HUNTER OWNER'S MANUAL
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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.

HUN 41127L98 — MAY 30, 1998
HULL NO. — DATE DELIVERED TO OWNER

ACADEMY II
YACHT NAME

Dr. Norman L. Eckel
OWNER NAME

7934 Middleton Pike
STREET ADDRESS

Bowling Green, Ohio USA — 43402
CITY — STATE/COUNTRY — ZIP CODE

Toledo Beach Marina
HOME PORT

YANMAR 4JH2E — 10809 — 17 X 15
ENGINE MODEL — SERIAL NO. — PROPELLER SIZE

Toledo Beach Yacht Sales — 734-243-3830
DEALER — PHONE

11840 Toledo Beach Road
STREET ADDRESS

LaSalle, Michigan USA — 48145
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

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 BLISER 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, sandblasted, 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

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

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

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 Arrostook 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 centerline.
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 *centerline.*
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 or 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 past of the bow to the aftermost part of the stern, excluding bowspirt, 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 our 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 *lifelines.*
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 sale; 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 would 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

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

SAFE BOATING TIPS

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

- ❑ 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 ☐ Food ☐ Flares ☐ Water ☐ Mirror ☐ EPIRB ☐ Flashlight ☐ 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

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.

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.

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.

! 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.

! 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.

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.

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 tthe 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 lever 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.

MOTORING 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.

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.

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.

⚠ WARNING

SINKING HAZARD - Ensure proper bilge pump operation.

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.

⚠ 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.

⚠ CAUTION

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

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.

SAFE BOATING TIPS

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.

JABSCO®

Model 45510-1000

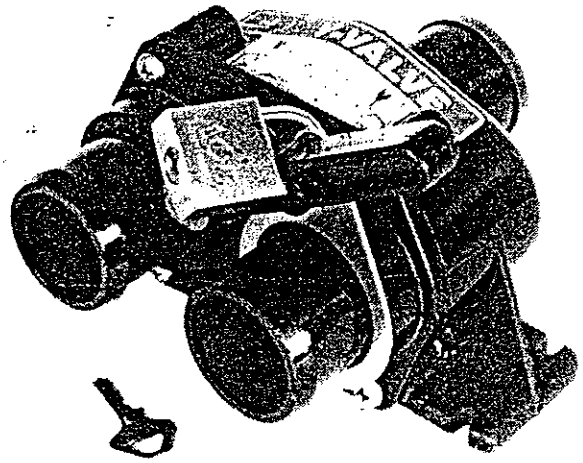
TWO POSITION Y-VALVE

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)



Padlock not included

Model 45510-1000

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.)

INSTALLATION

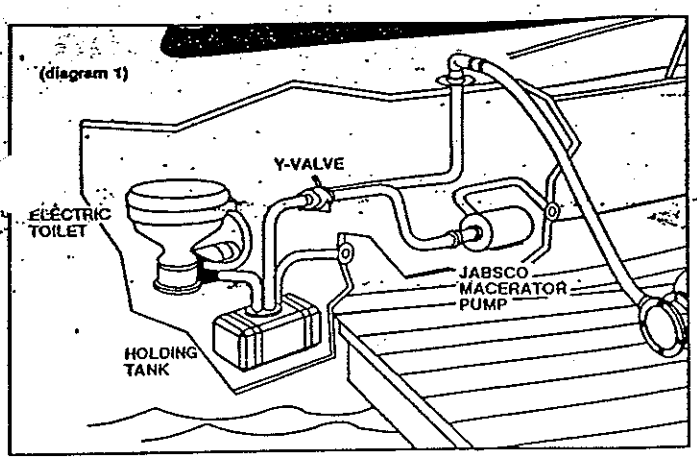
Lay out the system that the Y-Valve will be installed in so that all hoses can be installed without sharp bends, kinks or loops that trap fluids. After choosing a convenient, accessible location for the Y-Valve, be sure that there is adequate room to swing the selector lever. Mark locations for mounting 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.

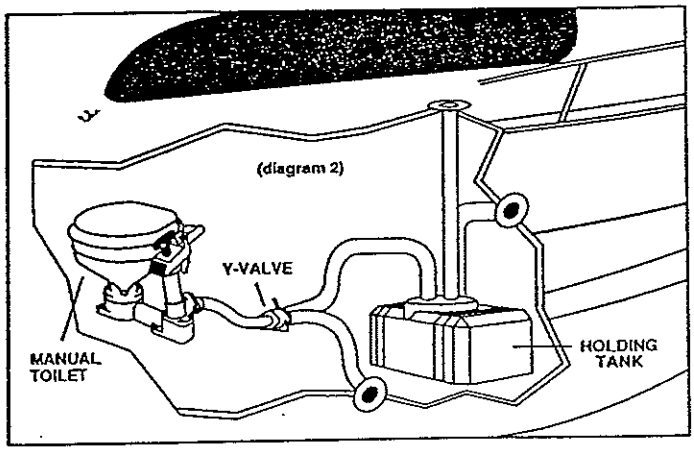
It is recommended that all hoses used in waste systems should be the heavy, non-collapsible fabric reinforced hose. Vacuum cleaner type hose and vinyl hoses will collapse under the vacuum of a dockside pumpout system, or will allow sewer gas to permeate into the boat. All hoses should be double clamped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

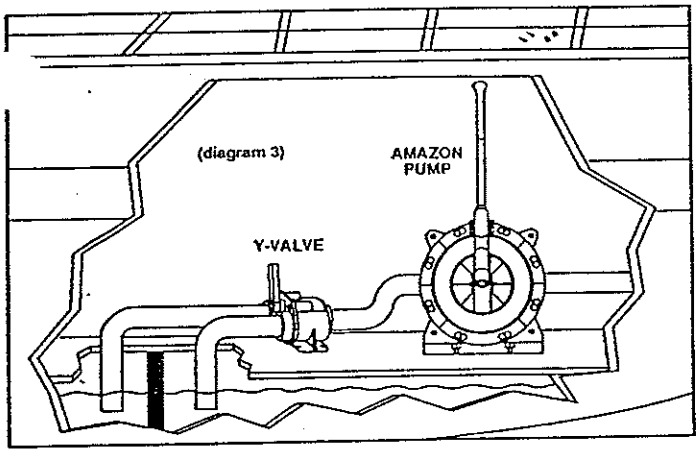
OPERATION

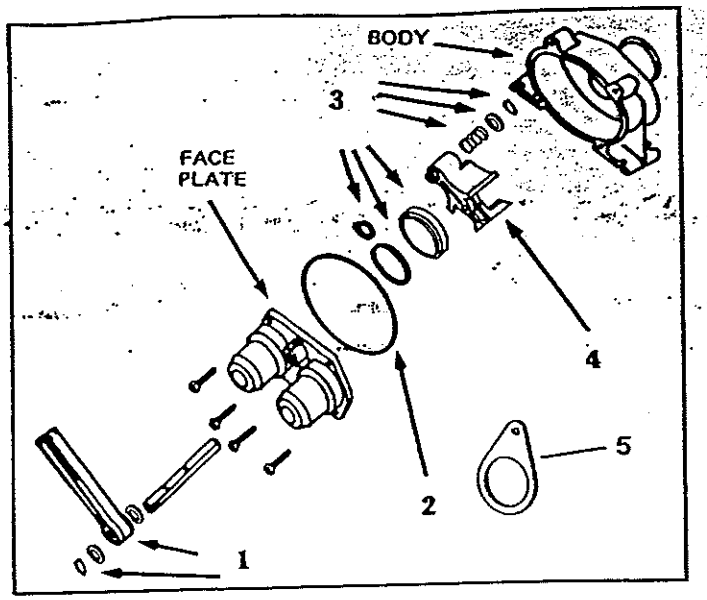
The Y-Valve is designed with a simple and positive diverter mechanism. When choosing the discharge hose system to use, simply orient the selector lever on the Y-Valve over the hose desired to be open to flow. When selecting the particular hose for flow, be sure that the lever is securely positioned against 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 [1]	45559-0000	1
2	O-Ring Gasket	45559-0001	1
3	Valve Seal Mechanism [2]	45559-0002	1
4	Swivel Block	45559-0003	1
5	Locking Ring [3]	45507-0001	1

[1] Includes Shaft Spring Retainer
[2] Includes Seal Disk and O-Ring, Shaft O-Ring, Shaft Spring, Shaft Snap Ring
[3] 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
nit of ITT Fluid Technology Corporation
.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

Printed in U.S.A.

Form 43000-0589 Rev. 1/96

ENVIRONMENTAL CONSIDERATIONS

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

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 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.

⚠ 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

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 sidewise 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

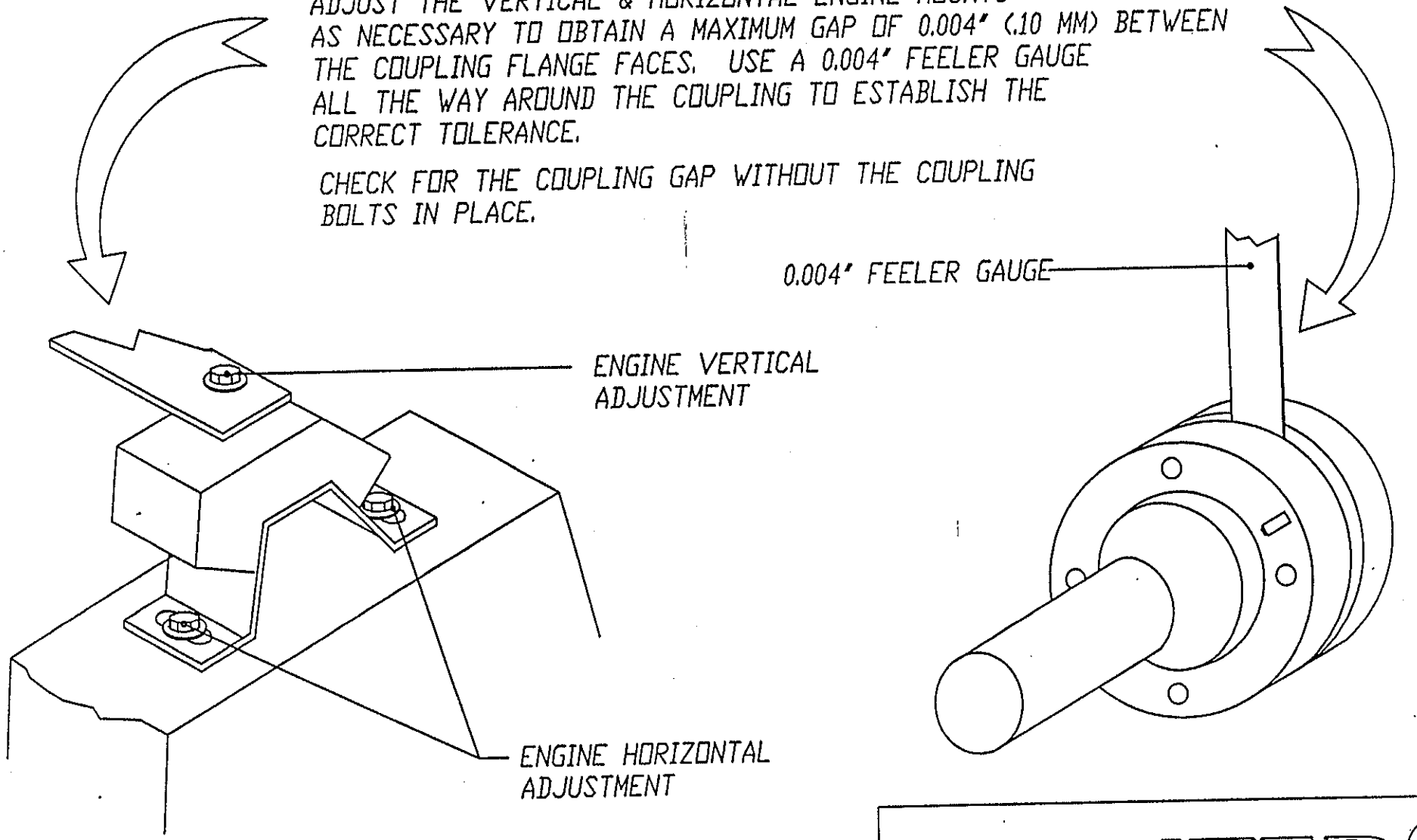
The stuffing box is held to the stern bearing by a rubber hose secured with hose clamps. (See the Shaft and Propeller section) The clamps should be tight and no water should leak from this location. While underway a slight drip from the stuffing box at the shaft exit is necessary (three to five drops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



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

• 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.

⚠ WARNING

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

⚠ 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.

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.

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

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 airflow 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

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

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

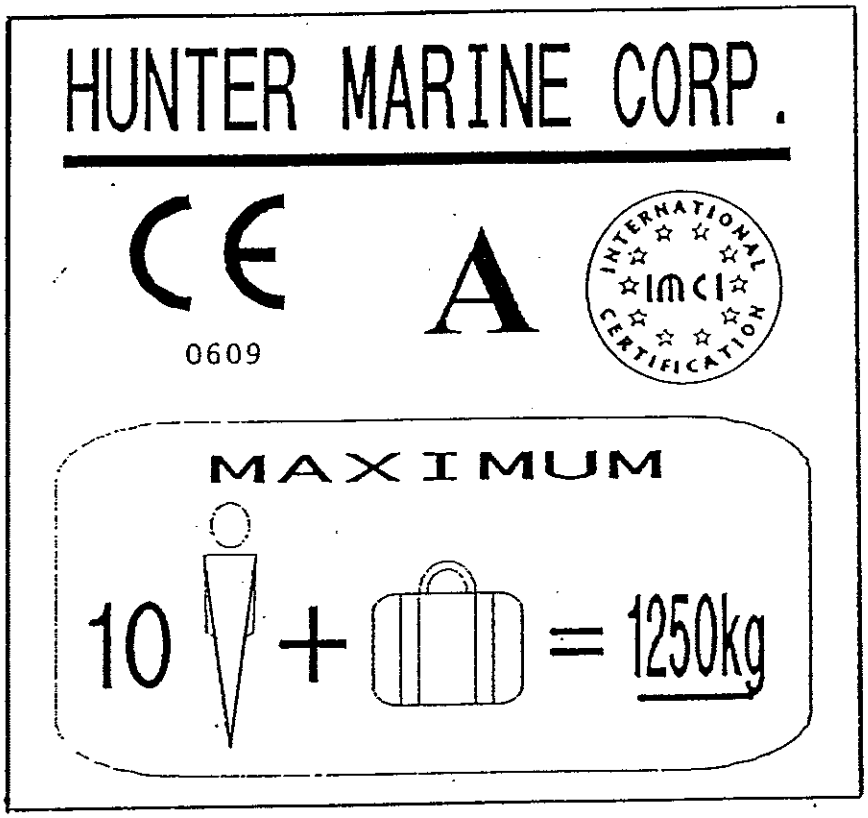
Your Hunter has been judged by the National Marine Manufacturers Association (NMMA) to be in compliance with the applicable federal regulations and American Boat and Yacht Council (ABYC) standard and recommended practices in effect at the time of manufacture.

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

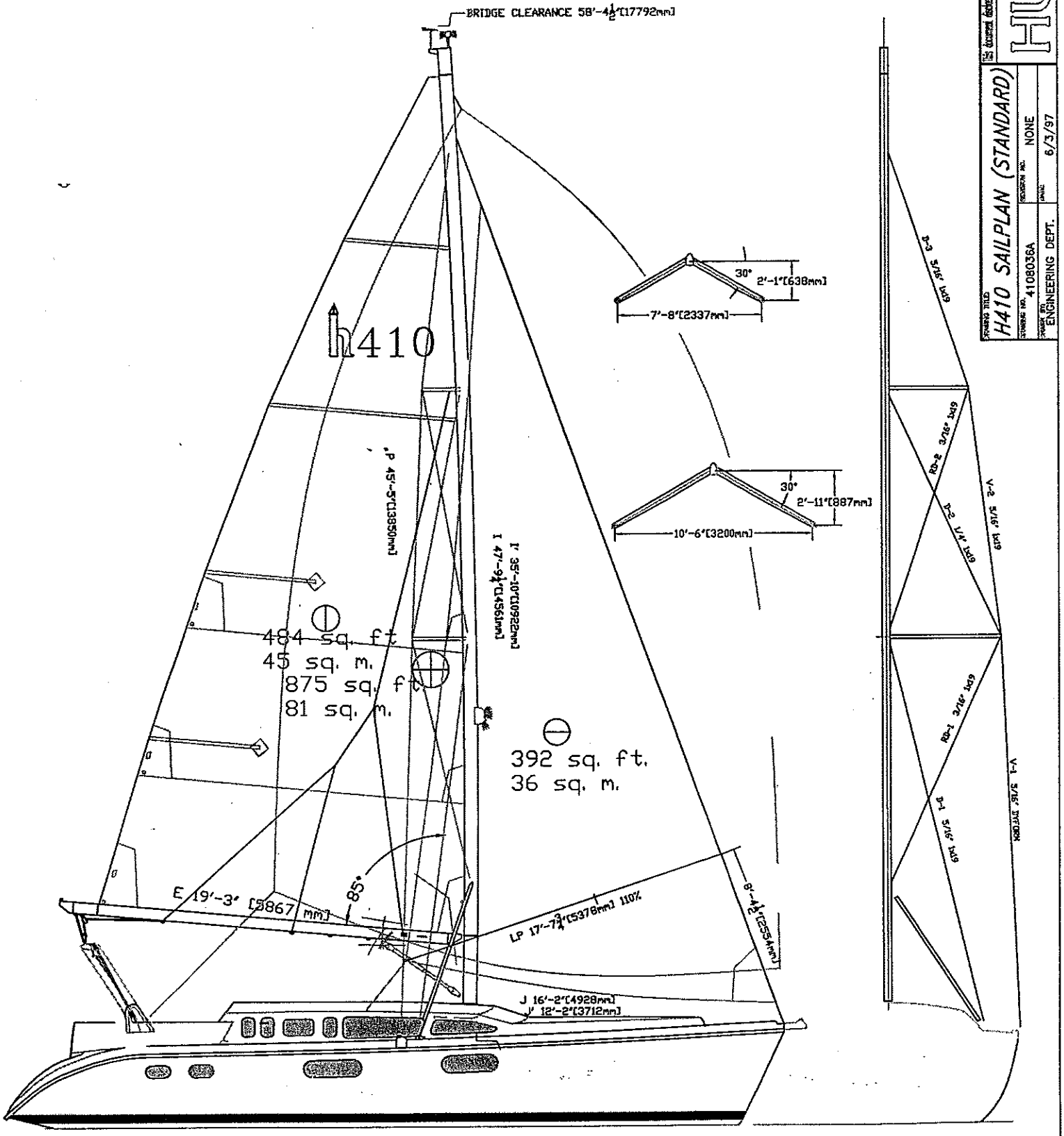
BUILDER'S INFORMATION PLATE

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.



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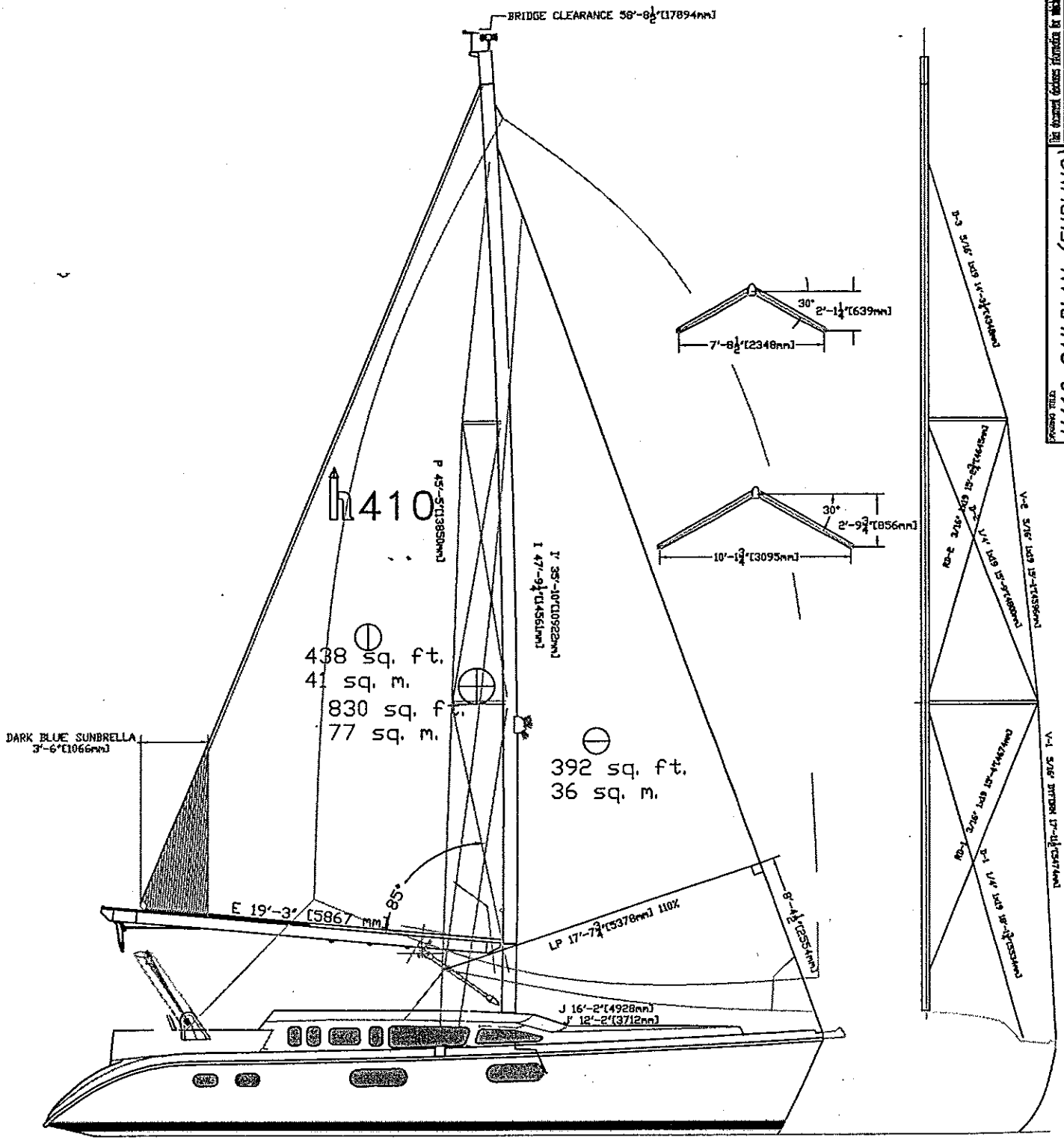
HUNTER

DRAWING TITLE: H410 SAILPLAN (STANDARD)

DRAWING NO.	4108036A
REVISION NO.	NONE
PROJECT NO.	ENGINEERING DEPT.
DATE	6/3/97



HUNTER

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DRAWING TITLE: H410 SAILPLAN (FURLING)

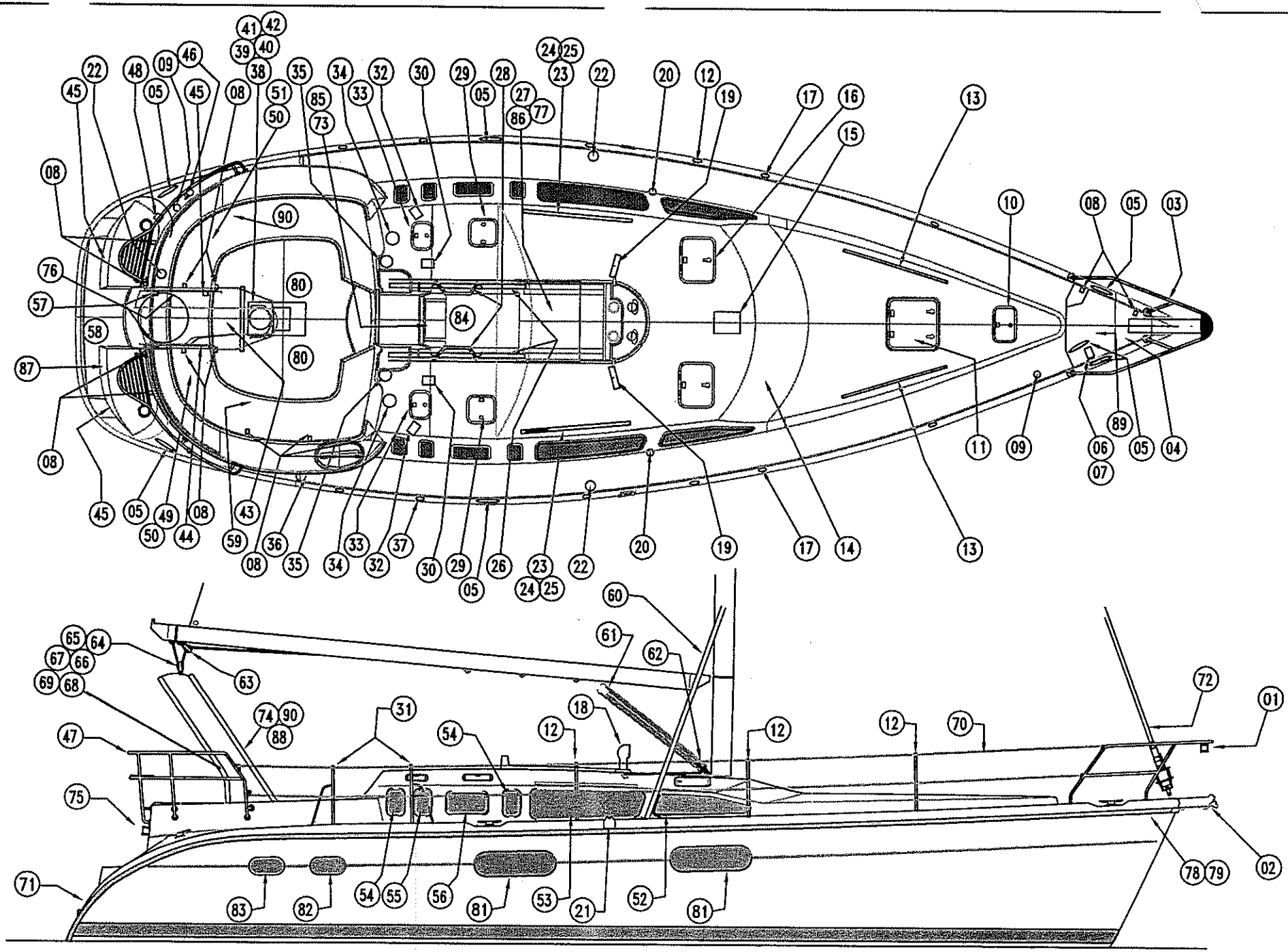
DRAWING NO.	REVISION NO.	
41080368	NONE	
DRAWN BY: ENGINEERING DEPT.	LAUNCH	6/26/97

PAGE 36B

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	H410 STANDARD DECK HARDWARE LAYOUT
DRAWING NO.	41020009
REVISION NO.	NONE
DRAWN BY	ENGINEERING DEPT.
DATE	6/25/97

HUNTER

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			HW2132	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 60		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 60T
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			HW4358	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

DRAWING TITLE: H410 STANDARD DECK HARDWARE LIST

DRAWING NO. 4108039 | REVISION NO. NONE

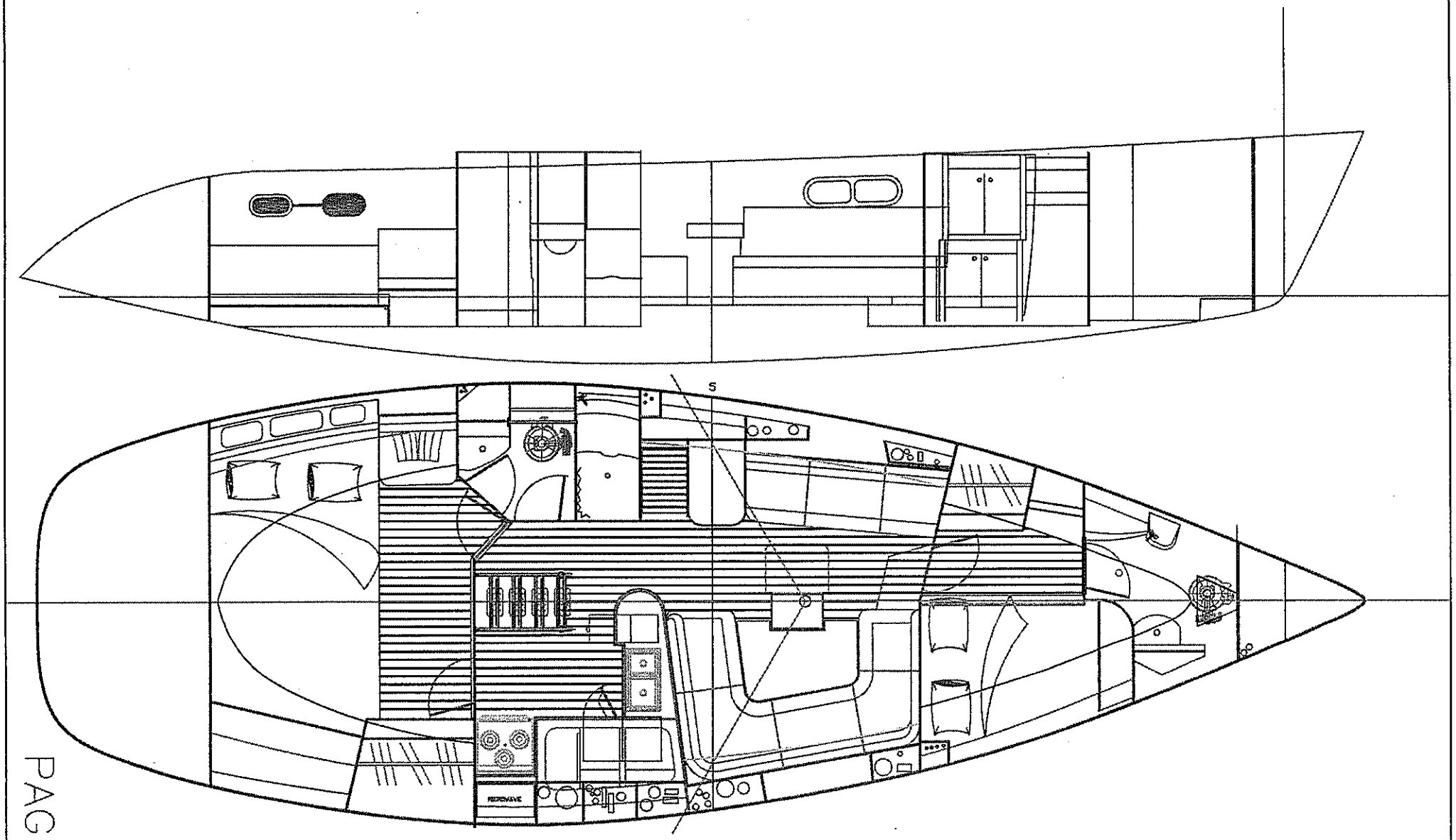
DRAWN BY ENGINEERING DEPT. | DATE 8/1/97

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			EL0389	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

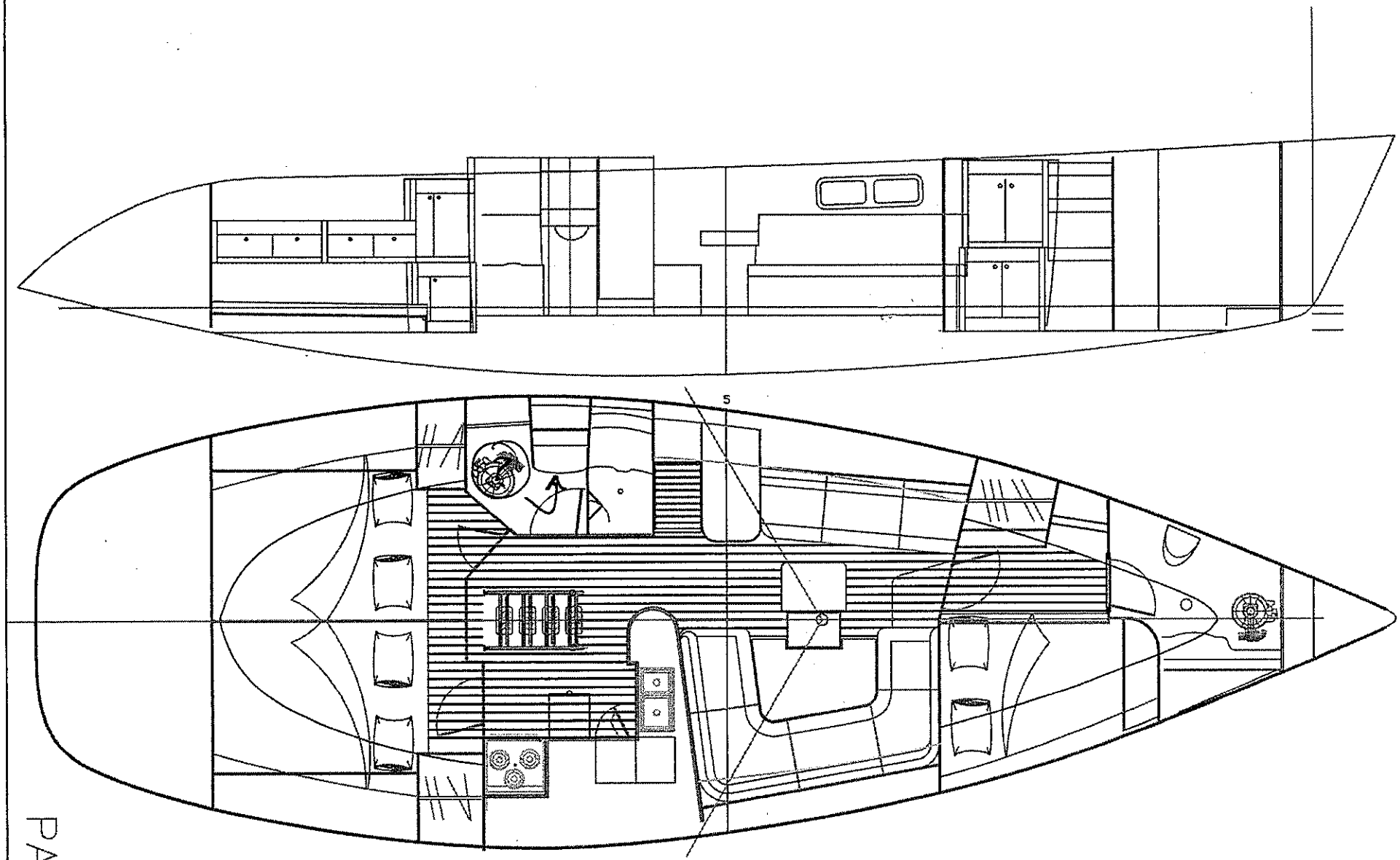
DRAWING TITLE: H410 STANDARD DECK HARDWARE LIST CONT.	
DRAWING NO. 4108040	REVISION NO. NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 8/1/97

HUNTER



DRAWING TITLE: H410 ACCOMMODATION PLAN (STD)	
DRAWING NO.: 4108041A	REVISION NO.: NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 6/3/97

HUNTER



DRAWING TITLE: H410 ACCOMMODATION PLAN (TRI-CABIN)	This document discloses information for which HUNTER MARINE CORP. has proprietary rights.
DRAWING NO.: 4108041B	REVISION NO.: NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 6/3/97

HUNTER

H410 DINETTE TABLE OPERATION

PHOTO #1

1A. REMOVE STORAGE BOX LID

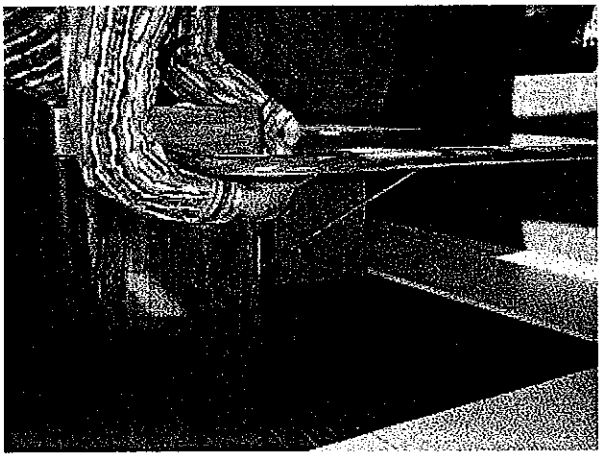


PHOTO #2

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.

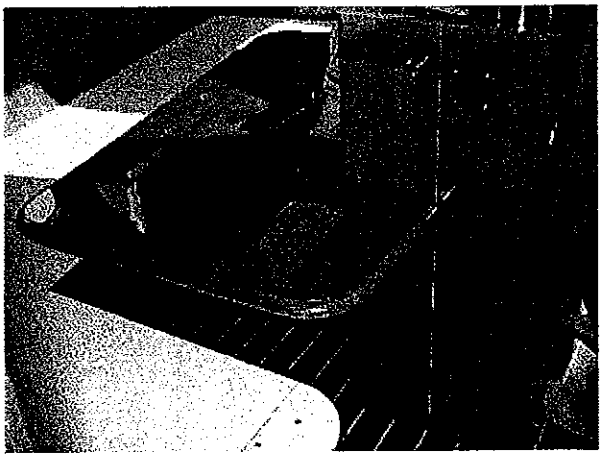


PHOTO #4

4A. LOWER TABLE UNTIL IT RESTS UPON SETTEE TOP.

STANDARD RIG

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

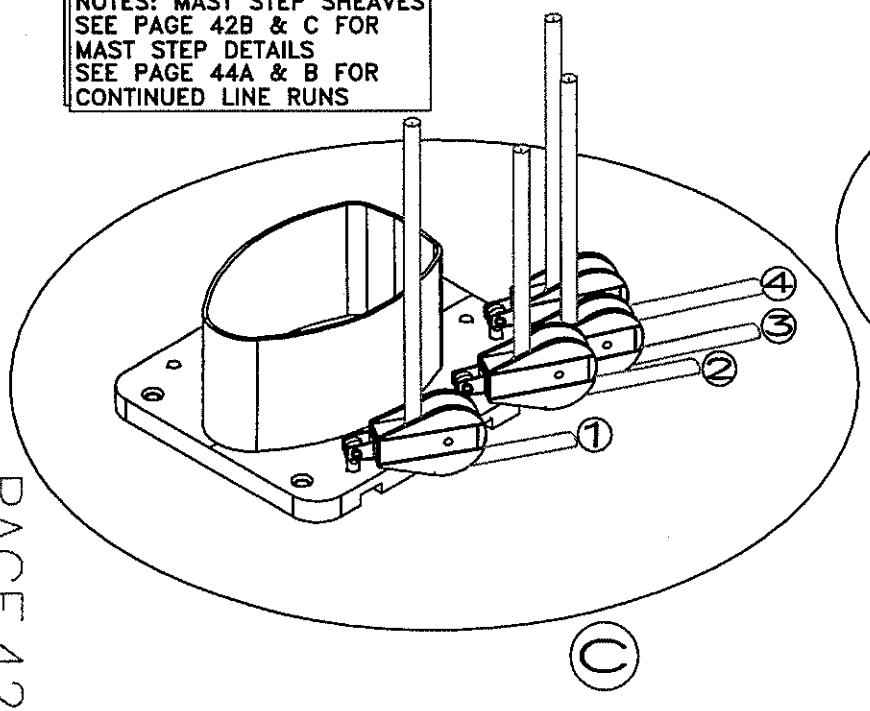
FURLING RIG

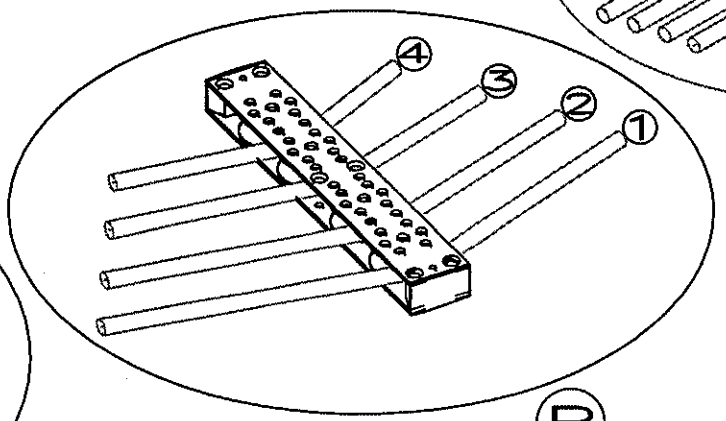
NOTES: LINE RUNS
①OPT. SPINN. HALYARD (BLACK)
(DISREGARD #1 IF SPINN. OPTION NOT CHOSEN)
②JIB HALYARD (RED)
③MAIN OUTHAUL
④MAIN FURLING

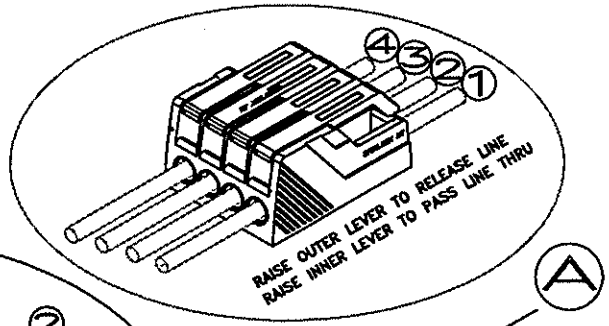
NOTES: SHEET STOPPER
OPTIONAL QUAD SHEET STOPPER SHOWN
STD. MODEL IS TRI STOPPER
(QUAD) SPINLOCK XT HUNTER # HW1267
(TRI) SPINLOCK XT HUNTER # HW1265

FORWARD
PORT

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







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

DRAWING TITLE: H410 PORT RUN. RIG & MAST STEP DETAIL

DRAWING NO.	REVISION NO.
4108042A-1	NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 6/26/97

HUNTER

NOTES: LINE RUNS

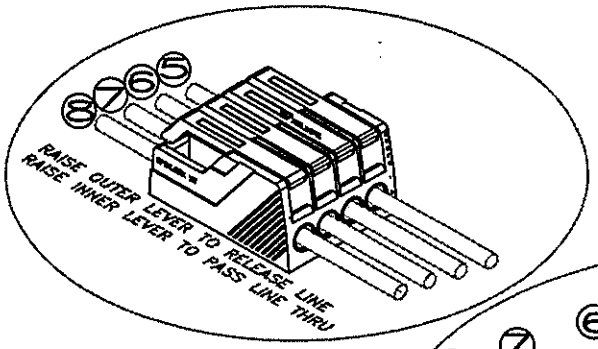
⑤VANG (WHITE)
⑥MAINSHEET (BLUE FLECK)
⑦MAIN HALYARD (BLUE)
⑧OPT. STAYSAIL HALYARD (GREEN)

(DISREGARD #8 IF STAYSAIL OPTION NOT CHOSEN)

SEE PAGE 44 FOR CONTINUED LINE RUNS

NOTES: SHEET STOPPER

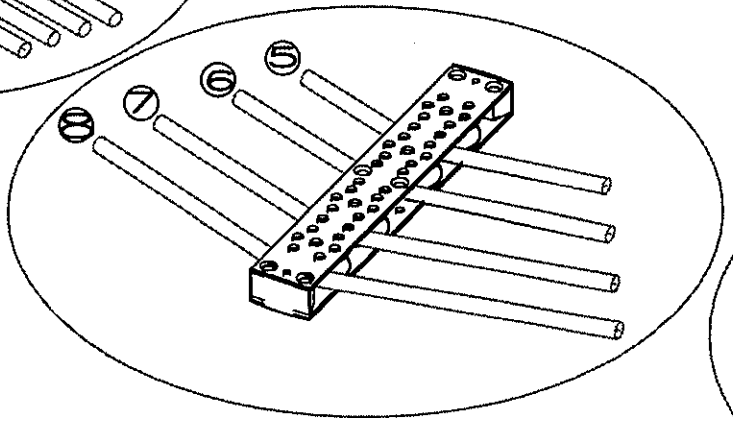
OPTIONAL QUAD SHEET STOPPER SHOWN
STD. MODEL IS TRI STOPPER
(QUAD) SPINLOCK XT HUNTER # HW1257
(TRI) SPINLOCK XT HUNTER # HW1265



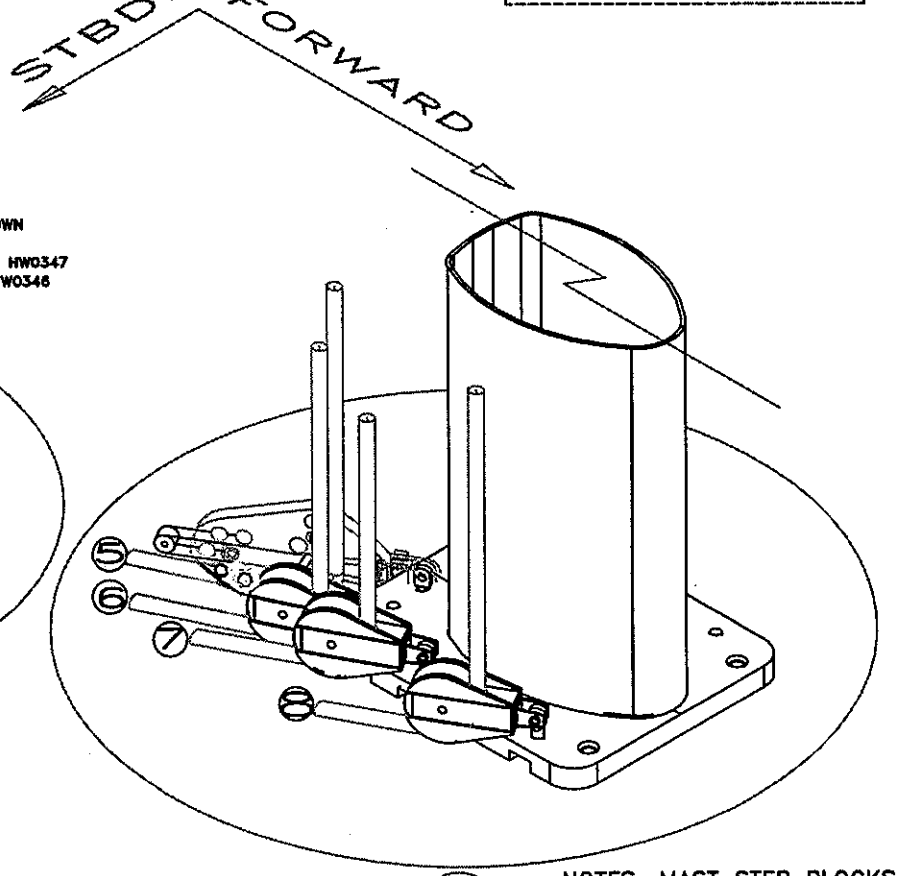
A

NOTES: ORGANIZER

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



B



C

NOTES: MAST STEP BLOCKS

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

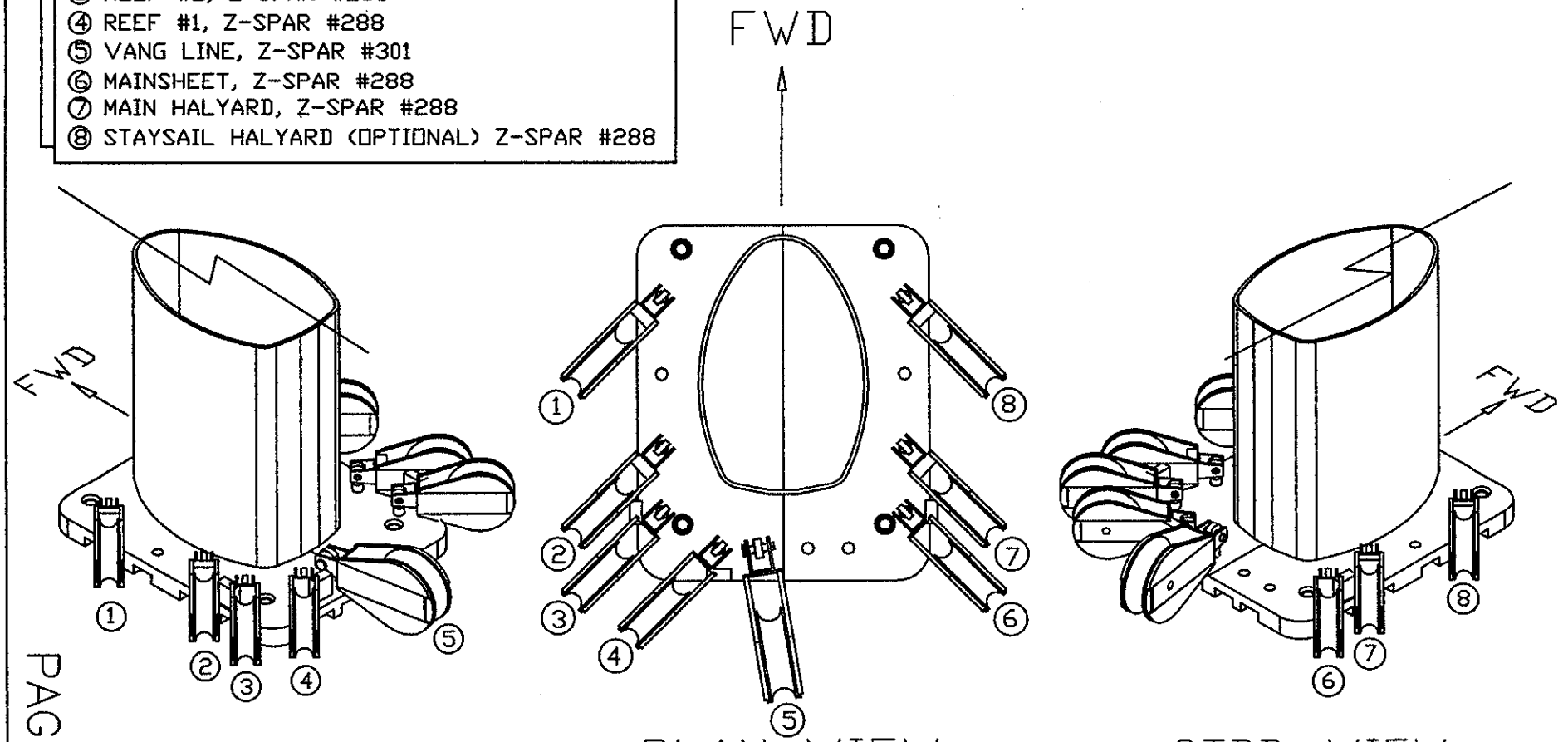
PAGE 42A-2

STBD. RUNNING RIGGING DETAIL

DRAWING TITLE: H410 STBD.RUN. RIG & MAST STEP DETAIL (STD.)	
DRAWING NO.: 4108042A-2	REVISION NO.: NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 6/10/97

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 #301
⑥ MAINSHEET, Z-SPAR #288
⑦ MAIN HALYARD, Z-SPAR #288
⑧ STAYSAIL HALYARD (OPTIONAL) Z-SPAR #288



PORT VIEW

PLAN VIEW

STBD. VIEW

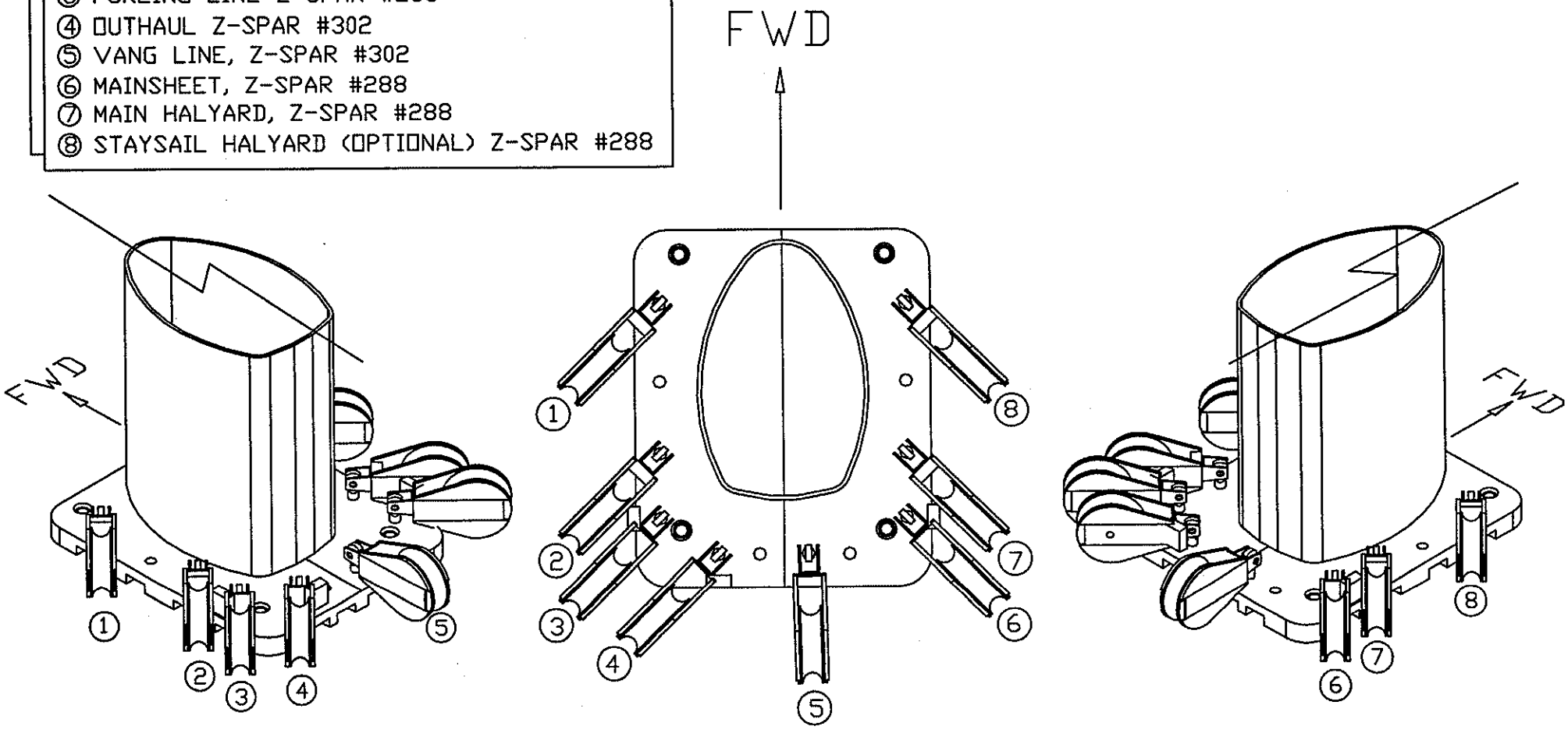
PAGE 42B

DRAWING TITLE: H410 MAST STEP DETAIL (STD.)

