

# HUNTER 33.5 OWNER'S MANUAL

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## HUNTER MARINE'S OWNER AND FOUNDER WARREN R. LUHRS BRIEF HISTORY

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

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

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

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

The sea skiff is a class of boat which has been very popular, owing to its seaworthiness. It features a sharp bow, which reduces pounding in surf or choppy seas, and a hull whose forward section is rounded below the water line to increase stability in rough water or a following sea. Such skiffs can either be smooth-sided or of lapstrake construction.

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

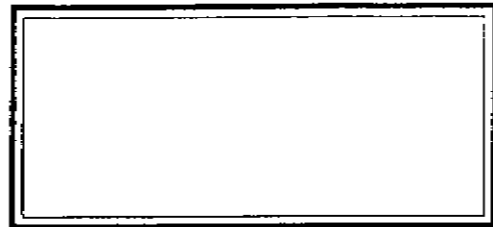
In 1960, Luhrs acquired the Ulrichsen Boat Company, Marlboro, New Jersey. It was here, to, that the Luhrs' Alura Fiberglass Division was located. In 1965, Henry sold his company to Bangor Arrostock Railroad, which was to become the recreational conglomerate, Bangor-Punta. It was also during this period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

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

# WARRANTY REGISTRATION



HUNTER MARINE CORPORATION  
P.O. Box 1030, Hwy. 441  
Alachua, FL 32615  
904/462-3077  
904/462-4077 - FAX



Year \_\_\_\_\_ Engine Model & Serial # \_\_\_\_\_  
Model \_\_\_\_\_ Generator Model & Serial # \_\_\_\_\_  
Hull # \_\_\_\_\_

Date Delivered to Dealer \_\_\_\_\_ Date Delivered to Customer \_\_\_\_\_

## OWNER

Street \_\_\_\_\_  
City & State \_\_\_\_\_ Zip Code \_\_\_\_\_  
Phone: Home \_\_\_\_\_ Work \_\_\_\_\_ Fax \_\_\_\_\_  
Boat Name \_\_\_\_\_ Location of Boat (Zip Code Only) \_\_\_\_\_

## DEALER

Street \_\_\_\_\_ Dealer Code \_\_\_\_\_  
City & State \_\_\_\_\_ Zip Code \_\_\_\_\_  
Phone \_\_\_\_\_ FAX # \_\_\_\_\_

## FINAL CHECK OUT:

- OWNER FAMILIARIZED WITH HUNTER WARRANTY & OWNERSHIP RESPONSIBILITIES.
- OWNER FAMILIARIZED WITH DEALERSHIP WARRANTY AND SERVICE POLICIES.
- OWNER RECEIVED HUNTER OWNER'S MANUAL AND APPROPRIATE ENGINE AND ACCESSORY MANUALS.
- OWNER RECEIVED & APPROVED PRE-DELIVERY SERVICE RECORD.

## BOAT INSPECTION - OWNER FAMILIARIZED WITH THE OPERATION OF:

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> FUEL SYSTEM                | <input type="checkbox"/> ENGINE AND DRIVE SYSTEM   | <input type="checkbox"/> STEERING SYSTEM         |
| <input type="checkbox"/> WATER SYSTEM               | <input type="checkbox"/> SAFETY SYSTEMS            | <input type="checkbox"/> MAINTENANCE & UPKEEP    |
| <input type="checkbox"/> AC/DC ELECTRICAL SYSTEM    | <input type="checkbox"/> OPERATION OF WASTE SYSTEM | <input type="checkbox"/> HANDLING & OPERATION    |
| <input type="checkbox"/> STANDING & RUNNING RIGGING | <input type="checkbox"/> STOVE OPERATION           | <input type="checkbox"/> OWNER SPECIFIED OPTIONS |

I understand that it is my responsibility to read and familiarize myself with the contents of the Hunter Marine Corporation Owner's Manual, the various engine and component manuals, and the Hunter Marine Corporation Limited Warranty. The Hunter Marine Corporation Limited Warranty gives you specific rights. You may also have other rights which vary from state to state. To activate your warranty, please complete this form and return it to HUNTER MARINE CORPORATION within 10 days of delivery.

OWNER'S SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

DEALER'S SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

# 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 trouble-free 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 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.

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

## 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

ZIP CODE

HOME PORT

MODEL

SIZE

HULL#/SAIL #

ENGINE MODEL

SERIAL NO.

PROPELLER SIZE

DEALER

STREET ADDRESS

CITY

STATE

ZIP CODE

DEALER SIGNATURE

OWNER SIGNATURE

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

Terms which are referred to in the text without a full explanation are included in the glossary. Some other terms which are clearly defined in the book are not included.

## A

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

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

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

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

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

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

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

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

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

## B

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

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

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

**Baggywrinkle:** rope, teased out, plated together and wound around *stays, shrouds* etc., to prevent chafing.

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

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

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

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

**Bear away:** 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 connect two ropes with a knot.

**Berth:** 1, a place occupied by a boat in harbour; 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 coloured 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

**Catamaran:** a sailing boat with twin hulls, connected by crossbeams, developed from Polynesian craft.

**Catboat:** a boat with a single sail.

**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. 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 a boat to which the *shrouds* or *backstays* are attached.



# GLOSSARY OF SAILING TERMS

**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.

**Claw ring:** a fitting, which slips over the boom like a claw, to which the main *sheet* is attached after *reefing* the mainsail.

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

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

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

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

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

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

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

**Contrail:** a trail of condensation left behind a jet aircraft, giving weather clues.

**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.

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

## D

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

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

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

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

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

**Drag:** 1, an anchor drags when it fails to hold; 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 liferaft to retard *drift*.

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

## E

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

## F

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

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

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

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

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

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

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

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

## G

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

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

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

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

# GLOSSARY OF SAILING TERMS

**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 main-sail.

**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-to-wind:** 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

**Kedge:** a small, light second anchor.

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

**Ketch:** a two-masted sailing vessel with a *mizzen* mast slightly smaller than the main and stepped forward of the rudder stock/post.

**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.

**Let fly:** to let a *sheet* go instantly, spilling the wind from 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 rolling 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.

# GLOSSARY OF SAILING

**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 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*.

**On the wind:** *close hauled*.

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

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

## P

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

**Pay out:** to let a rope out gradually.

**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 lie. 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 mid-way 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 perpendic-

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

**Riding sail:** a small sail hoisted to enable a boat to maintain *steerage way* during a storm.

**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.

# GLOSSARY OF SAILING TERMS

## S

**Sailmaker's palm:** a strong leather protective loop which fits across the palm of the hand. It has a hole for the thumb and metal reinforced plate on the palm to accept the eye of a needle, and is worn when mending sails or *splicing* ropes.

**Schooner:** a boat with two or more masts, with the mainmast aftermost.

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

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

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

**Sea room:** room in which a boat can manoeuvre, clear of land or dangers.

**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 stream.

**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 headsail.

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

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

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

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

**Split pin:** see Cotter pin.

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

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

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

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

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

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

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

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

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

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

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

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

## T

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

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

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

**Tackle:** a purchase system comprising 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 or 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 screwturn-buckle*.

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

# GLOSSARY OF SAILING TERMS

---

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

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

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

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

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

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

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

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

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

## U

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

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

## V

**Veer:** 1, the wind veers when

it shifts in a clockwise direction; 2, to pay out anchor cable or rope in a gradual, controlled way.

## W

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

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

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

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

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

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

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

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

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

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

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

## Y

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

# PRE-DEPARTURE CHECK-LIST

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

# FLOAT PLAN

1. Name of person reporting and telephone number:

2. Description of boat:

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

3. Persons aboard: NUMBER

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

4. Engine: TYPE H.P. FUEL CAPACITY

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

6. Radio: TYPE FREQUENCIES

7. Trip expectations:

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

8. Automobile: LICENSE # STATE

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

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

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

# CLOSING UP YOUR BOAT AFTER SAILING

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When leaving your Hunter, Legend, Passage or Vision at the dock for more than a short time, it is a good idea to review the following check list to make sure everything is in order. This will help protect the various parts of your boat and add considerably to their attractiveness and usable life.

- Fold and bag headsails and stow below.
- Furl mainsail and cover, or remove and also 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 convenient cleat to keep the rudder from swinging back and forth with the motion of the water.)
- Attach the shackle ends of all halyards to convenient fittings and take up slack.
- Cleat and coil halyard tails and permanent sheets, hanging them off the deck to promote drying.
- Coil and stow all other lines.
- Cover the winches and steering pedestal when leaving the boat for several days or more.
- Close all fuel lines and gate valves.
- Turn off the electrical system.
- Pump the bilge.
- Check air vents, secure ports and hatches, and swab the deck, particularly if you have operated on saltwater.
- Make a final check of mooring lines, chafing gear, fenders, etc.



# FOR SAFE BOATING

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## BE PREPARED

Take a safe boating course from the Coast Guard. You can call 800-336-BOAT for information on courses in your area.

Carry all safety equipment required by federal and state law. Federal requirements are discussed in "Federal Requirements for Recreational Boats" which can be acquired from U.S. Coast Guard Office of Boating, Public, and Consumer Affairs, Washington, D.C. 20593. State requirements will come from your local State Boating Administration. The Coast Guard also recommends a first-aid kit, a pump or bailer, a transistor or weather radio, extra fuel, a paddle, anchor and line, and extra drinking water; also, if not a requirement, flares.

Get a Coast Guard Auxiliary Courtesy Examination. This is a free, confidential safety inspection. Call your local Coast Guard Auxiliary for details.

Be familiar with the use of distress signals and PFDs.

## AVOID FIRES

Handle fuels carefully.

Read labels on any stove fuels.

Read the engine owner's manual for proper fuel-system maintenance and inspect your engine's fuel system periodically.

Heed fire extinguisher regulations and keep them in good condition.

While refueling:

- a. Fill the portable tanks on the dock.
- b. Tie the boat securely.
- c. Extinguish cigarettes and all flames on the boat. Turn off all engines and electrical equipment.
- d. Keep the hose nozzle in contact with the fuel can or fill.
- e. Wipe up all fuel spillage.
- f. Ventilate the engine and fuel compartment.
- g. Check boat for fumes.

## BEFORE GETTING UNDERWAY

Leave a float plan. (See example under Float Plan)

Perform pre-departure check list. (See Pre-departure Check List)

Check the weather: do not venture out if the weather is threatening.

## WHILE UNDERWAY

PFDs should be worn by children and non-swimmers at all times. *Everyone should wear them if conditions become hazardous.*

Do not operate a boat if intoxicated, fatigued or stressed. These human factors cause 50 percent of all boating accidents.

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.

Obey state and federal laws. Know your local laws and "rules of the road."

Respect bad weather: try to get to shore if the weather turns bad. Get and carry a radio with a NOAA "weather band" on FM 162.40-162.55MHZ.

## IF TROUBLE OCCURS

Radio for help. Use the emergency VHF, channel (i.e., 156.8MHZ).

Put on PFDs immediately.

Stay with the boat. In cold water, huddle together to prevent hypothermia.

## FLOAT PLAN

Make copies of the Float Plan page and use before each trip. Fill it out and leave it with a reliable person who will notify the Coast Guard or other rescue organizations if you fail to return on time. Do not forget to cancel the float plan upon your return.

# GENERAL HANDLING & OPERATION

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## 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 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.

If 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 build-up and moisture.

### Starting:

1. Visually check engine compartment to see that the throttle linkage, shifting controls, electrical connections and fuel lines are properly secured.
2. *Before each start* check oil in engine and transmission.
3. Insure that engine shut-off cable is properly secured and operating.
4. Place the shift lever in the neutral position.
5. Move the throttle or "fuel" lever forward to approximately the half-speed position.
6. Insert the starter key and turn to the "on" position.
7. Press the starter button and hold until engine starts, then release. The buzzer and/or light should then go off.
8. Back the throttle off to an idle position (700 to 800 rpm); allow cold engine to warm up a minimum of five minutes.
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. Before stopping, however, it is a good idea to idle the engine in neutral for about five minutes, then race it in the full-throttle position for a moment, then return to idle and stop engine.

**CAUTION:** Do not turn safety main switch to "off" while engine is running. This can seriously damage the alternator.

### Motoring:

If your boat is equipped with 110V shore power, remember to unplug it upon departure. When engine is warm, move the shift lever to forward and reverse to insure that it engages properly. To increase RPM's push throttle lever forward and pull back to decrease RPM's.

# GENERAL HANDLING & OPERATION

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## Motoring Continued:

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

**IMPORTANT:** Do not shift from forward to reverse or back without first lowering engine rpm to idle. 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.

## 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 (120V) simply by plugging your dockside power cord into a convenient outlet on shore and turning your AC main breaker on.

**CAUTION:** 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.

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 and, just as with your automobile, it must be charged regularly by operating the engine. 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 battery(ies) 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 battery(ies) and attach them to a trickle charger to keep them fully charged and ready to use.

## Water System

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

**CAUTION:** Do not turn the water heater on until you are sure the tank is filled with water. To do so will destroy the heating element, which is not covered by the warranty.

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

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

Please refer to your manual under Heads & Galley systems for more specific information.

# GENERAL HANDLING & OPERATION

## Toilet:

**IMPORTANT:** When not in use, lever must be left in the "dry" position to prevent flooding.

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

After using, return the 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.

**Note:** Always close seacocks when sailing or when boat is not in use.

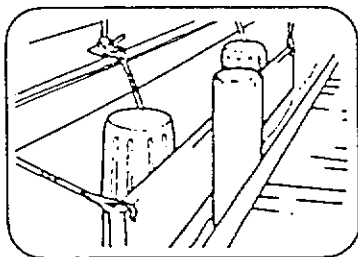
## Pumps:

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.*

Inspect all hoses for chafing and dry rot. 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 switch moves freely and is making an electrical connection.

## 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.

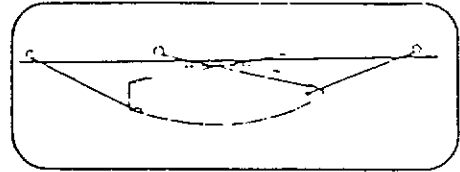
2. Approaching the dock-dock lines and fenders should be at ready, loose gear stowed and decks cleared. Determine the

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 stern 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

# GENERAL HANDLING & OPERATION

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



## Anchoring:

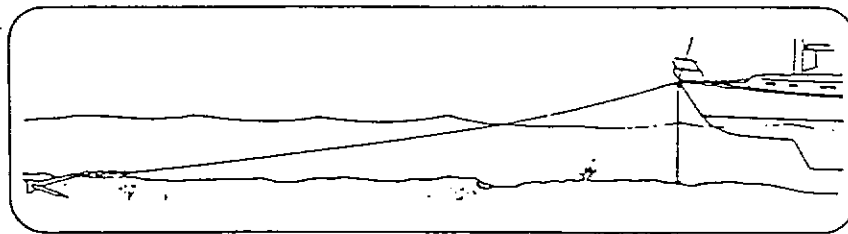
Your Hunter comes with an on-deck anchor well and a burying-type anchor as standard equipment. The anchor is selected to suit the size and weight of your boat under normal anchoring conditions, and provides its best holding characteristic in muddy or sandy bottoms.

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.

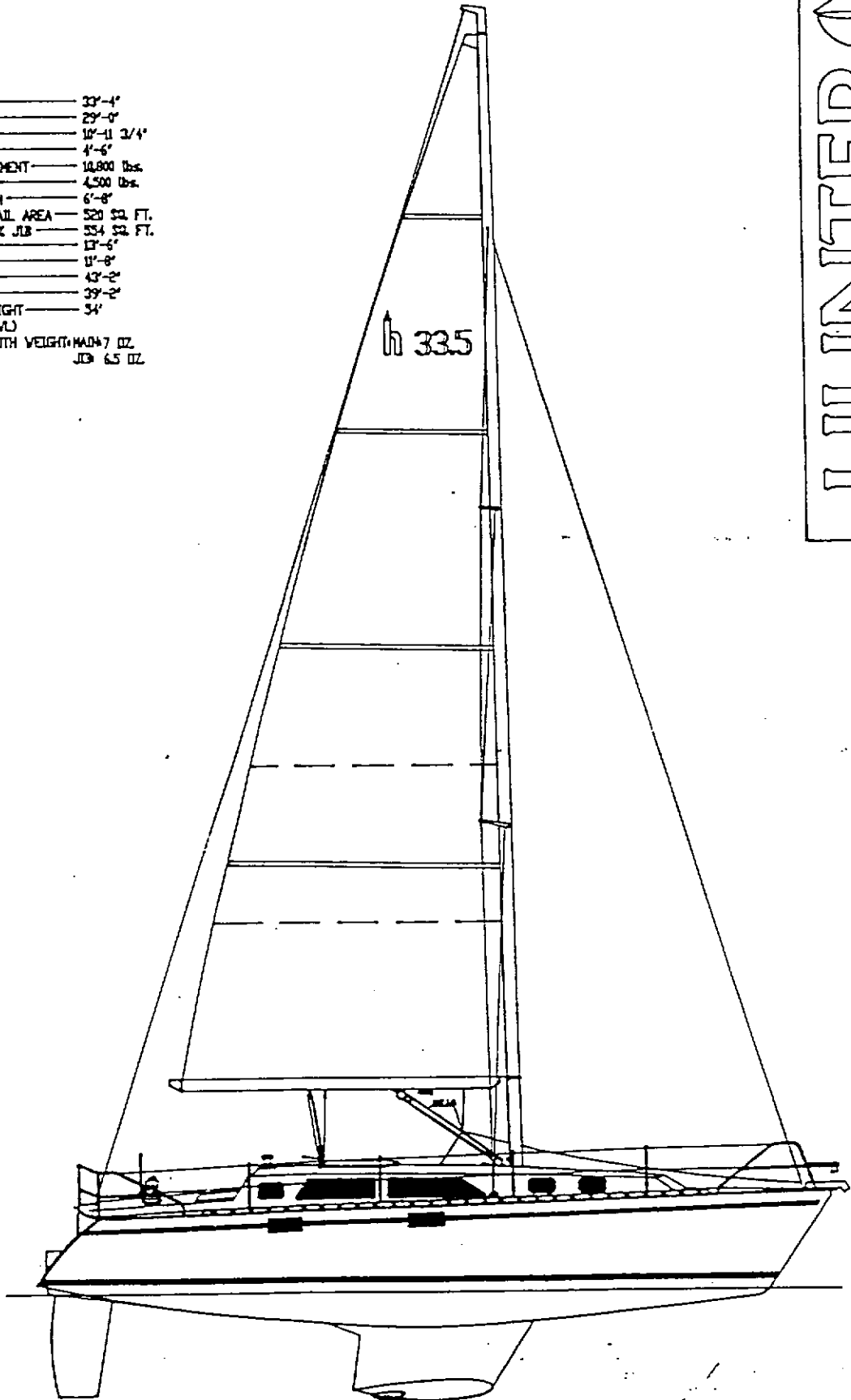
**CAUTION:** Anchoring in unusual water and/or weather conditions will require additional precautions. Consult your *Chapman's* or other approved guide for suggestions.


To weigh anchor, motor or sail (under main only) slowly forward. 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 the anchor aboard. It is good practice to thoroughly clean the anchor prior to placing it in the anchor well.



S series

LOA \_\_\_\_\_ 33'-4"  
LVL \_\_\_\_\_ 29'-0"  
BEAM \_\_\_\_\_ 10'-11 3/4"  
DRAFT \_\_\_\_\_ 4'-6"  
DISPLACEMENT \_\_\_\_\_ 14,800 LBS  
BALLAST \_\_\_\_\_ 4,500 LBS  
HEADROOM \_\_\_\_\_ 6'-8"  
TOTAL SAIL AREA \_\_\_\_\_ 520 SQ. FT.  
WITH 110% JIB \_\_\_\_\_ 534 SQ. FT.  
E \_\_\_\_\_ 17'-6"  
J \_\_\_\_\_ 17'-8"  
P \_\_\_\_\_ 42'-2"  
I \_\_\_\_\_ 39'-2"  
MAST HEIGHT \_\_\_\_\_ 34'  
(from DVL)  
SAIL CLOTH WEIGHT: MAIN 7 OZ  
JIB 6.5 OZ



HUNTER 

HUNTER 33.5 SAIL PLAN H33A2613

# SAILS & RIGGING

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**Tuning the Conventional Fractional Rig (Hunter 27OB, 27IB, 28, 30, 33.5, 35.5, and Legend 37.5)**

## **Tuning the Rigging:**

After raising your mast, attach the headstay, backstay, upper shrouds and lower shrouds. Set the headstay turnbuckle at half open and then tighten backstay turnbuckle to medium tension.

To center the mast athwartships, start with only slight tension on the upper and lower shrouds. Check that the mast is centered in the boat by measuring from the masthead to the chainplates with a steel tape measure hoisted completely up the main halyard. Adjust the upper shroud until the measurements port and starboard are exactly the same. Now the spar is plumb athwartships, tension both uppers equally, counting turnbuckle revolutions as you go. Tighten uppers until you have approximately one inch of "prebend" fore and aft in the mast. This is achieved because the swept spreaders will push the middle part of the mast forward as you increase tension of the uppers.

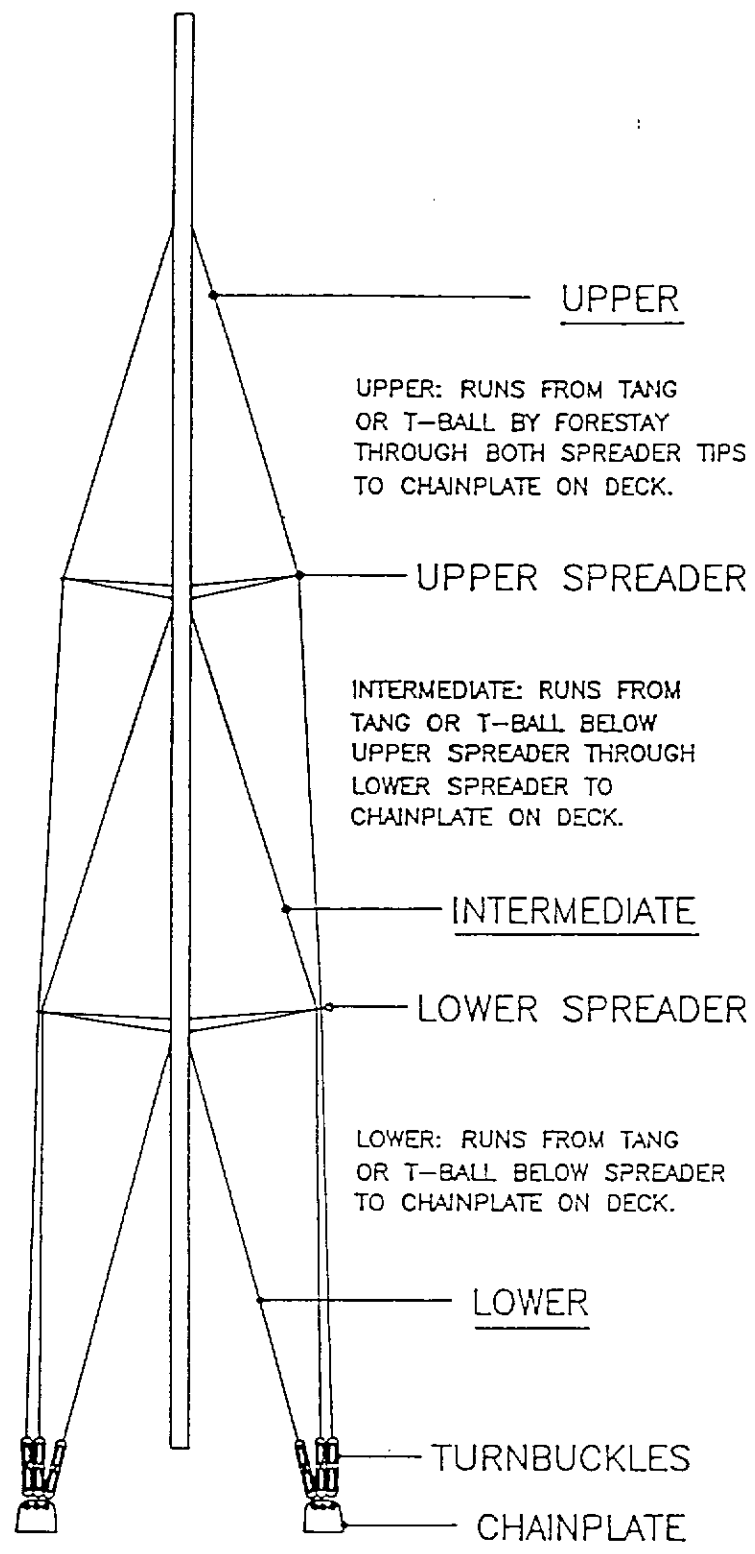
Now tighten the lower shrouds evenly, making sure the mast remains straight athwartship. Sight up the luff groove to assure this straightness. Lowers should end up almost as tight as the uppers. (The uppers should always be the tightest.) The 28, 30, 33.5, 35.5, and Legend 37.5 are equipped with double spreaders. The three shrouds should be made progressively tighter toward the top of the rig; the uppers should be the tightest of all. Tighten backstay to a taut position: perhaps eight to ten turns past your original tension.

Check the mast tuning by sailing in medium winds (10-12 knots). Sometimes fine tuning the upper and lower shrouds is necessary when the spar is loaded in sailing conditions. Sail on both tacks, sighting up the luff groove to check athwartship straightness. Both upper and lower shrouds should be taut on the leeward side.

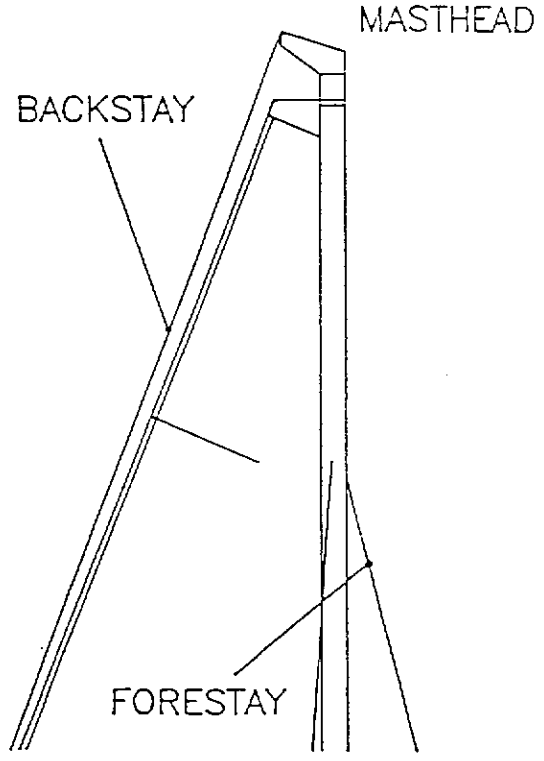
When mast tuning is complete, install cotter pins in all turnbuckles and tape over sharp edges of the cotter pins with chafe tape. (Refer to the drawing on Conventional Fractional Rig).

# HUNTER

DOUBLE SPREADER FRACTIONAL RIG  
W/ SWEEP BACK SPREADERS GENA2601



BACKSTAY: RUNS FROM MASTHEAD TO BACKSTAY-CHAINPLATE ON DECK.



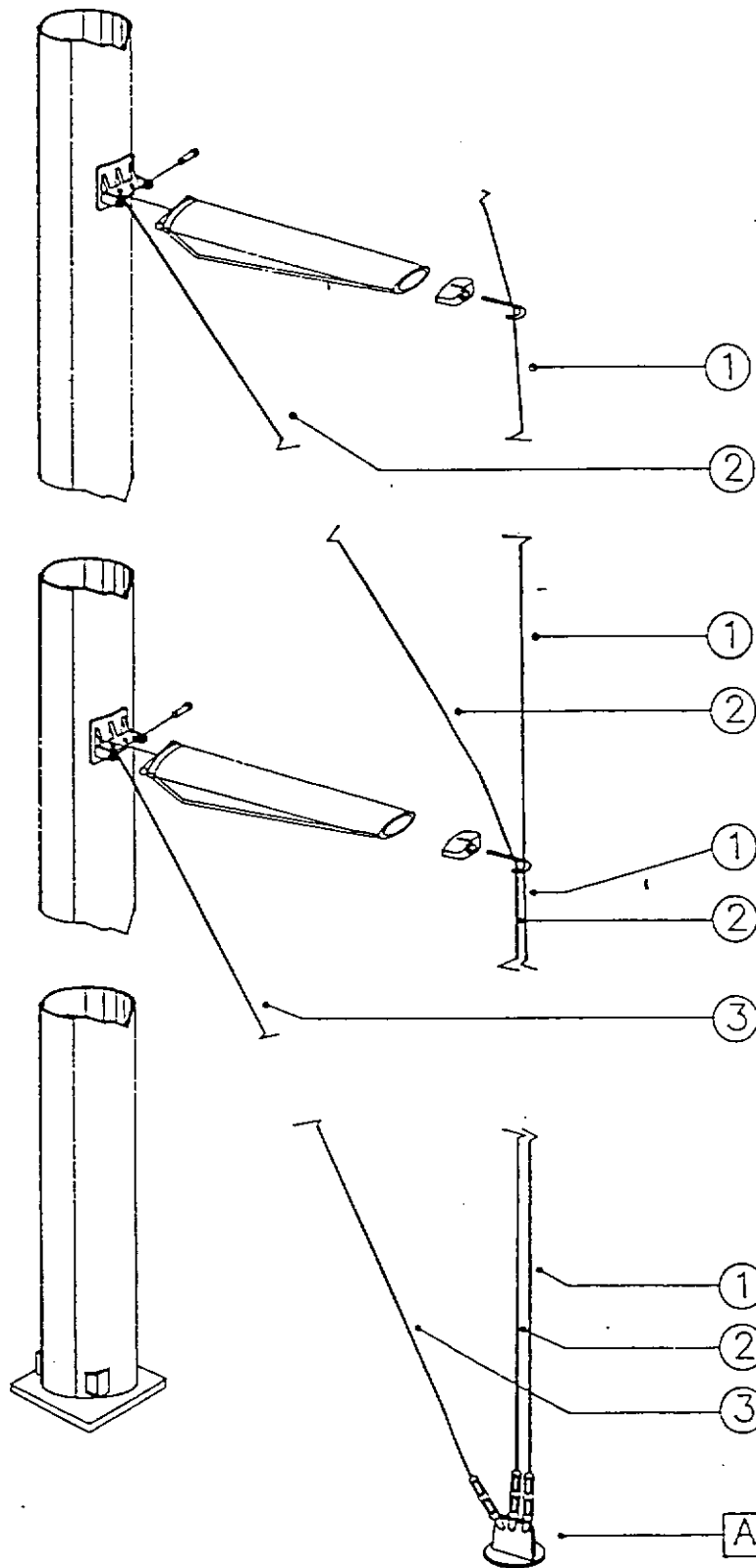
FORESTAY RUNS FROM A POINT APPROXIMATELY 20% BELOW MASTHEAD TO STEMHEAD FITTING.

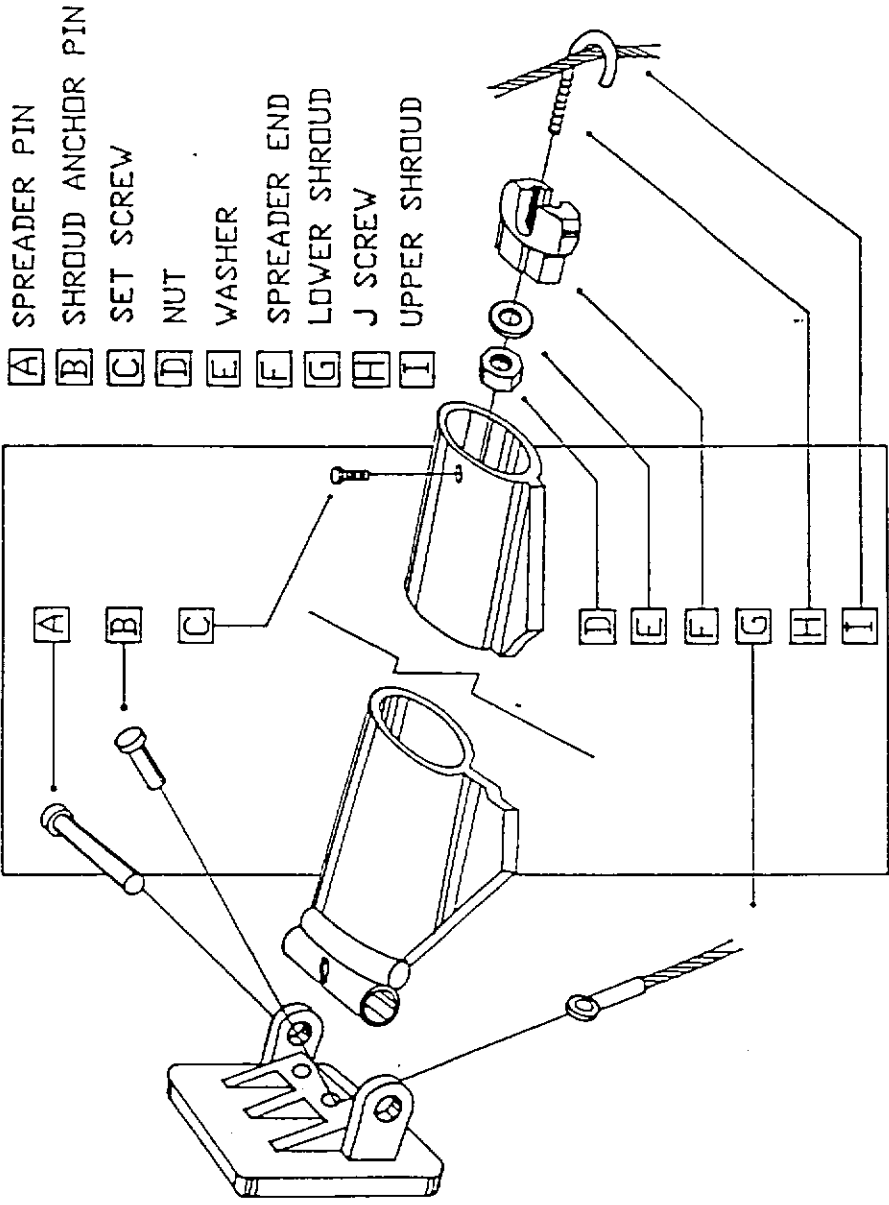


# HUNTER

Z-SPAR RIGGING ASSEMBLY GENA2602

- ① UPPER OR CAP SHROUD
- ② INTERMEDIATE
- ③ LOWER
- A CHAIN PLATE

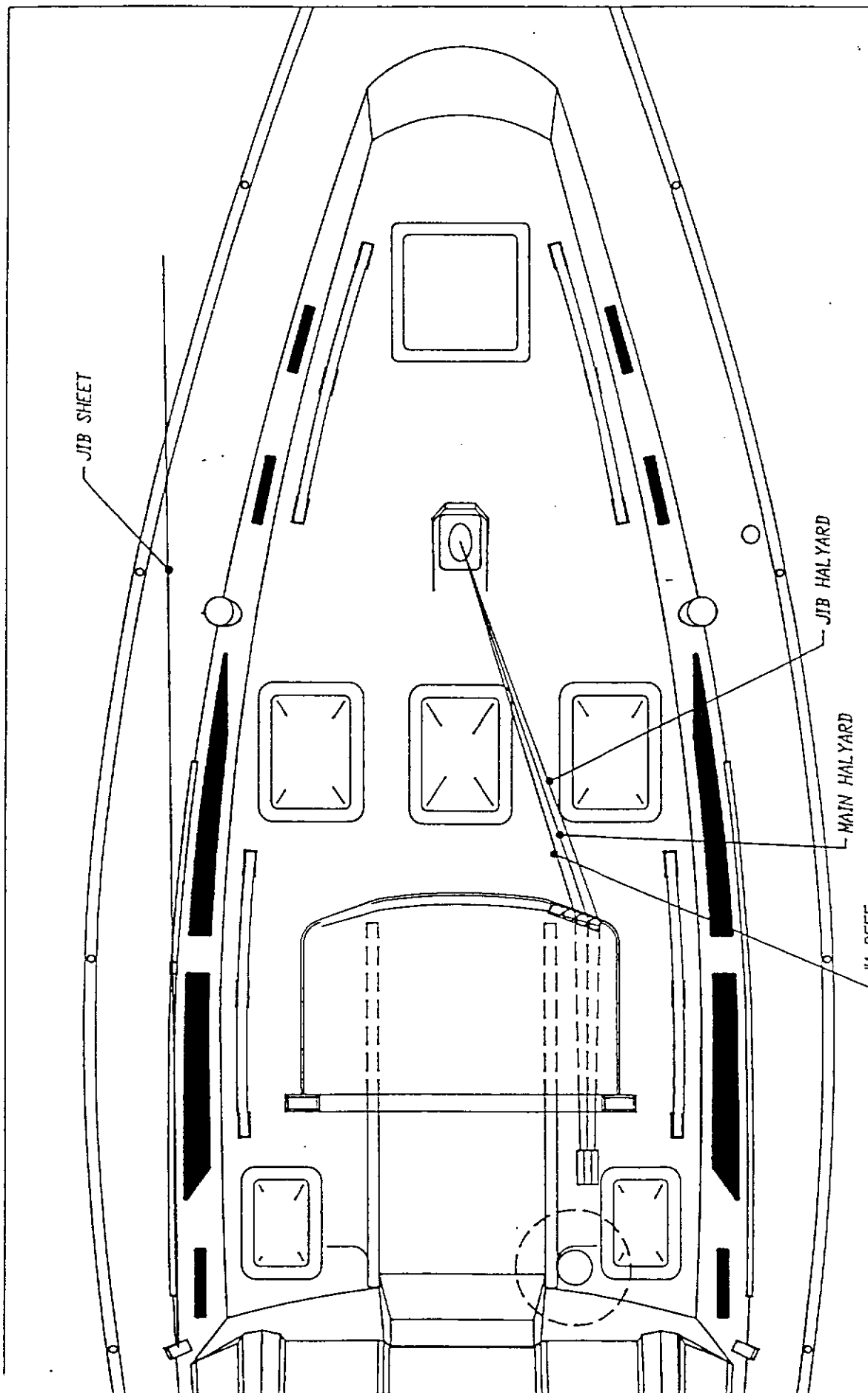




- A SPREADER PIN
- B SHROUD ANCHOR PIN
- C SET SCREW
- D NUT
- E WASHER
- F SPREADER END
- G LOWER SHROUD
- H J SCREW
- I UPPER SHROUD

