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.

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

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

HUNTER MARINE
LIMITED WARRANTY

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.

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 center-line.
Bear a way: to steer the boat away from the wind.
Bearing: the direction of an object from an observer, measured in degrees true or magnetic.
Beat: to sail a *zigzag course* towards the wind, *close-hauled* on alternate *tacks*.
Belay: to make fast a rope around a *cleat*, usually with a figure-of-eight knot.
Bend: 1, to secure a sail to a *spar* before hoisting; 2, to moor a boat; 3, a sleeping place on board.
Bight: a *bend* or loop in a rope.
Bilge: the lower, round part inside the hull where water collects.
Block: a pulley in a wooden or plastic cas, consisting of a *sheave* around which a rope runs. It is used to change the direction of pull.
Boot-topping: a narrow colored stripe painted between the bottom paint and the *topside* enamel.
Bottlescrew: see Rigging screw.
Broach: when a boat *running* downwind slews broadside to the wind and *heels* dangerously. It is caused by heavy following seas or helmsman's error.
Broad reach: the point of sailing between a beam *reach* and a *run*, when the wind blows over the *quarter*.
Bulkhead: partition wall in a boat normally fitted *athwartships*.

C

Caulk: to make the seams between wooden planks watertight by filling with cotton, oakum or a compound.
Cavitation: the formation of a vacuum around a propeller, causing loss in efficiency.
Center-board: a board lowered through a slot in the *keel* to reduce *leeway*.
Center-line: center of the boat in a fore and aft line.
Center or effort (COE): the point at which all the forces acting on the sails are concentrated.
Center of lateral resistance (CLR): the underwater center of pressure about which a boat pivots when changing *course*.
Chain pawl: a short lug which drops into a toothed rack to prevent the anchor chain running back.
Chain plate: a metal plate bolted to the boat to which the *shrouds* or *backstays* are attached.
Chart datum: reference level on a chart below which the tide is unlikely to fall. Soundings are given below chart datum. The datum level varies according to country and area.
Chine: the line where the bottom of the hull meets the side at an angle.
Cleat: a wooden, metal or plastic fitting around which rope is secured.
Clevis pin: a locking pin through which a split ring is passed to prevent accidental withdraw.
Clew: the after, lower corner of a sail where the foot and *leech* meet.
Close-hauled: *the point of sailing* closest to the wind; see also beat.
Close reach: *the point of sailing* between *close-hauled* and a beam *reach*, when the wind blows forward of the *beam*.
Close-winded: describes a boat able to sail very close to the wind.
Coamings: the raised structure surrounding a *hatch*, cockpit etc., which prevents water entering.
Cotter pin: soft, metal pin folded back on itself to form an eye.
Course: the direction in which a vessel is steered, usually given in degrees: true, magnetic or compass.
Cringle: 1, a rope loop, found at either end of a line of *reef* points; 2, an eye in a sail.

D

Dead run: running with the wind blowing exactly aft, in line with the *center-line*.
Deviation: the difference between the direction indicated by the compass needle and the magnetic *meridian*; caused by object aboard.
Displacement: 1, the weight of water displaced by a boat is equal to the weight of the boat; 2, a displacement hull is one that displaces its own weight in water and is only supported by buoyancy, as opposed to a planing hull which can exceed its hull, or displacement, speed.
Downhaul: a rope fitted to pull down a sail or spar.
Draft: the vertical distance from the *waterline* to the lowest point of the *keel*.
Drag: 1, an anchor drags when it fails to hole; 2, the force of wind on the sails, or water on the hull, which impedes the boat's progress.
Drift: 1, to float with the current or wind; 2, US the speed of a current (rate UK); 3, UK: the distance a boat is carried by a current in a given time.

GLOSSARY OF SAILING TERMS

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

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

E

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

F

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

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

Fathom: the measurement used for depths of water and lengths 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.

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.

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

⚠ WARNING

SINKING HAZARD - Ensure proper bilge pump operation.

⚠ CAUTION

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

WATER SYSTEM OPERATION

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

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

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

⚠ 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

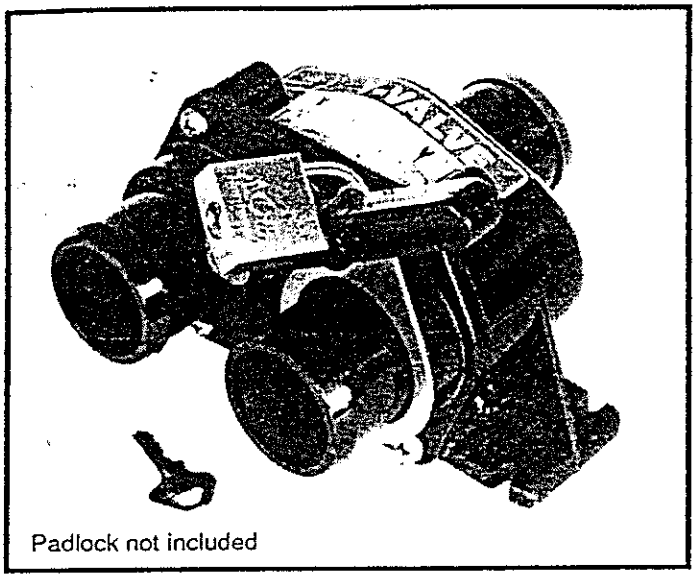
TWO POSITION Y-VALVE

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

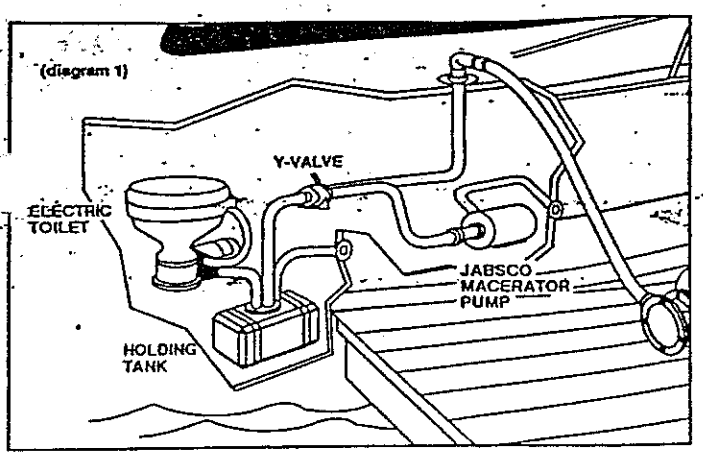
Lay out the system that the Y-Valve will be installed in so that all hoses can be installed without sharp bends, kinks or loops that trap fluids. After choosing a convenient, accessible location for the Y-Valve, be sure that there is adequate room to swing the selector lever. Mark locations for mounting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

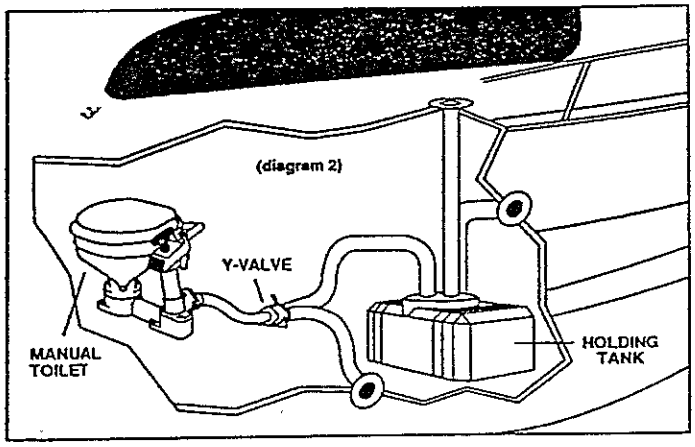
It is recommended that all hoses used in waste systems should be the heavy, non-collapsible fabric reinforced hose. Vacuum cleaner type hose and vinyl hoses will collapse under the vacuum of a dockside pumpout system, or will allow sewer gas to permeate into the boat. All hoses should be double clamped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

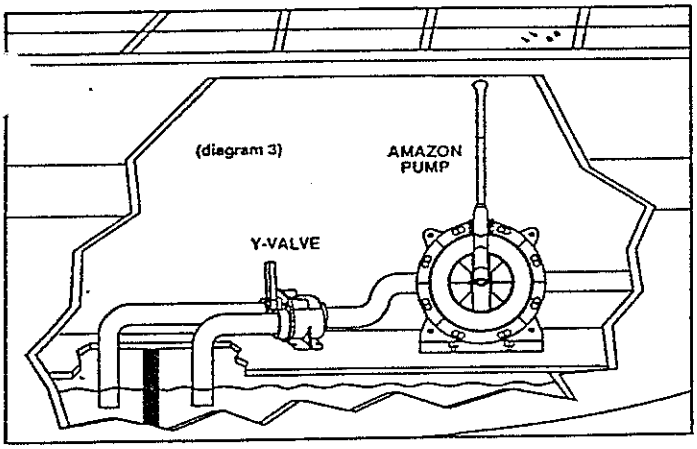
OPERATION

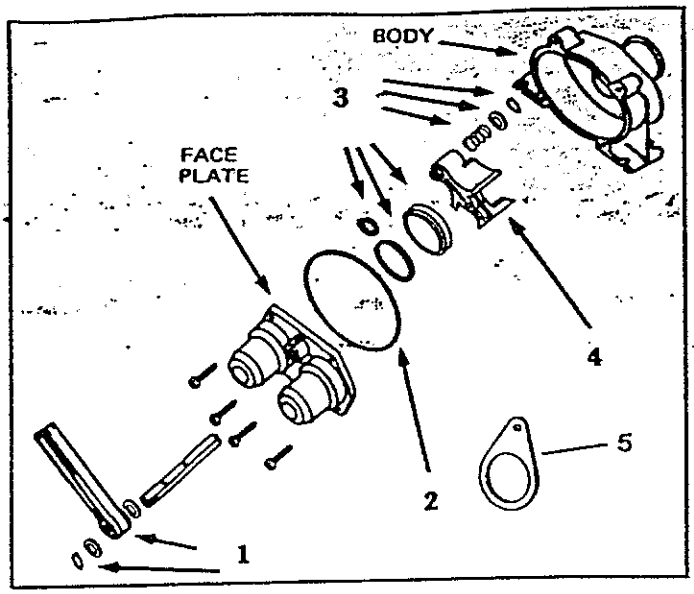
The Y-Valve is designed with a simple and positive diverter mechanism. When choosing the discharge hose system to use, simply orient the selector lever on the Y-Valve over the hose desired to be open to flow. When selecting the particular hose for flow, be sure that the lever is securely positioned against 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
Unit of ITT Fluid Technology Corporation
U.S.A. ITT Jabsco, 1485 Dale Way, P.O. Box 2158, Costa Mesa, CA 92628-2158; Tel: (714) 545-8251; Fax: (714) 957-0609

UNITED KINGDOM
ITT Jabsco
Hoddesdon, Herts.

CANADA
ITT Fluid Products
Guelph, Ontario

JAPAN
NHK Jabsco Co., LTD.
Yokohama, Kanagawa

GERMANY
Mintec, GmbH
Norderstedt

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

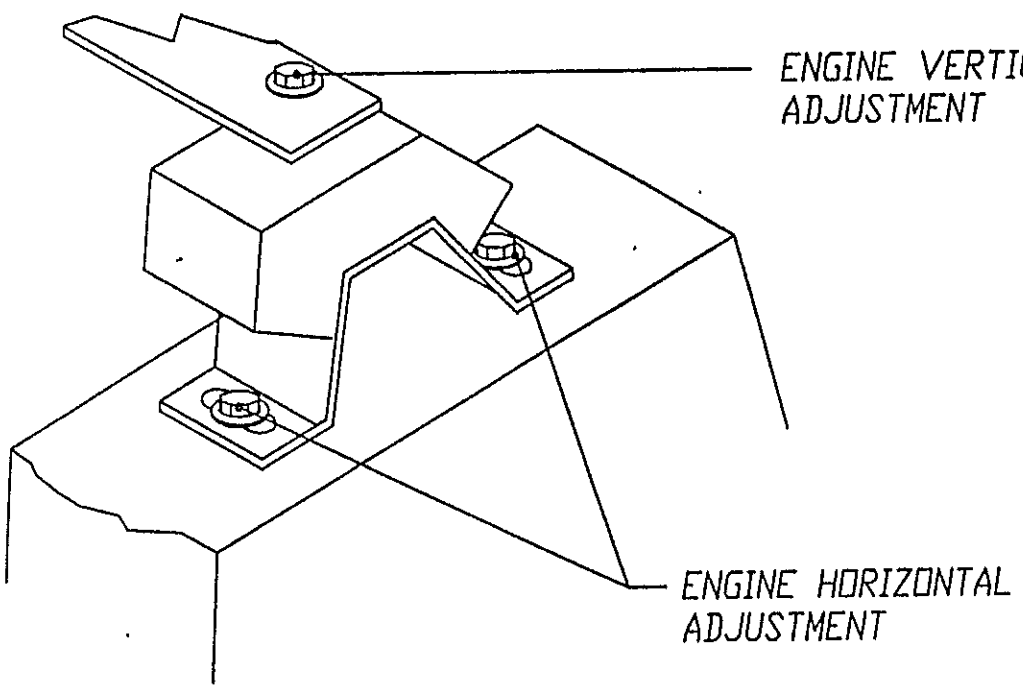
The stuffing box is held to the stern bearing by a rubber hose secured with hose clamps. (See the Shaft and Propeller section) The clamps should be tight and no water should leak from this location. While underway a slight drip from the stuffing box at the shaft exit is necessary (three to five drops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

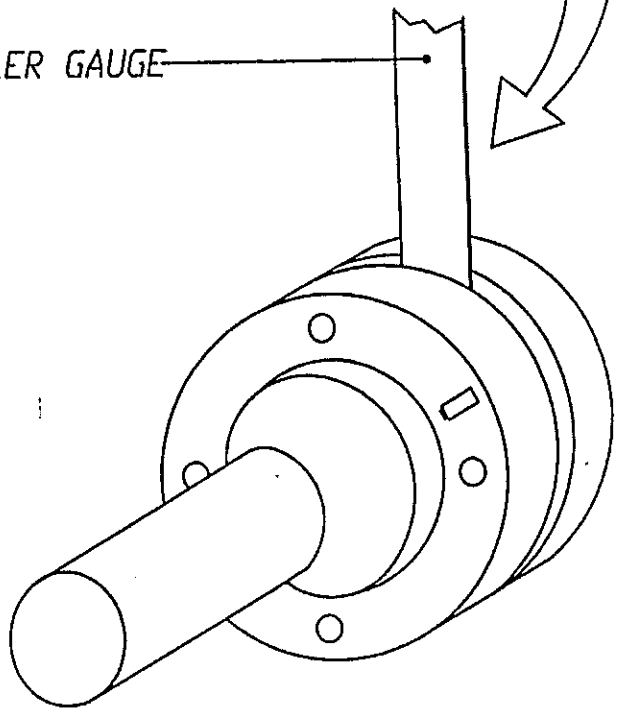
To adjust, loosen the locknut, tighten the gland nut one quarter turn, and retighten the lock nut. If excessive water flow persists after adjustment, replace the packing with 3/16" (or 5mm) square flax packing and then adjust as above.

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

Use only the Yanmar heat exchanger pressure cap for the 3JH2E system.
Use a low silicone content antifreeze (mix of 60% water / 40% antifreeze solution) such as that made by Prestone or Texaco (ethyl glycol solution).
Add FPPF 4000 to your antifreeze to improve coolant efficiency; follow the directions on the bottle.
Change coolant once a year (take out the thermostat, open valves and flush with distilled water). Recharge with fresh coolant mixture and FPPF 4000. Run the engine till it is warm, stop the engine and check the level. When the engine has had a few minutes to cool; add more coolant if the level is still low.
If the engine overheats the engine overheat sensor will signal a problem. Stop the engine, find the cause and fix. Here are some possibilities: engine sea hull intake is closed / sea water strainer is clogged with debris, or is letting in air (most likely the cause is one of these three culprits); the intake water hose has a leak; bad sensor; the impeller died (hope this does not happen to you in a rolling seaway as the repair is just *so* much fun); faulty heat exchanger pressure cap; bad thermostat; exhaust elbow is clogged and ready to be replaced (this is a major repair effort best left to a qualified mechanic); improper fuel timing; engine to propeller balance is incorrect, possibly indicating wrong prop.

WATER PUMP IMPELLER

The impeller should be replaced with the proper Yanmar part; be sure to have the impeller plate, screws and gaskets as provided in the minor repair kit. The starter has to be removed in order to get to the impeller. Do all of this in port. It is just too major of a repair job for the average sailor underway. The prudent sailor might want to replace the impeller every couple of seasons or so to avoid a breakdown.

TRANSMISSION / SHAFT & COUPLING/ TRANSMISSION FLUID / DIPSTICK

The transmission is located at the rear of the engine in line with the propeller shaft. The small automatic transmission fluid dipstick should be checked periodically to ensure sufficient fluid levels; a groove near the bottom of the stick is the full mark. NEVER overfill with automatic transmission fluid. One-half pint to a quart is maximum. Add fluid gingerly. If you don't you may overfill and then have frothing of the transmission fluid.
The shaft coupling should drip a drop of water or so an hour when not running. If it drips constantly, the shaft coupling should be tightened. If this does not fix the problem consider repacking the shaft. The drip rate should increase to 2-5 drops a minute when running.
The engine-to-shaft couplings need to be aligned so that it is straight as the shaft passes through the hull to the propeller. Coupling bolts should be re-torqued once a year to 37.5 foot/pounds. Serious damage can result from running an engine to power a misaligned or partially connected shaft. Note that barnacles on the shaft, a bent shaft, worn cutlass bearing, or bent prop will cause excessive vibration.
A shaft/propeller encumbered with debris can also cause loss of power and vibration.

ENGINE MOUNTS/ ALIGNMENT

Keep engine mounts clean as oil will really do some damage over the long-term. Use bilge cleaner.

OIL / OIL FILTER / DIP STICK / CHANGING OIL

Use API rated CD oil at SAE 30 by Yanmar for 3JH2E engine.
Oil pressure is normal at 36-42 psi.
Oil pressure alarm sounds at 7psi indicating trouble; shut down immediately!
Use Yanmar oil filter only for 3JH2E engine. Use a substitute and risk harming the engine.
Pull dip stick out, wipe it, set it back in. Don't seat it, walk away for 3 minutes, then check it for a true reading. If oil is near full mark, gingerly add a little more and then check level as above. NEVER OVER FILL.
Change oil with drill-driven pump or other suitable pump; use disposal bucket and have area covered with absorbent rags; change oil when it is warm enough to flow.

AIR INTAKE / EXHAUST ELBOW

Circular air mesh intake should be cleaned (remove then wipe it off (soap and water) at 10, 25, and 50 hour intervals and when commissioning boat each season. If you get blue smoke and/or your oil dipstick unseats itself, suspect a clogged crankcase breather mesh filter on top of your engine
Exhaust elbow is "u" shaped and carries the exhaust and used sea water from the engine. It works for 500-700 hours a maximum of 6 years.
If the elbow goes bad, the engine overheats, is hard starting, has low output (rpms); have a mechanic replace it ($250 - $350 w/labor - ouch!).
Don't idle your engine more than 2-3 minutes. Put it under load as this extends exhaust elbow and engine cylinder life.

RUNNING THE ENGINE / MOTOR SAILING

Run the engine with a load except for 2-3 minutes warm up time at idle. 750-850 rpm normal idle; 2500-2800 sustained cruise at desired speed; 2800-3400 to maintain speed in tough wind/current/wave conditions or to reach hull speed as necessary (approaching 7.6 knots in a steady sea state with normal weight aboard). Red line is 3600 rpm +/- 50 rpm on the Hunter 376 engine tachometer.
Run the engine once a month during the sailing season with sufficient rpm to reach sustained hull speed for 2 hours (this assumes the boat is not overloaded and the bottom is reasonably clean). The idea is to keep the engine reasonably clean of life-robbing varnish deposits on the cylinders.
Feeling a harmonic/vibration at 1100-1200 rpm, or at approx. 2350 +/-100 rpm is not unusual. Avoid these engine rpms and the vibration will disappear.
Motor sailing with the jib works fine, but don't exceed 17 degrees of heel as the engine pickup tube will cease sending oil to the engine oil pump.

COOLING SYSTEM / COOLANT / ADDITIVES / OVERHEATING PROBLEMS

The engine uses a sealed, freshwater cooled system contained in a bundle of cooling tubes. Sea water is pumped over the sealed system to carry away engine heat and then it is piped overboard via the exhaust mixing elbow (the sea water is 13 degrees hotter as a result of absorbing engine heat transferred to the sealed freshwater coolant). Engine heat is transferred via a heat exchanger to heat fresh water (water heater).

Recommend buying FPPF fuel additives and Yanmar 30wt oil

MAINTENANCE SERVICE INTERVALS

10 hour, 25 hour and 50 hour. Follow the manuals (this is a maintenance intensive approach)
First use of the day - engine check: belts, fuel/oil/transmission/coolant fluid levels (full); bolts secure on engine-shaft coupling; 12vdc availability (see volt and amp meters) (check battery fluid once a month if not using gel cells etc.); no evidence of coolant/transmission/oil/fuel leaks

FUEL INJECTION SYSTEM / FUEL LINE / FIXING FUEL LINE AIR LOCK / FUEL FILTER

Fuel flows from tank to Primary Racor 110 filter with a 10 micron insert to the secondary filter on the engine (10 micron).
Rigid fuel lines and injector feed lines cannot be bent unnaturally.
Prevent air lock by keeping enough fuel in the tank. The H-376 is baffled so when the boat heels the tank delivers fuel rather than air on the high side of the tank.
Clear an air lock by using a 10mm wrench to bleed the secondary filter by pumping the fuel lift pump. When you have fuel flow, open the fuel rack fully. Shut the engine seawater cooling hull valve. Crank the engine. Upon starting open the hull valve and reduce engine RPM gradually to idle. Start engine using pre-lube sequence if engine has been idle for 48 hours.
The Yanmar secondary filter is top starboard of the engine; primary is in the fuel line after the tank before the engine use Yanmar filters for the 3JH2E engine.

ENGINE STARTING / PRE-LUBE TECHNIQUE / ENGINE STOP CABLES

Use normal engine starting when it is warm and the engine has been run within the last 48 hours: hull sea cock open; turn key avoid prolonged cranking of the starter.
Use cold or 48 hour plus engine starting: 1) shut hull sea water sea cock; 2) with stop cable fully engaged (stop cable pulled out); 3) turn key 10 seconds then stop for 5 seconds; 4) turn key 10 seconds then stop for 5 seconds; 5) Then disengage stop cable (push the stop cable in) while turning the key to start 6) subsequently open hull sea water cock
Check stop cable: Keep it salt free, lubricated and adjusted. If it breaks get a new one.

FUEL

Use low sulfur diesel (amber), or red, bought at a marina. It is approx. 38 cetane (flash point for ignition). 45 cetane gives the best engine timing and prevents smoking.
ADD Yanmar FPPF 8 Plus cetane improver. 1/4 ounce per gallon. One bottle treats 120 gallons. It raises the cetane level and stops smoking and engine timing problems.
ADD Yanmar Biocide Killem (small amount) to treat tank and prevent algae growth.
ADD Yanmar FPPF Lubricity 100, 1/8 oz per gallon. A sulfur additive to stabilize fuel and lubricate.
ADD Yanmar Diesel Fuel Treatment if 45 degrees F or less to keep diesel fuel fluid.

DIESEL ENGINE TIPSTRIMMING THE "IRON GENOA": DIESEL ENGINE TIPS for the HUNTER 376 and 380

by Curt Morris (sail376@erols.com)
Managing Owner of Smooth Operator, a 1998 model H-376; member of Hunter Sailing Association 1 and the Seven Seas Cruising Association

Editor's Note: Although this document is directed to owners of the 376 and 380, we feel it is good reading for any owner with a Yanmar auxiliary diesel engine. However, be advised that we have not edited this submission nor have we verified its content with Yanmar, Hunter Marine, or any other manufacturer, service technician, or authority. As with all information on this site, you use it at your own risk.

PURPOSE

This unofficial operators tips paper is designed to be a ready reference for the 3JH2E diesel engine used in the Hunter 376 and 380. Much of what is presented is also applicable to other Yanmar engines used in various Hunter sailboat models.
The material is presented by major topic and the text is intentionally synoptic to get to the bottom line.

CAVEATS

This tips paper grew out of my own need to know more about the engine in my boat and is the result of personal research and discussions and input from other Hunter sailors and knowledgeable diesel experts. As such, the tips paper is unofficial and not a publication of Yanmar or Hunter Marine. Everyone I talked to thought the material should be shared; so here it is. Since it is unofficial, no liability is assumed or implied by me, Yanmar, Hunter, or any other company or person. The reader assumes all risks and is of course free to consult with Yanmar, Hunter, or other authority.

THE "IRON GENOA" FROM A SYSTEMS VIEWPOINT

ENGINE SERIES / PARTS

The model 3JH2E is the H-376, 36hp diesel (3 cylinder freshwater model with heat exchanger).
Use engine model number, or serial number, to get parts (numbers are located on an ID plate on the heat exchanger). The transmission serial number is located on the side or back. The numbers may be covered by gray paint.

WARRANTY

One year total except consumables (belts, etc.)/ second year all but fuel injectors and electrics
1998 boats - a five year warranty was being considered - check to confirm

MANUALS / TOOLS / SPARE PARTS / ADDITIVES

Follow at least the minimum maintenance schedule in the Hunter-provided Yanmar Operator Manual
Consider buying Yanmar Service Manual, Yanmar Diesel Engine Parts Manual (has all parts and torque pressure specifications etc.), and a metric ratchet head set (everything on the engine is metric except the engine mount bolts)
Consider a 3JH2E Minor Spares Kit with a impeller rebuild kit (cover plate included) to augment the impeller included in the minor spares kit

Check again to ensure that the mounts and engine alignment are correct if the boat has been in dry storage or the standing rigging has been adjusted. These stresses can affect the alignment.

BATTERIES / 12VDC CHARGER / SOLAR PANEL

An 80 amp starter battery is normally supplied with the boat and the regulator allows charging at 3 amps per hour. If the battery is drawn down to 60 amps, it will take 6-7 hours of engine running time to come back up to a full charge.

All battery connections should be clean and tight; otherwise a false high resistance may develop thereby rendering the system ineffective.

The 12V DC charger will normally keep the battery topped off given normal usage. The engine start battery uses a solar panel to keep the battery topped off at ² amp per hour...when the sun is shining. The 50 amp alternator provides the main charging to both batteries when the engine is run above 1100rpm.

The battery selector switches should be in the "on" position to allow the alternator to charge both batteries at the same time.

Fluid-filled battery levels should be checked once a month. Dry batteries die young.

THE "IRON GENOA" BOTTOM LINE

A well-cared for and properly operated 3JH2E can be counted on to deliver anytime, anywhere, for years before requiring an overhaul.

YANMAR QUICK REFERENCE LIST

Here it is, do-it-yourselfers... a complete reference guide of maintenance parts for all Yanmar engines. The numbers you see are Yanmar part numbers which may be ordered from many marine retailers, or direct from Yanmar at **(847) 541-1900, FAX (800) 323-2401**. We hope to soon have these parts available on HOW... but meanwhile, if you have questions, **don't ask us, ask Yanmar** or your Hunter dealer. We just work here.

This information is believed to be accurate, however, the Hunter Owners Web cannot attest to its accuracy. In using this information you agree to hold the Hunter Owners Web harmless from any liability resulting from loss, failure, or incorrect parts. All data is subject to change without notice. Please notice footnotes where provided.

Engine Model	Engine Oil	Oil Filter	Fuel Filter	Air Element	Cooling Water Belt	Alt/Gen Belt	Anti-Corrosive Zinc	Cooling Sea Water Impeller
D27 outboard	41540	119660-35150	129100-55650 x 120270-55101 y	NA	NA	120270-01430	120270-09302 196630-02670	196630-08151
D36 outboard	41540	129150-35150	120270-55101	NA	NA	120380-01430	120270-09302 196630-02670	196640-08051
D27A outboard	41540	129150-35151	129100-55650	NA	NA	120270-01430	120270-09302 196630-02680	196630-08152
D36A outboard	41540	129150-35151	129100-55650	NA	NA	120380-01430	120270-09302 196640-02680	196640-08051
1GM	41540	124450-35100	104500-55710	128170-12540	NA	128170-77350	27210-200200	128170-42070 (a)
2GM and 3GM (D)	41540	124450-35100	104500-55710	128270-12540	104511-78780	25132-003000	27210-200300	104211-42070 (b)
2GMF and 3GMF	41540	124450-35100	104500-55710	128270-12540	104511-78780	121150-42290	27210-200300	124223-42091 (c)
1GM10	41540	124450-35100	104500-55710	128171-12540	NA	128170-77350 t	27210-200200	128170-42070 (a)

STEERING

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

⚠ WARNING

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

ELECTRICAL SYSTEMS

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

⚠ WARNING

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

⚠ CAUTION

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

⚠ 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.

COMPASSES:

A BOAT COMPASS RARELY EXISTS IN AN ENVIRONMENT THAT IS COMPLETELY FREE FROM MAGNETIC MATERIALS OR INFLUENCES.

THE COMPASS ON YOUR BOAT SHOULD BE ADJUSTED BY A CERTIFIED COMPASS ADJUSTER, AND HAVE A DEVIATION TABLE MADE FOR IT.

IF YOU MUST DEPEND SOLELY ON YOUR COMPASS FOR NAVIGATION, MAKE A QUICK CHECK FOR ANY OBJECTS NEAR THE COMPASS THAT MAY CAUSE ADDITIONAL, UNMEASURED DEVIATION. TYPICAL OBJECTS THAT MAY FALL IN THIS CATEGORY INCLUDE: KNIVES, SMALL RADIOS, FLASHLIGHTS OR OTHER TOOLS.

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.

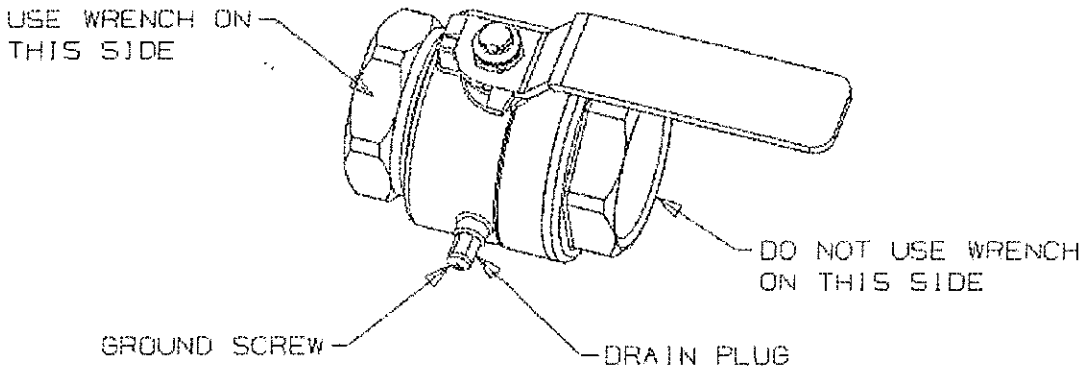
On a calendar basis the lists should note such matters as electrolyte levels in storage-batteries, pressure gauges on dry-chemical fire extinguishers, and all navigation lights. Check the operation of automatic bilge alarms or pump switches by running water into the boat. Periodically close and open 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.

MARINE HARDWARE INC™

Quality materials make it strong ... Our designs make it better.

BALL VALVE DRAINING AND WINTERIZING INSTRUCTIONS

To winterize, the vessel must be out of the water.
Close the valve and loosen the hose at its upper end opposite the valve.
Open the valve to drain hose and valve.
Remove the drain plug on the side of the valve to drain water from the valve body.
Open and close valve until liquids have been drained from valve body.
Replace and tighten plug. Reattach and tighten hose.
Check open and close operation of valve and all connections at spring recommissioning and before re-launch.
Check for leaks during re-launch.



5/20/04

Redmond, WA www.marinehardware.com Ormond Beach, FL
Phone: 425-883-0651 Fax: 425-869-1232
Ship: 14560 NE 91st Court • Redmond, WA 98052
Mail: P.O. Box 3099 • Redmond, WA 98073
Phone: 386-677-0687 Fax: 386-676-3869
5 Aviator Way • Ormond Beach, FL 32174

E

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

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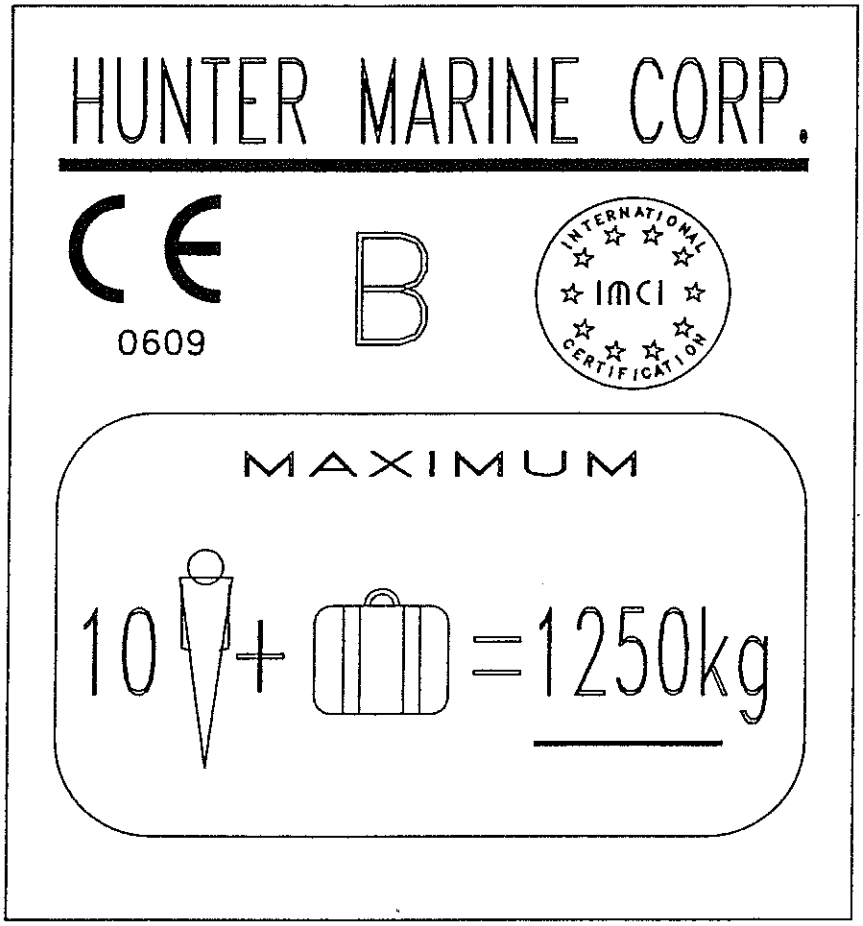
Chicago, IL 60611
PH: (1) 312-946-6200 FX: (1) 312-946-0388

BUILDER'S INFORMATION PLATE

HUNTER MARINE CORPORATION

H310



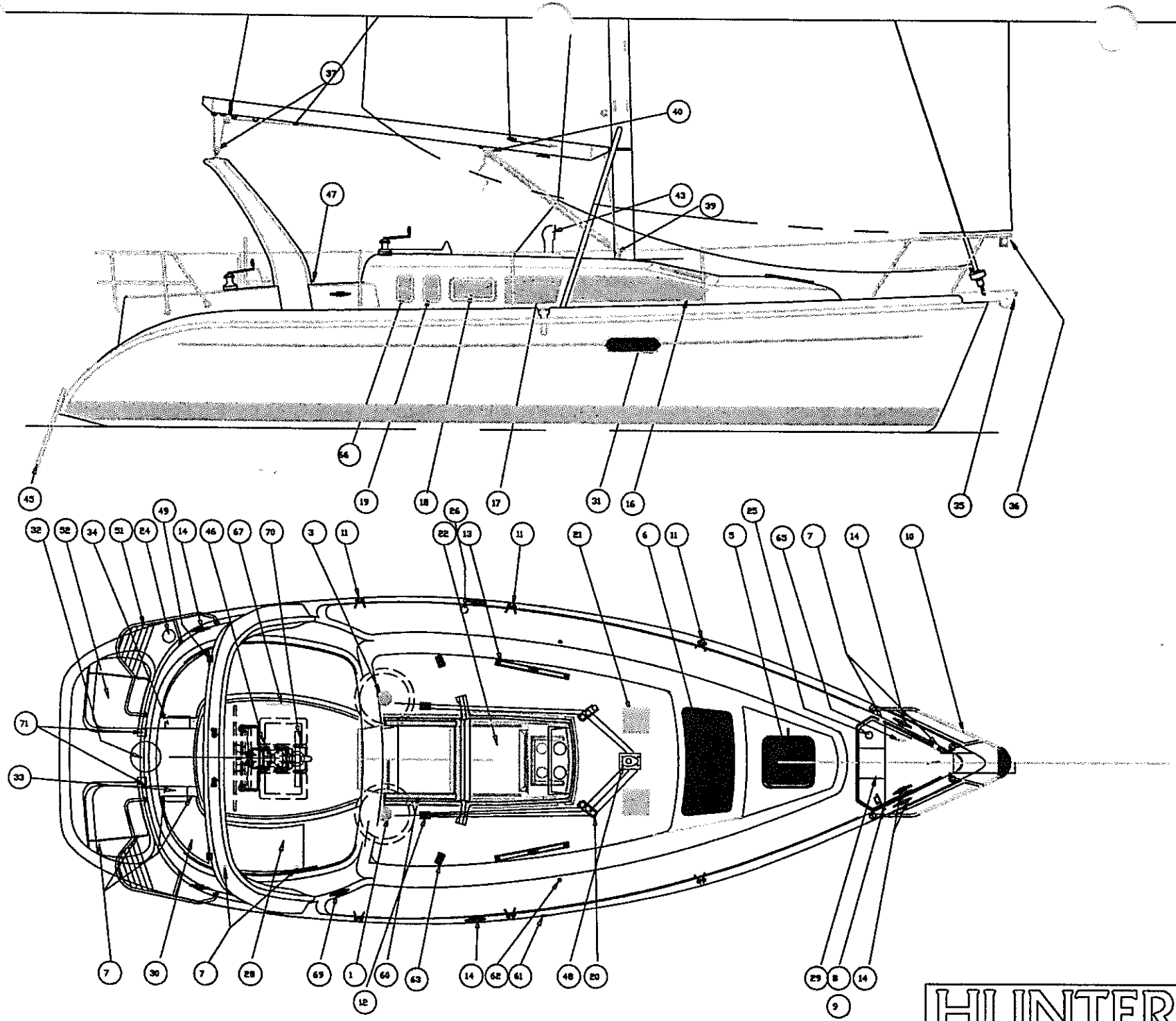
LIGHTSHIP DISPLACEMENT = 3887Kg (8551Lb)
FULL LOAD DISPLACEMENT = 5137Kg (11,301Lb)
SINK @ FULL LOAD = 82mm (3.24")

EACH HUNTER 310 MODEL WITH THE CE MARK IS AND WILL CONTINUE TO BE IDENTICAL TO THE INDIVIDUAL UNIT OF THAT MODEL WHICH WAS OFICIALLY INSPECTED AND APPROVED

DIMENSIONS, CAPACITIES, ETC.