DRAWING NO.	REVISION NO.
4108042B	NONE
DRAWN BY: ENGINEERING DEPT	DATE: 6/10/97

HUNTER

① SPINN. HALYARD (OPTIONAL) Z-SPAR #288
② JIB HALYARD, Z-SPAR #288
③ FURLING LINE Z-SPAR #288
④ OUTHAUL 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



PORT VIEW

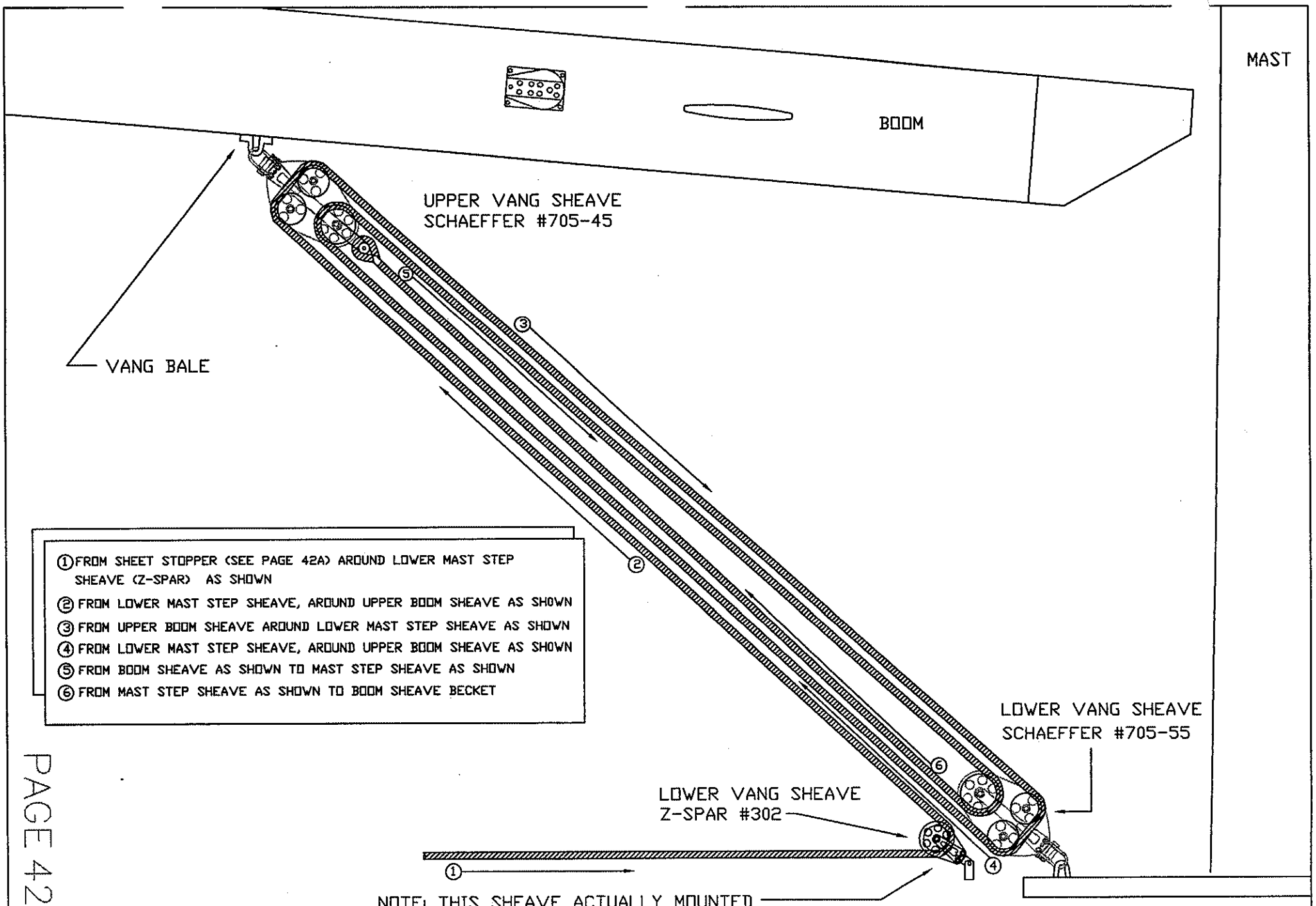
PLAN VIEW

STBD. VIEW

PAGE 42C

DRAWING TITLE: H410 MAST STEP DETAIL (FURLING)	
DRAWING NO. 4108042C	REVISION NO. NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 6/10/97

HUNTER



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

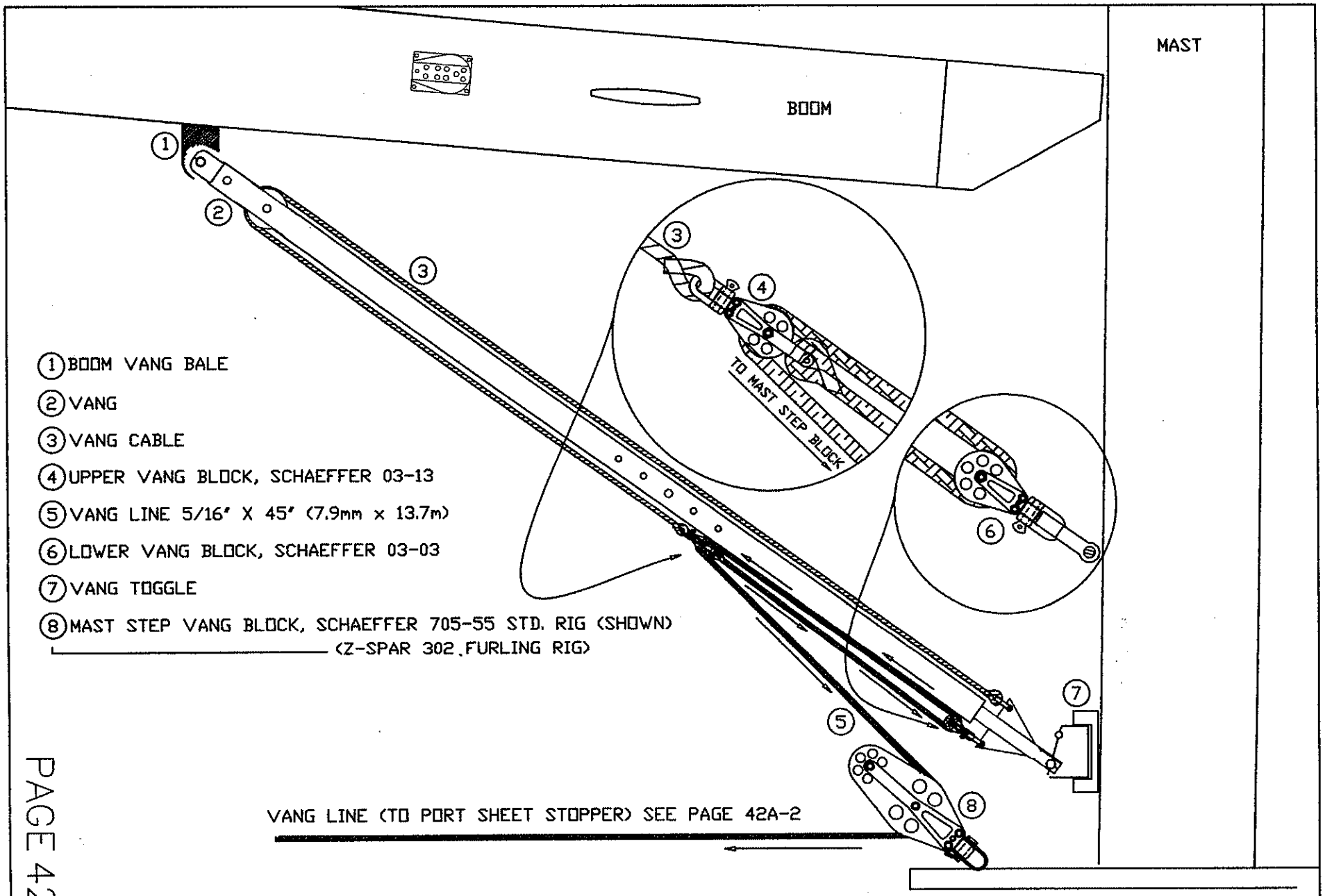
⑤ FROM BOOM SHEAVE AS SHOWN TO MAST STEP SHEAVE AS SHOWN

⑥ FROM MAST STEP SHEAVE AS SHOWN TO BOOM SHEAVE BECKET

PAGE 42D

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

HUNTER



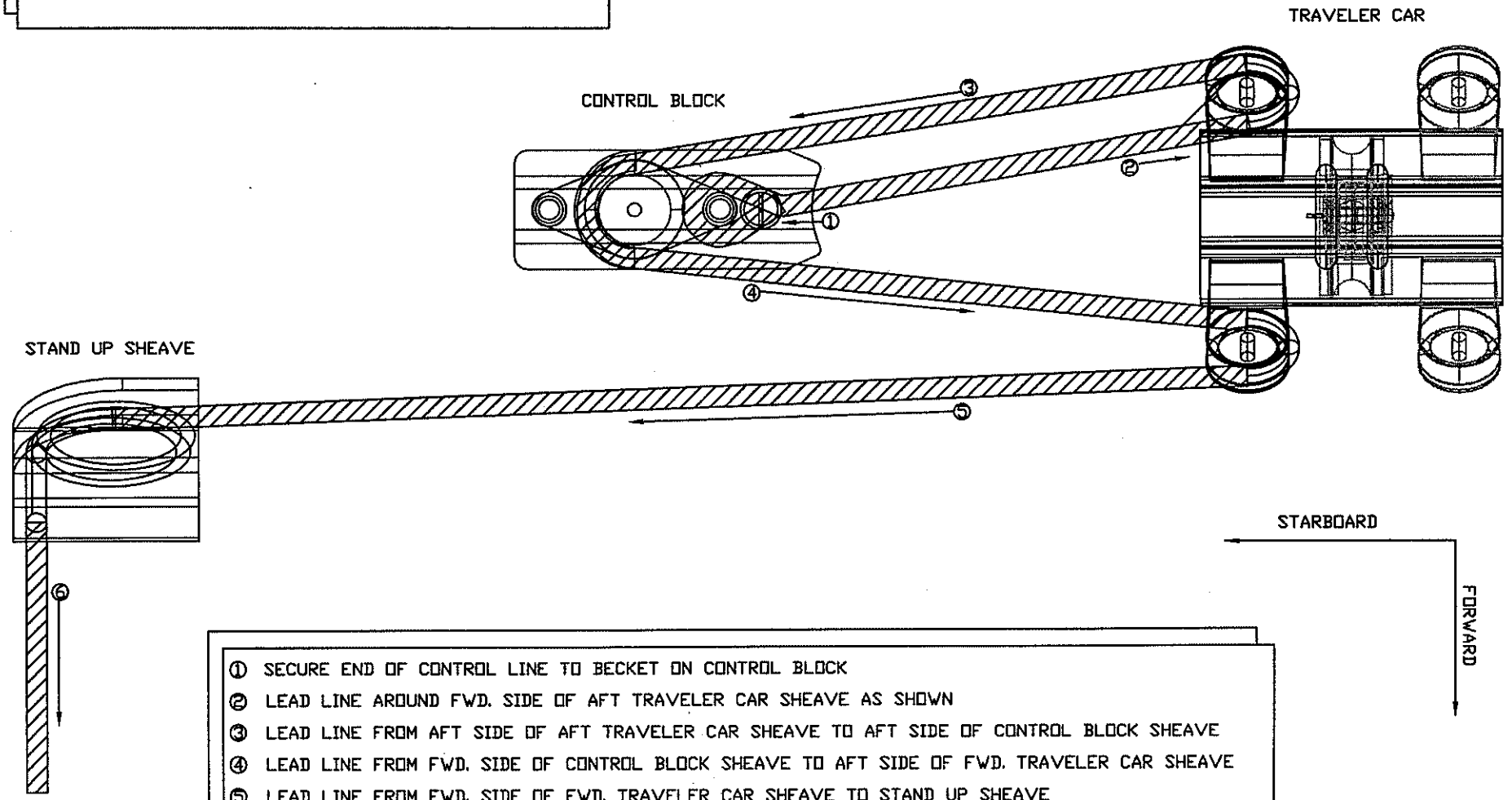
1. BOOM VANG BALE
2. VANG
3. VANG CABLE
4. UPPER VANG BLOCK, SCHAEFFER 03-13
5. VANG LINE 5/16" X 45' (7.9mm x 13.7m)
6. LOWER VANG BLOCK, SCHAEFFER 03-03
7. VANG TOGGLE
8. MAST STEP VANG BLOCK, SCHAEFFER 705-55 STD. RIG (SHOWN)
   (Z-SPAR 302 FURLING RIG)

PAGE 42E

H410 RIGID VANG DETAILS FURLING/OPT.	
4108042E	NONE
ENGINEERING DEPT.	11/13/97

HUNTER

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

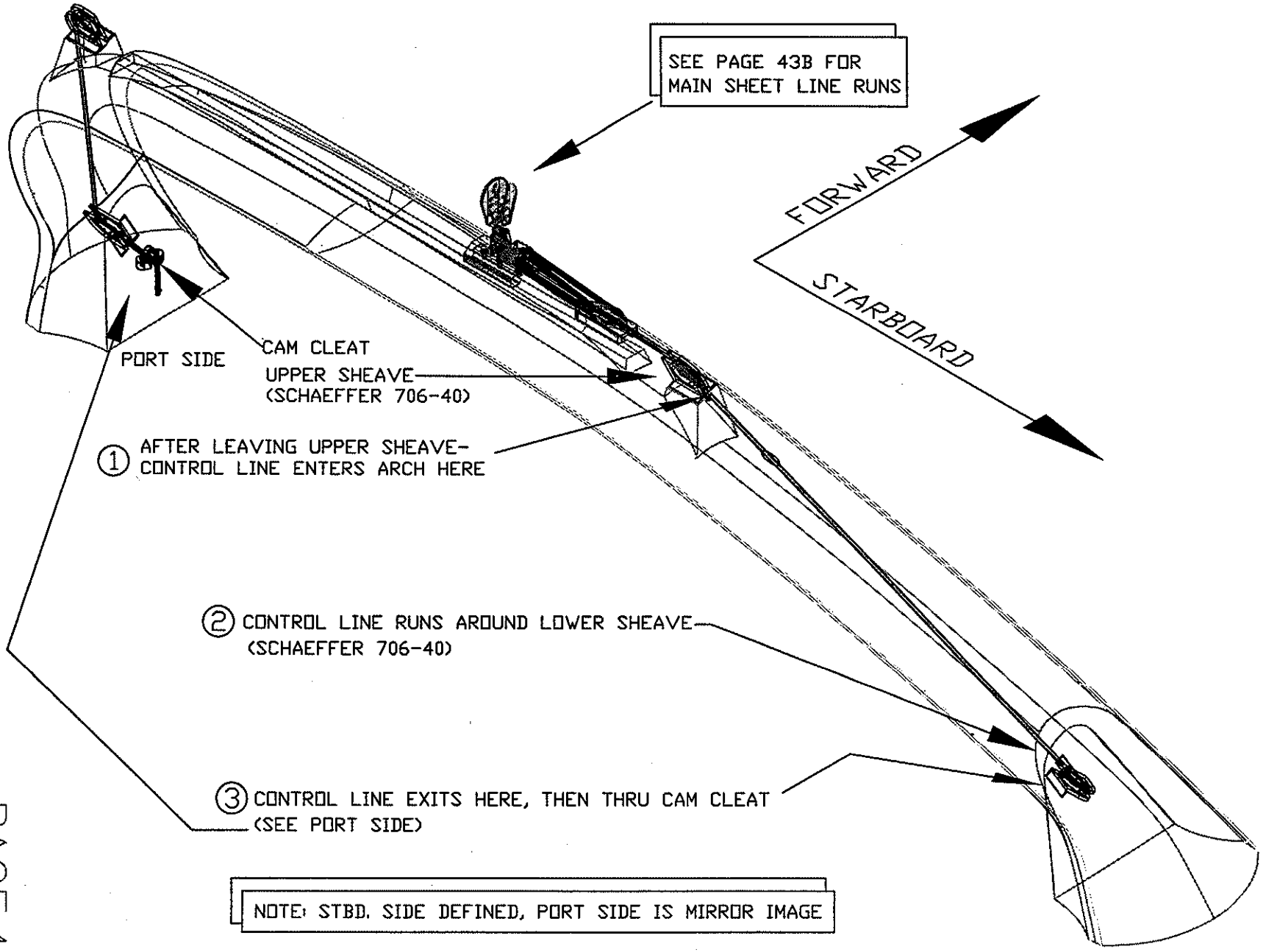


① SECURE END OF CONTROL LINE TO BECKET ON CONTROL BLOCK
② LEAD LINE AROUND FWD. SIDE OF AFT TRAVELER CAR SHEAVE AS SHOWN
③ LEAD LINE FROM AFT SIDE OF AFT TRAVELER CAR SHEAVE TO AFT SIDE OF CONTROL BLOCK SHEAVE
④ LEAD LINE FROM FWD. SIDE OF CONTROL BLOCK SHEAVE TO AFT SIDE OF FWD. TRAVELER CAR SHEAVE
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

PAGE 43A-1

DRAWING TITLE: 410 STANDARD ENDBOOM MAINSHEET TRAVELER
DRAWING NO. 4108043A-1
REVISION NO. NONE
DRAWN BY: ENGINEERING DEPT.
DATE: 6/18/97

HUNTER



DRAWING TITLE: H410 TRAV. CONTROL LINE DETAILS

DRAWING NO.	REVISION NO.
4108043A-2	NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 6/20/97

HUNTER

STANDARD MAINSHEET PURCHASE (ENDBOOM)

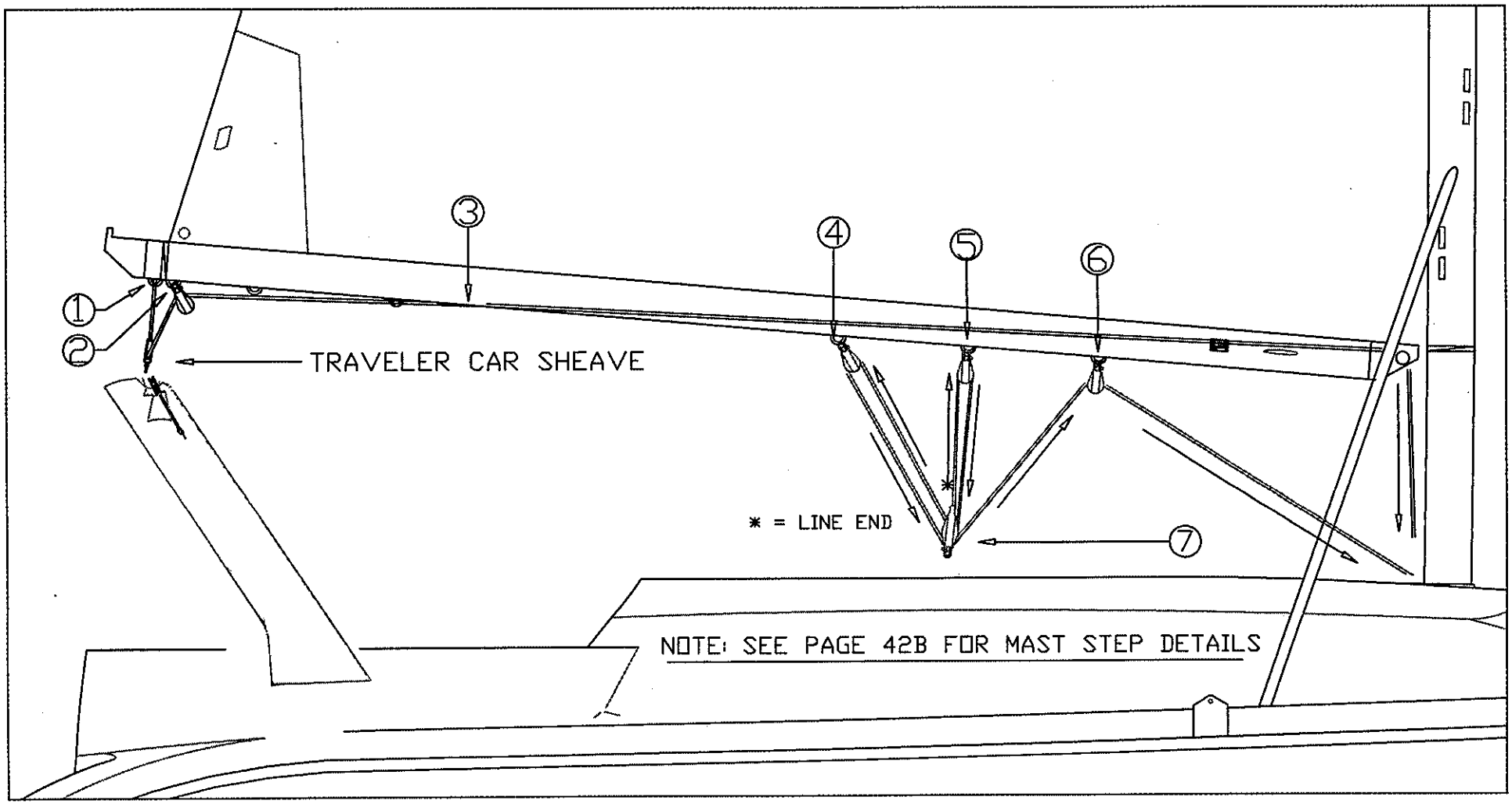
① BALE, MAINSHEET END
② BALE, MAINSHEET BLOCK
③ EXIT, MAINSHEET

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

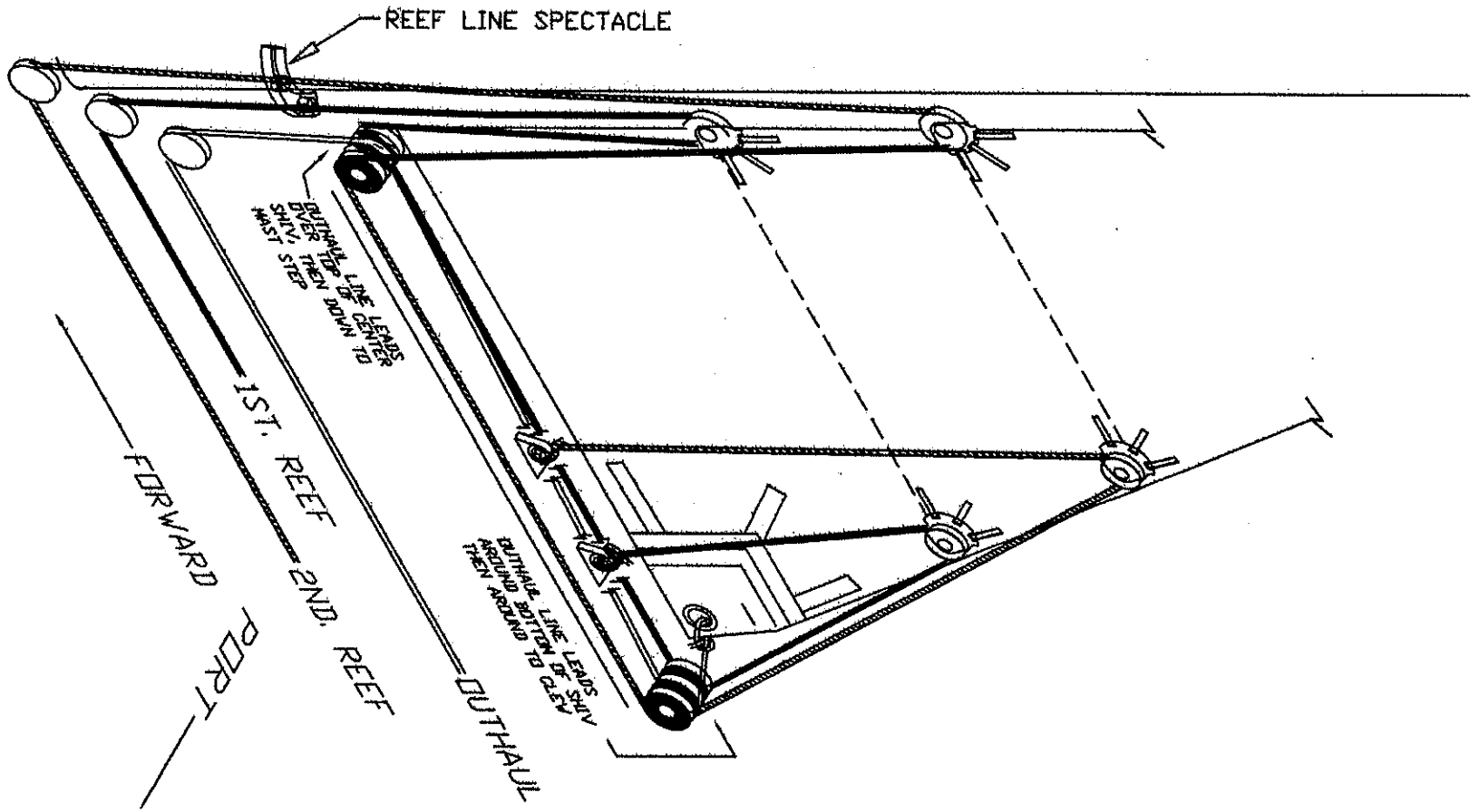
SEE PAGE 43A-3 FOR MIDBOOM TRAVELER DETAILS



DRAWING TITLED: H410 MAINSHEET PURCHASE
DRAWING NO.: 4108043B
REVISION NO.: NONE
DRAWN BY: ENGINEERING DEPT.
DATE: 6/23/97

HUNTER

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



H410 BOOM & REEF LAYOUT

4108044	NONE
ENGINEERING DEPT.	8/1/97

HUNTER

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.*

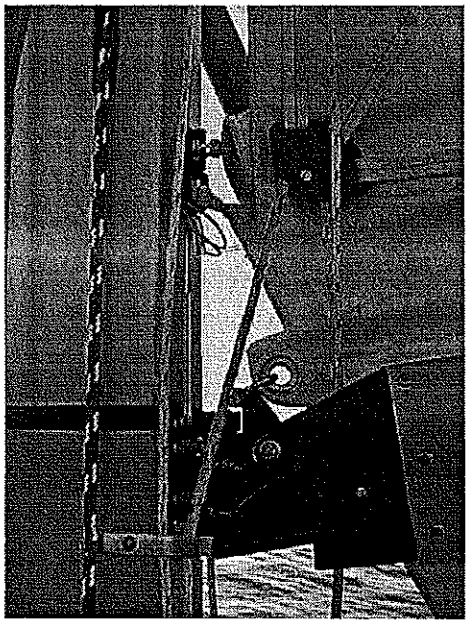


Figure 1 Reef 1 Tack Fitting

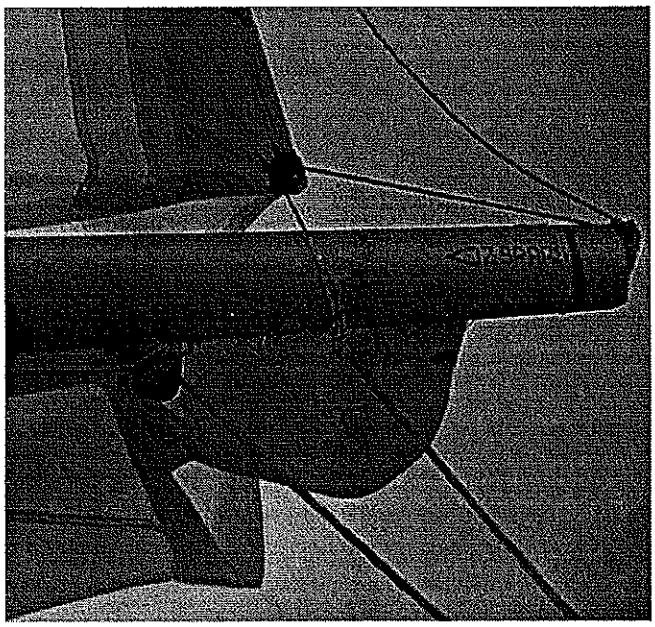


Figure 2 Reef 1 Clew Fitting

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.*

446/dwg/8ownman/reef.doc (m.s.word)

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: H410 RUNNING RIG SPECS (STD.)	
DRAWING NO.: 4108046A	REVISION NO.: NONE
DRAWN BY: ENGINEERING DEPT	DATE: 8/3/97

HUNTER

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

DRAWING TITLE: H410 RUNNING RIG SPECS (FURLING)
DRAWING NO. 41080468 | REVISION NO. NONE
DRAWN BY: ENGINEERING DEPT | DATE: 8/3/97

HUNTER

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.

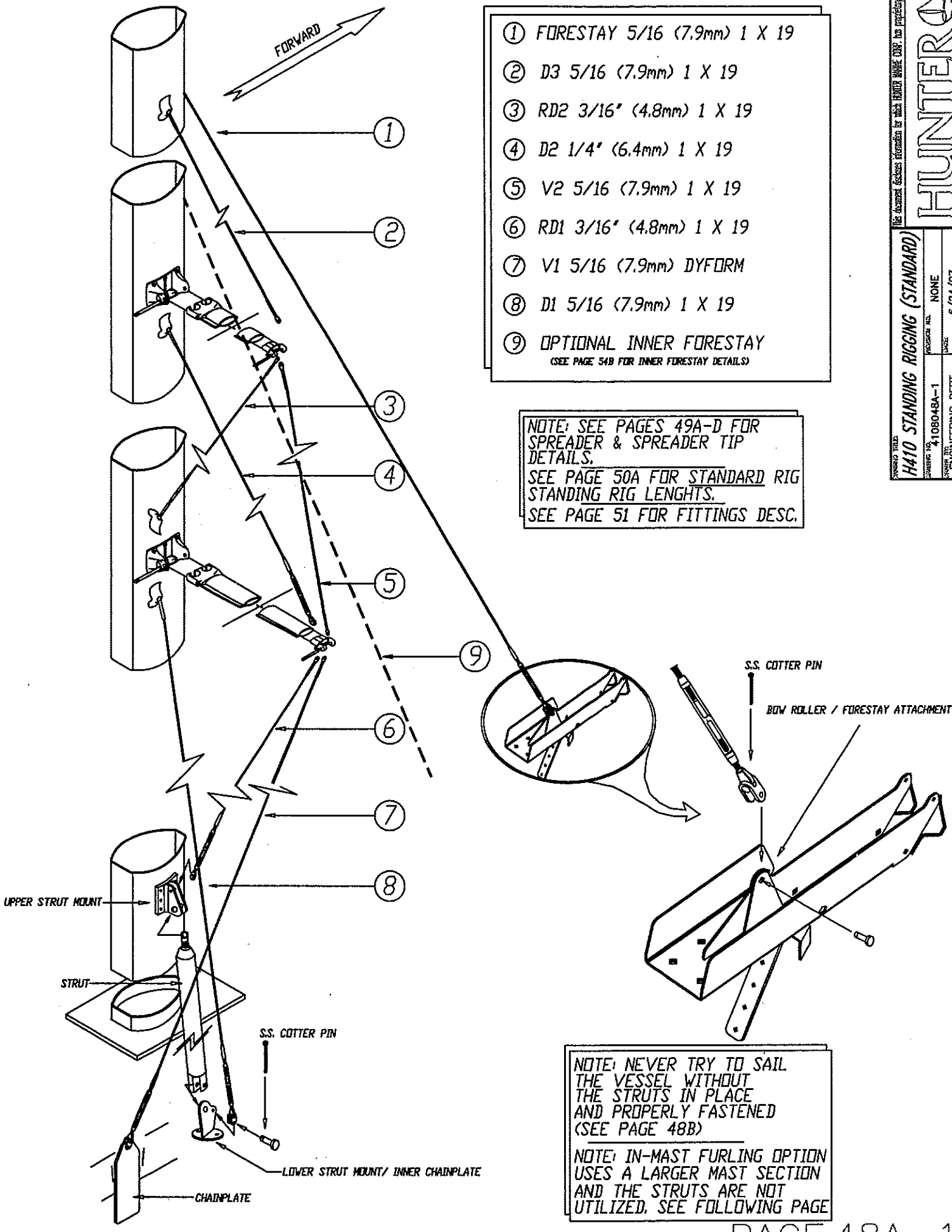
Additional support is given to the B&R rig (and is unique to it) with the addition of reverse diagonal rigging. For example, the diagonals that you see beginning by the top of the mast strut, ending at the tip of the spreader, supports and stabilizes the upper section of the mast as it creates a triangle 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 leach 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 addition 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.



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)

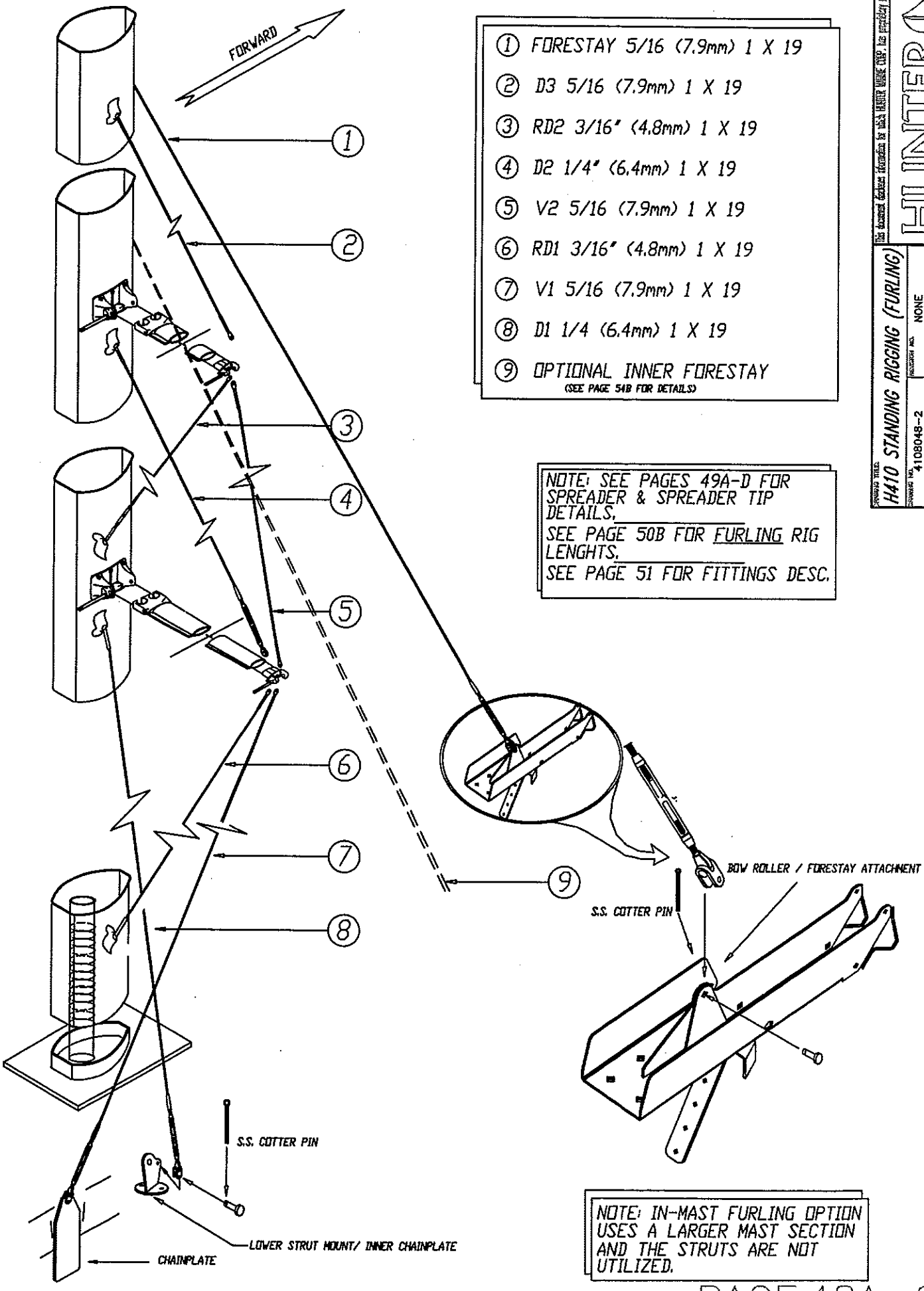
NOTE: SEE PAGES 49A-D FOR SPREADER & SPREADER TIP DETAILS.
SEE PAGE 50A FOR STANDARD RIG STANDING RIG LENGHTS.
SEE PAGE 51 FOR FITTINGS DESC.

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

STANDARD FIELD: H410 STANDING RIGGING (STANDARD)
DRAWING NO.: 4108048A-1
DRAWN BY: ENGINEERING DEPT.
REVISION NO.: NONE
DATE: 6/24/97

HUNTER



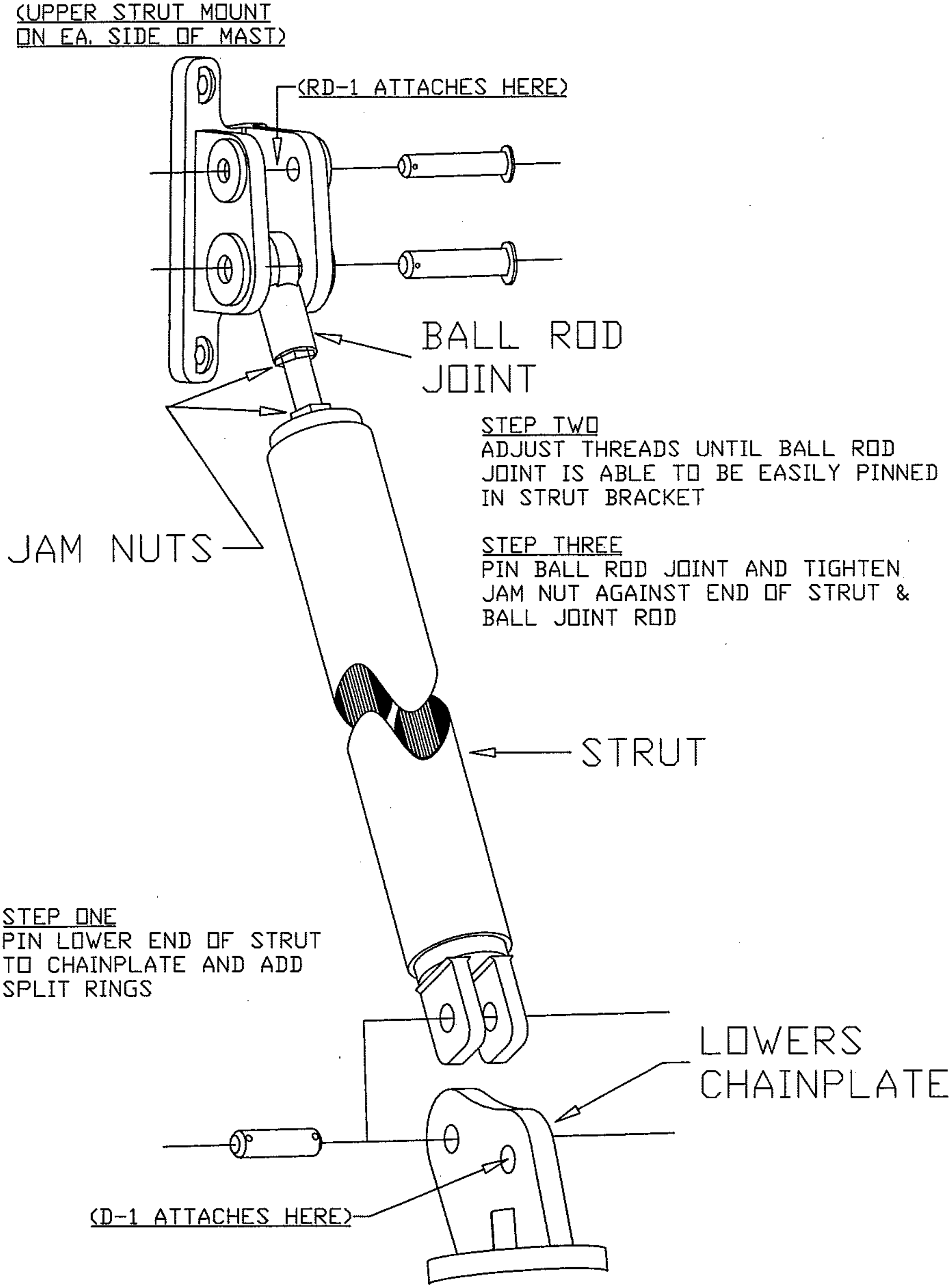
1. FORESTAY 5/16 (7.9mm) 1 X 19
2. D3 5/16 (7.9mm) 1 X 19
3. RD2 3/16" (4.8mm) 1 X 19
4. D2 1/4" (6.4mm) 1 X 19
5. V2 5/16 (7.9mm) 1 X 19
6. RD1 3/16" (4.8mm) 1 X 19
7. V1 5/16 (7.9mm) 1 X 19
8. D1 1/4 (6.4mm) 1 X 19
9. OPTIONAL INNER FORESTAY
   (SEE PAGE 54B FOR DETAILS)

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

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

HUNTER

DRAWING TITLE: H410 STANDING RIGGING (FURLING)
DRAWING NO.: 4108048-2
REVISION NO.: NONE
DRAWN BY: ENGINEERING DEPT.
DATE: 6/24/97



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

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

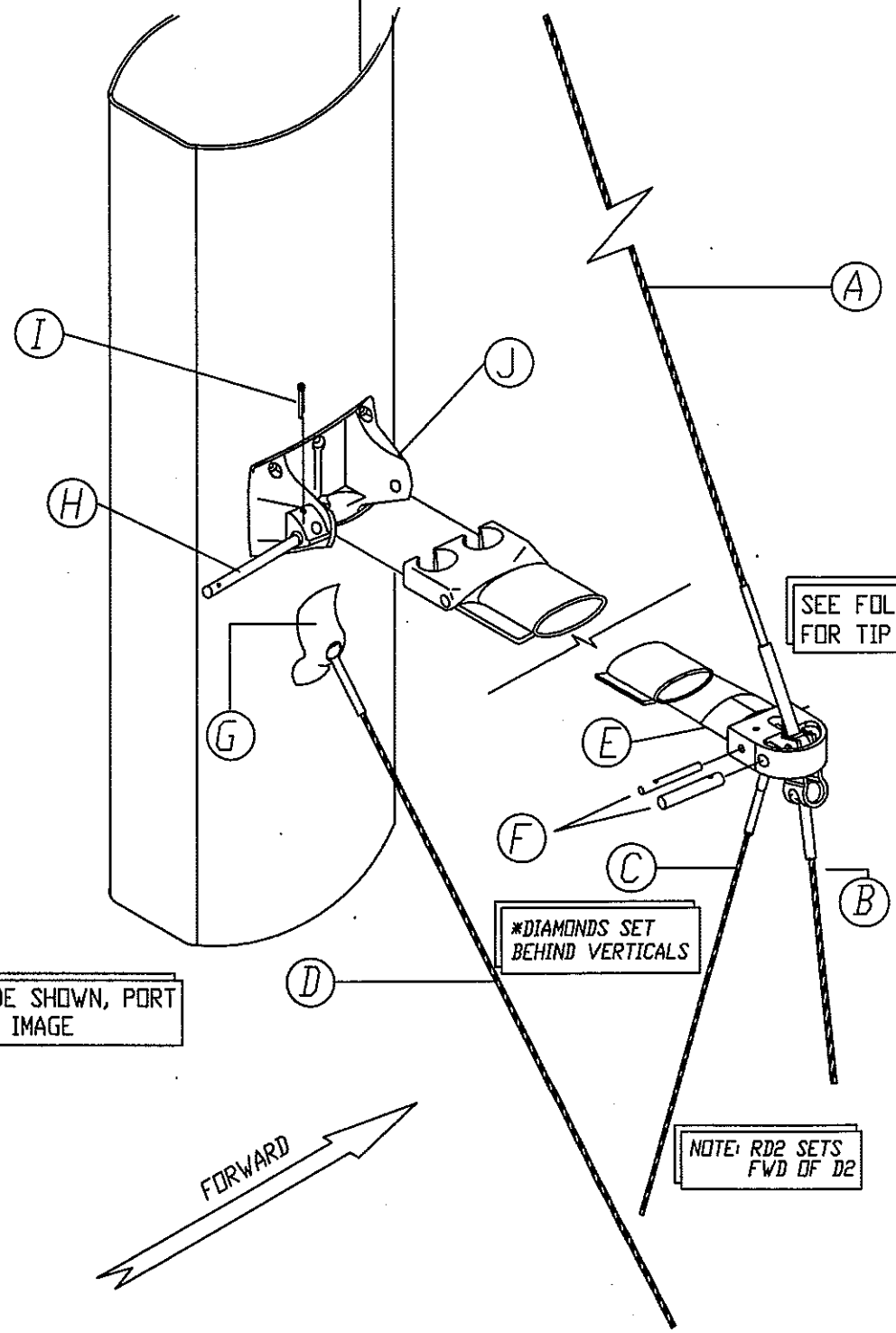
HUNTER

H410 STRUT ASSEMBLY

DRAWING NO. 41080488 | REVISION NO. NONE

DRAWN BY: ENGINEERING DEPT. | DATE: 6/25/97

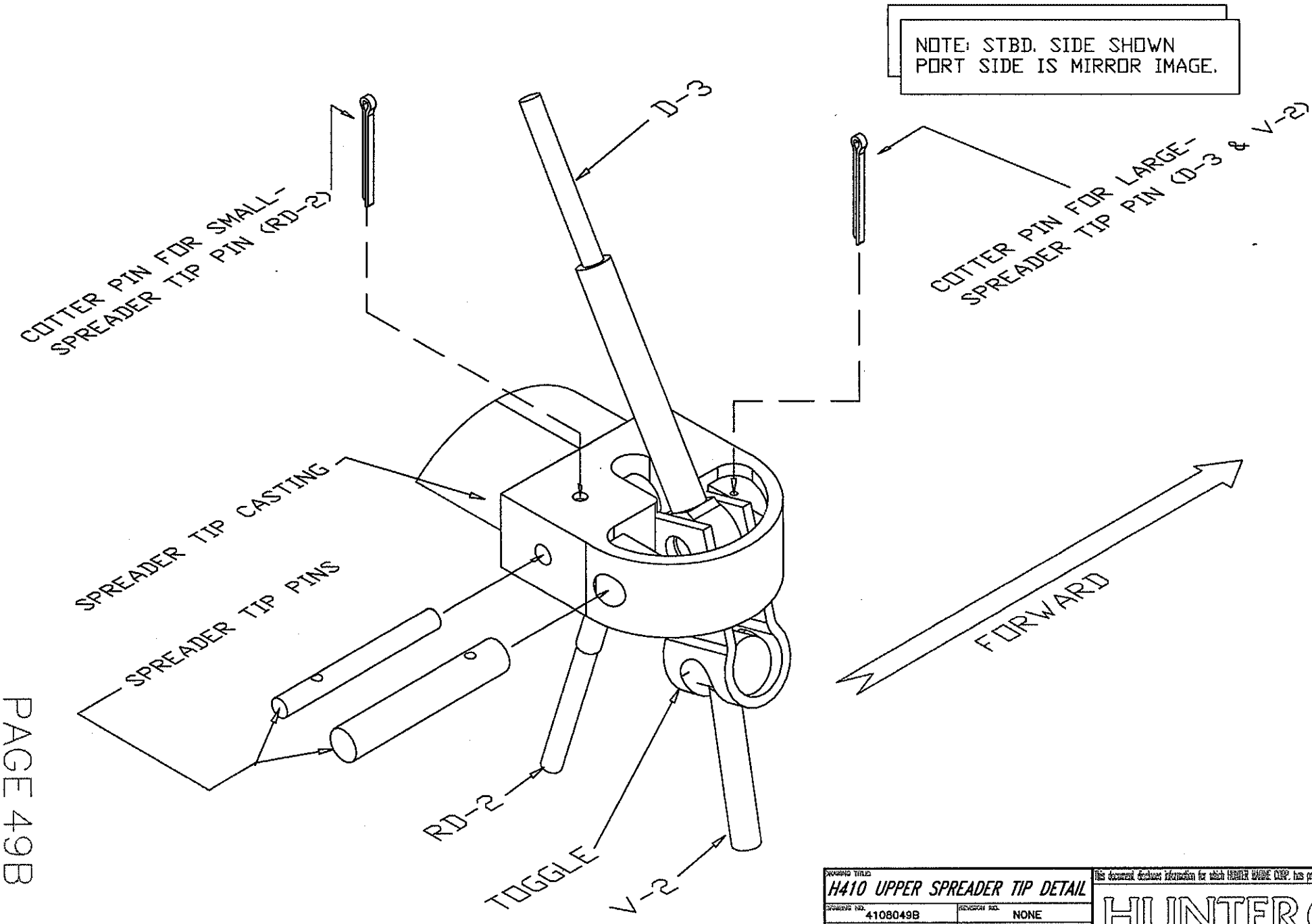
Ⓐ D3
Ⓑ V2
Ⓒ RD2 MARINE EYE W/ 1/2" (12.7 MM) HOLE
Ⓓ D2
Ⓔ SPREADER TIP CASTING
Ⓕ SPREADER TIP PINS
Ⓖ BACKING SHELL
Ⓗ SPREADER BRACKET PIN
Ⓘ COTTER PIN
Ⓙ SPREADER BASE



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

HUNTER

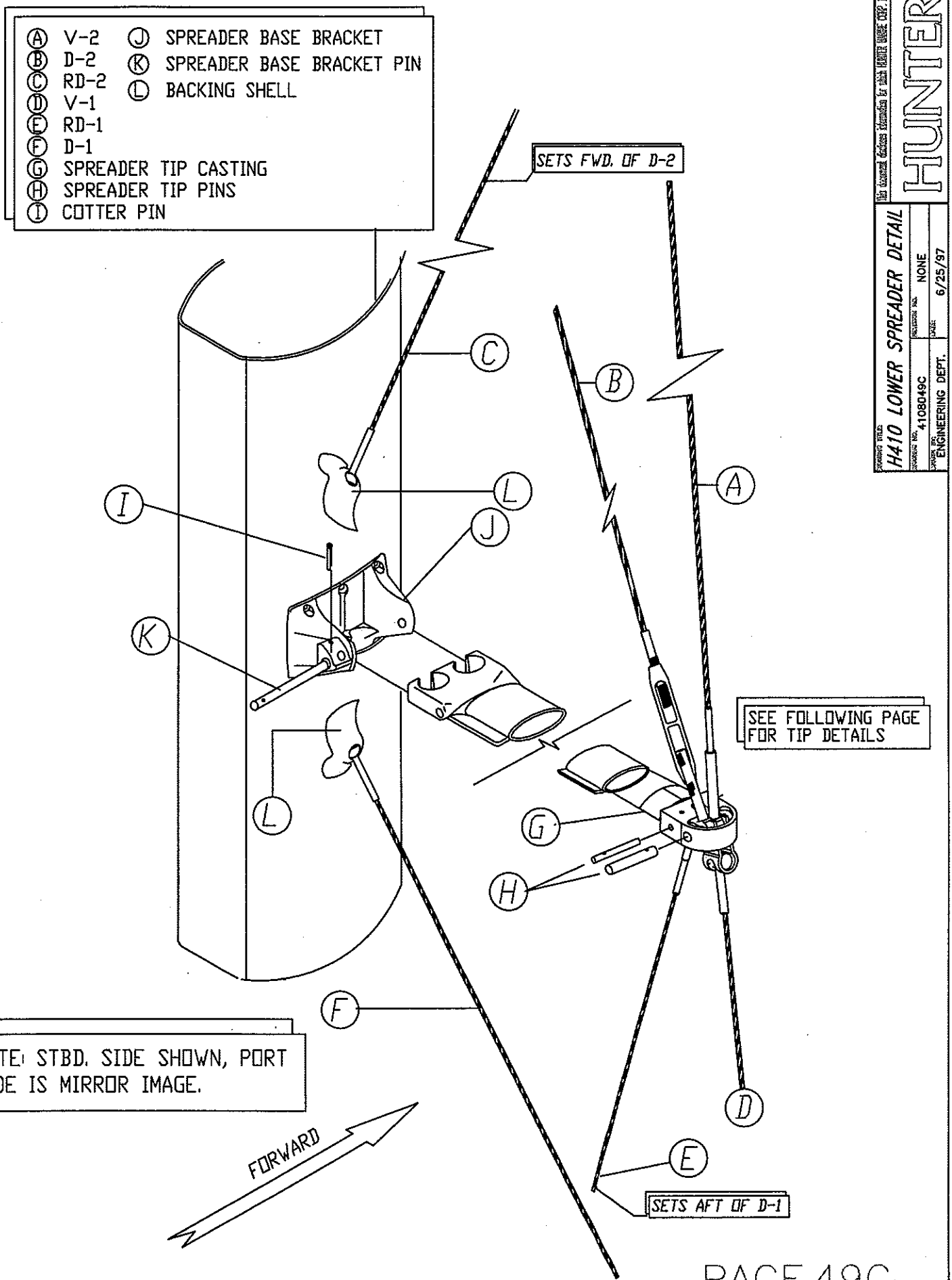
DRAWING TITLE: H410 UPPER SPREADER DETAIL
DRAWING NO.: 4108049A
REVISION NO.: NONE
DRAWN BY: ENGINEERING DEPT.
DATE: 6/25/97

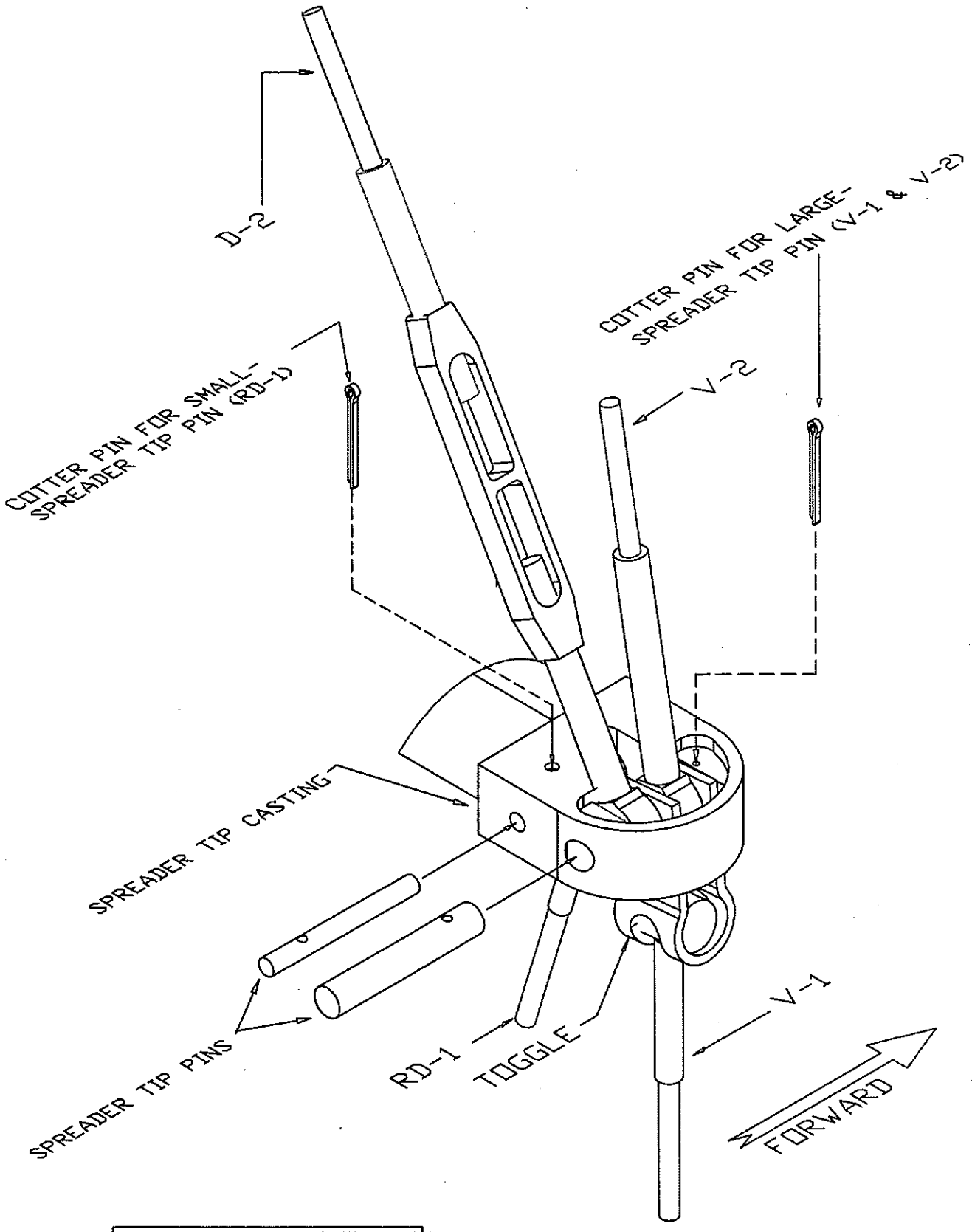


DRAWING TITLE
H410 UPPER SPREADER TIP DETAIL

DRAWING NO.	REVISION NO.
4108049B	NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 6/25/97

