HUNTER OWNER'S MANUAL

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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 where 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.

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 BLISTER WARRANTY

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

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

Hunter also warrants to the first-use purchaser and any subsequent owner during the warranty period that the boat will be free from gel-coat blistering on underwater surfaces of the hull, excluding the keel and rudder, for a period of five (5) years from the date of delivery to the first-use purchaser under normal use and service. During this period, Hunter will supply or reimburse an authorized Hunter dealer for all of the parts and labor required to repair a blistered underwater surface of the hull. The labor cost reimbursement will be based on the Labor Allowance Schedule established by Hunter from time to time. However, if the repair is performed by a non-Hunter dealer, the repair cost MUST be authorized by Hunter in advance and be based on a reasonable number of hours as determined by Hunter. Transportation, hauling, launching, bottom paint, storage, dockage, cradling rental, rigging and derigging, or other similar costs will not be paid by Hunter. It is recommended that the repair be done during a seasonal haul out for service or storage.

The following circumstances will void the bottom blister limited warranty:

(1) If the gel-coat has been sanded, sandblasted, or suggested to abrasion or impact.

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

RESTRICTIONS APPLICABLE TO WARRANTIES

These limited warranties do not cover:

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

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

HUNTER MARINE
LIMITED WARRANTY

RESTRICTIONS APPLICABLE TO WARRANTIES (continued)

THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY AND ALL OTHER REMEDIES AND WARRANTIES EXPRESSED AND IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS. SOME STATES OR COUNTRIES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. THE PURCHASER ACKNOWLEDGES THAT NO OTHER REPRESENTATIONS WERE MADE TO HIM OR HER WITH RESPECT TO THE QUALITY AND FUNCTION OF THE BOAT. ANY CONSEQUENTIAL DAMAGES WHICH MAY BE INCURRED ARE EXCLUDED AND JUDGED DEFECTIVE BY HUNTER. SOME STATES OR COUNTRIES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE OR COUNTRY TO COUNTRY.

WARRANTY REGISTRATION

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

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

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

TRANSFER OF LIMITED WARRANTIES

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

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

(2) The notice shall include the name, address and telephone number of the subsequent purchaser, the date of purchase, the hull number and the name of the seller of the boat.

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

HUNTER MARINE
LIMITED WARRANTY

EPOXY BARRIER COAT

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

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

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

CUSTOMER SATISFACTION SURVEYS

During the first year of ownership, the first purchaser will receive two Customer Satisfaction surveys - the first (CSS#1) will be received shortly after taking delivery and focuses on the dealer's ability to sell and commission the boat, and the Owner's initial satisfaction. The second survey (CSS#2), nine to ten months into ownership, "measures" dealer service capability and allows the owner to evaluate most of the boat's functional systems and characteristics. Both surveys are dependent upon receipt of the first purchaser's Warranty Registration Form.

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 NW 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		
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*.

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 counter-clockwise.
Back a sail: to sheet it to windward so that the wind fills on the side that is normally to *leeward*.
Backstay: a stay that supports the mast from aft and prevents its forward movement.
Ballast: extra weight, usually lead or iron, placed low in the boat or externally on the keel to provide stability.
Ballast keel: a mass of ballast bolted to the keel to increase stability and prevent a keel boat from capsizing.
Batten: a light, flexible strip fed into a batten pocket at the *leech* of the sail to support the *roach*.
Beam: 1, the maximum breadth of a boat; 2, a transverse *member* which supports the deck; 3, on the beam means that an object is at right angles to the centerline.
Bear a way: to steer the boat away from the wind.
Bearing: the direction of an object from an observer, measured in degrees true or magnetic.
Beat: to sail a *zigzag course* towards the wind, *close-hauled* on alternate tacks.
Belay: to make fast a rope around a cleat, usually with a figure-of-eight knot.
Bend: 1, to secure a sail to a spar before hoisting; 2, to moor a boat; 3, a sleeping place on board.
Bight: a *bend* or loop in a rope.
Bilge: the lower, round part inside the hull where water collects.
Block: a pulley in a wooden or plastic case, 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.
Coaming: the raised structure surrounding a *hatch*, cockpit, etc., which prevents water entering.
Cotter pin: soft, metal pin folded back on itself to form an eye.
Course: the direction in which a vessel is steered, usually given in degrees: true, magnetic or compass.
Cringle: 1, a rope loop, found at either end of a line of *reef* points; 2, an eye in a sail.

D

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

GLOSSARY OF SAILING TERMS

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 boats *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 down.
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.
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

GLOSSARY OF SAILING TERMS

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: 1, holes in the toe rail which allow water to drain off the deck; 2, drain cockpit through hull.

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

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

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

Serving mallet: tool with a grooved head, used when serving a rope 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 rope 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.

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 timer at the bow, from the *keel* upwards, to which the planking is attached.

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

GLOSSARY OF SAILING TERMS

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

T

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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 *ratting*.

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

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

Wetted surface: the area of the hull under water.

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

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

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

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

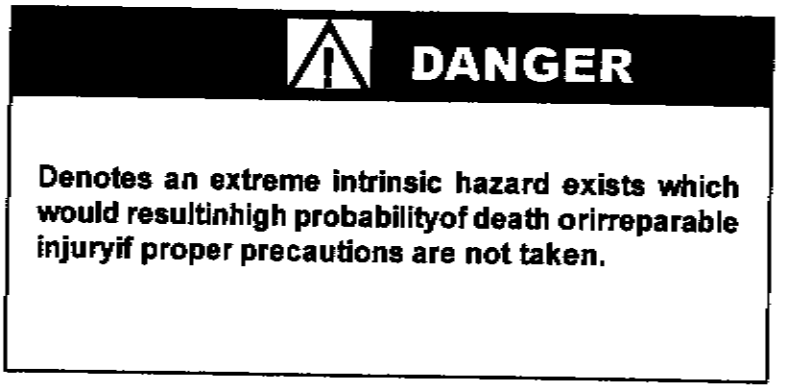
Windward: the direction from which the wind blows; towards the wind (opp. of *leeward*).

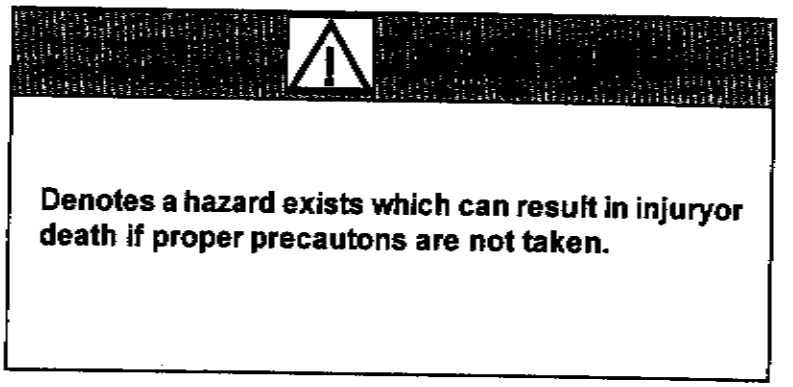
Y

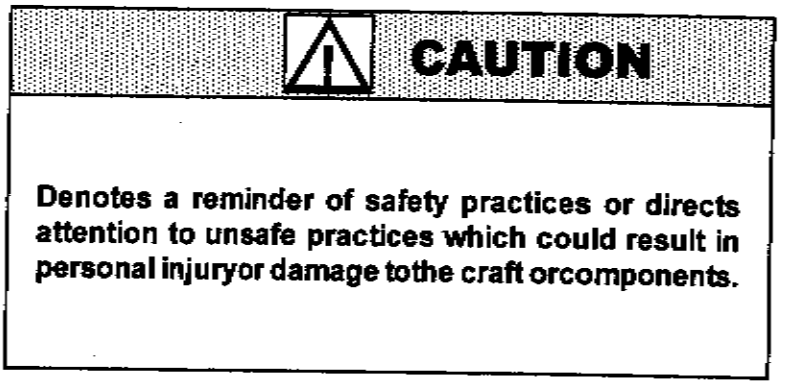
Yawl: a two masted boat with a *mizzen* stepped *aft* of the rudder stock/post.

EXPLANATION OF SAFETY PRECAUTIONS

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







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.

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

MINIMUM RECOMMENDED SAFETY EQUIPMENT

- Required life saving equipment including life vests and throwables
- Required fire extinguishing equipment
- First Aid kit
- Emergency Position Indicating Radio Beacon (EPIRB)
- Manual bailing device
- Anchor with sufficient line and/or chain
- flashlight with good batteries
- Binoculars
- VHF radio
- Navigational charts for the appropriate areas
- Flares
- Fog bell
- Noise emitting device
- Radar reflector
- Sufficient food and water provisions
- Auxiliary starting battery
- Space 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 flotation devices must be immediately available for use.

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 boards.

EXPLANATION OF SAFETY PRECAUTIONS

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.

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.

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.

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 ☐ Flares ☐ Mirror ☐ Flashlight ☐ Food ☐ Water ☐ EPIRB ☐ Raft/Dinghy

6. Radio: TYPE FREQUENCIES

7. Trip Expectations:

DEPARTING AT (APPROX. TIME) ON (DATE) FROM (LOCATION)

GOING TO (LOCATION) RETURNING (DATE) IN NO EVENT LATER THAN (TIME & DATE)

8. Automobile: LICENSE # STATE

MAKE COLOR PARKED AT

9. If not retuned by_____, call the Coast Guard or:_____

I:_____

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 usuable 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.
- ☐ Cover windshield.

SAFE BOATING TIPS

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

ANCHORING

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

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

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

CAUTION

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

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

SAFE BOATING TIPS

DIESEL ENGINE

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

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

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.

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

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 advise. (*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. Keep fuel tank full.

SAFE BOATING TIPS

STARTING YOUR DIESEL ENGINE

1. Visually check engine compartment to see that the throttle linkage, shifting controls, electrical connections and fuel lines are properly secured.
2. *Before each start* check oil in engine and transmission.
3. Insure that engine shut-off cable is properly secured and operating. Only on 340 and down.
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, life the collar under the shift lever knob and move the lever forward to advance the throttle for neutral warm-up.
5. Insert the starter key and turn to the "on" position.
6. Press the starter button and hold until engine starts, then release. The buzzer and/or light should then go off. **Press the starter button no longer than 5 seconds continuously.**
7. Allow cold engine to warm up a minimum of five minutes.
8. When warm-up is completed, return the hand 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. Not all engines are equipped with pull stops. 340 and down.

⚠ 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

Before departure, remember to unplug the shore power. 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. <u>Always check for overhead high tension wires before proceeding.</u> 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.

⚠

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

SAFE BOATING TIPS

ELECTRICAL SYSTEM (continued)

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

1. Turn off the boat's shore connection switch before connecting or disconnecting shore power cable.

2. Connect shore power cable at the boat first.

3. If polarity warning indicator is activated, immediately disconnect cable and have the fault corrected by a qualified electrician.

4. Disconnect shore power cable at shore outlet first.
5. Close inlet cover tightly.

DO NOT ALTER SHORE POWER CABLE CONNECTORS.

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

General: Themetallic parts of your cable set are made to resist corrosion. In a 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.

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.

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

WHEN CHARGING THE BATTERY:

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

SAFE BOATING TIPS

COOKING STOVE

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

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, please 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 lever to the "wet" position for flushing and pump until the bowl is thoroughly cleaned. Continue with several more full strokes to flush discharge lines. Return lever to the "dry" position and pump slowly until bowl is empty.

NOTICE:

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

CAUTION

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

SAFE BOATING TIPS

PUMPS

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

Bilge pump - Inspect all hoses for chafing and dry rot. See that the hose clamps are tight. Check that 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.

SINKING HAZARD - Ensure proper bilge pump operation.

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. Use tank gauge for filling. D.C. main should be turned on first.

To activate the water system,turn on D.C. main, 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 pump will also run if there is a leak.

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.

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

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

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

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, deck pumpout at dockside or Macerator Pump. 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

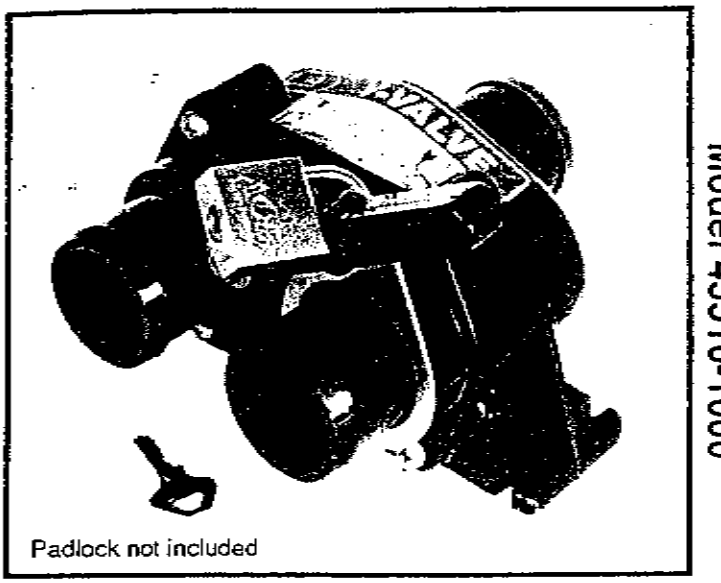
TWO POSITION Y-VALVE

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

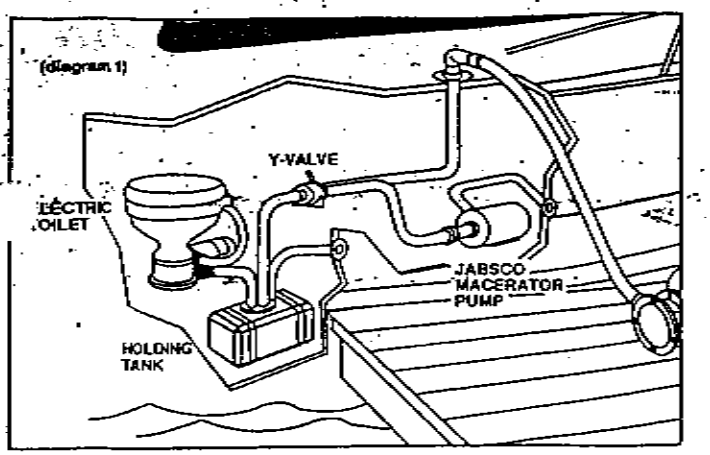
Lay out the system that the Y-Valve will be installed in so that all hoses can be installed without sharp bends, kinks or loops that trap fluids. After choosing a convenient, accessible location for the Y-Valve, be sure that there is adequate room to swing the selector lever. Mark locations for mounting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

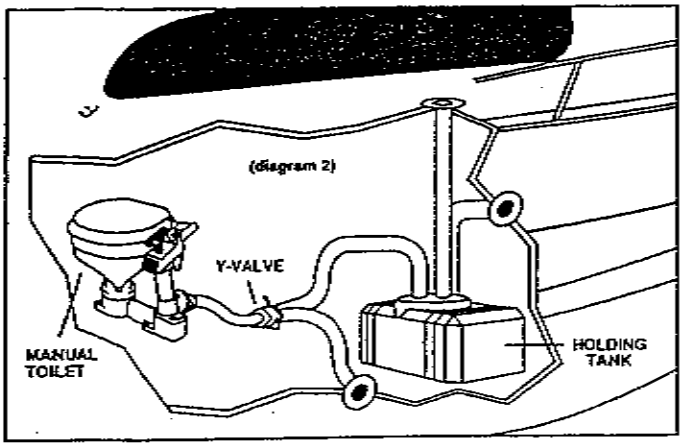
It is recommended that all hoses used in waste systems should be the heavy, non-collapsible fabric reinforced hose. Vacuum cleaner type hose and vinyl hoses will collapse under the vacuum of a dockside pumpout system, or will allow sewer gas to permeate into the boat. All hoses should be double clamped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

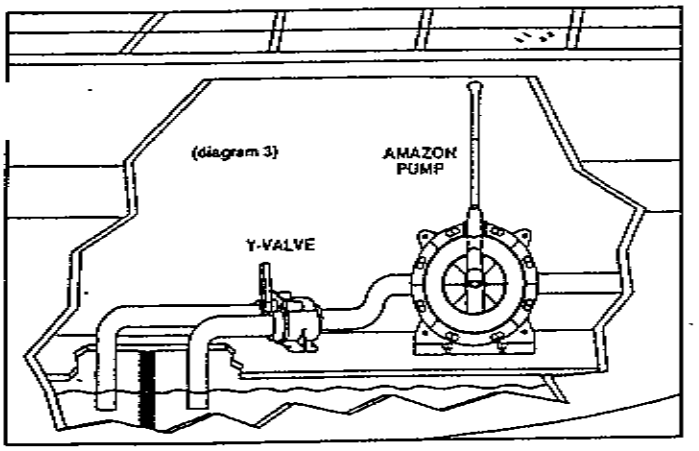
OPERATION

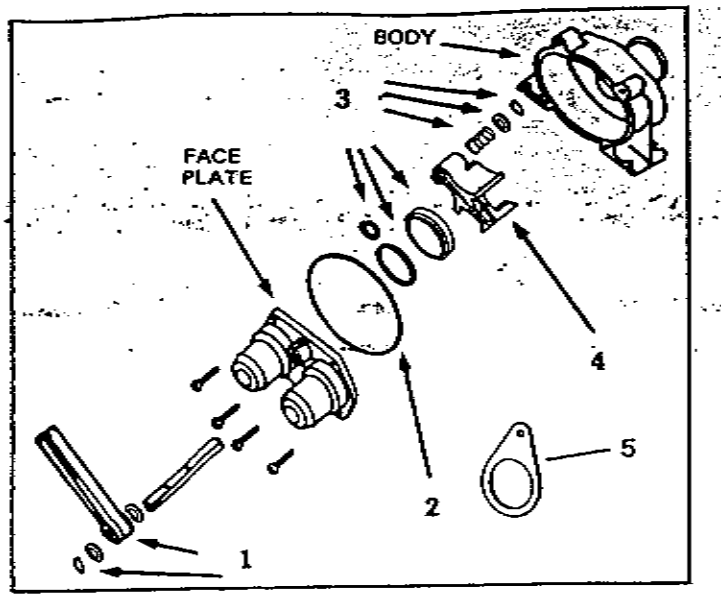
The Y-Valve is designed with a simple and positive diverter mechanism. When choosing the discharge hose system to use, simply orient the selector lever on the Y-Valve over the hose desired to be open to flow. When selecting the particular hose for flow, be sure that the lever is securely positioned against 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
A unit of ITT Fluid Technology Corporation
U.S.A. ITT Jabsco, 1485 Dale Way, P.O. Box 2158, Costa Mesa, CA 92628-2158; Tel: (714) 545-8251; Fax: (714) 957-0609
UNITED KINGDOM
ITT Jabsco
Hoddesdon, Herts.
CANADA
ITT Fluid Products
Guelph, Ontario
JAPAN
NHK Jabsco Co., LTD.
Yokohama, Kanagawa
GERMANY
Mintec, GmbH
Norderstedt

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.

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.

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.

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:

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.

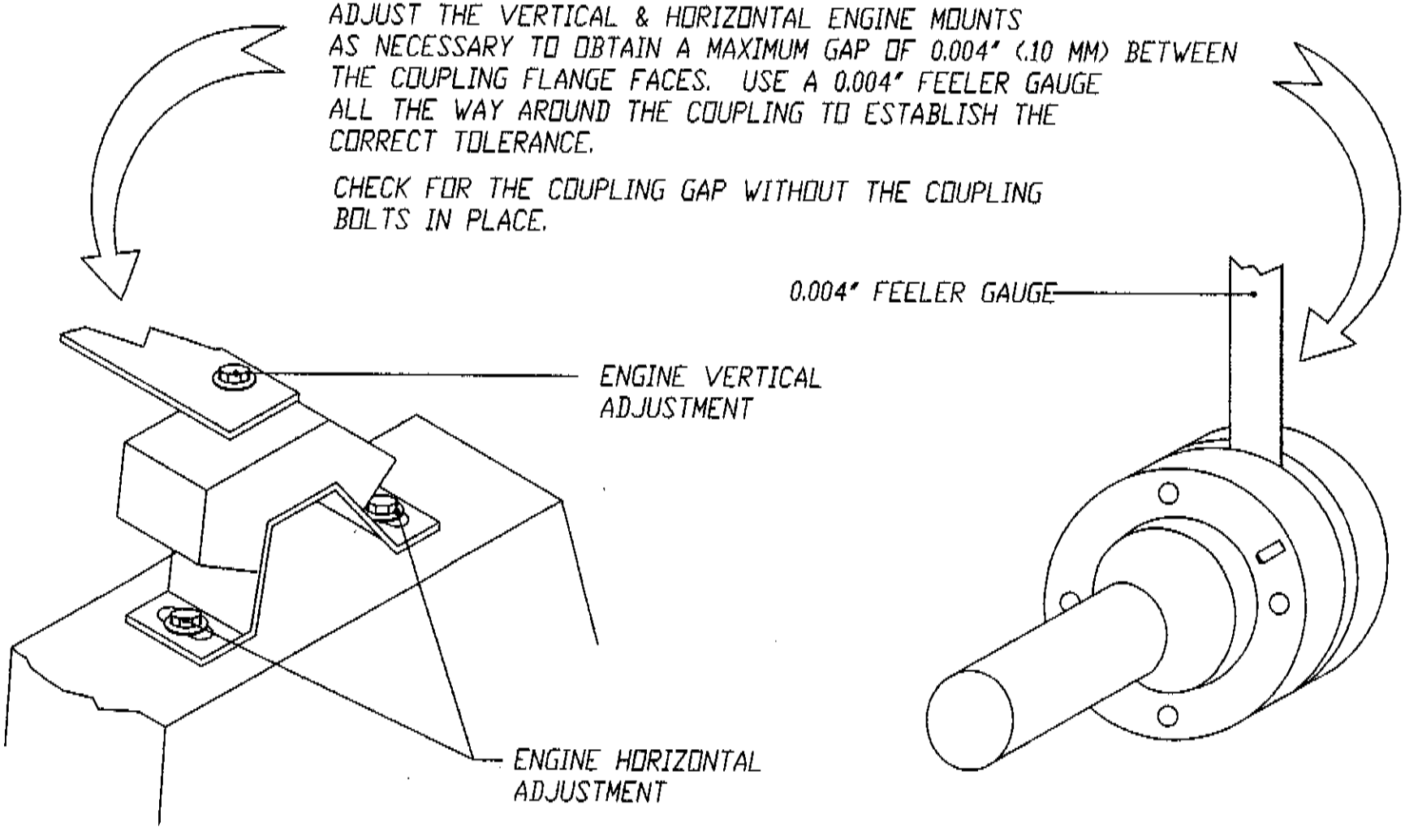
STUFFING BOX

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, loosed 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 flex 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.



STANDARD ALIGNMENT DIAGRAM FOR INBOARD ENGINES	
3808026	NONE
ENGINEERING DEPT.	10/22/98

HUNTER

MAINTENANCE

STEERING

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

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.

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

SHOCK/FIRE HAZARD

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

CAUTION

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

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.

MAINTENANCE

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 filter 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 was 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.

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.

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

MAINTENANCE

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 tot he boom, left and right, in about 18-9n. (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,* address below (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 sandpaper to smooth 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

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

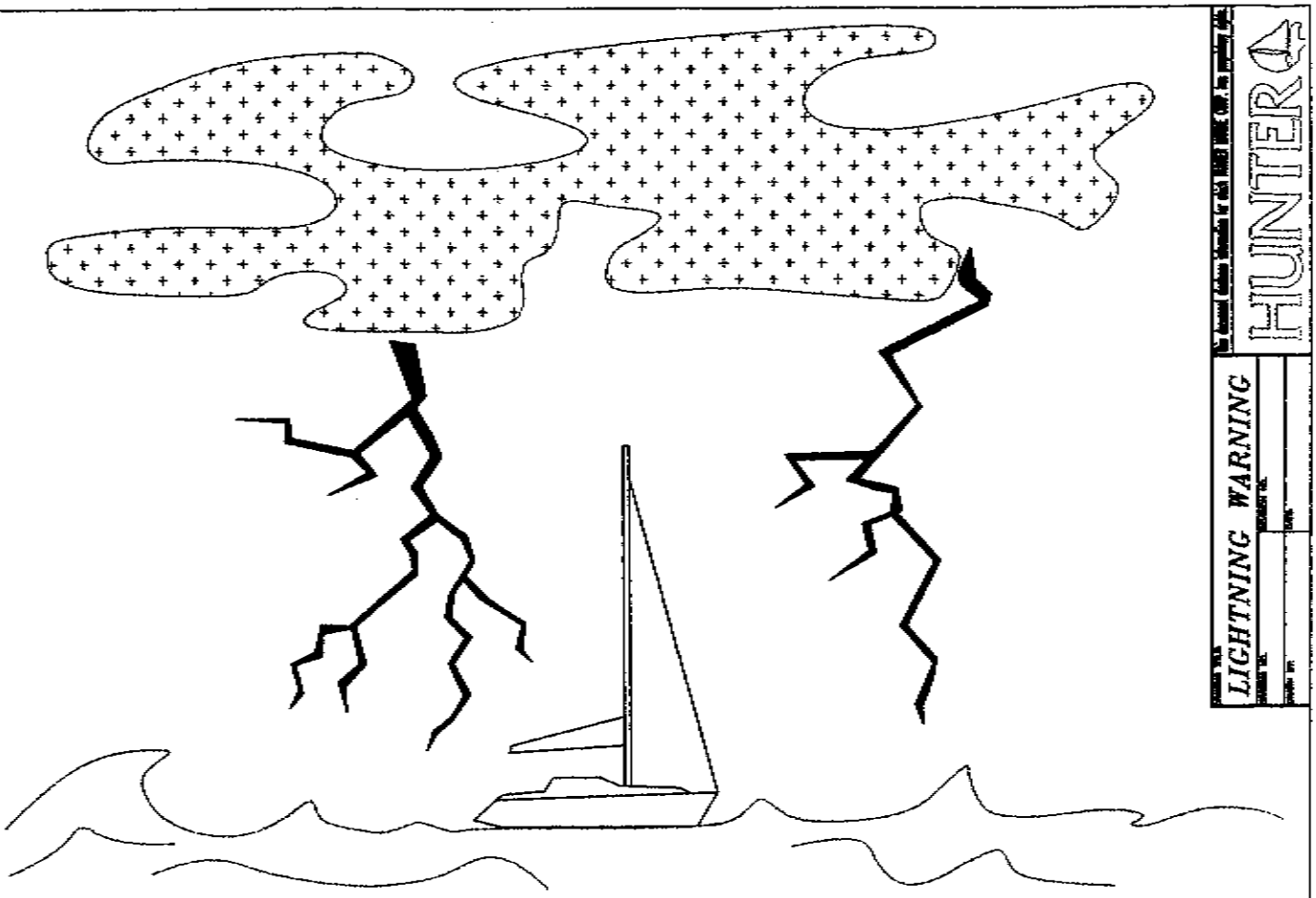
Take it home and store it in a safe place. Be very careful storing the gas tank as the gasoline is very flammable. Refer to "Engine Manual" for specific maintenance schedule.

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 seacock, remove the raw water pick up hose from the raw water pump and immerse 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.



LIGHTNING WARNING

HUNTER

LIGHTNING STORM WARNING:

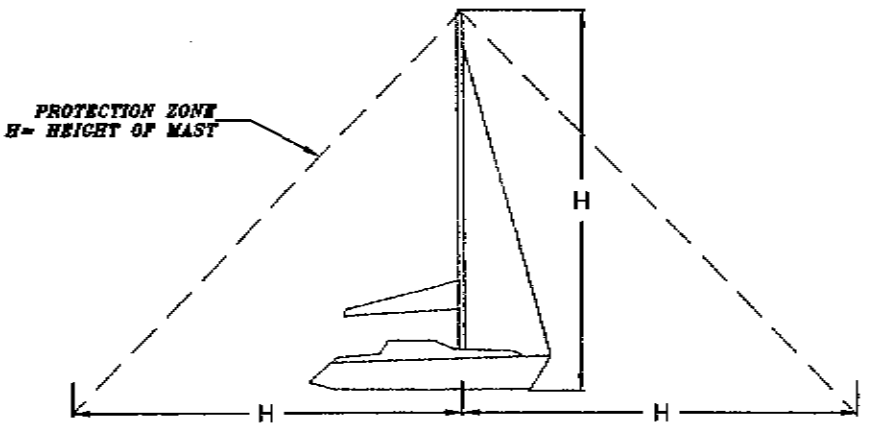
1. ALL WHIP ANTENNEAS SHOULD BE TIED–DOWN DURING STORM, UNLESS PART OF THE LIGHTNING POSITIONING SYSTEM.

2. PRECAUTIONS: DURING LIGHTNING STORMS: A. THE SHIPS OCCUPANTS SHOULD TAKE SHELTER INSIDE A CLOSED AREA OF THE BOAT. EXAMPLE: BELOW DECK. B. OCCUPANTS SHOULD NOT HAVE ANY BODY PARTS IN THE WATER. C. AVOID CONTACT WITH ANY COMPONENTS OF THE L.P.S. SYSTEM. AND D. AVOID ALL CONTACT WITH ANY METAL OBJECTS.

3. SEE DIAGRAM BELOW FOR INFORMATION ON THE LIGHTNING PROTECTION ZONE.

4. IF LIGHTNING SHOULD STRIKE THE SHIP, INSPECT ALL ELECTRONICS, ELECTRIC GEAR, COMPASS AND L.P.S. SYSTEM FOR POSSIBLE DAMAGE. RECALIBRATE AS NECESSARY. NOTE: BEGIN CHECKING ELECTRONICS <u>AFTER</u> THE THREAT OF LIGHTNING HAS PASSED.

<u>FAILURE TO FOLLOW PRECAUTIONS MAY RESULT IN SEVERE INJURY OR DEATH</u>



CERTIFICATION DETAILS

CE CERTIFIED

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

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

CE CRAFT DESIGN CATEGORIES

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

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

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

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

For additional information, contact:

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

NMMA CERTIFIED

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

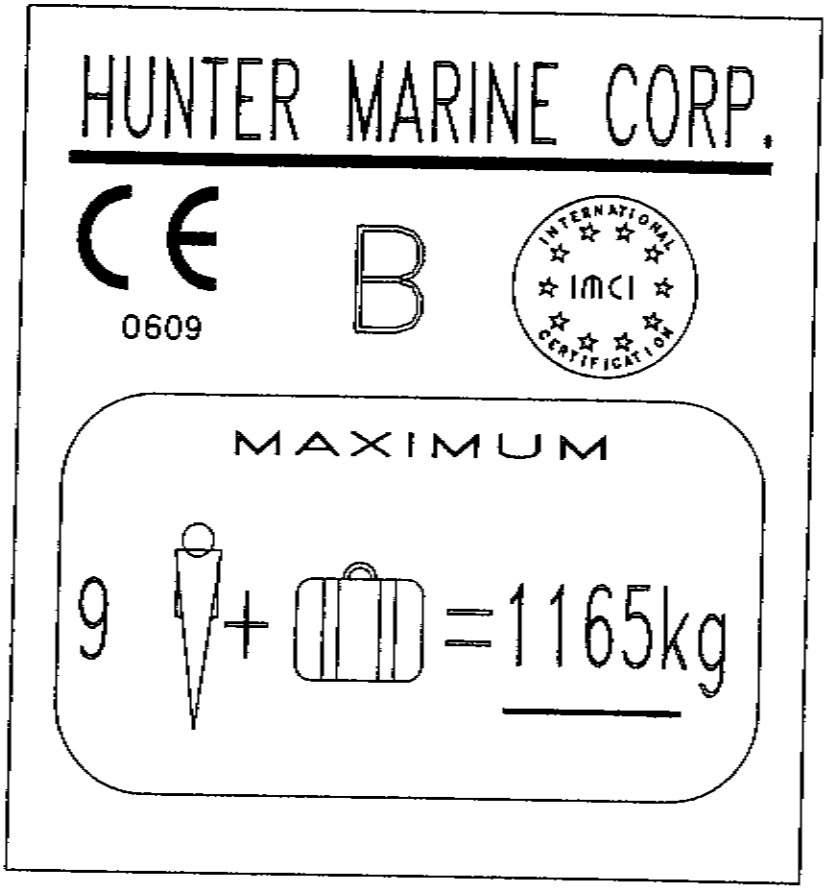
For additional information, contact:

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

BUILDER'S INFORMATION PLATE

HUNTER MARINE CORPORATION

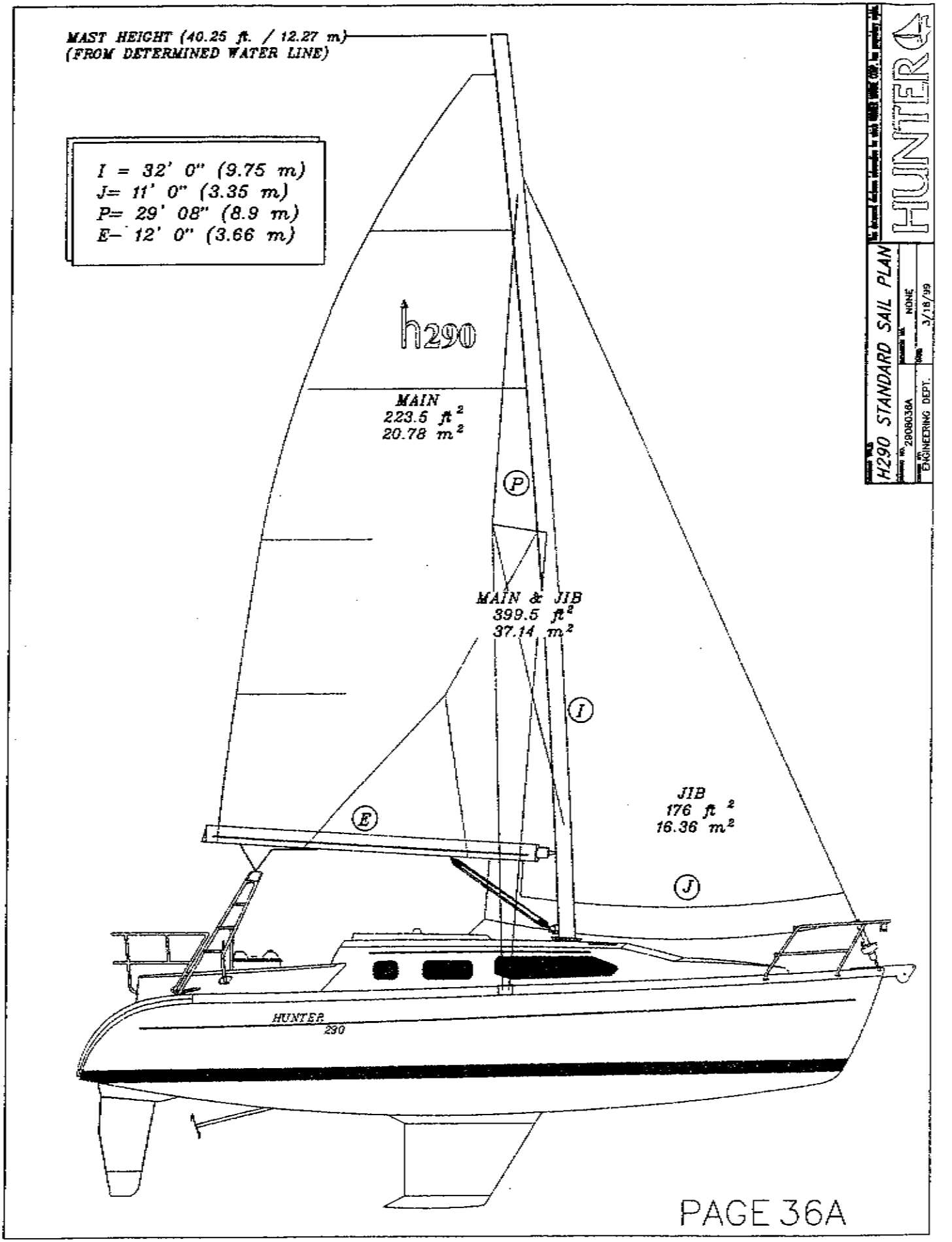
H290

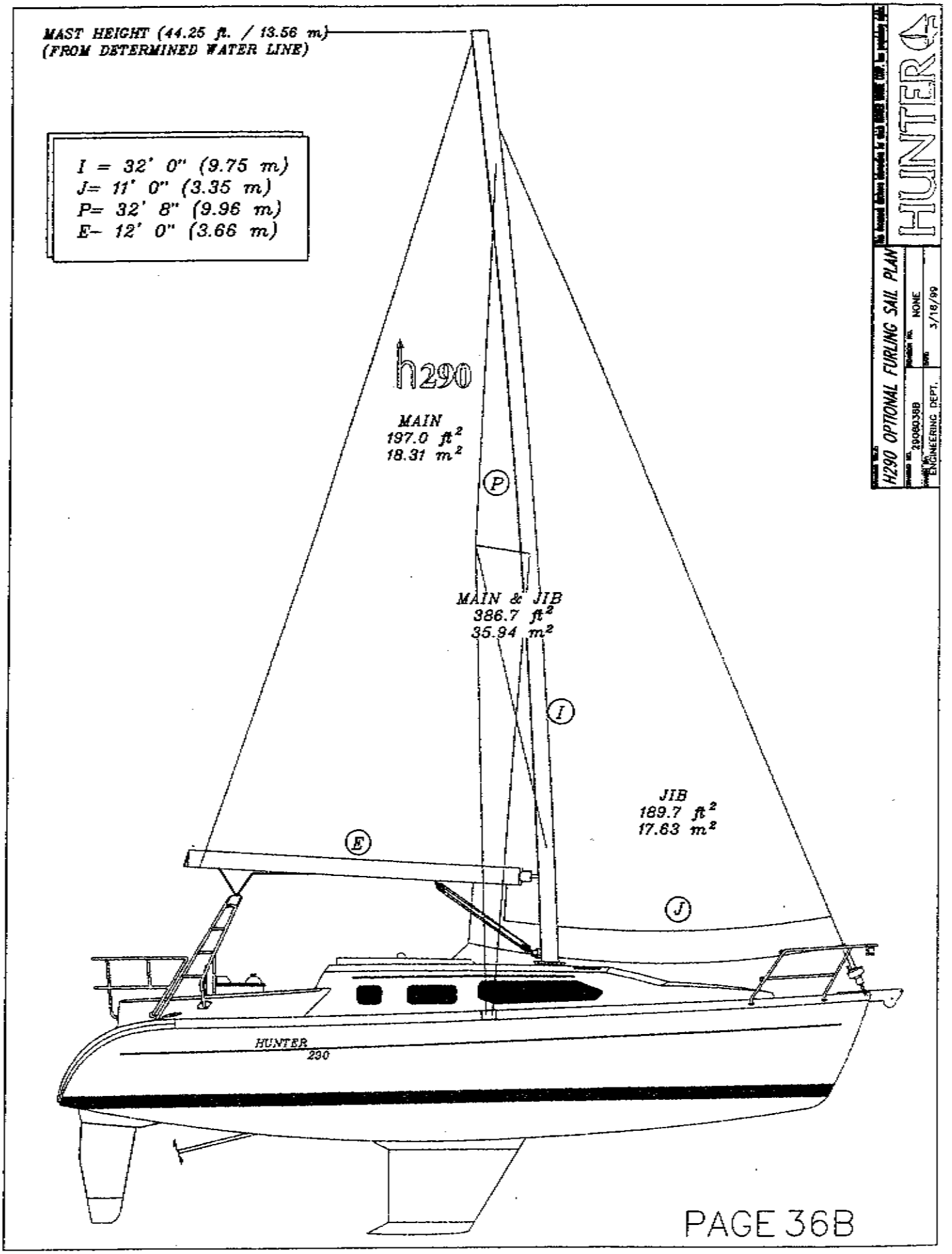


LIGHTSHIP DISPLACEMENT = 3,089Kg (6,796Lb)
FULL LOAD DISPLACEMENT = 4,254Kg (9,359Lb)
SINK @ FULL LOAD = 96mm (3.77")

EACH HUNTER 290 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

MODEL YEAR 2000

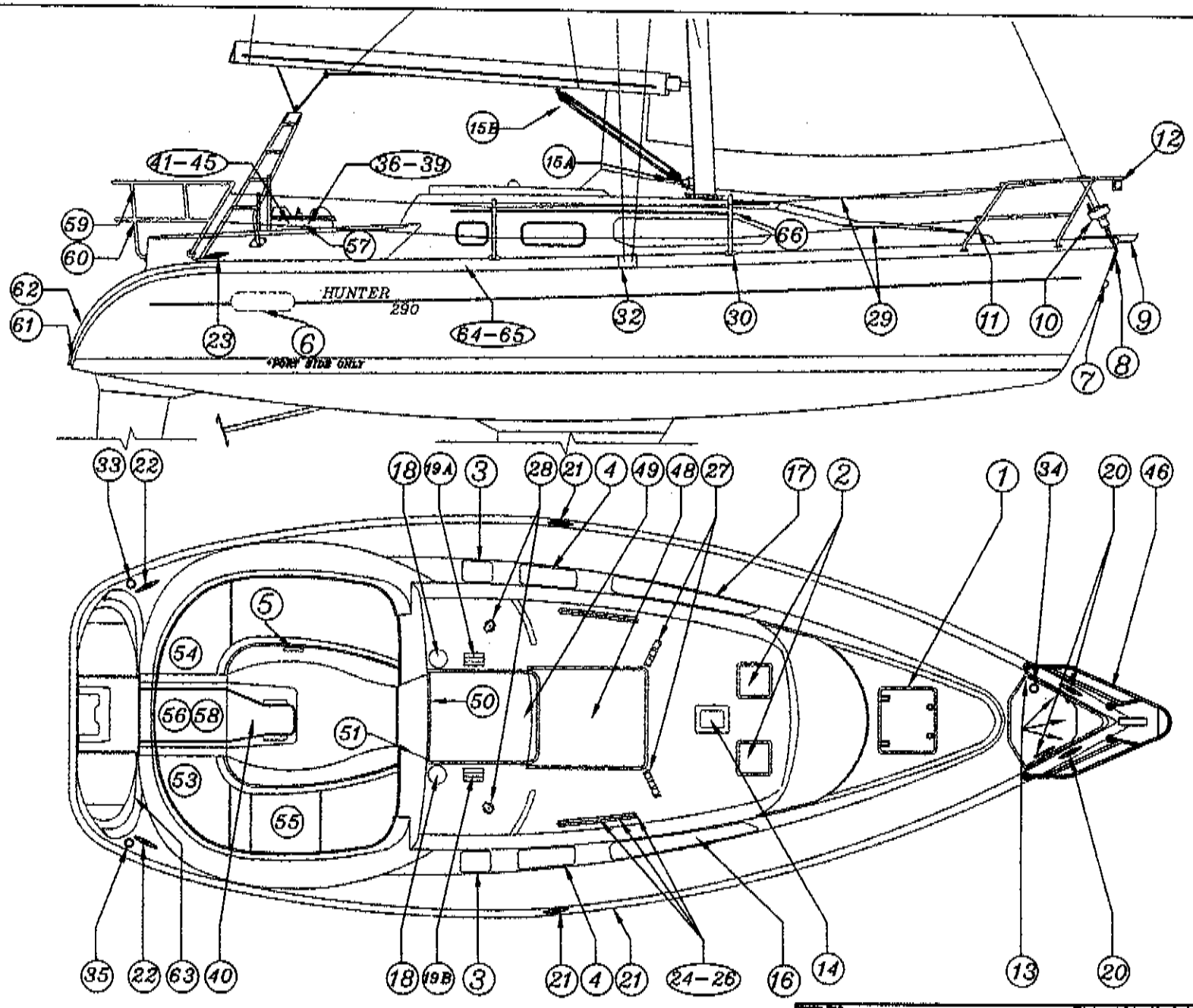

MAST HEIGHT (40.25 ft. / 12.27 m)
(FROM DETERMINED WATER LINE)
I = 32' 0" (9.75 m)
J= 11' 0" (3.35 m)
P= 29' 08" (8.9 m)
E= 12' 0" (3.66 m)
h290
MAIN
223.5 ft²
20.78 m²
P
MAIN & JIB
399.5 ft²
37.14 m²
J
E
JIB
176 ft²
16.36 m²
J
HUNTER
290
HUNTER
H290 STANDARD SAIL PLAN
NONE
3/18/99
ENGINEERING DEPT.


MAST HEIGHT (44.25 ft. / 13.56 m)
(FROM DETERMINED WATER LINE)
I = 32' 0" (9.75 m)
J= 11' 0" (3.35 m)
P= 32' 8" (9.96 m)
E= 12' 0" (3.66 m)
h290
MAIN
197.0 ft²
18.31 m²
P
MAIN & JIB
386.7 ft²
35.94 m²
I
JIB
189.7 ft²
17.63 m²
E
J
HUNTER
290
H290 OPTIONAL FURLING SAIL PLAN
DRAWING NO. 29080388
REVISION NO. NONE
DRAWN BY ENGINEERING DEPT.
DATE 3/18/99
HUNTER

DIMENSIONS, CAPACITIES, ETC.

