HEAD Y-VALVE HULL DISCHARGE\*\*
- INTERNATIONAL MODELS ONLY

NOTE: SEE SEACOCK PHOTOS FOLLOWING PAGE

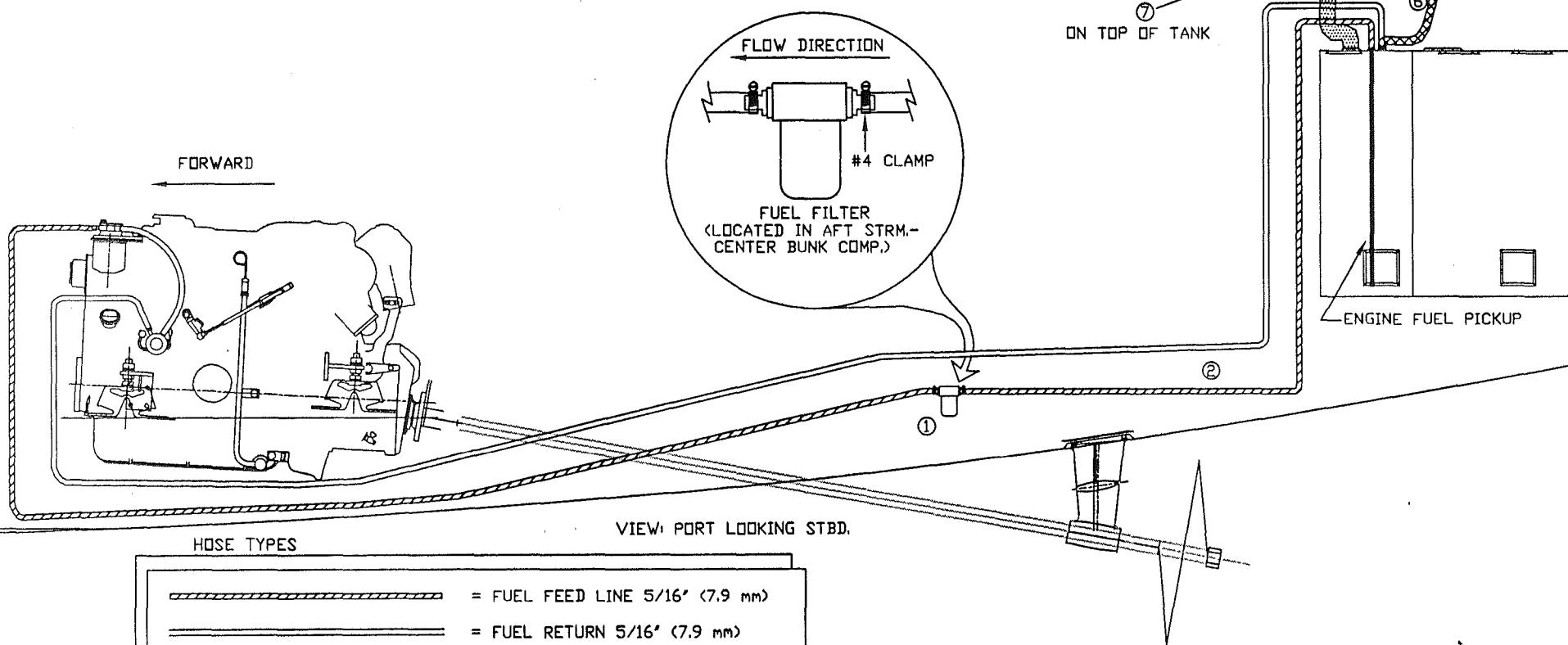
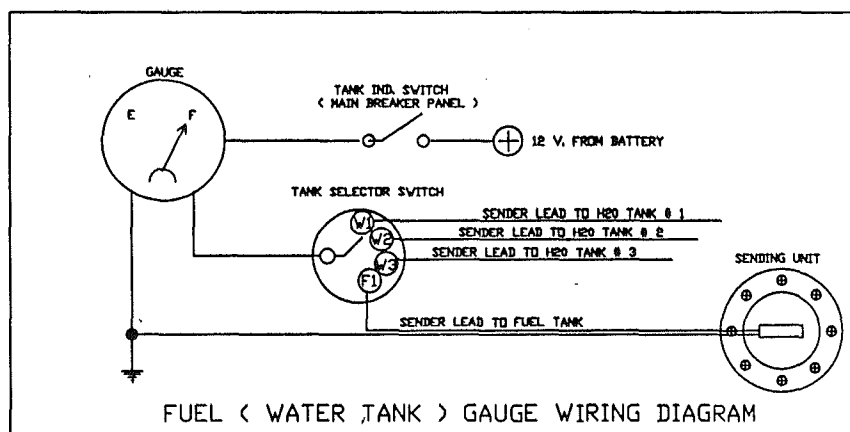
AIR COND. & GENERATOR SEACOCKS ARE OPTIONAL

NOTE: ALL SEACOCKS ARE LOCATED IN THREE COMPARTMENTS OF THE BOAT, AS SHOWN BY THIS SYMBOL.

(EXCEPTION: INTERNATIONAL MODELS, AFT HEAD Y-VALVE OVERBOARD DISCHARGE IS LOCATED IN PT. AFT SWIM SEAT LOCKER.)





DRAWING NO. 4108060A		DATE 7/21/97	
ENGINEERING DEPT.		HUNTER	

ITEM #	DESCRIPTION
1	ENGINE FUEL FILTER
2	ENGINE FUEL HOSE
3	DIESEL FILL (DECK FITTING)
4	DIESEL TANK VENT (HULL FITTING)
5	DIESEL FILL HOSE
6	DIESEL VENT HOSE
7	SENDING UNIT

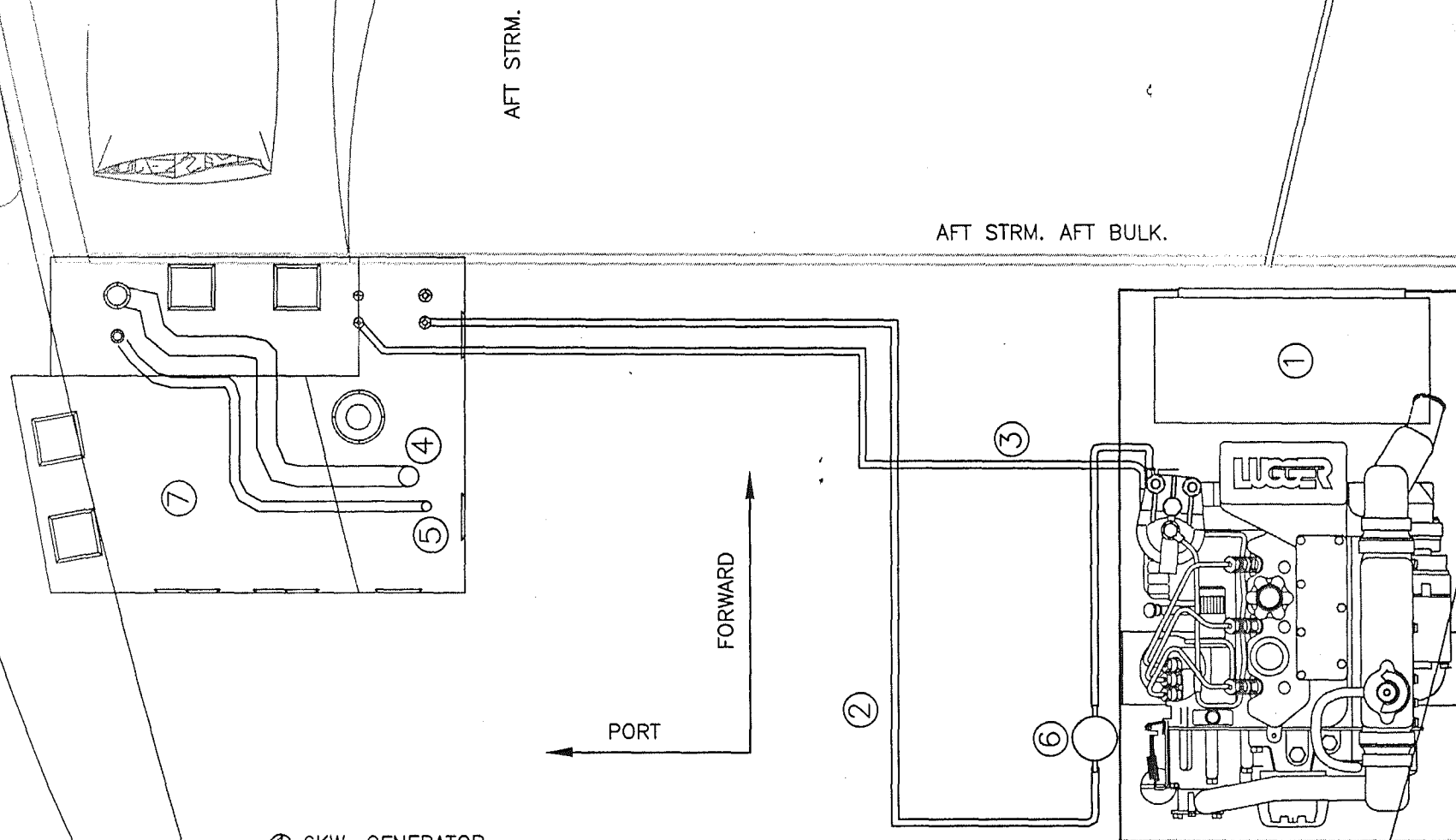


VIEW: PORT LOOKING

HOSE TYPES

	= FUEL FEED LINE 5/16" (7.9 mm)
	= FUEL RETURN 5/16" (7.9 mm)
	= FUEL VENT HOSE 3/4" (19.1 mm)
	= FUEL FILL HOSE 1 1/2" (38.1 mm)

ISSUING AGENCY		THIS DOCUMENT CONTAINS INFORMATION FOR WHICH HUNTER MACHINE CORP. HAS PROPRIETARY RIGHTS	
H410 ENGINE FUEL SYSTEM		HUNTER	
ISSUING AGENCY	RECEIVING AGENCY		
FUEL SYSTEM 8081A	NONE		
ISSUING DEPT	DATE		
ENGINEERING DEPT	7/22/97		



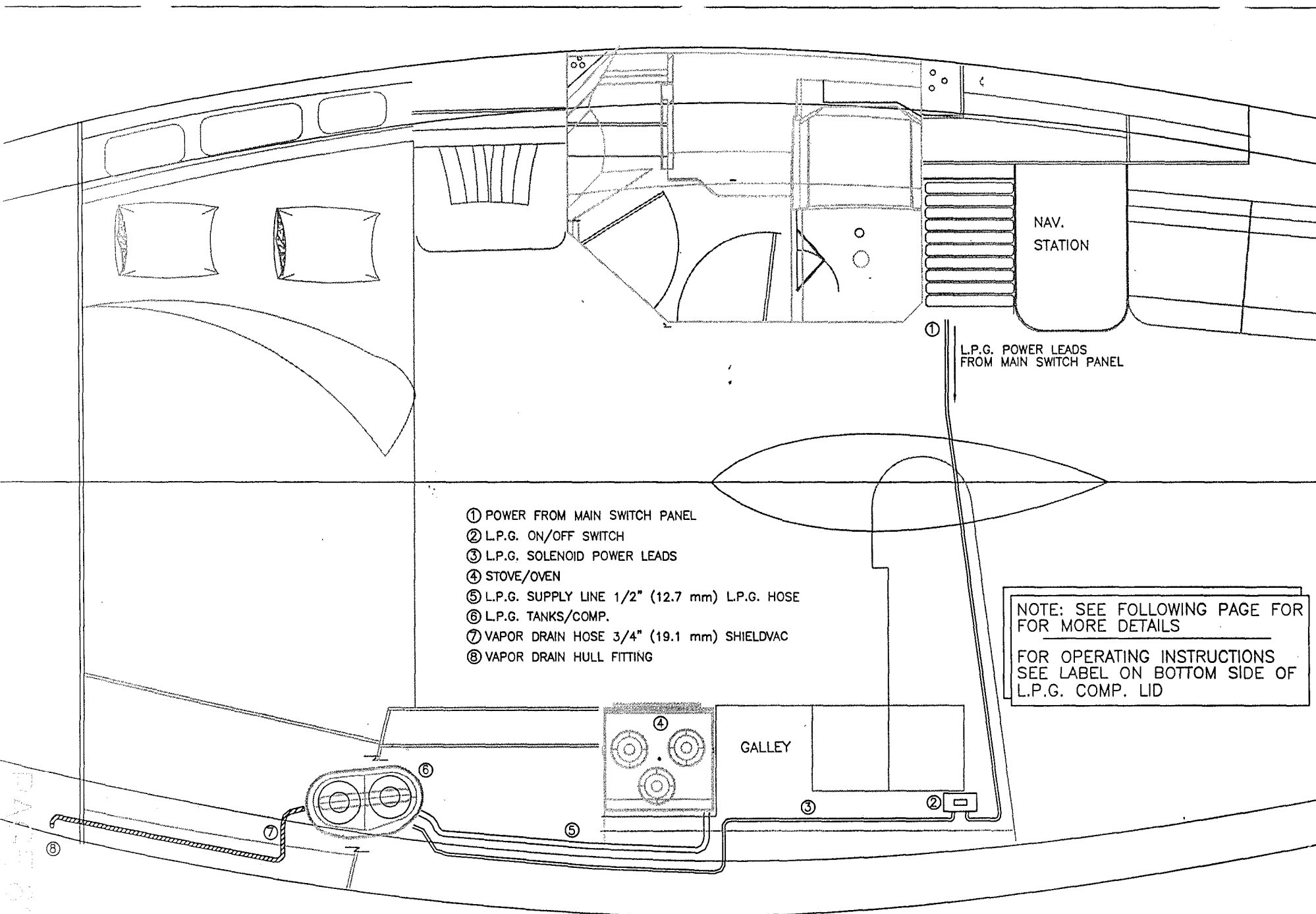
- ① 6KW. GENERATOR
- ② DIESEL FUEL FEED LINE 1/4" (6.4 mm) FUEL HOSE
- ③ DIESEL FUEL RETURN LINE 1/4" (6.4 mm) FUEL HOSE
- ④ DIESEL FUEL TANK FILL (DECK FITTING)
- ⑤ DIESEL FUEL TANK VENT (DECK FITTING)
- ⑥ PRIMARY FUEL FILTER (SEC. IS ON GEN.)
- ⑦ DIESEL FUEL TANK

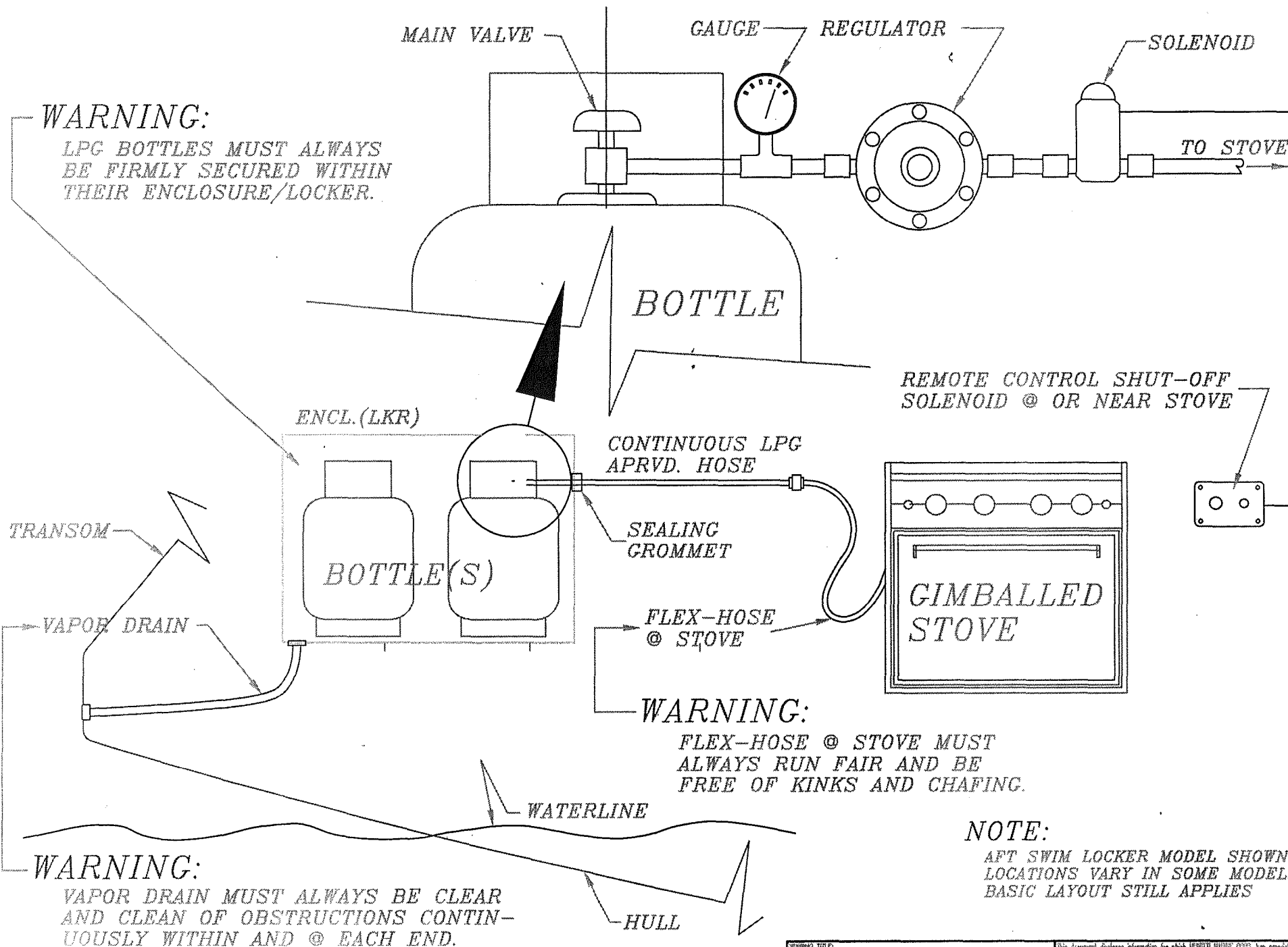
ACCESS GEN. THRU STBD. AFT SWIM SEAT

ACCESS FUEL TANK THRU PORT AFT SWIM SEAT

<b>SYNOPSIS TITLE:</b> <b>H410 GENERATOR FUEL SYSTEM</b>		<small>This document describes information for which HUNTER MARINE CORP. has proprietary rights.</small>	
<small>DESIGNED BY:</small> <b>4108061B</b>	<small>REVISION NO.:</small> <b>NONE</b>	<b>HUNTER</b>	
<small>DESIGNED BY:</small> <b>ENGINEERING DEPT.</b>	<small>DATE:</small> <b>7/22/97</b>		

FUEL SYSTEM PARTS LIST				
Component				Net
No.		Description	UOM	Q.P.A.
=====	===	=====	=====	=====
KB050001		410 ENGINE FUEL SUPPLY SUB ASSEMBLY	SUB	1
KB050005		410 FUEL TANK MOUNTING COMPONENTS	CPNT	1
EL0169-D		PANEL, P7-WF, 7 POSITION TANK DISPLAY	EA	1
EL0169-E		MOUNTING FLANGE, 3", FL-2	EA	1
450009		CABLE TIES 8" BLACK W/EYE	EA	6
450278		P/H PHIL #14 X 3/4" S/S T/A	EA	8
EL1020		TERMINAL C1614-10R 450/LB BLUE EYE	EA	2
EL0581		WIRE, DUPLEX, UL BOAT CABLE 16/2 BLK/WHT	FT	31
450264		P/H PHIL #10 X 3/4" S/S T/A	EA	6
PL1374		HOSE 5/8 FUEL SAEJ1527A2 TYPE A	FT	6
PL0520		FUEL VENT #503-4 (WATER)	EA	1
PL1530		HOSE FUEL FILL 1 1/2" 375-1126 TY A	FT	5
PL0540		HOSE CLAMP #10	EA	4
PL0550		HOSE CLAMP #24	EA	4
PL1430		HOSE BILGEFLEX(WHITE) 1 1/8"	FT	1
PL1126		DECK PLATE FUEL (DIESEL) GREEN	EA	1
450225		O/H PHIL #10 X 3/4" S/S T/A	EA	3
PR5052		TANK, FUEL (PLASTIC)	EA	1
PR5018		FITTING, 5/16" BARBX3/8" MPT BRASS	EA	2
PR5014		FUEL SENDER SU22	EA	1
PL0881		BARB, PIPE TO HOSE PVC #8001 (1/2")	EA	4
KB050015		410 FUEL FILTER MOUNTING COMPONENTS	CPNT	1
450278		P/H PHIL #14 X 3/4" S/S T/A	EA	2
PL0536		HOSE CLAMPS #6 NARROW BAND	EA	12
PL1062		ELBOW 90 DEGREE STR/ELL BR. 3/8"	EA	2
PL1370		HOSE, FUEL, 5/16" TYPE "A"	FT	18
PL1370		HOSE, FUEL, 5/16" TYPE "A"	FT	20
PR5011		FILTER, RACOR 660R-RAC-02	EA	1
PR5018		FITTING, 5/16" BARBX3/8" MPT BRASS	EA	2





		LIQUEFIED PETROLEUM GAS SYSTEM PARTS LIST			
COMP. #				U.O.M.	QTY.
KD030235	5	410 LPG BOX DRAIN PLUMBING COMPONENTS	CPNT		1
PL0540	250	HOSE CLAMP #10	EA		2
PL0840	250	THRU HULL 3/4" 90%	EA		2
PL1405	250	HOSE WATER 3/4"BLACK TYPE HEATER HWY DTY	FT		5
KD040330	5	410 LPG RANGE MOUNTING COMPONENTS	CPNT		1
HW4884	250	STOVE,3BURNER W/OVEN,LPG M#3172)	EA		1
EL0581	300	WIRE, DUPLEX, UL BOAT CABLE 16/2 BLK/WHT	FT		24
EL0581	300	WIRE, DUPLEX, UL BOAT CABLE 16/2 BLK/WHT	FT		24
450264	600	P/H PHIL #10 X 3/4" S/S T/A	EA		3
HW4938-A	250	HOSE - LP 20'	EA		1
HW4938-B	250	PANEL ONLY - LPG	EA		1
HW4938-E	250	REGULATOR LPG #93141	EA		1
HW4938-G	250	HOSE LPG @ 2' #93161	EA		1
HW4938-H	250	FITTING LPG B/H FLR #72904W/72905	EA		1
HW4938-I	250	SOLENOID LPG #93151	EA		1
HW4938-K	250	HOSE, LPG, 10"	EA		1
HW4940	250	TANK, LPG 10# TANK (#93131)	EA		1
PL0703	250	FITTING, 3/8" M. FLR X 1/4" MPT 90 BRASS	EA		2
PL0704	250	FITTING, 3/8" M. FLR X 3/8" MPT 90 BRASS	EA		1

# H410 POWER SYSTEMS OPERATING PROCEDURES

## SHORE POWER/BATTERY CHARGING OPERATION:

1. CONNECT SHORE POWER CORD #1 (AND #2 IF AIR COND. TO BE USED)
2. TURN ON A.C. RESET BREAKERS INSIDE PT. AFT COCKPIT LOCKER
3. TURN INVERTER BATTERY DRAW SELECTOR SWITCH (AT NAV. STA.) TO "BOTH" POSITION  
(NOTE: START BATTERY SWITCH SHOULD BE IN OFF POSITION AT ALL TIMES UNLESS USING ENGINE)
4. TURN ON A.C. MAINS "A & B" AT MAIN BREAKER PANEL, THIS WILL ACTIVATE BATTERY CHARGER AND TRANSFER SWITCH ON INVERTER AND AFTER A SHORT DELAY WILL PROVIDE A.C. POWER TO PANEL
5. TURN INVERTER REMOTE SWITCH AT NAV. STATION, TO THE "OFF" POSITION (NOTE: THERE IS AN ON/OFF SWITCH ON THE INVERTER UNIT ITSELF AND SHOULD REMAIN IN THE "OFF" POSITION AT ALL TIMES ON MODELS EQUIPPED WITH THE REMOTE PANEL)
6. WHEN LEAVING BOAT UNATTENDED, BE SURE INVERTER REMOTE IS IN THE "OFF" POSITION BECAUSE IF SHORE POWER IS LOST FOR ANY REASON THIS WILL PREVENT THE INVERTER FROM CONVERTING 12V.D.C. TO 110 V.A.C.(220 FOR OVERSEAS MODELS) CAUSING THE HOUSE BANK BATTERIES TO BE DRAINED.
7. THE INVERTER DRAW SELECTOR SWITCH IS ALSO THE BATTERY CHARGE SELECTOR SWITCH AND WHEN THE INVERTER REMOTE SWITCH IS IN THE OFF POSITION, THE UNIT IS AUTOMATICALLY IN THE CHARGE POSITION.