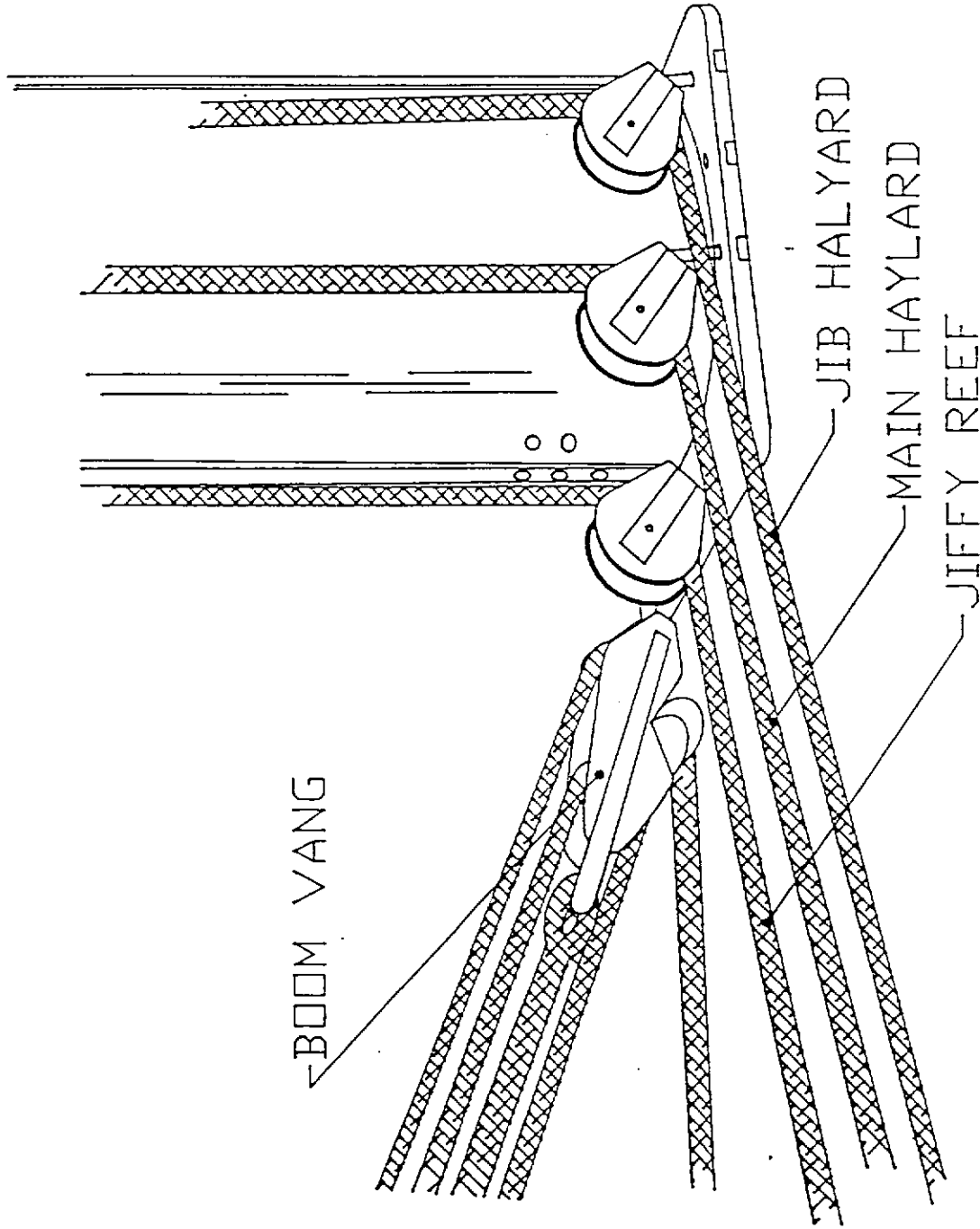
**HUNTER**

SPREADER DETAIL  
Z-SPAR GENA2616



**HUNTER** 

HUNTER 33.5 RUNNING RIGGING H33A2619

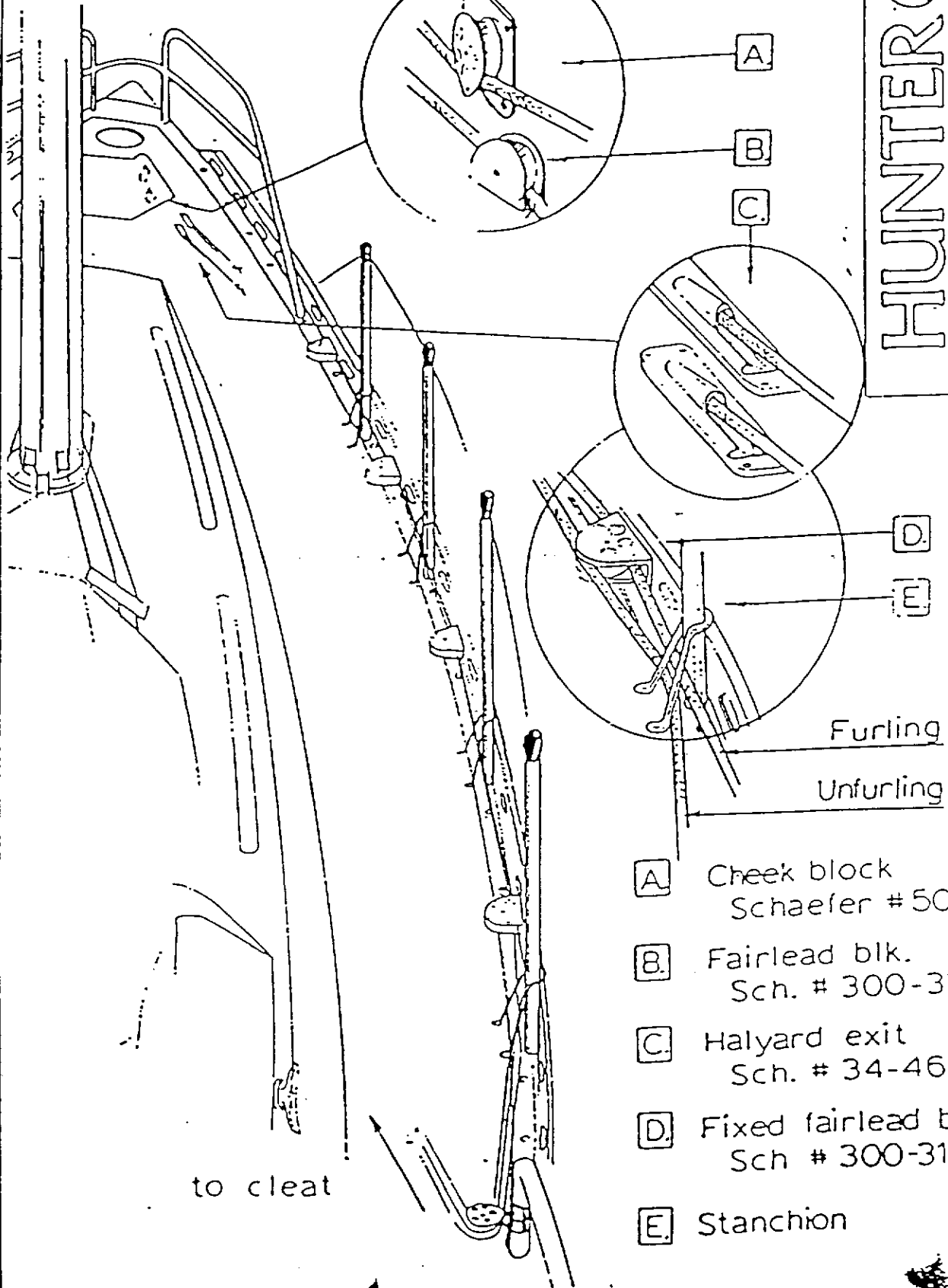


# HUNTER

MAST STEP DETAIL  
Z-SPAR HUNA2625

# HUNTER

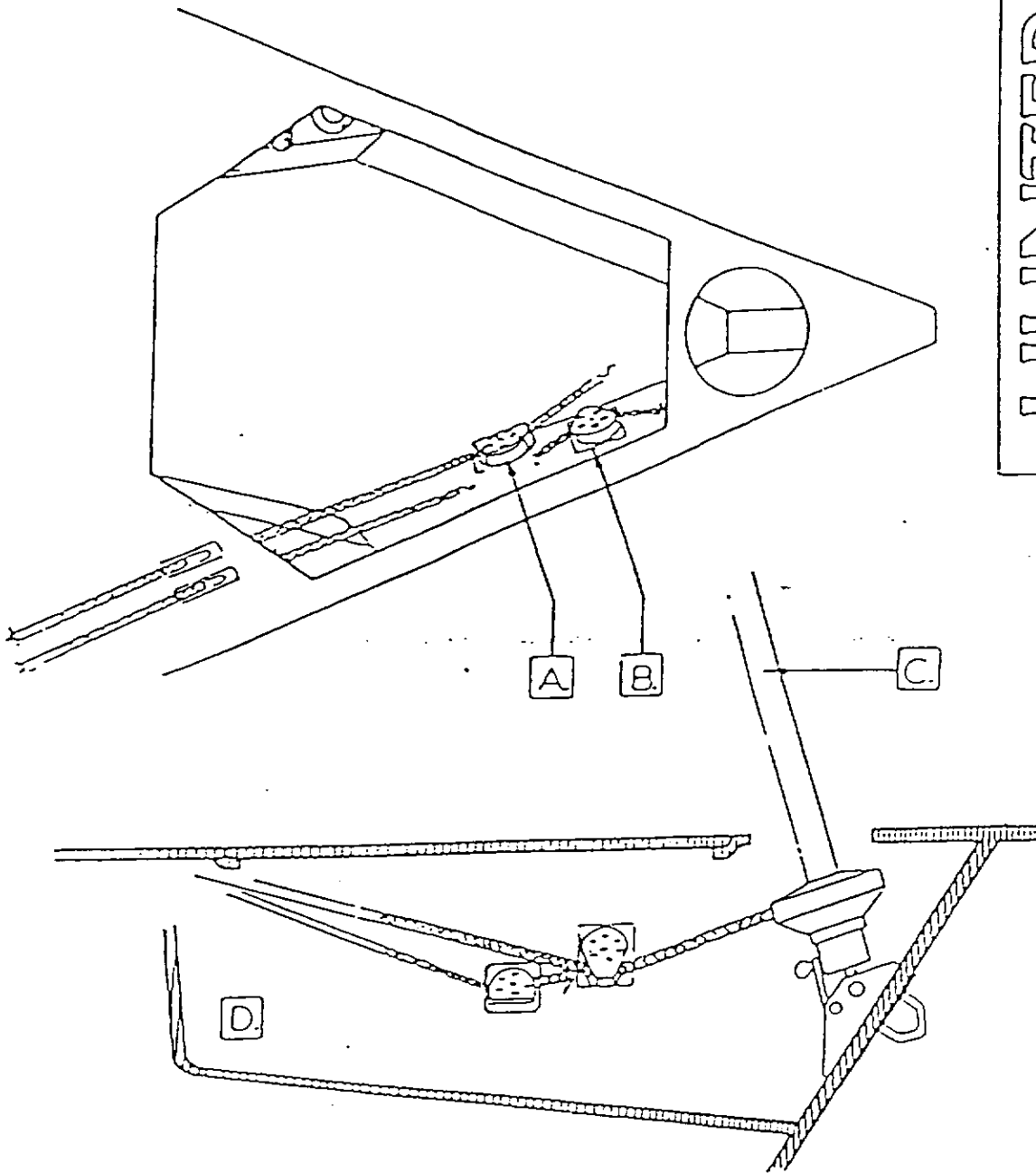
FURLING SYSTEM GENA2625



- A Cheek block  
Schaefer # 501-39
- B Fairlead blk.  
Sch. # 300-32
- C Halyard exit  
Sch. # 34-46 (2)
- D Fixed fairlead blk.  
Sch # 300-31 (4)
- E Stanchion

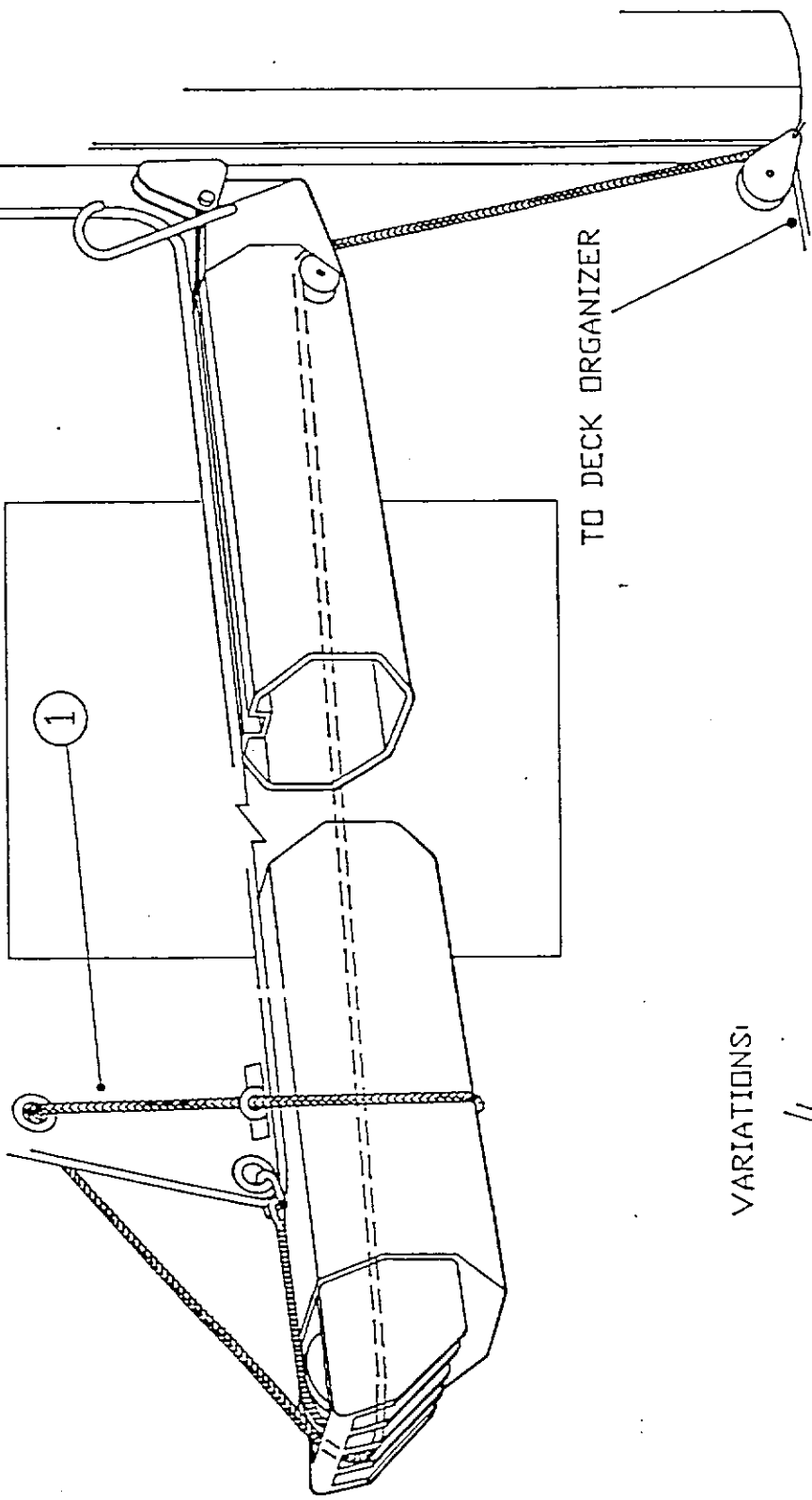
# HUNTER

FURLING GENA2624

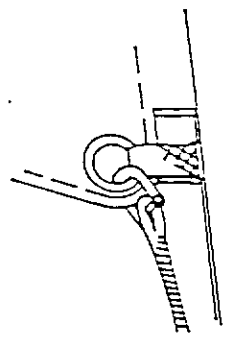


- A Fairlead block Schaefer #300-32
- B Cheek blk. Sch. #501-39
- C Furling
- D Anchor well

① REEF #1

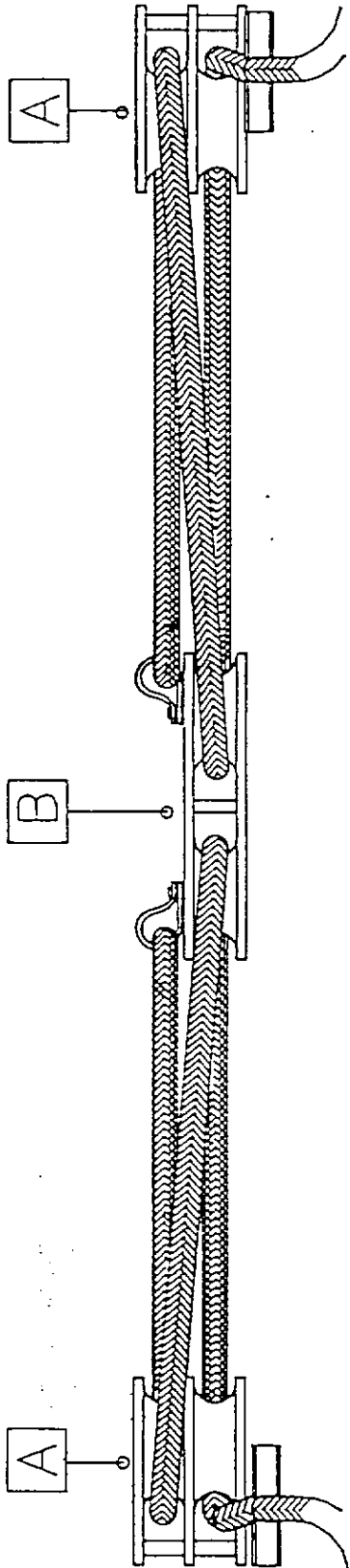


VARIATIONS:

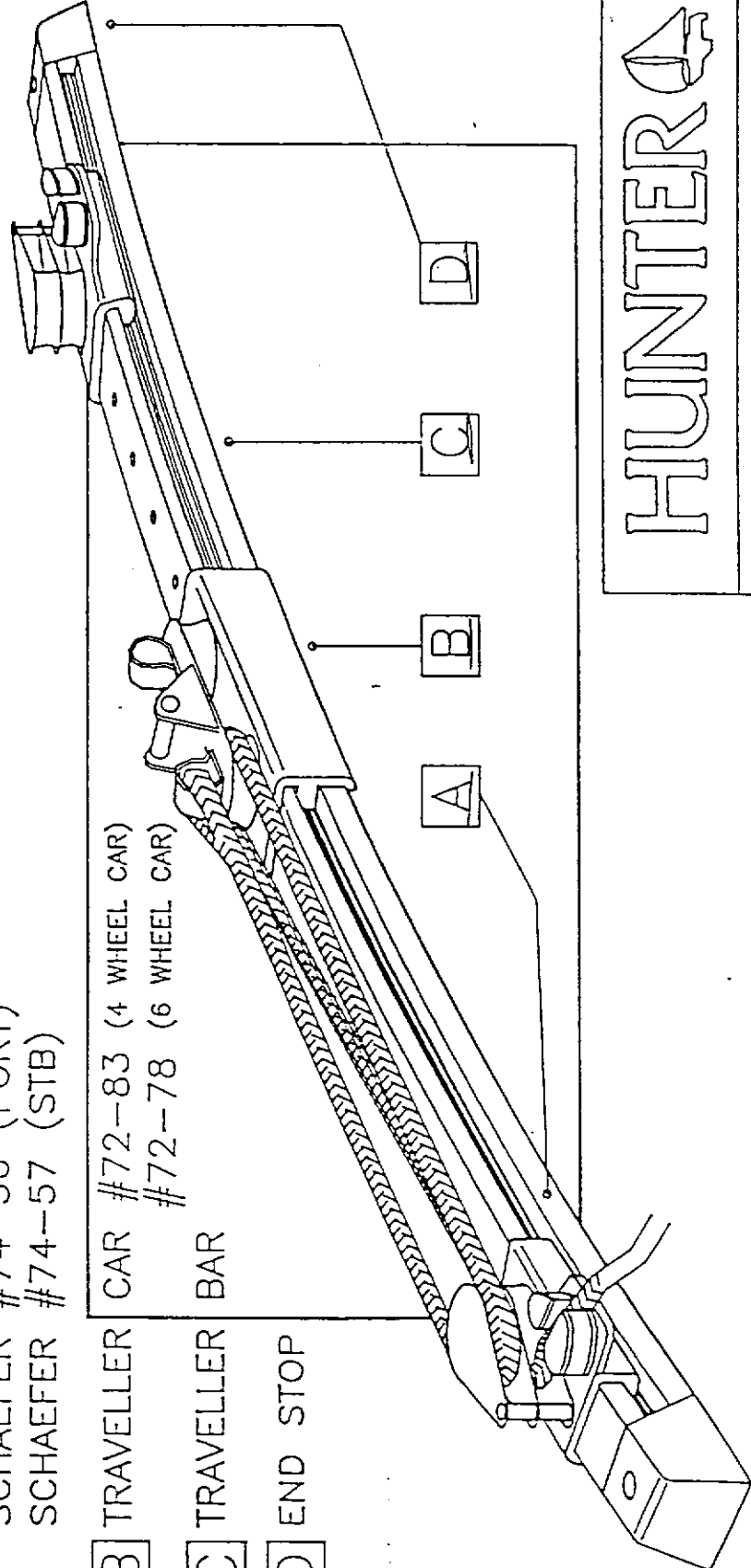


# HUNTER

BOOM AND REEF LAYOUT  
Z-SPAR H33A2621



**A** DOUBLE BLOCK WITH CAM CLEAT  
 SCHAEFER #74-56 (PORT)  
 SCHAEFER #74-57 (STB)



**B** TRAVELLER CAR #72-83 (4 WHEEL CAR)  
 #72-78 (6 WHEEL CAR)  
**C** TRAVELLER BAR  
**D** END STOP

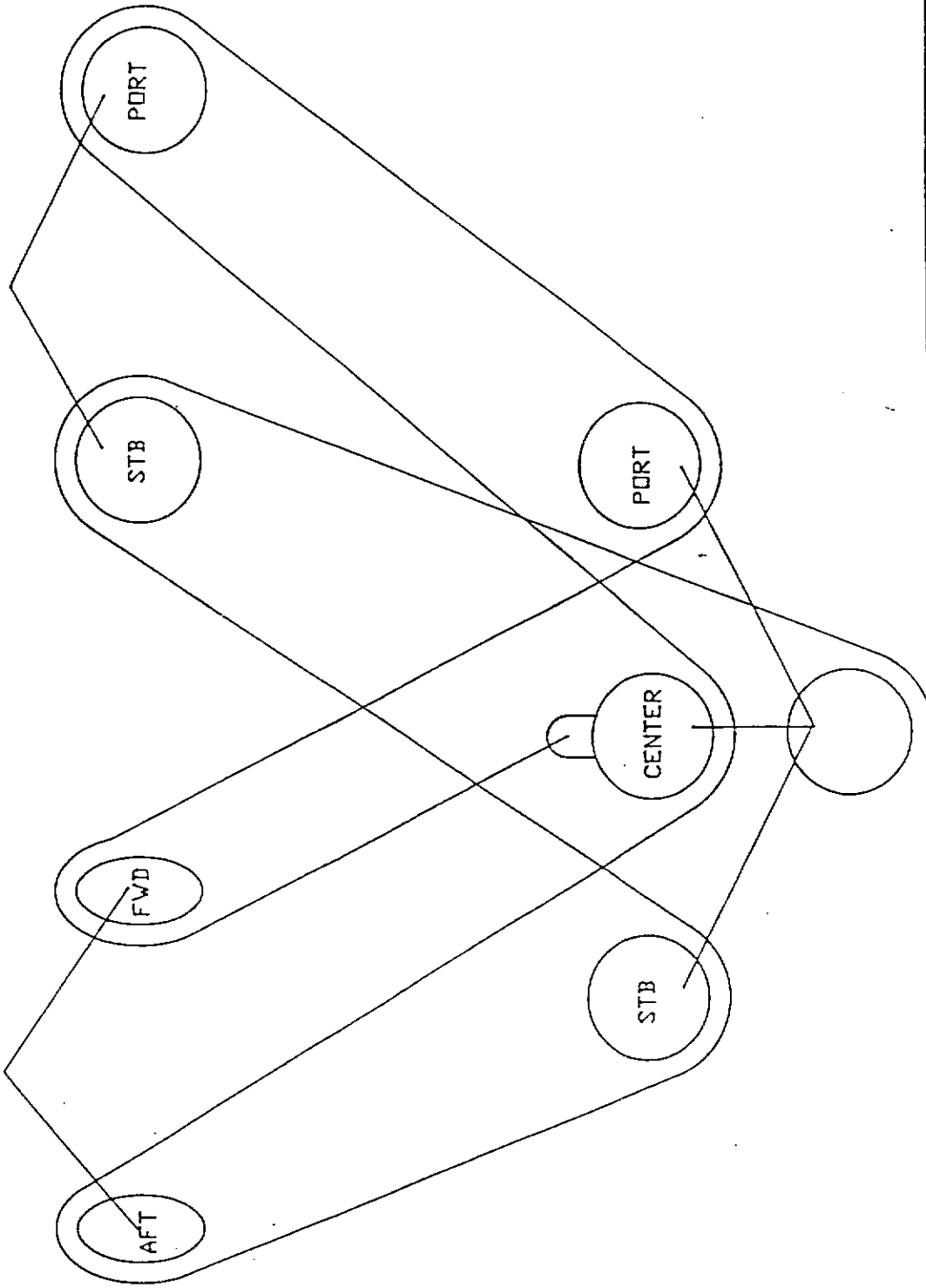
# HUNTER

TRAVELLER DETAIL GENA2611



DOUBLE BLOCK AFT  
FACING ATHWARTSHIPS

DOUBLE BLOCK FWD  
FACING FORE AND AFT



# HUNTER

8:1 MAIN SHEET RUN HUNA2626

## HUNTER 33.5 RIGGING SPECIFICATIONS

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### STANDING RIGGING

#### FITTINGS

<u>Description</u>	<u>Wire Size</u>	<u>Upper End</u>	<u>Lower End*</u>	<u>Overall Length</u>
Forestay	1/4	toggle jaw	8-16-16	41'-4 1/4"
Backstay	3/16	stemballw/2 cups	marine eye	27'-9 1/4"
Bridles	5/32	marine eye	5-10-10	24'-10"
Uppers	9/32	stemball w/cup	9-16-16	40'-2"
Intermediates	7/32	marine eye	7-12-12	29'-0 1/2"
Lowers	1/4"	marine eye	8-16-16	15'-5 1/2"

All wire is 1 x 9 stainless steel.

Backstay is attached to bridle with two splitter plates and three pins - 3/8", 5/16", 5/16".

\* "X-X-X" represents the turnbuckle size as follows:

Wire size/body size/pin diameter in 32nd's of an inch.

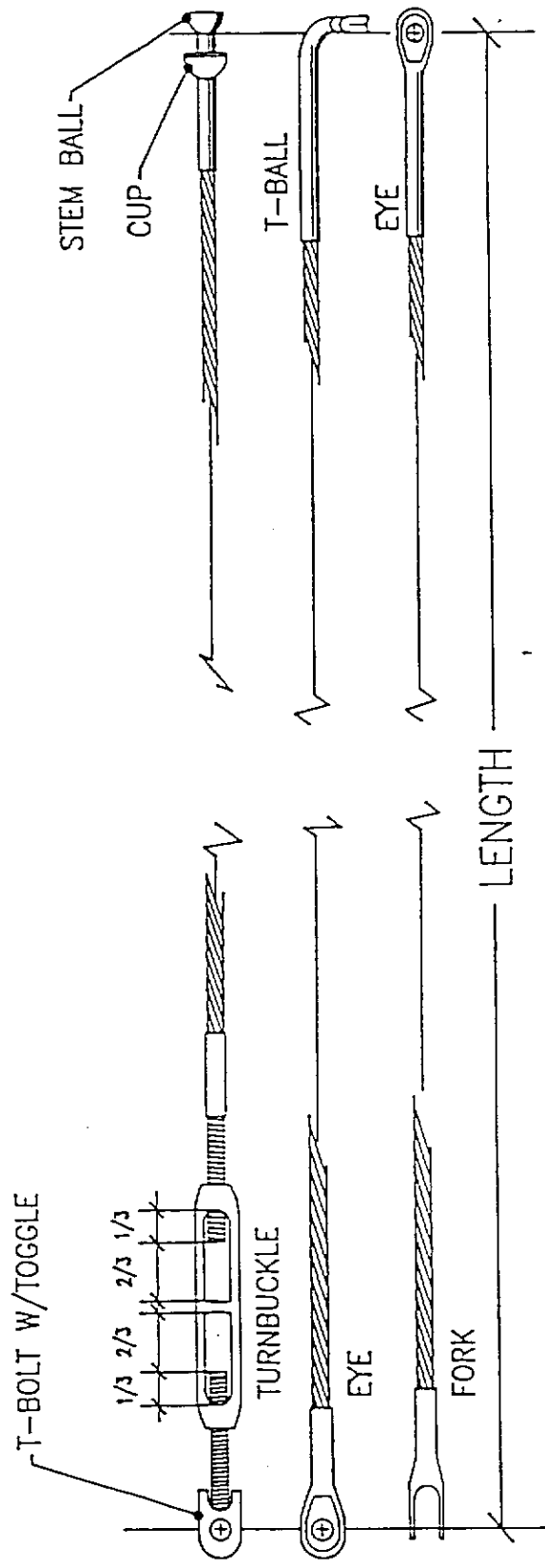
Example: 7-12-12 is a turnbuckle that accepts a 7/32" wire, has a 3/8" (12/32") thread diameter in the body, and uses a 3/8" (12/32") pin.

### RUNNING RIGGING

<u>Line</u>	<u>Size</u>	<u>Attachments</u>	<u>Overall Length</u>
Main Halyard	7/16"	Headboard shackle	108'
Jib Halyard	7/16"	Swivel snapshackle	93'
Reef Line	3/8"		48"
Main Sheet	7/16"	Eye splice	71'
Jib Sheets	7/16"		43'
Traveller Control Lines	3/8"	Eye splice	16'
Vang Line	3/8"	Eye splice	28'
Topping Lift	3/8"	Eye splice	96'
Anchor Line	1/2"	Shackle	150'

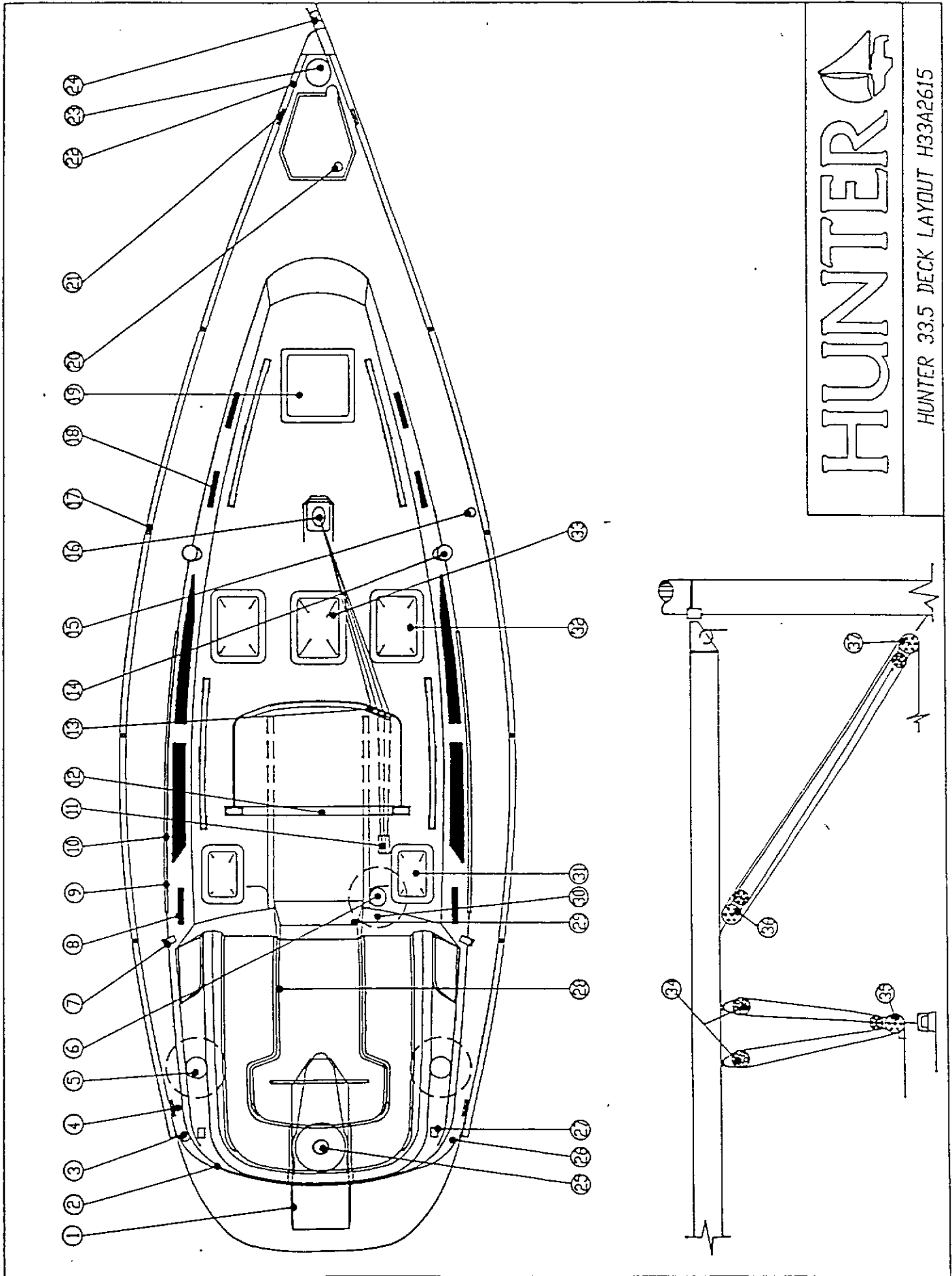
All lines low stretch Dacron except anchor line which is nylon.

All rigging is supplied by SECO SOUTH.



# HUNTER

RIGGING LENGTHS GENA2605

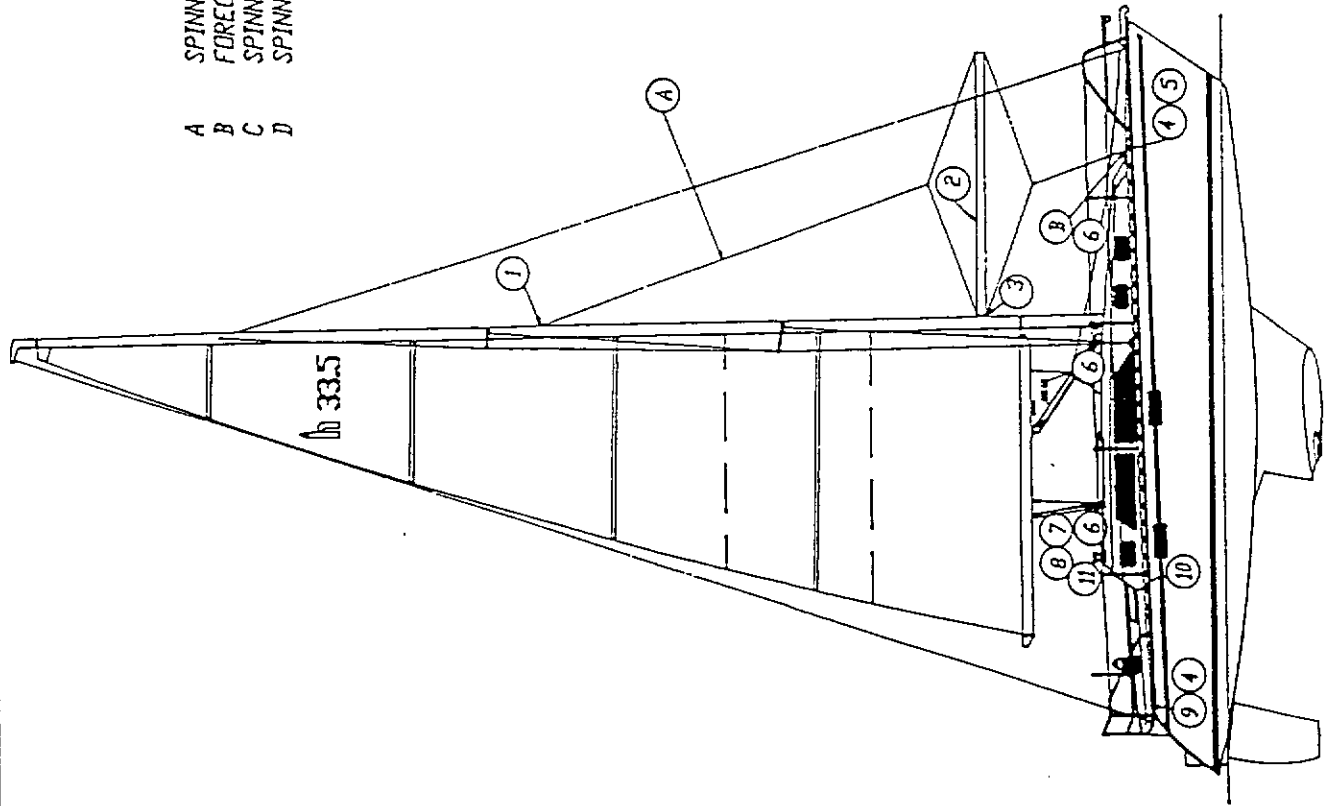


# HUNTER

HUNTER 33.5 DECK LAYOUT H33A2615

## HUNTER 33.5 DECK HARDWARE LAY-OUT (see diag.)

<u>PART</u>	<u>MANUFACTURER</u>	<u>MFG.#</u>	<u>HUNTER PART #</u>
1. Swim Ladder	Southcoast	N/A	HW2174
2. Stern Rail	Southcoast	N/A	HW2270
3. Diesel Fuel Fill	Scandvik	NY6145-03	PL1126
4. Mooring Cleat	Y/S	YS7107F-10"	HW0977
5. Primary Winch	Bariant	#22-39CST	HW2544
6. Halyard Winch	Bariant	17CST	HW2540
Handle	Bariant	10CX	HW2564
Handle, locking	Bariant	V10LIC	HW2566
7. Turning Block	Schaeffer	501-39	HW0312
8. Portlight	Lewmar	#8912	HW0049
Screen	Lewmar	for #8912	HW0049A
9. Lead Block	Schaeffer	32-98	HW0217
10. Genoa Track	Schaeffer	SK-6075	HW0216
End	Schaeffer	74-36G	HW0215
11. Triple Sheet Stopper	Garhauer	11-13	HW1280
12. Traveller Bar	Schaeffer	SK6198	HW0203
Stop	Schaeffer	74-93	HW0205
Car	Schaeffer	72-83	HW0204
Port Control Block	Schaeffer	74-56	HW0206
Stb. Control Block	Schaeffer	74-57	HW0207
13. Deck Organizer	Garhauer	N/A	HW0172
14. Chain Plate	Southcoast	N/A	HW1662
15. Waste Tank Pump Out	Scandvik	NY6146-00	PL1140
16. Mast Base	Z-Spar	1110	RI0520-A
17. Stanchion	Southcoast	N/A	HW2100-A
18. Portlight	Lewmar	#8902	HW0043
Screen	Lewmar	for #8902	HW0043A
19. Hatch	Custom	N/A	SC010040
20. Water Tank Fill	Nordic	NY46144-00	PL1130
21. Mooring Cleat	Y/S	YS7107F-10	HW0977
22. Bow Rail	Southcoast	N/A	HW2400
23. Forestay Chainplate	Southcoast	N/A	HW1600
24. Bow Rolier	Southcoast	N/A	HW1602
25. Inspection Port	Pyhi	DP40-W	HW0045
26. Backstay Chainplate	Southcoast	N/A	HW1790
27. Hatch Handle	Southcoast	N/A	HW4479
28. Porthole	Beckson	N/A	HW0041
Screen	Beckson	N/A	HW0037-C
29. Pinboard U-Frame	Bomar	N25-H33	HW0149
30. Hatch	Custom	N/A	SC010164
31. Line Holders	Southeast	N/A	HW2702
32. Hatch	Custom	N/A	SC010128
33. Skylight	Custom	N/A	SC010124
34. Double Block	Schaeffer	500-23-SS	HW0201
35. Mainsheet Block	Schaeffer	SK-6527	HW0200
36. Fiddle Block	Schaeffer	501-45	HW0211
37. Fiddle Block w/Cam	Schaeffer	25-55	HW0212



<u>LINES</u>			
<u>ITEMS</u>	<u>LINE SIZE</u>	<u>LENGTH (FEET)</u>	<u>SNAPSHACKLES</u>
A SPINNAKER POLE TOPPING LIFT	3/8'	70'	7200-210
B FOREGUY	3/8'	40'	7200-210
C SPINNAKER SHEETS (TVD)	7/16'	66'	7210-220
D SPINNAKER HALYARD	7/16'	98'	7210-220

DECK FITTINGS

<u>ITEMS</u>	<u>MANUFACTURER</u>
1 TOPPING LIFT BLOCK	Z-SPAR
2 SPINNAKER POLE	Z-SPAR
3 SPINNAKER POLE CAR WITH CONTROL	Z-SPAR
4 PAD EYE (THREE)	SCHAEFER 78-01
5 FOREGUT BLOCK (ONE)	SCHAEFER 05-05
6 BULLSEYE (THREE)	NICRO FICD 615
7 QUAD SHEET STOPPER	GARHAUER
8 WINCH	BARIENT 21CST
9 SPINNAKER SHEET BLOCKS (TVD)	SCHAEFER 05-15
10 TURNING BLOCK w/ STOPPER (TVD)	SPINLOCK JK 1
11 CAM CLEAT w/ FAIRLEAD	SCHAEFER 70-52

INSTALLATION NOTES

- ITEMS 1-3 FOLLOW MANUFACTURING INSTRUCTIONS.
- ITEMS 4,5 INSTALL ON CENTERLINE 12' AFT OF ANCHOR WELL.
- ITEM 6 MOUNT ON PORT SIDE EQUALLY SPACED.
- ITEMS 7,8 INSTALL ON PORT SIDE AS ORIGINAL EQUIPMENT IS INSTALLED ON STARBOARD SIDE.
- ITEM 9 SHEET BLOCKS SWAP TO TDE RAIL AFT.
- ITEM 10 CHANGE OUT TURNING BLOCK WITH LOCKING TYPE TOPPING LIFT BLOCK IS TO BE INSTALLED 24' BELOW THE UPPER SPREADER.