HUNTER 290

LENGTH OVERALL (LOA)	28' 6"	8.69 m
LENGTH OF WATERLINE (LWL)	26' 11"	8.19 m
BEAM (MAX)	10' 9"	3.28 m
DRAFT (SHOAL)	3' 6"	1.07 m
DRAFT (DEEP)	5' 0"	1.52m
DISPLACEMENT (SHOAL)	7,400 lbs	3,360 kg
BALLAST (SHOAL KEEL)	2,550 lbs.	1,158 kg
BALLAST (DEEP KEEL)	2,550 lbs.	1,158 kg
SAIL AREA (100% TRAINGLES)	349' 6" sq. ft.	32.47 sq.m
SAIL AREA (ACTUAL W/STANDARD SAILS)	399.5 sq. ft.	37.14 sq.m
I	32 0"	9.75 m
J	11' 0"	3.35 m
P	29' 1"	8.90 m
E	12' 0"	3.66 m
MAST HEIGHT (FROM WATERLINE)	40' 3"	12.27 m
HEADROOM	6' 2"	1.88 m
WATER CAPACITY	40 U.S. gal.	151 liters
HOLDING TANK CAPACITY	20 U S gal.	76 liters
FUEL TANK CAPACITY	20 US gal.	76 liters
LPG TANK CAPACITY	5 lbs.	2.28 kg
BATTERY CAPACITY	DEALER SUPPLIED	
ELECTRICAL VOLTAGES	12 V.D.C.	110 A.C.
	SELECT OVERSEAS MODELS 220 V	
INBOARD ENGINES	YANMAR 2GM20F (18 hp)	13.4 kw
PROP SIZE	(15 X 12 R.H.)	
MAXIMUM LOADING	9 PEOPLE	1165 kg (INCLUDING LUGGAGE)
LIFTING POINTS	INDICATED BY "SLING" LABELS ON HULL	

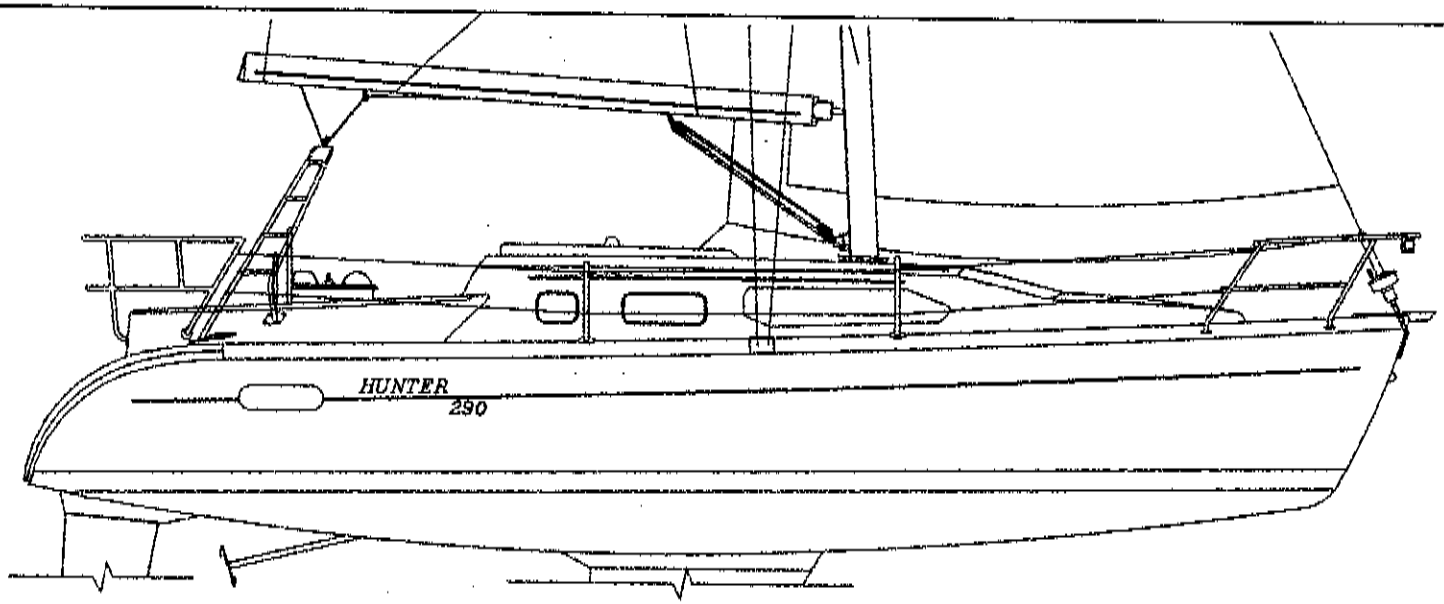


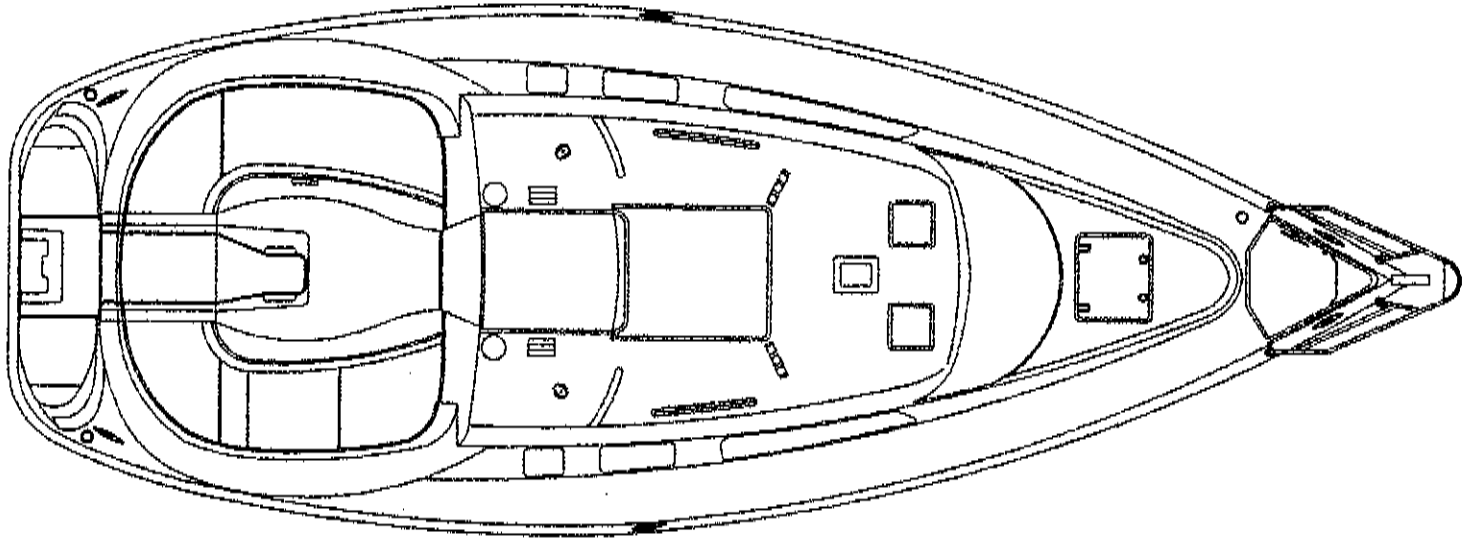
PAGE 38A

H290 STANDARD DECK HDWR LAYOUT

2908038A	NONE
ENGINEERING DEPT.	3/20/99

HUNTER





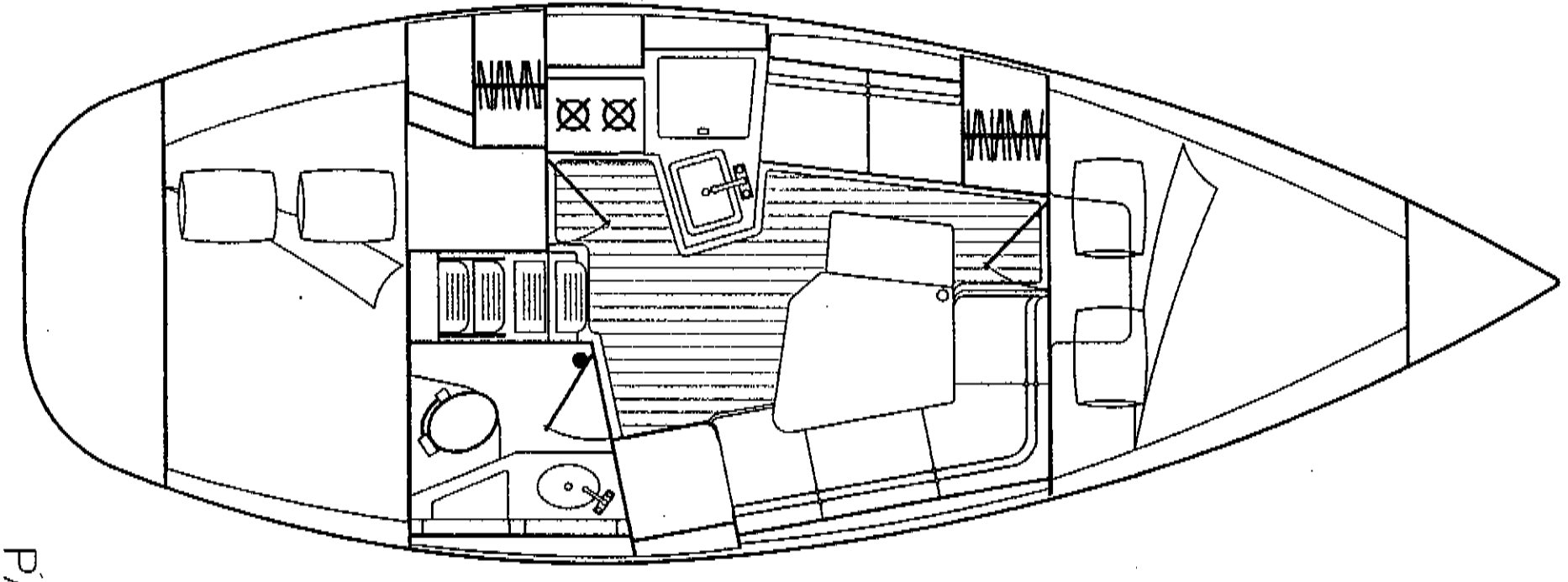
PAGE 38B

H290 OPTIONAL DECK HDWR LAYOUT	
29080386	NONE
ENGINEERING DEPT.	3/20/98

HUNTER

	REVISION #	6/17/99					
	HUNTER 290 DECK HARDWARE						
	GEN.DESCR.	LOC. & TYPE	VENDOR	MDL/NAME/#	#REQ.	PART #	DWG #
1	HATCH	FWD CABIN TOP	LEWMAR	SIZE 60	1	300950	
	SCREEN	SCREEN	LEWMAR		1	300954	
	TRIM RING	TRIM RING	LEWMAR	IVORY	1	300670	
2	HATCH	MAIN CABIN TOP	LEWMAR	OCEAN SIZE 10	2	300210	
	SCREEN	SCREEN	LEWMAR		2	300220	
	TRIM RING	TRIM RING	LEWMAR	IVORY	2	300230	
3	HATCH (OPENING PORT)	CABIN SIDE	LEWMAR	TRIMPORT 03	2	300180	
	SCREEN	SCREEN	LEWMAR		2	300220	
	TRIM RING	CABIN SIDE	HUNTER	IVORY	2	300200	
4	HATCH	CABIN SIDE	LEWMAR	SIZE 41	2	300280	
	SCREEN	CABIN SIDE	LEWMAR		2	3008300	
	TRIM RING	CABIN SIDE	HUNTER	IVORY	2	300840	
5	PORTLIGHT	PORT COCKPIT SIDE		WHITE 4x10	1	300390	
	SCREEN			4x10	1	300410	
6	FIXED HULL WINDOW	HULL SIDES	PLEX H310/340		1	422060	
	TRIM RING	HULL WINDOWS	VACU-FORM	BEIGE	1	300310	
7	BOW EYE	STEM		7/16" U-BOLT	1	318010	
8	BOW STRAP	HEADSTAY FITTING	SAME AS H280	ST STL TO PRINT	1	305620	
9	BOW ROLLER	STEM			1	304220	
10	FURLING UNIT	HEADSTAY	FURLEX	106-12 W/RIG SCRI	1	401265	
11	BOW RAIL	310	HUNTER	SAME AS 310	1	307480	
12	BOW LIGHT	ON BOW PULPIT	C/O 310	62246B	1	255806	
13	ANCHOR HATCH	NEW	HUNTER	NEW PART	1	?	
	ANCHOR LATCH (HANDLE)	ANCHOR WELL	HUNTER		1	315700	
	STRIKER PLATE	ANCHOR WELL	HUNTER		1	306120	
	HINGE	ANCHOR WELL		3"x1.5" SS POLISH	2	314900	
	EYE STRAP	ANCHOR WELL		1242-000 CHROME	2	315590	
	BUNGEE CORD	ANCHOR WELL		20" 650240-1	1	318530	
14	MAST STEP	H310			1	403096	
15A	VANG BLOCK						
15B	VANG BLOCK						
16	STBD CABIN SIDE PLEXI	CABIN SIDE FWD			1	P2837	
17	PORT SIDE PLEXI	CABIN SIDE FWD			1	P2836	
18	WINCH	CABIN TOP AFT	LEWMAR	16 CST	2	308590	
19A	SHEET STOPPER	CABIN TOP PT AFT	SPINLOCK	XA3	1	304000	
19B	SHEET STOPPER	CABIN TOP STBD AFT	SPINLOCK	XA3	1	304000	
20	CLEAT	FWD MOORING		ALUM 8" 4-HOLE	3	P2820	
21	CLEAT	MIDSHIPS SPRING		ALUM 8" 4-HOLE	2	P2820	
22	CLEAT	AFT MOORING		ALUM 8" 4-HOLE	2	P2820	
23	CLEAT (FURL)	COCKPIT COAMING	SCHAEFER	5" METAL	1	303360	
24	JIB TRACK	CABIN TOP	SCHAEFER	1"16"	2	301950	
25	JIB CARS	JIB TRACK	SCHAEFER	#32-88	2	302900	
26	JIB TRACK ENDS		SCHAEFER	#74-35-G	4	302890	
27	DK. ORGANIZER (TRIPLE)	CABIN TOP		506-81	2	303490	
28	CHEEK BLOCK (JIB SHEET)	CABIN TOP AFT CORNERS	SPINLOCK	JK/50X	2	303500	
29	LIFE LINES				I SET	P2885	
30	STANCHION W/ BASE	ON TOERAIL	HUNTER	SAME AS 310	4	305140	
32	CHAIN PLATE	ON HULL AMIDSHIPS	NEW DESIGN?	SIMILAR 280	I SET		
33	FILL PLATE	DIESEL			1	356181	
34	FILL PLATE	WATER			1	356199	
35	FILL PLATE	WASTE			1	356217	
36	STEERING CONSOLE	IN COCKPIT	HUNTER	SAME AS 310	1		
37	WHEEL	ON CONSOLE	WHITEWATER	32"	1	310825	
38	STEERING SYSTEM	IN COCKPIT	EDSON	C/O 310			
	"		CONNECT ROD				
39	SHIFT CONTROL						
40	QUAD COVER						
	EMERG.TILL ACCESS	IN QUAD COVER		DP40-W	1	300620	
41	GRABRAIL, AFT CONSOLE						
42	GRAB HANDLE, CONSOLE				1	307130	
43	COCKPIT TABLE						
44	TABLE DRINK HOLDER	COCKPIT TABLE		SAME AS 310	1		
45	STARBOARD	COCKPIT TABLE		SAME AS 310	1		
46	MAINSHEET U-BOLT	COCKPIT TABLE			1	318010	

47	MAINSHEET BLOCK						
48	SEA HOOD						
49	SLIDING HATCH				1	P2838	
50	SLIDER STOP						
51	COMPANIONWAY TRACK						
53	STBD GULLWING SEAT	STBD COCKPIT	HUNTER	GLASS PART	1	NEW	
	HINGES	GULLWING			2	314900	
	EYE STRAP	GULLWING			1	315590	
	BUNGEE	UNDER LID			1		
54	PORT GULLWING SEAT	PORT COCKPIT	HUNTER	GLASS PART	1	NEW	
	HINGES	GULLWING			2	314900	
	EYE STRAP	GULLWING			1	315590	
	BUNGEE	UNDER LID			1		
55	EURO HATCH	STBD COCKPIT	HUNTER	GLASS PART	1		
	HINGE	EURO HATCH			2	314900	
	EYE STRAP	EURO HATCH			1	315590	
	BUNGEE	UNDER LID			1		
56	MANUAL BILGE PUMP	COCKPIT	COMPAC		1	352203	
57	ENGINE PANEL						
58	HELM SEAT	COCKPIT	NEW DESIGN	GLASS PART	1		
	HINGES	HELM SEAT		4x1 SS STRAP	1 PR	314920	
	RUBBER LATCHES	HELM SEAT		BLACK FLEX	2	315430	
	EYE STRAP	HELM SEAT		1242-000	2	315590	
59	STERN RAIL	AFT COCKPIT COAMING	NEW DESIGN	SIMILAR 310	1 SET		
60	STERN LIGHT	AFT COCKPIT COAMING		622438	1	255878	
61	SWIM LADDER	SWIM PLATFORM	16" TELESCOPING	TDL3XL	1	303650	
62	SWIM GRAB HANDLE	STERN	TO PRINT		2	307600	
63	SHORE PWR.	TRANSOM		303SSEL-B	1	331700	
64	RUBRAIL	GUNN'L	NEW 310 STYLE	84 DUROMETER			
65	KEEPER, RUBRAIL	"	310, 340 SIZE				
66	TEAK EYEBROW	CABIN HOUSE SIDE	310, 340 STYLE	TEAK 1 PT/ 1 STBD	2		
	SPINNAKER OPTION						
	SPIN OPTION						
100	WINCH	COCKPIT COAMING	LEWMAR	16CST	2	308590	
101	SPIN BLOCK						
104	DK ORGANIZER (QUAD)						
105	SPINN SHEET BLOCK	ON STERN RAIL	SINGLE W/BECKET		2	318350	
	OPTIONAL GEAR (FURLING MAST)						
	FURLING, WITH SPIN						
125	SHEET STOPPER	PORT SIDE		SINGLE		304040	
126	DK ORGANIZER (TRIP)	PORT SIDE		TRIPLE		303490	
	OPTIONAL COCKPIT SHOWER						
150	COCKPIT SHOWER	OPTIONAL	WHALE	48500	1	351267	
	OPTIONAL ANCHOR WINDLASS						
200	WINDLASS	ANCHOR WELL	ANCHORMAN	800	1	310540	
201	DUAL CONTROL BOX	ANCHOR WELL		DUAL D	1	310550	
202	DECK SWITCH - UP	ANCHOR WELL			1	310570	
203	DECK SWITCH - DOWN	ANCHOR WELL			1	310600	



H290 INTERIOR LAYOUT	
DRAWING NO. 28680414	PROGRAM NO. NONE
DRAWN BY ENGINEERING DEPT.	DATE 3/18/99

HUNTER

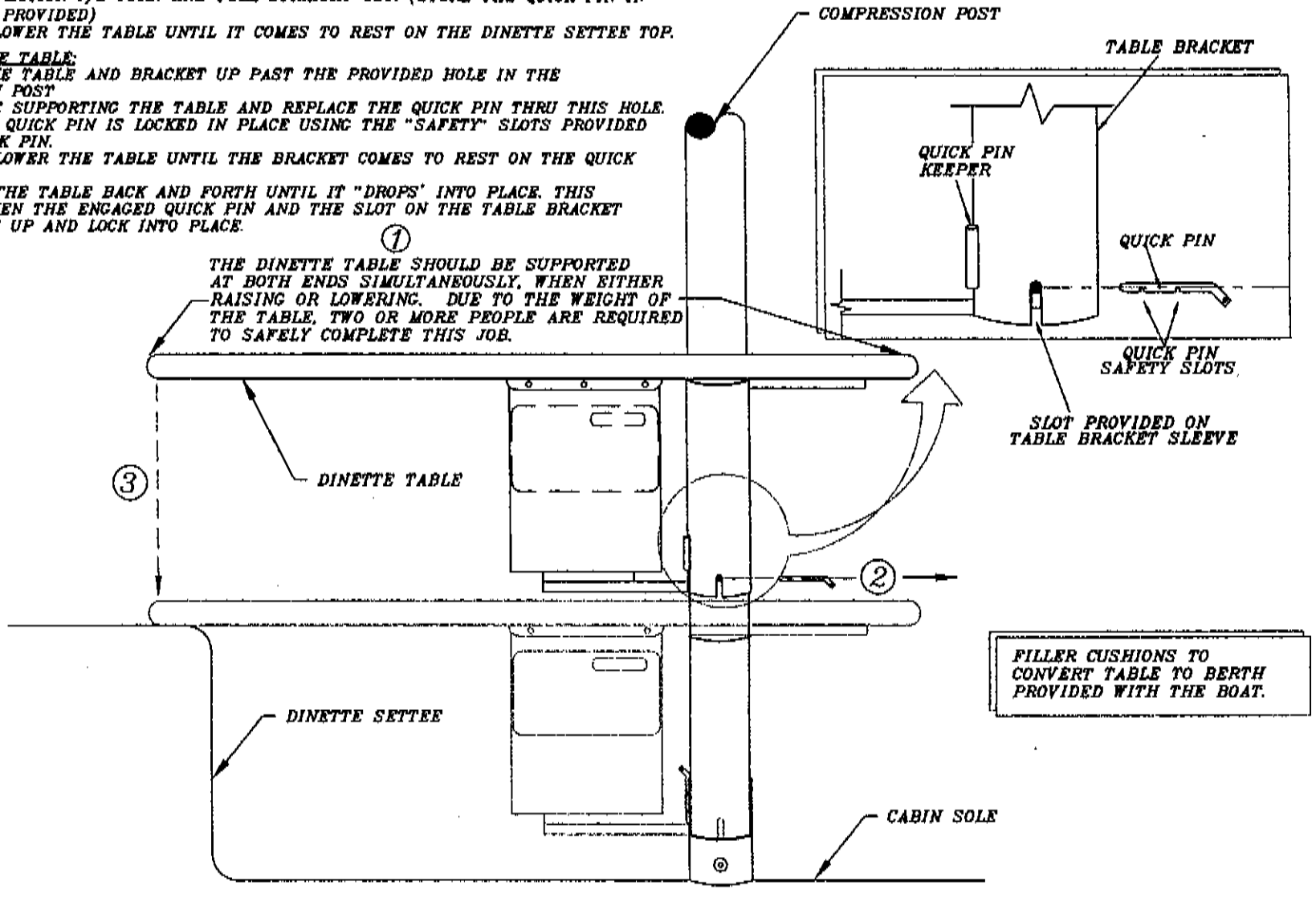
TABLE INSTRUCTIONS

TO LOWER THE TABLE:

1. LIFT UP ON THE TABLE TO RELIEVE PRESSURE ON THE QUICK PIN SUPPORTING THE TABLE BRACKET.
2. CONTINUE SUPPORTING THE TABLE AND REMOVE THE QUICK PIN BY TURNING IT IN A CLOCKWISE MOTION 1/2 TURN AND PULL STRAIGHT OUT. (STORE THE QUICK PIN IN THE KEEPER PROVIDED)
3. SLOWLY LOWER THE TABLE UNTIL IT COMES TO REST ON THE DINETTE SETTEE TOP.

TO RAISE THE TABLE:

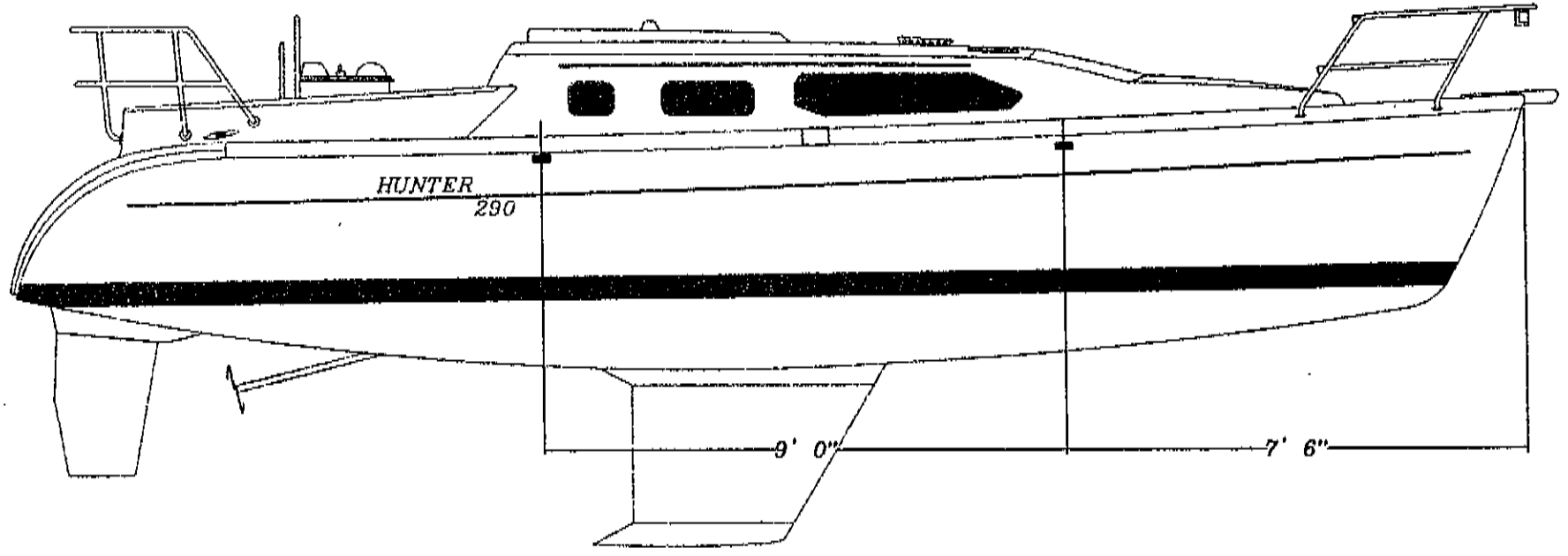
1. RAISE THE TABLE AND BRACKET UP PAST THE PROVIDED HOLE IN THE COMPRESSION POST
2. CONTINUE SUPPORTING THE TABLE AND REPLACE THE QUICK PIN THRU THIS HOLE. ENSURE THE QUICK PIN IS LOCKED IN PLACE USING THE "SAFETY" SLOTS PROVIDED ON THE QUICK PIN.
3. SLOWLY LOWER THE TABLE UNTIL THE BRACKET COMES TO REST ON THE QUICK PIN.
4. ROTATE THE TABLE BACK AND FORTH UNTIL IT "DROPS" INTO PLACE. THIS HAPPENS WHEN THE ENGAGED QUICK PIN AND THE SLOT ON THE TABLE BRACKET SLEEVE LINE UP AND LOCK INTO PLACE.



FILLER CUSHIONS TO CONVERT TABLE TO BERTH PROVIDED WITH THE BOAT.

H290 DINETTE TABLE OPERATION	
DRAWING NO. 29080418	REVISION NO. NONE
DRAWN BY: ENGINEERING DEPT.	DATE 8/8/99

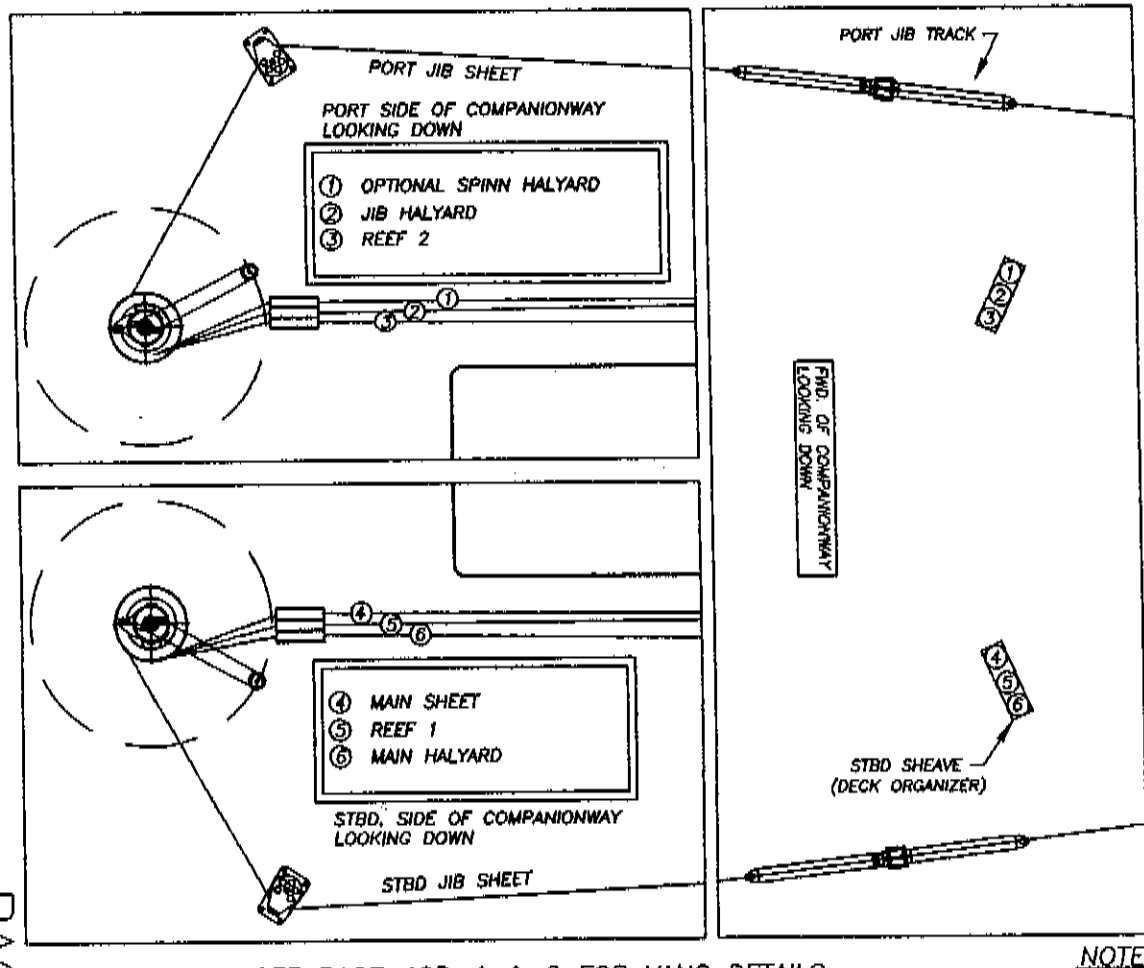
HUNTER

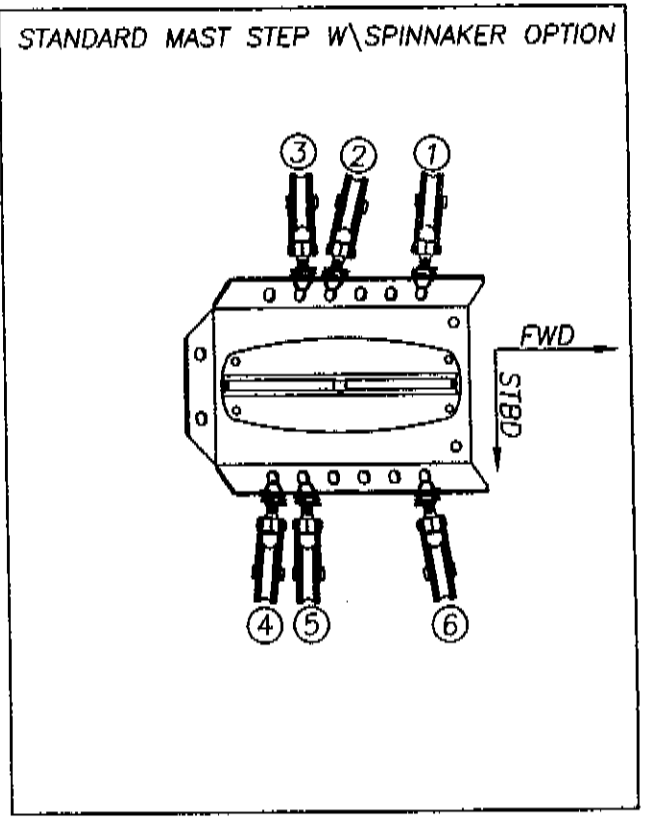


H290 LIFTING SLING LOCATIONS	
2906041C	NONE
ENGINEERING DEPT.	4/13/99

HUNTER

SELDEN STANDARD





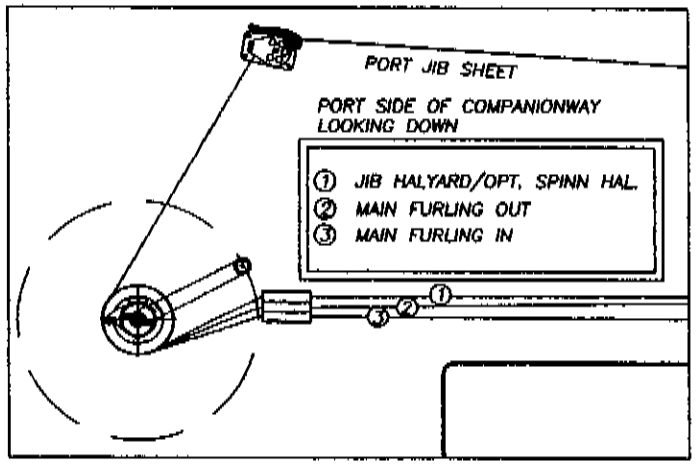
SEE PAGE 42B-1 & 2 FOR VANG DETAILS

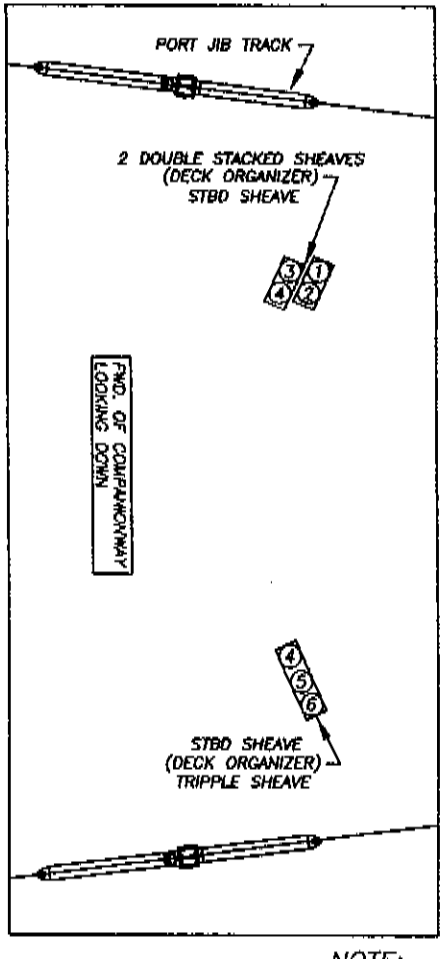
NOTE:
ALL BLOCKS ..... RUTGERSON SERIES 500 W/ SPRINGS

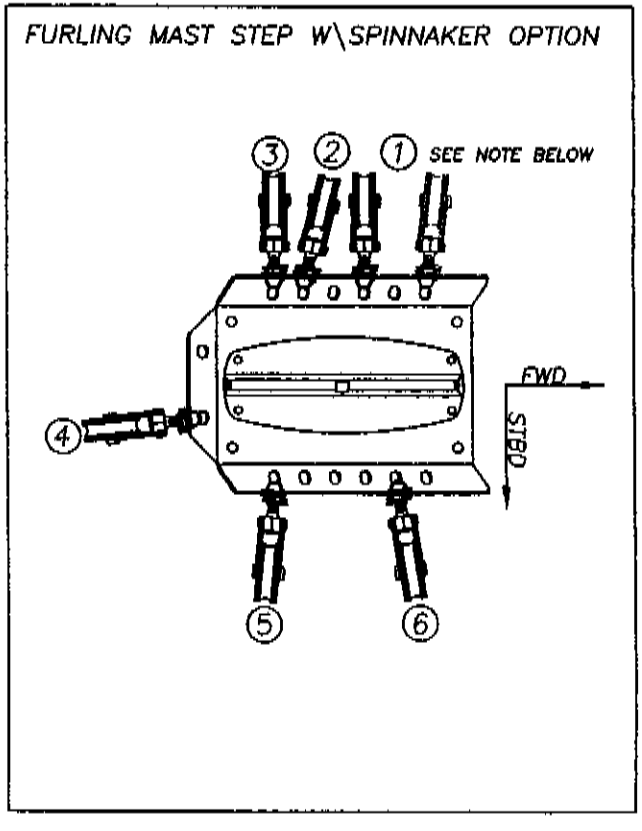
290 RUN. RIG & MAST STEP DETAIL (STD)	
2906042A-1	NONE
ENGINEERING DEPT.	5/10/99

HUNTER

SELDEN FURLING



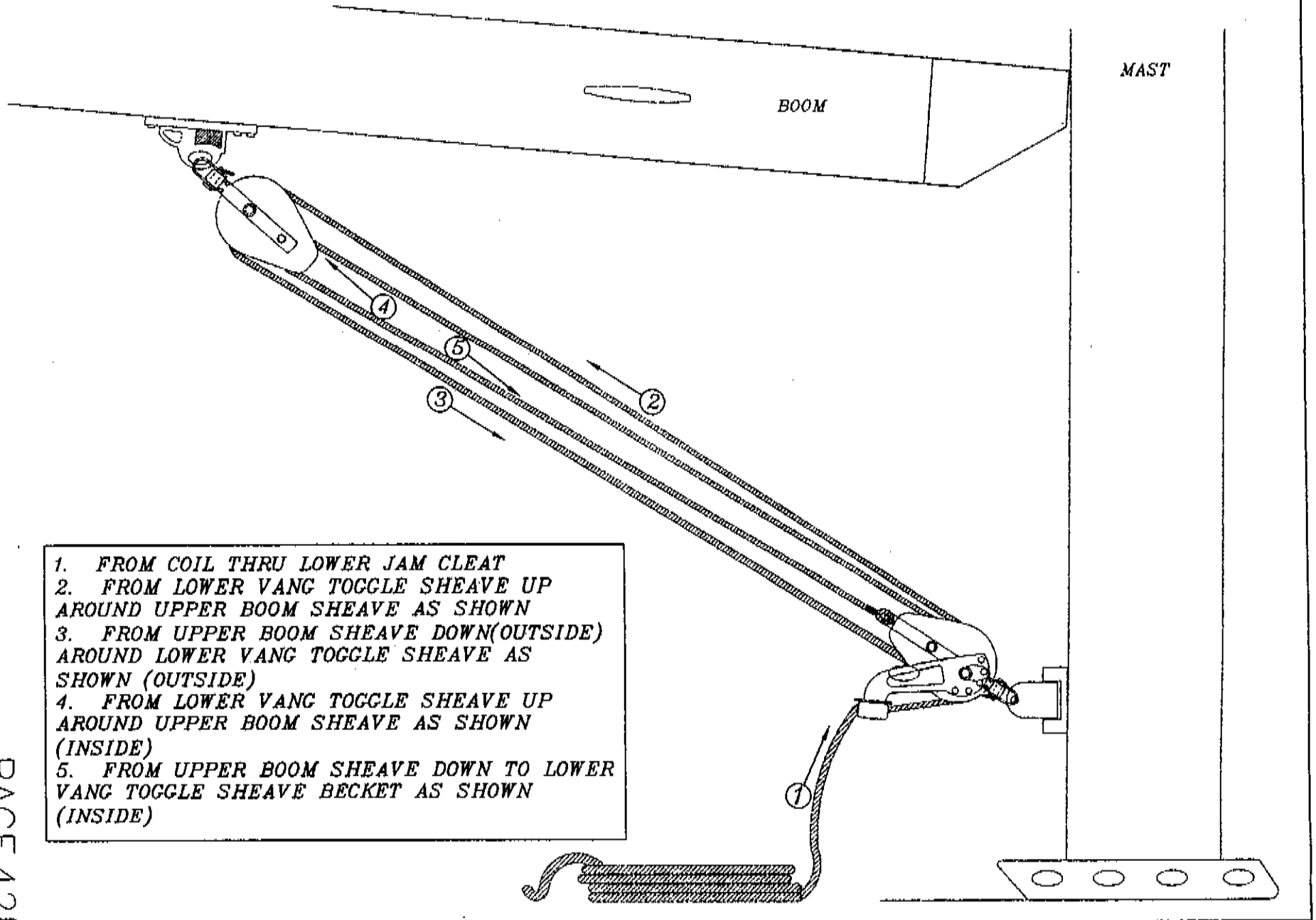




NOTE:
ALL BLOCKS ..... RUTGERSON SERIES 500 W/ SPRINGS
JIB HALYARD IS LOCKED OFF @ PORT
SIDE SHEET STOPPER. (FURLING MASTS)

H290 RUN. RIG & MAST STEP DETAIL (FURLING)	
2908042A-2	NONE
ENGINEERING DEPT.	4/13/99

HUNTER

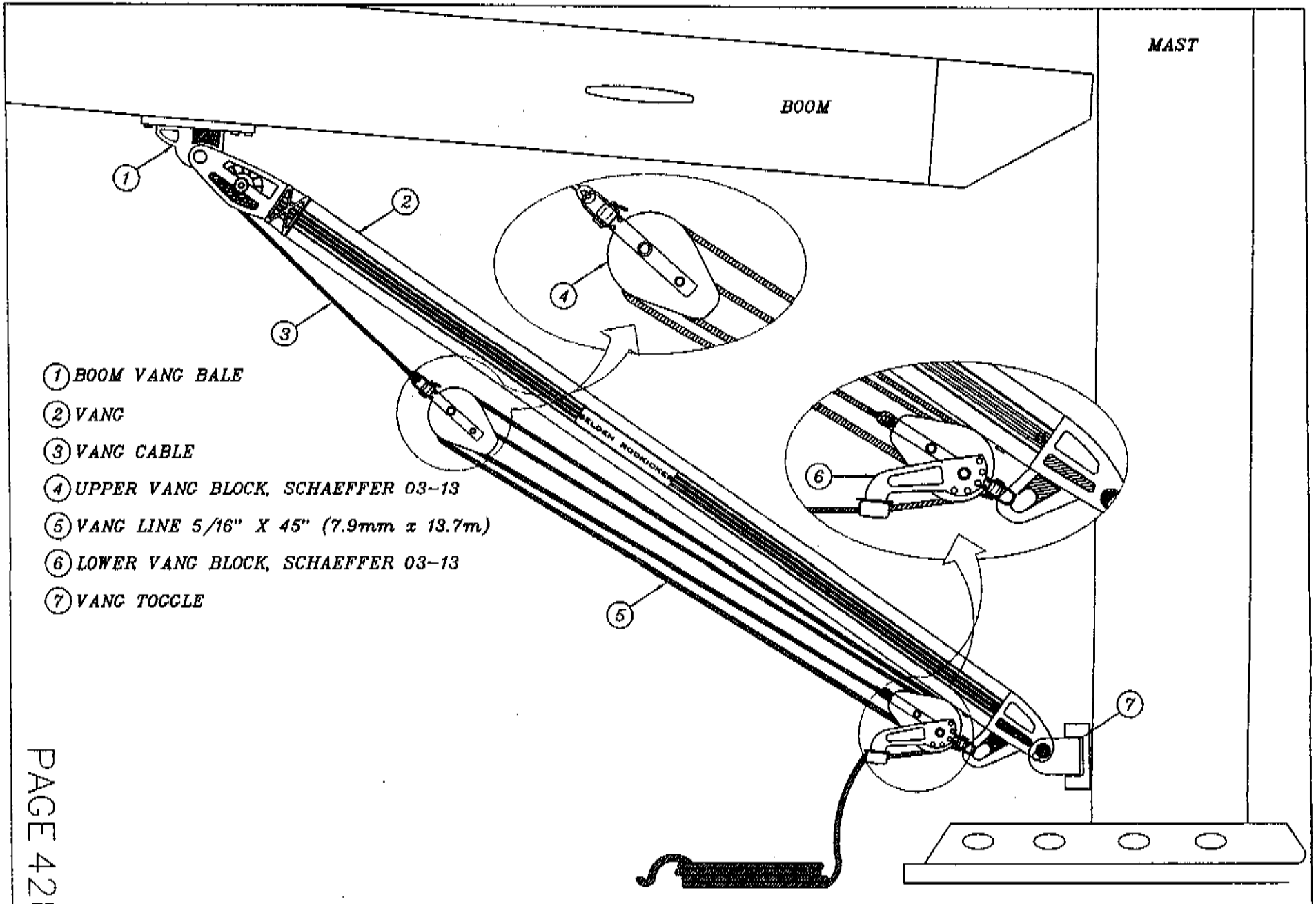


1. FROM COIL THRU LOWER JAM CLEAT
2. FROM LOWER VANG TOGGLE SHEAVE UP AROUND UPPER BOOM SHEAVE AS SHOWN
3. FROM UPPER BOOM SHEAVE DOWN(OUTSIDE) AROUND LOWER VANG TOGGLE SHEAVE AS SHOWN (OUTSIDE)
4. FROM LOWER VANG TOGGLE SHEAVE UP AROUND UPPER BOOM SHEAVE AS SHOWN (INSIDE)
5. FROM UPPER BOOM SHEAVE DOWN TO LOWER VANG TOGGLE SHEAVE BECKET AS SHOWN (INSIDE)

H290 ROPE VANG DETAILS (FURLING OPTION)

2908042B-1	NONE
ENGINEERING DEPT.	4/15/99

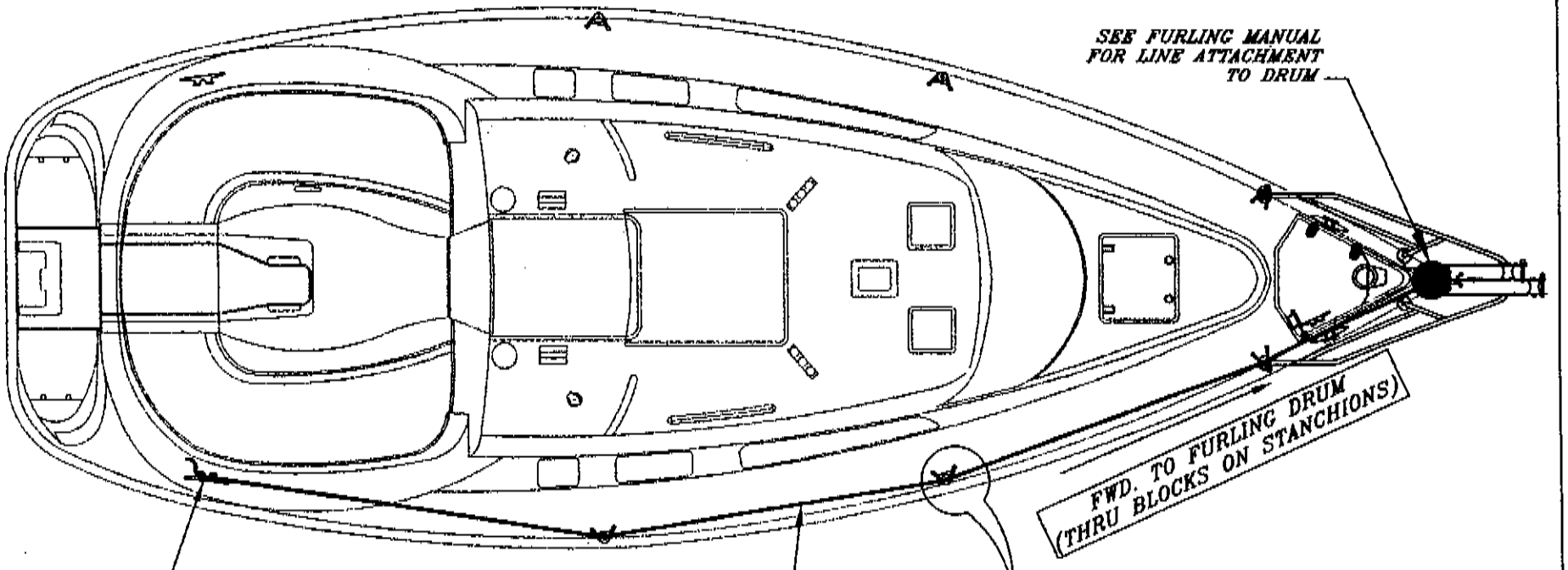
HUNTER

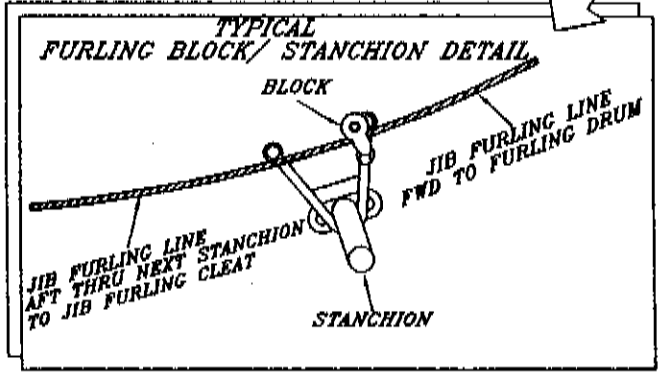


1. BOOM VANG BALE
2. VANG
3. VANG CABLE
4. UPPER VANG BLOCK, SCHAEFFER 03-13
5. VANG LINE 5/16" X 45" (7.9mm x 13.7m)
6. LOWER VANG BLOCK, SCHAEFFER 03-13
7. VANG TOGGLE

H290 RIGID VANG DETAILS (FURLING OPTION)		
29080428-2	NONE	HUNTER
ENGINEERING DEPT.	4/16/98	

JIB FURLING SYSTEM





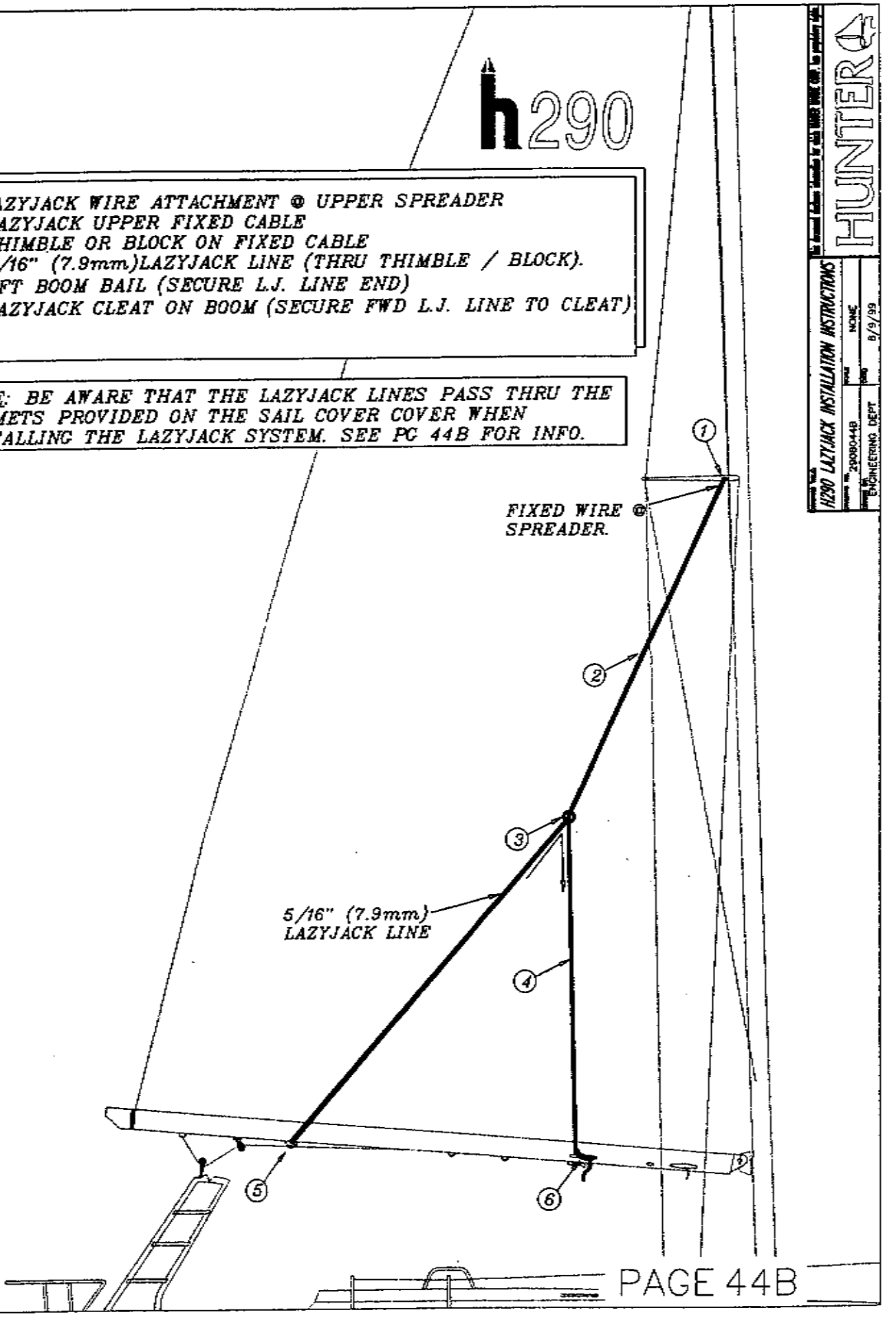
H290 JIB FURLING LINES LAYOUT	
2908042C	NONE
ENGINEERING DEPT.	4/14/99

HUNTER

h290

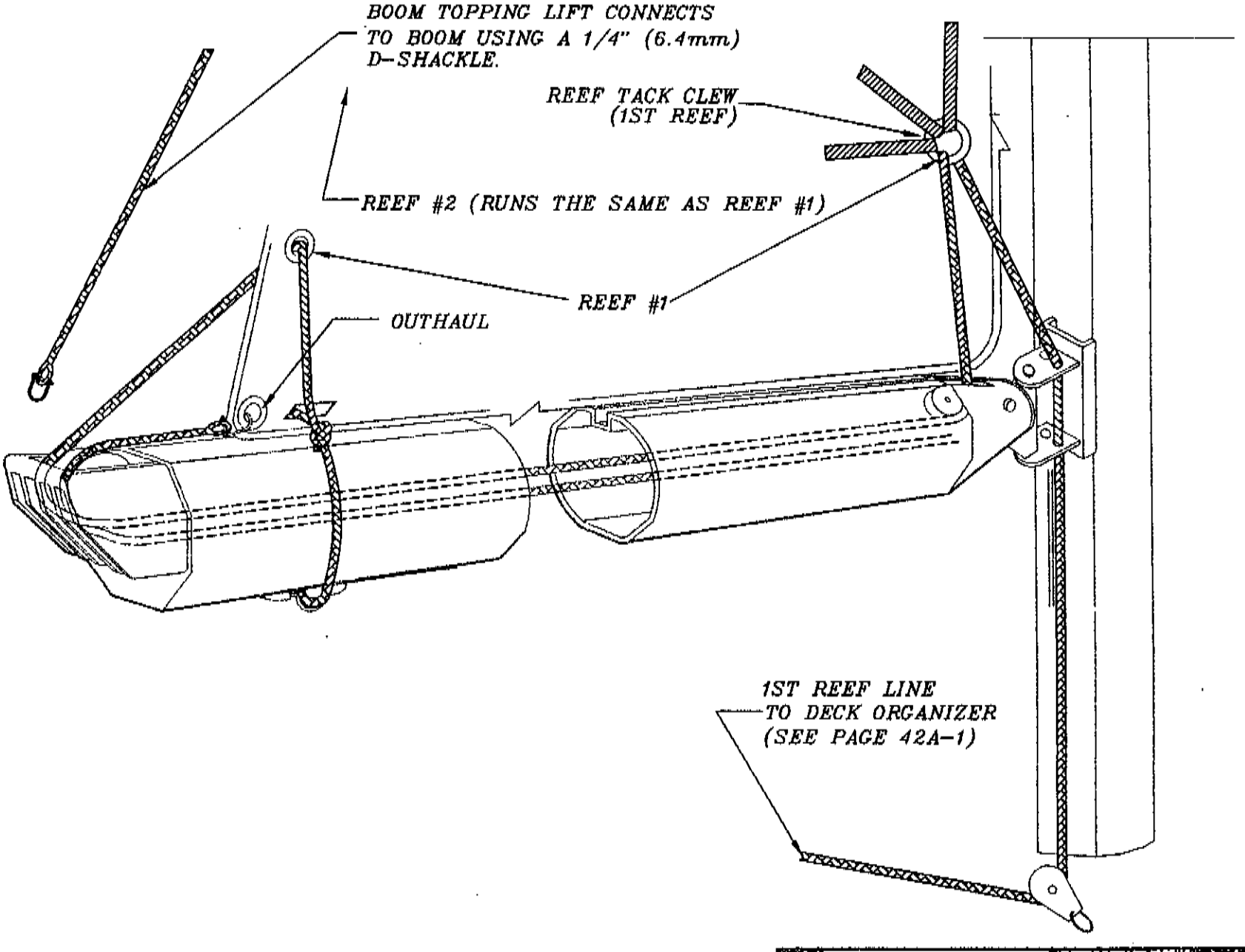
1. LAZYJACK WIRE ATTACHMENT @ UPPER SPREADER
2. LAZYJACK UPPER FIXED CABLE
3. THIMBLE OR BLOCK ON FIXED CABLE
4. 5/16" (7.9mm)LAZYJACK LINE (THRU THIMBLE / BLOCK).
5. AFT BOOM BAIL (SECURE L.J. LINE END)
6. LAZYJACK CLEAT ON BOOM (SECURE FWD L.J. LINE TO CLEAT)

NOTE: BE AWARE THAT THE LAZYJACK LINES PASS THRU THE GROMETS PROVIDED ON THE SAIL COVER COVER WHEN INSTALLING THE LAZYJACK SYSTEM. SEE PG 44B FOR INFO.