## INVERTER OPERATION:

1. TO "INVERT" 12.V.D.C. TO 110V.A.C. (220 FOR OVERSEAS MODELS) CHOOSE THE AMOUNT OF BATTERY/S YOU WILL BE DRAWING FROM BY TURNING THE INVERTER DRAW SELECTOR SWITCH TO THE "1" OR "2" OR "BOTH" POSITION. THIS SWITCH ALSO PROVIDES YOU WITH AN ISOLATION OPTION IN THE EVENT YOU HAVE A BAD BATTERY (DEAD CELL ETC.)
2. TURN THE INVERTER REMOTE SWITCH TO THE "ON" POSITION
3. TURN ON DESIRED BREAKER ON MAIN BREAKER PANEL TO PROVIDE POWER TO THAT SPECIFIC APPLIANCE.
4. NOTE: IT TAKES 10D.C. AMPS FOR THE INVERTER TO CREATE 1A.C. AMP. AND IF THE BATTERY VOLTAGE DROPS BELOW 10.5V. THE INVERTER WILL AUTOMATICALLY SHUT DOWN. ALSO **THE INVERTER DOES NOT OPERATE THE OPTIONAL AIR COND. SYSTEM** THIS IS OPERATED BY THE "SHORE POWER B" POWER SOURCE OR THE OPTIONAL GENERATOR ONLY.
5. IT IS POSSIBLE TO RUN THE D.C. MAIN BREAKER PANEL FROM ONE BATTERY AND THE INVERTER FROM THE OTHER BATTERY. THIS COMES IN HANDY FOR EXAMPLE: WHEN USING A HIGHER AMPERAGE APPLIANCE BEING DRAWN FROM THE INVERTER, THIS MIGHT CAUSE A MOMENTARY VOLTAGE DROP AND SOME EQUIP. IS VOLTAGE SENSITIVE (AN AUTO PILOT FOR EXAMPLE) AND WILL TURN OFF UNDER THIS CONDITION. TO USE THIS ISOLATION OPTION SIMPLY: A. TURN ON MAIN D.C. BREAKER THIS WILL RUN D,C, PANEL OFF BATT.#1  
B. TURN INVERTER SELECTOR SWITCH TO BATT. #2 POSITION, THIS ALLOWS THE INVERTER TO DRAW FROM BATT.#2 ONLY ISOLATING SYSTEMS RUNNING OFF THE 12V.D.C. SYSTEM  
NOTE: THIS APPLIES ONLY WHEN THERE IS NO SHORE OR GENERATOR POWER BEING PROVIDED.

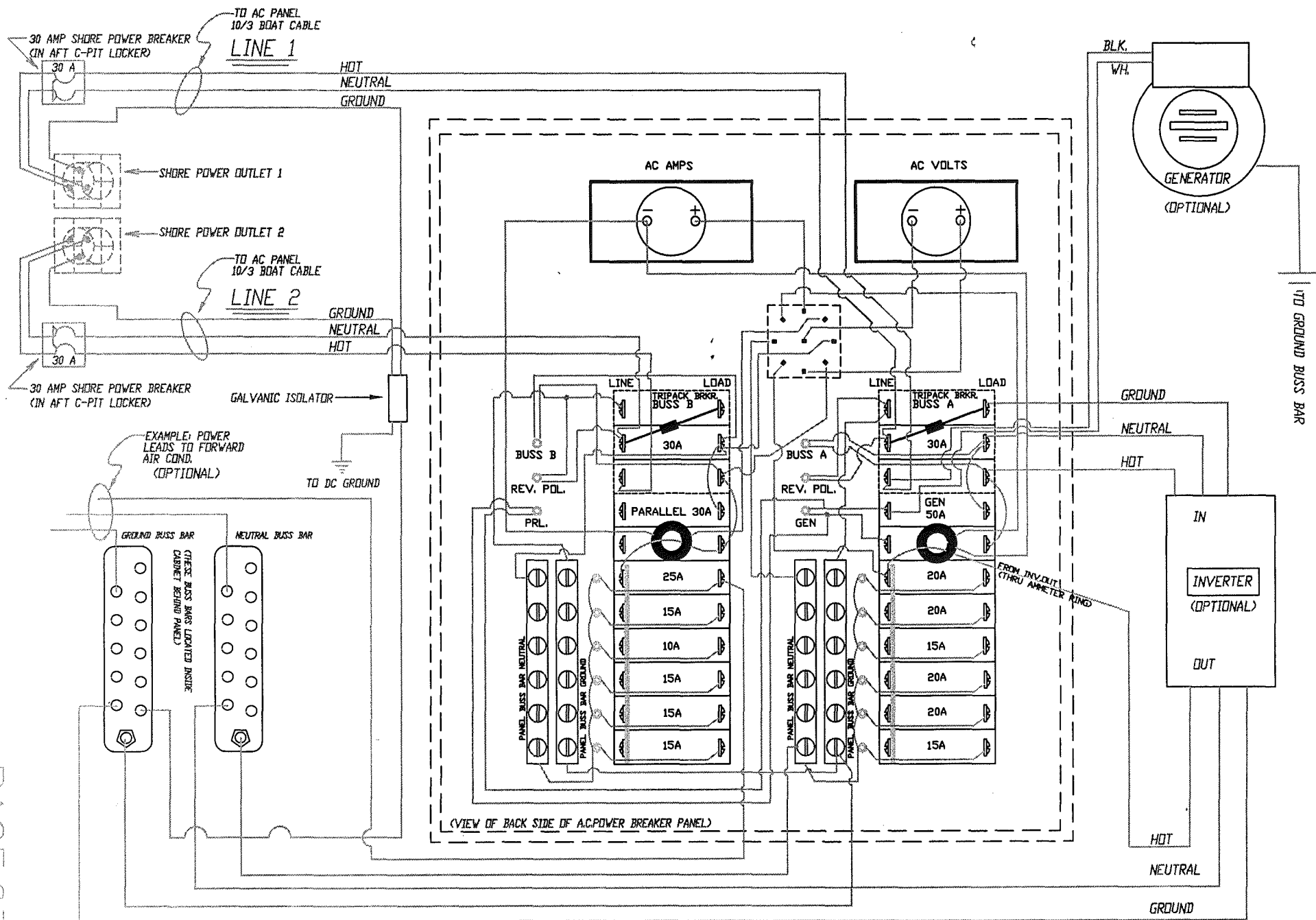
## CHARGING BATTERY/S USING THE SHIPS ENGINE:

1. TURN ON ENGINE "START BATTERY SELECTOR SWITCH"
2. USING ENGINE START PROCEDURE (SEE YANMAR MANUAL) START THE ENGINE
3. TURN INVERTER DRAW SELECTOR SWITCH TO "BOTH" POSITION TO CHARGE BOTH HOUSE BATTERIES AND TURN THE START BATTERY SELECTOR SWITCH TO THE ON POSITION.

## OPTIONAL GENERATOR POWER:

1. TURN ON ENGINE START BATT. SELECTOR SWITCH
2. USING GENERATOR START PROCEDURE (SEE GEN. MANUAL) START GENERATOR
3. TURN ON GENERATOR BREAKER ON A.C. SIDE OF MAIN BREAKER PANEL (NOTE: YOU MAY HAVE TO RAISE SLIDE BAR ON BREAKER ON SOME PANELS TO TURN THIS BREAKER ON.)
4. IF AIR COND. USED TURN ON PARALLEL BREAKER TO RUN AIR COND. AS WELL AS THE RELAY BREAKER (THIS RUNS AIR COND. CIRCULATION PUMP)
5. TO CHARGE BATTERIES FROM GENERATOR USE STEPS 3-5 UNDER SHORE POWER OPERATION WITH THE EXCEPTION BEING: THE START BATTERY SELECTOR SWITCH IS TO BE IN THE "ON" POSITION.





NOTE: DUAL SHORE POWER INLETS APPLY TO AIR COND. EQUIPPED MODELS ONLY.

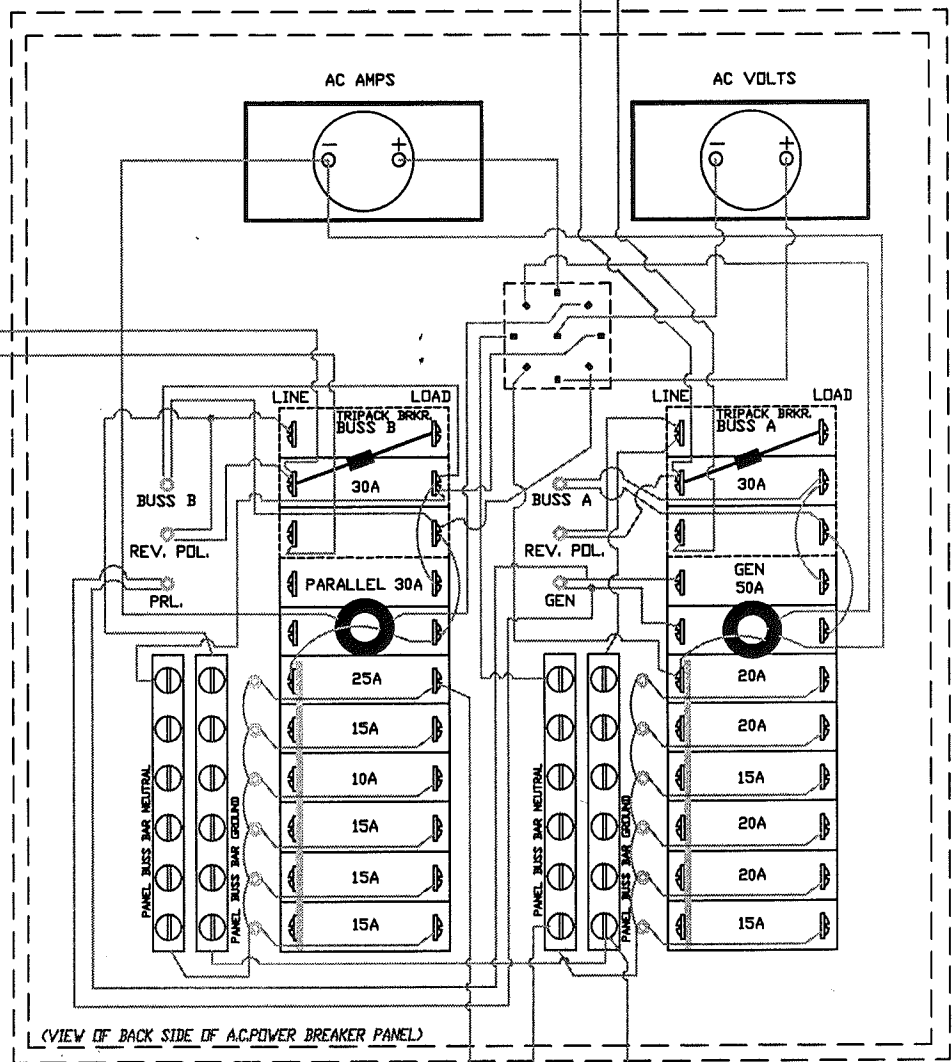
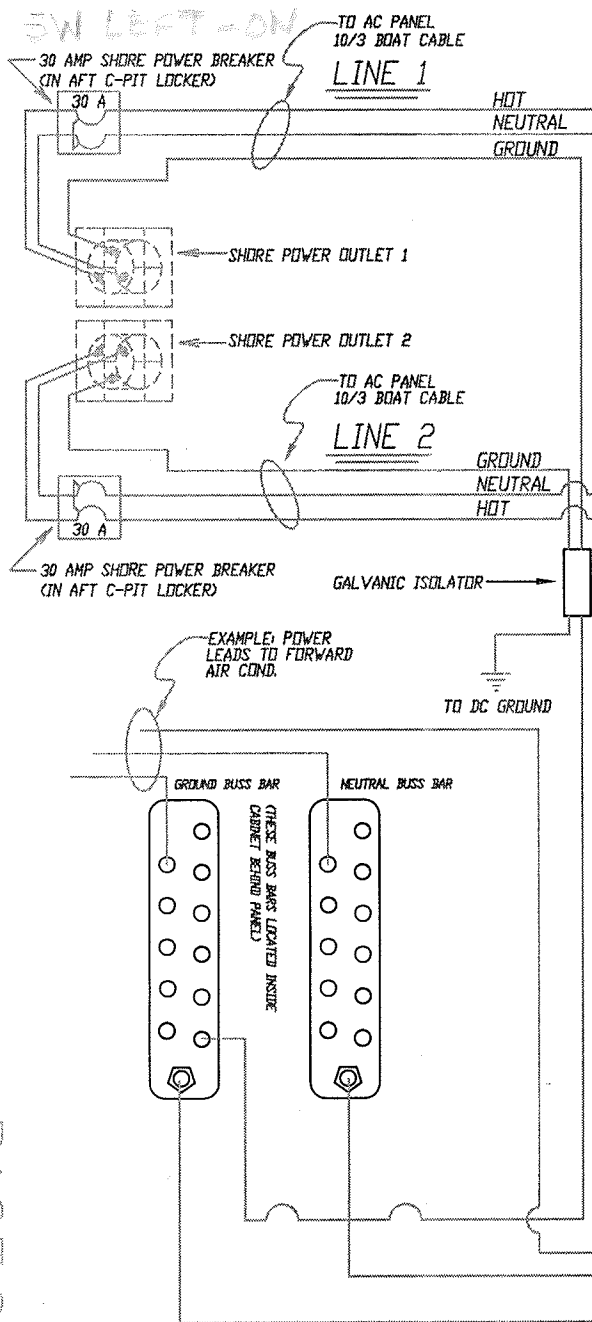
NOTE: ALL BREAKERS SHOWN MAY NOT APPLY TO ALL MODELS.

NOTE: INVERTER IS OPTIONAL ON SOME MODELS, SEE FOLLOWING PAGE FOR STD. SCHEMATIC.

DRAWING TITLE: <b>H410 A.C. POWER SCHEMATIC W/OPTIONS</b>	
DRAWING NO. 4108063A-1	REVISION NO. NONE
ENGINEERING DEPT.	DATE 7/23/97

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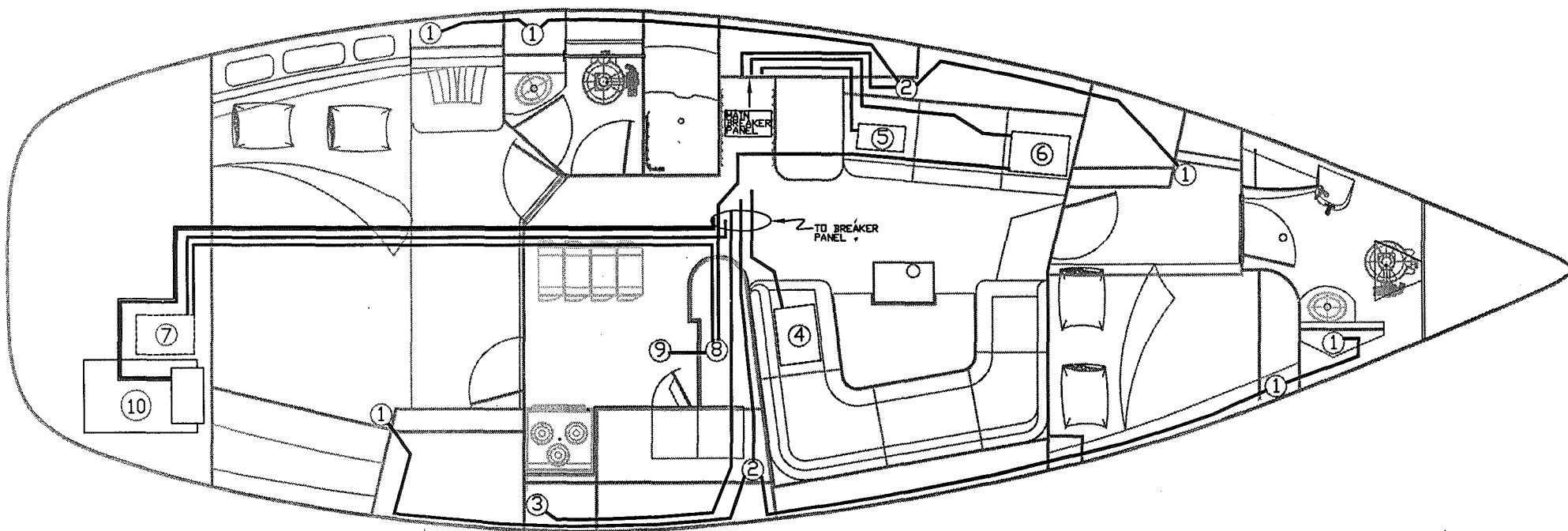
**HUNTER**




NOTE: DUAL SHORE POWER INLETS APPLY TO AIR COND. EQUIPPED MODELS ONLY.

NOTE: ALL BREAKERS SHOWN MAY NOT APPLY TO ALL MODELS.

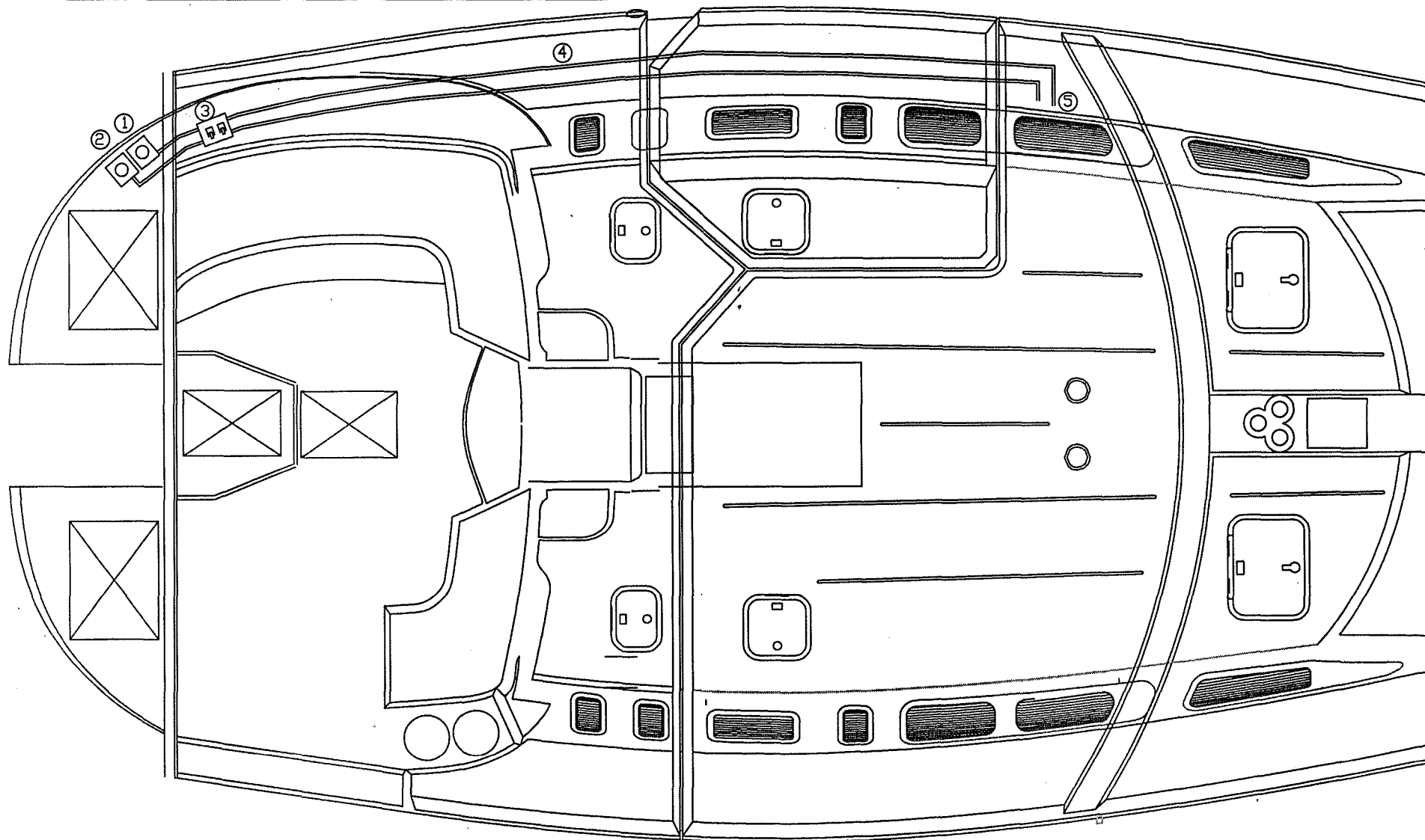




- ① = OUTLETS
- ② = G.F.I. OUTLETS
- ③ = MICROWAVE OVEN/OUTLET
- ④ = WATER HEATER
- ⑤ = OPTIONAL INVERTER/BATT. CHARGER
- ⑥ = OPTIONAL FWD. AIR COND.
- ⑦ = OPTIONAL AFT AIR COND.
- ⑧ = AIR COND. RELAY
- ⑨ = AIR COND. WATER PUMP
- ⑩ = OPTIONAL GENERATOR

DRAWING TITLE: <b>H410 AC POWER PAN WIRING</b>		This document discloses information for which HUNTER MARINE CORP. has proprietary rights.	
DRAWING NO. <b>4108063B</b>	REVISION NO. <b>NONE</b>	<b>HUNTER</b> 	
DRAWN BY: <b>ENGINEERING DEPT.</b>	DATE: <b>7/23/97</b>		

10/3 CABLE RUNS THRU PORT SIDE OF HEADLINER TO 30 AMP. BREAKER,  
 RUNS FORWARD FROM BREAKER, THEN DROPS DOWN TO MAIN BREAKER PANEL  
 (SEE PAGE 63A-1 THRU 63A-3 FOR SHORE POWER & 30 amp. BREAKER DETAILS TO PANEL)



- ① SHORE POWER #1
- ② SHORE POWER #2
- ③ 30 amp. SHORE POWER BREAKER
- ④ 10/3 BOAT CABLE (2)
- ⑤ TO MAIN BREAKER PANEL

NOTE: DUAL SHORE POWER INLETS  
 PROVIDED FOR AIR COND. EQUIPPED  
 MODELS ONLY

DRAWING TITLE: <b>H410 AC WIRING HEADLINER</b>		This document discloses information for which HUNTER MARINE CORP. has proprietary rights.	
DESIGNING NO. 4108063C	REVISION NO. NONE	<b>HUNTER</b> 	
DESIGNED BY ENGINEERING DEPT.	DATE 7/24/97		

## SECTION 63D...OPTIONAL AIR COND. SYSTEMS


### BASIC OPERATING INSTRUCTIONS:

- ① HOOK UP BOTH SHORE POWER CORDS (OR USE OPT. GENERATOR)
- ② TURN ON MAIN A.C. BREAKER AT MAIN PANEL
- ③ CHECK SEA STRAINER, (BELOW GALLEY SOLE) CLEAN IF NECESSARY
- ③ OPEN RAW WATER PICKUP SEACOCK BELOW GALLEY SOLE \_\_\_\_\_ (SEE PHOTO PAGE 60B)
- ④ TURN ON RELAY BREAKER UNDER AIR COND. BREAKERS
- ⑤ TURN ON DESIRED AIR COND. BREAKER/S
- ⑥ TURN ON UNIT/S AT THERMOSTAT DISPLAY PANEL AND SET TEMP.