HUNTER


Ⓐ V-2
Ⓑ D-2
Ⓒ RD-2
Ⓓ V-1
Ⓔ RD-1
Ⓕ D-1
Ⓖ SPREADER TIP CASTING
Ⓗ SPREADER TIP PINS
Ⓘ COTTER PIN
Ⓙ SPREADER BASE BRACKET
Ⓚ SPREADER BASE BRACKET PIN
Ⓛ BACKING SHELL
SETS FWD. OF D-2
SEE FOLLOWING PAGE FOR TIP DETAILS
NOTE: STBD. SIDE SHOWN, PORT SIDE IS MIRROR IMAGE.
FORWARD
SETS AFT OF D-1
H410 LOWER SPREADER DETAIL
4108049C
NONE
ENGINEERING DEPT.
6/25/97
HUNTER



NOTE: STBD. SIDE SHOWN PORT SIDE IS MIRROR IMAGE

DRAWING TITLE: H410 LOWER SPREADER TIP DETAIL

DRAWING NO. 4108049D | REVISION NO. NONE

DRAWN BY: ENGINEERING DEPT. | DATE: 6/25/97

HUNTER

h410 STANDARD 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	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.	6-10-10 STEMBALL TURNBUCKLE IN BACKING SHELL
8	OPT	INNER FORESTAY	1	1/4"(6.4mm) 1X19	STEMBALL IN BACKING SHELL	11.141 m	37 ft. 5 3/8 in.	FORESTAY RELEASE LEVER
9	STD	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: *H410 STANDING RIG SPECS (STD)*
DRAWING NO. 4108050A REVISION NO. NONE
DRAWN BY: ENGINEERING DEPT. DATE: 6/25/97

HUNTER

h410 FURLING 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	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	OPT	INNER FORESTAY	1	1/4"(6.4mm) 1X19	STEMBALL IN BACKING SHELL	12.065 m	39 ft. 7 in.	FORESTAY RELEASE LEVER
9	STD	FORESTAY	1	5/16"(7.9mm) 1x19	5/16 MARINE EYE	14.935 m	49 ft. 0 in.	TURNBUCKLE 10-20-20, TOGGLE

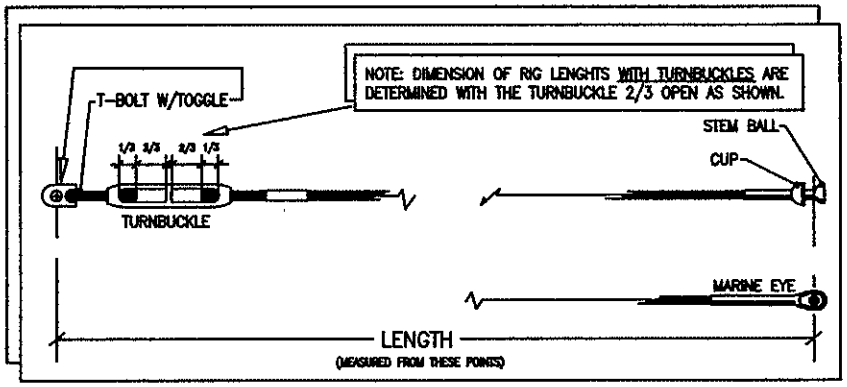
DRAWING TITLE: H410 STANDING RIG SPECS (FURLING)
DRAWING NO. 4108050B REVISION NO. NONE
DRAWN BY ENGINEERING DEPT. DATE 6/5/97

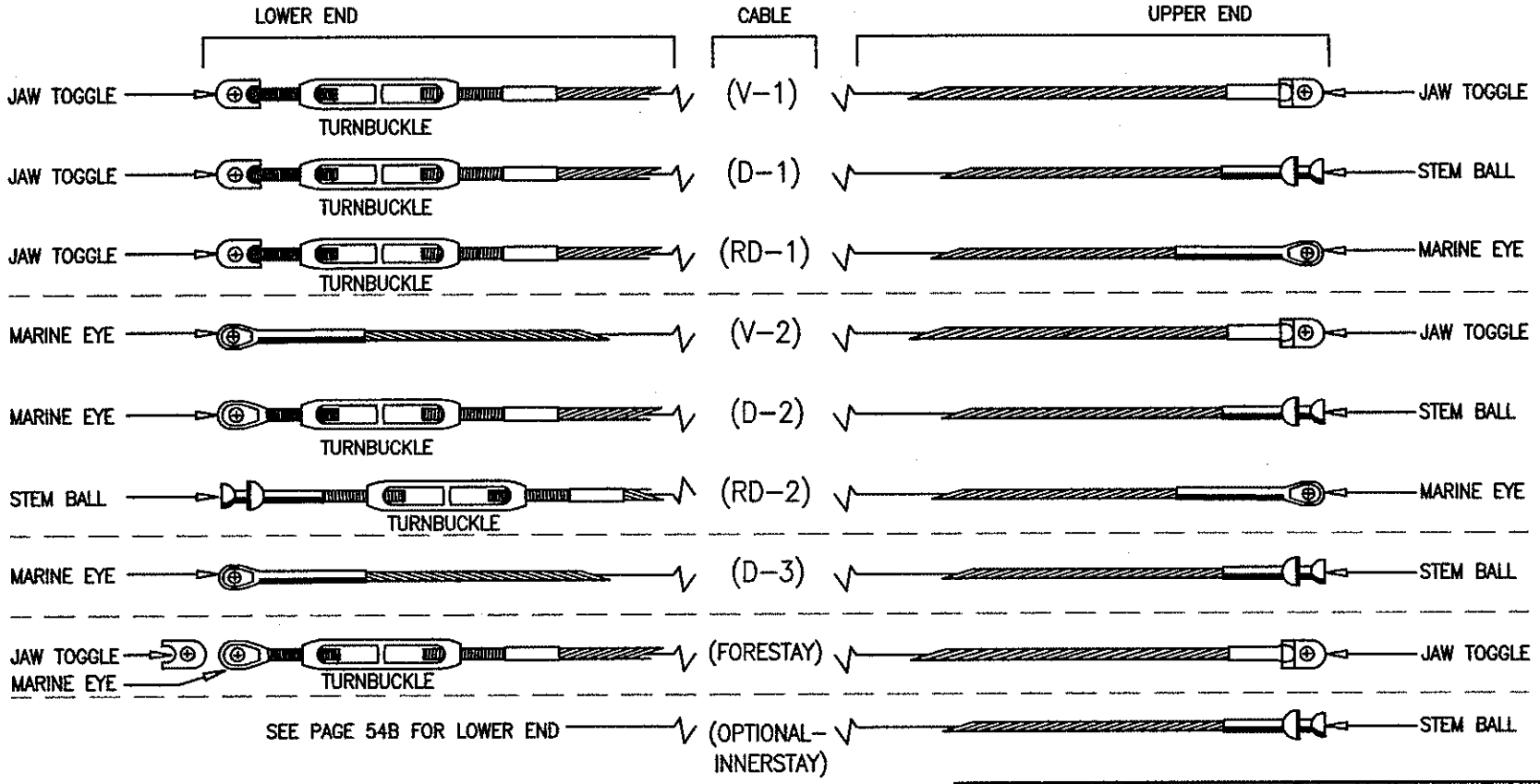
HUNTER

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

V = VERTICAL
D = DIAGONAL
RD = REVERSE DIAGONAL

1 = LOWER
2 = INTER.
3 = UPPER





DRAWING TITLE: H410 RIGGING LENGHTS DETAIL
DRAWING NO. 4108051
DIVISION NO. NONE
DRAWN BY: ENGINEERING DEPT
DATE: 6/26/97

HUNTER

TUNING THE H410 B&R RIG

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

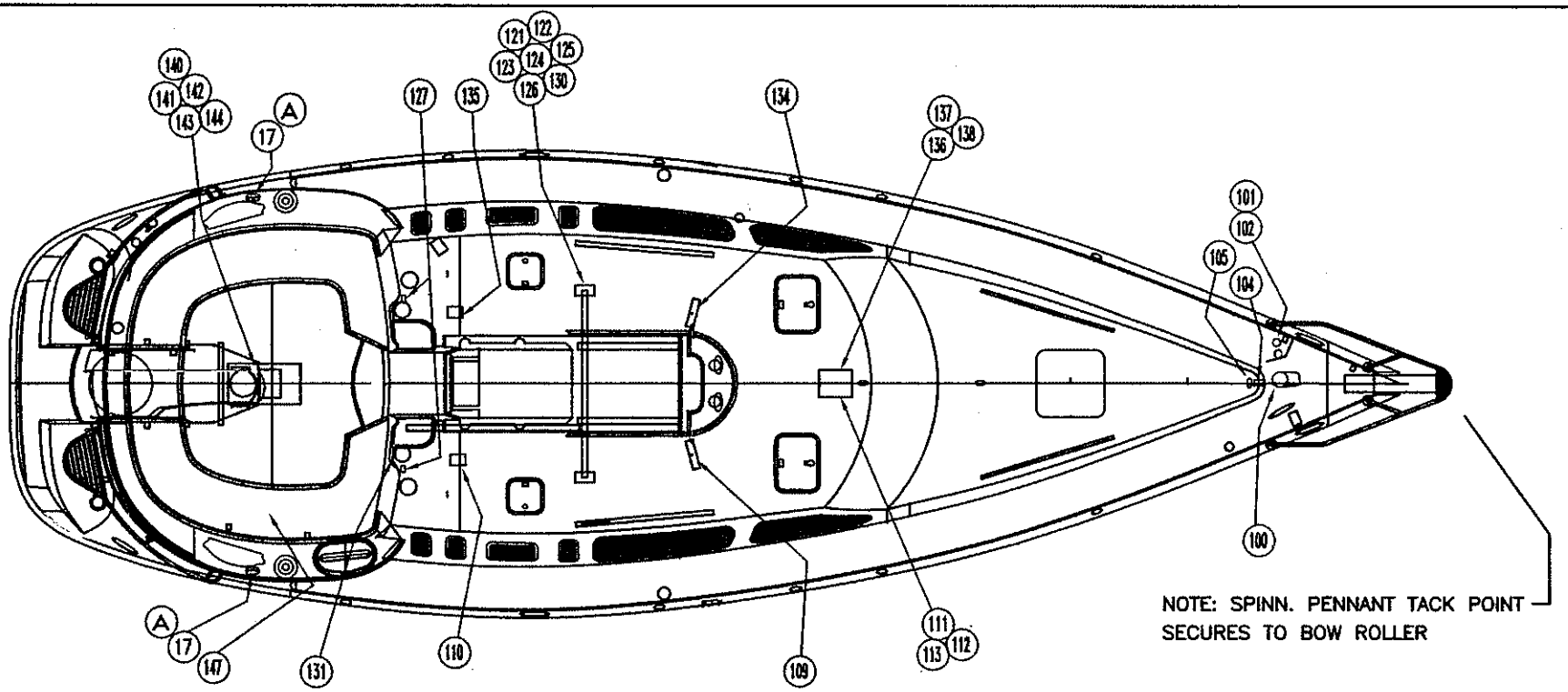
the ball joint bearing in the upper end of the strut until the holes in the pin can be attached. It is normal to have some play between the strut and the chainplate and strut bracket

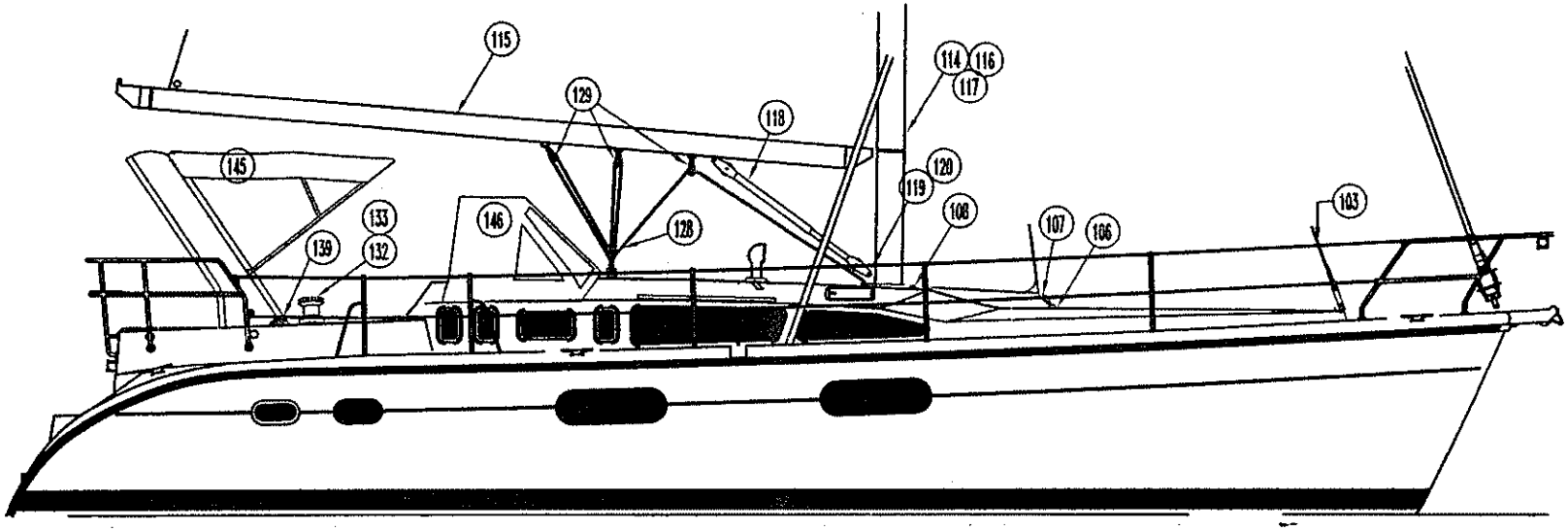
9. The final test is to go sailing in 10-15 knots of wind. First, adjust the tension in the shrouds. If when sailing upwind, the shrouds on the leeward side are slack then tighten them to remove about half the slack keeping note of the number of turns. Then tack and do the same to the other side. Do 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 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.

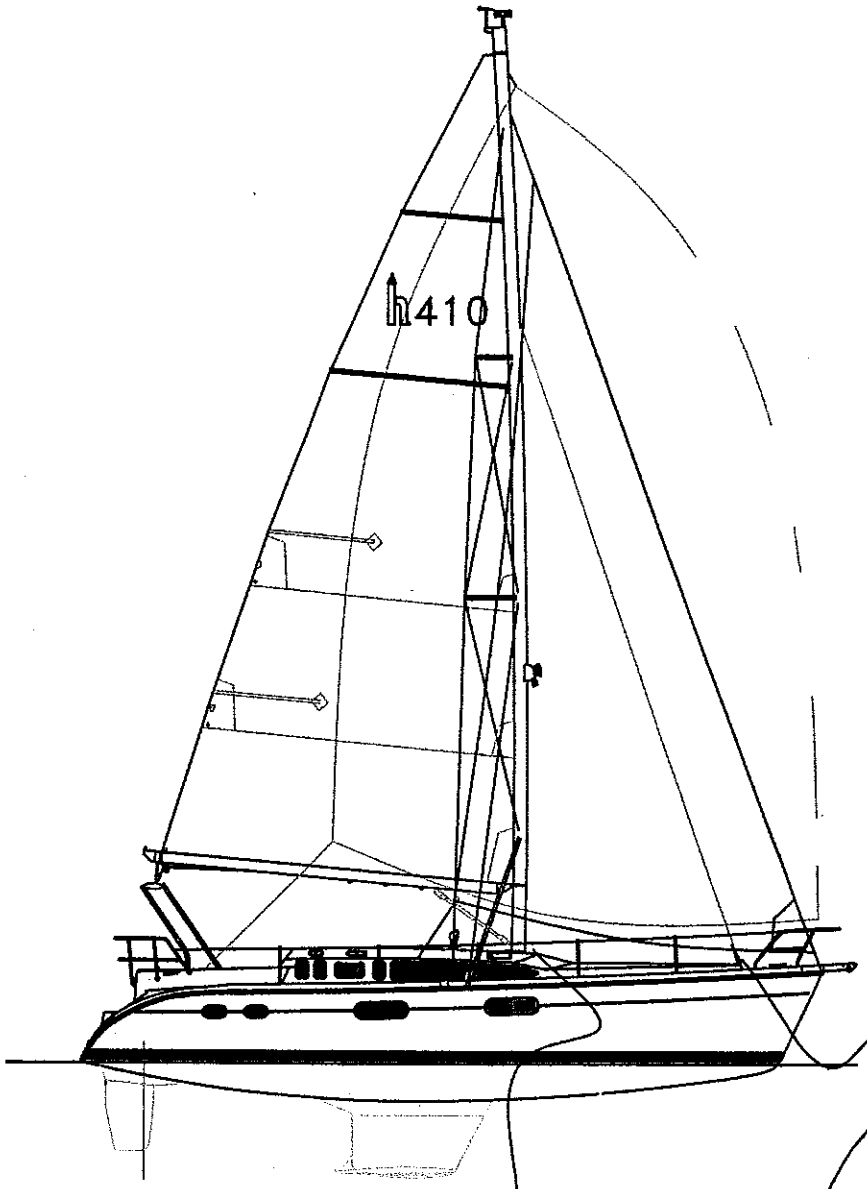




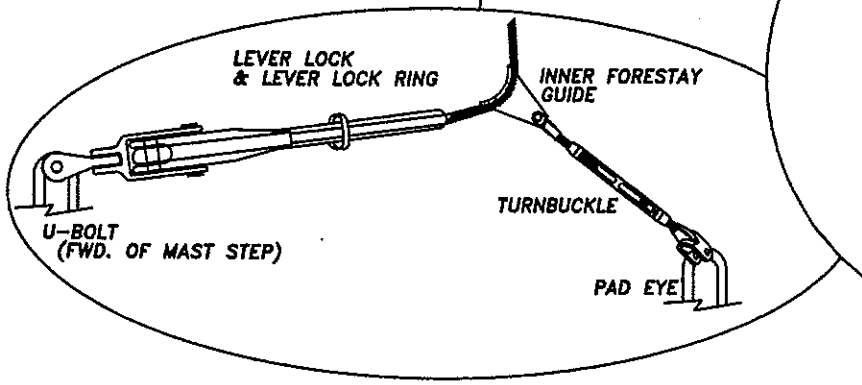
H410 OPTIONAL SPINN. & DECK HDWE.

4108054A	NONE
ENGINEERING DEPT.	8/8/97

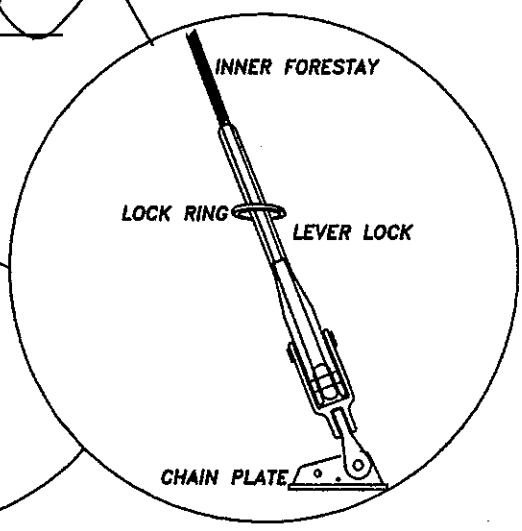
HUNTER



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



CONFIGURATION WHEN NOT IN USE



STAYSAIL CONFIGURATION IN USE

DRAWING TITLE: H410 OPTIONAL STAYSAIL LAYOUT
DRAWING NO.: 41080548
DRAWN BY: ENGINEERING DEPT
REVISION NO.: NONE
DATED: 8/8/97

HUNTER

	ELECTRIC WINDLASS KIT			
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
	INNER FORESTAY KIT			
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
	STAYSAIL KIT			
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	RIO236	1
112	STAYSAIL HALYARD BLOCK	Z-SPARS	RIO448	1 ON STARBOARD SIDE OF CASTING FWD.
113	STAYSAIL SHEETS	SECO SOUTH	RIO236	2 RUNNING RIGGING KIT
	FURLING MAST			
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
	RIGID VANG			
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
	MID-BOOM SHEETING			
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

DRAWING TITLE: H410 OPTIONAL DECK HARDWARE LIST
DRAWING NO. 4108054C | REVISION NO. NONE
DRAWN BY: ENGINEERING DEPT. | DATE: 8/1/97

HUNTER

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		SCHAEFFER 504-09	HW0289	2 STERN RAIL PORT & STBD.
17	SPINNAKER PAD EYES		SCHAEFFER	HW0853	2 PT. AFT COAMINGS
	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: H410 OPTIONAL DECK HARDWARE LIST CONT:	this document discloses information in which HUNTER OWNS the proprietary rights
DRAWING NO. 41080540	REVISION NO. NONE
DRAWN BY: ENGINEERING DEPT	DATE: 8/1/97

HUNTER

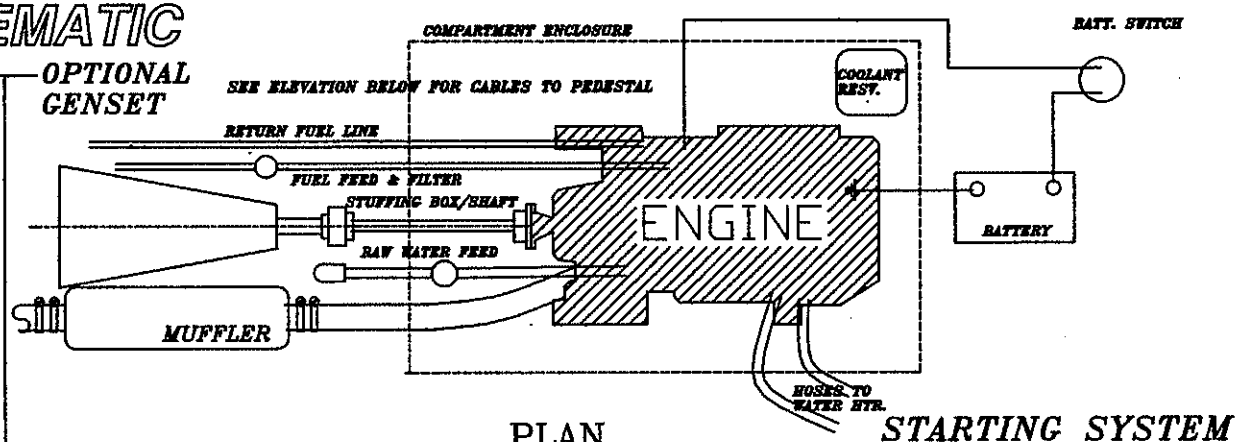
ENGINE OPERATING INSTRUCTIONS:

① FILL DIESEL TANK WITH DIESEL FUEL
② CHECK ENGINE OIL LEVEL (SEE YANMAR MANUAL)
③ OPEN ENGINE RAW WATER PICKUP SEACOCK (SEE PAGE 60)
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.

H410 ENGINE OPER. INST	
4108055A	NONE
ENGINEERING DEPT.	7/26/97

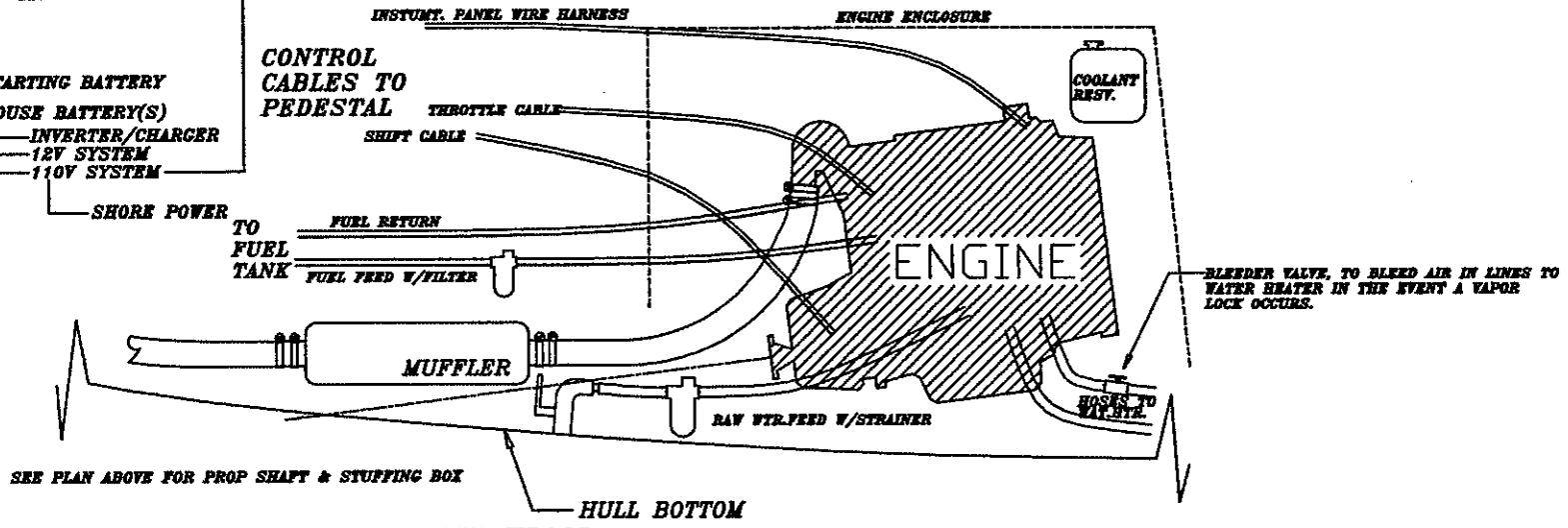
SYSTEMS SCHEMATIC

- ENGINE
  - WATER INTAKE
    - THRU-HULL
    - SEA COCK
    - STRAINER
  - EXHAUST
    - ELBO
    - HOSE
    - MUFFLER
  - FUEL SYSTEM
    - FEED
    - RETURN
    - TANK
    - FILTER
    - VALVE ● TANK
- RUNNING GEAR
  - SHAFT
  - COUPLING
  - STUFFING BOX
- CONTROLS
  - SHIFT
  - THROTTLE
  - PANEL HARNESS
- ELECTRICAL SYSTEM
  - BATT SW
    - STARTING BATTERY
    - HOUSE BATTERY(S)
      - INVERTER/CHARGER
      - 12V SYSTEM
      - 110V SYSTEM
      - SHORE POWER
- OPTIONAL GENSET



PLAN

STARTING SYSTEM



ELEVATION

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

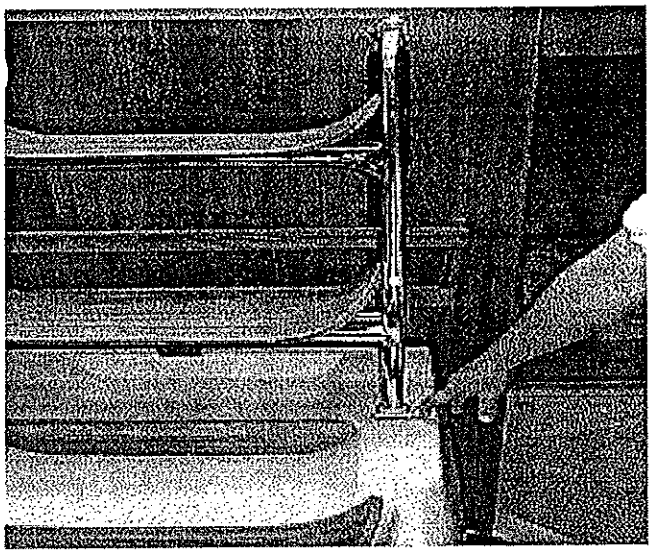
NOTE: SEE YANMAR ENGINE MANUAL FOR OPERATING & MAINTENENCE PROCEDURES

H410 ENGINE COMPARTMENT LAYOUT	
4108055A	NONE
ENGINEERING DEPT.	6/30/97

HUNTER

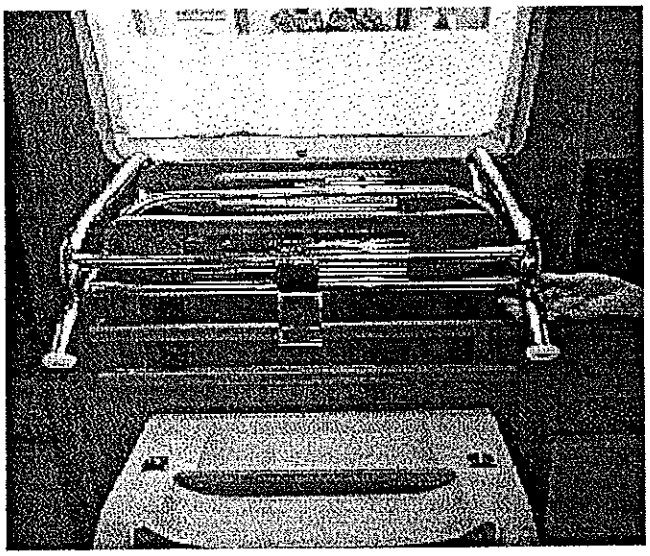
COMP. #			PROPULSION SYSTEM PARTS LIST	U.O.M.	QTY.
HW3412		150	ENGINE, 4JH2(B)E 50 HP 80AMP H43	EA	1
EL0825		300	CONDUIT 3/4" 125-0340	FT	20
KB020015		5	410 ENGINE MOUNTING COMPONENTS	CPNT	1
450130		600	HEX HD 1/2-13 X 3", S/S CAPSCREW	EA	8
450342		600	WASHER FLAT 3/8" S/S F/W	EA	8
450348		600	WASHER 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 SHIELDFLEX 1" TYPE 100-0346	FT	4
PL1525		250	HOSE SHIELDFLEX 1" TYPE 100-0346	FT	8
CO0191		560	LABEL,THRUHULL,"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 SHIELDFLEX 1" TYPE 100-0346	FT	1
PL1525		250	HOSE SHIELDFLEX 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

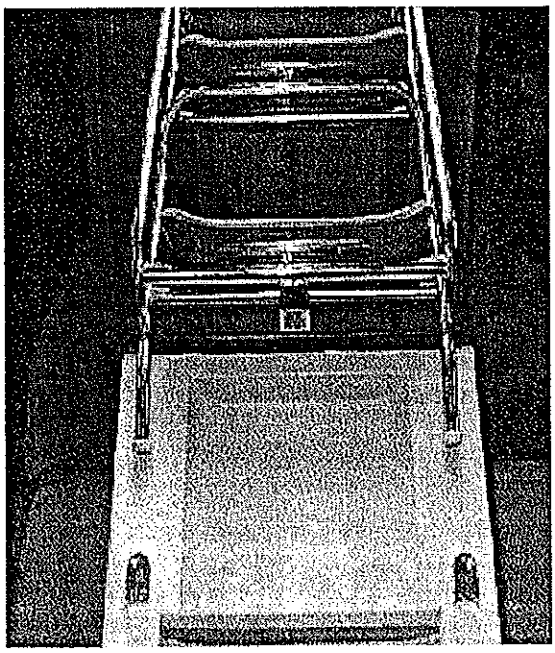
H410 ENGINE BOX OPENING INST.



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

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

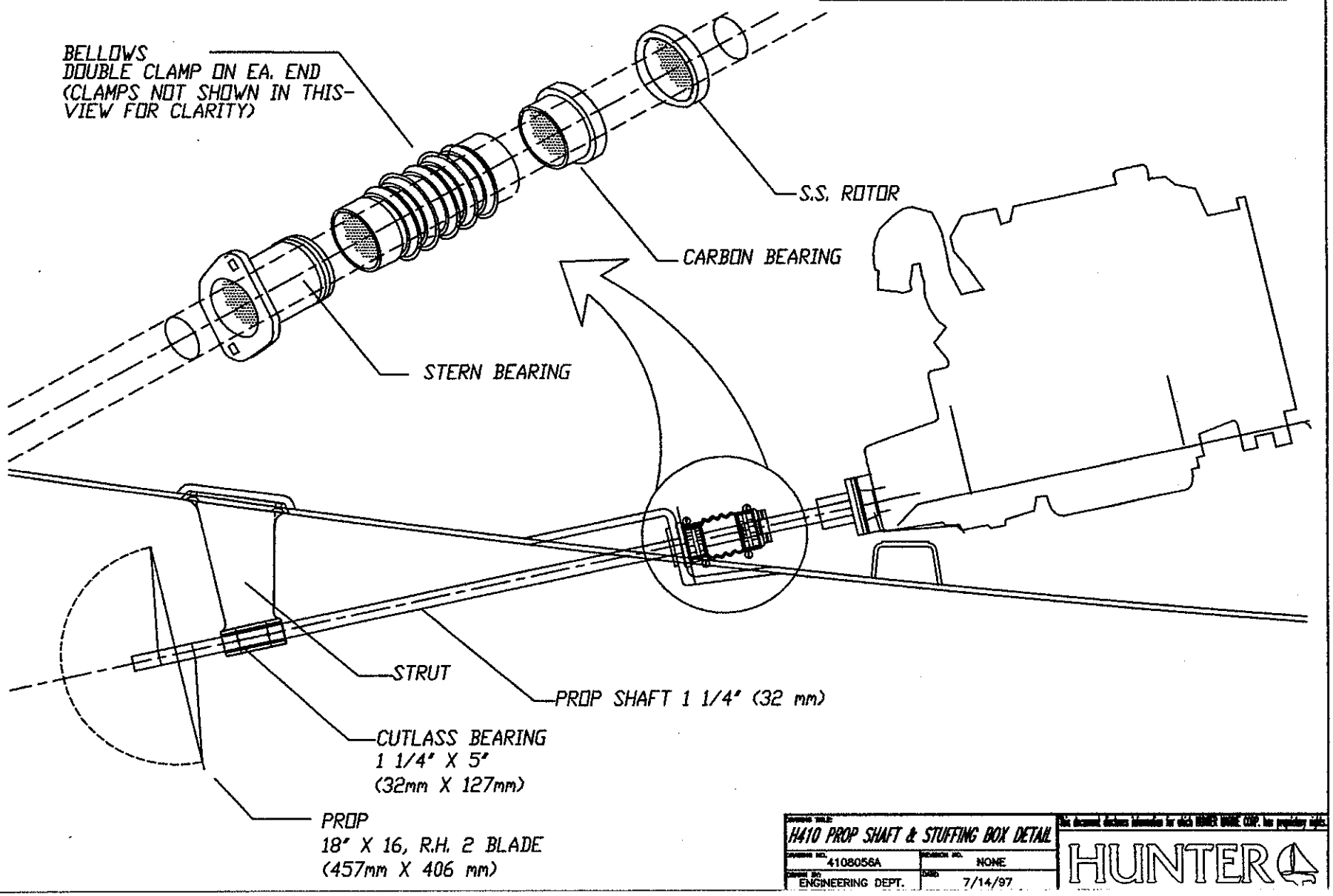




3. BRING THE LADDER & BOX TOGETHER AS SHOWN (TOP OF BOX FITS INBETWEEN LADDER LEGS AND BRACKET UNDER LOWER LADDER STEP)

DRIPLESS PACKING GLAND DETAIL

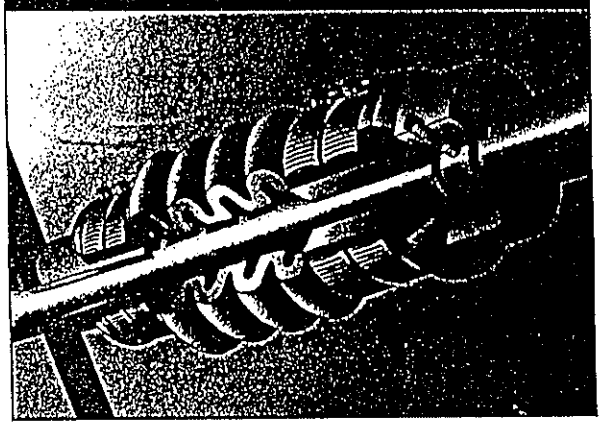
SEE FOLLOWING PAGES FOR DETAILED INSTALLATION & TROUBLESHOOTING DETAILS



H410 PROP SHAFT & STUFFING BOX DETAIL	
4108056A	NONE
ENGINEERING DEPT.	7/14/97

HUNTER

PACKLESS SEALING SYSTEM



SHAFT SEAL

INSTALLATION INSTRUCTIONS

For Shafts:

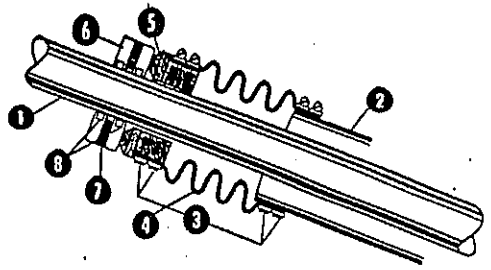
3/4" to 3 3/4"

(22mm to 90mm)

PAGE 56B

STANDARD SPEED P.S.S. SHAFT SEAL:

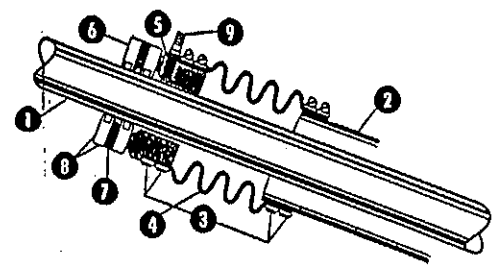
Hull Speed Under 12 Knots.
(Boats equipped with water injected stuffing box, use high speed.)



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

READ INSTRUCTIONS THOROUGHLY

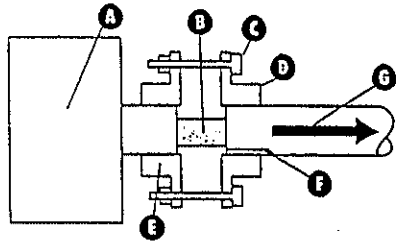
- **Do not use grease or oil to slide the stainless steel rotor down the shaft.**
- Do not allow petroleum based antifreeze to come in contact with face of the seal when winterizing engine.
- Install the P.S.S. Only when the boat is out of the water.
- Do not damage the carbon flange or stainless steel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

INSTALLATION INSTRUCTIONS:

1. Unbolt the shaft coupling from the transmission coupling.
2. 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
- B. Spacer
- C. Bolts
- D. Shaft Coupling
- E. Transmission Coupling
- F. Key
- G. Shaft

   A. Insert a spacer (with a diameter smaller than the shaft) between the shaft and transmission coupling.

   B. 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.

3. 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.*

4. 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.
5. 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.
6. 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 and shaft coupling (do not forget to secure coupling wit 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 (❷) with the two stainless steel hose clamps (❸).
9. Slide the stainless steel rotor (❻) down the shaft so it just comes in contact with the carbon graphite flange (❶). 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 (❻), compress the bellow (❹) 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)

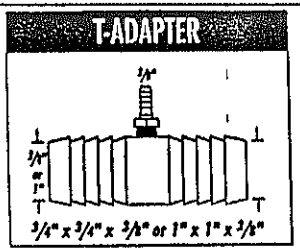
Note: amount of compression may vary depending on motor mounts and shaft misalignment.

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.

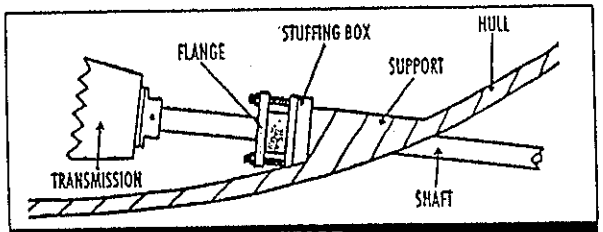
3. For keel cooled or in-line systems, water can be plumbed into the seal from an underwater scoop.

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.

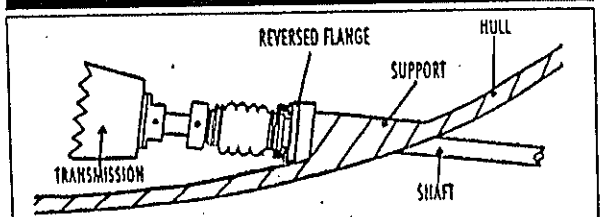
This procedure should be done every time the boat goes back in the water and is not required with high speed seals.

BOLT-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.



BEFORE



AFTER

THREADED STUFFING BOXES:

If your old stuffing box was threaded directly into the ou 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.

PYI INC.

P.O. Box 336 • Edmonds, WA 98020
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E Mail: pyi@compuserve.com

			ENGINE PROP SHAFT SYSTEM PARTS LIST		
COMP. #				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 60 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...
- (A) BY HEATING THE WATER THRU THE DIESEL ENGINE
- (B) BY SUPPLYING 110V.A.C. BY 'DOCKSIDE SHORE POWER'...'INVERTER POWER'...OR GENERATOR POWER

(7) TO HEAT BY 'ENGINE' SEE PAGE 55A FOR ENGINE OPERATING INST.

NOTE: WHEN COOLANT IS INSTALLED, BLEED AIR FROM HEAT EXCHANGER LINES TO WATER HEATER. CRANK ENGINE, OPEN BLEEDER VALVE (SEE PAGE 55A) UNTIL AIR IS GONE FROM LINES

(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'

NOTE: AS WITH ALL WATER HEATERS, BE SURE WATER TANK IS FULL BEFORE APPLYING POWER TO UNIT, TO AVOID DAMAGE TO HEATING ELEMENT

INVERTER AND/OR GENERATOR MAY OR MAY NOT BE OPTIONAL

DRAWING TITLE: H410 FRESH WATER OPERATING INST.	
DRAWING NO. 4108057	REVISION NO. NONE
DRAWN BY: ENGINEERING DEPT	DATE 7/15/97

HUNTER

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 (PL0189)
7E=...SHORE H2O INLET (PL1175)

AFT HEAD (SEE PAGE 57D)

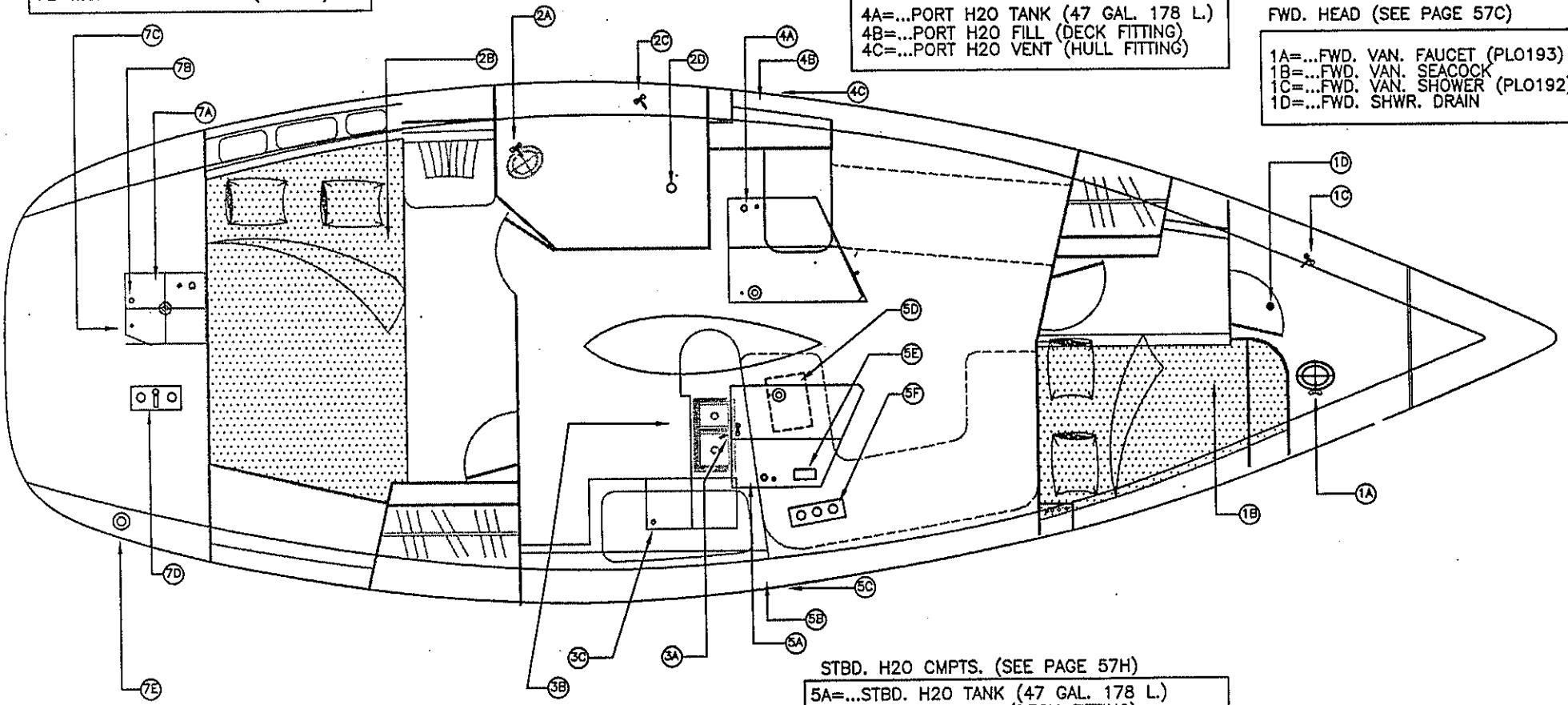
2A=...AFT VAN. FAUCET (PL0193)
2B=...AFT VAN. SEACOCK
2C=...AFT VAN. SHOWER (PL0192)
2D=...AFT SHOWER DRAIN

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 (PL0193)
1B=...FWD. VAN. SEACOCK
1C=...FWD. VAN. SHOWER (PL0192)
1D=...FWD. SHWR. DRAIN



GALLEY (SEE PAGE57E)

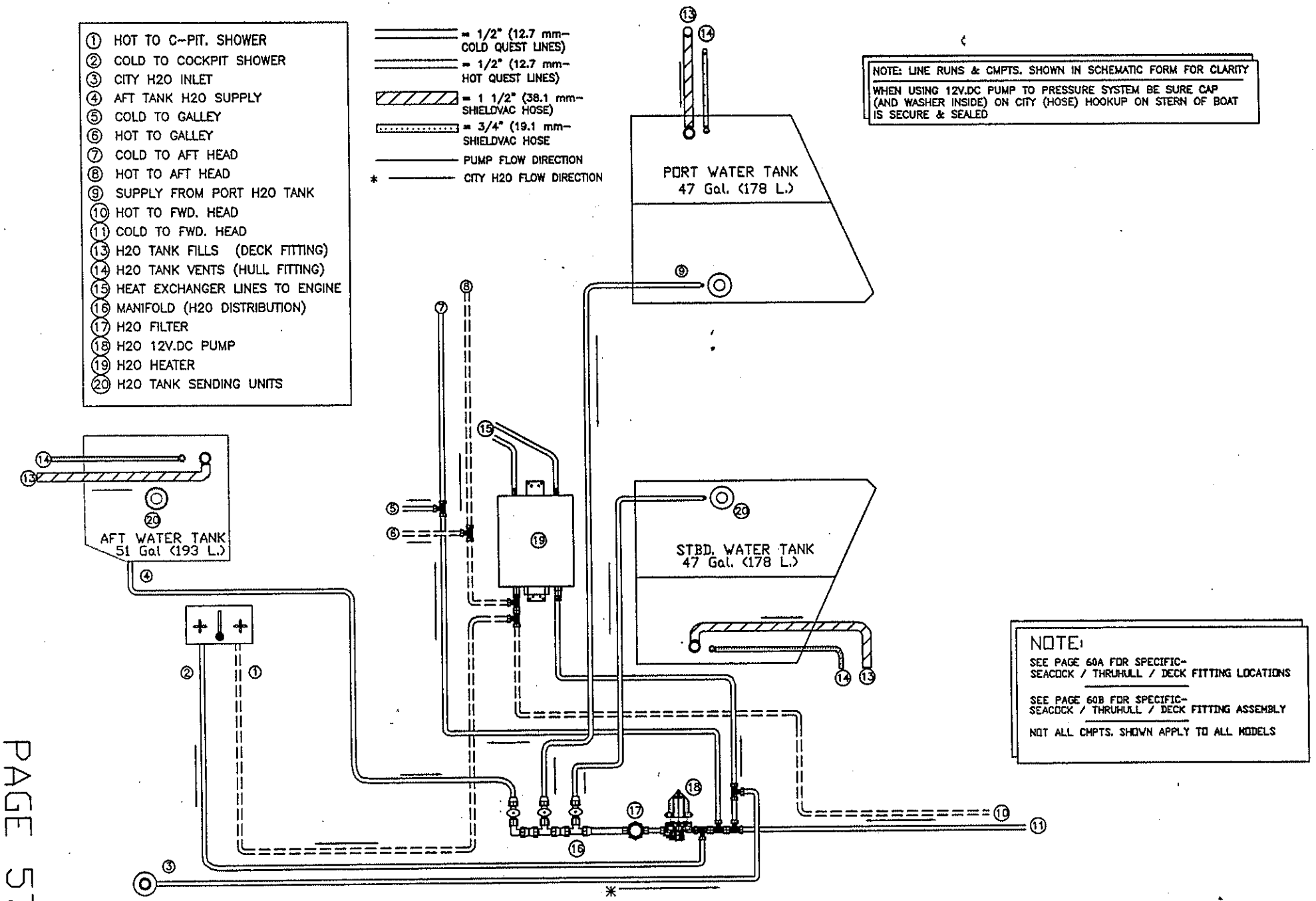
3A=...GALLEY FAUCET
3B=...GALLEY DRAIN SEACOCK
3C=...ICE BOX DRAIN

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.) (PL0280)
5E=...H2O PUMP (PL0301)
5F=...H2O MANIFOLD (PL01815 X 3)

DRAWING TITLE: H410 FRESH WATER/DRAIN GEN. LAYOUT	
DRAWING NO.: PLUMBING (B057A)	REVISION NO.: NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 7/15/97

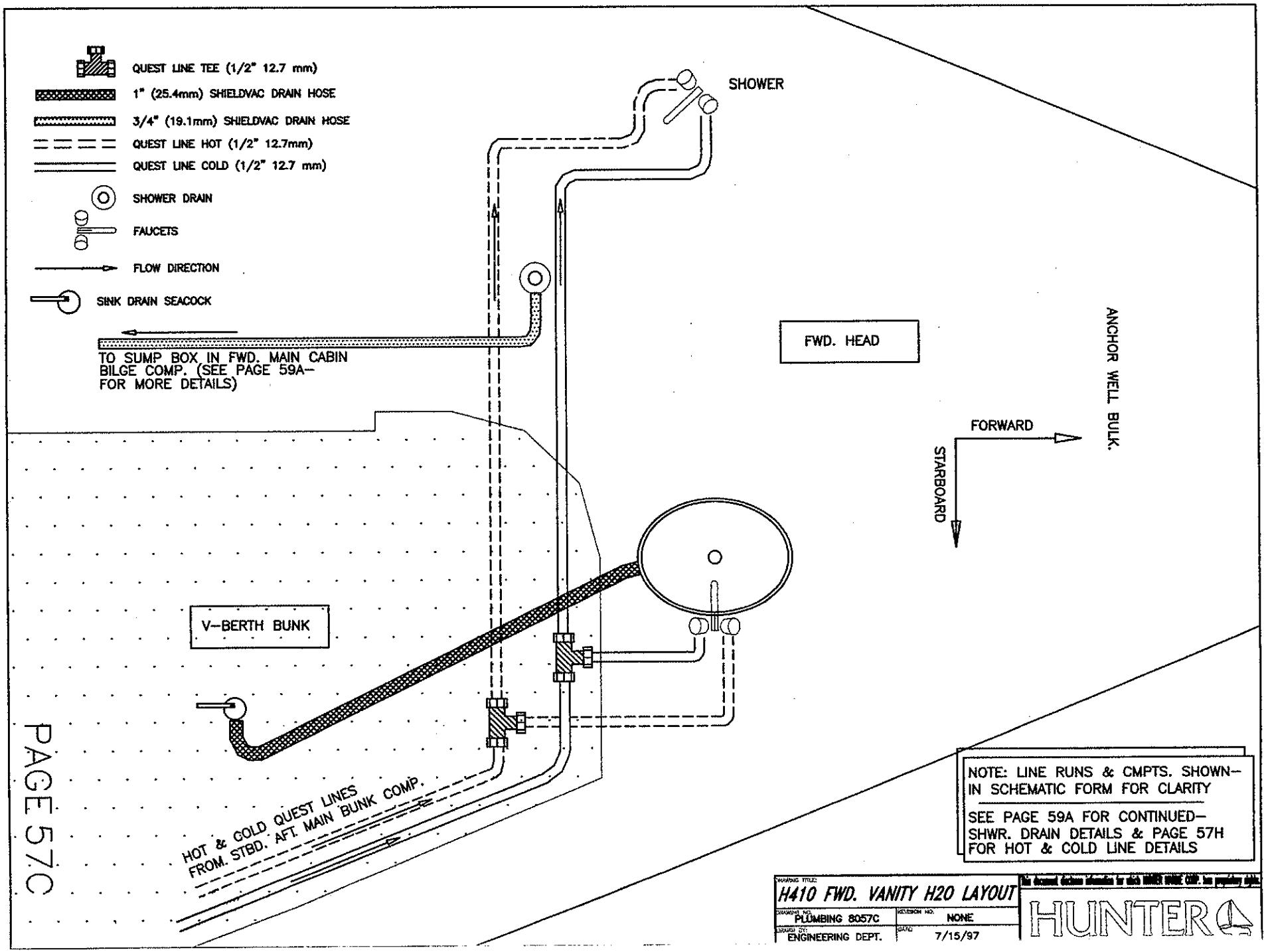
HUNTER



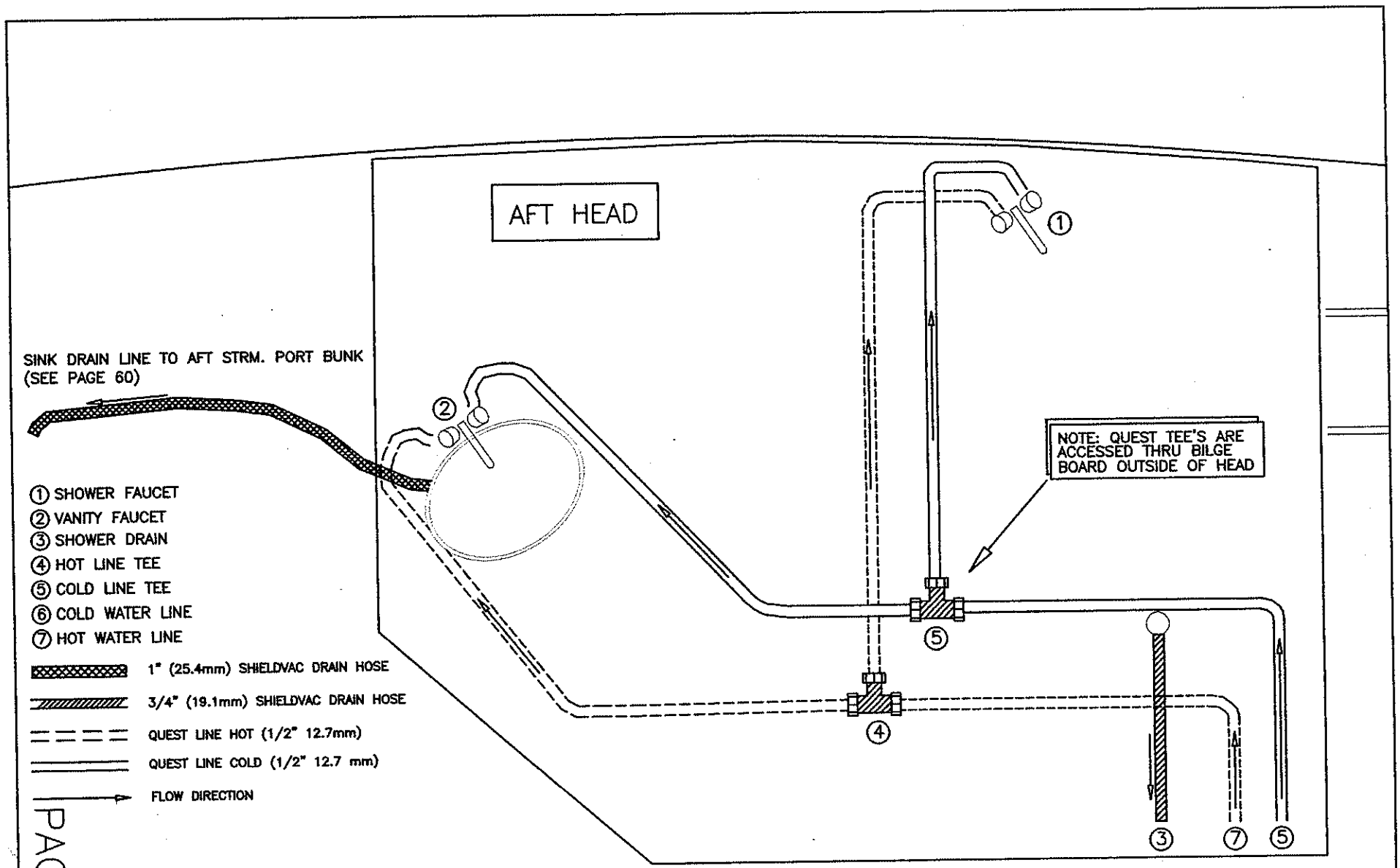
DRAWING TITLE: HUNTER FRESH WATER SYSTEM (BASIC LAYOUT)