# HUNTER

HUNTER 33.5 SPINNAKER PACKAGE H33A2622

# MARINCO SHORE POWER CABLE SET

---

## INSTRUCTION SHEET

**WARNING** - *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 MARINCO shore power cable set is intended for use outdoors. To prolong the life of the set, store indoors when not in use.

## MAINTENANCE

**WARNING** - *To prevent electrocution, always disconnect from power source before performing maintenance.*

### General:

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

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

### *In case of Salt Water Immersion:*

Rinse plug end and/or connector end thoroughly in fresh water, shake or blow out excess water and allow to dry. Spray with a moisture repellent before re-use.

## REPAIR

If either plug or connector end requires replacement (component or molded type), it can be replaced with the following MARINCO devices.

CABLE RATING	PLUG	COVER	CONNECTOR	COVER
30A-125V 2 pole, 3 wire	305CRP	102	305CRC	103R
50A-125V 2 pole, 3 wire	6361CR	7717	6360CR	7715CR
50A-125/250V 3 pole, 4 wire	6365CR	7717	6364CR	7715CR

# PERKO

## BATTERY SWITCHES



### INSTALLATION AND OPERATING INSTRUCTIONS

Fig. - 8501 Basic switch  
8502 with key lock  
8503 with alternator  
field disconnect  
8504 with lock & field  
disconnect

For use with alternators and generators rated 6-32 V D.C. switch rating 250 amperes continuous, 360 amperes intermittent.  
Locate switch to keep battery cables short as possible.  
All wiring to the switch shall be performed by a qualified marine electrician and in accordance with the Fire Protection Standard For Motor Craft N.F.P.A. No. 302 The Standards of the American Boat and Yacht Council, Inc. and the USCG safety standards for boat electrical systems (33CFR183).

**CAUTION:** (1) Make sure connections at terminals No. 1 and No. 2 are of the same polarity.  
(2) Always STOP engines before switching to "OFF" position. Make before break feature allows switching between 1 or 2 positions with engine running.

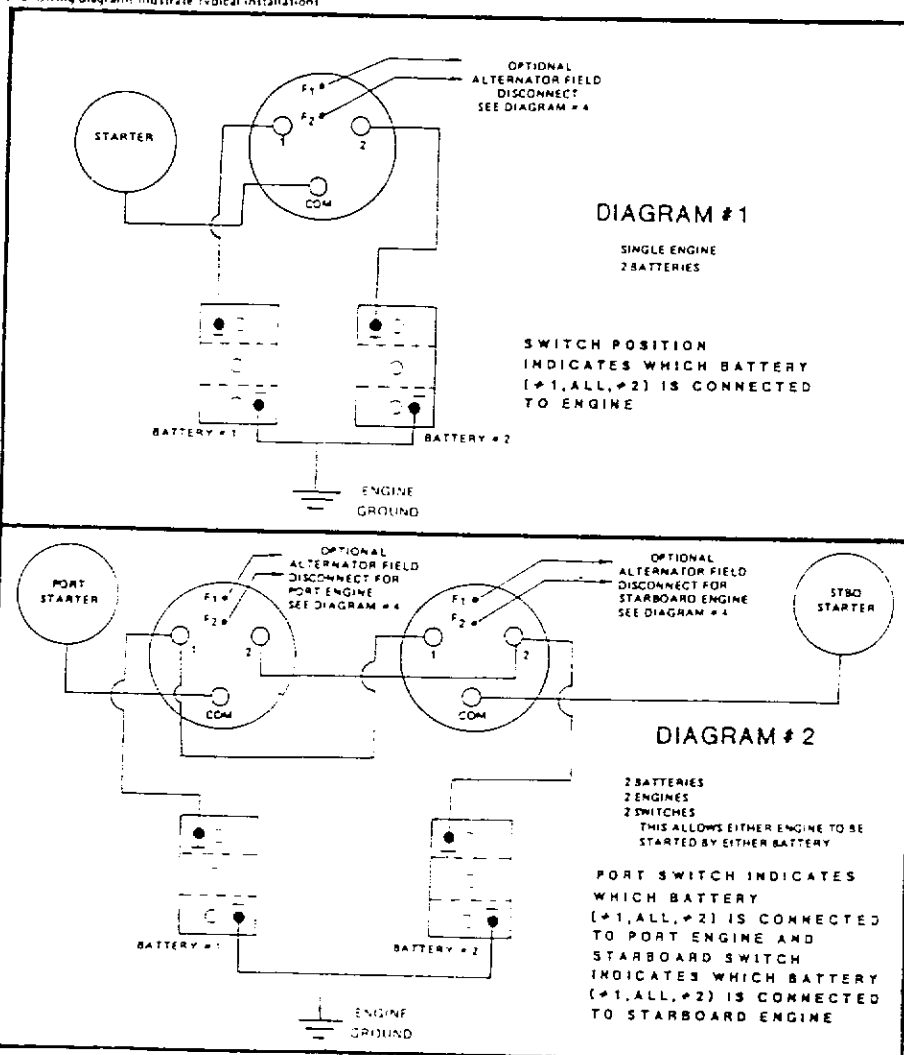
Erratic operation, particularly after very long periods of idleness, can be cleared by rapidly switching back and forth briskly several times without any load connected.

**NOTE:** If switch is to be mounted in an area subject to corrosion, it is recommended that a liquid electrical coating be applied to the terminal connections.

#### OPTIONAL ACCESSORIES

- (1) Key Lock - Switch can be locked only in the "OFF" position. Key can be removed in either the locked or unlocked position.
- (2) Alternator field disconnect is used to break the field current and protect the alternator diodes if the battery switch is inadvertently turned to the "OFF" position with engine running. Hook up instructions and applicability are explained in Diagram # 4.

The following diagrams illustrate typical installations.



**PERKO** INC

SEE OTHER SIDE

16490 N.W. 13th Avenue  
Miami, Florida 33169-5707

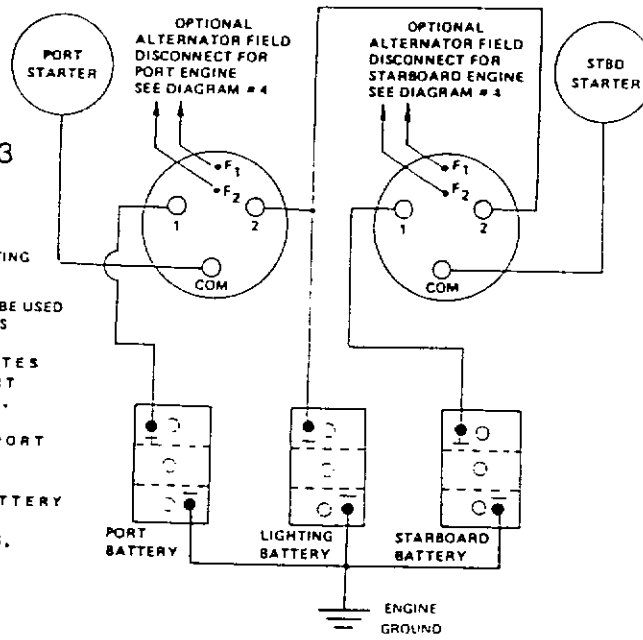


### DIAGRAM # 3

2 SWITCHES  
2 ENGINES  
2 ENGINE BATTERIES AND  
SEPARATE BANK OF LIGHTING  
BATTERIES.

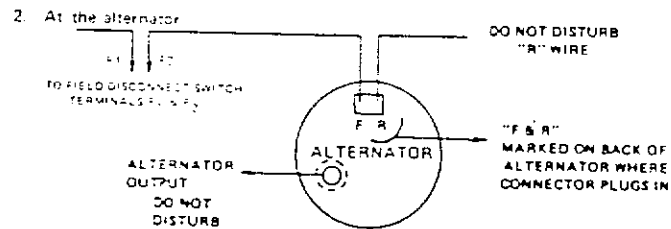
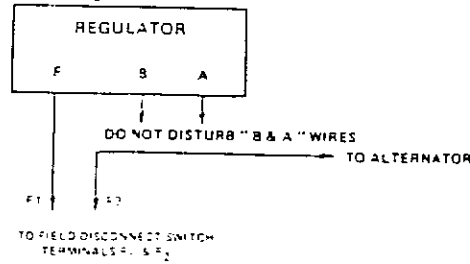
THIS ALLOWS BOTH ENGINES TO BE USED  
TO CHARGE LIGHTING BATTERIES

PORT SWITCH INDICATES  
WHICH BATTERY (PORT  
ONLY, PORT & LIGHTING,  
LIGHTING ONLY) IS  
CONNECTED TO THE PORT  
ENGINE AND THE  
STARBOARD SWITCH  
INDICATES WHICH BATTERY  
(STARBOARD ONLY,  
STARBOARD & LIGHTING,  
LIGHTING ONLY) IS  
CONNECTED TO THE  
STARBOARD ENGINE



### DIAGRAM # 4 ALTERNATOR FIELD DISCONNECT

- A. Use min. 14 awg wire, suitable for use in marine engine compartments.
- B. On systems with a separate regulator, splice the field disconnect switch into the field wire "F", as shown:
  1. At the regulator



- C. On unitized alternators with built in regulator - a field disconnect cannot be installed.

# GALLEY/HEAD SYSTEMS

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## WATER SYSTEM OPERATION

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

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

If pump kicks in frequently without system use, you may have a leak in the system and it should be checked. Do not activate water heater unless there is water in the system.

To operate shower, turn on hot & 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.

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# ORIGO 6000

U.S. Pat. No. 4,416,617 other patents pending

## INSTRUCTIONS

ORIGO 6000 is a non-pressurized alcohol stove with the fuel absorbed in a non-flammable pulp. ORIGO 6000 has no valves to develop leaks or other components in need of regular service. This makes ORIGO 6000 safe and easy to maintain.

As always — when working with a naked flame — certain precautions are required. Accordingly read the following simple instructions carefully before using your new ORIGO 6000 stove.

If an accident should ever occur, remember that burning alcohol can be extinguished with water.

### LOCATION OF YOUR NEW ORIGO 6000

Your stove should be located in a well-ventilated space. Avoid excessive draft. Mount the stove as far away from combustible materials as possible. Preferably mount the stove in a metal lined space.

### DESCRIPTION (Photo 1)

- 1 Stove top burner opening
- 2 Stove top regulator knob
- 3 Catch button
- 4 Locking screw, oven burner lid
- 5 Oven burner regulator knob
- 6 Oven thermometer

### TO FILL TOP BURNERS, OPEN THE STOVE TOP

For safety reasons the stove top can only be opened when the flames are extinguished, so turn the knobs to 0 position. Press the catch button and lift the top (Photo 2).

Lift out tank unit. Tank must not be filled near an open flame or a hot object.

It is essential that the flame from previous use has been completely extinguished, and that there is no heat glow on burner top. During use, the tanks are heated and the fuel requires space to expand. It is therefore important to avoid overfilling the tanks. The tank openings are recessed to facilitate filling.

Hold the tank as shown in photo 3, with the recess pointing down and pour the fuel directly into the opening covered by the wire mesh.

Check quantity by raising to vertical. When fuel is visible in recess, stop filling (Photo 4).

After filling, make certain no excess fuel remains in stove. Always wipe tanks dry. Place tanks in stove. Check that they fit properly in mountings. Close the stove. Knobs in 0 position! Fold down the stove top, the catch will lock. (Make certain that the regulating plates cover the burner openings so that the stove top is level).

### TO LIGHT (Photo 5)

Turn regulator knob counter-clockwise to open burner. Place a lighted match or lighter (optional extra) at burner opening. (Match can be dropped in and removed at next filling).

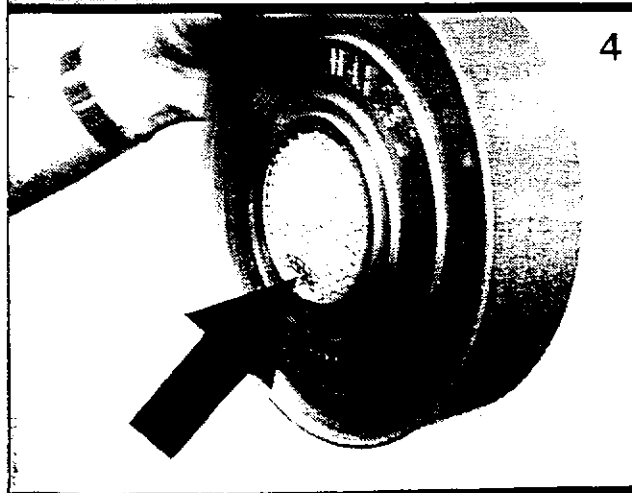
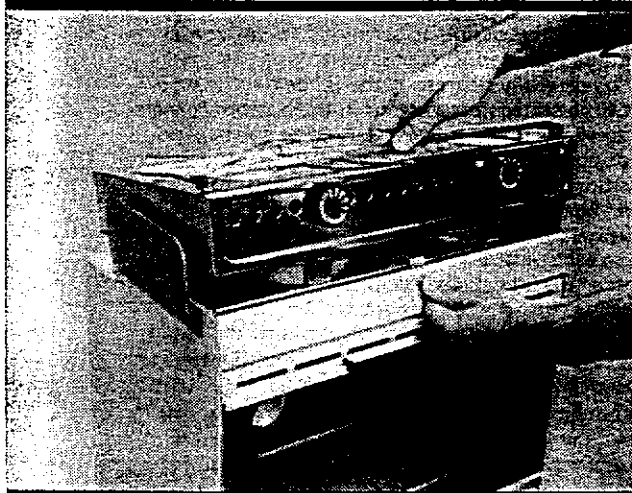
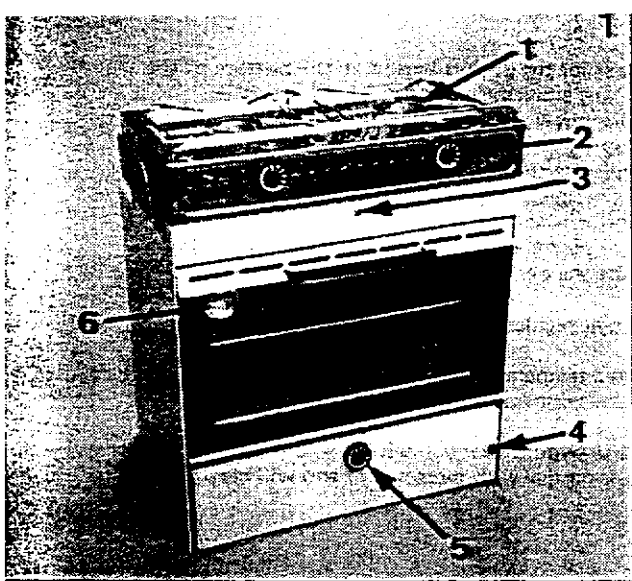
If the stove is warm (from previous use), burner may ignite suddenly and simultaneously extinguish. If this happens, blow down into burner opening to dissipate alcohol vapor, and re-light. Winterize your stove by burning remaining fuel.

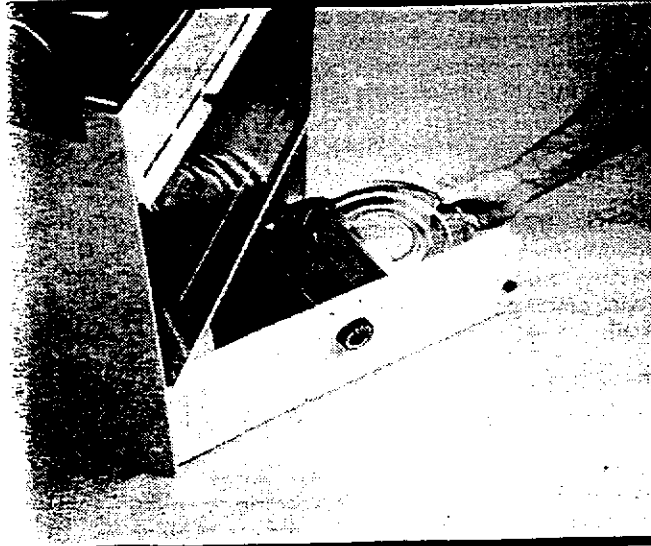
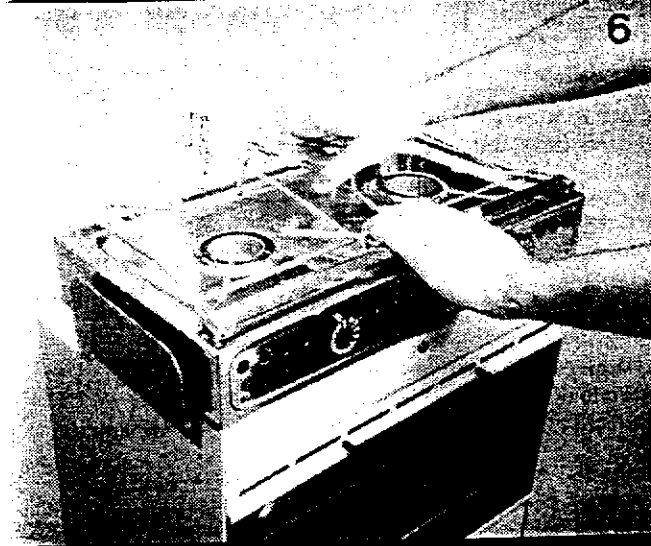
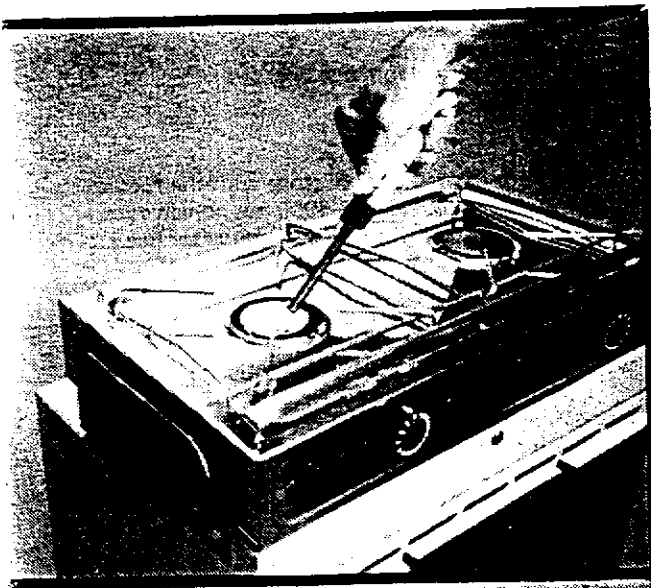
### TO EXTINGUISH

Turn regulator knob fully clockwise.

### TO REMOVE GRID (Photo 6)

At the back of the stove top is an oblong hole, into which the grid retaining hook fits. To remove grid, slide hook out of retaining hole, and grid can be lifted off.





## OVEN

The tank and burner for the oven is located in the bottom of the stove. Access to filling and lighting is through the lower lid. Unscrew the locking screw and open lid. Pull out the tank, while pressing the click spring (Photo 7) and fill according to instructions above. When reinserting the tank into its compartment, check that it is in the right position and that the click spring has engaged. The burner can now be lighted as described above and lid closed. Access to light the oven can also be gained by lifting the bottom lid inside the oven.

Extinguish by turning regulator knob fully clockwise.

Heat oven to desired temperature with burner fully open and reduce flame when the temperature is reached.

The first time you use your oven you will experience quite a strong smell. This is normal with most ovens and will cease after a while.

## INSTALLING

ORIGO 6000 is delivered with gimbals. It is recommended that these are used, but it is also possible to screw it to a horizontal surface, should this be preferred. It is possible to open the oven burner lid widely by carefully depressing the lid below the stopper to gain access to the attachment means in the bottom corners. When fitting the stove with gimbals, first determine the best position for the pivot points. This can be done by placing the stove in the desired position, open the stove top and mark through the holes in the gimbal sideplates. Remove the stove, fasten the pivot arms with fiber washers and screws removed. Fit one fiberwasher with round hole on each pivot and lift the stove from below up between the pivots so that the gimbal sideplates will spring into place on the pivots. With open stove top fit the fiber washers with oblong holes, make certain that they fit properly on the pivots so they can't rotate. Fit steelwashers, screws and tighten. Adjust the tension of the screws to desired friction.

Whether the fixed or gimballed installation is used or not, it is very important that there is ample distance to the surrounding fittings. To secure the distance along the sides, the gimbal side plates shall not be removed.

At the back of the stove is an outlet for hot air. A clearance of 4 inches to the fittings behind is required. If gimballed, allow for ample room to swing.

## GASKETS

The stove is supplied with rubber gaskets. They may be used if your stove is stored for some time. They also prevent evaporation in hot climate.

Use this way: fold up the stovetop, check that the stove has become cold. Put the gaskets over the tank openings. Fold down the stovetop to horizontal position and open the burners to lock the top in closed position.

## OPTIONAL EXTRAS

Potholders  
Lighter

## WARNING

TO BE USED ONLY WITH DENATURATED ALCOHOL.  
MUST NEVER BE USED WITH GASOLINE, KEROSENE,  
DIESEL OR ANY OTHER TYPE OF FUELS.

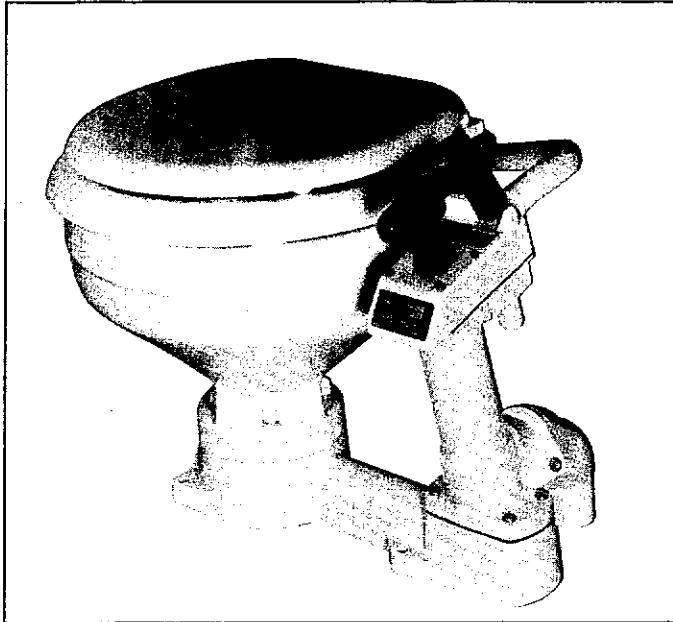
## TECHNICAL DATA

Height:	approx. 21 1/8" (537 mm)	excl. cooking grid
Depth:	approx. 13 3/16" (335 mm)	
Length:	approx. 18 1/4" (464 mm)	
	approx. 20 1/16" (510 mm)	incl. gimbal
Fuel tanks:	approx. 2,5 pints each tank (1,2 L)	
Fuel:	denatured alcohol, methylated spirit	
Efficiency:	Will boil 2 pints of water in approx. 7 minutes	

ORIGO USA INC.  
1121 LEWIS AVE.  
SARASOTA  
FLORIDA 33577  
USA

**PAR**

## Models 29090-0000 29120-0000



### MANUAL MARINE TOILET

#### FEATURES

- Easy to clean white ceramic bowl
- Sturdy wood seat with durable baked enamel finish
- Forward angled pump for easy operation
- Convenient top-mounted dry bowl selector
- Reversible pump mounting for right or left hand installation
- External seal housing/rod guide for easy replacement
- Smooth external surfaces with skirted base to maintain cleanliness
- Triadic full-flow joker valve to avoid accidental blockage
- Multi-angle discharge port for versatility of plumbing connection

Specifications: Inlet port – 3/4", Discharge port – 1 1/2"  
Weight – compact bowl: 26 lb.  
large bowl: 32 lb.

#### MODELS AVAILABLE

29090-0000	Compact Size Bowl & Seat
29120-0000	Household Size Bowl & Seat

Models 29090-0000 29120-0000

#### OPERATION

Manual Marine toilets have traditionally been somewhat cumbersome and confusing to operate and maintain. The PAR toilet has been designed with user convenience in mind. The pump assembly is angled forward to provide a natural, smooth stroke action. It has a top mounted wet/dry bowl selector which can be operated with the same hand used for pumping without releasing the pump handle.

The PAR toilet is surprisingly easy to operate. Simply move the wet/dry bowl selector to the wet bowl position (left) and pump handle up and down a few times to add some water to the bowl prior to use. After using, flush by again pumping handle up and down (in wet bowl position) until bowl is thoroughly rinsed and evacuated. Then move the wet/dry bowl selector to the dry bowl position (right) and continue pumping until only about one cup of water remains in the bottom of bowl. Leave the wet/dry bowl selector in the dry bowl position when toilet is not use.

#### APPLICATION

The PAR Manual toilet is designed to meet the requirements of onboard marine applications. It may be installed above or below the waterline (special plumbing requirements apply to below waterline installations). The toilet may be plumbed so waste is discharged to holding tank, directly overboard (where permitted by law) or into a certified waste treatment device. For installation versatility, the pump assembly may be positioned on the left or right hand side of the bowl. Its multi-angle discharge port will allow routing of discharge hose in almost any direction for ease of installation and neat appearance.

The toilet is available with either a compact china bowl to fit restrictive areas or a large bowl with household size seat assembly for maximum comfort. Its forward angled double action pump with convenient top mounted dry bowl selector is easy and natural to operate. It is self-priming with a dry suction lift of up to 3 feet (1 meter) and a discharge head to 9 feet (3 meters). A full-flow triadic joker valve resists blockage while providing positive back-flow prevention.

**WARNING: Hazard of flooding.** If toilet is installed below the waterline, it must be installed with properly positioned vented loops. Failure to do so may result in flooding which can cause loss of property and life.

#### Positioning and Mounting

The PAR Manual Toilet is assembled at the factory for operation with the right hand. If preferred, or required by available space, the pump and bowl may be rotated 180 degrees to provide left hand operation. To do this, remove hose from inlet elbow (back of bowl) and rotate elbow 180 degrees. It may be necessary to remove the elbow, loosen spud retaining nut and rotate the spud fitting so elbow will be tight when pointing in the opposite direction. Remove, rotate 180 degrees and reinstall both the bowl and pump assembly. Reconnect hose to inlet elbow and the toilet is ready for left hand operation.

The toilet must be installed on a well supported flat surface. Ideally, if underside of mounting surface is accessible, the toilet base should be through-bolted (using 5/16" bolts, washers and locknuts) to the mounting surface. If the underside of mounting surface is not accessible, the use of 5/16" lag bolts and washers is an acceptable alternative.

Before installing, position toilet in location to be installed. Ensure there is adequate space around toilet to easily operate pump and raise seat and lid to a fully opened position. Seat and lid should swing open at least 110 degrees and be supported when open to avoid strain on hinges. Ensure the base drain plug is accessible and inlet and discharge hoses can be routed to their respective ports. The discharge elbow may be rotated (by loosening two flange screws, rotating elbow and retightening screws) to accept the most convenient routing of the discharge hose.

When proper installation has been established mark the four base mounting holes on mounting surface and remove toilet. Ensure that no wiring or plumbing is positioned under the mounting surface which may be accidentally damaged when the surface is drilled. Drill appropriate size holes for fasteners being used. Mount toilet using flat washers between head of bolts and plastic toilet base. If desired a small bead of silicone or latex sealant may be applied around base where it contacts the mounting surface to prevent moisture from getting under the toilet base.

**NOTICE:** Do not use Polysulfide base sealants because they may chemically attack the plastic which can result in breakage.

## Plumbing

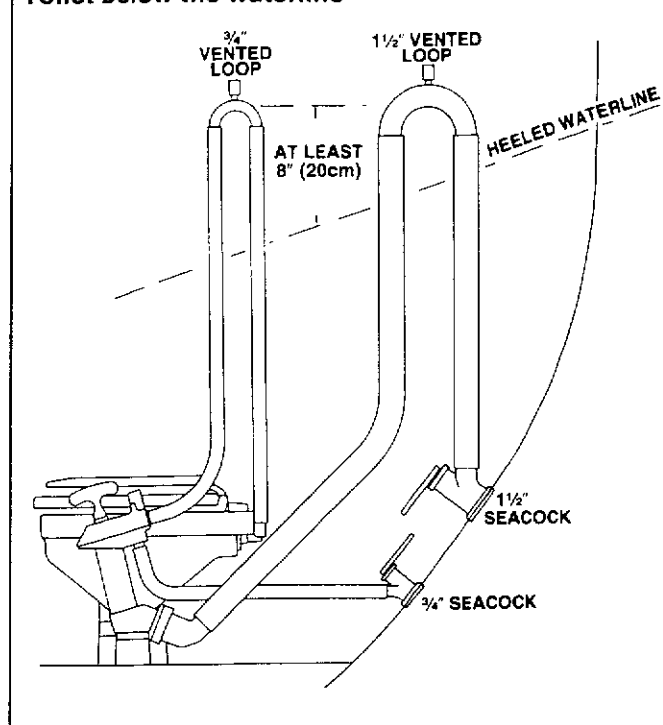
If installing a new inlet thru-hull/seacock, ensure that it is positioned on a part of the hull which is wetted at all angles of heel or trim and free of water turbulence at any hull speed. If discharging waste overboard (check legal restrictions for overboard discharge), ensure discharge thru-hull/seacock is both aft of and higher than the inlet thru-hull/seacock. All inlet plumbing should be a minimum of  $\frac{3}{4}$ " ID and discharge plumbing a minimum of  $1\frac{1}{2}$ " ID. All hose ends should be double clamped with stainless steel hose clamps.

If toilet is above waterline route hoses to seasocks, holding tank or treatment device via a route as direct as possible. However, for maximum sealing effect on the discharge joker valve, it is recommended that the discharge hose is looped upward about 8" above the discharge elbow before it descends to its termination point. All bends and elbows in plumbing should be kept to a minimum. It should not be necessary to use any sealing compound when attaching hoses to the inlet or discharge ports.

**WARNING: Hazard of flooding. If toilet is installed below the waterline, it must be installed with properly positioned vented loops. Failure to do so may result in flooding which can cause loss of property and life.**

If toilet is below waterline, a  $\frac{3}{4}$ " vented loop must be installed in a length of hose connecting the flushing pump to the rear of the bowl. The vented loop fitting must be positioned 8" above the waterline at all angles of heel or trim. To accomplish this remove the  $\frac{3}{4}$ " hose supplied with toilet and replace with a new length of hose long enough to properly position the vented loop. If the toilet is plumbed for overboard discharge, a  $1\frac{1}{2}$ " vented loop must be installed in the discharge hose. The waste vented loop fitting must also be positioned 8" above the waterline at all angles of heel or trim and ideally should be located as close to the toilet as practical.

## Toilet below the waterline



If unfamiliar with proper plumbing requirements for marine toilets, it is recommended that a qualified marine plumbing technician is contacted to do the installation.

## MAINTENANCE/SERVICE INSTRUCTIONS

### Maintenance

Periodic maintenance is generally not required; however, after long periods of non-use, the toilet may be easier to operate if lubricated.

To do this, fill bowl half-way with warm water and add a few drops of mineral oil or baby oil. With the wet/dry bowl selector in the dry bowl position, empty bowl using long complete strokes.

To winterize toilet, operate the pump in the dry bowl mode to evacuate as much water as possible. Drain the remaining water from the base by removing the base plug.

If charging the holding tank with anti-freeze by pumping it through the toilet, use only ethylene glycol based anti-freeze. To use petroleum based anti-freeze may cause damage to the internal rubber toilet parts.

### Service

Before performing any service flush the toilet long enough to ensure all waste is flushed from the discharge hose. Close both inlet and discharge (if applicable) seacocks and put a "DO NOT OPEN" notice on each to guard against accidental opening and flooding while service is being performed.

**SEAL REPLACEMENT** – Lift handle and wrap rod with one turn of tape just under the handle. Gently grasp piston rod (on tape) with pliers and unscrew handle. **HOLD PISTON ROD AT ALL TIMES OR IT MAY DROP DOWN INTO PUMP.** Remove bumper washer and unscrew and remove seal/rod guide assembly. Wrap threads of piston rod with one turn of tape to protect new seal and install new seal/rod guide assembly. Remove tape from threads and reinstall bumper washer and handle. Tighten handle snugly (do not overtighten) and remove remaining tape.

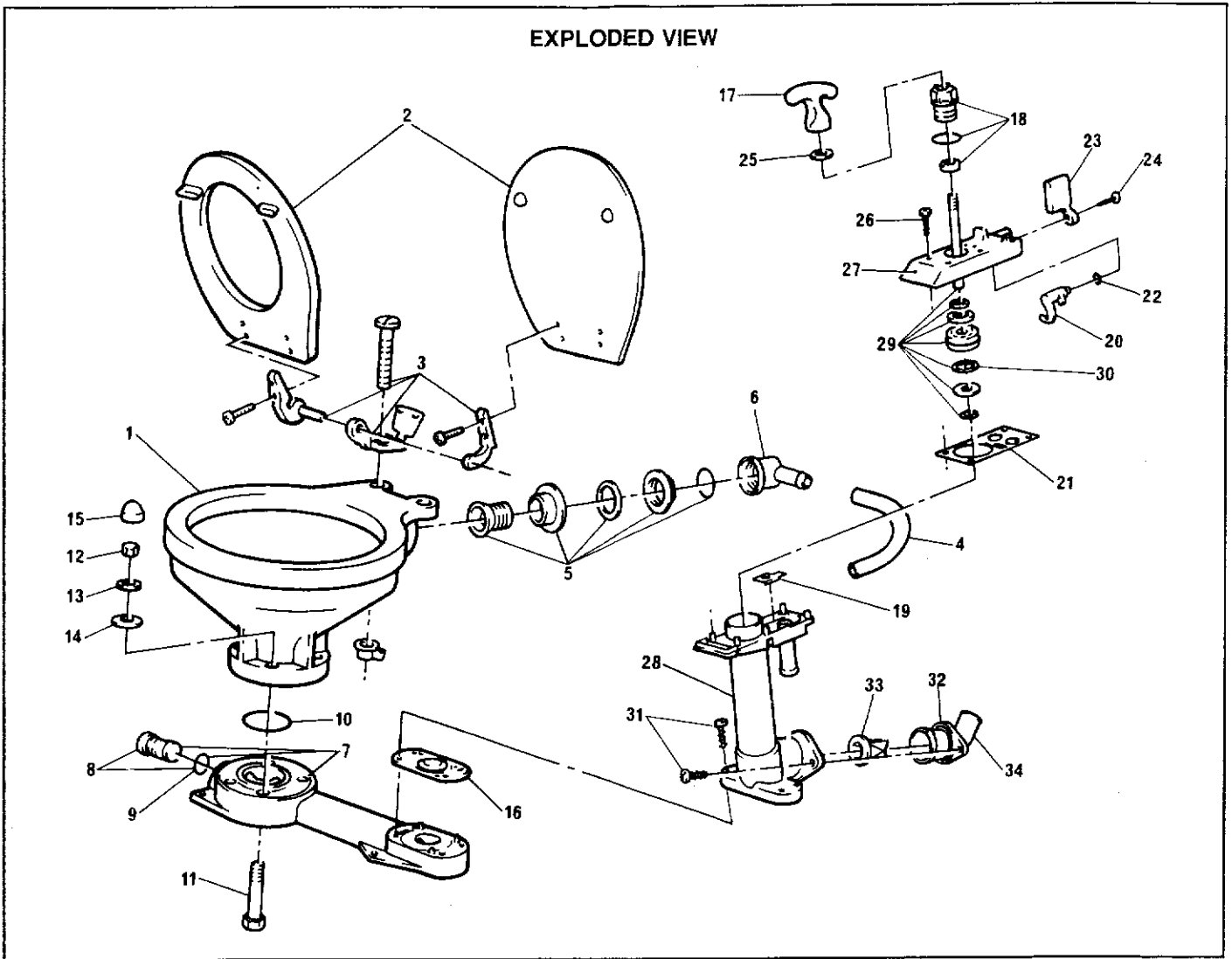
**MAJOR OVERHAUL** – Loosen hose clamps on inlet hose and remove it from the pump. Remove bowl link hose from rear of pump assembly. Remove the two screws that secure the discharge

flange and elbow. Remove the four screws that secure the pump to the base and remove pump assembly. The discharge joker valve and base valve/gasket can now be removed. Remove the six screws that secure the top valve cover, move the wet/dry bowl selector to the wet bowl position and remove valve cover and piston rod assembly from pump cylinder. Remove top valve/gasket assembly and valve seat. Remove piston O-Ring and seal/rod guide assembly (see Seal Replacement instructions). Clean all parts and inspect for damage. Ensure pump cylinder wall is not badly grooved or worn.

Install new seal/rod guide assembly (see Seal Replacement instructions). Install new piston O-Ring. Lubricate bore of pump cylinder with petroleum jelly. Position valve seat and top valve/gasket assembly on top of cylinder. With the wet/dry bowl selector in the wet bowl position, insert piston into cylinder bore and position valve cover on top of cylinder. Secure with six screws. Install joker valve in discharge elbow and base valve/gasket assembly on base. Position discharge flange and elbow on pump and secure with two screws. Position pump assembly on base and secure with four screws. Reattach bowl link hose to pump. Reattach inlet hose to pump and secure with clamps.

**BOWL SEAL REPAIR** – To replace the bowl seal (base O-Ring) disconnect inlet and discharge hoses and remove toilet from its mounting surface. Pry nut caps from bowl fasteners. Invert toilet and hold bolts on underside of base while removing nuts and washers. Lift base from bowl and remove O-Ring. Install new O-Ring, position base on bowl and resecure with fasteners ensuring plastic washers are sandwiched between S.S. flat washers and ceramic bowl. Invert toilet and snap plastic nut caps onto nuts. Reinstall toilet on mounting surface, connect hoses and secure with hose clamps.