#### NOTE:

IF THERE IS NO POWER AT PANEL WHEN CONNECTED TO SHORE POWER,  
CHECK MAIN BREAKERS INSIDE PORT AFT COCKPIT LOCKER

SEE MARINE AIR MANUAL FOR DETAILED TROUBLESHOOTING—  
OPERATING/PROGRAMMING INSTRUCTIONS

DRAWING TITLE <b>H410 OPTIONAL AIR COND. OPER. INST</b>		This document contains information for which HUNTER MARINE CORP. has proprietary rights.	
DRAWING NO. <b>4108063D-1</b>	REVISION NO. <b>NONE</b>	<b>HUNTER</b> 	
DESIGNED BY <b>ENGINEERING DEPT.</b>	DATE <b>7/26/97</b>		

- ① FWD. A.C. UNIT
- ② A.C. UNIT CONTROL BOX
- ③ RAW WATER LINE FROM PUMP TO FWD. A.C. UNIT
- ④ RAW WATER DISCHARGE (HULL FITTING)
- ⑤ POWER CABLE (10/3) FROM BREAKER PANEL TO FWD. A.C. CONTROL BOX
- ⑥ POWER WIRE FROM FWD. A.C. CONTROL BOX TO RELAY UNDER GALLEY SOLE
- ⑦ RAW WATER CIRCULATION PUMP
- ⑧ RAW WATER PICKUP, SEACOCK & SEA STRAINER — (SEE PHOTO ON PAGE 60B)
- ⑨ RELAY & POWER WIRE TO CIRCULATION PUMP
- ⑩ RAW WATER LINE FROM PUMP TO AFT A.C. UNIT
- ⑪ POWER WIRE FROM AFT A.C. CONTROL BOX TO RELAY UNDER GALLEY SOLE
- ⑫ POWER CABLE (10/3) FROM BREAKER PANEL TO AFT A.C. CONTROL BOX
- ⑬ THERMOSTAT DISPLAY & WIRE TO FWD.A.C. CONTROL BOX



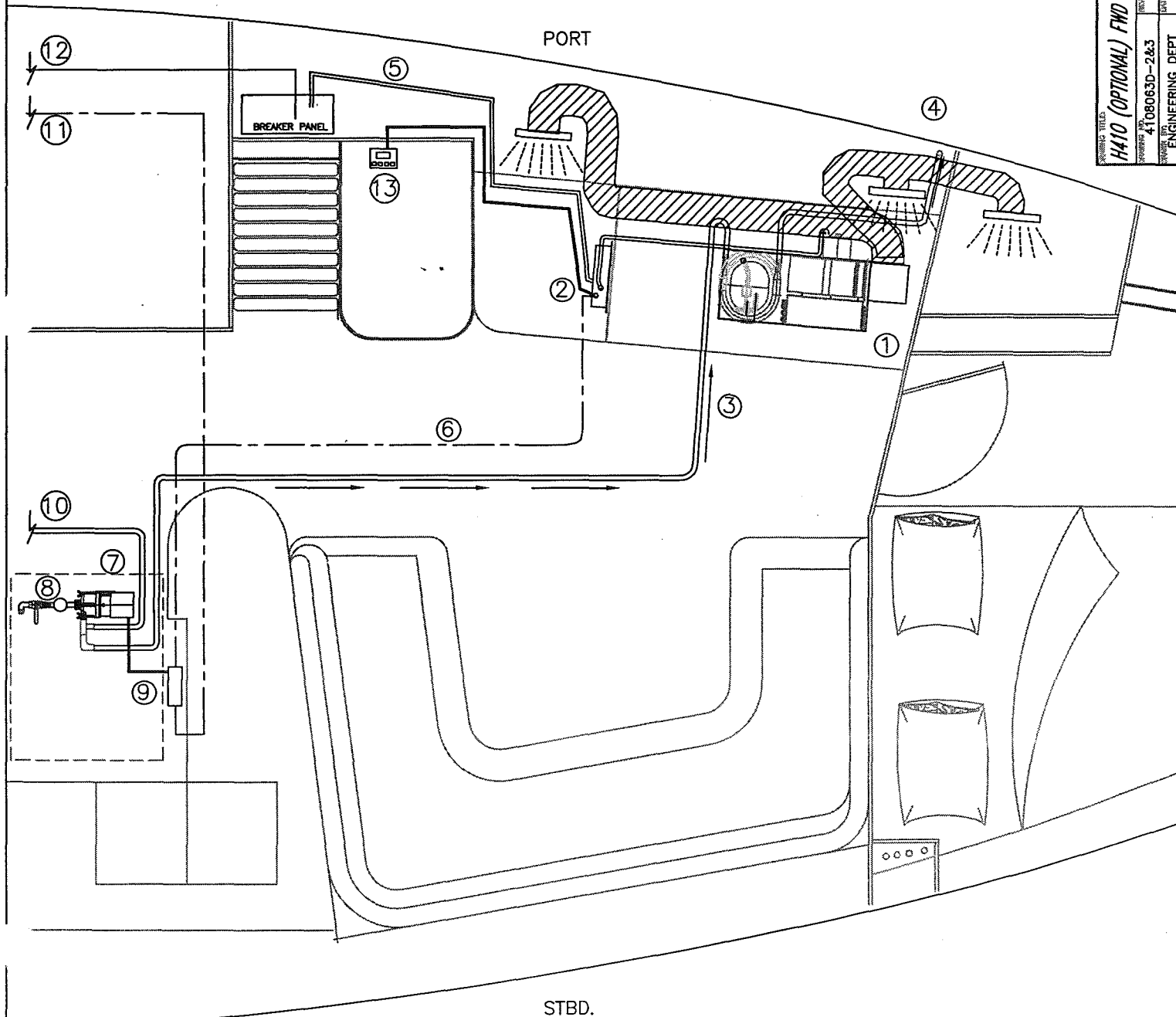
= AIR VENTS



= DUCT HOSE



= RAW WATER FLOW DIR.



HUNTER

H410 (OPTIONAL) FWD AIR COND. LAYOUT

DRAWING NO. 4108063D-2&3

REVISION NO. NONE

DATE 7/25/97

ENGINEERING DEPT

- ① RAW WATER LINE FROM PUMP TO AFT A.C. UNIT
- ① POWER WIRE FROM AFT A.C. CONTROL BOX TO RELAY UNDER GALLEY SOLE
- ② POWER CABLE (10/3) FROM BREAKER PANEL TO AFT A.C. CONTROL BOX
- ③ AFT A.C. UNIT
- ④ A.C. UNIT CONTROL BOX
- ⑤ THERMOSTAT DISPLAY & WIRE TO AFT A.C. CONTROL BOX
- ⑥ RAW WATER DISCHARGE



= DUCT HOSE

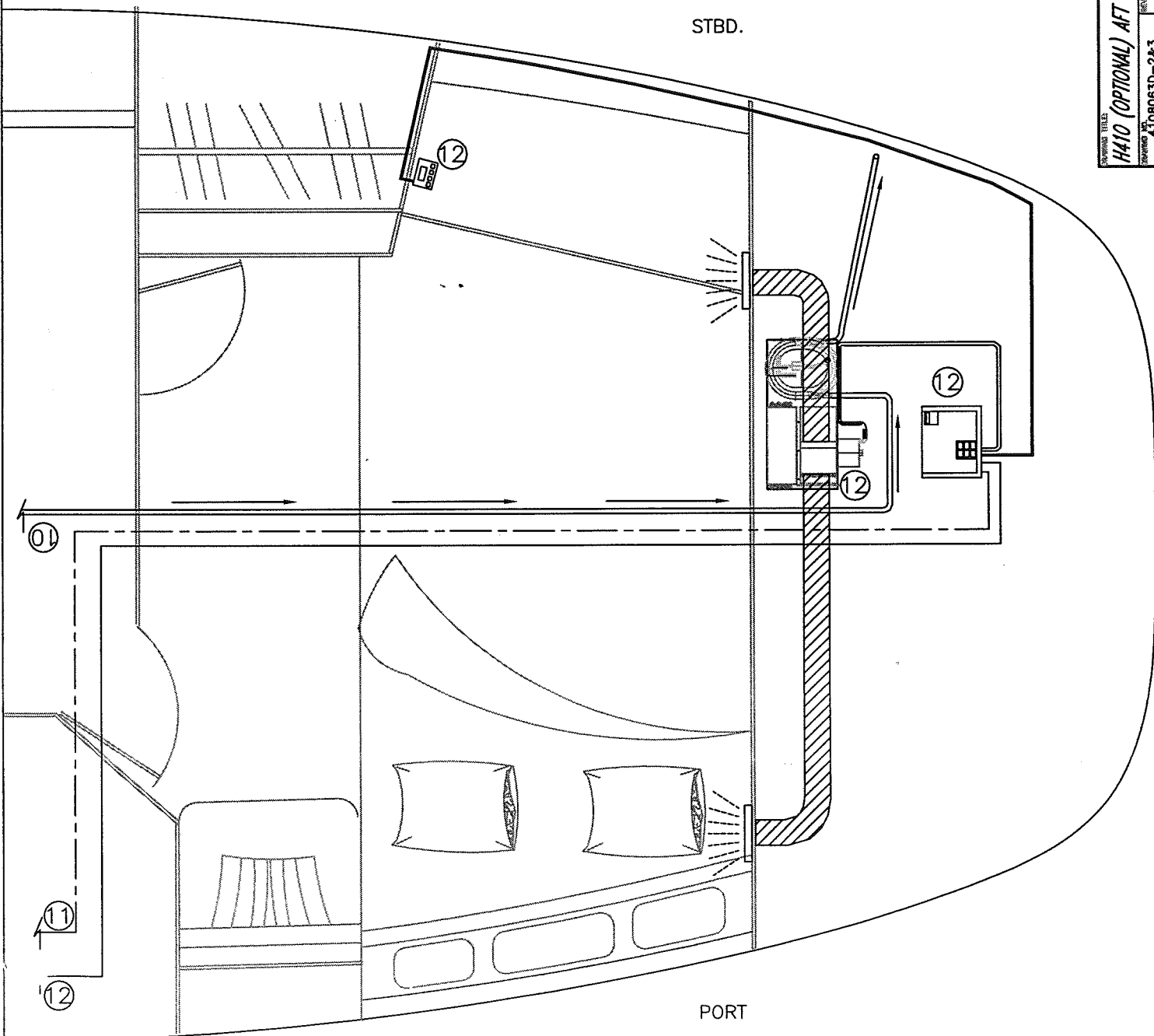


= VENTS



= RAW WATER FLOW DIR.

STBD.



PORT

HUNTER

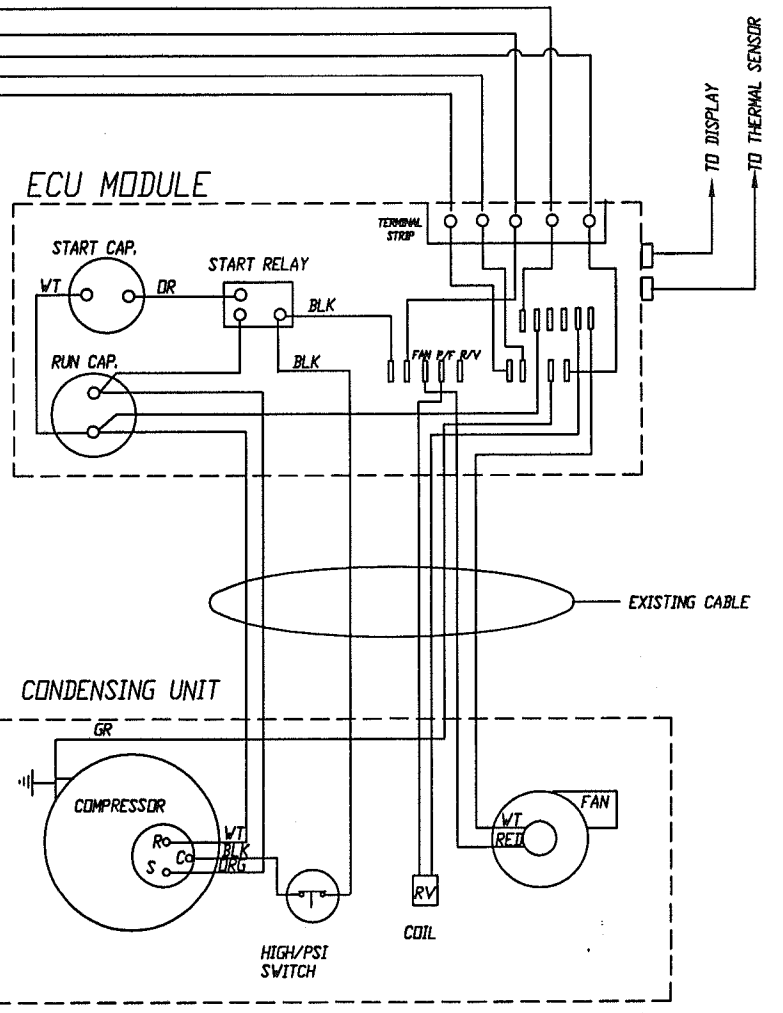
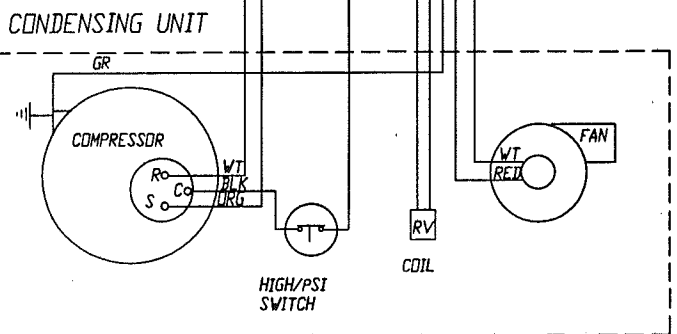
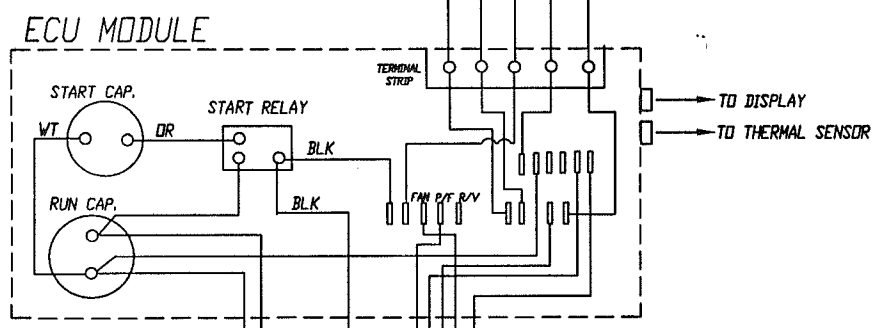
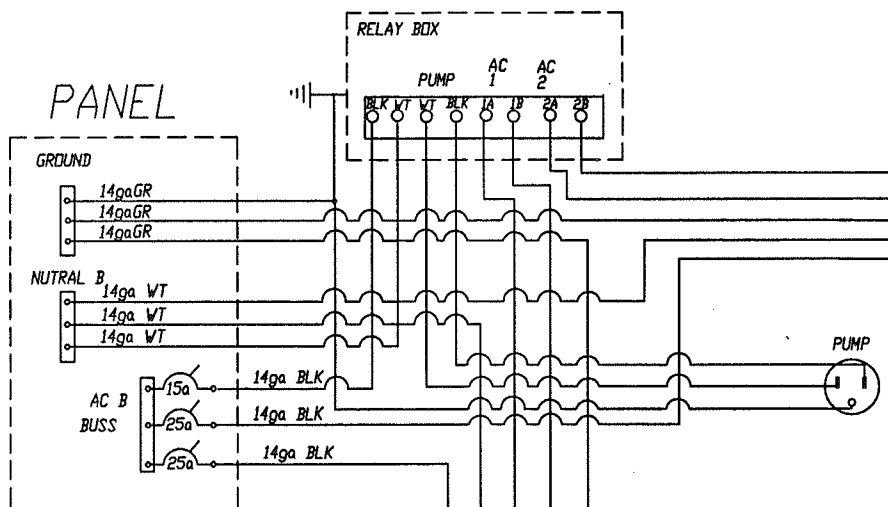
H410 (OPTIONAL) AFT AIR COND. LAYOUT

REVISION NO. NONE

DATE 7/25/97

ENGINEERING DEPT





PAGE 63D-1

OPTIONAL AIR CONDITIONING PARTS LIST				
Stg	Component	Cls.		Net
No.	No.	No.	Description	UOM Q.P.A.
=====	=====	=====	=====	=====
KE020050		5	410 AIR CONDITIONER COMPONENT	CPNT 1
26 PR5020		999	AIR CONDITIONING KIT (OPT)	UT 1
26 EL1500		890	A/C, COMPRESSOR 16000 BTU, 110 VOLT	EA 1
26 EL1510		570	REFRIGERATION PUMP 110 VAC	EA 1
26 EL1506		890	A/C, COMPRESSOR 7000 BTU, 110 VOLT	EA 1
26 PL0414		250	THRU-HULL CONN.W/BARB 1/2" 65-7-97BF	EA 2
26 PL0460		210	STRAINER,INTAKE, #65-005-PLB	EA 1
26 PL0498		150	STRAINER, 3/4" LINE 18001(AC/GEN OPT)	EA 1
26 PL0498-A		150	BRACKET, STRAINER,3/4"LINE 14240	EA 1
26 PL0540		250	HOSE CLAMP #10	EA 8
26 PL0548		250	HOSE CLAMP #16	EA 7
26 PL0663-A		250	BALL VALVE 3/4" #70-104-10	EA 1
26 PL0673		250	BARB, HOSE, BRASS, 3/4"	EA 1
26 PL1065		150	ELBOW 90 DEG.STR/ELL BR. 3/4"	EA 1


KE020015		5	410 AC STANDARD KIT COMPONENT	CPNT	1
EL1513		300	DUCTING A/C, 4"	FT	24
EL1514		300	DUCTING A/C, 5"	FT	12
EL1515		300	HOSE, A/C, 5/8" SEAWATER	FT	50
EL0560		300	WIRE 14/3 MARINE POWER	FT	28
EL0560		300	WIRE 14/3 MARINE POWER	FT	20
EL0560		300	WIRE 14/3 MARINE POWER	FT	18
EL0570		300	WIRE 10/3 MARINE POWER	FT	20
EL0570		300	WIRE 10/3 MARINE POWER	FT	26
EL1560		890	SUPPLY GRILL, BROWN 45A	EA	2

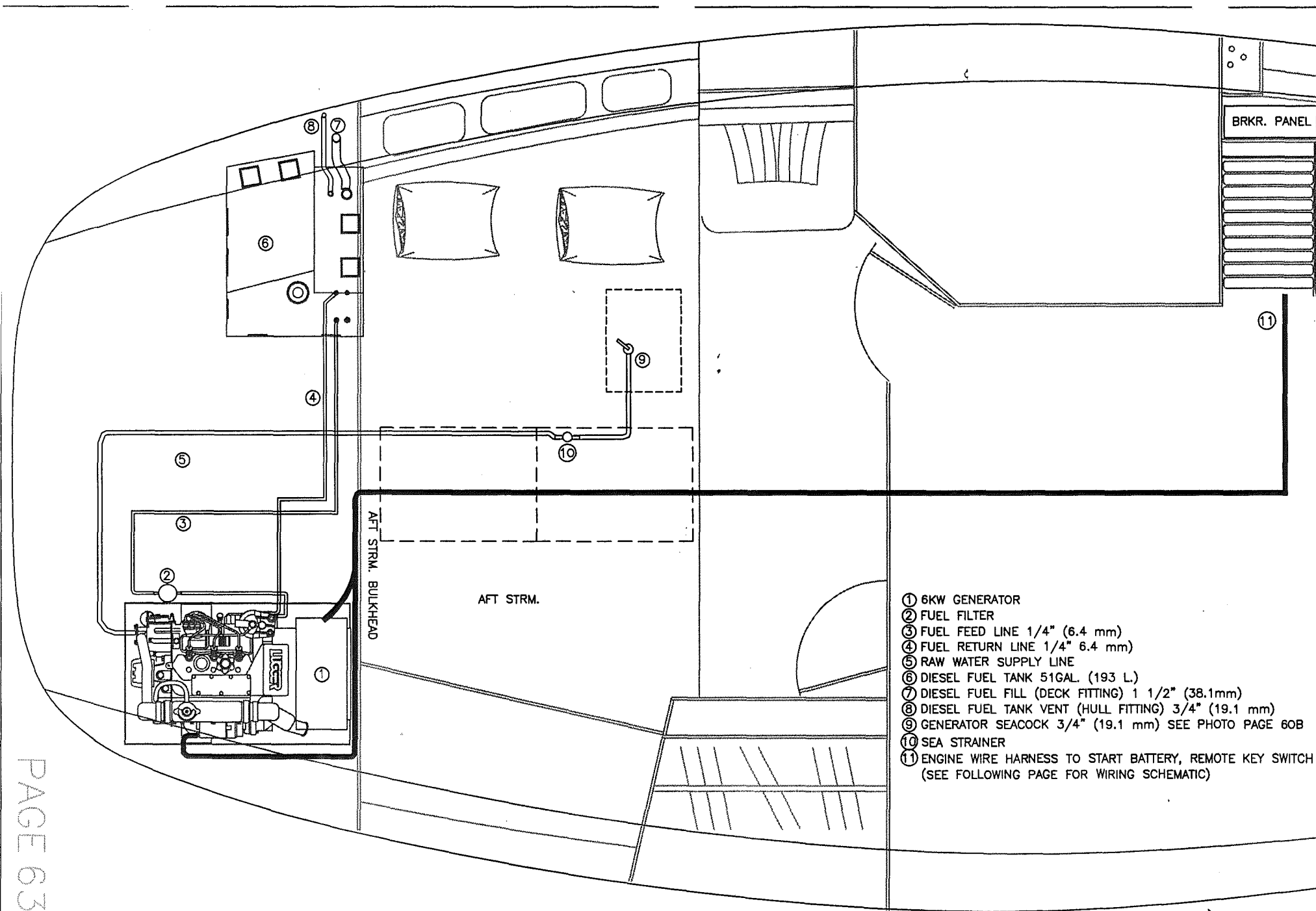
## SECTION 63E OPTIONAL GENERATOR SYSTEM...

BASIC OPERATING INSTRUCTIONS: (NOTE: READ GENERATOR MANUAL BEFORE OPERATING GEN.)

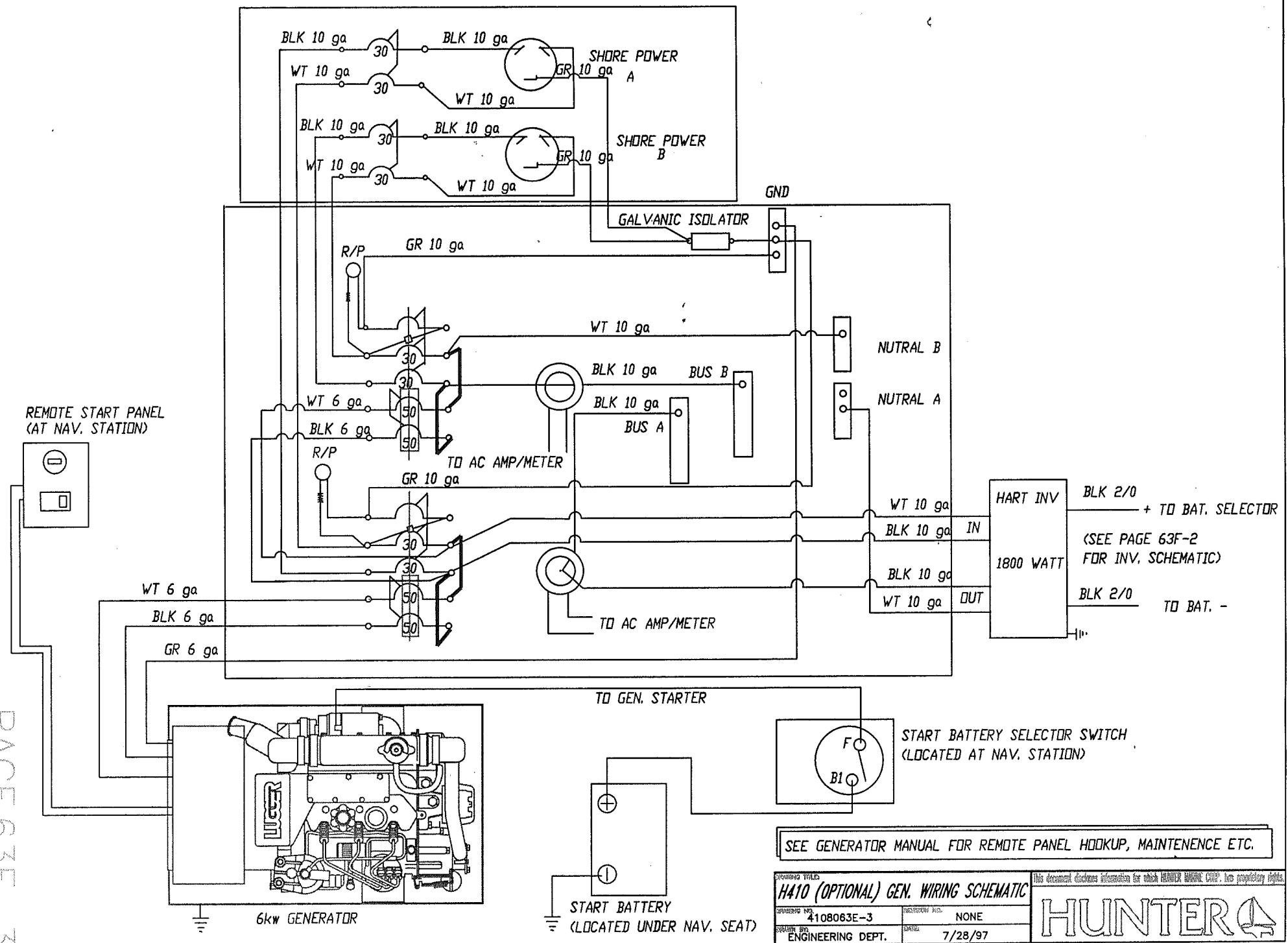
- ① FILL DIESEL FUEL TANK WITH DIESEL FUEL
- ② CHECK OIL LEVEL IN GENERATOR (SEE GEN. MANUAL FOR INST.)
- ③ TURN ON START BATTERY SELECTOR SWITCH (AT NAV. STA.)
- ④ CHECK SEA STRAINER UNDER (CENTER) AFT BERTH BUNK COMP. CLEAN IF NEC.
- ⑤ OPEN RAW WATER SEACOCK UNDER AFT BERTH BUNK (SEE PHOTO PAGE 60B)
- ⑥ PUSH START SWITCH ON GEN. START PANEL AT NAV. STATION TO  
START GEN. DO NOT RUN STARTER FOR MORE THAN 10 SECONDS AT A TIME  
WITH 15 SECONDS INBETWEEN, IF GEN. DOESN'T START CONSULT  
GENERATOR MANUAL.
- ⑦ TO SHUT GEN. DOWN PUSH STOP SWITCH UNTIL GEN STOPS.