HUNTER 310

LENGTH OVERALL (LOA)	30'10"	9.40m
LENGTH OF WATERLINE (LWL)	28'0"	8.53m
BEAM (MAX)	10'10"	3.30m
DRAFT (SHOAL)	4'0"	1.22m
DRAFT (DEEP)	5'6"	1.68m
DISPLACEMENT	8,551 lbs.	3,887 kg
BALLAST	3,000 lbs.	1,361 kg
SAIL AREA (100% TRAINGLES)	464 sq. ft.	43.1 sq.m
SAIL AREA (ACTUAL W/STANDARD SAILS)	545 sq. ft.	50.6 sq.m
I	37'1"	11.30m
J	11'8"	3.56m
P	39'1"	11.91m
E	12'8"	3.86m
MAST HEIGHT (FROM WATERLINE)	49'4"	15.04m
HEADROOM	6'4"	1.93m
WATER CAPACITY	50 U.S. gal.	189 liters
HOLDING TANK CAPACITY	50 U S gal.	76 liters
FUEL TANK CAPACITY	25 US gal.	95 liters
LPG TANK CAPACITY	4 lbs.	1.82 kg
BATTERY CAPACITY	DEALER SUPPLIED	
ELECTRICAL VOLTAGES	SEE ELECTRICAL DRAWINGS	
INBOARD ENGINES	18 hp	13.4 kw
MAXIMUM LOADING	10 PEOPLE	1250 kg (INCLIDING LUGGAGE)
LIFTING POINTS	INDICATED BY "SLING" LABELS ON HULL	

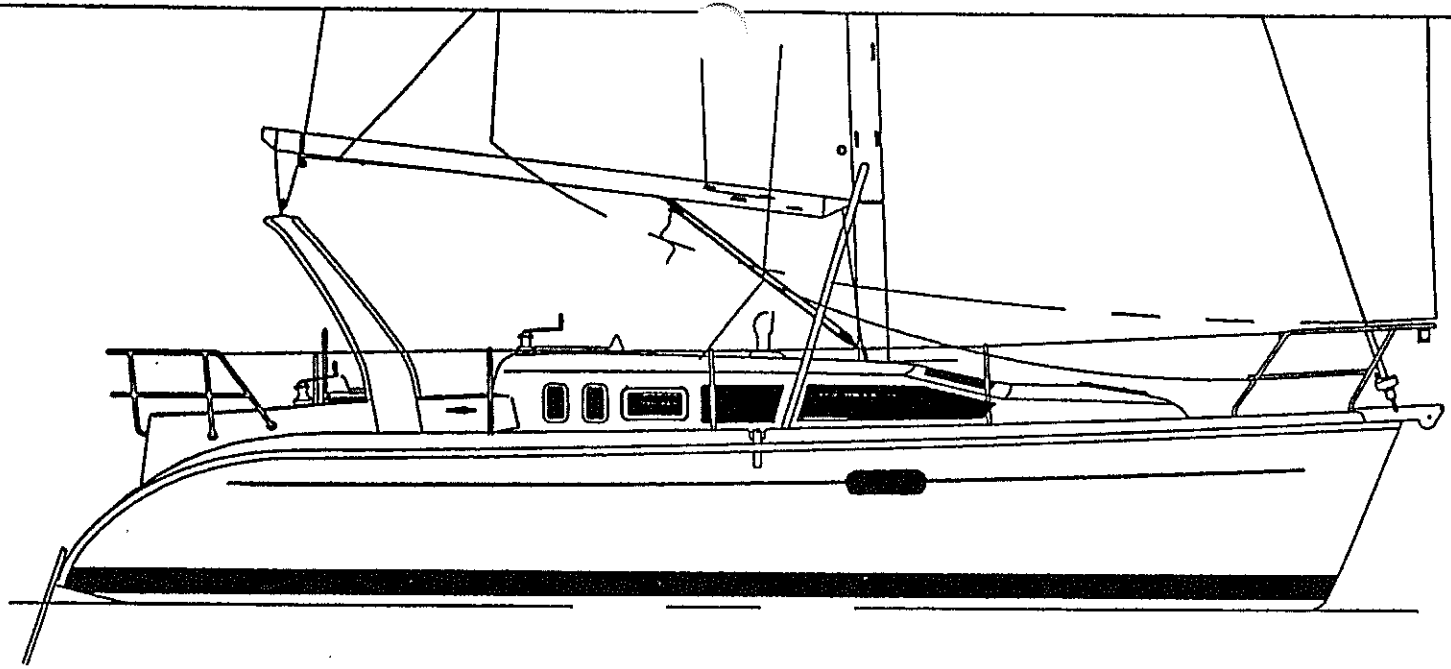


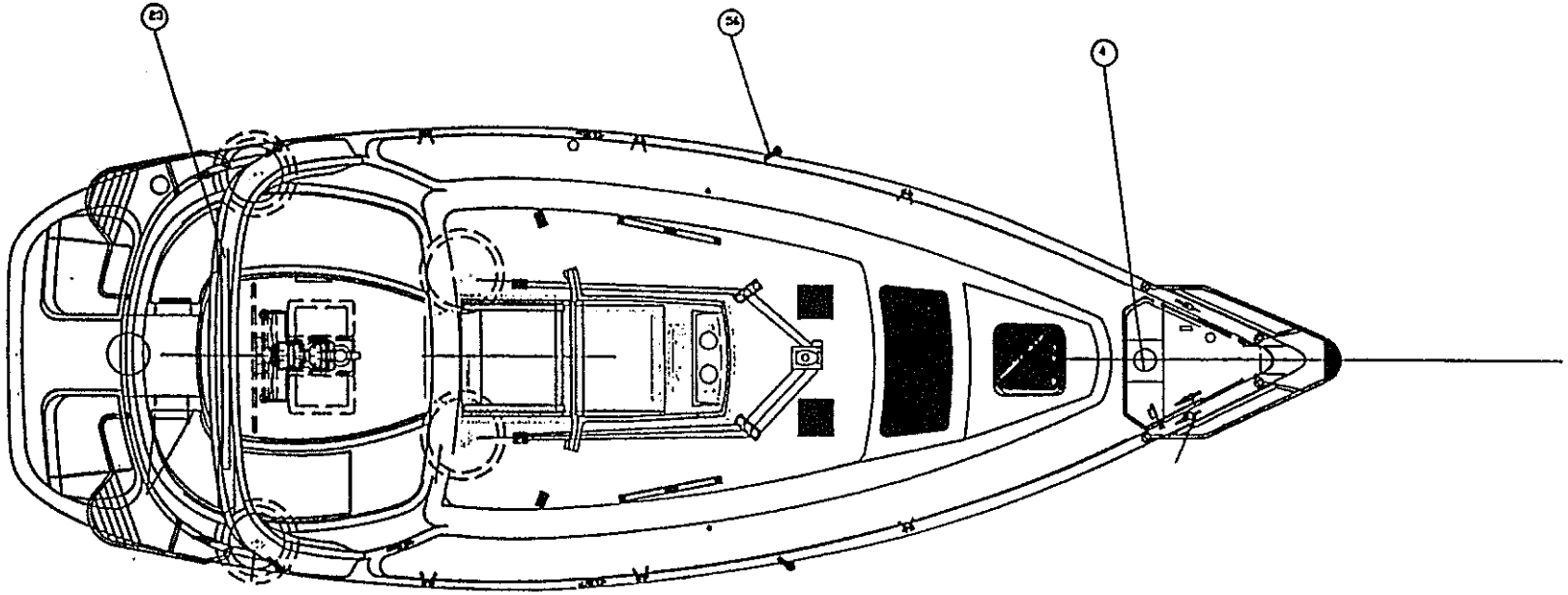
DECK HARDWARE LAYOUT

HUNTER

H-310 DECK LAYOUT

DRAWING # 3108038A





OPTIONAL DECK LAYOUT

HUNTER

H-310 OPT. LAYOUT

DRAWING # 3108038B

310 DECK GEAR

11/23/96

NUMBER	PART	HUNTER #	MANUFACTURER	MANUFACT #	FILE NAME	QUANTITY
1	WINCH	HW2519	LEWMAR	30ST		1
3	WINCH	HW2518	LEWMAR	16ST		1
5	FWD HATCH	HW0120	BOMAR	1080-10A		1
	TRIM RING	HW				1
	SCREEN	HW				1
6	CABIN WINDSHIELD	PX				1
21	MID HATCH	HW0014	LEWMAR	COAST 10		2
	TRIM RING	HW				2
	SCREEN	HW				2
7	HINGE	HW4172	GEM			12
8	ANCHOR LOCKER HANDLE	HW4481	SOUTHCOAST			1
9	STRIKER PLATE	HW	KENS		30620024	1
10	BOW PULPIT	HW	SOUTHCOAST		306008	1
11	STANCHION 450 TYPE	HW1747	SOUTHCOAST		30620018	6
12	HALYARD STOPPER STBD	HW1259	SPINLOCK	XA3		2
	HALYARD STOPPER PORT	HW1276	SPINLOCK	XA2		
13	JIB TRACK	29.5 STYLE	25" LONG			2
	JIB TRACK ENDS	HWO205	SCHAEFER			2
	JIB TRACK CAR	HW0238	SCHAEFER			2
14	CLEAT	HWO975				7
69	CLEAT	HW0980				1
15	CABIN WINDSHIELD	PX	VIPLEX			1
16	WINDOW (PLEXI)	PX				2
17	WINDOW PLEXI)	PX				2
18	WINDOW	PX0323				2
19	OPENING WINDOW	HW0043				2
66	WINDOW (PLEXI)	PL				2
67	WINDOW (COCKPIT)	HW0039				1
	TRIM RING	HW				1
	SCREEN	HW				1
20	HALYARD ORGANIZER	HWO399	SCHAEFER	505-81		2
22	SEA HOOD		GLASS PART		3060003	1
24	DIESEL FILL	PL1126	SEADOG			1
25	WATER FILL	PL1130	SEADOG			1
26	WASTE PUMP OUT	PL1140	TIMA			1
28	FORMER EURO HATCH LID		GLASS PART			1
29	ANCHOR HATCH LID		GLASS PART			1
30	GULL WING HATCH LID		GLASS PART			2
31	HULL SIDE PORT (FIXED)	PX	NORTH FLORIDA			2
32	INSPECTION PORT	VC010004	BECKSON			1
33	TRANSOM SHOWER	PLO189	SAILING SPEC			1
34	BILGE PUMP	PLO371	RULE			1
35	BOW ROLLER	HW161O	SOUTHCOAST		30620023	1
36	BOW LIGHT	ELO380	HELLA			1
37	MAINSHEET SYSTEM					
	ARCH MS. BLOCK	HW	HARKEN	O11		2
	BOOM BLOCK MS.	HW	HARKEN	O11		1
	STRAP EYE	HW	HARKEN	1558		2
	SPRING	HW	HARKEN	71		2
39	VANG BLOCK	HW0211	SCHAEFER	505-45		1
40	VANG BLOCK	HW0280	SCHAEFER	505-75		1
43	DORADE	HW4257	MARINCO			2
45	SWIM LADDER	HW	WINDLINE	TLD-3X		1
46	COCKPIT TABLE	N/A	HUNTCI MIII			1
	STEERING SYSTEM	HW	EDSON	RACK AND PINYON		1
47	COMPASS	LGO135	RITCHIE	PO79397		1
48	MAST STEP	HW	Z-SPAR	1103		1

49	GULL WING SEAT HANDLE	HW2318					2
51	STERN RAIL	HW2246				2	
52	TRANSOM HATCH LID		GLASS PART			2	
61	VERTICAL CHAINPLATE	HW1748			30620022	2	
62	LOWER CHAINPLATE	HW1748			30620021	2	
63	BLOCK WITH CAM STOPPER	HW	SPINLOCK	JK/50		2	
65	U BOLT	HW5512				1	
70	GRAB HANDLE	HW2315				1	
71	HELM SEAT HINGE	HW4175				2	
	MAIN HALYARD	RIO775				1	
	JIB HALYARD	RIO775				1	
	MAIN TRAVELER LINE	RIO775				2	
	REEFING LINE #1	RIO775				1	
	REEFING LINE #2	RIO775				1	
	JIB SHEET	RIO775				2	
	VANG	RIO775				1	
	LAZY JACK WIRE	RIO775				2	
	ADJUSTABLE LAZY JACK LINE	RIO775				2	
	MAINSHEET	RIO775				1	

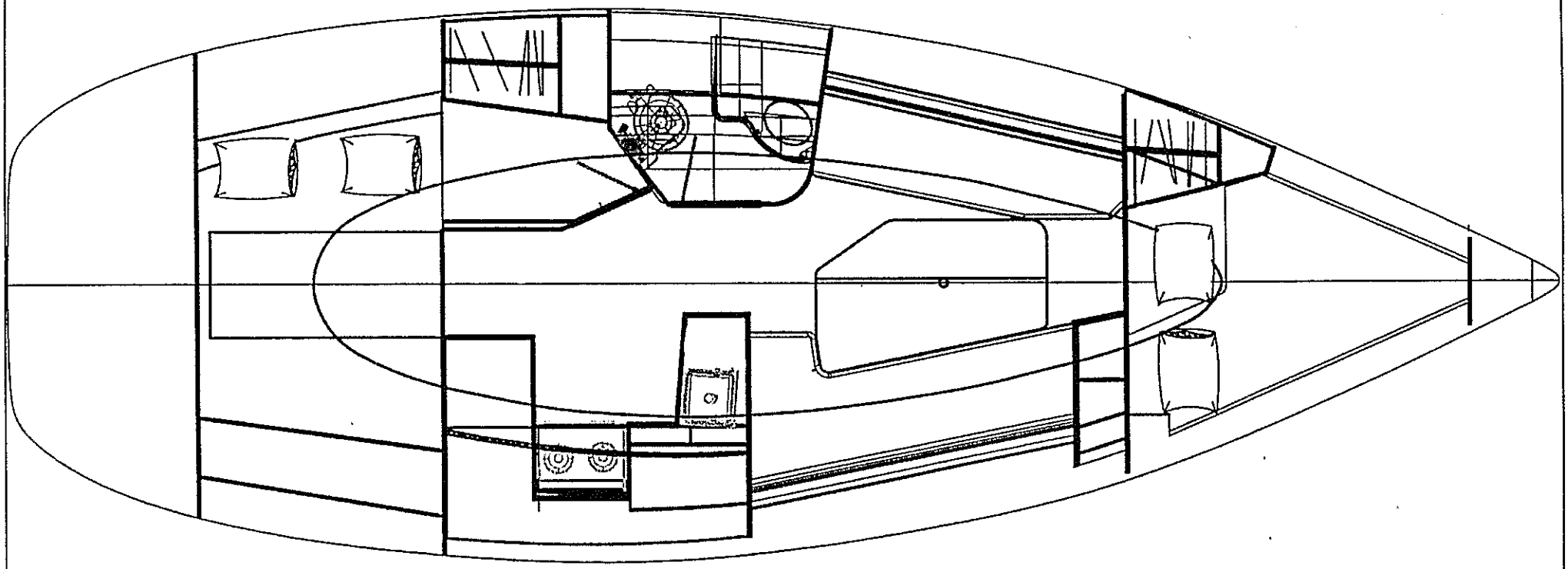
OPTIONAL GEAR

4	WINDLASS	HW	SIMPSON LAWREN	SL00605167		1
56	SNATCH BLOCK OPTIONAL	HW	SCHAEFER	07-99		2
	STEERING SYSTEM	HW	EDSON	QUADRENT		1
23	TRAVELER BAR	HW	HARKEN	1510-5' 6"		1
	TRAVELER CAR	HWO34O	HARKEN	1508		1
	TRAVELER END CAPS	HWO343	HARKEN	1524		2
	STAND UP TOGGLE	HWO34O	HARKEN	1561		

	PORT CONTROL BLOCK	HW0341	HARKEN 1516	1
	STBD. CONTROL BLOCK	HW0342	HARKEN 1516	1
	TRAVELER CONTROL BLOCK	HW0340	HARKEN 1845	2
	3" HARKEN BLOCK	HW	HARKEN 1540	1
	OVER THE TOP BLOCKS	PR5108	SCHAEFFER 506-40	4
	CAM CLEATS	PR5109	HARKEN 365	2

SPINN. GEAR

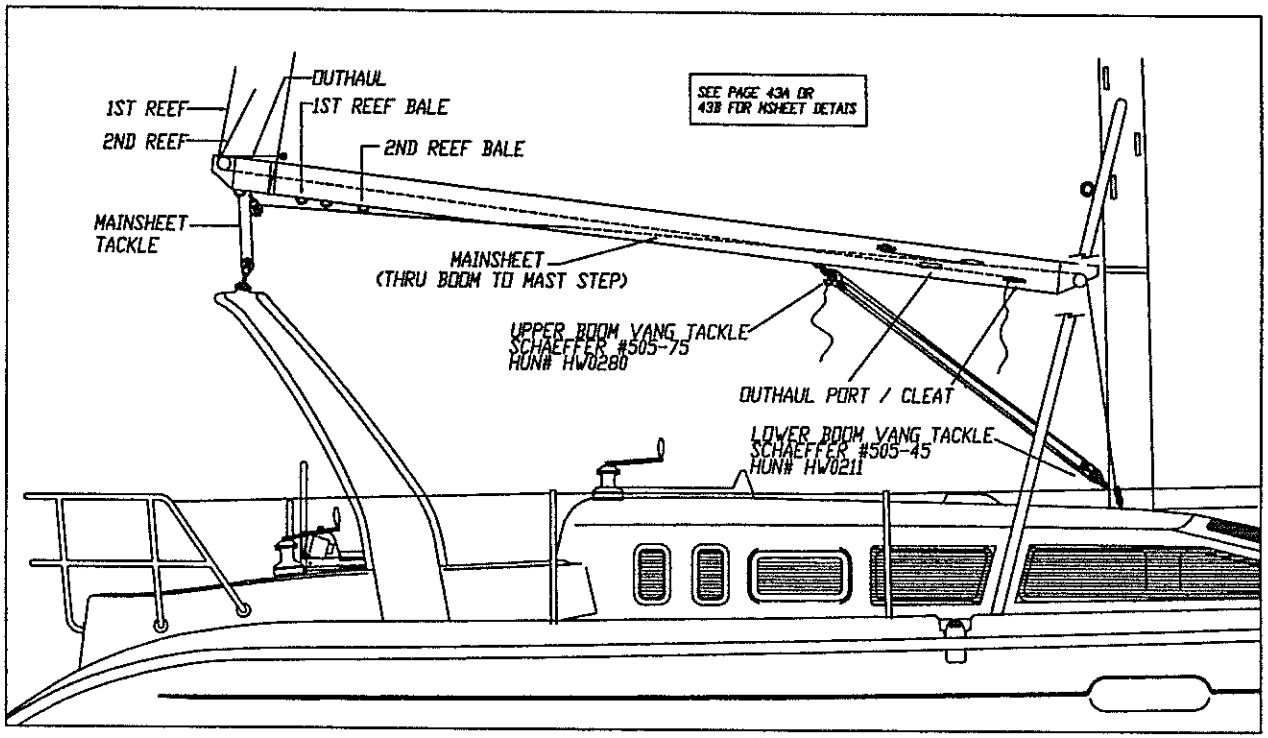
2	WINCH	HW2519	LEWMAR	30ST		2
50	SPIN BLOCK OPTIONAL	HW0276	SCHAEFER	505-15		2
68	MAST STEP BLOCK	RIO448	ZSPARS	275		1
69	LINE STOPPER	HW1274	XA-1			
	SPIN. SHEET	RI0245				2
	SPIN. HALYARD	RI0245				1

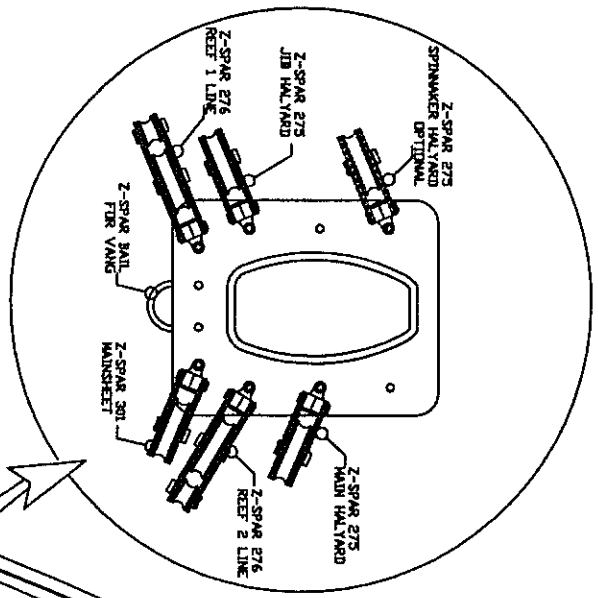


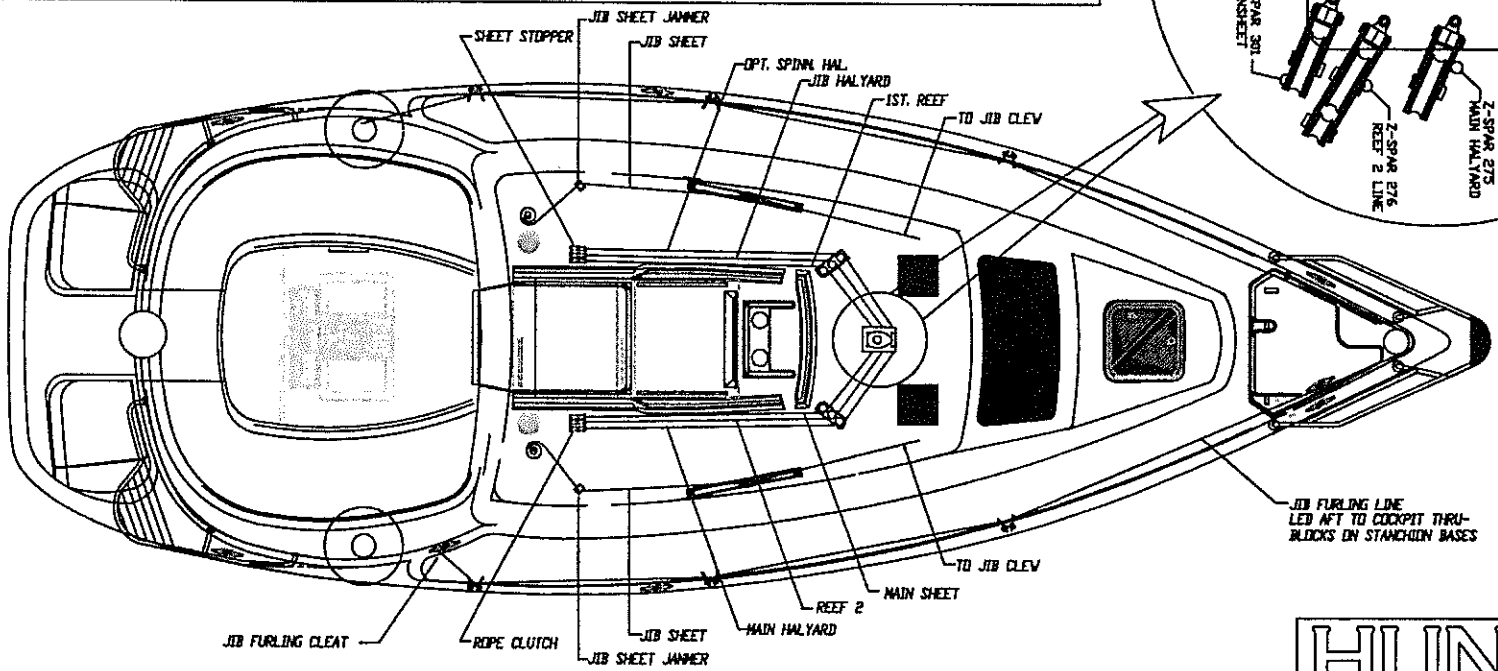
ACCOMODATION PLAN

HUNTER

H-310 ACCOMODATION
DRAWING # 3108041





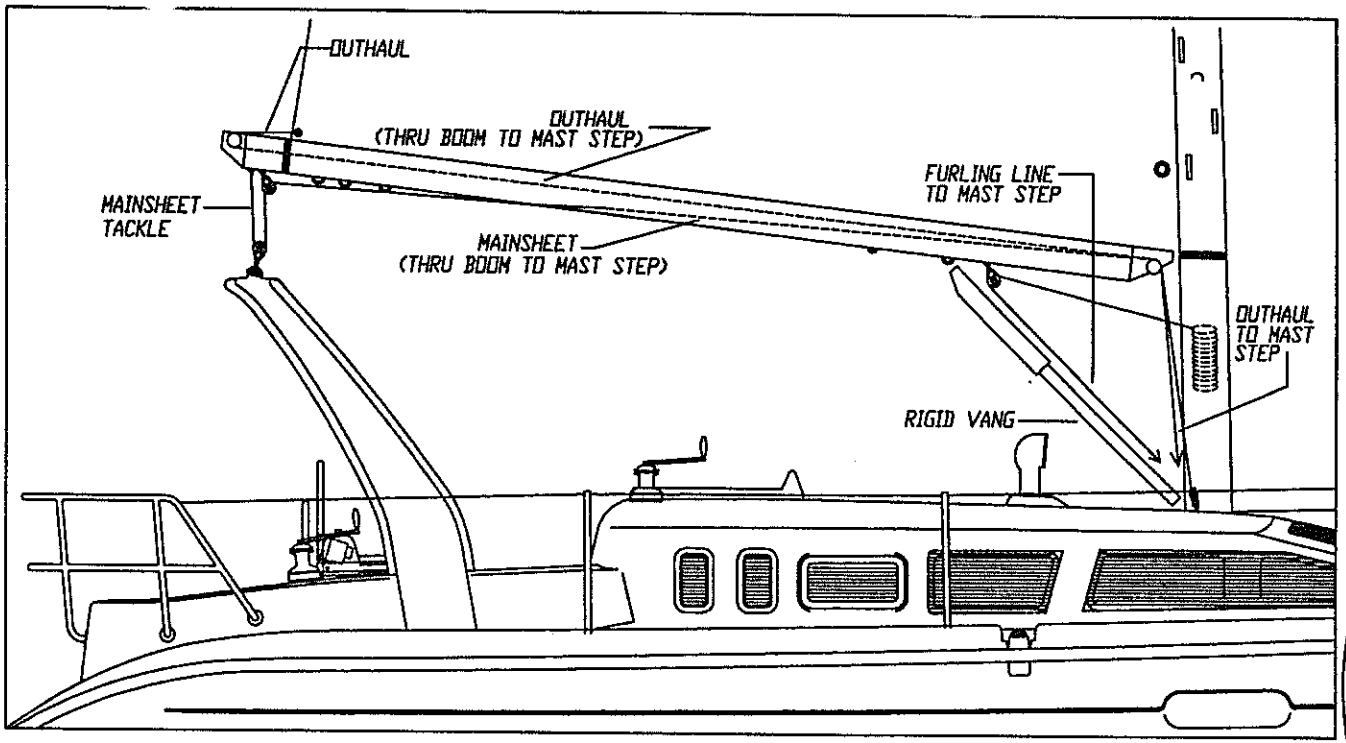


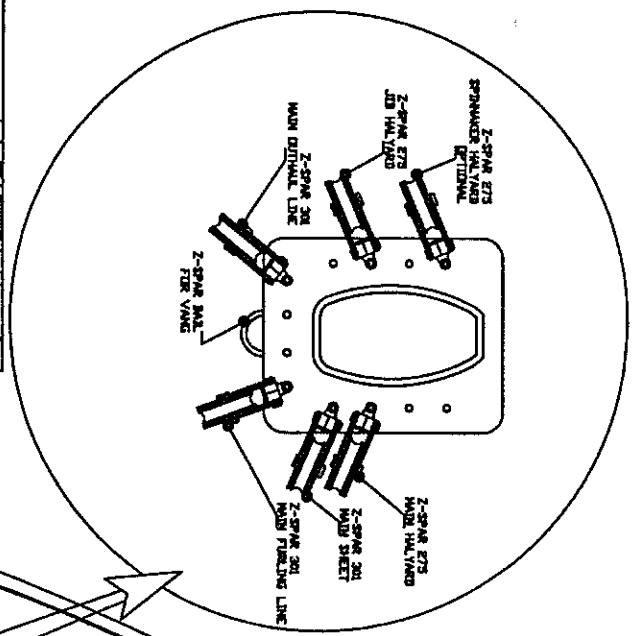
RUNNING RIGGING & MAST STEP LAYOUT (STANDARD)

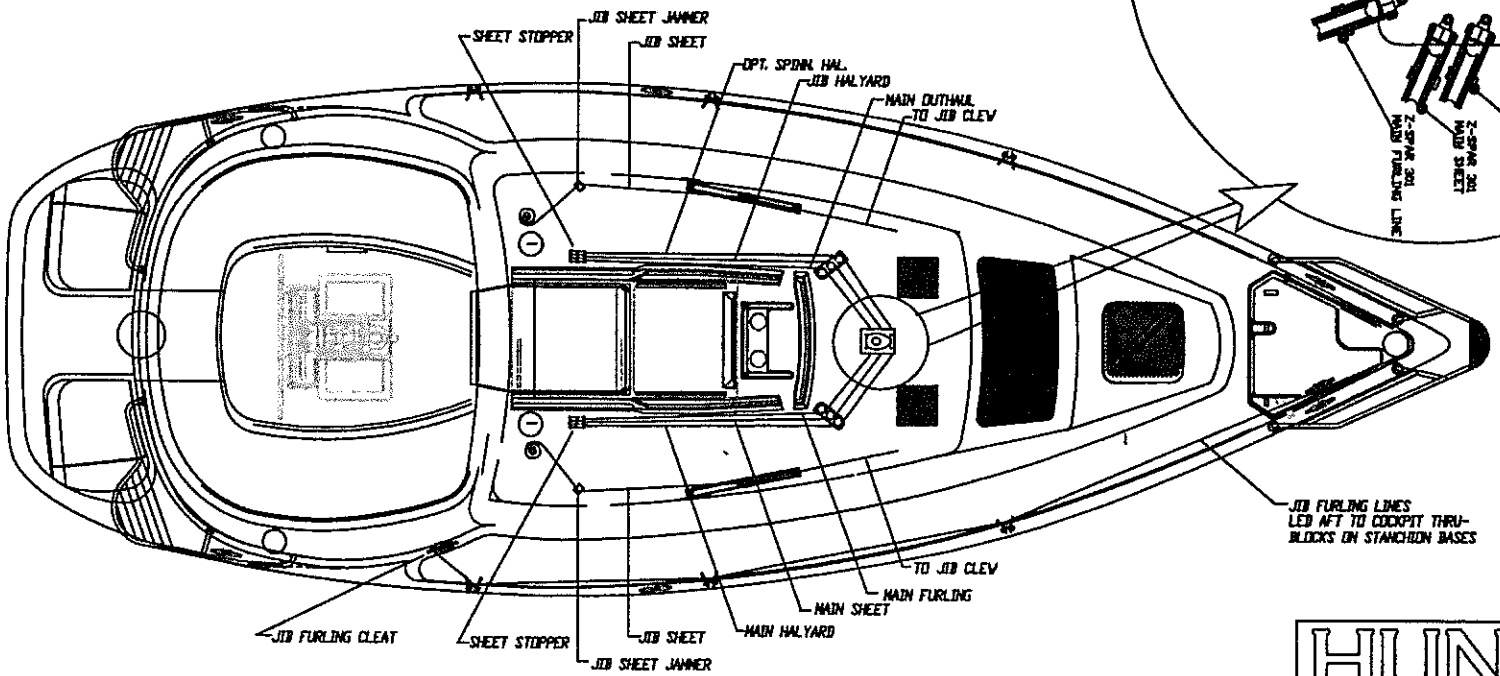
HUNTER

H-310 RUNNING RIG. STD.

DRAWING # 3108042A







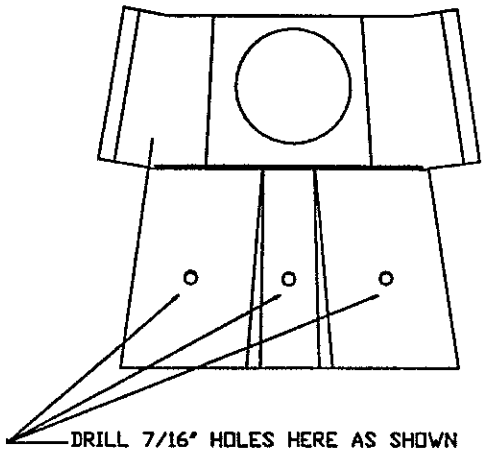
RUNNING RIGGING & MAST STEP LAYOUT (FURLING)

HUNTER

H-310 RUNNING RIG. FUR.

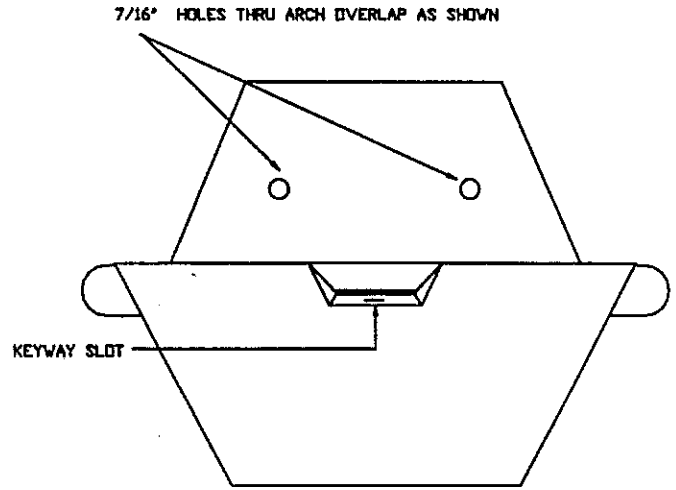
DRAWING # 3108042B

PAGE 42B



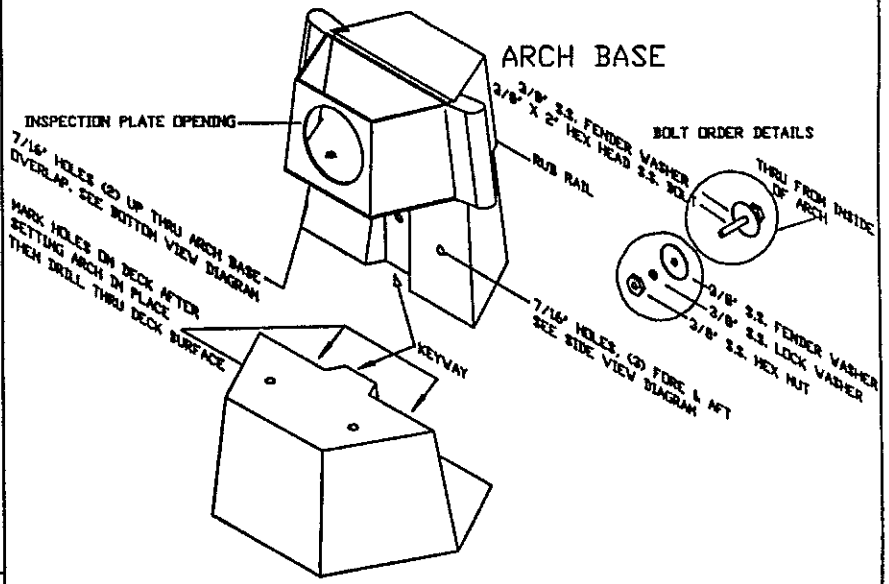
DRILL 7/16" HOLES HERE AS SHOWN
(APPROX. ON CENTER BOTH DIRECTIONS
ONE IN CENTER OF KEYWAY SLOT, AND ONE ON CENTER
OF EACH FLAT FWD. AND AFT OF KEYWAY SLOT)

ARCH BASE SIDE VIEW



ARCH BASE BOTTOM VIEW

ISO VIEW OF STBD. SIDE
AFT LOOKING FORWARD
(PORT SIDE MIRROR IMAGE)



DECK SURFACE
(ARCH RECEIVER BASE)

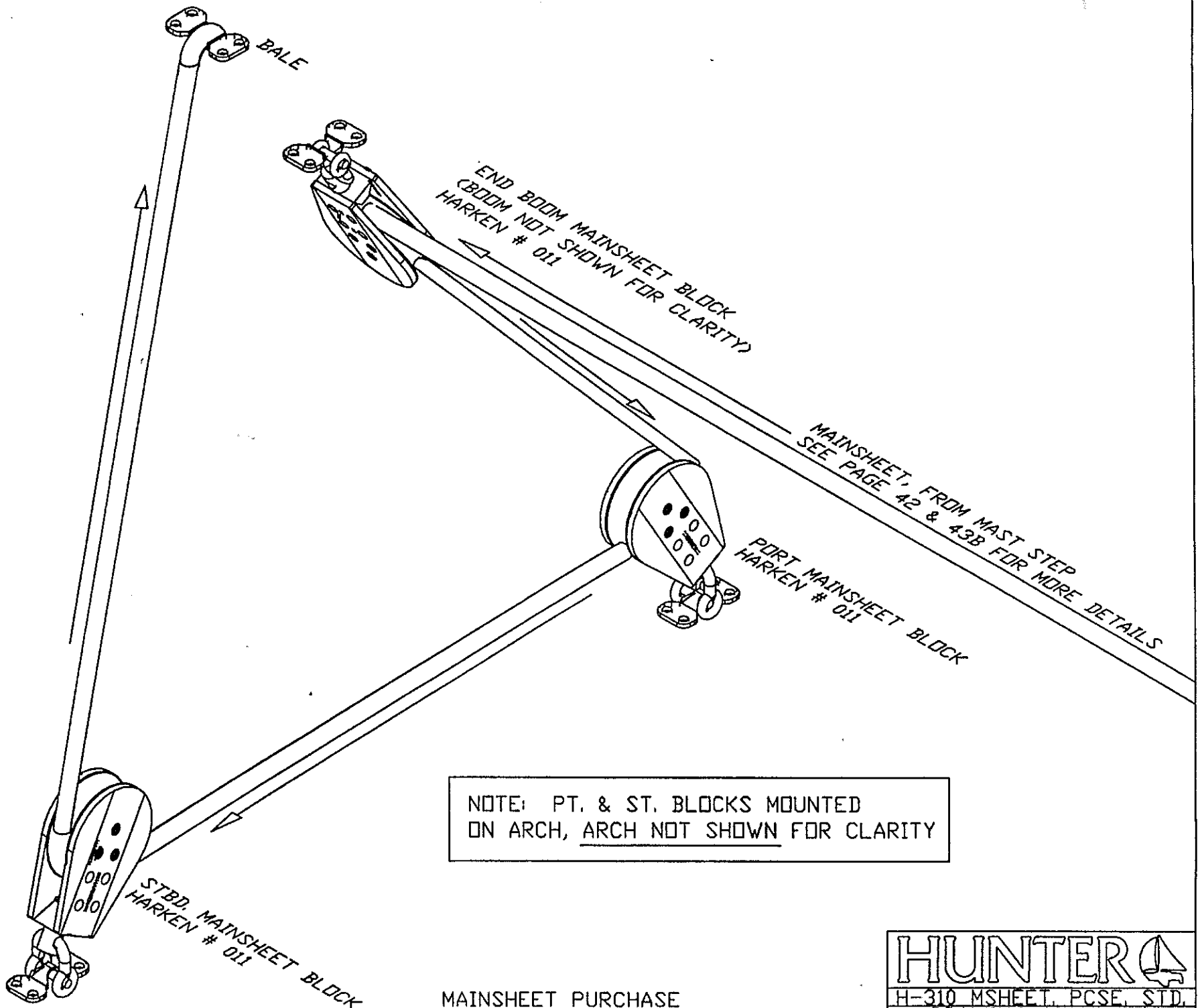
INSTRUCTIONS:

1. DRILL HOLES IN ARCH AS SHOWN IN SIDE VIEW AND BOTTOM VIEW DIAGRAMS. HOLES ARE 7/16" DIA. (5 EA.SIDE) NOTE: BOLTS ARE INSTALLED FROM INSIDE OF ARCH AND NUTS ARE INSTALLED FROM Q-BERTH SIDE, PT. SIDE, & INSIDE OF COCKPIT LOCKER STBD. SIDE. VERIFY CLEARANCE INSIDE OF ARCH AT HOLE LOCATIONS BEFORE DRILLING.
5. SET ARCH IN PLACE, USING A SHORT PENCIL REACH INSIDE OF ARCH AND MARK DECK SURFACE THRU HOLES INSIDE OF ARCH.
6. REMOVE ARCH, DRILL 7/16" HOLES AS MARKED APPLY SILICONE SEALANT GENEROUSLY AROUND HOLES AND MATING SURFACES TO ENSURE A WATERTIGHT SEAL.
7. RE-SET ARCH IN PLACE, INSTALL 3/8" HEX HEAD BOLTS WITH 3/8" FENDER WASHER FROM INSIDE OF ARCH AND A 3/8" FENDER WASHER THEN A 3/8" LOCK WASHER THEN A 3/8" NUT FROM Q-BERTH SIDE, & LOCKER SIDE AND TIGHTEN ALL.
8. CLEAN ALL EXCESS CAULK, THEN FINAL CAULK SEAM WITH WHITE SILICONE.