### EXPLODED VIEW



### REPAIR KITS AVAILABLE

KIT	PART NO.	DESCRIPTION
A	29045-0000	MAJOR SERVICE KIT, PUMP
B	29040-1000	PUMP ASSEMBLY
C	29094-0000	VALVE COVER ASSEMBLY
D	29051-0000	PUMP CYLINDER ASSEMBLY
E	29047-0000	BOWL INSTALLATION KIT

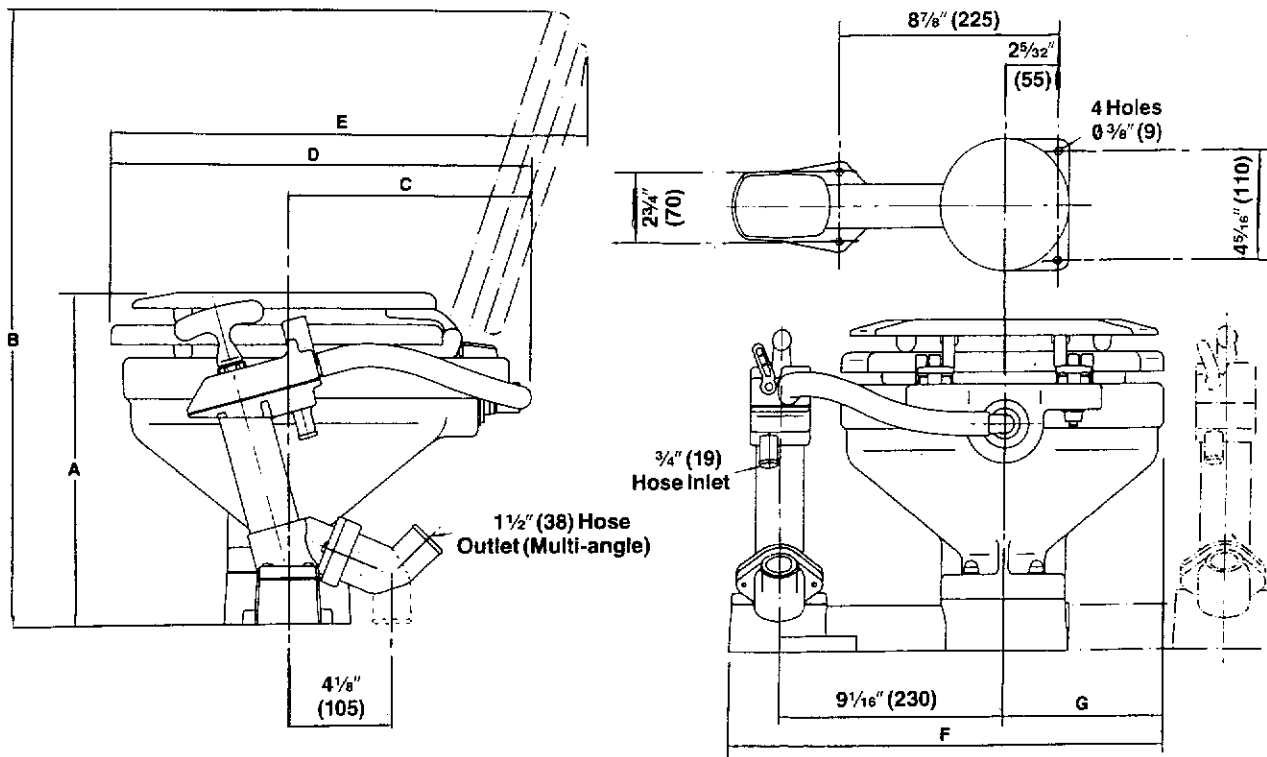
### PARTS LIST

KEY	DESCRIPTION	QTY. PER TOILET	PART NO.	QTY. PER REPAIR KIT				
				A	B	C	D	E
1	BOWL COMPACT	1	59127-7002					
	BOWL LARGE	1	18753-0060					
2	SEAT, LID & HINGE SET COMPACT	1	43990-0065					
	SEAT, LID & HINGE SET LARGE	1	18753-0061					
3	HINGE SET (1 PAIR)	1	18753-0181					
4	HOSE COMPACT	1	29035-0000					
	HOSE LARGE	1	29035-0001					
5	BOWL SPUD	1	29048-0000					
6	INTAKE ELBOW & O-RING	1						
7	BASE, PLUG & O-RING ASSY	1	29041-1000					
8	PLUG & O-RING ASSY	1	29028-1000	1				
9	O-RING (PLUG)	1						
10	O-RING (BOWL)	1		1				1

### PARTS LIST

KEY	DESCRIPTION	QTY. PER TOILET	PART NO.	QTY. PER REPAIR KIT				
				A	B	C	D	E
11	BOLT	4						4
12	NUT	4						4
13	WASHER (S.S.)	4						4
14	WASHER (NYLON)	4						4
15	CAP	4						4
16	BASE VALVE GASKET	1	29043-0000	1	1			
17	HANDLE	1	29026-0000		1			
18	SEAL ASSEMBLY	1	29044-0000	1	1	1		
19	TOP VALVE SEAT	1		1	1		1	
20	CAM	1			1	1		
21	TOP VALVE GASKET	1	29042-0000	1	1			
22	O-RING (FLUSH LEVER)	1		1	1	1		
23	FLUSH CONTROL LEVER	1			1	1		
24	SCREW (FLUSH LEVER)	1		1	1	1		
25	BUMPER	1		1	1			
26	SCREW (VALVE COVER)	6		1	6	6		
27	VALVE COVER	1			1	1		
28	PUMP CYLINDER	1			1		1	
29	PISTON, ROD & O-RING ASSY	1	29046-0000		1			
30	O-RING (PISTON)	1			1			
31	SCREW (PUMP CYLINDER)	6			2		2	
32	DISCHARGE FLANGE	1	29091-0000		1		1	
33	JOKER VALVE	1	29092-0000		1		1	
34	DISCHARGE ELBOW	1	29029-0000		1		1	

**DIMENSIONAL DRAWING  
INCHES (mm)**



	A	B	C	D	E	F	G
29090-0000	13 <sup>3</sup> / <sub>16</sub>	24 <sup>1</sup> / <sub>4</sub>	9 <sup>3</sup> / <sub>4</sub>	16 <sup>3</sup> / <sub>4</sub>	19 <sup>1</sup> / <sub>8</sub>	17 <sup>3</sup> / <sub>4</sub>	6 <sup>1</sup> / <sub>2</sub>
	(335)	(615)	(247)	(425)	(485)	(450)	(165)
29120-0000	13 <sup>5</sup> / <sub>8</sub>	27 <sup>5</sup> / <sub>8</sub>	11	19 <sup>5</sup> / <sub>16</sub>	22 <sup>7</sup> / <sub>8</sub>	18 <sup>5</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>8</sub>
	(345)	(700)	(280)	(490)	(580)	(465)	(180)

**One Year Limited Warranty**

**A. LIMITED WARRANTY:** ITT warrants that at the time of shipment, the products manufactured by ITT and sold hereunder shall be in conformity with applicable written specifications and descriptions referred to or set forth herein, free from defects in material and workmanship, merchantable, and suitable for a particular purpose, provided such is implied by State law under the circumstances of this sale.

**B. WARRANTY ADJUSTMENT:**

- ITT agrees to repair or furnish a replacement for, but not to remove or install, any product or component thereof which, within one (1) year from date of purchase, shall upon test and examination by ITT prove defective within the above warranty. Receipt verifying purchase date is required to obtain adjustment.
- Buyer shall notify ITT of any defect within this warranty no later than ninety (90) days after the defect is discovered.
- No product will be accepted for return or replacement without the prior written authorization of ITT. Upon such authorization, and in accordance with instructions from ITT, the product will be returned to ITT, shipping charges prepaid by Buyer. Products returned to ITT will be addressed as follows:

ITT JABSCO  
1485 Dale Way  
Costa Mesa, California 92626-3998

Or to such alternate locations as may be designated on the product, its container, or this sheet.

Repair or replacement made under this warranty will be shipped prepaid to Buyer.

**C. EXCLUSIONS FROM WARRANTY AND LIMITATION OF LIABILITY:**

- The foregoing warranty is limited solely as set forth herein and applies only for the period designated above.

- ITT SHALL NOT BE LIABLE FOR ANY LOSS, DAMAGE, SPECIAL OR CONSEQUENTIAL DAMAGE OF ANY KIND, WHETHER BASED UPON WARRANTY, CONTRACT, NEGLIGENCE, OR STRICT LIABILITY ARISING IN CONNECTION WITH THE SALE, USE, OR REPAIR OF THE PRODUCT.
- THE MAXIMUM LIABILITY OF ITT IN CONNECTION WITH THIS WARRANTY SHALL NOT IN ANY CASE EXCEED THE CONTRACT PRICE FOR THE PRODUCT CLAIMED TO BE DEFECTIVE OR UNSUITABLE.
- This warranty does not extend to any product manufactured by ITT which has been subjected to misuse, neglect, accident, improper installation, or use in violation of instructions furnished by ITT.
- This warranty does not extend to or apply to any unit which has been repaired or altered at any place other than ITT's factory, or by persons not expressly approved by ITT, nor to any unit the serial number, model number, or identification of which has been removed, defaced or changed.
- Components manufactured by any supplier other than ITT shall bear only that warranty made by the manufacturer of that product.
- This warranty applies to products defined as "consumer products" by the Consumer Product Warranties Act as from time to time amended.

**D. CONSUMER RIGHTS:** This warranty gives you specific legal rights, and you may have other rights which vary from state to state. Some states do not allow exclusion or limitation of damages.

**STANDARD WARRANTY:** If the products manufactured and sold hereunder are not Consumer Products, the warranty extended to Buyer shall be as set forth in subparagraphs (a), (b), and (c), EXCEPT THAT ALL EXPRESS OR IMPLIED WARRANTIES OR MERCHANTABILITY OR SUITABILITY FOR ANY PARTICULAR PURPOSE ARE EXCLUDED.

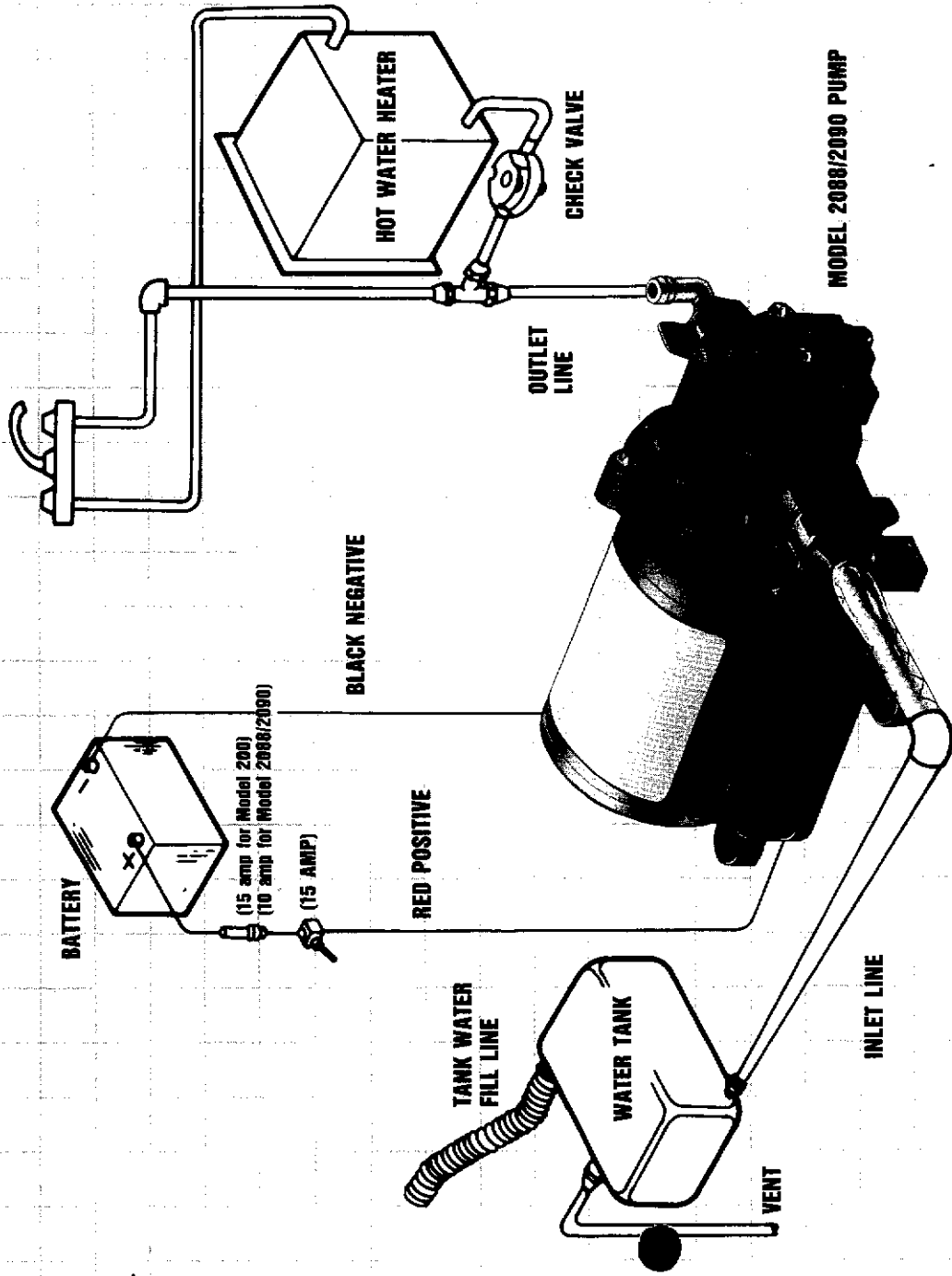
**ITT JABSCO**  
A Unit of ITT Corporation

1485 Dale Way, P.O. Box 2158, Costa Mesa, California 92628-2158, Telephone: (714) 545-8251  
Bingley Road, Hoddesdon, Hertfordshire EN11 0BU England, Telephone: +44-992-467191



# SHUR

TO BE SURE



Model Series 2088/2090 RV and Marine Installation Manual

## Location and Installation of Pump

The pump should be in a readily accessible location to allow easy service or repair if required.

The Model Series 2088/2090 Pump has excellent priming characteristics. It can be located above, even with or below the water tank level. Secure the pump with screws through the rubber feet in the mounting plate. Take care not to tighten the screws so tight that they depress the rubber feet as this prevents

the shock absorber effect and increases pump noise.

The water tank must be vented to the outside of the coach.

It is essential that a filter be used in the pump input line to prevent particles from entering the pump head. A tank filter or an in-line filter is ideal. Filter screen should be 50 mesh or smaller.

## Electrical Wiring Requirements

"We highly recommend that the pump be on a circuit of its own. However, it can be on a circuit shared by other 12 VDC electrical devices provided the proper wire size and over current protection is used for the TOTAL (All devices on the circuit) amperage requirement. The minimum acceptable wire sizes are 14 gauge up to 20 feet, 12 gauge from 20 to 50 feet, and 10 gauge over 50 feet.

It is important that the ground wire (negative) back to the source, or chassis, or to a common ground be the same wire size used as the supply wire (positive).

The system's on/off switch must be rated at 10 amps (minimum), and be on the pump's positive lead. This switch will allow the pump to be shut off when not in use, in storage, in an emergency, or when traveling."

## Plumbing Requirements

The inside diameter of the plumbing line is of utmost importance. If too small, it increases back pressure and reduces the flow causing excessive pump cycling. Main lines should be at least 1/2 inch in diameter and shorter "feeder" lines to the faucet should be 3/8 inch in diameter. All fittings used to join sections of the plumbing should have the same flow diameter as the lines. Use a SHURflo In-Line Filter part #170-019-00 or a SHURflo "SHUR-Guard" Twist-On Filter part #170-06X-XX. (Available in 1/2" barb inlet or 1/2" pipe inlet.)

The output hose on the pump may be exposed to high pressure when the RV is connected to city water. Use only high pressure potable water hose. Route hoses away from heat source. Care should be taken to avoid any kinks in the line. Use hose clamps at both ends of each hose. Clamps prevent air leaks which can prevent proper priming.

Check valves used in the system must be a free flow design. If you can blow through it in the direction of the flow the valve is suitable. If you cannot, it may cause excessive restriction.

**CAUTION:** Do not use pipe dope on the input side of the pump. Pipe dope can get into the pump head and may cause failure.

Water purifiers must be on a separate line as they create high back pressure.

## LIMITED WARRANTY

### Save This Warranty

SHURflo warrants its pump to be free of defects in workmanship and materials for one year beginning with the purchase date of the unit or in the absence of proof of the purchase date then one year from the date of manufacture as shown on the pump. Warranty is limited to the replacement of or the cost of the original pump.

### WARRANTY PROCEDURE

Each and every pump has been operated and tested before being shipped from the SHURflo factory. In the event you feel the pump is not operating correctly we suggest: You communicate with the SHURflo factory by phone or letter. You will be asked to return the pump to the factory or if more appropriate, to the nearest SHURflo Official Service Center.

Upon inspection, if the pump itself is found to be faulty the pump will be repaired or replaced. During the warranty period there will be no charge for parts or labor used in the repair of the pump. However, we have no control over the location of the pump in the unit, how it is installed, nor its accessibility for repair. There may be a charge for removal and reinstallation of the pump. We are not responsible for such charges.

If you wish to repair the pump yourself you may do so without voiding the warranty provided you use SHURflo parts and assemble the pump correctly.

Or, you may send the pump to us for prompt repair. Package it carefully to avoid shipping damage—enclose your name and address, the date of purchase of your unit and the Brand name—plus Three Dollars for return postage. We will process the pump and have it on the way back within 48 hours.

The above represents our warranty policy. Under no circumstances will we assume nor accept responsibility for unauthorized expenditures.

## “Check Out” Procedure

Examine the installation. Is it complete . . . Are the clamps tight . . . Are there any kinks in the hose . . . Is the fuse good . . . etc?

Use a fully charged battery or 12 volt DC converter of at least 10 amp capacity.

### Initial Operation

1. Fill the tank with water.

2. Open all faucets . . . Hot and Cold.

3. Switch pump to “On” position. Allow time for the hot water tank to fill. Shut off each faucet as flow becomes steady and free of air. Shutting off the last faucet should cause the pump to shut off.

To check for leaks we recommend a positive pressure check with a pressure gauge. A drop in pressure with all faucets off will indicate a leak in the system. Correct all leaks no matter how small.

## Trouble Shooting

Any or all of the following problems can be caused by loose pump head screws.

### MOTOR DOES NOT OPERATE

Is the battery charge too low? Are the wires disconnected. Is the switch in the “on” position? Is the fuse good? Is the pump head frozen? If so, place a lamp bulb near the pump to thaw.

### PUMP RUNS BUT WATER DOES NOT APPEAR

Is there water in the tank? Are there kinks in the hose? Is air leaking into the inlet hose or fittings? Is the inlet line clogged? To check, remove the outlet hose and try again. If water flows the problem is further on in the system.

### MOTOR RUNS BUT WATER SPUTERS

Indicates air getting into the lines. Check hose and clamps on the input side of the pump. Restart and allow air to clear from the lines and hot water tank.

### PUMP CYCLES (RAPID ON/OFF)

Cycling of the pump is normal if the flow of water is restricted to less than the flow capacity of the pump. For example, a faucet partially opened. Under these conditions the pump will cycle on and off in a rhythmic interval.

### ABNORMAL CYCLING

If the pump cycles on and off when all faucets are closed, something is wrong. Most likely there is a leak somewhere. Check faucets for dripping,

especially the toilet valve. Correct any leak no matter how small. Also check the city water input.

If no leak can be detected, shut off the pump. Remove the output line. Insert a cap or plug in the open end. You can make a plug from a barb fitting with a cap tightly screwed on the threads.

If the fitting is threaded, use a cap or plug. Either way—there must be no leak. Turn the pump switch on. The pump should come on, run a few seconds and shut off. If the pump remains off, the problem is not the pump. The problem is in the system. If, however, the pump goes on and off there may be a problem in the pump. There may be an internal pump leak which allows water to escape from the high pressure area back into the low pressure inlet area causing the pump to cycle. This may be caused by a valve held open by a foreign particle or by a crack in the casting.

### PUMP DOES NOT SHUT OFF

The wall switch may be used for temporary control of the pump. A low battery may be the cause. Voltage should be 10.5 volts or more to the pump. If the motor runs but the pump does not switch off, it may be air in the lines or a valve problem. Try valve replacement kit #94-232-00. If the motor draws current but does not run, it may hum. It may be a switch problem. Try switch replacement kit #94-230.

Should you be unable to isolate the problem, contact Shurflo via one of the toll free numbers and request the names of the nearest Shurflo service centers for professional help.

SHUR

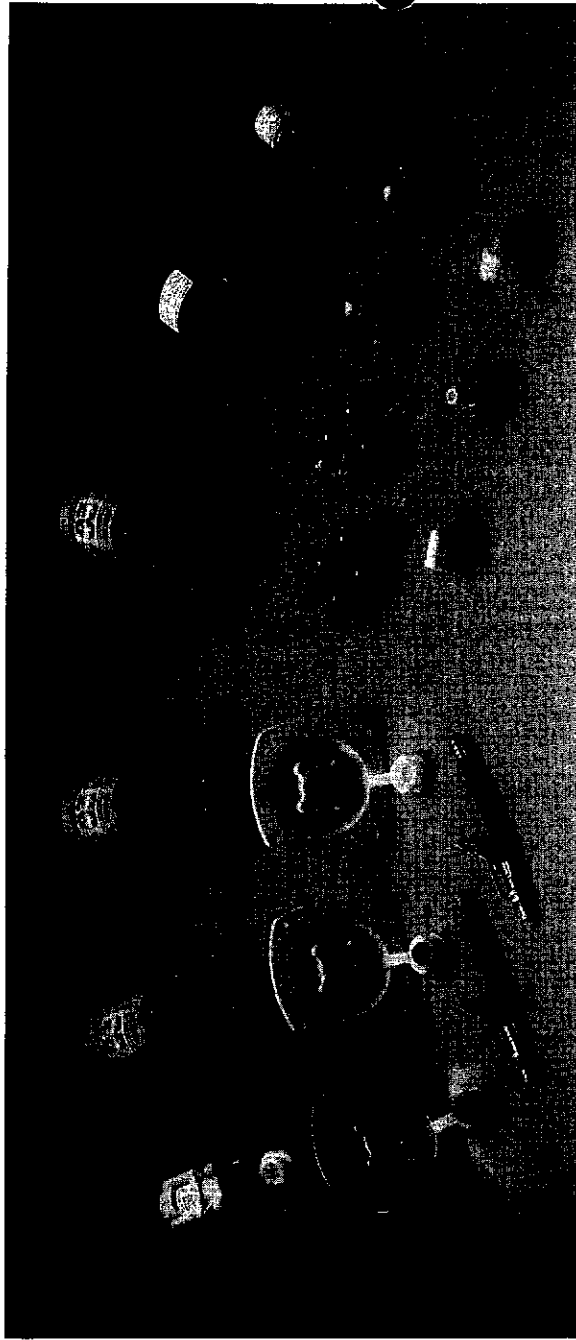
## Winterizing Your Water System

Satisfactory winterizing requires draining the water from the entire water system. Because of the check valve mechanism built into the pump blowing the lines will not remove the water from the pump and tank. For the best results in removing all the water from your water system, follow the four steps below.

1. Drain the water tank through the drain on the tank. If the tank has no drain then open a faucet and allow the pump to pump the tank dry.
2. Now drain the lines by opening the lowest outlet or drain in the system.

3. Remove the outlet hose on the pump. Turn the pump on, allowing the pump to pump out any remaining water . . . about a cupful. A towel or rag can be used to catch this water. Should you wish to blow the lines out with air, apply the air nozzle to the system where the outlet hose has been removed. Be sure all valves are open.
4. Having removed the water from the system, attach the pump hose now . . . or later. The system is now winterized. NOTE: It is much easier to winterize using the potable antifreeze solutions available. See your local RV Dealer.

## More Quality Products from SHURflo



**SHURflo**  
TO BE SURE

**SHURflo SERVICE CENTERS**  
12650 Westminster Avenue  
Santa Ana, California 92706-2100  
(800) 854-3218 • (714) 554-7709

52748 Park Six Court  
Elkhart, IN 46514-5427  
(800) 762-8094 • (219) 262-0478

# Important

Fill out and return to SHURLO within 10 days!

Customer's Name (please print) \_\_\_\_\_ Phone Number \_\_\_\_\_

Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Dealer's Name \_\_\_\_\_ Date Sold \_\_\_\_\_

Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Unit Brand Name \_\_\_\_\_ Type (RV, Boat, Yacht, etc.) \_\_\_\_\_

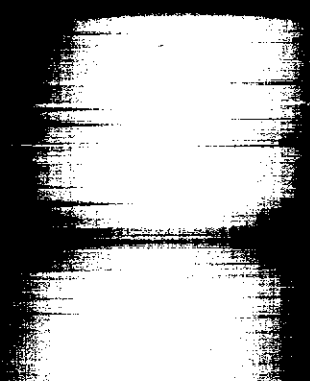
We hope you are completely satisfied with the quality of our product. We would like to ask you to take just a few minutes to help us with something very important. Please rate us on the following:

	EXCELLENT	GOOD	POOR
* QUALITY .....			
* SERVICE .....			
* INSTRUCTIONS ...			

Thank you ...  
*Sandy Castaneda*  
Sandy Castaneda  
CUSTOMER SERVICE REP.

COMMENTS: \_\_\_\_\_

MODEL # \_\_\_\_\_



STAMP

**SHURflo** CARR-GRIFF, INC.

12650 Westminster Ave.  
Santa Ana, California 92706-2100

Model Series 2088/2090

**Seaward** *Products*

POST OFFICE  
LA PUENTE, CALIFORNIA  
PHONE: (626) 961-1111  
FAX: (626) 961-1112

WATER HEATERS

# **OWNER'S MANUAL**

**FOR**

**ELECTRIC/HEAT EXCHANGING  
WATER HEATERS**

**MODELS:**

**S600, S650, S700, S750**

**S1100, S1150, S1200, S1250**

**S1800, S1850, S1900, S1950**

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## **IMPORTANT SAFETY INSTRUCTIONS**

**WARNING:** When using electrical appliances, basic safety precautions to prevent the risk of fire, electric shock, or injury to persons should be followed.

1. READ ALL INSTRUCTIONS BEFORE USING THIS WATER HEATER.
2. This water heater must be grounded. Connect only to properly grounded electrical system. See "GROUNDING INSTRUCTIONS" found on Page 3, Item 7.
3. Install or locate this water heater only in accordance with the provided instructions.
4. Use this water heater only for its intended use as described in the instructions.
5. Do not use an extension cord set with this water heater. If no outlet is available adjacent to the water heater, contact a qualified electrician to have an outlet properly installed.
6. As with any appliance, close supervision is necessary when used.
7. Do not operate this water heater if it has a damaged cord or plug, if the cord is frayed or damaged, or if it has been damaged or dropped.
8. This water heater should be serviced only by qualified service personnel. For service, contact the nearest authorized service facility for examination, repair, or replacement.

**SAVE THESE INSTRUCTIONS**



### **WARNING:**

This Water Heater is equipped with a heat exchanger. Extended circulation through the heater may result in excessively hot water.

This Water Heater Tank and Heat Exchanger are made of aluminum. Do not use caustic chemicals in Heat Exchanger or damage may occur. Use only the manufacturer's recommended coolant in coolant system. Damage to the Water Heater due to chemical reaction by caustic chemicals is not under warranty.

### **CAUTION:**

Hydrogen gas can be produced in a hot water system served by these heaters if they have not been used for a long period of time (generally 2 weeks or more). Hydrogen gas is extremely flammable. To reduce the risk of injury under these circumstances, it is recommended that the hot water faucet be opened for several minutes before using and electrical appliance connected to the hot water line. If hydrogen is present, there will probably be an unusual sound such as a hissing through the pipe as the water begins to flow. There should be no smoke or flame near the faucet at the time it is open.

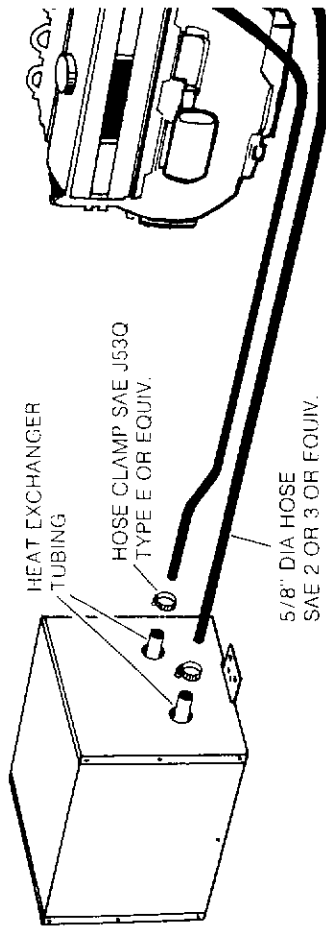
## **OPERATING INSTRUCTIONS**

1. Fill water system and completely fill tank.
2. Locate and turn remote electrical switch to "ON".
3. Turn switch to "OFF" position prior to draining water system.

**NOTE:** Do not operate heater without element being submerged in water.

## **MAINTENANCE**

1. Check heat exchanger lines for leaks at regular intervals. A leak in the heat exchanger can cause coolant loss and may damage engine.
2. Flush tank periodically.
3. Drain tank if subjected to temperatures less than 32°F, to prevent possible damage.



## INSTALLATION

1. Locate water heater at or below engine level as close to engine as possible.
2. Secure mounting brackets to structure with eight #12 minimum size minimum cap screws and nuts.
3. Connect cold water supply and hot water outlet to heater.
4. Connect heat exchanger system described in figure above.
5. Pressure temperature relief valve is factory installed. The pressure relief valve pressure to 127.5 PSI (879.3 KPA) minimum, 150 PSI (1034.2 KPA) maximum.

The valve must be oriented, provided with tubing, or otherwise installed so that the valve can exit only within 6 inches above, or at any distance below the structure, cannot contact any live electrical part.

Install replacement temperature and pressure protective equipment according to applicable codes, but not less than a combination temperature and pressure relief valve meeting the requirements for relief valves and automatic gas shutoff devices. The heater shall be inspected periodically by a nationally recognized testing laboratory for periodic inspection of production of listed equipment or materials.

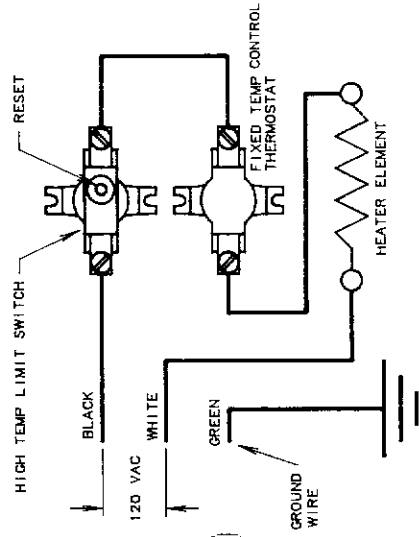
6. Connect the electrical supply by a qualified electrician. The electrical supply shall be permanent wiring, armored cable or conduit, per national electrical code for a minimum capacity of 1500 watts.
7. **GROUNDING INSTRUCTIONS:** The supply ground shall be connected to a ground point located in the water heater wiring compartment. Do not place switch in the ground circuit.

Use a UL-Listed ON-OFF switch rated 15 AMP/120 VAC in the black supply Volt models. Use a UL-Listed double pole ON-OFF switch rated 10 AMPS/2 in the red and black supply lines on 220 Volt models.

The heater is equipped with a high limit switch which can be manually reset switch activates, proceed as follows:

- Turn power off at main power panel or remote switch
- Remove wiring access cover
- Depress red button on high temperature limit
- Replace cover and turn power on
- If temperature limit switch reactivates, contact a Seaward Products author center.

WIRING DIAGRAM FOR 120V

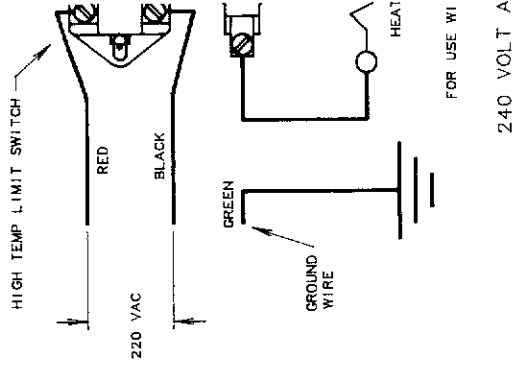


FOR USE WITH COPPER CONDUCTORS

**CAUTION !**  
 TO REDUCE RISK OF SHOCK  
 OR FIRE, USE ONLY ON A UTILITY  
 SYSTEM HAVING A MAXIMUM  
 120/250 VOLT, THREE WIRE SYSTEM.

120 VOLT AC

WIRING DIAGRAM I



FOR USE WI

240 VOLT A

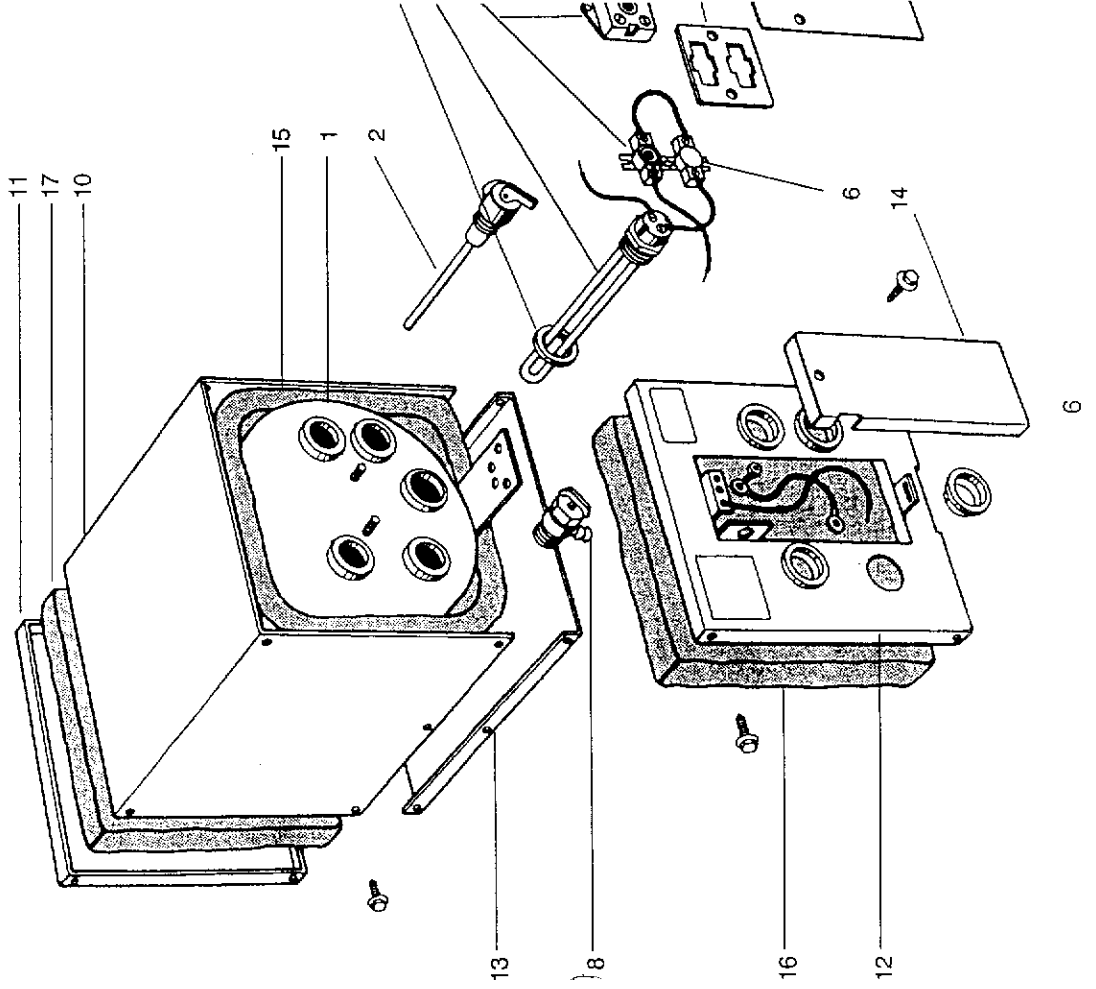
**PARTS LIST  
MODELS**

**S600, S650, S700, S750  
S1100, S1150, S1200, S1250  
S1800, S1850, S1900, S1950**

ITEM	MODEL NO.	PART. NO.	DESCRIPTION
1.	S600/S700	80253	TANK ASSEMBLY
	S1100/S1200	80254	
	S1800/S1900	80263	
	ALL MODELS	73127	TEMPERATURE/PI
	ALL MODELS	73124	HEATING ELEMEN
	120 VOLT	73364	HEATING ELEMEN
	240 VOLT	73365	
	120 VOLT	73128	HIGH LIMIT SWITC
	240 VOLT	73154	
	ALL MODELS	73129	THERMOSTAT
6.	120 VOLT	73148	THERMOSTAT MO
	240 VOLT	73171	
8.	ALL MODELS	73145	DRAIN VALVE
	ALL MODELS	73137	WIRE SHIELD
	S600	73283	JACKET
	S700	73166	
	S1100	73287	
	S1200	73395	
	S1800	73405	
	S1900	73140	BACK PANEL
	S600	73286	
	S700	73169	
11.	S1100	73290	
	S1200	73398	
	S1800	73408	
	S1900	73139	FRONT PANEL
	S600	73285	
	S700	73168	
	S1100	73289	
	S1200	73397	
	S1800	73407	
	S1900	73138	BASE
13.	S600	73284	
	S700	73170	
	S1100	73288	
	S1200	73396	
14.	S1800	73406	
	S1900	73141	WIRE ACCESS CO
	S600/S1100/S1800	73291	
	S700/S1200/S1900		

# PARTS LIST (cont.)

- |     |             |       |                            |
|-----|-------------|-------|----------------------------|
| 15. | S600/S700   | 73146 | INSULATION WRAP            |
|     | S1100/S1200 | 73175 |                            |
|     | S1800/S1900 | 73409 |                            |
| 16. | S600/S700   | 73147 | INSULATION FRONT           |
|     | S1100/S1200 | 73176 |                            |
| 17. | S600/S700   | 73330 | INSULATION BACK            |
|     | S1100/S1200 | 73331 |                            |
|     | S1800/S1900 | 73403 | INSULATION TOP (NOT IN)    |
| 19. | S1800/S1900 | 73404 | INSULATION BOTTOM (NOT IN) |



## **REPAIR PARTS**

Repair parts listed herein may be ordered through Seaward Products, Seaward Dealers, or Dealer's Authorized Service Centers.

All parts will be shipped at prevailing prices.