NOTE: SEE GENERATOR MANUAL FOR PROPER MAINTENENCE, TRUOBLESHOOTING, ETC.

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DRAWING NO. <b>4108063E-1</b>	REVISION NO. <b>NONE</b>	<b>HUNTER</b> 	
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- ① 6KW GENERATOR
- ② FUEL FILTER
- ③ FUEL FEED LINE 1/4" (6.4 mm)
- ④ FUEL RETURN LINE 1/4" 6.4 mm)
- ⑤ RAW WATER SUPPLY LINE
- ⑥ DIESEL FUEL TANK 51GAL. (193 L.)
- ⑦ DIESEL FUEL FILL (DECK FITTING) 1 1/2" (38.1mm)
- ⑧ DIESEL FUEL TANK VENT (HULL FITTING) 3/4" (19.1 mm)
- ⑨ GENERATOR SEACOCK 3/4" (19.1 mm) SEE PHOTO PAGE 60B
- ⑩ SEA STRAINER
- ⑪ ENGINE WIRE HARNESS TO START BATTERY, REMOTE KEY SWITCH (SEE FOLLOWING PAGE FOR WIRING SCHEMATIC)



OPTIONAL GENERATOR PARTS LIST				
Stg Component	Cls.			Net
No. No.	No.	Description	UOM	Q.P.A.
=====	=====	=====	=====	=====
KE020500	5	410 GENERATOR OPTION	CPNT	1
26 C00195	560	LABEL,THRUHULL,"GENERATOR PICKUP"	EA	1
23 CH0475	150	FUEL DIESEL	GL	5
23 EL0452	300	CABLE BATTERY BLACK 2/0	FT	20
23 EL0451	300	CABLE BATTERY RED 2/0	FT	25
23 EL0480	300	WIRE, BLACK 6 GUAGE	FT	31
23 EL0485	300	WIRE WHITE 6 GUAGE	FT	31
23 EL0482	300	WIRE GREEN 6 GUAGE	FT	31
23 EL0810	300	CONDUIT 1 1/4" BLACK 125-1140	FT	12
23 EL0825	300	CONDUIT 3/4" 125-0340	FT	9
27 450011	600	CABLE TIES BLACK, 15" W/ EYE .	EA	30
27 450264	600	P/H PHIL #10 X 3/4" S/S T/A	EA	40
27 450143	600	HEX HD 3/8 X 1 1/2" S/S L/B	EA	4
27 450342	600	WASHER FLAT 3/8" S/S F/W	EA	4
27 450348	600	WASHER LOCK 3/8" S/S L/W	EA	4
24 HW3465	150	GENERATOR, 6KW 1PH,120/240VOLT H43	EA	1
26 HW3465-A	77	GENERATOR,PANEL, 120VOLT,1PH W/HARN H43	EA	1
26 PL0430	150	FUEL FILTER - RACOR #110-HUNT-01	EA	1
26 PL0481	250	BRASS THRU HULL FITTING 3/4" #65-BN7-50	EA	1
26 PL0498	150	STRAINER, 3/4" LINE 18001(AC/GEN OPT)	EA	1
26 PL0498-A	150	BRACKET, STRAINER,3/4"LINE 14240	EA	1
26 PL0530	250	HOSE CLAMP #4	EA	12

OPTIONAL GEN. PARTS LIST CONT:

26 PL0540	250	HOSE CLAMP #10	EA	8
26 PL0570	250	HOSE CLAMP #32	EA	4
26 PL0550	250	HOSE CLAMP #24	EA	4
26 PL0663-A	250	BALL VALVE 3/4" #70-104-10	EA	1
26 PL0673	250	BARB, HOSE, BRASS, 3/4"	EA	1
26 PL0725	250	HOSE BARB TO MPT BRASS 1/4" X 1/4"	EA	4
26 PL0882	250	BARB, PIPE TO HOSE PVC #8002 (3/4")	EA	2
26 PL1080	150	ELBOW 90 DEG. STR/ELL BR. 1/4" FPT/MPT	EA	2
26 PL1415	250	HOSE FUEL 1/4" TYPE "A" SAEJ1527 A1	FT	11
26 PL1415	250	HOSE FUEL 1/4" TYPE "A" SAEJ1527 A1	FT	9
26 PL1526	250	HOSE SHIELD FLEX 3/4" TYPE 2091	FT	10
26 PL1526	250	HOSE SHIELD FLEX 3/4" TYPE 2091	FT	9
26 PL1710	175	TUBE GLASS 2" X 1/8" S-500 -5615-1	FT	0.5
26 PL1625	250	HOSE 2"(CORGATED)EXHAUST TYPE 252-2006	FT	8
26 PL1109	890	MUFFLER, GENERATOR 6K.W. 1.5"X1.5" H43	EA	1
26 PL1550	250	HOSE, 1 1/2" CORR.EXHAUST HOSE H43	FT	5
26 PL0429-A	5	FUEL FITTING #225		1
56 450318	600	T/H PHIL #8 X 3/4" BLACK OXIDE S/S M/S	EA	4
KE020510	5	410 GENERATOR BLOWER COMPONENT	CPNT	1
28 EL0640	300	WIRE YELLOW SC-12 GAUGE	FT	25
28 EL0670	300	WIRE BLACK SC-12 GAUGE	FT	15
28 EL0825	300	CONDUIT 3/4" -125-0340	FT	6
27 450008	600	CABLE TIES 15" W/O EYE BLACK	EA	6
27 450267	600	P/H PHIL #6 X 1/2" S/S T/A	EA	6
27 450264	600	P/H PHIL #10 X 3/4" S/S T/A	EA	3
26 PL1435	300	HOSE BLOWER VENT 4"	EA	10
26 HW3418	200	BLOWER INLINE #70404 4" INLINE	EA	1
31 HW6039	210	VENT, LOUVERED, WHITE #337415 H450	EA	1
16 PL1720	200	EXHAUST TUBE GLASS 2" X 1/4" S-500	EA	1


## SECTION 63F...OPTIONAL INVERTER SYSTEM

### BASIC OPERATING INSTRUCTIONS:

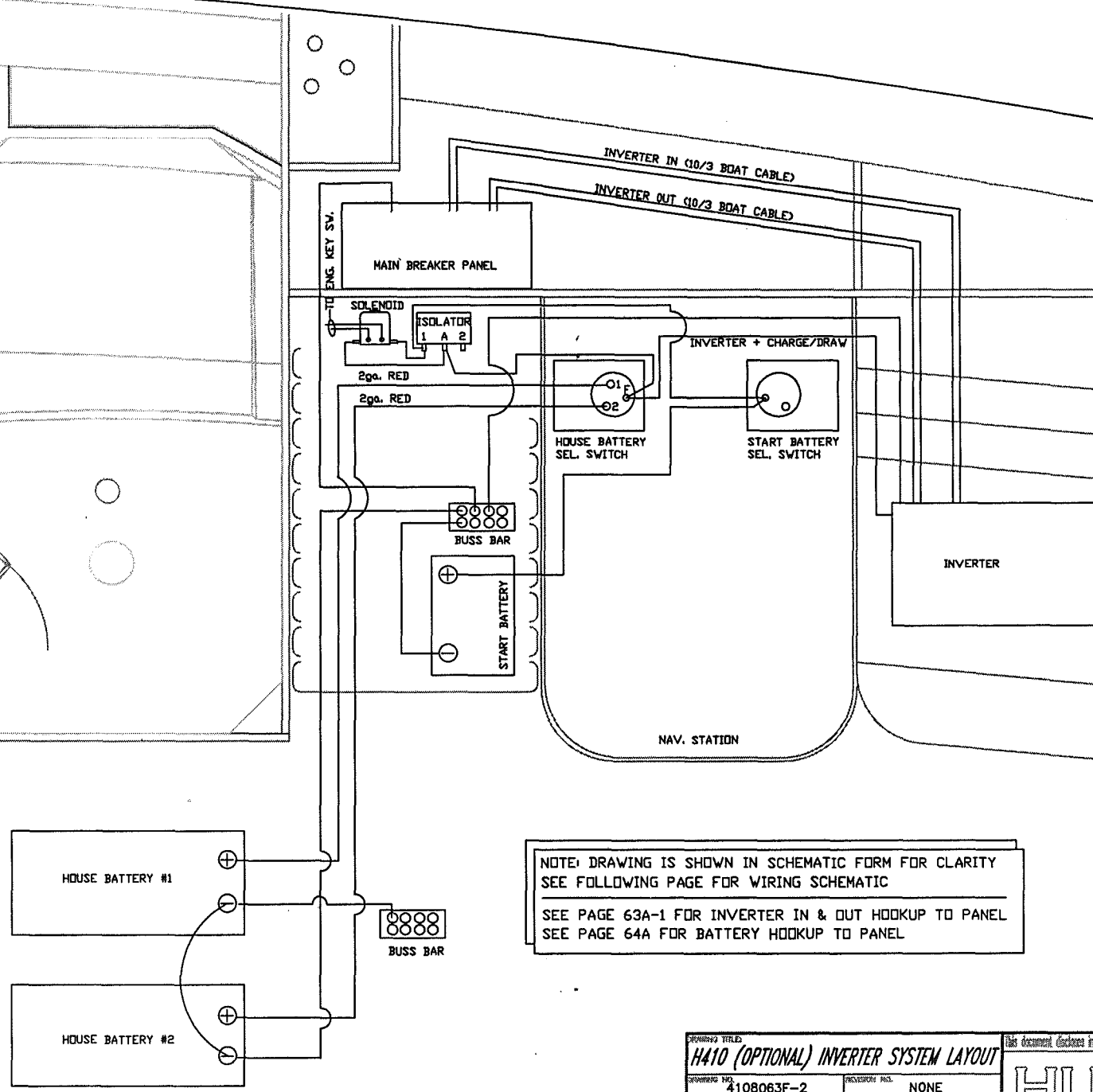
- ① TURN ON HOUSE BATTERY SELECTOR SWITCH
- ② TURN ON MAIN A.C. & MAIN D.C. BREAKERS AT MAIN PANEL
- ③ TURN ON INVERTER AT REMOTE PANEL AT NAV. STATION
- ④ TURN ON APPROPRIATE APPLIANCE BREAKER AT MAIN BRKR. PANEL

#### NOTE:

SEE INVERTER MANUAL FOR TECHNICAL DATA, TROUBLESHOOTING, ETC.  
OPERATING/PROGRAMMING INSTRUCTIONS

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REVISION NO. <b>4108063F-1</b>	PREVIOUS EDITION <b>NONE</b>	<b>HUNTER</b> 	
DESIGNED BY <b>ENGINEERING DEPT.</b>	DATE: <b>7/26/97</b>		





NOTE: DRAWING IS SHOWN IN SCHEMATIC FORM FOR CLARITY  
SEE FOLLOWING PAGE FOR WIRING SCHEMATIC  
SEE PAGE 63A-1 FOR INVERTER IN & OUT HOOKUP TO PANEL  
SEE PAGE 64A FOR BATTERY HOOKUP TO PANEL

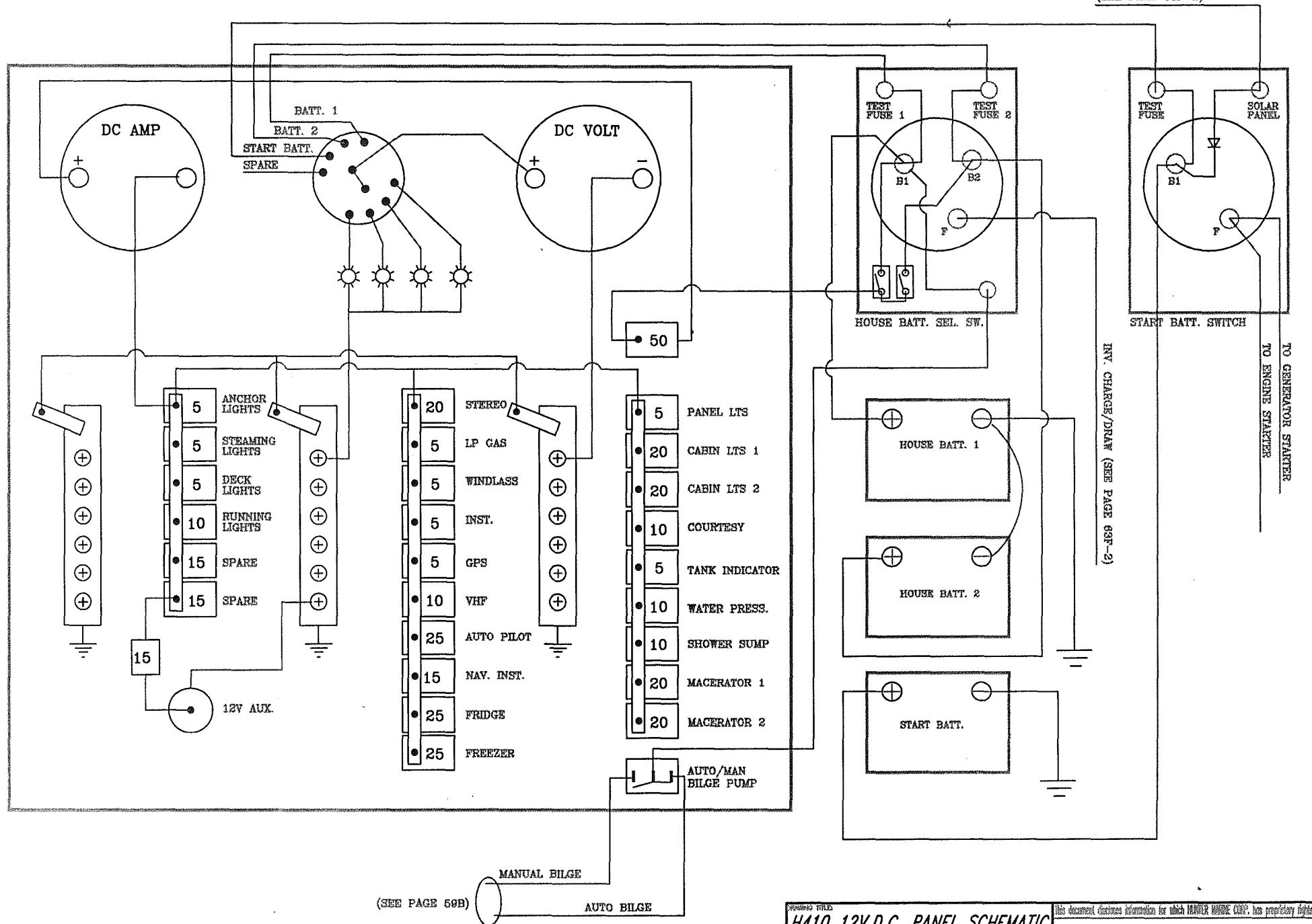


OPTIONAL INVERTER SYSTEM PARTS LIST				
Stg	Compone	Cls.		Net
No.	No.	Description	UOM	Q.P.A.
=====	=====	=====	=====	=====
KE040090	5	410 INVERTER COMPONENT	CPNT	1
26 EL0204	300	INVERTER,FREEDOM 20 W/82-0100-03 12VOLT	EA	1
23 EL0570	300	WIRE 10/3 MARINE POWER	FT	14
23 EL0570	300	WIRE 10/3 MARINE POWER	FT	14
23 EL0810	300	CONDUIT 1 1/4" BLACK 125-1140	FT	15
23 EL0826	300	CONDUIT 3/8" 125-0380	FT	6
27 EL0940	600	TERMINAL C1210-SC 180/LB YELLOW BUTT	EA	6
27 450008	600	CABLE TIES 15" W/O EYE BLACK	EA	20
27 450264	600	P/H PHIL #10 X 3/4" S/S T/A	EA	20
27 450242	600	P/H PHIL 1/4-20 X 1 1/2"S/S MS	EA	4
27 450189	600	NUT LOCK 1/4-20 S/S L/N	EA	4
27 450333	600	WASHER FLAT 1/4" S/S F/W	EA	4
26 EL0220	300	ELECTRICAL COVER MED. (VACCUM)BLACK	EA	1
26 EL1560	890	SUPPLY GRILL, BROWN 45A	EA	2
56 450318	600	T/H PHIL #8 X 3/4" BLACK OXIDE S/S M/S	EA	4

COMP. #		A.C. VOLTAGE SYSTEM PARTS LIST	U.O.M.	QTY.
KE010001	5	410 ELECTRICAL ASSEMBLY	ASSY	1
KE020001	5	410 110 VOLT ELECTRICAL SUB ASSEMBLY	SUB	1
KE020010	5	410 RECEPTACLE, 110 GFI BOX COMPONENT	CPNT	1
EL0044	300	PLATE, RECEPTACLE, IVORY, PLASTIC H376	EA	2
EL0051	300	RECEPTACLE, WATERP. PLASTIC, 4976-G4	EA	2
EL0060	300	DUPLEX RECEPTACLES #5320-1 IVORY	EA	7
EL0080	300	SWITCH BOX SWB RACO #410 3"X2" NON-GANG	EA	7
EL0084	300	RECEPTACLE - GFI #6599I	EA	2
EL0215	300	ELECTRICAL COVER SM. (VACCU) BLACK	EA	4
EL0560	300	WIRE 14/3 MARINE POWER	FT	106
EL0950	300	TERMINAL C1614-SC 400/LB BLUE BUTT	EA	10
EL1020	300	TERMINAL C1614-10R 450/LB BLUE EYE	EA	24
EL1030	300	TERMINAL C1210-10R 250/LB YELLOW EYE	EA	54
450267	600	P/H PHIL #6 X 1/2" S/S T/A	EA	42
EL0424	300	BUSS BAR #M449 - 10 GANG	EA	2
KE020020	5	410 GFI OUTLETS COMPONENT	CPNT	1
EL0058	300	BOX - RECEPTACLE #LCOW (FOR GFI RECP.)	EA	2
EL0084	300	RECEPTACLE - GFI #6599I	EA	2
EL0560	300	WIRE 14/3 MARINE POWER	FT	10
EL1020	300	TERMINAL C1614-10R 450/LB BLUE EYE	EA	6
EL1030	300	TERMINAL C1210-10R 250/LB YELLOW EYE	EA	6
450267	600	P/H PHIL #6 X 1/2" S/S T/A	EA	8
KE020060	5	410 BATTERY CHARGER COMPONENT	CPNT	1
EL0209	300	BATTERY, CHARGER, 12 VOLT 30 AMP	EA	1
EL1000	300	TERMINAL C 8-3/8R 120/LB RED EYE	EA	6
EL0804	300	WIRE ORANGE W/RED STRIPE 8GA	FT	6
EL0801	300	WIRE RED W/BLACK STRIPE 8GA. TINN/COPPER	FT	7
EL0802	300	WIRE RED W/WHITE STRIPE 8GA.	FT	12
EL0560	300	WIRE 14/3 MARINE POWER	FT	14
KE020070	5	410 SHORE POWER INLET COMPONENT	CPNT	1
PL1657	250	PIPE 1 1/2" PVC SCH160	FT	14
EL0112	300	PANEL, SHOREPOWER RESET BREAKER, ALUM	EA	1
EL0570	300	WIRE 10/3 MARINE POWER	FT	24
EL0570	300	WIRE 10/3 MARINE POWER	FT	29
EL1030	300	TERMINAL C1210-10R 250/LB YELLOW EYE	EA	29
450011	600	CABLE TIES BLACK, 15" W/ EYE.	EA	6
450267	600	P/H PHIL #6 X 1/2" S/S T/A	EA	12
450264	600	P/H PHIL #10 X 3/4" S/S T/A	EA	16
450224	600	O/H PHIL #10 X 3/4" B/O T/A	EA	8
LG0100	300	INLET #303SSEL-B (SHIP/SHORE)	EA	2
LG0101	300	ADAPTER #104A (SHIP/SHORE)	EA	2
LG0102	300	CORDSET MOLDED 50' #50PCM	EA	2
PL1627	250	TUBING ENT 1" NM #205-300	FT	14

		A.C. VOLTAGE SYSTEM PARTS LIST CONT:			
COMP. #				U.O.M.	QTY.
KE040110	5	410 MICROWAVE OVEN WIRING COMPONENT	CPNT		1
EL0044	300	PLATE,RECEPTABLE,IVORY,PLASTIC H376	EA		1
EL0060	300	DUPLEX RECEPTACLES #5320-1 IVORY	EA		1
EL0080	300	SWITCH BOX SWB RACO #410 3"X2" NON-GANG	EA		1
EL0560	300	WIRE 14/3 MARINE POWER	FT		29
EL1020	300	TERMINAL C1614-10R 450/LB BLUE EYE	EA		6
450267	600	P/H PHIL #6 X 1/2" S/S T/A	EA		6
HW5869	300	MICROWAVE,.6 CF GOLDSTAR MA680	EA		1
PX2095	175	PLEX,MICROWAVE TRIM RING P-450	EA		1
EL0424	300	BUSS BAR #M449 - 10 GANG	EA		2

(SEE PAGE 63F-2)

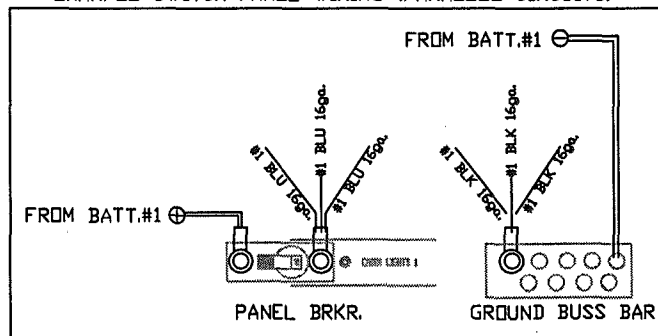


(SEE PAGE 59B)

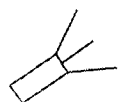
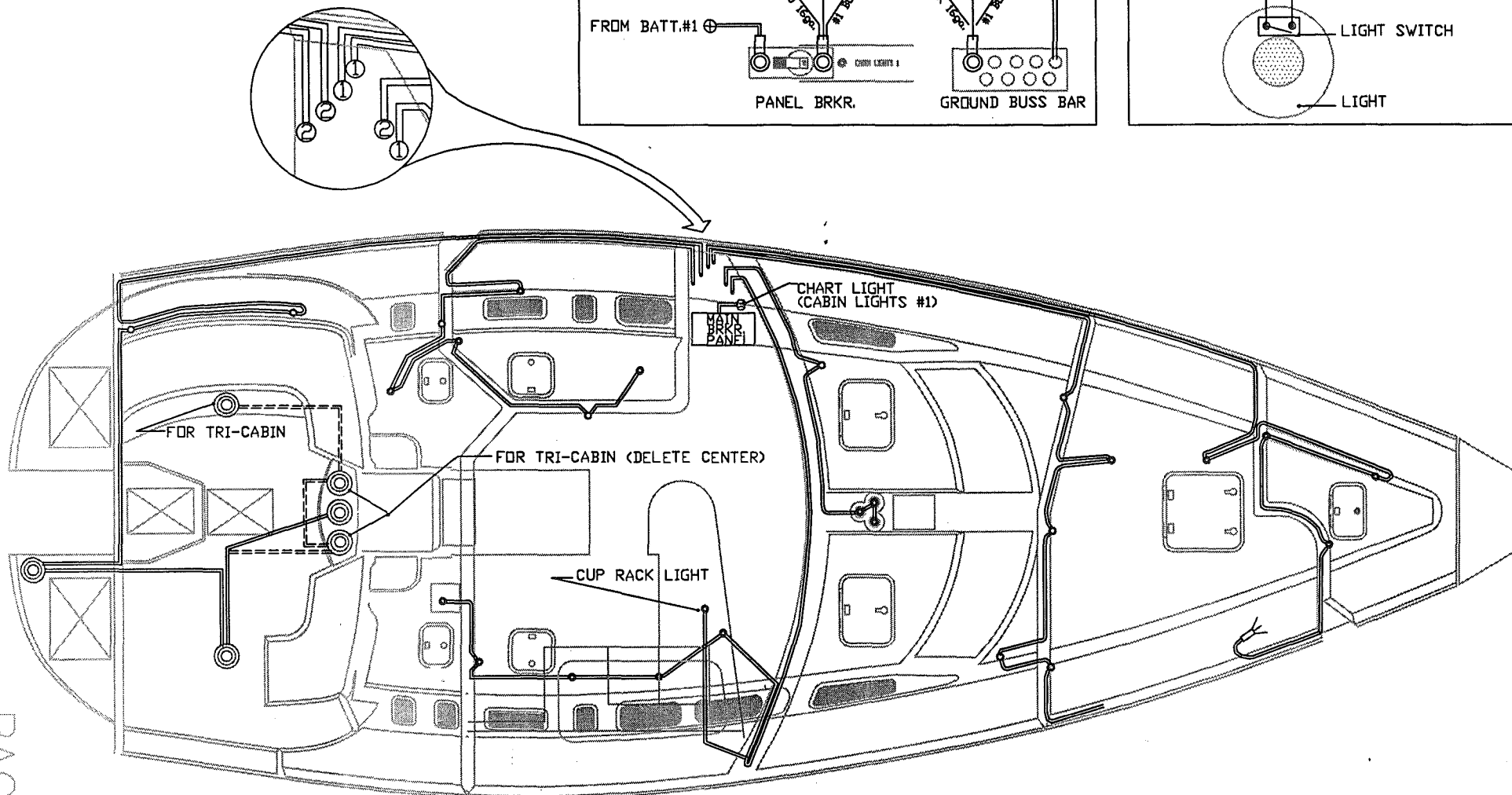
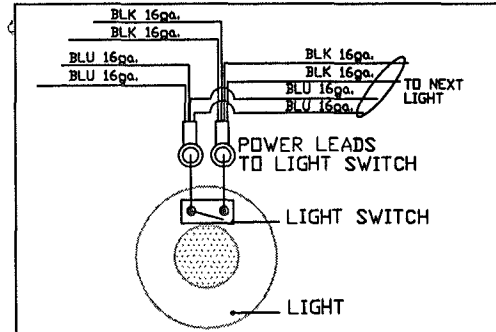
EACH CIRCUIT IN PARALLEL, 16ga. BLU (LOAD TO BREAKER)  
AND 16ga. BLK. GROUND TO GROUND BUSS BAR (SEE EX.)