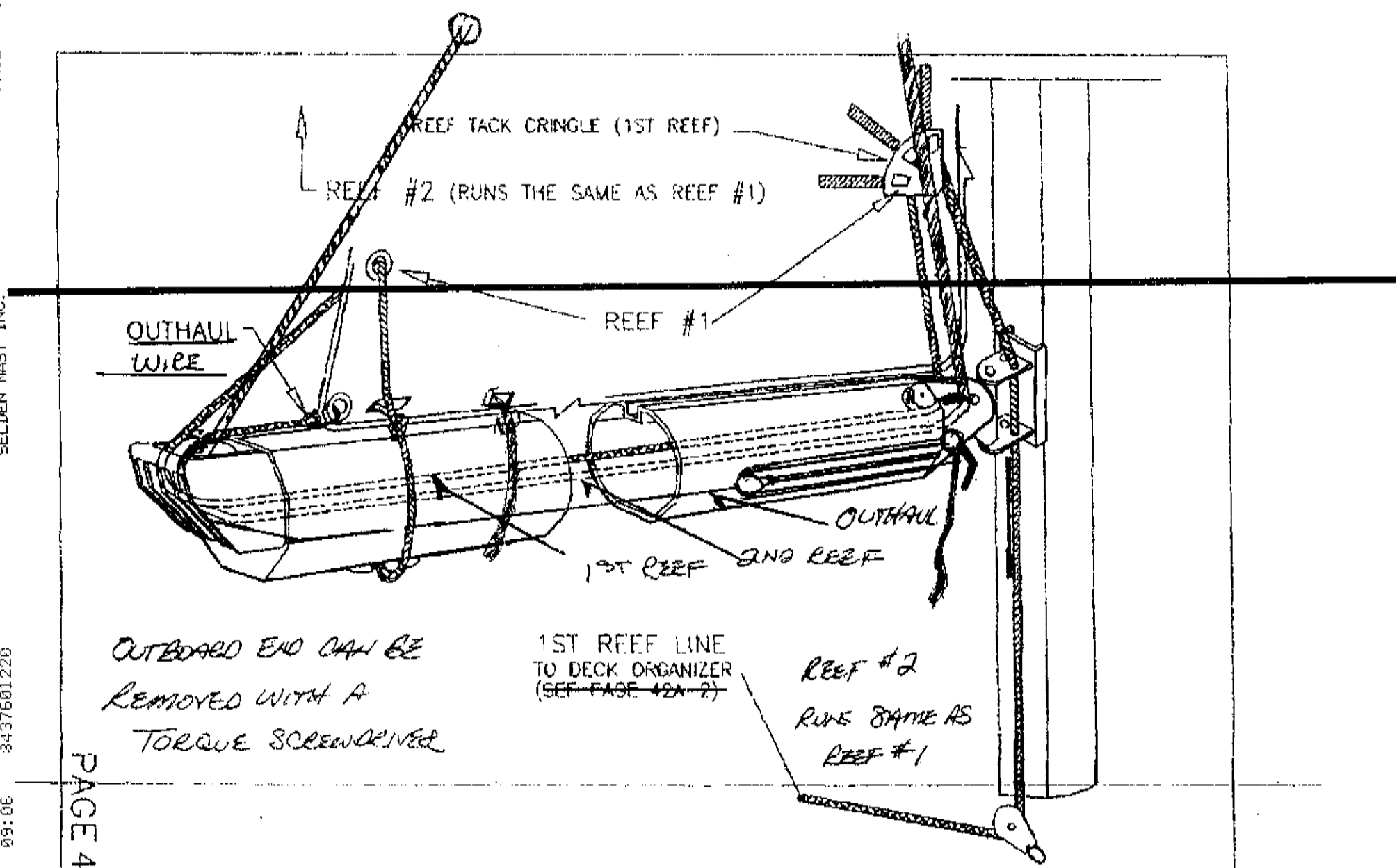
HUNTER

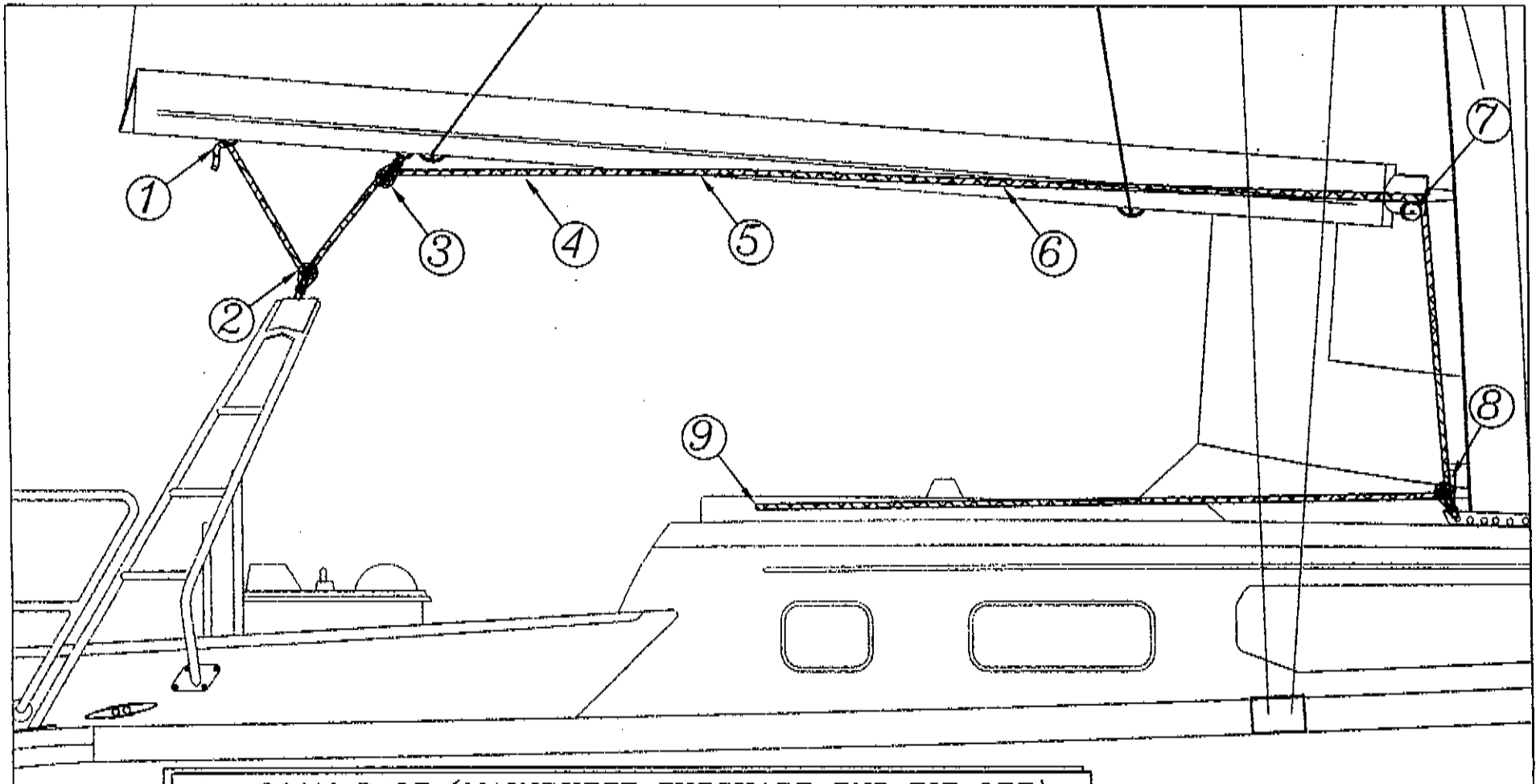
TITLE	H290 LAZYJACK INSTALLATION INSTRUCTIONS
DRAWING No.	290804AB
SCALE	NONE
DRAWN BY	ENGINEERING DEPT
DATE	8/9/99



H290 BOOM AND REEF LAYOUT	
2908044A	NONE
ENGINEERING DEPT.	4/14/99

HUNTER





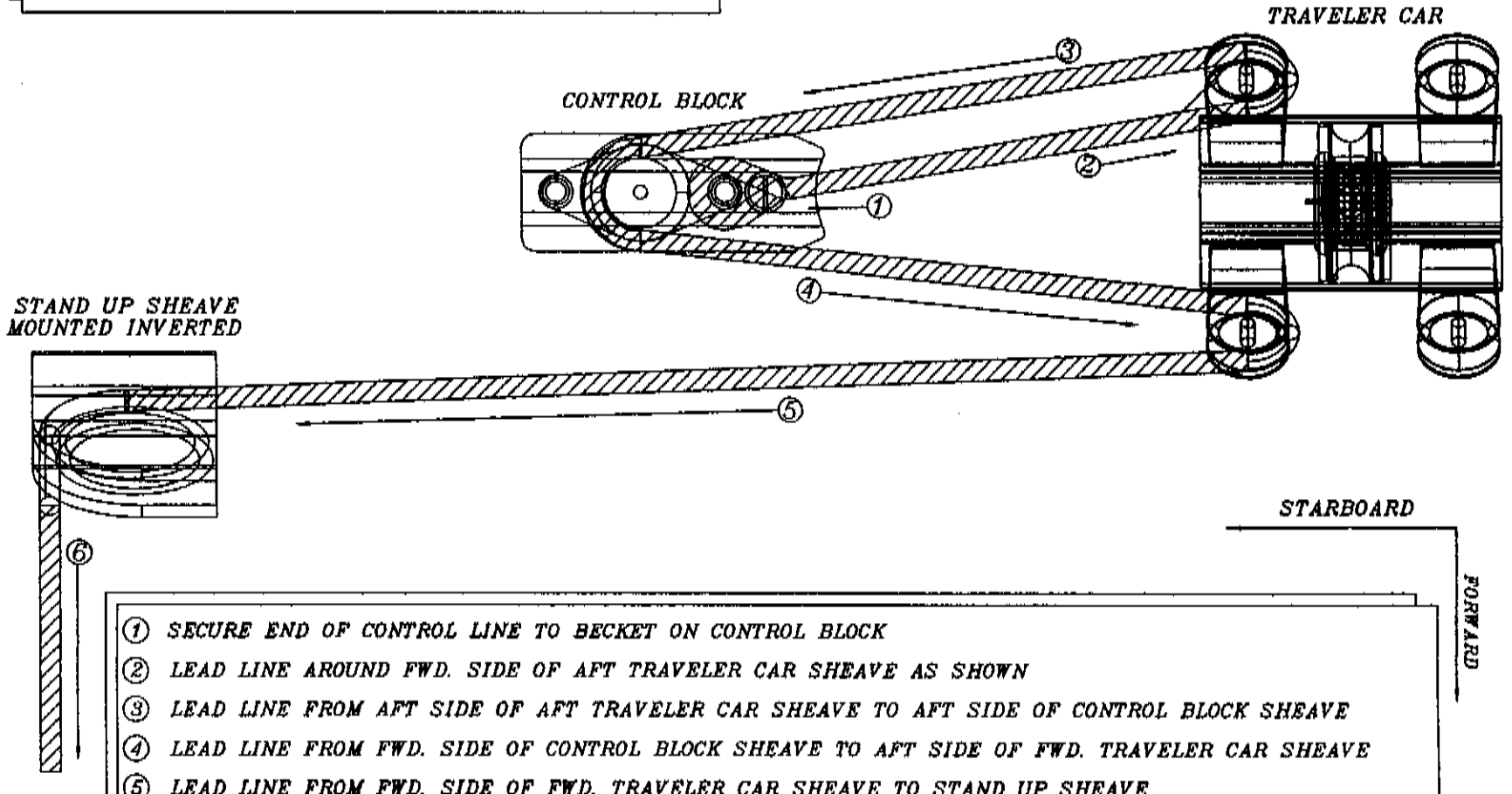
1. BOOM BALE (MAINSHEET PURCHASE END TIE OFF)
2. ARCH BRIDLE / (OPT TRAVELER CAR SHEAVE)
3. BOOM BALE AND MAINSHEET BLOCK
4. MAINSHEET PURCHASE HALYARD
5. HALYARD EXIT
6. HALYARD RUN INSIDE BOOM
7. HALYARD SHEAVE INSIDE FWD BOOM END
8. MAINSHEET BLOCK AT MAST STEP (SEE PG 42A-1)
9. HALYARD RUN AFT TO COCKPIT

H290 MAINSHEET PURCHASE LAYOUT

29080430	NONE
ENGINEERING DEPT.	6/11/99

HUNTER

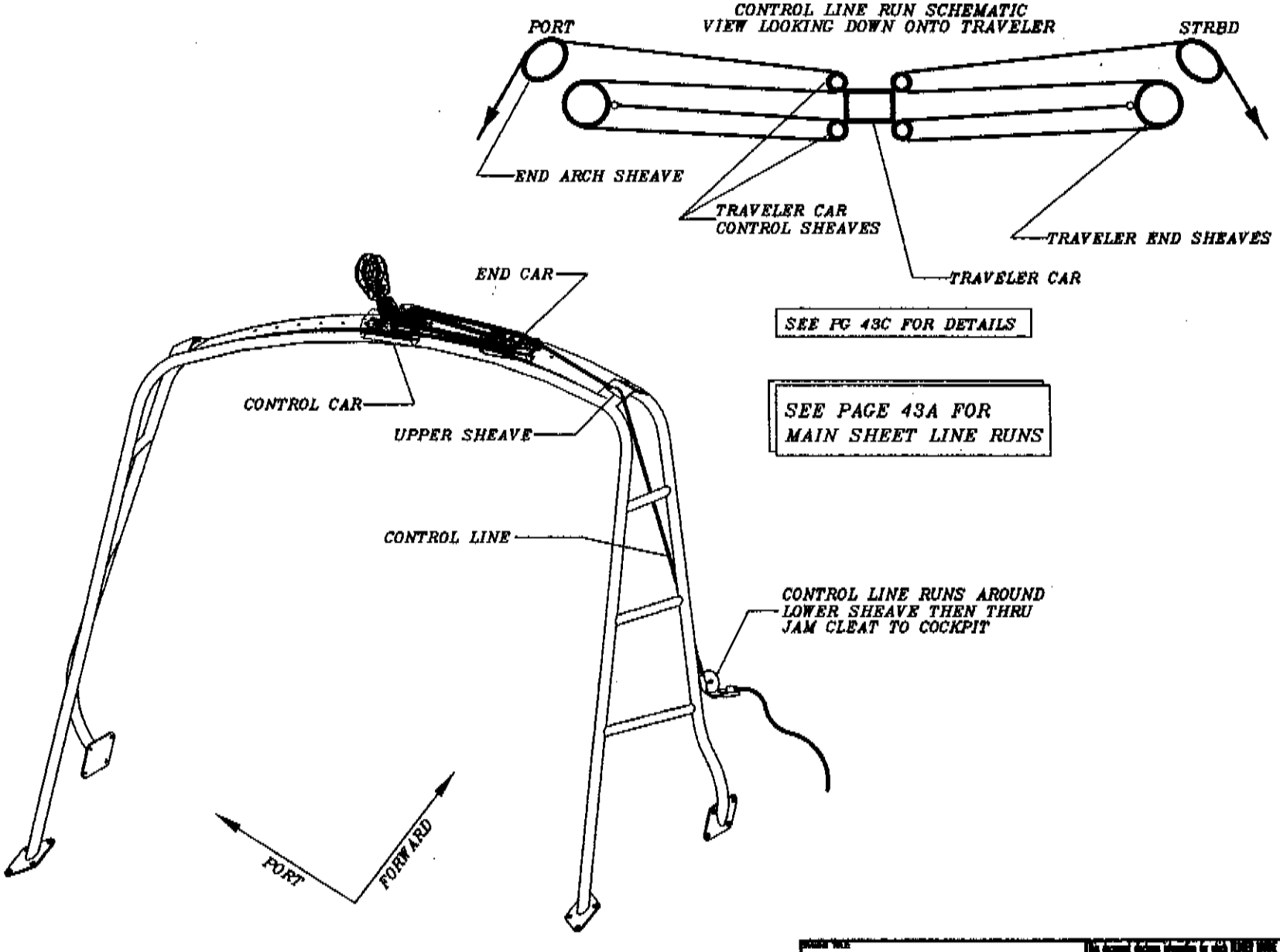
NOTE: ARCH & TRAVELER BAR NOT SHOWN FOR CLARITY.
STARBOARD SIDE SHOWN, PORT SIDE IS MIRROR IMAGE
SEE PREVIOUS PAGE FOR MORE DETAILS



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

H290 OPTIONAL TRAVELER LAYOUT	
2908043C	NONE
ENGINEERING DEPT.	6/8/99

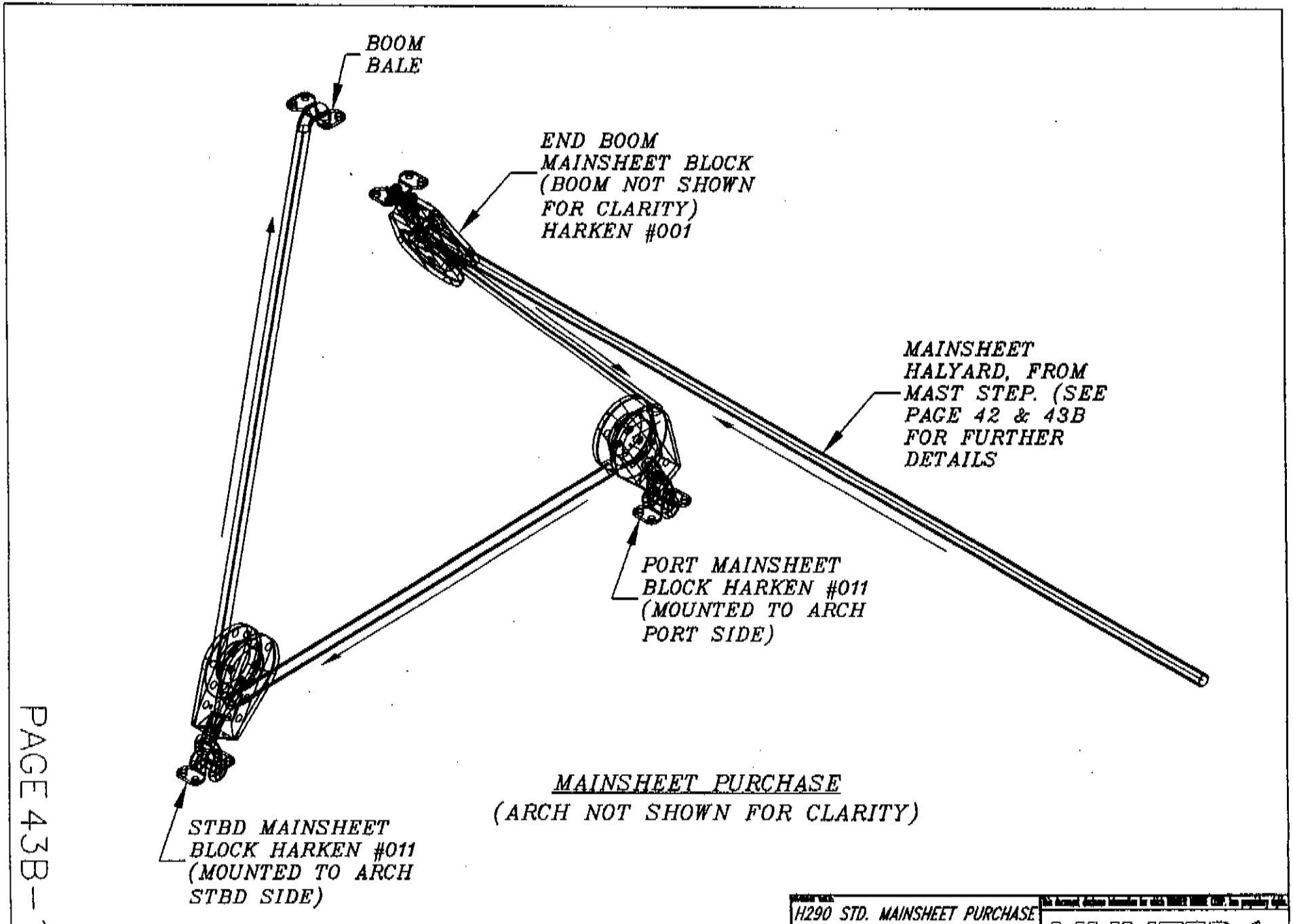
HUNTER



PAGE 43B-2

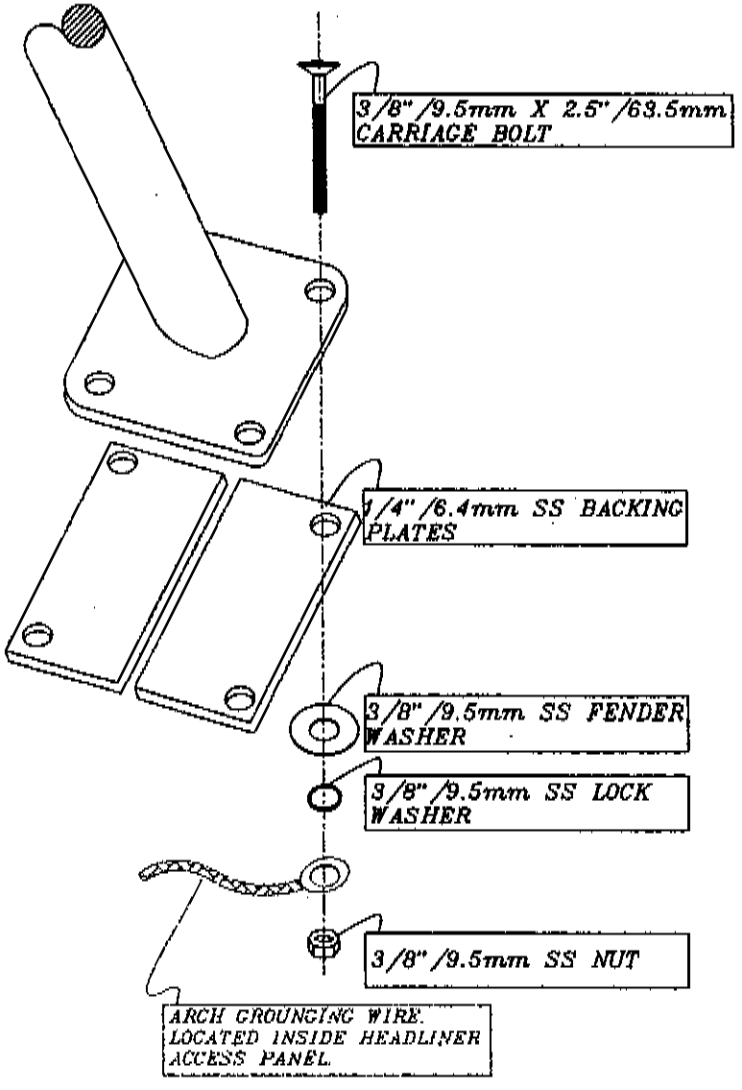
H290 OPT. TRAV. CONTROL LINE DETAILS	
29060438-2	NONE
ENGINEERING DEPT.	6/19/99.

HUNTER



MAINSHEET PURCHASE
(ARCH NOT SHOWN FOR CLARITY)

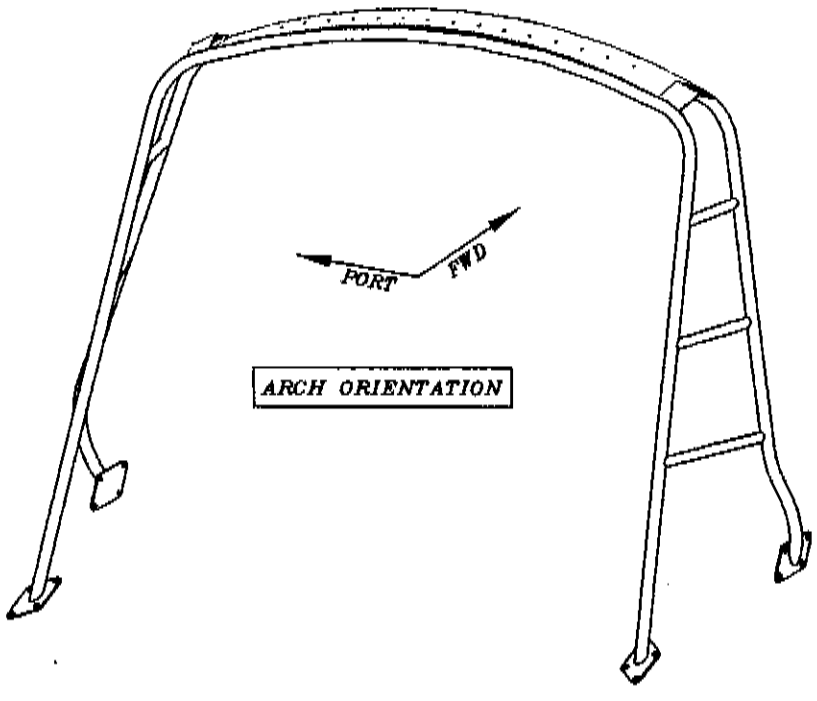
H290 STD. MAINSHEET PURCHASE		
29080438-1	NONE	HUNTER
ENGINEERING DEPT.	6/29/99	



1. REMOVE ALL ACCESSORIES STOWED IN THE AFT COCKPIT LOCKERS.
2. ACCESS ARCH FOOT LOCATIONS:
   PORT FWD: THRU ACCESS PANEL IN PORT SIDE AFT STRM. HEADLINER
   PORT AFT: THRU PORT SIDE AFT GULLWING LOCKER
   STBD FWD: THRU STBD SIDE EURO LOCKER
   STBD AFT: THRU STBD SIDE AFT GULLWING LOCKER
   (IT MAY BE NECESSARY TO CLIMB INTO THE LOCKER FOR EASIER ACCESS.)
3. CLEAN AREAS AROUND THE ARCH MOUNTING HOLES APPLY NO SEALANT AT THIS TIME.
4. ALIGN THE ARCH FEET PRE-DRILLED HOLES AND THE COAMING PRE-DRILLED MOUNTING HOLES. IT MAY BE NECESSARY TO USE A RATCHET STRAP TO "PULL" THE ARCH FEET IN LINE WITH THE HOLES.
5. INSTALL THE (3/8"/9.5mm) CARRIAGE BOLTS THRU THE ARCH FEET AND DOWN INTO THE DECK.
6. WHERE POSSIBLE, INSTALL THE (1/4"/6.4mm) ARCH BACKING PLATES ON THE UNDERSIDE OF THE DECK, AND ALIGN WITH THE ARCH MOUNTING HOLES. (THERE EXIST SOME CASES WHERE BACKING PLATES WILL NOT FIT. IF THIS IS ENCOUNTERED, ENSURE THE PRESENCE OF METAL LAMINATED IN THE DECK, AND FASTEN THE ARCH FOOT USING THE WASHERS AND NUT ONLY). SEE ACCESS LOCATIONS ABOVE. THE BOLTS NOW SHOULD PASS THRU THE ARCH FEET, THE DECK LAMINATE, AND THE ARCH BACKING PLATES.
7. LOOSELY INSTALL THE FENDER WASHERS, LOCK WASHERS AND NUTS FROM THE UNDERSIDE OF THE DECK. (INSTALL THE ARCH GROUNDING WIRE EYE BETWEEN THE LOCK WASHER AND THE NUT. ONE GROUNDING WIRE IS PROVIDED PER ARCH. IT IS ACCESSED THRU THE HEADLINER ACCESS PANELS AND GROUNDS THE ARCH TO THE ENGINE STRUT BOLTS) NOTE: GRND WIRE TO BE CONNECTED AFTER STEP 12). APPLY A SMALL AMOUNT OF NEVER SEIZE TO THE BOLTS TO PREVENT GAULING OF THE THREADS
8. CHECK FOR EVEN SPACING OF THE ARCH ONTO THE COAMING AND ADJUST ACCORDINGLY. ENSURE A MINIMUM HEADROOM CLEARANCE OF 6'-2" FROM THE UNDERSIDE OF THE ARCH TO THE COCKPIT SOLE.
9. SECURELY TIGHTEN THE (TWO) ARCH MOUNTING NUTS USING A CROSS TIGHTENING PATTERN. THIS WILL ALLOW BOTH SIDES OF THE ARCH TO TIGHTEN EVENLY AGAINST THE COAMING. USING THE 3/8" DRILL BIT, DRILL OUT THE REMAINING HOLES IN THE ARCH MOUNTING FOOT (THREE MORE PER FOOT)
10. REMOVE THE TWO BOLTS HOLDING THE ARCH IN PLACE. REMOVE THE ARCH AND CLEAN THE AREAS AROUND THE ARCH MOUNTING HOLES. GENEROUSLY APPLY 5M 2500 AROUND ALL THE MOUNTING HOLES.
11. RESET THE ARCH AND ALIGN THE ARCH MOUNTING FEET PREDRILLED HOLES WITH THE HOLES NOW DRILLED AND SEALED ON THE DECK.
12. RECHECK ARCH FIT ONTO DECK AND FOR CORRECT HEADROOM.
13. REPEAT STEPS 6 THRU 9 FOR ALL THE ARCH MOUNTING BOLTS.
14. CLEAN OFF THE EXCESS SEALANT AROUND THE ARCH FEET AND COAMING AREAS USING ALCOHOL.

H290 ARCH INSTALLATION INSTRUCTIONS CONT'	
2908043A-2	NONE
ENGINEERING DEPT.	6/8/99

HUNTER



ARCH ORIENTATION

ARCH INSTALLATION: NOTES AND TOOL LIST

NOTES:

1. IMPORTANT: COMPLETELY READ ALL OF THE INSTALLATION INSTRUCTIONS BEFORE BEGINING.
2. THIS JOB REQUIRES THREE PEOPLE. IT IS IMPORTANT THAT THE ARCH CONTINUE BEING SUPPORTED ONCE IT HAS BEEN SET IN PLACE, UNTIL BEING FULLY SECURED TO THE DECK..
3. WHEN INSTALLING ARCH: TO AVOID POSSIBLE INJURY, ORIENT THE DIRECTION OF THE ARCH (LEANING FORWARD) PRIOR TO BEGINING THE INSTALLATION PROCESS.
4. SEE BELOW FOR A LIST OF TOOLS SUGGESTED FOR THE INSTALLATION PROCESS
5. BE SURE TO CHECK FOR A HEADROOM CLEARANCE OF NO LESS THAN 6'-2" WHEN ARCH IS BOLTED DOWN.
6. IMPORTANT: REMEMBER TO CHECK ALL THE ARCH BOLTS / NUTS AFTER THE INITIAL SEA TRAIL AND RETIGHTEN AS NECESSARY

SUGGESTED TOOL LIST:

- 3/8" DRIVE RATCHET
- 6" EXTENSION
- 9/16" DEEP & REGULAR SOCKET
- 9/16" WRENCH
- AIR RATCHET
- COMPRESSED AIR SOURCE
- SCREW DRIVER--PHILLIPS HEAD
- 3/8" DRILL BIT
- RATCHET STRAP
- CAULK GUN
- TUBE OF SEALANT (3M 5200)
- NEVER SEIZE (BOLT LUBE)
- RAZOR KNIFE
- RAGS
- ALCOHOL / CLEAN UP

H290 ARCH INSTALLATION INSTRUCTIONS	
2908043A-1	NONE
ENGINEERING DEPT.	6/8/99

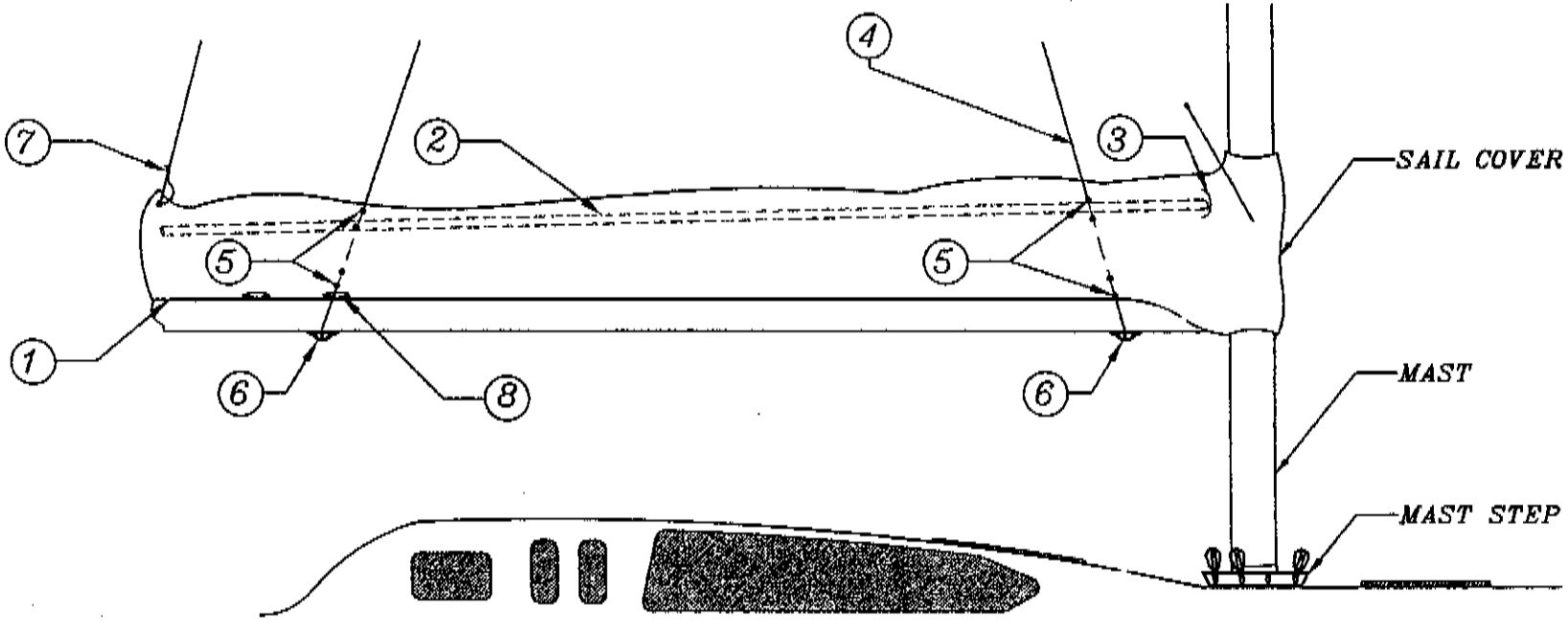
HUNTER

SLIDE THE BOLTROPE ON THE TWO HALVES OF THE COVER INTO THE BOLTROPE TRACKS (1) ON BOTH SIDES OF THE BOOM. START FROM THE AFT END AND MAKE YOUR WAY FORWARD.

INSTALL THE PVC BATTENS (2) INTO EACH HALF OF THE SAIL COVER. THERE ARE POCKETS (3) THAT OPEN TOWARDS THE FRONT, ON THE INSIDE OF THE COVER. SLIDE THE BATTENS INTO PLACE FROM THE FRONT, AND ROLL THE INSIDE LIP OF THE POCKET BACK IN ORDER TO HOLD THE BATTENS STATIONARY.

FEED THE LAZYJACK LINES (4) DOWN THROUGH THE GROMMETS/RINGS (5) IN THE SAIL COVER, STARTING AT THE TOP AND COMING OUT AT THE BOTTOM OF THE COVER. DEAD END THE LINES TO THE BAILS ON THE UNDERSIDE OF THE BOOM (6).

TIE THE AFT END OF THE SAIL COVER UP TO THE TOPPING LIFT LINE USING THE PIECE OF STRING PROVIDED (7). USE HALF HITCH KNOTS TO SECURE THE COVER IN PLACE AT THE OUTER END OF THE BOOM. THE REEF LINES RUN OUT THROUGH THE COVER SLOTS (8) AND TIE OFF.



SAIL COVER ONLY OFFERED ON STANDARD MAST BOATS

H290 HUNTER LAZYJACK SAIL COVER	
2906044C	NONE
ENGINEERING DEPT	5/25/99

HUNTER

REEFING INSTRUCTIONS

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 GOOSE NECK ON THE AFT 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 (PORT SIDE, RED.)

3. RAISE THE MAIN SAIL.

4. EASE THE MAINSHEET AND VANG.

5. LOWER THE MAIN SAIL TO APPROXIMATELY THE FIRST REEF POSITION.

6. TAKE UP THE SLACK IN THE FIRST REEF LINE UNTIL THE TACK AND THE CLEW ARE DOWN TO ABOUT 2" ABOVE THE BOOM.

7. ADJUST THE MAIN HALYARD SO THAT THE TACK REEF BLOCK IS NOT CONTACTING THE GOOSE NECK ON THE FRONT OF THE SPAR AND IS APPLYING TENSION TO THE LUFF OF THE MAIN ABOVE THE REEF, NOT BELOW. THERE WILL BE APPROXIMATELY 6" (150mm) OF STRECH IN THE MAIN LUFF AND MAIN HALYARD WHEN THE REEFING LINE IS TENSIONED, SO MAKE SURE THAT THIS IS ALLOWED FOR WHEN ADJUSTING THE MAIN HALYARD TO LOCATE THE TACK REEF BLOCK.

8. ALSO, 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 TACK SHACKLE 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" (25mm) 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 AND VANG.

3. CHECK THE TOPPING LIFT FOR ADEQUATE BOOM SUPPORT.

4. LOWER THE MAIN HALYARD TO THE APPROPRIATE MARK, AND SNUB THE LINE WITH THE STOPPER.

5. TENSION THE REEFING LINE WITH THE SELF-TAILING WINCH UNTIL THE REEF CLEW IS BROUGHT DOWN TO THE BOOM. APPLY STOPPER AND TENSION THE MAIN HALYARD BACK UP. EASE THE TOPPING LIFT. (IF NEEDED)

SHAKING OUT A REEF

1. HEAD UP INTO THE WIND.

2. EASE THE MAINSHEET AND VANG. TENSION TO TOPPING LIFT. (IF NEEDED)

3. RELEASE THE REEF STOPPER AND REMOVE REEF LINE FROM WINCH.

4. TENSION THE MAIN HALYARD TO RAISE SAIL, MAKING SURE REEF LINES RUN FREELY WHILE SAIL IS BEING RAISED. APPLY STOPPER TO MAIN HALYARD.

5. RE-TENSION VANG AND MAINSHEET. EASE THE TOPPING LIFT. (IF NEEDED)

H290 STANDARD REEFING INSTRUCTIONS	
2908045	NONE
ENGINEERING DEPT.	4/1/4/99

HUNTER

h290 SELDEN STANDARD MAST RUNNING RIGGING SPECIFICATIONS

BOAT: H290 | REVISION: ADD 4' TO MAIN HALY, SHORTEN REEFS 10' KJC 7/14/99

BY: KJC | DATE: 5/12/99

CHECKED BY:

	OPT/STD	ITEM	QUANTITY	LINE SIZE	LINE TYPE	COLOR	END 1	LENGTH		END 2
1	STD	JIB HALYARD	1	3/8" (9.5mm)	XLS	RED	EYE	23.7 m	78 ft	BARE
2	OPT	MAIN TRAVELER LINE	2	5/16" (8mm)	LS	WHITE	SMALL EYE	7.9 m	26 ft	BARE
3	STD	MAINSHEET	1	3/8" (9.5mm)	LS	BLUE FLECK	SMALL EYE	14.8 m	49 ft	BARE
4	STD	JIB SHEET	2	7/16" (11mm)	LS	RED FLECK	BARE	10.1 m	33 ft	BARE
5	STD	REEF LINE 1	1	3/8" (9.5mm)	LS	GREEN FLECK	BARE	14.6 m	48 ft	BARE
6	STD	REEF LINE 2	1	3/8" (9.5mm)	LS	RED FLECK	BARE	21.9 m	72 ft	BARE
7	OPT	SPINN. SHEET	2	3/8" (9.5mm)	LS	BLACK FLECK	BARE	20.1 m	66 ft	BARE
8	STD	LAZY JACK WIRE	2	5/32" (4mm)	1x19 PLASTIC COATED	WHITE	NICO PRESSED EYE W/ 1/4" D-SHACKLE	2.1 m	7 ft	EYE AND LARGE OVAL THIMBLE
9	STD	LAZY JACK ROPE	2	5/16" (8mm)	LS	WHITE	BARE	6.1 m	20 ft	BARE
10	OPT	SPINNAKER HALYARD	1	3/8" (9.5mm)	XLS	BLACK	SNAP SHACKLE NF11000s	23.7 m	78 ft	BARE
11	STD	MAIN HALYARD	1	3/8" (9.5mm)	XLS	BLUE	HEADBOARD SHACKLE	24.5 m	80 ft	BARE
12	STD	BOOM TOPPING LIFT	1	5/16" (8mm)	LS	WHITE	1/4" D-SHACKLE	19.6 m	64 ft	BARE

H290 STANDARD RUNNING RIGGING SPECS.

2908046A | NONE

ENGINEERING DEPT. | 5/26/99

HUNTER

h290 SELDEN FURLING MAST RUNNING RIGGING SPECIFICATIONS

BOAT: h290 | REVISION:

BY: KJC | DATE: 5/12/99

CHECKED BY:

	OPT/STD	ITEM	QUANTITY	LINE SIZE	LINE TYPE	COLOR	END 1	LENGTH		END 2
1	STD	JIB HALYARD	1	3/8" (9.5mm)	XLS	RED	EYE	23.7 m	78 ft	BARE
2	OPT	MAIN TRAVELER LINE	2	5/16" (8mm)	LS	WHITE	SMALL EYE	7.9 m	26 ft	BARE
3	STD	MAINSHEET	1	3/8" (9.5mm)	LS	BLUE FLECK	SMALL EYE	14.8 m	49 ft	BARE
4	STD	JIB SHEET	2	7/16" (11mm)	LS	RED FLECK	BARE	10.1 m	33 ft	BARE
5	OPT	SPINN. SHEET	2	3/8" (9.5mm)	LS	BLACK FLECK	BARE	20.1 m	66 ft	BARE
6	OPT	SPINNAKER HALYARD	1	3/8" (9.5mm)	XLS	BLACK	SNAP SHACKLE NF11000s	23.7 m	78 ft	BARE
7	STD	MAIN FURLING LINE	1	3/8" (9.5mm)	LS	BLUE	BARE	9.1 m	30 ft	BARE
8	STD	BOOM TOPPING LIFT	1	1/4" (6.4mm)	LS	WHITE	1/4" D-SHACKLE	21.9 m	72 ft	BARE

H290 FURLING RUNNING RIGGING SPECS.

29080468 | NONE

ENGINEERING DEPT. | 5/25/99

HUNTER

H290 B&R RIG DESCRIPTION

The B&R rig, utilized on the Hunter H290, 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.

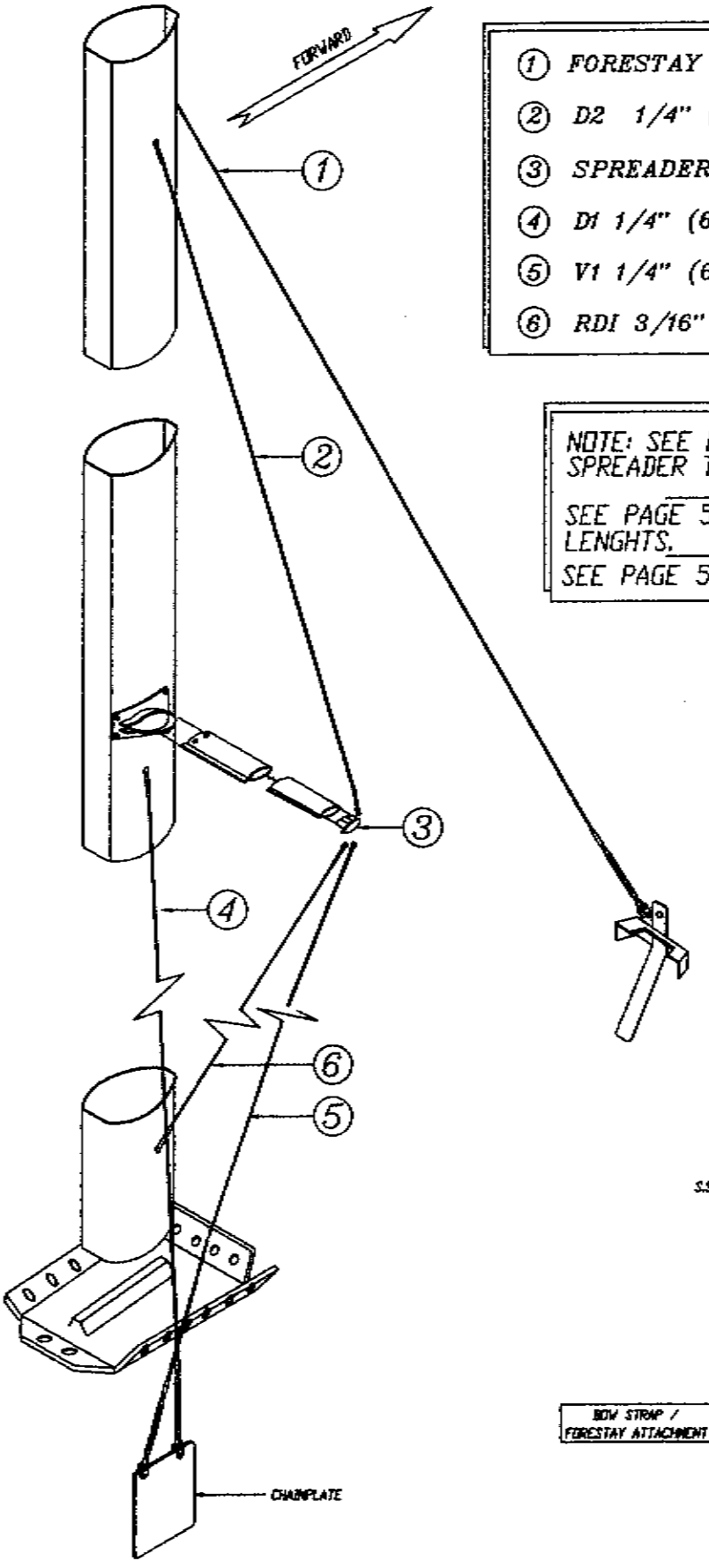
Additional support is given to the B&R rig (and is unique to it) with the addition of reverse diagonal rigging. For example, the diagonals that you see beginning near the gooseneck and ending at the tip of the spreader, supports and stabilizes the lower section of the mast as it creates a triangle with the lower shroud. The top RD2 runs from above the lower spreader base to the end of the top spreader, and stabilizes the top section of the mast.

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 H290 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.

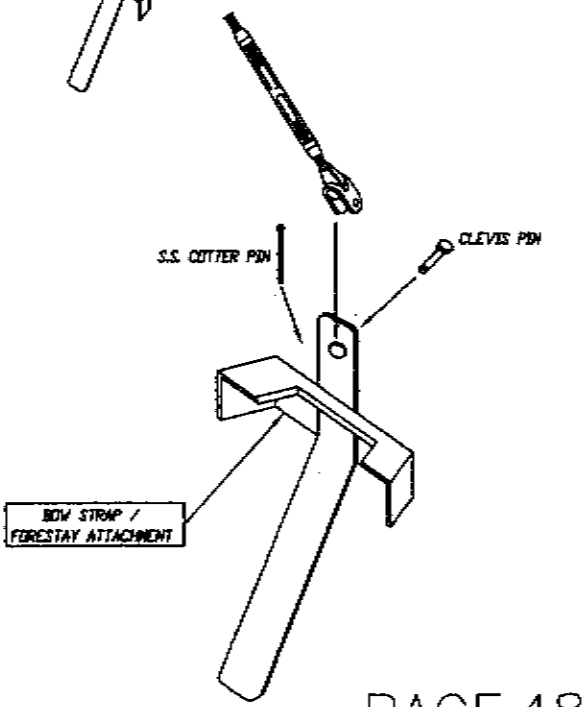


1. FORESTAY 1/4" (6.4mm) 1 X 19
2. D2 1/4" (6.4mm) 1 X 19
3. SPREADERS (SEE PAGES 49B & C)
4. D1 1/4" (6.4mm) 1 X 19
5. V1 1/4" (6.4mm) 1 X 19
6. RDI 3/16" (4.75mm) 1 X 19

NOTE: SEE PAGES 49A & B FOR SPREADER TIP DETAILS.

SEE PAGE 50A & B FOR RIG LENGHTS.

SEE PAGE 51 FOR FITTINGS DESC.

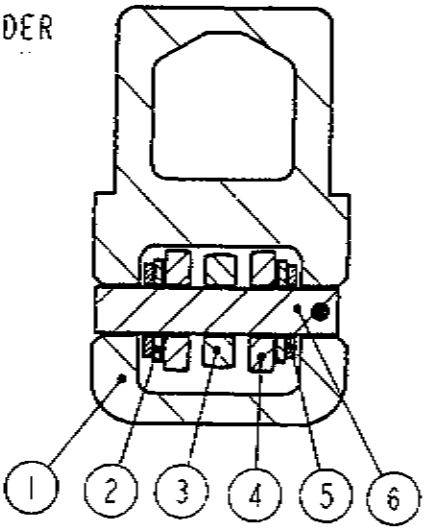


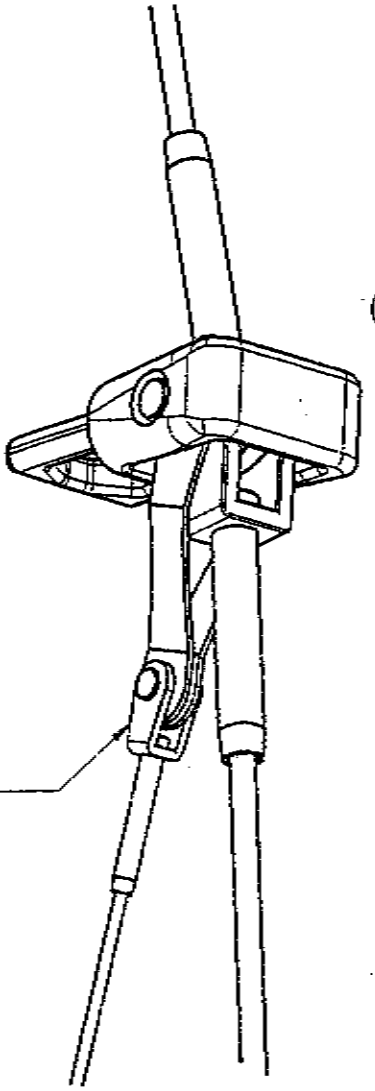
HUNTER

H290 STANDING RIGGING DETAILS

DRAWING NO. 4608048 | REVISIONS NO. NONE | DATE 5/25/99 | ENGINEERING DEPT.

UPPER SPREADER



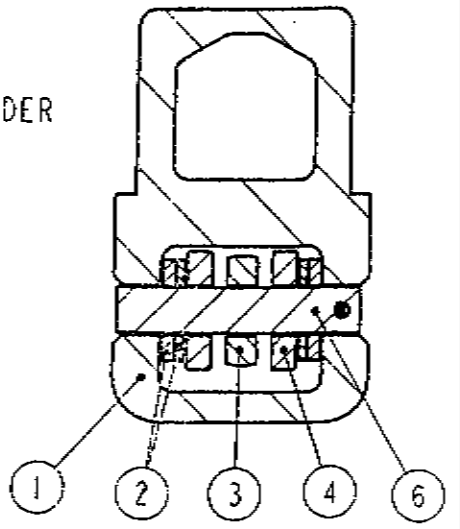


NYLON WASHERS
BETWEEN STRIPS
TO FILL OUT
EXCESSIVE PLAY

1. *SPREADER TIP CASTING*
2. *NYLON WASHER*
3. *MARINE EYE*
4. *TOGGLE*
5. *LINK PLATES*
6. *SPREADER TIP PIN*

NOTE: OTHER LINK PLATES WILL ATTACH TO SPREADER TIP ON EITHER SIDE OF #3.