DRAWING NO. 4108057B	REVISION NO. NONE
DRAWN BY ENGINEERING DEPT	DATE 6/30/97

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
SINK DRAIN SEACOCK
SHOWER
TO SUMP BOX IN FWD. MAIN CABIN BILGE COMP. (SEE PAGE 59A– FOR MORE DETAILS)
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
DRAWING NO. PLUMBING 8057C
REVISION NO. NONE
DRAWN BY: ENGINEERING DEPT.
DATE: 7/15/97
HUNTER

PAGE 57C

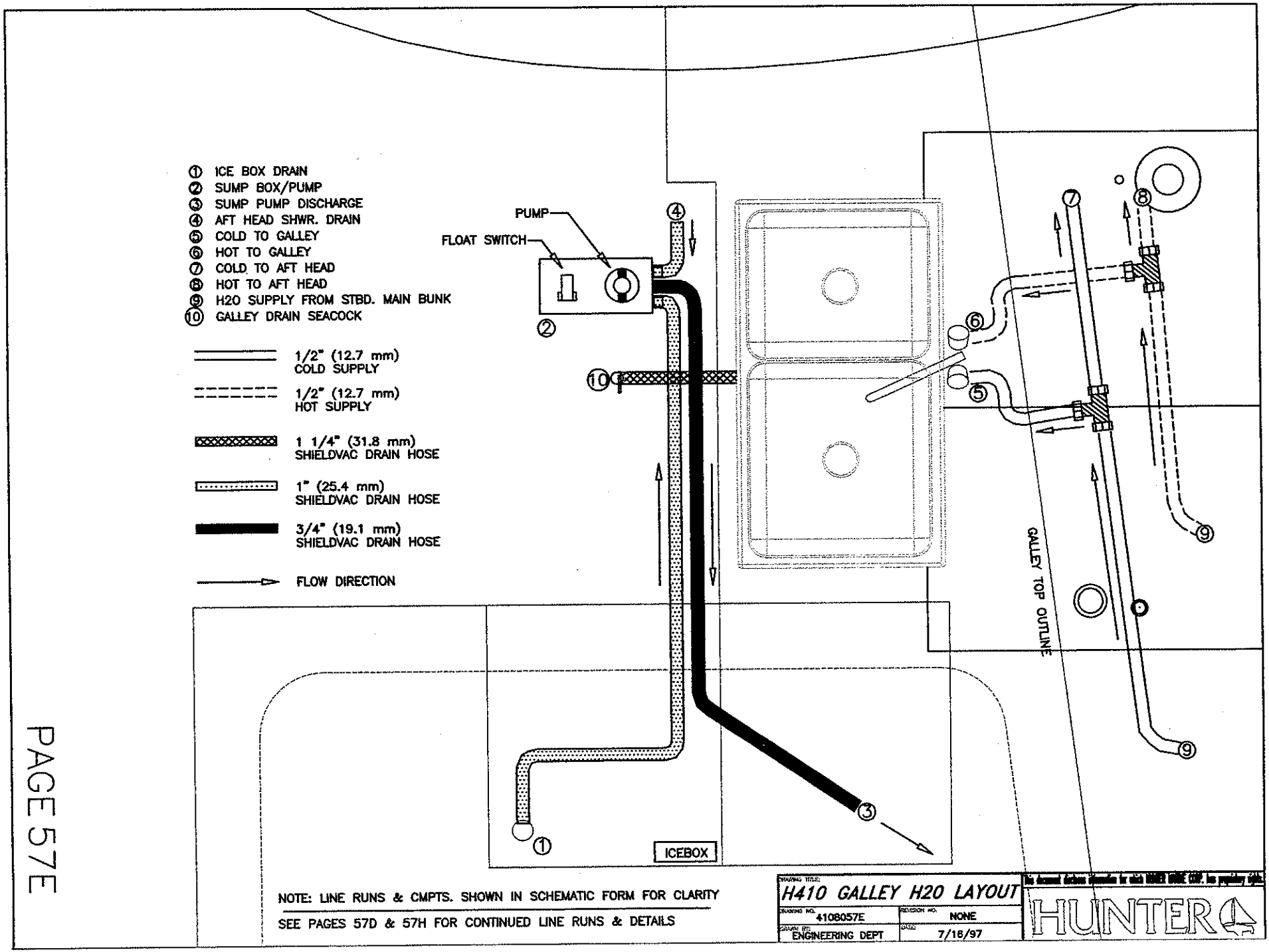


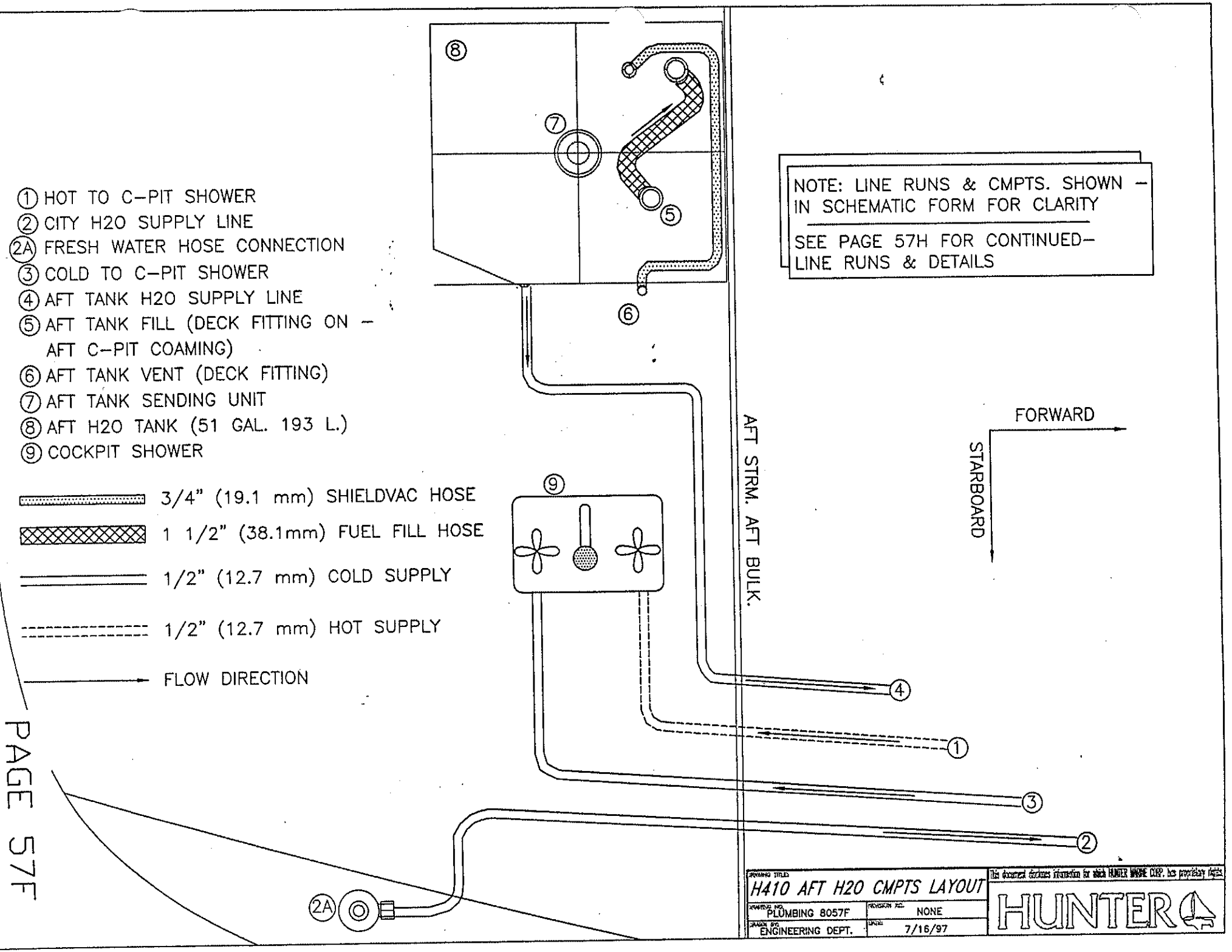
PAGE 57D

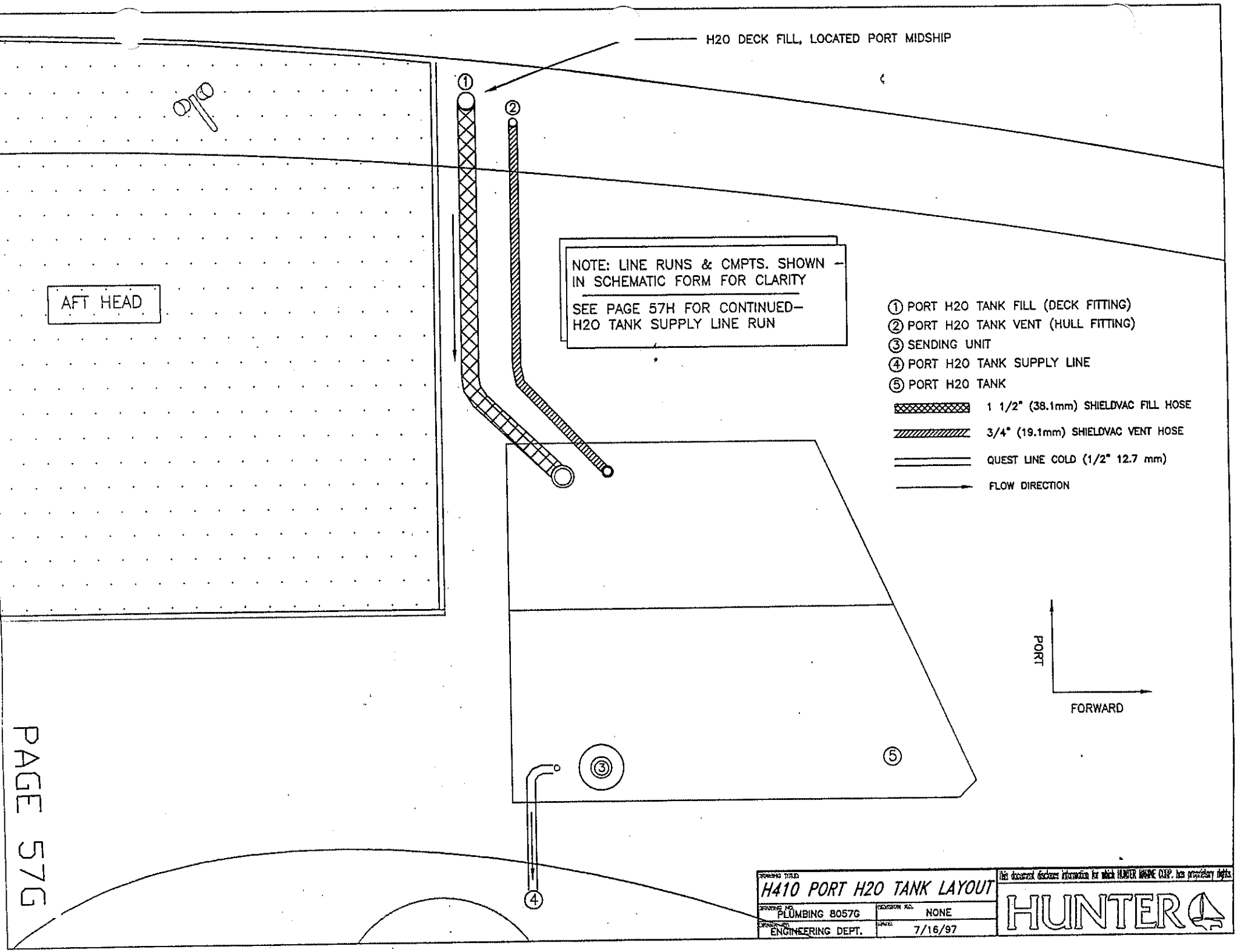
DRAWING TITLE: *H410 AFT VANITY H20 LAYOUT*

DRAWING NO.	REVISION NO.
PLUMBING 8057D	NONE
DRAFTS BY: ENGINEERING DEPT.	DATE: 7/15/97

HUNTER


① ICE BOX DRAIN
② SUMP BOX/PUMP
③ SUMP PUMP DISCHARGE
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
1/2" (12.7 mm) COLD SUPPLY
1/2" (12.7 mm) HOT SUPPLY
1 1/4" (31.8 mm) SHIELDVAC DRAIN HOSE
1" (25.4 mm) SHIELDVAC DRAIN HOSE
3/4" (19.1 mm) SHIELDVAC DRAIN HOSE
FLOW DIRECTION
PUMP
FLOAT SWITCH
ICEBOX
GALLEY TOP OUTLINE
NOTE: LINE RUNS & CMPTS. SHOWN IN SCHEMATIC FORM FOR CLARITY
SEE PAGES 57D & 57H FOR CONTINUED LINE RUNS & DETAILS
H410 GALLEY H20 LAYOUT
4108057E
NONE
ENGINEERING DEPT
7/18/97
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
H410 AFT H2O CMPTS LAYOUT
PLUMBING 8057F
NONE
ENGINEERING DEPT.
7/16/97
HUNTER

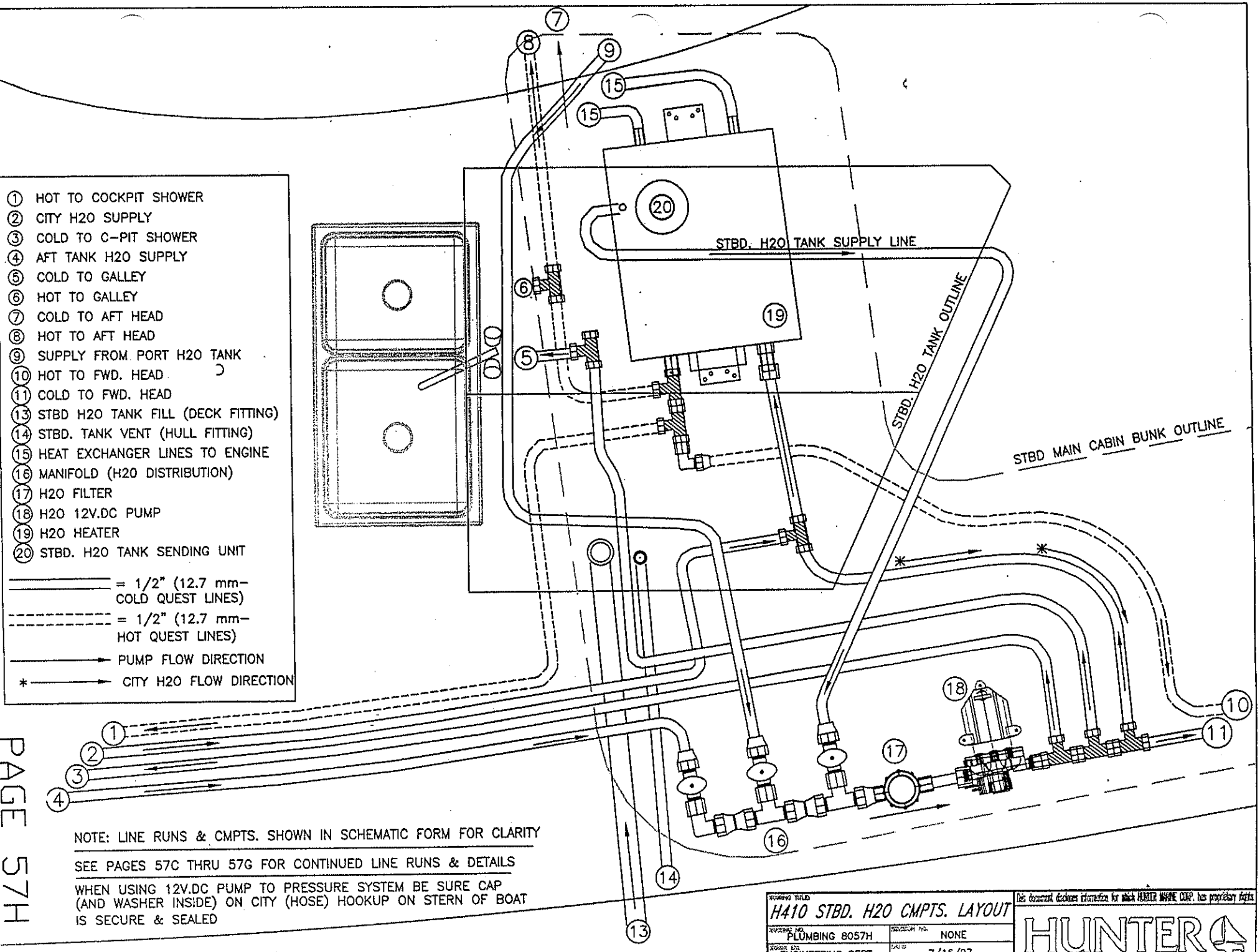


PAGE 57G

DRAWING TITLE
H410 PORT H2O TANK LAYOUT

DRAWING NO. PLUMBING 8057G	REVISION NO. NONE
DRAWN BY ENGINEERING DEPT.	DATE 7/16/97

HUNTER



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

DRAWING TITLE: H410 STBD. H2O CMPTS. LAYOUT

DRAWING NO.: PLUMBING 8057H

REVISION NO.: NONE

DRAWN BY: ENGINEERING DEPT.

DATE: 7/16/97

HUNTER

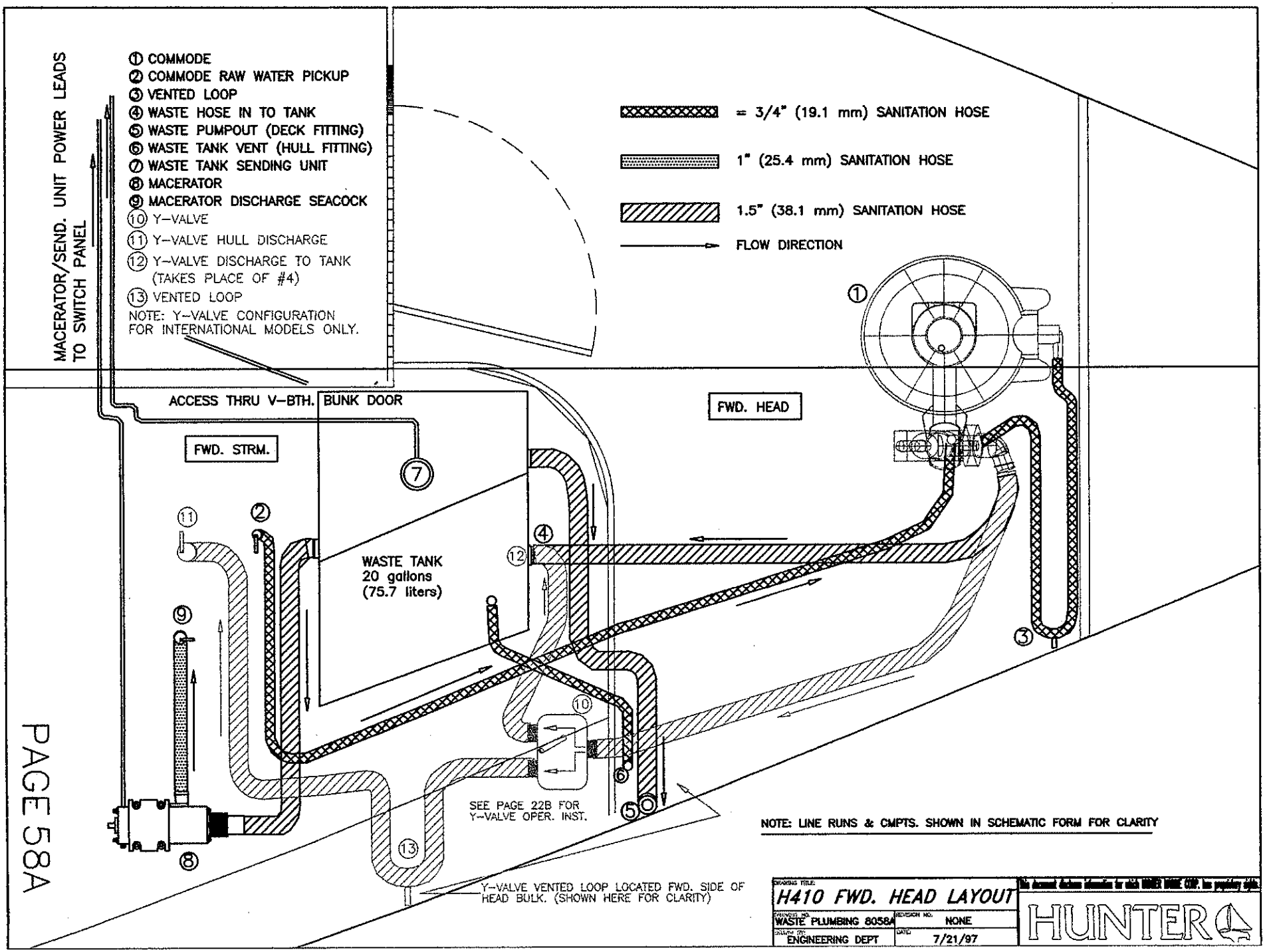
			FRESH WATER PLUMBING PARTS LIST		
				U.O.M.	QTY
COMP. #					
KD010001		5	410 PLUMBING ASSEMBLY	ASSY	1
KD020001		5	410 FRESH WATER PLUMBING SUB ASSEMBLY	SUB	1
KD020015		5	410 FWD SHOWER FAUCET PLUMBING CPNT	CPNT	1
PL0192		250	FAUCET - VANITY - W/SHOWER #10-324 MD	EA	1
PL1820		250	SEATING 1/2 O.D. 500FNCR-2	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
CO0147		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

			FRESH WATER PARTS LIST CONT:		
COMP. #				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
CO0148		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"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	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
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 MAINIFOLD PLUMBING CPNTS	CPNT	1
450264		600	P/H PHIL #10 X 3/4" S/S T/A	EA	4
PL0524		250	CLAMP DC-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 #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
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:		
COMP.				U.O.M.	QTY.
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


MACERATOR/SEND. UNIT POWER LEADS TO SWITCH PANEL
① COMMODE
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
ACCESS THRU V-BTH. BUNK DOOR
FWD. STRM.
FWD. HEAD
WASTE TANK 20 gallons (75.7 liters)
SEE PAGE 22B FOR Y-VALVE OPER. INST.
Y-VALVE VENTED LOOP LOCATED FWD. SIDE OF HEAD BULK. (SHOWN HERE FOR CLARITY)
NOTE: LINE RUNS & CMPTS. SHOWN IN SCHEMATIC FORM FOR CLARITY
DRAWING TITLE: H410 FWD. HEAD LAYOUT
DRAWING NO. WASTE PLUMBING 8058A
REVISION NO. NONE
DRAWN BY ENGINEERING DEPT
DATE 7/21/97
HUNTER

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

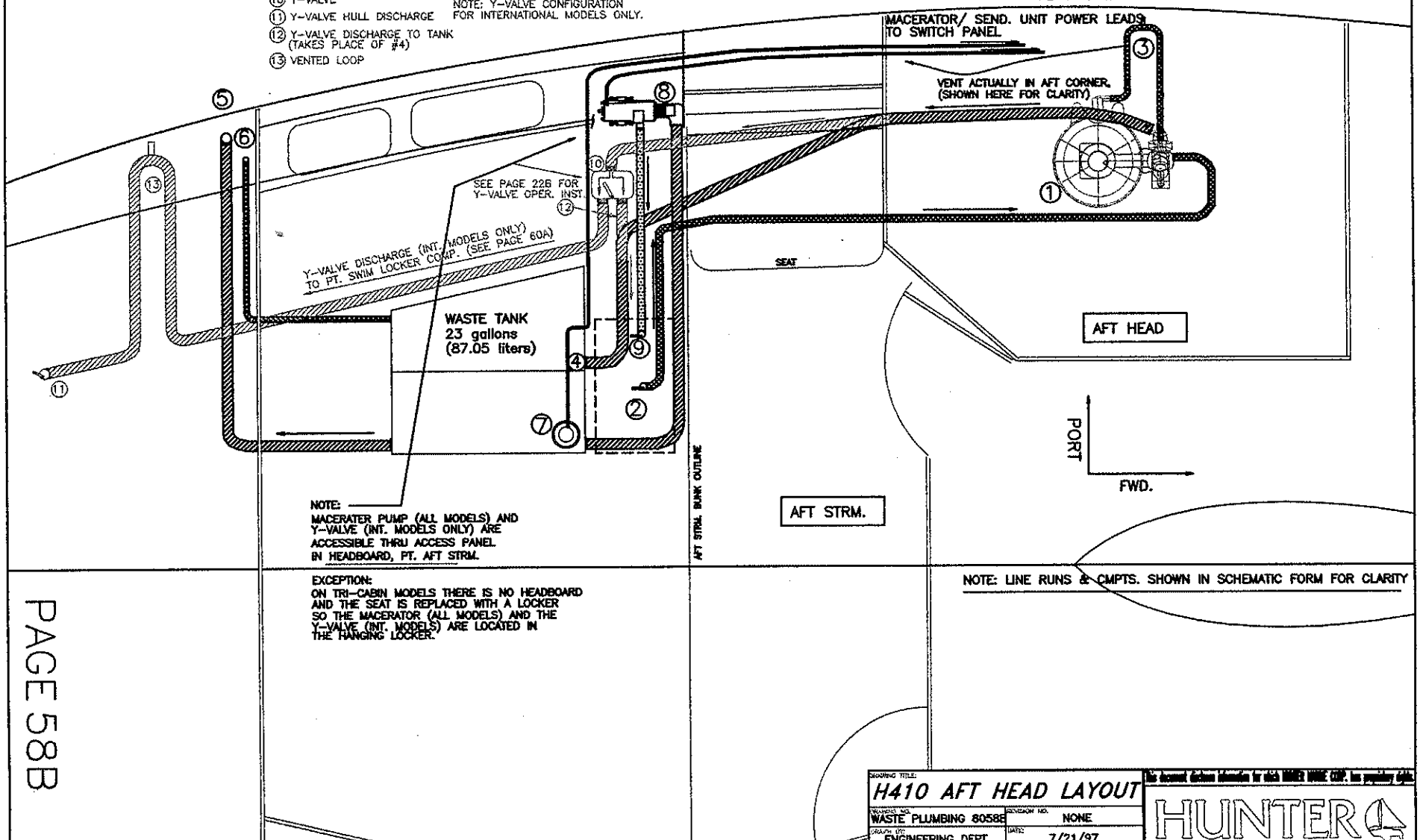
NOTE: Y-VALVE CONFIGURATION FOR INTERNATIONAL MODELS ONLY.

= 3/4" (19.1 mm) SANITATION HOSE

1" (25.4 mm) SANITATION HOSE

1.5" (38.1 mm) SANITATION HOSE

FLOW DIRECTION



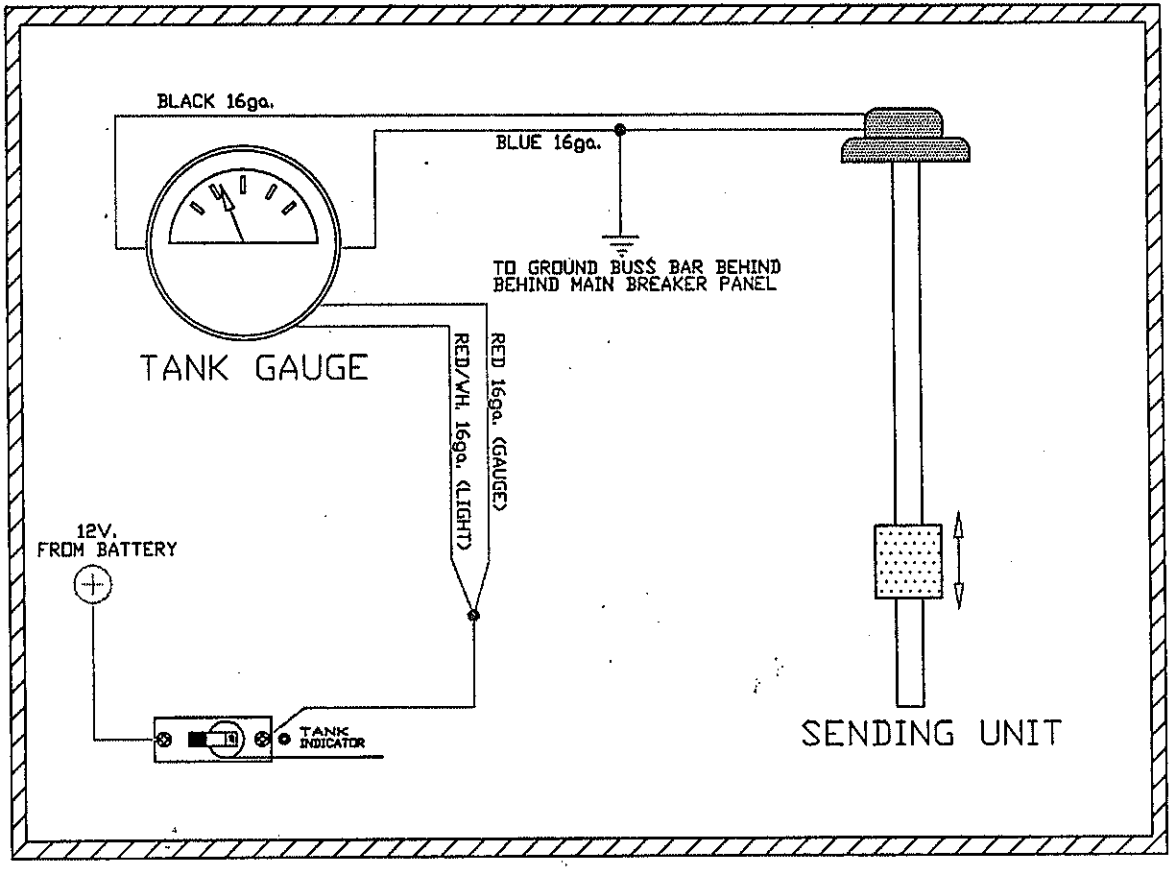
NOTE: MACERATER PUMP (ALL MODELS) AND Y-VALVE (INT. MODELS ONLY) ARE ACCESSIBLE THRU ACCESS PANEL IN HEADBOARD, PT. AFT STRM.

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: H410 AFT HEAD LAYOUT
DRAWING NO.: WASTE PLUMBING 80588
REVISION NO.: NONE
DRAWN BY: ENGINEERING DEPT
DATE: 7/21/97

HUNTER



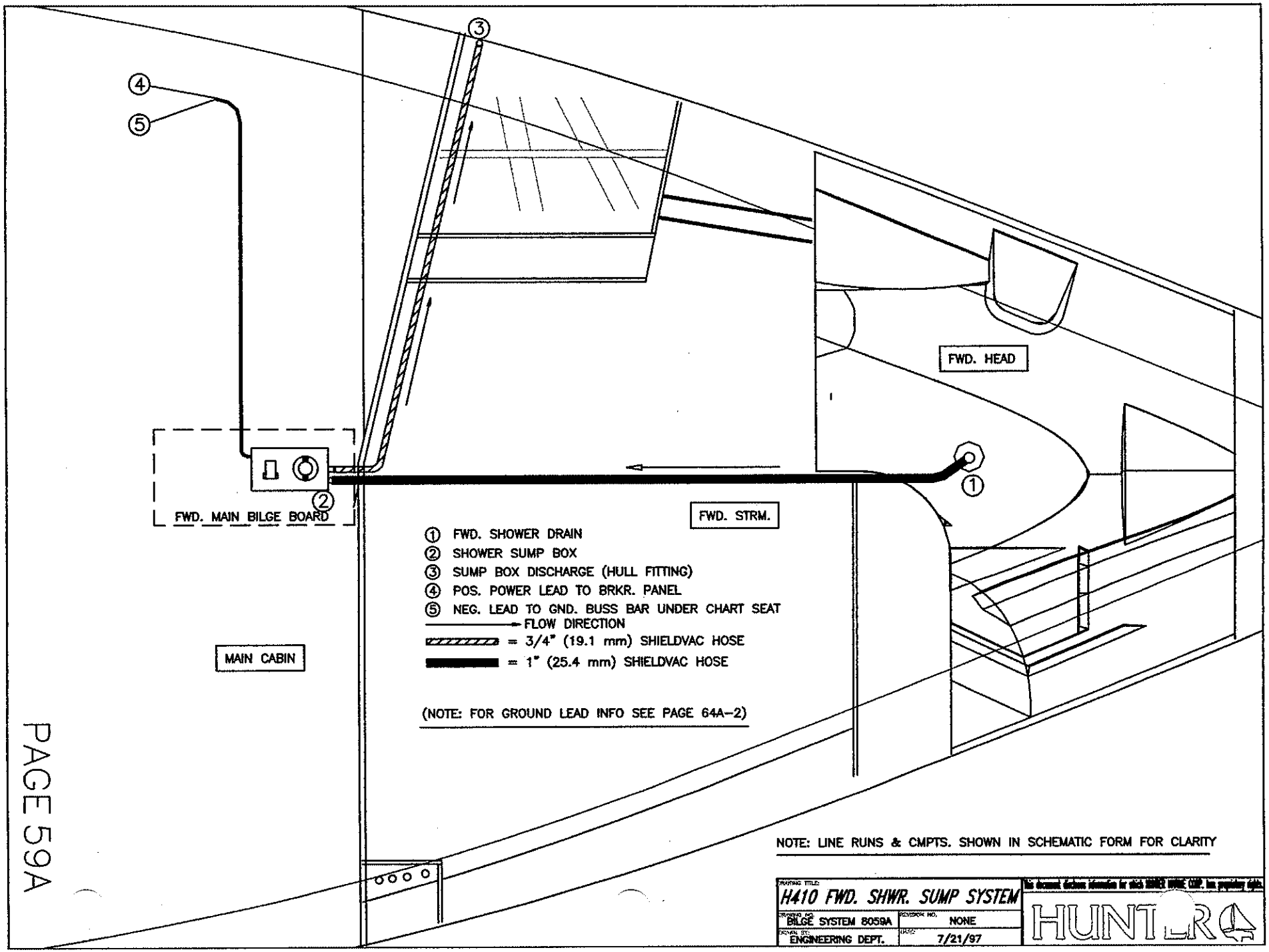
DRAWING TITLED: *H410 WASTE SENDING UNIT SCHEMATIC*	This document discloses information for which HUNTER MARINE CORP. has proprietary rights.
DRAWING NO. 4108058C	REVISION NO. NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 7/21/97

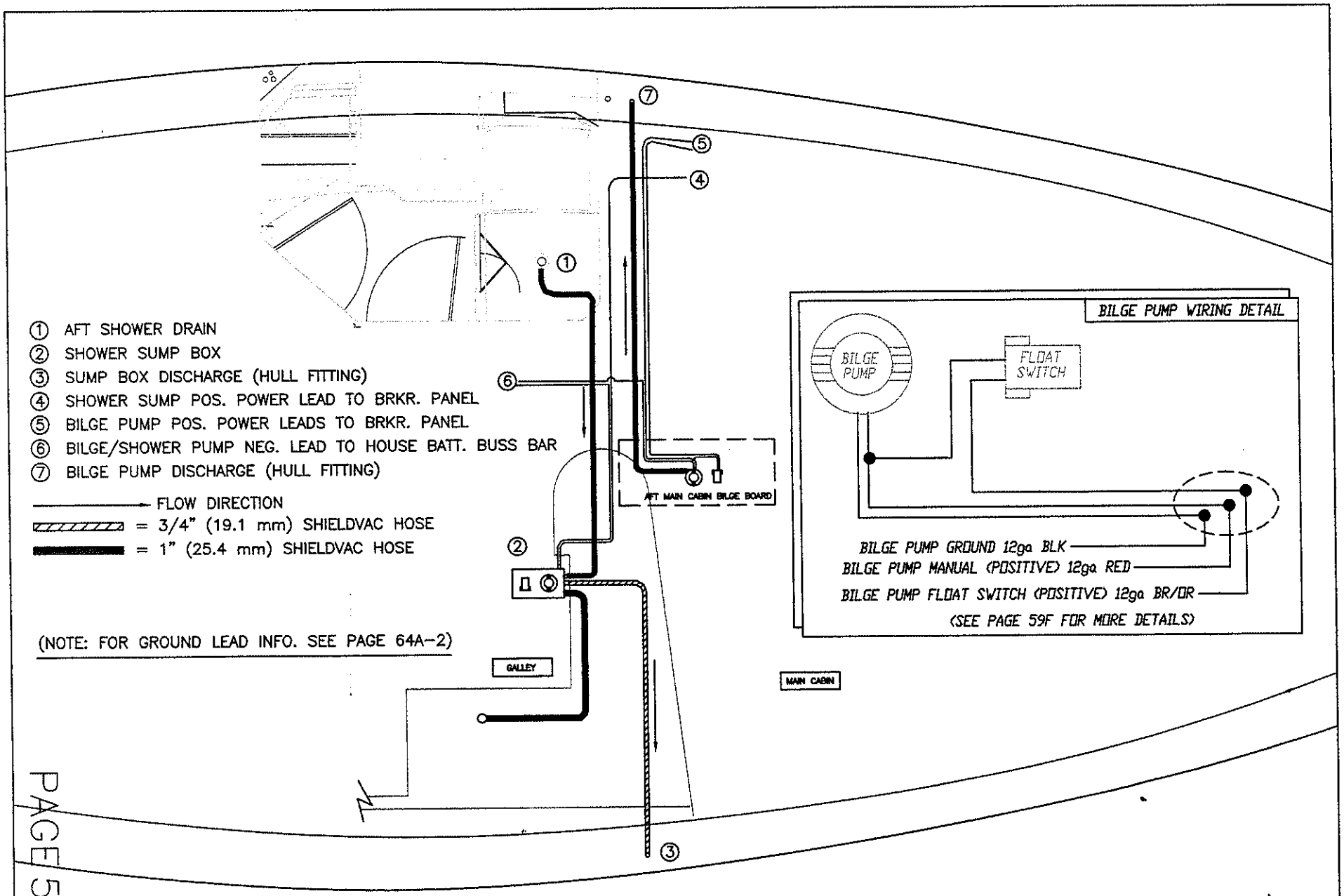
HUNTER

			WASTE SYSTEM PARTS LIST		
COMP. #				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"MPTX3/4"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,THRUHULL,"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 SHIELDVAC 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,THRUHULL,VANITY DISCHARGE	EA	1

			WASTE SYSTEM PARTS LIST CONT:		
COMP. #				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"MPTX3/4"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	TOLIET, 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, THRUHULL,"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 SHIELDVAC 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

			WASTE SYSTEM PARTS LIST CONT:		
COMP. #				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 SHIELDFLEX 1" TYPE 100-0346	FT	3
C00189		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 SHIELDFLEX 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

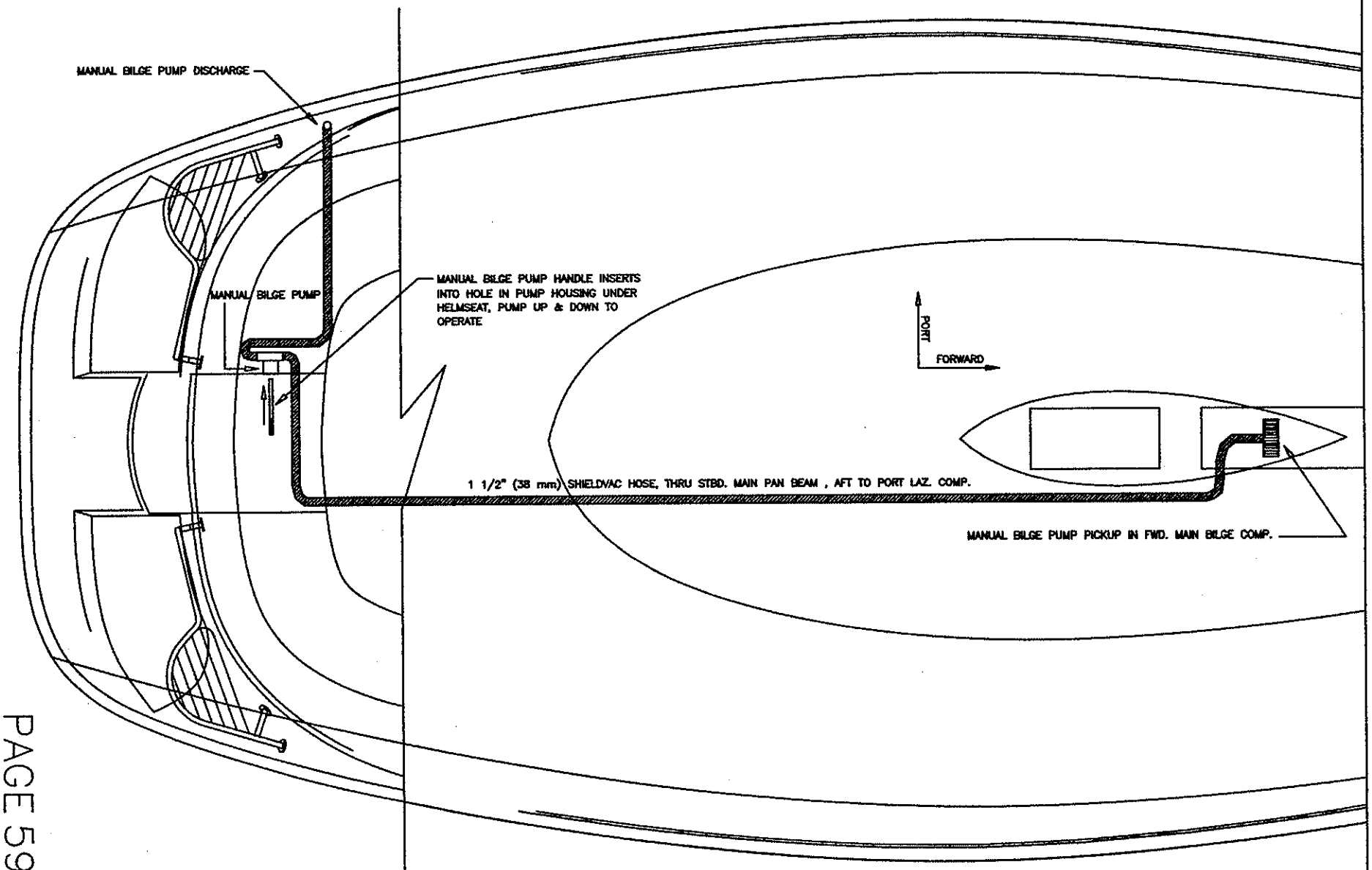

FWD. HEAD
FWD. STRM.
FWD. MAIN BILGE BOARD
MAIN CABIN
① FWD. SHOWER DRAIN
② SHOWER SUMP BOX
③ SUMP BOX DISCHARGE (HULL FITTING)
④ POS. POWER LEAD TO BRKR. PANEL
⑤ NEG. LEAD TO GND. BUSS BAR UNDER CHART SEAT
FLOW DIRECTION
= 3/4" (19.1 mm) SHIELDVAC HOSE
= 1" (25.4 mm) SHIELDVAC HOSE
(NOTE: FOR GROUND LEAD INFO SEE PAGE 64A-2)
NOTE: LINE RUNS & CMPTS. SHOWN IN SCHEMATIC FORM FOR CLARITY
DRAWING TITLE: H410 FWD. SHWR. SUMP SYSTEM
DRAWING NO. BILGE SYSTEM 8059A
REVISION NO. NONE
DRAWN BY: ENGINEERING DEPT.
DATE: 7/21/97
HUNTER



PAGE 59B

H410 AFT SHWR./MAIN BILGE SUMP SYSTEM	
BILGE SYSTEM 8059B	NONE
ENGINEERING DEPT	7/21/97

HUNTER



DRAWING TITLE: *H410 MANUAL BILGE PUMP LAYOUT*

DRAWING NO.	REVISION NO.
4108058C	NONE
DRAWN BY: ENGINEERING DEPT	DATE: 8/26/97

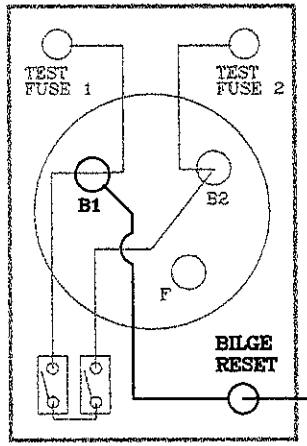
HUNTER

			BILGE/SUMP PUMP PARTS LIST		
COMP. #				U.O.M.	QTY.
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

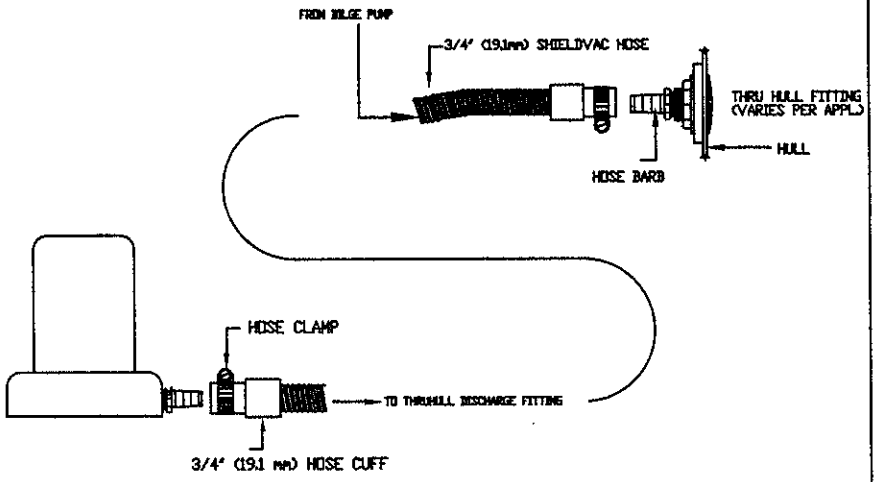
			BILGE/SUMP PUMP PARTS LIST CONT:		
COMP. #				U.O.M.	QTY.
KD040045		5	410 MAIN BILGE PUMP DRAIN COMPONENTS	CPNT	1
EL0175		200	SWITCH, BILGE, AUTO.	EA	1
EL0661		300	WIRE BROWN W/RED STRIPE 12 GA	FT	17
EL0670		300	WIRE BLACK SC-12 GAUGE	FT	5
EL0798		300	WIRE BROWN W/ORANGE STRIPE 12GA.	FT	17
EL0950		300	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

OPTIONAL INVERTER BATTERY PANEL

HOUSE BATTERY SEL. SWITCH

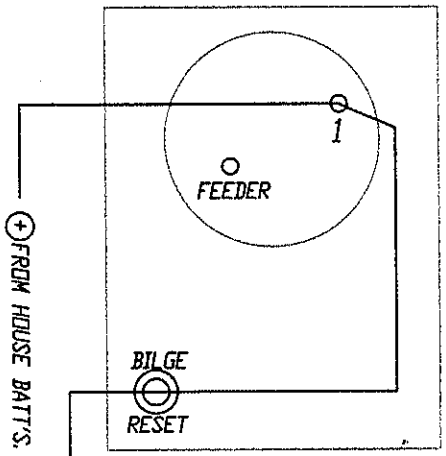


BILGE PUMP PLUMBING DETAIL

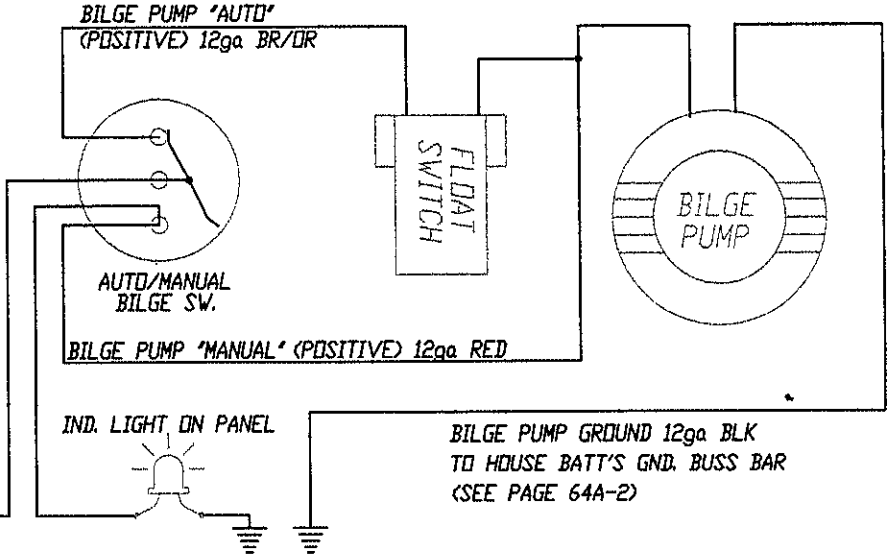


NOTE: THOUGH TWO TYPES OF PANELS ARE USED
1 FOR STD. BATT. CHARGER MODEL &
1 FOR THE OPTIONAL INVERTER MODEL
THE WIRING FOR THE BILGE RESET IS THE SAME

STD. BATT. CHARGER PANEL



BILGE PUMP WIRING DETAIL



DRAWING TITLE: H410 BILGE SYSTEM DETAILS	
DRAWING NO.: 4108059F	REVISION NO.: NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 1/28/98

HUNTER

HULL FITTING =*

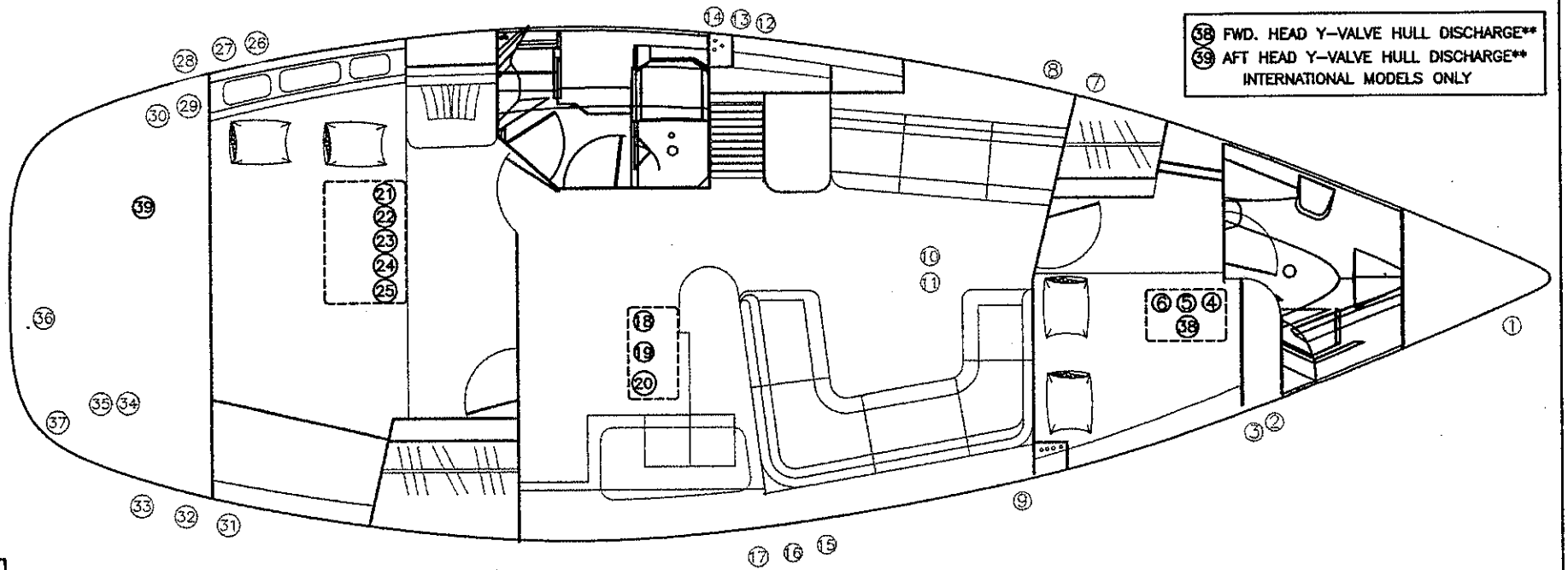
SEACOCK =**

DECK FITTING =***

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 WATERPICKUP****
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

38. **FWD. HEAD Y-VALVE HULL DISCHARGE****
39. **AFT HEAD Y-VALVE HULL DISCHARGE****

INTERNATIONAL MODELS ONLY



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.)