#1 & #2 = CABIN LIGHTS #1 & #2 CIRCUITS

#### EXAMPLE SWITCH PANEL WIRING (PARALLEL CIRCUITS)



#### EXAMPLE LIGHT WIRING (PARALLEL CIRCUITS)



= READING LIGHT



= RECESSED LIGHT



= DOME LIGHT

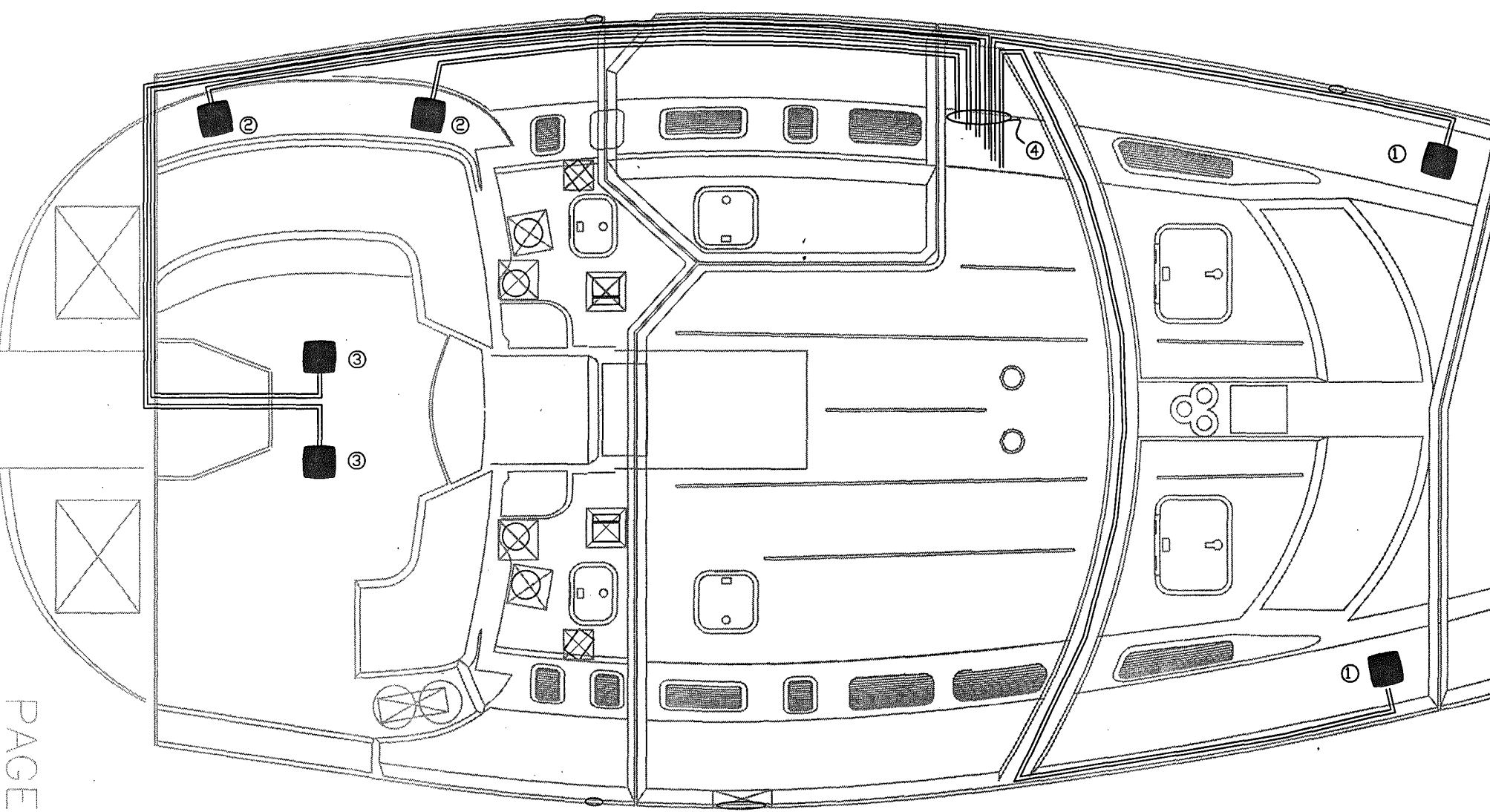
NOTE: SEE PAGE 64J FOR FIXTURE AND REPL. BULB PART #,S

FORMING TITLE	H410 12V. LIGHTS WIRING (HEADLINER)		This document discloses information for which HUNTER MARINE CORP. has proprietary rights.
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ENGINEERING DEPT.		DATE	7/26/97


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PAGE 64B-2



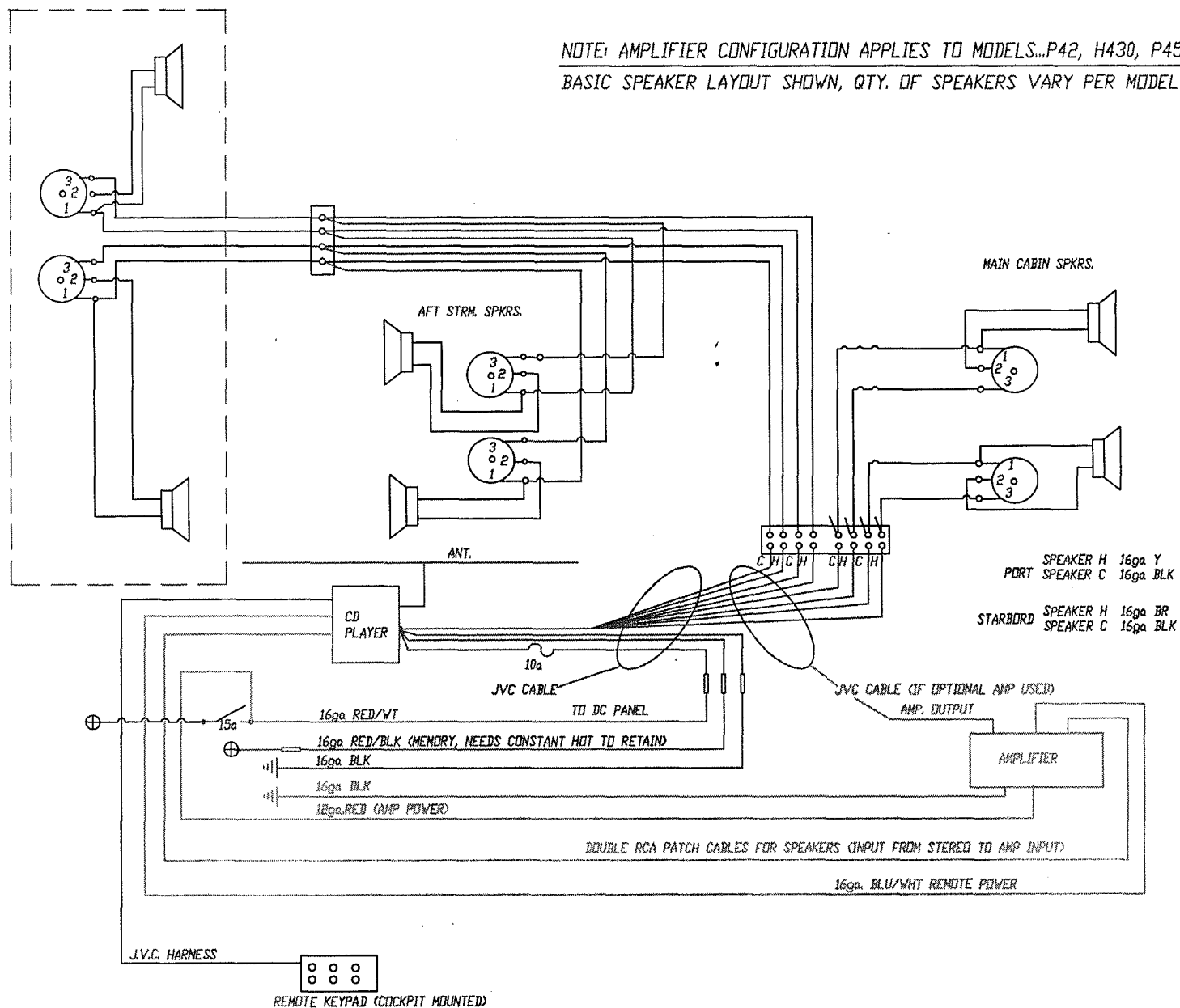
- ① MAIN SALON SPEAKERS
  - ② AFT STRM SPEAKERS
  - ③ COCKPIT SPEAKERS
  - ④ SPKR. WIRES TO STEREO UNIT
- SEE FOLLOWING PAGE FOR STEREO SYSTEM SCHEMATIC

DRAWING TITLE: <b>H410 ACCESSORY WIRING HEADLINER</b>		<small>This document discloses information for which HUNTER MARINE CORP. has proprietary rights.</small> <b>HUNTER</b> 
DRAWING NO. <b>4108064B-2</b>	REVISION NO. <b>NONE</b>	
DRAWN BY <b>ENGINEERING DEPT.</b>	DATE: <b>7/26/97</b>	



COCKPIT SPKRS.

NOTE: AMPLIFIER CONFIGURATION APPLIES TO MODELS...P42, H430, P450  
BASIC SPEAKER LAYOUT SHOWN, QTY. OF SPEAKERS VARY PER MODEL

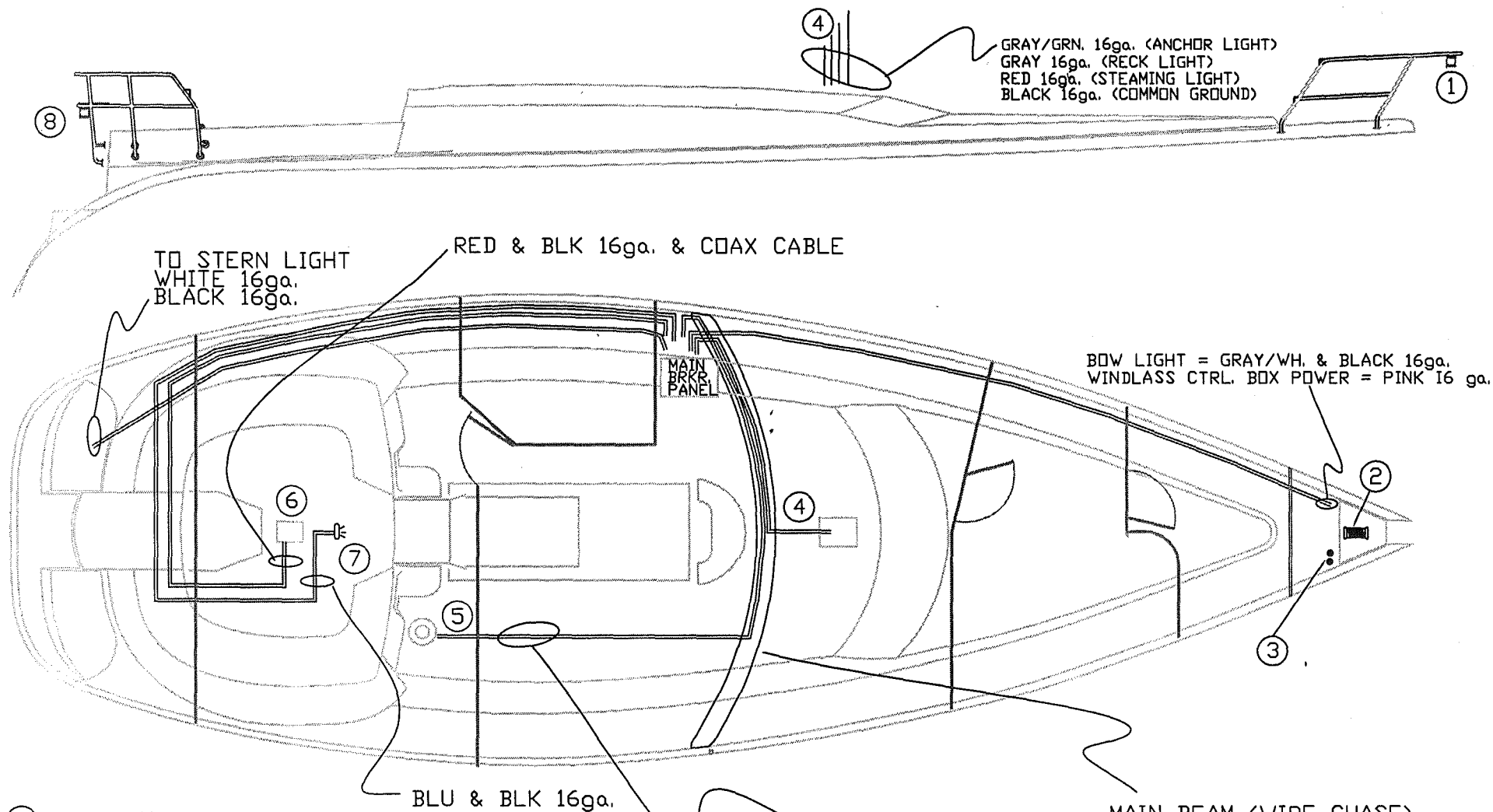


DRAWING TITLE: <b>STEREO WIRING SCHEMATIC</b>	
DRAWING NO. <b>4108064B-3</b>	REVISION NO. <b>NONE</b>
DESIGNED BY <b>ENGINEERING DEPT.</b>	DATE <b>7/26/97</b>

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COMP. #		STEREO SYSTEM PARTS LIST	U.O.M.	QTY.
KE040050	5	410 STEREO/CD PLAYER WIRING COMPONENT	CPNT	1
EL0102	300	ANTENNA AM/FM F3660	EA	1
EL0110	300	STEREO, 12VOLT, AM/FM, CD PLAYER H42	EA	1
EL0241	300	VOLUME CONTROL W/HARN. LP90S	EA	2
EL1175	300	BLOCK TERMINAL - #M429 - 10 GANG	EA	1
EL0610	300	WIRE RED SC-12 GAUGE	FT	4
EL0610	300	WIRE RED SC-12 GAUGE	FT	4
EL0670	300	WIRE BLACK SC-12 GAUGE	FT	4
EL0690	300	WIRE BROWN SC-16 GAUGE	FT	50
EL0700	300	WIRE YELLOW SC-16 GAUGE	FT	36
EL0750	300	WIRE BLACK SC-16 GAUGE TINNED/COPPER	FT	90
EL0794	300	WIRE BLUE W/ WHITE STRIPE 16GA.	FT	100
EL0750	300	WIRE BLACK SC-16 GAUGE TINNED/COPPER	FT	75
EL0110A	888	HARNESS,(ONLY)STEREO, 110V.KSG40	EA	1



- ① BOW LIGHT
- ② OPTIONAL ANCHOR WINDLASS (SEE PAGE 64D1&2 & 64G)
- ③ WINDLASS CONTROLS
- ④ POWER LEADS TO ANCHOR, DECK, STEAMING LIGHTS
- ⑤ OPTIONAL ELEC. HALYARD (SEE PAGE 64E-1 & 2)
- ⑥ VHF RADIO (IN COCKPIT CONSOLE)
- ⑦ COURTESY LIGHT (IN COCKPIT CONSOLE BASE)
- ⑧ STERNLIGHT

NOTE: SOME WIRE RUNS SHOWN IN APPROXIMATE LOCATIONS FOR CLARITY, SEE PAGE 64F FOR WIRE CHASE LOCATIONS  
 SEE PAGE 64-J FOR LIGHT FIX. & REPL. BULB PART #'S

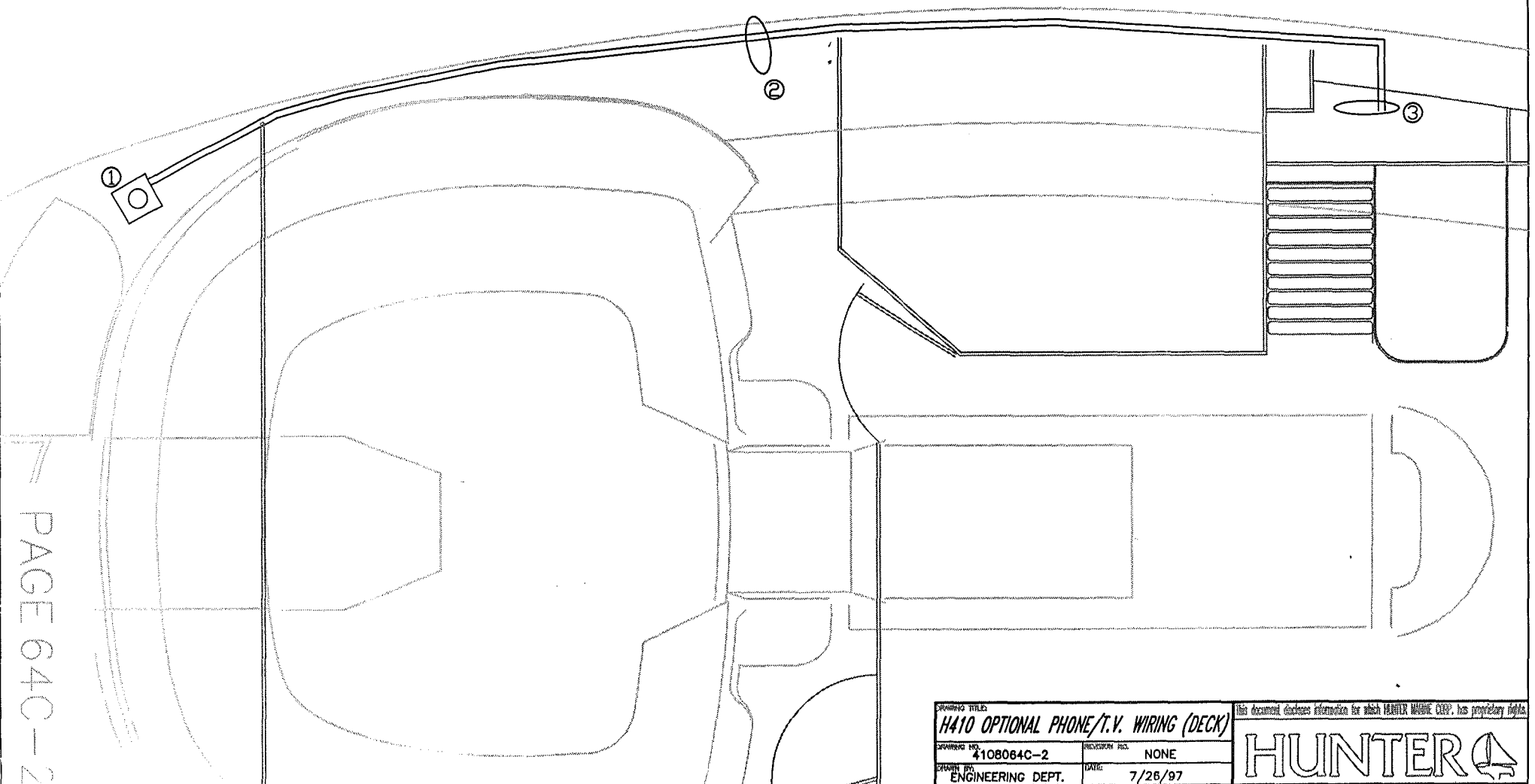
WIRING TITLED <b>H410 12V. WIRING (DECK)</b>	
DESIGNER NO. 4108064C-1	REVISIONS NO. NONE
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- ① PHONE/T.V. SHORE HOOKUP (PORT AFT STERN)
- ② T.V. COAX CABLE
- ③ COAX CABLE TO MAIN BREAKER PANEL CABINET

NOTE: OWNER TO SUPPLY PHONE LINE FROM SHORE  
HOOKUP TO DESIRED LOCATION.