When ordering repair parts, please give the following information:

1. The Part Number
2. The Part Description
3. The Model Number of the Heater
4. The Serial Number of the Heater

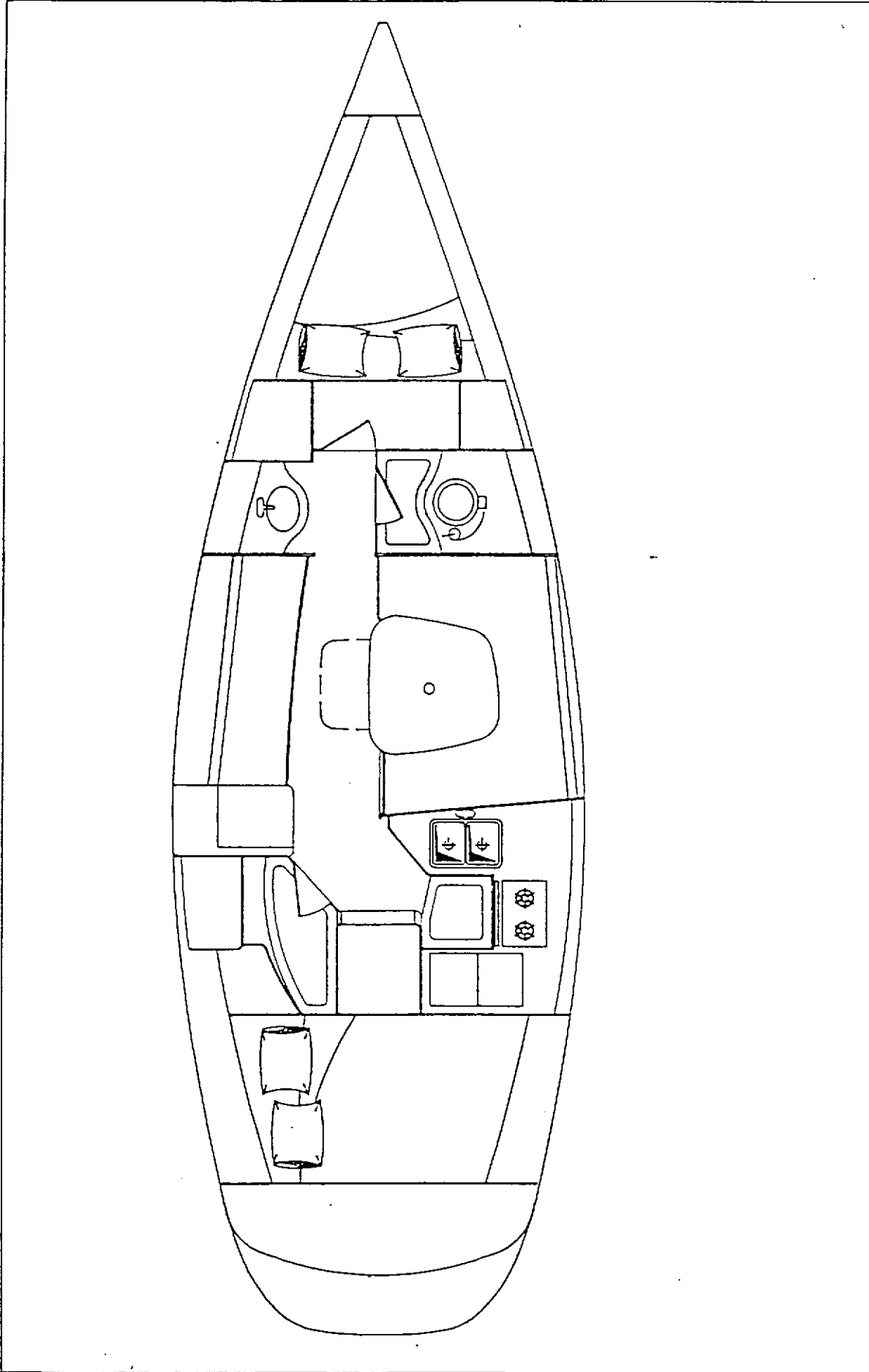
The Model Number and the Serial Number of the heater will be found on the front panel.

For the Authorized Service Center nearest you, please contact Seaward Products.

CUSTOMER SERVICE

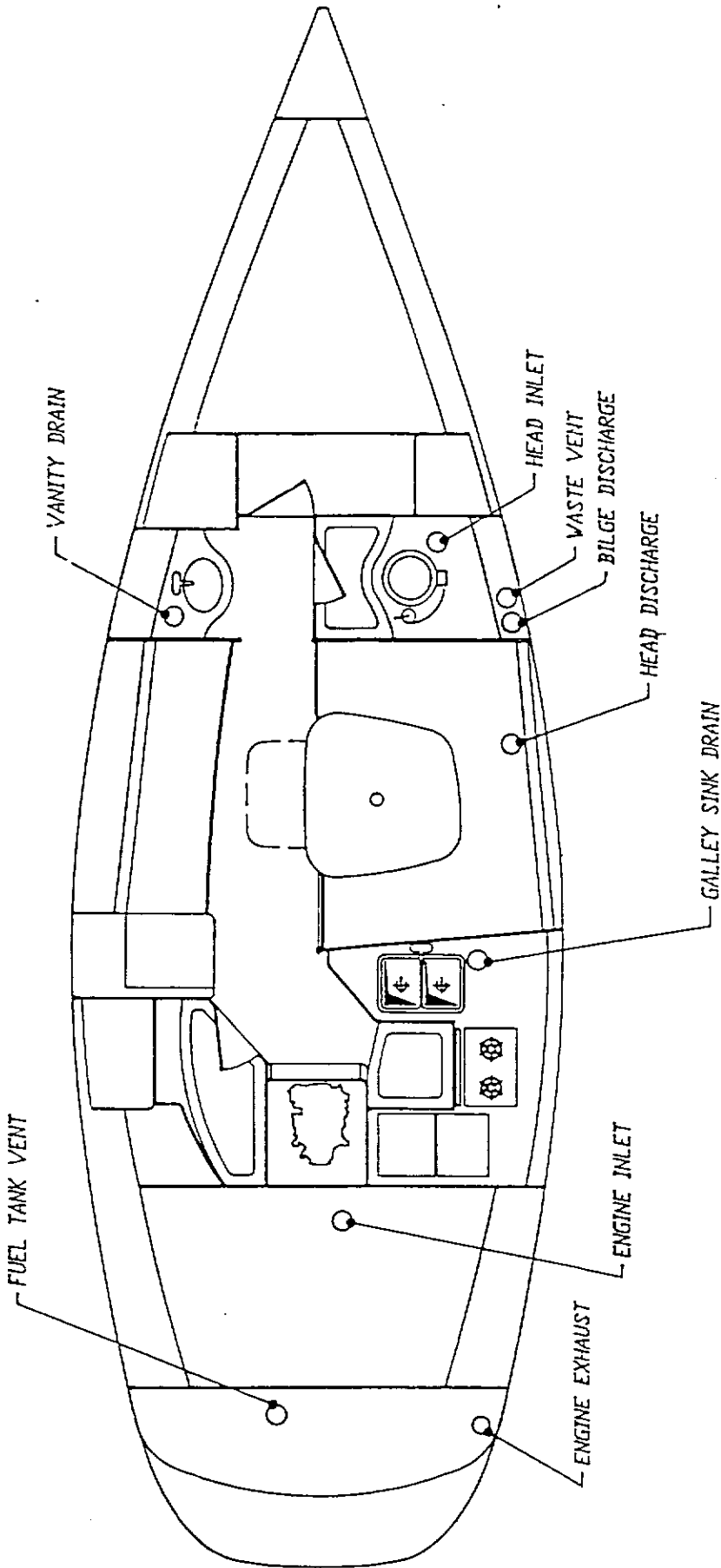
***Seaward Products***

15600 SALT LAKE AVENUE  
CITY OF INDUSTRY, CA 91745  
POST OFFICE BOX 566  
LA PUENTE, CA 91747  
PHONE: (818) 968-2117  
FAX: (818) 330-5442



# HUNTER

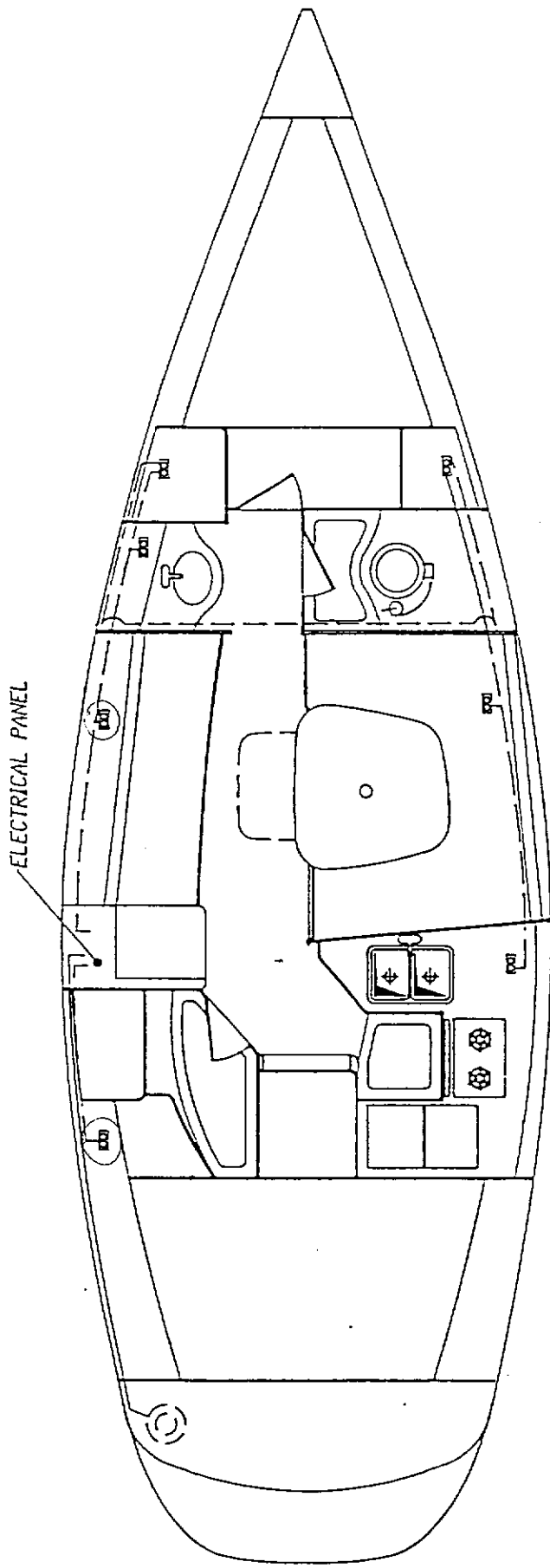
HUNTER 33.5 INTERIOR H33A2623





# HUNTER

HUNTER 33.5 THRU-HULL LOCATIONS H33A2620





ELECTRICAL PANEL

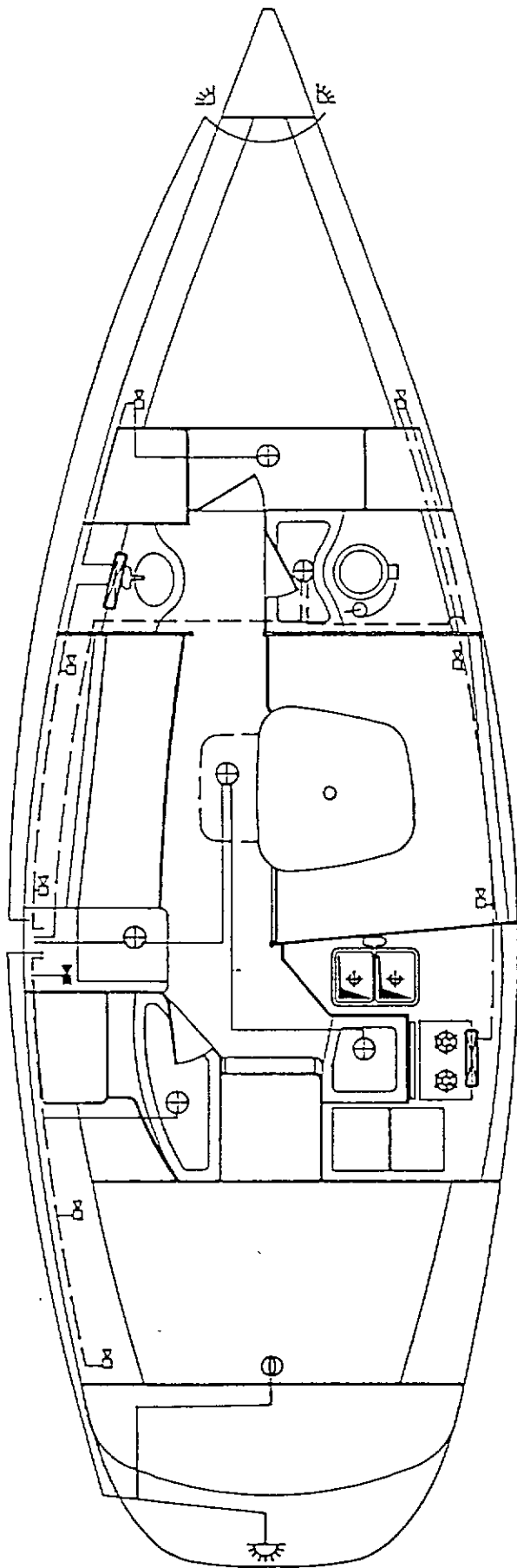
 OUTLET  
 SHORE POWER RECEPTACLE

14/3 BC WIRE - - - - -  
 10/3 BC WIRE \_\_\_\_\_

# HUNTER

HUNTER 33.5 110 V. ELEC. SYSTEM H33A2625

ELECTRICAL PANEL



- ⊖ COMPASS
- ⊕ FLUORESCENT
- OUTLET
- ⊞ READING LIGHT
- ⊞ CHART LIGHT
- ⊞ DOME LIGHT
- ⊞ STBD RUNNING LIGHT
- ⊞ PORT RUNNING LIGHT
- ⊞ STERN LIGHT

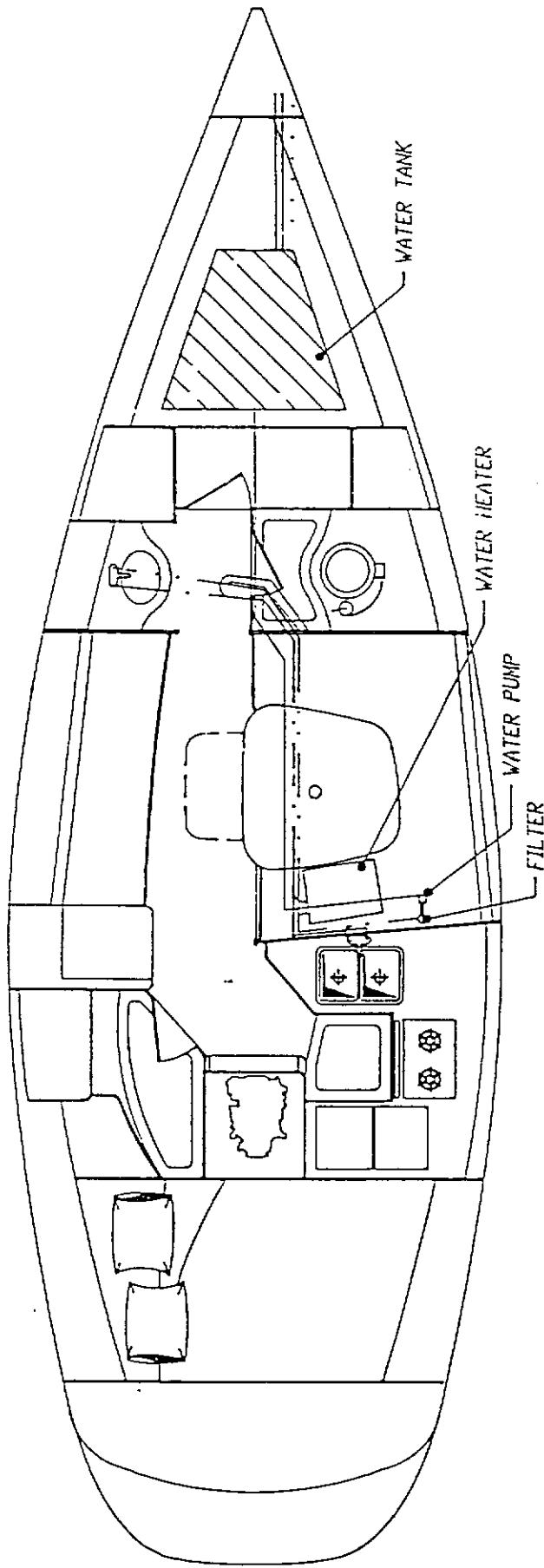
NOTE  
 WIRES LEADING TO DOME AND SWIVEL LIGHTS ARE  
 IN PAIRS OF 16 GAUGE BLACK AND BLUE V/WHITE STRIPE.  
 WIRES LEADING TO BOV LIGHTS ARE IN PAIRS OF  
 16 GAUGE BLACK AND GRAY V/WHITE STRIPE.  
 WIRES LEADING TO STERN LIGHT ARE IN A PAIR OF  
 16 GAUGE BLACK AND GRAY.

--- LIGHTING  
 --- NAVIGATION LIGHTS

# HUNTER

HUNTER 33.5 HEADLINER ELEC. SYSTEM H33A2624

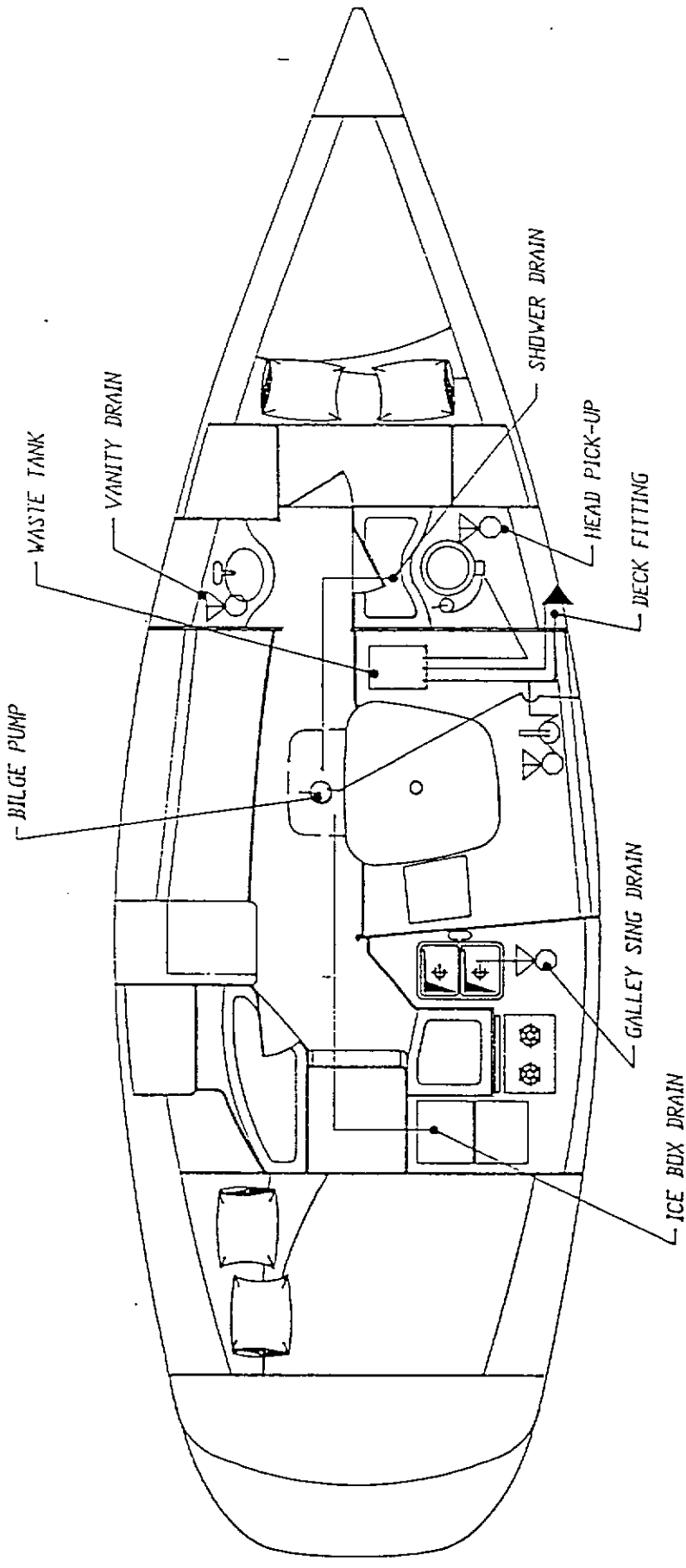




- HOT WATER ———— 3/8' POLYBUTYLENE
- COLD WATER ———— 3/8' POLYBUTYLENE
- WATER FEED ———— 3/8' POLYBUTYLENE
- WATER FILL ———— 1 1/2' SHIELDVAC
- TANK VENT . . . . . 3/4' SHIELDVAC

# HUNTER

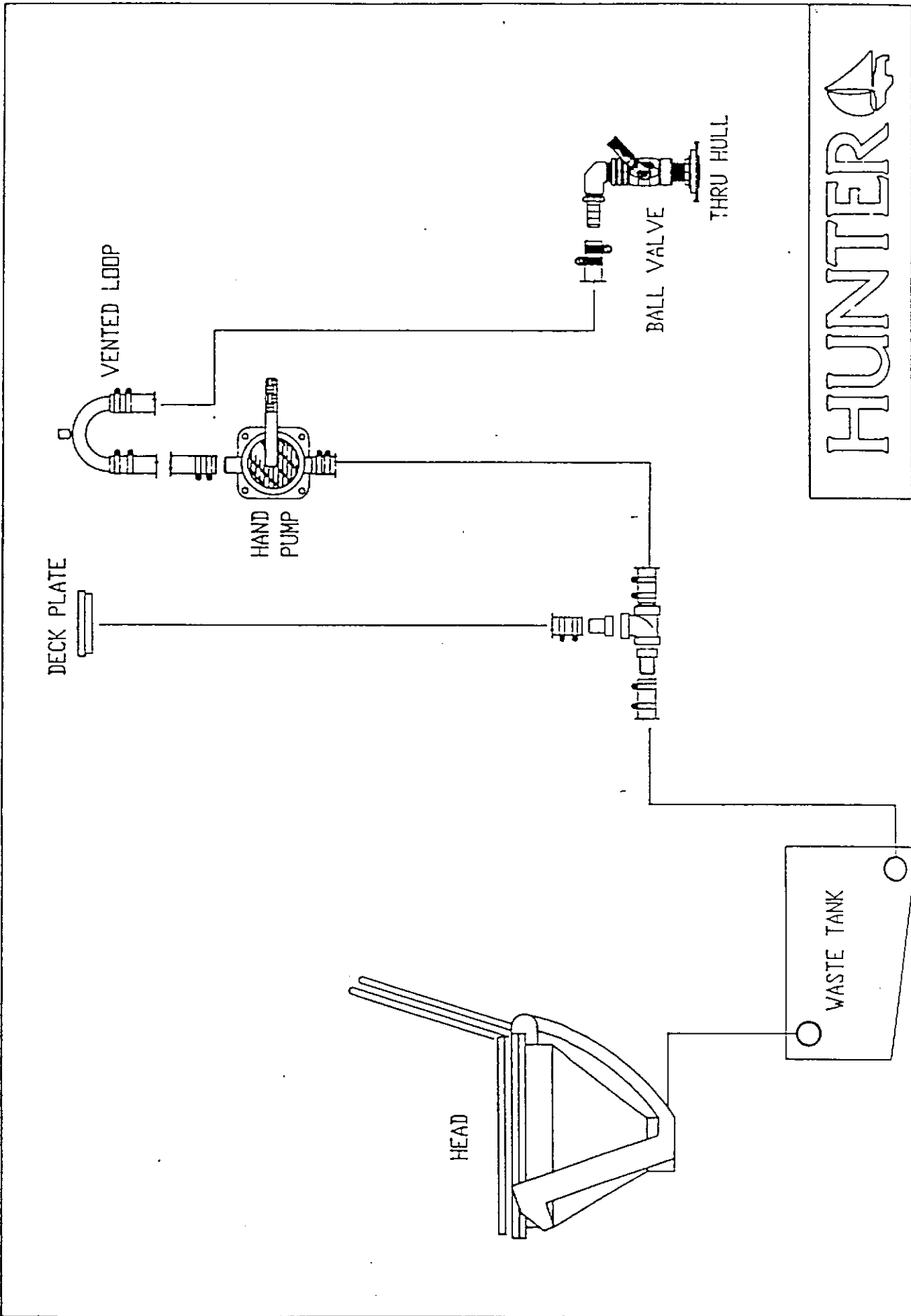
HUNTER 33.5T PLUMBING LAYOUT H33A2616



- ⊕ HAND PUMP
- BALL VALVE
- ▽ PLASTIC THRU-HULL
- ▽ BRONZE THRU-HULL
- ▲ TANK VENT

# HUNTER

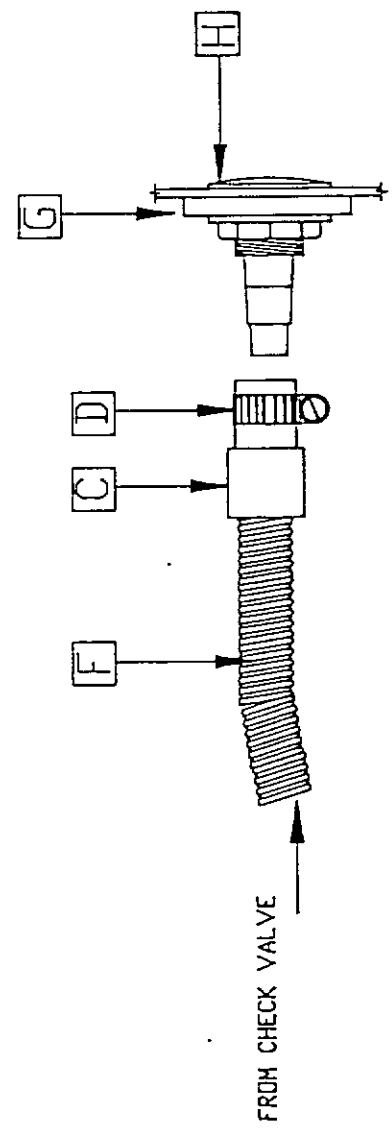
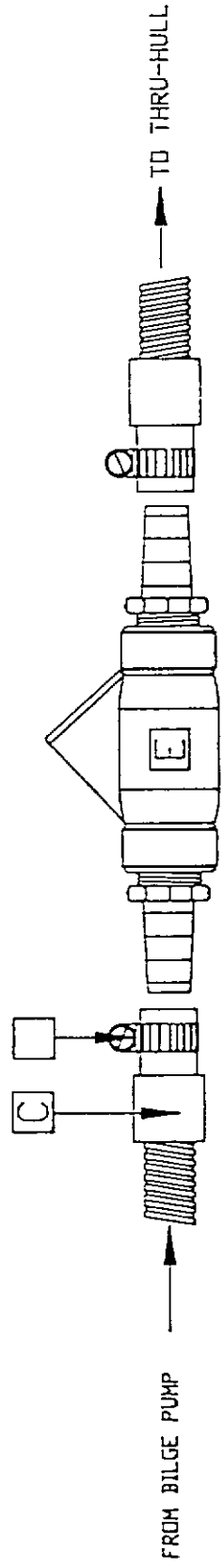
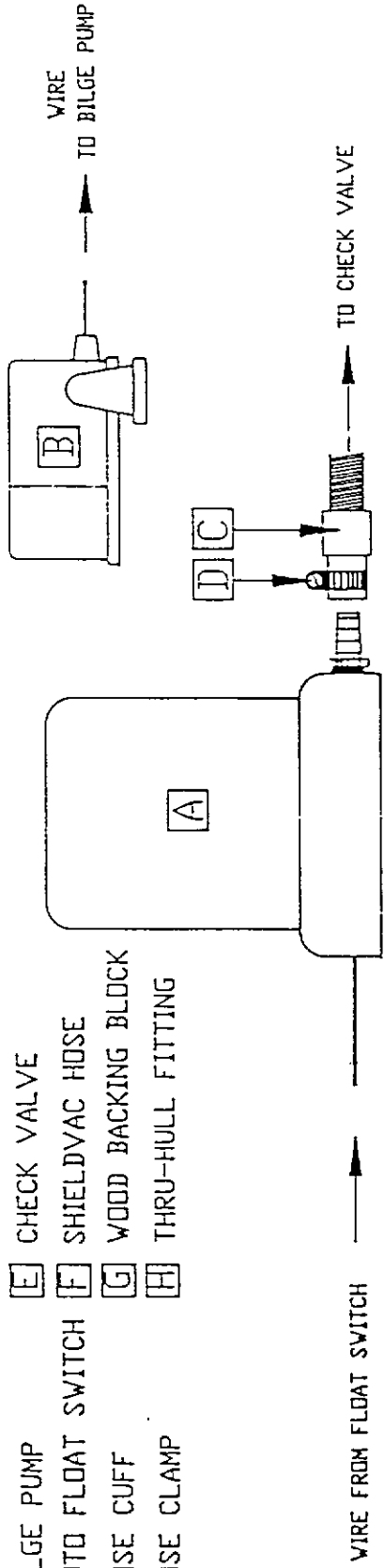
HUNTER 33.5 WASTE WATER SYSTEM H33A2617



# HUNTER

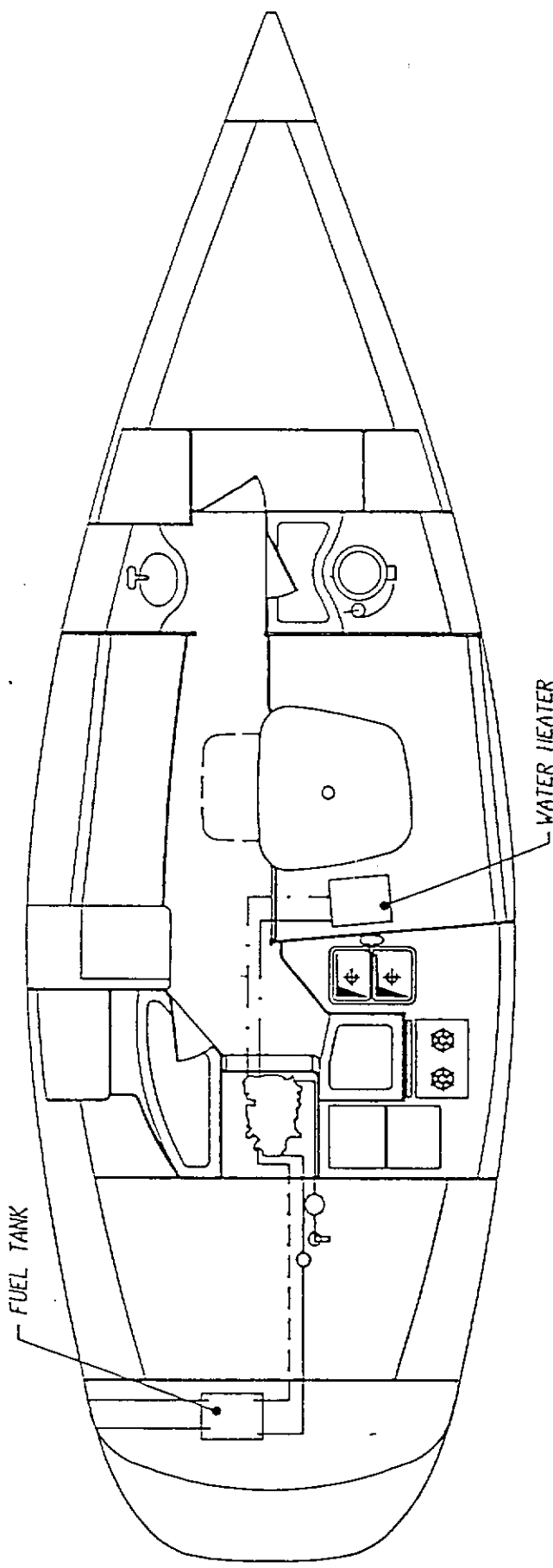
HEAD PLUMBING DIA. GENA2620

- [A] BILGE PUMP
- [B] AUTO FLOAT SWITCH
- [C] HOSE CUFF
- [D] HOSE CLAMP
- [E] CHECK VALVE
- [F] SHIELD/VAC HOSE
- [G] WOOD BACKING BLOCK
- [H] THRU-HULL FITTING



# HUNTER

AUTO BILGE PUMP LAYOUT GENA2613



FUEL TANK

WATER HEATER

- FUEL FILTER
- ⊗ SEA COCK
- SEA STRAINER

- WATER HEATER
- WATER INLET
- FUEL INLET
- FUEL RETURN
- FUEL VENT
- FUEL FILL

# HUNTER

HUNTER 33.5 ENGINE SYSTEM H33A2626



## HUNTER 33.5 LIGHT BULB SPECIFICATION

---

Your Hunter 33.5 has 15 interior lights and 6 exterior lights. Of the interior lights, 6 are swivel lights and 5 dome lights. Of the exterior lights, 3 are navigation lights and 3 are on the mast.

### LIGHT

### REPLACEMENT BULB

#### Interior

Swivel	#1831 and Wagner #S8-1073
Dome	#1572 and Wagner #S8-1141
Chart	#Aqua Signal #90400282
Florescent (15")	#F8T5CW/6E

#### Exterior

Red bow	Osram 12V #6411, 24V #6429 Phillips 12V #12866, 24V #13866
Green bow	Same as above
Stern	Same as above
Anchor	Aqua Signal #90400200
Steaming	Perko #69-12V-10W

# PUMPS, STRAINERS, FILTERS

---

<u>COMPONENT</u>	<u>MANUFACTURER AND PART NUMBER</u>
Bilge pump	Rule 800 or Mayfair 800
Waste pump	ITT Jabsco #142M
Water pump	ITT Jabsco Flo-Jet 4405-143-C
Water strainer	ITT Jabsco 364000-1000
Engine strainer	1/2" Perko 493-004 PLB
Fuel filter	Racor 110

# INSTRUCTIONS FOR PREPARATION FOR BOTTOM PAINTING

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## WARNING!

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

## BOTTOM PAINTING

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

Follow the procedure recommended by the manufacturer of the paint, while making sure not to void the Hunter Hull Blistering Warranty. The procedure for preparing for and painting the bottom varies between paint manufacturers, but should always include dewaxing, etching and sometimes priming of the surface.

The rudder should always be bottom painted using a white bottom paint, to avoid heat build-up in the rudder, which colored paints can contribute to, when the boat is on land. For further instructions on preparation of the rudder, see the instructions sheet from *Foss Foam, Inc.* under the General Information heading within this manual.

# TEAK CARE

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Teak wood is a high quality, extremely durable wood with a high oil content. In order to help you protect the original beauty of your teak interior, we have sealed the beauty of your interior with a 3 to 4 coat finish system of high quality Seafin Teak Oil, manufactured by *Dalys* (wood finishing products). This material is a penetrating oil that dries to a low sheen to seal and protect the wood from moisture and weathering. It creates a durable, non-slip 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 out live urethane varnish on interior and even exterior surfaces. (floor, bulkheads, trim wood & 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.

## REPAIRS

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

1. Take 180 to 220 grit wet/dry sand paper 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 2nd coat, and repeat above procedure.

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

*DALYS*  
3525 STONEWAY NORTH  
SEATTLE, WA 98103  
(206) 633-4200

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# MAINTENANCE

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## 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.

(Refer to this manual's alignment drawing)

Any questions or problems concerning the engine, please contact our distributor, Mack Boring at (201) 964-0700.

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

**DRIVETRAIN:** The shaft log (stuffing box) should be inspected periodically.

The stuffing box is held to the shaft log tube by a rubber tube secured by hose clamps. The clamps should be tight and no water should leak from this location. A slight drip from the stuffing box at the shaft exit is necessary (four drops a minute) and is normal.

To adjust, loosen the lock nut, tighten gland nut one-quarter turn, and retighten lock nut. If excessive water flow persists after adjustment, replace the packing and then adjust as above.

## Steering

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

## Electrical Systems

The electrical system is a 12-volt, negative ground installation. The owner should weekly inspect battery(ies), terminals and cables 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.

# MAINTENANCE

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## 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 dry rot. 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. Refer to Engine Manual.

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 Spec & Tech section.

**General Thru-hull List** (*varies from boat to boat-see diagrams in Spec & Tech Info.*)

- 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 seek out 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.

## 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.

It is also a good idea to wax the fiberglass once or twice a year to maintain a deep, glossy appearance. Your local marine supply should be able to provide an appropriate wax.

**Sail Care:** Sunlight is a sail's worst enemy, so cover the sails when they are 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.

# MAINTENANCE

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## Sail care continued.

Check all sails regularly for chafe, particularly where they chafe on deck fittings or rigging, at reef points, batten sleeves and the foot of the headsail. Sail batten pockets should be inspected on a regular basis.

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

The headsail, neatly rolled and fastened, can be temporarily stowed along the lifelines. To stow below, flake it into a length; 1. then roll from luff to leech, 2. Take care not to crease the leech. Pack in a clearly marked bag.

## Fabric Care

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

## Winch Maintenance

Follow the maintenance instructions prescribed by the winch manufacturer. We recommend a minimum of an annual cleaning and light greasing.

## 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.

# MAINTENANCE

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## Electrolysis and Galvanic Protection

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

It is not enough to know that your boat does not suffer from electrolysis: a newcomer in the adjacent marina berth may start a too-friendly association with metal components on it. An easy place to fit an anode is on the propeller shaft, or covering the propeller nut. The anode should not be painted because this will only defeat the purpose.

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



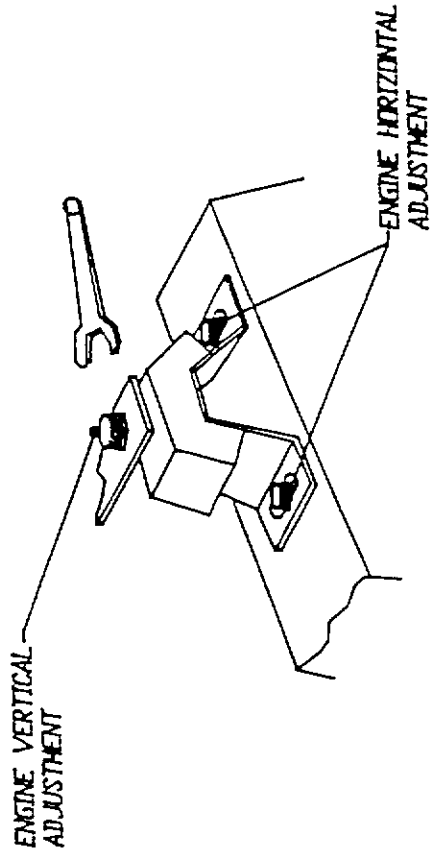
# MAINTENANCE

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## Alignment Procedure

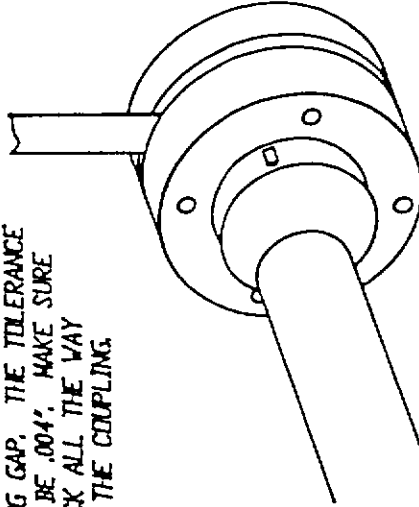
1. Separate the coupling, move the shaft end back to clear the pilot in the center.
2. Establish the shaft in the center of the shaft log by raising the shaft until it touches the top of the log - note position - lower the shaft until it touches bottom of the log - note position - repeat sidewise and locate shaft in the center; block shaft in this position, using a block of wood under the shaft packing gland.
3. Now, adjust the engine mounts to allow the pilot on the coupling halves to slip together without moving shaft up, down, or sideways.
4. Adjust the engine mounts as necessary until a 0.004" feeler gauge will not enter anywhere along the edge of the flange between the faces.
5. Tighten the locks on the adjustable mounts.
6. Re-check coupling with feeler, re-adjust if necessary.
7. Check stuffing box (allow to drip slightly).

STEP 1



STEP 2

USE FEELER GAUGE TO CHECK COUPLING GAP, THE TOLERANCE SHOULD BE .004". MAKE SURE TO CHECK ALL THE WAY AROUND THE COUPLING.



NOTE: CHECK COUPLING GAP WITHOUT COUPLING BOLTS IN PLACE.

# HUNTER

ALIGNMENT DIAGRAM GEN2619A

# 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 to 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 - WATER HEATER

### WATER SYSTEM:

Open a faucet and allow the pump to empty the tank. Then add approximately two gallons of non-toxic anti-freeze 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 automotive anti-freeze (ethyleneglycol) in a 50/50 mixture with water, pump through toilet and into holding tank. Refer to Galley/Head section for instructions.

# STORAGE/WINTERIZATION CONTINUED.

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## ENGINE

1. Drain the cooling water completely out of the engine and flush the line thoroughly with fresh water. Don't use high pressure through the line.
2. Remove the fuel completely from all fuel lines.
3. Disconnect the main battery cables from the battery terminals.
4. To prevent corrosion inside the cylinders, pour a little lubricating oil into the suction pipe while turning the engine. Enough oil to reach the intake/exhaust valve is sufficient.
5. Put the piston at top dead center of compression stroke so that the intake/exhaust valves are completely closed.
6. Apply a thin anti-corrosion treatment to the plating and exposed painted surfaces.
7. The engine should be in a well ventilated area, and protected from any kind of dampness.
8. Put a dust cover over the engine.
9. Check your operation manual for engine diagram and for "Manufacturer's Recommended Winterizing Procedures."