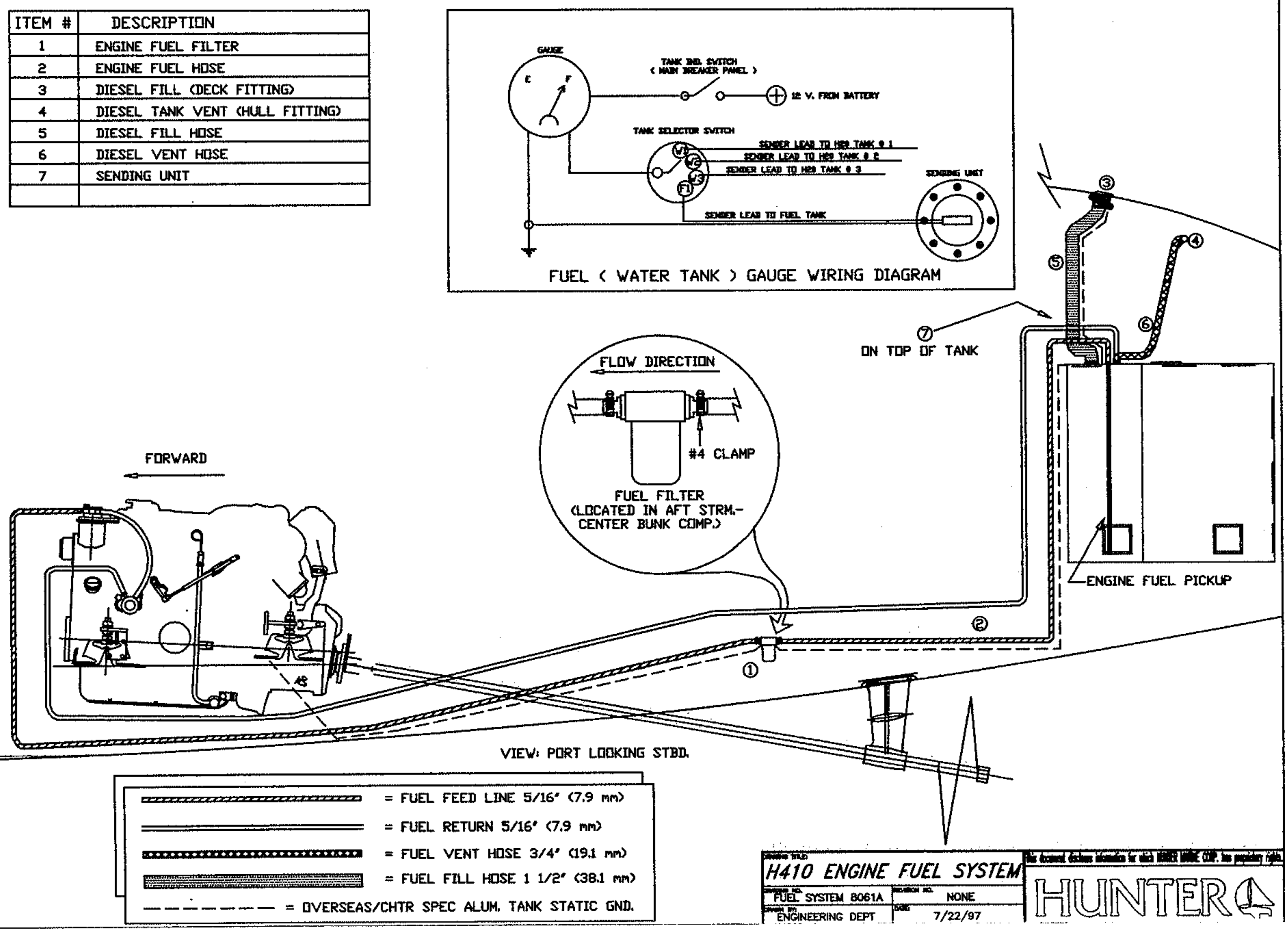
DRAWING TITLE: HA10 THRUHULL/DECK & SEACOCK LOCATIONS

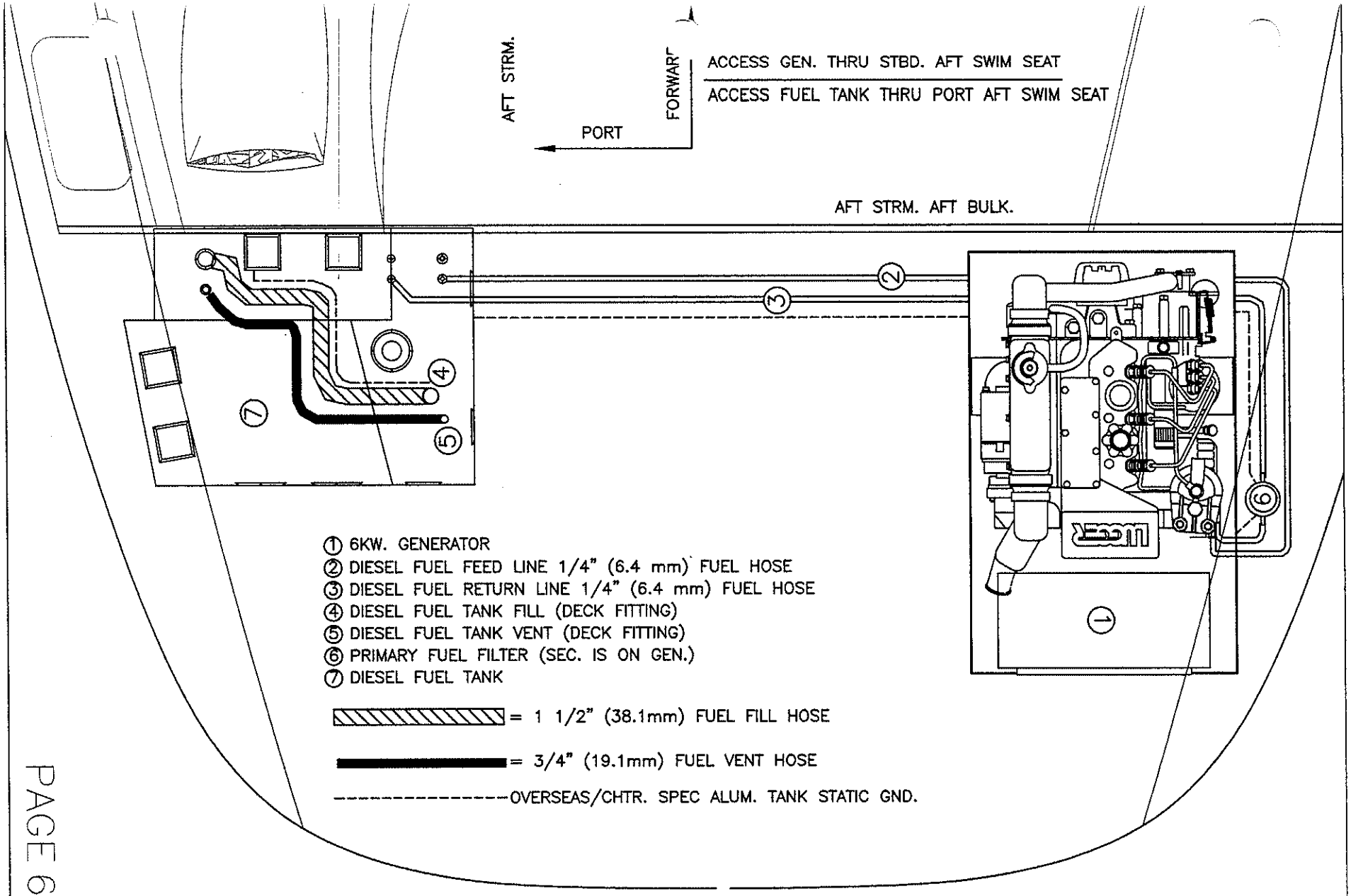
DRAWING NO. 4108060 | REVISION NO. NONE

DRAWN BY: ENGINEERING DEPT | DATE 7/21/97

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



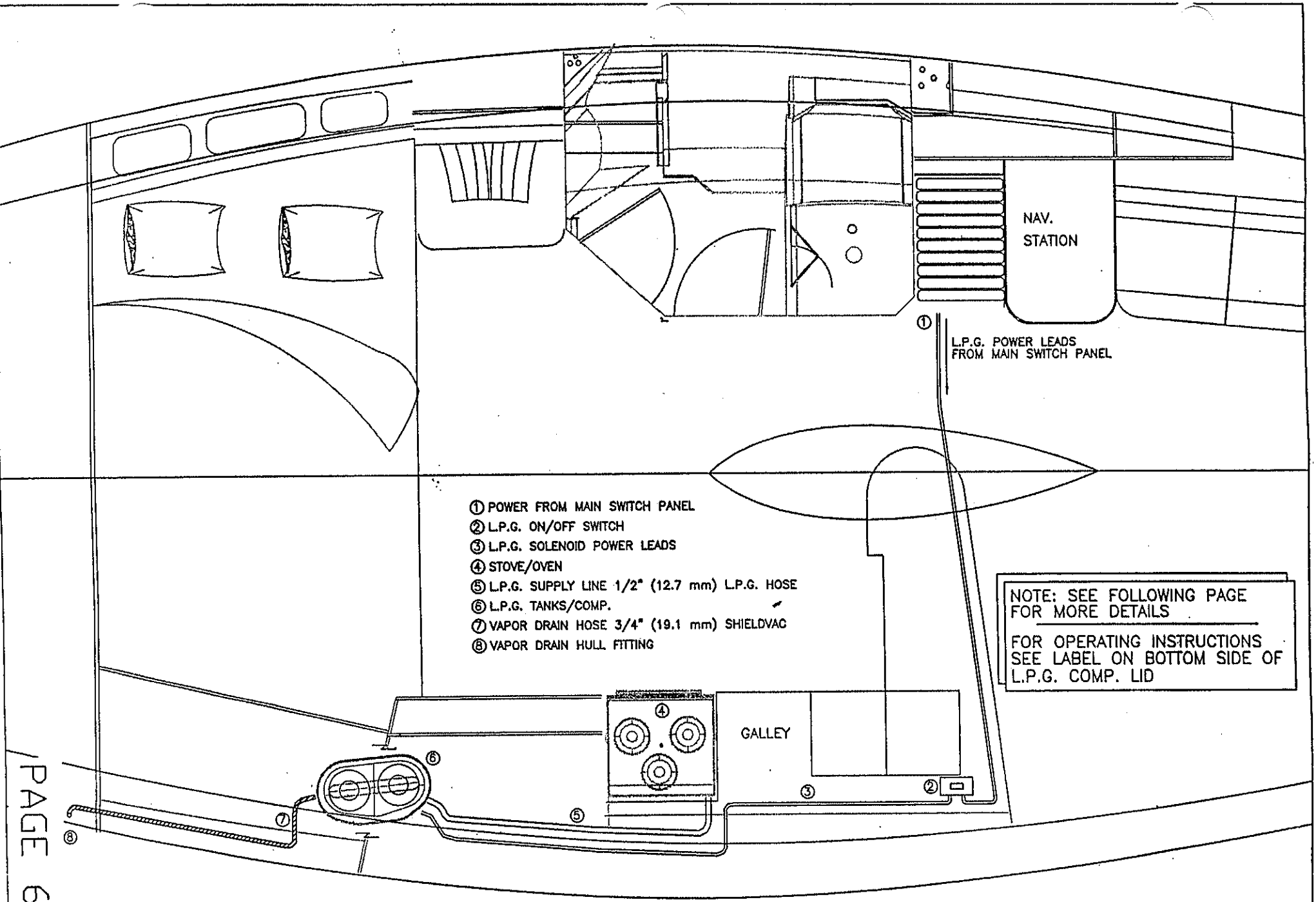


DRAWING TITLE: H410 GENERATOR FUEL SYSTEM

DRAWING NO.	REVISION NO.
4108061B	NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 7/22/97

HUNTER

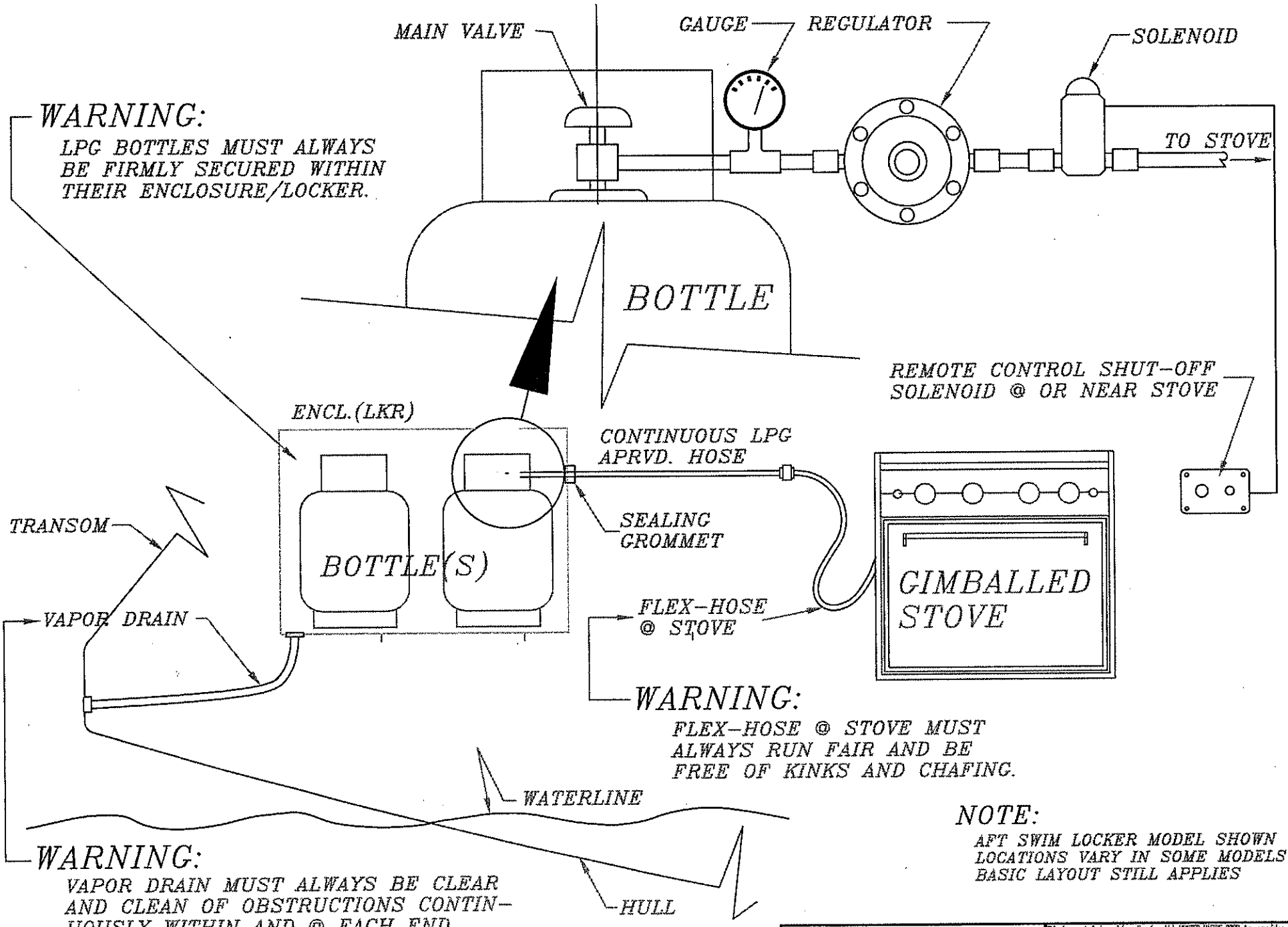
		FUEL SYSTEM PARTS LIST		
Component				Net
No.		Description	UOM	Q.P.A.
=========	===	==========	=======	=======
KB050001		410 ENGINE FUEL SUPPLY SUB ASSEMBLY	SUB	1
KB050005		410 FUEL TANK MOUNTING COMPONENTS	CPNT	1
EL0169-D		PANEL, P7-WF, 7 POSITION TANK DISPLAY	EA	1
EL0169-E		MOUNTING FLANGE, 3", FL-2	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



PAGE 62A

DRAWING TITLE: H410 L.P.G. SYSTEM	
DRAWING NO. 4108062A	REVISION NO. NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 7/23/97

HUNTER



PAGE 62B

DRAWING TITLE: H410 L.P.G. SYSTEM LAYOUT (BASIC)	This document discloses information for which HUNTER MARINE CORP. has proprietary rights.
DRAWING NO. 4108062B	REVISION NO. NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 7/7/97

HUNTER

			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

NOTE TO CONSUMER

THE FOLLOWING PAGES PROVIDE DETAILED INFORMATION, SCHEMATICS ETC. PERTAINING TO THE H 410 **STANDARD** ELECTRICAL SYSTEMS AS WELL AS THE **OPTIONAL** ELECTRICAL SYSTEMS.

BE SURE TO READ THE DRAWING TITLE IN THE TITLE BLOCK TO BE SURE YOU ARE REFERRING TO THE CORRECT SYSTEM FOR YOUR MODEL.

MAJOR DIFFERENCES EXIST FOR EXAMPLE IN THE CHARGING SYSTEM SCHEMATICS WHERE THE STANDARD MODEL IS EQUIPPED WITH A BATTERY CHARGER AND THE OPTIONAL MODEL IS EQUIPPED WITH AN INVERTER/CHARGER.

H410 ELECTRICAL SYSTEM CONTENTS

PAGES 63A-2 THRU 63G-2 CONTAINS A.C. POWER SYSTEMS
(110 V.A.C.) (220 V.A.C. ON OVERSEAS MODELS)

PAGES 64A-1 THRU 64J-4 CONTAINS D.C. POWER SYSTEMS
(12 VOLT D.C.)

H410 POWER SYSTEMS OPERATION PROCEDURES

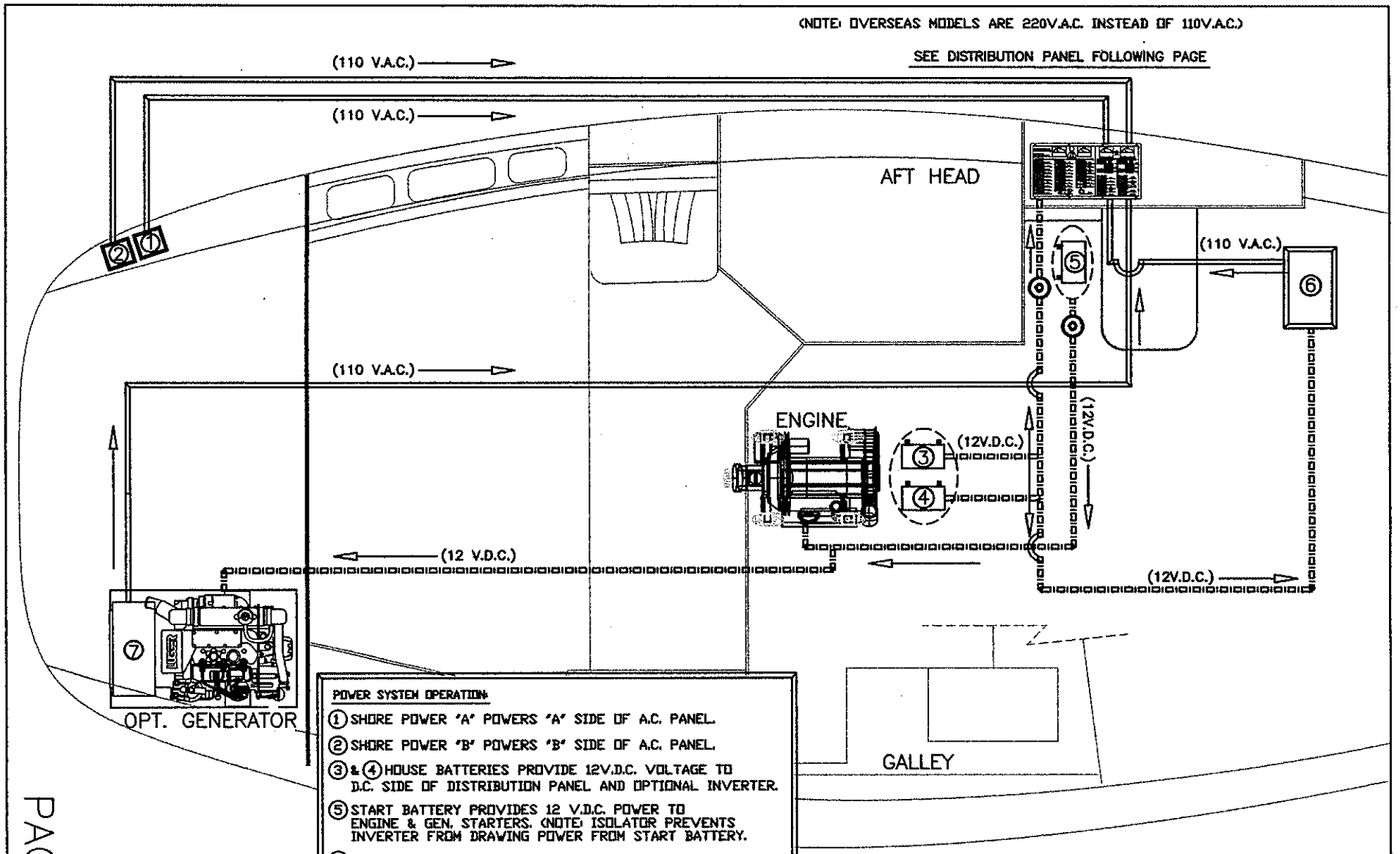
POWER SOURCE:	TO OPERATE:
D.C. MAIN	**STD. BATTERY CHARGER MODEL:** TURN BATTERY SWITCH (LOCATED UNDER CHART TABLE) TO THE "ON" POSITION, THEN TURN ON "D.C. MAIN" BREAKER. ON D.C. SIDE OF MAIN DISTRIBUTION PANEL. **IF NO POWER:** CHECK 50a. RESET ON "HOUSE" BATTERY SWITCH PANEL AND/OR BATTERY CONNECTIONS IF NECESSARY.
D.C. MAIN	**OPTIONAL INVERTER MODEL:** TURN ON "D.C. MAIN" BRKR. ON D.C. SIDE OF MAIN DISTRIBUTION PANEL. IT IS **NOT** NECESSARY TO TURN ON THE INVERTER/DRAW SEL. SW. TO EITHER THE #1, #2, OR BOTH POSITION, **THIS PORTION OF THE INV/DRAW SEL. SW. IS FOR THE CHARGING/INVERTING SYSTEM (AND ISOLATION OF) ONLY.** IT IS NECES. HOWEVER TO TURN ON EITHER THE #1, OR #2, BREAKER/S LOCATED ON THE BOTTOM OF THE INV/DRAW SEL. SW. PANEL TO PROVIDE POWER TO D.C. PANEL FROM EITHER THE HOUSE BATT. #1 OR #2. (#1=HOUSE BATTERY #1) (#2= HOUSE BATTERY #2) **IF NO POWER: CHECK 300 amp IN LINE FUSE AT EACH HOUSE BATTERY IN HOUSE BATTERY COMPARTMENT, AND/OR BATTERY CONNECTIONS IF NECESSARY.**
SHORE POWER "A"	1. CONNECT SHORE POWER CABLE #1, TO SUPPLY POWER TO "A" SIDE OF A.C. POWER MAIN DISTRIBUTION PANEL 2. TURN ON MAIN BREAKER ON SHORE POWER "A" SIDE OF PANEL 3. "A" SIDE OF A.C. POWER MAIN DISTRIBUTION PANEL SHOULD NOW BE OPERABLE (NOTE: APPROX. 15 SECOND DELAY ON OPT. INV. MODELS) **IF NO POWER TO "A" SIDE OF PANEL CHECK THE FOLLOWING:** **1. BREAKER AT DOCKSIDE POWER SUPPLY BOX** **2. BREAKER #1 INSIDE PORT COCKPIT SEAT LOCKER**
SHORE POWER "B"	1. CONNECT SHORE POWER CABLE #2, TO SUPPLY POWER TO "B" SIDE OF A.C. POWER MAIN DISTRIBUTION PANEL 2. TURN ON MAIN BREAKER ON SHORE POWER "B" SIDE OF PANEL 3. "B" SIDE OF A.C. POWER MAIN DISTRIBUTION PANEL SHOULD NOW BE OPERABLE **IF NO POWER TO "B" SIDE OF PANEL CHECK THE FOLLOWING:** **1. BREAKER AT DOCKSIDE POWER SUPPLY BOX** **2. BREAKER #2 INSIDE PORT COCKPIT SEAT LOCKER**
OPTIONAL INVERTER **WHEN IN INVERT MODE** (CONVERTS 12V.D.C. TO 110V.A.C.) POWERS "A" SIDE OF A.C. PANEL ONLY WHEN INVERTING USED WHEN NO SHORE POWER OR GEN.POWER BEING USED.	1 CHOOSE HOUSE BATTERY/S TO DRAW POWER FROM BY TURNING INV/DRAW (HOUSE BATT'S) SEL. SWITCH UNDER CHART TABLE TO 1,2, OR BOTH POSITION (THIS SW. PROVIDES **ISOLATION CAPABILITY** IN THE EVENT OF A BAD BATTERY, FOR EX. A DEAD CELL) 2. TURN THE INVERTER REMOTE SW. (LOCATED AT INB. END OF CHART SEAT) TO THE "ON" POSITION 3. TURN ON DESIRED BREAKER (EX. OUTLETS) ON "A" SIDE OF A.C. MAIN DISTRIBUTION PANEL NOTE: IT TAKES 10D.C. AMPS TO CREATE 1A.C. AMP, IF THE BATTERY VOLTAGE DROPS BELOW 10.5V. THE INVERTER WILL AUTOMATICALLY SHUT DOWN. (SEE "SEL. SW" & "METERS" ON PAGE 63A-7) **ALSO THE OUTPUT OF THE INVERTER IS NOT CAPABLE OF POWERING THE WATER HEATER OR AIR COND. SYSTEM,** THE WATER HEATER IS POWERED BY "SHORE POWER A" CABLE OR OPT. GENERATOR. THE AIR COND'S ARE POWERED BY THE "SHORE POWER B" CABLE OR THE OPT. GENERATOR. **NOTE: IF ANY OTHER APPLIANCES ARE TO BE USED WITH AIR COND/'S RUNNING WHEN ON SHORE POWER BOTH "SHORE POWER A" AND "SHORE POWER B" CABLES MUST BE HOOKED UP. TO POWER D.C. SIDE OF PANEL AND "A" SIDE OF A.C. PANEL SIMULTANEOUSLY USING INVERTER:** 1. TURN ON D.C. MAIN BREAKER ON D.C. SIDE OF MAIN DISTRIBUTION PANEL 2. TURN THE INV/DRAW (HOUSE BATT'S) SELECTOR SWITCH TO THE #2 POSITION 3.TURN THE **#1 BREAKER** LOCATED AT THE BOTTOM OF THE INV/DRAW SEL. SWITCH PANEL TO THE **"ON"** POSITION. AND TURN THE **#2** BREAKER TO THE **"OFF"** POSITION. 4. TURN INVERTER REMOTE SWITCH TO THE "ON" POSITION THIS PROCEDURE ALLOWS INVERTER TO SUPPLY 110V.A.C. POWER TO "A" SIDE OF A.C. PANEL BY DRAWING POWER FROM HOUSE BATTERY #2, WHILE D.C. SIDE OF PANEL DRAWS POWER FROM HOUSE BATTERY #1. THIS ISOLATION PROCEDURE COMES IN HANDY FOR EXAMPLE WHEN USING A HIGHER AMPERAGE APPLIANCE OFF OF THE INVERTER THAT MIGHT CAUSE A MOMENTARY VOLTAGE DROP THAT COULD EFFECT EQUIP. (SUCH AS THE OPT. AUTOPILOT) THAT IS VOLTAGE SENSITIVE CAUSING THE UNIT TO TURN OFF. (THIS APPLIES WHEN THERE IS NO SHORE OR GENERATOR POWER BEING SUPPLIED TO PANEL)
BUILT IN INVERTER-TRANSFER SWITCH.	THE INVERTER AUTO. TRANSFERS SHORE POWER TO THE A.C. PANEL WHEN "SHORE POWER A" CABLE CONNECTED AND DOCKSIDE POWER PRESENT AT A.C. PANEL BYPASSING THE INVERT MODE CAPABILITIES.
OPTIONALGENERATOR	1.TURN (START) BATTERY SW. (LOCATED UNDER CHART TABLE) TO THE "ON" POSITION 2. CHECK SEA STRAINER AND OPEN RAW WATER SEACOCK. SEE PAGE 60 FOR LOCATION 3. START GENERATOR (FOLLOW STARTING INSTRUCTIONS PROVIDED IN THE "GENERATOR MANUAL") 3. RAISE SLIDE BAR ON "A" SIDE OF A.C. PANEL AND TURN GENERATOR BREAKER TO THE "ON" POSITION 4. TO POWER "B" SIDE OF A.C. PANEL (TO USE AIR COND'S) RAISE SLIDE BAR ON "B" SIDE OF A.C. PANEL AND TURN PARALLEL BREAKER TO THE "ON " POSITION

H410 BATTERY CHARGING SYSTEMS OPERATION PROCEDURES

STD. BATT. CHARGER	1. CONNECT SHORE POWER CABLE #1 TO POWER "A" SIDE OF A.C. POWER MAIN DISTRIBUTION PANEL AND TURN ON "SHORE POWER A" MAIN BREAKER 2. TURN "BATTERY CHARGER" BREAKER (LOCATED ON "A" SIDE OF A.C. PANEL) TO THE "ON" POSITION NOTE: **IT IS NOT NECESSARY** TO TURN ON THE "HOUSE" OR THE "START" BATTERY SWITCHES TO PROVIDE CHARGING POWER TO THE HOUSE & START BATTERIES.
ENGINE ALTERNATOR	1. TURN (START) BATTERY SELECTOR SWITCH TO THE "ON" POSITION 2. CHECK SEA STRAINER & OPEN RAW WATER SEACOCK. SEE PAGE 60 FOR LOCATION 3. START SHIP'S ENGINE (FOLLOW STARTING INSTRUCTIONS IN THE "ENGINE MANUAL") 4. TURN (HOUSE) BATTERY SWITCH TO THE "ON" POSITION **(ON OPT. INV. MODEL THE INV/DRAW SEL. SWITCH TO THE "BOTH" POSITION)**
OPTIONAL INVERTER INVERTER HAS A BUILT IN AUTO. CHARGING SYSTEM	1. CONNECT SHORE POWER CABLE #1 TO POWER "A" SIDE OF A.C. POWER MAIN DISTRIBUTION PANEL AND TURN ON "SHORE POWER A" MAIN BREAKER 2. TURN INVERTER REMOTE SWITCH TO THE **"OFF"** POSITION 3. TURN INVERTER/DRAW (HOUSE BATT'S) SELECTOR SWITCH TO THE "BOTH" POSITION NOTE: **IT IS NOT NECESSARY** TO TURN ON THE "START" BATTERY SWITCH TO PROVIDE CHARGING POWER TO THE START BATTERY. NOTES: **WHEN LEAVING BOAT UNATTENDED, BE SURE INVERTER REMOTE SWITCH IS IN THE "OFF" POSITION,** THIS WAY IF SHORE POWER IS LOST FOR ANY REASON, THIS WILL PREVENT THE INVERTER FROM CONVERTING 12V.D.C. TO A.C. VOLTAGE CAUSING HOUSE BATTERIES TO BE DRAINED. WHEN THE INVERTER REMOTE SWITCH IS IN THE "OFF" POSITION THE INVERTER AUTOMATICALLY GOES INTO CHARGE MODE INVERTER CHARGE MODE WORKS ONLY WHEN THERE IS POWER TO THE "A" SIDE OF THE A.C. PANEL
OPT. GENERATOR	1. TURN (START) BATTERY SWITCH TO THE "ON" POSITION 2. CHECK SEA STRAINER & OPEN RAW WATER SEACOCK SEE PAGE 60 FOR LOCATION 3. START GENERATOR (FOLLOW STARTING INSTRUCTIONS IN THE "GENERATOR MANUAL" 4. **ON STD. BATTERY CHARGER MODEL:**TURN ON THE "GENERATOR" MAIN BREAKER ON THE A.C. SIDE OF MAIN DISTRIBUTION PANEL TURN ON "BATTERY CHARGER" BREAKER ON THE "A" SIDE OF A.C. PANEL. IT IS **NOT** NECESSARY TO TURN ON THE HOUSE BATTERY SW. 5. **ON OPT. INVERTER MODEL:** TURN THE INVERTER REMOTE SWITCH TO THE "OFF" POSITION, AND THE INV/DRAW SEL. SWITCH TO THE "BOTH" POSITION.

(NOTE: OVERSEAS MODELS ARE 220V.A.C. INSTEAD OF 110V.A.C.)

SEE DISTRIBUTION PANEL FOLLOWING PAGE



POWER SYSTEM OPERATION:

1. SHORE POWER 'A' POWERS 'A' SIDE OF A.C. PANEL.
2. SHORE POWER 'B' POWERS 'B' SIDE OF A.C. PANEL.
3. & 4. HOUSE BATTERIES PROVIDE 12V.D.C. VOLTAGE TO D.C. SIDE OF DISTRIBUTION PANEL AND OPTIONAL INVERTER.
5. START BATTERY PROVIDES 12 V.D.C. POWER TO ENGINE & GEN. STARTERS. (NOTE: ISOLATOR PREVENTS INVERTER FROM DRAWING POWER FROM START BATTERY.
6. OPT. INVERTER CONVERTS 12 V.D.C. TO A.C. VOLTAGE AND POWERS 'A' SIDE OF A.C. PANEL ONLY.
7. OPT. GENERATOR PROVIDES A.C. POWER TO BOTH 'A' & 'B' SIDES OF PANEL WHEN GENERATOR AND PARALLEL BREAKERS ARE IN THE 'ON' POSITION WHILE GENERATOR RUNNING.

= BATTERY SELECTOR SWITCHES

= POWER FLOW DIRECTION

= 12 V.D.C.

= 110 V.A.C. (220 V.A.C. OVERSEAS MODELS)

NOTE: THIS LAYOUT IS INTENDED TO PROVIDE A BASIC UNDERSTANDING OF THE VARIOUS POWER SYSTEMS ONLY, IT IS NOT A SCHEMATIC! SEE FOLLOWING PAGES FOR MORE DETAILED INFO. SCHEMATICS, ETC.

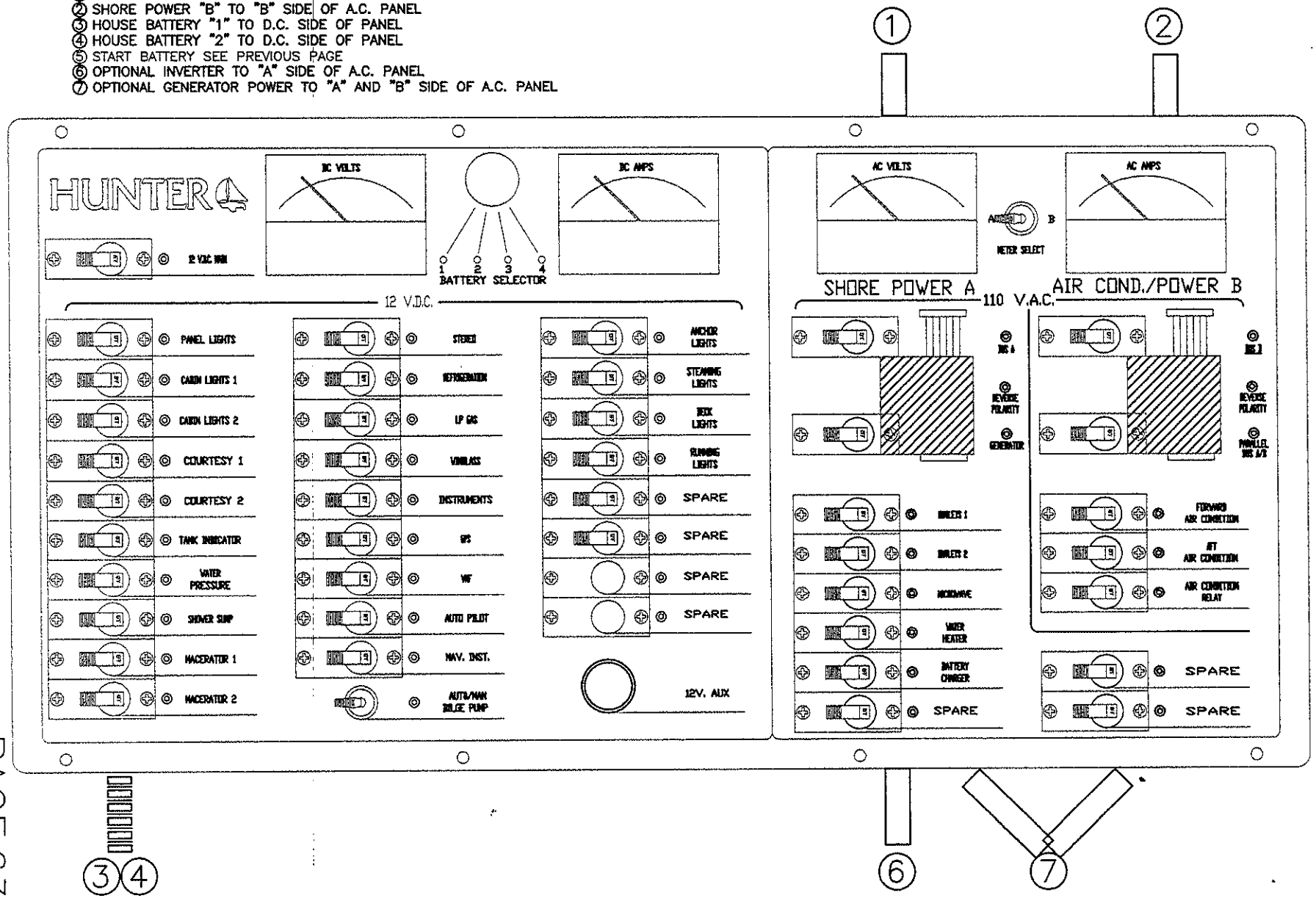
DRAWING TITLE: H410 BASIC POWER SYSTEM LAYOUT

DRAWING NO. 4108063A-3 | REVISION NO. NONE

DRAWN BY: ENGINEERING DEPT. | DATE: 12/15/97

HUNTER

① SHORE POWER "A" TO "A" SIDE OF A.C. PANEL
② SHORE POWER "B" TO "B" SIDE OF A.C. PANEL
③ HOUSE BATTERY "1" TO D.C. SIDE OF PANEL
④ HOUSE BATTERY "2" TO D.C. SIDE OF PANEL
⑤ START BATTERY SEE PREVIOUS PAGE
⑥ OPTIONAL INVERTER TO "A" SIDE OF A.C. PANEL
⑦ OPTIONAL GENERATOR POWER TO "A" AND "B" SIDE OF A.C. PANEL

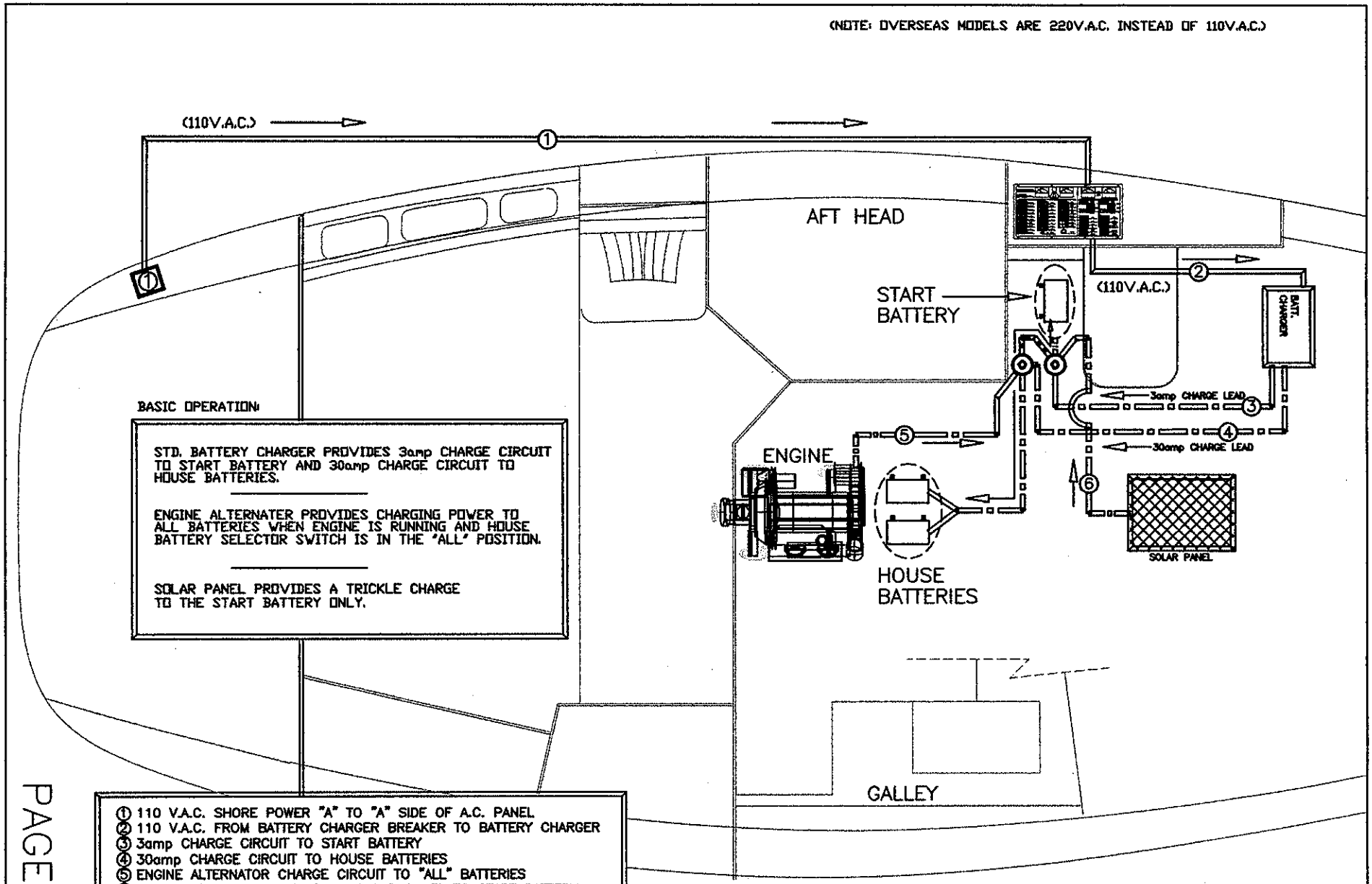


SEE PAGES 63A-7 & 8 FOR BREAKER DESCRIPTIONS

DRAWING TITLE: H410 MAIN DISTRIBUTION PANEL LAYOUT
DRAWING NO. 4108063A-4
REVISION NO. NONE
DRAWN BY: ENGINEERING DEPT.
DATE: 12/15/97

HUNTER

(NOTE: OVERSEAS MODELS ARE 220V.A.C. INSTEAD OF 110V.A.C.)



BASIC OPERATION:

STD. BATTERY CHARGER PROVIDES 3amp CHARGE CIRCUIT TO START BATTERY AND 30amp CHARGE CIRCUIT TO HOUSE BATTERIES.

ENGINE ALTERNATER PROVIDES CHARGING POWER TO ALL BATTERIES WHEN ENGINE IS RUNNING AND HOUSE BATTERY SELECTOR SWITCH IS IN THE "ALL" POSITION.

SOLAR PANEL PROVIDES A TRICKLE CHARGE TO THE START BATTERY ONLY.

① 110 V.A.C. SHORE POWER "A" TO "A" SIDE OF A.C. PANEL
② 110 V.A.C. FROM BATTERY CHARGER BREAKER TO BATTERY CHARGER
③ 3amp CHARGE CIRCUIT TO START BATTERY
④ 30amp CHARGE CIRCUIT TO HOUSE BATTERIES
⑤ ENGINE ALTERNATOR CHARGE CIRCUIT TO "ALL" BATTERIES
⑥ TRICKLE CHARGE CIRCUIT FROM SOLAR PANEL TO START BATTERY

◎ = BATTERY SELECTOR SWITCHES
→ = POWER FLOW DIRECTION
▭▭▭▭▭ = CHARGE CIRCUITS
═══ = 110 V.A.C. (220 V.A.C. OVERSEAS MODELS)

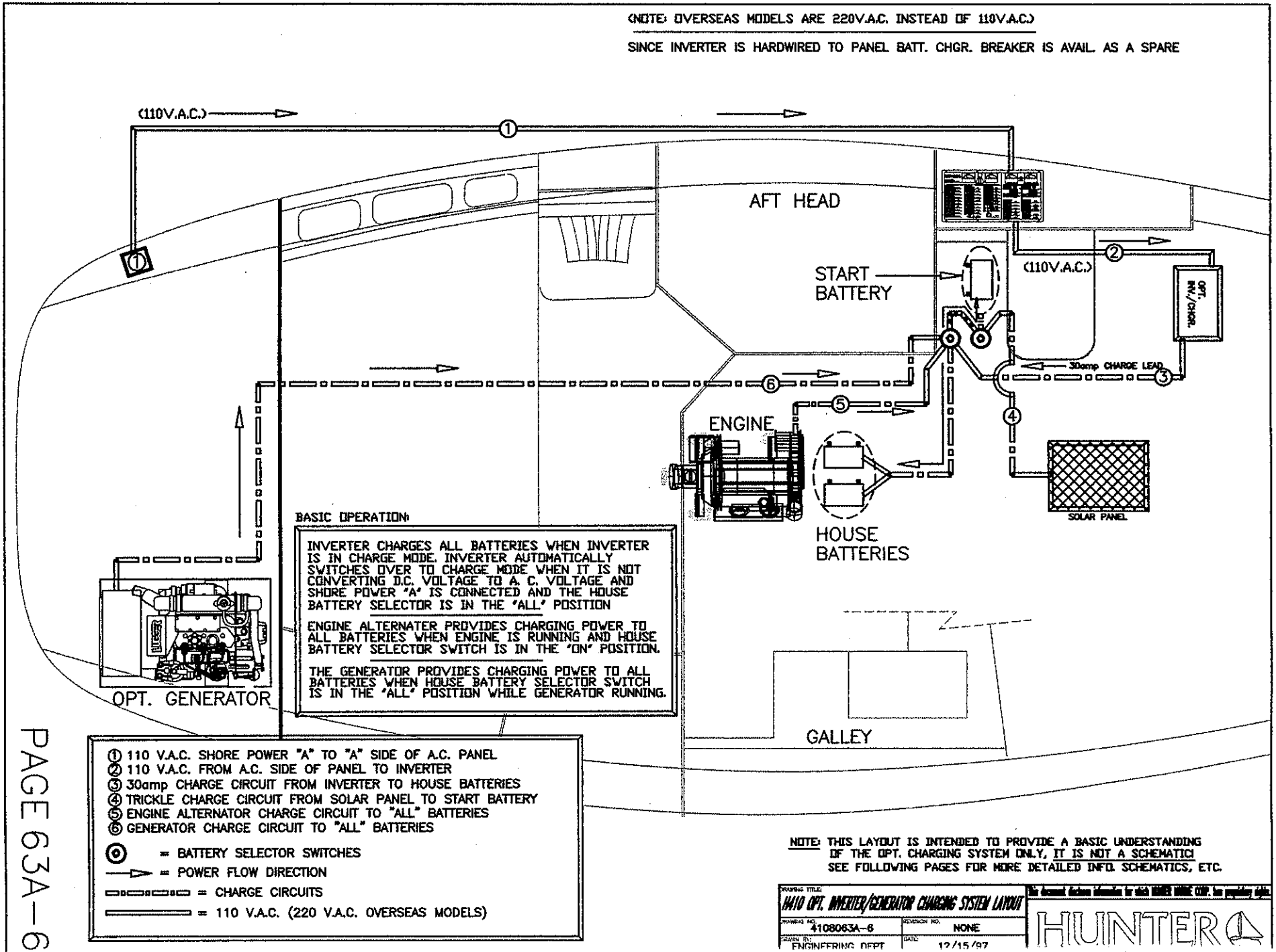
NOTE: THIS LAYOUT IS INTENDED TO PROVIDE A BASIC UNDERSTANDING OF THE STD. CHARGING SYSTEM ONLY, IT IS NOT A SCHEMATIC! SEE FOLLOWING PAGES FOR MORE DETAILED INFO. SCHEMATICS, ETC.

DRAWING TITLE: H410 CHARGING SYSTEM LAYOUT W/STD. BATT. CHARGER	
DRAWING NO. 4108083A-5	REVISION NO. NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 12/15/97

HUNTER

(NOTE: OVERSEAS MODELS ARE 220V.A.C. INSTEAD OF 110V.A.C.)

SINCE INVERTER IS HARDWIRED TO PANEL BATT. CHGR. BREAKER IS AVAIL. AS A SPARE



BASIC OPERATION:

INVERTER CHARGES ALL BATTERIES WHEN INVERTER IS IN CHARGE MODE. INVERTER AUTOMATICALLY SWITCHES OVER TO CHARGE MODE WHEN IT IS NOT CONVERTING D.C. VOLTAGE TO A. C. VOLTAGE AND SHORE POWER "A" IS CONNECTED AND THE HOUSE BATTERY SELECTOR IS IN THE "ALL" POSITION

ENGINE ALTERNATER PROVIDES CHARGING POWER TO ALL BATTERIES WHEN ENGINE IS RUNNING AND HOUSE BATTERY SELECTOR SWITCH IS IN THE "ON" POSITION.

THE GENERATOR PROVIDES CHARGING POWER TO ALL BATTERIES WHEN HOUSE BATTERY SELECTOR SWITCH IS IN THE "ALL" POSITION WHILE GENERATOR RUNNING.

① 110 V.A.C. SHORE POWER "A" TO "A" SIDE OF A.C. PANEL
② 110 V.A.C. FROM A.C. SIDE OF PANEL TO INVERTER
③ 30amp CHARGE CIRCUIT FROM INVERTER TO HOUSE BATTERIES
④ TRICKLE CHARGE CIRCUIT FROM SOLAR PANEL TO START BATTERY
⑤ ENGINE ALTERNATOR CHARGE CIRCUIT TO "ALL" BATTERIES
⑥ GENERATOR CHARGE CIRCUIT TO "ALL" BATTERIES

◎ = BATTERY SELECTOR SWITCHES
→ = POWER FLOW DIRECTION
▭▭▭▭▭ = CHARGE CIRCUITS
═══ = 110 V.A.C. (220 V.A.C. OVERSEAS MODELS)

NOTE: THIS LAYOUT IS INTENDED TO PROVIDE A BASIC UNDERSTANDING OF THE OPT. CHARGING SYSTEM ONLY, IT IS NOT A SCHEMATIC! SEE FOLLOWING PAGES FOR MORE DETAILED INFO. SCHEMATICS, ETC.

DRAWING TITLE: 1410 OPT. INVERTER/GENERATOR CHARGING SYSTEM LAYOUT	
DRAWING NO. 4108063A-6	REVISION NO. NONE
DRAWN BY: ENGINEERING DEPT	DATE: 12/15/97

HUNTER

12 V.D.C. DISTRIBUTION PANEL

BREAKER	DESCRIPTION
12 V. D.C. MAIN	SUPPLIES 12 V.D.C. POWER TO ALL BREAKERS ON D.C. SIDE OF PANEL.
PANEL LIGHTS	ILLUMINATES BOTH A.C. & D.C. SIDES OF THIS PANEL FOR NIGHT USE
CABIN LIGHTS 1	SUPPLIES POWER TO CABIN LIGHTS IN THE MAIN SALON, FWD. STRM., AND FWD. HEAD.
CABIN LIGHTS 2	SUPPLIES POWER TO CABIN LIGHTS IN THE GALLEY, AFT HEAD, AND AFT STATEROOM (NOTE: CABIN LIGHTS ARE CONTROLLED BY THEIR OWN INDEPENDENT SWITCH.)
COURTESY 1	SUPPLIES POWER TO ALL **SWITCHED CTSY. LIGHTS,** THESE ARE THE FRIDGE/FREEZER COMPTS., SEACOCK COMPTS. LOC. IN FWD. STRM., AFT STRM. AND GALLEY. ALSO THE COCKPIT LITE AND THE MAP LITE AT THE NAV. STATION.
COURTESY 2	SUPPLIES POWER TO ALL CABIN SOLE LIGHTS LOCATED AT THE MAIN CABIN DOOR AS WELL AS BOTH PORT AND STBD. AFT STATEROOM DOORS.
TANK INDICATOR	SUPPLIES POWER TO TANK SELECTOR SWITCH (AT INBOARD END OF CHART SEAT) ROTATE SWITCH TO DESIRED TANK, THEN VIEW TANK LEVEL ON LEVEL GAUGE.
WATER PRESSURE	SUPPLIES POWER TO FRESH WATER PUMP TO PRESSURIZE H20 SYSTEM.
SHOWER SUMP	SUPPLIES POWER TO BOTH FWD. AND AFT SHOWER SUMP BOXES. (SELF CONTAINED FLOAT SWITCH IN EACH SUMP ACTIVATES PUMP INSIDE EACH SUMP BOX. (SEE PAGE 59 FOR SUMP LOCATIONS)
MACERATOR 1	SUPPLIES POWER TO FWD. MACERATOR (LOCATED UNDER FWD. STRM BUNK)
MACERATOR 2	SUPPLIES POWER TO AFT MACERATOR (LOCATED INSIDE PT. AFT STRM. HEADBOARD, EXCEPTION: TRI CABIN-MODELS, IT IS LOCATED INSIDE PT. AFT STRM. HANG. LOCKER.) **NOTE: THESE DEVICES ARE USED FOR DIRECT OVERBOARD DISCHARGE OF RAW SEWAGE, BE AWARE OF YOUR LOCAL BOATING REG. BEFORE USING.**
STEREO	SUPPLIES POWER TO STEREO UNIT (ALSO AMPLIFIER IF APPLIES)
REFRIGERATION	SUPPLIES POWER TO REF. COMPRESSOR, ADJUST THERMOSTATS INSIDE FRIDGE/FREEZER TO DESIRED TEMP.
L. P. GAS	SUPPLIES POWER TO L.P. GAS SWITCH AT GALLEY. SEE "SEAWARD MANUAL" FOR OPER. & SAFETY INST.
WINDLASS	SUPPLIES POWER TO UP/DOWN CONTROLS AT ANCHOR WELL. **NOTE: BECAUSE THE WINDLASS DRAWS IT'S POWER FROM THE START BATTERY, IT IS GOOD PRACTICE TO START THE SHIPS ENGINE PRIOR TO OPERATING WINDLASS TO PREVENT BATTERY DRAIN. (CHECK RESET ON REMOTE PANEL)**
INSTRUMENTS	SUPPLIES POWER TO KNOT, DEPTH, & SPEED REPEATERS LOCATED ON HELM CONSOLE.
G.P.S.	THIS BREAKER PROVIDED FOR AN OPTIONAL GLOBAL POSITIONING SYSTEM.
VHF	SUPPLIES POWER TO THE VHF RADIO LOCATED ON THE HELM CONSOLE
AUTOPILOT	THIS BREAKER PROVIDED FOR AN OPTIONAL AUTUPILOT SYSTEM.
NAV. INST.	THIS BREAKER PROVIDED FOR OPTIONAL NAVIGATION INSTRUMENTS SUCH AS RADAR.
BILGE PUMP	TOGGLE SWITCH STAYS IN THE "AUTO" POSITION, THIS ALWAYS FEEDS POWER TO THE FLOAT SWITCH (AS LONG AS BATTERIES ARE CONNECTED AND HAVE AMPLE CHARGE) FOR MANUAL USE, PUSH SWITCH TO "MANUAL" ILLUMINATED L.E.D. INDICATES POWER TO PUMP AND PUMP SHOULD BE RUNNING. PRIOR TO LEAVING VESSEL "MANUALLY" TEST PUMP AND CHECK BATTERY LEVEL. SEE BATTERY SELECT SWITCH BELOW.
ANCHOR LIGHT	SUPPLIES POWER TO 360 DEGREE LIGHT AT TOP OF MAST, USE WHEN ANCHORED AT NIGHT.
STEAMING LIGHT	SUPPLIES POWER TO STEAMING LIGHT LOCATED ON FWD. SIDE OF MAST APPROXIMATELY AT THE HEIGHT OF THE LOWER SPREADERS. USE AT NIGHT (WITH RUNNING LIGHTS) WHEN VESSEL UNDERWAY BY ENGINE POWER.
DECK LIGHT	SUPPLIES POWER TO DECK LIGHT (IS COMBINATION WITH STEAMING LIGHT) PROVIDES LIGHT TO DECK BELOW.
RUNNING LIGHTS	SUPPLIES POWER TO THE BOW, STERN , & COMPASS LIGHT. USE AT NIGHT UNDER SAIL AND/OR ENGINE POWER.
SPARE/S	15amp SPARE BREAKERS ARE PROVIDED FOR ADDITIONAL 12 V.D.C. ACCESSORIES.
BATT. SEL. SW.	USE TO REVIEW STATUS OF EA. BATTERY ROTATE TO SELECT BATTERY, VIEW STATUS ON METERS.
METERS	D.C. VOLTS DISPLAYS **AVAILABLE VOLTAGE** FROM SELECTED BATTERY D.C. AMPS DISPLAYS **AMPERAGE BEING DRAWN** FROM SELECTED BATTERY.
12V. AUX.	THIS POWER PLUG PROVIDED FOR CELLPHONE, LAPTOP COMPUTER, ETC.
YELLOW L.E.D.'S	LIGHT EMITTING DIODES ILLUMINATE WHEN 12 V.D.C. POWER PRESENT.
NOTES:	IF THE OPTIONAL AUTOPILOT WAS INSTALLED AT THE FACTORY, THE "INSTRUMENTS" POWER LEADS ARE WIRED TO THE AUTOPILOT BREAKER. (THIS APPLIES TO THE OPTIONAL G.P.S. AS WELL) THIS ALLOWS THESE UNITS TO WORK SIMULTANEOUSLY OFF THE AUTOPILOT BREAKER. THE BREAKER/S IN MENTION ARE NOW SPARE/S. **SEE PAGE 64A-1 FOR BREAKER AMPERAGES.**

110V.A.C. (220 OVERSEAS MODELS) DISTRIBUTION PANEL

EAKERS	DESCRIPTION
	"A" SIDE OF A.C. PANEL
BUS "A" BREAKER	PROVIDES A.C. VOLTAGE TO THIS SIDE OF PANEL WHEN SHORE POWER CORD "A" IS CONNECTED TO OUTLET AT DOCKSIDE POWER SUPPLY.
GENERATOR	SUPPLIES POWER **FROM** GENERATOR TO BOTH SHORE POWER "A" AND SHORE POWER "B" (AIR COND.) SIDES OF PANEL. NOTE: TO PROVIDE POWER TO SHORE POWER "B" SIDE OF PANEL MOVE SLIDE BAR UP AND TURN ON THE PARALLEL BREAKER ON THE SHORE POWER "B" SIDE OF PANEL.
OUTLETS 1	PROVIDES A.C. POWER TO THE OUTLETS ON THE PORT SIDE OF BOAT.
OUTLETS 2	PROVIDES A.C. POWER TO THE OUTLETS ON THE STBD. SIDE OF BOAT.
MICROWAVE	SUPPLIES POWER TO OUTLET BEHIND MICRO. IN WHICH MICROWAVE IS PLUGGED INTO.
WATER HEATER	SUPPLIES POWER TO WATER HEATER. **BE SURE TANK IS FULL AND SYSTEM IS FREE FROM AIR BEFORE APPLYING POWER TO HEATER TO PREVENT ELEMENT BURNOUT. NOTE DO NOT TRY TO POWER WATER HEATER OFF OF THE OPTIONAL INVERTER, IT IS NOT CAPABLE OF SUPPLYING ENOUGH POWER TO POWER UNIT.**
BATT. CHARGER	PROVIDES POWER TO BATTERY CHARGER WHICH IN TURN PROVIDES CHARGING POWER TO BATTERIES. NOTE: IF OPTIONAL INVERTER CHOSEN THIS BREAKER IS NOT UTILIZED AND IS AVAILABLE AS A "SPARE" BREAKER.
	"B" SIDE OF PANEL
BUS "B" BREAKER	PROVIDES A.C. VOLTAGE TO THIS SIDE OF PANEL WHEN SHORE POWER CORD "B" IS CONNECTED TO OUTLET AT DOCKSIDE POWER SUPPLY.
PARALLEL	PROVIDES POWER FROM GENERATOR TO THIS SIDE OF PANEL.(MOVE SLIDE BAR UP TO TURN BREAKER ON.)
FWD/AFT AIR COND.	PROVIDES POWER TO EITHER FWD. OR AFT AIR COND. UNITS (SEE "MARINE AIR MANUAL" FOR OPER. INSTRUCTIONS.
AIR COND. RELAY	PROVIDES POWER TO RAW WATER CIRCULATION PUMP USED TO COOL AIR COND. COMPRESSORS UNITS, THIS BREAKER MUST BE ON WHEN OPERATING AIR COND. UNIT/S. NOTE: **DO NOT TRY TO POWER A.C. UNITS OFF OF THE OPTIONAL INVERTER, IT IS NOT CAPABLE OF SUPPLYING ENOUGH POWER TO POWER UNIT/S.**
	MISC. INFO
SPARE BREAKERS	15amp SPARE BREAKERS ARE PROVIDED FOR ADDITIONAL ACCESSORIES
RED L.E.D.'S	ILLUMINATE WHEN A.C. POWER PRESENT.
METER SEL. SWITCH	ALLOWS VOLTAGE BEING SUPPLIED AND AMPERAGE BEING DRAWN TO BE DISPLAYED ON VOLT & AMP METERS SWITCH POSITION "A" = "A" SIDE OF PANEL. SWITCH POSITION "B" = "B" SIDE OF PANEL.
REV. POLARITY	IF REVERSED POLARITY L.E.D./S ILLUMINATE AFTER CONNECTING SHORE POWER HAVE DOCKSIDE POWER CHECKED BY QUALIFIED PERSONELL.
NOTE:	SEE PAGE 63A-4 FOR BREAKER AMPERAGES

NOTE: A PRUDENT MARINER REALIZES THAT THE RESOURCES TO POWER A VESSEL ARE LIMITED. WHEN USING THE INVERTER OR GENERATOR ONE SHOULD BE CONSERVATIVE AND AWARE OF THE AMOUNT OF POWER BEING SUPPLIED VERSES POWER BEING DRAWN. THIS IS ESPECIALLY IMPORTANT WHEN USING OPTIONAL INVERTER POWER. CONSULT THE "INVERTER MANUAL" FOR POWER OUTPUT CAPABILITIES.