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## SECTION 64D...OPTIONAL WINDLASS SYSTEM

### BASIC OPERATING INSTRUCTIONS:

#### LOWERING ANCHOR....

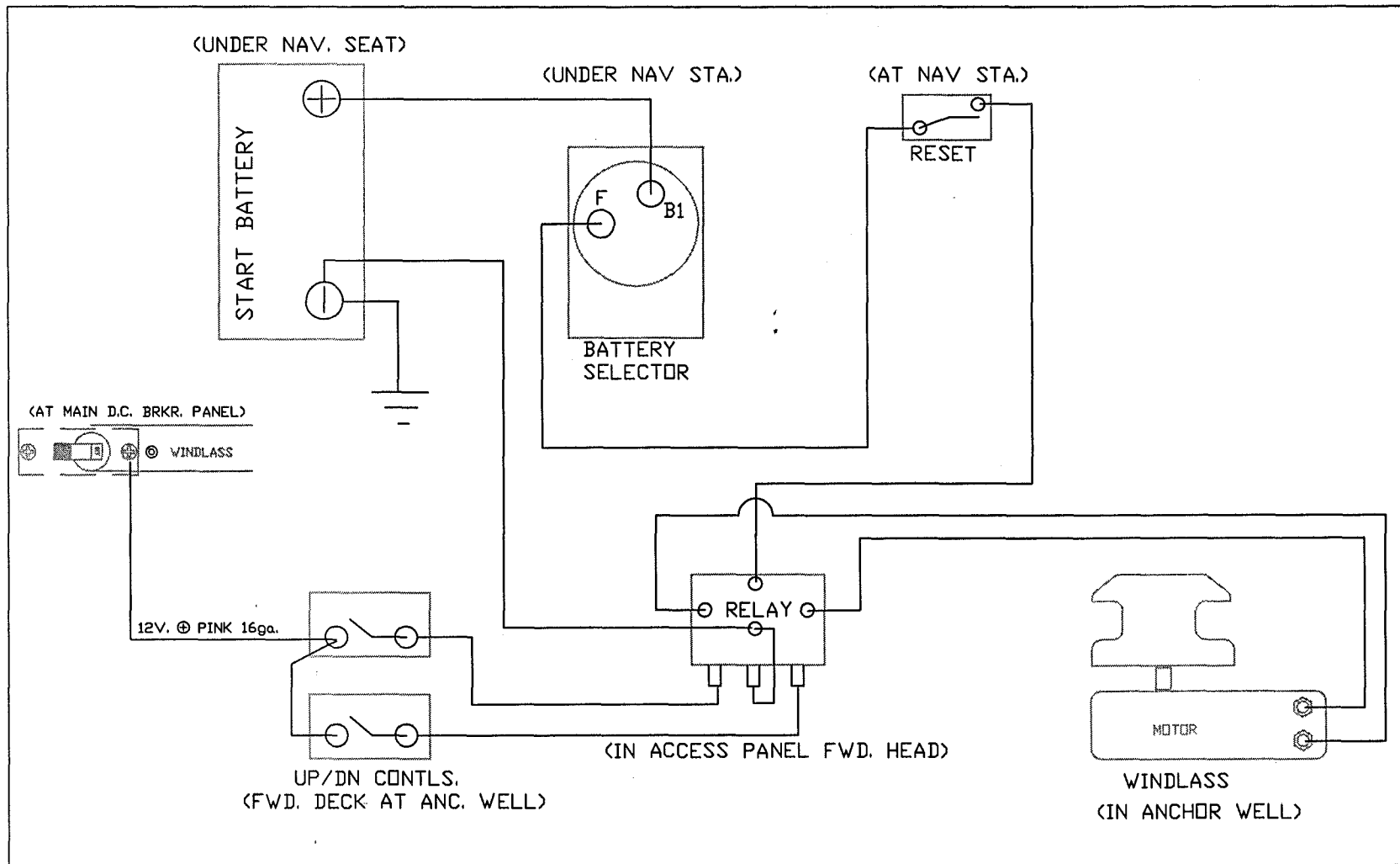
- ① TURN ON START BATTERY SWITCH UNDER NAV. STATION.
- ② TURN ON WINDLASS BRKR. ON MAIN D.C. BRKR. PANEL.
- ③ PUSH WINDLASS "DOWN" BUTTON ON FOREDECK AFT OF ANCHOR WELL.

NOTE: "BUMP" SWITCH UNTIL ANCHOR CLEARS ANCHOR ROLLER AND HULL BEFORE LETTING ANCHOR DOWN FREELY.

#### RAISING ANCHOR....

- ① START BOAT ENGINE, THIS WILL ALLOW CONTROL OF BOAT WHEN ANCHOR BECOMES FREE, AS WELL AS REDUCING LOAD ON BATTERY
- ② SAME AS STEP #1 OF LOWERING ANCHOR
- ③ SAME AS STEP #2 OF LOWERING ANCHOR
- ④ PUSH WINDLASS "UP" BUTTON (LOCATED-NEXT TO "DOWN BUTTON" BEING CAREFUL AS THE ANCHOR APPROACHES THE HULL AND ANCHOR ROLLER) UNTIL THE ANCHOR RESTS IN THE STEMHEAD PROPERLY.

NOTE: IF IT APPEARS THERE IS NO POWER TO THE WINDLASS, CHECK RESET BRKR. AT THE NAV. STATION.  
IF WINDLASS BECOMES INOPERABLE ELECTRICALLY, A MANUAL WINCH HANDLE IS SUPPLIED, SEE THE "HORIZON WINDLASS MANUAL" SUPPLIED IN YOUR OWNERS MANUAL PACKAGE FOR INSTRUCTIONS.



NOTE: SEE PAGES 64C-1 & 64G FOR WIRE RUN LOCATIONS

DRAWING TITLE: <b>H410 WINDLASS WIRING</b>	
DRAWING NO. <b>4108064D-2</b>	REVISION NO. <b>NONE</b>
DRAWN BY <b>ENGINEERING DEPT.</b>	DATE <b>7/26/97</b>

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**HUNTER**

OPTIONAL WINDLASS PARTS LIST				
Stg Component	Cls.			Net
No. No.	No.	Description	UOM	Q.P.A.
=====	=====	=====	=====	=====
56 EL0022	890	BREAKER, 5 AMP WHITE AC/DC 004-012	EA	1
23 EL0451	300	CABLE BATTERY RED 2/0	FT	31
23 EL0451	300	CABLE BATTERY RED 2/0	FT	2
23 EL0452	300	CABLE BATTERY BLACK 2/0	FT	17
23 EL0452	300	CABLE BATTERY BLACK 2/0	FT	3
23 EL0737	300	WIRE, 16GA RED/BLACK TRACER TINNED/COPP	FT	31
23 EL0795	250	WIRE PINK 16GA.	FT	31
23 EL0735	300	WIRE, 16GA,RED/WHITE TRACER,TINN/COPP	FT	31
23 EL1125	600	TERMINAL LUGS SL2/0-3/8R	EA	6
27 EL1020	300	TERMINAL C1614-10R 450/LB BLUE EYE	EA	6
56 HW3206-A	210	WINDLASS,ANCHOR,DUAL D CONLBOX H37/42/43	EA	1
56 HW3206-B	210	WINDLASS,ANCH, BREAK 70AMP H37/42/43	EA	1
31 HW3206-C	210	WINDLASS,ANCH,200A DECK SWITCH H37-42-43	EA	1
31 HW3208	200	WINDLASS, SPRINT ATLANTIC GD 376/42/43	EA	1
31 HW3206-F	200	SWITCH,"DOWN"FOOT,SAFETY COVERED 376-43	EA	1
56 450318	600	T/H PHIL #8 X 3/4" BLACK OXIDE S/S M/S	EA	4

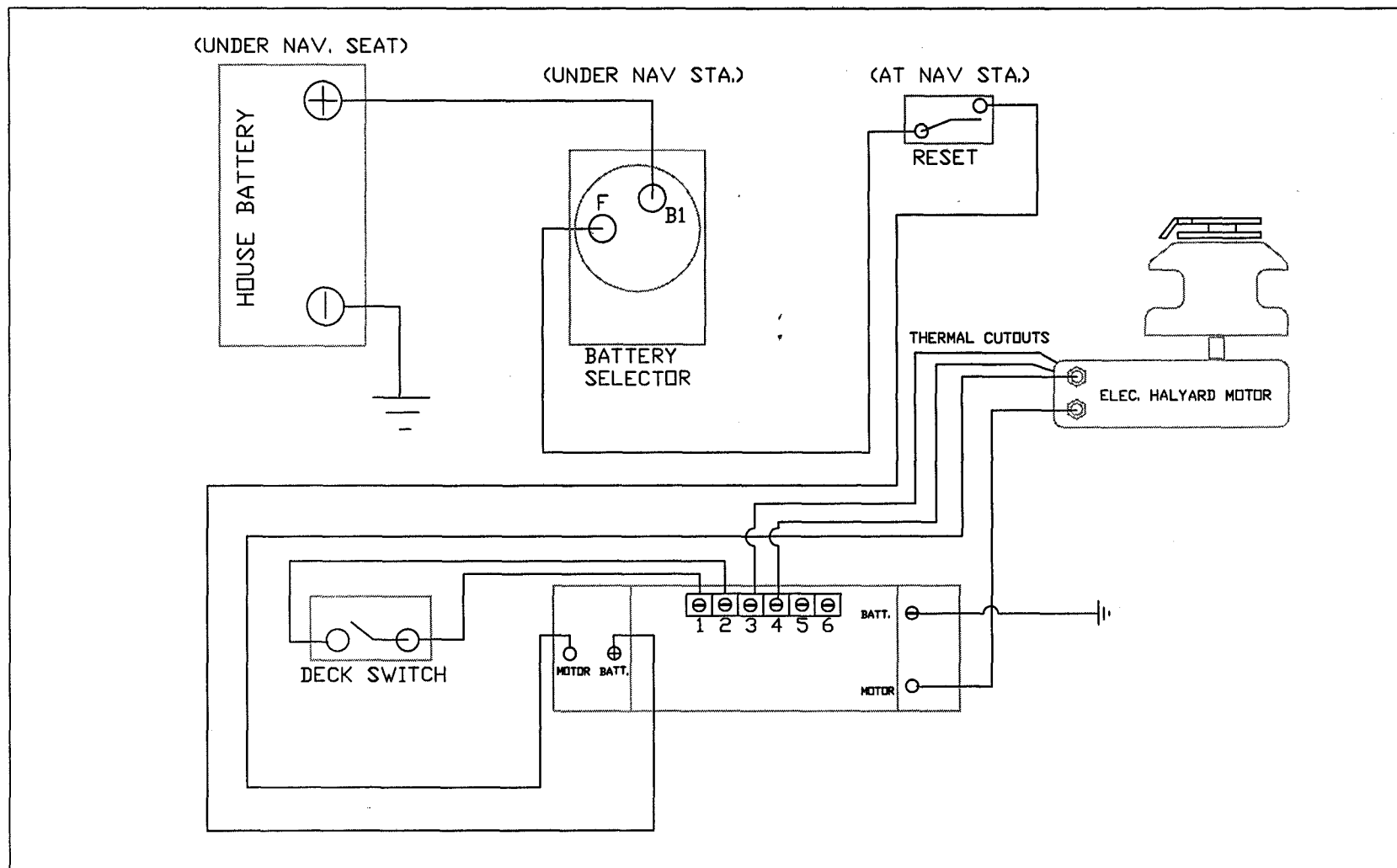
## SECTION 64E...OPTIONAL ELEC. HALYARD SYSTEM

### BASIC OPERATING INSTRUCTIONS:

- ① TURN ON "HOUSE BATTERY" SWITCH  
AT NAV. STATION.
- ② CHECK ELEC. HAL. RESET BREAKER  
AT NAV. STATION
- ③ HALYARD SWITCH ON DECK SHOULD  
NOW OPERATE WINCH

DRAWING TITLE: <b>H410 ELEC. HALYARD OPERATING INST.</b>		This document contains information for which HUNTER ENGINE CORP. has proprietary rights.	
ENGINEERING NO. <b>4108064E-1</b>	ENGINEERING DATE: <b>NONE</b>	<b>HUNTER</b> 	
ENGINEERING DEPT.	DATE: <b>7/26/97</b>		





NOTE: SEE PAGES 64C-1 FOR WIRE RUN LOCATIONS

REVISION TITLE:  
H410 (OPTIONAL) ELEC. HALYARD SCHEMATIC

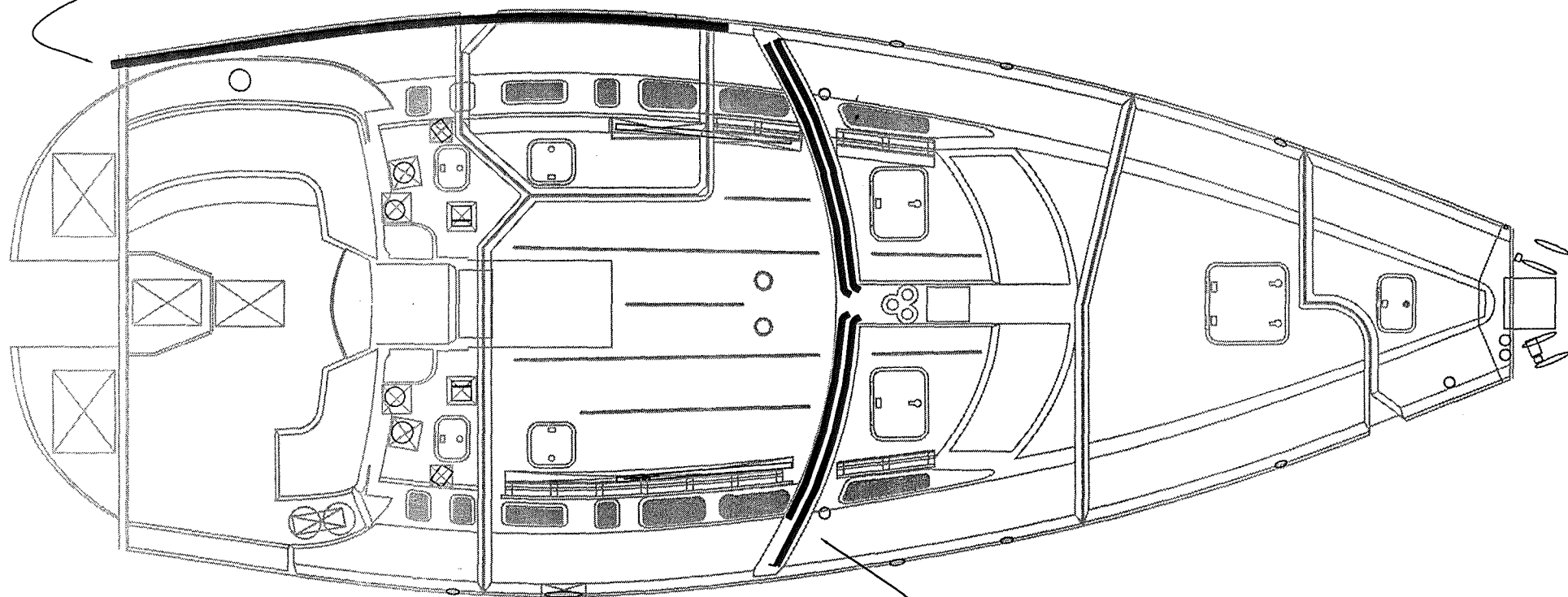
DESIGNER NO. 4108064E-2	ENGINEER NO. NONE
DESIGN NO. ENGINEERING DEPT.	DATE 7/26/97

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**HUNTER**

		OPTIONAL ELEC. HALYARD PARTS LIST		
Stg Compo	Cls.			Net
No. No.	No.	Description	UOM	Q.P.A.
=====	=====		=====	=====
33 EL0442	300	CABLE BATTERY RED 2GA.	FT	34
33 EL0442	300	CABLE BATTERY RED 2GA.	FT	3
33 EL0442	300	CABLE BATTERY RED 2GA.	FT	3
33 EL0445	300	CABLE BATTERY BLACK 2 GA.	FT	3
33 EL0446	300	TERMINAL LUG SL2 3/8 R	EA	8
33 EL0780	300	WIRE GREEN SC-16 GAUGE TINNED/COPPER	FT	3
33 EL0780	300	WIRE GREEN SC-16 GAUGE TINNED/COPPER	FT	3
32 EL1020	300	TERMINAL C1614-10R 450/LB BLUE EYE	EA	6
31 HW2569	200	WINCH, ELECTRIC, #44CEST,HORIZ.	EA	1
33 EL0445	300	CABLE BATTERY BLACK 2 GA.	FT	1
56 450318	600	T/H PHIL #8 X 3/4" BLACK OXIDE S/S M/S	EA	4

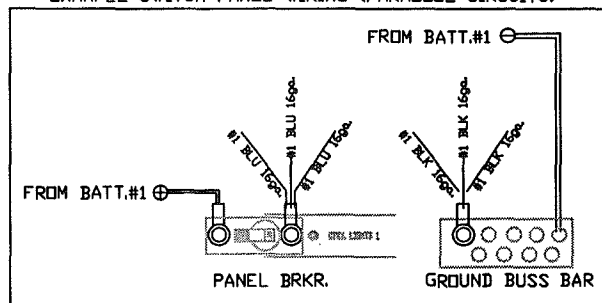
1 1/2" (38.1 mm) P.V.C. CHASE TUBE RUNS FROM PT. AFT COCKPIT LOCKER  
FORWARD TO MAIN BREAKER PANEL CABINET



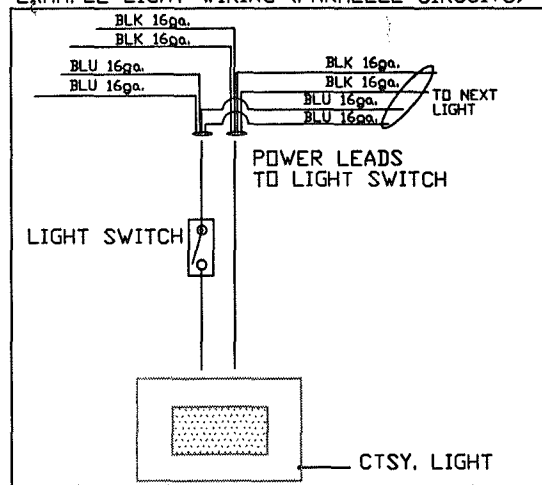
2" (50.8 mm) FLEX. CONDUIT CHASE TUBES RUN FROM PORT & STBD MAIN BEAM IN HEADLINER  
TO ACCESS PANEL ABOVE COMPRESSION POST IN MAIN SALON  
MESSENGER LINES ARE INSTALLED, AND CAN BE ACCESSED THRU CHAINPLATE  
AND MAST COMPRESSION POST ACCESS COVERS

DRAWING TITLE: <b>H410 WIRE CHASE LOCATIONS (HEADLINER)</b>		This document discloses information for which HUNTER MARINE CORP. has proprietary rights.	
DRAWING NO. <b>410B064F</b>	REVISION NO. <b>NONE</b>	<b>HUNTER</b> 	
ENGINEERING DEPT.	DATE: <b>7/26/97</b>		

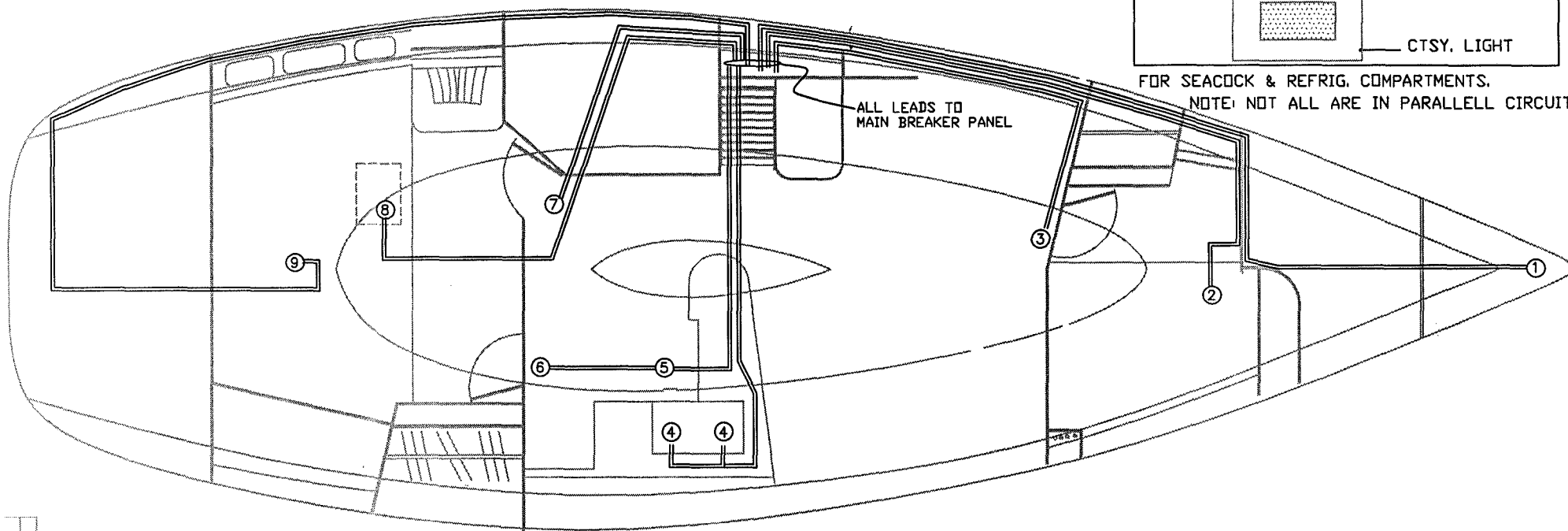
EXAMPLE SWITCH PANEL WIRING (PARALLEL CIRCUITS)



EXAMPLE LIGHT WIRING (PARALLEL CIRCUITS)



FOR SEACOCK & REFRIG. COMPARTMENTS.  
NOTE: NOT ALL ARE IN PARALLELL CIRCUIT



- ① POWER LEADS TO OPTIONAL WINDLASS
- ② FWD. STRM., SEACOCK COMP. CTSY. LITE
- ③ FWD. MAIN SALON CTSY. LITE
- ④ FRIDGE & FREEZER CTSY. LITES
- ⑤ GALLEY SEACOCK COMP. CTSY. LITE
- ⑥ STBD. AFT STRM. DOOR CTSY. LITE
- ⑦ PORT AFT STRM. DODR CTSY. LITE
- ⑧ AFT STRM. SEACOCK COMP. CTSY. LITE
- ⑨ COCKPIT COURTESY LITE


NOTE: SEE PAGE 64J FOR LIGHT BULB PART #'S

## SECTION 64H...REFRIGERATION SYSTEM

### BASIC OPERATING INSTRUCTIONS:

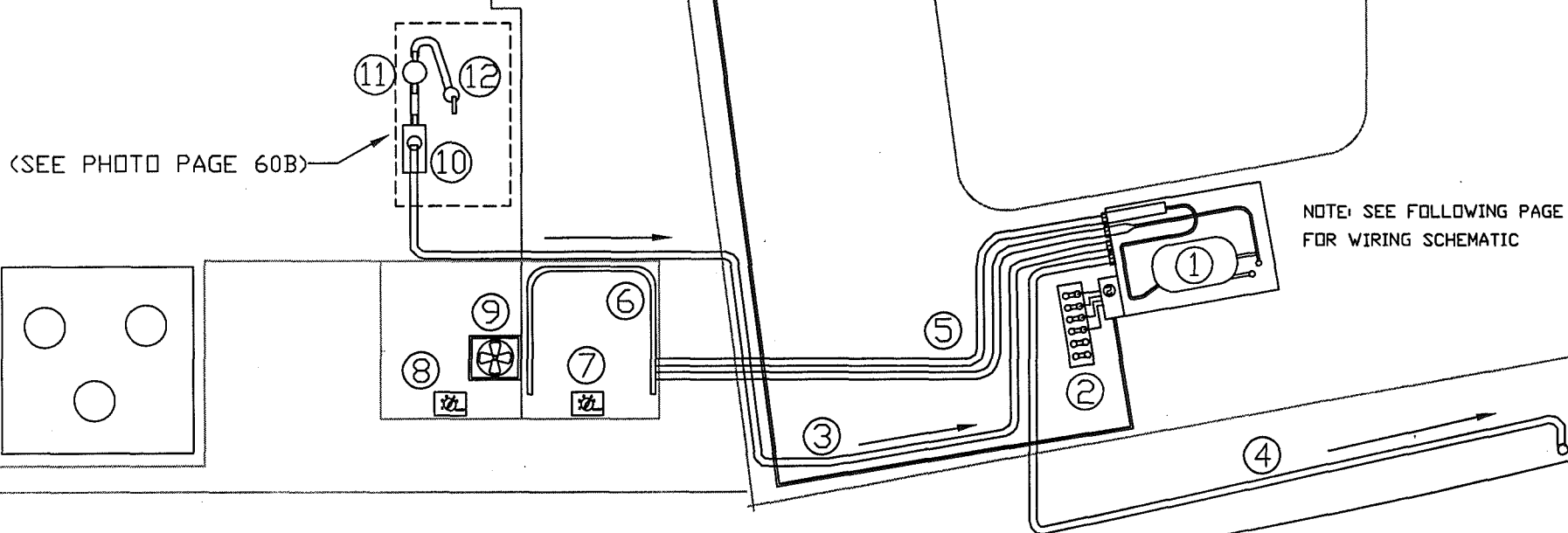
- ① CHECK SEA STRAINER & OPEN RAW WATER SEACOCK UNDER GALLEY SOLE (SEE PHOTO PAGE 60B)
- ② TURN ON HOUSE BATTERY SEL. SWITCH (UNDER CHART TABLE)
- ③ TURN ON MAIN D.C. BREAKER AT MAIN BREAKER PANEL
- ④ TURN ON REFRIG. BREAKER
- ⑤ SET THERMOSTATS TO DESIRED TEMP.

NOTE: KEEP SEA STRAINER CLEAN TO PREVENT IMPROPER CIRCULATION  
IF LEAVING UNIT ON WHEN AWAY FROM BOAT  
BE SURE SHORE POWER CABLES ARE CONNECTED AND  
BATTERY CHARGER IS ON TO PREVENT BATTERY DRAIN.