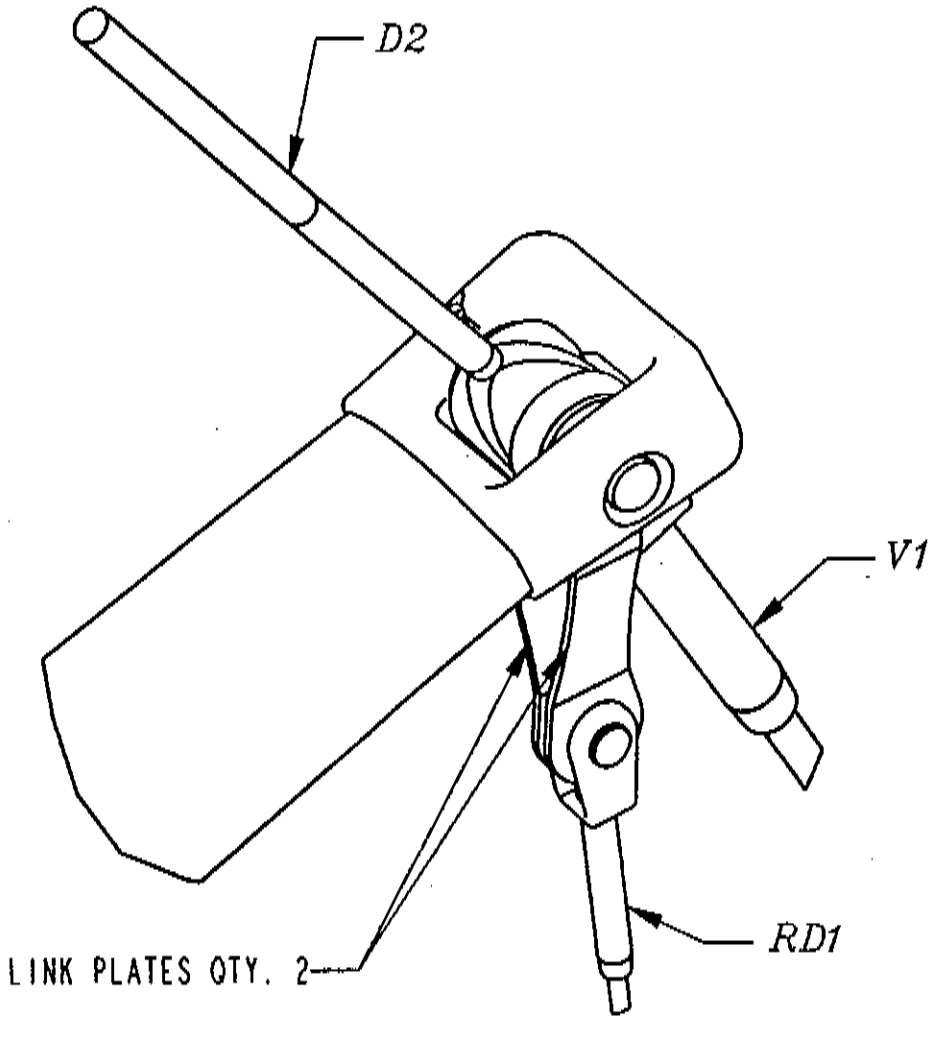
LOWER SPREADER



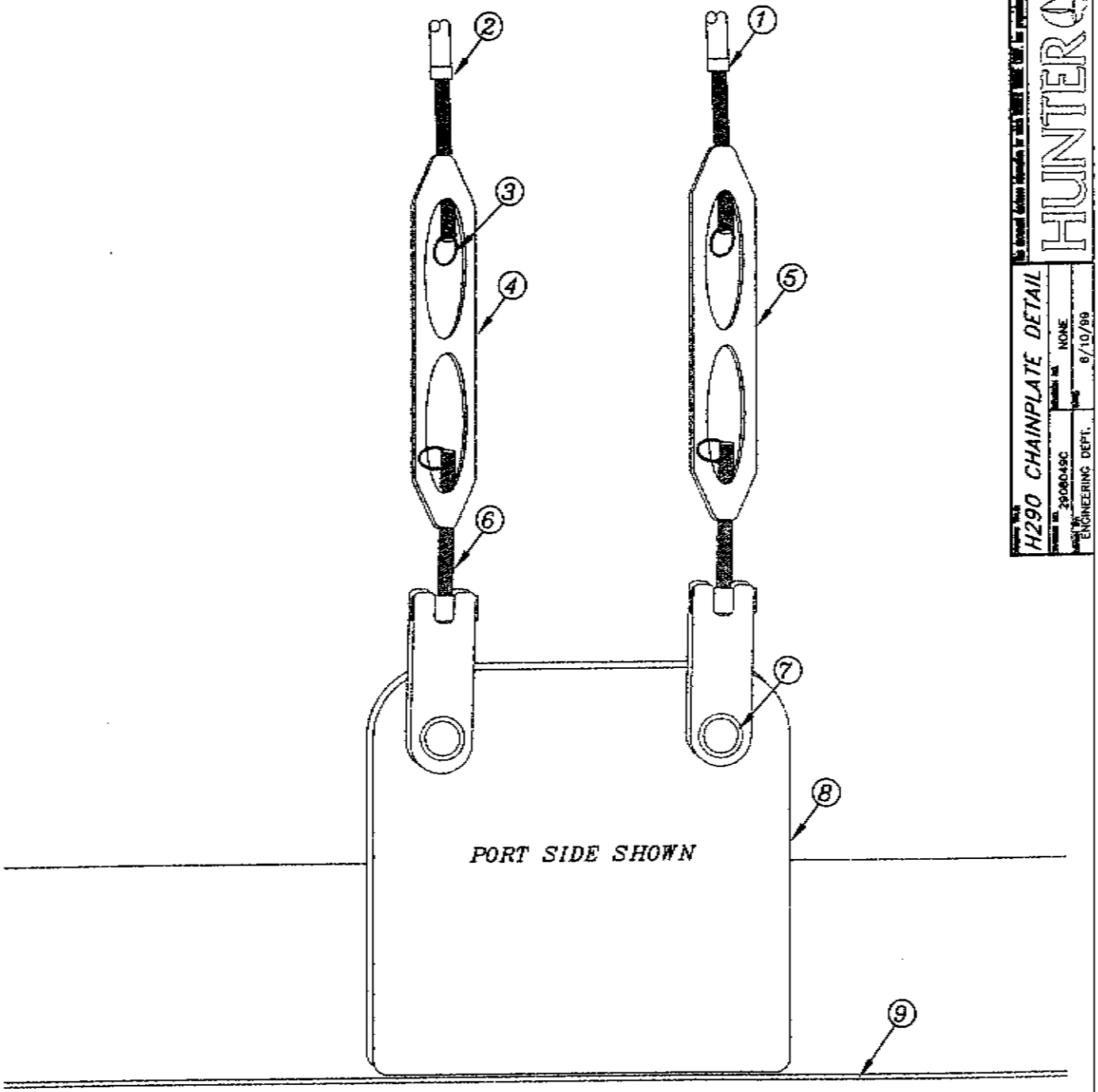
HUNTER

SELDEN MAST SPREADER TIP DETAIL

DRAWING NO.	
PROJECT NO. 46080-19C	DRAWING NO. NONE
DRAWN BY ENGINEERING DEPT.	DATE 3/3/99



H290 SELDEN MAST SPREADER DETAIL	
2908049B	NONE
ENGINEERING DEPT.	6/10/99



HUNTER

H290 CHAINPLATE DETAIL

	Drawing No. 290B049C	NONE
	ENGINEERING DEPT.	6/10/89

1. DIAGONAL SHROUD SWAGE END
2. VERTICAL SHROUD SWAGE END
3. SPILT RING(S) ON ALL SHROUD ENDS
4. DIAGONAL SHROUD TURNBUCKLE BODY
5. VERTICAL SHROUD TURNBUCKLE BODY
6. THREADED TOGGLE JAW(S)
7. CLEVIS PIN(S)
8. STAINLESS STEAL CHAINPLATE
9. RUB RAIL

h290 SELDEN STANDARD STANDING RIGGING SPECIFICATIONS

BY: KJC DATE: 9-Jun-99 **REVISION:**

	OPT/STD	ITEM	QUANTITY	WIRE SIZE	UPPER END	LENGTH			LOWER END
1	STD	D2	2	7/32" (5.5mm) 1x19	841-1/4 SHROUD TERMINAL	4.064 m	13 ft.	4 in.	MARINE EYE 1/2" PIN
2	STD	V1	2	7/32" (5.5mm) 1x19	RIGGING TOGGLE JAW 1/2" PIN	5.458 m	17 ft.	10 7/8 in.	8-12-12 TURNBUCKLE
3	STD	D1	2	7/32" (5.5mm) 1x19	841-1/4 SHROUD TERMINAL	5.334 m	17 ft.	6 in.	8-12-12 TURNBUCKLE
4	STD	LOWER DIAMOND, RD1	2	3/16 "(4.75mm) 1X19	RIGGING TOGGLE JAW 3/8" PIN	3.651 m	11 ft.	11 3/4 in.	6-12-12 TURNBUCKLE WITH JAW TOGGLE
5	STD	FORESTAY	1	7/32" (5.5mm) 1x19	MARINE EYE	10.008 m	32 ft.	10 in.	FURLEX DRUM W/ 12mm PIN

HEADSTAY SUPPLIED BY JIB FURLING SYSTEM PROVIDER

H290 STANDARD STANDING RIGGING SPECS.
2908050A | NONE
ENGINEERING DEPT. | 4/1/4/99
HUNTER

h290 SELDEN FURLING STANDING RIGGING SPECIFICATIONS

BY: KJC DATE: **27-May-99** **REVISION:**

	OPT/STD	ITEM	QUANTITY	WIRE SIZE	UPPER END	LENGTH		LOWER END
1	STD	D2	2	1/4" (6.4mm) 1x19	841-1/4 SHROUD TERMINAL	4.064 m	13 ft. 4 in.	MARINE EYE 1/2" PIN
2	STD	V1	2	1/4" (6.4mm) 1x19	RIGGING TOGGLE JAW 1/2" PIN	5.486 m	18 ft. 0 in.***	8-12-12 TURNBUCKLE
3	STD	D1	2	1/4" (6.4mm) 1x19	841-1/4 SHROUD TERMINAL	5.334 m	17 ft. 6 in.***	8-12-12 TURNBUCKLE
4	STD	LOWER DIAMOND, RD1	2	3/16 "(4.75mm) 1X19	RIGGING TOGGLE JAW 3/8" PIN	4.432 m	14 ft. 6 1/2 in.	6-12-12 TURNBUCKLE WITH JAW TOGGLE
5	STD	FORESTAY	1	1/4"(6.4mm) 1X19	MARINE EYE	10.058 m	33 ft. 0 in.*** ###	FURLEX DRUM W/ 12mm PIN

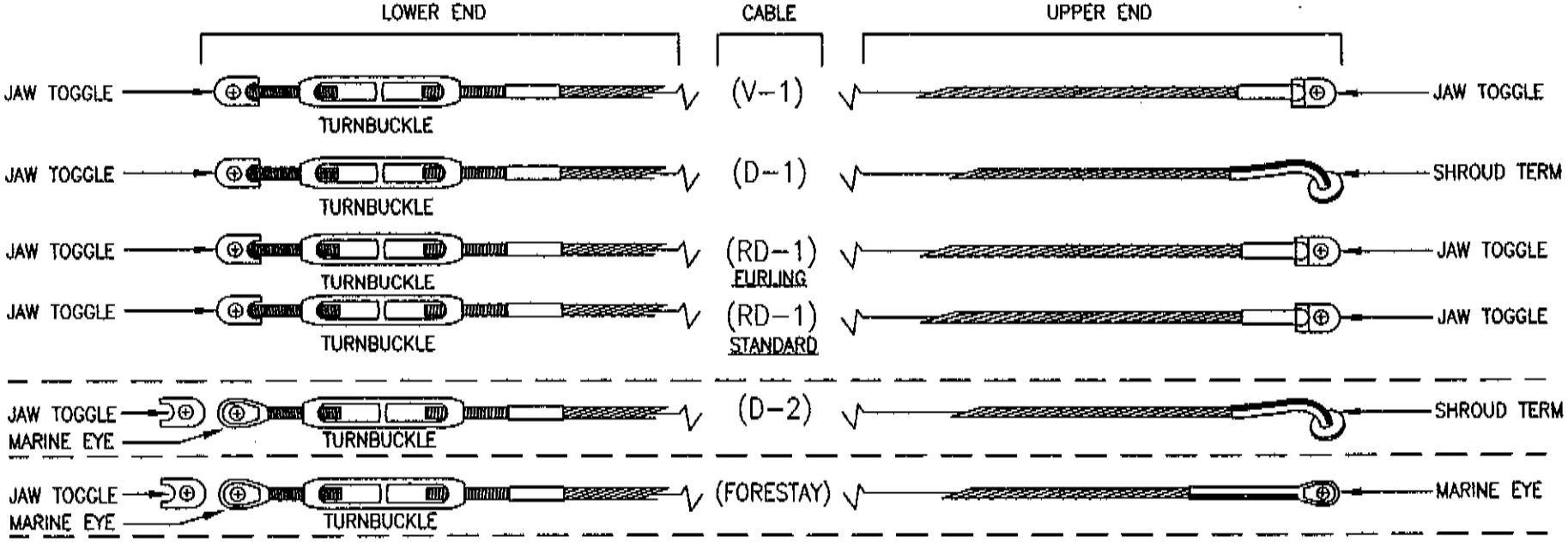
HEADSTAY SUPPLIED BY JIB FURLING SYSTEM PROVIDER
EXCEPT PROTOTYPE WHICH REQUIRES 1/4" 1x19 WITH 8-16-16 TURNBUCKLE
*** MEASUREMENTS ARE APPROXIMATE AND MUST BE CLOSED ON PROTOTYPE BOAT

H290 OPTIONAL FURLING STANDING RIGGING SPECS.
2908050B | NONE
ENGINEERING DEPT. | 4/1/4/99
HUNTER

HUNTER 290 CONVENTIONAL STANDING RIGGING

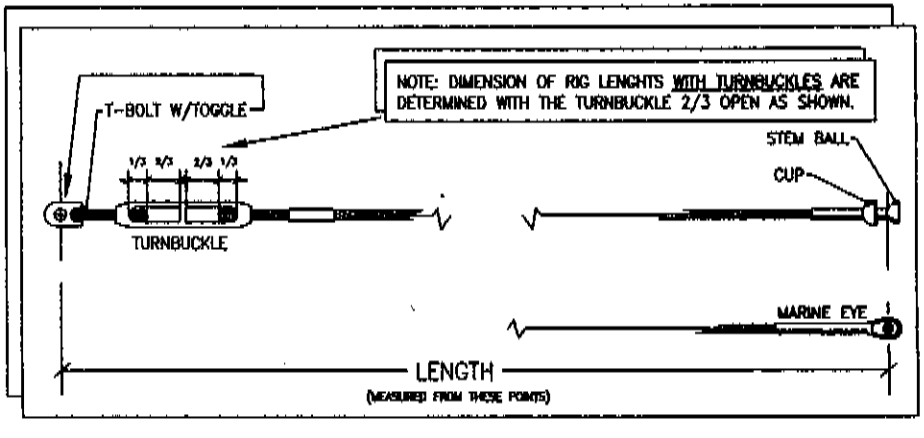
	ITEM	QTY	WIRE SIZE		FITTINGS	OVERALL LENGTH	
1	D2	2	1/4"	6MM	T-TERMINAL 308-324	13ft. 4in.	4065 MM
					EYE 308-362		
2	V1	2	1/4"	6MM	FORK 308-314	17ft. 10 3/4in.	5455 MM
					STD/TGLE TB 3/8"		
3	D1	2	1/4"	6MM	T-TERMINAL 308-324	17ft. 5 1/2in.	5320 MM
					STD/TGLE TB 3/8"		
4	RD1	2	5/32"	4MM	FORK 308-312	11ft. 3 1/2in.	3440 MM
					STD/T TB 174--014		
5	FORESTAY	1	1/4"	6MM	FURLEX 106-12	32ft. 10in.	10008 MM
SELDEN MAST SRIG-2686H							

RECORD	
DATE	REVISIONS
12/11/99	ORIGINAL
12/21/99	RD1
3/3/00	RD1



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

V = VERTICAL
D = DIAGONAL
RD = REVERSE DIAGONAL



PAGE 51

H290 RIGGING LENGTHS DETAIL	
2908051	NONE
ENGINEERING DEPT	6/19/98

HUNTER

TUNING THE 290 B&R RIG

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

1. Start with all the rigging slack. Then induce the mast bend by tightening the reverse diagonals (diamonds). Measure the bend by tensioning a line or the main halyard between the masthead and the gooseneck. The maximum amount of bend should be no more than 6" (152 mm)for the standard rig and no more than 2" (50 mm) for the furling mast measured perpendicular from the aft face of the mast to the halyard at the deepest part of the bend. It can be less than that based on the sail shape and your own preference. The bend should also be evenly distributed along the mast to give a smooth shape. Keep in mind that bending a furling mast may make it more difficult to furl and will not do much to flatten the sail as in a standard rig. It is very important that the mast also be straight from side to side at this time. Tighten or loosen the diagonals or the reverse diagonals to achieve this.

2. Step the mast with all shrouds attached but with the turnbuckles completely loosened (if the mast was not already stepped).

3. Attach the jib halyard to a cleat on the bow to support the mast in a raked position (the masthead should be about 2-1/2' behind the step). Attach the verticals and tighten them until you can just see the hole for the cotter pin in the turnbuckle. Tighten the jib halyard until you can attach the forestay. At this point the masthead should be raked so that a weight hung on the main halyard hangs about 1' behind the mast step.

4. Use the main halyard to check that the mast is centered from side to side. Pull it tight and mark the halyard next to the verticals chainplate. Now do the same to the other side to see if the marks line up. If not, tighten and/or loosen the verticals until the marks line up. Once the masthead is centered, begin tightening the verticals until the turnbuckles are approximately half closed. While tightening the verticals you may notice the bend in the mast increasing. Now you can tighten the lowers which will tend to straighten the lower part of the mast. Be sure to tighten port and starboard sides evenly.

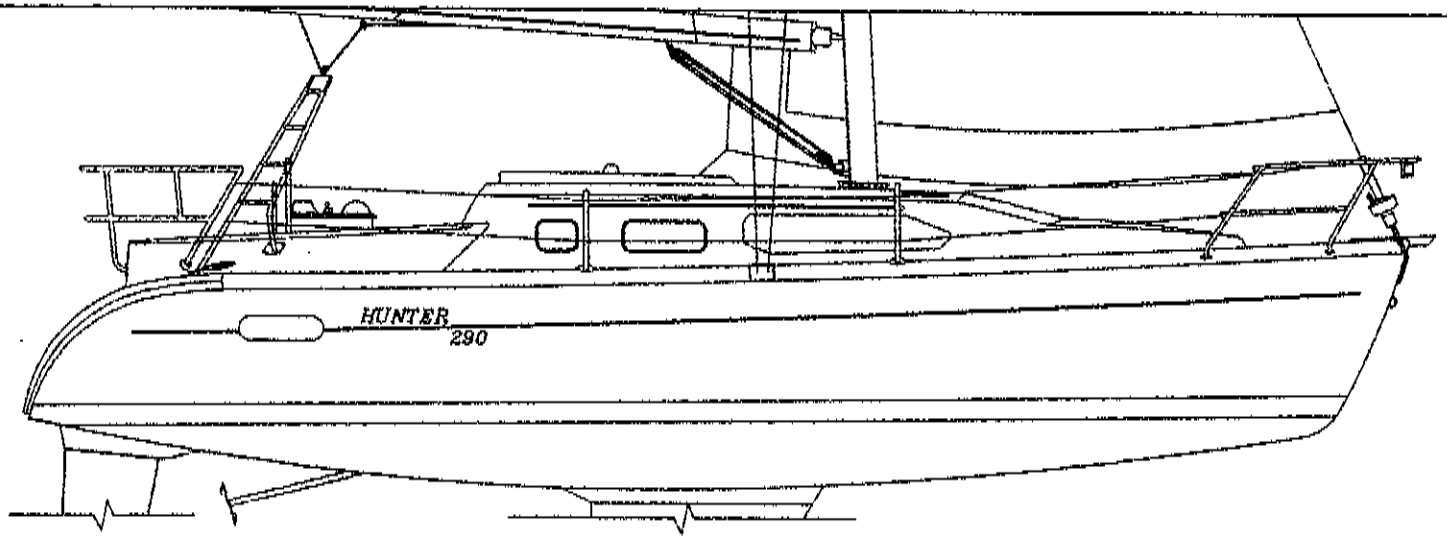
5. Now you should tighten the headstay until it is approximately half closed as well. This should induce the appropriate amount of headstay tension. *Never* use anything more than a pair of wrenches to tighten your rigging. If you use an extended piece of pipe on the handle of a wrench you can over tighten the rigging and do damage to the mast or rigging.

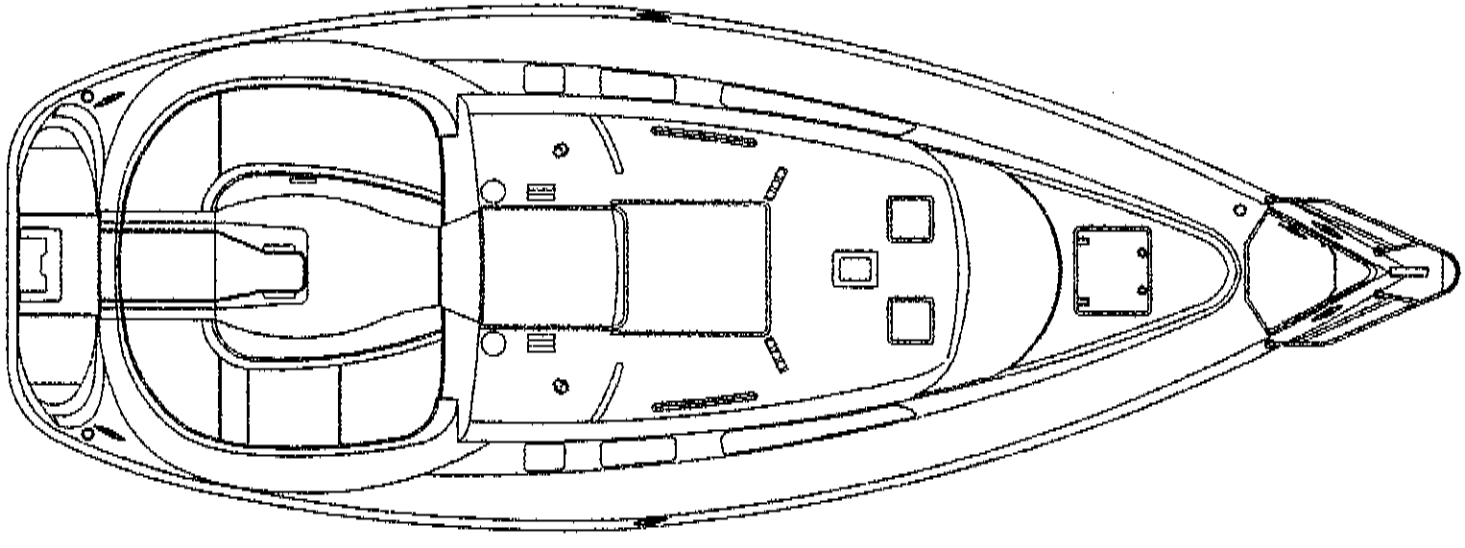
6. The final test is to go sailing in 10-15 knots of wind. First, adjust the tension in the shrouds. If when sailing upwind, the shrouds on the leeward side are slack then tighten them to remove about half the slack keeping note of the number of turns. Then tack and do the same to the other side. Do this until you are happy with the tension and the leeward side does not get loose when the boat is heeled. Now sight up the mast to be sure it is still relatively straight from side to side. If it is not then adjust to appropriate rigging to correct it.

7. At this point you should have adequate headstay tension. The sails are built for about 10" of headstay sag, the bend in the standard mast should be about 6" and 2" in the furling mast and it should be nearly straight from side to side when sailing upwind. If any of these are not true then revisit the appropriate step above to correct it. If the sag in the headstay is too much then adding tension to the verticals will fix it.

8. Once the rig is tuned you should make sure to add the cotter pins to all the rigging bending back the ends and taping them to prevent snagged lines sails and fingers.

Remember that rigging, like everything else, can age. As it gets older it may need to be replaced. The frequency for which this becomes necessary depends on the climate and conditions in which the boat is sailed. For example: if you sail in the Caribbean it should be replaced every 2-3 years compared to every 10 for the great lakes. You should consult a professional rigger for advice.





SEE PAGES 38B--40 FOR DETAILED OPTIONAL DECK HARDWARE INFORMATION

H290 SPINNAKER HDWR LAYOUT	
2908054	NONE
ENGINEERING DEPT.	3/20/99

HUNTER

ENGINE OPERATING INSTRUCTIONS:

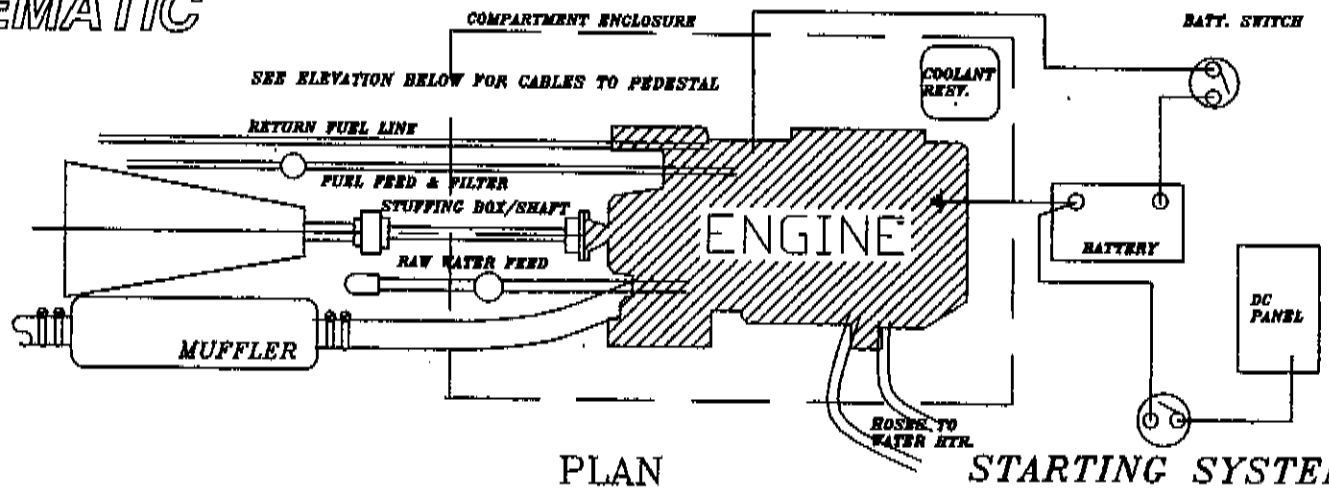
① FILL DIESEL TANK WITH DIESEL FUEL
② CHECK ENGINE OIL LEVEL (SEE YANMAR MANUAL)
③ OPEN ENGINE RAW WATER PICKUP SEACOCK (SEE PAGE 60A)
④ TURN ON "START BATTERY SELECTOR SWITCH" (LOCATED AT NAVIGATION STATION)
⑤ TURN KEY TO START POSITION, RELEASE WHEN ENGINE STARTS
NOTE" IF ENGINE APPEARS TO HAVE TROUBLE STARTING, SEE YANMAR MANUAL
⑥ TO SHUT ENGINE DOWN: PUSH RED BUTTON AT KEY SWITCH PANEL
UNTIL ENGINE STOPS RUNNING THEN TURN KEY TO OFF POSITION.

WARNING: DO NOT LEAVE AFT HATCHES/ PORTS OPEN WHILE ENGINE IS RUNNING. THERE EXISTS A POSSIBILITY OF EXHAUST POISIONING, OR EVEN DEATH.

H290 ENGINE OPERATING INST.		
2908055A	NONE	HUNTER
ENGINEERING DEPT.	4/14/99	

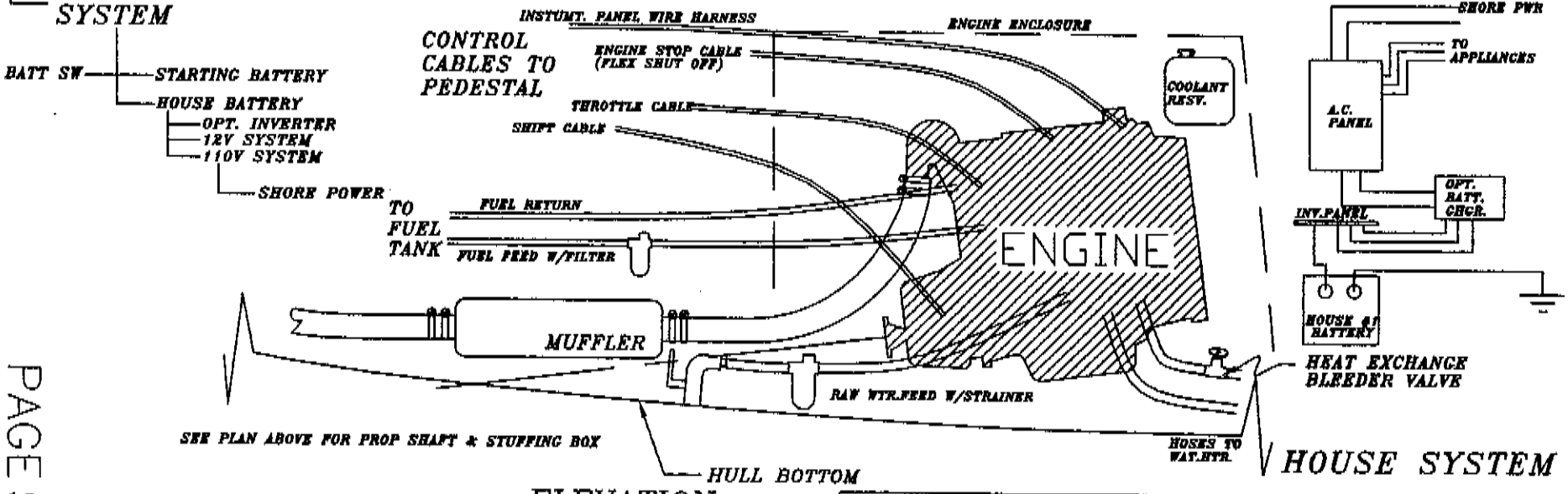
SYSTEMS SCHEMATIC

- ENGINE
  - WATER INTAKE
    - THRU-HULL
    - SEA COCK
    - STRAINER
  - EXHAUST
    - ELBO
    - HOSE
    - MUFFLER
  - FUEL SYSTEM
    - FEED
    - RETURN
    - TANK
    - FILTER
    - VALVE @ TANK
- RUNNING GEAR
  - SHAFT
  - COUPLING
  - DRIPLESS
- CONTROLS
  - SHIFT
  - THROTTLE
  - PANEL HARNESS
- ELECTRICAL SYSTEM
  - BATT SW
    - STARTING BATTERY
    - HOUSE BATTERY
      - OPT. INVERTER
      - 12V SYSTEM
      - 110V SYSTEM
    - SHORE POWER



PLAN

STARTING SYSTEM



ELEVATION

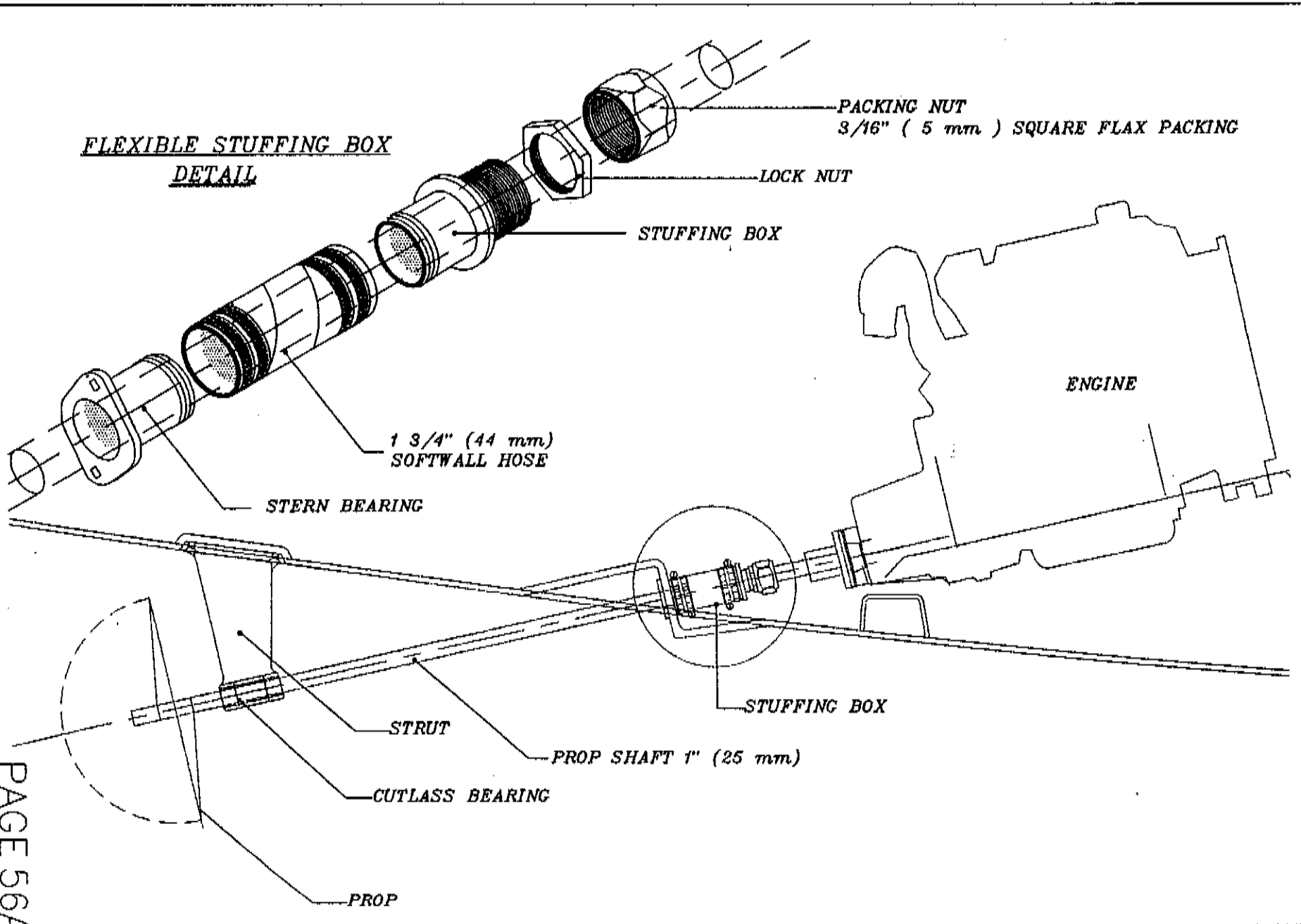
HOUSE SYSTEM

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

PAGE 55B

H290 ENGINE COMPARTMENT LAYOUT	
29080558	NONE
ENGINEERING DEPT.	5/5/99

HUNTER



PAGE 56A

H290 FLEXIBLE STUFFING BOX DETAIL	
2908056A	NONE
ENGINEERING DEPT.	5/11/99

HUNTER

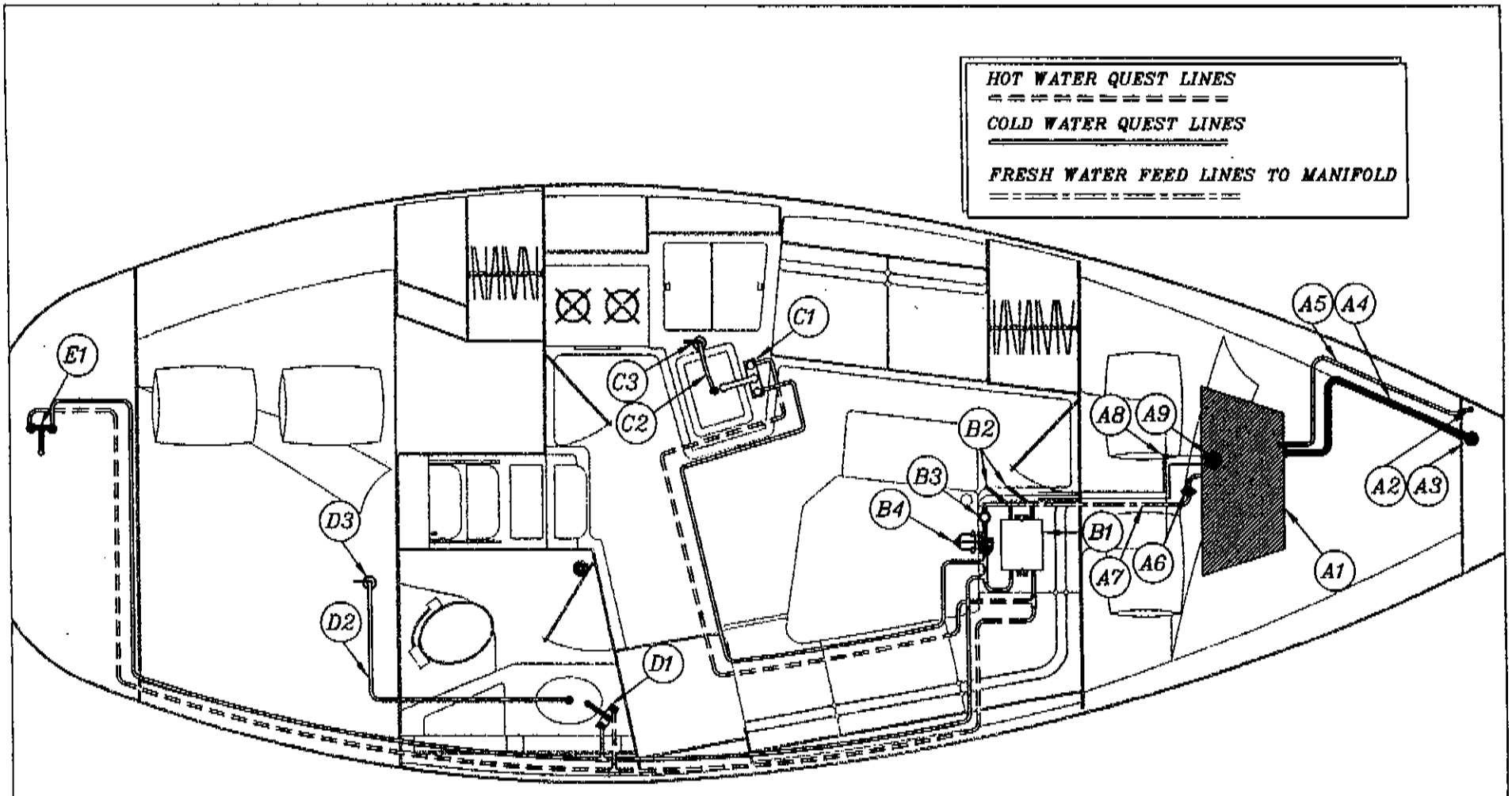
FRESH WATER SYSTEM OPERATION:

① FILL TANK WITH FRESH WATER (SEE PAGE 60B FOR FILL LOCATIONS)
② OPEN MANIFOLD VALVE (SEE PAGE 57B-1 FOR MANIFOLD LOCATION)
③ TURN BATTERY "ON/OFF" SWITCH TO THE ON POSITION
"FLIP" MAIN PANEL BREAKERS @ BATTERY SWITCH TO THE "ON" POSITION
(LOCATED BELOW NAV STATION)
④ TURN ON "D.C. MAIN" BREAKER ON MAIN BREAKER PANEL
⑤ TURN ON "WATER PRESSURE" BREAKER ON MAIN BREAKER PANEL
⑥ "HOT WATER" IS ATTAINABLE BASICALLY IN TWO WAYS...
Ⓐ BY HEATING THE WATER THRU THE ENGINE HEAT EXCHANGER UNIT
Ⓑ BY SUPPLYING 110V.A.C. BY "DOCKSIDE SHORE POWER".
⑦ TO HEAT BY "ENGINE" SEE PAGE 55 FOR ENGINE OPERATING INSTRUCTIONS.
NOTE: WHEN COOLANT IS INSTALLED, BLEED AIR FROM HEAT EXCHANGER LINES TO WATER HEATER. CRANK ENGINE, OPEN BLEEDER VALVE (SEE PAGE 55A) UNTIL AIR IS GONE FROM LINES
⑧ TO HEAT BY "SHORE POWER"
Ⓐ HOOK UP SHORE POWER CABLE/S
Ⓑ TURN ON A.C. MAIN BREAKER ON MAIN BREAKER PANEL
Ⓒ TURN ON "WATER HEATER" BREAKER ON MAIN BREAKER PANEL

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

H290 FRESH WATER OPERATING INST.	
2908057A	NONE
ENGINEERING DEPT	4/14/99

HUNTER



H290 FRESH WATER SYSTEM LAYOUT

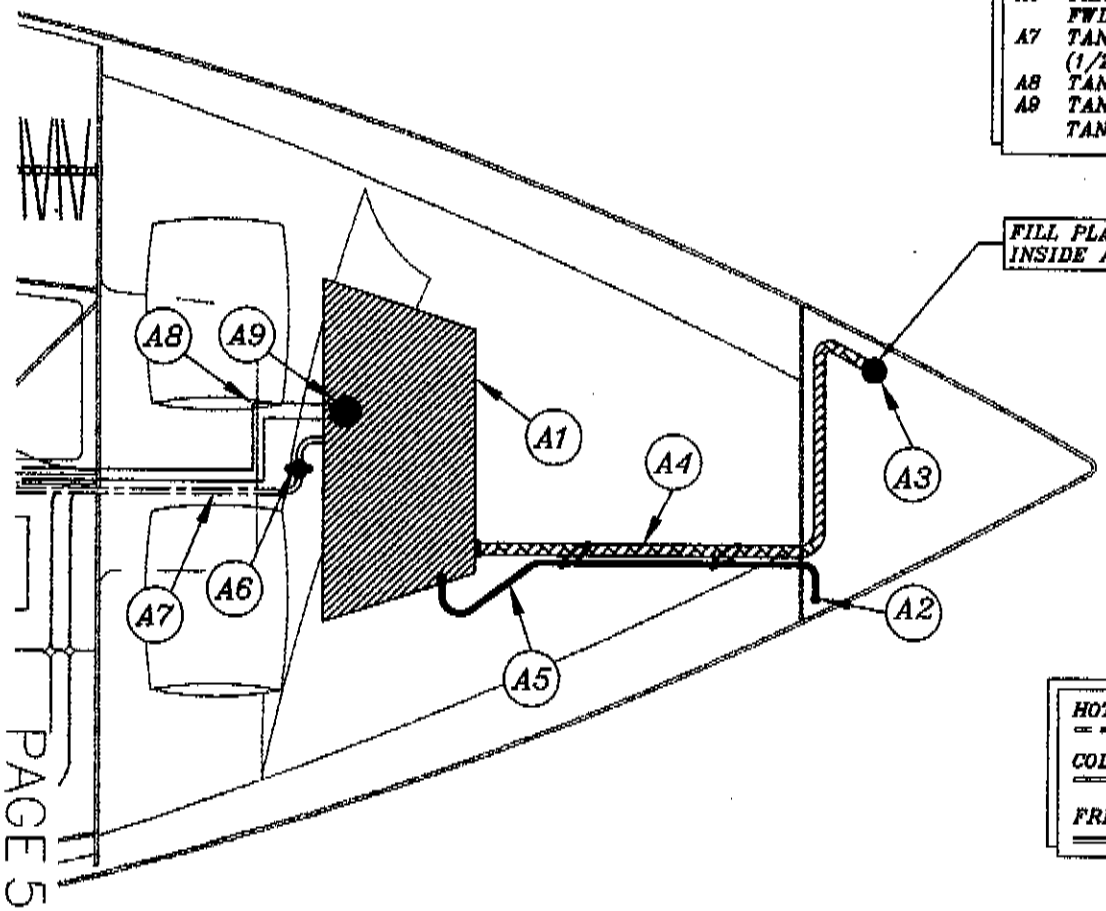
29080578-1	NONE
ENGINEERING DEPT.	4/14/98

HUNTER

FRESH WATER SYSTEM LAYOUT LIST

FWD WATER TANK COMPONENTS	A1	FWD WATER TANK (40 GALLONS/151 LITERS)
	A2	TANK FILL VENT LOCATION (3/4" / 19.1mm HULL FITTING)
	A3	TANK FILL LOCATION (1 1/2" / 38.1mm DECK FITTING)
	A4	FILL HOSE RUN (1 1/2" / 38.1mm SHEILDVAC)
	A5	VENT HOSE RUN (3/4" / 19.1mm)
	A6	TANK ON/OFF VALVE (MANIFOLD) LOCATION (JUST AFT OF FWD BERTH)
	A7	FWD WATER TANK FEED LINE TO WATER PUMP (1 1/2" /38.1mm)
	A8	TANK SENDING UNIT/ POWER LEADS
	A9	TANK SENDING UNIT LOCATION
WATER PUMP/HEATER COMPONENTS	B1	WATER HEATER (6 GALLONS/23 LITERS)
	B2	WATER HEATER HEAT EXCHANGER LINES TO ENGINE
	B3	IN LINE WATER FILTER (LOCATED UNDER FWD STBD SETTEE)
	B4	12 VOLT D.C. WATER PUMP
GALLEY WATER SYSTEM COMPONENTS	C1	GALLEY FAUCET
	C2	GALLEY SINK DRAIN HOSE RUN (1 1/2" / 38.1mm SHEILDVAC)
	C3	GALLEY SINK DRAIN SEACOCK (1 1/2" / 38.1mm)
HEAD WATER SYSTEM COMPONENTS	D1	HEAD VANITY/ SHOWER FAUCET (SEE PG 59B FOR MORE DETAILS)
	D2	HEAD VANITY SINK DRAIN HOSE RUN (1" / 25.4mm)
	D3	HEAD VANITY SINK DRAIN SEACCK (1" / 25.4mm)
TRANSOM SHOWER WATER SYSTEM COMPONENTS	E1	(OPTIONAL) TRANSOM SHOWER FAUCET

H290 FRESH WATER SYSTEM LAYOUT LIST (TM CAB.)	
29080578-2	NONE
ENGINEERING DEPT	4/15/99



A1 FWD WATER TANK (LOCATED UNDER FWD BERTH) 40 GALLONS / 151 LITERS
A2 TANK FILL VENT THRU HULL (3/4" / 19.1mm)
A3 TANK FILL DECK PLATE (1 1/2" / 38.1mm)
A4 TANK FILL HOSE RUN (1 1/2" / 38.1mm)
A5 TANK VENT HOSE RUN (3/4" / 19.1 mm)
A6 TANK (ON/OFF) VALVE LOCATED @ AFT END OF FWD BERTH. ACCESSED THRU PANEL UNDER BERTH
A7 TANK FEED LINE TO WATER FILTER AND PUMP (1/2" / 12.7mm)
A8 TANK SENDING UNIT POWER/ GAUGE LEADS
A9 TANK SENDING UNIT (LOCATED ON FWD WATER TANK AFT END)

FILL PLATE LOCATED INSIDE ANCHORWELL.