## 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.

## DEPARTURE FROM THE BOAT

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

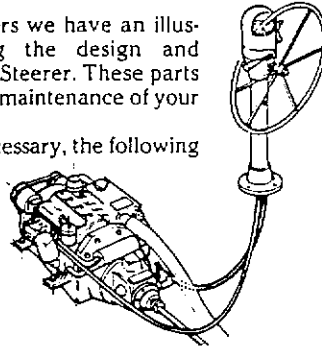
## ROUTINE MAINTENANCE

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

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

As a further service to our customers we have an illustrated parts breakdown showing the design and construction of your Edson Pedestal Steerer. These parts drawings will assist you in the proper maintenance of your steering system.

If disassembly should become necessary, the following instructions will provide a simple but precise method of removing and replacing the steering shaft and its components.



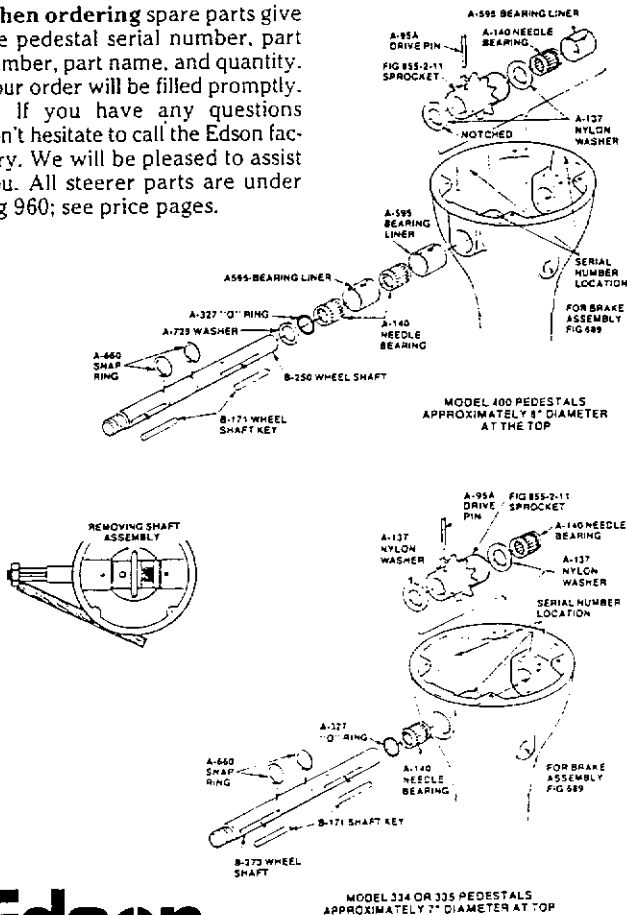
## DISASSEMBLY

1. With the wheel and brake assembly removed, replace the wheel nut with any standard thread  $\frac{3}{4}$ " or 1" hex nut.
  2. Loosen the steering cables and chain by backing off the take-up eyes at the Quadrant or Radial Driver, lift the chain off the sprocket and tie to the forward part of the bowl.
  3. Put a cloth just under the sprocket so no parts drop down.
  4. Align the notch in the aft nylon washer with the "V" stamped on the sprocket.
  5. Carefully drive the pin out of the sprocket (drive from the round end toward the grooved end).
  6. With a piece of wood against the  $\frac{3}{4}$ " or 1" hex nut, gently tape the wheel shaft from the housing (see illustration); be careful not to drop the shaft components into the pedestal.
  7. Remove the sprocket, two nylon washers and forward needle bearing.
  8. Remove aft needle bearing and washers.
  9. Wipe out any dirt or old grease before reassembly.
- To reassemble, reverse the above procedure; do not grease the bearings until reassembly is completed.

**NOTE:** Check your compass for possible readjustment.

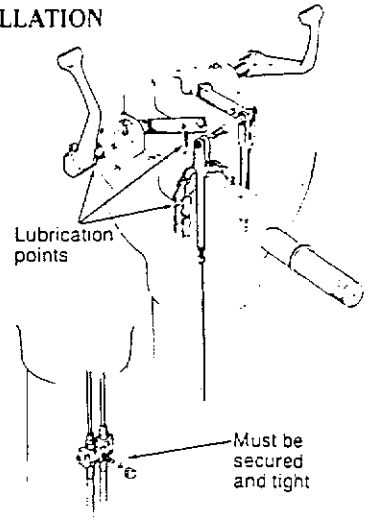
**When ordering spare parts** give the pedestal serial number, part number, part name, and quantity. Your order will be filled promptly.

If you have any questions don't hesitate to call the Edson factory. We will be pleased to assist you. All steerer parts are under Fig 960; see price pages.



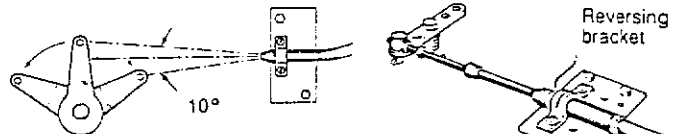
## ENGINE CONTROLS INSTALLATION

Great care must be taken to assure ease and safety of engine controls operation. Components must be installed and adjusted so the engine goes into gear smoothly and completely, and the throttle operates easily. Cables must be installed straight or in broad curves. Refer to the Engine Connections illustrations (opposite) for installation procedures. Don't force engine controls when operating above idle. Force-shifting can result in broken cables and loss of boat control. Familiarize yourself with the operation of the engine controls. Caution and train all those on board.

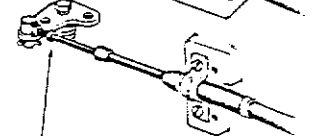


## ENGINE CONNECTIONS

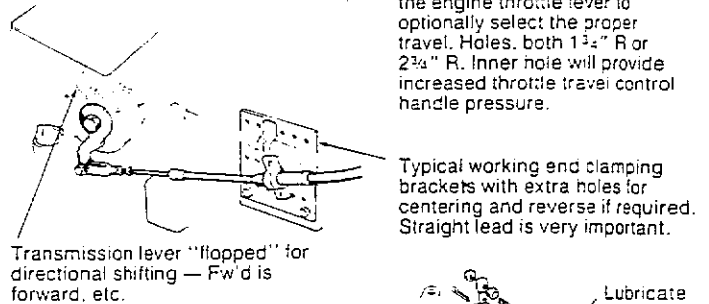
**NOTE:** Use the information below as a guideline. Most engine and control cable manufacturers furnish instructions for installing their products. Use their instructions if there is any variance with the instructions shown below.



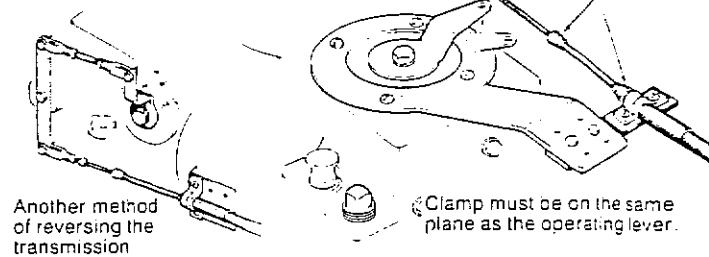
When aligning the cable anchor point with the control lever, the centerline of the cable must be aimed to the mid point of the lever to allow an equal amount of swivel to each other. No more than 10° total cable bend is allowed.



Two holes must be provided in the engine throttle lever to optionally select the proper travel. Holes, both 1 $\frac{1}{2}$ " R or 2 $\frac{3}{4}$ " R. Inner hole will provide increased throttle travel control handle pressure.



Transmission lever "flopped" for directional shifting — Fwd is forward, etc.



## ENGINE CONTROLS MAINTENANCE

Oil the control handle shaft bearings with #30 motor oil. Use a good grade of Teflon spray with an extender nozzle for the pedestal end of the engine control push/pull cables.

At the engine, clean off the control cable metal ends and spray with Teflon grease. This will increase cable life and make operation easier. Engine cables are subject to high heat from the transmission, and salty bilge water, both very hard on moving parts. If stiff, replace.

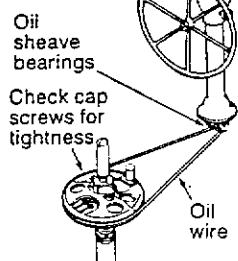
To properly maintain the moving parts in the top of the pedestal, it is necessary to remove the compass and its cylinder. For proper alignment when re-installing the compass, we recommend placing three or four lengths of tape on the pedestal and compass as shown below. Slit the tape when removing compass, align the strips of tape when re-installing the compass for visual realignment. Your compass MUST then be checked out for accuracy. Lubrication of needle bearings should be done by squeezing Edson Fig 827 Teflon Lubricant into the holes located on top of the bearing housings inside the pedestal bowl. Spin the wheel when squeezing the lubricant in to make sure the entire bearing is serviced. Winch grease or water pump grease can be used as an alternative, but don't let the bearings run dry. Do not over grease as it will run onto the brake pads. Oil the chain with #30 weight motor oil. Do NOT grease chain as it does not penetrate the links.

Inspect the condition of the wire, tension of the wire and lightly oil. Edson recommends placing about five layers of "Kleenex" on the palm of your hand, squirt oil on the tissues and lightly oil the wire. This will lubricate the strands but will also "flag" a broken or hooked strand by tearing off a small section of tissue. If you do have a wire break, replace the wire immediately. See Edson Fig 775 Wire and Chain Replacement Kits. (Caution: Wire splinters can cause painful cuts.) Replace the wire after 5 years. If still good, keep the old wire on board as a spare.

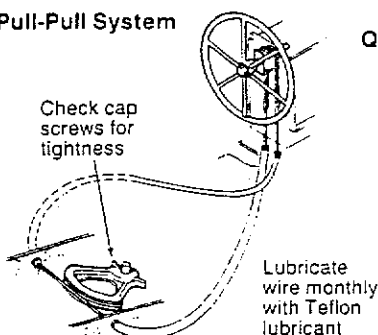
## STEERING WIRE TENSION

A top quality roller chain to wire steering system can be kept in "as new" sensitivity by keeping the wire at a correct tension. To check for proper wire tension, lock the wheel in position by using the pedestal brake, or by tying off the wheel. Cable tension is best when you cannot

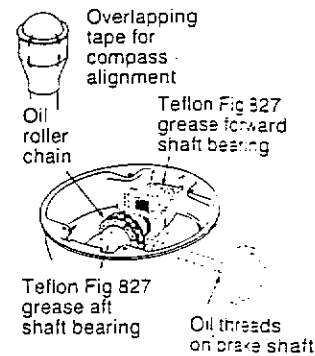
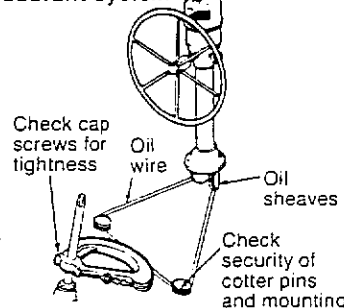
### Radial Drive System



### Pull-Pull System



### Quadrant System



move the quadrant or drive wheel by hand with the wheel locked in place. Over tightening will greatly reduce the sensitivity of the system.

It must be emphasized that all on board must be familiar with the care and operation of the Steering System and engine controls. One person must be assigned the job of maintenance and must be thoroughly familiar with the operation and intent of all the equipment. If at any time your Steering System makes strange noises or reacts differently than it has previously, you must find the causes immediately and correct the problem.

Screws, nuts, bolts, as well as clevis and cotter pins that are part of the steering system, engine controls or pedestal accessories, must be checked regularly for tightness and wear. Failure to inspect all steering parts, engine controls and pedestal accessories may cause loss of control or failure of the engine or steering system. *All boats must have an emergency tiller or its equivalent and all on board must be familiar with its location and operation. An emergency tiller drill is just as important as a man-overboard drill and must be regularly conducted.*

On a new boat and at least once a year, inspect the system when under a strong load. On a calm day and under power, go away from the other boats and with the person who is assigned the maintenance watching from below, put the wheel hard over at full throttle. The maintenance man should watch carefully for all parts of the system bending, distorting, creaking, or giving any indication of failing if placed under a heavy load for a period of time. If, for any reason something did fail or needs adjusting, the day is early and you will have plenty of time.

When leaving your boat at her mooring or slip, make sure that your wheel is properly tied off. **DO NOT LEAVE THE STEERING SYSTEM TO FREE WHEEL.**

## CLEANING STAINLESS STEEL

Pedestal guards, steering wheels and shafts are all made from top quality stainless steel. The implication of its name "stainless steel" does not mean it is totally rustproof. All stainless steel will rust to a certain degree due to chemical reaction to air and saltwater. This is mainly cosmetic and will require an occasional polishing with an abrasive type cleaner such as "Brasso" or equivalent.

## CLEANING PEDESTAL AND ACCESSORIES

Clean them with soap and water; don't use chemicals such as MEK or acetone as they break down the super finish on your Edson pedestal

system, compasses and instruments. Most manufacturers of compasses and electronic instruments suggest that they all be removed during winter storage and kept in a warm dry area. Compasses are normally held in place by two or three slotted-head screws, placed near the top of the compass. A Fig 672 Rubber Connector will assist in removing the compass. Instruments can be removed by the screws in the Edson faceplate. Just unplug the instrument and you are all set.

**CAUTION:** When the equipment is in the tropics or in charter service, the maintenance schedule must be speeded up. Or, to put it in a few words: clean it up, oil it, inspect it, cover it. The effects of sun, saltwater and inexperienced operators can be severe.

### LUBRICATION RECORD

component	lubricant	schedule	1st year	2nd year	3rd year	4th year	5th year	6th year	7th year
			19____	19____	19____	19____	19____	19____	19____
sheave bearings	#30 oil*	check and oil monthly							
pull-pull cables	Teflon Fig 827	check and grease monthly							
wire rope	#30 oil*	check and oil annually							
roller chain	#30 oil*	check and oil annually							
pedestal shaft bearings	Teflon Fig 827	check and grease annually							

\* Any light oil is suitable. We recommend #30 weight motor oil since most boat owners have it aboard.

**CAUTION:** 1.) On extended voyages your steering system should be inspected each day and lubricated weekly. Carefully inspect your steering system at least one week before a vacation cruise to avoid last minute maintenance.  
2.) When the boat is unattended secure the wheel with the brake or a line. In rough weather the rudder can swing violently from stop to stop causing damage.



Dear Edson Owner,

Welcome to the World of Edson! So that we may properly register your new Edson Steering System, please fill out and return the attached Steerer Registration Card to the Edson Corporation. We will register the serial number of your steerer so that if you ever have any questions, Edson's worldwide sales network will be ready to be of assistance. If you ever have any questions pertaining to your steering system, please be sure to contact Edson immediately. We are standing by ready to help you.

Upon receipt of the Edson Registration Card, we will not only register your Pedestal Serial number, but we will also send you the latest 60 page Edson catalog/handbook, showing Edson's complete line of accessories which can be purchased through your dealer.

Thank you,

Customer Service Dept.  
THE EDSON CORPORATION

**EDSON REGISTRATION CARD**

In order to properly register Edson's steerer, please fill out and return the Edson Registration Card below. By return mail Edson will send the latest catalog/handbook.

THE EDSON CORPORATION, 460 INDUSTRIAL PARK RD., NEW BEDFORD, MA., 02745 - TEL. 508-995-9711 - FAX: 508-995-5021

PLEASE PRINT CLEARLY

OWNER'S NAME \_\_\_\_\_

STREET \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

BOAT DEALER \_\_\_\_\_

DEALER ADDRESS \_\_\_\_\_

BOAT BUILDER \_\_\_\_\_ LENGTH \_\_\_\_\_

CLASS \_\_\_\_\_ YEAR BUILT \_\_\_\_\_

HULL # \_\_\_\_\_ EDSON SERIAL # \_\_\_\_\_

**RECORD YOUR  
SERIAL NO.  
BELOW FOR  
YOUR RECORDS**

**EDSON SERIAL NO. LOCATED ON INSIDE OF PEDESTAL BOWL BENEATH COMPASS.**

CHECK IF YOU ALREADY HAVE OUR CATALOG

THE EDSON CORP., 460 INDUSTRIAL PK., RD., NEW BEDFORD, MA., 02745  
TELEPHONE (508) 995-9711 - FAX: (508) 995-5021

# DEALER/OWNER CHECK LIST



For the best performance of your new steering system, engine control, or Edson accessories, Edson recommends that the owner and dealer carefully check over the steerer installation before the boat leaves the dock.

Our experience has shown that fastenings tend to be vibrated loose in delivery especially those boats delivered by truck, and we advise that the items on the check list be inspected. After the initial inspection this check list should be followed on a regular basis.

FASTENERS	USE AND LOCATION
Screws	<input type="checkbox"/> Quadrant-at rudder post <input type="checkbox"/> Radial Drive-at rudder post <input type="checkbox"/> Engine Controls at handles and cable holder
Nuts	<input type="checkbox"/> Wheel <input type="checkbox"/> Pedestal Bolts <input type="checkbox"/> Idler Sheaves <input type="checkbox"/> Wire Take Up Eyes on Quadrant or Radial Drive
Bolts	<input type="checkbox"/> Outer radius joint of Radial Drive <input type="checkbox"/> Sheave housings <input type="checkbox"/> Rudder stop on Radial Drive
Cotter Pins	<input type="checkbox"/> Chain ends <input type="checkbox"/> Sheave Pins <input type="checkbox"/> Engine Control Clevis Pins

For the best performance of the steering system, the roller chain, bearings, and sheave pins and bushings must be properly lubricated. Also check for proper wire tension. Please refer to the maintenance guide for the complete instructions.

Be sure that all crew members are familiar with the care and operation of the steering system as well as the location and use of the emergency tiller. This guide, the maintenance guide, and the catalog, should be kept on the boat for reference purposes.

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## Edson International

460 INDUSTRIAL PARK RD.  
NEW BEDFORD, MASS. 02745





UK SAILS MADE IN HONG KONG ARE WARRANTED FOR A PERIOD OF ONE YEAR AGAINST DEFECTS IN MATERIALS OR WORKMANSHIP. THE WARRANTY COVERS SAILS THAT HAVE RECEIVED REASONABLE USE AND HAVE NOT BEEN DAMAGED DUE TO ABUSE OR NEGLIGENCE.

NOTICE OF DEFECT MUST BE GIVEN WITHIN 30 DAYS OF DISCOVERY TO UK SAILMAKERS HONG KONG, P. O. BOX 69527, KWUN TONG, KOWLOON, HONG KONG. PHONE NO.: (852) 775-7711. UK SAILMAKERS H.K. WILL ARRANGE TO HAVE THE SAIL REPAIRED OR REPLACED. THIS WARRANTY IS IN LIEU OF ANY OTHER WARRANTY EXPRESS OR IMPLIED AND DOES NOT COVER ANY INCIDENTAL DAMAGES AND DOES NOT COVER TRANSPORTATION COSTS.



### SAILS WARRANTY REGISTRATION FORM

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

TELEPHONE (OFFICE) \_\_\_\_\_ TYPE OF BOAT \_\_\_\_\_  
(RES.) \_\_\_\_\_

FAX \_\_\_\_\_

DATE SAILS PURCHASED \_\_\_\_\_ SAIL SERIAL # \_\_\_\_\_

NAME OF DEALER \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

\* THIS WARRANTY FORM MUST BE RETURNED WITHIN 30 DAYS OF RECEIPT OF SAIL TO UK SAILMAKERS HONG KONG.

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U K SAILMAKERS HONG KONG  
P. O. BOX 69527  
KWUN TONG  
KOWLOON  
HONG KONG



# HUNTER MARINE

## LIMITED WARRANTY

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The following warranties apply to all 1993 Model Year boats produced by HUNTER MARINE CORPORATION:

### 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 subjected to abrasion or impact.
  
- (2) If the instructions provided in the Hunter Owner's Manual are not followed according to Hunter's required bottom preparation procedures.

# HUNTER MARINE LIMITED WARRANTY

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## RESTRICTIONS APPLICABLE TO WARRANTIES

These limited warranties do not cover:

- (1.) Paint, window glass, gelcoat, 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.
- (3.) Boats used for commercial activities including charter.

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 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 PURCHASER'S REMEDY IS LIMITED TO REPAIRS OR REPLACEMENT OF ANY PART(S) JUDGED DEFECTIVE BY HUNTER. SOME STATES 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.

## 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 of 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.

# HUNTER MARINE LIMITED WARRANTY

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## TRANSFER OF LIMITED WARRANTIES

Effective with 1993 hull numbers, the 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. (see form letter, attached) The transfer of the ownership of the boat will not extend the expiration dates of the limited warranties.

## 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.

# **GALVANIC ISOLATO**

Because of overriding concerns for personal safety, according to the prevailing standards of the American Boat Council and plugged into a dock wired according to Electrical Code is subject to increased galvanic corrosion electric current move between boat and shore through the wire in the shore cord.

Since 1986, Galvanic Isolators have been widely used to flow of harmful, low voltage currents that may cause galvanic corrosion. Today, most U.S. built boats with factory installed 110 or 240 volt power systems are equipped with Galvanic Isolators.

We feel that it is advisable to add a Galvanic Isolator to every boat so equipped. These devices are inexpensive and easily installed. If you have no local source for such a device, there is a reliable source for corrosion information and equipment. Your warranty does not cover galvanic corrosion.

Dutch Vandervort  
**Corrosion Clearing House**  
25 Encinal Place  
Ventura, California 93001  
Phone (805) 643-2506  
Fax (805) 658-0492

## LIMITED ONE YEAR WARRANTY

SEAWARD PRODUCTS warrants the products delivered will be:

- A. free from (1) encumbrances and (2) defects in material and workmanship, normal use and service, and
- B. will meet applicable specifications and descriptions at time of delivery to E

The obligation of SEAWARD under this Warranty is limited to the repair, replacement, at SEAWARD'S option, any part or component thereof, which exc discloses to our satisfaction to have been nonconforming or defective. SEAWA establishing customer's purchase date and determining problem to be under will either repair the product at their factory or authorized service center and al and parts for (1) one year from purchase date. Transportation charges responsibility of the customer. Items not covered under warranty are

- (1) Porcelain Enamel
- (2) Glass
- (3) Routine Maintenance that may be required.

The foregoing Warranty and condition shall apply to any repaired, reworked, or products, part or component supplied by SEAWARD. SEAWARD shall in no liable to BUYER or BUYER'S customers for any incidental or consequential c or loss of use, or other losses, however occasioned.

Implied Warranties of merchantability and of the fitness of the product for any are warranted for a period of one year on parts and labor. SEAWARD n warranties, expressed or implied after that time.

Some states do not allow limitation on how long an implied warranty lasts, exclusion or limitations of incidental or consequential damages, therefore, th limitations may not apply to you.

This Warranty is extended to the original purchaser only, unless purchased for resale.

This Warranty gives you specific legal rights, and you may also have other rights vary from state to state.

**Seaward** *Products*

15600 SALT LAKE AVENUE • CITY OF INDI  
POST OFFICE BOX 566 • LA PI  
PHONE (818) 968-2117 • F/

**OWNERSHIP REGISTRATION**  
(Please fill out and Return within 10 days)

NAME \_\_\_\_\_ BRAND NAME OF BOAT \_\_\_\_\_  
ADDRESS \_\_\_\_\_  POWER  SAIL  
CITY \_\_\_\_\_ OVERALL LENGTH \_\_\_\_\_  
STATE \_\_\_\_\_ ZIP \_\_\_\_\_ TYPE OF APPLIANCE:  
DEALER'S NAME \_\_\_\_\_  STOVE  RANGE  MICROWAVE  
ADDRESS \_\_\_\_\_  WATER HEATER  
CITY \_\_\_\_\_ YOUR AGE:  20-30  30-40  40+  
STATE \_\_\_\_\_ ZIP \_\_\_\_\_ ANY COMMENTS: \_\_\_\_\_  
DATE PURCHASED \_\_\_\_\_  
PRODUCT SERIAL # \_\_\_\_\_  
PRODUCT MODEL # \_\_\_\_\_



From \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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***Seaward Products***

P.O. Box 566  
La Puente, CA 91747

Customer Service

# SEAWARD PRODUCTS

## AUTHORIZED SERVICE CENTERS

### CALIFORNIA

#### PROPER TIGHE MARINE

2427 Clement, Alameda, CA 94501  
(415) 523-3143

#### SAILING SUPPLY

2822 Cannon Street, San Diego, CA 92106  
(619) 225-0158

#### SOUTH BAY MARINE ENTERPRISES, INC.

2500 Miner Street, San Pedro, CA 90731  
(213) 833-1450

#### WESLEY HEINMILLER CO.

1945 Lomita Blvd., Lomita, CA 90717  
(213) 534-8116

### CANADA

#### RIVER MARINE SUPPLIES

P.O. Box 23500 Vancouver AMF  
8060 Capstan Way, Richmond, B.C., Canada V6X 1R5  
(604) 270-9455

#### SHORTWAVE MARINE SERVICE, LTD.

81 Lakeshore Road East, Mississauga, Ontario, Canada L5H 1C9  
(416) 278-6541

### CONNECTICUT

#### MACRI MARINE

7 Ruby Street, Norwalk, CT 06850  
(201) 255-1100

### FLORIDA

#### A.C. MARINE, INC.

2012 Whitfield Park Drive, Sarasota, FL 34243  
(813) 755-8053

#### APPLIANCES OF PALM COAST

2 Hargrove Grade, Palm Coast, FL 32037  
(904) 445-1439

#### D & S SERVICE

11339 S.W. 84 LN, Miami, FL 33173  
(305) 271-8644

#### SPACE COAST APPLIANCE INC.

7412 North Atlantic Lane, Coco, FL 32920  
(407) 784-0202 • 639-0875

#### TAMPA MARINE

202 North Thirteenth Street, Tampa, FL 33602  
(813) 229-2734

### HAWAII

#### ALA WAI MARINE LTD.

1651 Ala Moana, Honolulu, HI 96815  
(808) 946-4213

### MARYLAND

#### VIKING BOAT SUPPLY

320 Sixth Street East Port. Annapolis, MD 21403  
(301) 268-8000  
Alco & Kero Only

### MICHIGAN

#### NORTHLAND APPLIANCE SERVICE CO.

2231 Adams Road, Sterling, MI 48659  
(517) 654-3160

#### TORRESEN MARINE, INC.

3126 Lakeshore Drive, Muskegon, MI 49441  
(616) 759-8596

### MISSISSIPPI

#### GULFPORT MARINE SUPPLY

1316 27th Avenue, Gulfport, MS 34501  
(601) 868-3599

### NEW JERSEY

#### JAY MARINE

Rt. 38 & Rudderow Avenue, Maple Shade, NJ 08052  
(609) 482-1501

### NEW YORK

#### ACME SERVICE CO.

8 Davidson Plaza, East Rockaway, NY 11518  
(516) 599-6829

#### SURFSIDE 3 MARINA

846 S. Wellwood, Lindenhurst, NY 11757  
(516) 957-9288

### OREGON

#### JIM PRINGLE'S REEL REPAIR

30 North Oakdale, Medford, OR 97501  
(503) 770-5184

#### SEXTONS CHANDLERY

303 N.E. Romahawk Island Drive, Portland, OR 97217  
(503) 289-9358

### RHODE ISLAND

#### CORP BROS

#1 Brook Street, Providence, RI 02903  
(401) 331-8020

#### F & M SERVICE, INC.

2580 East Main Road, Portsmouth, RI 02871  
(401) 683-5025

#### ISLAND MR. FIX IT, INC.

12 East Main Road, Middletown, RI 02840  
(401) 849-3340

### UTAH

#### PETERSON MARINE SUPPLY

4455 South 900 West, Ogden, UT 84405  
(801) 621-7532

### WASHINGTON

#### MULTITRONICS, INC.

3837 Stoneway Avenue North, Seattle, WA 98103  
(206) 632-4434

#### SURE MARINE SERVICES, INC.

5320 28th Avenue N.W., Seattle, WA 98107  
(206) 789-1660



Cat. No. 493 Series Standard Intake Water Strainers  
 Cat. No. 500 Series Heavy Duty Intake Water Strainers

**INSTALLATION AND OPERATING INSTRUCTIONS**

**NOTE:** Prior to installation, consult your Engine Manual for recommended pipe size and strainer location. For proper protection, A.B.Y.C. Standards E-1 (Bonding of Direct Current Systems) and E-2 (Cathodic Protection) must be adhered to.\*

- 1). The PERKO Water Strainers have been designed to be installed on the intake side of the water cooling system.
- 2). Mount strainer on a flat surface in a vertical position. Allow clearance above strainer to remove basket for cleaning.
- 3). For correct installation, note that the inlet and outlet fittings are marked on the top casting. For convenience in piping, there are mounting lugs on both sides of the strainer.
- 4). Drill mounting holes, using mounting lugs on strainer as a template. Strainer should be mounted to ensure proper support from bulkhead to eliminate any strain on the pipe.
- 5). PERKO strainers are designed to give 100% full flow, without restriction (see Note No. 7). The use of reducers may cause engine damage and therefore is not recommended. The following table shows the rated strainer open area to pipe cross-section ratios:

<u>CAT. NO.</u>	<u>PIPE SIZE</u>	<u>RATIO</u>
493-003-PLB	3/8	22:1
493-004-PLB	1/2	30:1
493-005-PLB	3/4	25:1
493-006-PLB	1	20:1
493-007-PLB	1-1/4	13:1
493-008-PLB	1-1/2	17:1
493-009-PLB	2	13:1
493-010-PLB	2-1/2	10:1
500-009-PLB	2	20:1
500-010-PLB	2-1/2	18:1
500-011-PLB	3	14:1

- 6). After all connections are complete, start engine and check entire system for leaks.
- 7). **IMPORTANT:** Periodic inspection and removal of foreign matter is essential for safe operation. This requirement will vary, depending on amount of use and local operating conditions. Quick cleaning of strainer is accomplished by removal of basket through access plate in top of casting.
- 8). **IMPORTANT:** Periodic inspection of components is also essential for safe operation. Make sure to check castings, fasteners, cover gaskets, plug, tie rods, etc. for damage or deterioration on a regular schedule.
- 9). **WINTERIZING:** To prevent damage by freezing, drain the strainer cylinder prior to storage in freezing temperatures.

**SPARE PARTS**

Specify Cat. No. of Strainer, Size and Part No. below  
 (For Example: 493-005-99F Specifies a cover gasket for a 3/4 inch strainer)

- |                            |   |  |
|----------------------------|---|--|
| 99A - Top Casting          | 99L - Hinged Bolt for Cover with Pin, Nut and Washer                          | 99P - Tie Rods, Nuts and Washers Consists of:<br>(4 of each for 493 Series.) |
| 99B - Bottom Casting       |   | (1 of each for 500 Series.)  |
| 99C - Transparent Cylinder | 99M - Gasket Kit Consists of:<br>1 - Cover Gasket and<br>2 - Cylinder Gaskets |  |
| 99D - Basket Strainer      |   |  |
| 99E - Cover with Gasket    | 99N - Cover Gaskets (2 per bag)   |  |

Above standards can be obtained from:

American Boat & Yacht Council, Inc.  
 405 Headquarters Drive, Suite 3  
 Millersville, MD 21108

PERKO, INC.  
 16490 N.W. 13th Avenue  
 Miami, FL 33169-5707

# PERKOPLATE/PERKO-KOTE

## LIMITED WARRANTY

PERKO, Inc. guarantees that all of its products finished with the PERKOPLATE chromium plating process will maintain their original luster and brightness, or those finished with the PERKO-KOTE powder coating process will remain corrosion-free for as long as the original consumer-purchaser owns them. During the Warranty period, PERKO, Inc. agrees to repair or replace, (at PERKO's option) without cost to the original consumer-purchaser, any product upon which the PERKOPLATE chromium finish corrodes, becomes dull or otherwise does not maintain its original luster and brightness, or any product upon which the PERKO-KOTE finish corrodes. For this Warranty to be effective, the PERKO product must be returned prepaid and insured to PERKO, Inc. at its address shown below.

This Warranty is void if the PERKOPLATE or PERKO-KOTE finish has been damaged by accident, unreasonable use, neglect, improper service or other cause not arising out of defects in material or workmanship.

**IN NO EVENT SHALL PERKO, INC. BE LIABLE FOR LOSS OF USE OF ITS CONSUMER PRODUCTS NOR FOR OTHER INCIDENTAL OR CONSEQUENTIAL COSTS, EXPENSES, OR DAMAGES INCURRED BY THE INDIVIDUAL.**

Some states do not allow the exclusion or limitation of incidental or consequential damage, so the above limitation 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.

### PERKO, INC.

16490 N.W. 13th Avenue • Miami, Florida 33169-5707 • (305) 621-7525

4/92

### ONE YEAR LIMITED WARRANTY

PERKO, INC. (PERKO) warrants to the original consumer-purchaser that PERKO'S consumer products will be free from defective materials or workmanship, under normal use and service, for a period of one (1) year from the original purchase date.

ALL IMPLIED WARRANTIES, INCLUDING MERCHANTABILITY, ARE ALSO LIMITED IN DURATION TO THE ONE YEAR PERIOD FROM THE ORIGINAL PURCHASE DATE. PERKO SHALL NOT BE LIABLE FOR LOSS OF USE OF ANY OF ITS CONSUMER PRODUCTS, NOR SHALL PERKO BE LIABLE FOR OTHER INCIDENTAL OR CONSEQUENTIAL COSTS, EXPENSES, OR DAMAGES INCURRED BY THE ORIGINAL CONSUMER-PURCHASER OR BY ANY OTHER PERSON, FIRM OR CORPORATION.

SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY OR MAY NOT APPLY TO YOU. SOME STATES 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 is void if the consumer product warranted has been damaged by accident or unreasonable use, neglect, improper service or other cause not arising out of defects in material or workmanship. Excluded from this Warranty are Electric light bulbs (Lamps), Sealed Beam Units, and Fuses.

During the warranty period, your PERKO product will either be repaired or it will be replaced with a like product (at PERKO'S option) without charge to the original consumer-purchaser, when returned prepaid and insured, with proof-of-purchase date to PERKO at our factory in Miami, FL. In the event of replacement, the replacement product will continue the warranty of the original product, or ninety (90) days whichever is longer. IMPORTANT: FOR THIS WARRANTY TO BE EFFECTIVE PERKO MUST BE SUPPLIED WITH PROOF-OF-PURCHASE DATE OF THE PRODUCT.

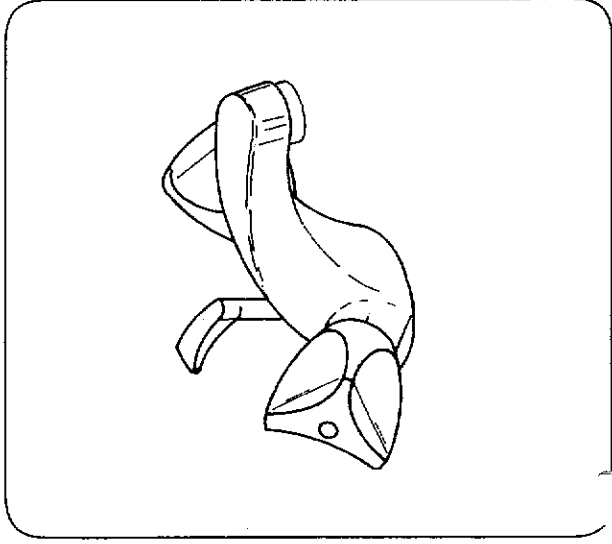
PERKO does not authorize any person or company to create for it any other obligation or liability in connection with any of its products.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.



# Classic 21 021, 21 285 and variants

Technical Product Information



Centerset



Gedruckt auf chlorfrei gebleichtem Papier.  
Printed on chlorine-free bleached paper.  
Imprimé sur papier blanchi sans chlore.

## certification

### Application

- Pressurized storage heaters
- Thermally controlled instantaneous heaters (set flow temperature to 120 °F)
- Hydraulically controlled instantaneous heat (operation is however subject to certain restrictions in comfort occasioned by the function of the heater)

Operation with low pressure storage heaters (displacement water heaters) is **not possible**.

### Specification

- Max. flow 2.2
- Flow pressure 15-75
- min
- recommended
- greater than 75 p.s.i., fit pressure reducing valve
- Working pressure - max. 150
- Test pressure 230
- Temperature 1
- max. (hot water inlet) 1
- recommended (economy setting) hot
- Water connection cold

### Note

Major pressure differences between cold and water supply should be avoided.

**Flush pipes thoroughly**

**Mount centerset on lavatory**

See dimensional drawing fold out page I.

When installing the faucet in counter top thicker than 1" it is necessary to use suitable shank extension, see replacement parts page 3 items 17 and 18.

**Connect centerset**

For this purpose the copper pipes must be fitted on to the angle stops (or other supply points).

The hot water supply should be connected on the left, the cold water supply on the right side.

**Open angle stops and check function of faucet**

**Check connections for leakage.**

Only original Grohe replacement parts may be used.



## Replacement parts/ Care

No.	Description	Cat. No.	Pack- ing unit	No.	Description	Cat. No.	Pk in u l
1	TDL-handle, blue	06 498	1	13	Mounting set	45 012	
1.1	Handle connection set	45 001	1	14	Flow regulator	13 955	
2	TDL-handle, red	06 499	1	14.1	Flow regulator set	45 220	
3	TDL-handle, neutral	06 486	1	15	Pop up waste	28 958	
4	Lever-handle, blue	06 923	1	15.1	Stopper	45 324	
5	Lever-handle, red	06 924	1	15.1.1	Stopper O-ring	01 147	
6	Cap	01 702	1	15.2	Flange	01 153	
7	Tricorn-handle, blue	06 113	1	15.3	Shank nut and bushing	45 266	
8	Tricorn-handle, red	06 114	1	15.4	Nut and bushings	45 265	
9	Ceramic cart. 90°, right	45 625	1	15.5	Ball rod	45 264	
9.1	Body seal O-ring	03 924	10	15.6	Strap with screw	45 263	
10	Ceramic cart. 90°, left	45 626	1				
11	Lift rod	06 073	1		Optional accessories		
12	Lift rod	06 078	1	16	6" Escutcheon	07 542	
				17	2" Extension kit	12 925	
				18	1" Extension kit	12 927	

Subject to technical modification without notice.