ONLY ARCH BASE & ARCH
RECEIVER SHOWN FOR CLARITY

HUNTER

H310 ARCH INST. DWG.
DRAWING # 3108043A



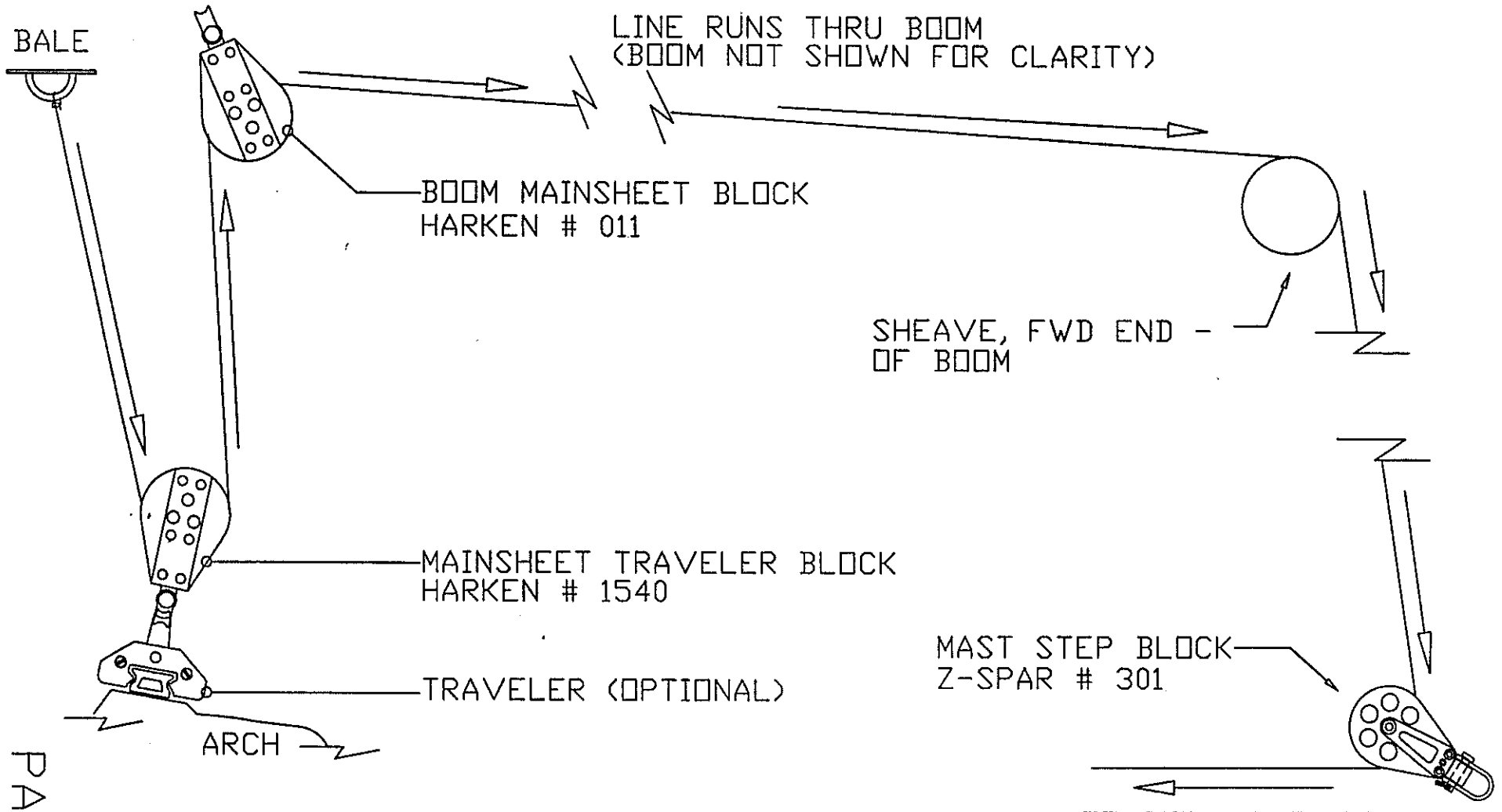
NOTE: PT. & ST. BLOCKS MOUNTED ON ARCH, ARCH NOT SHOWN FOR CLARITY

MAINSHEET PURCHASE

HUNTER

H-310 MSHEET, PCSE, STD.
DRAWING # 3108043B

IMPORTANT!
USE CAUTION WHEN EASING LAZY JACK TENSION
TO PREVENT BOOM FROM STRIKING ARCH

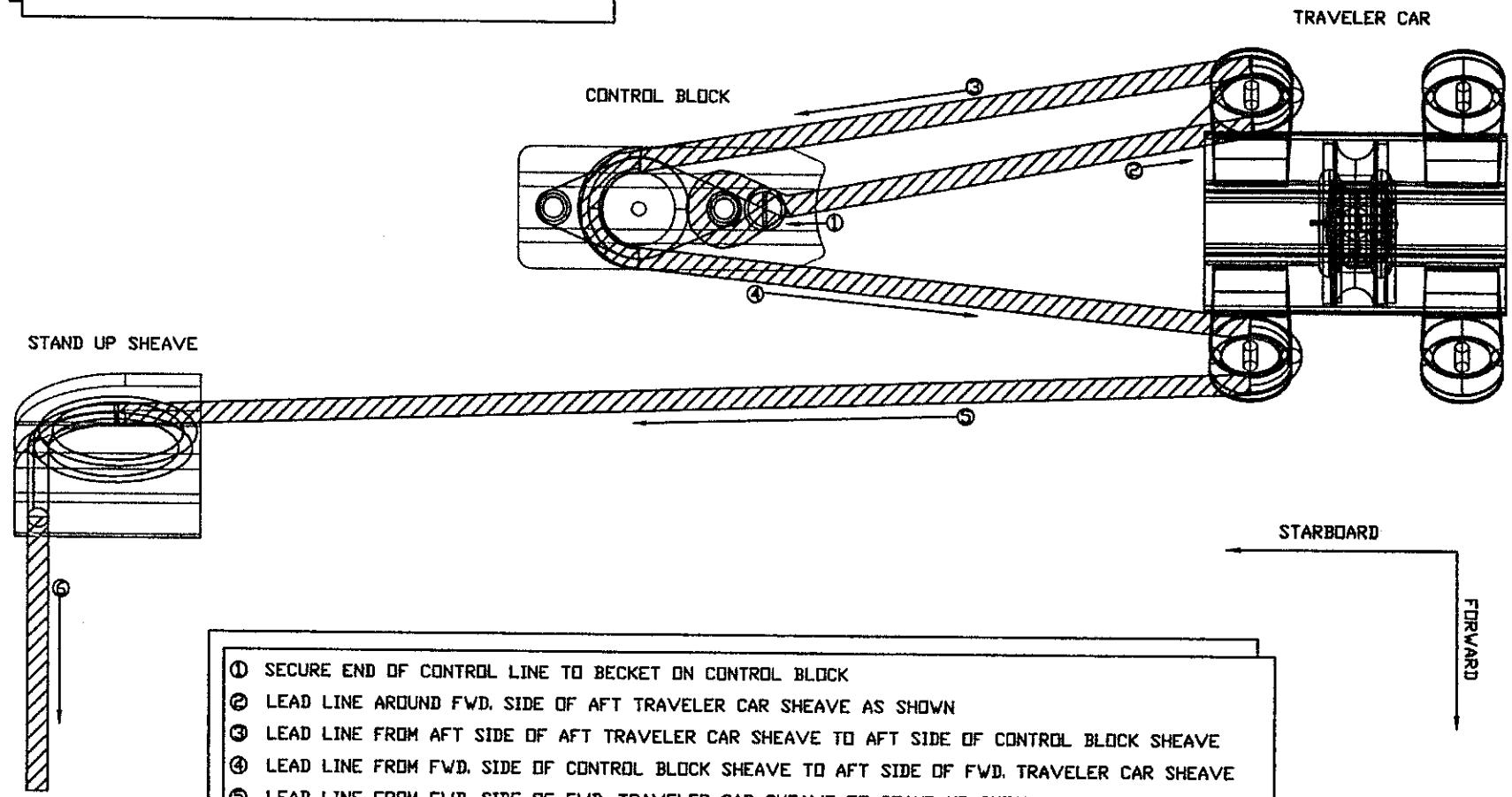


MAINSHEET PURCHASE (W/OPTIONAL TRAVELER)

HUNTER

H-310 END BOOM MS. PCSE.
DRAWING # 3108043C

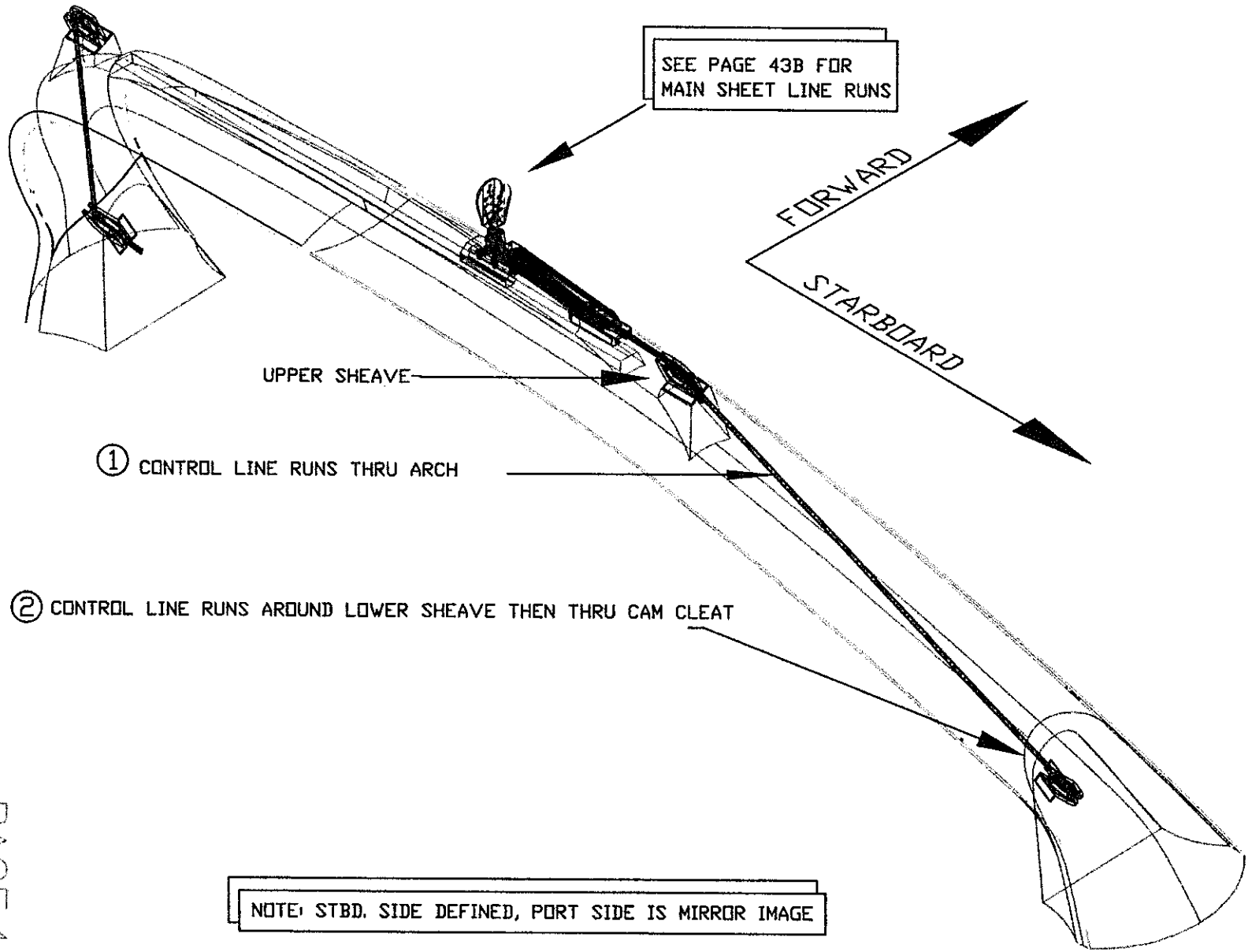
NOTE: ARCH & TRAVELER BAR NOT SHOWN FOR CLARITY.
STARBOARD SIDE SHOWN, PORT SIDE IS MIRROR IMAGE
SEE FOLLOWING PAGE FOR MORE DETAILS



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

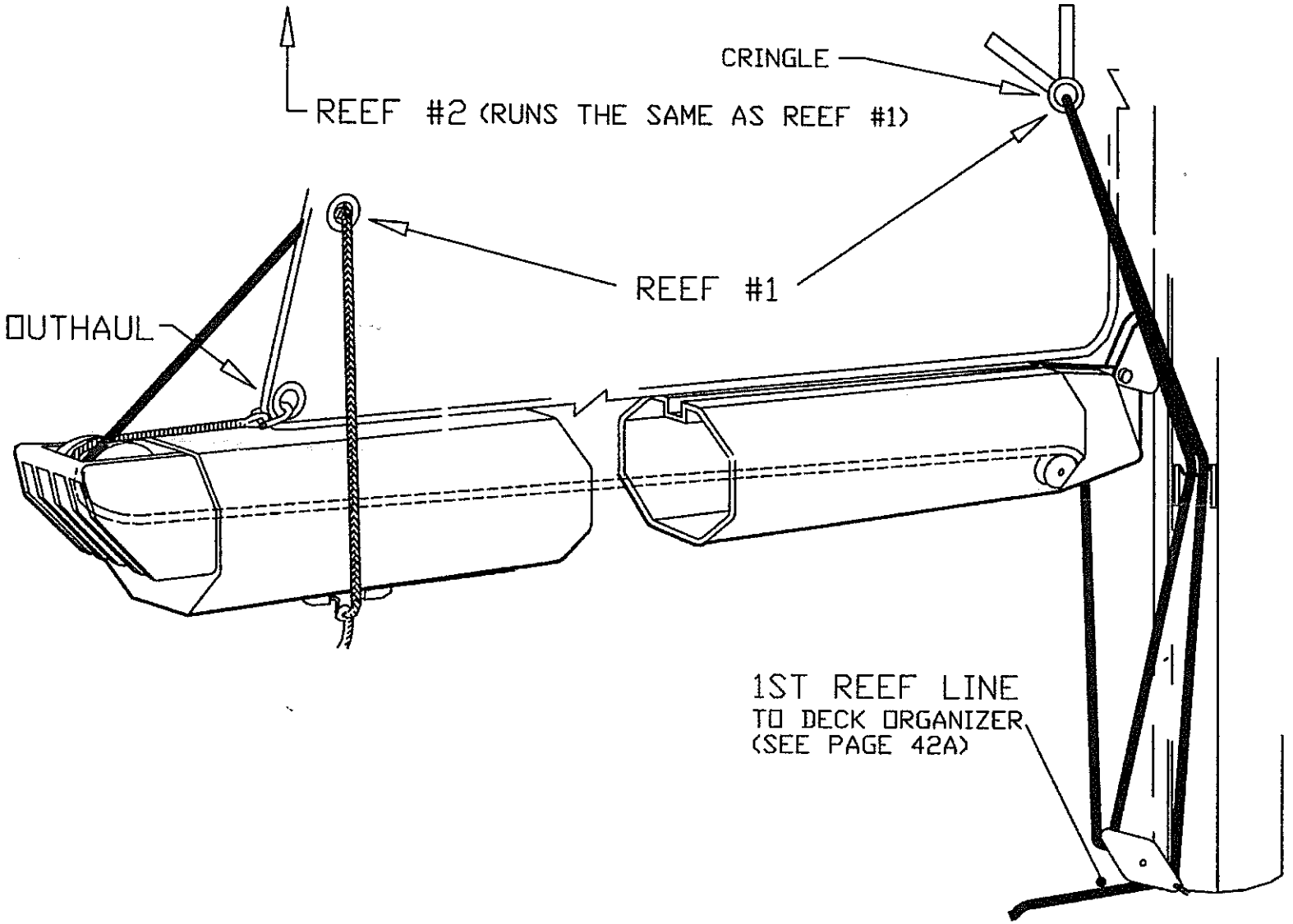
310 OPTIONAL TRAVELER LAYOUT	
3108043D	NONE
ENGINEERING DEPT.	10/31/97

HUNTER



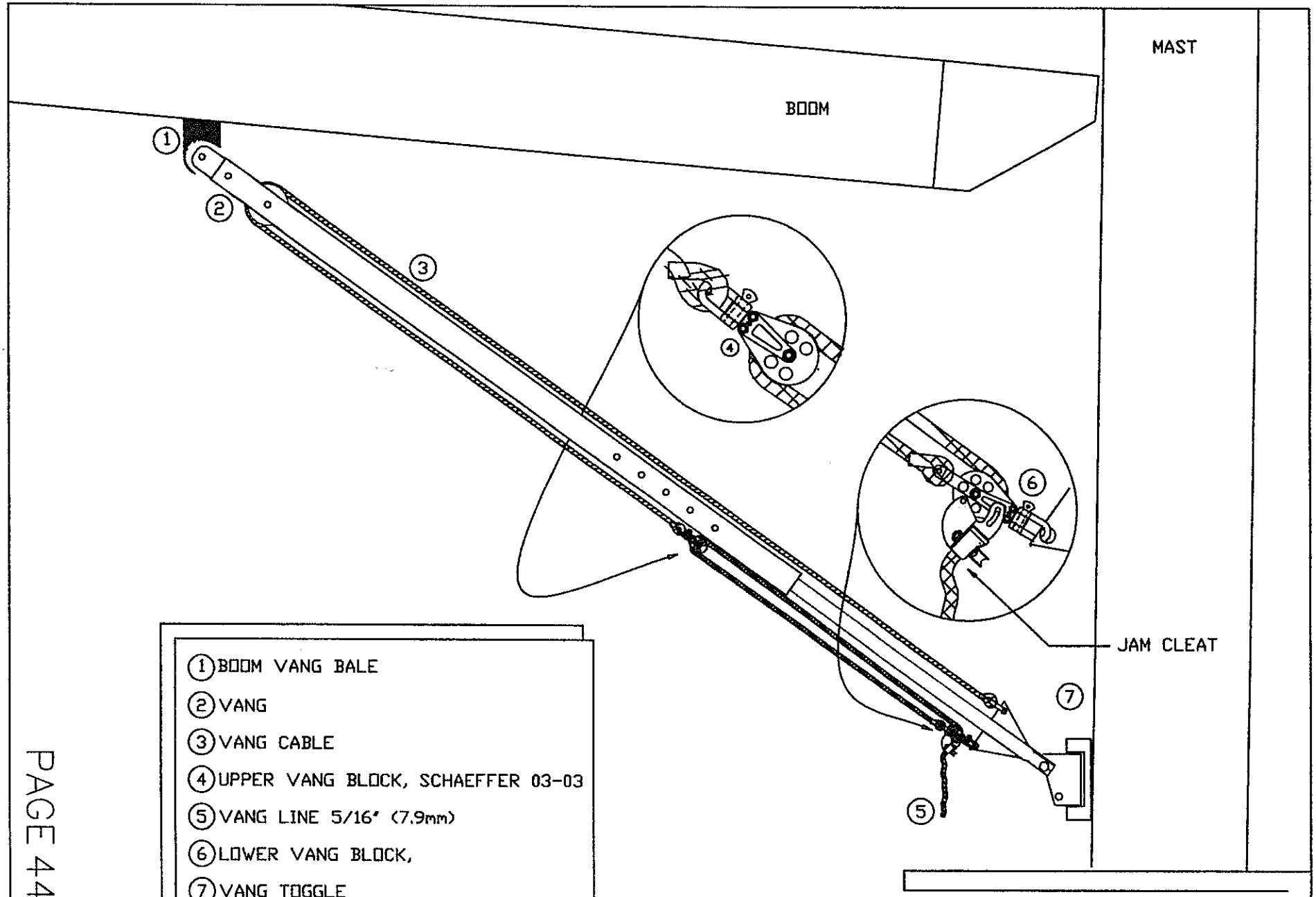
H310 ARCH/TRAVELER DETAILS	
3106043E	NONE
ENGINEERING DEPT.	10/31/97

HUNTER



DRAWING TITLE: H310 BOOM & REEF LAYOUT	
DRAWING NO. 3108044A	REVISION NO. NONE
ENGINEERING DEPT	11/22/97

HUNTER



1. BOOM VANG BALE
2. VANG
3. VANG CABLE
4. UPPER VANG BLOCK, SCHAEFFER 03-03
5. VANG LINE 5/16" (7.9mm)
6. LOWER VANG BLOCK,
7. VANG TOGGLE

DRAWING TITLE:	H310 RIGID VANG DETAILS FURLING/OPT.
DRAWING NO.	31080448
REVISION NO.	NONE
DRAWN BY:	ENGINEERING DEPT.
DATE:	11/22/97

HUNTER

REEFING INSTRUCTIONS

PRE-MARK THE MAIN HALYARD FOR EACH REEF

1. Shackle tack reef blocks to first and second reef tack cringles.

2. Run both reefing lines as illustrated in the boom & reef layout. Both portions of the reefing line leading to the reef tack block must run through the stainless steel eye on the side of the spar. The shorter reef line will be used on the first reef (starboard side, GREEN) the longer reef line on the second reef (portside, RED,).

3. Raise the main sail.

4. Ease the mainsheet vang.

5. Lower the main sail to approximately the first reef position

6. Take up the slack in the first reefing line.

7. Adjust the main halyard so that the tack reef block is not contacting the stainless steel eye on the side of the spar and is applying tension to the luff of the main above the reef, not below. There will be approximately 6" (150 mm) of stretch in the main luff and make sure that this is allowed for when adjusting the main halyard to locate the tack reef block.

8. Tension the reef line with the appropriate self-tailing winch until the clew reef cringle is brought down to the boom.

9. Confirm that the tack reef block is still clear of the stainless steel eye and that only the main luff above the reef cringle is tensioned, not the luff between the cringle and the top stacked sail slide. Ease the reef line and readjust the halyard if necessary.

10. Mark the halyard at the stopper with a 1" (25- mm) single band of indelible marker ink. By dropping the halyard to this mark every time a reef is required the halyard is automatically in the correct position for the reef.

11. Repeat the procedure for the second reef, using double bands to mark the halyard in the correct position.

REEFING PROCEDURE

1. Head up into the wind.

2. Ease the mainsheet & vang.

3. Lower the main halyard to the appropriate mark, and snug the line with the stopper.

4. Tension the reefing line with the self-tailing winch until the reef clew is brought down to the boom. Apply stopper. Ease the topping lift.

SHAKING OUT A REEF

1. Head up into the wind.

2. Ease the mainsheet and vang.

3. Release the reef stopper and remove the reef line from the winch.

4. Tension the main halyard to raise the mainsail, ensuring that the reef lines run freely while the sail is being raised. Then apply the line stopper to the main halyard.

5. Re-tension the boom vang and mainsheet.

RUNNING RIGGING SPECIFICATIONS

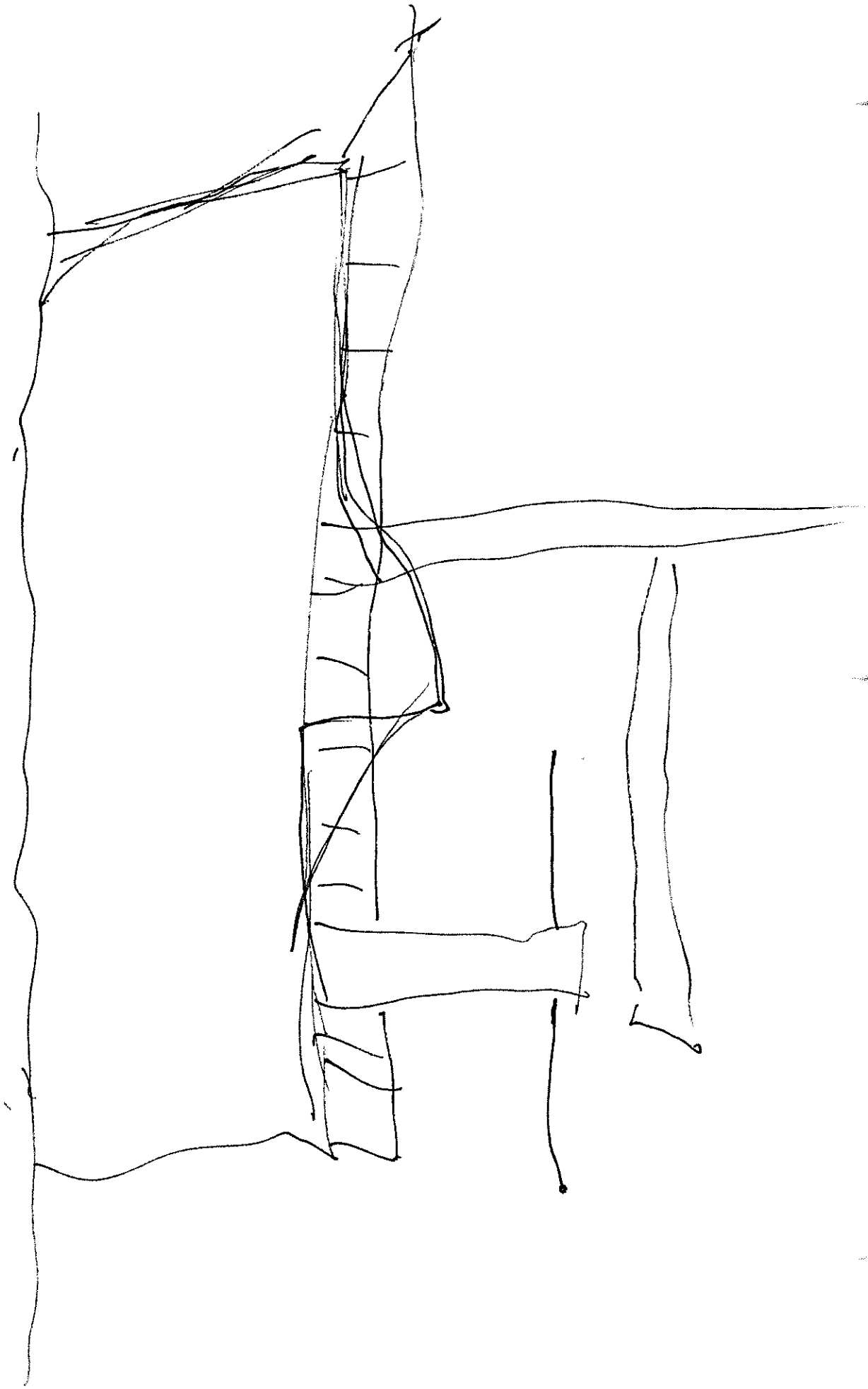
BOAT: h310	FILE NAME: PR3091	REVISION: SHORTENED JIB SHEET 11/26/96
BY: KJC	DATE: 10/10/96	SHORTENED MAIN HALY, CHANGE LAZY JACKS 12/10/96
CHECKED BY:	DATE:	

	OPT/STD	ITEM	QUANTITY	LINE SIZE	LINE TYPE	COLOR	END 1	LENGTH		END 2
1	STD	MAIN HALYARD	1	3/8" (9.5mm)	XLS EXTRA	BLUE	HEADBOARD SHACKLE	29.1 m	95 ft	BARE
2	STD	JIB HALYARD	1	3/8" (9.5mm)	XLS	RED	EYE	27.0 m	89 ft	BARE
3	OPT	MAIN TRAVELER LINE	2	5/16" (8mm)	LS	WHITE	SMALL EYE	6.7 m	22 ft	BARE
4	STD	MAINSHEET	1	3/8" (9.5mm)	LS	BLUE FLECK	SMALL EYE	15.6 m	51 ft	BARE
5	STD	REEFING LINE #1	1	3/8" (9.5mm)	TRACER	GREEN FLECK	BARE	18.0 m	59 ft	BARE
6	STD	REEFING LINE #2	1	3/8" (9.5mm)	TRACER	RED FLECK	BARE	25.9 m	85 ft	BARE
7	STD	JIB SHEET	2	7/16" (11mm)	LS	RED FLECK	BARE	9.0 m	29 ft	BARE
8	OPT	SPINN. SHEET	2	3/8" (9.5mm)	LS	BLACK FLECK	BARE	21.0 m	69 ft	BARE
9	OPT	SPINNAKER HALYARD	1	3/8" (9.5mm)	XLS	BLACK	SNAP SHACKLE NF11000s	27.0 m	89 ft	BARE
10	STD	VANG	1	3/8" (9.5mm)	LS	WHITE	SMALL EYE	14.7 m	48 ft	BARE
11	STD	LAZY JACK WIRE	2	5/32" (4mm)	PLASTIC COATED 1x19 WIRE	WHITE	EYE & THIMBLE,SMALL SHACKLE	3.4 m	11 ft	EYE & LARGE OVAL THIMBLE
12	STD	ADJUSTABLE LAZY JACK LINE	1	5/16" (8mm)	LS	WHITE	BARE	18.3 m	60 ft	BARE

h310 FURLING MAST RUNNING RIGGING SPECIFICATIONS

BOAT: h310	FILE NAME: PR310FRL	REVISION: ADDED BOOM TOPPING LIFT 12/12/96
BY: KJC	DATE: 11/25/96	
CHECKED BY:	DATE:	

	OPT/STD	ITEM	QUANTITY	LINE SIZE	LINE TYPE	COLOR	END 1	LENGTH		END 2
1	STD	MAIN HALYARD	1	3/8" (9.5mm)	XLS EXTRA	BLUE	HEADBOARD SHACKLE	30.0 m	98 ft	BARE
2	STD	JIB HALYARD	1	3/8" (9.5mm)	XLS	RED	EYE	27.0 m	89 ft	BARE
3	OPT	MAIN TRAVELER LINE	2	5/16" (8mm)	LS	WHITE	SMALL EYE	5.2 m	17 ft	BARE
4	STD	MAINSHEET	1	3/8" (9.5mm)	LS	BLUE FLECK	SMALL EYE	15.6 m	51 ft	BARE
5	STD	JIB SHEET	2	7/16" (11mm)	LS	RED FLECK	BARE	10.5 m	34 ft	BARE
6	OPT	SPINN. SHEET	2	3/8" (9.5mm)	LS	BLACK FLECK	BARE	21.0 m	69 ft	BARE
7	OPT	SPINNAKER HALYARD	1	3/8" (9.5mm)	XLS	BLACK	SNAP SHACKLE NF11000s	27.0 m	89 ft	BARE
8	STD	BOOM TOPPING LIFT	1	5/16" (8mm)	LS	WHITE	1/4" D-SHACKLE	25.6 m	84 ft	BARE



h310 B&R RIG WITH STRUTS DESCRIPTION

The B&R rig, utilized on the Hunter 310, 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 310 is equipped with the in-mast furling option, the mast is a larger section size and the struts are not utilized.

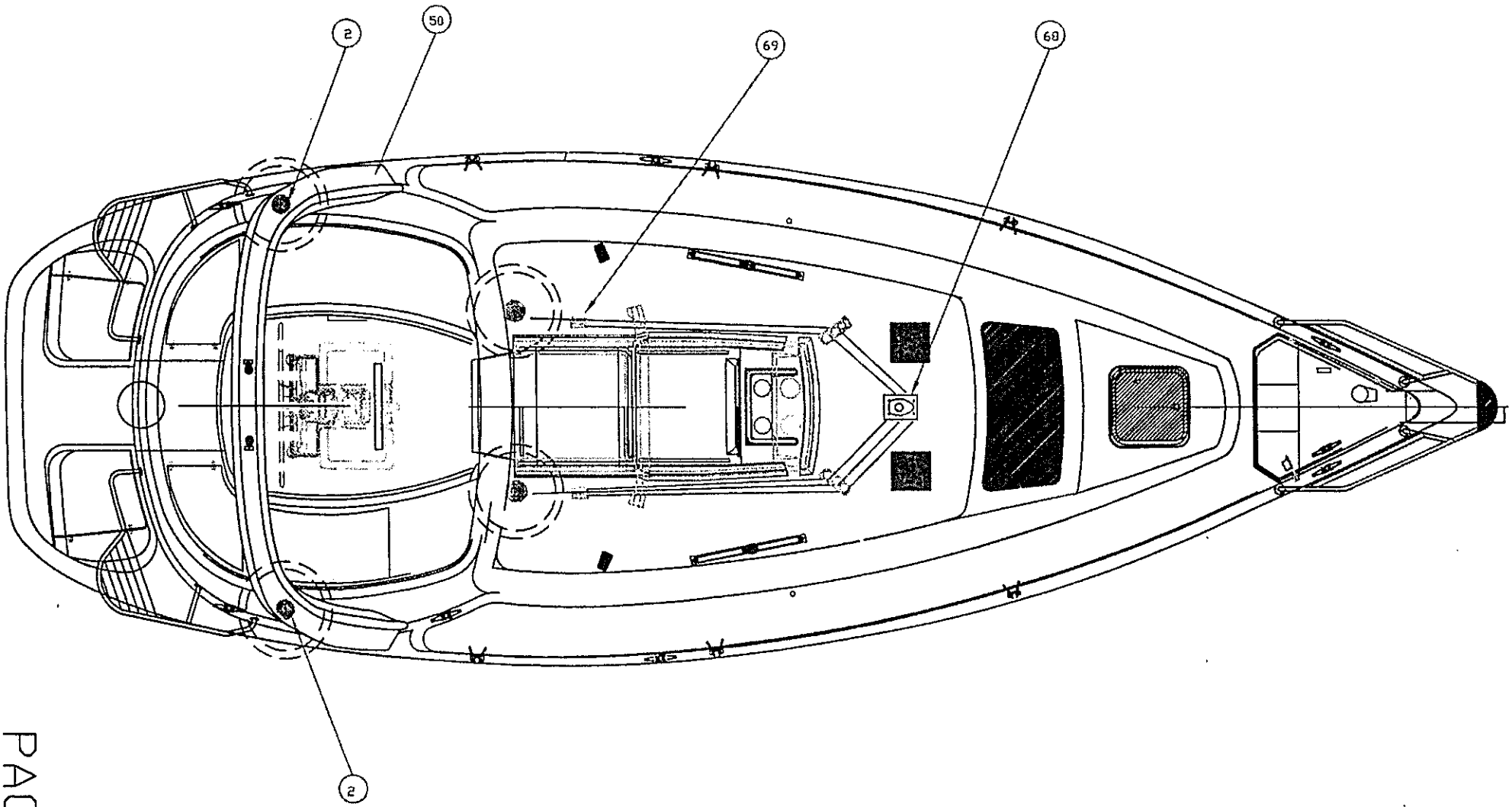
Additional support is given to the B&R rig (and is unique to it) with the addition of reverse diagonal rigging. For example, the diagonals that you see beginning by the top of the mast strut, ending at the tip of the spreader, supports and stabilizes the upper section of the mast as it creates a triangle 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 310 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.

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



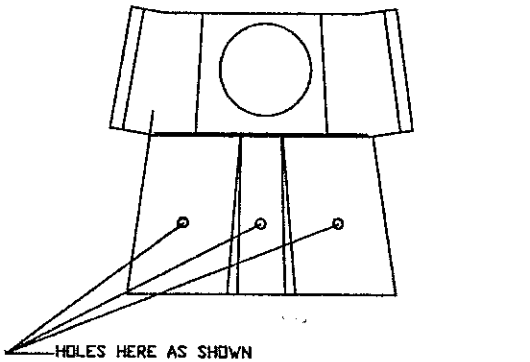
OPTIONAL SPINNAKER LAYOUT

HUNTER

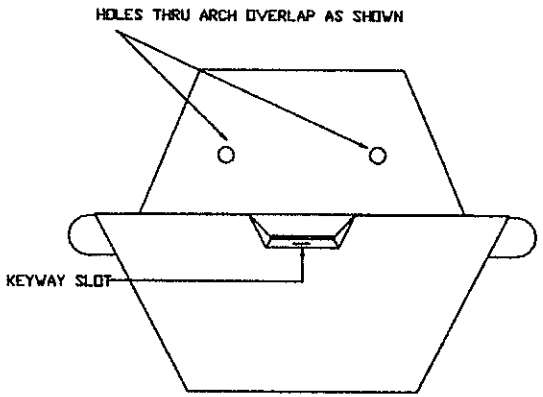
H-310 OPT. SPINN.
DRAWING #3108054A

SPINN. GEAR

2	WINCH	HW2519	LEWMAR	30ST	2
50	SPIN BLOCK OPTIONAL	HW0276	SCHAEFER	505-15	2
68	MAST STEP BLOCK	RIO448	ZSPARS	275	1
69	LINE STOPPER	HW1274	XA-1		
	SPIN. SHEET	RI0245			2
	SPIN. HALYARD	RI0245			1

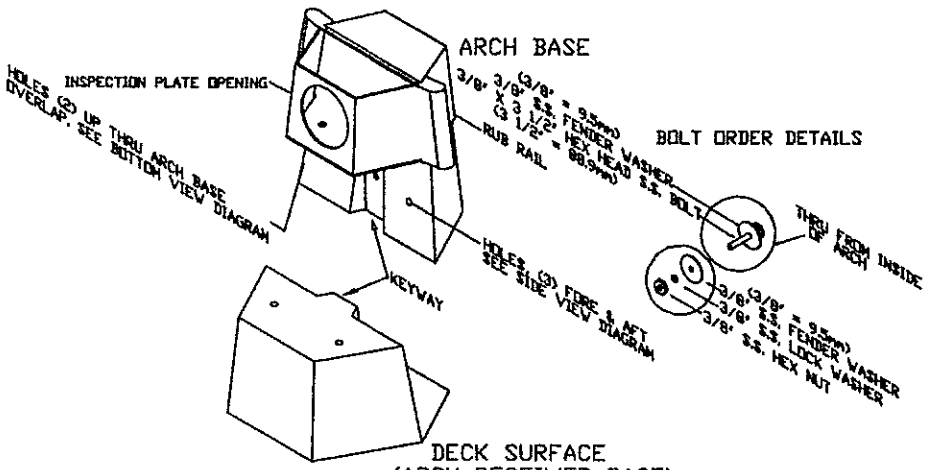


ARCH BASE SIDE VIEW



ARCH BASE BOTTOM VIEW

ISO VIEW OF STBD. SIDE
AFT LOOKING FORWARD
(PORT SIDE MIRROR IMAGE)



INSTRUCTIONS:

1. LIGHTLY SAND THE DECK AND ARCH BASE, THEN APPLY SILICONE SEALANT GENEROUSLY AROUND HOLES AND MATING SURFACES TO ENSURE A WATER TIGHT SEAL.
2. SET ARCH IN PLACE, INSTALL 3/8" HEX HEAD BOLTS WITH 3/8" FENDER WASHER FROM INSIDE OF ARCH AND A 3/8" FENDER WASHER THEN A 3/8" LOCK WASHER THEN A 3/8" NUT FROM Q-BERTH SIDE, & LOCKER SIDE AND TIGHTEN ALL.
3. CLEAN ALL EXCESS CAULK, THEN FINAL CAULK SEAM WITH WHITE SILICONE.
4. INSURE DRAINS IN ARCH ARE CLEAR OF ALL DEBRIS AND CAULK