HOT WATER QUEST LINES (1/2" / 12.7mm)

COLD WATER QUEST LINES (1/2" / 12.7mm)

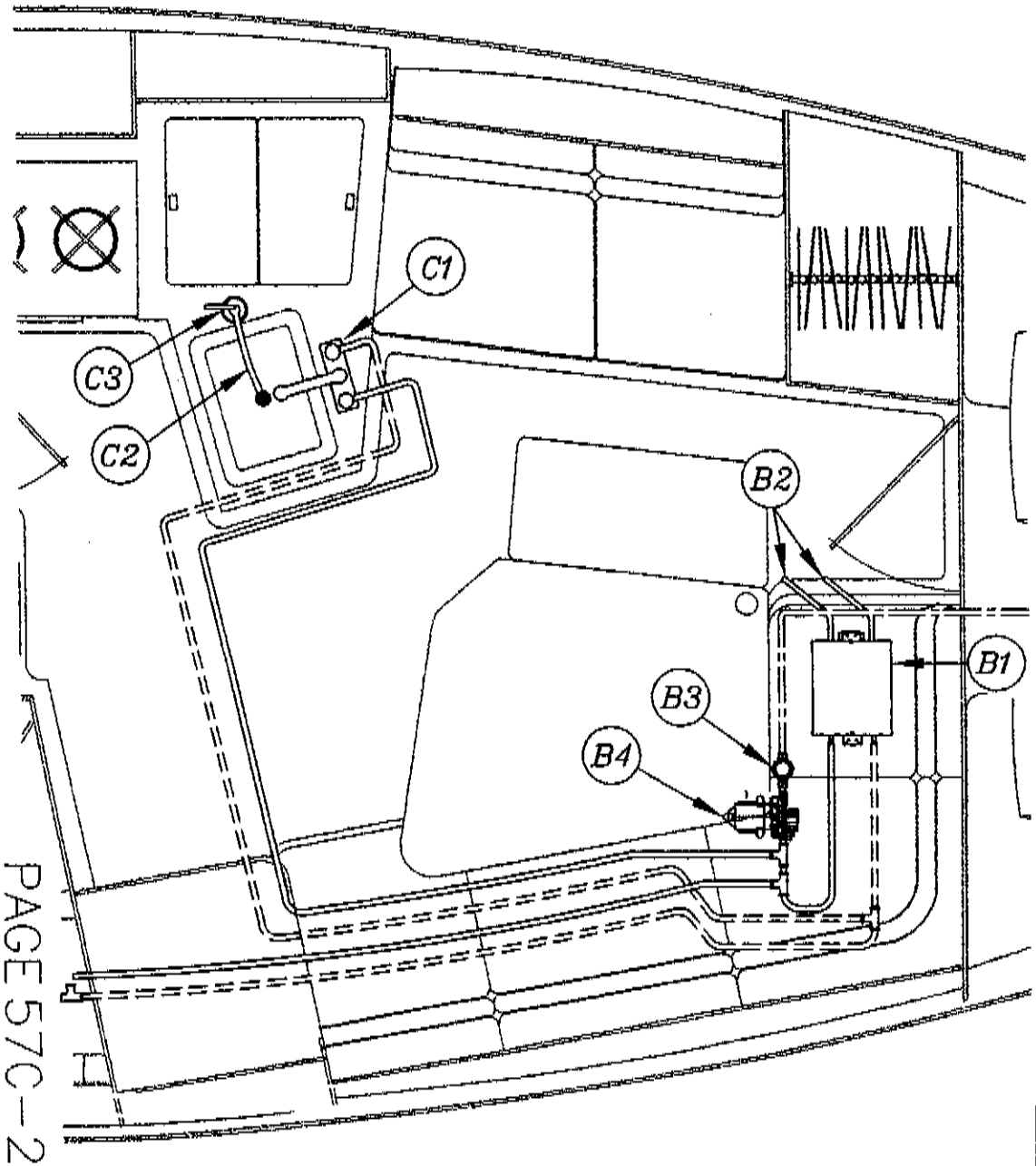
FRESH WATER FEED LINES TO MANIFOLD

PAGE 57C-1

H290 FWD WATER TANK COMPONENT LAYOUT

2906057C-1	NONE
ENGINEERING DEPT.	4/14/99

HUNTER



HOT WATER QUEST LINES (1/2" / 12.7mm)

COLD WATER QUEST LINES (1/2" / 12.7mm)

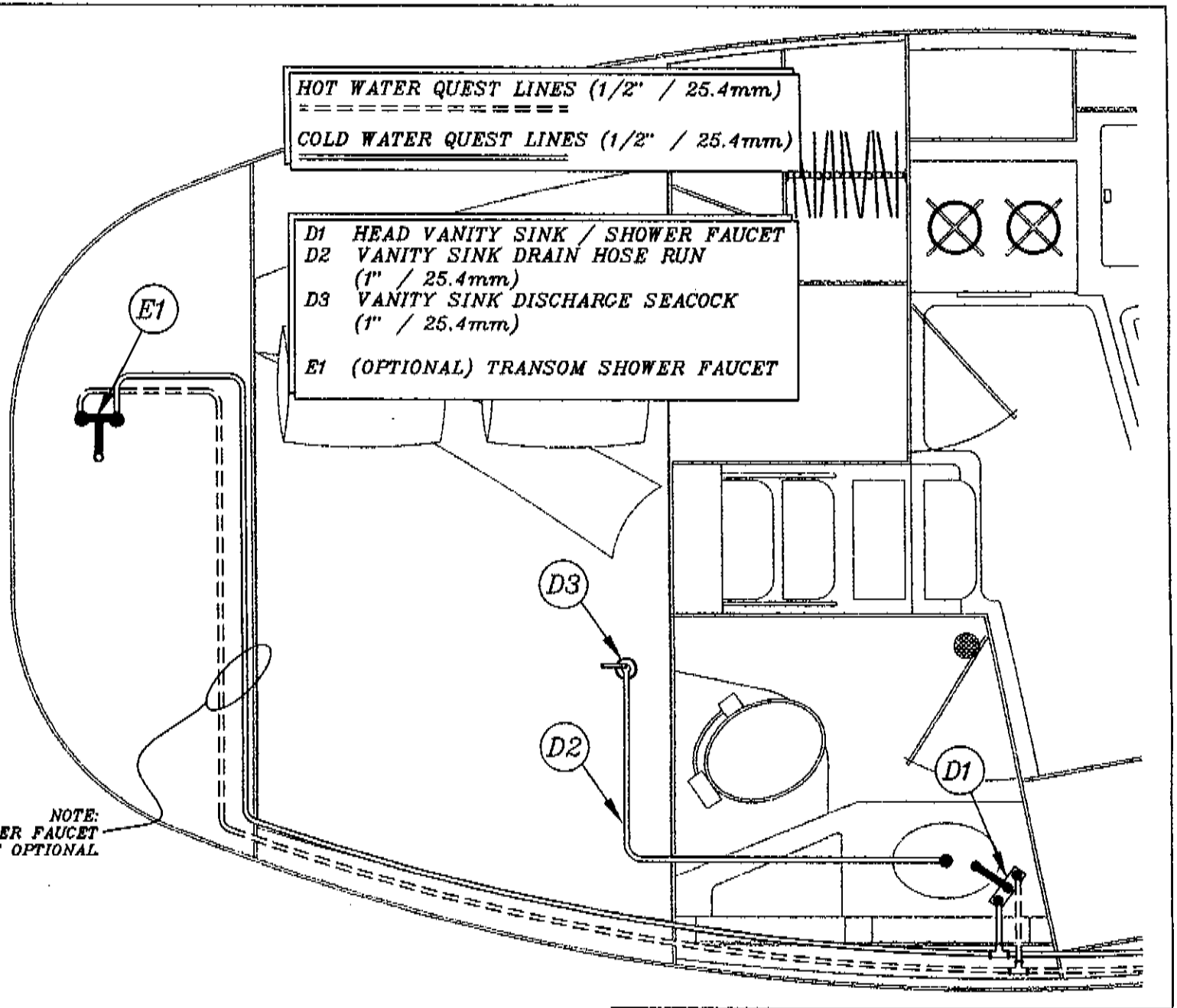
B1 6 GALLONS (23 LITERS) WATER HEATER
B2 HEAT EXCHANGER LINES AFT TO ENGINE
B3 IN LINE WATER FILTER (ACCESS UNDER FWD STBD SETTEE ACCESS PANEL)
B4 12 VOLT D.C. WATER PUMP (PRESSURIZES WATER SYSTEM)

C1 GALLEY FAUCET
C2 GALLEY FAUCET SINK DRAIN HOSE RUN TO SEACOCK (1 1/12" / 38.1mm SHEILDVAC)
C3 GALLEY DRAIN DISCHARGE SEACOCK (1 1/2" /38.1mm)

H290 WATER PUMP/ GALLEY COMPONENT LAYOUT

2008057C-2	NONE
ENGINEERING DEPT.	4/14/99

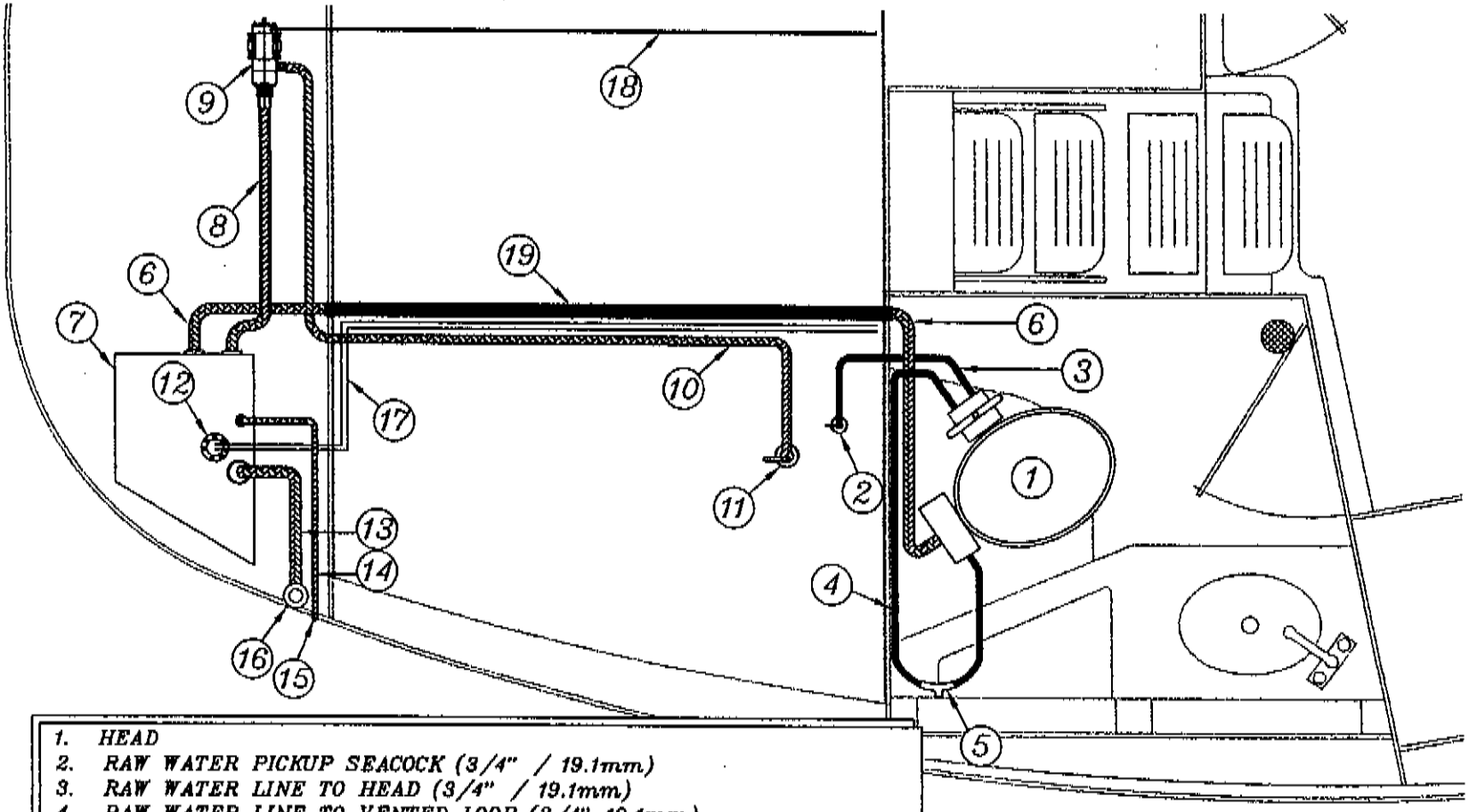
HUNTER



H290 HEAD/ TRANSOM SHOWER COMPONENT LAYOUT

2908057C-3	NONE
ENGINEERING DEPT.	4/14/99

HUNTER



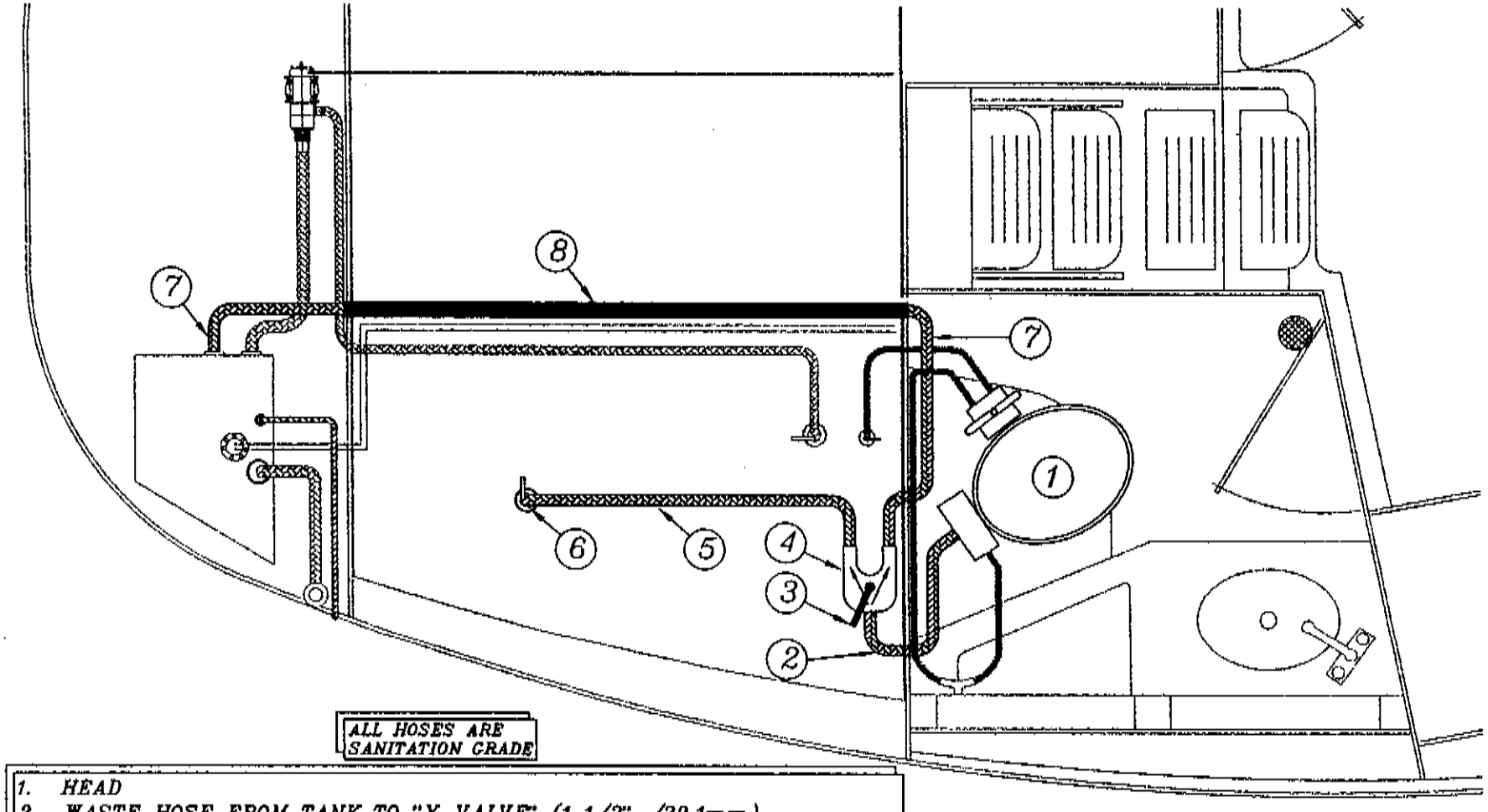
1. HEAD
2. RAW WATER PICKUP SEACOCK (3/4" / 19.1mm)
3. RAW WATER LINE TO HEAD (3/4" / 19.1mm)
4. RAW WATER LINE TO VENTED LOOP (3/4" 19.1mm)
5. VENTED LOOP (3/4" / 19.1mm)
6. WASTE HOSE INTO TANK FROM HEAD (1 1/2" / 38.1mm)
7. WASTE HOLDING TANK (20 GAL. / 76 L.)
8. WASTE HOSE FROM TANK TO MACERATOR (1 1/2" / 38.1mm)
9. 12 VOLT D.C. MACERATOR PUMP
10. WASTE HOSE FROM MACERATOR TO DISCHARGE (1" / 25.4mm)
11. MACERATOR DISCHARGE SEACOCK (1" / 25.4mm HULL FITTING)
12. HOLDING TANK SEDNING UNIT
13. WASTE HOSE FROM TANK TO PUMPOUT (1 1/2" / 38.1mm)
14. WASTE TANK VENT HOSE (3/4" / 19.1mm)
15. WASTE TANK VENT FITTING (3/4" / 19.1mm HULL FITTING)
16. WASTE TANK PUMPOUT DECK PLATE (1 1/2" / 38.1mm)
17. SENDING UNIT POWER LEADS TO PANEL / GAUGE
18. MACERATOR POWER LEADS TO MOMENTARY SWITCH/PANEL
19. (1 1/2" / 38.1mm) PVC WASTE PIPE RUN (THRU PAN)

ALL HOSES ARE SANITATION GRADE

H290 WASTE SYSTEM LAYOUT

2905058A-1	NONE
ENGINEERING DEPT.	4/15/99

HUNTER



ALL HOSES ARE SANITATION GRADE

1. HEAD
2. WASTE HOSE FROM TANK TO "Y-VALVE" (1 1/2" /38.1mm.)
3. "Y-VALVE" HANDLE (LOCATED ON VAVLE)
4. "Y-VALVE" PRESENT ON SELECT OVERSEAS BOATS ONLY
5. WASTE HOSE FROM "Y-VALVE" TO DISCHARGE (1" / 25.4mm.)
6. DIRECT OVERBOARD DISCHARGE SEACOCK (1" / 25.4mm HULL FITTING)
7. WASTE HOSE FROM "Y-VALVE" TO HOLDING TANK (1 1/2" / 38.1mm.)
8. (1 1/2" / 38.1mm) PVC WASTE PIPE RUN (THRU PAN)

NOTE:

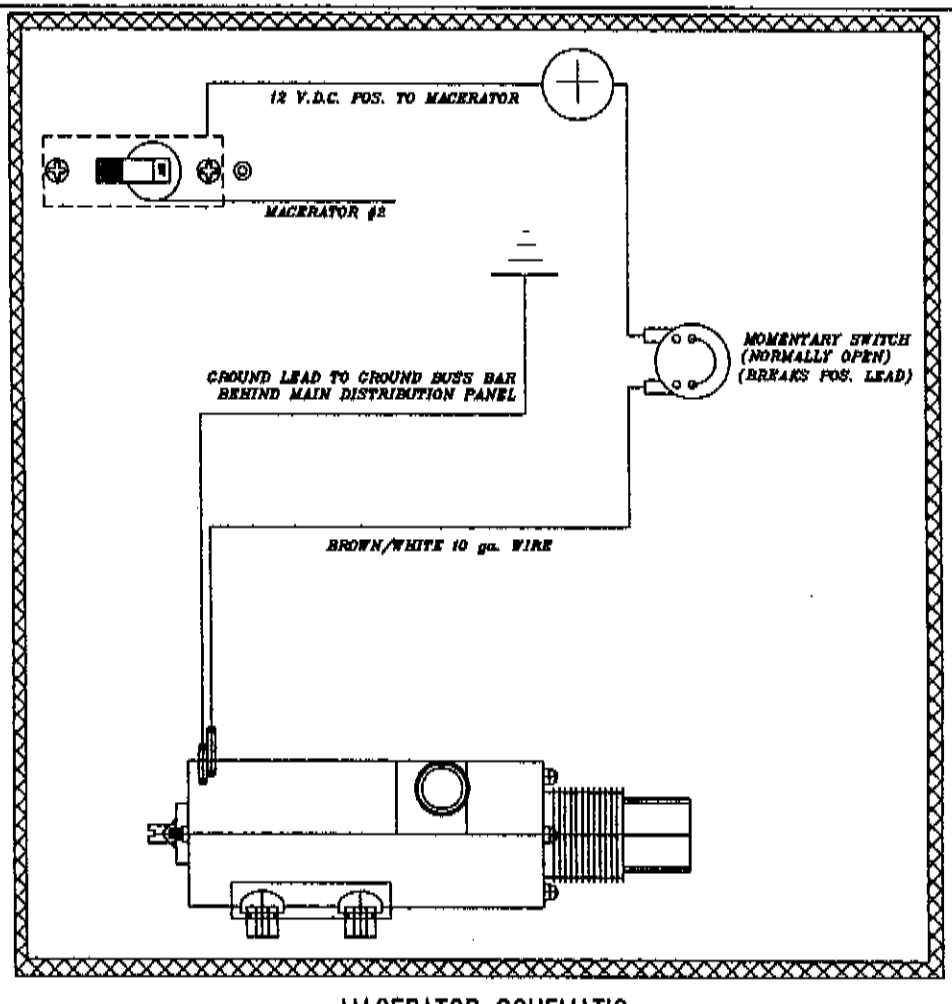
ALL OTHER COMPONENTS ARE THE SAME AS THE PREVIOUS PAGE. SEE PAGE 58A-1 FOR FURTHER INFORMATION.

H290 INTERNATIONAL WASTE SYSTEM LAYOUT

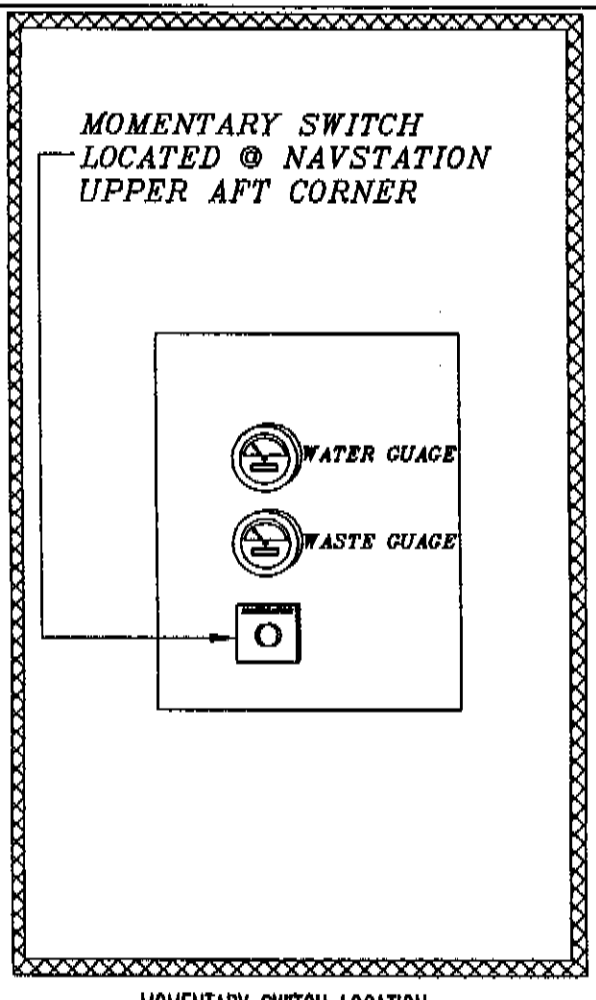
2908058A-2	NONE
ENGINEERING DEPT.	4/15/99

HUNTER

THE MACERATOR MOMENTARY SWITCH IS PROVIDED TO PROHIBIT THE "DRY RUNNING" OF THE MACERATOR. TO OPERATE THE MACERATOR, TURN THE MACERATOR BREAKER TO THE "ON" POSITION. WHILE EITHER WATCHING THE WASTE TANK LEVEL INDICATOR, OR LISTENING TO THE PITCH OF THE PUMP, PUSH THE MOMENTARY SWITCH IN. THIS WILL ACTIVATE THE MACERATOR. ONCE THE TANK LEVEL INDICATOR REACHES "EMPTY", OR THE PITCH CHANGES NOTICABLY, RELEASE THE MOMENTARY SWITCH AND TURN THE BREAKER TO THE "OFF" POSITION. (NOTE: OCCASIONALLY THE TANK SENDING UNIT BECOMES STUCK, AND DOES NOT GIVE AN ACCURATE READING, THEREFORE IT IS MORE EFFECTIVE AND SAFER FOR THE PUMP IF THE OPERATOR USES THE "LISTENING" METHOD TO DETERMINE IF THE TANK HAS BEEN EMPTIED.)



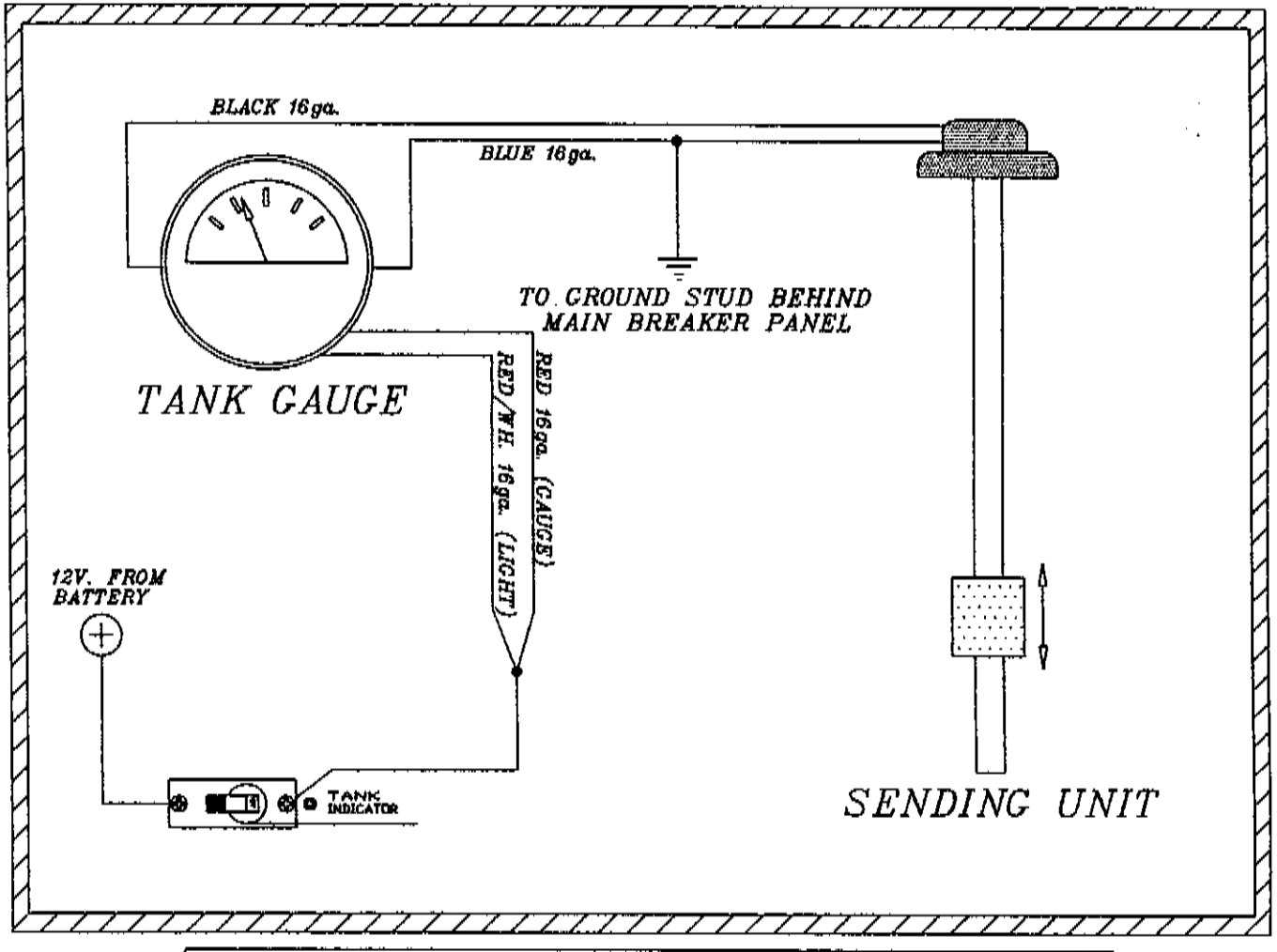
MACERATOR SCHEMATIC
TYPICAL



MOMENTARY SWITCH LOCATION

H290 OPTIONAL MACERATOR WIRING SCHEMATIC	
29080588	NONE
ENGINEERING DEPT	4/15/99

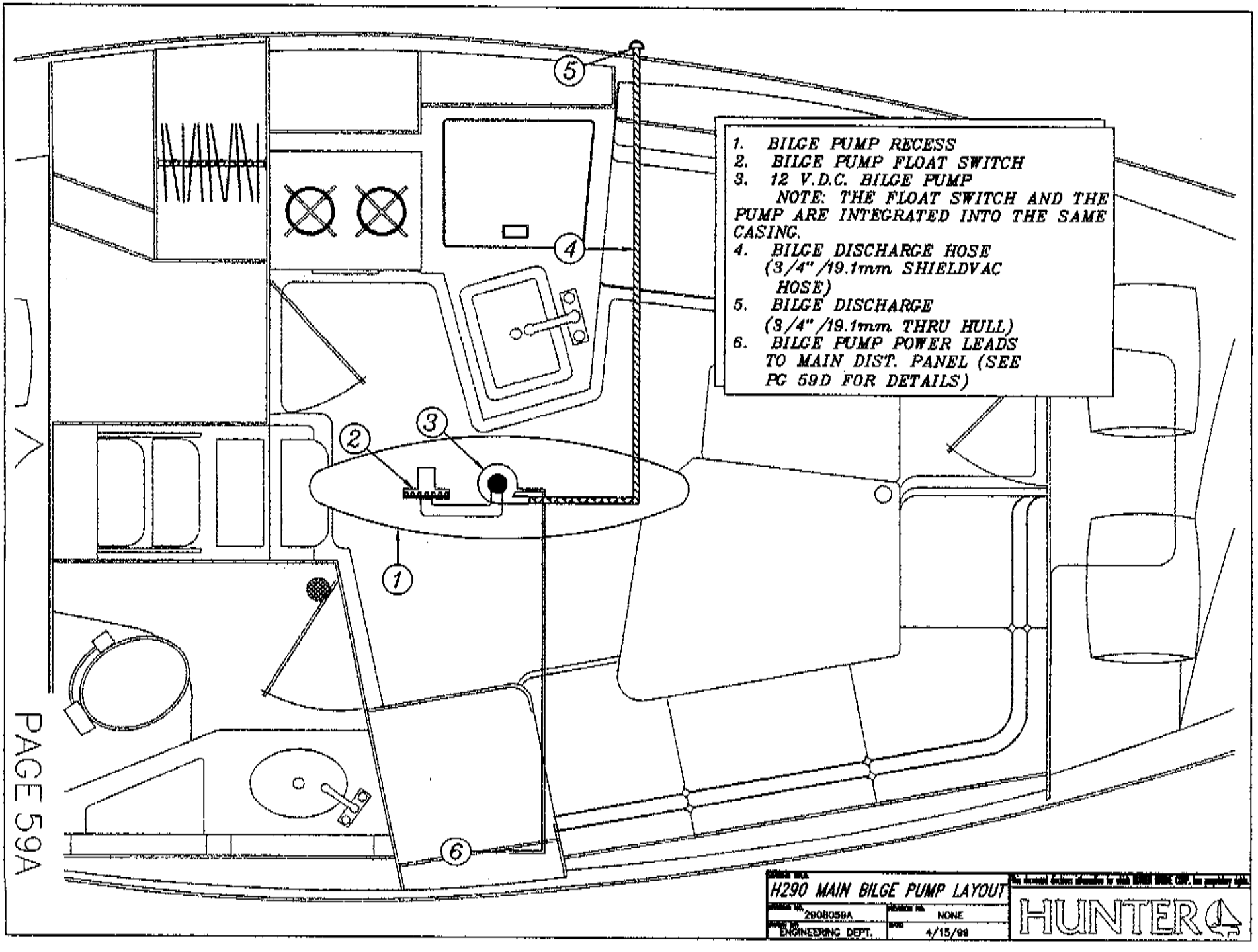
HUNTER

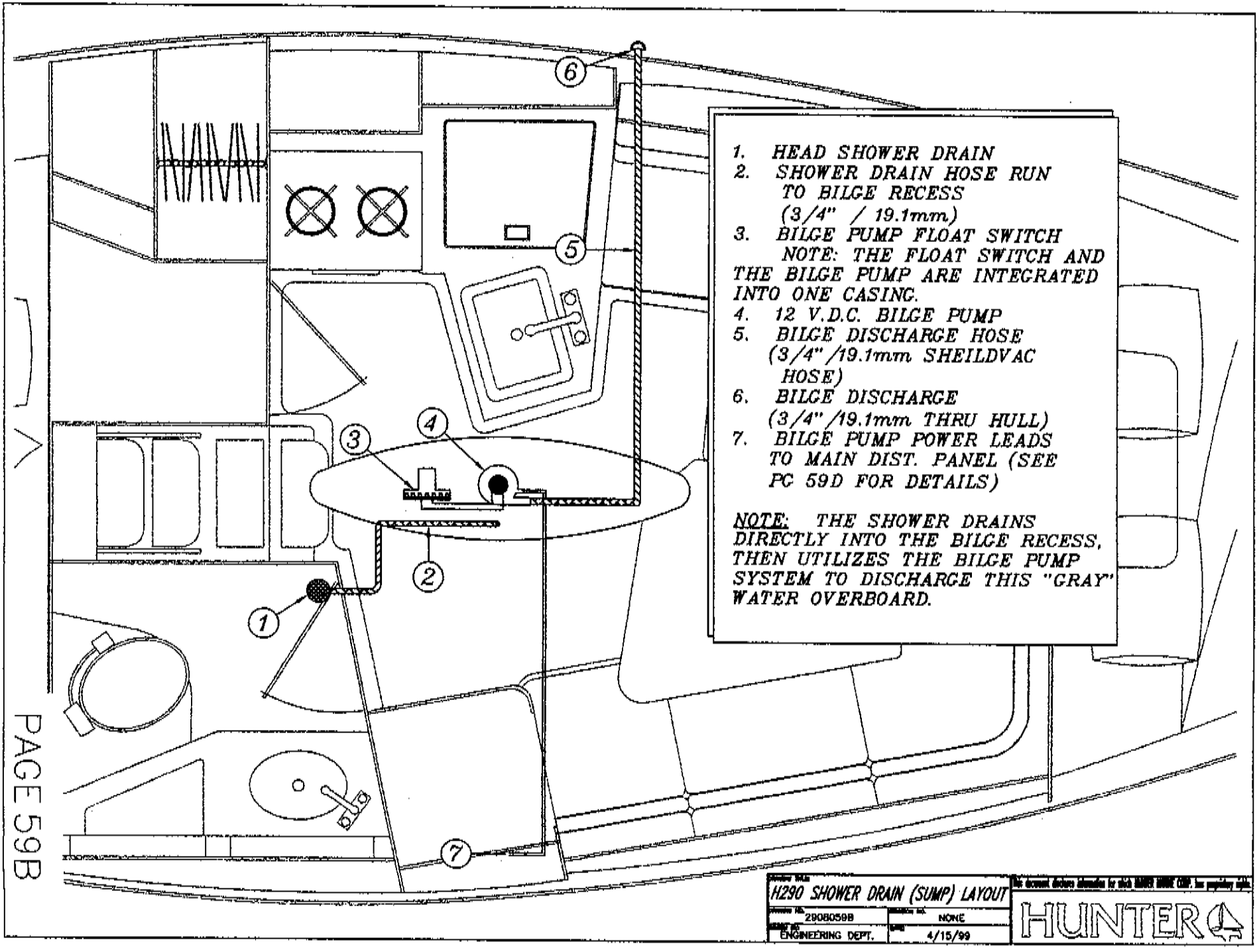


NOTE:
ALWAYS KEEP WASTE DISCHARGE THRU HULL BALL VALVE CLOSED WHEN SYSTEM IS NOT IN USE.

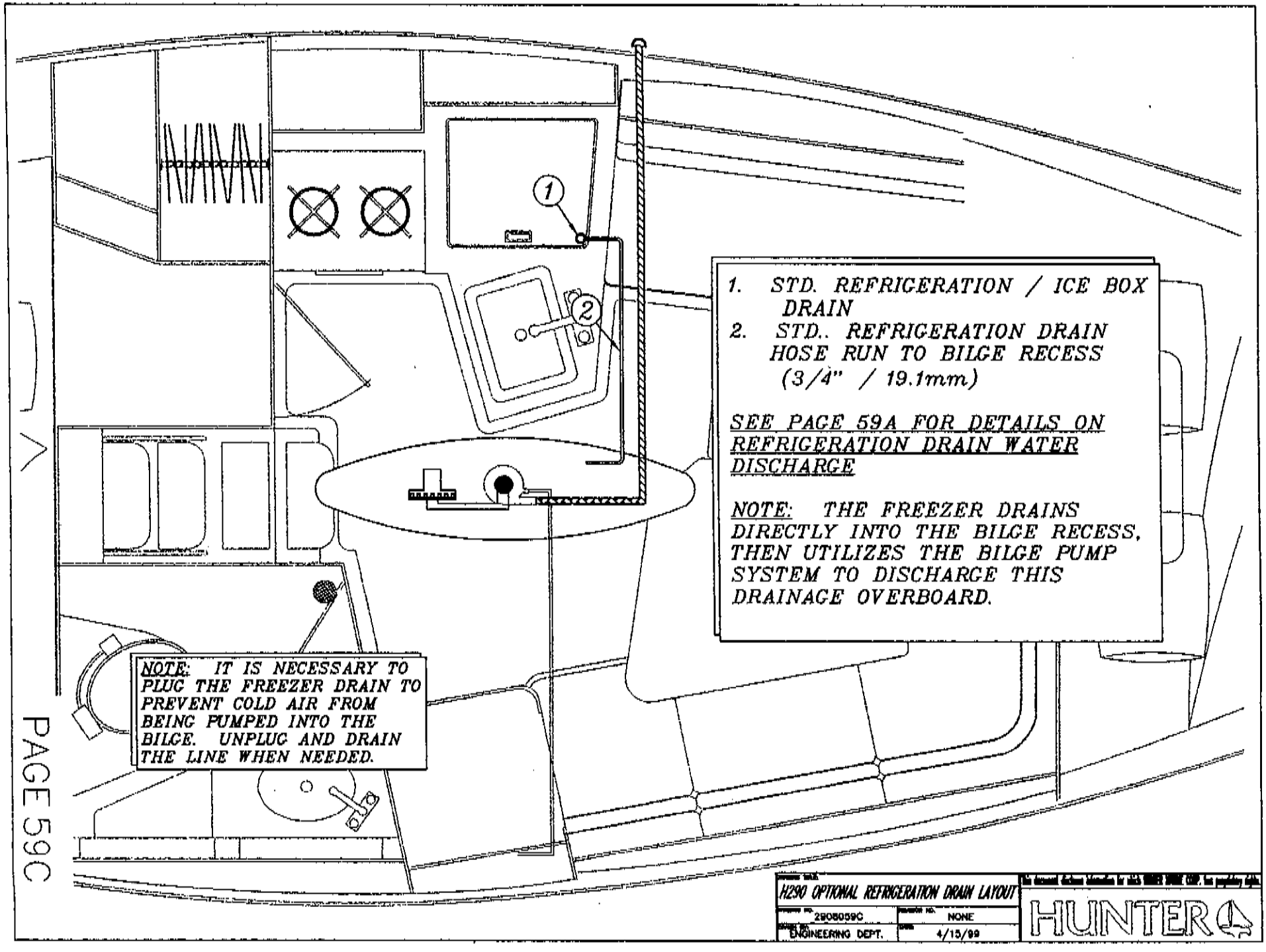
H290 WASTE TANK SENDING UNIT SCHEMATIC	
2908058C	NONE
ENGINEERING DEPT.	4/15/99

HUNTER


1. BILGE PUMP RECESS
2. BILGE PUMP FLOAT SWITCH
3. 12 V.D.C. BILGE PUMP
NOTE: THE FLOAT SWITCH AND THE PUMP ARE INTEGRATED INTO THE SAME CASING.
4. BILGE DISCHARGE HOSE (3/4" /19.1mm SHIELDVAC HOSE)
5. BILGE DISCHARGE (3/4" /19.1mm THRU HULL)
6. BILGE PUMP POWER LEADS TO MAIN DIST. PANEL (SEE PG 59D FOR DETAILS)
1
2
3
4
5
6
H290 MAIN BILGE PUMP LAYOUT
2908059A
NONE
ENGINEERING DEPT.
4/15/99
HUNTER


1. HEAD SHOWER DRAIN
2. SHOWER DRAIN HOSE RUN TO BILGE RECESS (3/4" / 19.1mm)
3. BILGE PUMP FLOAT SWITCH NOTE: THE FLOAT SWITCH AND THE BILGE PUMP ARE INTEGRATED INTO ONE CASING.
4. 12 V.D.C. BILGE PUMP
5. BILGE DISCHARGE HOSE (3/4" /19.1mm SHEILDVAC HOSE)
6. BILGE DISCHARGE (3/4" /19.1mm THRU HULL)
7. BILGE PUMP POWER LEADS TO MAIN DIST. PANEL (SEE PC 59D FOR DETAILS)
NOTE: THE SHOWER DRAINS DIRECTLY INTO THE BILGE RECESS, THEN UTILIZES THE BILGE PUMP SYSTEM TO DISCHARGE THIS "GRAY" WATER OVERBOARD.
H290 SHOWER DRAIN (SUMP) LAYOUT
29080598
NONE
ENGINEERING DEPT.
4/15/99
HUNTER

PAGE 59B



1. *STD. REFRIGERATION / ICE BOX DRAIN*
2. *STD.. REFRIGERATION DRAIN HOSE RUN TO BILGE RECESS (3/4" / 19.1mm)*

SEE PAGE 59A FOR DETAILS ON REFRIGERATION DRAIN WATER DISCHARGE

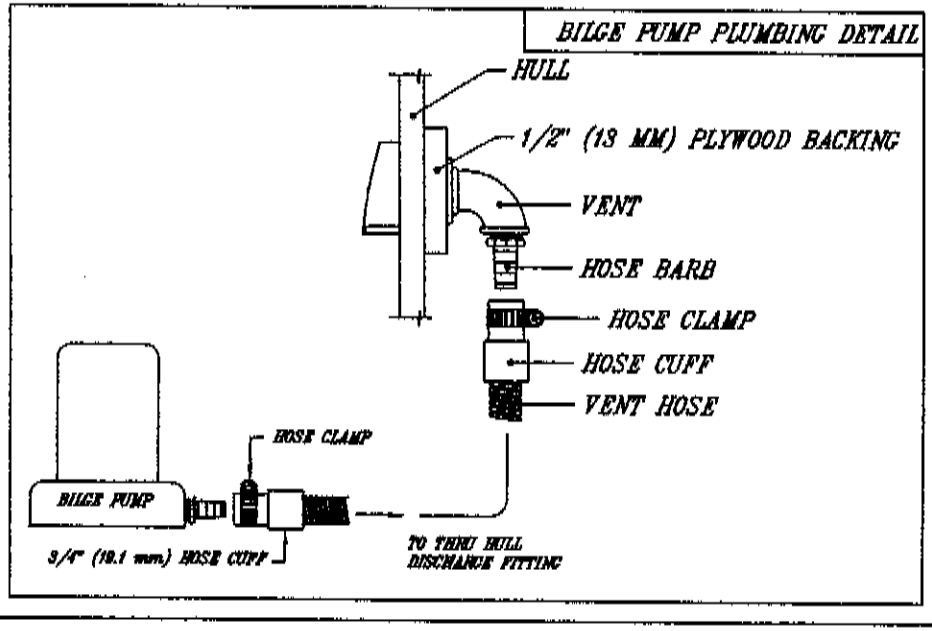
NOTE: THE FREEZER DRAINS DIRECTLY INTO THE BILGE RECESS, THEN UTILIZES THE BILGE PUMP SYSTEM TO DISCHARGE THIS DRAINAGE OVERBOARD.

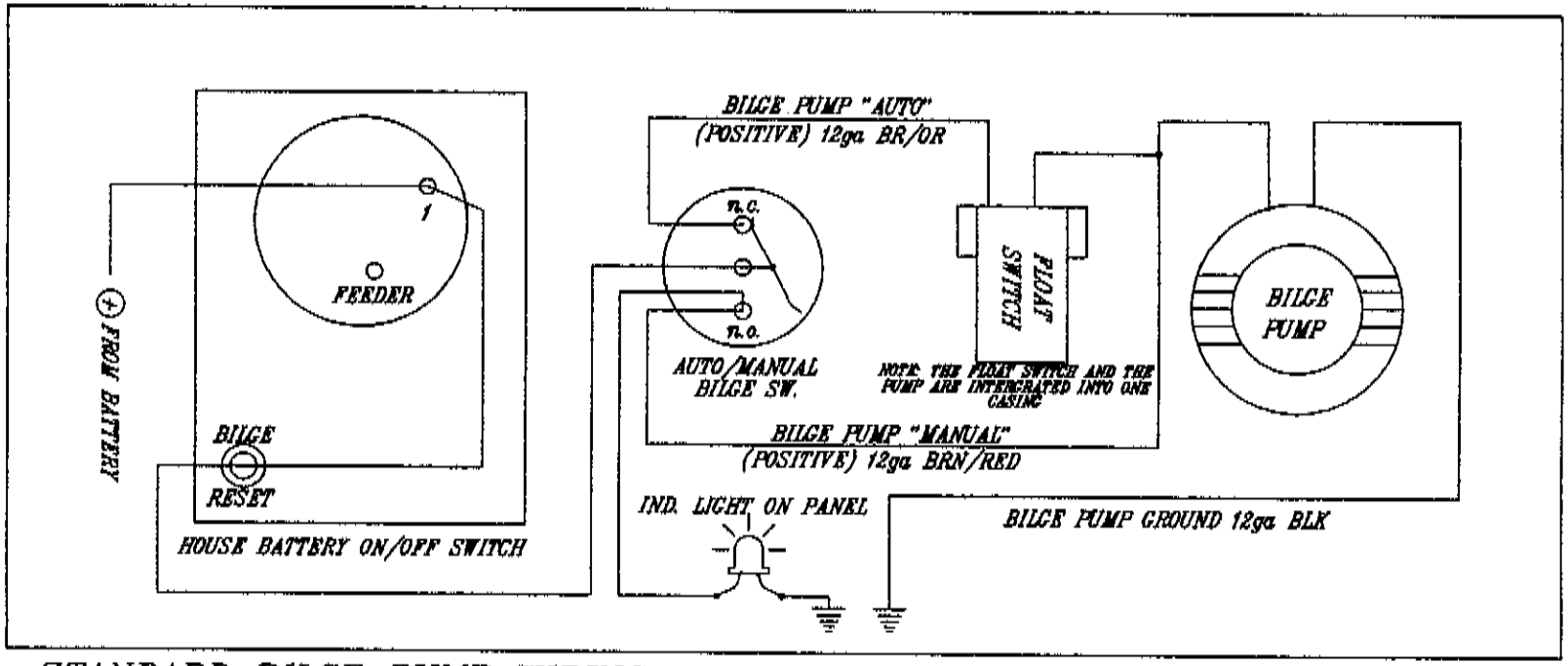
NOTE: IT IS NECESSARY TO PLUG THE FREEZER DRAIN TO PREVENT COLD AIR FROM BEING PUMPED INTO THE BILGE. UNPLUG AND DRAIN THE LINE WHEN NEEDED.

H290 OPTIONAL REFRIGERATION DRAIN LAYOUT

2905059C	NONE
ENGINEERING DEPT.	4/15/99

HUNTER

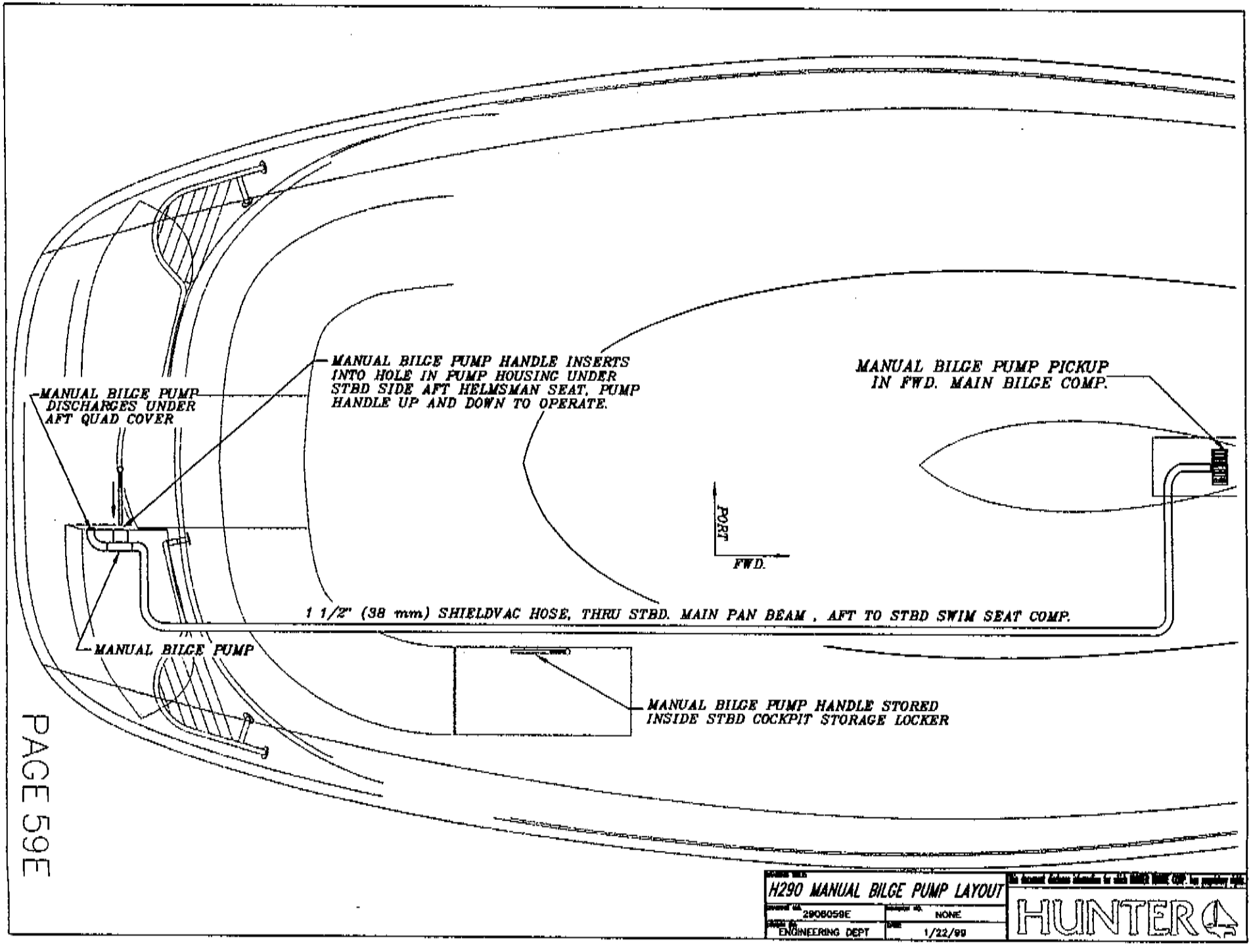




STANDARD BILGE PUMP WIRING

H290 BILGE SYSTEM DETAILS	
29080590	NONE
ENGINEERING DEPT.	4/16/99

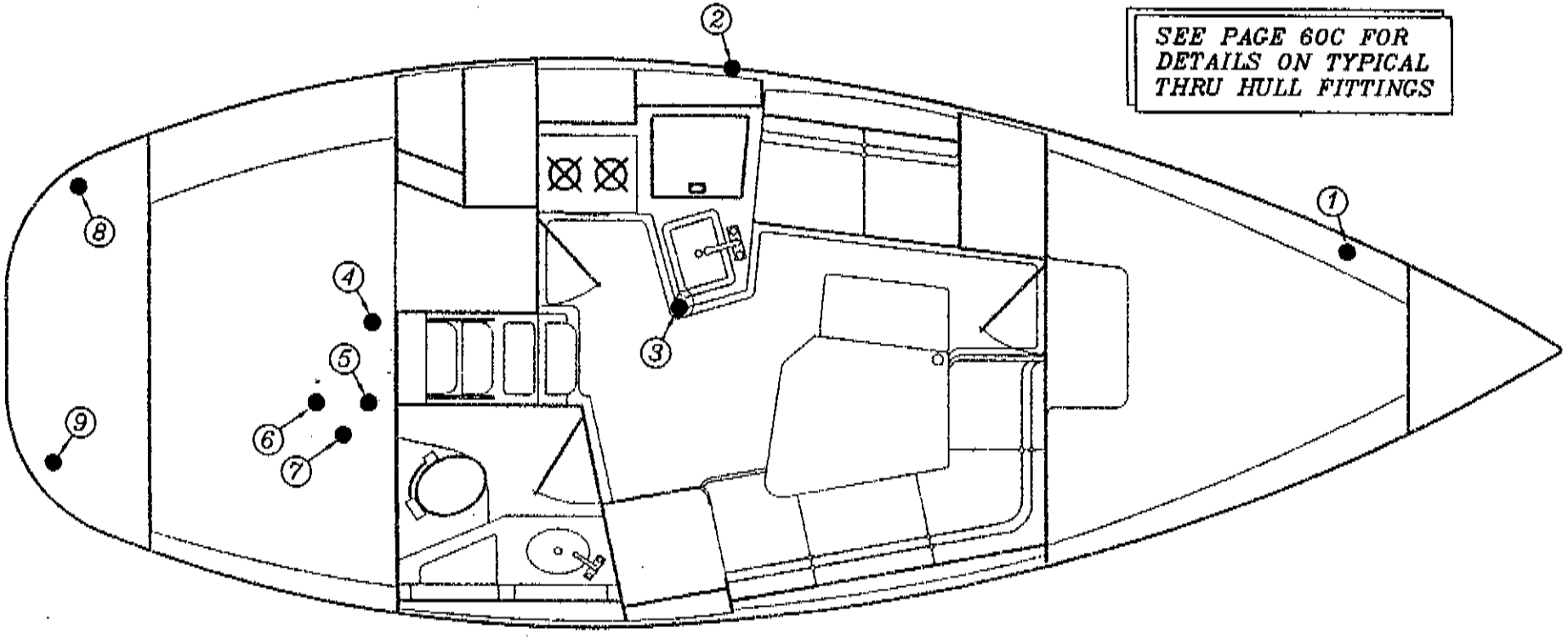
HUNTER



H290 MANUAL BILGE PUMP LAYOUT

2906059E	NONE
ENGINEERING DEPT	1/22/99

HUNTER



SEE PAGE 60C FOR DETAILS ON TYPICAL THRU HULL FITTINGS

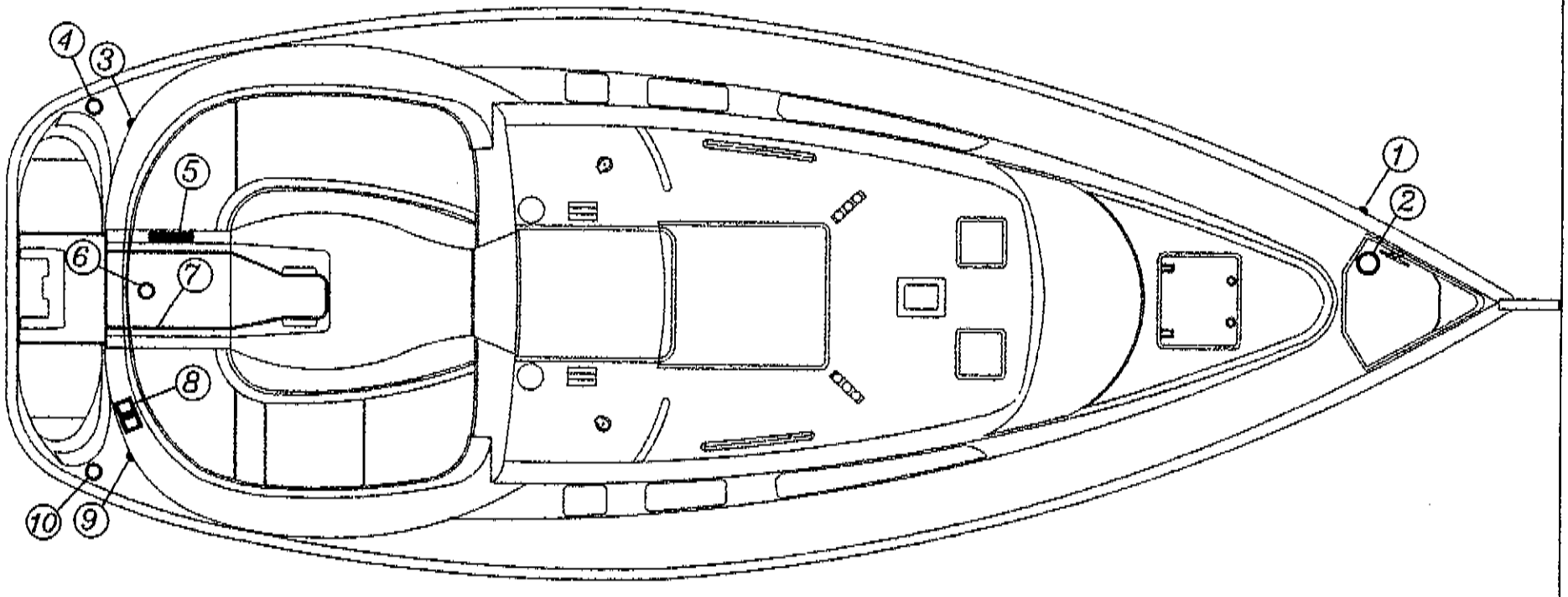
1. WATER TANK VENT (THRU HULL)
2. BILGE PUMP DISCHARGE (THRU HULL)
3. GALLEY SINK DISCHARGE (BALL VALVE)
4. ENGINE RAW WATER PICKUP (BALL VALVE)
5. SELECT OVERSEAS MODEL DIRECT OVERBOARD WASTE DISCHARGE (BALL VALVE)
6. MACERATOR DISCHARGE (BALL VALVE)
7. HEAD VANITY SINK DISCHARGE (BALL VALVE)
8. LPG LOCKER DRAIN (THRU HULL)
9. ENGINE EXHAUST