## Care

Instructions for care of this center set, will be found in the Limited Warranty supplier

Grohe America Inc.  
241 Covington Drive  
Bloomington, IL  
60108  
U.S.A.  
Technical Services  
Phone: (708)582-7711  
Fax: (708)582-7722

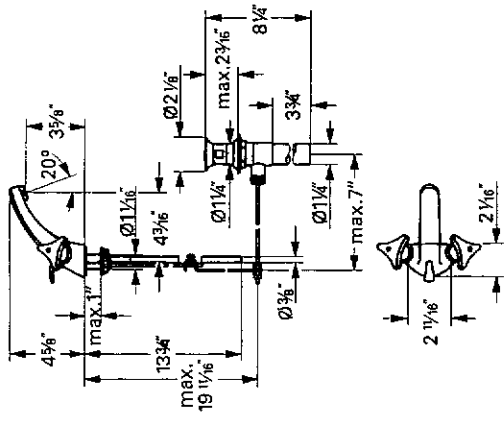
Grohe Canada Inc.  
862 Arvin Avenue, Unit  
Stoney Creek, Ontario  
Canada, L8E 5P2  
Technical Services  
Phone: (905)643-9848  
Fax: (905)643-9843

Installation dimensions

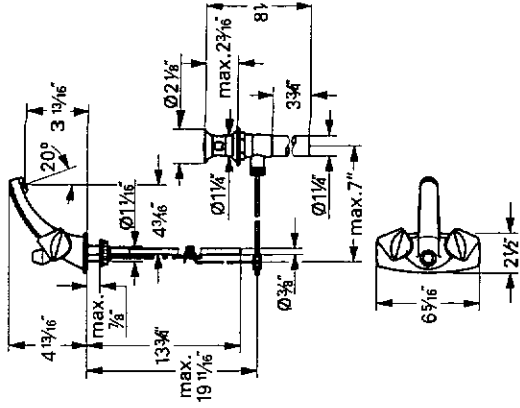
21 021

21 363 (with tricor deluxe handle)

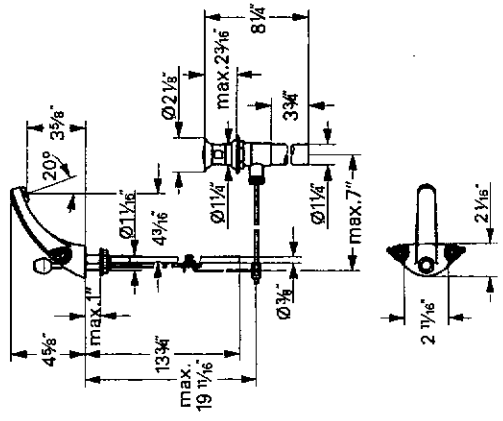
21 364 (with lever handle)



21 175



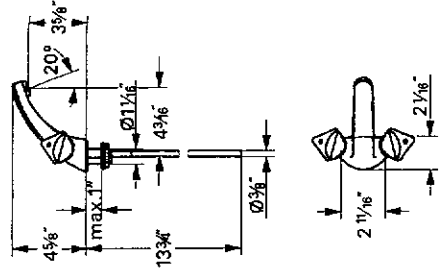
21 285



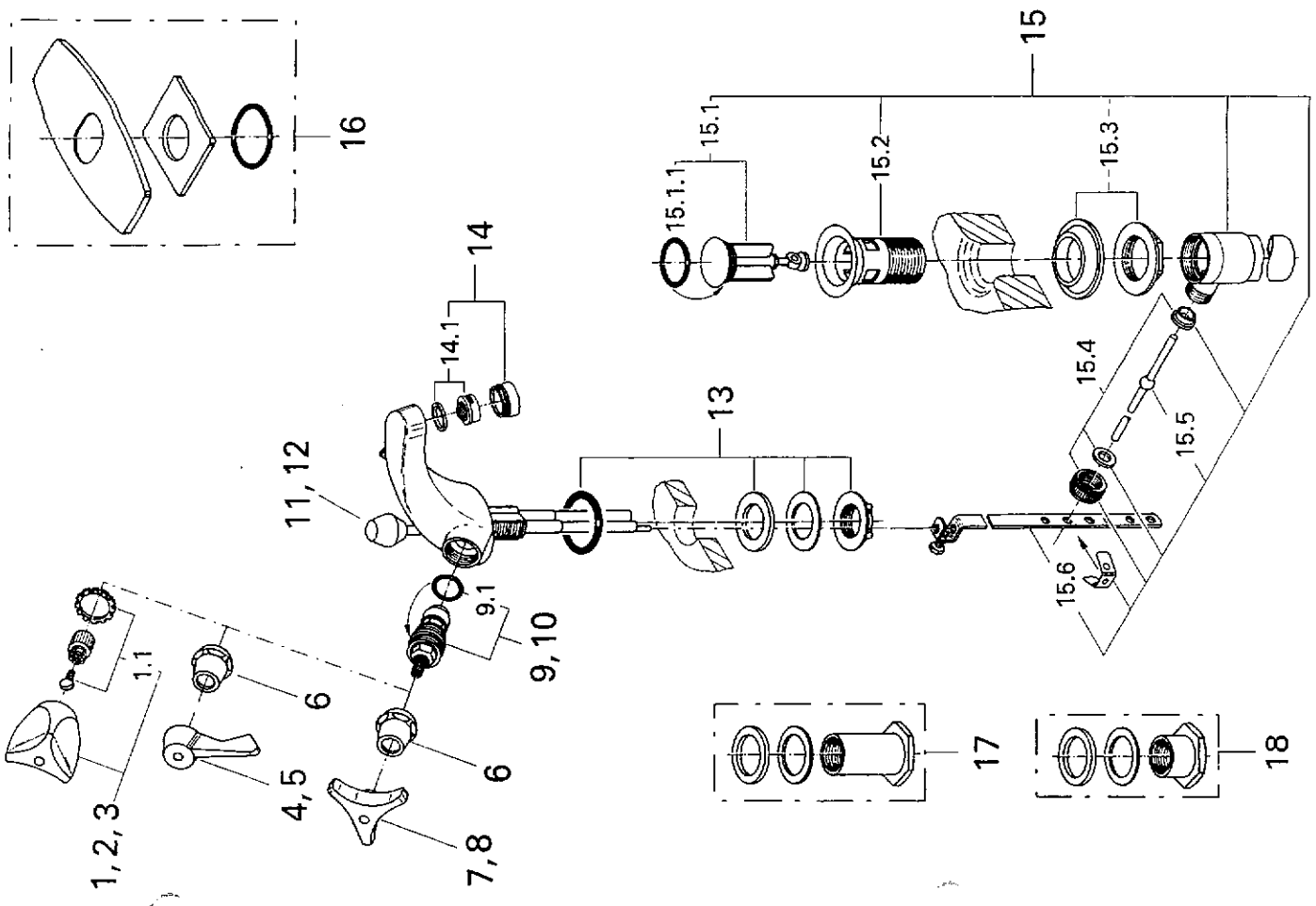
21 360

21 361 (with tricor handle)

21 362 (with lever handle)



реplacements parts





Dear Valued Customer:

We thank you for the confidence you have shown in one of our Grohe products.

The surfaces of our fittings are produced using the best materials and proven processes and are constantly improved by advanced quality assurance methods.

To derive long-lasting pleasure from your product and to preserve its attractive appearance, please note the following:

Water contains lime, to a greater or lesser extent, which is retained on the surface of the fitting, leaving deposits when the water has evaporated.

You can prevent lime deposits from forming by always wiping the fitting dry immediately after use. If you have already noticed lime deposits on the fitting, remove them by scrubbing with a soft brush. Do not use a water-soapy cloth to wipe off and wipe dry with a towel.

To maintain your product's luster, wipe the fitting with Grohe's ColourCare™ (15 088).

**Caution:** Do not under any circumstances use scouring agents, abrasive sponges, hydrochloric acid, i.e. so-called lime-scale removers, vinegar (acetic acid)-based cleaners, ammonia or other alkalies. In view of the multiplicity of domestic bathroom cleaners, it is difficult to specify purpose cleaners on the market and the fact that each manufacturer's instructions should be read and they should not be used for cleaning our fittings.

In view of the foregoing, please refrain from any damage to surface material caused by incorrect treatment is not covered by the terms of the limited warranty.



4400 - 188th AVENUE NORTH  
CLEARWATER FLORIDA  
34617  
AREA CODE (813) 577-0478

## FOSS FORM, INC. // POLYURETHANE FOAM

### YOUR FOSS FIBERGLASS AND URETHANE RUDDER

Foss Foam Inc. has been producing sailboat rudders for over twenty five years for most major boat companies. The fiberglass blade with it's rigid urethane core has proven to be an extremely strong dependable rudder.

The near neutral bouyancy of your rudder helps the performance of your boat by reducing total weight, as well as reducing the moment of inertia in the stern. Near neutral bouyancy also is helpful should the rudder ever need to be removed for steering system repairs. The boat does not need to be hauled out of the water to remove the rudder.

Tough fiberglass and urethane plastic used in the construction of your rudder is nearly indestructable. The urethane core is composed of a strong rigid closed cell urethane. Water, diessel, solvents or marine borers will not damage your rudder blade, even if the glass coating has been damaged.

The edge seam should not be ground flush unless you re-glass the seam. If it is ground flush without re-glassing it will cause it to sepearate.

When you paint your rudder the first time, particular attention should be paid to the paint manufacturer's instructions for preparing the surface. Solvent washing is not enough. The rudder must be sanded heavily to remove a heavy coating of mold release. We recommend white paint be used. White is a popular color as it is easy to see weeds and other debris which can catch on your rudder.

Cosmetic surface repairs may be performed by cleaning, drying and roughing up the damaged area and applying Marine bondo or any similar filler with a putty knife. Should a small blister appear, it may be filled with resin or cut away and repaired. Once the patch has dried, it may be sanded smooth and painted directly with botcom paint or any coating you desire.

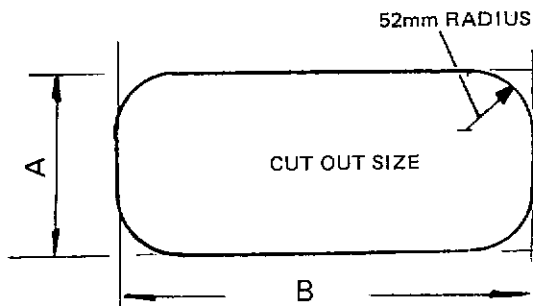
We do not recommend the use of dark colors on your rudder, as they generate heat when the boat is out of the water in the sun. Since the rudder is made of cellular material this heat can cause dimensional changes and cosmetic damage. If the rudder is painted with a dark color it should be shielded from the sun with a white wrapping when the boat is out of the water. The rudder Warranty excludes damage caused by heat.

You should make periodic inspections of your rudder and look for possible damage from grounding or electrolysis. Slight bends or shaft erosion often are not noticed until the shaft fails in heavy sea conditions.

Should you have any questions about your rudder, feel free to call us at (813)577-0478

## LEWMAR PORTLIGHT – FITTING INSTRUCTIONS FOR OPENING VERSIONS

- 1) Check that Portlight can be fitted in the planned position. Hold the outer frame at the intended position and check that a flat surface (to  $\pm 1\text{mm}$ ) exists to 12mm beyond the edge of the planned cutout. Hold the inner frame on the inside at the intended position and check that all fastenings will be clear of any deck moulding radius in the hull etc. and that a flat bearing surface exists over the surface of the inner frame to ensure a good bolting down seal. (See sketch of Typical Cross Section.)
- 2) With a pencil mark out the cutout to the recommended dimensions shown.



SIZE	PORTLIGHT SIZE	DIMENSION A		DIMENSION B	
0	4" x 10"	156mm	6 $\frac{1}{8}$ "	304mm	12"
1	5" x 12"	171mm	6 $\frac{3}{4}$ "	347mm	13 $\frac{5}{8}$ "
2	4" x 14"	155mm	6 $\frac{1}{8}$ "	405mm	16"
3	5" x 15"	171mm	6 $\frac{3}{4}$ "	429mm	
4	5" x 23"	171mm	6 $\frac{3}{4}$ "	627mm	

- 3) Cut out to just inside of the pencil line using a suitable jig saw. It is important to make an accurate cut within the line. It may be necessary to ease/rasp out beyond this size to achieve the best possible fit of your Portlight. As production tolerances exist we advise that you measure your Portlight to check exactly the cutout sizing before you cut. (Remember the old adage: Measure twice, cut once).
- 4) Measure thickness of skin (and inner trim if fitted).
- 5) Clear away swarf, apply bedding compound to outer frame. Fit outer frame unit, and with inner frame in place (such that the butt joint is at the lower edge to allow for water drainage), bolt firmly up to a maximum torque of 25 in.lb (0.113 N.m.) from the centre working out to the edges using the bolts supplied. Make sure compound spreads out evenly on the outside of outer frame. Clean off surplus sealant compound.

### Caution

M5 screws supplied are for hull thickness 15–19mm. It is important that you use the correct length screw otherwise you will damage the portlight. Check depth of hull and select correct length of screw from table overleaf.

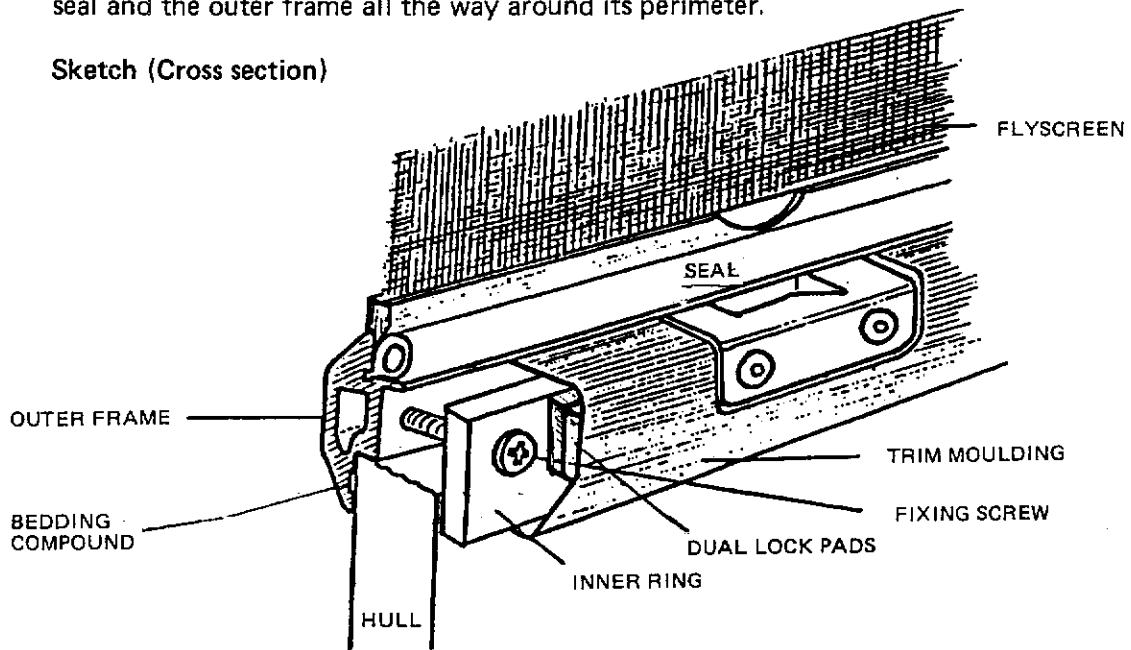
- 6) Adjust the trim moulding by cutting the inner edge only to suit, using fine toothed saw or tin snips, such that when in place the trim ring fixes to the 'dual lock' pads. Snap the trim mouldings into final position making sure the trim ring picks up the top dual lock pads and that the trim is fully home all around its perimeter. It is a simple matter to remove the trim ring by prising it away and refitting by snapping back onto the dual lock pads. On craft with considerable wrap/curvature or difficult inner trim it may be necessary to use more dual lock fixing, in which case use our spares kit. Alternatively, in extreme cases, it may be necessary to use screw fixings through the trim into the inner ring.

- 7) Check for correct operation of window, closing/locking operation, even pressure

8) **Fitting Flyscreen**

Showing flyscreen in position – behind outer frame and in front of seal. Fit the flyscreen from the inside by first locating each end, and then easing it between the seal and the outer frame all the way around its perimeter.

Sketch (Cross section)



9) **M5 fixing screws**

For hull thickness

6 – 10mm	use M5 x 16,	Cat. 8991
11 – 14mm	use M5 x 20,	Cat. 8992
15 – 19mm	use M5 x 25,	Cat. 8993
20 – 24mm	use M5 x 30,	Cat. 8994
25 – 29mm	use M5 x 35,	Cat. 8995
30 – 34mm	use M5 x 40,	Cat. 8996

(supplied as standard)

Min. hull thickness 6mm. Max hull thickness 32mm.

10) **Spares:**

Spares are available, should damage occur. These include:

Portlight Size	Replacement Trim Mouldings	Replacement Flyscreen	Replacement Seals
4 x 10	8973	8980	8985
5 x 12	8974	8981	8986
4 x 14	8975	8982	8987
5 x 15	8970	8983	8988
5 x 23	8979	8984	8989

11) **Deadlight**

If a deadlight is required we suggest that the trim moulding be removed.

A plywood/aluminium/fibreglass plate be cut to cover the port (notched to clear hinges and locking handles), and drilled such that by using longer bolts it may be bolted on top of the aluminium frame.

**Warning**

Cleaning of portlight with all solvents could cause damage.



# IM LEWMAR EXTENDED WARRANTY

## Warranty Statement:

- Winches - Models 6-66 inclusive, self-tailing & standard
- Powered Winches - Models 40-66 inclusive
- Portlights
- Hatches
- Hardware
- Windlass - Models 700 - 2500 inclusive

Lewmar warrants the above products in normal usage to be free of defects in materials and workmanship for a period of five years from the date of purchase, subject to conditions and limitations and exceptions listed below. Any product or part which proves to be defective under normal usage during that five year period will be repaired or replaced by Lewmar at their discretion.

## Conditions and Limitations:

1. Warranty only applies to the first two owners of the yacht manufactured by HUNTER MARINE, CORP. and products installed by them as original equipment
2. Warranty does not apply to yachts used at any time for charter.
3. Lewmar's liability shall be limited to repair or replacement of goods or parts defective in materials and workmanship.
4. Determination of the suitability of the product for the use contemplated by the buyer is the sole responsibility of the buyer and Lewmar shall have no responsibility in connection with such suitability.
5. Lewmar shall not be liable in any way for:
  - a. Failures due to use of products in applications for which they are not intended.
  - b. Failures due to corrosion, ultra violet degradation, wear and tear or improper installation.
  - c. Failures due to incorrect maintenance.
  - d. Failures due to conditions that exceed the product's performance specifications as stated in the Lewmar Sailboat Equipment catalog.

## Conditions and Limitations (Continued)

6. Product subject to warranty claim must be returned to the head US office of Lewmar Marine (International Marine Marketing) for examination unless otherwise agreed by Lewmar (IMM) in writing.
7. Lewmar shall not be responsible for shipping or installation labor associated with any warranty claims without prior written authorization. On products found to be defective, Lewmar (IMM) will cover the cost of the return shipment with the method matching that of the customer return.
8. Service by anyone other than an authorized Lewmar representative shall void this warranty unless it accords with Lewmar guideline's and standards of workmanship.

## Exceptions:

1. Warranty is limited to one year in the case of the following:
  - Electric Motors and Electrical Equipment
  - Electric Controls
  - Hydraulic pumps, valves and actuators
  - Weather seals
  - Products used in "Grand Prix" racing applications
2. There are no warranties of merchantability fitness for purpose or any other kind, express or implied, and none shall be implied by law. The duration of any such warranties that are nonetheless implied by law for the benefit of a consumer shall be limited to a period of one year from original purchase (first owner) by the user. Some countries do not allow limitations on how long an implied warranty last.
3. Lewmar shall not be liable for consequential damages to yachts, equipment or other property or persons due to any failure of Lewmar equipment. Some countries do not allow the exclusion or limitation or consequential damages, so the above limitation exclusion may not apply to you.

Lewmar Marine Limited reserve the right to alter design and specification without prior notice.

## IM LEWMAR WARRANTY REGISTRATION (Detach and Return to the Lewmar office stated below)

Hunter Model: \_\_\_\_\_ Hull Number: \_\_\_\_\_ Date Commissioned: \_\_\_\_\_

Owner's Name: \_\_\_\_\_ Dealer's Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_ Phone No: \_\_\_\_\_

Registration Card must be filled out completely and returned to: IM LEWMAR

Date Registered: \_\_\_\_\_

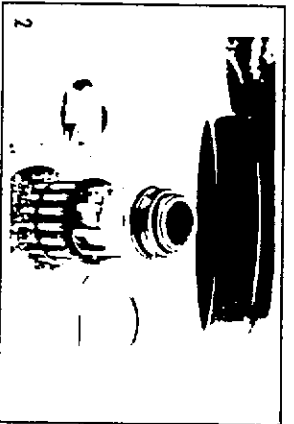
International Marine Marketing Inc.,  
P.O. Box 308, New Whitfield ST.  
Guilford, CT, 06437  
(203) 458-6200

# HOW TO SERVICE YOUR LEWMAR WINCH

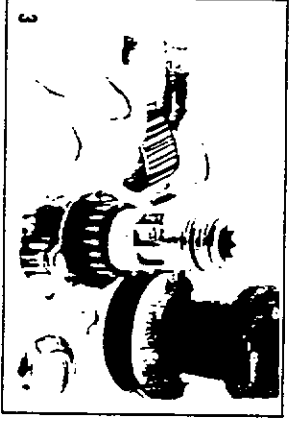
## Single Speed 16ST



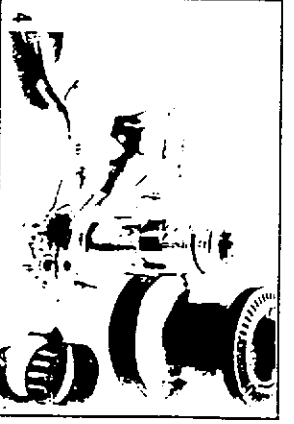
1  
Unscrew and remove the top cap, lift off the leader arm and the 2 bronze retaining collets.



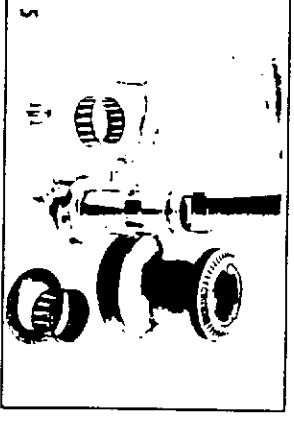
2  
Lift off the drum.



3  
Remove and clean the drum bearings and washer.



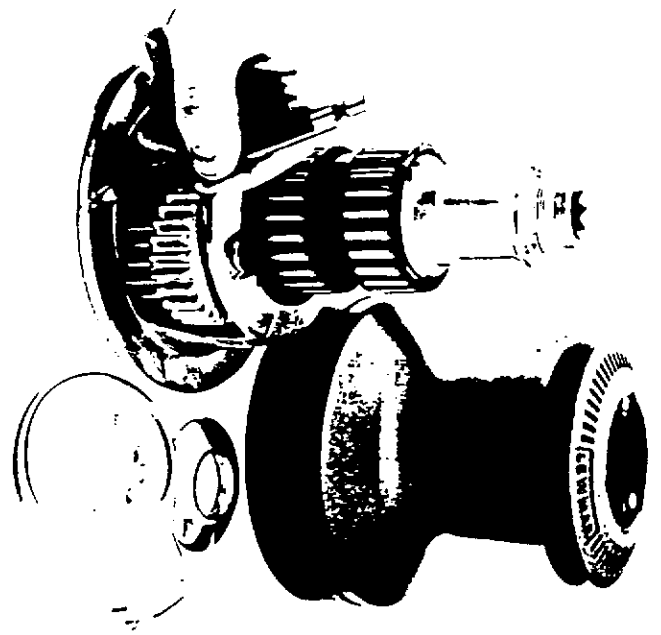
4  
Remove and clean the gear spindle and gear.



5  
To remove the main spindle, rotate it in a clockwise direction as you lift it, also remove the ratchet gear.



6  
Remove, clean and inspect the pawls and springs, look for excess wear, replace if necessary. Lubricate pawls with a light machine oil.



**IM LEWMAR**

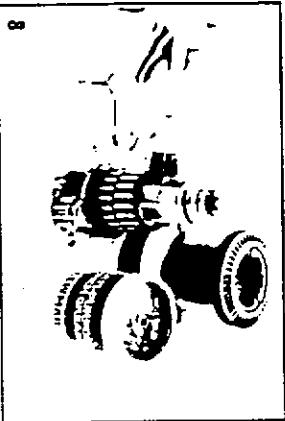
# SERVICING

# THE TWO TYPES OF SPRUNG JAWS

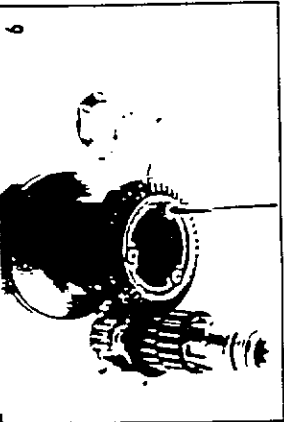
## Single Speed 16ST



Lightly grease the ratchet gear, place it in position with the ratchet facing up as shown.



Re-assemble in reverse of the above, remember to lightly grease all gears, ratchets, tracks and splines.



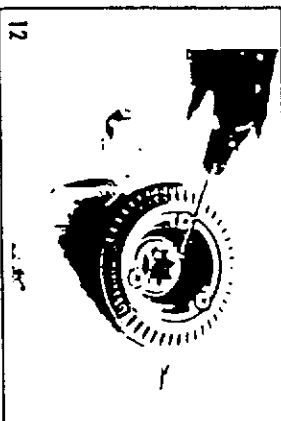
Remove the 3 fixing screws holding the crown assembly to the drum.



Carefully lift off the crowns and lift out the springs.



Remove, clean and inspect pawls and pawl springs, look for excess wear, replace as necessary. Lubricate pawls with a light machine oil. Re-assemble.



To replace the drum you will need to use a small bladed screwdriver to close the pawls.

## Winches from 16ST to 48ST are Lower sprung jaws

Use a cross headed screwdriver, remove the 3 x cross head screws which secure the crown assembly to the drum.

Lift the crowns clear of the drum, care should be taken not to lose any springs that may have stuck to the lower crown. Separate the crowns, clean and replace.

## Winches from 50ST to 66ST have Upper sprung jaws

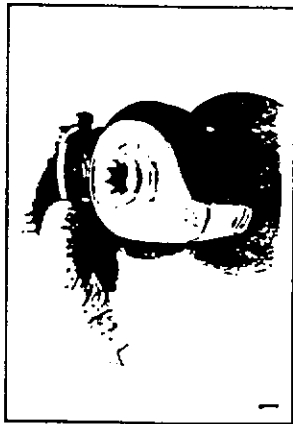
Using an Allen key, undo the 4 x cap head retaining screws evenly. (5 screws on 66ST).

Lift off the top plate together with the retaining screws. Also remove the springs and spring pillars. You can now remove the crown assembly, separate, clean and replace.

**Note:** When rebuilding the drum assembly, care should be taken to engage the locating pip on the underside of the lower crown with its locating hole on the drum top.

# SERVICING

30ST, 40ST, 44ST, 48ST, 50ST, 54ST, 58ST, 62ST



1

Unscrew top cap.



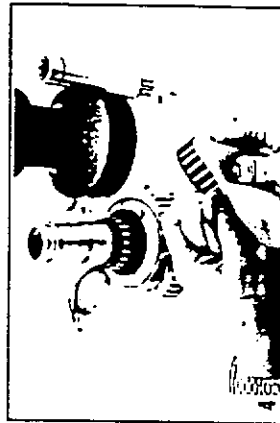
2

Lift and remove the feeder arm.



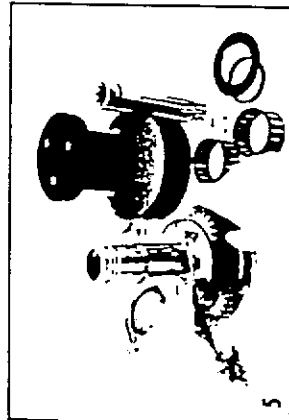
3

Remove the 2 split retaining collets, lift out the main spindle.



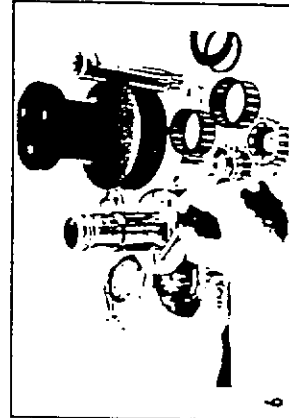
4

Remove and clean the drum, bearings and washer.



5

Using a small bladed screwdriver lift the 2 gear spindles.



6

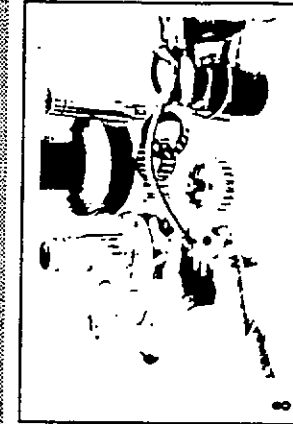
Lift out the gear spindles and remove the gear assemblies.

2 Speed Winch



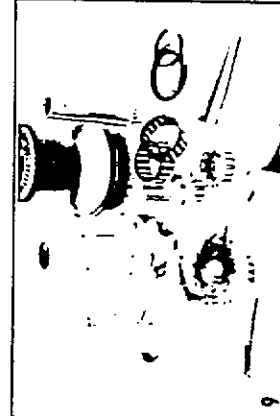
7

Remove and inspect the pawls and pawl springs, replace if necessary.



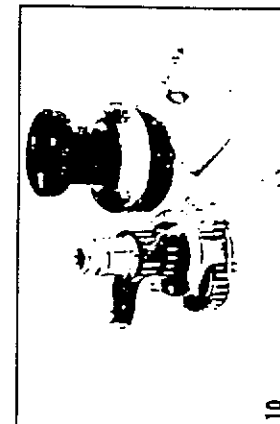
8

Replace the pawls and springs, lightly oil the pawls, check for correct operation. (No sticking)



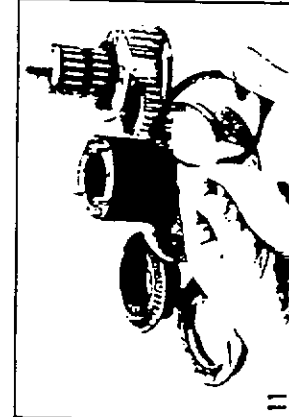
9

Lightly grease the ratchet and bearing surfaces, reassemble the gears.



10

Lightly grease and replace the gears, gear spindles and the main spindle.



11

Strip and clean crown assembly (see "BEFORE YOU START")

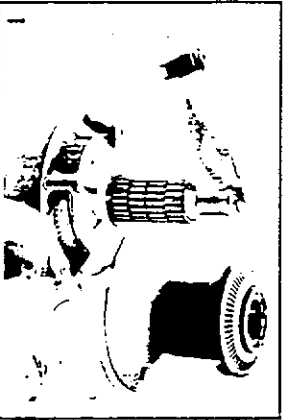


12

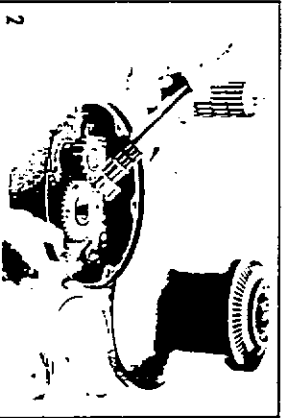
Replace the drum, main spindle retaining collets and feeder arm. Lightly grease the "O" ring and thread of the top of the cap before replacing it.

# SERVICING

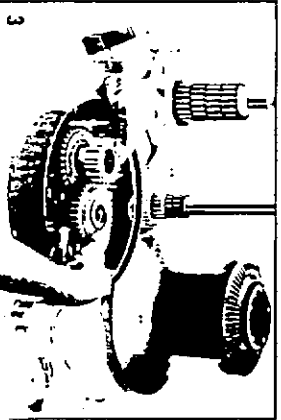
## 2 Speed 665T



1  
UnscREW top cap, remove the feeder arm and retaining colllets. Lift off the drum. Undo and remove the 6 x 10mm fixing screws holding the centre stem to the base.



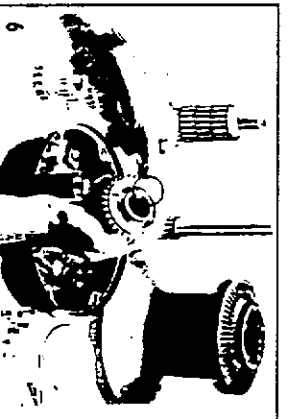
2  
Carefully lift off the centre stem, take care to support the main spindle as you do so.



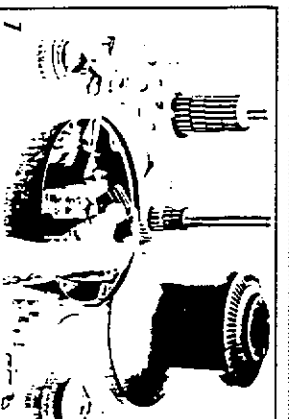
3  
To remove the gear assemblies lift them both out at the same time.



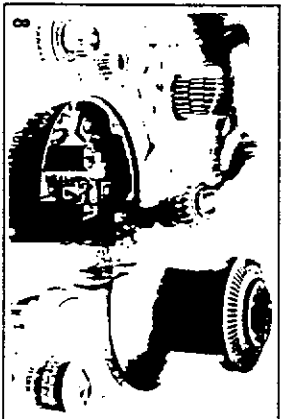
4  
Separate the gear assemblies clean and inspect for signs of excess wear.



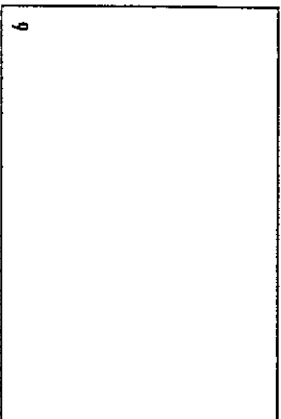
6  
Lightly grease the ratchet gears and bearing surfaces. Remember to replace the plastic washer shown before re-assembling these gears.



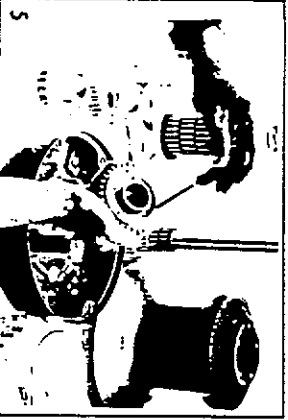
7  
Remove the circlip, remove, clean and inspect pawls and springs replace as necessary.



8  
Remember to lightly grease all bearings and moving parts.



9  
Care should be taken when replacing the drum washer. Ensure the chamfer is facing down when replacing the washer.

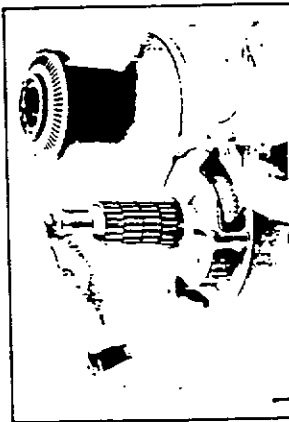


5  
Using a cross headed screwdriver, remove the 3 screws securing the pawl retaining plate. Clean and inspect all pawls and springs, replace if necessary.

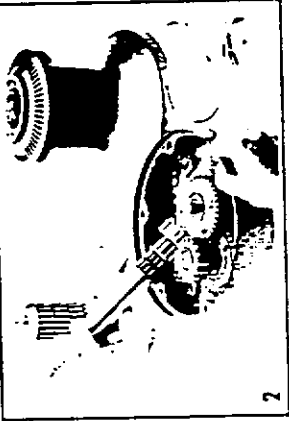
**Note:** Remember to use only light machine oil to lubricate the pawls.

# SERVICING

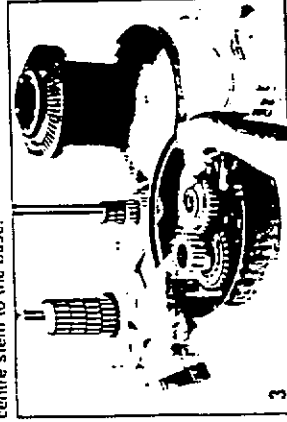
## 2 Speed 665T



1  
Unscrew top cap, remove the feeder arm and retaining collets. Lift off the drum. Undo and remove the 6 x 10mm fixing screws holding the centre stem to the base.



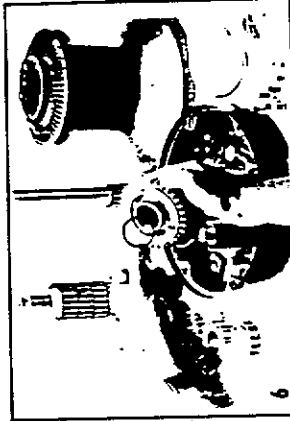
2  
Carefully lift off the centre stem, take care to support the main spindle as you do so.



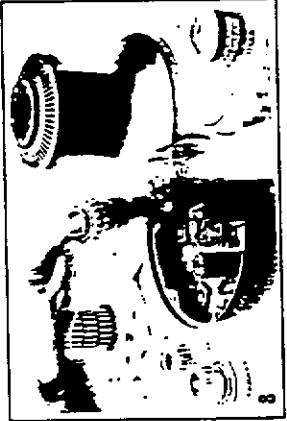
3  
To remove the gear assemblies lift them both out at the same time.



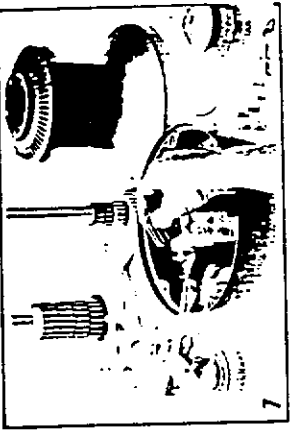
4  
Separate the gear assemblies clean and inspect for signs of excess wear.



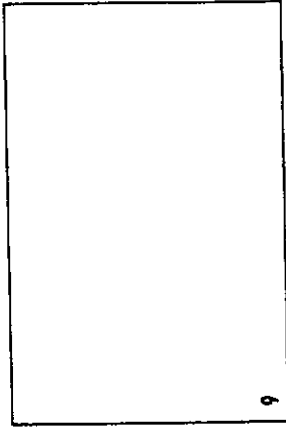
6  
Lightly grease the ratchet gears and bearing surfaces. Remember to replace the plastic washer shown before re-assembling these gears.



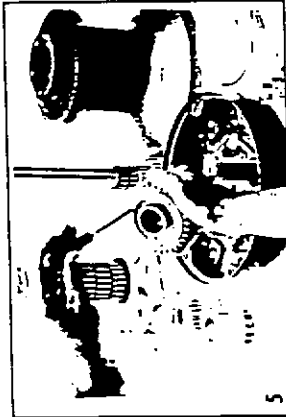
8  
Remember to lightly grease all bearings and moving parts.



7  
Remove the circlip, remove, clean and inspect pawls and springs replace as necessary.



9  
Care should be taken when replacing the drum washer. Ensure the chamfer is facing down when replacing the washer.



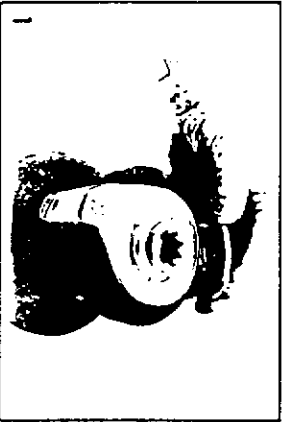
5  
Using a cross headed screwdriver, remove the 3 screws securing the pawl retaining plate. Clean and inspect all pawls and springs, replace if necessary.

Note: Remember to use only light machine oil to lubricate the pawls.

# SERVICING

30ST, 40ST, 44ST, 48ST, 50ST, 54ST, 58ST, 62ST

## 2 Speed Wind



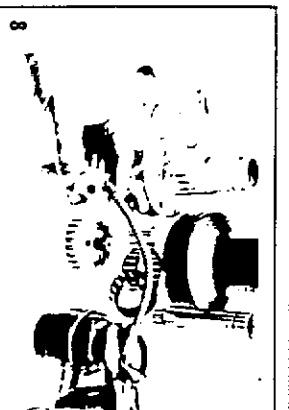
1 Unscrew top cap.



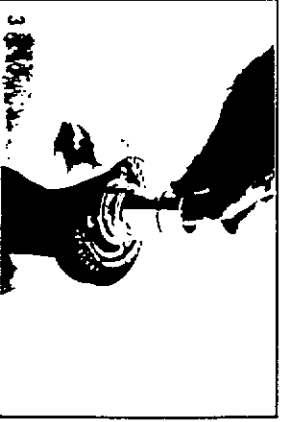
2 Lift and remove the feeder arm.