ONLY ARCH BASE & ARCH
RECEIVER SHOWN FOR CLARITY

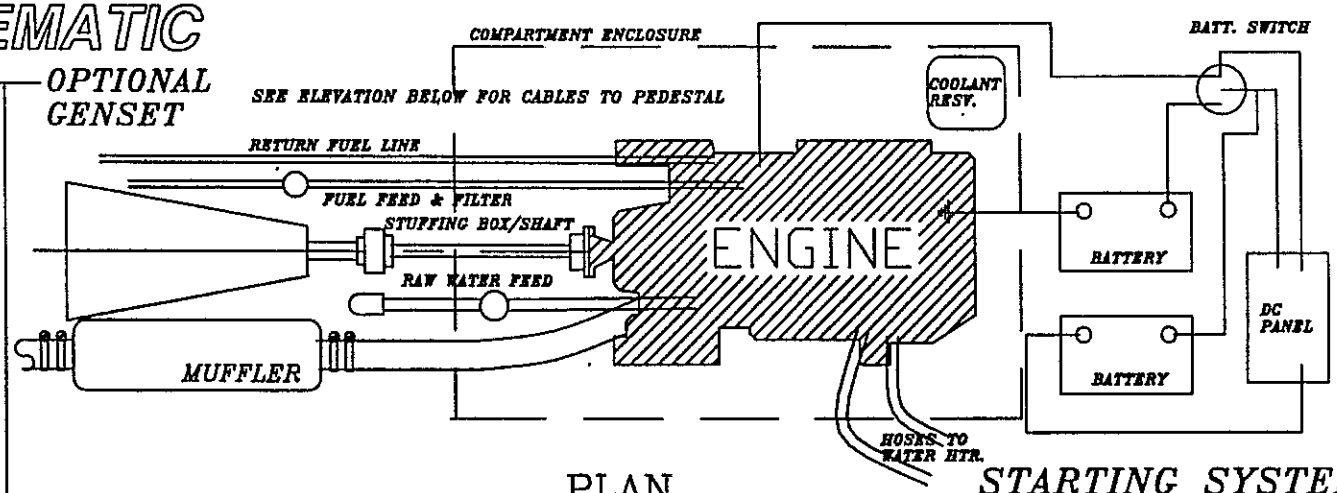
PAGE 54C

310 ARCH INSTALLATION	
DRAWING NO. 3108054C	SCALE NONE
DRAWN BY ENGINEERING DEPT.	DATE 4/30/98

HUNTER

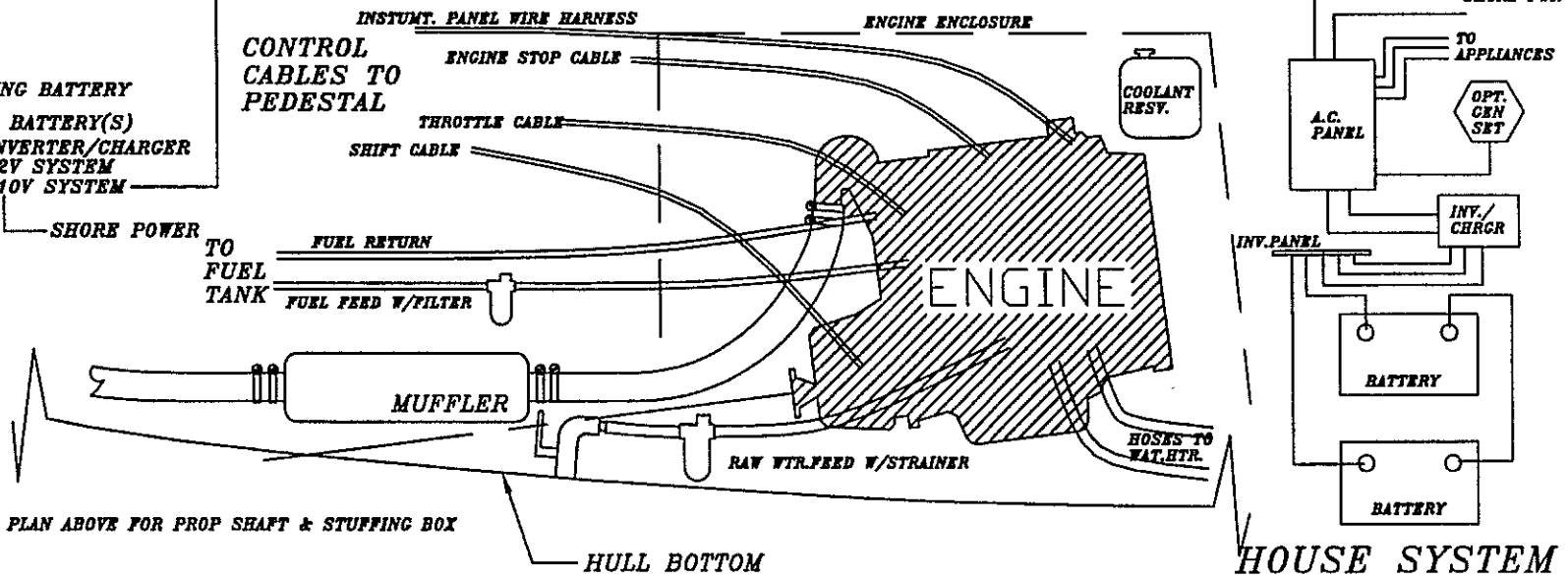
SYSTEMS SCHEMATIC

- 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
- OPTIONAL GENSET
- ELECTRICAL SYSTEM
  - BATT SW
    - STARTING BATTERY
    - HOUSE BATTERY(S)
      - INVERTER/CHARGER
      - 12V SYSTEM
      - 110V SYSTEM
    - SHORE POWER



PLAN

STARTING SYSTEM



ELEVATION

HOUSE SYSTEM

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

NOTE: QTY. OF BATTERIES VARY PER MODEL

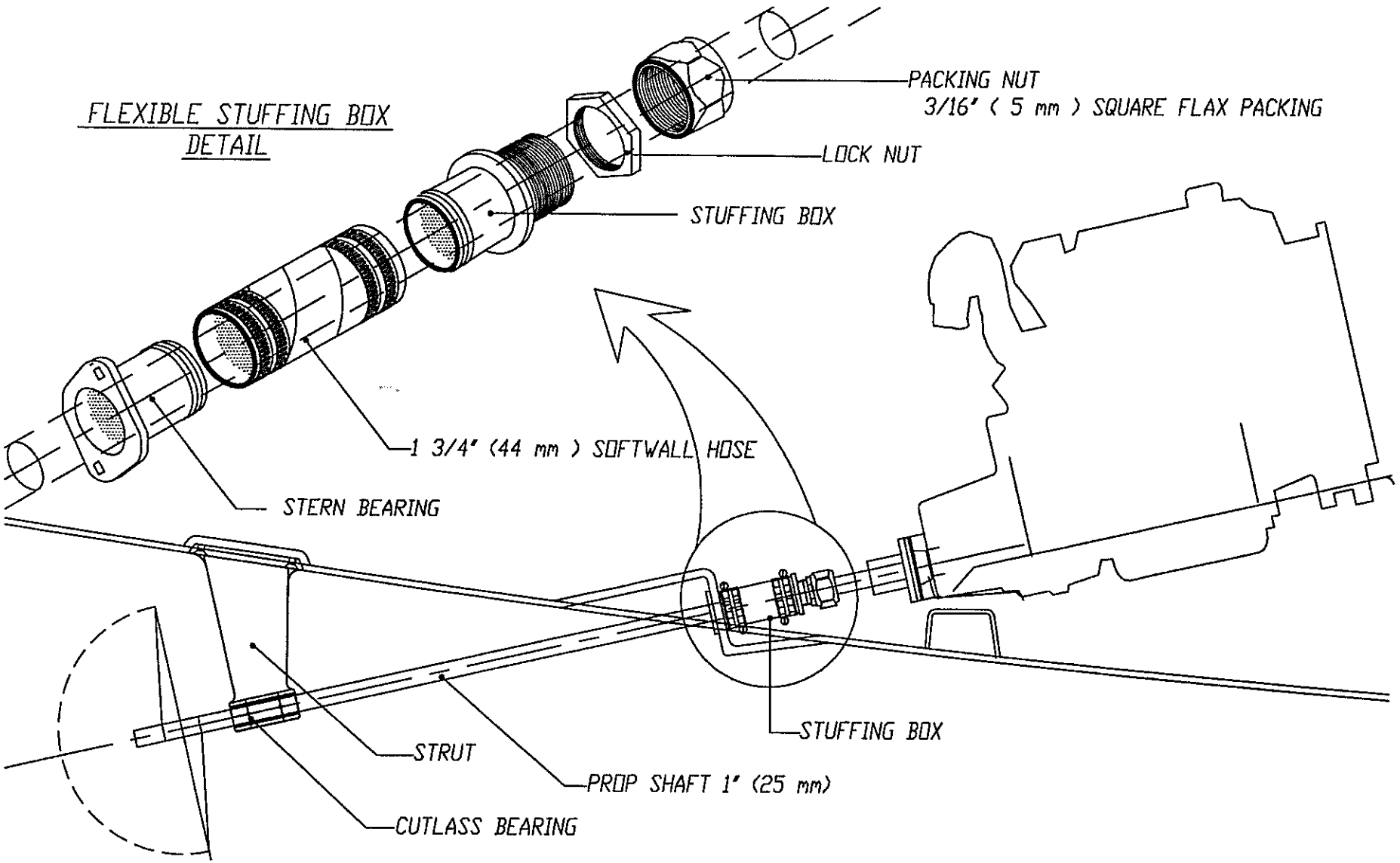
PAGE 55

ENGINE SYSTEM LAYOUT

HUNTER

H-310 ENGINE SYSTEM

DRAWING # 3108055



PROP SHAFT & STUFFING BOX DETAIL

HUNTER
H-310 PR. SHT. & ST. BOX
DRAWING # 3108056

NOTE:

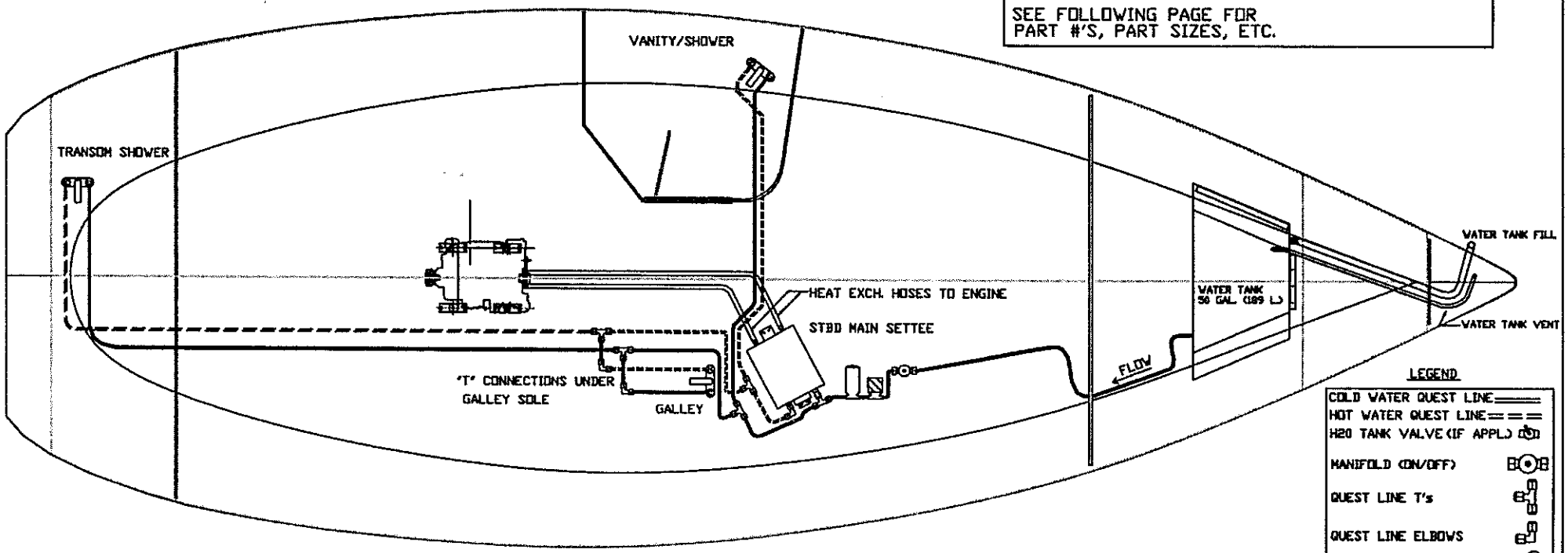
SEE PAGE 60A FOR SPECIFIC-
SEACOCK / THRUHULL / DECK FITTING LOCATIONS

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

SEE PAGE 64D FOR SPECIFIC-
WATER PUMP WIRING LAYOUTS

SEE PAGE 63A FOR SPECIFIC-
WATER HEATER WIRING LAYOUTS

SEE FOLLOWING PAGE FOR
PART #'S, PART SIZES, ETC.



LEGEND

COLD WATER QUEST LINE
HOT WATER QUEST LINE
H20 TANK VALVE (IF APPL.)
MANIFOLD (ON/OFF)
QUEST LINE T's
QUEST LINE ELBOWS
FAUCETS/SHOWERS
WATER PRESSURE PUMP
WATER FILTER

POTABLE WATER SYSTEM (310 MODEL)

HUNTER
H-310 H20 SPECIFIC
DRAWING # 3108057A

HUNTER PART #'s

WATER HEATER 6 GAL. (23 L.)	PL0280
WATER PUMP	PL0301
WATER FILTER	PL0350
TANK VALVE	PL1815
COCKPIT SHOWER	PL0189
QUEST LINE 1/2" (12.7 MM)	PL1825
QUEST LINE NUTS	PL1820
QUEST LINE T's	PL1830
QUEST LINE ELBOW	PL1853
WATER DECK FILL 1 1/2" (38.1 MM)	PL1130
1-1/2" (38.1 MM) SHIELDVAC HOSE	PL1440
1-1/2" (38.1 MM) HOSE CUFF	PL1500
TANK VENT FITTING	PL0520
3/4" (19.1 MM) SHIELDVAC. HOSE	PL1450
3/4" (19.1 MM) HOSE CUFF	PL1480
WATER TANK	SPECIFIC TO BOAT MODEL
FAUCET\S	SPECIFIC TO BOAT MODEL
SENDING UNIT(S)	SPECIFIC TO BOAT MODEL

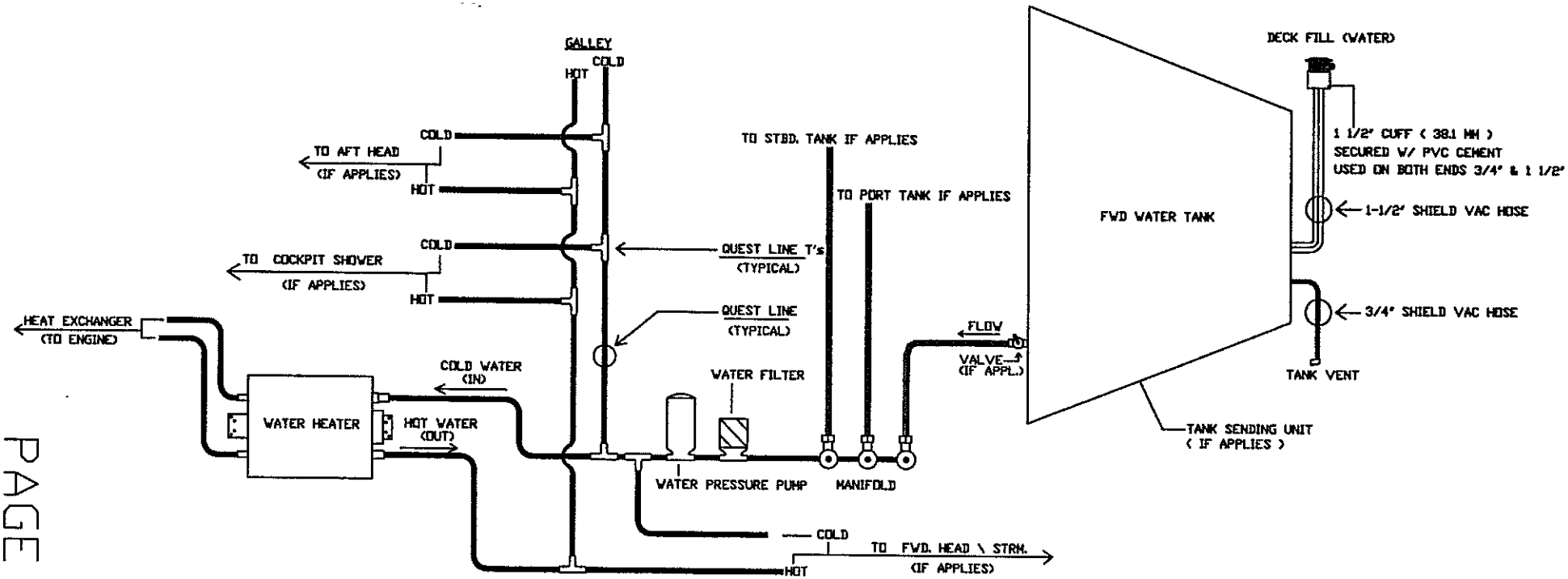
NOTE:

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

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

SEE PAGE 64D FOR SPECIFIC-
WATER PUMP WIRING LAYOUTS

SEE PAGE 63A FOR SPECIFIC-
WATER HEATER WIRING LAYOUTS



STANDARD H20 SYSTEM LAYOUT

HUNTER

H-310 STD. H20 LAYOUT
DRAWING # 3108057B

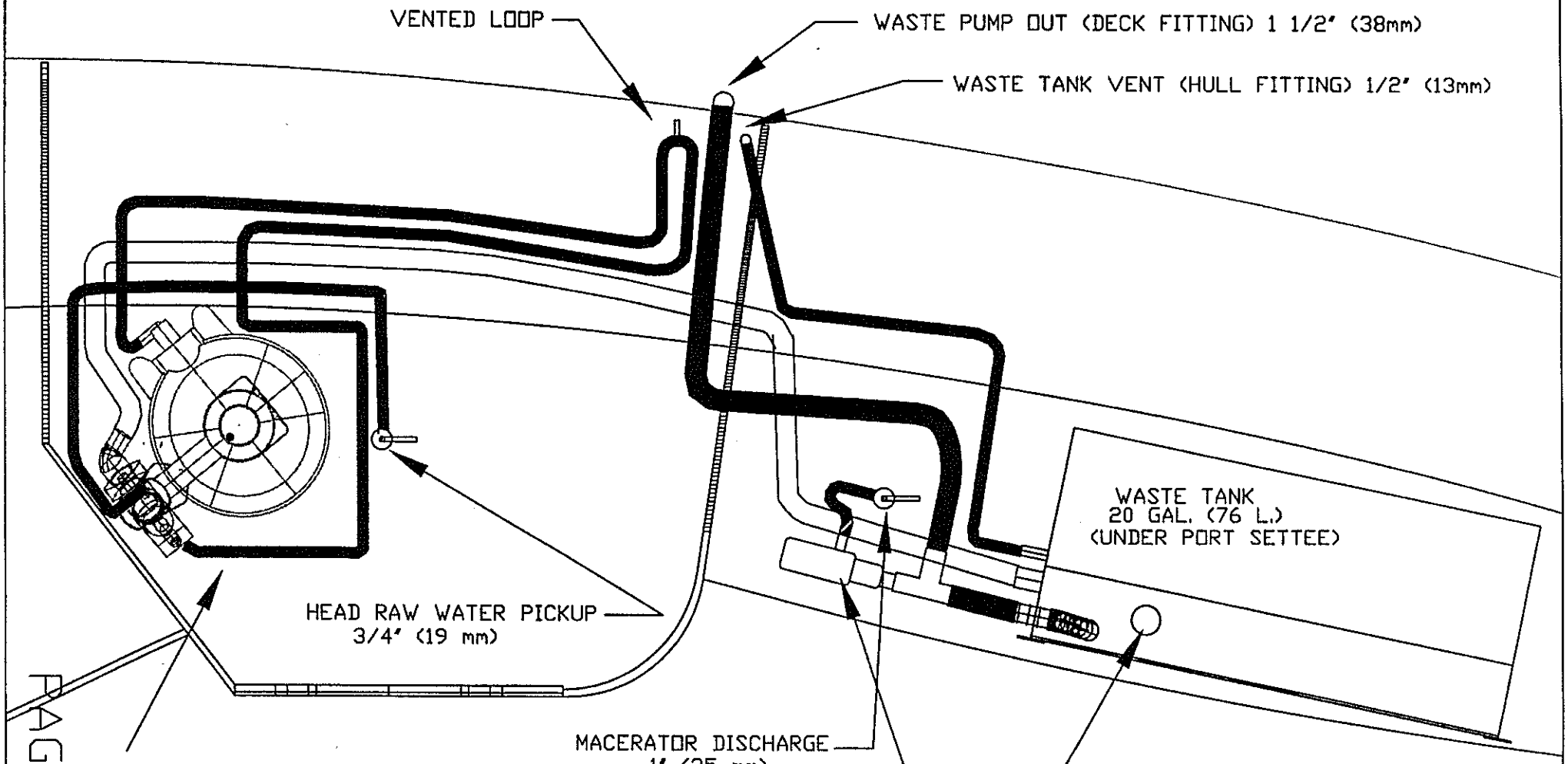
NOTE:

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

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

SEE PAGE 64D FOR SPECIFIC-
MACERATOR, SENDING UNIT WIRING LAYOUTS

SEE FOLLOWING PAGE FOR
PART #'S, PART SIZES, ETC.



HEAD(S) & WASTE SYSTEM

HUNTER

H-310 WASTE SYSTEM
DRAWING # 3108058A

HUNTER PART #'s

WASTE (PUMP OUT) DECK FITTING.....PL1140

1" (25.4 MM) BALL VALVE (DISCHARGE).....PL661A
1" (25.4 MM) DISCHARGE THRU HULL FITTING.....PL0483
1"(25.4 MM) WASTE (SEA) DISCHARGE HOSE.....PL1525
1-1/2" (38.1 MM) DECK WASTE PUMPOUT HOSE.....PL1525

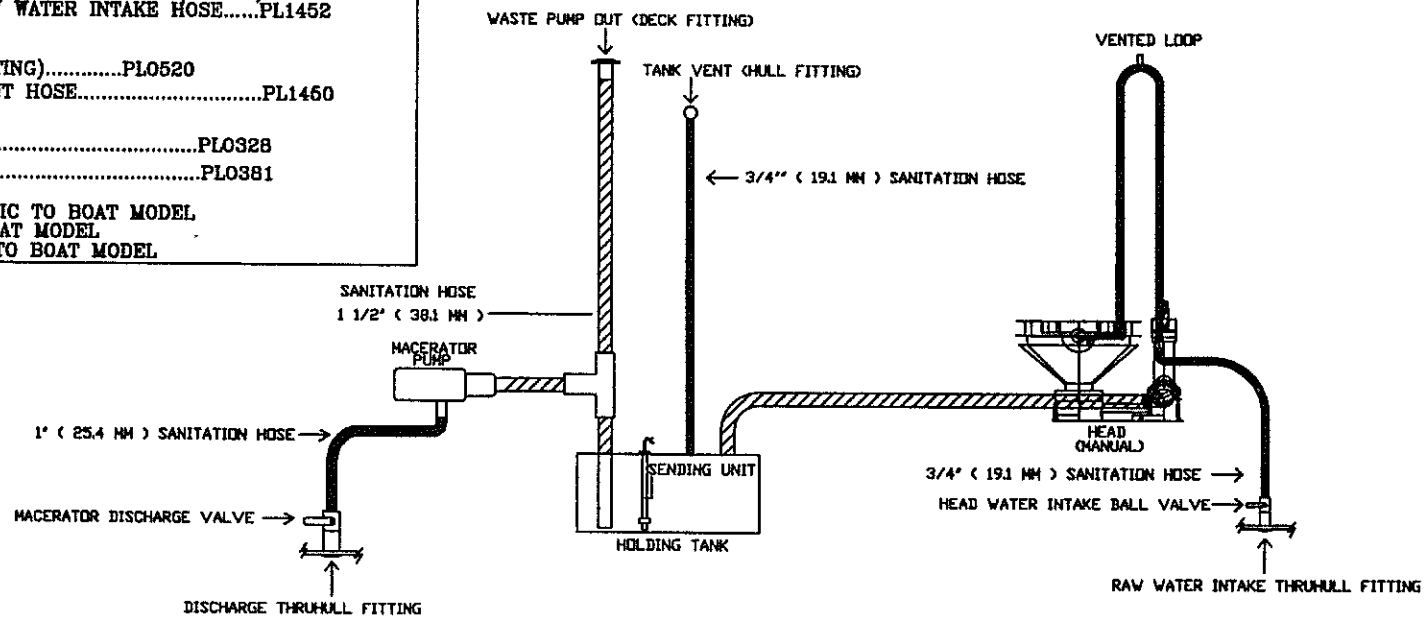
3/4" (19.1 MM) BALL VALVE (INTAKE).....PL663A
3/4" (19.1 MM) THRU HULL FITTING (INTAKE).....PL0482
3/4" (19.1 MM) RAW WATER INTAKE HOSE.....PL1452

TANK VENT (HULL FITTING).....PL0520
3/4" (19.1 MM) VENT HOSE.....PL1460

MACERATOR PUMP.....PL0328
VENTED LOOP.....PL0381

HOLDING TANK...SPECIFIC TO BOAT MODEL
HEAD...SPECIFIC TO BOAT MODEL
SEND UNIT...SPECIFIC TO BOAT MODEL

STANDARD WASTE SYSTEM LAYOUT (NON ELECTRIC HEAD MODELS)



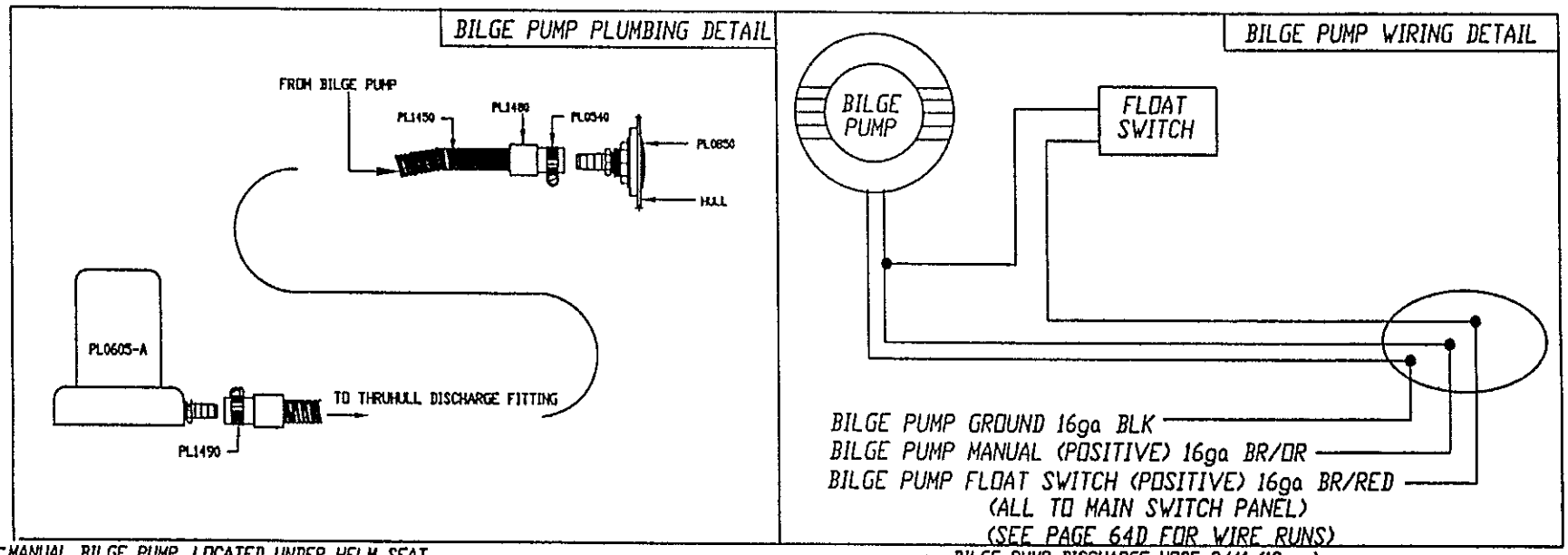
NOTE:
SEE PAGE 60A FOR SPECIFIC -
SEACOCK / THRUHULL / DECK FITTING LOCATIONS

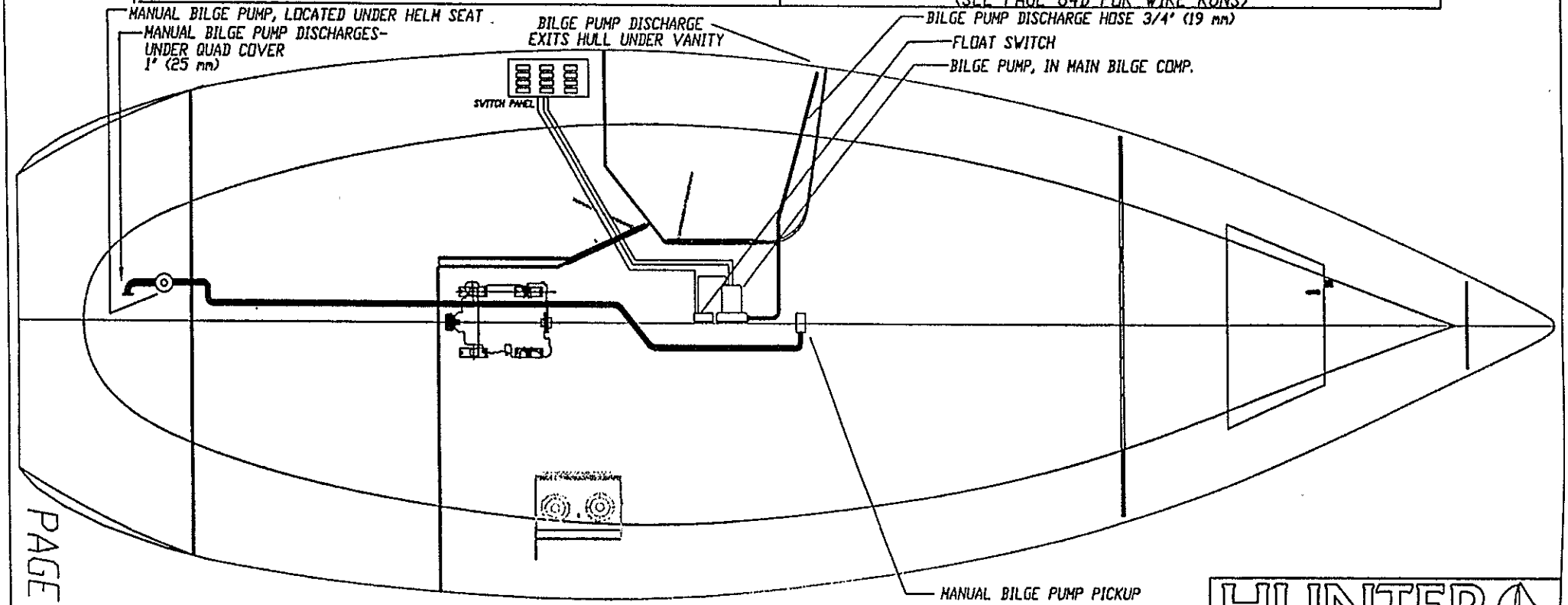
SEE PAGE 60B FOR SPECIFIC -
SEACOCK / THRUHULL / DECK FITTING ASSEMBLY

SEE PAGE 64D FOR SPECIFIC -
SENDING UNITS / MACERATOR-
WIRING LAYOUTS

STD. WASTE SYSTEM LAYOUT

HUNTER
H-310 STD WASTE SYSTEM
DRAWING # 3108058B

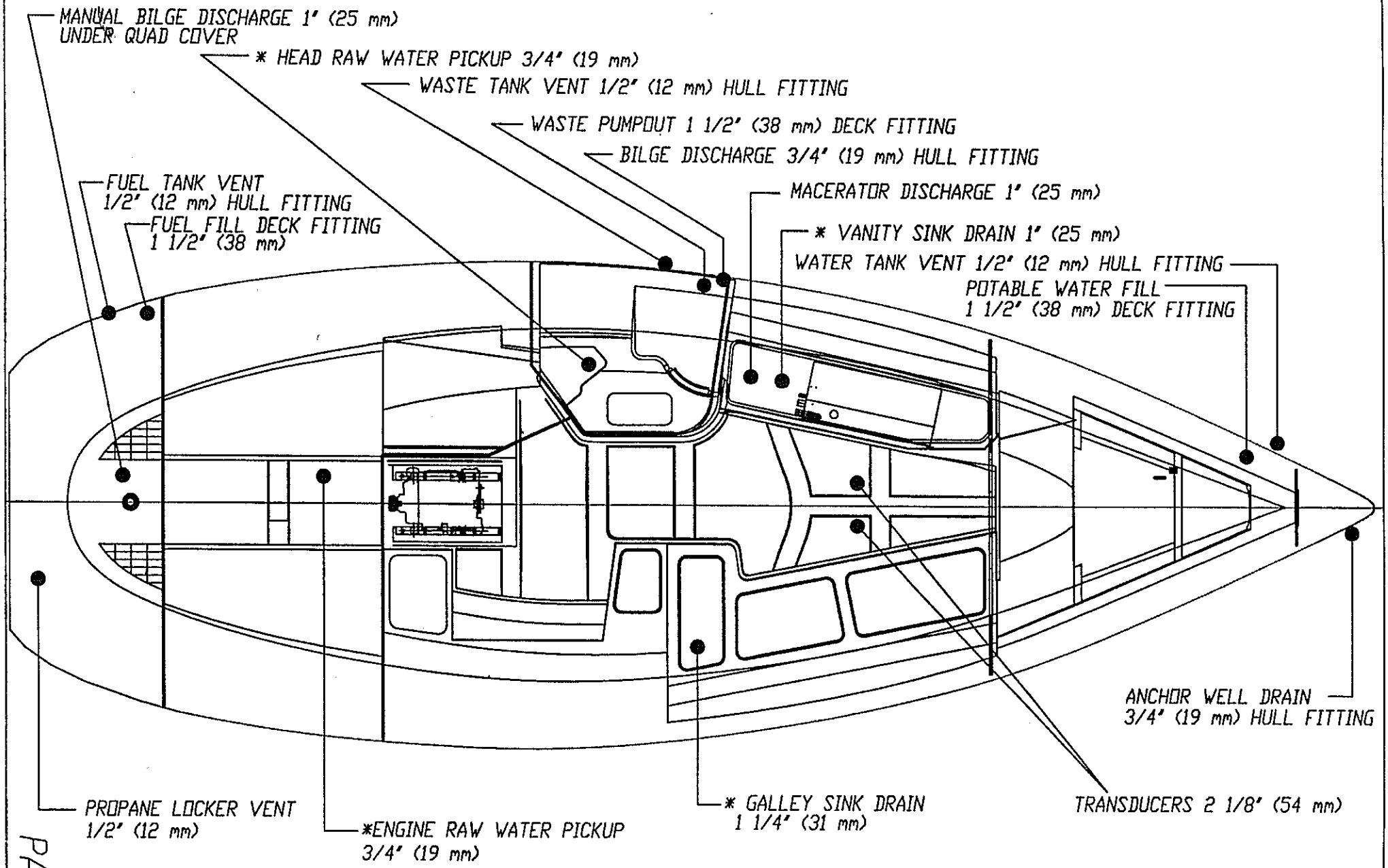




BILGE PUMP SYSTEM

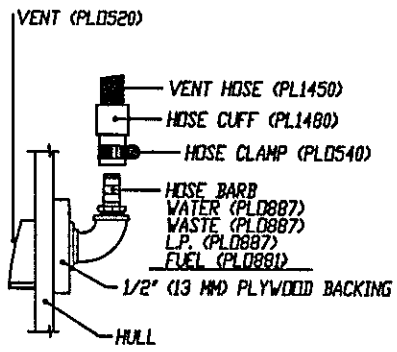
HUNTER

H-310 BILGE PUMP SYSTEM
DRAWING # 3108059

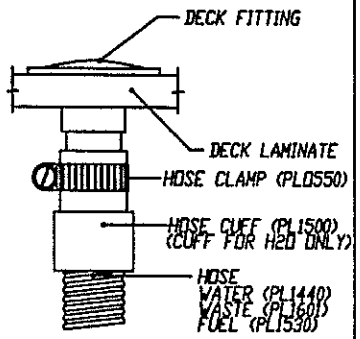


THRU HULL/DECK/SEACOCK LOCATIONS
(* = SEACOCKS)

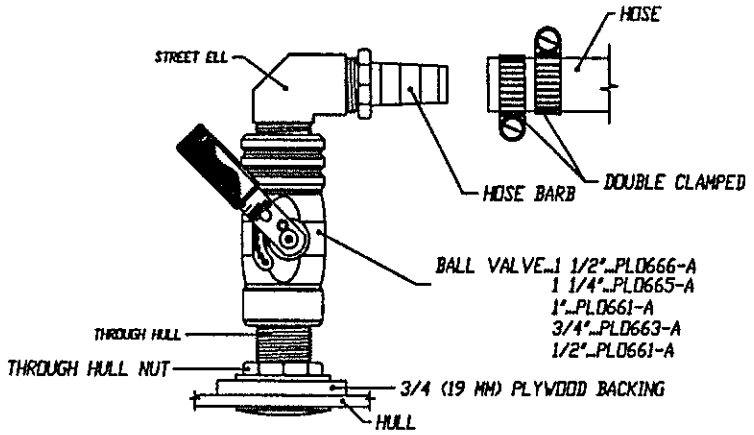
HUNTER
H-310 SEACOCK LOCATIONS
DRAWING # 3108060A



TYP. VENT DETAIL



TYP DECK PLATE DETAIL



TYP. THRU-HULL W/ SEACOCK DETAIL

			ENGINE WATER PICKUP MODELS 376 ON UP = 1"..... (25.4 MM) MODELS 336 ON DOWN = 3/4"....(19.1 MM)
WATER TANK VENT....1/2"....(12.7 MM)	WATER FILL....1 1/2"....(38.1 MM)...PL1130	GALLEY DRAIN.....1 1/4".....(31.8 MM)	
WASTE TANK VENT....1/2"....(12.7 MM)	DIESEL FILL....1 1/2"....(38.1 MM)...PL1126	VANITY DRAIN.....1 ".....(25.4 MM)	HEAD WATER PICKUP....3/4"....(19.1 MM)
DIESEL TANK VENT....1/2"....(12.7 MM)	WASTE P.OUT....1 1/2"....(38.1 MM)...PL1140	BILGE PUMP DISCHARGE MODELS 29.5 ON DOWN = 3/4"...(19.1 MM)	GEN.WATER PICKUP (IF APPL.)-3/4"-(19.1 MM)
L.P. TANK VENT....1/2"....(12.7 MM)		MODELS.....336 ON UP = 1"..(25.4 MM)	REF. WATER PICKUP (IF APPL.)..3/4"..(19.1 MM)
VENT HOSE SIZES AS FOLLOWS: H_2O/WASTE/L.P. HOSE = 3/4"... (19.1 MM)		MACERERATOR DIS.....1"....(25.4 MM)	A. C. WATER PICKUP (IF APPL.)..3/4"..(19.1 MM)
FUEL HOSE....5/8"...(15.9 MM)		WASTE O.BOARD DIS.....1 1/2".....(38.1 MM) OVERSEAS MODELS ONLY	SH. SUMP DIS. (IF APP.)...3/4"...(19.1 MM) ALL MODELS EXCEPT P-42 P-42 = 1"..(25.4 MM)

TYP. VENT SIZES

TYP DECK PLATE SIZES (REFLECTS HOSE SIZE)

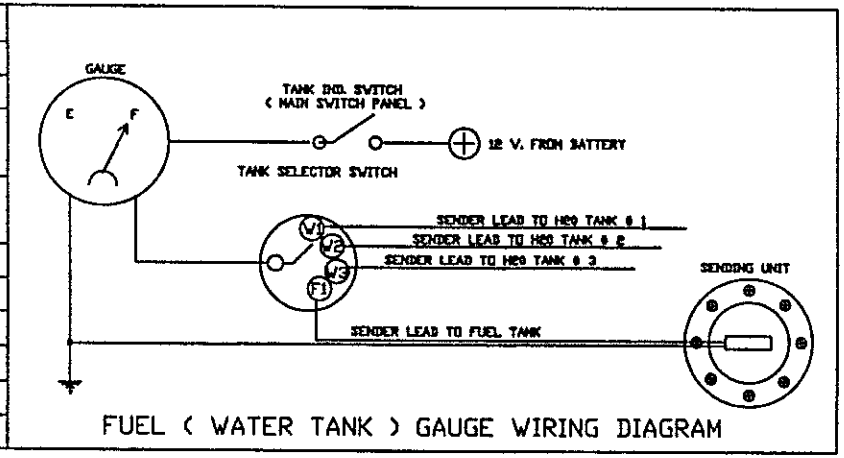
TYP. THRU-HULL/SEACOCK SIZES (REFLECTS HOSE SIZE)