H290 THRU HULL LOCATIONS

2906060A | NONE

ENGINEERING DEPT. | 4/16/99

HUNTER

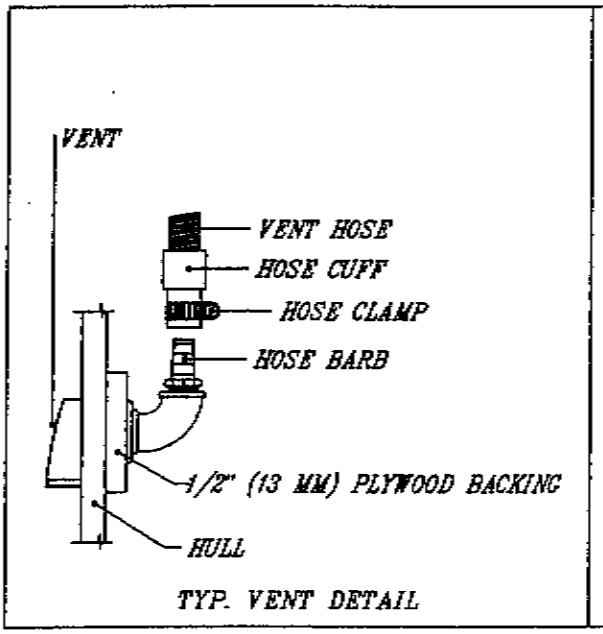


1. FWD WATER TANK FILL VENT (3/4" / 19.1mm)
2. FWD WATER TANK FILL LOCATION (1 1/2" / 38.1mm)
3. FUEL TANK VENT (3/4" / 19.1mm)
4. FUEL TANK FILL LOCATION (1 1/2" / 38.1mm)
5. TRANSOM SHOWER LOCATION
6. EMERGENCY TILLER COVER PLATE
7. MAUNAL BILGE PUMP PUMP ASSEMBLY
8. SHORE POWER INLET LOCATION
9. WASTE TANK VENT (3/4" / 19.1mm)
10. WASTE TANK DECK PUMP OUT LOCATION (1 1/2" / 38.1mm)

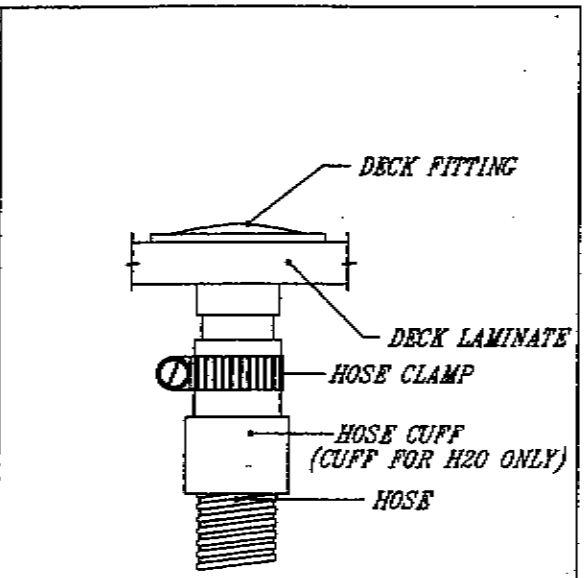
H290 THRU DECK LOCATIONS

29080608	NONE
ENGINEERING DEPT.	5/15/99

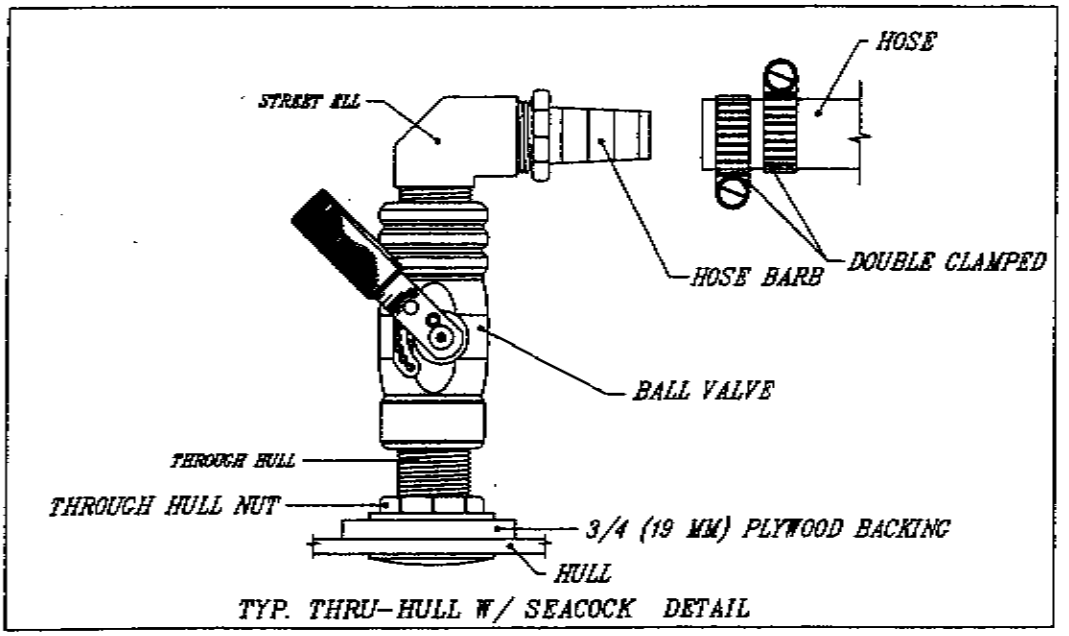
HUNTER



TYP. VENT DETAIL

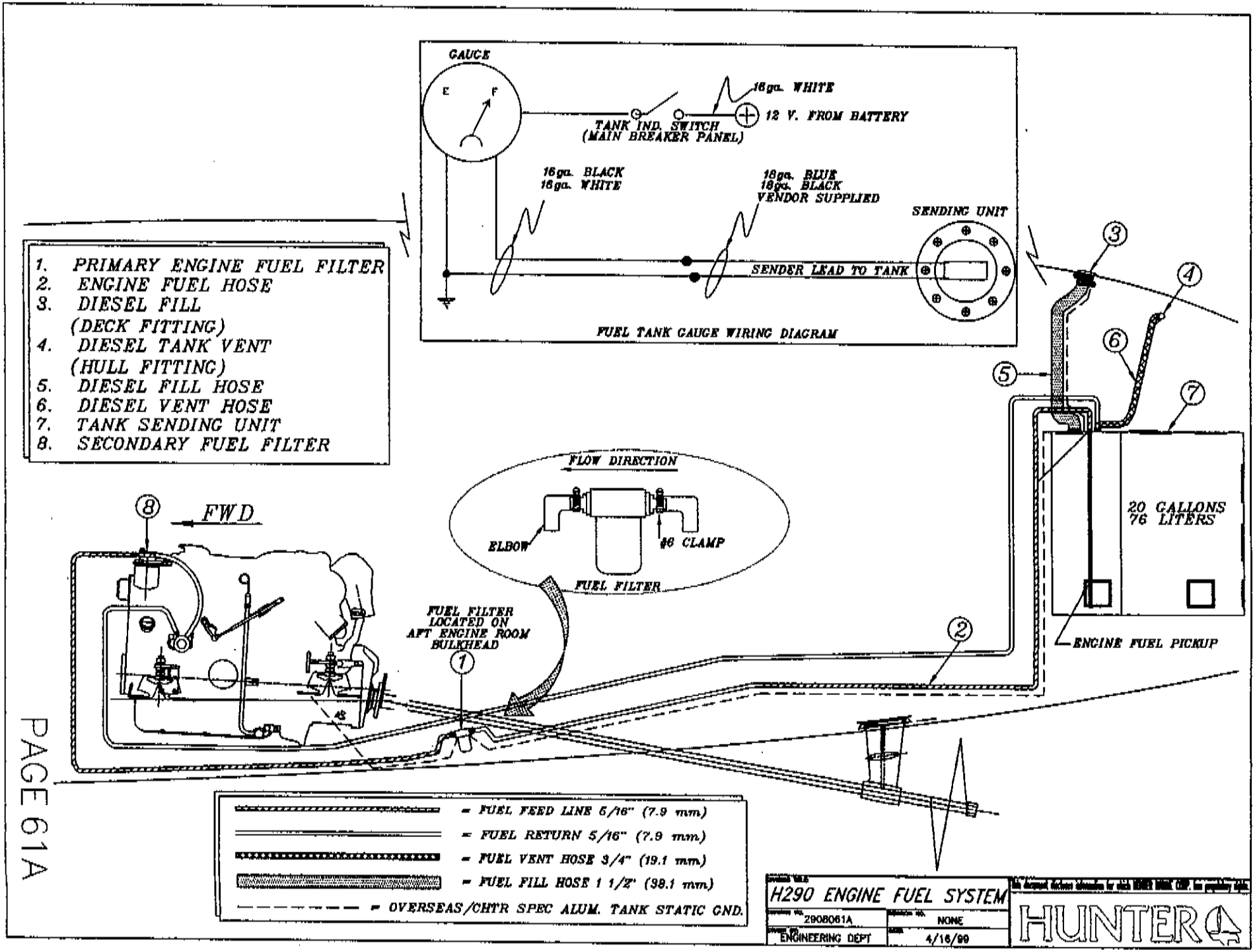


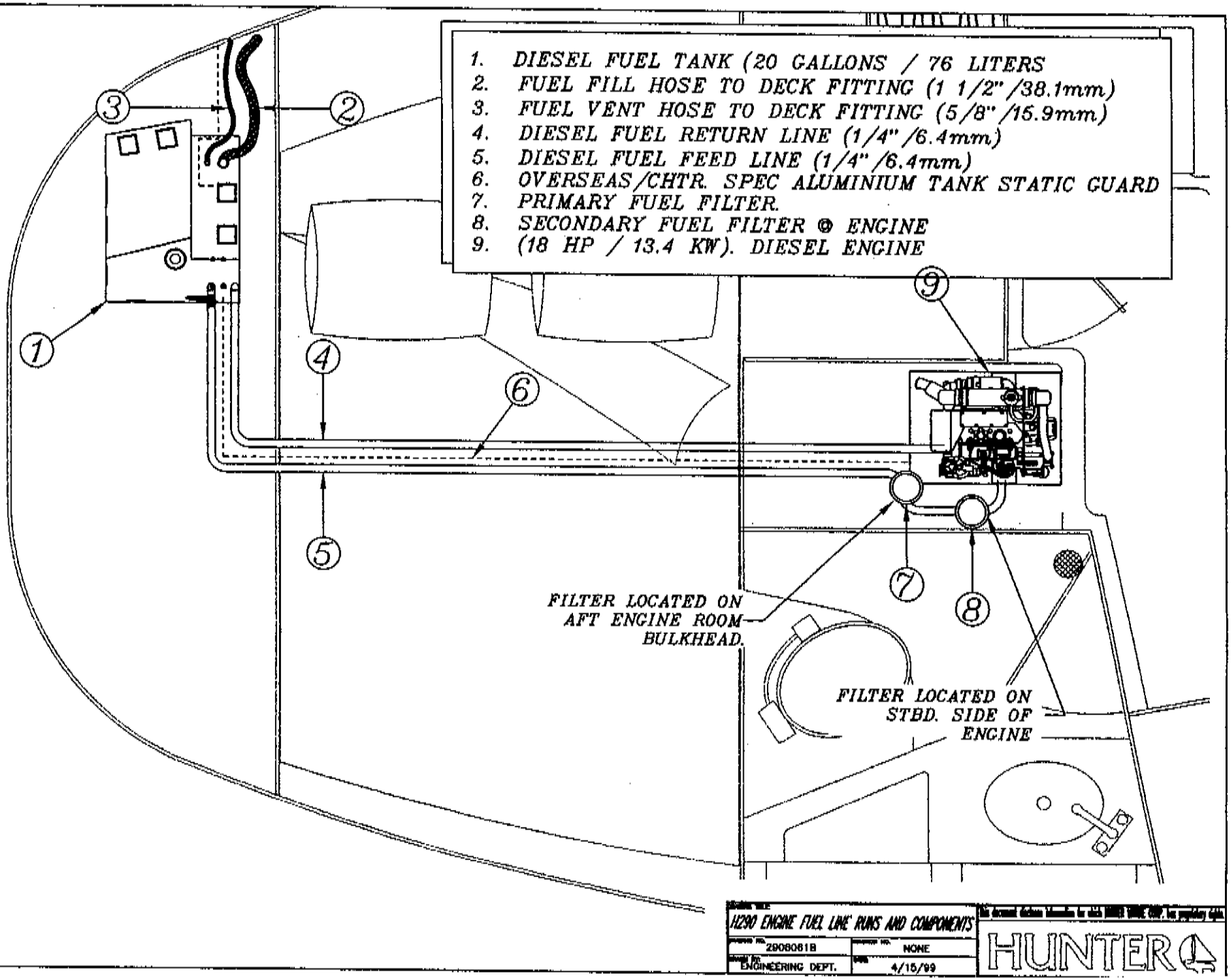
TYP DECK PLATE DETAIL

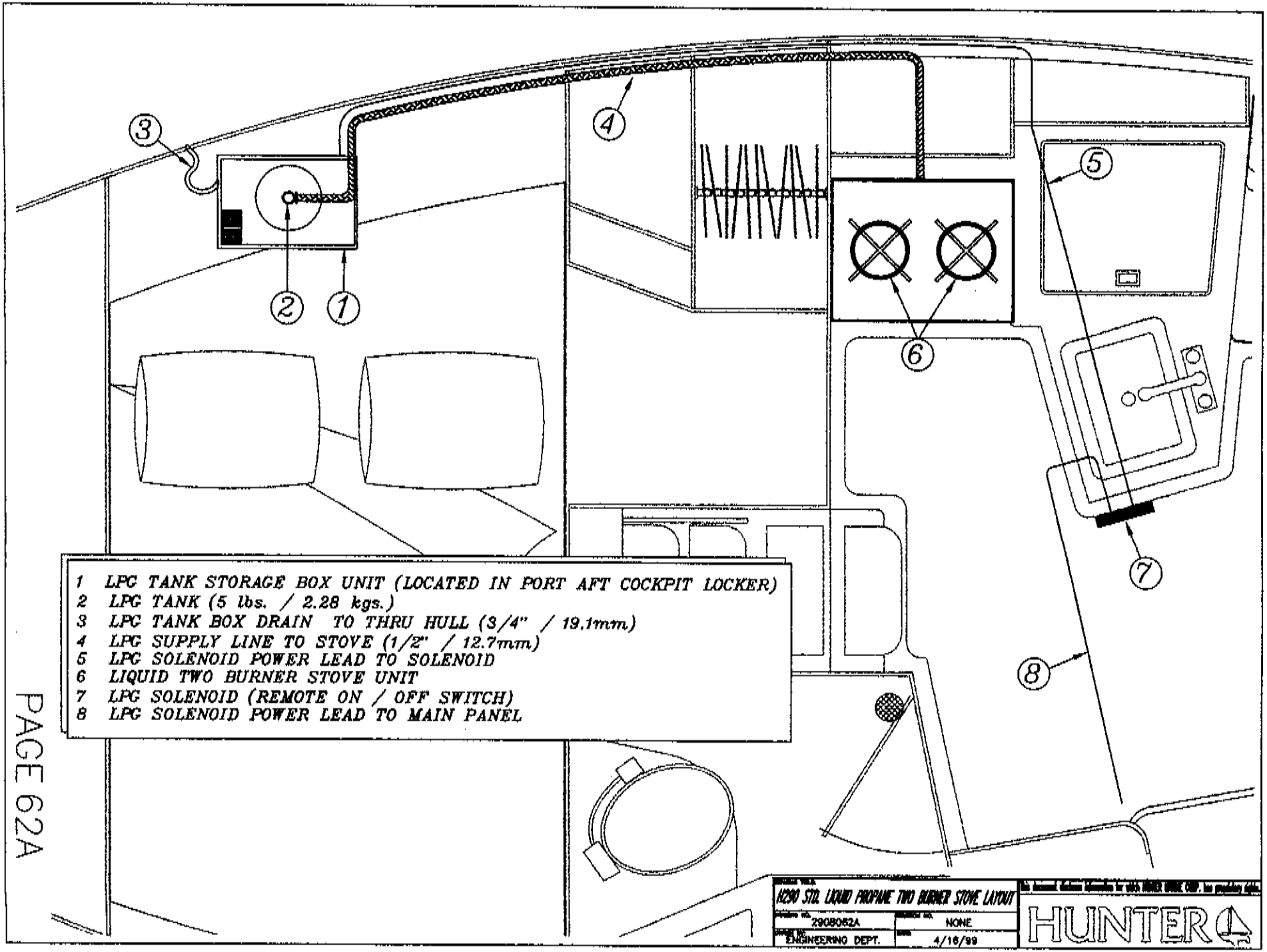


TYP. THRU-HULL W/ SEACOCK DETAIL

H290 TYP. THRU HULL/DECK FITTINGS
Drawing No. 290B060C
Revision No. NONE
Date 6/25/99
Approved By ENGINEERING DEPT.


GAUGE
E
F
16ga. WHITE
12 V. FROM BATTERY
TANK IND. SWITCH
(MAIN BREAKER PANEL)
16ga. BLACK
16ga. WHITE
18ga. BLUE
18ga. BLACK
VENDOR SUPPLIED
SENDING UNIT
SENDER LEAD TO TANK
FUEL TANK GAUGE WIRING DIAGRAM
1. PRIMARY ENGINE FUEL FILTER
2. ENGINE FUEL HOSE
3. DIESEL FILL (DECK FITTING)
4. DIESEL TANK VENT (HULL FITTING)
5. DIESEL FILL HOSE
6. DIESEL VENT HOSE
7. TANK SENDING UNIT
8. SECONDARY FUEL FILTER
FLOW DIRECTION
ELBOW
#6 CLAMP
FUEL FILTER
FWD
FUEL FILTER LOCATED ON AFT ENGINE ROOM BULKHEAD
20 GALLONS 76 LITERS
ENGINE FUEL PICKUP
= FUEL FEED LINE 5/16" (7.9 mm.)
= FUEL RETURN 5/16" (7.9 mm.)
= FUEL VENT HOSE 3/4" (19.1 mm.)
= FUEL FILL HOSE 1 1/2" (38.1 mm.)
= OVERSEAS/CHTR SPEC ALUM. TANK STATIC GND.
H290 ENGINE FUEL SYSTEM
2908061A
NONE
ENGINEERING DEPT
4/16/99
HUNTER


1. DIESEL FUEL TANK (20 GALLONS / 76 LITERS
2. FUEL FILL HOSE TO DECK FITTING (1 1/2" /38.1mm)
3. FUEL VENT HOSE TO DECK FITTING (5/8" /15.9mm)
4. DIESEL FUEL RETURN LINE (1/4" /6.4mm)
5. DIESEL FUEL FEED LINE (1/4" /6.4mm)
6. OVERSEAS/CHTR. SPEC ALUMINIUM TANK STATIC GUARD
7. PRIMARY FUEL FILTER.
8. SECONDARY FUEL FILTER @ ENGINE
9. (18 HP / 13.4 KW). DIESEL ENGINE
FILTER LOCATED ON AFT ENGINE ROOM BULKHEAD.
FILTER LOCATED ON STBD. SIDE OF ENGINE
H290 ENGINE FUEL LINE RUNS AND COMPONENTS
2908061B
NONE
ENGINEERING DEPT.
4/15/99
HUNTER

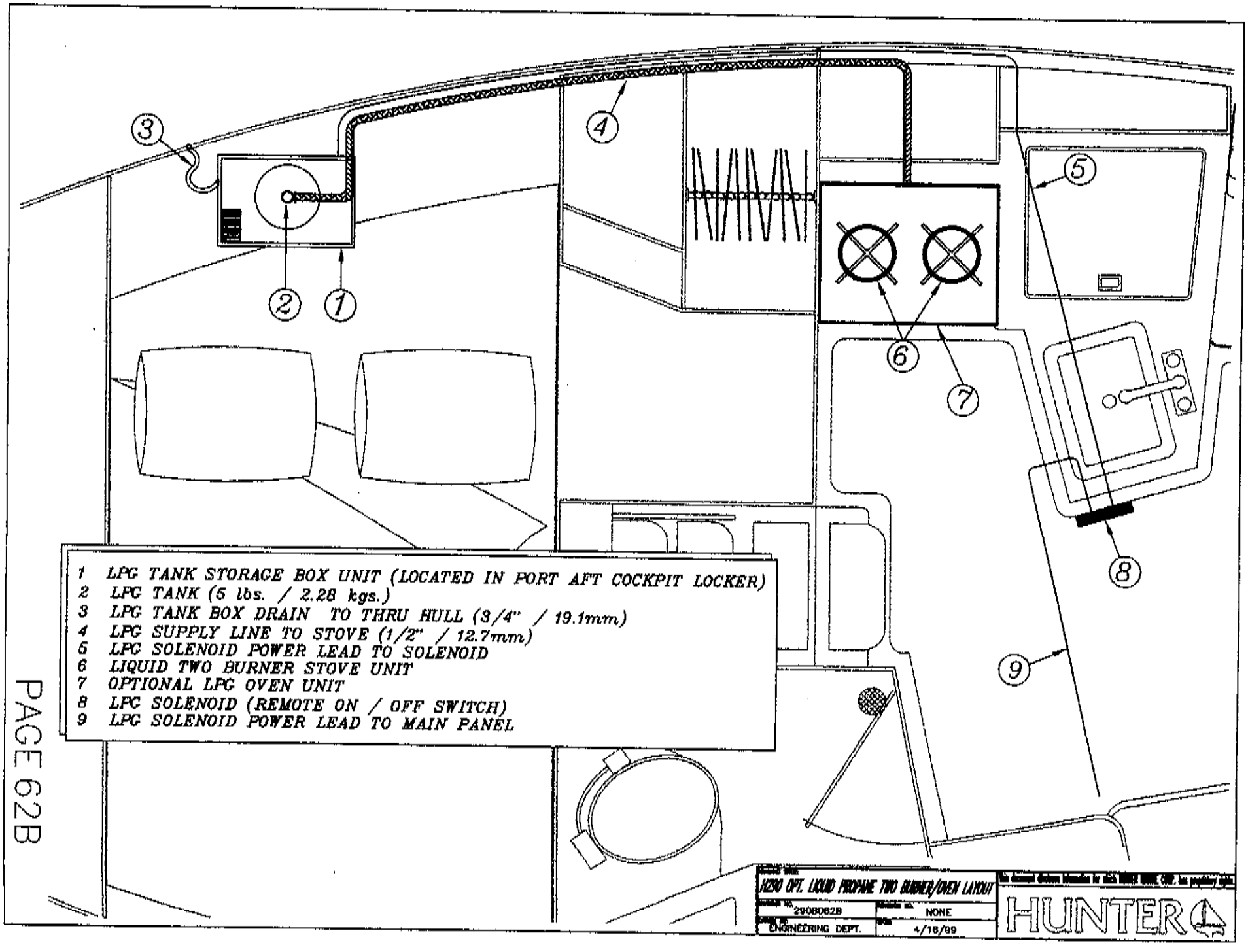


1 LPG TANK STORAGE BOX UNIT (LOCATED IN PORT AFT COCKPIT LOCKER)
2 LPG TANK (5 lbs. / 2.28 kgs.)
3 LPG TANK BOX DRAIN TO THRU HULL (3/4" / 19.1mm.)
4 LPG SUPPLY LINE TO STOVE (1/2" / 12.7mm)
5 LPG SOLENOID POWER LEAD TO SOLENOID
6 LIQUID TWO BURNER STOVE UNIT
7 LPG SOLENOID (REMOTE ON / OFF SWITCH)
8 LPG SOLENOID POWER LEAD TO MAIN PANEL

H290 STD. LIQUID PROPANE TWO BURNER STOVE LAYOUT

2908062A	NONE
ENGINEERING DEPT.	4/16/99

HUNTER

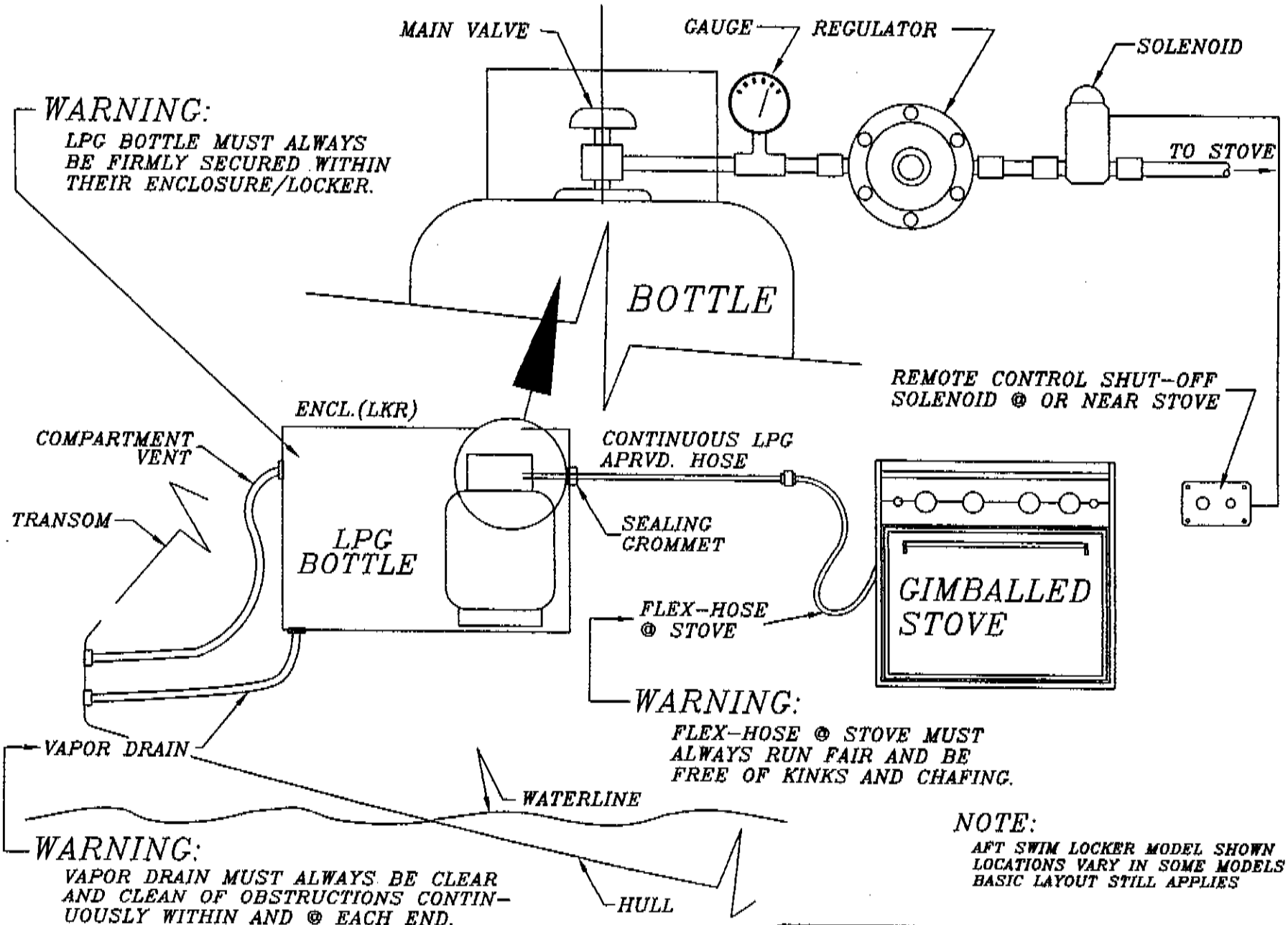


1 LPG TANK STORAGE BOX UNIT (LOCATED IN PORT AFT COCKPIT LOCKER)
2 LPG TANK (5 lbs. / 2.28 kgs.)
3 LPG TANK BOX DRAIN TO THRU HULL (3/4" / 19.1mm)
4 LPG SUPPLY LINE TO STOVE (1/2" / 12.7mm)
5 LPG SOLENOID POWER LEAD TO SOLENOID
6 LIQUID TWO BURNER STOVE UNIT
7 OPTIONAL LPG OVEN UNIT
8 LPG SOLENOID (REMOTE ON / OFF SWITCH)
9 LPG SOLENOID POWER LEAD TO MAIN PANEL

H290 OPT. LIQUID PROPANE TWO BURNER/OVEN LAYOUT

29080828	NONE
ENGINEERING DEPT.	4/16/99

HUNTER



PAGE 62C

H290 OPTIONAL L.P.G. SYSTEM LAYOUT

29080820	NONE
ENGINEERING DEPT.	4/15/99

HUNTER

NOTE TO CONSUMER

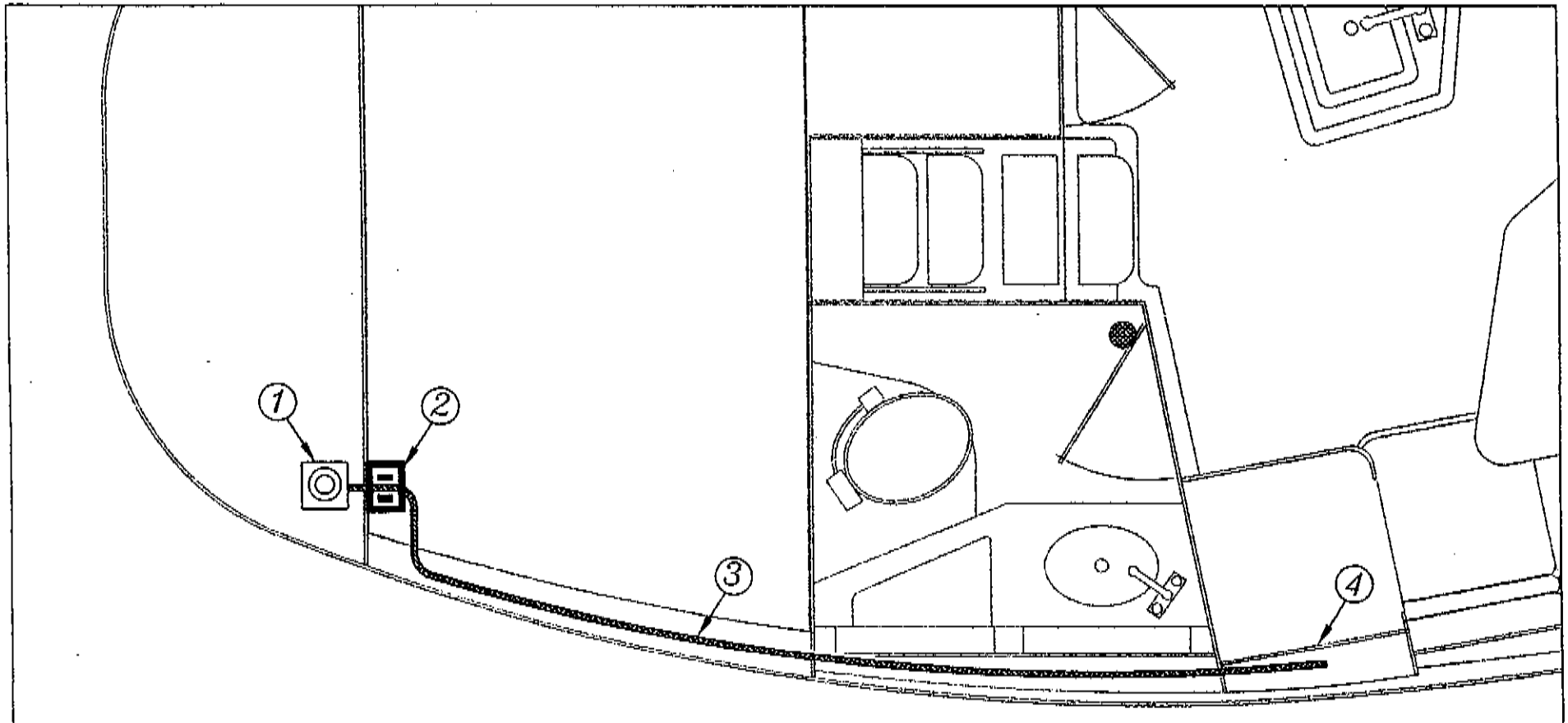
THE FOLLOWING PAGES PROVIDE DETAILED INFORMATION, SCHEMATICS ETC. PERTAINING TO THE H290 **STANDARD** ELECTRICAL SYSTEMS AS WELL AS THE **OPTIONAL** ELECTRICAL SYSTEMS.

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

H290 ELECTRICAL SYSTEM CONTENTS

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

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



1. SHORE POWER "A" POWER INLET (DECK FITTING)
2. 30 amp SHORE POWER RESET BREAKER (LOCATED IN STBD. AFT EURO LOCKER)
3. 10/3 BOAT CABLE SHORE POWER FEED
4. LOCATION OF MAIN BREAKER PANEL (NAV STATION)

H290 AC POWER HEADLINER WIRING SCHEMATIC	
2908083C	NONE
ENGINEERING DEPT.	5/20/99

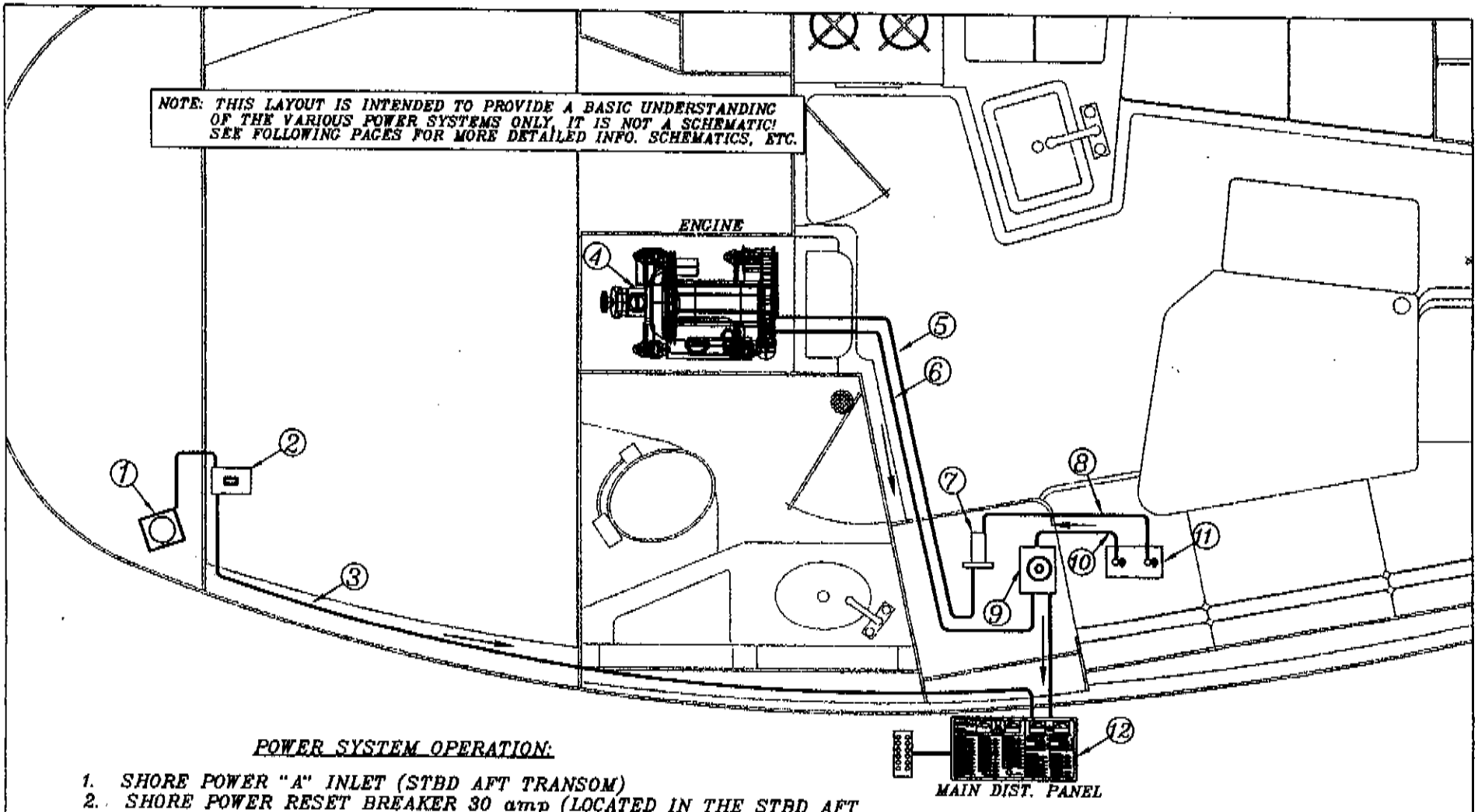
HUNTER

H290 POWER SYSTEMS OPERATION PROCEDURES

POWER SOURCE:	TO OPERATE:
(12V.)D.C. MAIN	1. TURN BATTERY SWITCH (LOCATED UNDER NAV STATION, AFT FACE OF SETTEE) 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 .**

H290 OPTIONAL BATTERY CHARGING SYSTEM OPERATION PROCEDURES

CHARGE SOURCE:	TO OPERATE:
OPT. 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 OPT. "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.**
ENGINE ALTERNATOR	1. CHECK SEA STRAINER & OPEN ENGINE RAW WATER SEACOCK. SEE PAGE 60A FOR LOCATION. 2. TURN BATTERY SELECTOR SWITCH TO THE #1, POSITION.** 3. START SHIP'S ENGINE (**FOLLOW STARTING INSTRUCTIONS IN THE "ENGINE MANUAL"**)



POWER SYSTEM OPERATION:

1. SHORE POWER "A" INLET (STBD AFT TRANSOM)
2. SHORE POWER RESET BREAKER 30 amp (LOCATED IN THE STBD AFT EUROLOCKER)
3. 110 V.A.C. SUPPLY LINE TO A.C. SIDE OF MAIN DISTRIBUTION PANEL
4. ENGINE
5. ENGINE ALTERNATOR GROUND TO BUSS BAR
6. ENGINE ALTERNATOR LEAD TO BATTERY ON / OFF SWITCH
7. GROUNDING STUD
8. START BATTERY GROUND TO GROUNDING STUD
9. BATTERY ON / OFF SWITCH (LOCATED BELOW CHART TABLE)
10. START BATTERY LEAD TO BATTERY ON / OFF SWITCH
11. START BATTERY
12. MAIN DISTRIBUTION PANEL (LOCATED @ CHART TABLE)

= BATTERY SELECTOR SWITCHES

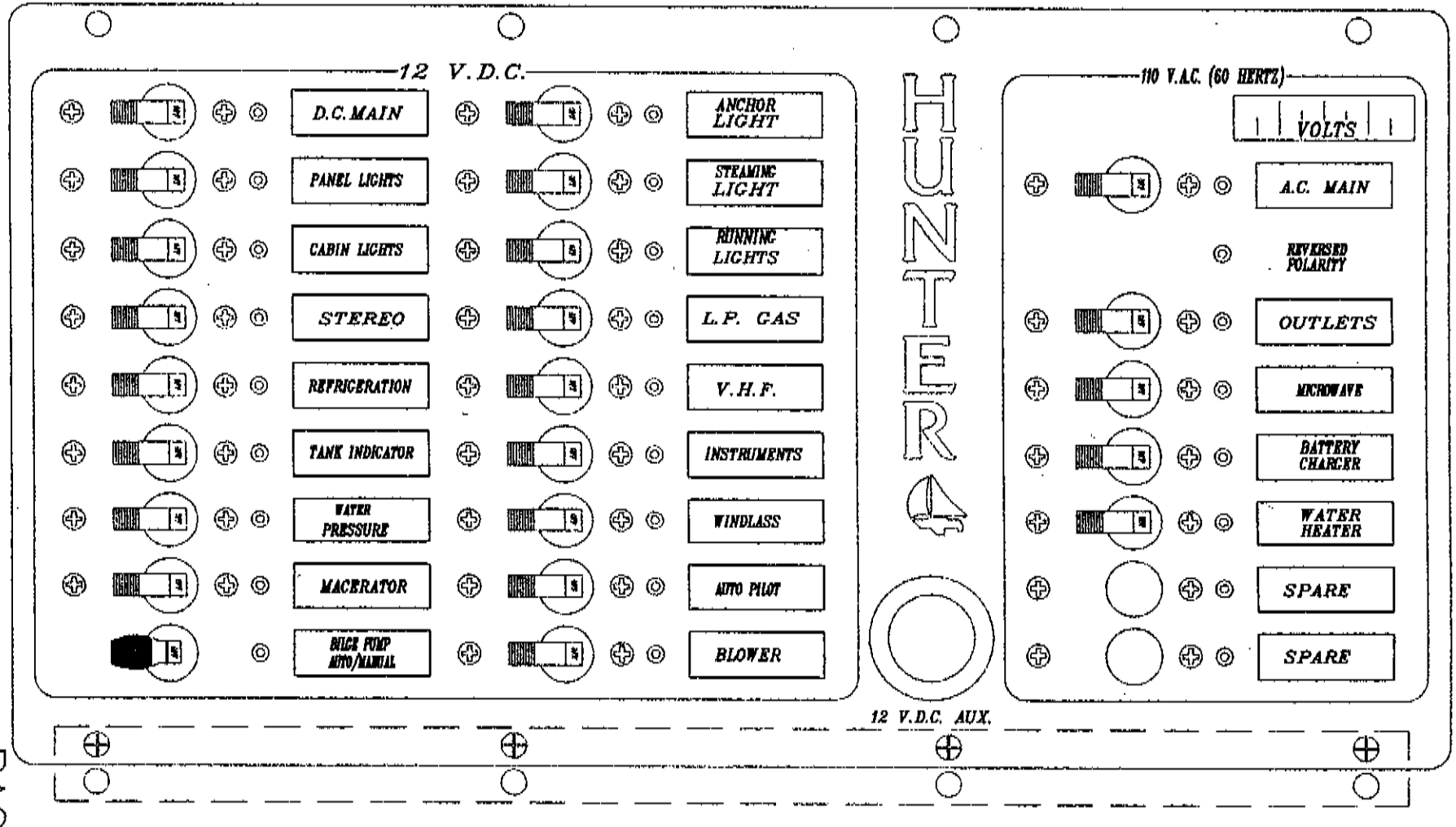
= POWER FLOW DIRECTION

= 12 V.D.C.

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

H290 BASIC POWER SYSTEM LAYOUT	
2908063A-3	NONE
ENGINEERING DEPT.	5/18/99

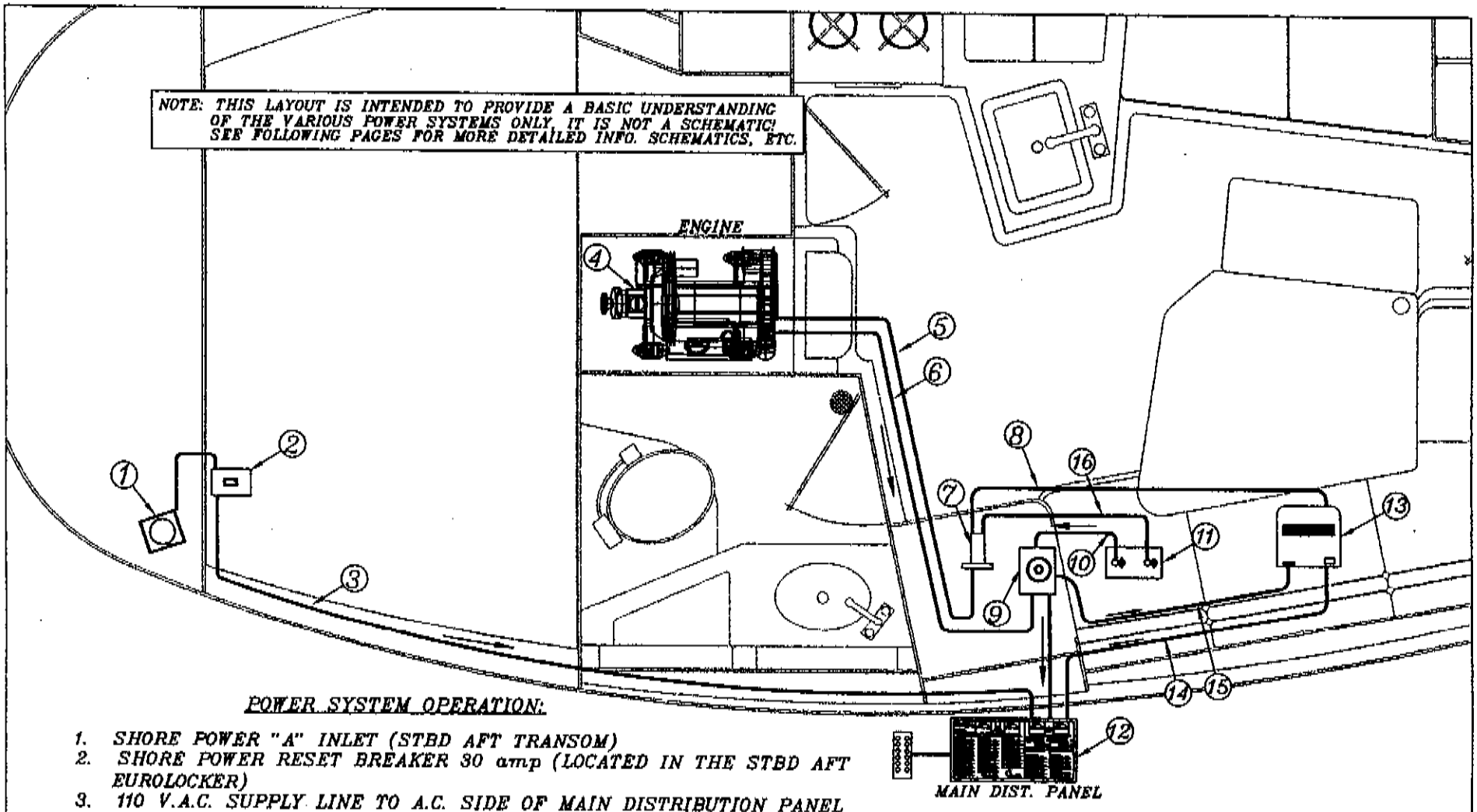
HUNTER



PAGE 63A-4

H290 MAIN DISTRIBUTION PANEL LAYOUT	
29080634-4	NONE
ENGINEERING DEPT.	5/5/99

HUNTER



POWER SYSTEM OPERATION:

1. SHORE POWER "A" INLET (STBD AFT TRANSOM)
2. SHORE POWER RESET BREAKER 30 amp (LOCATED IN THE STBD AFT EUROLOCKER)
3. 110 V.A.C. SUPPLY LINE TO A.C. SIDE OF MAIN DISTRIBUTION PANEL
4. ENGINE
5. ENGINE ALTERNATOR LEAD TO GROUNDING STUD
6. ENGINE ALTERNATOR LEAD TO BATTERY ON / OFF SWITCH
7. GROUNDING STUD
8. START BATTERY GROUND TO GROUNDING STUD
9. BATTERY ON / OFF SWITCH (LOCATED BELOW CHART TABLE)
10. START BATTERY LEAD TO BATTERY ON / OFF SWITCH
11. START BATTERY
12. MAIN DISTRIBUTION PANEL (LOCATED @ CHART TABLE)
13. OPTIONAL BATTERY CHARGER
14. OPTIONAL BATTERY CHARGER LEAD TO MAIN DISTRIBUTION PANEL
15. OPTIONAL BATTERY CHARGER LEAD TO BATTERY ON / OFF SWITCH
16. OPTIONAL BATTERY CHARGER LEAD TO GROUNDING STUD

= BATTERY SELECTOR SWITCHES

= POWER FLOW DIRECTION

= 12 V.D.C.

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

H290 BASIC CHARGING SYSTEM LAYOUT	
29080634-5	NONE
ENGINEERING DEPT.	5/18/99

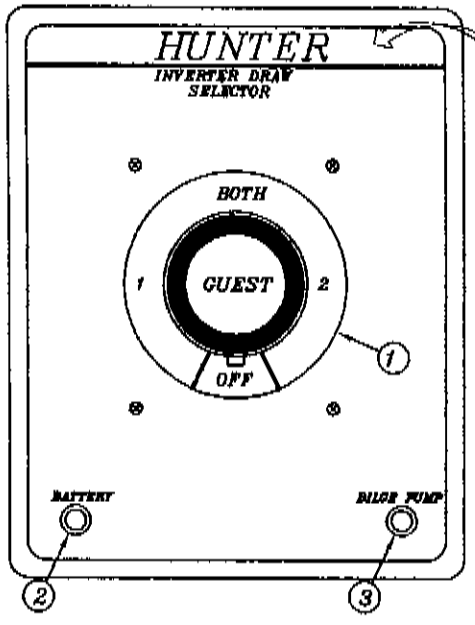
HUNTER

H290 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.
PANEL LIGHTS	SUPPLIES POWER TO THE BACK LIGHTING ON THE MAIN DISTRIBUTION 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 PORT 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 IN THE COMPANIONWAY(PT SIDE). (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 BEHIND THE AFT STATEROOM BUNK) **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)**
BLOWER	SUPPLIES POWER TO ENGINE BOX BLOWER (LOCATED INSIDE ENGINE COMPARTMENT) AIDS IN COMPT VENTILATION
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	PROVIDES A.C. POWER TO THE OUTLETS IN THE AFT STATEROOM ,GALLEY , HEAD AND NAV. STATION
OUTLETS NOTE:	NOTE: NO OUTLET PROVIDED IN HEAD ON SELECT 220 V. MODELS. G.F.C.I. (GROUND FAULT CIRCUIT INTERRUPTER) OUTLETS ARE PROVIDED IN THE HEAD. THE G.F.C.I. OUTLET PROTECTS ALL THE OUTLETS ON THE PORT AND STBD SIDES OF THE BOAT THE RED (RESET) BUTTON RESTORES POWER TO THE OUTLETS ON 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 63A-10 FOR DETAILS)
MICROWAVE	SUPPLIES POWER TO OUTLET BEHIND MICRO. IN WHICH MICROWAVE IS PLUGGED INTO.
SPARE	THIS SPACE PROVIDED FOR AN ADDITIONAL BREAKER IF DESIRED
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

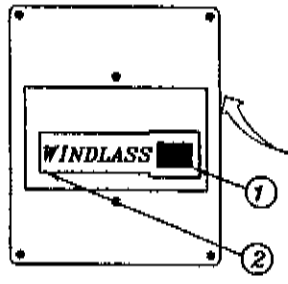
BATTERY ON / OFF SELECTOR SWITCH



1. BATTERY SELECTOR SWITCH. ENABLES DRAW FROM EITHER BATTERY #1, BATTERY #2 (NOT PROVIDED) OR BOTH
2. BATTERY RESET BREAKER
3. BILGE PUMP RESET BREAKER

NOTE: (SWITCH LOCATED BELOW NAV STATION ON AFT FACE OF SETTEE)

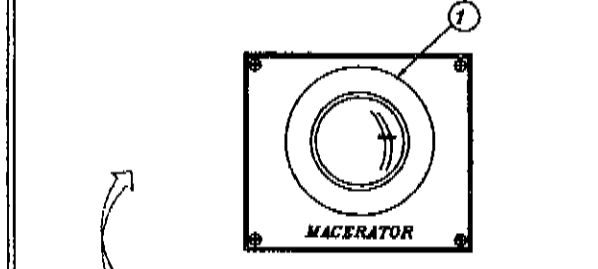
LOCATED BELOW THE CHART TABLE ON THE AFT FACE OF THE NAV SEAT



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

NOTE: WINDLASS PANEL SUPPLIES POWER TO THE WINDLASS MOTOR. THE "WINDLASS BREAKER" ON THE DC MAIN DISTRIBUTION PANEL, SUPPLIES POWER TO THE UP/DOWN CONTROLS IN THE ANCHORWELL LOCKER.