12V.D.C. SYSTEM TROUBLESHOOTING GUIDE

TO POWER D.C. PANEL: THIS IS TO POWER PANEL FOR CHARGING, SEE PAGE 63A-2	**STD. BATTERY CHARGER MODEL** TURN ON (HOUSE) BATTERY SWITCH TO THE "ON" POSITION, THEN TURN ON "D.C. MAIN" BREAKER ON MAIN DIST. PANEL. **IF NO POWER TO PANEL:** CHECK **"RESET"** ON (HOUSE) BATTERY SWITCH PANEL AND/OR BATT. CONNECTIONS IF NECESSARY.
TO POWER D.C. PANEL: THIS IS TO POWER PANEL FOR CHARGING, SEE PAGE 63A-2	**OPTIONAL INVERTER MODEL,** TURN ON "D.C. MAIN" BREAKER ON PANEL, IT IS **NOT** NECESSARY TO TURN ON THE INV/DRAW SEL. SWITCH TO THE #1, #2, OR BOTH POSITION TO SUPPLY POWER TO D.C. PANEL. **IT IS NECESSARY HOWEVER TO TURN ON EITHER THE #1 0R #2 BREAKER/S ON THE INV/DRAW SEL. SWITCH PANEL** TO PROVIDE POWER TO D.C. PANEL, FROM EITHER #1, OR #2, HOUSE BATTERIES. **IF NO POWER TO PANEL:** CHECK THESE **BREAKERS** AND/OR THE 300 a.IN LINE FUSES AT THE HOUSE BATT'S AND BATT. CONNECTIONS IF NECESSARY.

COMPONENT	SYMPTOM	POSSIBLE SOLUTION/S
D.C. MAIN	NO POWER TO PANEL	SEE "TO POWER PANEL" ABOVE BATTERY/S CHARGED?
PANEL LIGHTS	PANEL WON'T ILLUMINATE	SEE "TO POWER TO PANEL" ABOVE BATTERY TERMINALS CLEAN? SEEK QUALIFIED PERSONELL
CABIN LIGHTS	WON'T ILLUMINATE	SEE "TO POWER PANEL" ABOVE BULB/S NEED REPLACING?
COURTESY LIGHTS (AT STEP DOWNS CABIN SOLE)	WON'T ILLUMINATE	SEE "TO POWER PANEL" ABOVE BULBS/S NEED REPLACING?
COURTESY LIGHTS (SEACOCK COMPARTMENTS)	WON'T ILLUMINATE	SEE "TO POWER PANEL" ABOVE PLUNGER SWITCH AT SEACOCK COMP. DOOR/DROP IN STUCK?
TANK INDICATOR	TANK LEVEL GAUGES DON'T ILLUMINATE TANK LEVEL DISPLAYED IS INCORRECT	SEE "TO POWER PANEL" ABOVE TANK SENDING UNIT NEEDS CLEANING
WATER PRESSURE	NO POWER CYCLES ON/OFF EXCESSIVELY	SEE "TO POWER PANEL" ABOVE FAUCETS OFF? LEAK IN SYSTEM SEE PAGEC 57C-H FOR CONNECTION LOC.
SHOWER SUMP	WON'T PUMP WHEN SUMP BOX FILLED (PUMP WON,T QUIT RUNNING) PUMP MAKES NOISE, DOESN'T PUMP PUMP RUNS BUT DOESN'T PUMP	SEE "TO POWER PANEL" ABOVE IS FLOAT SWITCH STUCK? DEBRIS IN PUMP IMPELLER? DISCHARGE HOSE CLOGGED?
MACERATOR/S	RUNS BUT DOESN'T DISCHARGE PUMP MAKES NOISE, DOESN'T PUMP	IS DISCHARGE SEACOCK OPEN? IS WASTE DECK FITTING SECURE, IS IT PULLING AIR THRU? IF SO REPLACE 0- RING ON CAP. IS TANK VENT (HULL FITTING) CLOGGED? SEE PAGE 60 FOR LOCATIONS LODGED DEBRIS, **TURN OFF POWER** TO PUMP, INSERT SCREWDRIVER INTO PUMP ARMATURE AT END OF PUMP AND TURN TO DISLODGE DEBRIS
STEREO	WON'T TURN ON STEREO TURNS ON, NO SOUND	SEE "TO POWER PANEL" ABOVE IS STEREO UNIT ON? ARE VOLUME CONTROLS AT SPEAKERS TURNED DOWN?
REFRIGERATION	WON'T GET COLD	SEE "TO POWER PANEL" ABOVE THERMOSTATS TURNED ON? SEEK QUALIFIED PERSONELL
L.P. GAS	NO POWER TO SWITCH AT GALLEY SYSTEM TURNS ON, NO GAS PRESENT	SEE "TO POWER PANEL" ABOVE IS TANK VALVE OPEN? IS TANK EMPTY? SEE STOVE/OVEN MANUAL

NOTE: COMPONENT/S FAILURE COULD ALSO BE THE RESULT OF A POOR "GROUND" CONNECTION. SEE PAGE 64A-2 FOR GROUND SYSTEM LAYOUT AND GROUND STUD/BUSSBAR LOCATIONS. DUE TO VIBRATION, WEATHER CONDITIONS ECT. OCCASIONAL INSPECTION, CLEANING AND TIGHTENING OF THESE TERMINALS (BY QUALIFIED PERSONELL) MAY BE NECESSARY.

12V. D.C. SYSTEM TROUBLESHOOTING GUIDE CONT:

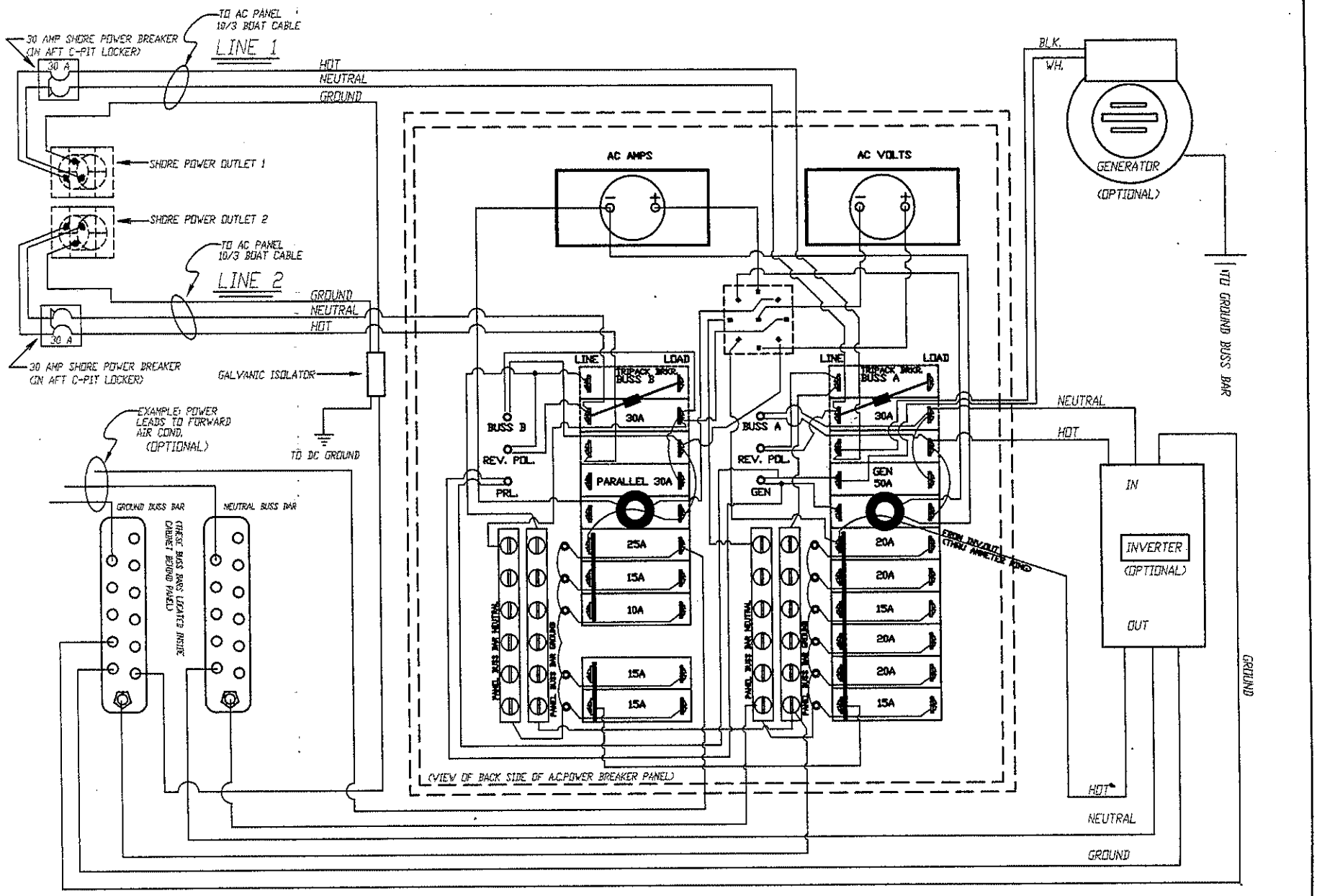
COMPONENT	SYMPTOM	POSSIBLE SOLUTION/S
WINDLASS	UP/DOWN CONTROLS DON'T OPERATE WINDLASS	SEE "TO POWER PANEL" PREV. PAGE WINDLASS SWITCH AT WINDLASS RESET PANEL ON? IS RESET TRIPPED?
INSTRUMENTS	REPEATERS DON'T OPERATE	SEE "TO POWER PANEL" PREV. PAGE DO TRANSDUCERS NEED CLEANING? SEE INSTRUMENTS MANUAL
OPTIONAL G.P.S.	WON'T OPERATE	SEE "TO POWER PANEL" PREV. PAGE SEE G.P.S. MANUAL
VHF RADIO	WON'T OPERATE TURNS ON, WON'T TRANSMIT/RECEIVE	SEE "TO POWER PANEL" PREV. PAGE RADIO TURNED ON? ANTENNA CONNECTED PROPERLY?
OPTIONAL AUTO PILOT	WON'T OPERATE WON'T HOLD STEADY COURSE CONSTANTLY ADJUSTING HELM	SEE "TO POWER PANEL" PREV. PAGE IS THERE ANY METAL OBJECTS NEAR THE FLUX GATE COMPASS LOCATED IN THE STBD. AFT MAIN BUNK COMP? SENSITIVITY SETTING SET TO HIGH, SEE "AUTO PILOT MANUAL" FOR SENS. ADJ.
OPTIONAL NAV. INST.	WON'T OPERATE	SEE "TO POWER PANEL" PREV. PAGE IS UNIT "ON"?
BILGE PUMP	WON'T OPERATE AUTO OR MANUAL PUMP MAKES NOISE, DOESN'T PUMP PUMP RUNS BUT DOESN'T DISCHARGE	BATTERY LEVEL O.K.? SEE VOLT METER CHECK BILGE RESET ON BATT. SEL. SWITCH PANEL UNDER CHART TABLE. BATTERY CONNECTIONS GOOD? DEBRIS IN PUMP IMPELLER? DISCHARGE HOSE CLOGGED?
ANCHOR, STEAMING, DECK, & RUNNING LIGHTS	WON'T ILLUMINATE	SEE "TO POWER PANEL" PREV. PAGE CHECK CONNECTIONS IN ACCESS PANEL TOP OF COMPRESSION POST. BULBS NEED REPLACING?
12 V.D.C.AUX. PLUG	NO POWER PRESENT	CHECK IN-LINE FUSE BACK OF PANEL
VOLT METER	NO VOLTAGE DISPLAYED	SEE "TO POWER PANEL" PREV. PAGE IS SEL. BATT. SW. ON #4? IF SO THIS POSITION AVAILABLE FOR ADDITIONAL BATTERY, USE #1,2, OR 3 POSITION. CK. FUSES ON BATT. SEL. SW. PANEL ARE BATTERY CONNECTIONS GOOD? HAVE BATTERIES CHECKED HAVE METER CHECKED BY QUALIFIED PERSONELL.
AMP METER	NO AMPERAGE DISPLAYED	IS D.C. MAIN ON? IS ANYTHING IN THE 12V. SYSTEM TURNED ON & RUNNING? HAVE METER CHECKED BY QUALIFIED PERSONELL.
SOLAR PANEL	NO OUTPUT TO BATTERY/S	CK. FUSES ON BATT. SEL. SW. PANEL

110V.A.C. (220V. OVERSEAS MODELS) SYSTEM TROUBLESHOOTING GUIDE

COMPONENT	SYMPTOM	POSSIBLE SOLUTION/S
SHORE POWER "A"	NO POWER TO PANEL	SEE "POWER SYSTEM OPERATIONS" PAGE 63A-2 CHECK DOCKSIDE BREAKER AND/OR BREAKER #1 LOCATED INSIDE PT. GULLWING LOCKER. CHECK "RESETS" ON (OPT.)INVERTER (SEE "INVERTER MAN.")
OUTLETS #1 & 2	NO POWER	SEE "POWER SYSTEM OPERATIONS" PAGE 63A-2 IS OUTLET BREAKER/S ON? CHECK RESET ON G.F.I. OUTLETS AT GALLEY & AT NAV. STATION. CHECK RESETS ON (OPT.) INVERTER (SEE "INVERTER MAN.")
MICROWAVE	NO POWER	IS BREAKER ON? SEE "POWER SYSTEM OPERATIONS" PAGE 63A-2 IS MICROWAVE ON? SEE "MICRO MANUAL"
WATER HEATER	NO POWER WON'T HEAT WATER WATER TO COLD/HOT	IS BREAKER ON? SEE "POWER SYSTEM OPERATIONS" PAGE 63A-2 CHECK "RESET" ON HEATER SEE "WATER HEATER MANUAL" FOR LOCATION. SEE "WATER HEATER MANUAL" FOR THERMOSTAT ADJUSTMENT AND/OR ELEMENT REPLACEMENT, SEEK QUALIFIED PERSONELL.
BATTERY CHARGER (STANDARD)	NOT CHARGING BATTERY/S	IS SHORE POWER "A" ON IS BATT. CHARGER BREAKER ON? IS RESET TRIPPED ON HOUSE BATTERY SEL. SW. PANEL CHECK FUSES BEHIND BATT. SEL. SW. PANELS ARE BATTERY CONNECTIONS GOOD?
INVERTER/BATT. CHARGER (OPTIONAL)	INV. NOT SUPPLYING A.C.POWER INV. ON BUT UNABLE TO OPERATE DESIRED APPLIANCE/S	IS INVERTER REMOTE SWITCH AT INBOARD END OF NAV. SEAT ON? IS DESIRED APPLIANCE BREAKER ON? IS BATTERY VOLTAGE LOW? SEE VOLTAGE DISPLAY ON INVERTER REMOTE PANEL, SELECT OTHER BATTERY ON INV/DRAW SELECTOR SWITCH PANEL UNDER CHART TABLE. ARE YOU ASKING THE INVERTER TO POWER MORE THAN IT IS CAPABLE? SEE "INVERTER MANUAL" FOR INFORMATION REGARDING POWER OUTPUT CAPABILITIES. CHECK "RESETS ON (OPT.) INVERTER (SEE "INVERTER MAN.")
INVERTER/**BATT. CHARGER** (OPTIONAL)	NOT CHARGING BATTERY/S	IS SHORE POWER "A".ON? SEE "POWER SYSTEM OPERATIONS" PAGE 63A-2 IS BATTERY SELECTOR SWITCH IN "BOTH" POSITION? CHECK IN-LINE FUSE AT BATTERY/S ARE BATTERY CONNECTIONS GOOD? INVERTER REMOTE SWITCH SHOULD BE IN THE "OFF" POSITION. (THIS IS NECESSARY IN THE EVENT YOU "LOSE" SHORE POWER, THE INVERTER DOESN'T GO INTO INVERT MODE CAUSING BATT./S TO DRAIN IF YOU LEFT AN A.C. APPLIANCE ON..

110V.A.C. (220V. OVERSEAS MODELS) SYSTEM TROUBLESHOOTING GUIDE CONT:

COMPONENT	SYMPTOM	POSSIBLE SOLUTIONS
SHORE POWER "B"	NO POWER TO PANEL	SEE "POWER SYSTEMS OPERATION PAGE 63A-2" CHECK DOCKSIDE BREAKER AND/OR BREAKER #2 INSIDE PT. GULLWING LOCKER.
AIR COND. FWD/AFT	WON'T TURN ON	ARE APPROPRIATE BREAKERS ON? SEE "POWER SYSTEMS OPERATION" PAGE 63A-2 SEE "MARINE AIR" MANUAL
	TURNS ON THEN SHUTS DOWN	IS AIR COND. RELAY "ON"? IS AIR COND. RAW WATER SEACOCK OPEN? IF SO, IS WATER CIRCULATING? SEE PAGE 60 FOR AIR COND. DISCHARGE THRUHULL LOCATION, IF NOT IS AIR COND. PICKUP BEING RESTRICTED BY DEBRIS?
	OTHER	SEE "MARINE AIR" MANUAL
OPTIONAL GENERATOR (APPLIES TO BOTH "A" & "B" SIDES OF A.C. PANEL)		
GENERATOR	NO POWER TO STARTER RUNNING, BUT NO POWER AT PANEL.	IS START BATT. SELECTOR SWITCH ON? IS "GENERATOR BREAKER" ON "A" SIDE OF PANEL ON? (MOVE SLIDE BAR UP TO TURN THIS BREAKER ON). IS "PARALLEL BREAKER" ON "B" SIDE OF PANEL ON? SEE GENERATOR MANUAL
	WON'T START	DID YOU FOLLOW PROPER STARTING PROCEDURE AS DESCRIBED IN THE "GENERATOR MANUAL"? DO YOU HAVE AN AMPLE AMOUNT OF DIESEL FUEL? REMEMBER THE GENERATOR FUEL PICKUP TUBE IS SHORTER THAN THE PICKUP TUBE FOR THE ENGINE, THIS PREVENTS GENERATOR FROM DRAINING TANK SINCE ENGINE POWER IS MORE IMPORTANT THAN GENERATOR POWER. REFER TO GENERATOR MANUAL FOR POSSIBLE FUSE OR RESET ON GENERATOR.
	GEN. STARTS THEN SHUTS DOWN	IS RAW WATER PICKUP SEACOCK OPEN?



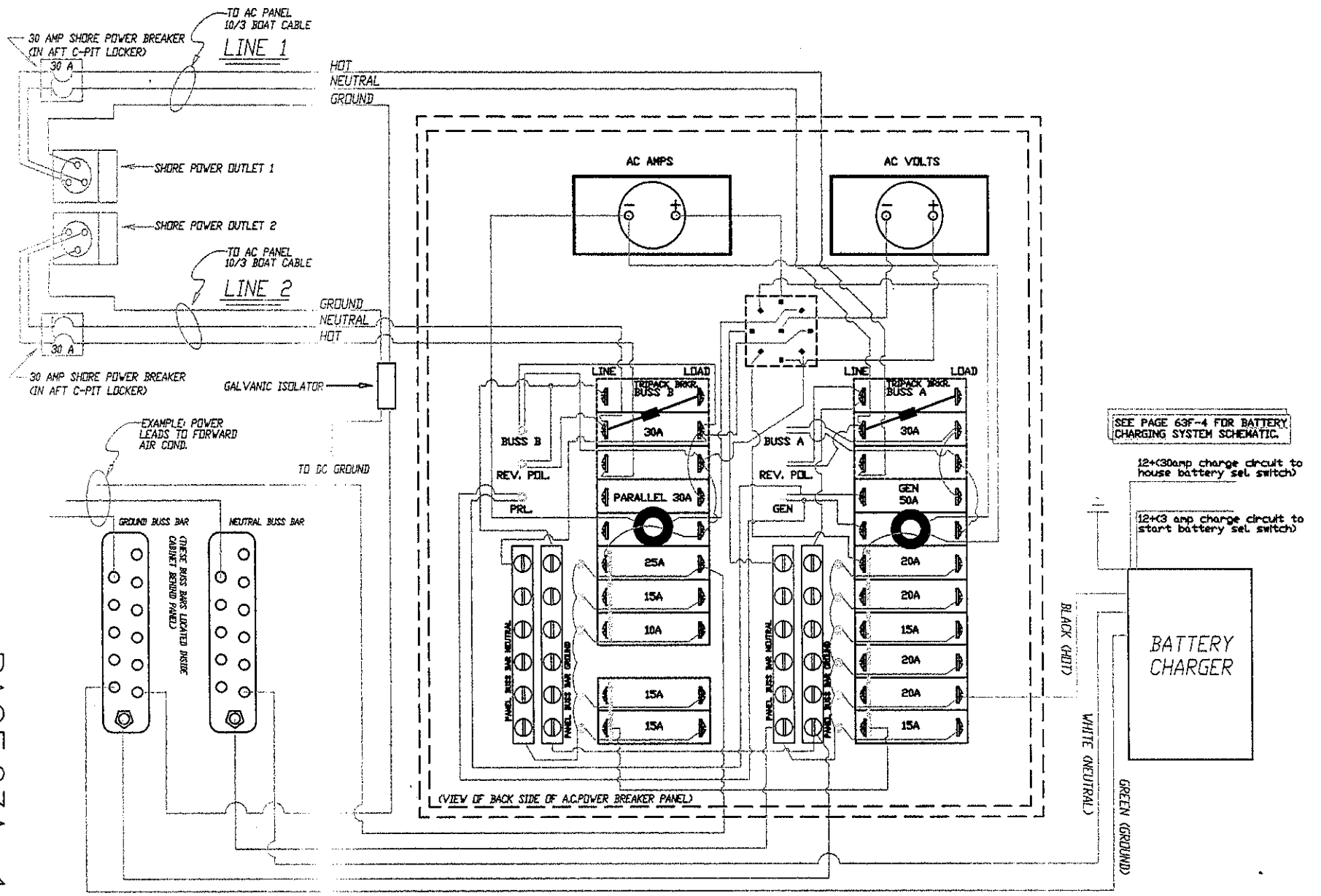
PAGE 63A-13

DRAWING TITLE: M410 A.C. PANEL SCHEMATIC W/OPTIONAL GEN. & INV.

DRAWING NO. 4108063A-13 | REVISION NO. NONE

DRAWN BY: ENGINEERING DEPT. | DATE: 7/22/97

HUNTER



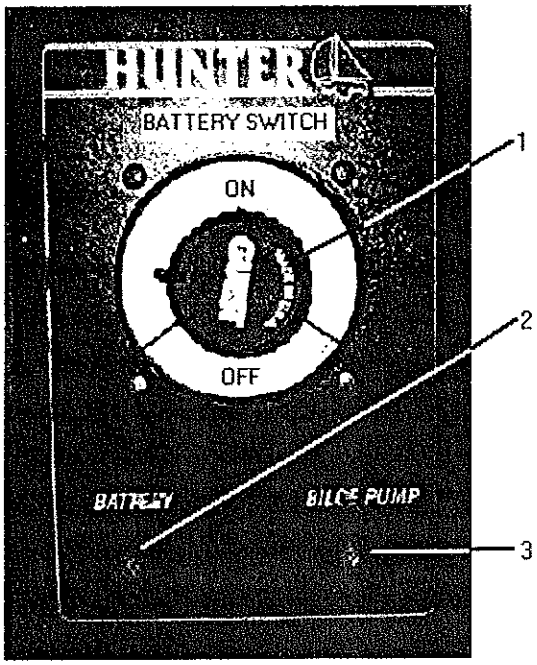
PAGE 63A-14

DRAWING TITLE: H410 STANDARD A.C. PANEL SCHEMATIC

DRAWING NO.	REVISION NO.
4108063A-14	NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 7/22/97

HUNTER

H410 SELECTOR SWITCH PANELS



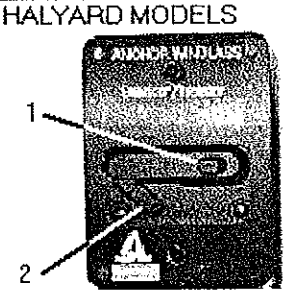
HOUSE BATTERY ON/OFF SAFETY SWITCH PANEL
(USED ON STD. BATTERY CHARGER MODEL)

1. ON OFF SWITCH, SUPPLIER POWER FROM HOUSE BATTERIES TO MAIN D.C. PANEL.
2. RESET, PUSH TO RESTORE POWER FROM HOUSE BATTERIES TO D.C. PANEL.
3. BILGE PUMP RESET, PUSH TO RESET

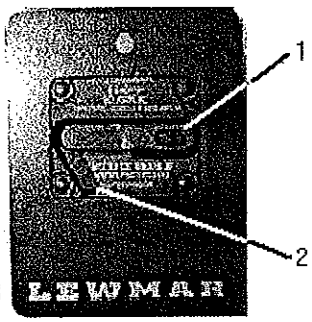
THESE PANELS USED ON (OPTIONAL) WINDLASS & ELEC. HALYARD MODELS

1. TEST (ON/OFF) BUTTON, PUSH TO TRIP RESET
2. RESET, PUSH UP TO RESET

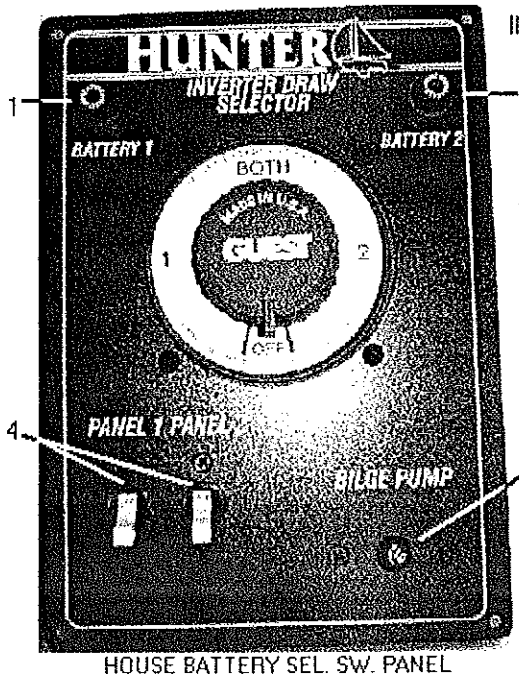
THESE PANELS SUPPLY POWER TO THE MOTOR/S



WINDLASS BREAKER



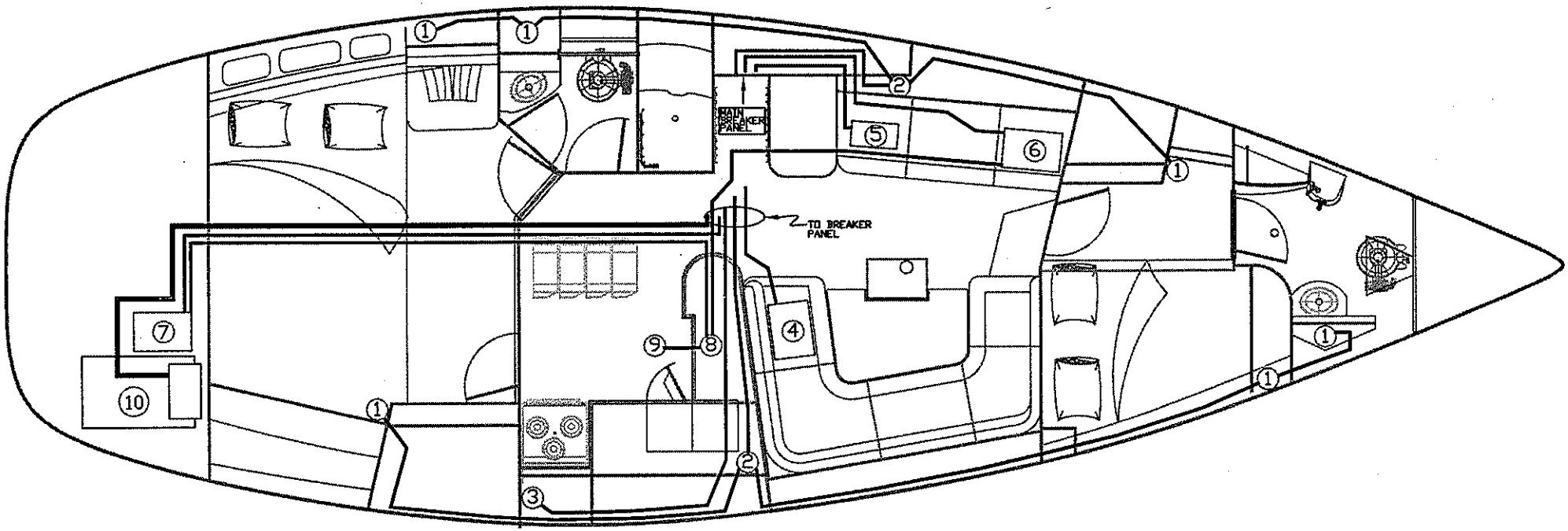
HALYARD BREAKER .



HOUSE BATTERY SEL. SW. PANEL

INVERTER (OPTIONAL) HOUSE BATTERY DRAW/CHARGE SEL. SW.

1. FUSE, FOR DISPLAYING VOLTAGE ON METERS ON MAIN D.C./ PANEL FROM HOUSE BATTERY #1
2. FUSE, FOR DISPLAYING VOLTAGE ON METERS ON MAIN D.C./ PANEL FROM HOUSE BATTERY #2
3. BILGE PUMP RESET, PUSH TO RESET.
4. HOUSE BATTERY BREAKERS SUPPLY POWER FROM HOUSE BATTERIES #1 & #2 TO MAIN D.C. PANEL.
   PANEL #1= HOUSE BATT. #1
   PANEL #2= HOUSE BATT. #2



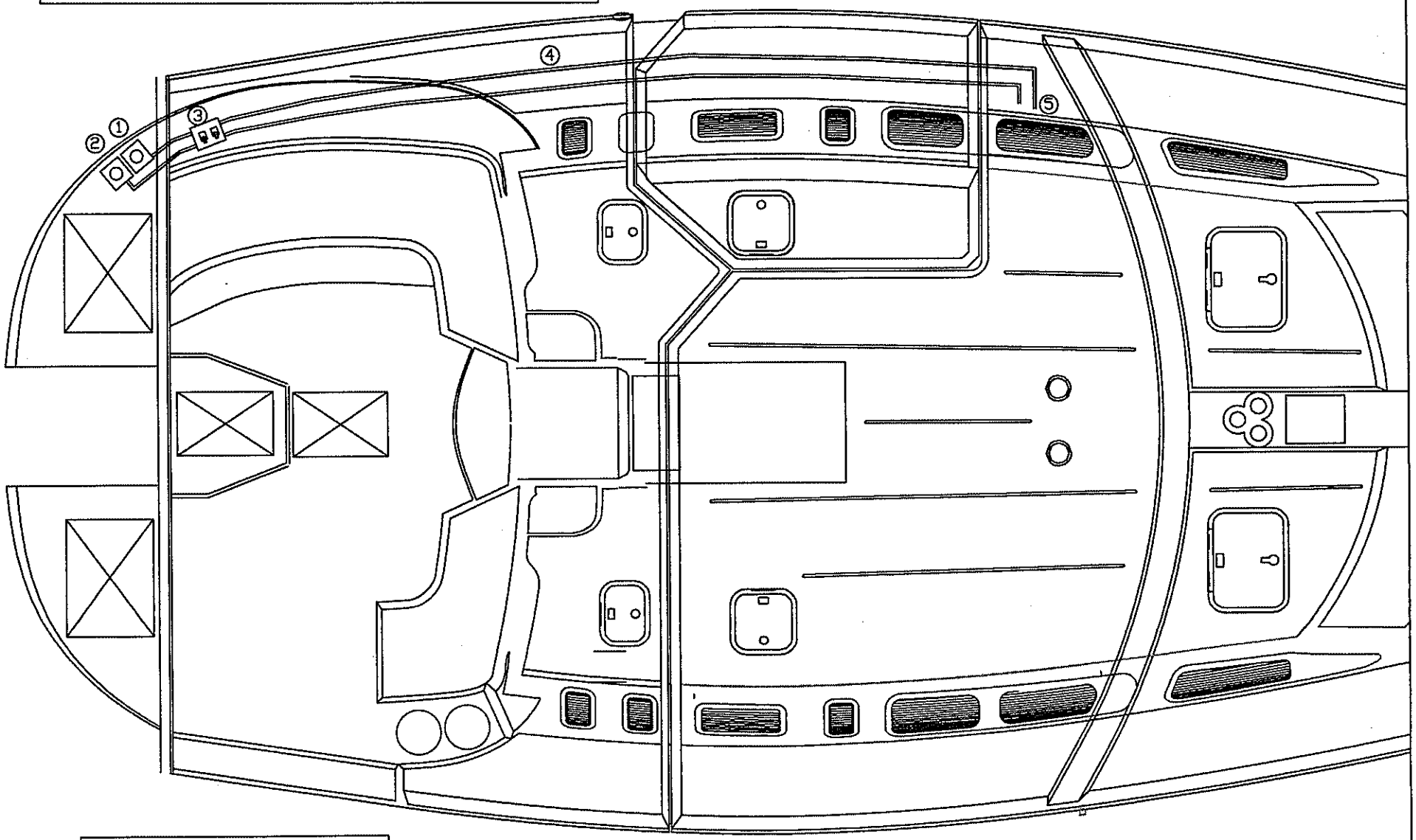
① = OUTLETS
② = G.F.I. OUTLETS
③ = MICROWAVE OVEN/OUTLET
④ = WATER HEATER
⑤ = OPTIONAL INVERTER/BATT. CHARGER
⑥ = OPTIONAL FWD. AIR COND.
⑦ = OPTIONAL AFT AIR COND.
⑧ = AIR COND. RELAY
⑨ = AIR COND. WATER PUMP
⑩ = OPTIONAL GENERATOR

DRAWING TITLE: *H410 AC POWER PAN WIRING*

DRAWING NO.	REVISION NO.
4108063B	NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 7/23/97

HUNTER

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: *H410 AC WIRING HEADLINER*

DRAWING NO.	REVISION NO.
4108063C	NONE
DESIGN BY: ENGINEERING DEPT.	DATE: 7/24/97

HUNTER

SECTION 63D...OPTIONAL AIR COND. SYSTEMS

BASIC OPERATING INSTRUCTIONS:

① CHOOSE POWER SOURCE (SHORE POWER OR GENERATOR) SEE PAGES 63A–2
② CHECK AIR COND. SEA STRAINER, (BELOW GALLEY SOLE) CLEAN IF NECESSARY
③ OPEN RAW WATER PICKUP SEACOCK BELOW GALLEY SOLE
④ TURN ON A.C. MAIN (BUS "B") BREAKER ON MAIN A.C. PANEL
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:

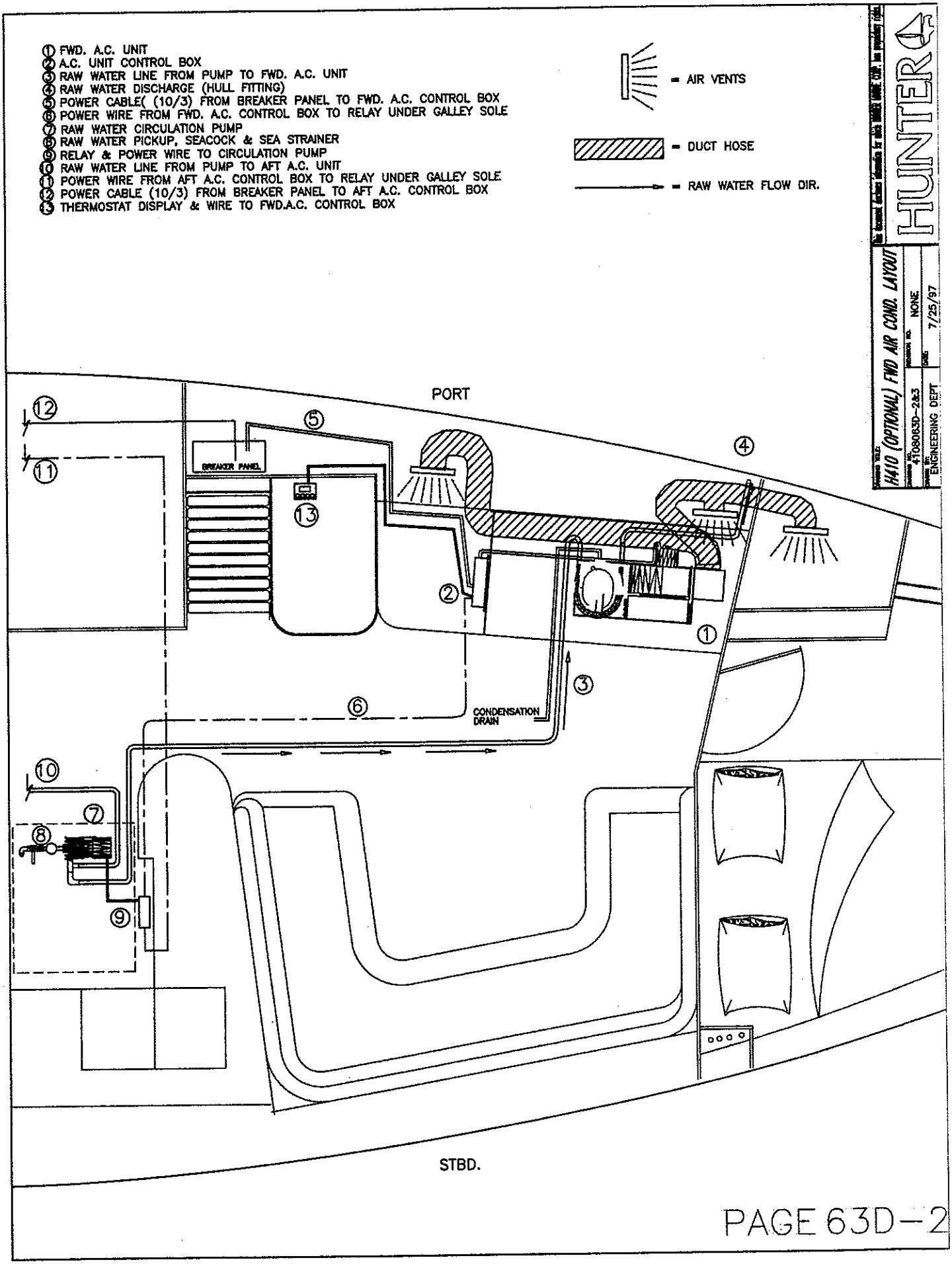
IF ANY OTHER APPLIANCES ARE TO BE USED WHEN AIR CONDITIONERS ARE RUNNING WHEN ON SHORE POWER, BOTH "SHORE POWER A" AND "SHORE POWER B" CABLES MUST BE HOOKED UP.

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 OPERATING PROGRAMMING/TROUBLESHOOTING INSTRUCTIONS

DRAWING TITLE: H410 OPTIONAL AIR COND. OPER. INST
DRAWING NO. 4108063D–1 | REVISION NO. NONE
DRAWN BY: ENGINEERING DEPT. | DATE: 7/26/97

HUNTER

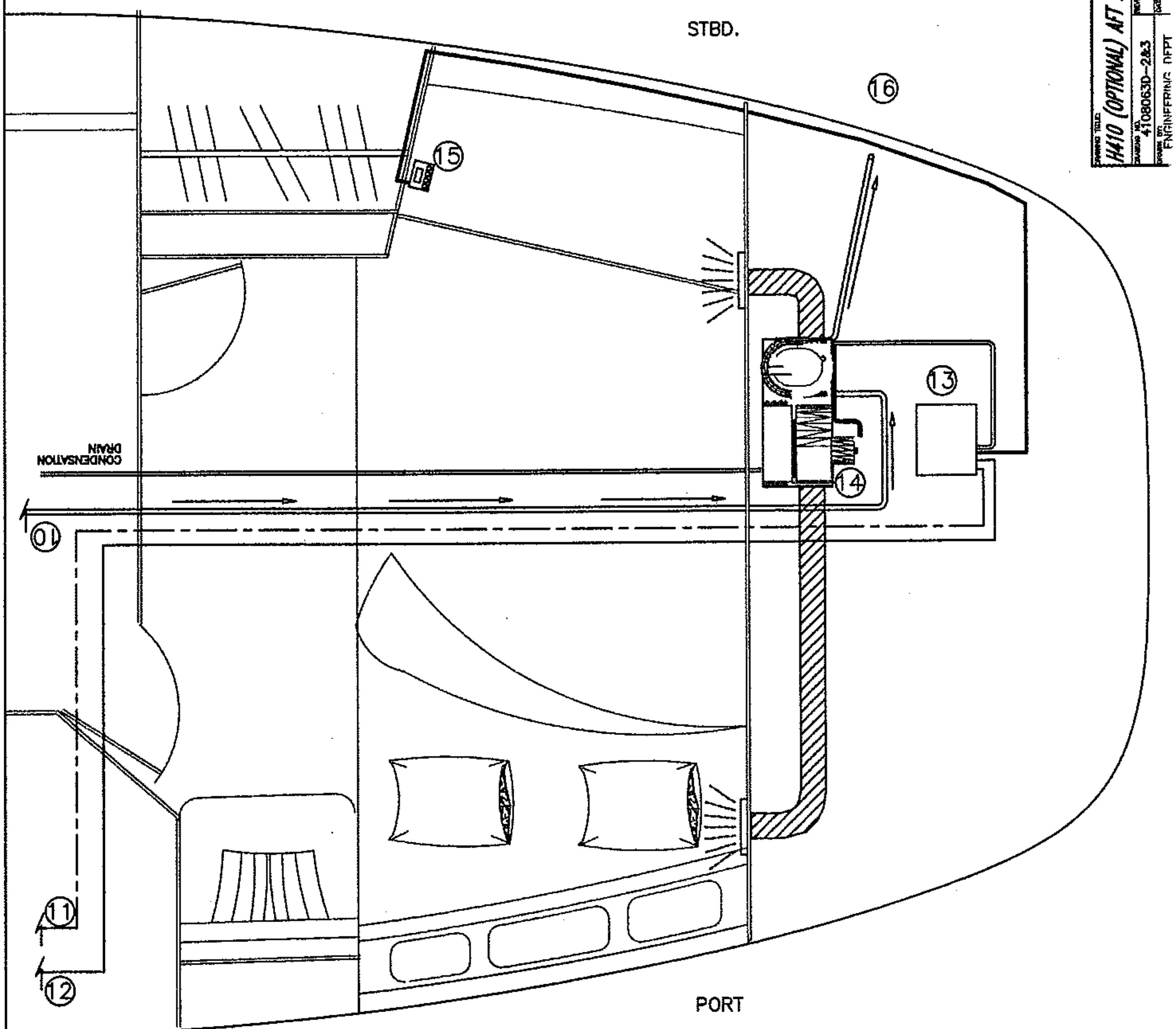

① FWD. A.C. UNIT
② A.C. UNIT CONTROL BOX
③ RAW WATER LINE FROM PUMP TO FWD. A.C. UNIT
④ RAW WATER DISCHARGE (HULL FITTING)
⑤ POWER CABLE((10/3) FROM BREAKER PANEL TO FWD. A.C. CONTROL BOX
⑥ POWER WIRE FROM FWD. A.C. CONTROL BOX TO RELAY UNDER GALLEY SOLE
⑦ RAW WATER CIRCULATION PUMP
⑧ RAW WATER PICKUP, SEACOCK & SEA STRAINER
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
NONE
7/25/97
ENGINEERING DEPT
PORT
STBD.
BREAKER PANEL
CONDENSATION DRAIN

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 AFT A.C. UNIT
14 A.C. UNIT CONTROL BOX
15 THERMOSTAT DISPLAY & WIRE TO AFT A.C. CONTROL BOX
16 RAW WATER DISCHARGE

= DUCT HOSE

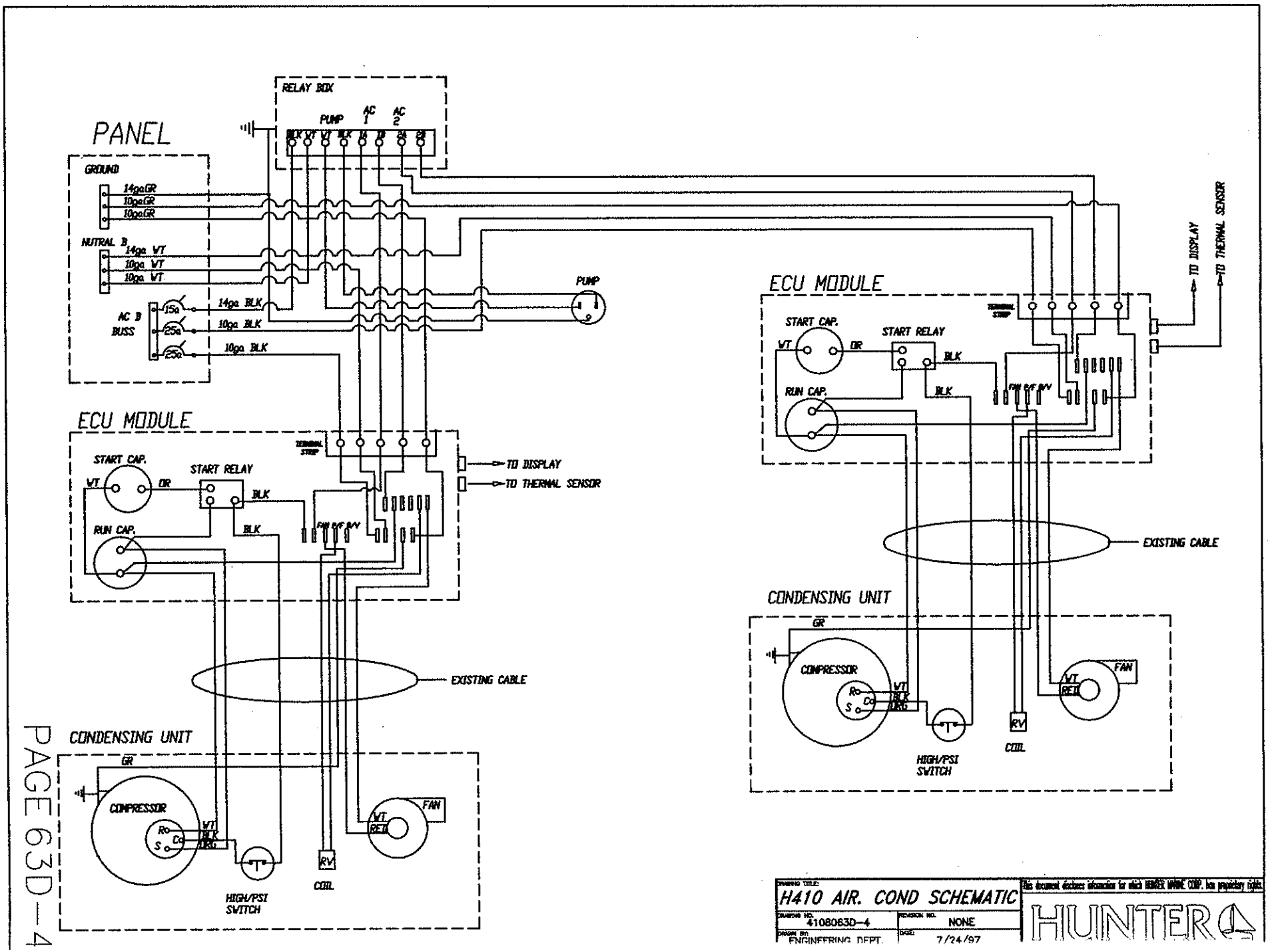
= VENTS

= RAW WATER FLOW DIR.



DRAWING TITLE: H410 (OPTIONAL) AFT AIR COND. LAYOUT
DRAWING NO. 41080063D-2&3
REVISION NO. NONE
DRAWN BY: ENGINEERING DEPT
DATE 7/25/97

HUNTER



PAGE 63D-4

DRAWING TITLE: H410 AIR. COND SCHEMATIC

DRAWING NO.	REVISION NO.
41080630-4	NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 7/24/97

HUNTER

Stg Componen No.	Cls. No.	OPTIONAL AIR CONDITIONING PARTS LIST Description	UOM	Net 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...

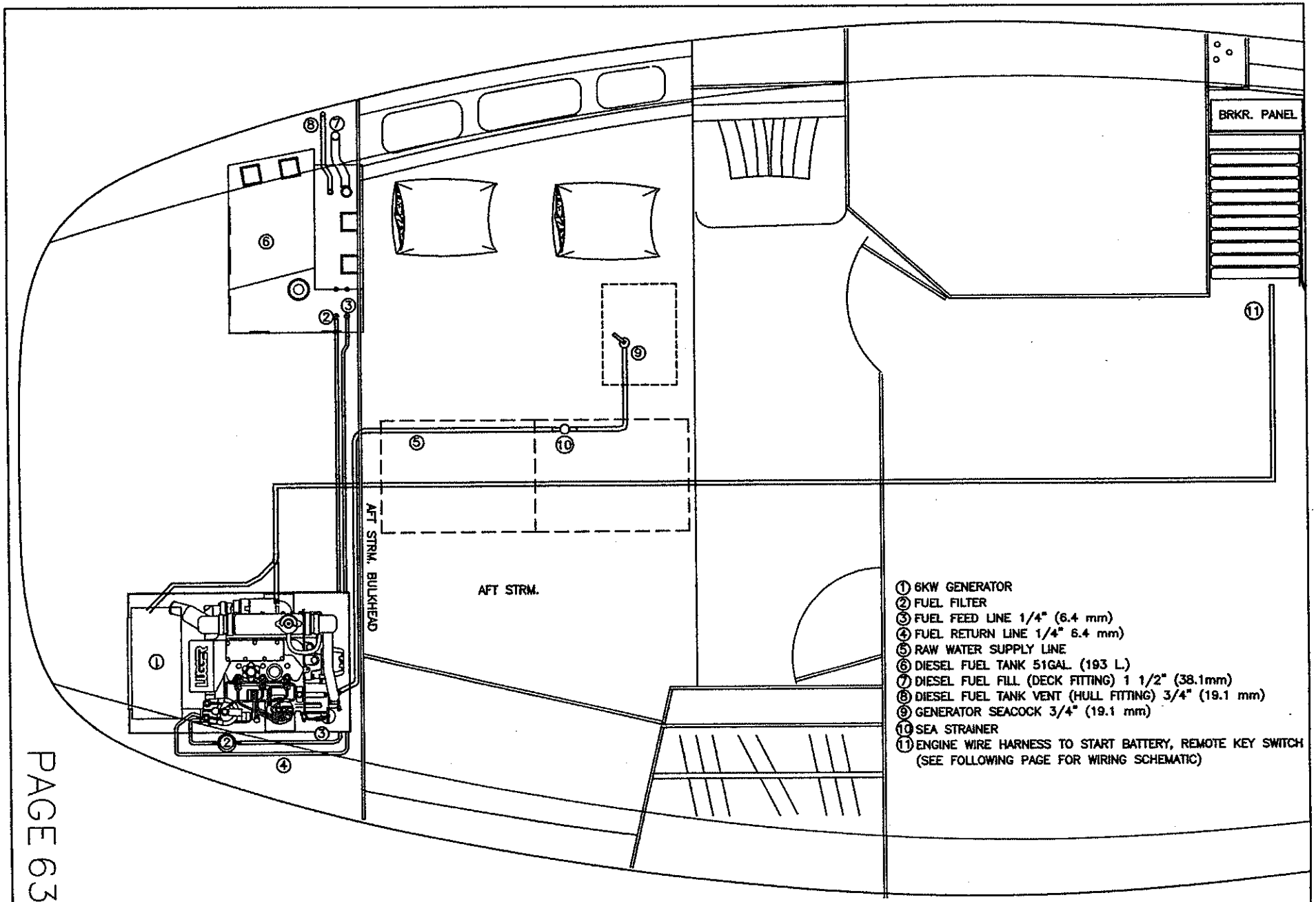
BASIC OPERATING INSTRUCTIONS: (NOTE: READ GENERATOR MANUAL BEFORE OPERATING GEN.)

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
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. TURN ON THE "GENERATOR" BREAKER ON "SHORE POWER A" SIDE OF MAIN A.C. PANEL, AND/OR TO POWER "SHORE POWER B" SIDE, RAISE THE SLIDE BAR ON "SHORE POWER B" SIDE OF MAIN A.C. PANEL AND TURN "PARALLEL" BREAKER "ON". A.C. PANEL SHOULD NOW BE OPERABLE.
8. TO SHUT GEN. DOWN PUSH STOP SWITCH UNTIL GEN STOPS.