THRUHULL/DECK,SEACOCK,VENT, DETAILS

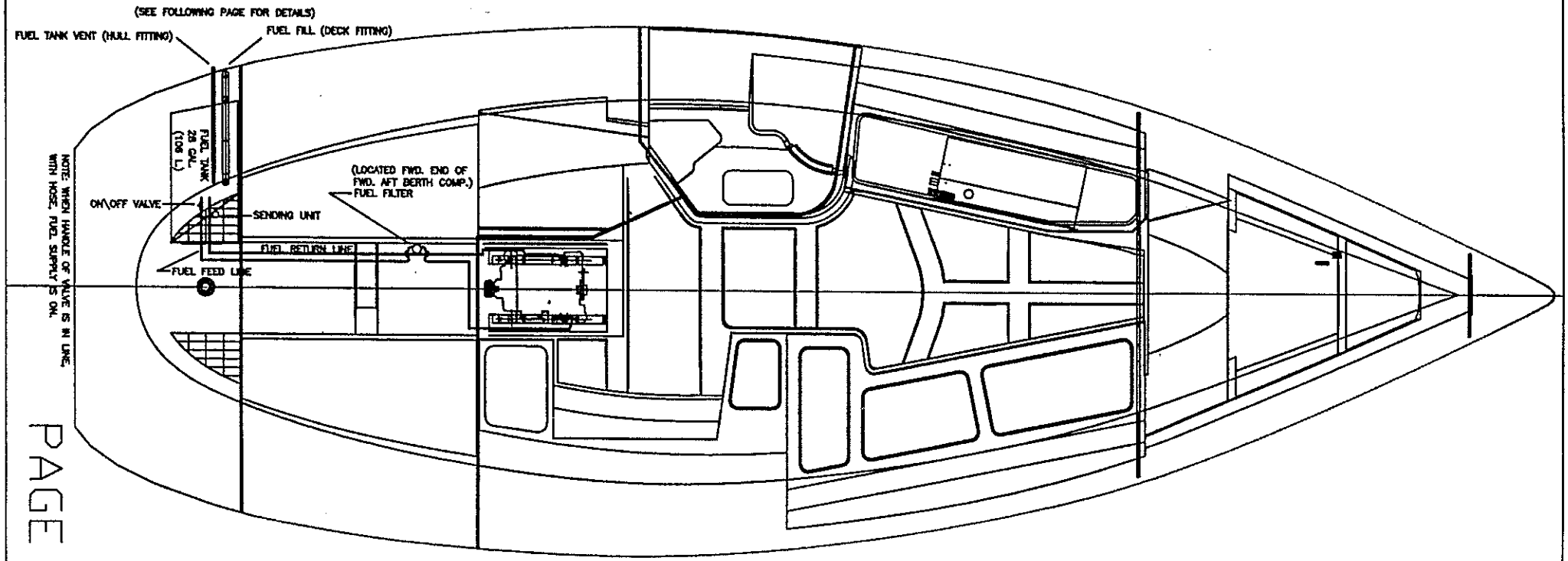
HUNTER

H-310 FITTING DETS.
DRAWING # 3108060B

DESCRIPTION	HUNTER PART #
ENGINE FUEL FILTER	PL0430
GENER. FUEL FILTER (OPTION SOME MODELS)	PL0430
ENGINE FUEL FEED / RETURN HOSE 5/16" (7.9 MM)	PL1370
GENER. FUEL HOSE FEED / RETURN 1/4" (6.4 MM)	PL1415
DIESEL FILL FITTING	PL1126
TANK VENT FITTING	PL0520
DIESEL FILL HOSE 1 1/2" (38.1 MM)	PL1530
TANK VENT HOSE 3/4" (19.1 MM)	PL1450
TANK GAUGE	EL00690



FUEL (WATER TANK) GAUGE WIRING DIAGRAM



H-310 FUEL SYSTEM

HUNTER
H-310 FUEL SYSTEM
DRAWING # 3108061A

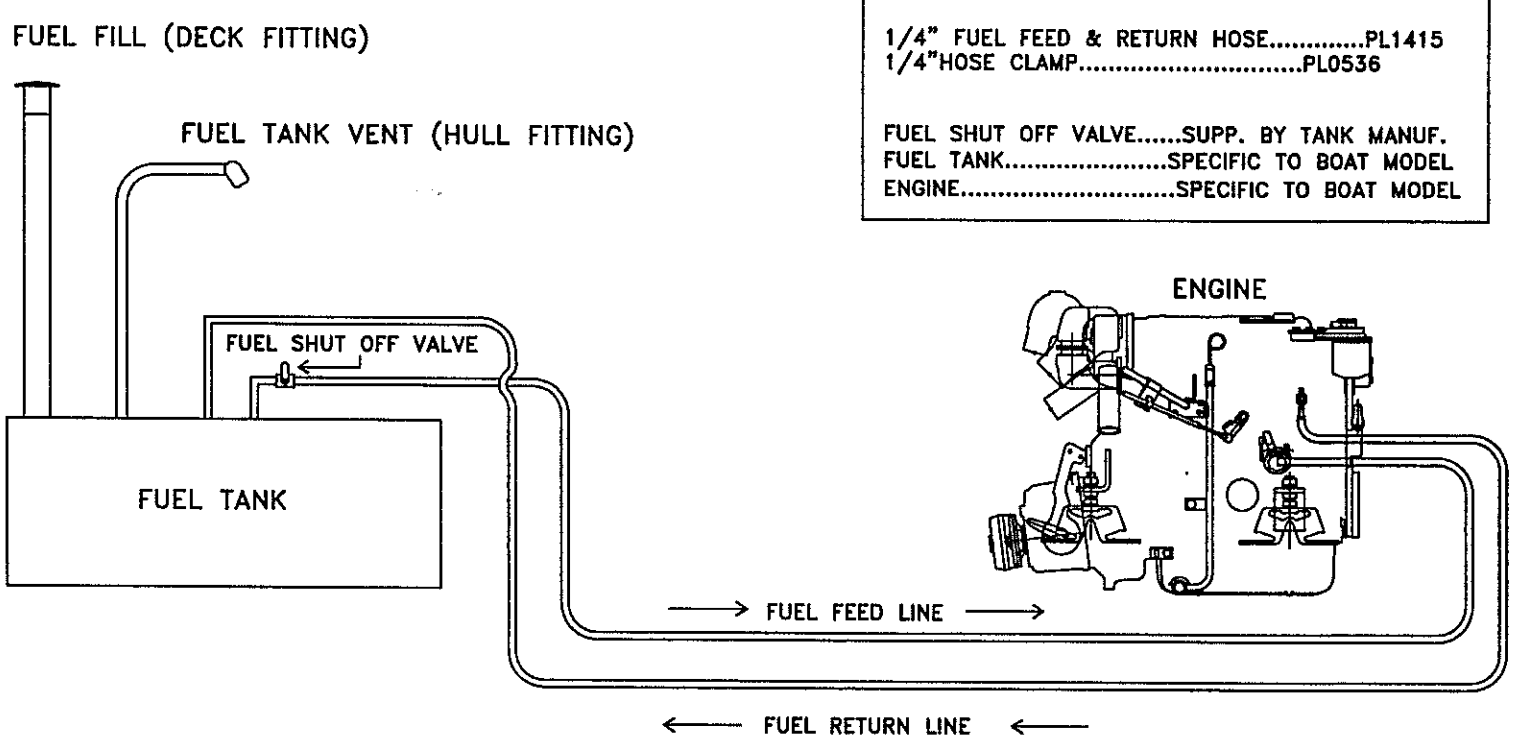
HUNTER PART #'s

FUEL FILL (DECK FITTING).....PL1126
1-1/2" FUEL FILL HOSE.....PL1530
1-1/2" HOSE CLAMP.....PL0550

FUEL TANK VENT (HULL FITTING).....PL0520
5/8" VENT HOSE.....PL1374
5/8"HOSE CLAMP.....PL0540

1/4" FUEL FEED & RETURN HOSE.....PL1415
1/4"HOSE CLAMP.....PL0536

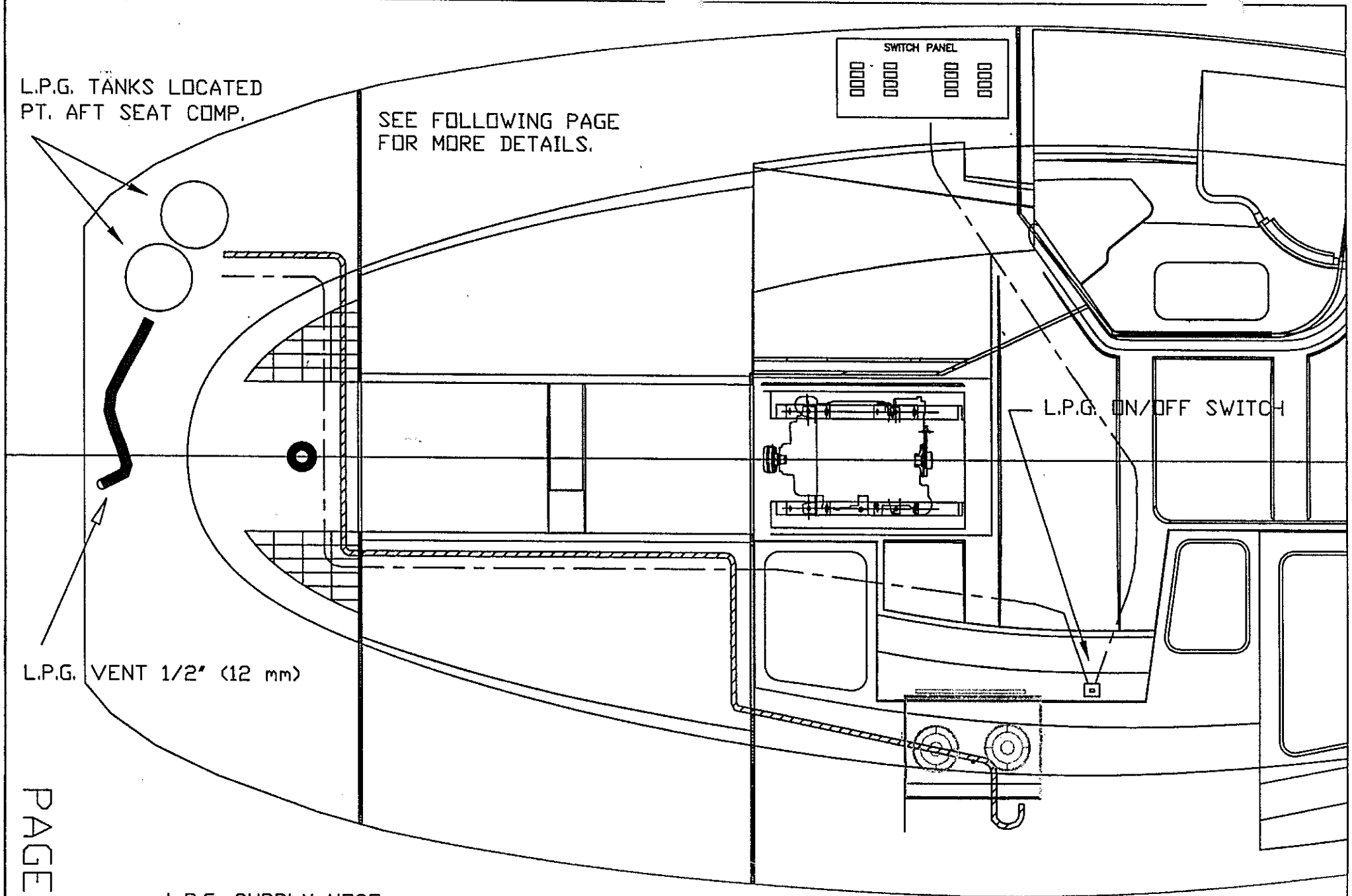
FUEL SHUT OFF VALVE.....SUPP. BY TANK MANUF.
FUEL TANK.....SPECIFIC TO BOAT MODEL
ENGINE.....SPECIFIC TO BOAT MODEL



NOTE: LOCATION OF FUEL FEED & RETURN LINES AT ENGINE VARY PER ENGINE MODEL

STD. FUEL SYSTEM LAYOUT

HUNTER
H-310 STD.FUEL SYSTEM
DRAWING # 3108061B

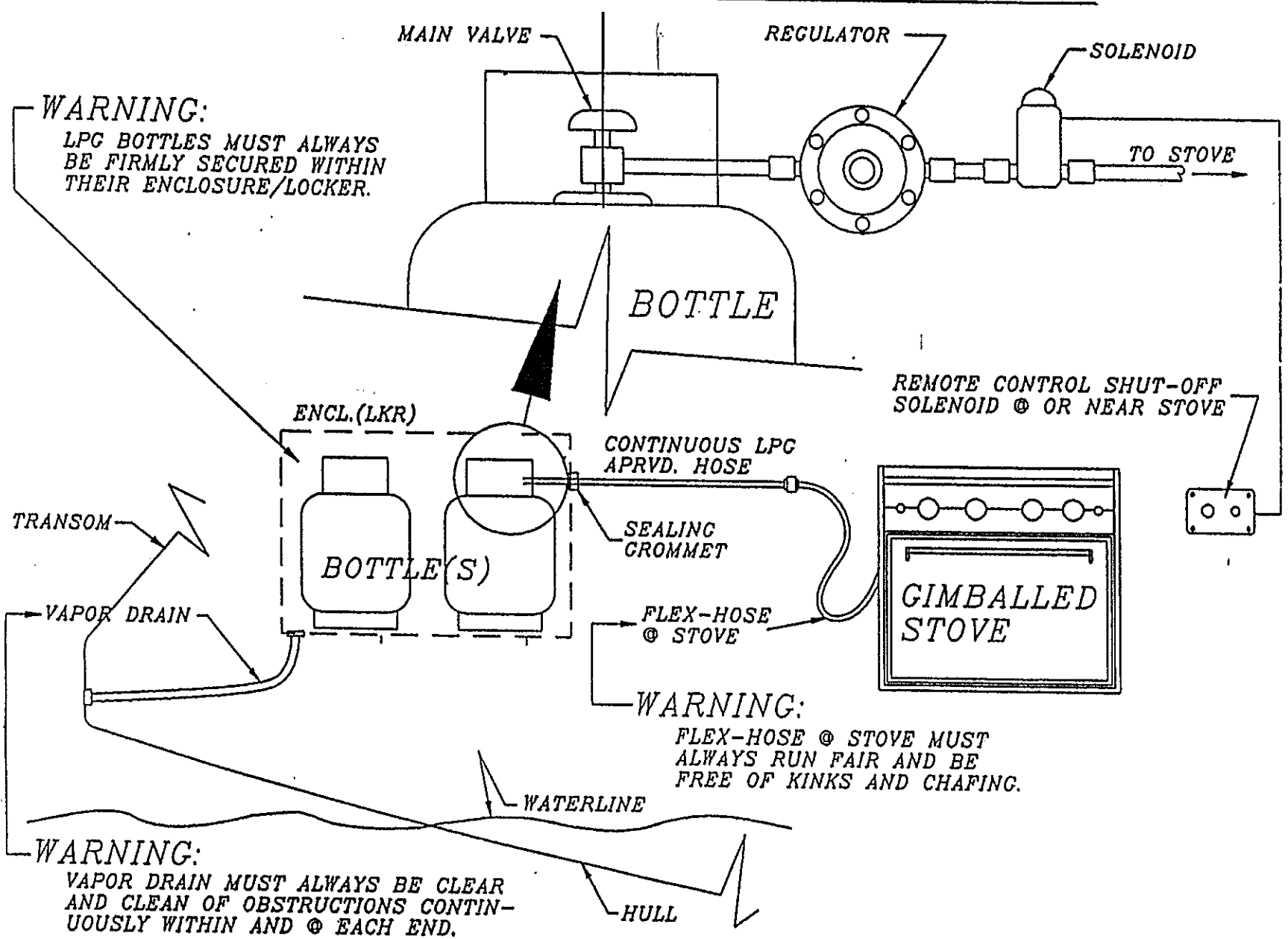


L.P.G. SYSTEM (310 MODEL)

HUNTER

H-310 LPG SYSTEM
DRAWING # 3108062A

NOTE: P-45 MODEL, TANKS ARE LOCATED IN PORT COCKPIT SEAT LOCKER



STD. L.P.G. SYSTEM LAYOUT

HUNTER

H-310 STD. LPG SYSTEM
DRAWING # 3108062B

H310 ELECTRICAL SYSTEMS

H310 ELECTRICAL SYSTEM CONTENTS

PAGES 63A-10 THRU 63C-3 CONTAINS A.C. POWER SYSTEMS
(110 V.A.C.) (220 V.A.C. ON OVERSEAS MODELS)

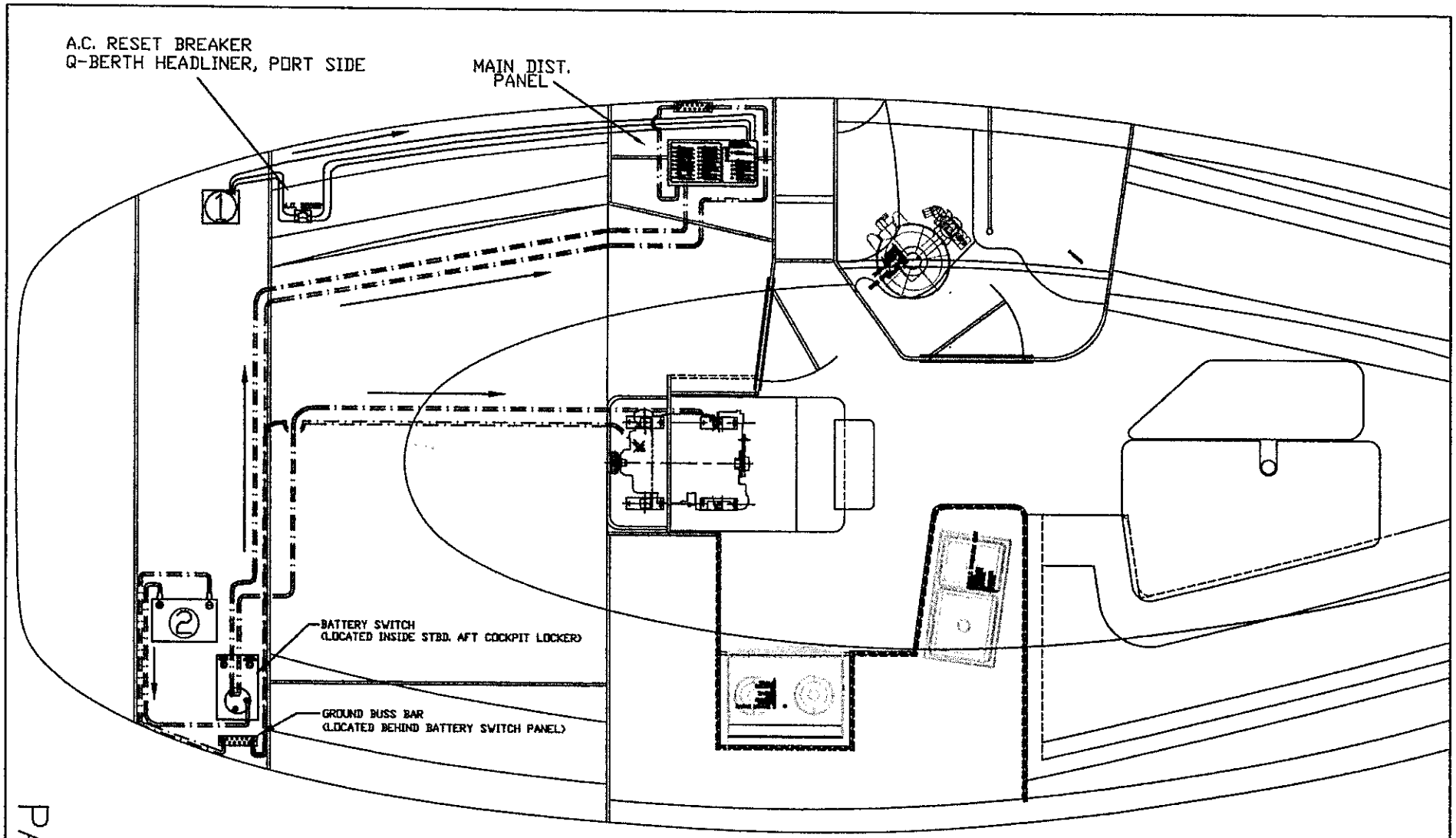
PAGES 64A-1 THRU 64G-3 CONTAINS D.C. POWER SYSTEMS
(12 VOLT D.C.)

H310 POWER SYSTEMS OPERATION PROCEDURES

ER SOURCE:	TO OPERATE:
(12V.)D.C. MAIN	1. TURN BATTERY SWITCH (LOCATED INSIDE STBD. AFT COCKPIT LOCKER) TO THE #1, #2 OR "BOTH" POSITION.** **(SEE BATTERY SEL. SW. NOTE BELOW)** 2. TURN ON "D.C. MAIN" BREAKER ON D.C. SIDE OF MAIN DISTRIBUTION PANEL. D.C. SIDE OF DISTRIBUTION PANEL SHOULD NOW BE OPERABLE. **IF NO POWER:** CHECK 50a. RESET ON BATTERY SWITCH PANEL AND/OR BATTERY CONNECTIONS.
(110V.) A.C. MAIN (220V.A.C. ON SOME OVERSEAS MODELS)	1. CONNECT SHORE POWER CABLE TO DOCKSIDE POWER SUPPLY AND SHORE POWER INLET ON STERN OF BOAT. 2. TURN ON "A.C. MAIN" BREAKER ON A.C. SIDE OF MAIN DISTRIBUTION PANEL. A.C. SIDE OF DISTRIBUTION PANEL SHOULD NOW BE OPERABLE. **IF NO POWER:** **CHECK BREAKER AT DOCKSIDE POWER SUPPLY BOX.** **CHECK A.C. BREAKER LOCATED ON PORT SIDE OF Q-BERTH HEADLINER .**

H310 BATTERY CHARGING SYSTEM OPERATION PROCEDURES

CHARGE SOURCE:	TO OPERATE:
BATTERY CHARGER	1. CONNECT SHORE POWER CABLE TO POWER A.C. SIDE OF MAIN DISTRIBUTION PANEL AND TURN ON THE "A.C. 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 BATTERY SWITCH TO PROVIDE CHARGING POWER TO THE BATTERY/S.**
NE ALTERNATOR	1. CHECK SEA STRAINER & OPEN ENGINE RAW WATER SEACOCK. SEE PAGE 60 FOR LOCATION. 2. TURN BATTERY SELECTOR SWITCH TO THE #1, POSITION.** 3. START SHIP'S ENGINE (**FOLLOW STARTING INSTRUCTIONS IN THE "ENGINE MANUAL"**)
**BATTERY SEL. SWITCH	**NOTE: THE H310 IS CAPABLE OF HAVING TWO BATTERIES IF DESIRED (2ND BATT. NOT PROVIDED) SEE PAGE 63C-3 FOR BATTERY CONNECTION/CHARGER DETAILS. WHEN CONNECTED AS SHOWN, YOU NOW HAVE ISOLATION CAPABILITIES BY TURNING THE SEL. SW. TO THE #1 OR #2 POSITION, OR DRAW POWER FROM BOTH BATTERIES WHEN SWITCH IS IN THE "BOTH" POSITION.**



1. SHORE POWER INLET, SUPPLIES A.C. POWER FROM DOCKSIDE RECEPTACLE TO A.C. SIDE OF MAIN DISTRIBUTION PANEL
2. BATTERY, SUPPLIES 12 V.D.C. POWER TO BOTH THE D.C. SIDE OF MAIN DISTRIBUTION PANEL & ENGINE STARTER

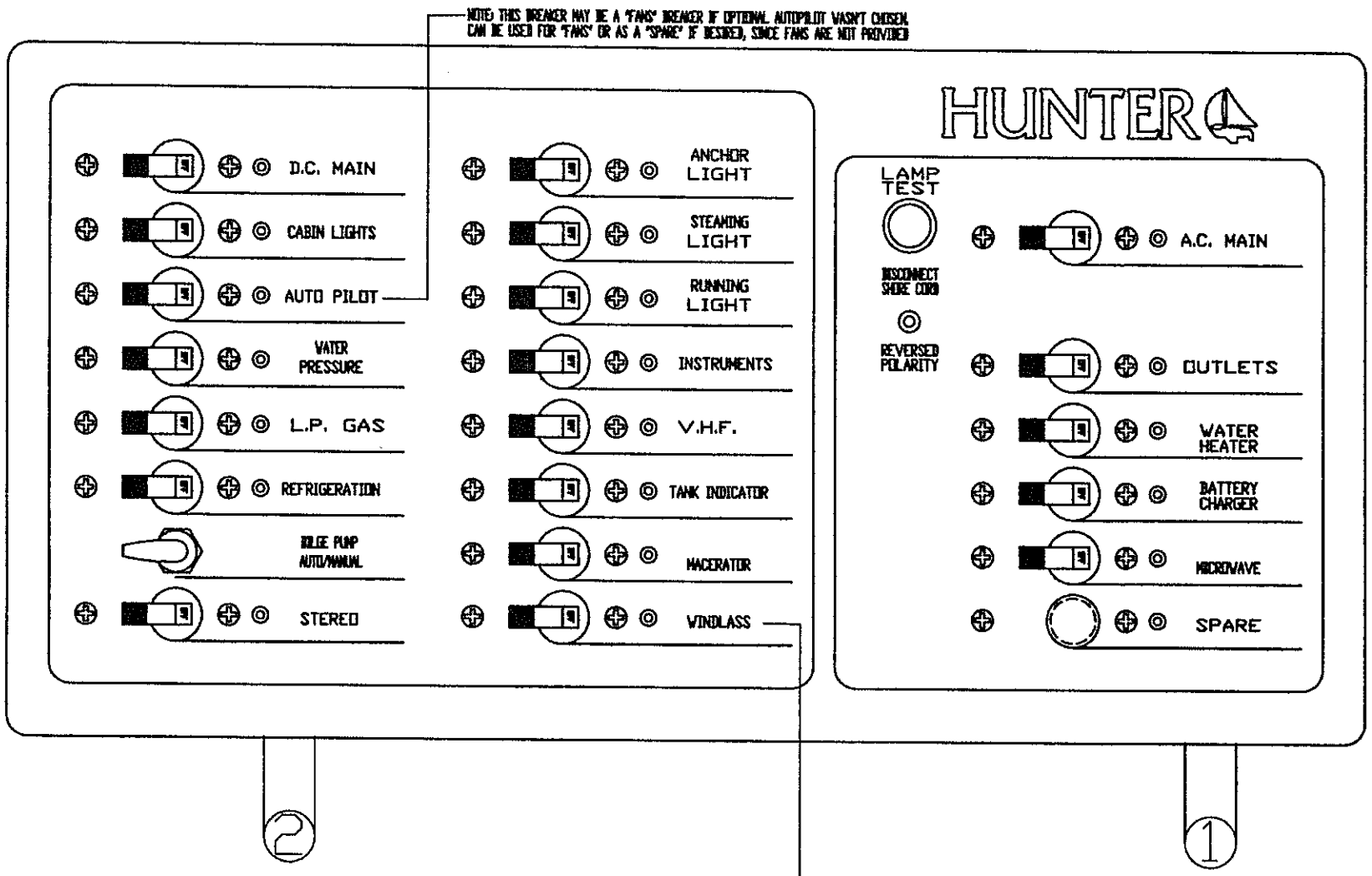
= 110 V.A.C. POWER LEADS (220 V. ON SOME OVERSEAS MODELS)

= 12 V.D.C. POWER LEADS

= POWER FLOW DIRECTION

H310 BASIC POWER (SUPPLY) SYSTEM LAYOUT	
DRAWING NO. 3108063A-3	REVISION NO. NONE
DRAWN BY ENGINEERING DEPT.	DATE 3/9/98

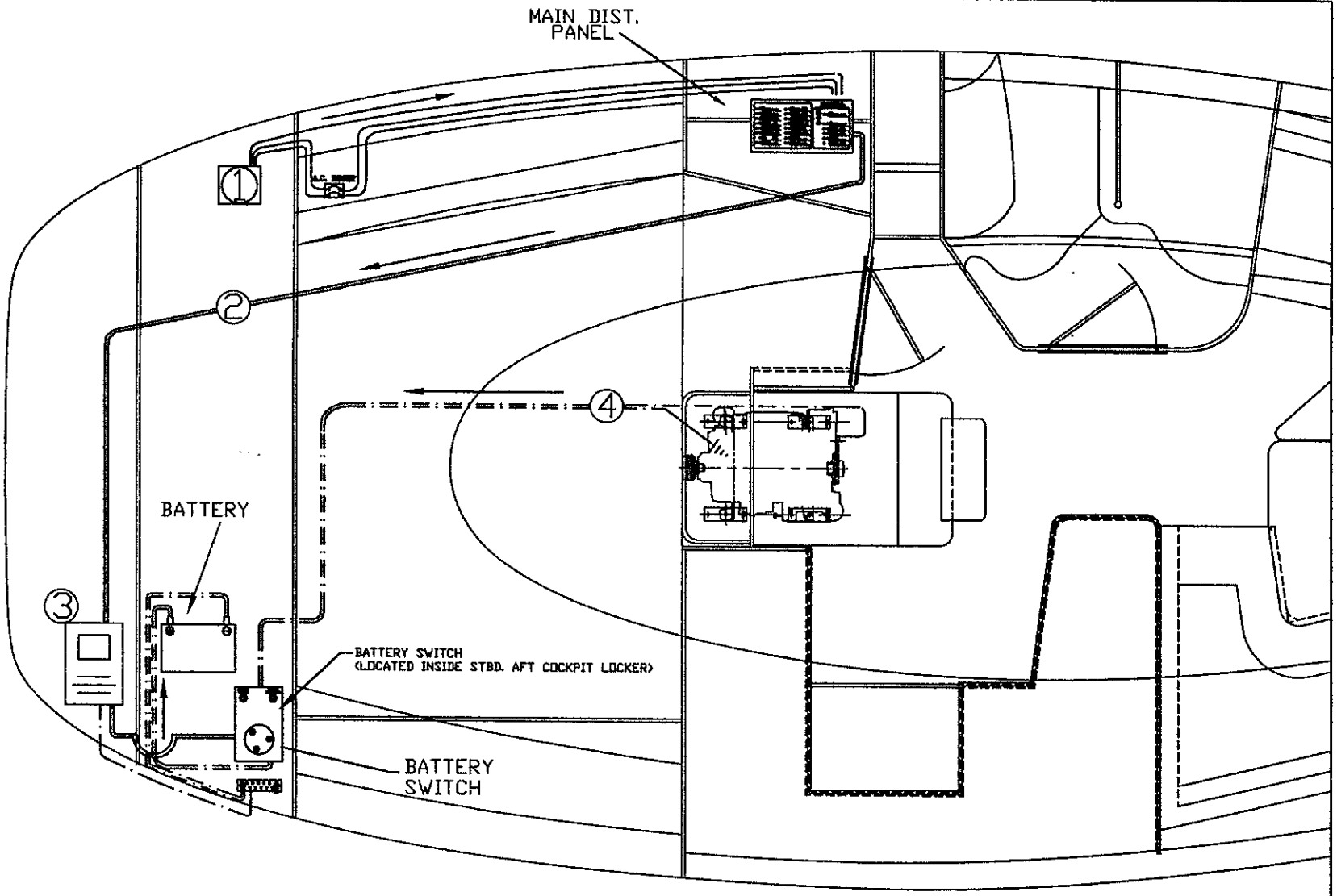
HUNTER



1. SHORE POWER TO A.C. SIDE OF PANEL
2. HOUSE BATTERY POWER TO D.C. SIDE OF PANEL

H310 MAIN DISTRIBUTION PANEL	
3108063A--4	NONE
ENGINEERING DEPT.	3/9/98

HUNTER



1. SHORE POWER INLET, SUPPLIES A.C. POWER FROM DOCKSIDE RECEPTACLE TO A.C. SIDE OF MAIN DISTRIBUTION PANEL
2. A.C. POWER FROM PANEL TO BATTERY CHARGER
3. BATTERY CHARGER
4. ENGINE ALTERNATOR CHARGE CIRCUIT

= 110 V.A.C. POWER LEADS (220 V. ON SOME OVERSEAS MODELS)

= CHARGING CIRCUIT

= POWER FLOW DIRECTION

H310 BASIC CHARGING SYSTEM LAYOUT	
DRAWING NO. 3108063A-5	REVISION NO. NONE
DRAWN BY ENGINEERING DEPT.	DATE 3/10/98

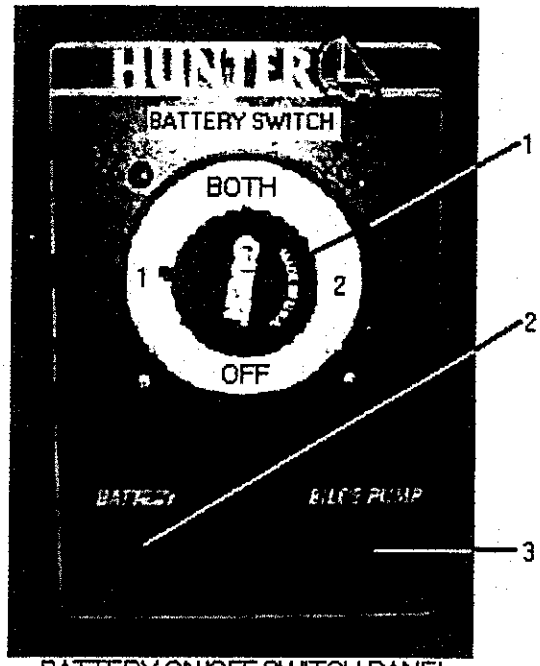
HUNTER

H310 DISTRIBUTION PANEL

BREAKER	(D.C. SIDE OF PANEL)	DESCRIPTION
D.C. MAIN	SUPPLIES 12 V.D.C. POWER FROM BATTERY TO ALL BREAKERS ON D.C. SIDE OF PANEL.
CABIN LIGHTS	SUPPLIES POWER TO ALL THE INTERIOR LIGHTING AND COCKPIT LIGHT
AUTO PILOT (OPTIONAL)	SUPPLIES POWER TO THE OPTIONAL AUTOPILOT MOTOR/COMPONENTS. NOTE: THIS BREAKER MAY BE A "FANS" BREAKER IF OPTIONAL AUTOPILOT WASN'T CHOSEN. MAY BE USED FOR "FANS" OR AS A "SPARE" IF DESIRED, SINCE FANS ARE NOT PROVIDED.
WATER PRESSURE	SUPPLIES POWER TO FRESH WATER PUMP TO PRESSURIZE H20 SYSTEM.
L. P. GAS	SUPPLIES POWER TO L.P. GAS SWITCH AT GALLEY. SEE "SEAWARD MANUAL" FOR OPER. & SAFETY INST.
REFRIGERATION	SUPPLIES POWER TO THE OPTIONAL REFRIGERATION COMPRESSOR LOCATED IN THE STBD. MAIN BUNK COMP.
BILGE PUMP	TOGGLE SWITCH STAYS IN THE "AUTO" POSITION, THIS ALWAYS FEEDS POWER TO THE FLOAT SWITCH (AS LONG AS BATTERY IS CONNECTED AND HAS AMPLE CHARGE) FOR MANUAL USE, PUSH SWITCH TO "MANUAL" PRIOR TO LEAVING VESSEL, "MANUALLY" TEST PUMP AND CHECK FLUID LEVELS (IF APPLIES) IN BATTERIES.
STEREO	BREAKER PROVIDED, STEREO IS NOT
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 W/ANCHOR LIGHT) USE AT NIGHT WHEN VESSEL UNDERWAY BY ENGINE POWER. (ALONG W/RUNNING LTS.)
RUNNING LIGHTS	SUPPLIES POWER TO THE BOW, STERN , & COMPASS LIGHT. USE AT NIGHT UNDER SAIL AND/OR ENGINE POWER.
INSTRUMENTS	SUPPLIES POWER TO KNOT & DEPTH, REPEATERS LOCATED ON SEAHOOD.
VHF	SUPPLIES POWER TO THE VHF RADIO LOCATED ON THE HELM CONSOLE. (ON SOME EXPORT MODELS THE V.H.F. RADIO IS LOCATED BY THE MAIN DISTRIBUTION PANEL)
TANK INDICATOR	SUPPLIES POWER TO TANK/S SENDING UNITS TO DISPLAY TANK LEVELS ON TANK GAUGES.
MACERATOR	SUPPLIES POWER TO MACERATOR (LOCATED IN PORT MAIN BUNK COMP.) **NOTE: THIS DEVICE IS USED FOR DIRECT OVERBOARD DISCHARGE OF RAW SEWAGE, BE AWARE OF YOUR LOCAL BOATING REGULATIONS BEFORE USING.**
WINDLASS (OPTIONAL)	SUPPLIES POWER TO UP/DOWN CONTROLS AT ANCHOR WELL. **NOTE: IT IS GOOD PRACTICE TO START THE SHIPS ENGINE PRIOR TO OPERATING WINDLASS TO PREVENT BATTERY DRAIN.** **(IF NO POWER, CHECK RESET ON WINDLASS REMOTE PANEL)**
YELLOW L.E.D.'S	LIGHT EMITTING DIODES ILLUMINATE WHEN 12 V.D.C. POWER PRESENT.
NOTE:	SEE PAGE 64A-1 FOR BREAKER AMPERAGES

BREAKERS	(A.C. SIDE OF PANEL)	DESCRIPTION
A.C. MAIN (SHORE POWER)	PROVIDES A.C. VOLTAGE TO MAIN DISTRIBUTION PANEL WHEN SHORE POWER CORD IS CONNECTED TO OUTLET AT DOCKING FACILITY.
OUTLETS **OUTLETS NOTE:**	PROVIDES A.C. POWER TO THE OUTLETS IN THE Q-BERTH.,GALLEY, HEAD, V-BERTH AND NAV. STATION NOTE: NO OUTLET PROVIDED IN HEAD ON SELECT 220 V. MODELS. G.F.C.I. (GROUND FAULT CIRCUIT INTERRUPTER) OUTLETS ARE PROVIDED IN THE Q-BERTH & GALLEY. THE G.F.C.I. OUTLET IN THE Q-BERTH PROTECTS ALL THE OUTLETS ON THE PORT SIDE OF THE BOAT AND THE GALLEY G.F.C.I. OUTLET PROTECTS THE OUTLET ABOVE THE REFRIGERATOR. THE RED (RESET) BUTTON RESTORES POWER TO THE OUTLET/S IN THAT CIRCUIT. THE BLACK BUTTON (TEST) DISCONNECTS POWER TO THAT CIRCUIT.
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.**
BATTERY CHARGER	SUPPLIES POWER TO CHARGER FOR CHARGING BATTERY/S (IF 2ND BATT. DESIRED SEE PAGE 63C-3 FOR DETAILS)
MICROWAVE	SUPPLIES POWER TO OUTLET BEHIND MICRO. IN WHICH MICROWAVE IS PLUGGED INTO.
SPARE	THIS SPACE PROVIDED FOR AN ADDITIONAL BREAKER IF NEEDED
MISC. INFO	
RED L.E.D.'S	ILLUMINATE WHEN A.C. POWER PRESENT.
REV. POLARITY	IF REVERSED POLARITY L.E.D. ILLUMINATES AFTER CONNECTING SHORE POWER CORD, DISCONNECT CORD AND HAVE DOCKSIDE POWER CHECKED BY QUALIFIED PERSONELL.
NOTE:	SEE PAGE 63A-10 FOR BREAKER AMPERAGES

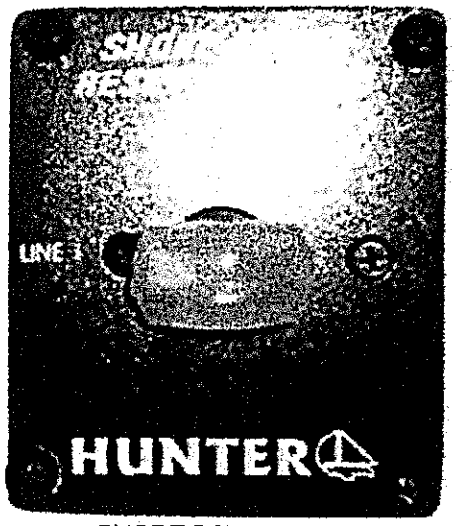
H310 SWITCH PANELS



1. BATTERY SWITCH
2. BATTERY RESET
3. BILGE PUMP RESET

LOCATED IN STBD. AFT COCKPIT LOCKER.