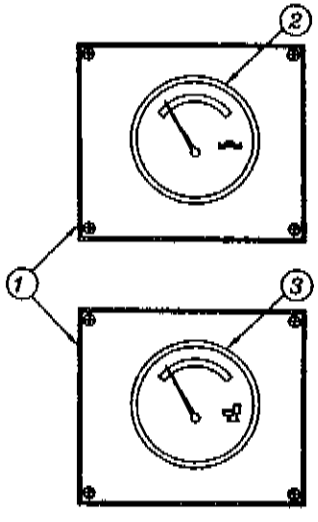
LOCATED BELOW THE CHART TABLE



1. MACERATOR MOMENTARY SWITCH LOCATED @ NAV STATION (SEE PAGE 68B FOR OPERATING DETAILS)

LOCATED AT MAIN ELECTRICAL PANEL (BELOW TANK GAUGES)

1. WASTE / WATER TANK LEVEL DISPLAYS (LOCATED @ AFT END OF UPPER NAV STATION)
2. WATER TANK LEVEL GAUGE
3. WASTE TANK LEVEL GAUGE



LOCATED AT MAIN ELECTRICAL PANEL

NOTE: THE FUEL TANK LEVEL GAUGE IS LOCATED @ THE COCKPIT CONSOLE

PAGE 63A-7

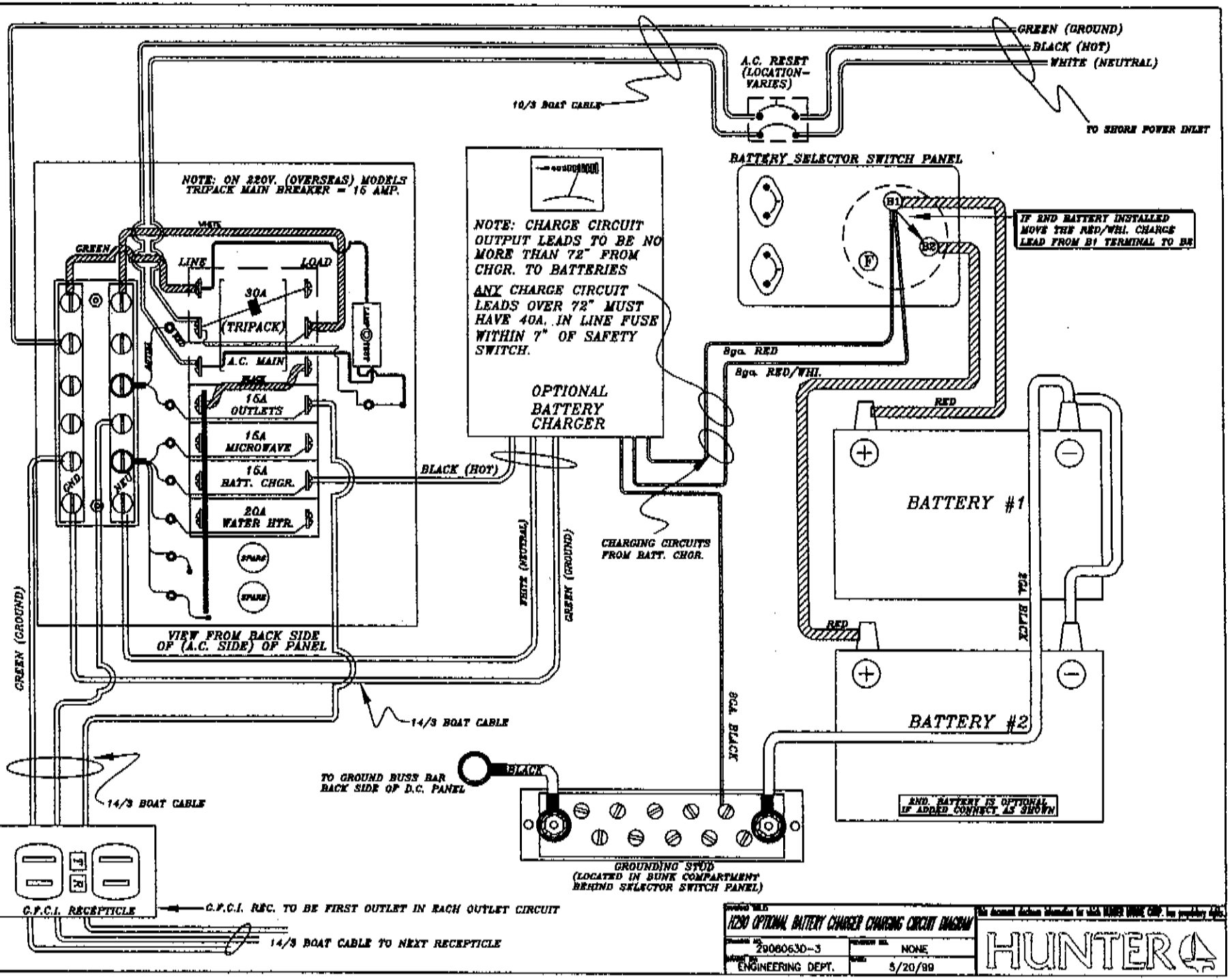
H290 NAV SWITCH PANELS	
290863A-7	NONE
ENGINEERING DEPT.	5/18/99

H290 *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?
PANEL LIGHTS	WON'T ILLUMINATE	SEE "TO POWER PANEL" ABOVE (BULB/S / L.E.D.S) NEED REPLACING?
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?
BLOWER	WON'T OPERATE PUMP MAKES NOISE, DOESN'T PUMP PUMP RUNS BUT DOESN'T DISCHARGE	BATTERY LEVEL O.K.? CHECK BREAKER @ MAIN DISTRIBUTION PANEL BATTERY CONNECTIONS GOOD? DEBRIS IN PUMP IMPELLER? DISCHARGE HOSE CLOGGED?

NOTE: COMPONENT/S FAILURE COULD ALSO BE THE RESULT OF A POOR "GROUND" CONNECTION. GROUND BUSS BARS ARE LOCATED IN THE BUNK COMPARTMENT BEHIND THE SELECTOR SWITCH PANEL. DUE TO VIBRATION, WEATHER CONDITIONS, ETC. OCCASIONAL INSPECTION, CLEANING AND TIGHTENING OF THESE TERMINALS (BY QUALIFIED PERSONELL) MAY BE NECESSARY.



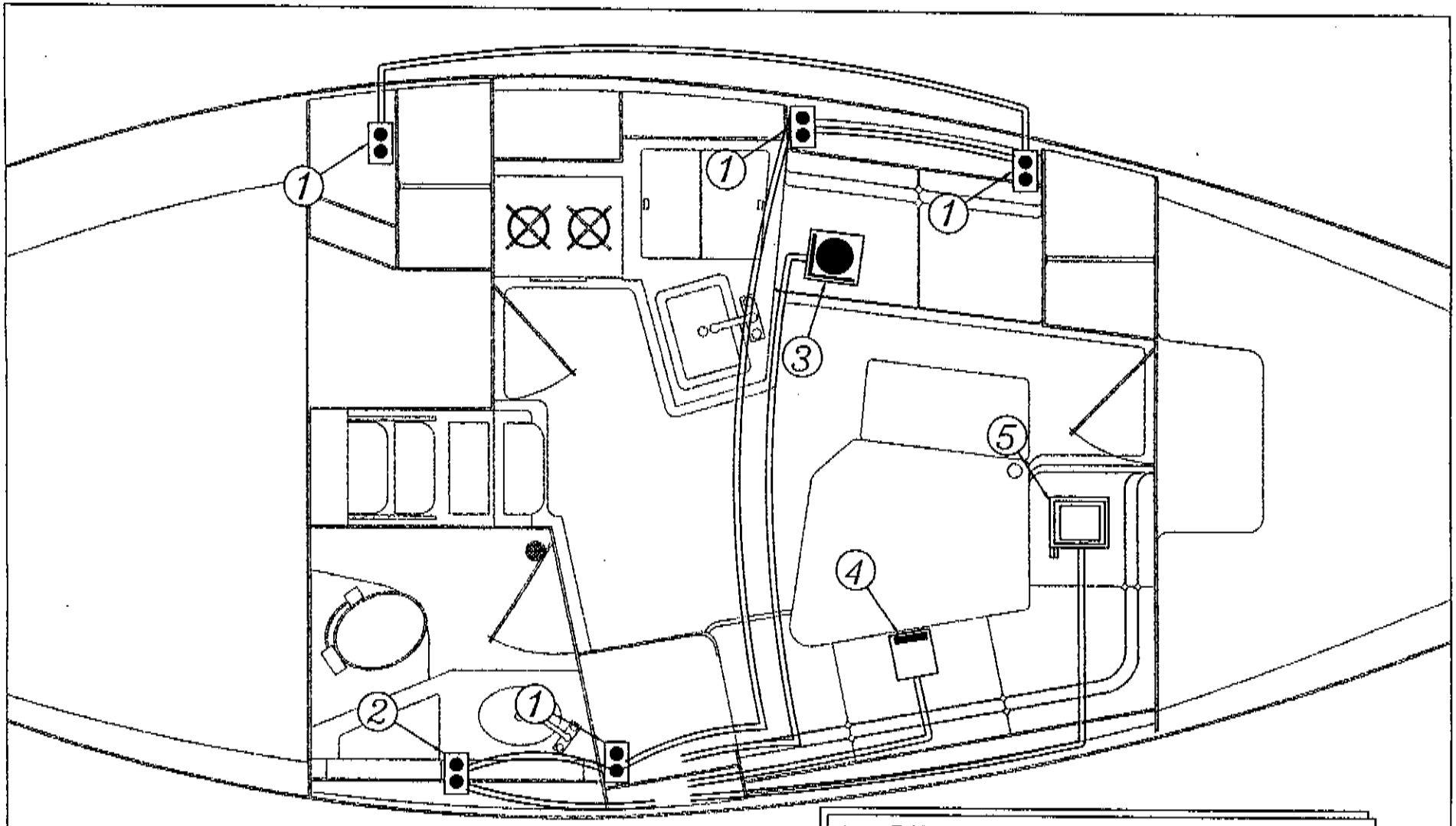
1230 OPTIONAL BATTERY CHARGER CHARGING CIRCUIT DIAGRAM

29080630-3	NONE
ENGINEERING DEPT.	5/20/99

HUNTER

H290 110V.A.C. (220V. OVERSEAS MODELS) SYSTEM TROUBLESHOOTING GUIDE

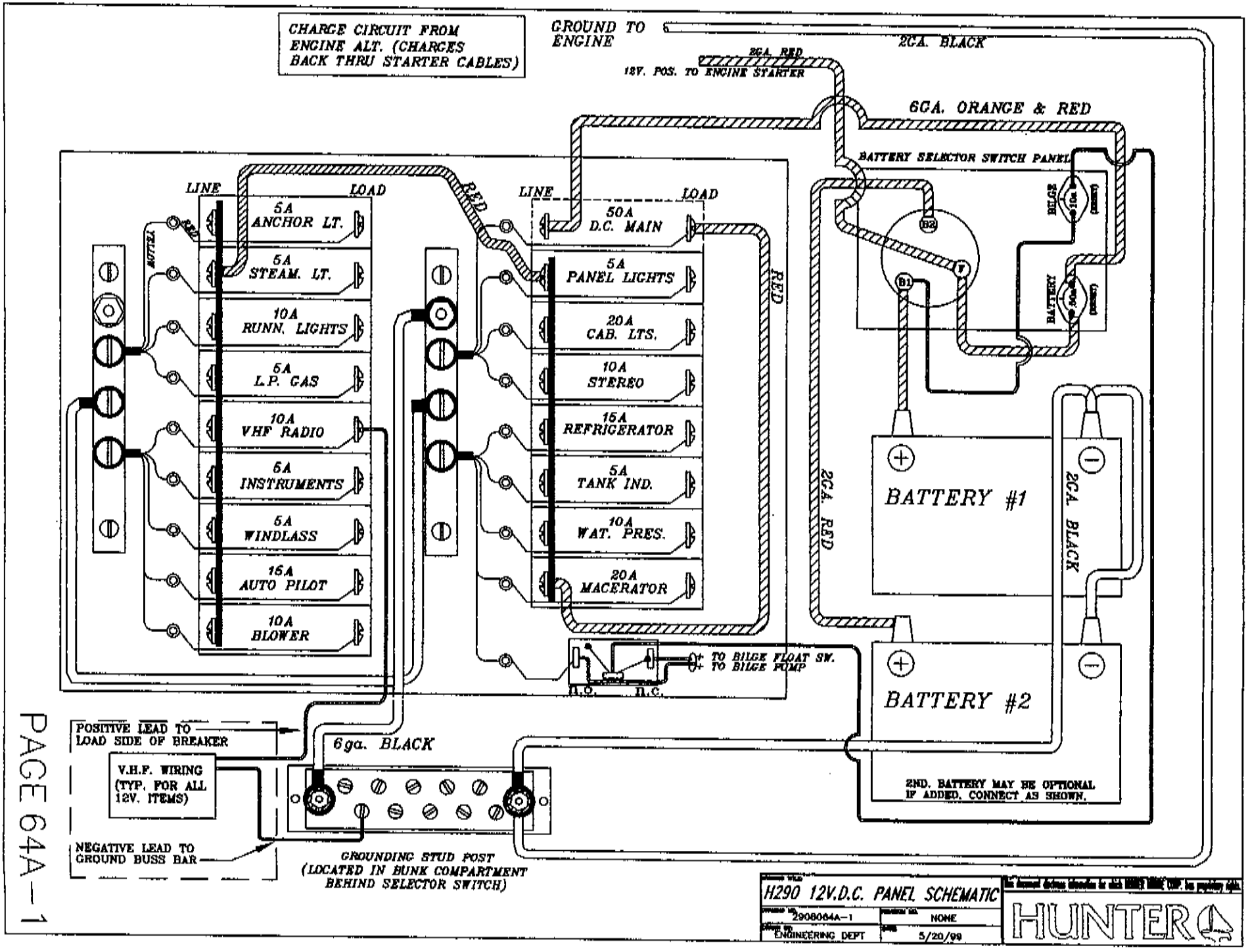
COMPONENT	SYMPTOM	POSSIBLE SOLUTION/S
A.C. MAIN (SHORE POWER)	NO POWER TO PANEL	SEE TO POWER PANEL ABOVE
OUTLETS	NO POWER	SEE TO POWER PANEL ABOVE IS OUTLET BREAKER/S ON? CHECK RESET (RED BUTTON) ON G.F.C.I. OUTLETS AT GALLEY AND Q-BERTH
WATER HEATER	NO POWER	SEE TO POWER PANEL ABOVE IS BREAKER ON?
	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)
OPT. 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"
ALTERNATOR	NOT CHARGING BATTERY/S	CHECK CONNECTIONS AND/OR SEE "ENGINE" MANUAL
MICROWAVE		SEE TO POWER PANEL ABOVE IS BREAKER ON? IS MICROWAVE ON? SEE "MICROWAVE MANUAL"



1. POWER OUTLETS
2. G.F.I. OUTLETS
3. REFRIGERATION COMPRESSOR UNIT
4. OPTIONAL BATTERY CHARGER
5. WATER HEATER

H290 AC POWER PAN WIRING SCHEMATIC	
NO. 29080838	REVISION NO. NONE
DRAWN BY ENGINEERING DEPT.	DATE 5/20/98

HUNTER

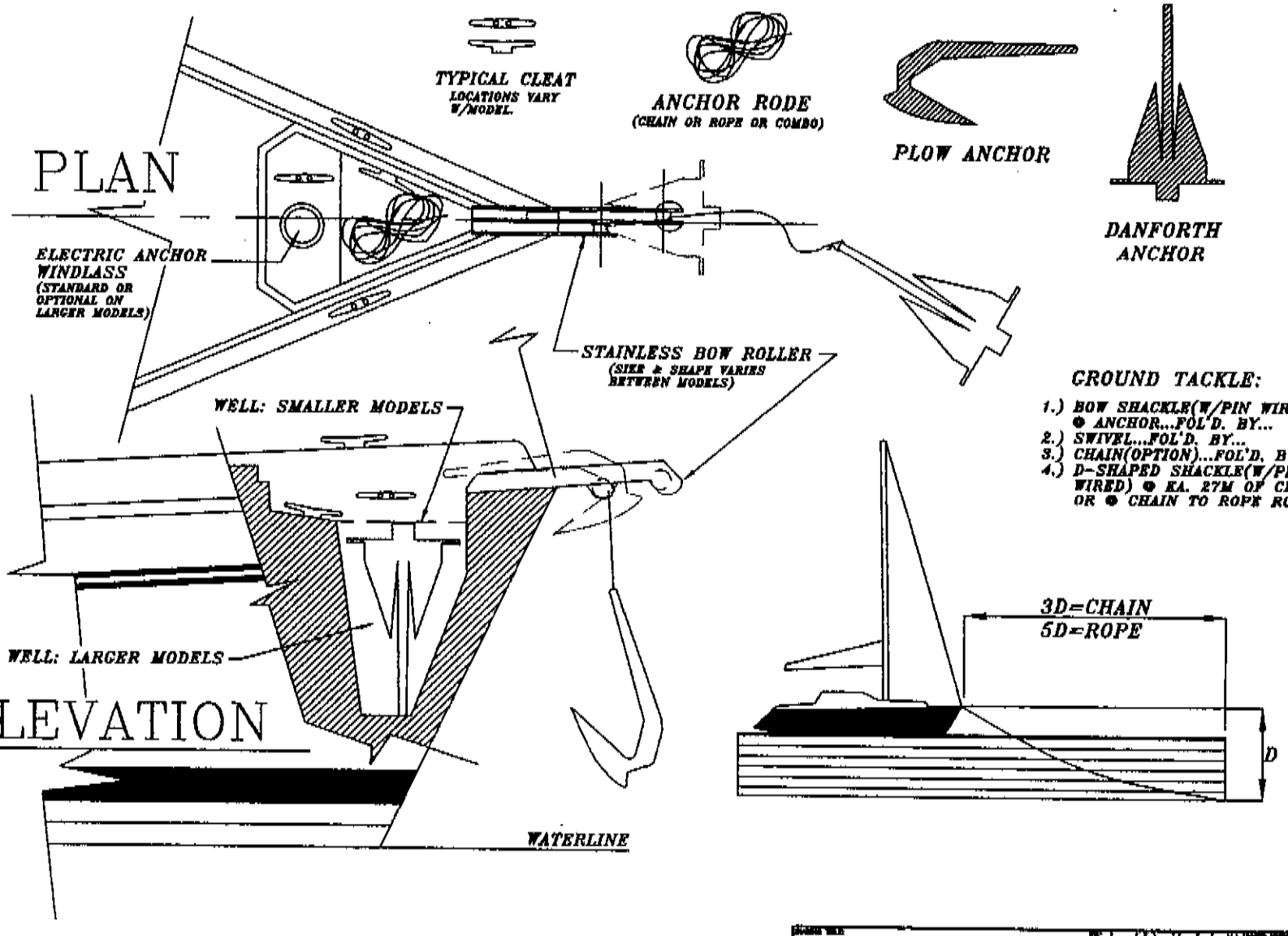


PAGE 64A-1

H290 12V.D.C. PANEL SCHEMATIC

2908064A-1	NONE
ENGINEERING DEPT	5/20/99

HUNTER



PAGE 70

H290 BASIC ANCHORING DIAGRAM	
2908070	NONE
ENGINEERING DEPT.	4/16/99

HUNTER

SECTION 63C...OPTIONAL BATTERY CHARGING SYSTEM

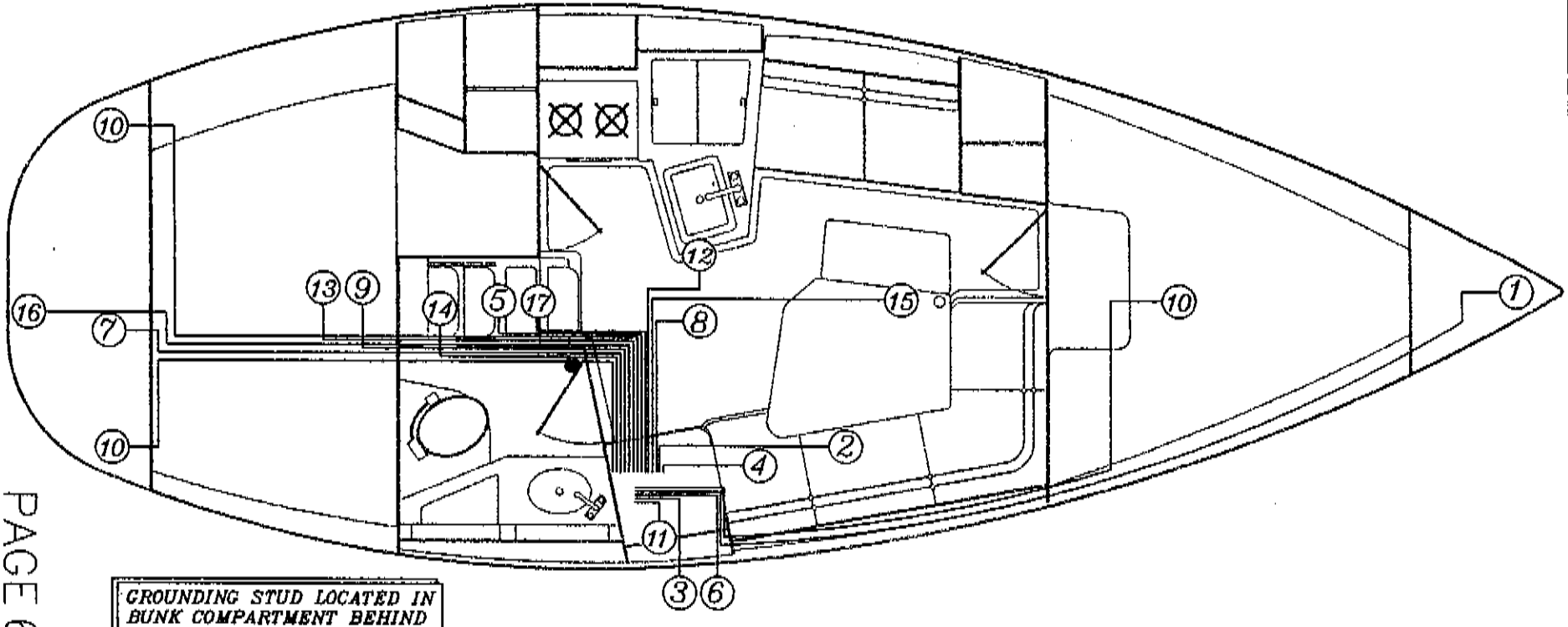
BASIC OPERATING INSTRUCTIONS:

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.

H290 OPTIONAL BATTERY CHARGING SYSTEM OPERATING INSTRUCTION
280863D-1
NONE
ENGINEERING DEPT.
5/20/99
HUNTER

1. OPTIONAL WINDLASS
2. OPTIONAL BATTERY CHARGER
3. PANEL GROUND TO GRND. STUD
4. START BATTERY
5. ENGINE GROUND TO GRND. STUD
6. CABIN LIGHTS
7. MACERATOR
8. BILGE PUMP
9. OPTIONAL AUTO PILOT
10. TANK SENDING UNITS
11. STEREO
12. OPTIONAL LPG SOLENOID
13. INSTRUMENTS
14. VHF RADIO
15. ANCHOR/STEAMING/DECK/RUNNING LIGHTS (TERMINAL STRIP LOCATED ATOP COMPRESSION POST)
16. STERN LIGHT
17. ENGINE COMPARTMENT BLOWER

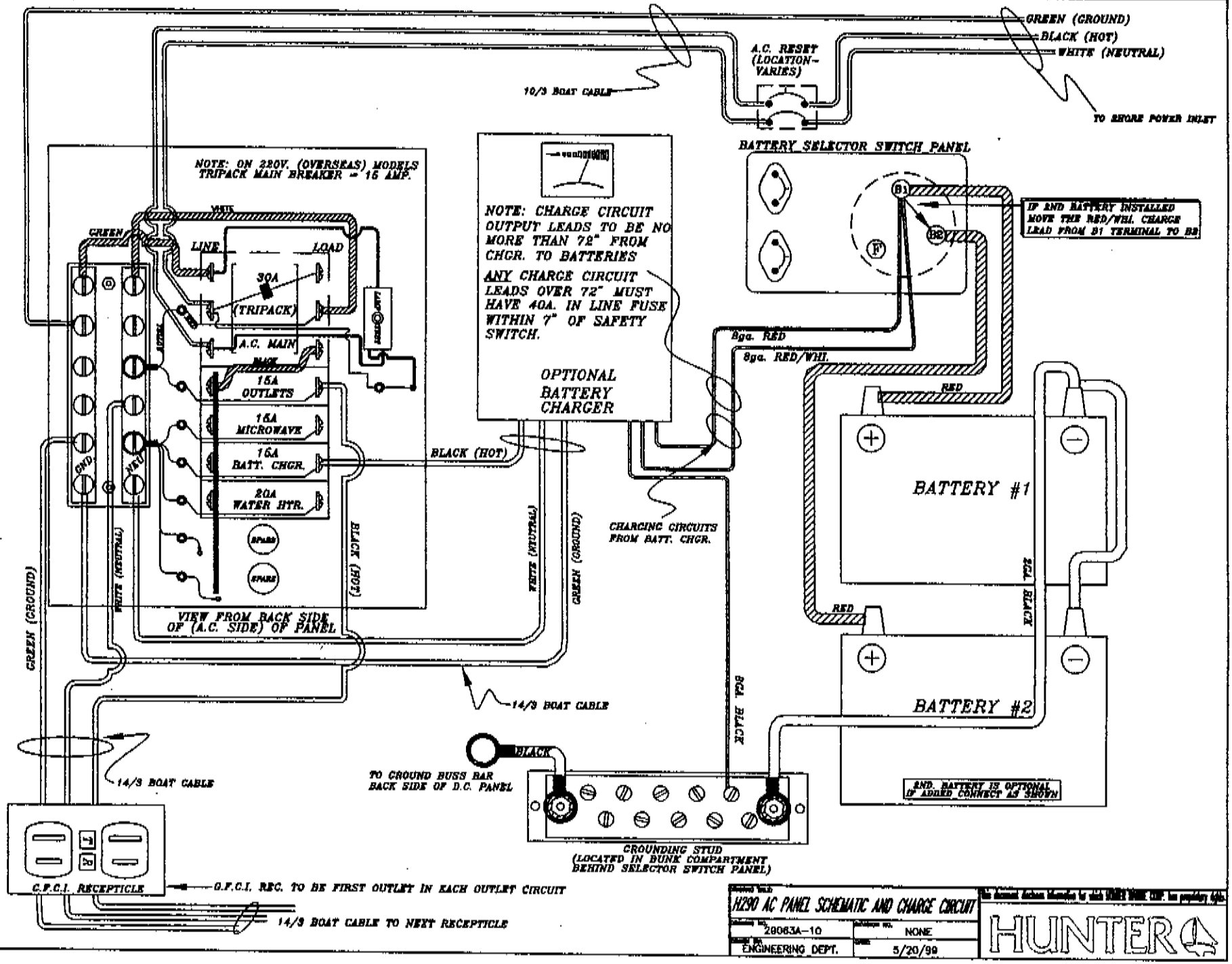


GROUNDING STUD LOCATED IN BUNK COMPARTMENT BEHIND SELECTOR SWITCH PANEL

PAGE 64A-2

H290 D.C. GROUNDING SYSTEM LAYOUT	
2906064A-2	NONE
ENGINEERING DEPT.	5/20/98

HUNTER

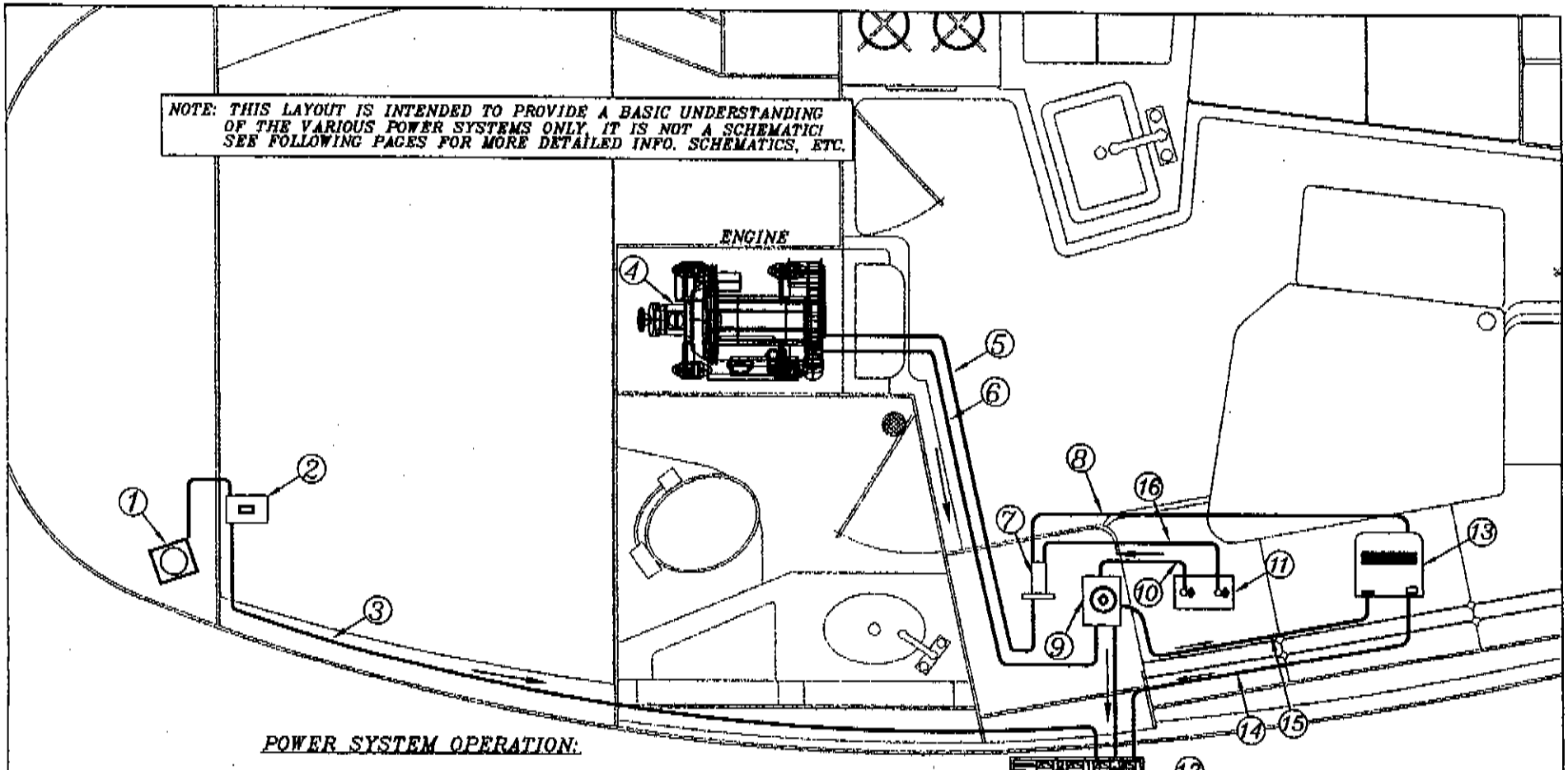


H290 AC PANEL SCHEMATIC AND CHARGE CIRCUIT

28063A-10	NONE
ENGINEERING DEPT.	5/20/99

HUNTER

PAGE 63A-10



POWER SYSTEM OPERATION:

1. SHORE POWER "A" INLET (STBD AFT TRANSOM)
2. SHORE POWER RESET BREAKER 30 amp (LOCATED IN THE STBD AFT EUROLOCKER)
3. 110 V.A.C. SUPPLY LINE TO A.C. SIDE OF MAIN DISTRIBUTION PANEL
4. ENGINE
5. ENGINE ALTERNATOR LEAD TO GROUNDING STUD
6. ENGINE ALTERNATOR LEAD TO BATTERY ON / OFF SWITCH
7. GROUNDING STUD
8. START BATTERY GROUND TO GROUNDING STUD
9. BATTERY ON / OFF SWITCH (LOCATED BELOW CHART TABLE)
10. START BATTERY LEAD TO BATTERY ON / OFF SWITCH
11. START BATTERY
12. MAIN DISTRIBUTION PANEL (LOCATED @ CHART TABLE)
13. OPTIONAL BATTERY CHARGER
14. OPTIONAL BATTERY CHARGER LEAD TO MAIN DISTRIBUTION PANEL
15. OPTIONAL BATTERY CHARGER LEAD TO BATTERY ON / OFF SWITCH
16. OPTIONAL BATTERY CHARGER LEAD TO GROUNDING STUD

= BATTERY SELECTOR SWITCHES

= POWER FLOW DIRECTION

= 12 V.D.C.

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

H290 OPTIONAL BATTERY CHARGER SYSTEM LAYOUT		HUNTER
29080630-2	NONE	
ENGINEERING DEPT.	8/23/99	

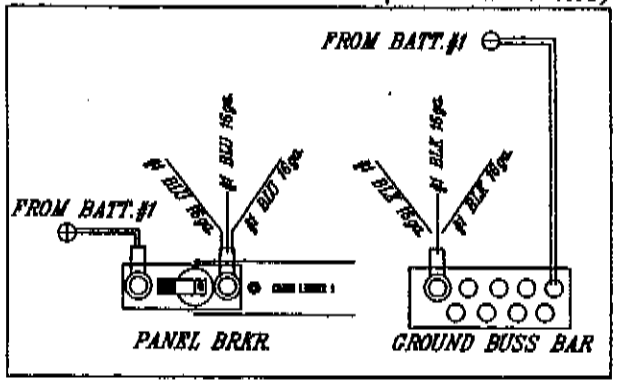
SWIVEL LIGHTS

DOME LIGHTS

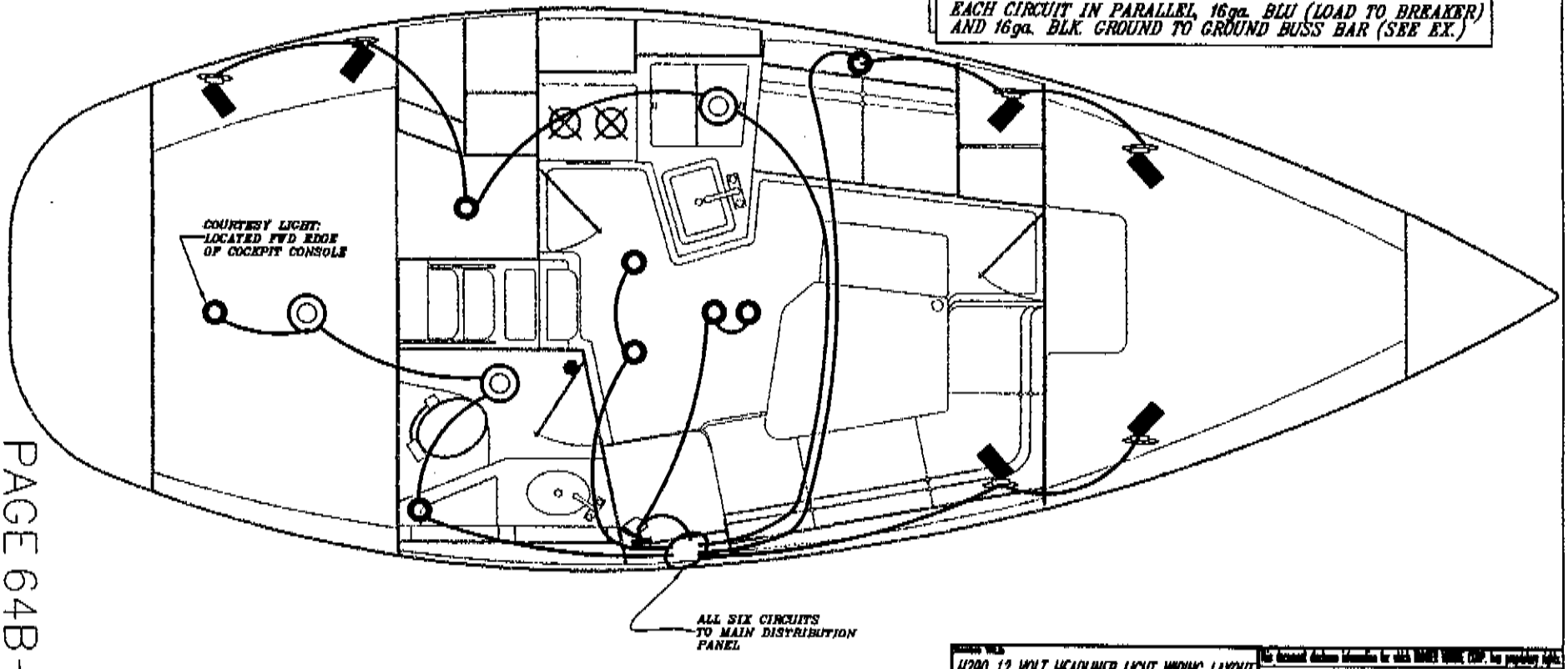
RECESSED LIGHTS

NAV STATION MAP LIGHT

EXAMPLE SWITCH PANEL WIRING (PARALLEL CIRCUITS)



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

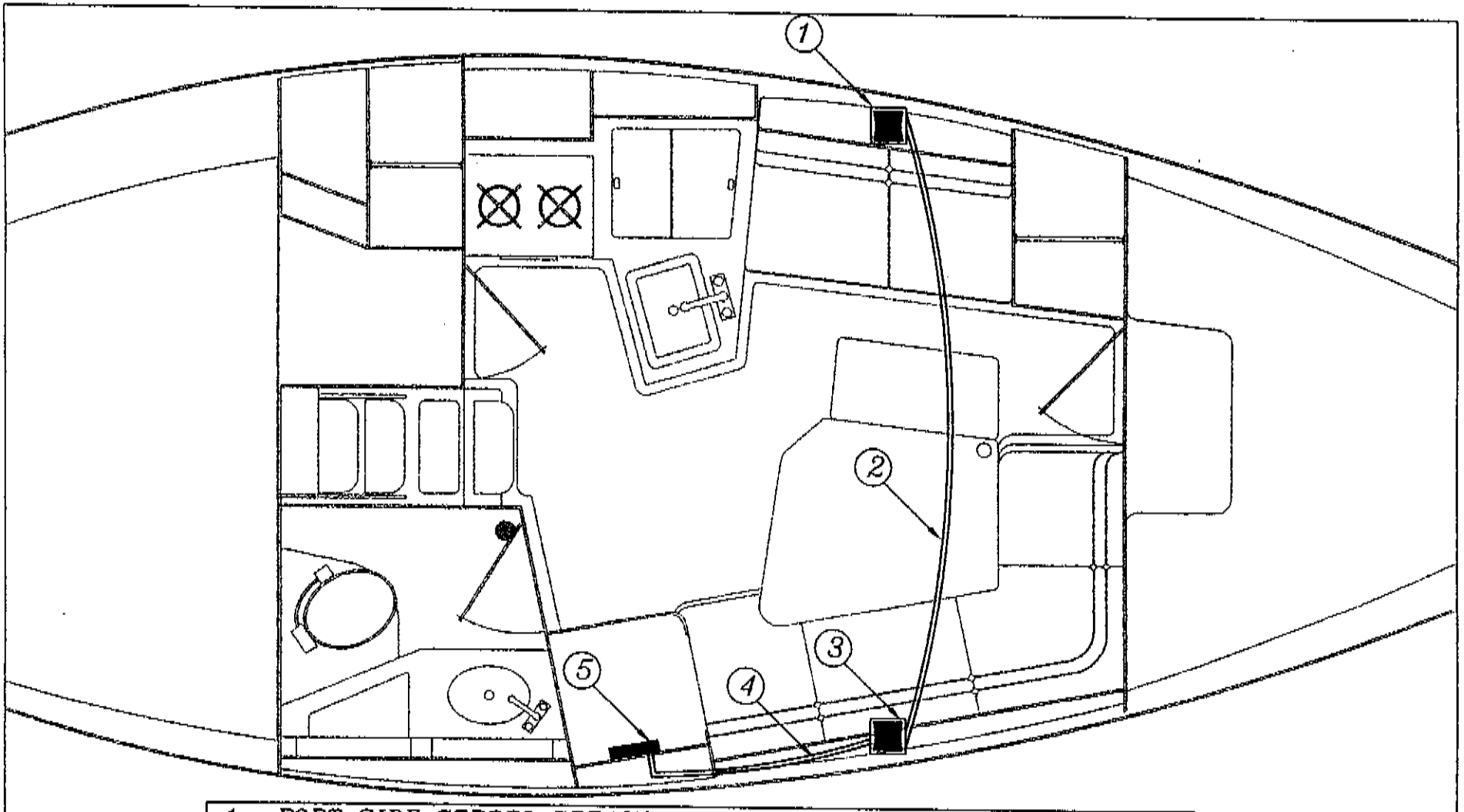


PAGE 64B-1

H290 12 VOLT HEADLINER LIGHT WIRING LAYOUT

29080648-1	NONE
ENGINEERING DEPT.	5/20/98

HUNTER



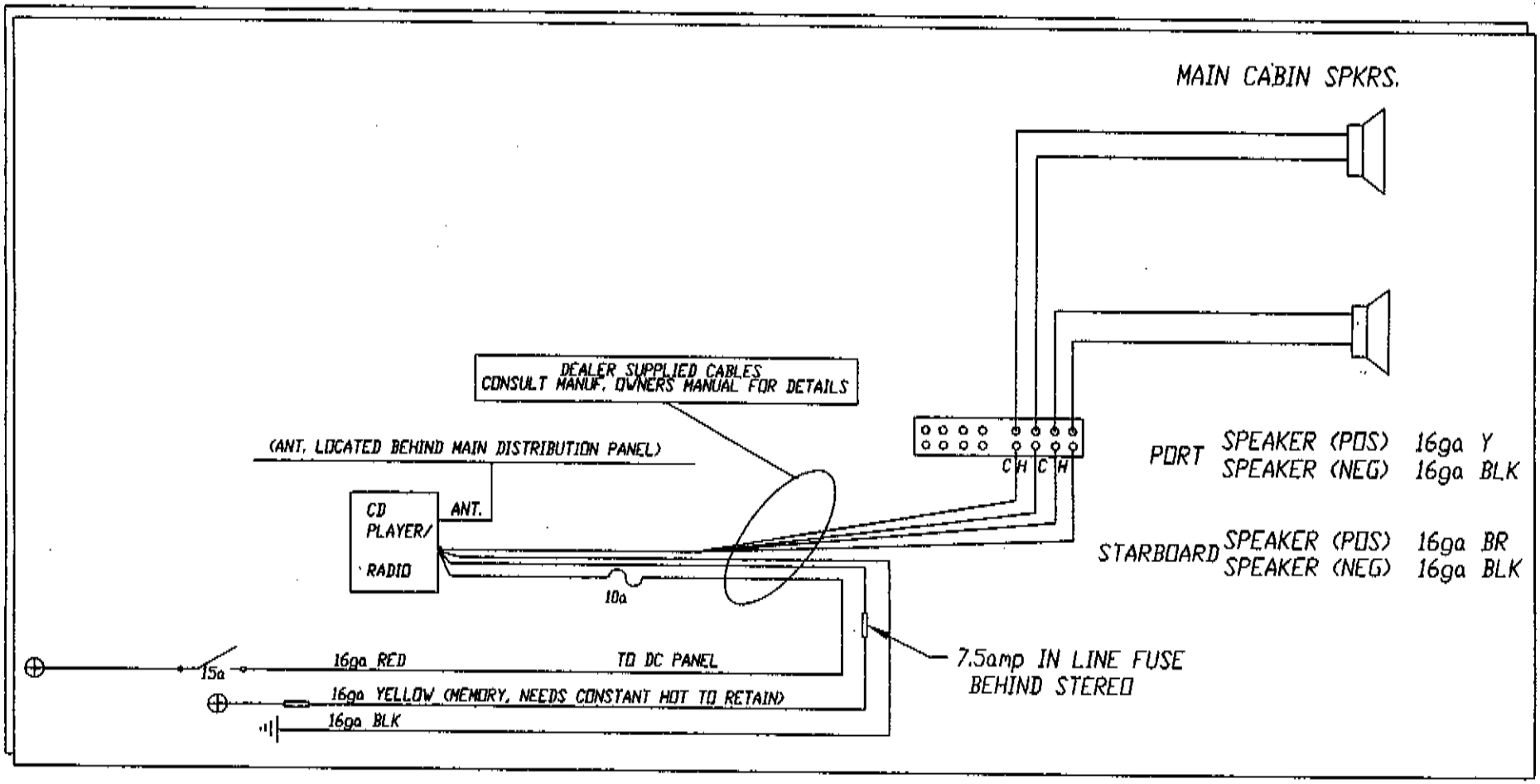
1. PORT SIDE STEREO SPEAKER
2. STEREO SPEAKER WIRE (RUNS THRU CHASE TUBE IN HEADLINER)
3. STBD. SIDE STEREO SPEAKER
4. SPEAKER WIRE RUN TO STEREO RECEIVER UNIT
5. AM/FM/CD STEREO RECEIVER (LOCATED @ NAV STATION)

NOTE: SEE FOLLOWING PAGE FOR SPEAKER WIRING SCHEMATIC.

H290 SPEAKER HEADLINER WIRING

2908064B-2	NONE
ENGINEERING DEPT.	5/20/98

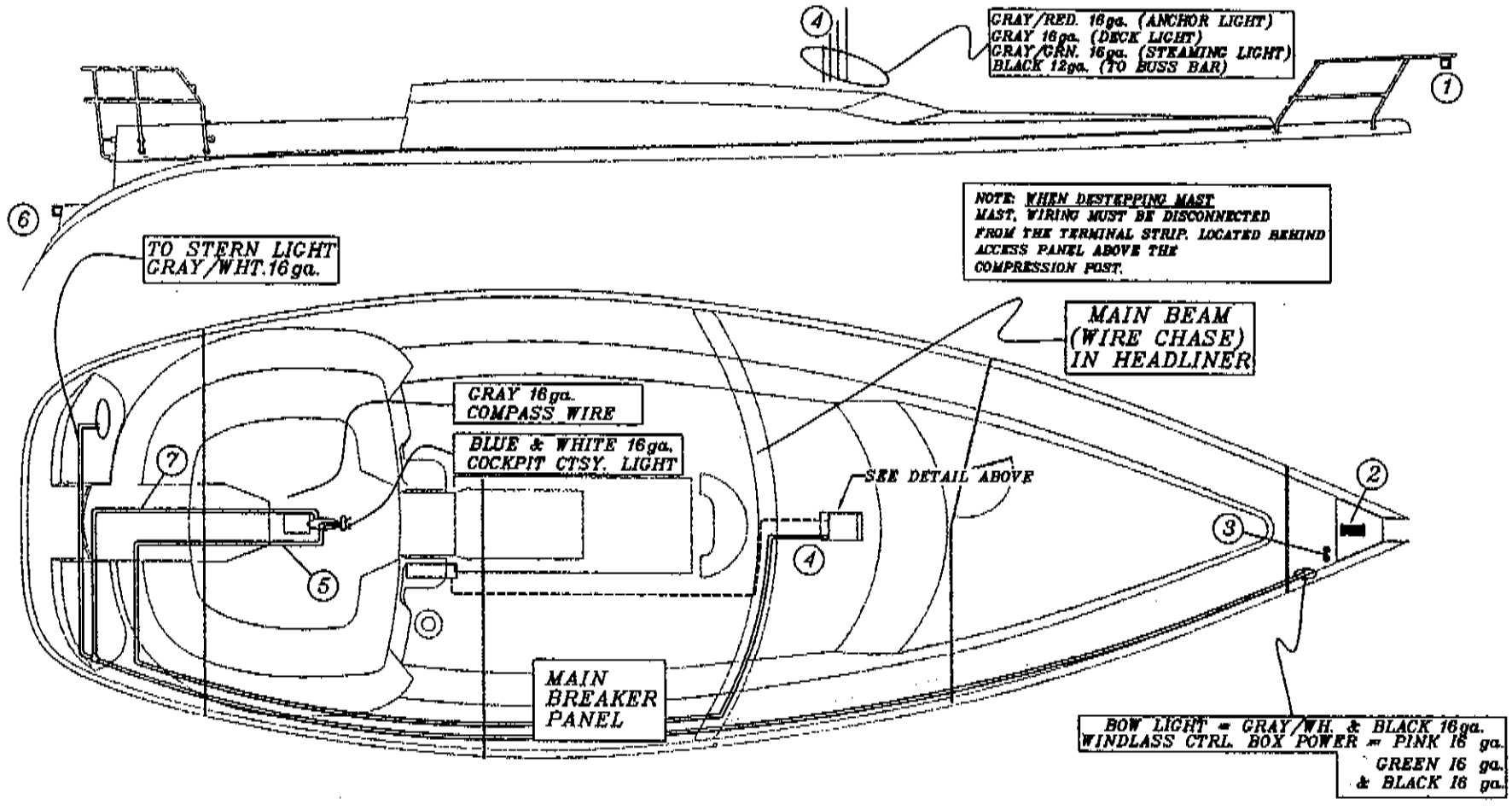
HUNTER



H290 STEREO WIRING SCHEMATIC

29080648-3	NONE
ENGINEERING DEPT.	5/21/99

HUNTER



(1) BOW LIGHT
(2) OPTIONAL ANCHOR WINDLASS (SEE PAGE 64D–1 & 64D–2)
(3) OPTIONAL WINDLASS CONTROLS
(4) POWER LEADS TO ANCHOR, DECK, STEAMING LIGHTS
(5) COURTESY LIGHT (IN COCKPIT CONSOLE BASE)
(6) STERNLIGHT
(7) COMPASS WIRE RUN

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

NOTE: SOME WIRE RUNS SHOWN IN APPROXIMATE LOCATIONS FOR CLARITY. SEE PAGE 64F FOR WIRE CHASE LOCATIONS

H290 12V. WIRING DECK	
29080640	NONE
ENGINEERING DEPT	5/21/99

HUNTER

SECTION 64D...OPTIONAL WINDLASS SYSTEM

BASIC OPERATING INSTRUCTIONS:

LOWERING ANCHOR...

1. TURN ON START BATTERY SWITCH UNDER NAV. STATION.
2. TURN ON WINDLASS BRKR. ON MAIN D.C. BRKR. PANEL.
3. ENSURE THE RESET BREAKER @ NAVIGATION STATION IS "RESET"
4. PUSH WINDLASS "DOWN" BUTTON INSIDE ANCHOR WELL LOCKER.