DRAWING TITLE <b>H410 REFRIG. OPER. INSTRUCTIONS</b>		This document discloses information for which HUNTER MARINE CORP. has proprietary rights.	
DISPOSING NO. <b>4108064H-1</b>	REVISION NO. <b>NONE</b>	<b>HUNTER</b> 	
DESIGNED BY <b>ENGINEERING DEPT.</b>	DATE <b>7/26/97</b>		

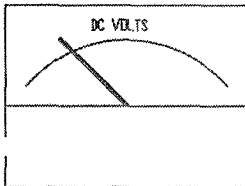
- ① REFRIG. UNIT
- ② TERMINAL STRIP
- ③ RAW WATER LINE IN TO UNIT
- ④ RAW WATER DISCHARGE (THRU HULL FITTING)
- ⑤ HI & LO PRES. LINES TO COLD PLATE
- ⑥ COLD PLATE
- ⑦ FREEZER THERMOSTAT CONTROL
- ⑧ FRIDGE THERMOSTAT CONTROL
- ⑨ SPILL OVER FAN
- ⑩ RAW WATER PUMP
- ⑪ SEA STRAINER
- ⑫ RAW WATER SEACOCK
- ⑬ 12 V.D.C. LEADS TO PANEL

→ = RAW WATER FLOW DIRECTION



NOTE: SEE FOLLOWING PAGE  
FOR WIRING SCHEMATIC

# HUNTER



12 VAC MIN

BATTERY SELE  
1 2 3

12 V.D.C.

PANEL LIGHTS

CABIN LIGHTS 1

CABIN LIGHTS 2

STEREO

REFRIGERATION

LP GAS

- ① REFRIG. COMPRESSOR
- ② REF. UNIT CTRL. BOX
- ③ TERMINAL STRIP
- ④ FREEZER THERMOSTAT
- ⑤ FRIDGE THERMOSTAT
- ⑥ RAW WATER PUMP
- ⑦ SPILL OVER FAN
- ⑧ 12V. + FROM LOAD SIDE OF BRKR. TO REF. UNIT
- ⑨ GND. FROM REF. UNIT TO GRD. BUSS BAR BEHIND BRKR. PANEL

NOTE: SEE REFRIGERATION MANUAL FOR CONTROL BOX HOOKUP DETAILS

8ga. RED

8ga. BLK

16ga. BWN.

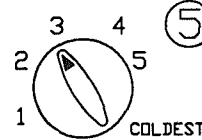
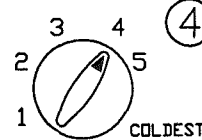
16ga. YEL. & BLK

⑦

16ga. BWN.

16ga. BLK.

16ga. RED & BLK



②

③

⑨

⑧

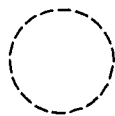
⑥

		REFREGERATION SYSTEM PARTS LIST		
COMP. #			U.O.M.	QTY.
KE040030	5	410 REFRIGERATION COMPONENT	CPNT	1
450264	600	P/H PHIL #10 X 3/4" S/S T/A	EA	6
PR5025	999	REFRIGERATION	UT	1
EL0270	300	LIGHT,UTLITIY,WHITE, #140 H376	EA	4
EL0049	300	SWITCH,PUSH,MOTOR BOX LIGHT H376	EA	3
EL0510	300	WIRE RED SC-8 GAUGE	FT	22
EL0500	300	WIRE BLACK SC-8 GAUGE TINNED/COPPER	FT	11
PR5025-A	999	REFRIGERATION KIT, STAGE 43 H410	UT	1
EL1177	300	BLOCK - TERMINAL - #M426 - 4 GANG	EA	1
450274	600	P/H PHIL #8 X 5/8" S/S T/A	EA	2

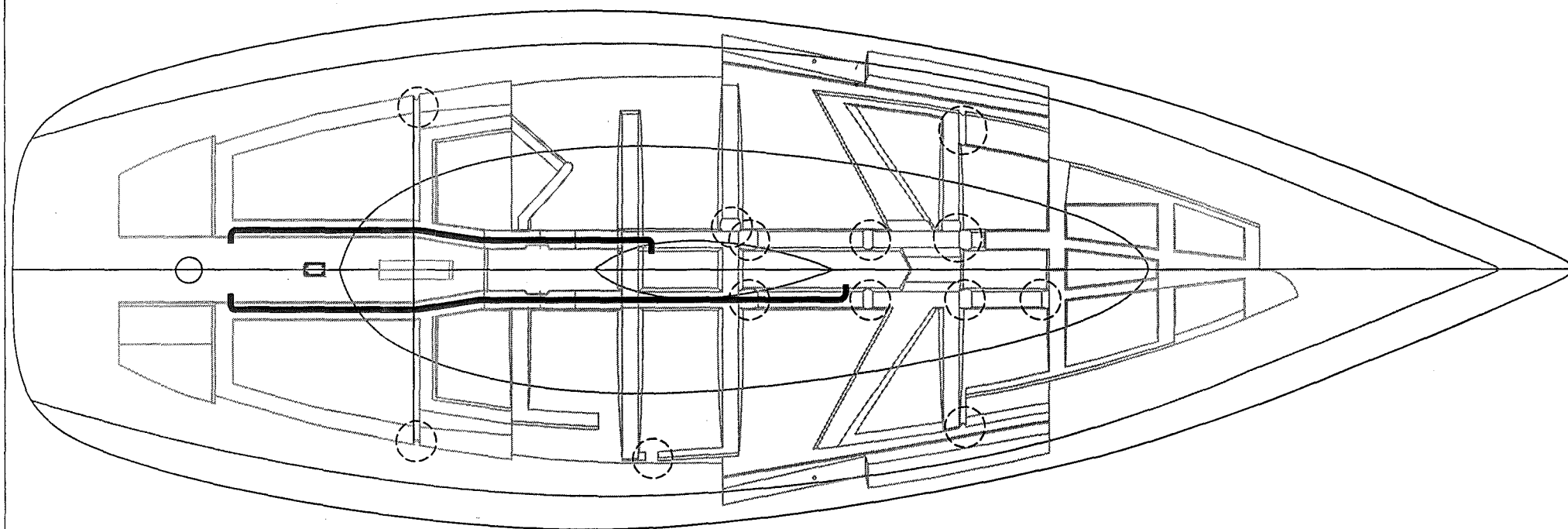





= PVC CHASE PIPE



= CROSSOVER/EXIT DETAILS



PAGE 641

DRAWING TITLE: <b>H410 WIRE CHASE LOCATIONS (PAN)</b>		This document discloses information for which HUNTER MARINE CORP. has proprietary rights.	
DRAWING NO. <b>41080641</b>	REVISION NO. <b>NONE</b>	<b>HUNTER</b> 	
DRAWN BY <b>ENGINEERING DEPT.</b>	DATE <b>7/26/97</b>		

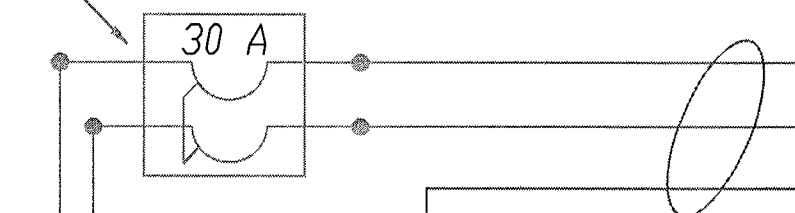
12.V.D.C. VOLTAGE SYSTEM PARTS LIST						
COMP. #					U.O.M.	QTY.
KE030001	5	410 12 VOLT DC SUB ASSEMBLY			SUB	1
KE030010	5	410 BOW LIGHT WIRING COMPONENTS			CPNT	1
EL0750	300	WIRE BLACK SC-16 GAUGE TINNED/COPPER			FT	24
EL0785	300	WIRE GREY W/WHITE STRIPE SC-16GA			FT	24
450187	600	NUT LOCK 10-24 S/S L/N			EA	2
EL0344	300	LIGHT,BOW, BI-COLOR,62207B H450			EA	1
KE030030	5	410 DEPTH & SPEED COMPONENTS			CPNT	1
EL0088	300	GUAGE,SPEED-KNOT- ST-50 Z095 NO MAN.			EA	1
EL0086	300	GUAGE,ST-50 DEPTH SOUND Z096 W/O MAN			EA	1
EL0258	300	ST 30/80 9M EXT. CABLE, # D287			EA	3
EL0077	300	INSTALLATION KIT D131 CABLE WITH ENDS			KT	1
EL0079-A	300	TRANSDUCER,MOLDED, SPEED, Z092P			EA	1
EL0087-A	300	TRANSDUCER,MOLDED, DEPTH Z091			EA	1
EL0077-A	300	CABLE,POWERLEAD,NN-Z003 10'			EA	1
EL0087-B	300	NN-002, TRANSDUCER PLUG BRACKET			EA	1
450274	600	P/H PHIL #8 X 5/8" S/S T/A			EA	2
KE030050	5	410 ANCHOR LIGHT COMPONENT			CPNT	1
EL0950	300	TERMINAL C1614-SC 400/LB BLUE BUTT			EA	2
450238	600	P/H PHIL 10-24 X 1/2" S/S M/S			EA	2
450187	600	NUT LOCK 10-24 S/S L/N			EA	2
RI0563-B	500	LITE MAST ANCHOR H-40 H-42			EA	1
KE030075	5	410 MAST LIGHT WIRING COMPONENT			CPNT	1
EL0670	300	WIRE BLACK SC-12 GAUGE			FT	15
EL0730	300	WIRE GREY SC-16 GAUGE			FT	15
EL0731	300	WIRE GRAY W/RED STRIPE 16 GA			FT	15
EL0732	300	WIRE GRAY W/GREEN STRIPE 16 GA			FT	15
EL1175	300	BLOCK TERMINAL - #M429 - 10 GANG			EA	1
EL0048	300	SWITCH,ROCKER,W/PANEL, WATER PROOF28-43			EA	1
EL0250	200	LIGHT, SHALLOW DEPTH WHITE, 8071-5			EA	1
KE030080	5	410 WIND SPEED INDICATOR COMPONENT			CPNT	1
EL0259	890	Z135P, ST50 WIND SYSTEM			EA	1
KE030090	5	410 SOLAR PANEL COMPONENT			CPNT	1
EL0167	300	DIODE, SOLAR PANEL TO PRINT			EA	1
EL0580	300	WIRE 14/2 GREY DUPLEX			FT	18
EL0950	300	TERMINAL C1614-SC 400/LB BLUE BUTT			EA	2
EL1020	300	TERMINAL C1614-10R 450/LB BLUE EYE			EA	2
EL1050	300	TERMINAL PC-1614-FF 390/LB BLUE SLIP-ON			EA	2
EL1180	570	SOLAR PANEL, MODEL MBC-262 11WATT 15.6V			EA	1
EL0025	300	FUSE HOLDER W/ 40A.FUSE HEJ-BB			EA	1

COMP. #		12V.D.C. VOLTAGE SYSTEM PARTS LIST CONT.	U.O.M.	QTY.
KE030100	5	410 VHF RADIO WIRING COMPONENTS	CPNT	1
EL0014	300	BARREL, PL258, GOOD DESCRIPTION	EA	1
EL0015	300	CONNECTOR, MALE, PL259	EA	1
EL0065A	888	HARNESS, VHF, #5200,	EA	1
EL0119	300	RADIO, VHF, APELCO 5200, WTRPROOF, 3 YR WRTY	EA	1
EL0119-A	300	FLUSH MOUNT KIT, FOR APELCO 5200	EA	1
EL0346	300	CABLE, C176/RG213/U TINNED COPPER	FT	38
EL0750	300	WIRE BLACK SC-16 GAUGE TINNED/COPPER	FT	4
EL0794	300	WIRE BLUE W/ WHITE STRIPE 16GA.	FT	31
EL0950	300	TERMINAL C1614-SC 400/LB BLUE BUTT	EA	2
EL1020	300	TERMINAL C1614-10R 450/LB BLUE EYE	EA	34
450213	600	O/H PHIL 6 X 3/4" BLK OX.	EA	6
450034	600	FAST, 8MM X 10MM HEX HD, S/S, CAP SCREW	EA	2
EL0670	300	WIRE BLACK SC-12 GAUGE	FT	23
KE030110	5	410 CHART LIGHT WIRING COMPONENTS	CPNT	1
EL0309	300	LIGHT CHART#33132-012 28'33'35'37'40'45'	EA	2
EL0424	300	BUSS BAR #M449 - 10 GANG	EA	1
EL0950	300	TERMINAL C1614-SC 400/LB BLUE BUTT	EA	2
KE030120	5	410 COURTESY LIGHTS WIRING COMPONENT	CPNT	1
EL0364	300	LIGHT COURTESY #81750-C	EA	3
EL0049	300	SWITCH, PUSH, MOTOR BOX LIGHT H376	EA	3
EL0364-A	210	LIGHT, CHR COCKPIT W/RED LENS 81750-R	EA	3
EL0670	300	WIRE BLACK SC-12 GAUGE	FT	18
EL0950	300	TERMINAL C1614-SC 400/LB BLUE BUTT	EA	6
KE030130	5	410 DOME LIGHT WIRING COMPONENT	CPNT	1
EL0306	210	LIGHT, DOME, 8018-11-B, PLASTIC	EA	3
EL0720	300	WIRE BLUE SC-16 GAUGE TINNED/COPPER	FT	200
EL0950	300	TERMINAL C1614-SC 400/LB BLUE BUTT	EA	40
EL0750	300	WIRE BLACK SC-16 GAUGE TINNED/COPPER	FT	30
450267	600	P/H PHIL #6 X 1/2" S/S T/A	EA	80
KE030150	5	410 HALOGEN LIGHT WIRING COMPONENT	CPNT	1
EL0351	300	LIGHT, W/SWITCH 3109-002	EA	6
EL0750	300	WIRE BLACK SC-16 GAUGE TINNED/COPPER	FT	180
EL0720	300	WIRE BLUE SC-16 GAUGE TINNED/COPPER	FT	200
EL0950	300	TERMINAL C1614-SC 400/LB BLUE BUTT	EA	8
KE030160	5	410 INDIRECT LIGHT WIRING COMPONENT	CPNT	1
EL0048	300	SWITCH, ROCKER, W/PANEL, WATER PROOF 28-43	EA	6
EL0351	300	LIGHT, W/SWITCH 3109-002	EA	16
450267	600	P/H PHIL #6 X 1/2" S/S T/A	EA	1
EL0950	300	TERMINAL C1614-SC 400/LB BLUE BUTT	EA	1

12V.D.C. VOLTAGE SYSTEM PARTS LIST CONT.			U.O.M.	QTY.
COMP. #				
KE030170	5	410 READING LIGHT WIRING COMPONENT	CPNT	1
EL0950	300	TERMINAL C1614-SC 400/LB BLUE BUTT	EA	12
450267	600	P/H PHIL #6 X 1/2" S/S T/A	EA	24
EL0349	300	LIGHT,READING,HALOGEN,SWIVEL,BEIGE 8269	EA	1
EL0720	300	WIRE BLUE SC-16 GAUGE TINNED/COPPER	FT	100
EL0750	300	WIRE BLACK SC-16 GAUGE TINNED/COPPER	FT	25
EL0950	300	TERMINAL C1614-SC 400/LB BLUE BUTT	EA	4
KE030180	5	410 STEREO SPEAKER COMPONENT	CPNT	1
EL0101-A	300	SPEAKER W/GRILL, WHITE 6 1/4"	EA	6
EL0690	300	WIRE BROWN SC-16 GAUGE	FT	50
EL0700	300	WIRE YELLOW SC-16 GAUGE	FT	36
EL0750	300	WIRE BLACK SC-16 GAUGE TINNED/COPPER	FT	90
EL1050	300	TERMINAL PC-1614-FF 390/LB BLUE SLIP-ON	EA	12
450213	600	O/H PHIL 6 X 3/4" BLK OX.	EA	24
KE030200	5	410 COCKPIT TABLE LIGHT WIRING COMPONENT	CPNT	1
EL0048	300	SWITCH,ROCKER,W/PANEL, WATER PROOF28-43	EA	1
EL0250	200	LIGHT, SHALLOW DEPTH WHITE, 8071-5	EA	1
EL0950	300	TERMINAL C1614-SC 400/LB BLUE BUTT	EA	2
KE030220	5	410 COMPASS LIGHT WIRING COMPONENT	CPNT	1
EL0950	300	TERMINAL C1614-SC 400/LB BLUE BUTT	EA	2
LG0130	570	COMPASS #FN-201 37' 40' 45'	EA	1
EL0581	300	WIRE, DUPLEX, UL BOAT CABLE 16/2 BLK/WHT	FT	4

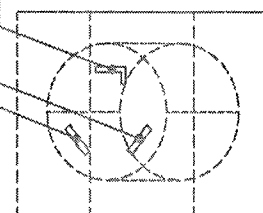
COMP. #		12V.D.C. VOLTAGE SYSTEM PARTS LIST CONT.	U.O.M.	QTY.
KE030230	5	410 HOUSE BATTERY WIRING COMPONENT	CPNT	1
EL0010	300	FUSES 7 1/2 AMP AGC	EA	4
EL0025	300	FUSE HOLDER W/ 40A.FUSE HEJ-BB	EA	1
EL0020	300	FUSE HOLDER BUSSMAN HKP-HH	EA	2
EL0454	175	PANEL,INVERTOR SWITCH TO PRINT H450	EA	1
EL0188	300	BATTERY, 4D DEEP CYCLE SRM-4D H450	EA	2
EL0451	300	CABLE BATTERY RED 2/0	FT	8.5
EL0451	300	CABLE BATTERY RED 2/0	FT	9.6
EL0452	300	CABLE BATTERY BLACK 2/0	FT	3.6
EL0452	300	CABLE BATTERY BLACK 2/0	FT	3
EL0480	300	WIRE, BLACK 6 GUAGE	FT	11
EL0807	300	WIRE ORANGE W/RED STRIPE 6GA.	FT	11
EL0581	300	WIRE, DUPLEX, UL BOAT CABLE 16/2 BLK/WHT	FT	11
EL0581	300	WIRE, DUPLEX, UL BOAT CABLE 16/2 BLK/WHT	FT	31
EL0446	300	TERMINAL LUG SL2 3/8 R	EA	1.5
EL0446	300	TERMINAL LUG SL2 3/8 R	EA	1.5
HW3782	210	STRAP, BATTERY 54" #9013A3 H376	EA	2
EL0451	300	CABLE BATTERY RED 2/0	FT	2
EL0451	300	CABLE BATTERY RED 2/0	FT	2
EL1125	600	TERMINAL LUGS SL2/0-3/8R	EA	10
EL1108	300	TERMINAL BATTERY LUG #2/0 W/5/16" RING	EA	4
EL1121	600	TERMINAL, 6GA W 1/4" EYE	EA	4
EL1100	77	TERMINAL C-1614-1/4R 460/LB BLUE EYE	EA	4
EL0935	600	TERMINAL, 6GA W/3/8" EYE	EA	2
EL0932	600	TERMINAL C6-1/4R RING TONGUE	EA	6
EL0034	300	SOLENOID,2411701 12V,65AMP, H40/42/43	EA	1
EL0246	300	ISOLATOR,MULTI-BATTERY, #2430 120AMP	EA	1
EL0172	300	SAFETY MAIN SWITCH - ON/OFF/BOTH #8501	EA	1
EL0038	300	FUSE, 300A INLINE 84-4151-00 H43	EA	1
450318	600	T/H PHIL #8 X 3/4" BLACK OXIDE S/S M/S	EA	4
KE030240	5	410 STARTER BATTERY WIRING COMPONENT	CPNT	1
EL0046	300	PANEL,BATTERY START,ALUM H376	EA	1
EL0186	300	BATTERY SRM-24 550CCA DEEP CYCLE	EA	1
EL0352	300	SWITCH-BATTERY-ON/OFF-9601	EA	1
EL0451	300	CABLE BATTERY RED 2/0	FT	12
EL0452	300	CABLE BATTERY BLACK 2/0	FT	6.5
EL0446	300	TERMINAL LUG SL2 3/8 R	EA	4
HW3780	300	BATTERY BOX #11527	EA	1
450318	600	T/H PHIL #8 X 3/4" BLACK OXIDE S/S M/S	EA	4
KE030250	5	410 STERN LIGHT WIRING COMPONENT	CPNT	1
EL0389	200	STERN LIGHT,WHITE,BLACK'41" H430	EA	1
EL0750	300	WIRE BLACK SC-16 GAUGE TINNED/COPPER	FT	14
EL0785	300	WIRE GREY W/WHITE STRIPE SC-16GA	FT	38
EL0950	300	TERMINAL C1614-SC 400/LB BLUE BUTT	EA	2
450238	600	P/H PHIL 10-24 X 1/2" S/S M/S	EA	2
450187	600	NUT LOCK 10-24 S/S L/N	EA	2

30 AMP SHORE POWER BREAKER

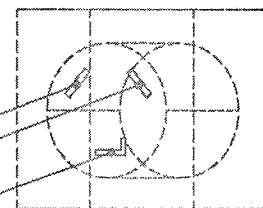


TO AC PANEL  
10/3 BOAT CABLE

LINE 2



SHORE POWER OUTLET 2

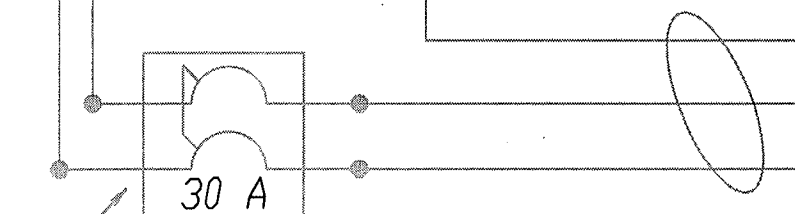


SHORE POWER OUTLET 1

NOTES: 30 amp BREAKERS ARE  
INSIDE PORT COCKPIT LOCKER

SEE PAGE 63A-1 FOR HOOKUP  
TO PANEL

SEE PAGE 63C FOR WIRE  
RUN LOCATION




10/3 BOAT CABLE  
TO AC PANEL

LINE 1

30 AMP SHORE POWER BREAKER

PAGE 65A

DRAWING TITLE: <b>H410 SHORE POWER CONNECTOR SCH.</b>		This document discloses information for which HUNTER MARINE CORP. has proprietary rights.	
DESIGNING NO. <b>4108065A</b>	REVISION NO. <b>NONE</b>	<b>HUNTER</b> 	
ENGINEERING DEPT.	DATE: <b>7/8/97</b>		

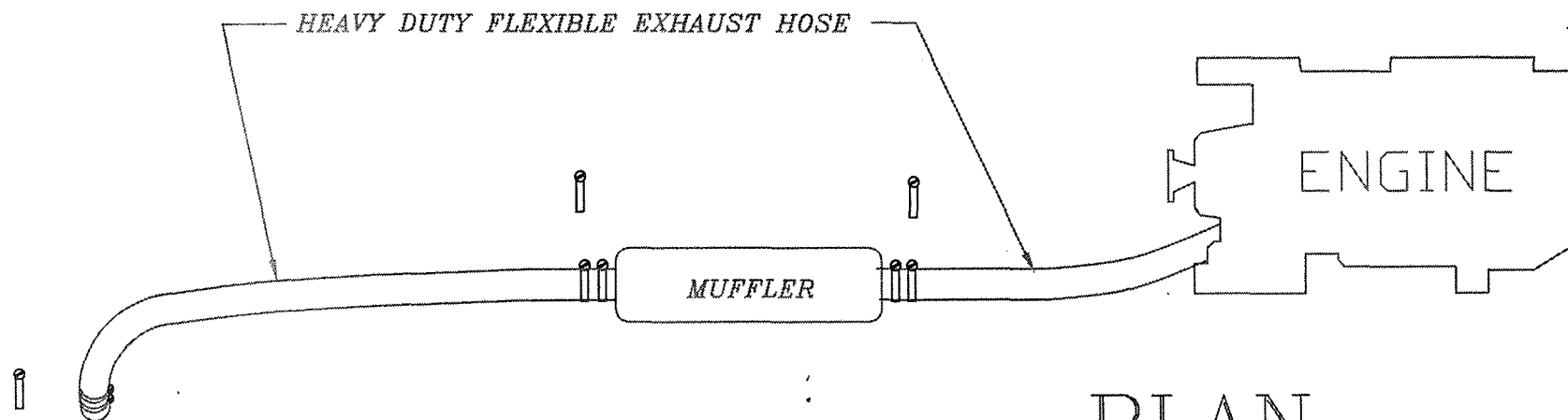
# HUNTER MARINE

## ELECTRICAL WIRING DATA

COMPONENT 12V.	WIRE GA.	COLOR CODE
CABIN LIGHTS	16 GA.	BLUE & BLACK
COURTESY LIGHTS	16 GA.	BLUE/WHITE & BLACK
WATER PUMP	12 GA.	BROWN & BLACK
SHOWER SUMP (FWD)	12 GA.	BROWN/YELLOW & BLACK
SHOWER SUMP (AFT)	12 GA.	BROWN/BLACK & BLACK
MACERATOR	10 GA.	BROWN/WHITE & BLACK
STEREO	16 GA.	RED & YELLOW & BLACK
SPEAKERS (STBD.)	16 GA.	YELLOW & BLACK
SPEAKERS (PORT)	16 GA.	BROWN & BLACK
INST. KNOT & DEPTH	AUTOHELM	RED/YELLOW/SHIELD
VHF RADIO	16 GA.	RED/WHITE & BLACK
WINDLASS (RELAY)	16 GA.	PINK
BILGE PUMP	12 GA.	BRN/OR & BRN/RED & BLK
ANCHOR LIGHT	16 GA.	GRAY/RED & BLACK.*
STEAMING LIGHT	16 GA.	GRAY/GREEN & BLACK.*
DECK LIGHT	16 GA.	GRAY/ & BLACK.*
RUNNING LIGHTS	16 GA.	GRAY/WHITE & BLACK
		* = (1) 12 GA. COMMON GRD.