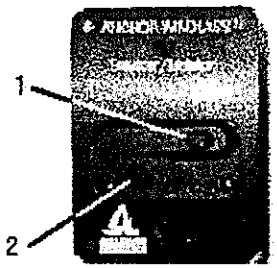
BATTERY ON/OFF SWITCH PANEL



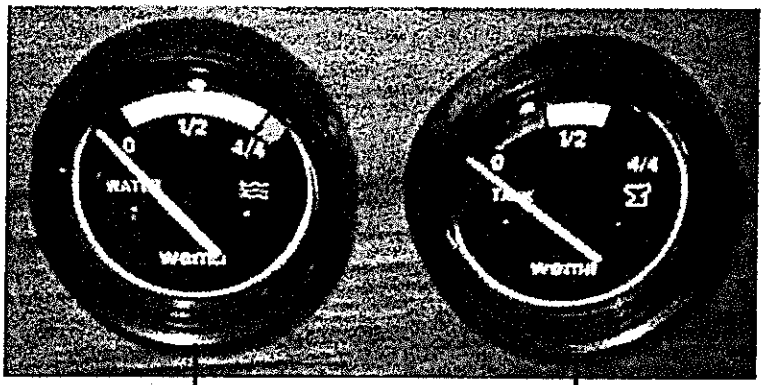
SHORE POWER RESET
LOCATED IN Q-BERTH
PORT AFT HEADLINER

WINDLASS RESET PANEL
LOCATED IN STBD. AFT COCKPIT LOCKER

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



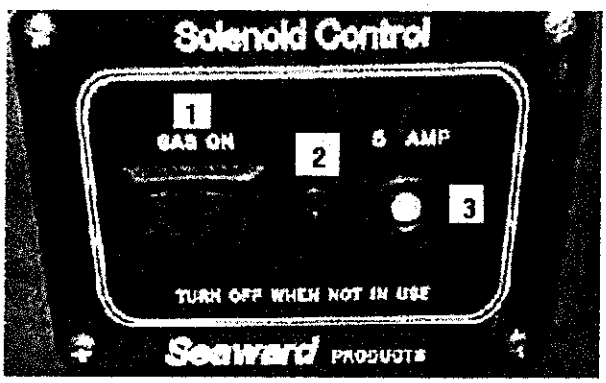
WINDLASS BREAKER



TANK GAUGES

WATER WASTE

LOCATED NEXT TO DISTRIBUTION PANEL IN Q-BERTH



L.P. GAS PANEL
LOCATED AT GALLEY

1. L.P.G. ON/OFF SWITCH
2. SYSTEM "ON" L.E.D.
3. RESET BUTTON

12V.D.C. SYSTEM TROUBLESHOOTING GUIDE

TO POWER PANEL: 1. TURN BATTERY SWITCH TO THE #1 OR #2 OR "BOTH" POS. (LOCATED IN STBD. AFT COCKPIT LOCKER)
2. TURN ON "D.C. MAIN" BREAKER ON PANEL,
IF NO POWER TO PANEL, PUSH "RESET" ON BATTERY SWITCH PANEL
AND/OR CHECK BATTERY CONNECTIONS.

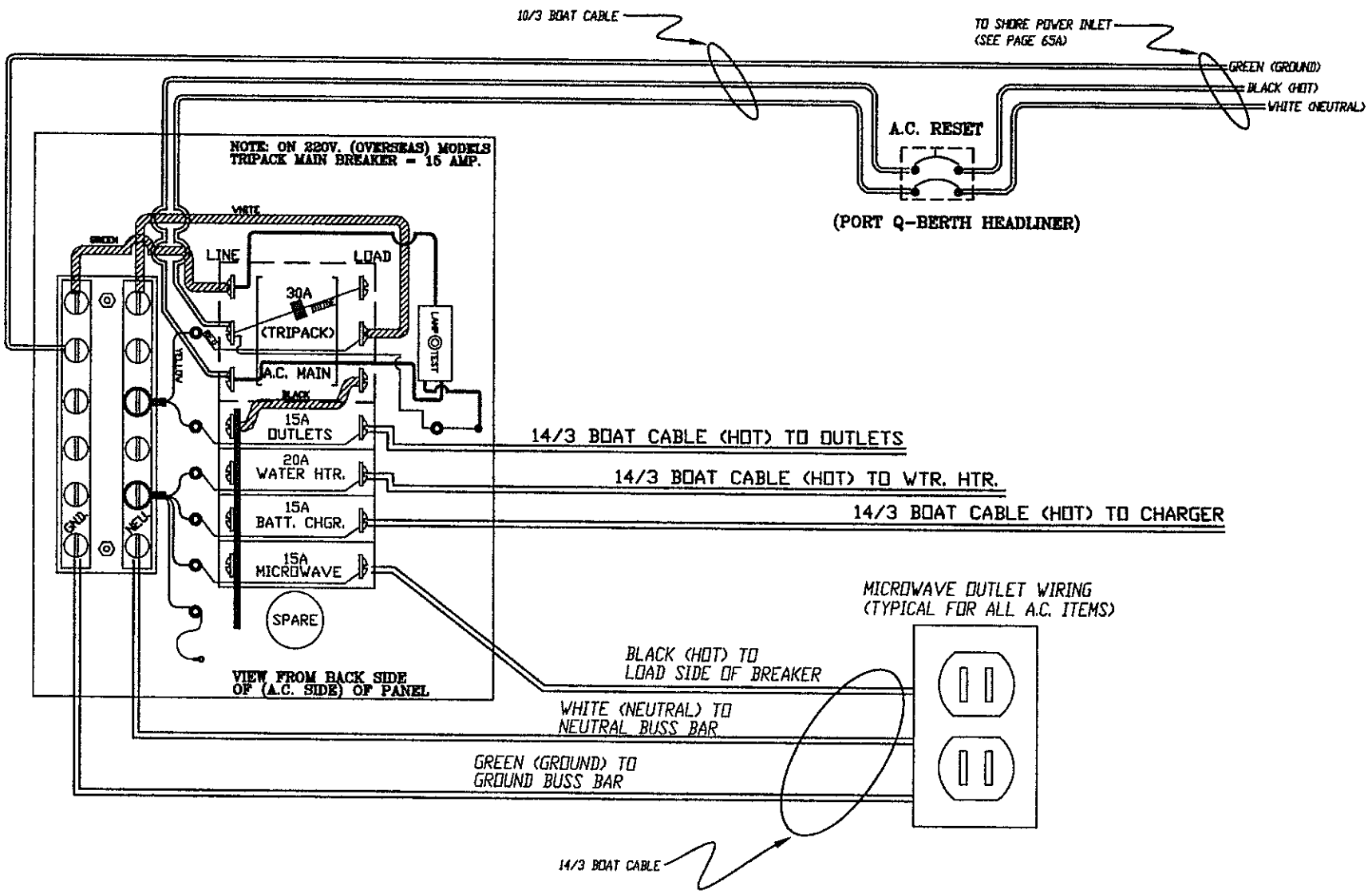
COMPONENT	SYMPTOM	POSSIBLE SOLUTION/S
D.C. MAIN	NO POWER TO PANEL	SEE "TO POWER PANEL" ABOVE BATTERY/S CHARGED?
CABIN LIGHTS	WON'T ILLUMINATE	SEE "TO POWER PANEL" ABOVE BULB/S NEED REPLACING?
OPT. AUTO PILOT	WON'T OPERATE WON,T HOLD STEADY COURSE CONSTANTLY ADJUSTING HELM	SEE "TO POWER PANEL" ABOVE IS THERE ANY METAL OBJECTS NEAR THE FLUX GATE COMPASS LOCATED BEHIND THE KICKBOARD BULKHEAD IN THE Q-BERTH ? SENSITIVITY SETTING SET TO HIGH, SEE "AUTO PILOT MANUAL" FOR SENS. ADJ.
WATER PUMP	NO POWER CYCLES ON/OFF EXCESSIVELY	SEE "TO POWER PANEL" ABOVE FAUCETS OFF? LEAK IN SYSTEM SEE PAGEC 57A FOR CONNECTION LOC.
L.P. GAS	NO POWER TO SWITCH AT GALLEY SYSTEM TURNS ON, NO GAS PRESENT	SEE "TO POWER PANEL" PREV. PAGE IS TANK VALVE OPEN? IS TANK EMPTY? SEE "STOVE/OVEN" MANUAL
REFRIGERATION	WON'T GET COLD	SEE "TO POWER PANEL" ABOVE THERMOSTAT TURNED ON? SEE "REFRIGERATION" MANUAL SEEK QUALIFIED PERSONELL
BILGE PUMP	WON'T OPERATE AUTO OR MANUAL PUMP MAKES NOISE, DOESN'T PUMP PUMP RUNS BUT DOESN'T DISCHARGE	BATTERY LEVEL O.K.? CHECK BILGE RESET ON BATT. SW. PANEL BATTERY CONNECTIONS GOOD? DEBRIS IN PUMP IMPELLER? DISCHARGE HOSE CLOGGED?
ANCHOR, STEAM., & RUNNING LIGHTS	WON'T ILLUMINATE	SEE "TO POWER PANEL" ABOVE CHECK CONNECTION/S @ TERMINAL STRIP ABOVE PANEL AT TOP OF COMPRESSION POST BULB/S NEED REPLACING?
INSTRUMENTS	REPEATERS DON'T OPERATE	SEE "TO POWER PANEL" ABOVE DO TRANSDUCERS NEED CLEANING? SEE "INSTRUMENTS" MANUAL
V.H.F. RADIO	WON'T OPERATE TURNS ON WON'T TRANSMIT/RECEIVE	SEE "TO POWER PANEL" ABOVE RADIO TURNED ON? ANTENNA CONNECTED PROPERLY?
TANK INDICATOR	TANK LEVEL GAUGES DON'T ILLUMINATE TANK LEVEL DISPLAYED IS INCORRECT	SEE "TO POWER PANEL" ABOVE TANK SENDING UNIT NEEDS CLEANING
MACERATOR	WON'T TURN ON RUNS BUT DOESN'T DISCHARGE PUMP MAKES NOISE, DOESN'T PUMP	SEE "TO POWER PANEL" IS DISCHARGE SEACOCK OPEN? IS WASTE DECK FITTING SECURE, IS IT PULLING AIR THRU? IF SO, TIGHTEN CAP OR REPLACE O- 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
WINDLASS (OPT.)	UP/DOWN CONTROLS DON'T OPERATE WINDLASS	SEE "TO POWER PANEL" ABOVE IS RESET "TRIPPED" ON WINDLASS RESET PANEL?
NOTE: COMPONENT/S FAILURE COULD ALSO BE THE RESULT OF A POOR "GROUND" CONNECTION. GROUND BUSS BARS ARE LOCATED IN THE STBD. AFT COCKPIT LOCKER, AND BEHIND THE MAIN DISTRIBUTION PANEL. DUE TO VIBRATION, WEATHER CONDITIONS, ETC. OCCASIONAL INSPECTION, CLEANING AND TIGHTENING OF THESE TERMINALS (BY QUALIFIED PERSONELL) MAY BE NECESSARY.		

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

'OWER PANEL:

1. CONNECT SHORE POWER CORD TO DOCKSIDE POWER SUPPLY AND SHORE POWER INLET ON STERN OF BOAT.
2. TURN ON "A.C. MAIN" BREAKER ON MAIN DISTRIBUTION PANEL.
   IF NO POWER TO PANEL, CHECK DOCKSIDE BREAKER AND/OR A.C. RESET (BREAKER) ON Q-BERTH HEADLINER PORT SIDE.

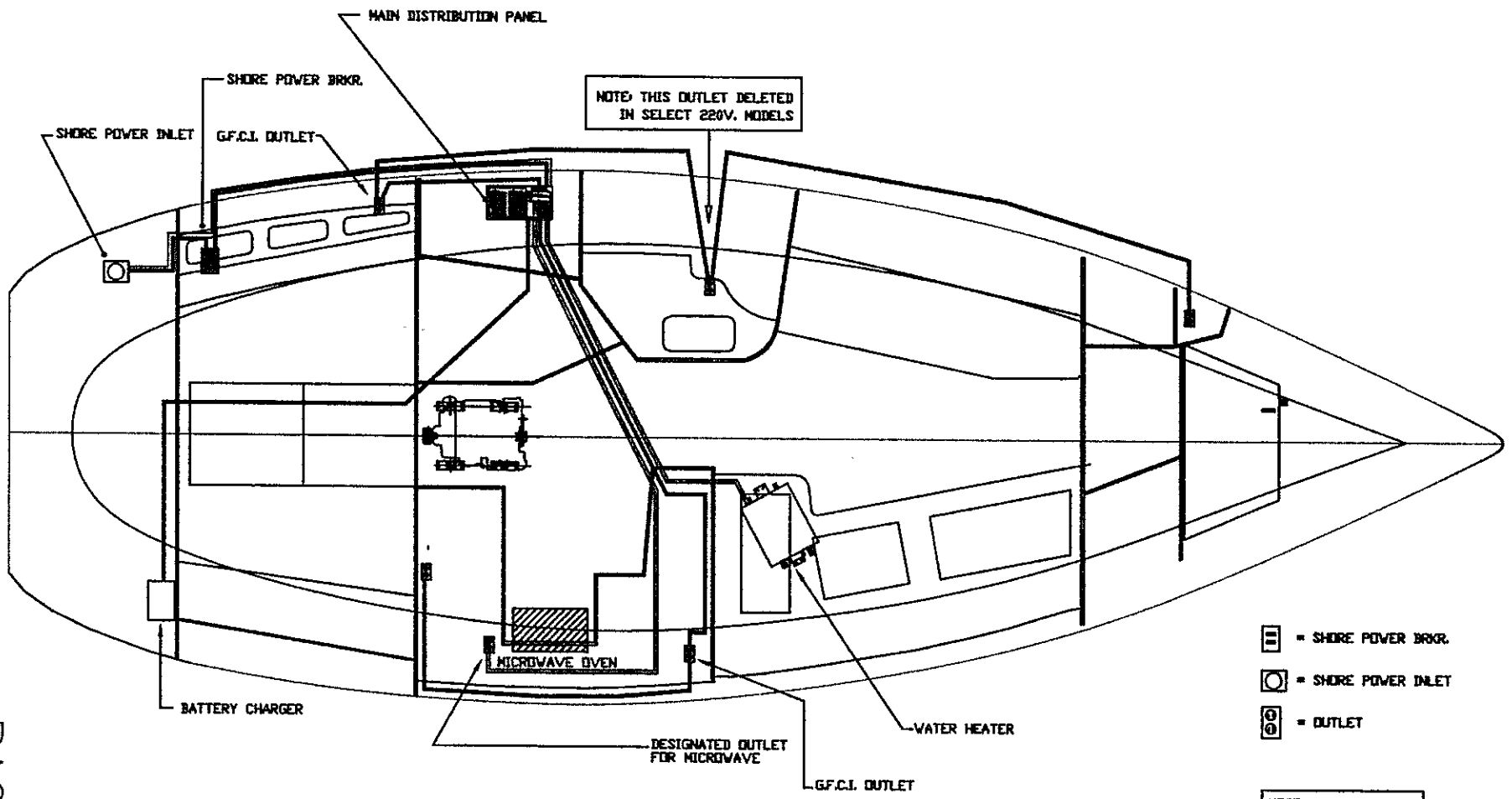
COMPONENT	SYMPTOM	POSSIBLE SOLUTION/S
A.C. MAIN (SHORE POWER)	NO POWER TO PANEL	SEE TO POWER PANEL ABOVE
OUTLETS	NO POWER	SEE TO POWER PANEL ABOVE IS OUTLET BREAKER/S ON? CHECK RESET (RED BUTTON) ON G.F.C..I. OUTLETS AT GALLEY AND Q-BERTH
WATER HEATER	NO POWER	SEE TO POWER PANEL ABOVE IS BREAKER ON?
	WON'T HEAT WATER	CHECK "RESET" ON HEATER SEE "WATER HEATER MANUAL" FOR LOCATION.
	WATER TO COLD/HOT	SEE "WATER HEATER MANUAL" FOR THERMOSTAT ADJUSTMENT AND/OR ELEMENT REPLACEMENT, (SEEK QUALIFIED PERSONELL)
BATTERY CHARGER	NOT CHARGING BATTERY/S NOTE: 2ND BATTERY NOT PROVIDED AS STANDARD	SEE TO POWER PANEL ABOVE IS BATT. CHARGER BREAKER ON? ARE BATTERY CONNECTIONS GOOD? CHECK GROUND CONNECTIONS AT GROUND BUSS BAR SEE "CHARGER MANUAL"
'ERNATOR	NOT CHARGING BATTERY/S	CHECK CONNECTIONS AND/OR SEE "ENGINE" MANUAL
.ROWAVE		SEE TO POWER PANEL ABOVE IS BREAKER ON? IS MICROWAVE ON? SEE "MICROWAVE MANUAL"



PAGE 63A-10

H310 A.C. PANEL SCHEMATIC	
3108063A-10	NONE
ENGINEERING DEPT.	3/10/98

HUNTER



H310 A.C. POWER PAN WIRING	
3108063A-11	NTS
ENGINEERING DEPT.	3/11/98

HUNTER

SECTION 63B...OPTIONAL AIR COND. SYSTEMS

BASIC OPERATING INSTRUCTIONS:

① CONNECT SHORE POWER CORD
② CHECK AIR COND. SEA STRAINER, (Q–BERTH COMP.) CLEAN IF NECESSARY
③ OPEN RAW WATER PICKUP SEACOCK Q–BERTH BUNK COMP.
④ TURN ON A.C. MAIN BREAKER ON A.C. DISTRIBUTION PANEL
⑤ TURN ON AIR COND. BREAKER
⑥ TURN ON UNIT AT E.C.U. (ENVIRONMENT CONTROL UNIT) DISPLAY PANEL AND SET TEMP.

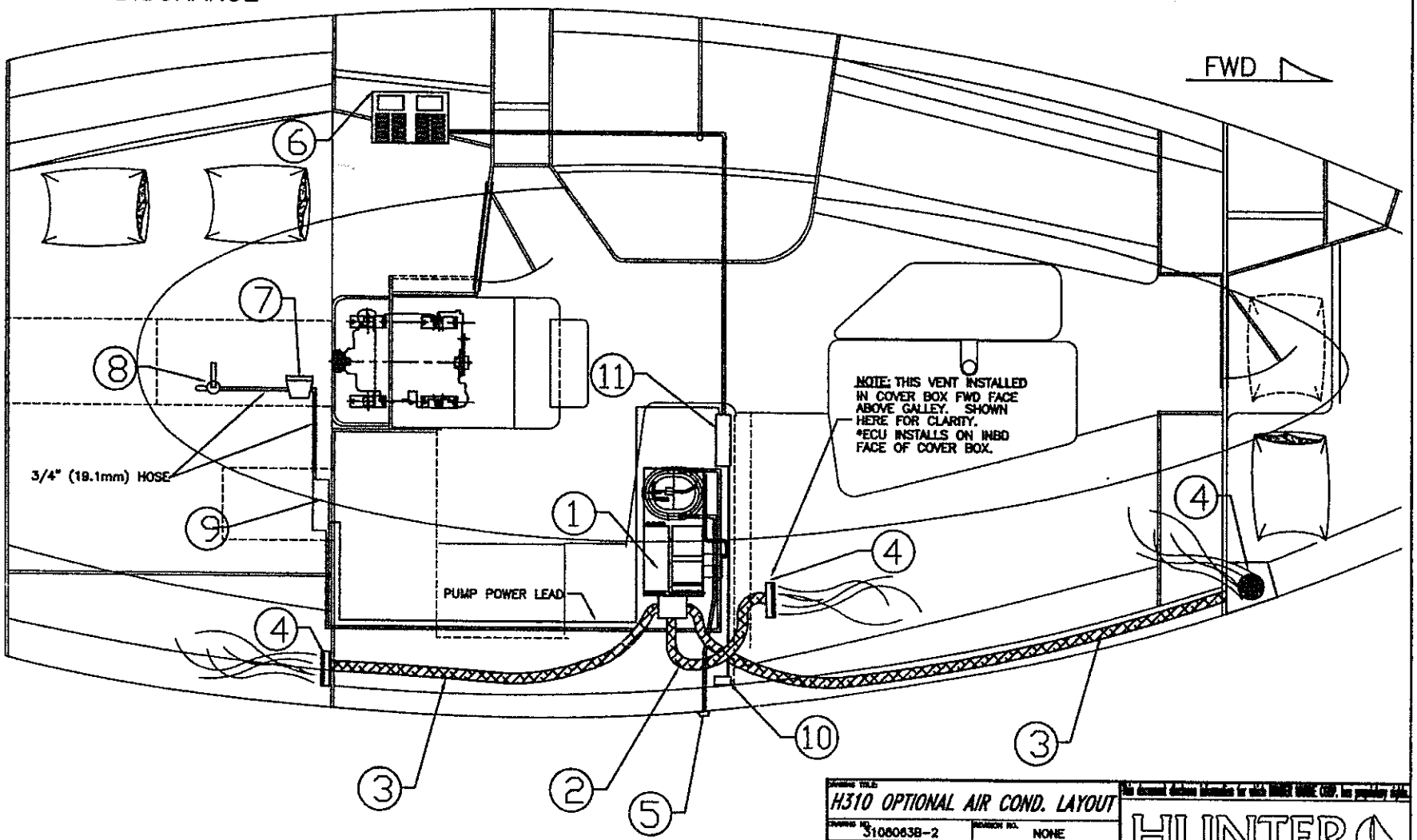
NOTE:
WHEN USING AIR COND. SYSTEM WITH OTHER APPLIANCE/S "POWER UP" THE AIR COND. FIRST.

IF THERE IS NO POWER AT PANEL WHEN CONNECTED TO SHORE POWER, CHECK MAIN BREAKER IN Q–BERTH HEADLINER, PORT SIDE

SEE MARINE AIR MANUAL FOR DETAILED OPERATING PROGRAMMING/TROUBLESHOOTING INSTRUCTIONS

H310 OPTIONAL AIR COND. OPER. INST	
31080638–1	NONE
ENGINEERING DEPT.	3/11/98

① AIR COND. COMPRESSOR (INSIDE GALLEY)
② 5" (127.0mm) AC DUCT
③ 3" (76.2mm) AC DUCT
④ VENTS
⑤ 5/8"(15.9mm) RAW WATER DISCHARGE
⑥ MAIN DISTRIBUTION PANEL
⑦ SEA STRAINER
⑧ RAW WATER INTAKE (SEACOCK) 3/4"(19.1mm)
⑨ CIRCULATION PUMP
⑩ ENVIRONMENT CONTROL UNIT (ECU)
⑪ CONTROL BOX



H310 OPTIONAL AIR COND. LAYOUT	
3106063B-2	NONE
ENGINEERING DEPT.	3/11/98

HUNTER

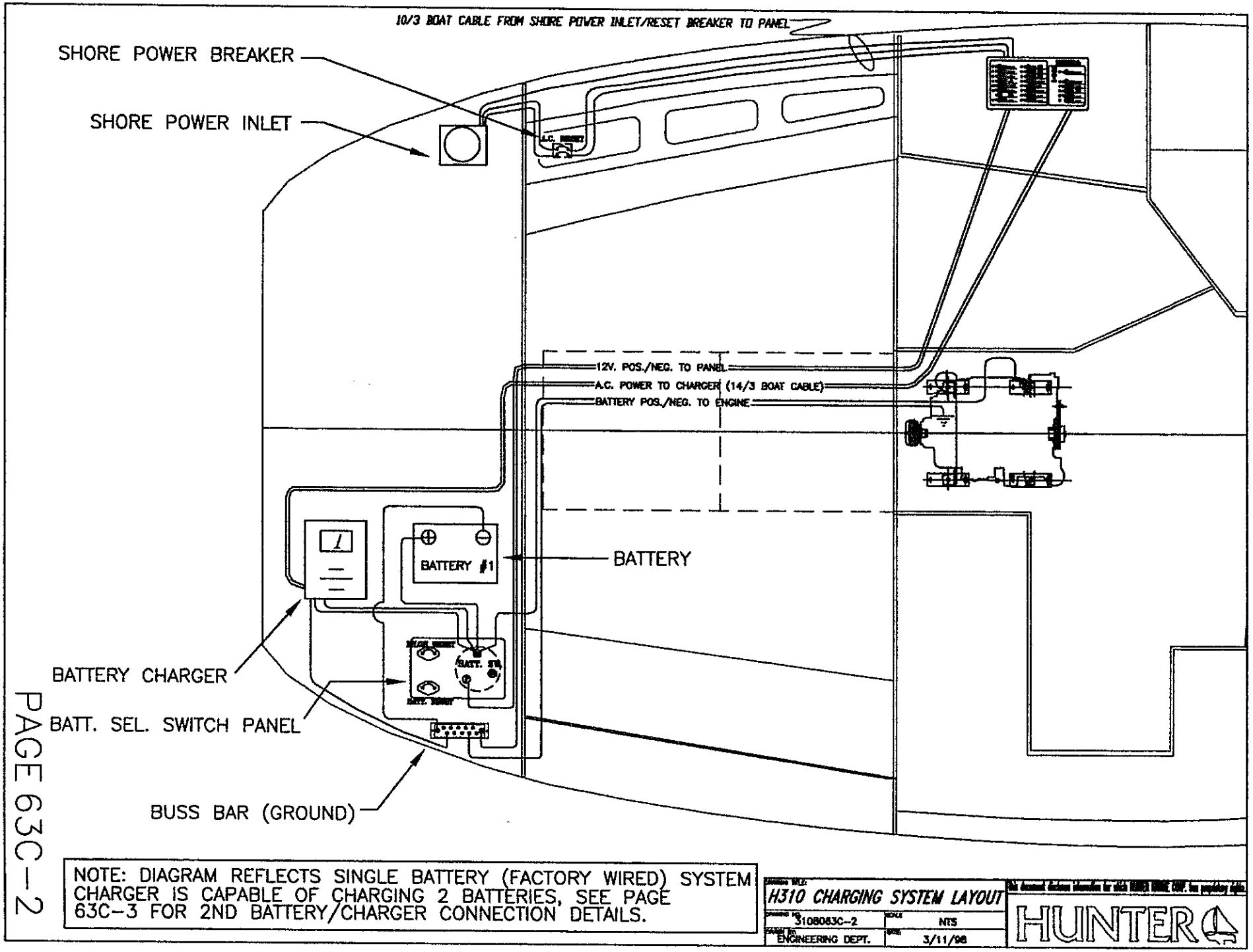
SECTION 63C...BATTERY CHARGING SYSTEM

BASIC OPERATING INSTRUCTIONS:

① CONNECT SHORE POWER TO DOCKSIDE SUPPLY AND SHORE POWER INLET ON STERN OF BOAT
② TURN ON "A.C. MAIN" BREAKER
③ TURN ON "BATTERY CHARGER" BREAKER

NOTE:
CHECK FOR CORRECT FLUID LEVEL IN BATTERIES (IF APPLICABLE) PRIOR TO USING CHARGER.
USE OF CHARGER (OR ENGINE ALT.) IS IMPORTANT WHEN USING 12V.D.C. SYSTEMS
TO REDUCE BATTERY DRAIN.

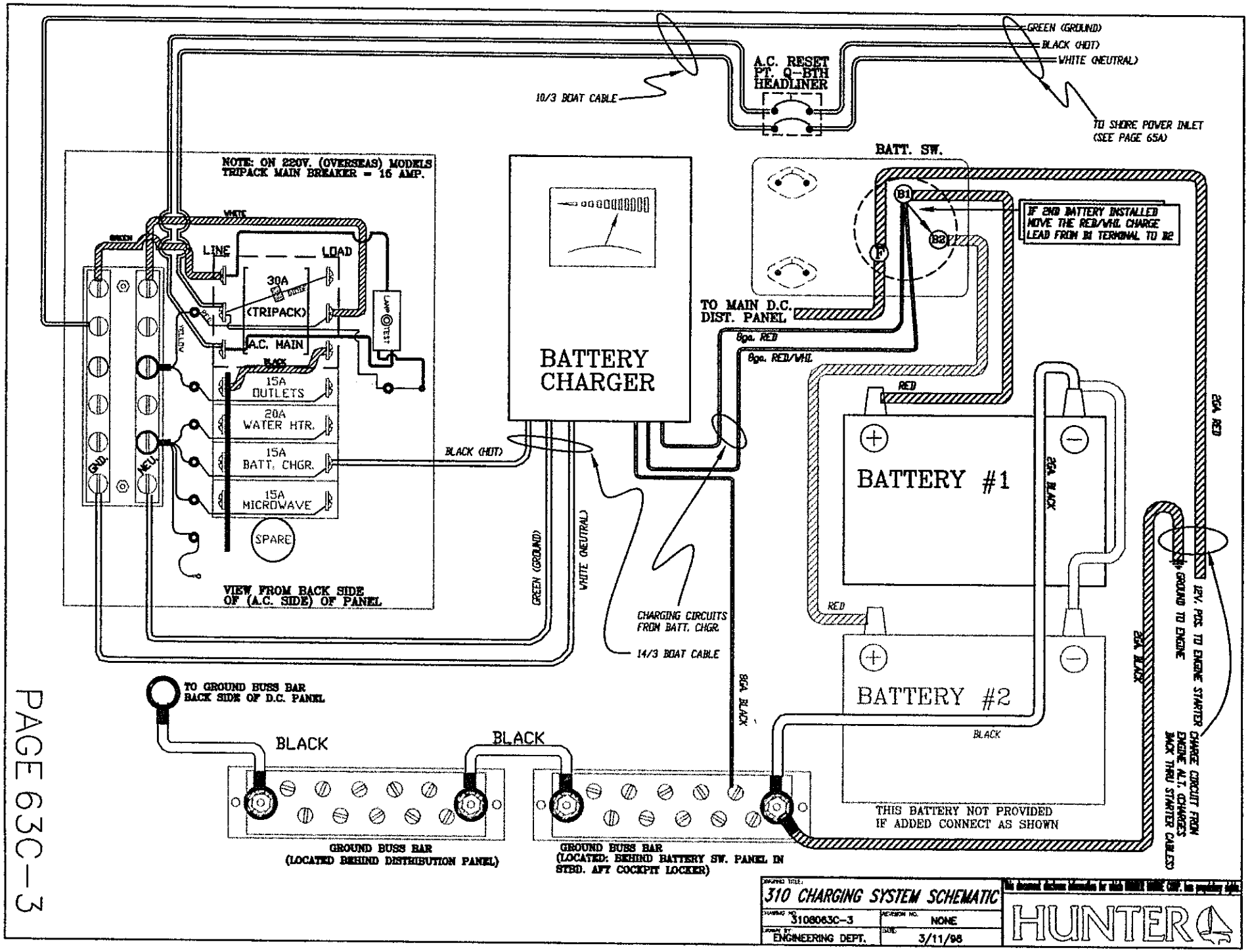
H310 CHARGING SYSTEM OPERATING INSTRUCTION	
3108063C-1	NONE
ENGINEERING DEPT.	2/23/98



NOTE: DIAGRAM REFLECTS SINGLE BATTERY (FACTORY WIRED) SYSTEM CHARGER IS CAPABLE OF CHARGING 2 BATTERIES, SEE PAGE 63C-3 FOR 2ND BATTERY/CHARGER CONNECTION DETAILS.

DRAWING TITLE:	H310 CHARGING SYSTEM LAYOUT
DRAWING NO.	31080630-2
SCALE	NTS
DRAWN BY	ENGINEERING DEPT.
DATE	3/11/98

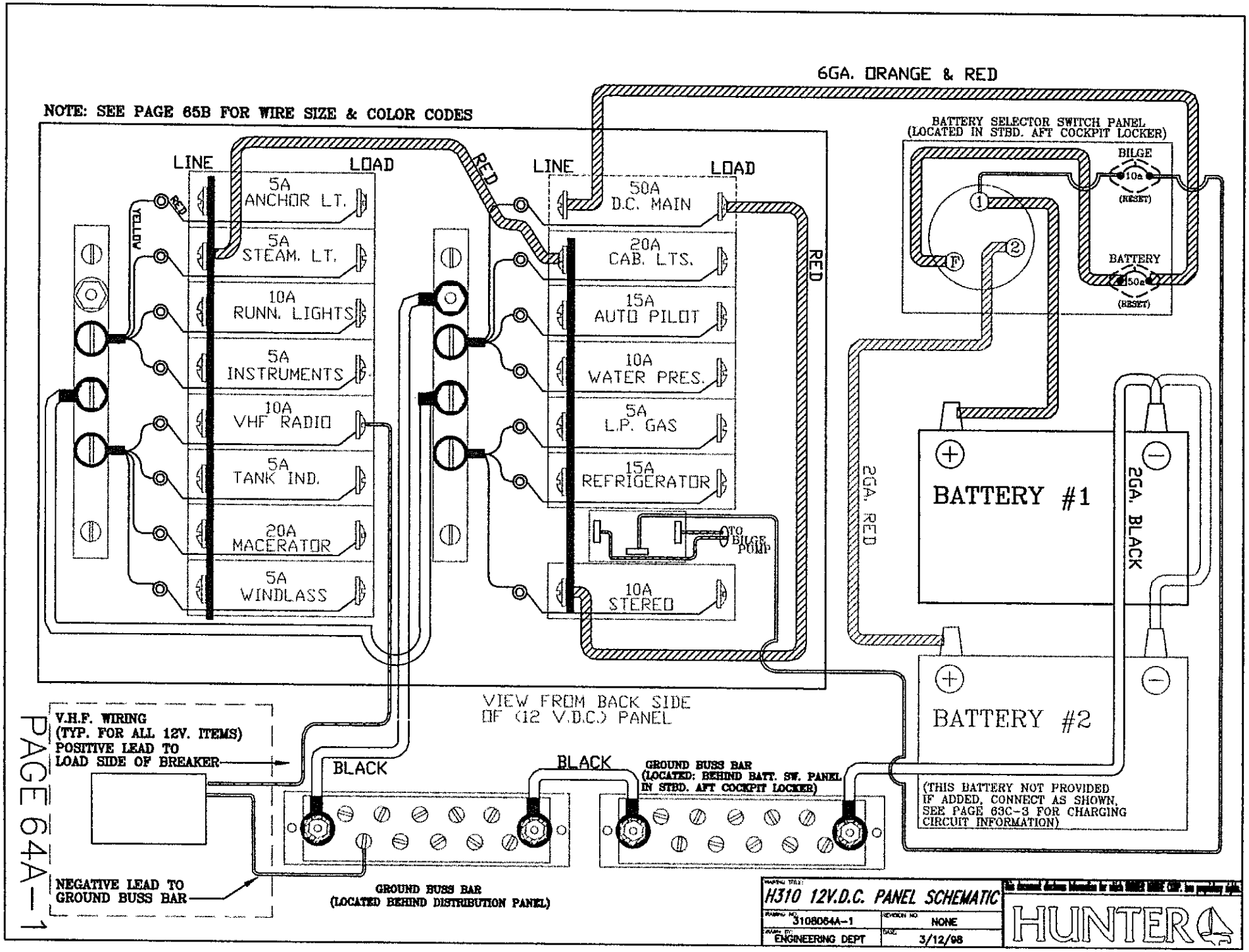
HUNTER



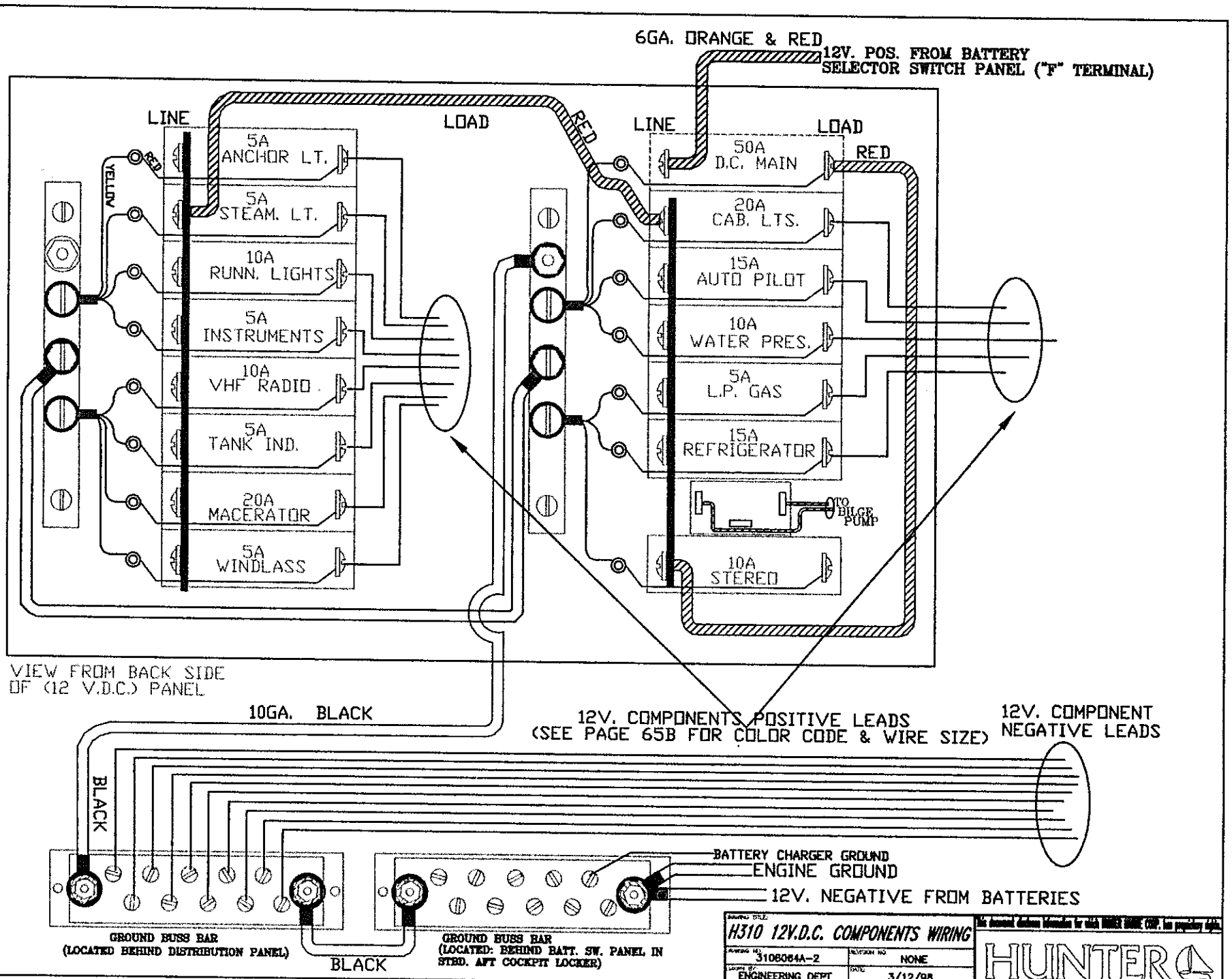
PAGE 63C-3

310 CHARGING SYSTEM SCHEMATIC	
31080630-3	NONE
ENGINEERING DEPT.	3/11/98

HUNTER


6GA. ORANGE & RED
NOTE: SEE PAGE 65B FOR WIRE SIZE & COLOR CODES
BATTERY SELECTOR SWITCH PANEL
(LOCATED IN STBD. AFT COCKPIT LOCKER)
BILGE
10a
(RESET)
BATTERY
150a
(RESET)
LINE
LOAD
5A
ANCHOR LT.
5A
STEAM. LT.
10A
RUNN. LIGHTS
5A
INSTRUMENTS
10A
VHF RADIO
5A
TANK IND.
20A
MACERATOR
5A
WINDLASS
50A
D.C. MAIN
20A
CAB. LTS.
15A
AUTO PILOT
10A
WATER PRES.
5A
L.P. GAS
15A
REFRIGERATOR
TO BILGE PUMP
10A
STEREO
RED
YELLOW
2GA. RED
2GA. BLACK
BATTERY #1
BATTERY #2
(THIS BATTERY NOT PROVIDED
IF ADDED, CONNECT AS SHOWN,
SEE PAGE 63C-3 FOR CHARGING
CIRCUIT INFORMATION)
VIEW FROM BACK SIDE
OF (12 V.D.C.) PANEL
V.H.F. WIRING
(TYP. FOR ALL 12V. ITEMS)
POSITIVE LEAD TO
LOAD SIDE OF BREAKER
BLACK
BLACK
GROUND BUSS BAR
(LOCATED: BEHIND BATT. SW. PANEL
IN STBD. AFT COCKPIT LOCKER)
NEGATIVE LEAD TO
GROUND BUSS BAR
GROUND BUSS BAR
(LOCATED BEHIND DISTRIBUTION PANEL)
H310 12V.D.C. PANEL SCHEMATIC
3108064A-1
NONE
ENGINEERING DEPT
3/12/98
HUNTER