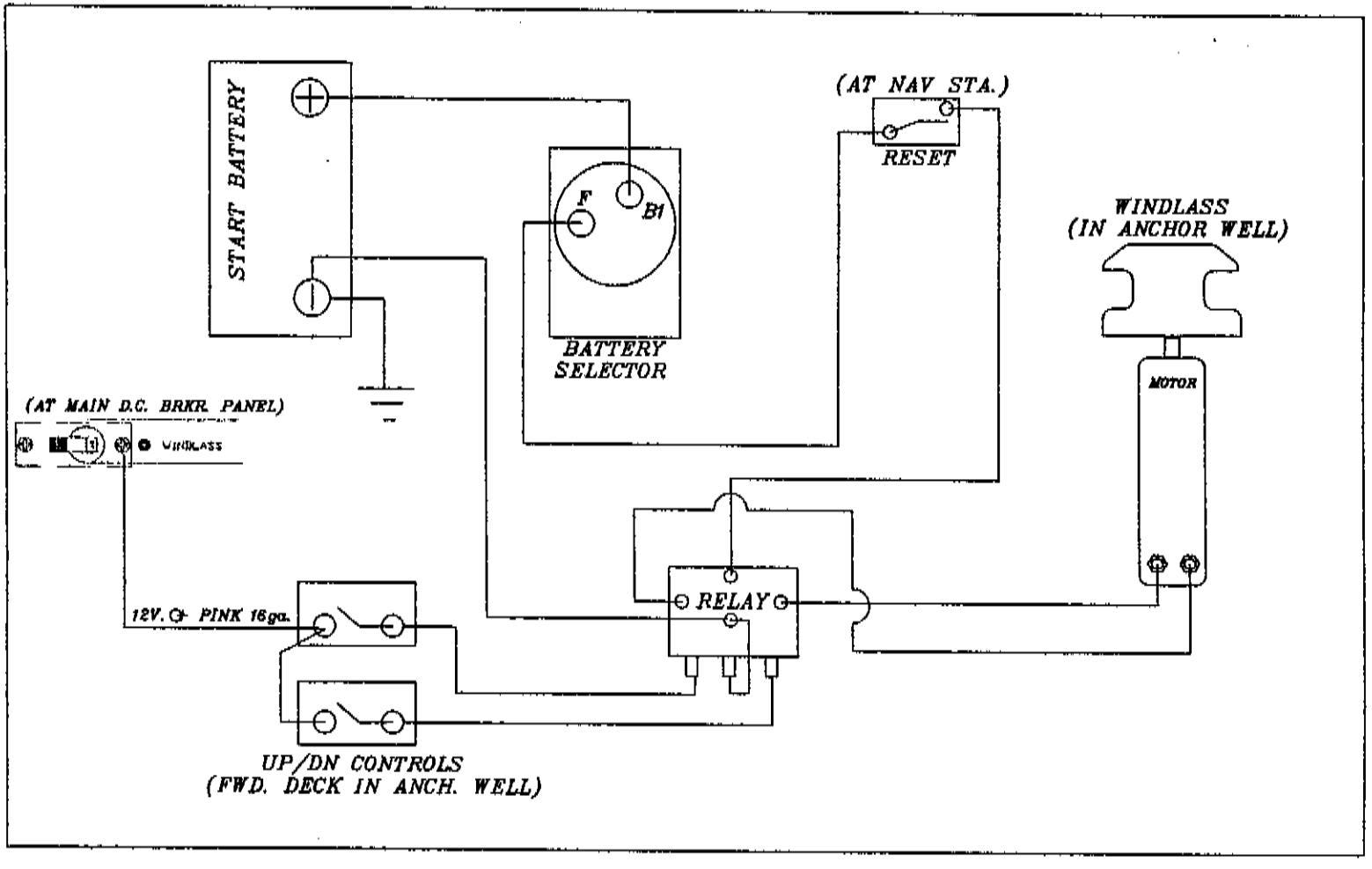
NOTE: "BUMP" SWITCH UNTIL ANCHOR CLEARS ANCHOR ROLLER AND HULL BEFORE LETTING ANCHOR DOWN FREELY.

RAISING ANCHOR...

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

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

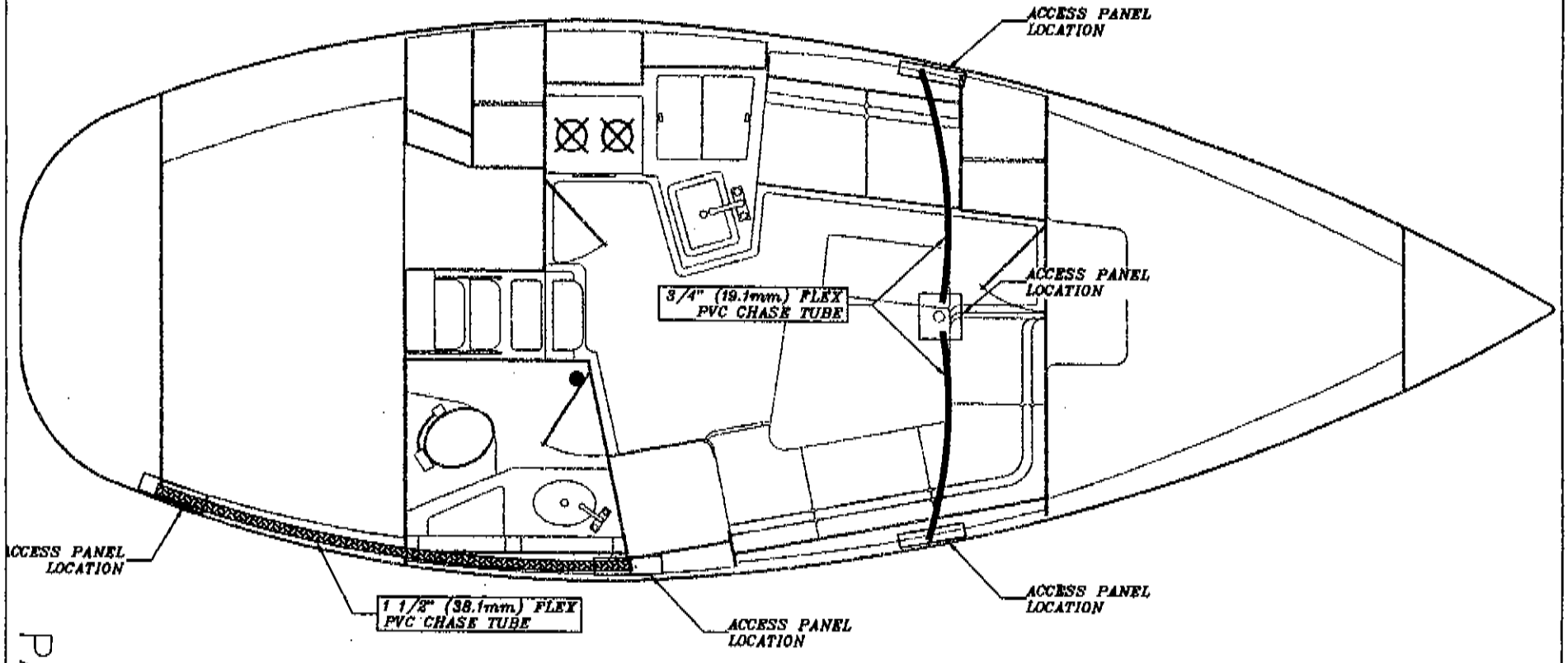
H290 OPTIONAL WINDLASS OPERATING INST.		
29080640–1	NONE	HUNTER
ENGINEERING DEPT.	5/21/99	



NOTE: SEE PAGE 64C FOR POWER FEED/WIRE RUN LOCATIONS

H290 OPTIONAL WINDLASS WIRING	
29080640-2	NONE
ENGINEERING DEPT.	6/23/99

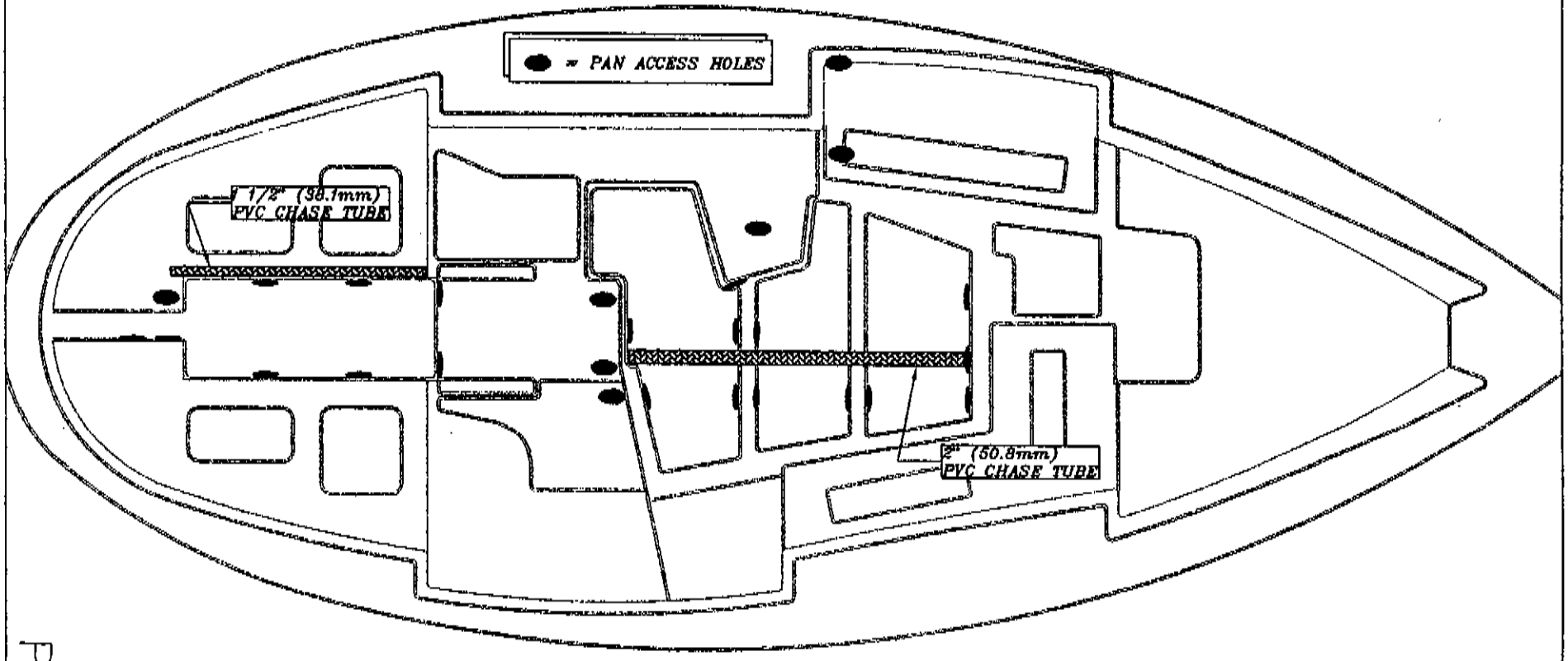
HUNTER



H290 HEADLINER CHASE TUBE LOCATION

2908064E	NONE
ENGINEERING DEPT.	5/20/98

HUNTER



PAGE 64F

H290 THRU PAN HOLE/CHASE TUBE LOCATIONS	
2908084F	NONE
ENGINEERING DEPT.	4/30/99

HUNTER

THIS PAGE IS PROVIDED FOR ANY ADDITIONAL DC ELECTRICAL INFORMATION.

1. ALL DC WIRING WITHIN 12" OF ANY COMPASS SHALL BE TWISTED PAIRS... THAT IS THE HOT LINE AND GROUND SHALL BE TWISTED TOGETHER.

HUNTER

H290 DC CONSUMER NOTES

DRAWING NO. 40080640 | SCALE: NONE

DRAWN BY: ENGINEERING DEPT. | DATE: 5/21/99

SECTION 64G...OPTIONAL REFRIGERATION SYSTEM

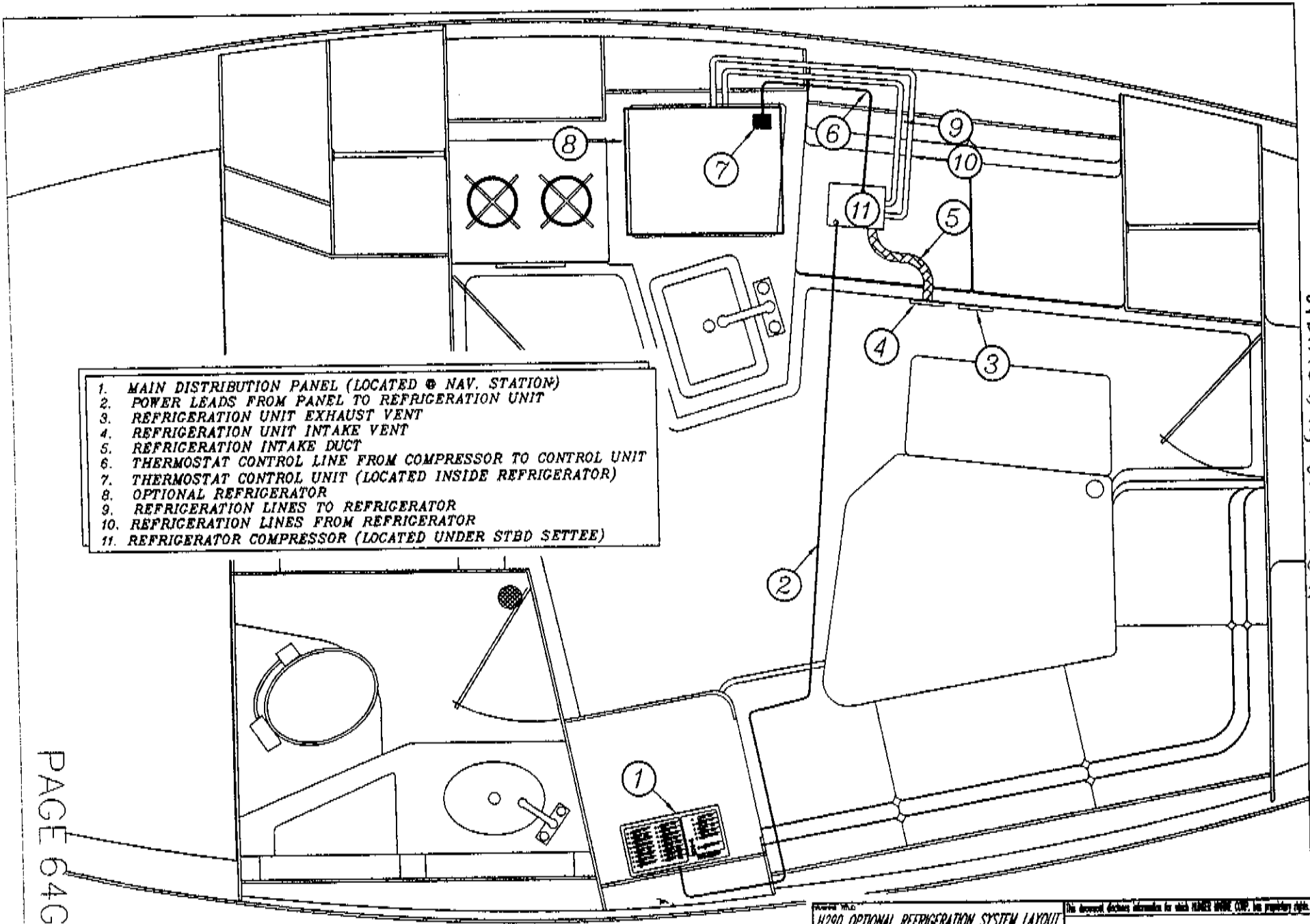
UPDATED AS OF HULL #357

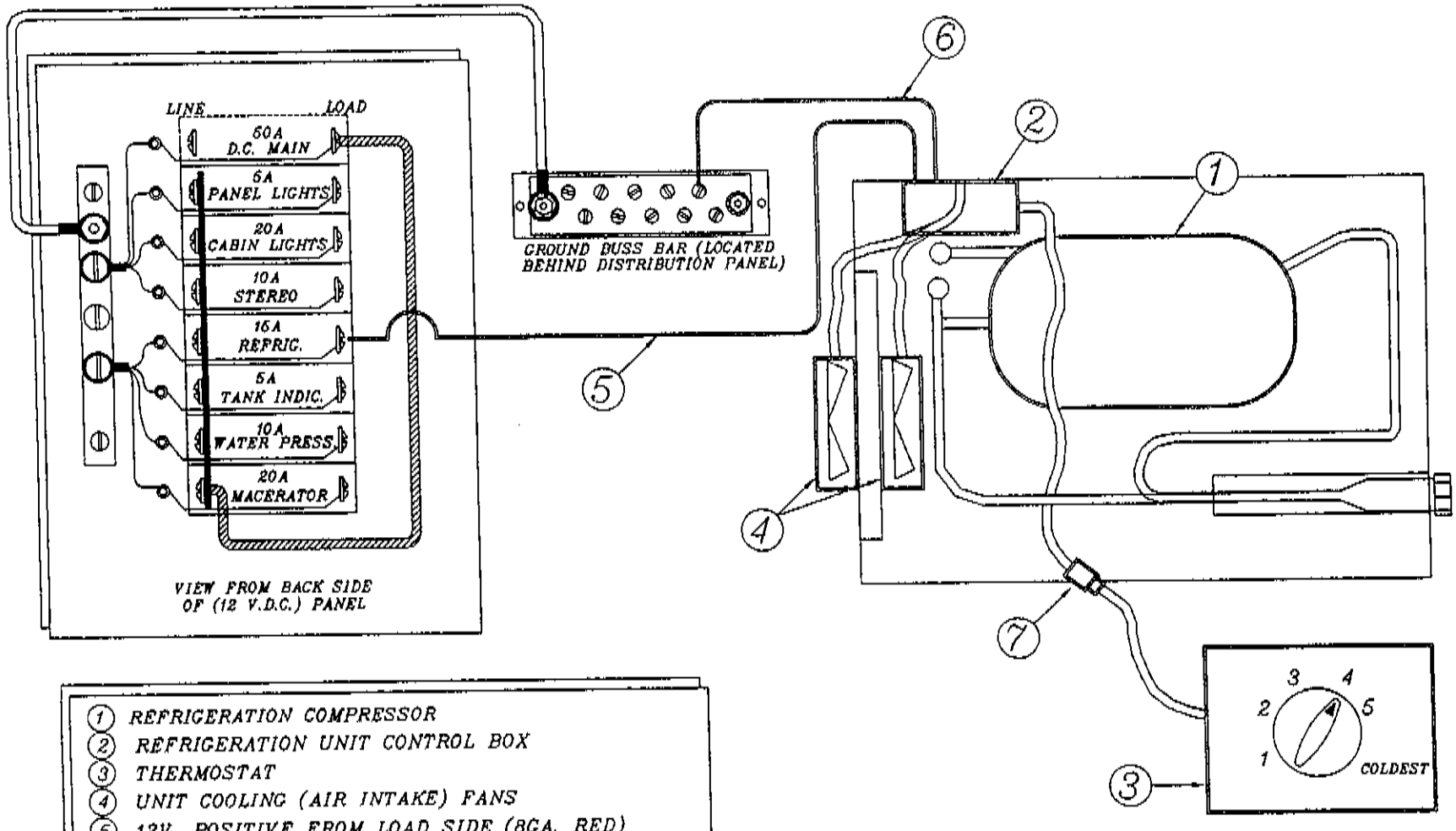
BASIC OPERATING INSTRUCTIONS:

① TURN ON HOUSE/START BATTERY SWITCH (LOCATED UNDER NAV. STATION)
② TURN ON MAIN D.C. BREAKER AT MAIN BREAKER PANEL
③ TURN ON REFRIGERATION BREAKER
④ SET THERMOSTATS 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.

H290 OPTIONAL REFRIGERATION INSTRUCTIONS	
29080640-1	NONE
ENGINEERING DEPT.	11/16/99


1. MAIN DISTRIBUTION PANEL (LOCATED @ NAV. STATION)
2. POWER LEADS FROM PANEL TO REFRIGERATION UNIT
3. REFRIGERATION UNIT EXHAUST VENT
4. REFRIGERATION UNIT INTAKE VENT
5. REFRIGERATION INTAKE DUCT
6. THERMOSTAT CONTROL LINE FROM COMPRESSOR TO CONTROL UNIT
7. THERMOSTAT CONTROL UNIT (LOCATED INSIDE REFRIGERATOR)
8. OPTIONAL REFRIGERATOR
9. REFRIGERATION LINES TO REFRIGERATOR
10. REFRIGERATION LINES FROM REFRIGERATOR
11. REFRIGERATOR COMPRESSOR (LOCATED UNDER STBD SETTEE)
UPDATED AS OF HULL # 354
H290 OPTIONAL REFRIGERATION SYSTEM LAYOUT
29D8064G-2
NONE
ENGINEERING DEPT.
1/13/00
HUNTER



1. REFRIGERATION COMPRESSOR
2. REFRIGERATION UNIT CONTROL BOX
3. THERMOSTAT
4. UNIT COOLING (AIR INTAKE) FANS
5. 12V. POSITIVE FROM LOAD SIDE (8GA. RED) OF BREAKER TO REFRIGERATION UNIT
6. GROUND FROM REFRIGERATION UNIT (8GA. BLACK) TO GROUND BUSS BAR BEHIND BREAKER PANEL
7. THERMOSTAT CONNECTOR PLUG

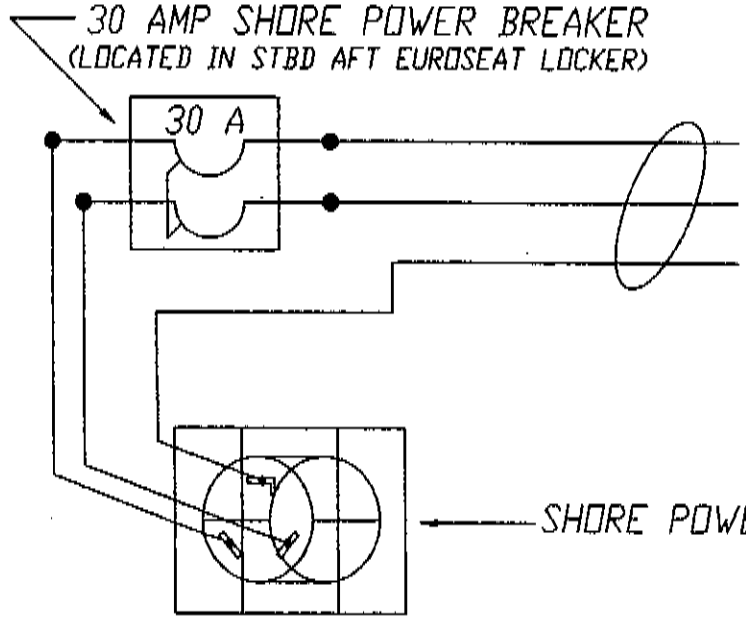
NOTE: SEE REFRIGERATION MANUAL FOR CONTROL BOX HOOKUP DETAILS

H290 REFRIGERATION SCHEMATIC

29080646-3	NONE
ENGINEERING DEPT.	1/12/00

HUNTER

UPDATED AS OF NOV # 356



NOTES: RESET BREAKER ARE IN THE STBD AFT EURO LOCKER

SEE PAGE 60B FOR LOCATION OF SHORE POWER INLET.

SEE PAGE 63C FOR WIRE RUN LOCATION

SEE PAGE 64A-1 FOR "BATTERY SWITCH" WIRING

PAGE 65A

H290 SHORE POWER DIAGRAM		
29080653A	NONE	HUNTER
ENGINEERING DEPT.	5/21/99	

H290 ELECTRICAL WIRING/CABLE DATA

12V.D.C. SYSTEM

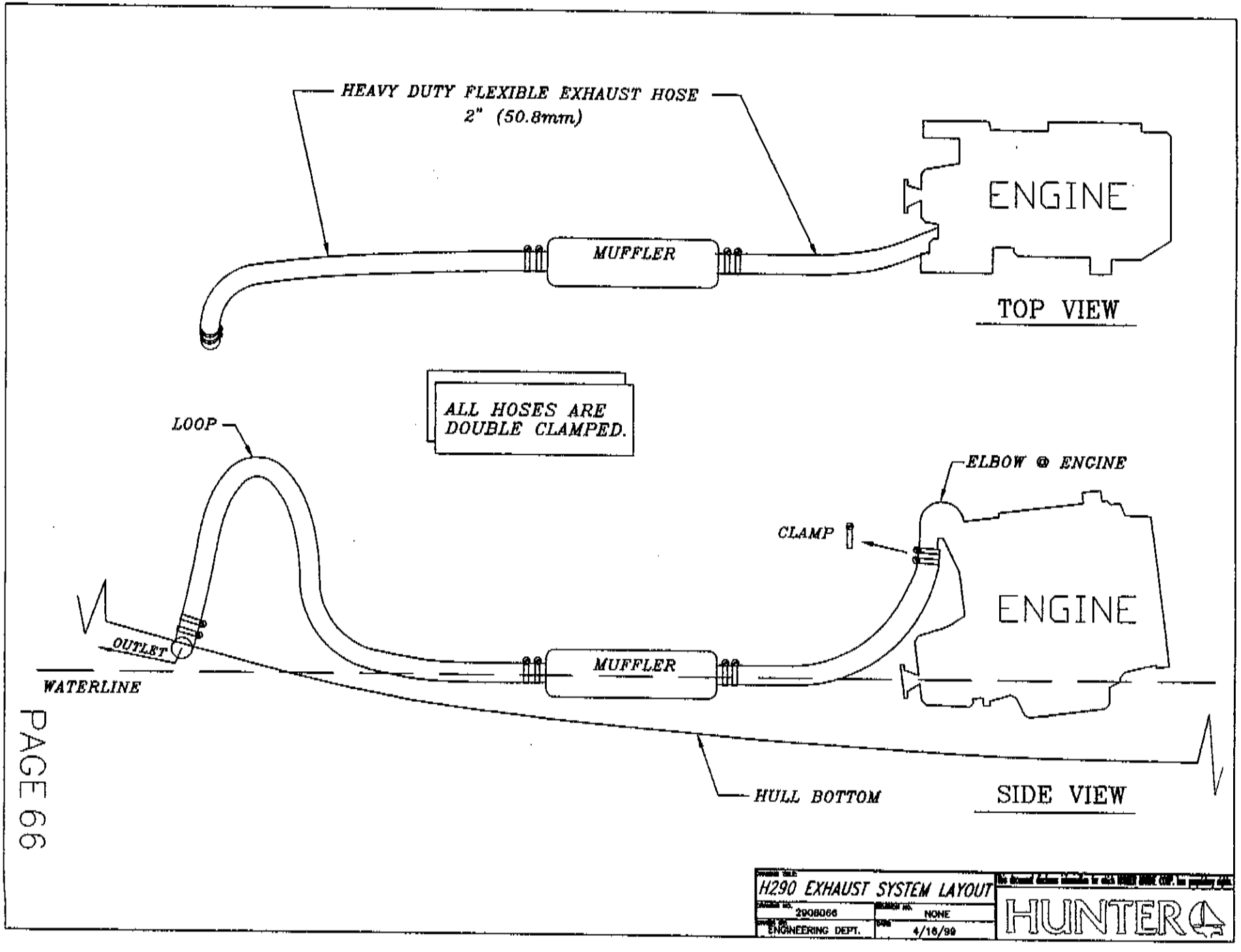
CIRCUIT/BREAKER	AMPERAGE	WIRE SIZE	WIRE COLOR
D.C. MAIN	50amp	6gague	ORANGE/RED
PANEL LIGHTS	5amp	INTERN. WIRED	RED
CABIN LIGHTS	20amp	16gauge	BLUE
STEREO	10amp	16gauge	RED & YELLOW
REFRIGERATION	15amp	8gauge	RED
TANK INDICATOR	5amp	16/2 BOAT CABLE	BLACK (NEG.) & WHITE (POS.)
WATER PRESSURE	10amp	12gauge	BROWN
MACERATOR 1	20amp	10gauge	BROWN/WHITE
ANCHOR LIGHT	5amp	16gauge	GRAY/RED
STEAMING LIGHT	5amp	16gauge	GRAY/GREEN
RUNNING LIGHTS	5amp (SM. MOD.)	16gauge	GRAY/WHITE
L.P. GAS	5amp	16/2 BOAT CABLE	BLACK (NEG.) & WHITE (POS.)
V.H.F.	10amp	16gauge	RED & WHITE
INSTURMENTS	5amp	VENDOR SUPPLIED	RED & YELLOW (SCREEN)
L.P. GAS	5amp	16/2 BOAT CABLE	BLACK (NEG.) & WHITE (POS.)
WINDLASS (SWITCH)	5amp	16gauge	RED/WHITE & RED/BLACK
WINDLASS (MOTOR) CABLE		2gauge	RED
AUTO-PILOT	VARIES PER MODEL	8gauge	RED

110V.A.C. SYSTEM

SHORE POWER A.C. MAIN/S	30 amp	10/3 BOAT CABLE	BLACK (HOT) & WHITE (NEU.)
OUTLETS	15amp	14/3 BOAT CABLE	BLACK (HOT) & WHITE (NEU.)
MICROWAVE OVEN	15amp	14/3 BOAT CABLE	BLACK (HOT) & WHITE (NEU.)
OPT. BATTERY CHARGER	15amp	14/3 BOAT CABLE	BLACK (HOT) & WHITE (NEU.)
WATER HEATER	20amp	14/3 BOAT CABLE	BLACK (HOT) & WHITE (NEU.)

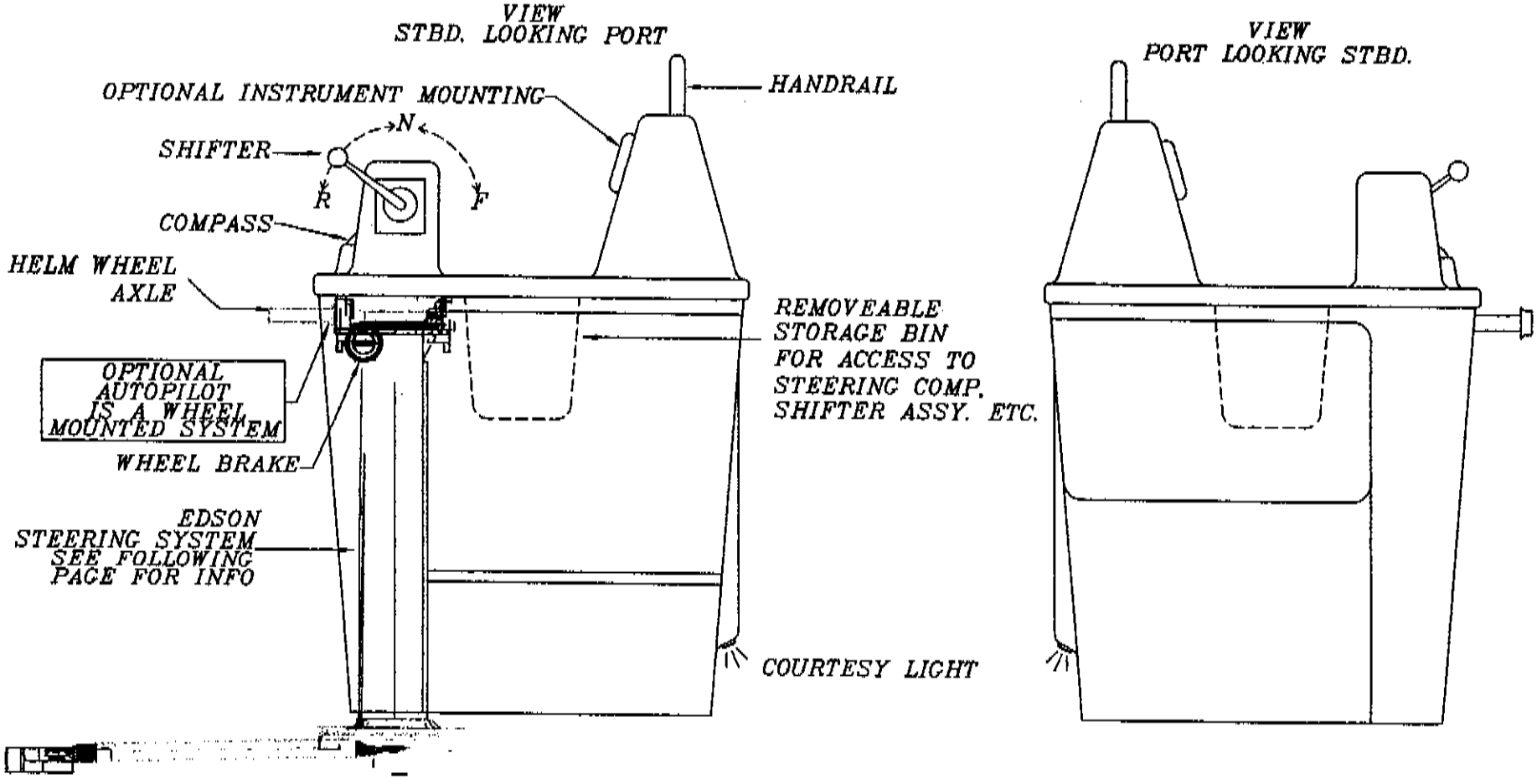
220V.A.C. SYSTEM (ON SELECT OVERSEAS MODELS ONLY)

SHORE POWER A.C. MAIN/S	15 amp	10/3 BOAT CABLE	BLACK (HOT) & WHITE (NEU.)
OUTLETS	10amp	14/3 BOAT CABLE	BLACK (HOT) & WHITE (NEU.)
MICROWAVE OVEN	10amp	14/3 BOAT CABLE	BLACK (HOT) & WHITE (NEU.)
OPT. BATTERY CHARGER	10amp	14/3 BOAT CABLE	BLACK (HOT) & WHITE (NEU.)
WATER HEATER	10amp	14/3 BOAT CABLE	BLACK (HOT) & WHITE (NEU.)



H290 EXHAUST SYSTEM LAYOUT	
2908066	NONE
ENGINEERING DEPT.	4/16/99

HUNTER



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H290 STEERING/CONSOLE LAYOUT	
2908067A	NONE
ENGINEERING DEPT.	4/16/99

HUNTER

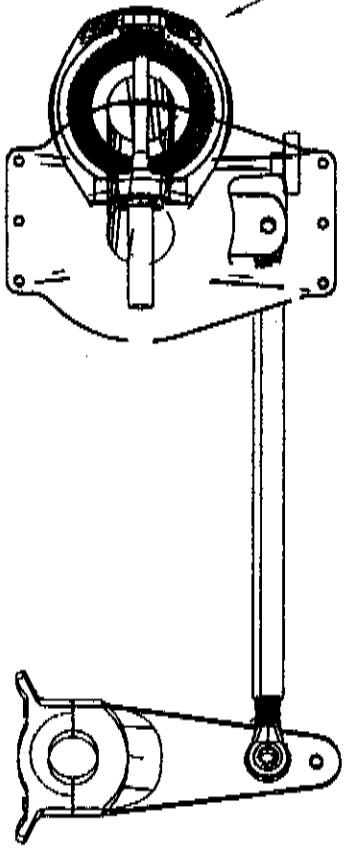
IMPORTANT:

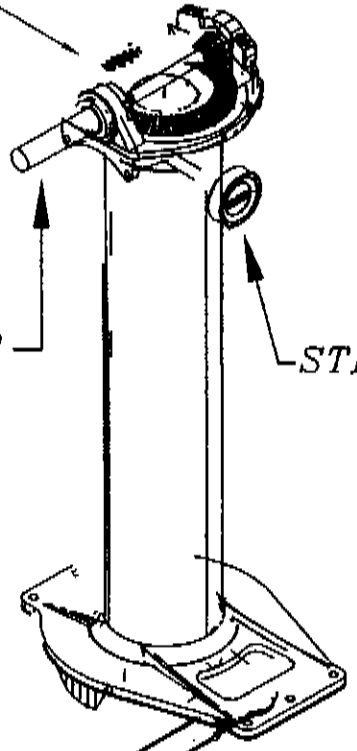
SEE EDSON STEERING MAINTENANCE UNDER "MAINTENANCE" FOR A COMPLETE DESCRIPTION OF STEERING COMPONENTS AND VITAL ROUTINE MAINTENANCE PROCEDURES.

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

PLAN VIEW

ISO VIEW





HELM WHEEL AXLE

STEERING BRAKE

CONTROL ARM (MOUNTED TO- RUDDER POST UNDER QUAD COVER)

TIE ROD, UNDER QUAD COVER

H290 EDSON STEERING COMP.		
2908067B	NONE	HUNTER
ENGINEERING DEPT.	4/15/99	

EDSON ENGINEERING BULLETIN

CD–i COMPACT RACK AND PINION PEDESTAL STEERING MAINTENANCE

THE EDSON CD–i GEARED STEERING SYSTEM HAS BEEN DESIGNED FOR YEARS OF TROUBLE–FREE SERVICE. BUT AS WITH ALL SYSTEMS USED IN THE HARSH MARINE ENVIORNMENT, PROPER MAINTENANCE AND CARE IS REQUIRED SO THAT THE SYSTEM REMAINS IN LIKE–NEW CONDITION.

THE EDSON CD–i SYSTEM SHOULD BE LUBRICATED WITH HEAVY–DUTY TEFLON GREASE, SUCH AS EDSON'S PART #827. THE TOP RACK AND PINION GEARS, UPPER AND LOWER GREASE FITTINGS FOR THE NEEDLE BEARINGS REQUIRE ANNUAL LUBRICATION.

RACK AND PINION TEETH: GRADUALLY TURN THE WHEEL FROM PORT TO STARBOARD WHILE APPLYING GREASE TO THE INDIVIDUAL TEETH TO INSURE THAT THE ENTIRE TOOTH SURFACES ARE BEING LUBRICATED.

DOWNTUBE NEEDLE BEARINGS: GREASE FITTINGS ARE LOCATED ON THE INSIDE OF THE DOWNTUBE JUST BELOW THE WHEEL SHAFT AND JUST ABOVE THE LOWER END OF THE DOWNTUBE ON THE FORWARD SIDE. BOTH BEARINGS SHOULD BE LUBRICATED AT THESE LOCATIONS. BECAUSE OF THE VERY TIGHT TOLERENCES OF THE BEARINGS, A LITTLE GREASE GOES A LONG WAY– DO NOT OVER LUBRICATE THE SYSTEM. THE SYSTEM SHOULD BE LUBRICATED AT LEAST ONCE A YEAR.

IMPORTANT
TO PROPERLY MAINTAIN THE MOVING PARTS IN THE EDISON CD–i COMPACT RACK AND PINION STEERING SYSTEM, IT IS NECESSARY TO REMOVE THE COMPASS AND ITS CYLINDER. FOR PROPER ALIGNMENT WHEN REINSTALLING THE COMPASS, WE RECOMMEND PLACING THREE OR FOUR PIECES OF TAPE ON THE PEDASTAL AND COMPASS. SLIT THE TAPE WHEN REMOVING THE COMPASS FOR VISUAL REALIGNMENT,
TOUR COMPASS MUST THEN BE CHECKED FOR ACCURACY BEFOR USING THE BOAT

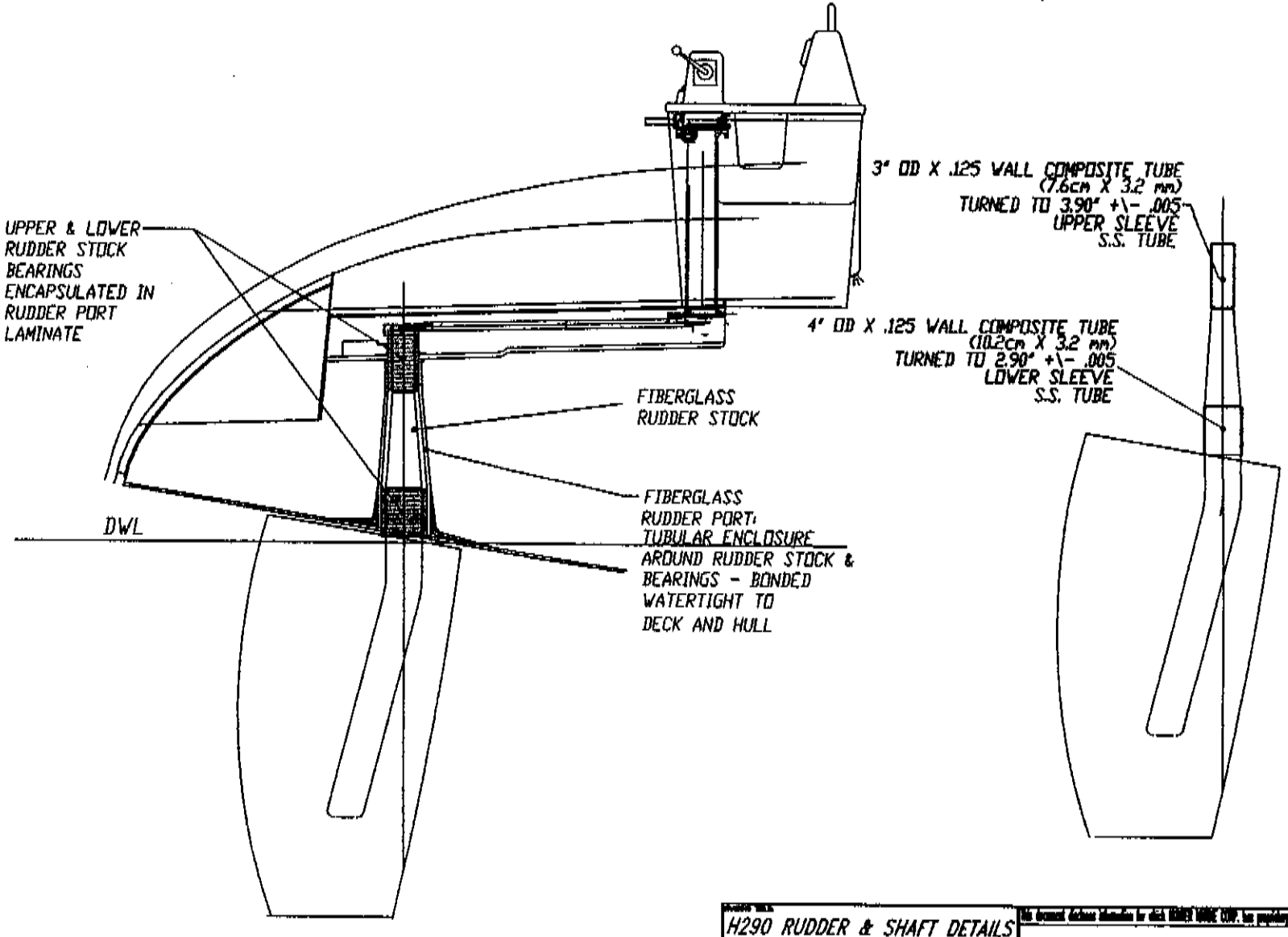
DRAG LINK END FITTINGS: THE BALL JOINT AT BOTH ENDS OF THE DRAG LENGTHS SHOULD BE LUBRICATED ANNUALLY WITH TEFLON GREASE AS WELL. APPLY A SMALL AMOUNT OF GREASE TO THE BALL JOINT AND MOVE THE BALL SIDE–TO–SIDE TO LUBRICATE THE ENTIRE BEARING SURFACE. REMOVING THE DRAG LINK ENDS FROM THE TILLER ARMS MAY BE NECESSARY.

SPECIAL INFORMATION FOR EDSON INTERNAL CD–i STEERING SYSTEMS INSTALLED ON HUNTER YATCHS:

BOTH THE DOWNTUBE AND STEERING SHAFT BEARINGS REQUIRE LUBRICATION WITH TEFLON GREASE. THE UPPER BEARING GREASE FITTING IS LOCATED JUST UNDER THE TOP BOWL CASTING ON THE FORWARD SIDE OF THE OUTER TUBE. THE LOWER BEARING GREASE FITTING IS LOCATED JUST ABOVE DECK LEVEL ON THE FOWARD SIDE OF THE OUTER TUBE. THE STEERING WHEEL SHAFT NEEDLE BEARING GREASE FITTING IS LOCATED ON THE TOP OF THE AFT BEARING RACE. THE FORWARD BEARING IS SEALED AND REQUIRES NO LUBRICATION.

H290 EDSON STEERING MAINTENANCE
DRAWING NO. 29080670
REVISION NO. NONE
DRAWN BY ENGINEERING DEPT.
DATE 4/16/99

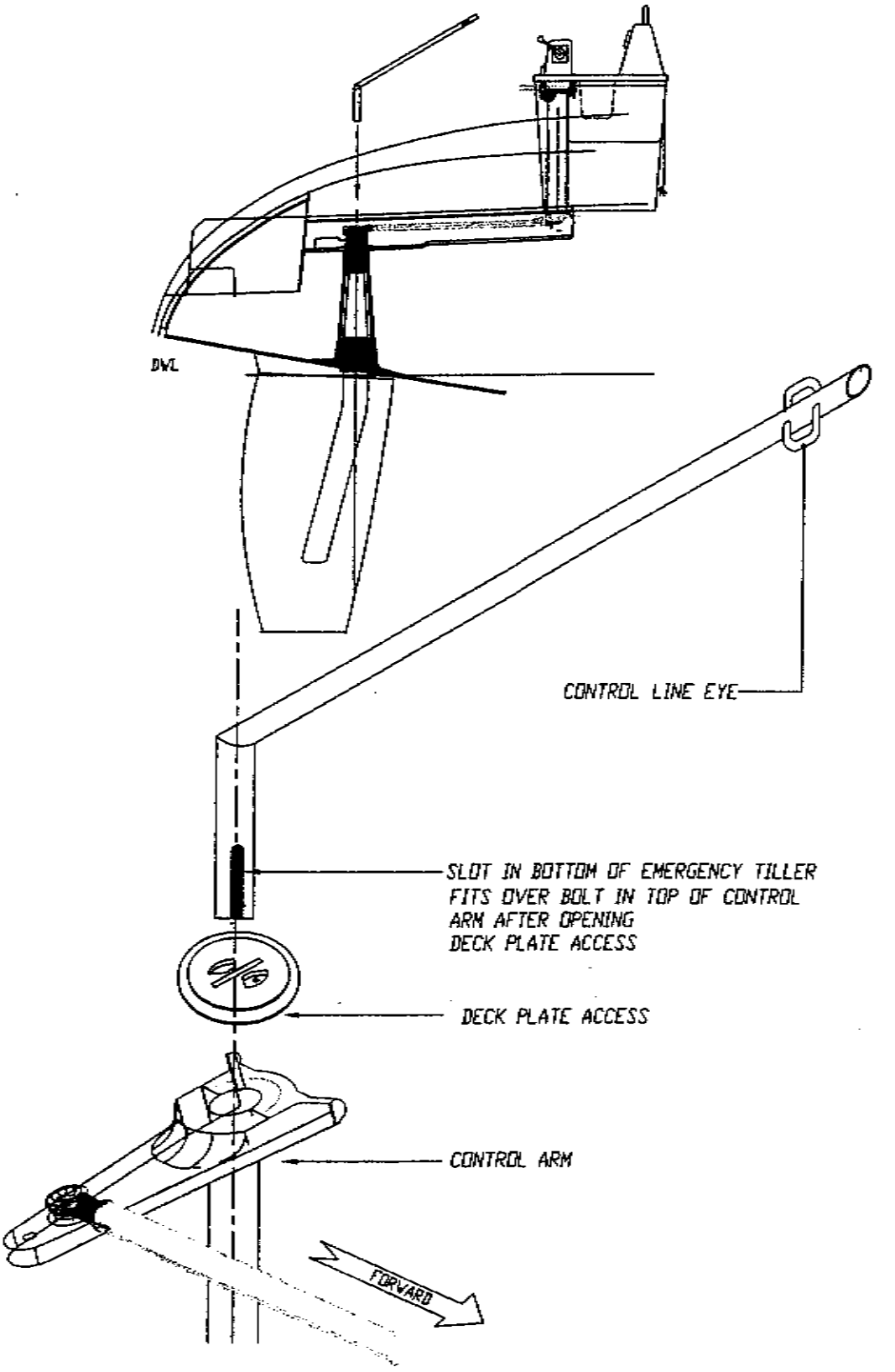
HUNTER



H290 RUDDER & SHAFT DETAILS

2906068	NONE
ENGINEERING DEPT.	2/4/98

HUNTER



H290 EMERGENCY TILLER

HUNTER

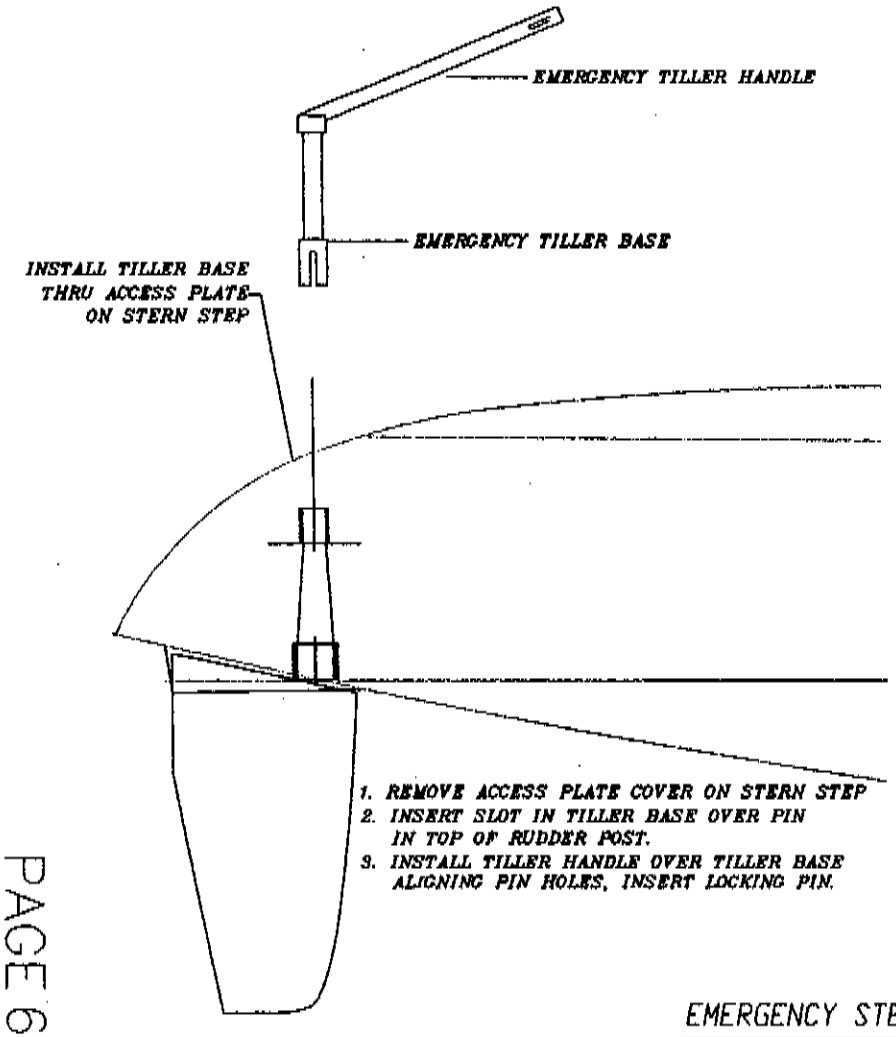
NONE

4/16/09

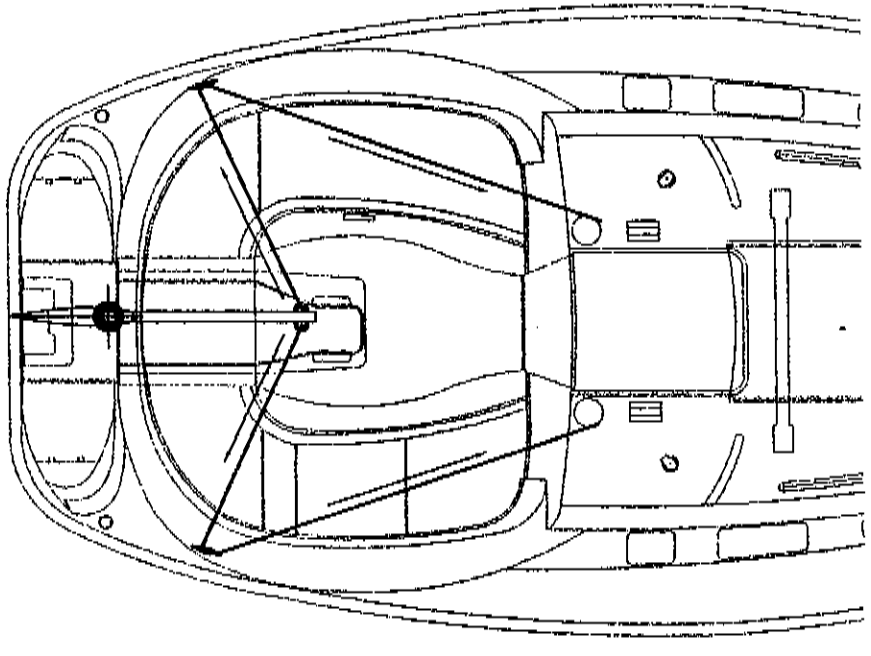
ENGINEERING DEPT.

NOTE: IF SECURING TILLER BECOMES NECESSARY-
OR IF YOU DESIRE TO STEER FROM COCKPIT

SECURE LINE TO EYE ON TILLER HANDLE
LEAD AROUND MOORING CLEATS AS SHOWN
THEN FORWARD TO WINCHES.



1. REMOVE ACCESS PLATE COVER ON STERN STEP
2. INSERT SLOT IN TILLER BASE OVER PIN IN TOP OF RUDDER POST.
3. INSTALL TILLER HANDLE OVER TILLER BASE ALIGNING PIN HOLES, INSERT LOCKING PIN.



EMERGENCY STEERING

H290 EMERGENCY TILLER SECURING LINE LAYOUT	
DRAWING NO. 29080698	REVISION NO. NONE
DRAWN BY ENGINEERING DEPT.	DATE 4/16/09

HUNTER