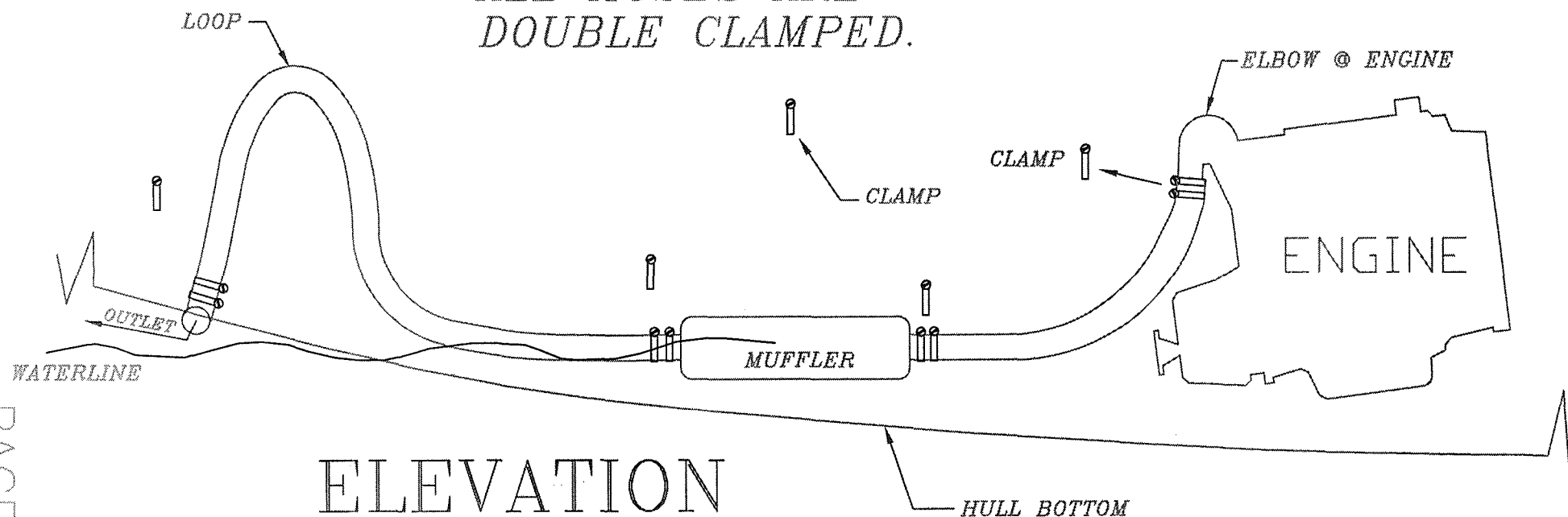
## ELECTRICAL CABLE DATA

COMPONENT	CABLE GA.	COLOR CODE
	DC VOLT (12)	
BATTERY CABLES	2/0	RED & BLACK
ENGINE START CABLE	2 GA.	RED & BLACK
HALYARD WINCH CABLE	2 GA.	RED & BLACK
WINDLASS CABLE	2 GA.	RED & BLACK
TANK GAUGES	14/2	BOAT CABLE
L.P.G. ON/OFF	14/2	BOAT CABLE
	AC VOLT	
SHORE POWER	10/3	BOAT CABLE
INVERTER	10/3	BOAT CABLE
AIR COND.	10/3	BOAT CABLE
AIR COND. RELAY	14/3	BOAT CABLE
BATTERY CHARGER	14/3	BOAT CABLE
MICROWAVE	14/3	BOAT CABLE
OUTLETS	14/3	BOAT CABLE
WATER HEATER	14/3	BOAT CABLE
NOT ALL COMPONENTS RELATIVE TO ALL MODELS		



PLAN

ALL HOSES ARE  
DOUBLE CLAMPED.



ELEVATION

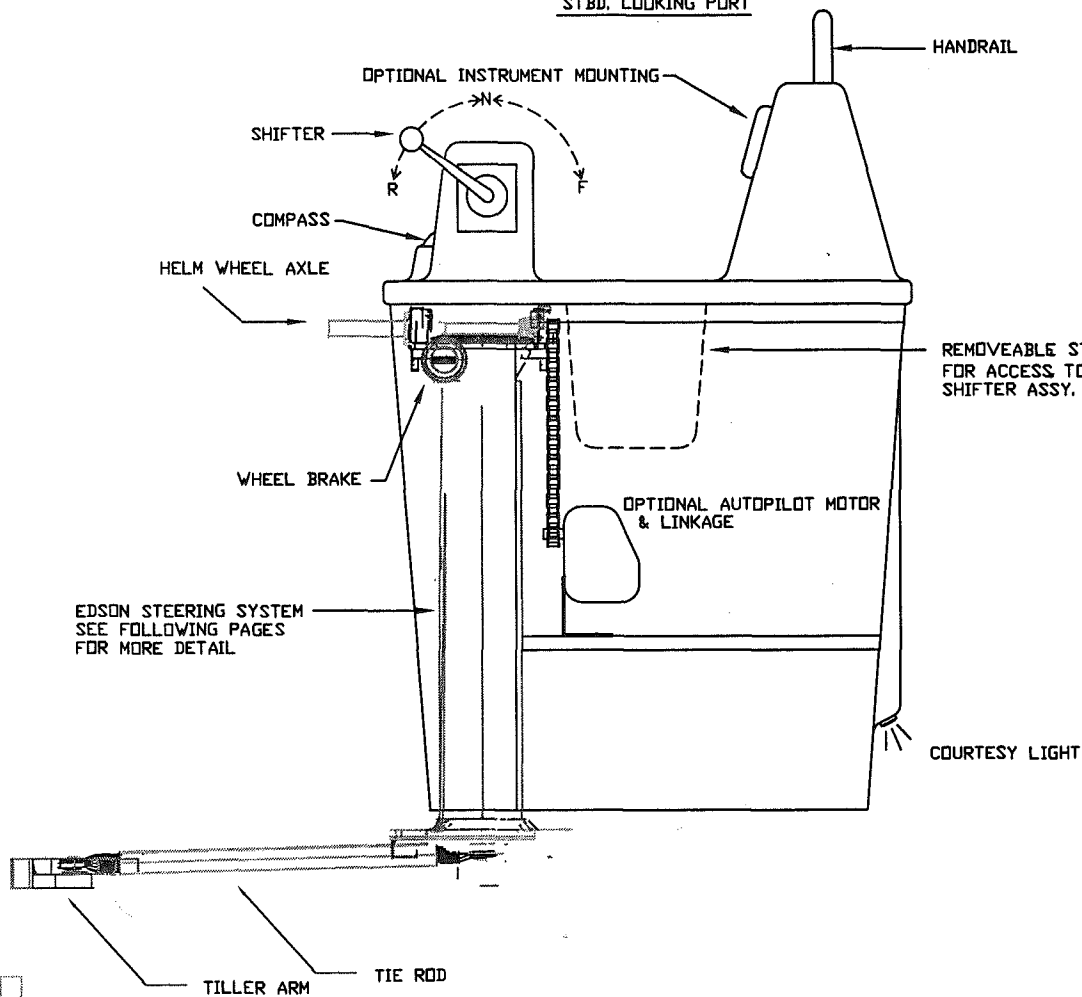
DRAWING TITLE: <b>H410 EXHAUST SYSTEM LAYOUT</b>		This document discloses information for which HUNTER MARINE CORP. has proprietary rights.	
DRAWING NO.: 4108066A	REVISION NO.: NONE		
DRAWN BY: ENGINEERING DEPT.	DATE: 7/14/97		

HUNTER

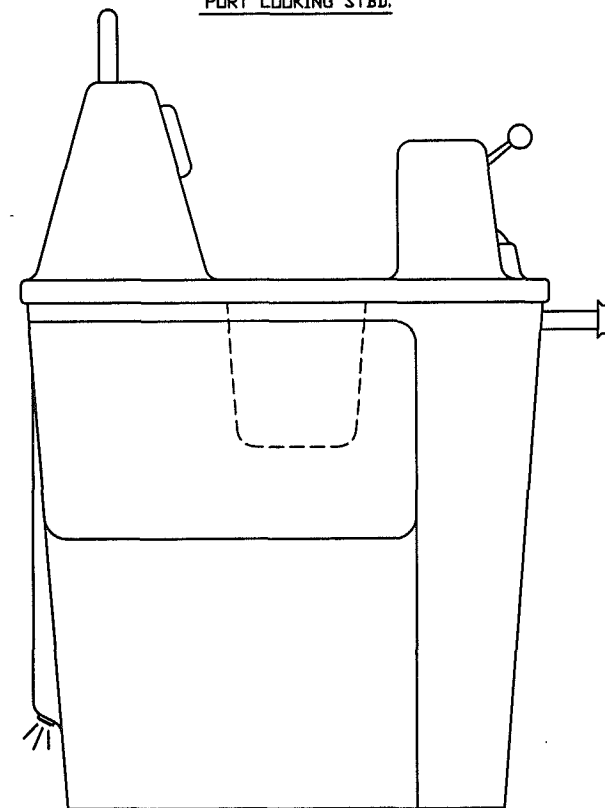


	ENGINE EXHAUST PARTS LIST		NET
COMP. #		UOM	Q.P.A.
KB060001	410 ENGINE EXHAUST SUB ASSEMBLY	SUB	1
KB060005	410 ENGINE EXHAUST MOUNTNG COMPONENTS	CPNT	1
PL1722	TUBE GLASS 3" X 1/4 S-500	FT	0.65
PL1626	HOSE 3" CORRIGATED EXHAUST TYPE 2065	FT	4
PL1626	HOSE 3" CORRIGATED EXHAUST TYPE 2065	FT	13
PL0580	HOSE CLAMP # 52	EA	8
PR5010	MUFFLER, TO PRINT XH HUN2180 H410	EA	1
PL0528	CLAMP #DG56 ALUM. 27P	EA	3


VIEW  
STBD. LOOKING PORT



VIEW  
PORT LOOKING STBD.



PAGE 67A

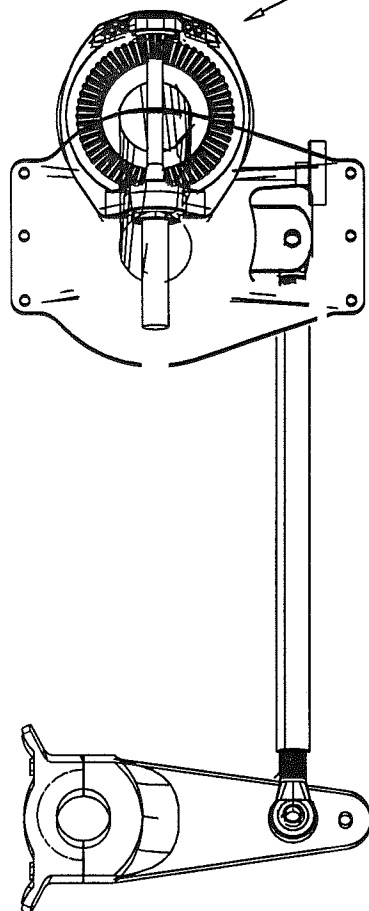
DRAWING TITLE: <b>H410 STEERING/CONSOLE LAYOUT</b>		This document discloses information for which HUNTER MARINE CORP. has proprietary rights.	
APPROVED BY: <b>4108067A</b>	DESIGNATION NO.: <b>NONE</b>	<b>HUNTER</b> 	
ENGINEERING DEPT.	DATE: <b>7/14/97</b>		

IMPORTANT:

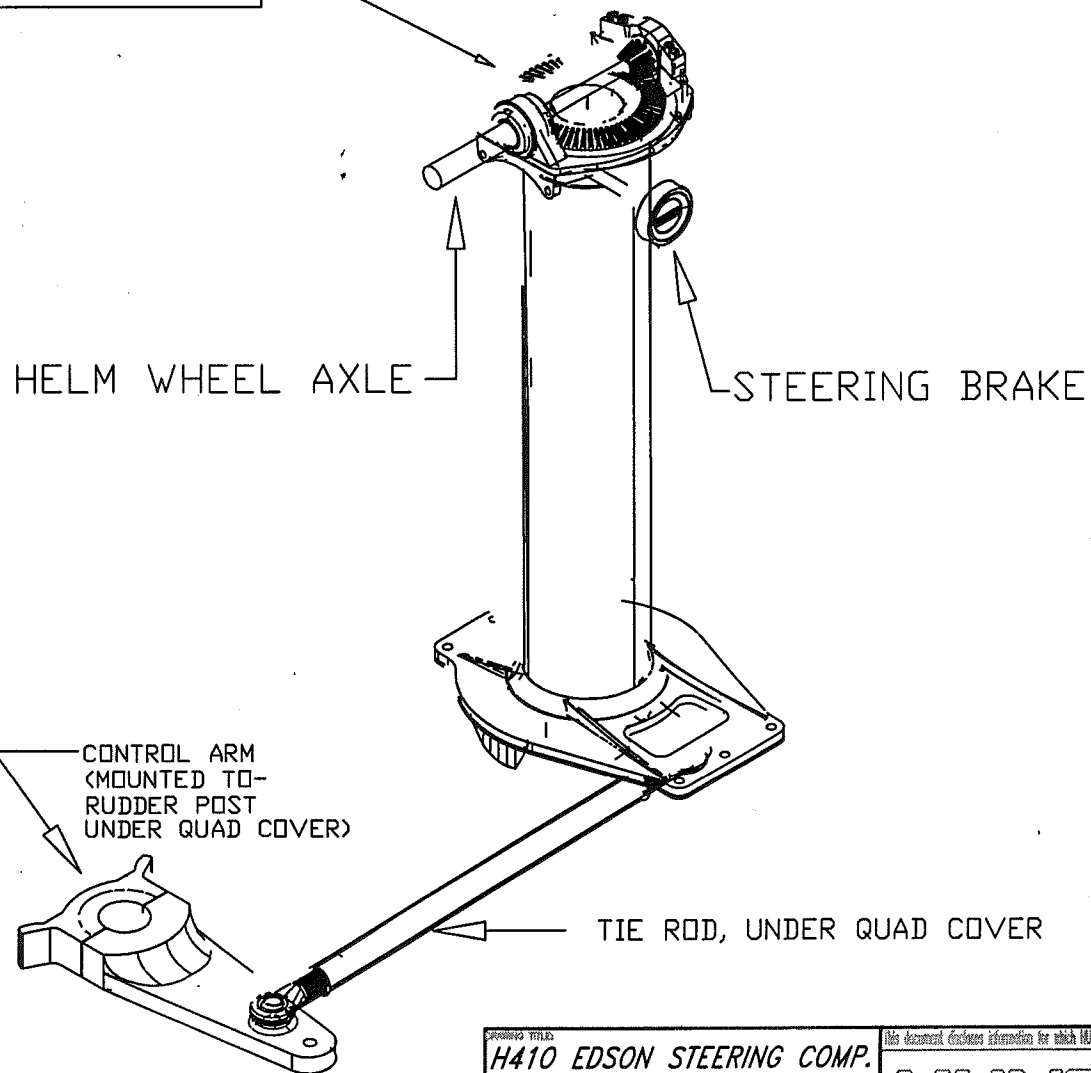
SEE EDSON STEERING MAINTENANCE UNDER "MAINTENANCE"  
FOR A COMPLETE DESCRIPTION OF STEERING COMPONENTS  
AND VITAL ROUTINE MAINTENANCE PROCEDURES.

NOTE: THIS UNIT IS INSIDE  
COCKPIT CONSOLE, CONSOLE  
NOT SHOWN FOR CLARITY

PLAN VIEW



ISO VIEW



DRAWING TITLE: <b>H410 EDSON STEERING COMP.</b>		
DRAWING NO. <b>4108067B</b>	REVISION NO. <b>NONE</b>	
APPROVED BY <b>ENGINEERING DEPT.</b>	DATE <b>7/14/97</b>	

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**HUNTER** 

STEERING SYSTEM PARTS LIST				
COMP. #			U.O.M.	QTY.
KH000001	5	410 STEERING SYSTEM	SYS	1
KH010001	5	410 STEERING ASSEMBLY	ASSY	1
KH030001	5	410 WHEEL STEERING SUB ASSEMBLY	SUB	1
KH030010	5	410 STEERING CONSOLE/BEAM MNTNG CPNTS.	CPNT	1
KH030020	5	410 RUDDER MOUNTING COMPONENTS	CPNT	1
HW2771	550	BEARING,L,UHMMW 6"IDX6 1/4"H40.5/43/42	EA	1
HW2737	550	SLEEVE, UPPER, 3"ODX8.5" S/S/ H40.5	EA	1
HW2770	550	SLEEVE,LOWER S/S 6.0"IDX6"L,H40.5/43/42	EA	1
HW2774	550	BEAR,UPP,UHMMW,3"IDX6" 336/355/42/	EA	1
KH030030	5	410 STEERING HARDWARE INSTALLATION CPNTS	CPNT	1
PR5028	999	STEERING SYSTEM W/AUTOPILOT SHAFT	EA	1
HW3280	450	STEERING WHEEL #524-42"-909 35'37'40'	EA	1
HW3284	77	STEERING SYSTEM 32' 33.5'	UT	1
KH030040	5	410 PEDESTAL GUARD INSTALLATION CPNTS	CPNT	1
KH030050	5	410 RUDDER FINISHING COMPONENTS	CPNT	1
KH030060	5	410 EMERGENCY TILLER INSTALLATION CPNTS	CPNT	1
HW3973	550	TILLER, EMERGENCY, GALV, TO PRINT H410	EA	1

UPPER & LOWER  
RUDDER STOCK  
BEARINGS  
ENCAPSULATED IN  
RUDDER PORT  
LAMINATE

UMHW  
UPPER BEARING

UMHW  
LOWER BEARING

DWL

FIBERGLASS  
RUDDER STOCK

FIBERGLASS  
RUDDER PORT  
TUBULAR ENCLOSURE  
AROUND RUDDER STOCK &  
BEARINGS - BONDED  
WATERTIGHT TO  
DECK AND HULL

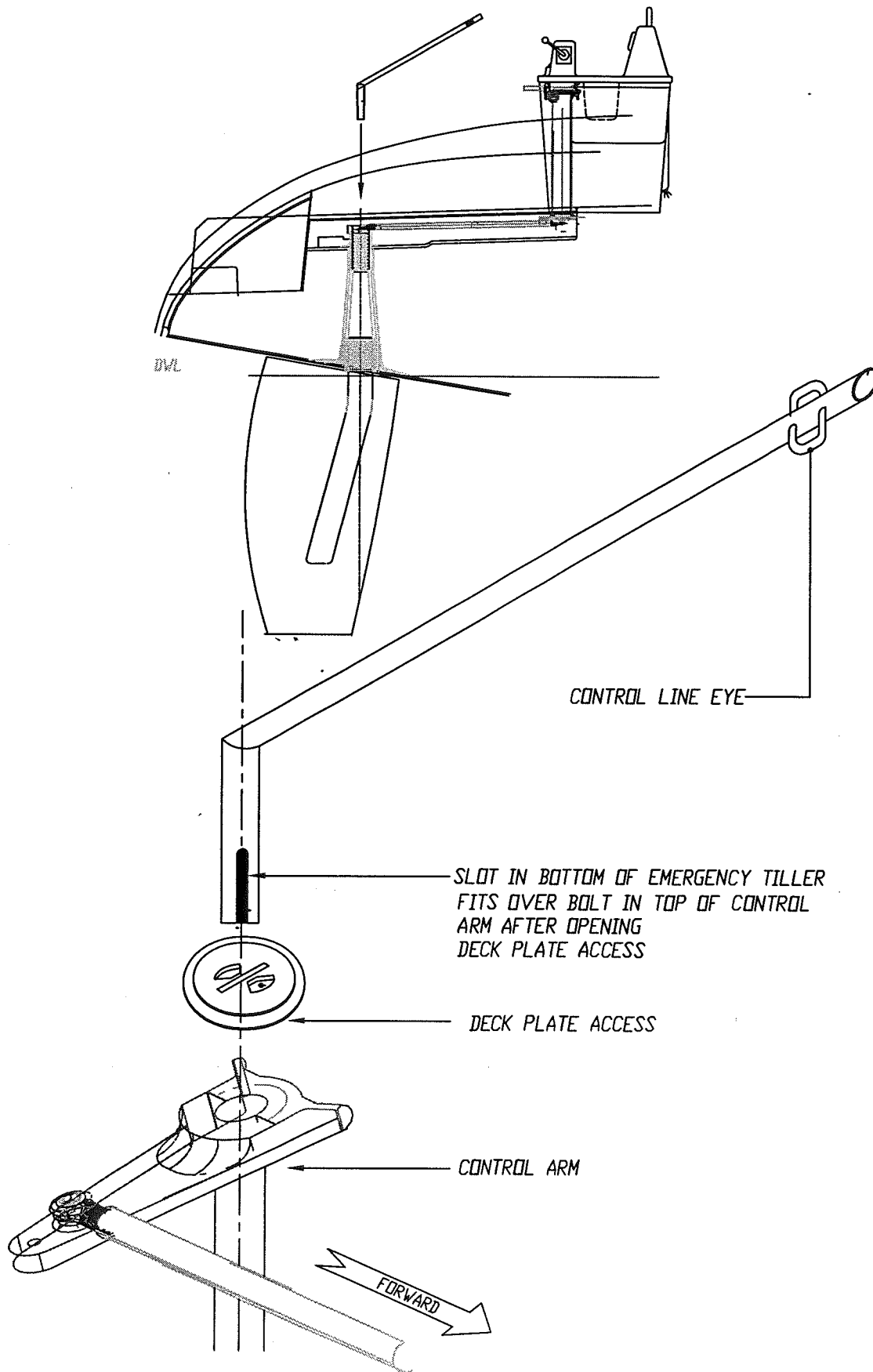
UPPER SLEEVE  
3" O.D. X .120 WALL S.S. TUBE  
(76.2mm X 3.048mm)  
TURNED TO 2.970" +/- .005

LOWER SLEEVE  
6" O.D. X .25 WALL S.S. TUBE  
(152mm X 6mm)  
TURNED TO 5.970" +/- .005

DRAWING TITLE: <b>H410 RUDDER &amp; SHAFT DETAILS</b>	
DRAWING NO. <b>4108068</b>	REVISION NO. <b>NONE</b>
ENGINEERING DEPT.	DATE <b>8/8/97</b>

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PLAN

ELECTRIC ANCHOR  
WINDLASS  
(STANDARD OR  
OPTIONAL ON  
LARGER MODELS)

TYPICAL CLEAT  
LOCATIONS VARY  
W/MODEL.

ANCHOR RODE  
(CHAIN OR ROPE OR COMBO)

PLOW ANCHOR

DANFORTH  
ANCHOR

STAINLESS BOW ROLLER  
(SIZE & SHAPE VARIES  
BETWEEN MODELS)

WELL: SMALLER MODELS

WELL: LARGER MODELS

ELEVATION

WATERLINE

GROUND TACKLE:

- 1.) BOW SHACKLE(W/PIN WIRED)  
● ANCHOR...FOL'D. BY...
- 2.) SWIVEL...FOL'D. BY...
- 3.) CHAIN(OPTION)...FOL'D. BY...
- 4.) D-SHAPED SHACKLE(W/PIN  
WIRED) ● EA. 27M OF CHAIN  
OR ● CHAIN TO ROPE RODE.

3D=CHAIN  
5D=ROPE