PAGE 64A-1



H310 12V.D.C. COMPONENTS WIRING

3106064A-2	NONE
ENGINEERING DEPT	3/12/98

HUNTER

LEGEND

DOME LIGHTS

HALOGEN LIGHTS

BOW LIGHT

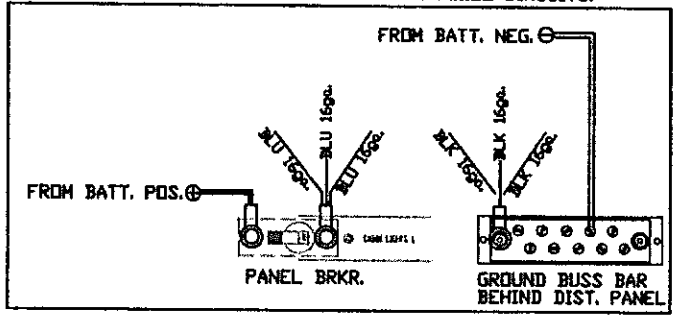
READING LIGHTS

WIRE RUNS

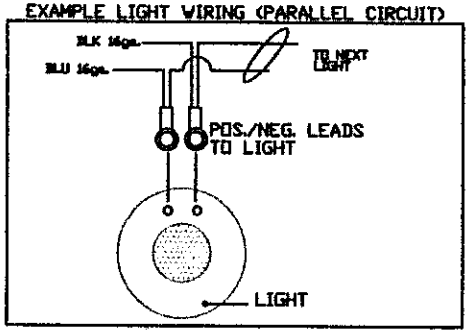
ON\OFF SWITCH

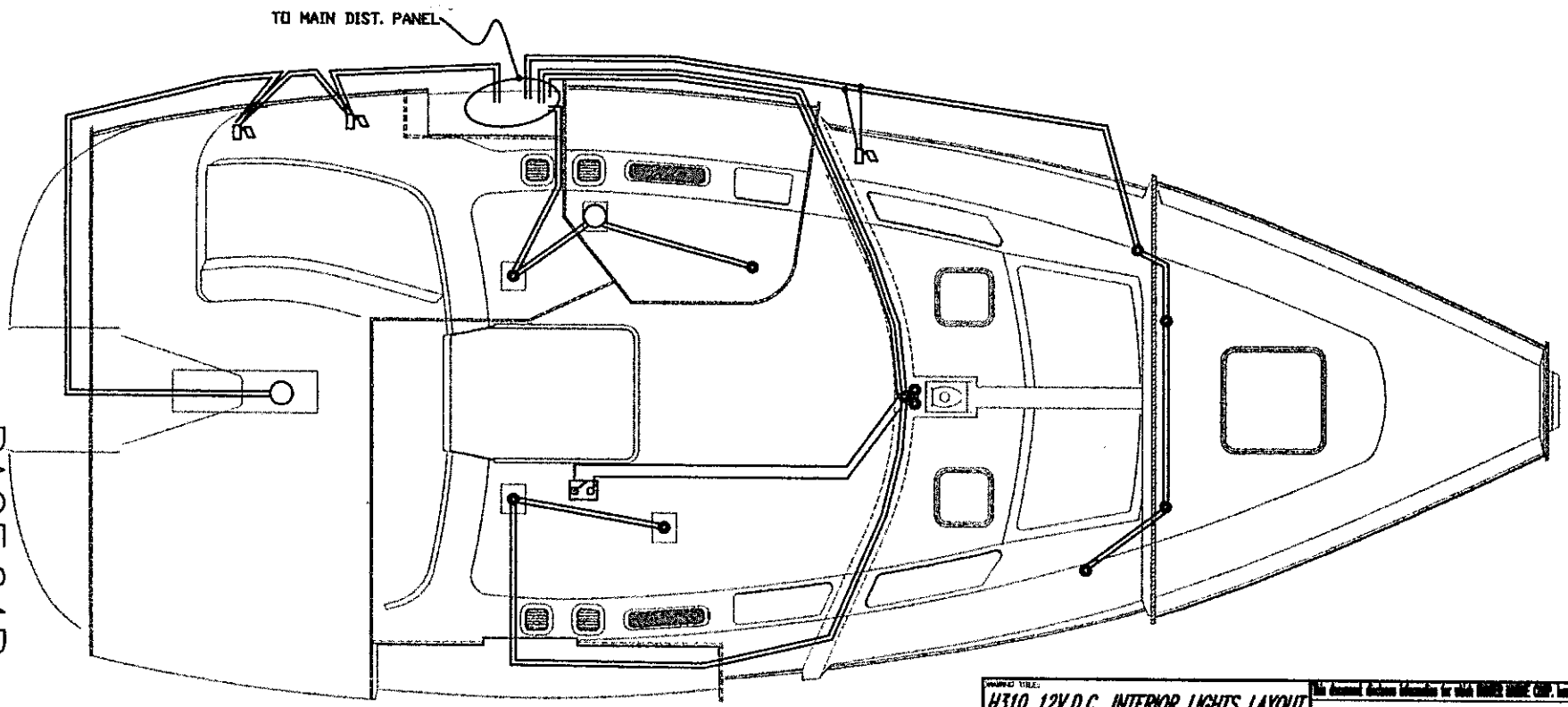
NOTE: SEE PAGE 65B FOR WIRE SIZE & COLOR CODE

EXAMPLE SWITCH PANEL WIRING (PARALLEL CIRCUITS)



EXAMPLE LIGHT WIRING (PARALLEL CIRCUIT)

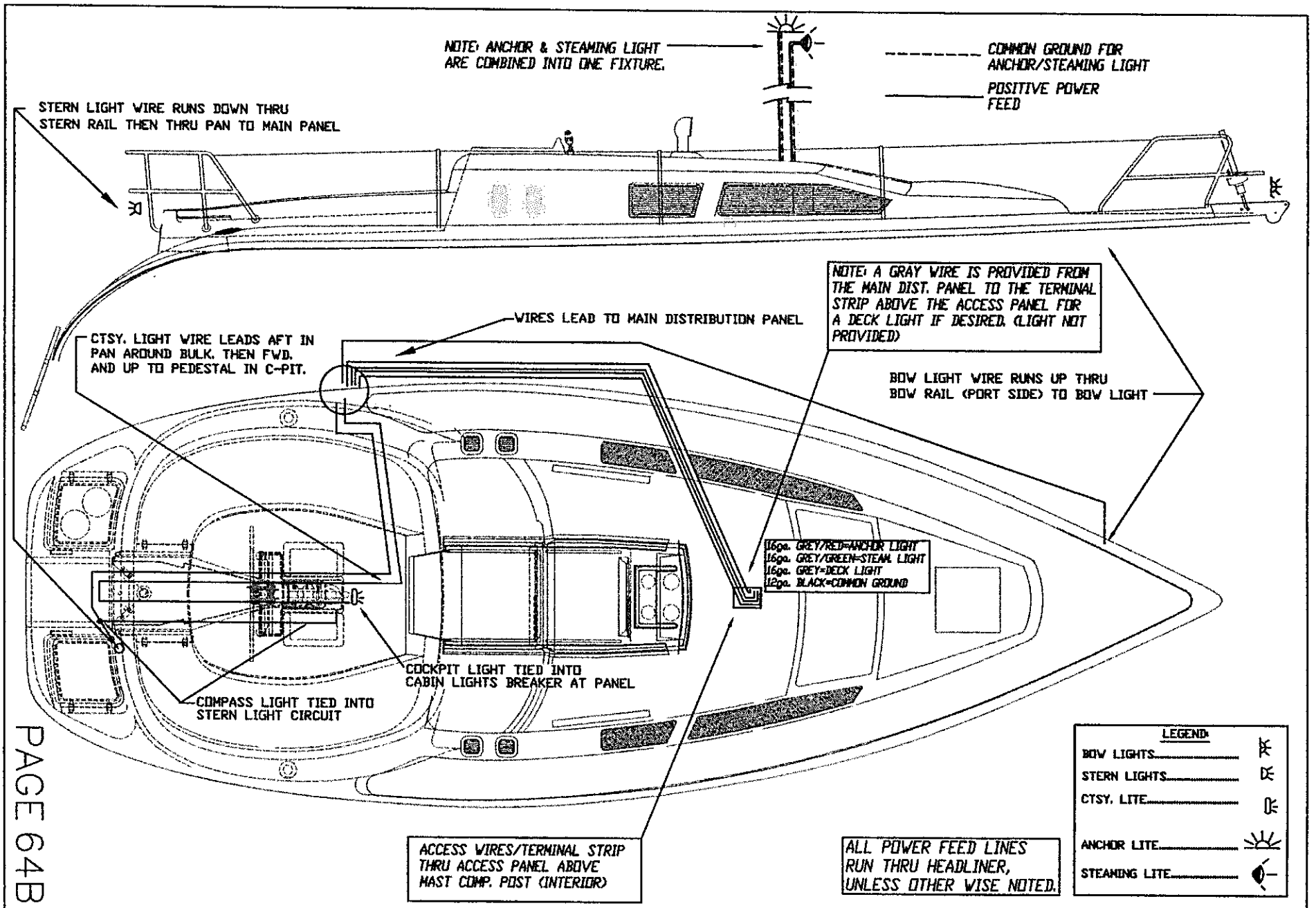




PAGE 64B-1

DRAWING TITLE: H310 12V.D.C. INTERIOR LIGHTS LAYOUT	
DRAWING NO. 31080648-1	SCALE NTS
DRAWN BY ENGINEERING DEPT.	DATE 3/12/98

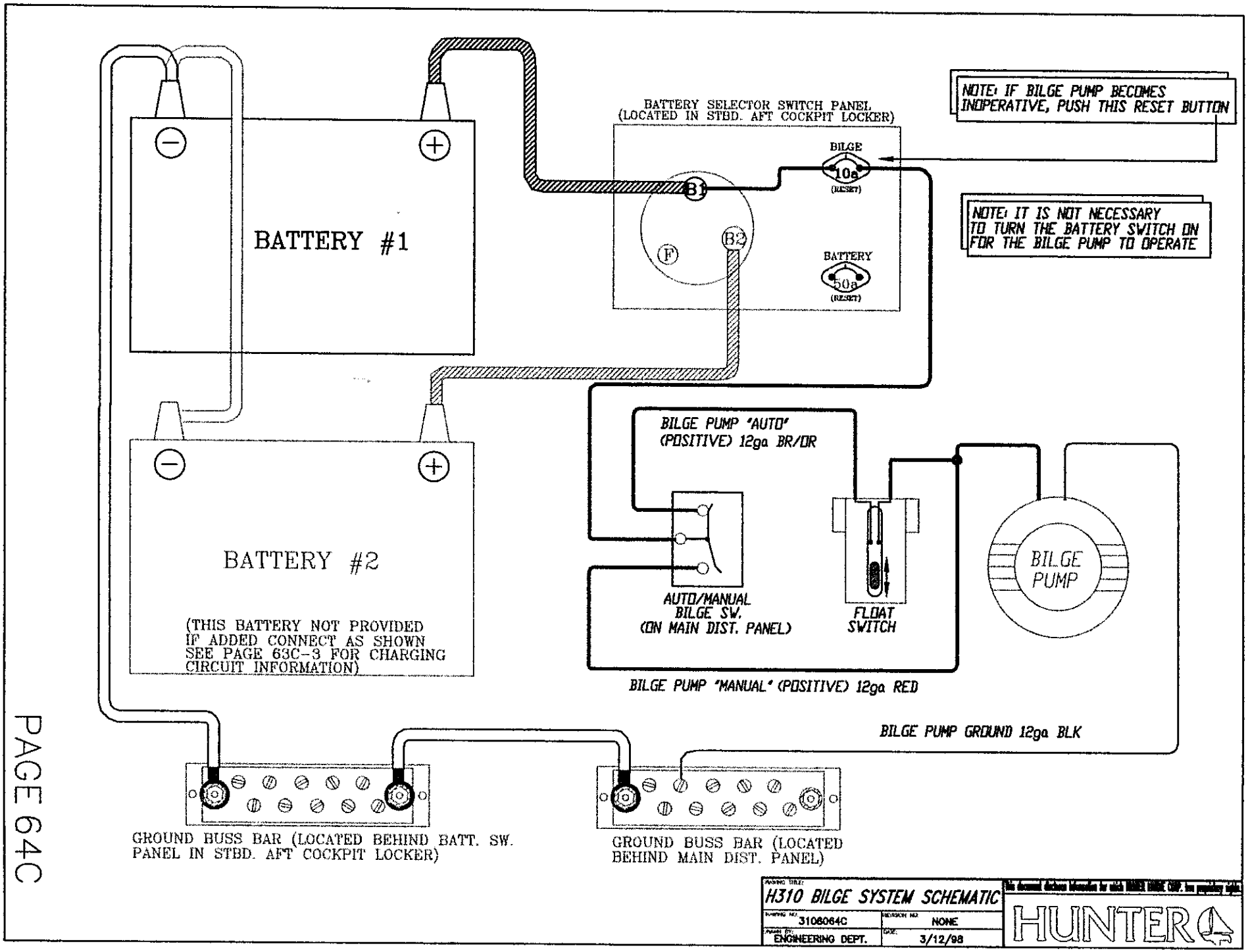
HUNTER



PAGE 64B-2

H310 EXTERIOR LIGHTS LAYOUT	
31080648-2	31080648-2
ENGINEERING DEPT.	3/12/98

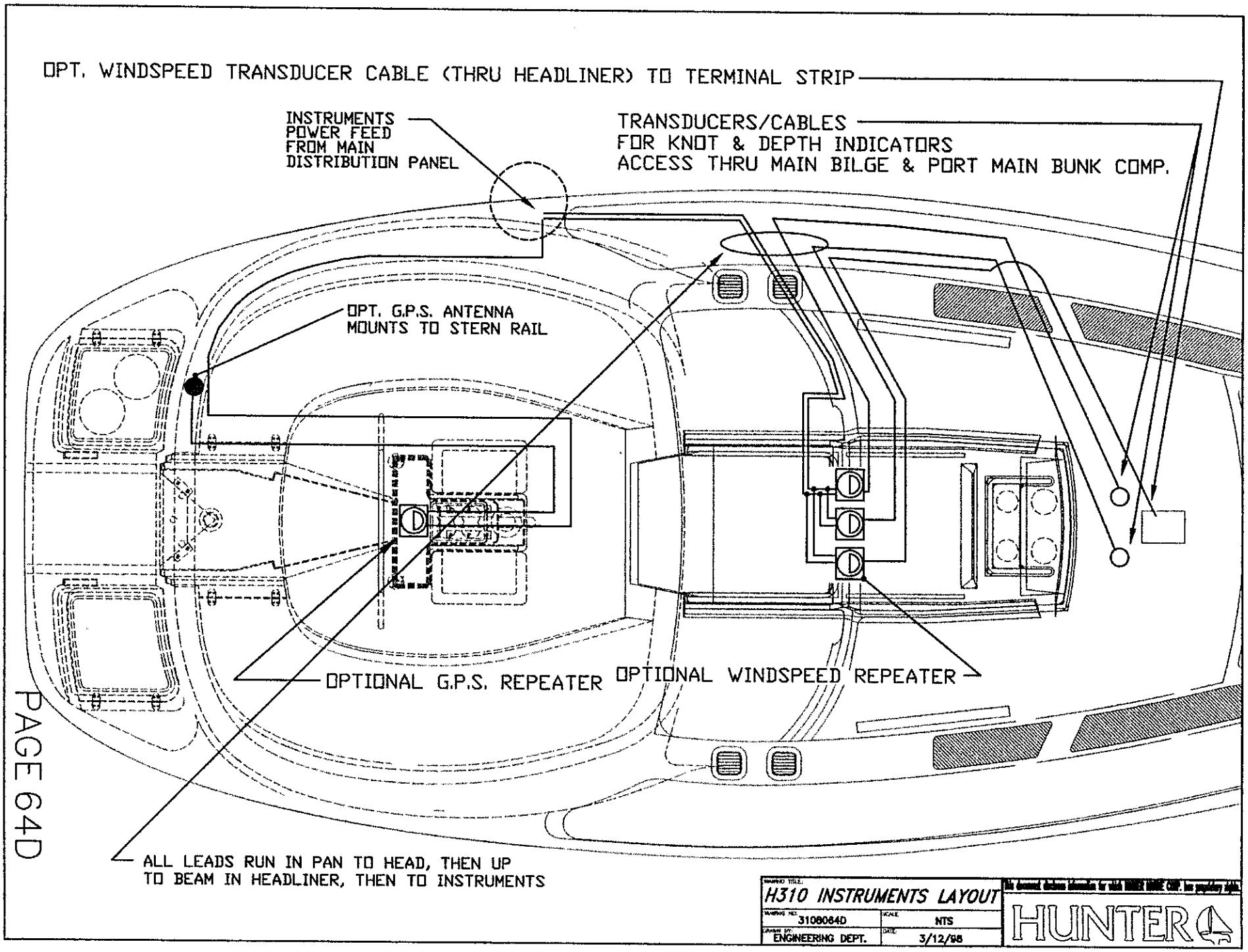
HUNTER



PAGE 64C

H310 BILGE SYSTEM SCHEMATIC	
3108064C	NONE
ENGINEERING DEPT.	3/12/98

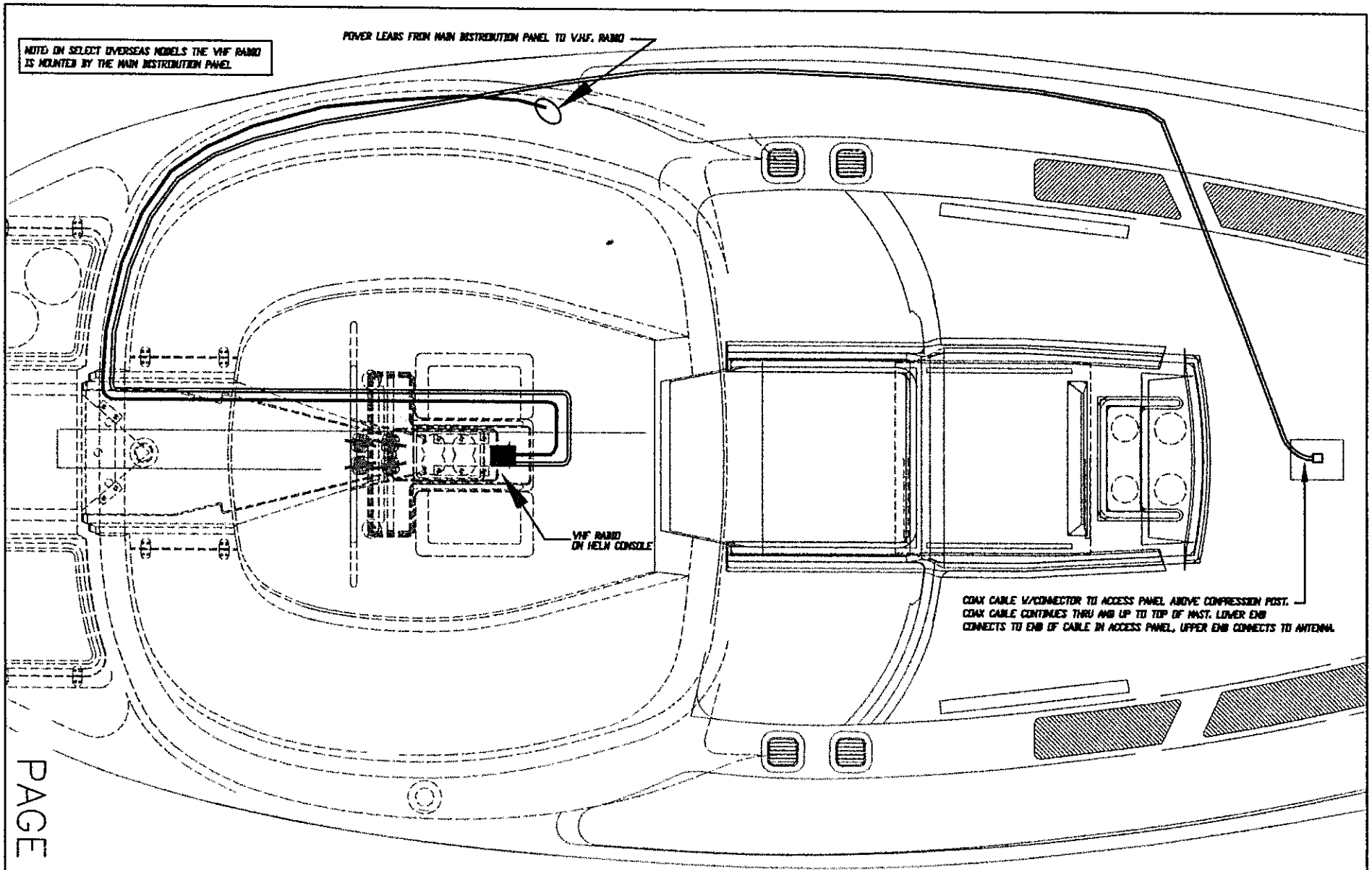
HUNTER



PAGE 64D

DRAWING TITLE: H310 INSTRUMENTS LAYOUT	
DRAWING NO: 3100084D	SCALE: NTS
DRAWN BY: ENGINEERING DEPT.	DATE: 3/12/98

HUNTER



LINE RUNS:

POWER LEADS...FROM MAIN DIST. PANEL, DOWN, THEN AFT THRU PAN, UP & AROUND Q-BERTH BULKHEAD, FWD & UP TO RADIO.

ANTENNA (COAX) LEAD...FROM MAST STEP, CABLE RUNS THRU HEADLINER AFT INTO COCKPIT LOCKER, THEN FWD. BETWEEN DECK & HEADLINER THEN UP TO RADIO.

DRAWING TITLE: H310 VHF RADIO LAYOUT	
DRAWING NO. 3108064E	SCALE NTS
DRAWN BY: ENGINEERING DEPT.	DATE 3.13.98

HUNTER

SECTION 64F...REFRIGERATION SYSTEM (OPTIONAL)

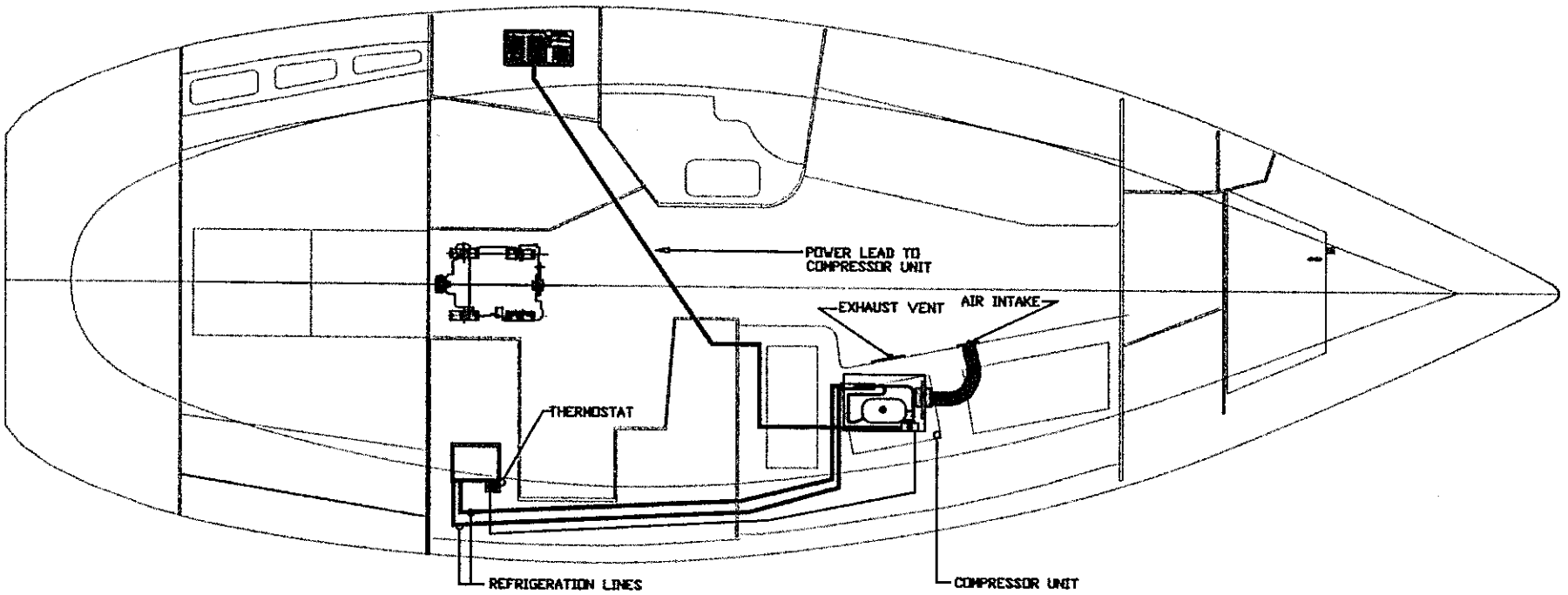
BASIC OPERATING INSTRUCTIONS:

① TURN ON HOUSE BATTERY SWITCH (IN STBD AFT C.PIT LOCKER)
② TURN ON MAIN D.C. BREAKER AT MAIN BREAKER PANEL
③ TURN ON REFRIG. BREAKER
④ SET THERMOSTAT TO DESIRED TEMP.

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

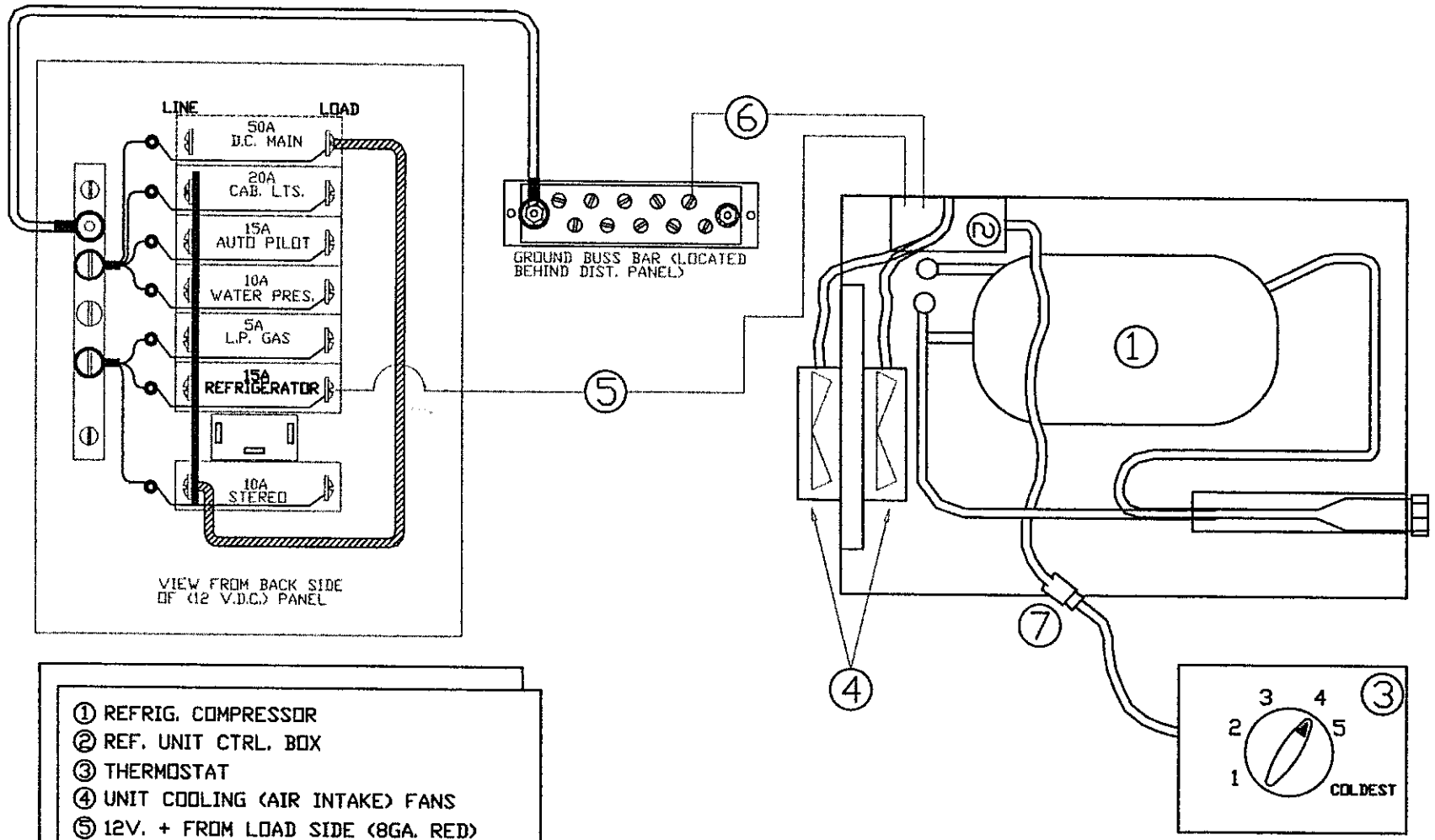
H310 REFRIG. (OPTIONAL) OPER. INSTRUCTIONS	
3108064F-1	NONE
ENGINEERING DEPT.	3/13/98

HUNTER



H310 (OPTIONAL) REFRIGERATION LAYOUT	
DRAWING NO. 3108064F-2	SCALE NTS
DRAWN BY: ENGINEERING DEPT.	DATE 3/13/98

HUNTER



① REFRIG. COMPRESSOR
② REF. UNIT CTRL. BOX
③ THERMOSTAT
④ UNIT COOLING (AIR INTAKE) FANS
⑤ 12V. + FROM LOAD SIDE (8GA. RED) OF BRKR. TO REF. UNIT
⑥ GND. FROM REF. UNIT (8GA. BLACK) TO GRD. BUSS BAR BEHIND BRKR. PANEL
⑦ THERMOSTAT CONNECTOR PLUG

NOTE: SEE REFRIGERATION MANUAL FOR CONTROL BOX HOOKUP DETAILS

DRAWING TITLE: H310 REFRIGERATION SCHEMATIC	
DRAWING NO.: 3108064F-3	REVISION NO.: NONE
DRAWN BY: ENGINEERING DEPT.	DATE: 3/13/98

HUNTER

SECTION 64G...(OPTIONAL) WINDLASS SYSTEM

BASIC OPERATING INSTRUCTIONS:

LOWERING ANCHOR....

① TURN ON BATTERY SWITCH

② TURN ON WINDLASS BRKR. ON MAIN D.C. BRKR. PANEL.

③ PUSH WINDLASS "DOWN" BUTTON (GREY) ON FOREDECK AFT OF ANCHOR WELL.

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

RAISING ANCHOR....

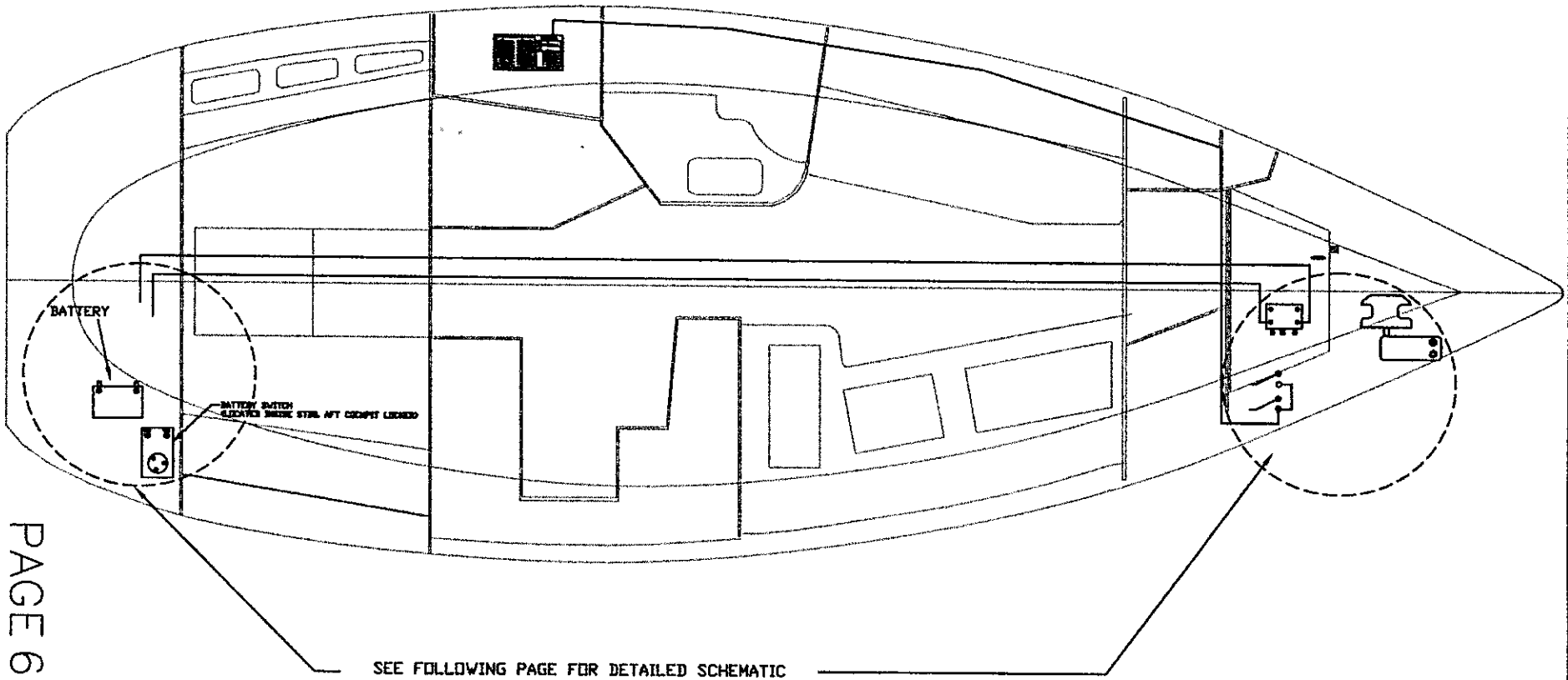
① START BOAT ENGINE, THIS WILL ALLOW CONTROL OF BOAT WHEN ANCHOR BECOMES FREE, AS WELL AS REDUCING LOAD ON BATTERY

② SAME AS STEP #2 OF LOWERING ANCHOR

③ PUSH WINDLASS "UP" BUTTON (RED) 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. IN STBD. AFT COCKPIT COMP.
IF WINDLASS BECOMES INOPERABLE ELECTRICALLY, A MANUAL WINCH HANDLE IS SUPPLIED, SEE THE "HORIZON WINDLASS MANUAL" SUPPLIED IN YOUR OWNERS MANUAL PACKAGE FOR INSTRUCTIONS.

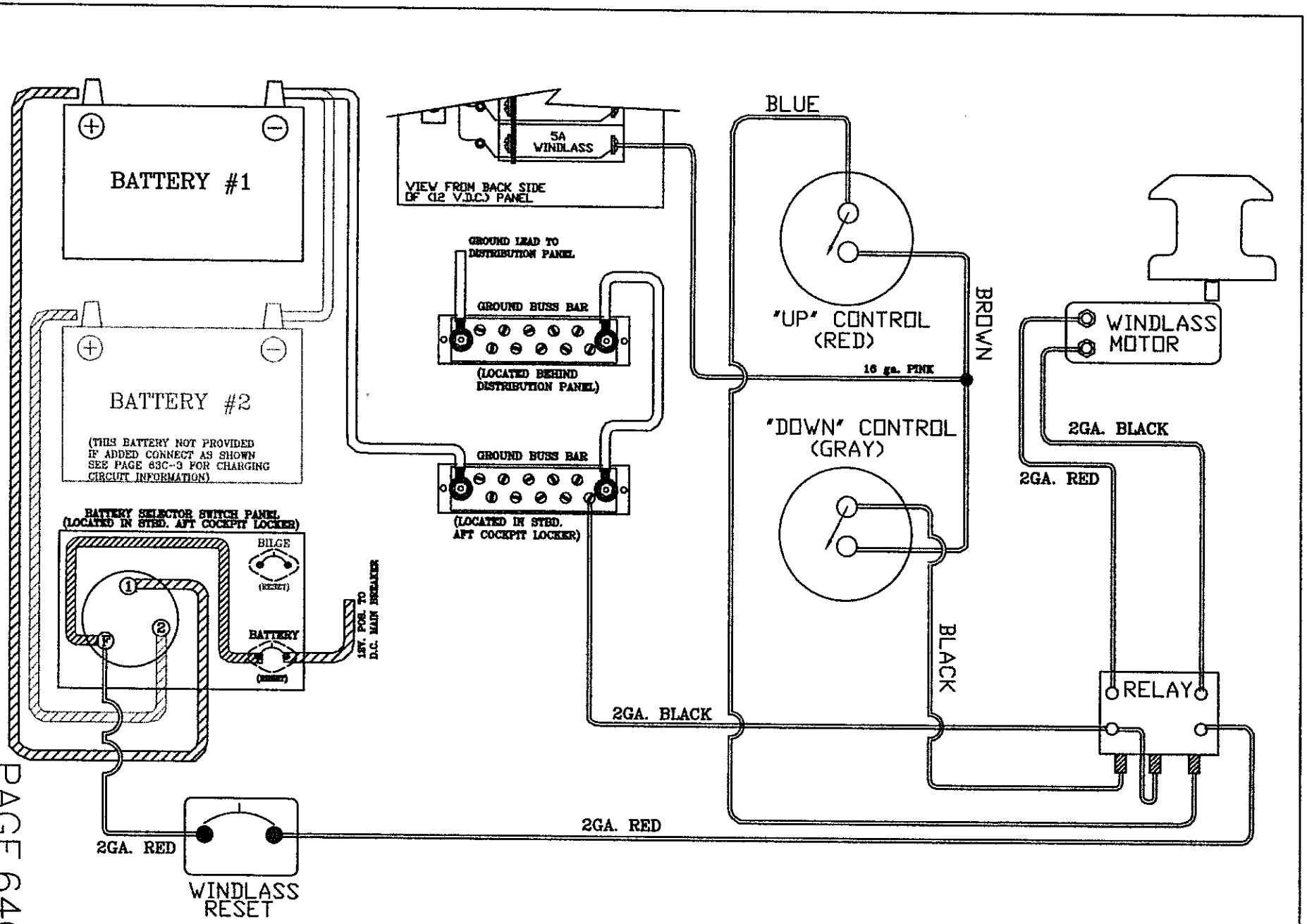
H310 WINDLASS (OPTIONAL) OPERATING INST.	
3108064G-1	NONE
ENGINEERING DEPT.	3/13/98