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

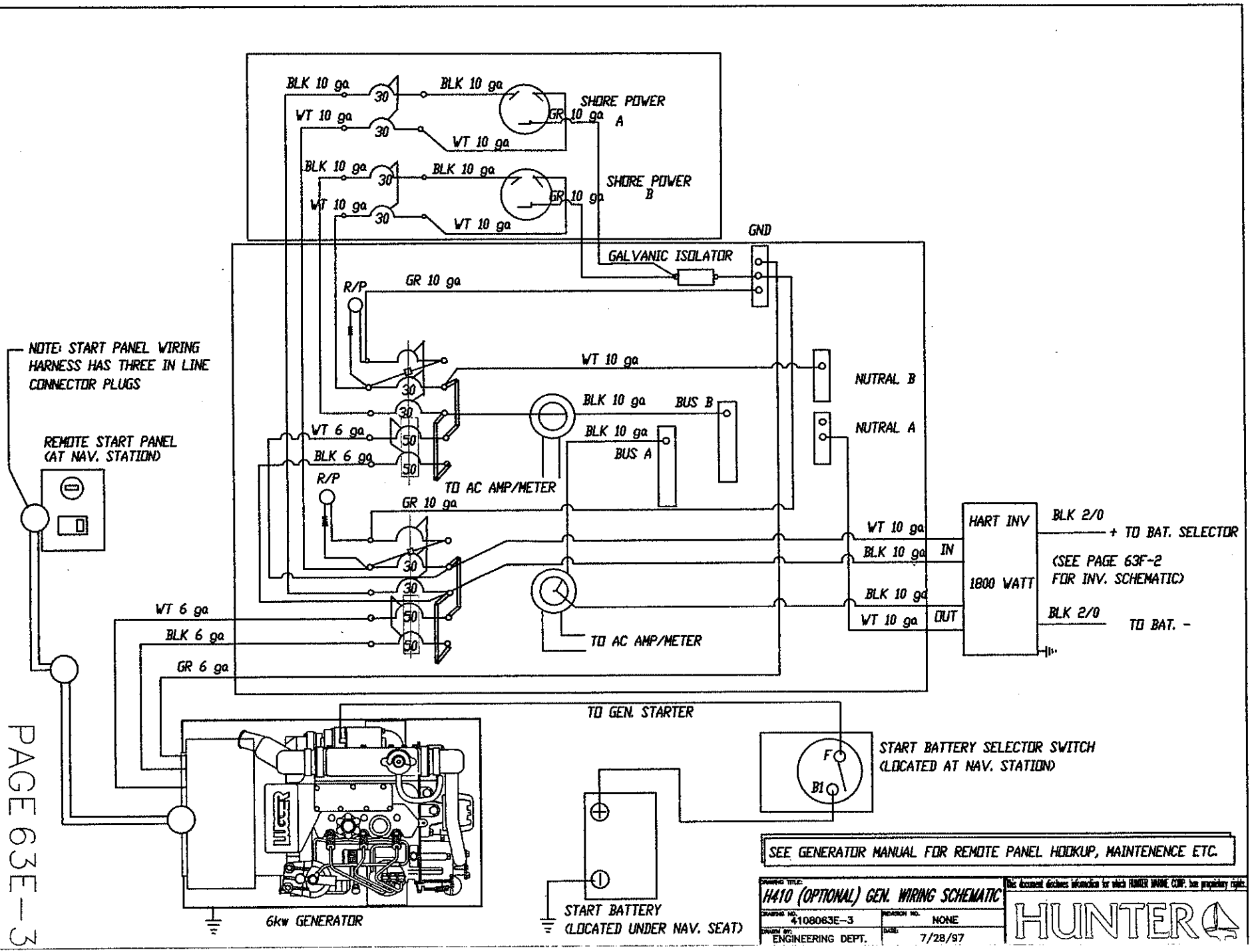
DRAWING TITLE: H410 GEN. OPER. INST.
DRAWING NO. 4108063E-1 | REVISION NO. NONE
DRAWN BY: ENGINEERING DEPT. | DATE: 7/28/97

HUNTER



H410 (OPTIONAL) GENERATOR SYSTEM LAYOUT	
4108063E-2	NONE
ENGINEERING DEPT.	7/28/97

HUNTER


BLK 10 ga
30
BLK 10 ga
WT 10 ga
30
WT 10 ga
GR 10 ga
SHORE POWER A
SHORE POWER B
GND
GALVANIC ISOLATOR
R/P
GR 10 ga
NOTE: START PANEL WIRING HARNESS HAS THREE IN LINE CONNECTOR PLUGS
WT 10 ga
NUTRAL B
NUTRAL A
BUS B
BUS A
WT 6 ga
BLK 6 ga
50
REMOTE START PANEL (AT NAV. STATION)
TO AC AMP/METER
HART INV
1800 WATT
IN
OUT
BLK 2/0
+ TO BAT. SELECTOR
(SEE PAGE 63F-2 FOR INV. SCHEMATIC)
TO BAT. -
TO GEN. STARTER
START BATTERY SELECTOR SWITCH (LOCATED AT NAV. STATION)
F
B1
6kw GENERATOR
START BATTERY (LOCATED UNDER NAV. SEAT)
SEE GENERATOR MANUAL FOR REMOTE PANEL HOOKUP, MAINTENENCE ETC.
H410 (OPTIONAL) GEN. WIRING SCHEMATIC
4108083E-3
NONE
ENGINEERING DEPT.
7/28/97
HUNTER

		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

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 SHIELDFLEX 3/4" TYPE 2091	FT	10
26 PL1526	250	HOSE SHIELDFLEX 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: (FOR INVERTING D.C. POWER TO A.C. POWER)

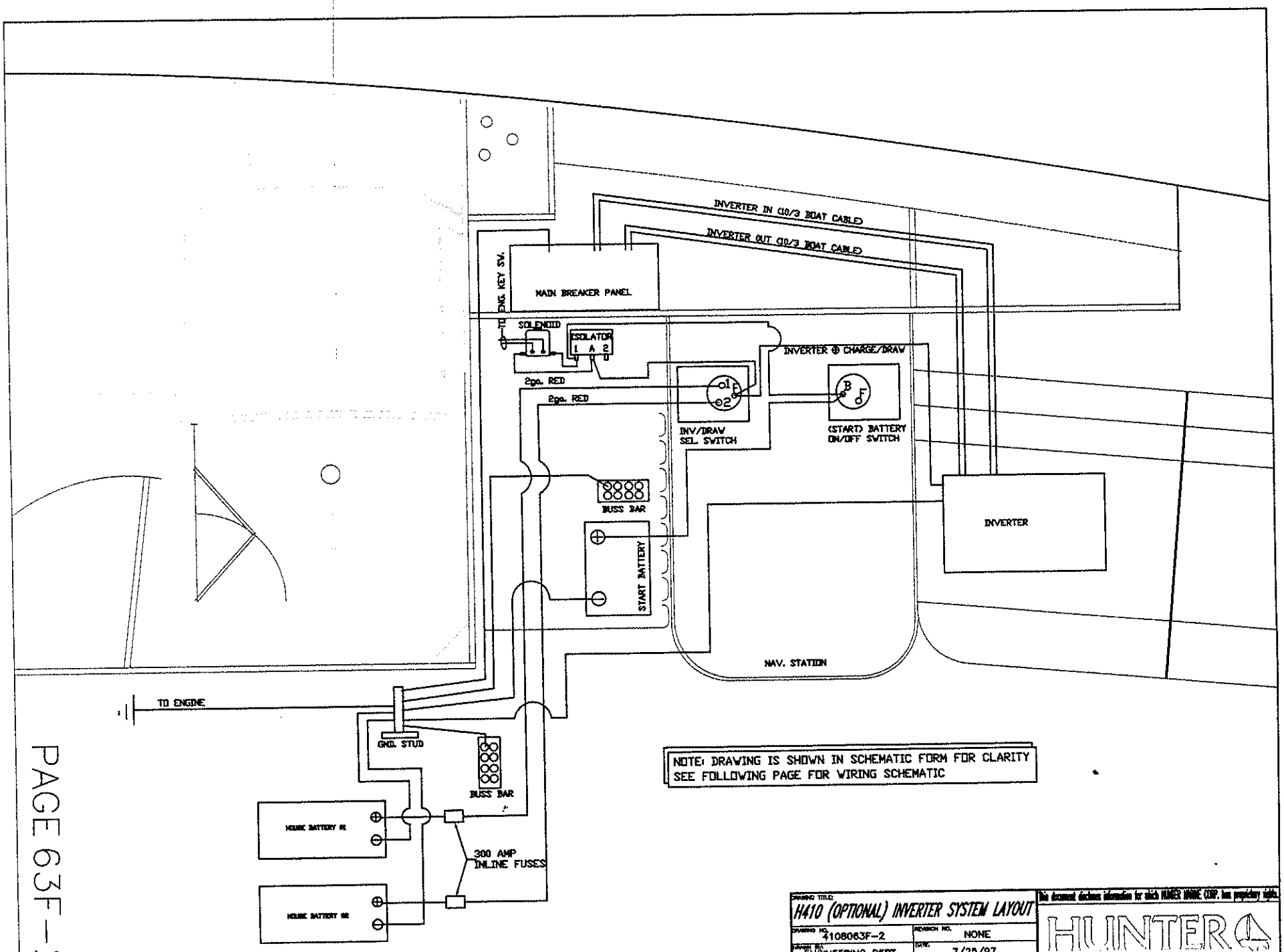
① TURN ON INV/DRAW (HOUSE) BATTERY SELECTOR SWITCH TO #1, #2 OR BOTH
② TURN ON INVERTER AT REMOTE PANEL AT NAV. STATION
③ TURN ON APPROPRIATE APPLIANCE BREAKER ON V.A.C. SIDE OF PANEL

NOTE:
READ "OPTIONAL INVERTER" ON PAGE 63A–2 FOR INVERTER SYSTEM DETAILS

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

DRAWING TITLE: H410 OPTIONAL INVERTER OPER. INST	This document discloses information for which HUNTER MARINE CORP. has proprietary rights.
DRAWING NO. 4106063F–1	REVISION NO. NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 7/28/97

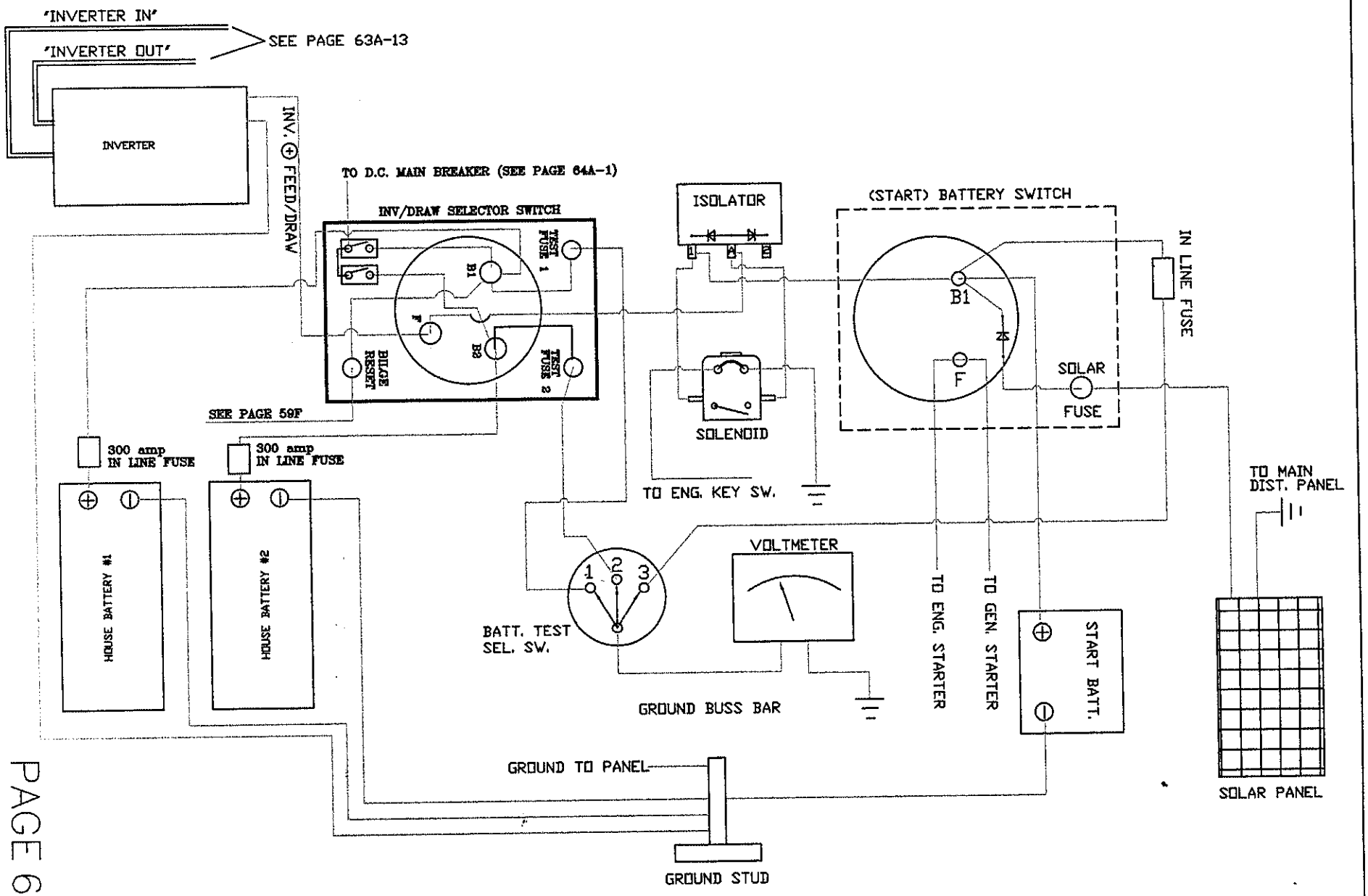
HUNTER



DRAWING TITLE: H410 (OPTIONAL) INVERTER SYSTEM LAYOUT

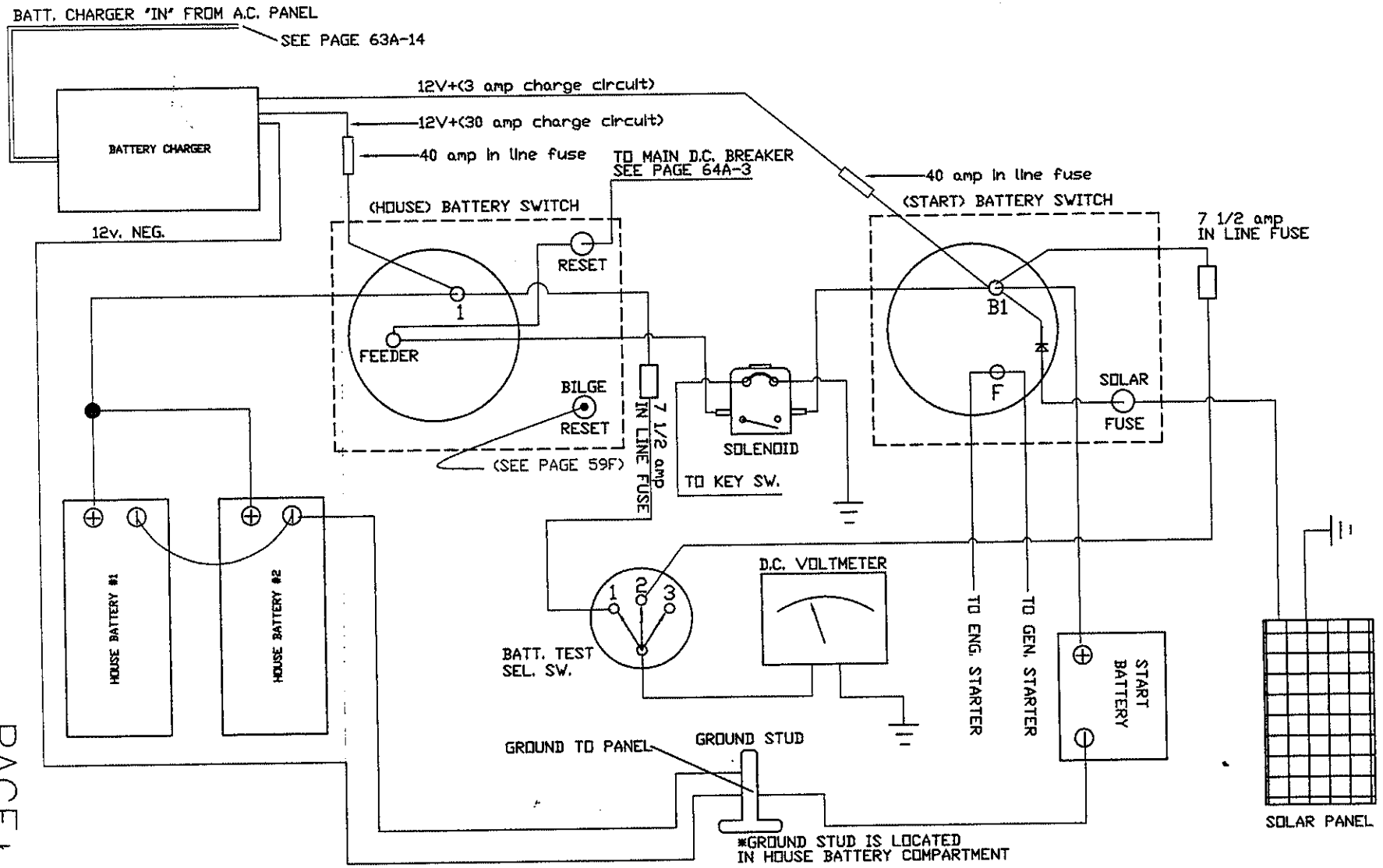
DRAWING NO.	REVISION NO.
4108063F-2	NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 7/25/97

HUNTER



DRAWING TITLE:	H410 (OPTIONAL) INVERTER/CHARGING SYSTEM SCHEMATIC
DRAWING NO.	4108063F-3
REVISION NO.	NONE
DRAWN BY:	ENGINEERING DEPT.
DATE	7/28/97

HUNTER



PAGE

FOR BATT. CHARGER OPERATION SEE PAGE 63A-2
FOR TROUBLESHOOTING SEE PAGE 63A-9

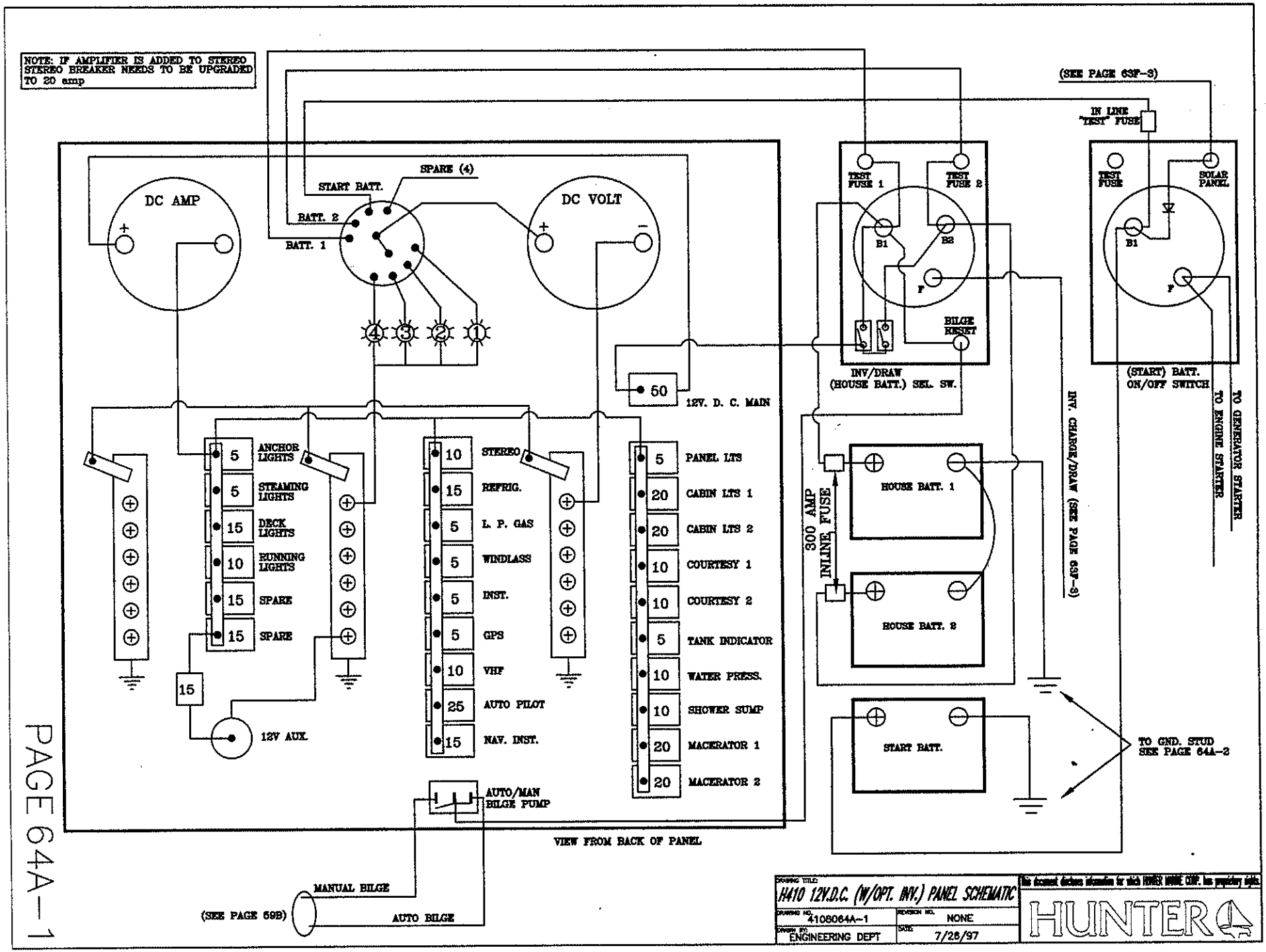
DRAWING TITLE:	H410 STANDARD BATTERY CHARGER SYSTEM
DRAWING NO.	4108063F-4
REVISION NO.	NONE
DRAWN BY:	ENGINEERING DEPT
DATE:	12/10/97

HUNTER

		OPTIONAL INVERTER SYSTEM PARTS LIST		
Stg Compone	Cls.			Net
No. 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

			A.C. VOLTAGE SYSTEM PARTS LIST		
COMP. #				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,RECEPTABLE,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	RECETACLE - GFI #6599I	EA	2
EL0215		300	ELECTRICAL COVER SM.(VACCUM) 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	RECETACLE - 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



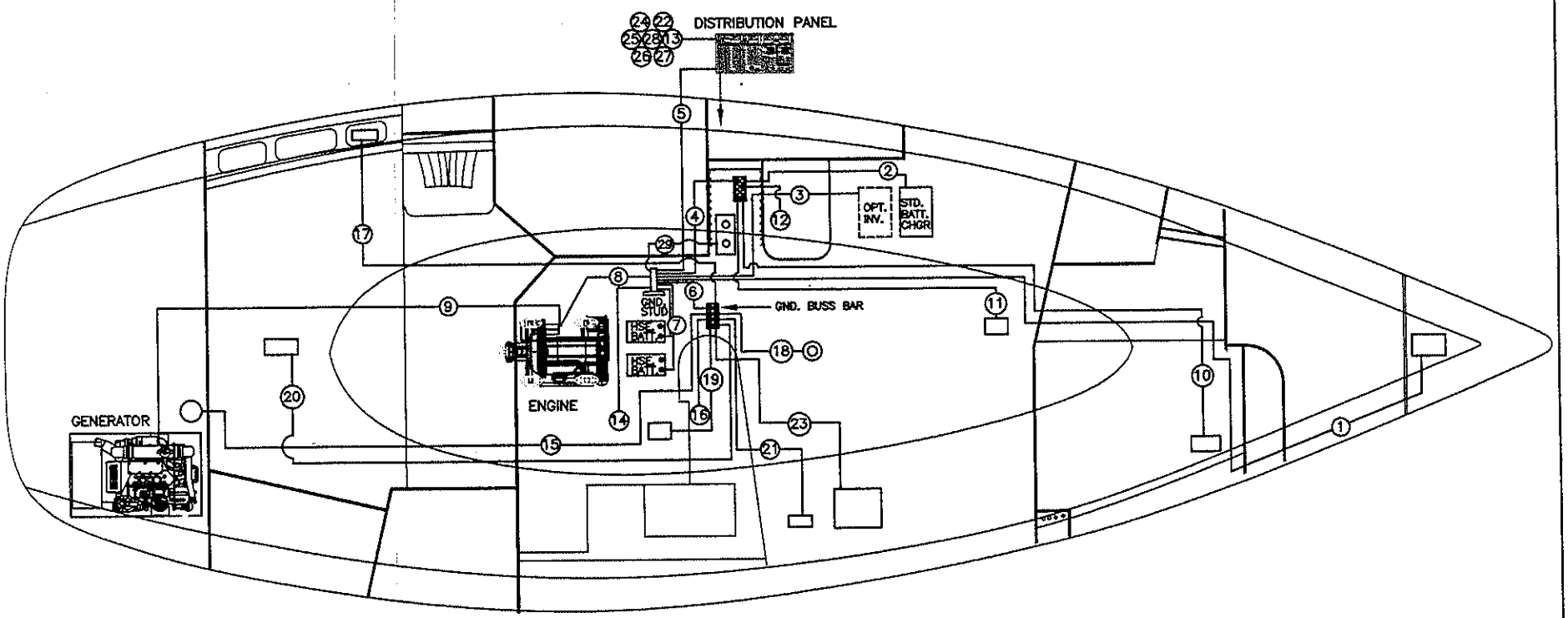
PAGE 64A-1

DRAWING TITLE: H410 12V.D.C. (W/OPT. INV.) PANEL SCHEMATIC

DRAWING NO. 4108064A-1 | REVISION NO. NONE

DRAWN BY: ENGINEERING DEPT | DATE: 7/28/97

HUNTER



GROUND WIRE/CABLE SPECS:

1. WINDLASS .....2/0 CABLE
2. STANDARD BATTERY CHARGER.....8ga. WIRE
3. OPTIONAL INVERTER.....2/0 CABLE
4. PANEL BUSS BAR TO GND. STUD.....2ga. WIRE
5. PANEL GND. TO GND STUD.....6ga. WIRE
6. GND. BUSS BAR TO GND. STUD.....2ga. WIRE
7. HOUSE BATT. GND'S TO GND. STUD.....2/0 CABLE
8. ENGINE GND. TO GND. STUD.....2/0 CABLE
9. GENERATOR GND. TO ENGINE.....2/0 CABLE
10. FWD. MACERATOR.....10ga. WIRE
11. FWD. SHOWER SUMP.....12ga. WIRE
12. TO FWD. CTSY LIGHTS.....16ga. WIRE
13. ALL CABIN LIGHTS.....16ga. WIRE
14. OPTIONAL ELEC. HALYARD.....2 ga. WIRE
15. GENERATOR BLOWER (OPTIONAL).....12ga. WIRE
16. GALLEY & AFT CTSY. LIGHTS.....16ga. WIRE
17. AFT MACERATOR.....10ga. WIRE
18. BILGE PUMP.....12ga. WIRE
19. AFT SHOWER SUMP.....12ga. WIRE
20. OPTIONAL AUTO PILOT.....8ga. WIRE
21. WATER PRESSURE PUMP.....12ga. WIRE
22. TANK SEND UNITS.....16ga. WIRE
23. REFRIGERATION.....8ga. WIRE
24. STEREO.....16ga. WIRE
25. L.P.G. SOLENOID.....16ga. WIRE
26. INSTRUMENTS.....MANUF. SUPPLIED CABLE
27. VHF RADIO.....16ga. WIRE
28. ANC./STEAM./DECK/RUNNING LIGHTS.....16ga. WIRE
29. START BATTERY.....2/0 CABLE

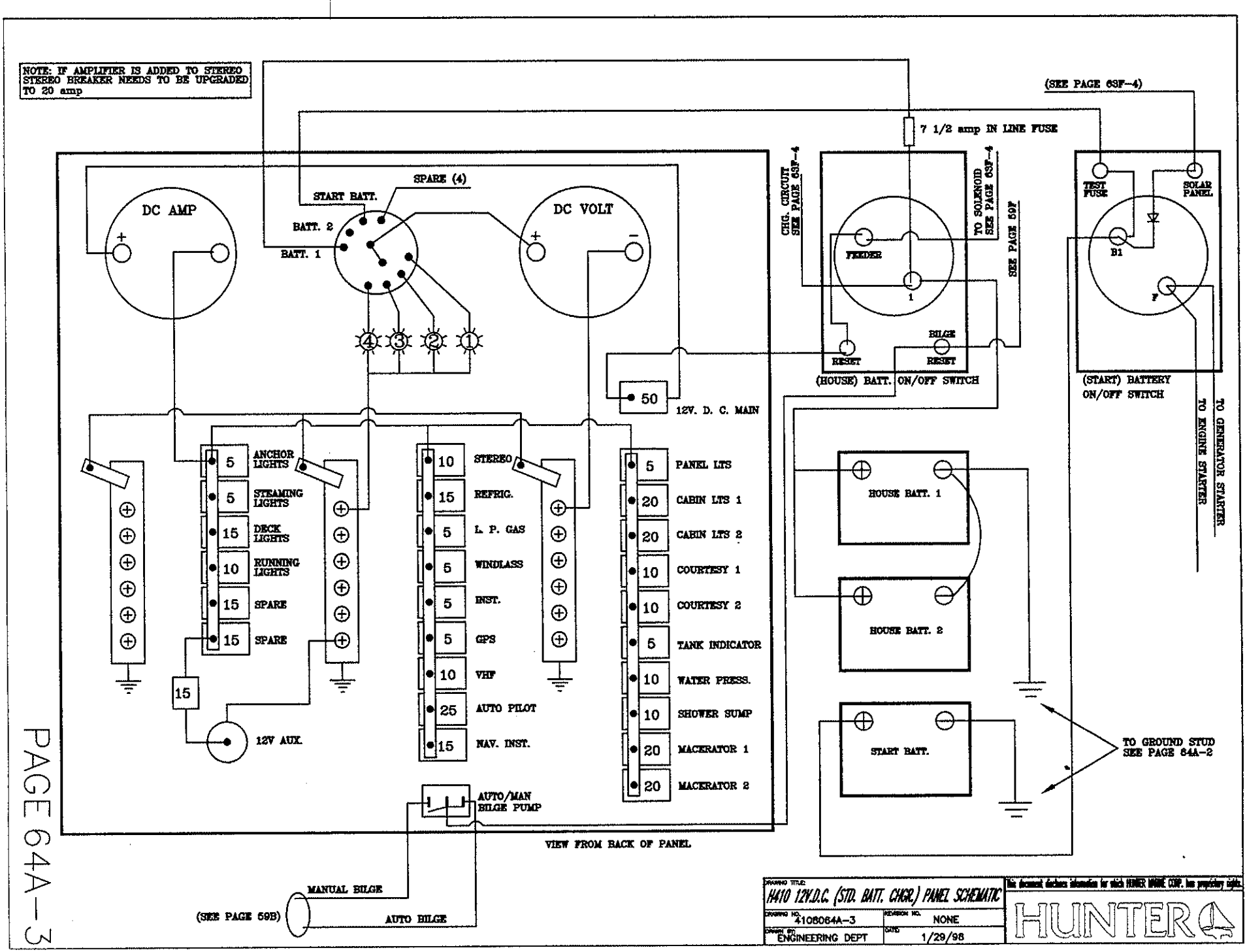
NOTE: WIRE RUNS & COMPNTS. ARE SHOWN IN SCHAMATIC FORM FOR CLARITY

DRAWING TITLE: H410 D.C. GROUNDING SYSTEM LAYOUT

DRAWING NO. 4108064A-2 | REVISION NO. NONE

DRAWN BY: ENGINEERING DEPT. | DATE: 12/11/97

HUNTER



DRAWING TITLE: H410 12V.D.C. (STD. BATT. CHGR.) PANEL SCHEMATIC

DRAWING NO. 4106064A-3 | REVISION NO. NONE

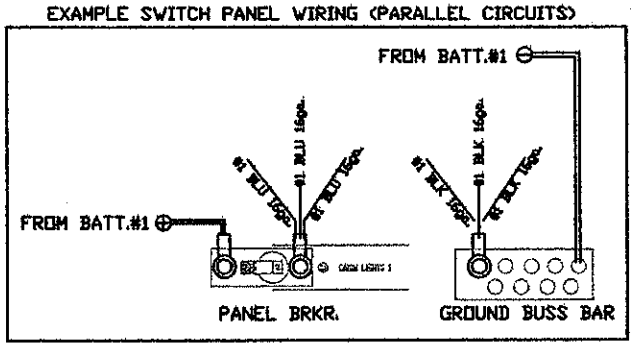
DRAWN BY: ENGINEERING DEPT | DATE: 1/29/98

HUNTER

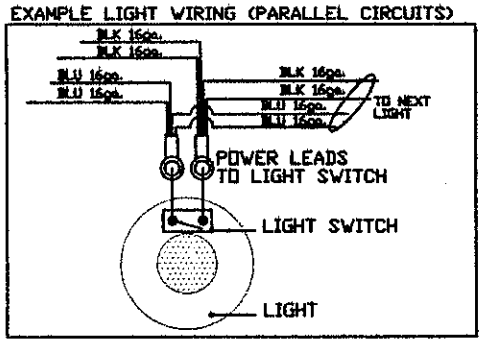
EACH CIRCUIT IN PARALLEL, 16ga. BLU (LOAD TO BREAKER) AND 16ga. BLK. GROUND TO GROUND BUSS BAR (SEE EX.)

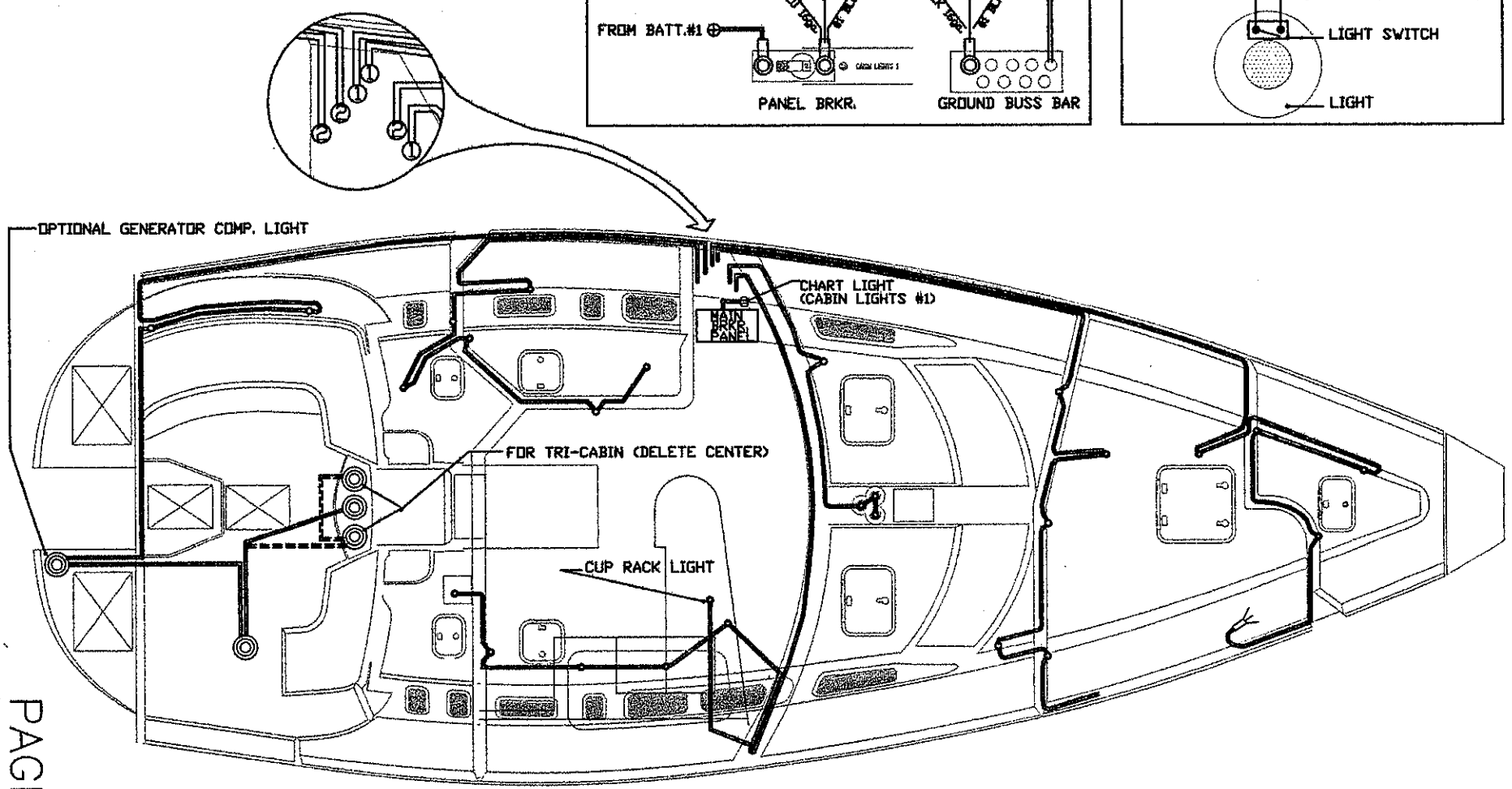
#1 & #2 = CABIN LIGHTS #1 & #2 CIRCUITS

EXAMPLE SWITCH PANEL WIRING (PARALLEL CIRCUITS)



EXAMPLE LIGHT WIRING (PARALLEL CIRCUITS)





= READING LIGHT

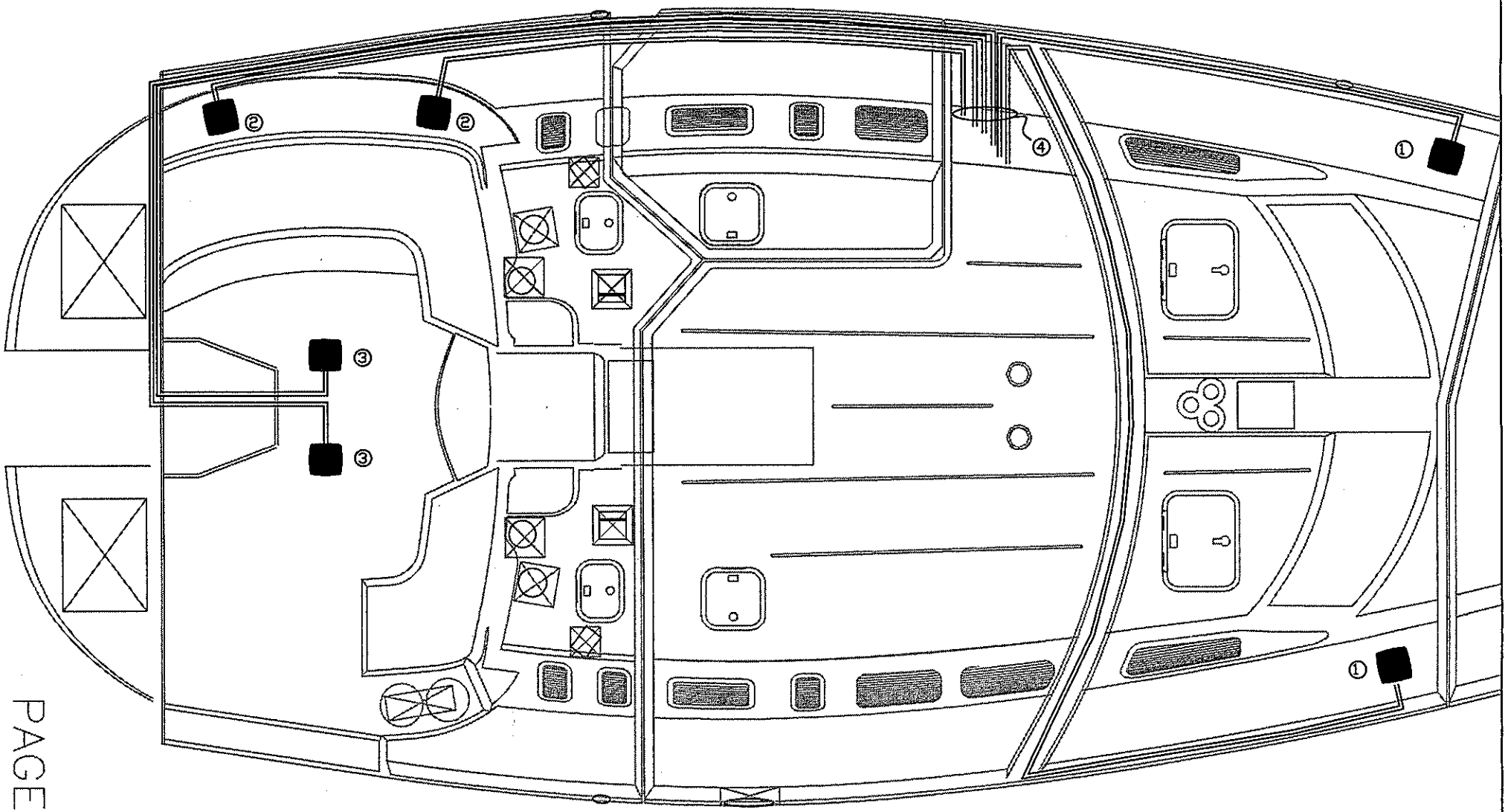
= RECESSED LIGHT

= DOME LIGHT

NOTE: SEE PAGE 64J2 & 3 FOR FIXTURE AND REPL. BULB PART #,S

DRAWING TITLE: H410 12V. LIGHTS WIRING (HEADLINER)	
DRAWING NO. 4108084B-1	REVISION NO. NONE
DRAWN BY: ENGINEERING DEPT	DATE: 7/26/97

HUNTER



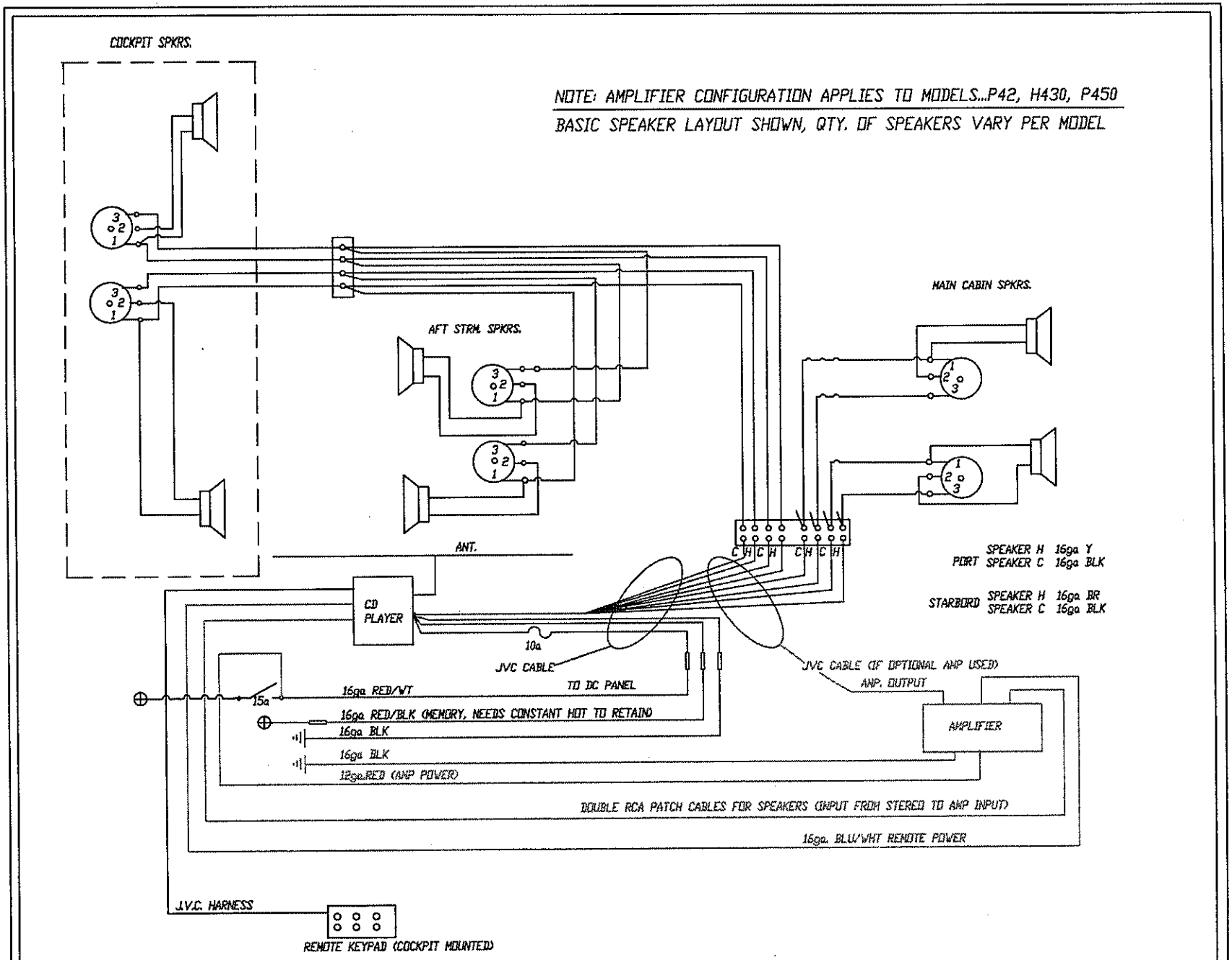
①MAIN SALON SPEAKERS
②AFT STRM SPEAKERS
③COCKPIT SPEAKERS
④SPKR. WIRES TO STEREO UNIT

SEE FOLLOWING PAGE FOR STEREO SYSTEM SCHEMATIC

DRAWING TITLE: H410 ACCESSORY WIRING HEADLINER

DRAWING NO.	REVISION NO.
4108064B-2	NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 7/26/97

HUNTER

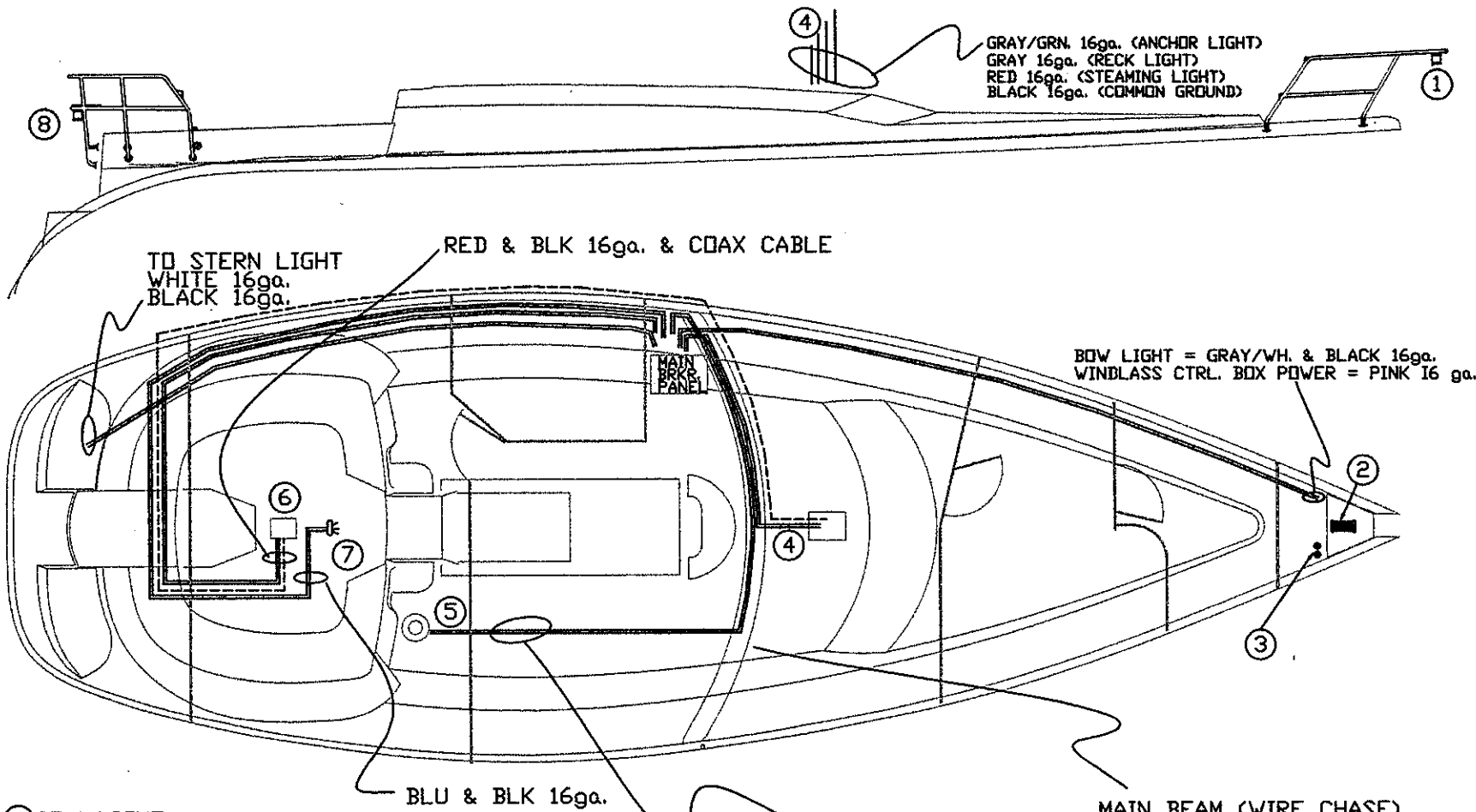


DRAWING TITLE: STEREO WIRING SCHEMATIC

DRAWING NO.	REVISION NO.
4108064B-3	NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 7/26/97

HUNTER

			STEREO SYSTEM PARTS LIST		
COMP. #				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

---------- = VHF COAX CABLE (CONNECTOR ABOVE MAST POST)

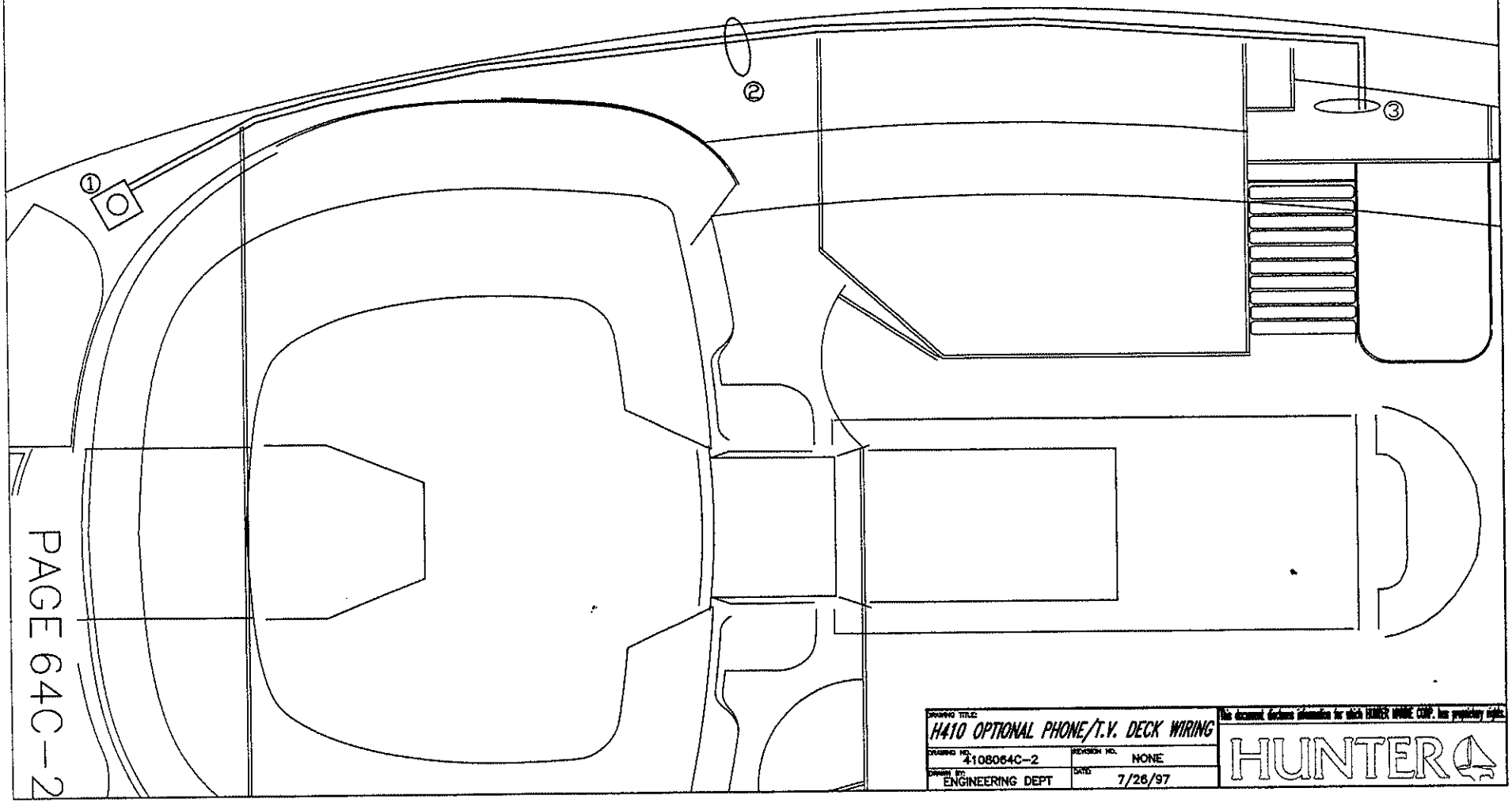
NOTE: SOME WIRE RUNS SHOWN IN APPROXIMATE LOCATIONS FOR CLARITY, SEE PAGE 64F FOR WIRE CHASE LOCATIONS
SEE PAGE 64-J FOR LIGHT FIX. & REPL. BULB PART #'S

DRAWING TITLE: H410 12V. WIRING DECK
DRAWING NO. 4108064C-1 | REVISION NO. NONE
DRAWN BY: ENGINEERING DEPT | DATE: 7/26/97

HUNTER

① PHONE/T.V. SHORE HOOKUP (PORT AFT STERN)
② T.V. COAX CABLE
③ COAX CABLE TO MAIN BREAKER PANEL CABINET

NOTE: T.V. COAX CABLE IS STANDARD, DECK CONNECTOR FITTING IS OPTIONAL
OWNER TO SUPPLY PHONE LINE FROM SHORE
HOOKUP TO DESIRED LOCATION.



DRAWING TITLE: H410 OPTIONAL PHONE/T.V. DECK WIRING

DRAWING NO. 4108064C-2 | REVISION NO. NONE

DRAWN BY ENGINEERING DEPT | DATE 7/26/97

HUNTER

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.