SEE FOLLOWING PAGE FOR DETAILED SCHEMATIC

H310 WINDLASS (OPTIONAL) LAYOUT	
31080640-2	NTS
ENGINEERING DEPT.	3/13/98

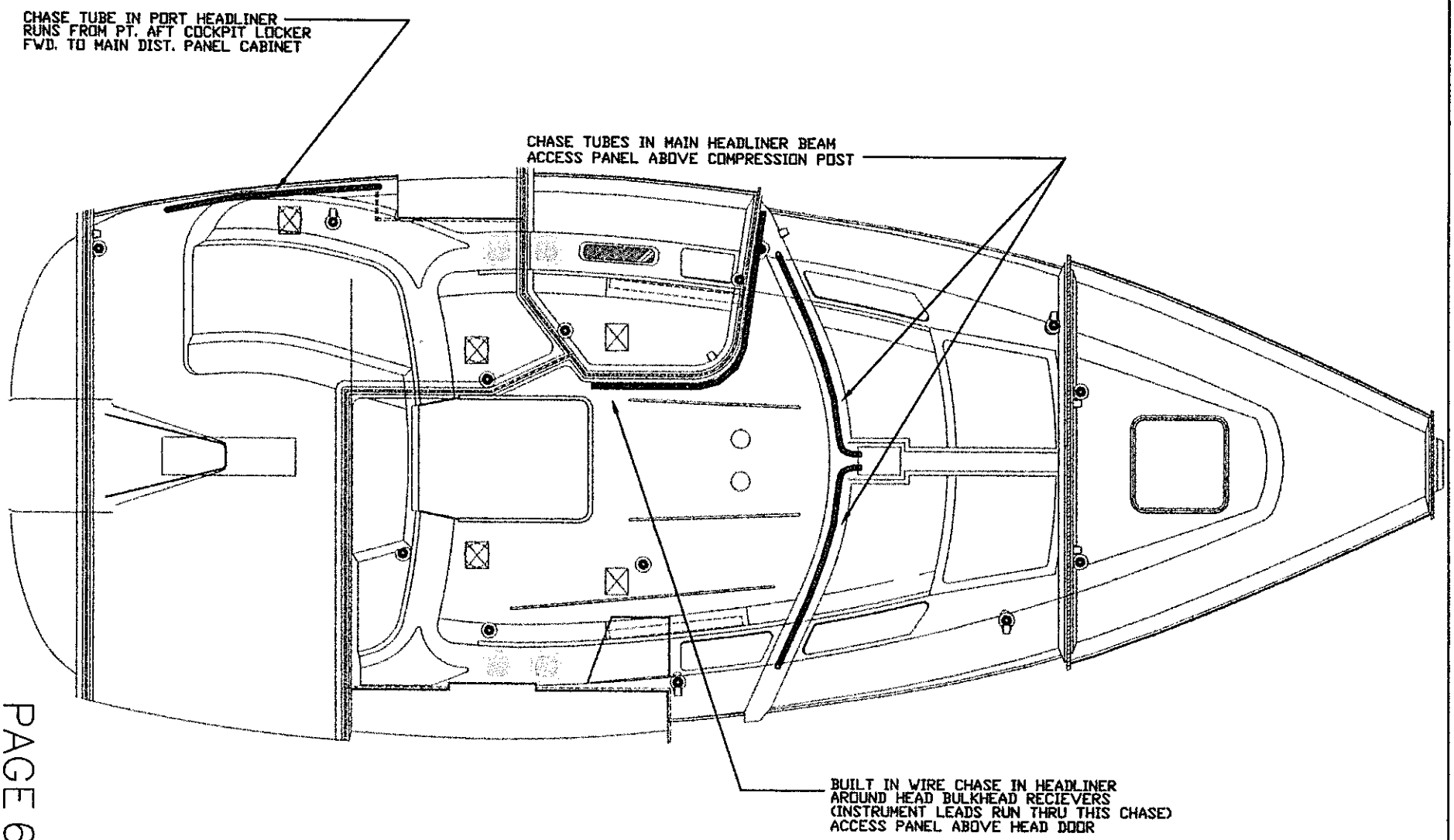
HUNTER



PAGE 64G-3

H310 WINDLASS SCHEMATIC	
3108064G-3	NONE
ENGINEERING DEPT	3/13/98

HUNTER

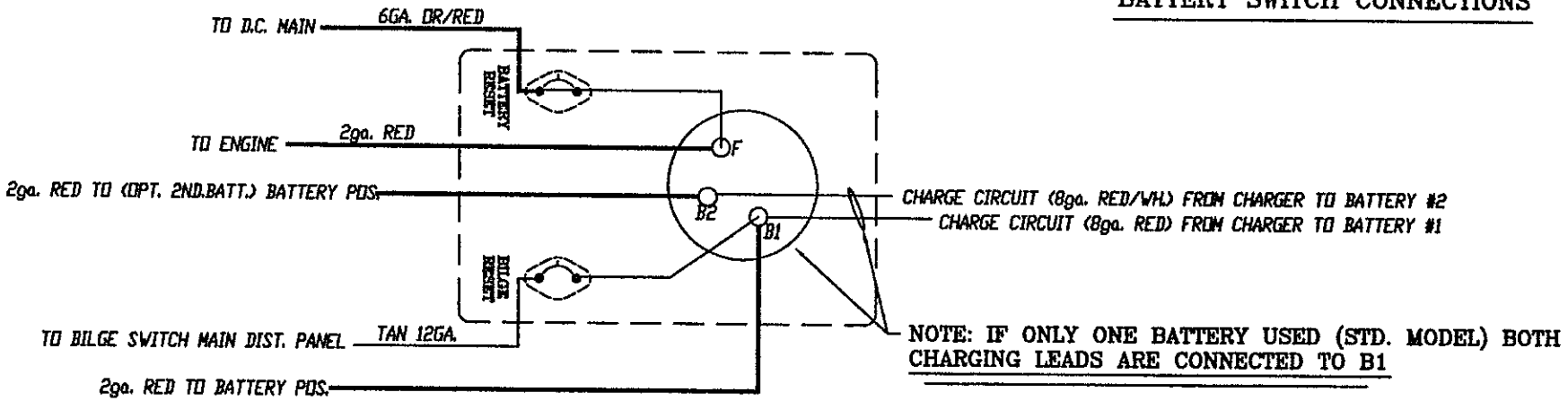


PAGE 64H

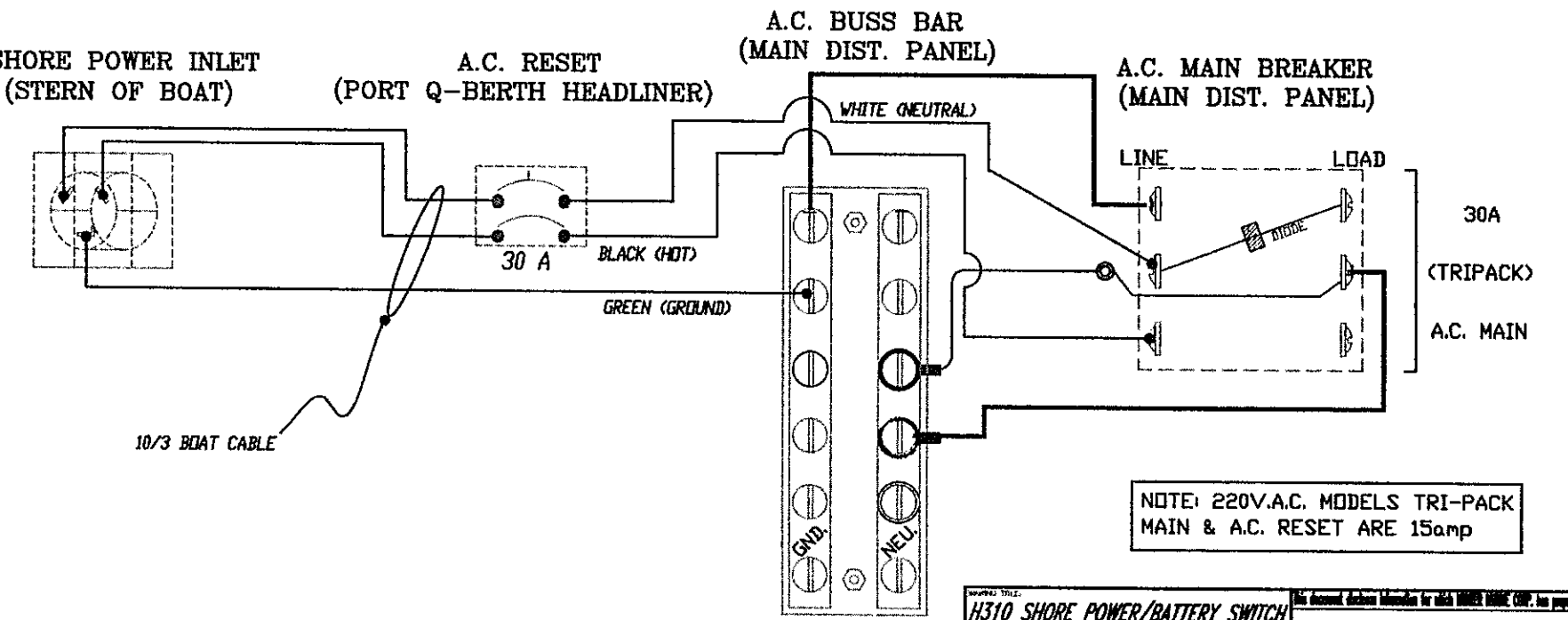
H310 WIRE CHASE LOCATIONS	
3108064H	NTS
ENGINEERING DEPT.	3/23/98

HUNTER

BATTERY SWITCH CONNECTIONS



SHORE POWER CONNECTIONS



PAGE 65A

H310 SHORE POWER/BATTERY SWITCH	
3108065A	NTS
ENGINEERING DEPT.	3/23/98

HUNTER

ELECTRICAL WIRING INFO.

12V. ONLY

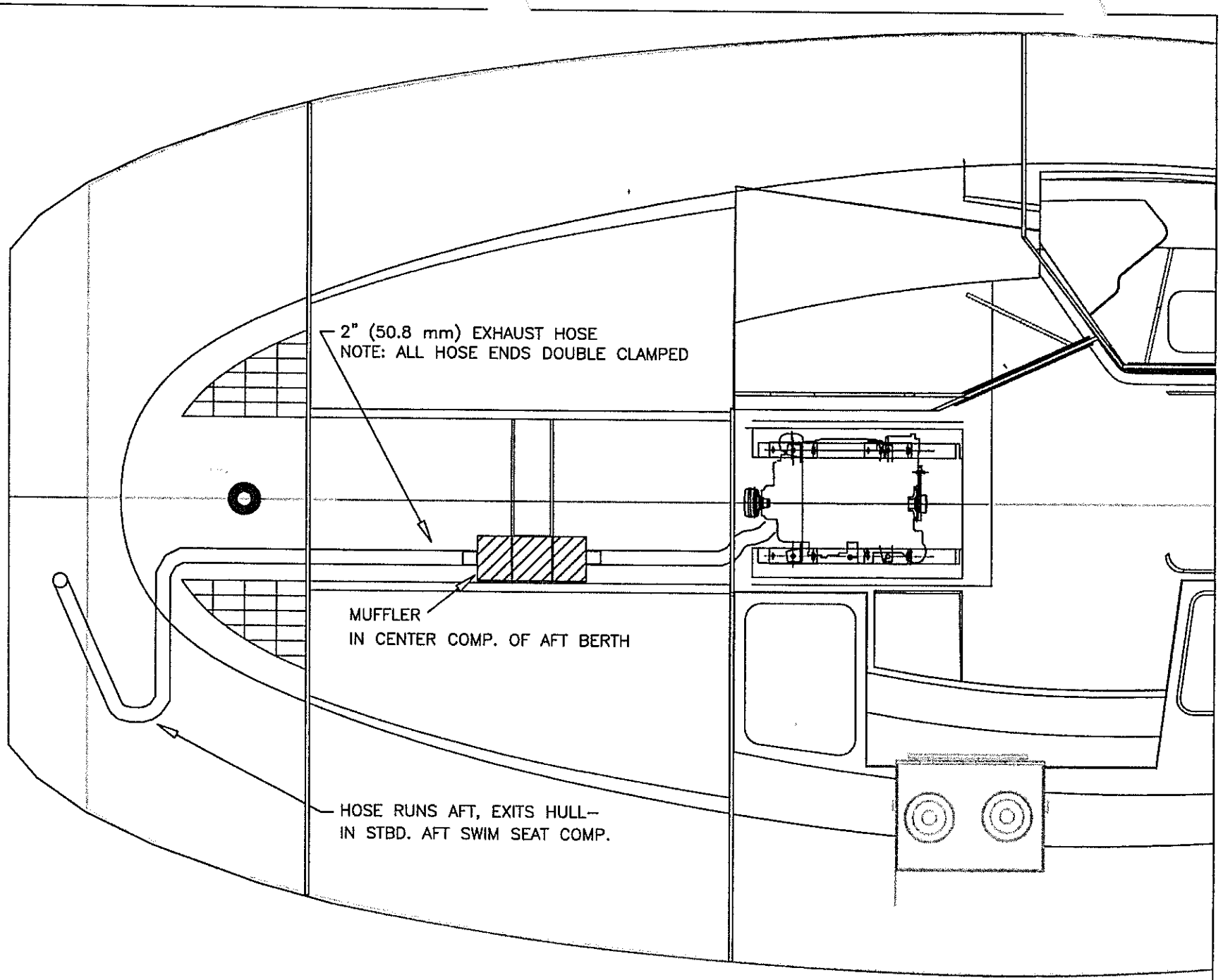
EL. COMP.	GA. WIRE	COLOR CODE	
INSTMTS.	22GA.	RED/YEL/SHIELD	VENDOR SUPPLIED
ANC. LITE	16 GA.	GRAY / RED & - *	
CAB. LITE	16 GA.	BLUE & BLK	
CTSY LITE	16 GA.	BLU/WH & BLK	
DECK LITE	16 GA.	GRAY & - *	
FANS	16 GA.	WH & BLK	
RUN. LITE	16 GA.	GRAY/WH & BLK	
SPEAKERS	16 GA.	YEL & BLK	PORT SIDE OF BOAT
SPEAKERS	16 GA.	BRN & BLK	STBD SIDE OF BOAT
STEAMING	16 GA.	GRAY/GRN & - *	
STEREO	16 GA.	RED & YEL & BLK	
VHF RADIO	16 GA.	RED/WHI & BLK	
WINDLASS	16 GA.	PINK	
L.P. SYS.	14/2	BOAT CABLE	
TANK IND.	14/2	BOAT CABLE	
SHWR.SUMP	12GA.	BRN/YEL & BLK	FORWARD SHOWER
SHWR.SUMP	12GA.	BRN/BLK & BLK	AFT SHOWER
WAT. PUMP	12 GA.	BROWN & BLK	
MACERATOR	10GA.	BRN/WH & BLK	
FREEZER	8 GA.	RED/WH & BLK	
FRIDGE	8 GA.	RED/BLK & BLK	
BILGE PUMP	16GA.	BRN/RED & BRN/OR & BLK	

NOTE: * = (1) 12 GAUGE CABLE (BLACK) FOR - ANC./ DECK/ STEAMING LIGHTS

ELECTRICAL CABLE INFO.

12V. & 110V.

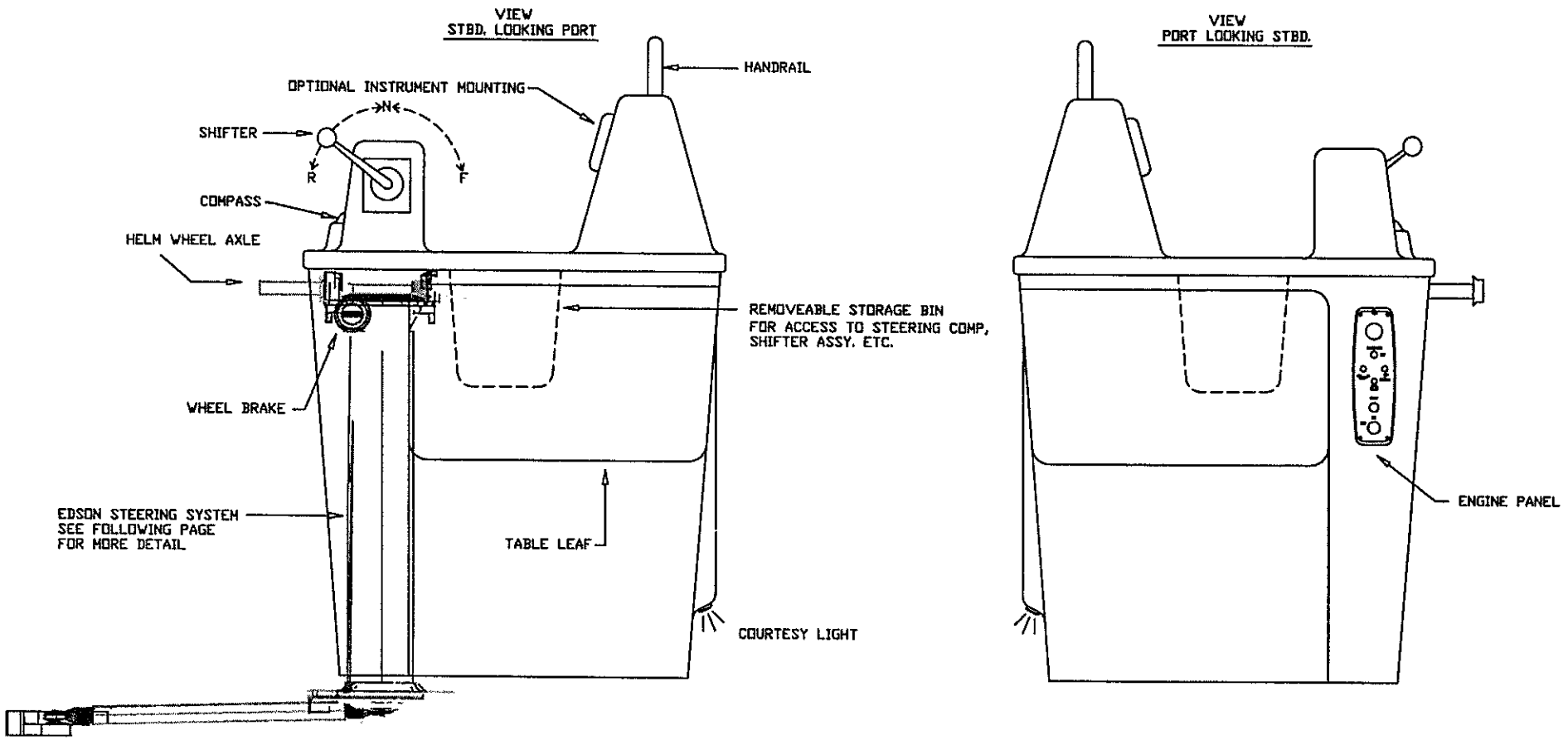
EL. COMP.	GA. WIRE	COLOR CODE
BAT. CABLES	2/0	RED & BLK
ENG.ST. CAB.	2 GA.	RED & BLK
HAL.WINCH" "	2 GA.	RED & BLK
WDLS. CABLE	2/0	RED & BLK — STANDARD (376=2 GAUGE)
	↑(12 V)↑	
SH. POWER	10/3 (110V) →	BOAT CABLE → NOTE: EURO. MODELS = 220 V.
INVERTER		
AIR COND.		
AC. RELAY	14/3 (110V) →	BOAT CABLE → NOTE: EURO. MODELS = 220 V.
BAT. CHGR		
MICRO.		
OUTLETS		
WATER HTR.		



EXHAUST SYSTEM LAYOUT

HUNTER

H-310 EXHAUST SYSTEM
DRAWING # 3108066



STEERING CONSOLE LAYOUT

HUNTER

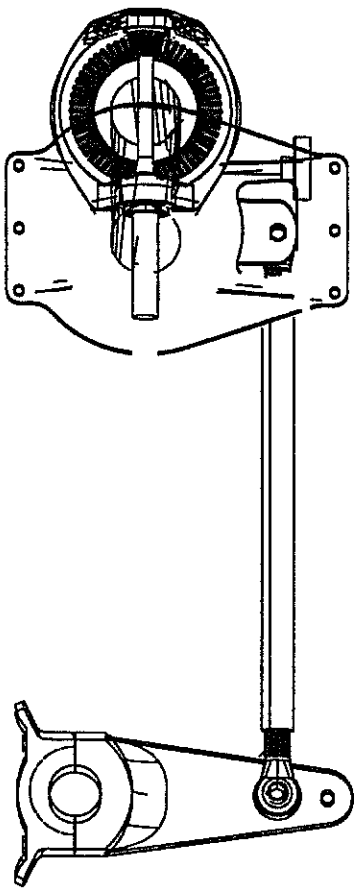
H-310 STEERING SYSTEM
DRAWING # 3108067A

IMPORTANT:

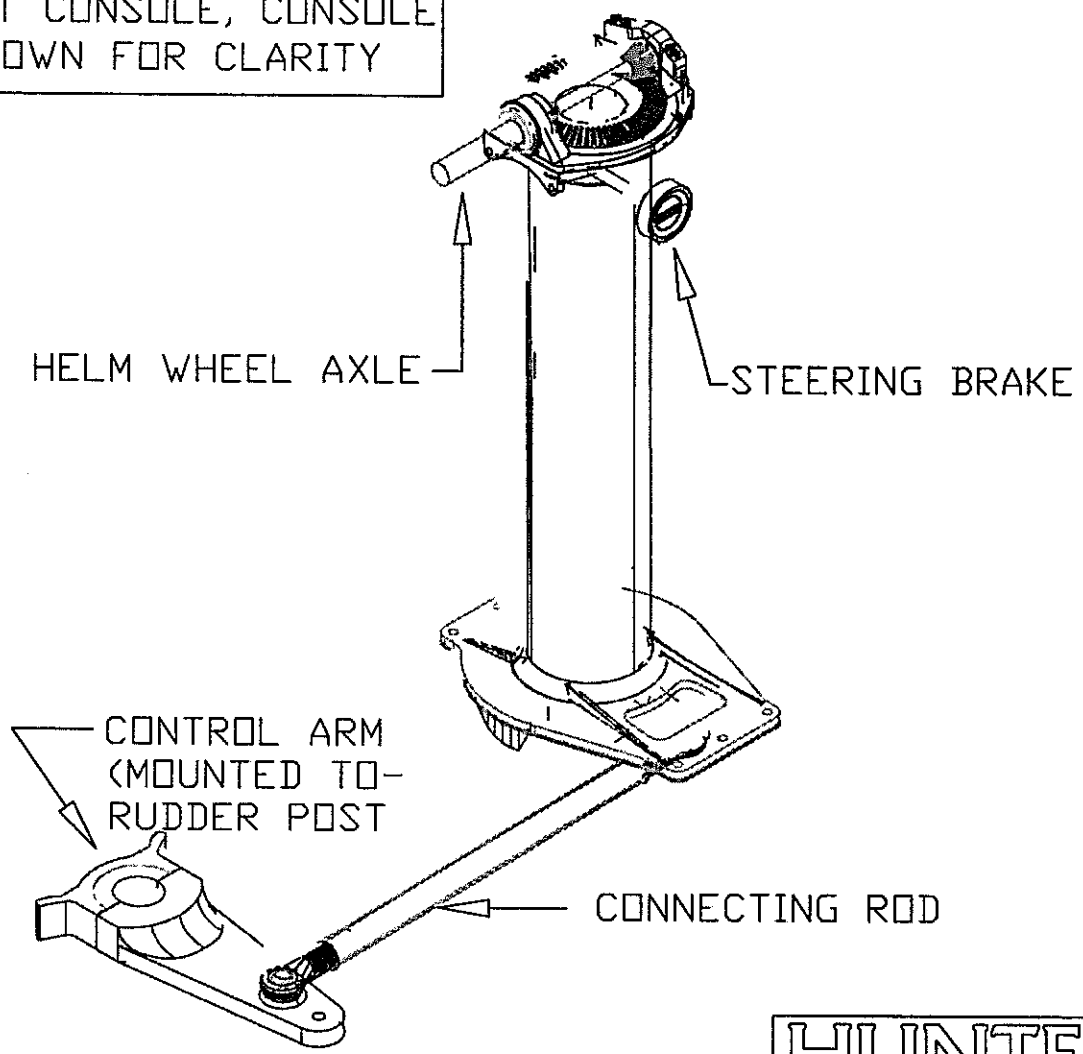
SEE EDSON STEERING MAINTENANCE UNDER "MAINTENANCE" FOR A COMPLETE DESCRIPTION OF STEERING COMPONENTS AND VITAL ROUTINE MAINTENANCE PROCEDURES.

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

PLAN VIEW



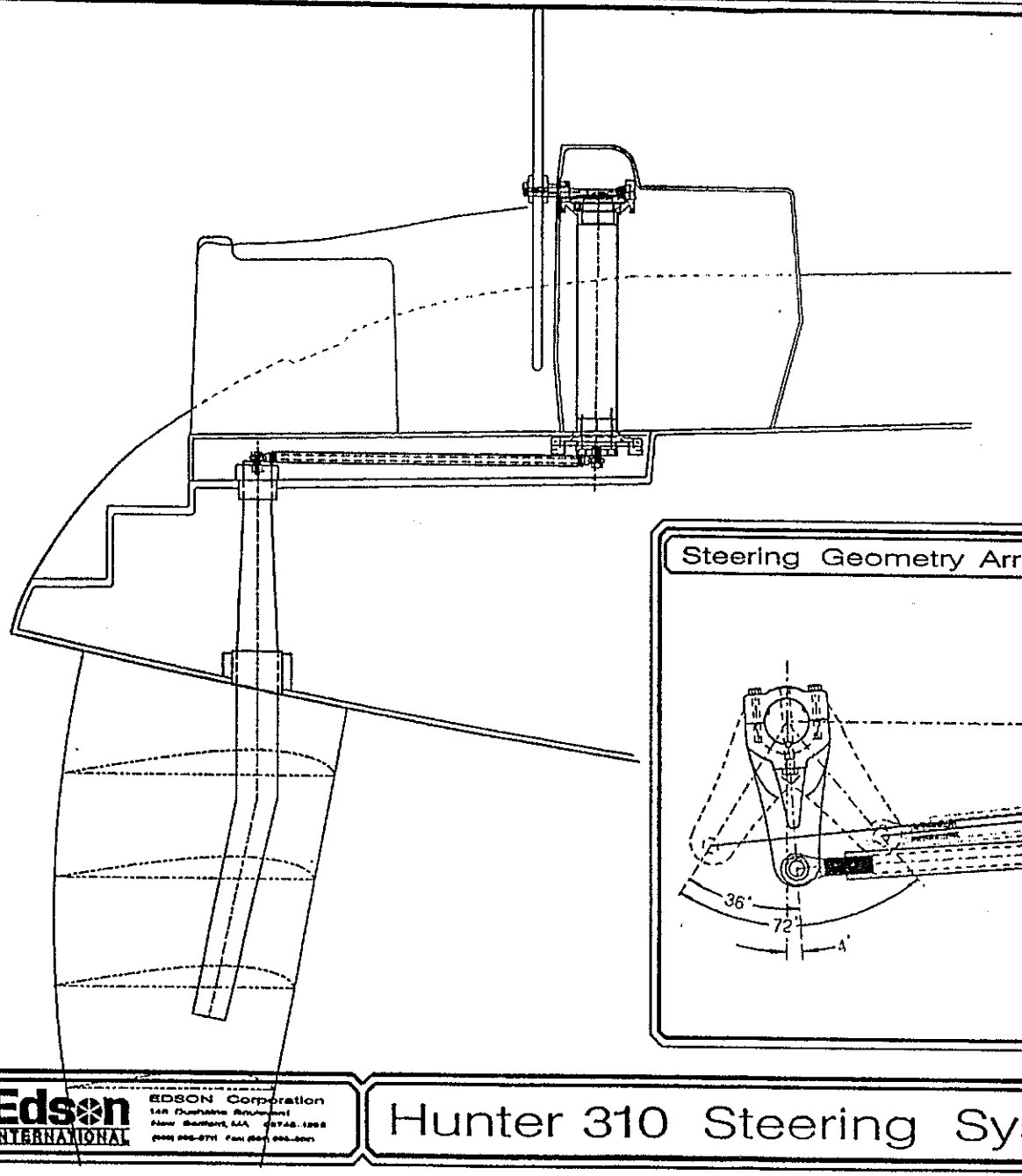
ISO VIEW



H-310 STEERING LAYOUT

HUNTER

H-310 STEERING SYSTEM
DRAWING # 3108067B



Steering Specifications

Length Overall	31' – 0"
Length Waterline	28' – 7"
Rudder Area	8.75 sq.ft.
Wheel Diameter	28 Inches
Rudder Travel	72 Degrees
Offset Angle	4 Degrees
Wheel Travel	1.8 Turns – Lock to Lock
Equivalent Tiller Length	8 Feet

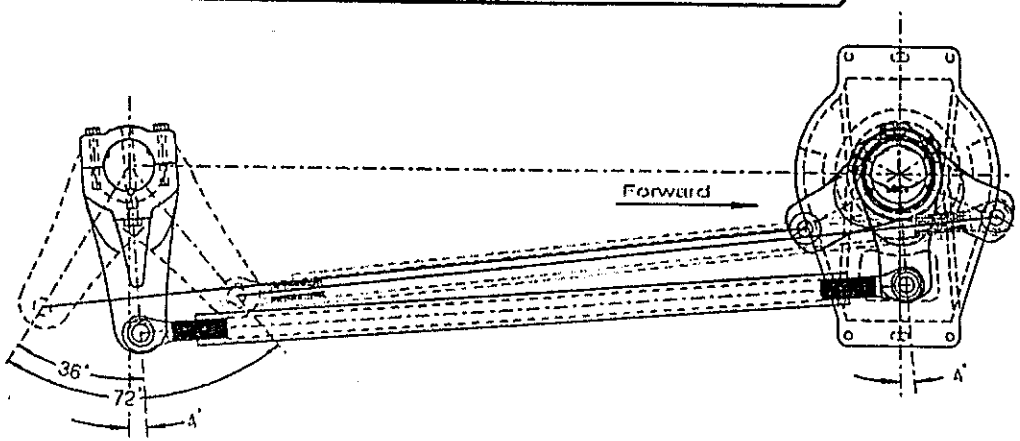
Steerer:

Edson Fig. 470–5

- 5 1/4" Output Lever – #B–643
- 8" Tiller Arm – #B–676
- 37" Tie Rod – #B–680
- 2 Part Brake Assembly

Steering Geometry Arrangement

1/6 th Size

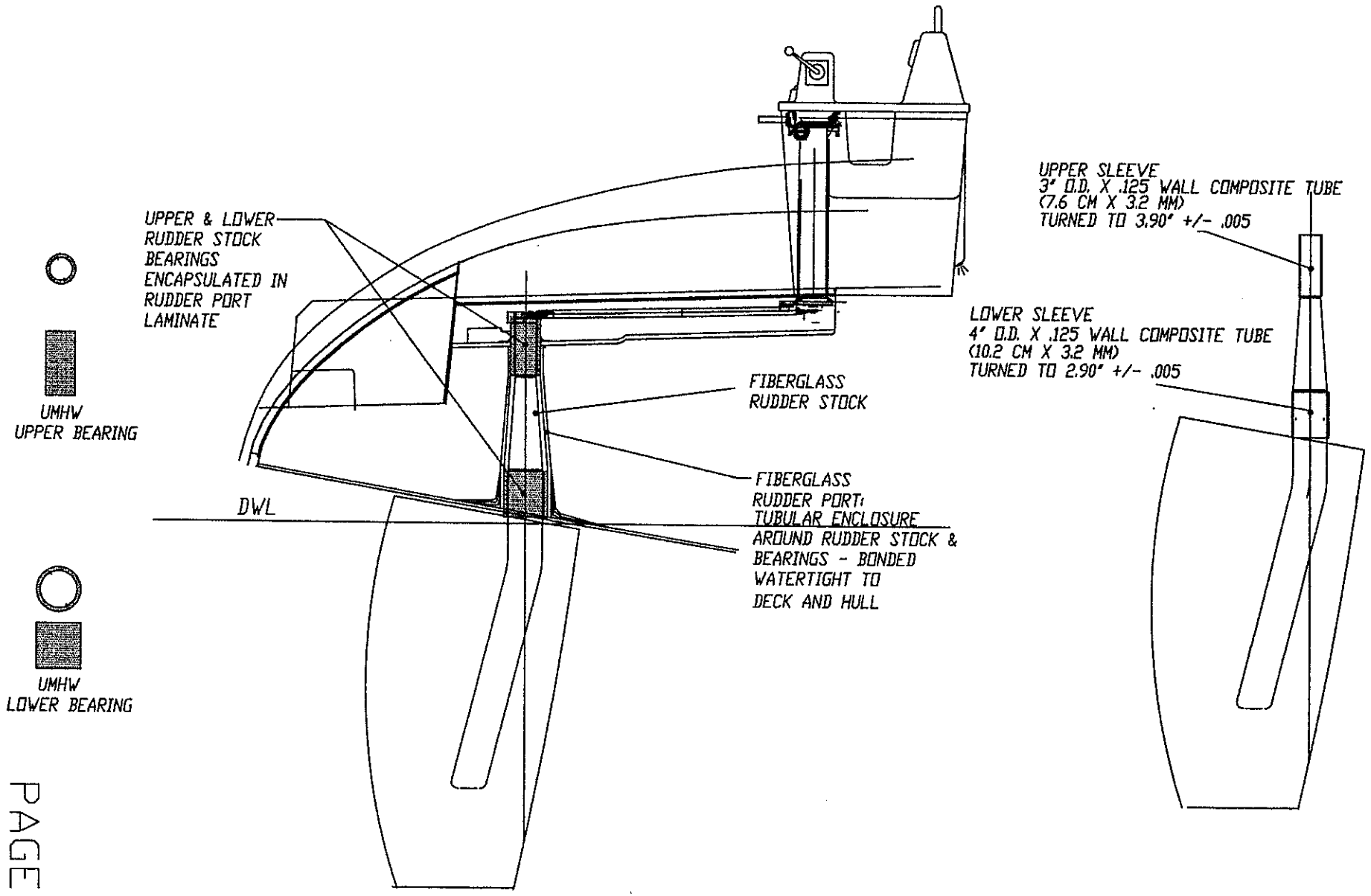


Edson INTERNATIONAL

EDSON Corporation

Hunter 310 Steering System

Scale	Drawn by	Drawing Number
1" = 1'–0"	RwB	S–96–2498
Date: April 7 th, 1997		



RUDDER & SHAFT DETAIL

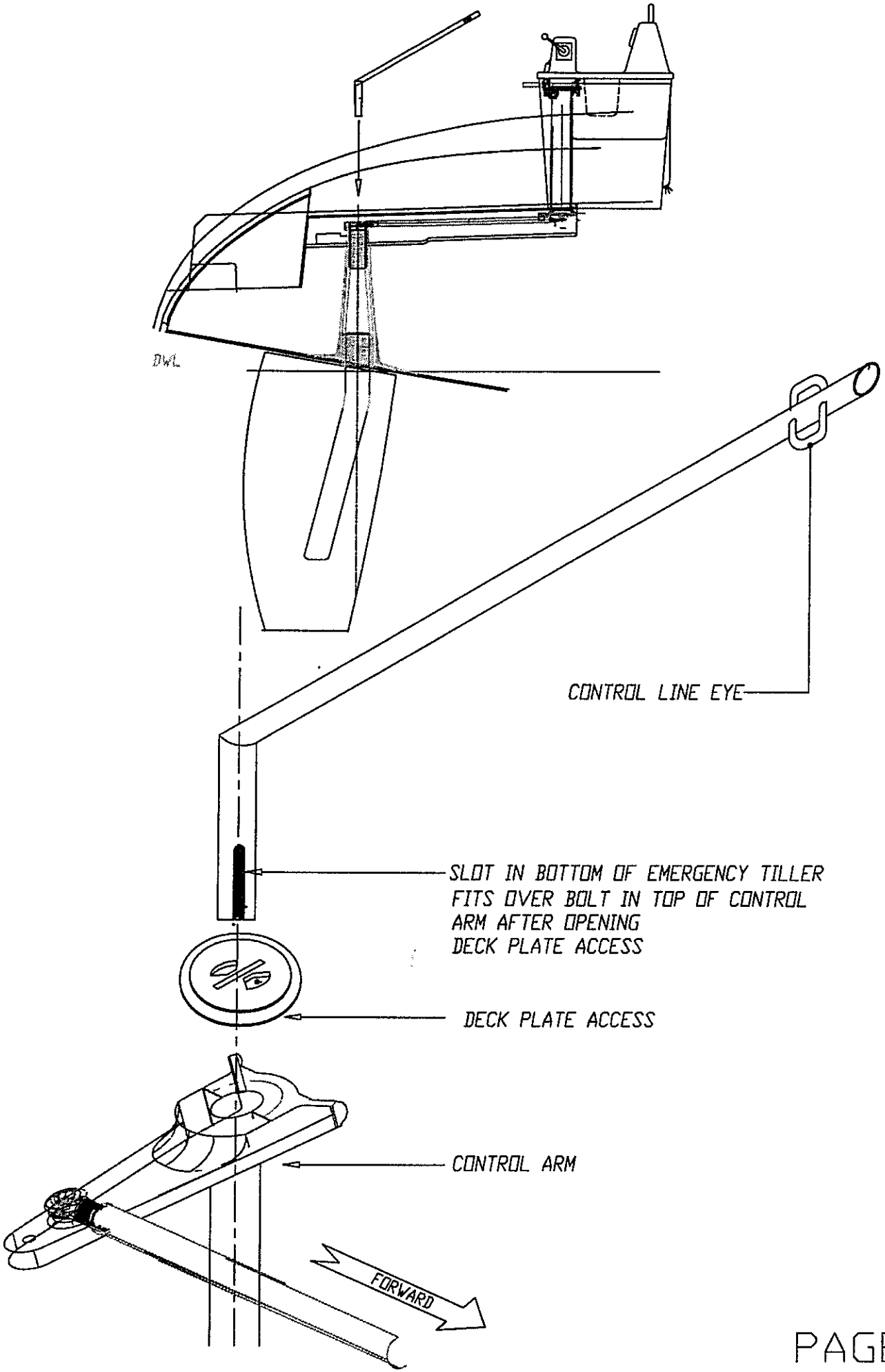
HUNTER

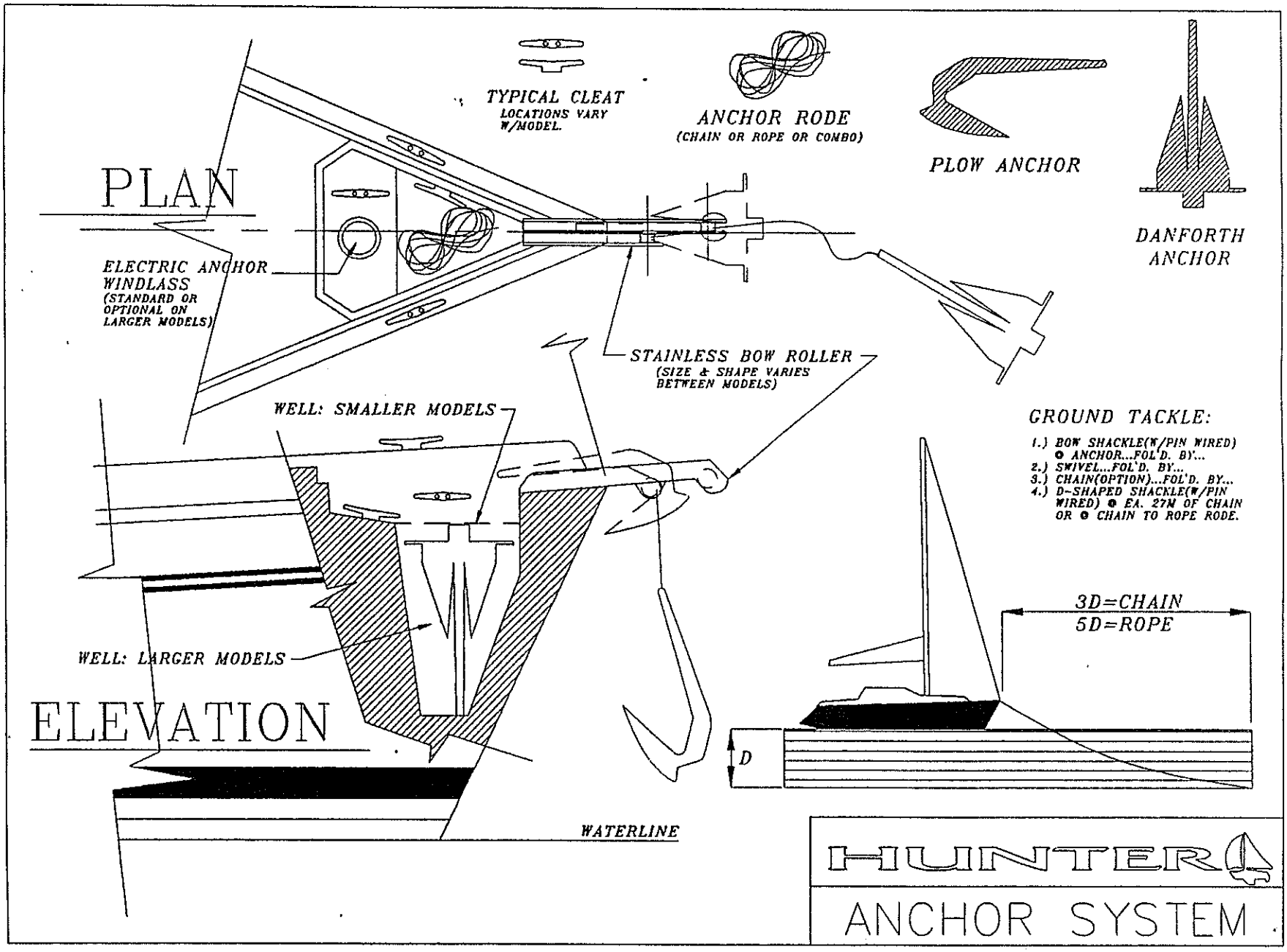
H-310 RUDDER & SHAFT

DRAWING # 3108068

HUNTER
H-310 EMERG. TILLER
DRAWING # 3108069

EMERGENCY TILLER SYSTEM




TYPICAL CLEAT
LOCATIONS VARY W/MODEL.
ANCHOR RODE
(CHAIN OR ROPE OR COMBO)
PLOW ANCHOR
DANFORTH ANCHOR
PLAN
ELECTRIC ANCHOR WINDLASS
(STANDARD OR OPTIONAL ON LARGER MODELS)
STAINLESS BOW ROLLER
(SIZE & SHAPE VARIES BETWEEN MODELS)
WELL: SMALLER MODELS
GROUND TACKLE:
1.) BOW SHACKLE(W/PIN WIRED) @ ANCHOR...FOL'D. BY...
2.) SWIVEL...FOL'D. BY...
3.) CHAIN(OPTION)...FOL'D. BY...
4.) D-SHAPED SHACKLE(W/PIN WIRED) @ EA. 27M OF CHAIN OR @ CHAIN TO ROPE RODE.
3D=CHAIN
5D=ROPE
WELL: LARGER MODELS
ELEVATION
D
WATERLINE
HUNTER
ANCHOR SYSTEM