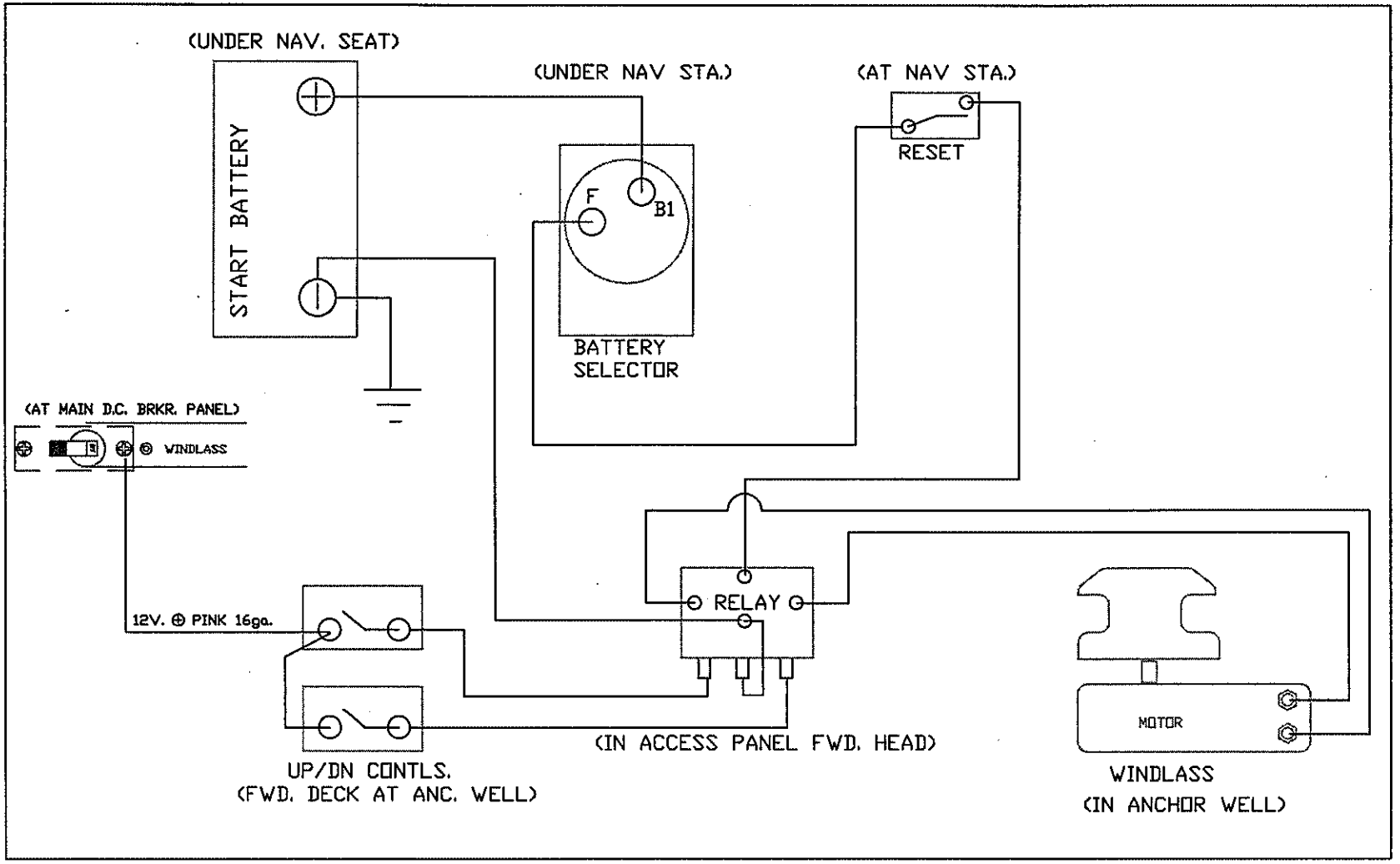
RAISING ANCHOR....

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.

DRAWING TITLE: *H410 WINDLASS OPERATING INST.*	
DRAWING NO. 4108064D-1	REVISION NO. NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 7/26/97

HUNTER



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

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

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

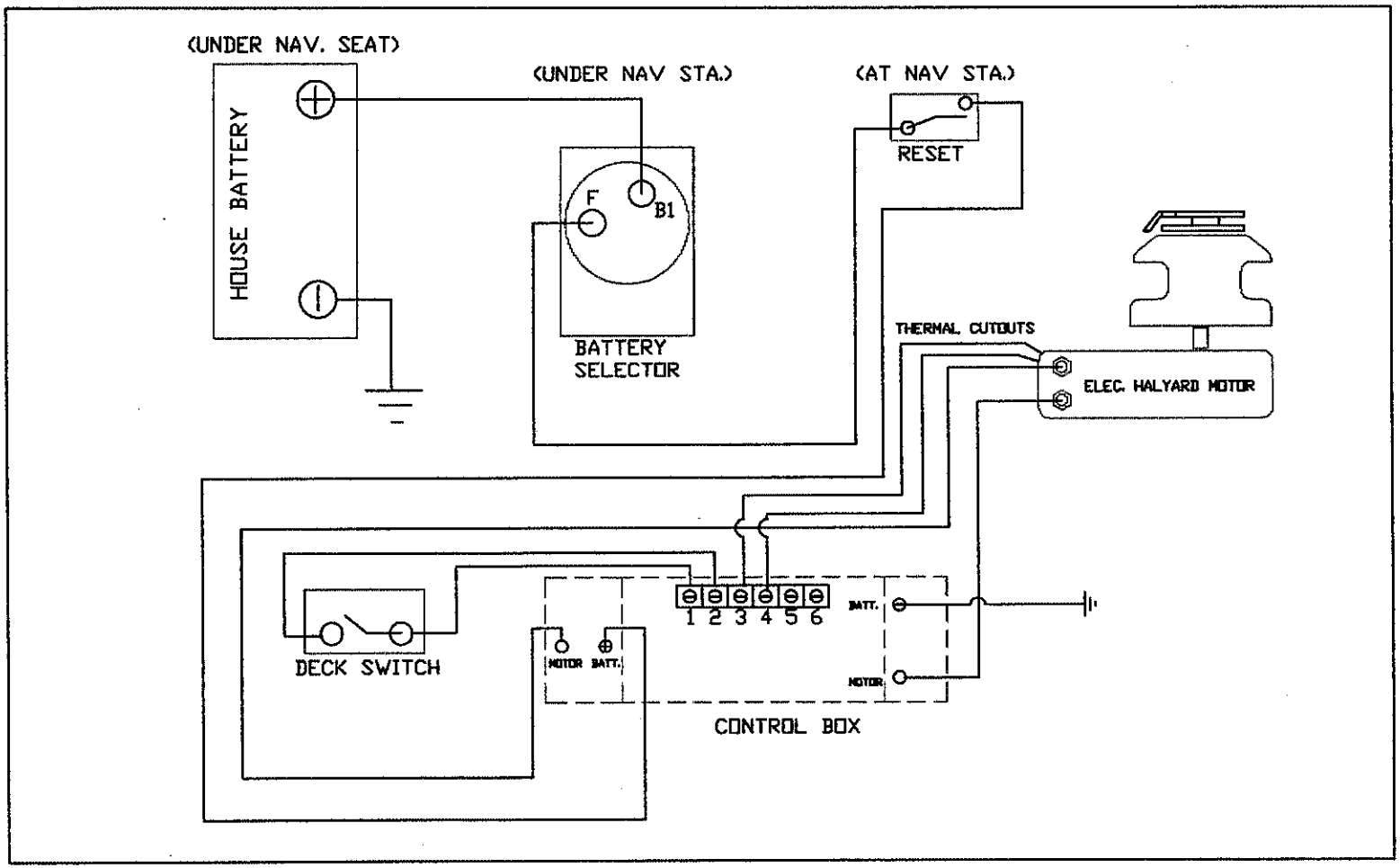
SECTION 64E...OPTIONAL ELEC. HALYARD SYSTEM

BASIC OPERATING INSTRUCTIONS:

1. TURN ON "HOUSE BATTERY" SWITCH AT NAV. STATION.
2. HALYARD SWITCH ON DECK SHOULD NOW OPERATE WINCH

DRAWING TITLE	H410 ELEC. HALYARD OPERATING INST.
DRAWING NO.	4108064E-1
REVISION NO.	NONE
DRAWN BY	ENGINEERING DEPT.
DATE	7/26/97

HUNTER



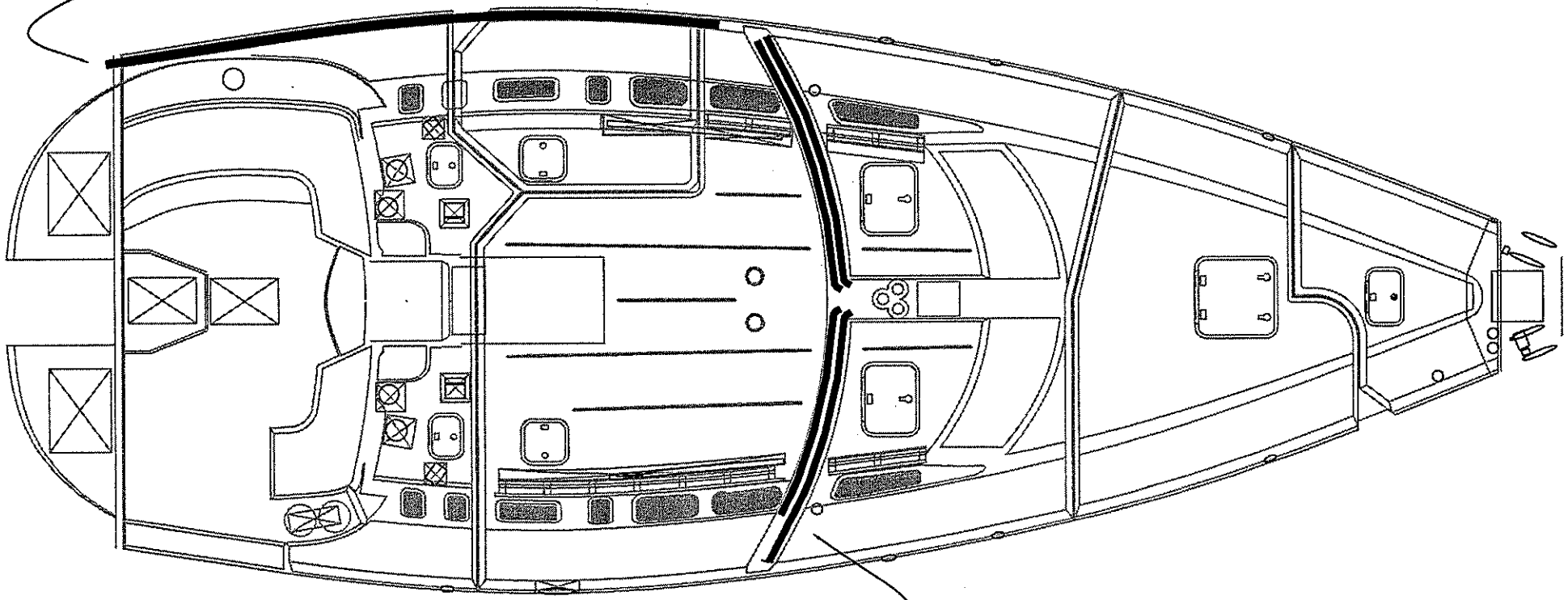
NOTE: SEE PAGES 64C-1 FOR WIRE RUN LOCATIONS

DRAWING TITLE	H410 (OPTIONAL) ELEC. HALYARD SCHEMATIC
DRAWING NO.	4108064E-2
REVISION NO.	NONE
DRAWN BY	ENGINEERING DEPT.
DATE	7/28/97

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

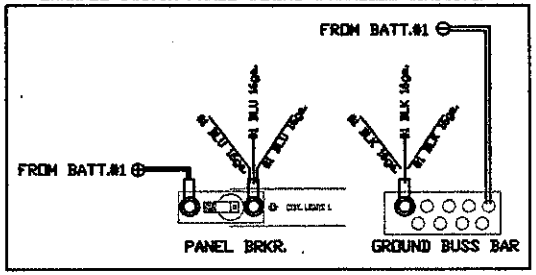


2" (50.8 mm) FLEX. CONDUIT CHASE TUBES RUN FROM PORT & STBD MAIN BEAM IN HEADLINER
TO ACCESS PANEL ABOVE COMPRESSION POST IN MAIN SALON
MESSENGER LINES ARE INSTALLED, AND CAN BE ACCESSED THRU CHAINPLATE
AND MAST COMPRESSION POST ACCESS COVERS

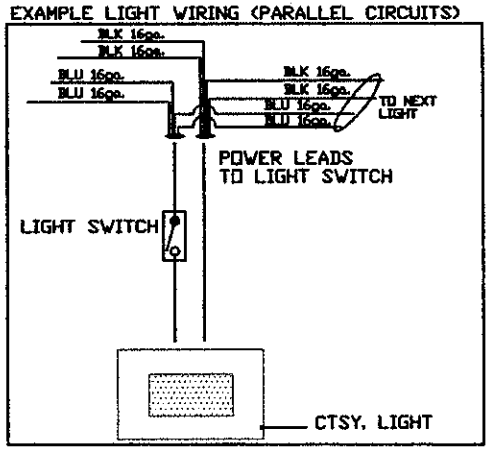
DRAWING TITLE: H410 WIRE CHASE LOCATIONS (HEADLINER)	
DRAWING NO. 4108064F	REVISION NO. NONE
DRAWN BY ENGINEERING DEPT.	DATE: 7/26/97

HUNTER

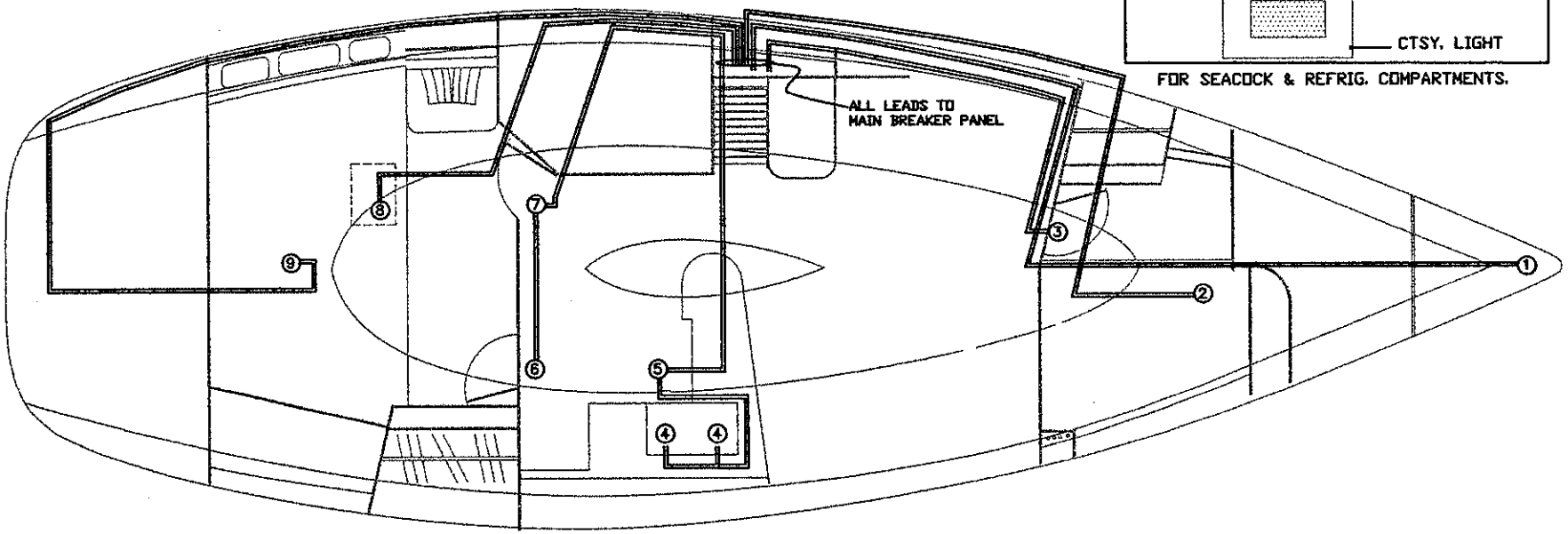
EXAMPLE SWITCH PANEL WIRING (PARALLEL CIRCUITS)



EXAMPLE LIGHT WIRING (PARALLEL CIRCUITS)



FOR SEACOCK & REFRIG. COMPARTMENTS.



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

NOTE: SEE PAGE 64J2 FOR LIGHT BULB PART #'S

DRAWING TITLE: H410 CTSY. LITE/WINDLASS WIRING (PAN)

DRAWING NO.	REVISION NO.
41080646	NONE
DRAWN BY: ENGINEERING DEPT	DATE: 7/26/97

HUNTER

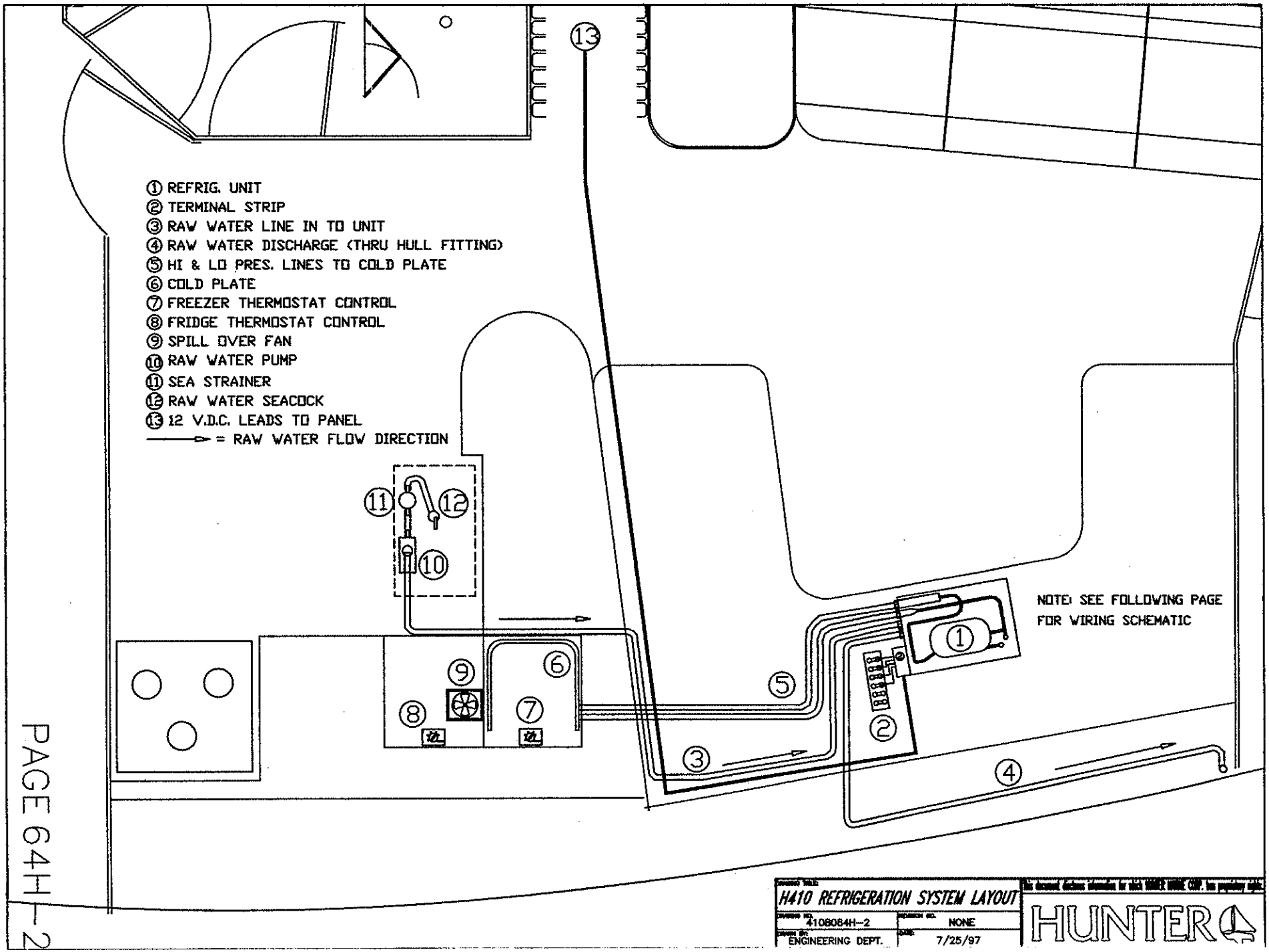
SECTION 64H...REFRIGERATION SYSTEM

BASIC OPERATING INSTRUCTIONS:

① CHECK SEA STRAINER & OPEN RAW WATER SEACOCK UNDER GALLEY SOLE
② ON STANDARD BATTERY CHARGER MODEL,TURN ON HOUSE BATTERY SEL. SWITCH (UNDER CHART TABLE)
(NOT NECESSARY ON OPTIONAL INVERTER MODELS)
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.

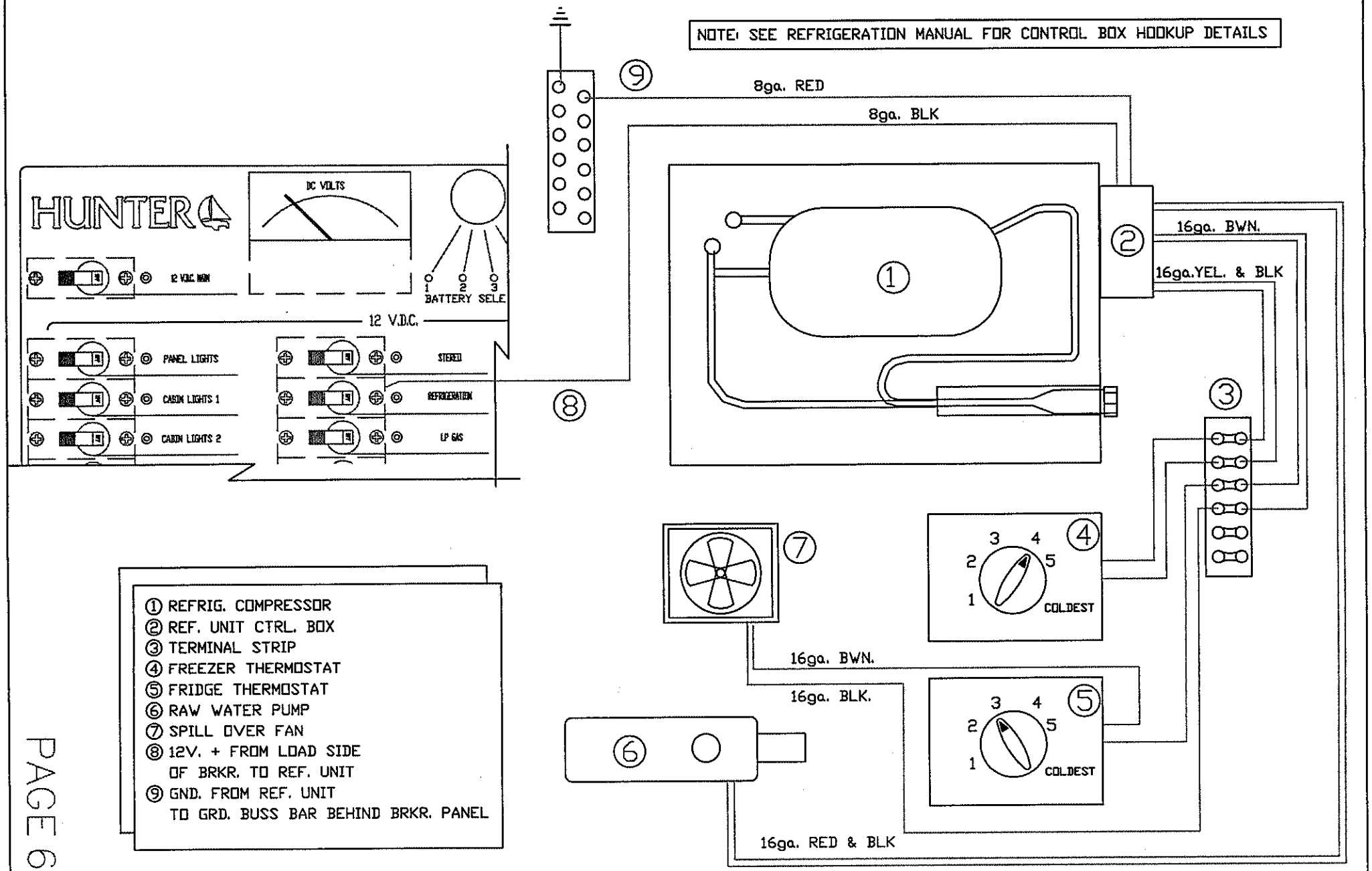
DRAWING TITLE: H410 REFRIG. OPER. INSTRUCTIONS		
DRAWING NO. 4108064H-1	REVISION NO. NONE	HUNTER
DRAWN BY: ENGINEERING DEPT.	DATE: 7/28/97	



H410 REFRIGERATION SYSTEM LAYOUT

4108084H-2	NONE
ENGINEERING DEPT.	7/25/97

HUNTER



DRAWING TITLE: H410 REFRIGERATION SCHEMATIC

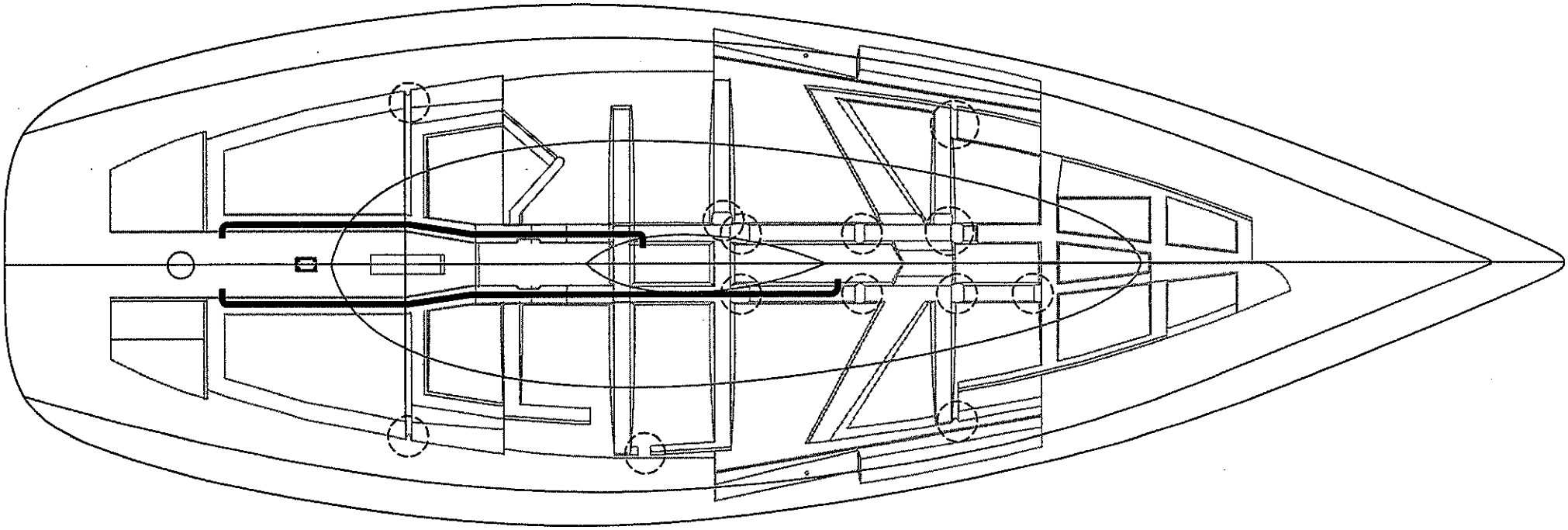
DRAWING NO.	REVISION NO.
4108064H-3	NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 7/29/97

HUNTER

			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: *H410 WIRE CHASE LOCATIONS (PAN)*	
DRAWING NO. 41080641	REVISION NO. NONE
DRAWN BY ENGINEERING DEPT.	DATE 7/26/97

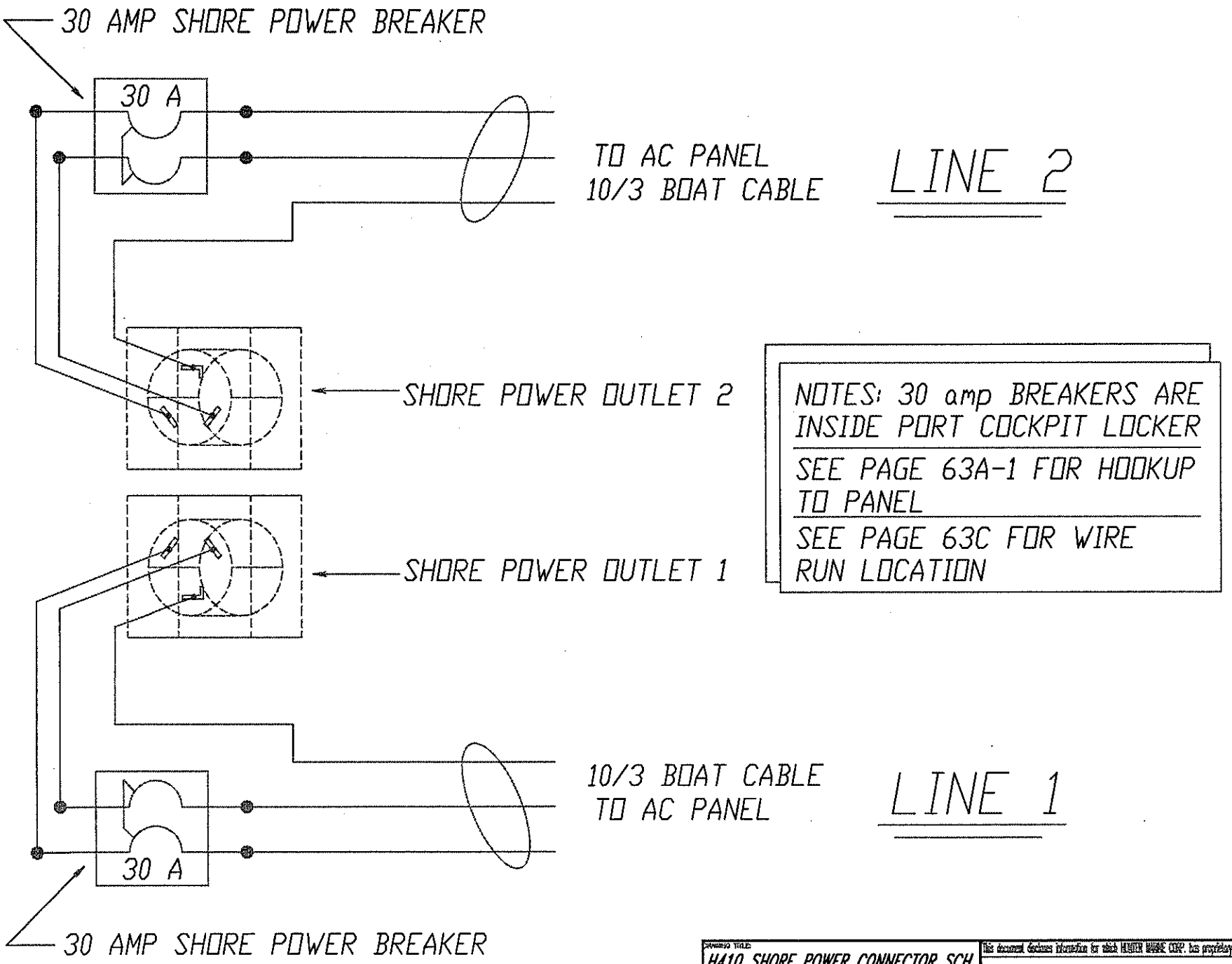
HUNTER

			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

			12V.D.C. VOLTAGE SYSTEM PARTS LIST CONT.		
COMP. #				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 PROOF28-43	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.		
COMP. #				U.O.M.	QTY.
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



PAGE 65A

DRAWING TITLE: H410 SHORE POWER CONNECTOR SCH.

DRAWING NO.	REVISION NO.
4108065A	NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 7/8/97

HUNTER

HUNTER MARINE

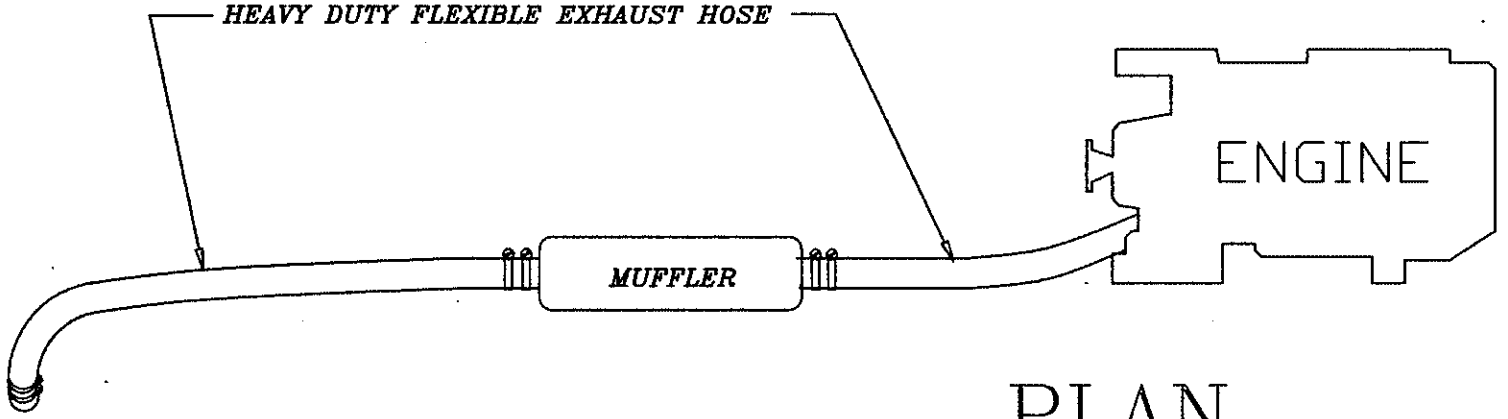
ELECTRICAL WIRING DATA

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

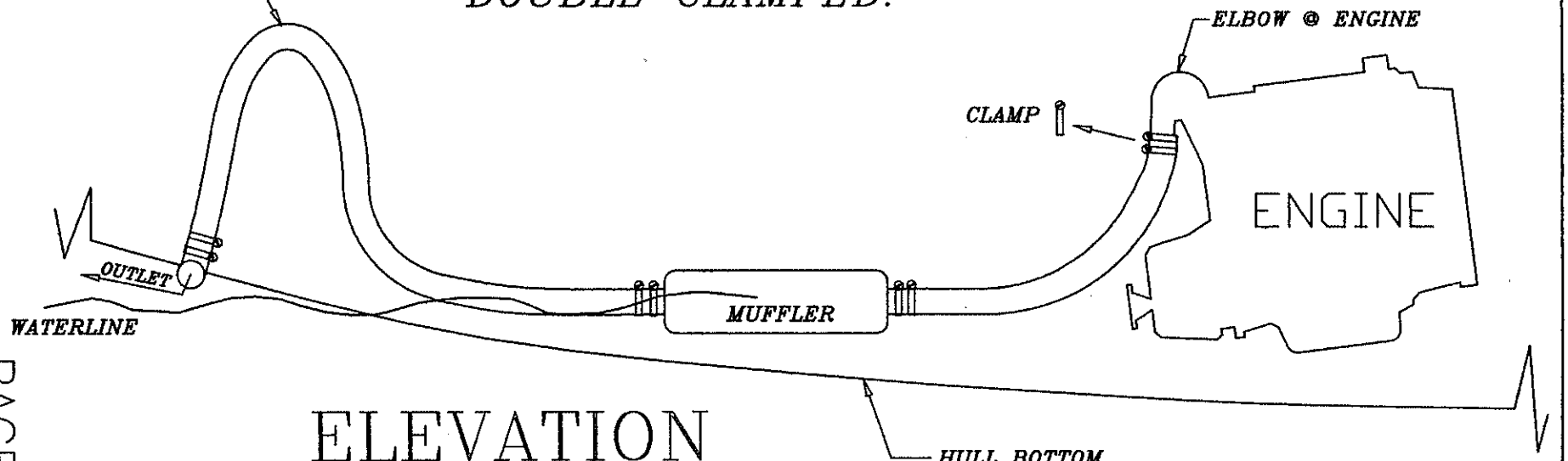
COMPONENT	CABLE GA.	COLOR CODE
	DC VOLT (12)	
BATTERY CABLES	2/0	RED & BLACK
ENGINE START CABLE	2 GA.	RED & BLACK
HALYARD WINCH CABLE	2 GA.	RED & BLACK
WINDLASS CABLE	2 GA.	RED & BLACK
TANK GAUGES	14/2	BOAT CABLE
L.P.G. ON/OFF	14/2	BOAT CABLE
	AC VOLT	
SHORE POWER	10/3	BOAT CABLE
INVERTER	10/3	BOAT CABLE
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.

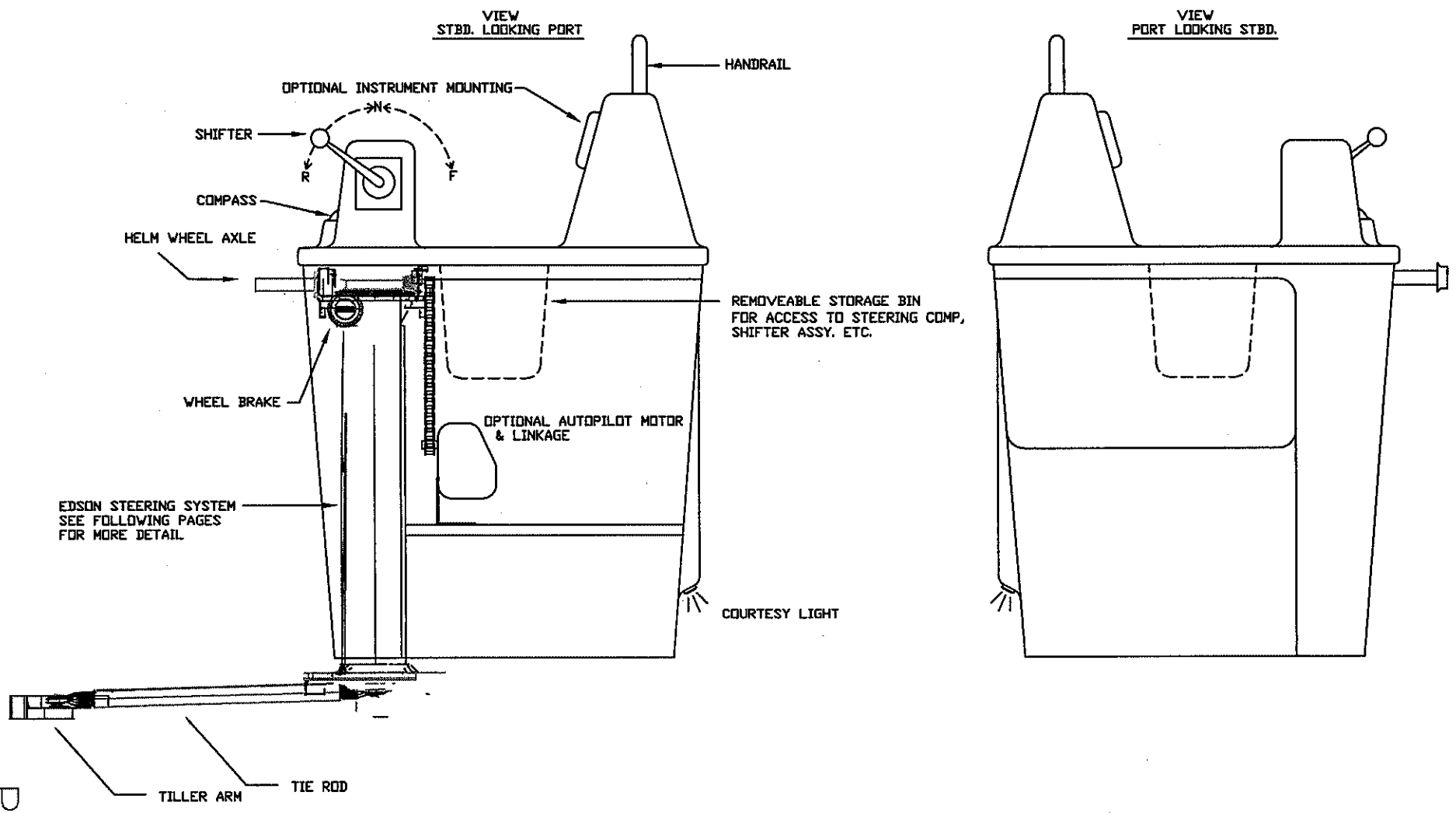


ELEVATION

PAGE 66A

H410 EXHAUST SYSTEM LAYOUT		
4108068A	NONE	HUNTER
ENGINEERING DEPT.	7/14/97	

		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



PAGE 67A

DRAWING TITLE: H410 STEERING/CONSOLE LAYOUT	
DRAWING NO.: 4108067A	REVISION NO.: NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 7/14/97

HUNTER

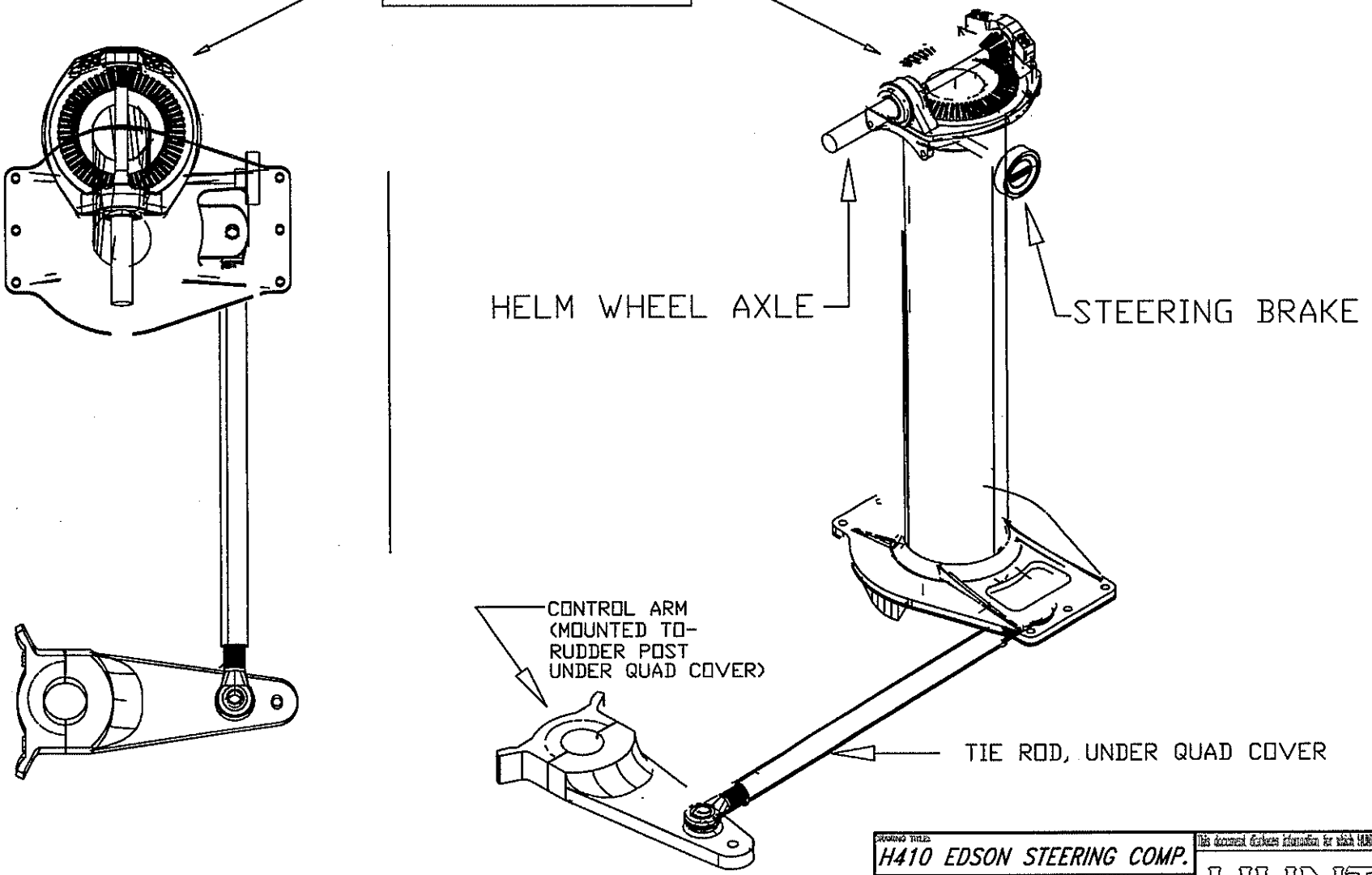
IMPORTANT:

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

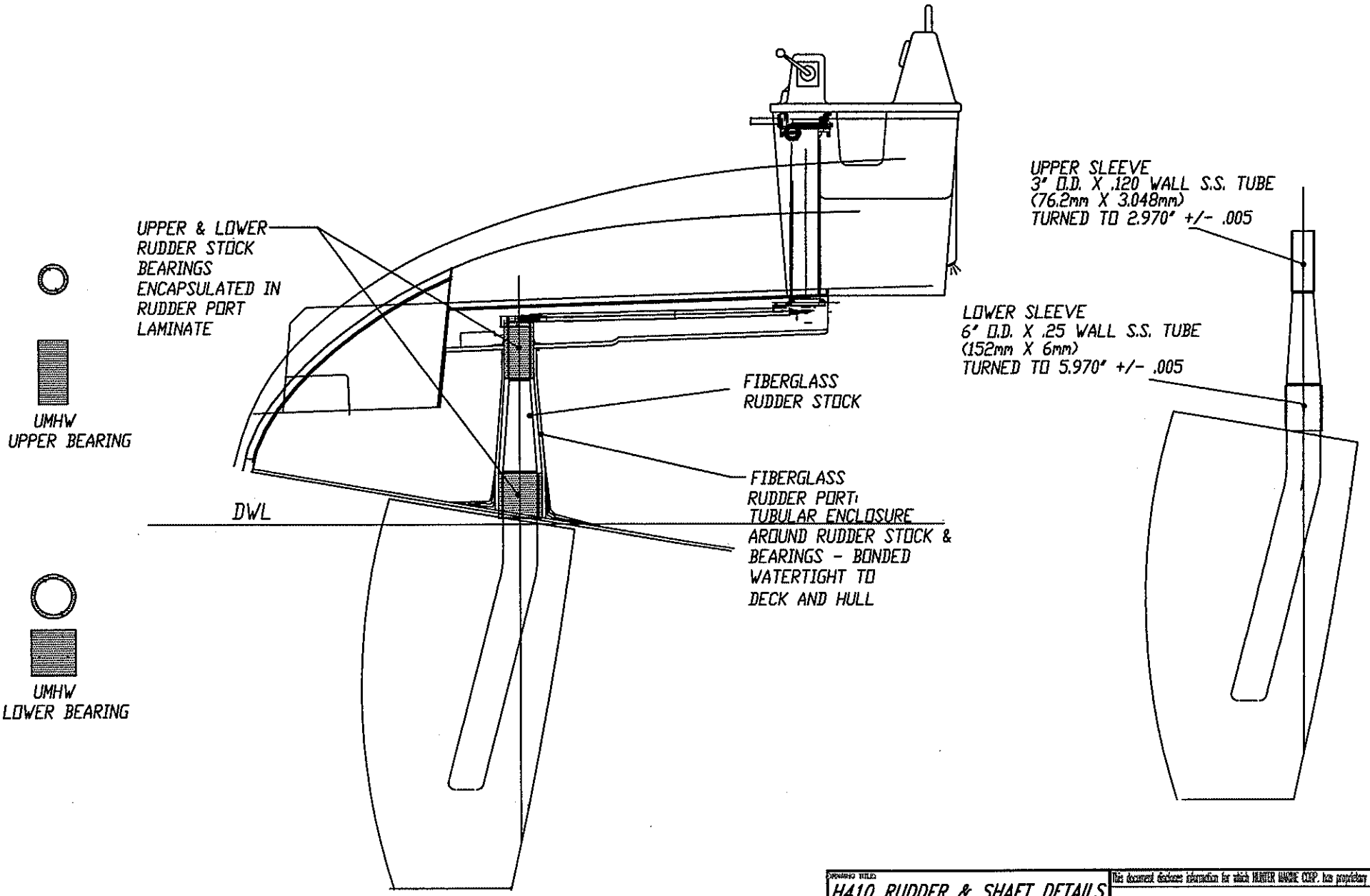
ISO VIEW



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

HUNTER

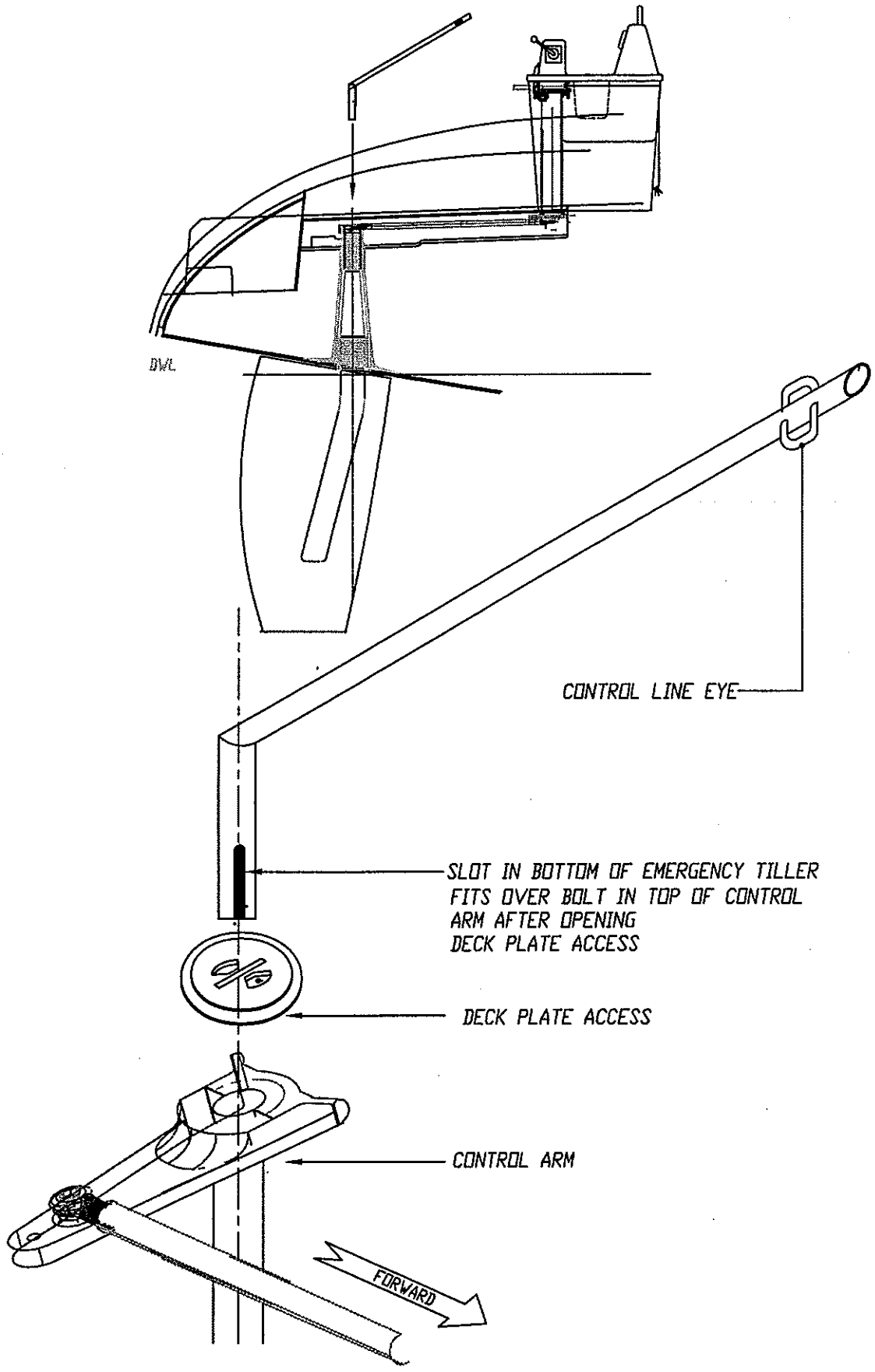
			STEERING SYSTEM PARTS LIST		
COMP. #				U.O.M.	QTY.
KH000001		5	410 STEERING SYSTEM	SYS	1
KH010001		5	410 STEERING ASSEMBLY	ASSY	1
KH030001		5	410 WHEEL STEERING SUB ASSEMBLY	SUB	1
KH030010		5	410 STEERING CONSOLE/BEAM MNTNG CPNTS.	CPNT	1
KH030020		5	410 RUDDER MOUNTING COMPONENTS	CPNT	1
HW2771		550	BEARING,L.UHMW 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"I.DX6"L,H40.5/43/42	EA	1
HW2774		550	BEAR,UPP,UHMW,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



DRAWING TITLED
H410 RUDDER & SHAFT DETAILS

DRAWING NO.	REVISION NO.
4108068	NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 8/8/97

HUNTER

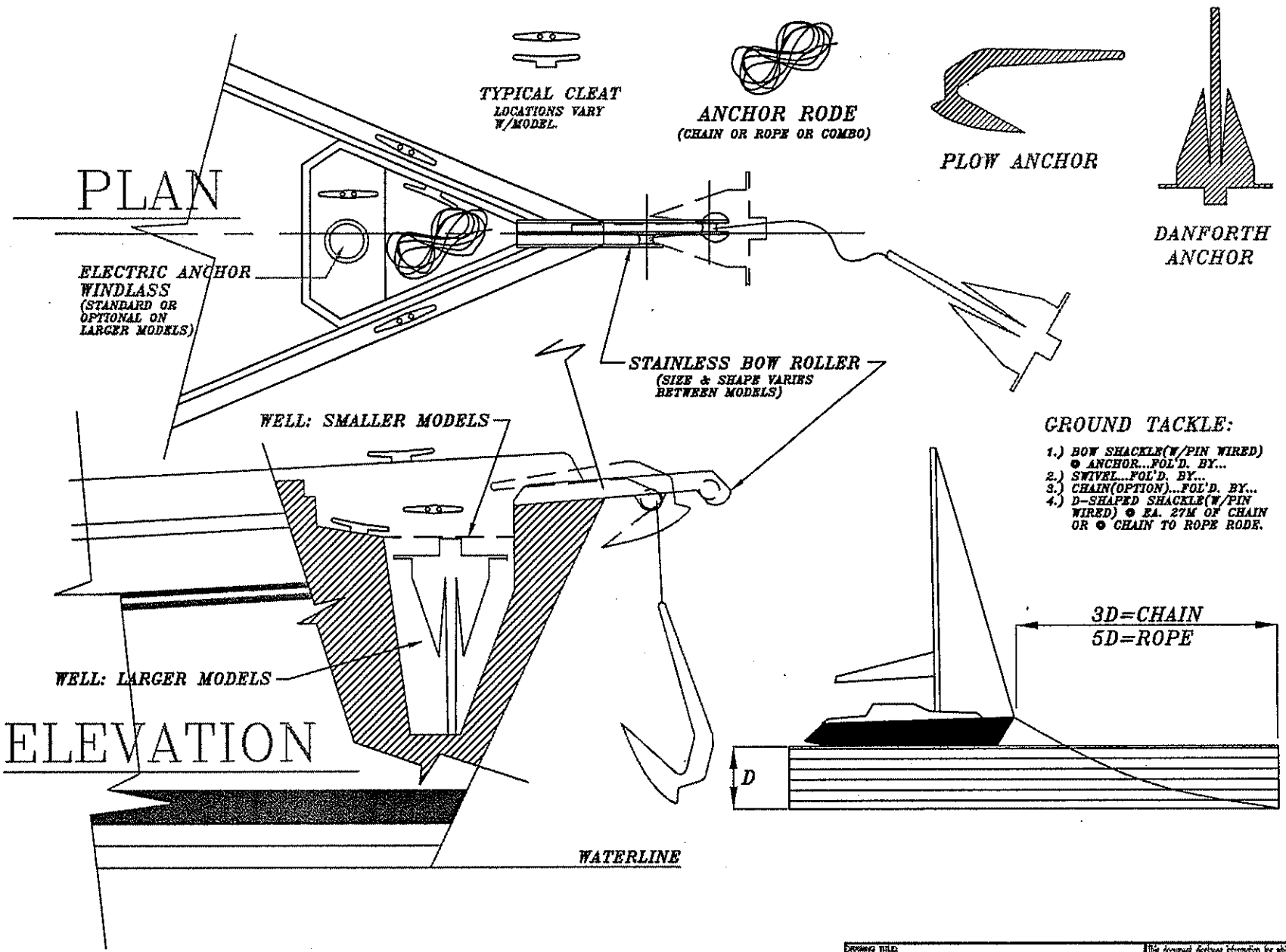


HUNTER

DRAWING TITLE: H410 EMERGENCY TILLER

DRAWING NO. 4108069 | REVISION NO. NONE

DRAWN BY: ENGINEERING DEPT. | DATE: 8/8/97



DRAWING TITLE: ANCHORING	
DRAWING NO.: 4108070	REVISION NO.: NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 8/8/97

HUNTER