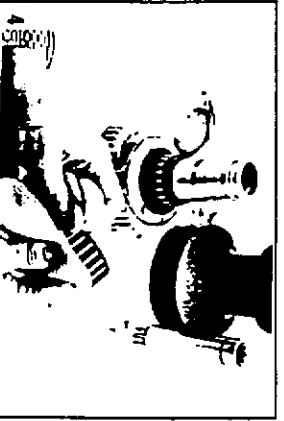
7 Remove and inspect the pawls and pawl springs. replace if necessary.



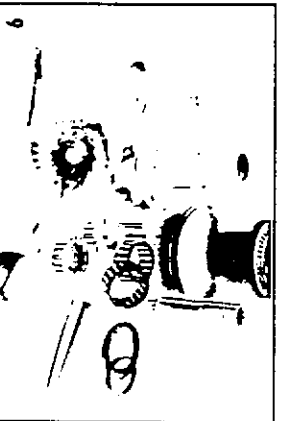
8 Replace the pawls and springs. lightly oil the pawls, check for correct operation. (no sticking)



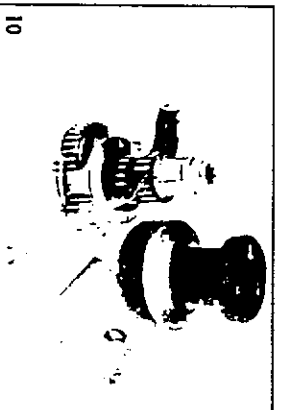
3 Remove the 2 split retaining colllets, lift out the main spindle.



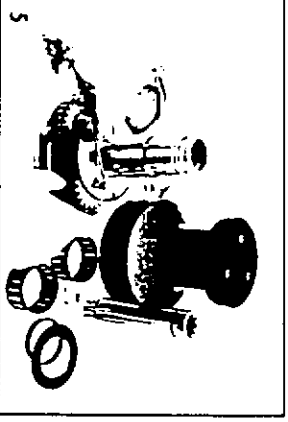
4 Remove and clean the drum, bearings and washer.



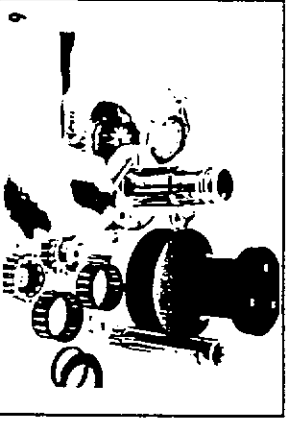
9 Lightly grease the ratchet and bearing surfaces, re-assemble the gears.



10 Lightly grease and replace the gears, gear spindle and the main spindle.



5 Using a small bladed screwdriver lift the 2 gear spindles.



6 Lift out the gear spindles and remove the gear assemblies.

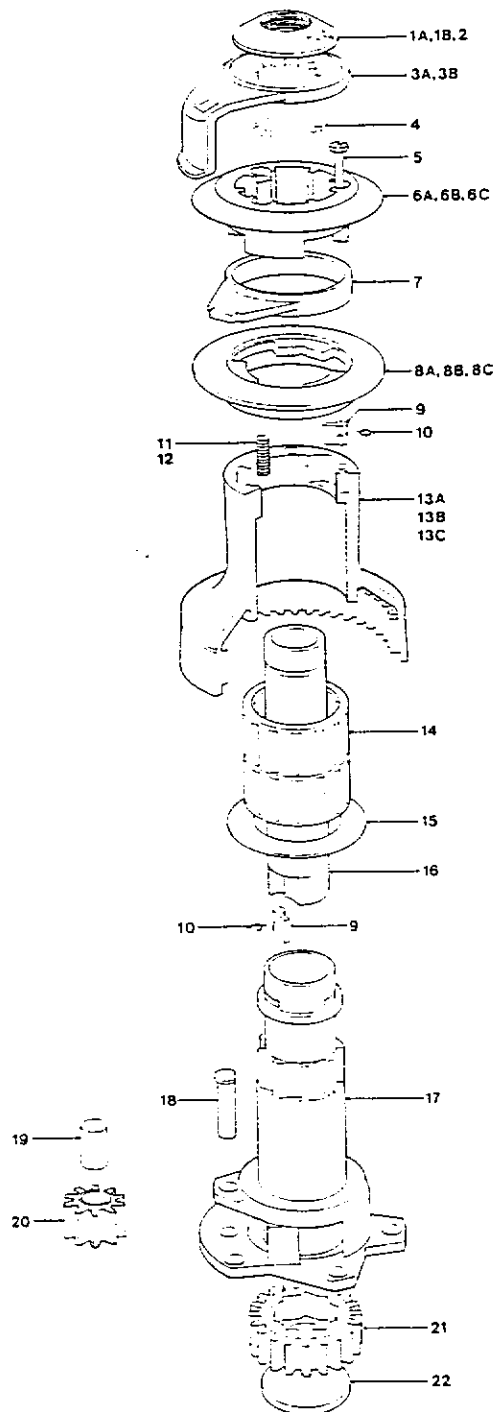


11 Strip and clean crown assembly (see "BEFORE YOU START")



12 Replace the drum, main spindle retaining colllets and feeder arm. Lightly grease the 'O' ring and thread of the top of the cap before replacing it.

# No. 16ST



## No 16 - 1 SPEED SELF TAILING WINCH

ITEM No	PART No	DESCRIPTION	No Off
1A	45000000	Chromed Top Cap 16AST/16CST/16CCST	1
1B	45000001	Bronze Top Cap 16BST/16BBST	1
2	86061	'O' Ring (Fitted in Item 1A/1B)	1
3A	45000003	Chrome Feeder Arm 16AST/16CST/16CCST	1
3B	45000004	Bronze Feeder Arm 16BST/ 16BBST	1
4	45000102	Collet	2
5	45000064	M5x30 S/S Posicrv Pan HD Screw	3
6A	45000005	Upper Crown (Grey) 16AST/16CST/16BST	1
6B	48016000	Bronze Upper Crown Assy 16BBST	1
6C	48016001	Chrome Upper Crown Assy 16CCST	1
7	45000008	Stripper Ring (Grey)	1
8A	45000009	Lower Crown (Grey) 16AST/16CST/16BST	1
8B	48016005	Bronze Lower Crown Assy 16BBST	1
8C	48016006	Chrome Lower Crown Assy 16CCST	1
9	1260/8	Pawl	5
10	1260/7	Pawl Spring	5
11	45000112	Spring	3
12	45000113	Spring Cup	3
13A	45000014	Drum Alloy 16AST	1
13B	45000016	Drum Bronze 16BST/16BBST	1
13C	45000015	Drum Chrome 16CST/16CCST	1
14	15008007	Roller Bearing Assy	2
15	15000466	Drum Washer	1
16	45000018	Main Spindle	1
17	48016017	Centre Stem	1
18	45000023	Gear Spindle	1
19	45000033	Gear Spindle Sleeve	1
20	15000827	Idler Gear	1
21	15000464	Ratchet Gear	1
22	15000461	Gear Retainer	1

### NOTE:

Conversion Kit for All Bronze and All Chrome Winch:-

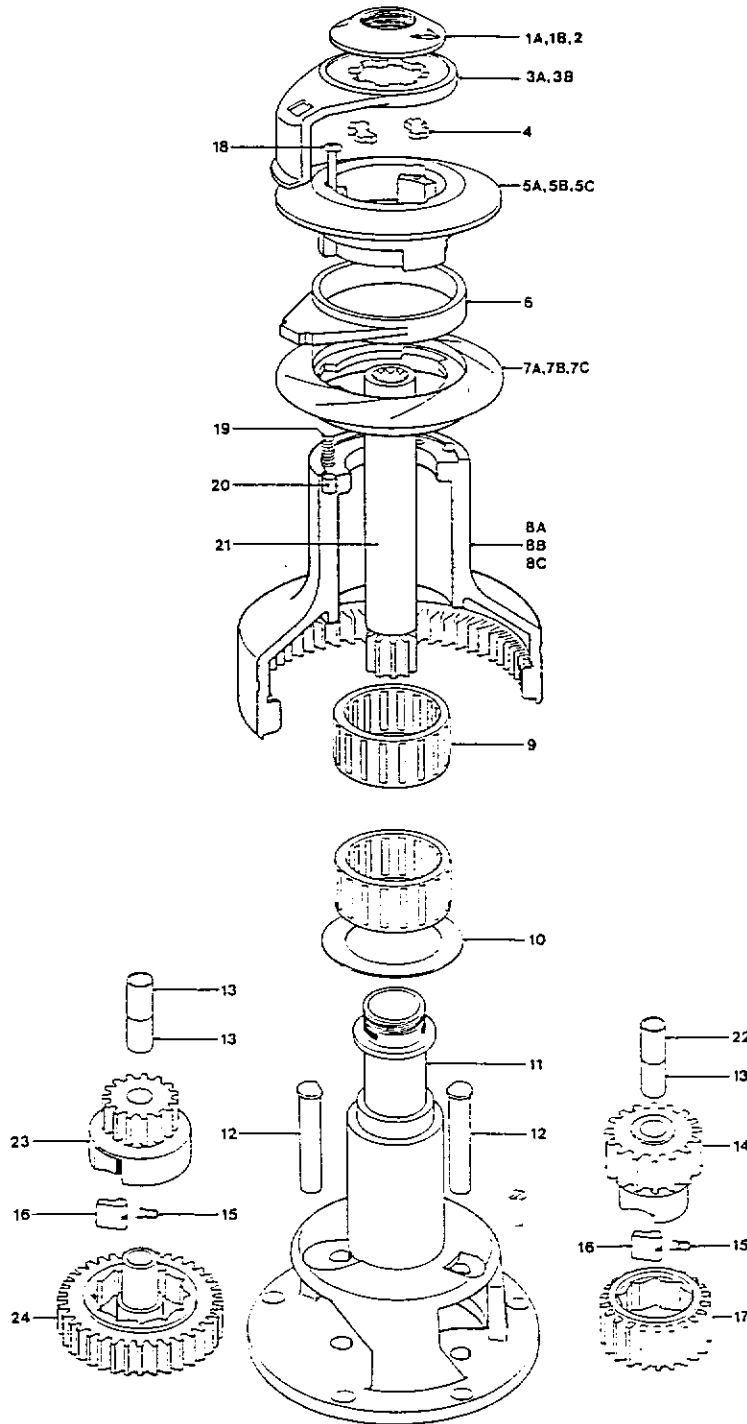
6B + 8B = 48016022

6C + 8C = 48016023

6B/6C/8B/8C are assembled components NOT available separated.



# No. 30ST



## No 30 - 2 SPEED SELF TAILING WINCH

ITEM No	PART No	DESCRIPTION	No Off
1A	45000100	Chrome Top Cap 30AST/30CST/30CCST	1
1B	45000101	Bronze Top Cap 30BST/30BBST	1
2	B6061	'O' Ring (Fitted In Item 1A/1B)	1
3A	45000103	Chrome Feeder Arm 30AST/30CST/30CCST	1
3B	45000104	Bronze Feeder Arm 30BST/30BBST	1
4	45000102	Collet	2
5A	45000105	Upper Crown (Grey) 30AST/30BST/30CST	1
5B	48030000	Bronze Upper Crown Assy 30BBST	1
5C	48030001	Chrome Upper Crown Assy 30CCST	1
6	45000108	Stripper Ring (Grey)	1
7A	45000109	Lower Crown (Grey) 30AST/30BBST/30CST	1
7B	48030005	Bronze Lower Crown Assy 30BBST	1
7C	48030006	Chrome Lower Crown Assy 30CCST	1
8A	45000114	Alloy Drum 30AST	1
8B	45000116	Bronze Drum 30BST/30BBST	1
8C	45000115	Chrome Drum 30CST/30CCST	1
9	15008007	Roller Bearing Assy	2
10	15000466	Drum Washer	1
11	48030017	Centre Stem	1
12	45000123	Gear Spindle	1
13	45000029	Gear Spindle Sleeve	3
14	45000119	Pawl Gear	1
15	1260/7	Pawl Spring	4
16	1260/8	Pawl	4
17	45000120	Ratchet Gear	1
18	B0326	M5x30 S/S Posidriv Pan HD Screw	3
19	45000112	Spring	6
20	45000113	Spring Cup	6
21	45000118	Main Spindle	1
22	15000378	Gear Spindle Sleeve	1
23	45000121	Pawl Gear	1
24	45000122	Ratchet Gear	1

### NOTE:

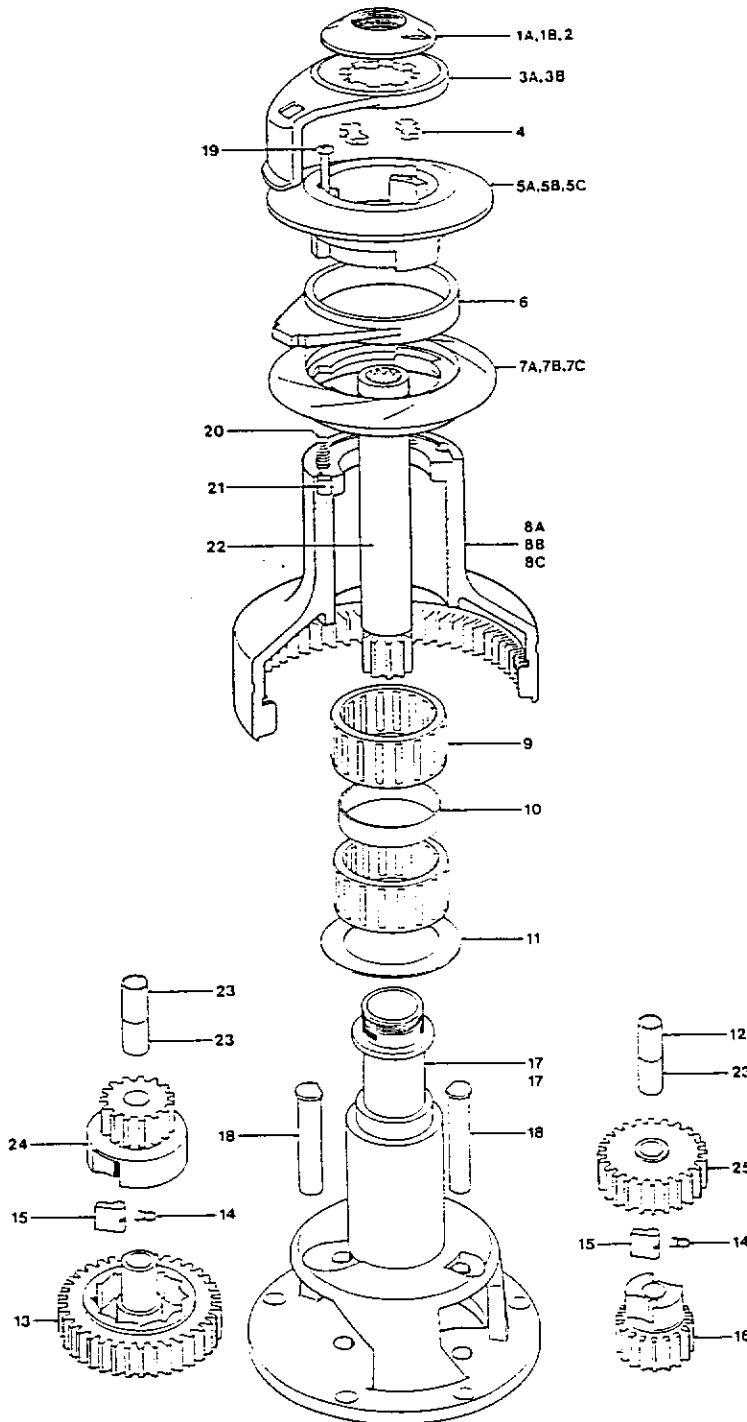
Conversion Kit for All Bronze and All Chrome winch:

5B + 7B = 48030022

5C + 7C = 48030023

5B/5C/7B/7C are assembled components NOT available separated.

# No. 40ST



## No 40 - 2 SPEED SELF TAILING WINCH

ITEM No	PART No	DESCRIPTION	No Off
1A	45000100	Chrome Top Cap 40AST/40CST/40CCST	1
1B	45000101	Bronze Top Cap 40BST/40BBST	1
2	B6061	'O' Ring (Fitted In Item 1A/1B)	1
3A	45000203	Chrome Feeder Arm 40AST/40CST/40CCST	1
3B	45000204	Bronze Feeder Arm 40BST/40BBST	1
4	45000102	Collet	2
5A	45000105	Upper Crown (Grey) 40AST/ 40BST/40CST	1
5B	48030000	Bronze Upper Crown Assy 40BBST	1
5C	48030001	Chrome Upper Crown Assy 40CCST	1
6	45000108	Stripper Ring (Grey)	1
7A	45000109	Lower Crown (Grey) 40AST/ 40BST/40CST	1
7B	48030005	Bronze Lower Crown Assy 40BBST	1
7C	48030006	Chrome Lower Crown Assy 40CCST	1
8A	45000214	Alloy Drum 40AST	1
8B	45000216	Bronze Drum 40BST/40BBST	1
8C	45000215	Chrome Drum 40CST/40CCST	1
9	15008007	Roller Bearing Assy	2
10	15000491	Bearing Spacer	1
11	15000466	Drum Washer	1
12	15000378	Gear Spindle Sleeve	1
13	45000220	Ratchet Gear	1
14	1260/7	Pawl Spring	4
15	1260/8	Pawl	4
16	45000221	Pawl Gear	1
17	48040017	Centre Stem	1
18	45000123	Gear Spindle	2
19	B0337	M5x35 S/S Positiv Pan HD Screw	3
20	45000112	Spring	6
21	45000113	Spring Cup	6
22	45000218	Main Spindle	1
23	45000029	Gear Spindle Sleeve	3
24	45000119	Pawl Gear	1
25	45000222	Ratchet Gear	1

### NOTE:

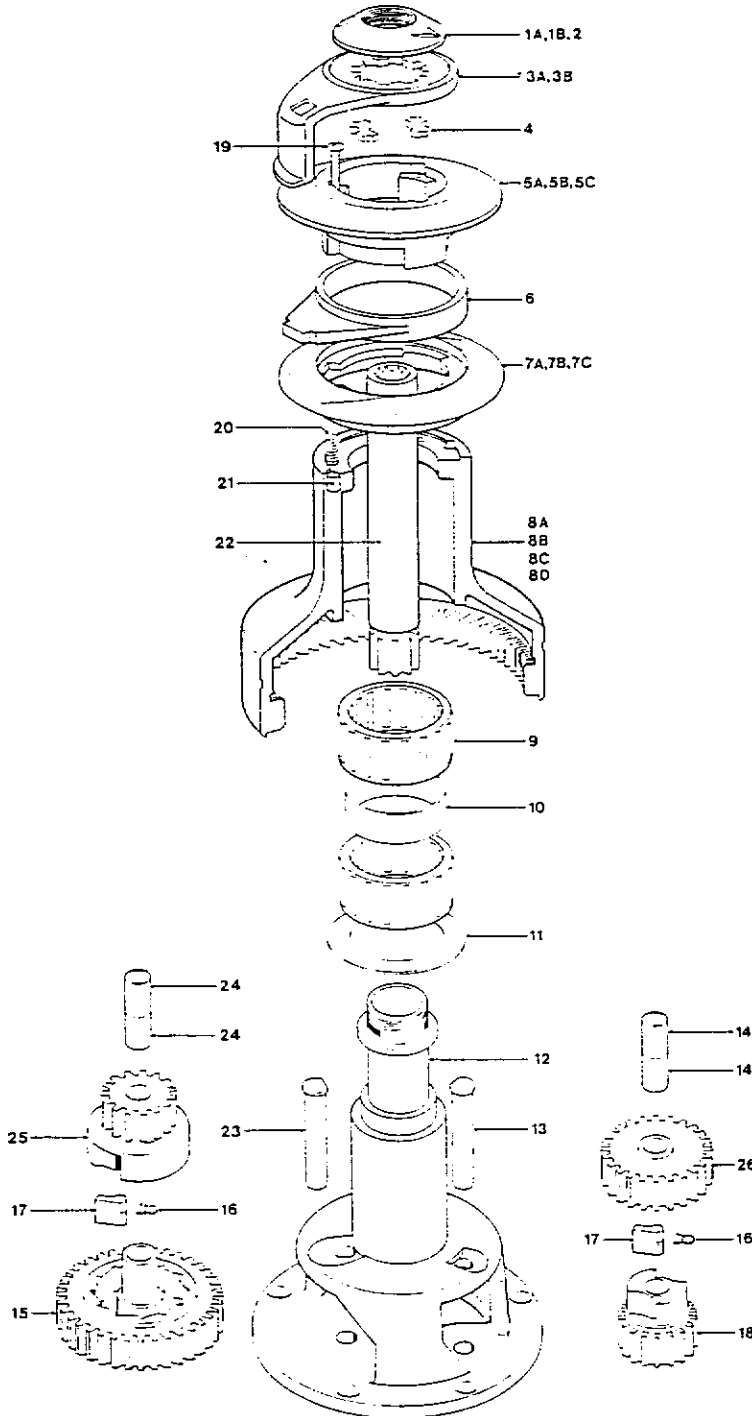
Conversion Kit for All Bronze and All Chrome winch:

5B + 7B = 48030022

5C + 7C = 48030023

5B/5C/7B/7C are assembled components NOT available separated.

# No. 44ST



## No 44 - 2 SPEED SELF TAILING WINCH

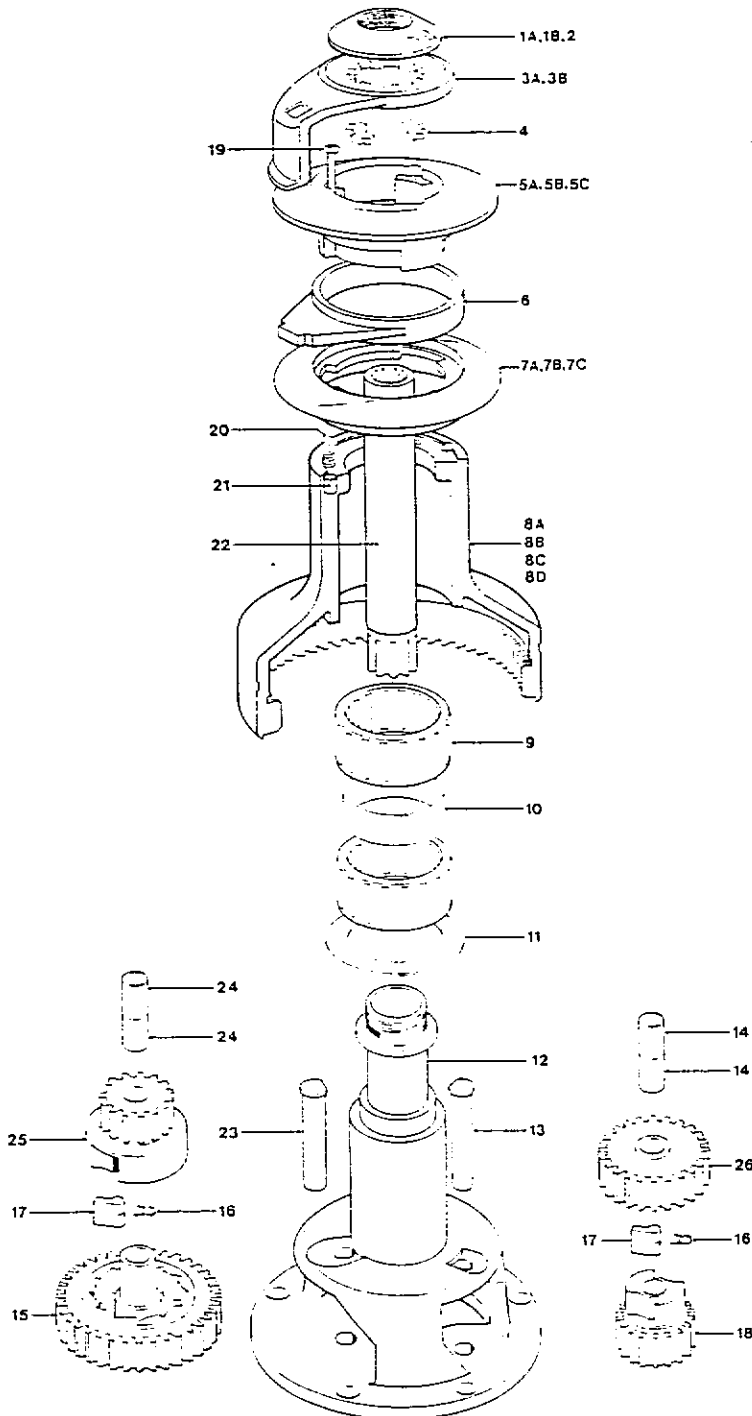
ITEM No	PART No	DESCRIPTION	No Off
1A	45000100	Chrome Top Cap 44AST/44CST/44CCST	1
1B	45000101	Bronze Top Cap 44BST	1
2	B6061	O' Ring (Fitted In Item 1A/1B)	1
3A	45000303	Chrome Feeder Arm 44AST/44CST/44CCST	1
3B	45000304	Bronze Feeder Arm 44BBST	1
4	45000102	Collet	2
5A	45000305	Upper Crown (Grey) 44AST/44BST/44CST	1
5B	48044000	Bronze Upper Crown Assy 44BBST	1
5C	48044001	Chrome Upper Crown Assy 44CCST	1
6	45000308	Stripper Ring (Grey)	1
7A	45000309	Lower Crown (Grey) 44AST/44BST/44CST	1
7B	48044005	Bronze Lower Crown Assy 44BBST	1
7C	48044006	Chrome Lower Crown Assy 44CCST	1
8A	45000314	Drum Alloy 44AST	1
8B	45000316	Drum Bronze 44BST/44BBST	1
8C	45000315	Drum Chrome 44CST/44CCST	1
8D	TBA	Drum Stainless Steel	1
9	15010007	Roller Bearing Assy	2
10	15000404	Spacer	1
11	15044116	Drum Washer	1
12	48044017	Centre Stem	1
13	45000324	Gear Spindle	1
14	15000398	Gear Spindle Sleeve	2
15	45000320	Ratchet Gear	1
16	1260/7	Pawl Spring	4
17	1260/8	Pawl	4
18	15000397	Pawl Gear	1
19	80327	M5x40 S/S Posidriv Pan HD Screw	3
20	45000112	Spring	6
21	45000113	Spring Cup	6
22	45000318	Main Spindle	1
23	45000323	Gear Spindle	1
24	45000029	Gear Spindle Sleeve	2
25	45000319	Pawl Gear	1
26	45000322	Ratchet Gear	1

**NOTE:**  
Conversion Kit for All Bronze and All Chrome winch:-

5B + 7B = 48044022  
5C + 7C = 48044023

5B/5C/7B/7C are assembled components **NOT** available separated.

# No. 48ST



## No 48 - 2 SPEED SELF TAILING WINCH

ITEM No	PART No	DESCRIPTION	No Off
1A	45000100	Chrome Top Cap 48AST/48CST/48CCST	1
1B	45000101	Bronze Top Cap 48BST/48BBST	1
2	B6061	'O' Ring (Fitted In item 1A/1B)	1
3A	45000403	Chrome Feeder Arm 48AST/48CST/48CCST	1
3B	45000404	Bronze Feeder Arm 48BST/48BBST	1
4	45000102	Collet	2
5A	45000405	Upper Crown (Grey) 48AST/48BST/48CST	1
5B	48048000	Bronze Upper Crown Assy 48BBST	1
5C	48048001	Chrome Upper Crown Assy 48CCST	1
6	45000408	Stripper Ring (Grey)	1
7A	45000409	Lower Crown (Grey) 48AST/48BST/48CST	1
7B	48048005	Bronze Lower Crown Assy 48BBST	1
7C	48048006	Chrome Lower Crown Assy 48CCST	1
8A	45000414	Drum Alloy 48AST	1
8B	45000416	Drum Bronze 48BST/48BBST	1
8C	45000415	Drum Chrome 48CST/48CCST	1
8D	TBA	Drum Stainless Steel	1
9	15044121	Roller Bearing Assy	2
10	15000404	Spacer	1
11	15044116	Drum Washer	1
12	48048017	Centre Stem	1
13	45000424	Gear Spindle	1
14	15000398	Gear Spindle Sleeve	2
15	45000420	Ratchet Gear	1
16	1260/7	Pawl Spring	4
17	1260/8	Pawl	4
18	15000397	Pawl Gear	1
19	B0327	M5x40 S/S Positiv Pan HD Screw	3
20	45000112	Spring	6
21	45000113	Spring Cup	6
22	45000418	Main Spindle	1
23	45000423	Gear Spindle	1
24	45000029	Gear Spindle Sleeve	2
25	45000419	Pawl Gear	1
26	45000422	Ratchet Gear	1

**NOTE:**

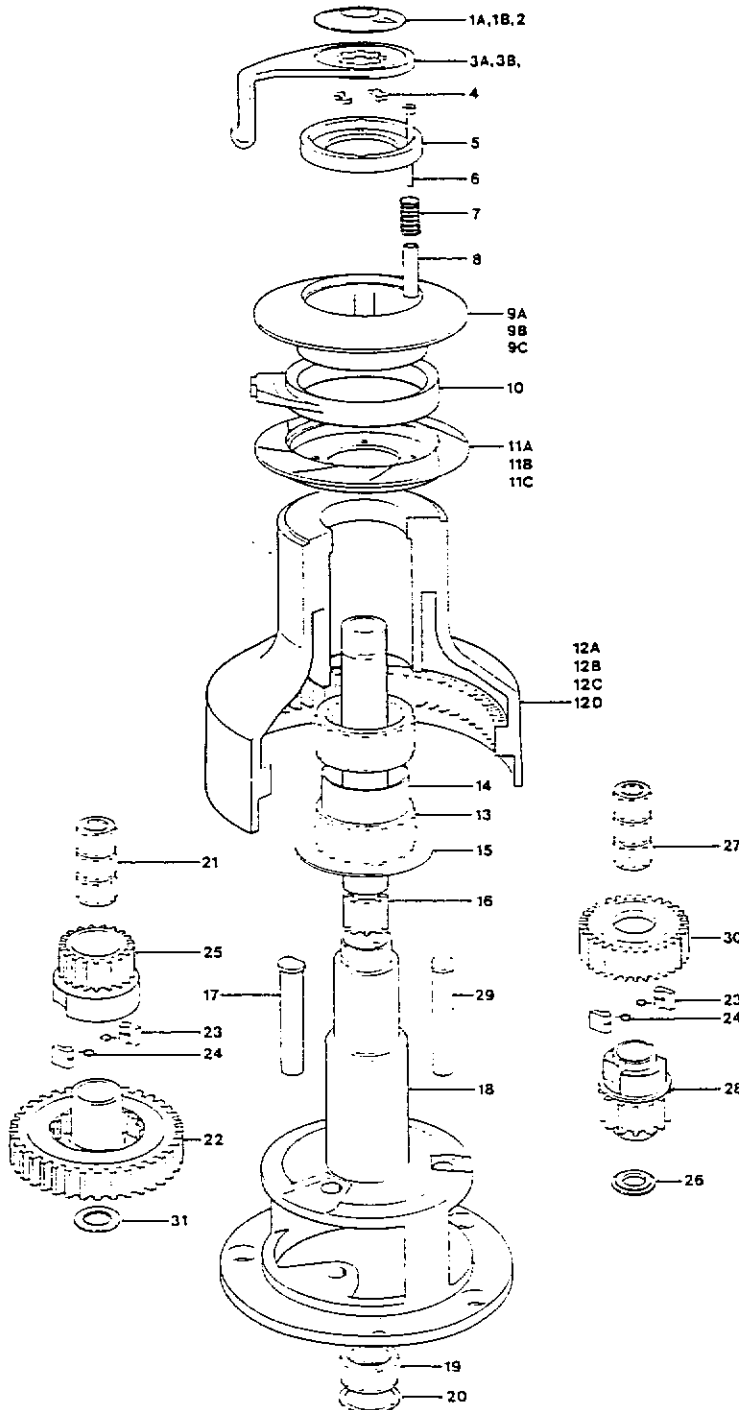
Conversion Kit for All Bronze and All Chrome winch:

5B + 7B = 48048022

5C + 7C = 48048023

5B/5C/7B/7C are assembled components NOT available separated.

# No. 50ST



## No 50 - 2 SPEED SELF TAILING WINCH

ITEM No	PART No	DESCRIPTION	No Off
1A	45000100	Chrome Top Cap 50AST/ 50CST/50CCST	1
1B	45000101	Bronze Top Cap 50BST/50BBST	1
2	86061	'O' Ring (Fitted In Item 1A/1B)	1
3A	45000503	Chrome Feeder Arm 50AST/50CST/50CCST	1
3B	45000504	Bronze Feeder Arm 50BST/ 50BBST	1
4	45000102	Collet	2
5	45000525	Spring Retainer	1
6	80746	M6x50 Skt Hd Cap Screw	4
7	45000512	Spring	4
8	45000513	Spacer	4
9A	45000505	Upper Crown (Grey) 50AST/50BST/50CST	1
9B	48050000	Bronze Upper Crown Assy 50BBST	1
9C	48050001	Chrome Upper Crown Assy 50CCST	1
10	45000508	Stripper Ring (Grey)	1
11A	45000509	Lower Crown (Grey) 50AST/50BST/50CST	1
11B	48050005	Bronze Lower Crown Assy 50BBST	1
11C	48050006	Chrome Lower Crown Assy 50CCST	1
12A	45000514	Drum Alloy 50AST	1
12B	45000516	Drum Bronze 50BST/50BBST	1
12C	45000515	Drum Chrome 50CST/50CCST	1
12D	TBA	Drum Stainless Steel 50SST	1
13	15044121	Roller Bearing Assy	2
14	15042012	Bearing Spacer	1
15	45000534	Drum Washer	1
16	45000518	Main Spindle	1
17	45000523	Gear Spindle	1
18	45000517	Centre Stem	1
19	15000019	Roller Bearing Assy (Fitted In Item 18)	1
20	B2092	Circlip (Fitted In Item 18)	1
21	1300/SA2	Roller Bearing Assy	3
22	45000520	Ratchet Gear	1
23	1264/8	Pawl	4
24	1260/7	Pawl Spring	4
25	45000519	Pawl Gear	1
26	15000646	Flanged Washer	1
27	15000017	Roller Bearing Assy	3
28	45000521	Pawl Gear	1
29	45000524	Gear Spindle	1
30	45000522	Ratchet Gear	1
31	15000981	Washer	1

### NOTE:

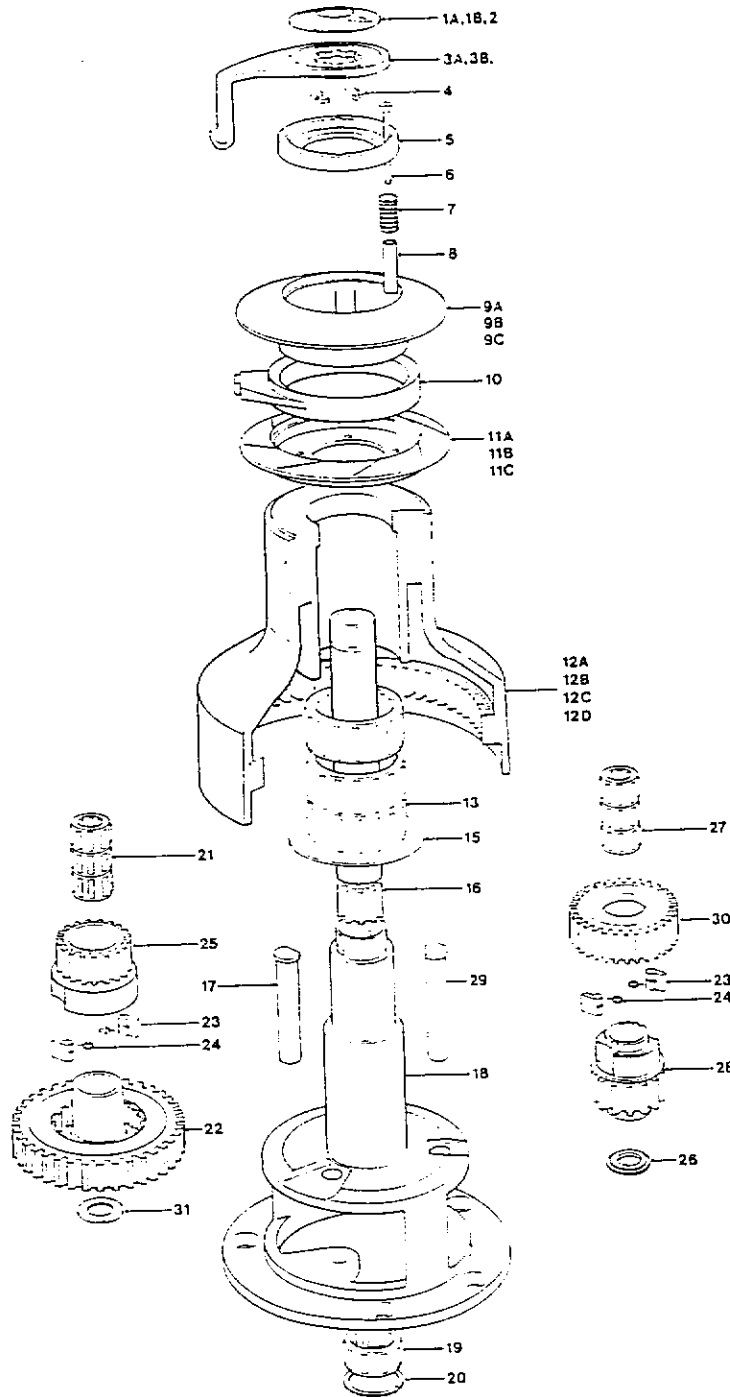
Conversion Kit for All Bronze and All Chrome winch:-

9B + 11B = 48050022

9C + 11C = 48050023

9B/9C/11B/11C are assembled components NOT available separated.

# No. 54ST



## No 54 - 2 SPEED SELF TAILING WINCH

ITEM No	PART No	DESCRIPTION	No Off
1A	45000100	Chromed Top Cap 54AST/54CST/54CCST	1
1B	45000101	Bronze Top Cap 54BST/54BBST	1
2	B6061	'O' Ring (Fitted In Item 1A/1B)	1
3A	45000603	Chrome Feeder Arm 54AST/54CST/54CCST	1
3B	45000604	Bronze Feeder Arm 54BST/54BBST	1
4	45000102	Collet	2
5	45000525	Spring Retainer	1
6	B0746	M6x50 Skt HD Cap Screw	4
7	45000512	Spring	4
8	45000513	Spacer	4
9A	45000505	Upper Crown (Grey) 54AST/54BST/54CST	1
9B	48054000	Bronze Upper Crown Assy 54BBST	1
9C	48054001	Chrome Upper Crown Assy 54CCST	1
10	45000508	Stripper Ring (Grey)	1
11A	45000509	Lower Crown (Grey) 54AST/ 54BST/54CST	1
11B	48054005	Bronze Lower Crown Assy 54BBST	1
11C	48054006	Chrome Lower Crown Assy 54CCST	1
12A	45000614	Drum Alloy 54AST	1
12B	45000616	Drum Bronze 54BST/54BBST	1
12C	45000615	Chrome Drum 54CST/54CCST	1
12D	TBA	Drum Stainless Steel 54SST	1
13	15044121	Roller Bearing Assy	3
14	-	-	-
15	45000534	Drum Washer	1
16	45000618	Main Spindle	1
17	45000523	Gear Spindle	1
18	45000617	Centre Stem	1
19	15000019	Roller Bearing Assy (Fitted In Item 18)	1
20	B2092	Circlip (Fitted In Item 18)	1
21	1300/SA2	Roller Bearing Assy	3
22	45000520	Ratchet Gear	1
23	1264/8	Pawl	4
24	1260/7	Pawl Spring	4
25	45000519	Pawl Gear	1
26	45000646	Flanged Washer	1
27	15000017	Roller Bearing Assy	3
28	45000621	Pawl Gear	1
29	45000624	Gear Spindle	1
30	45000522	Ratchet Gear	1
31	15000981	Washer	1

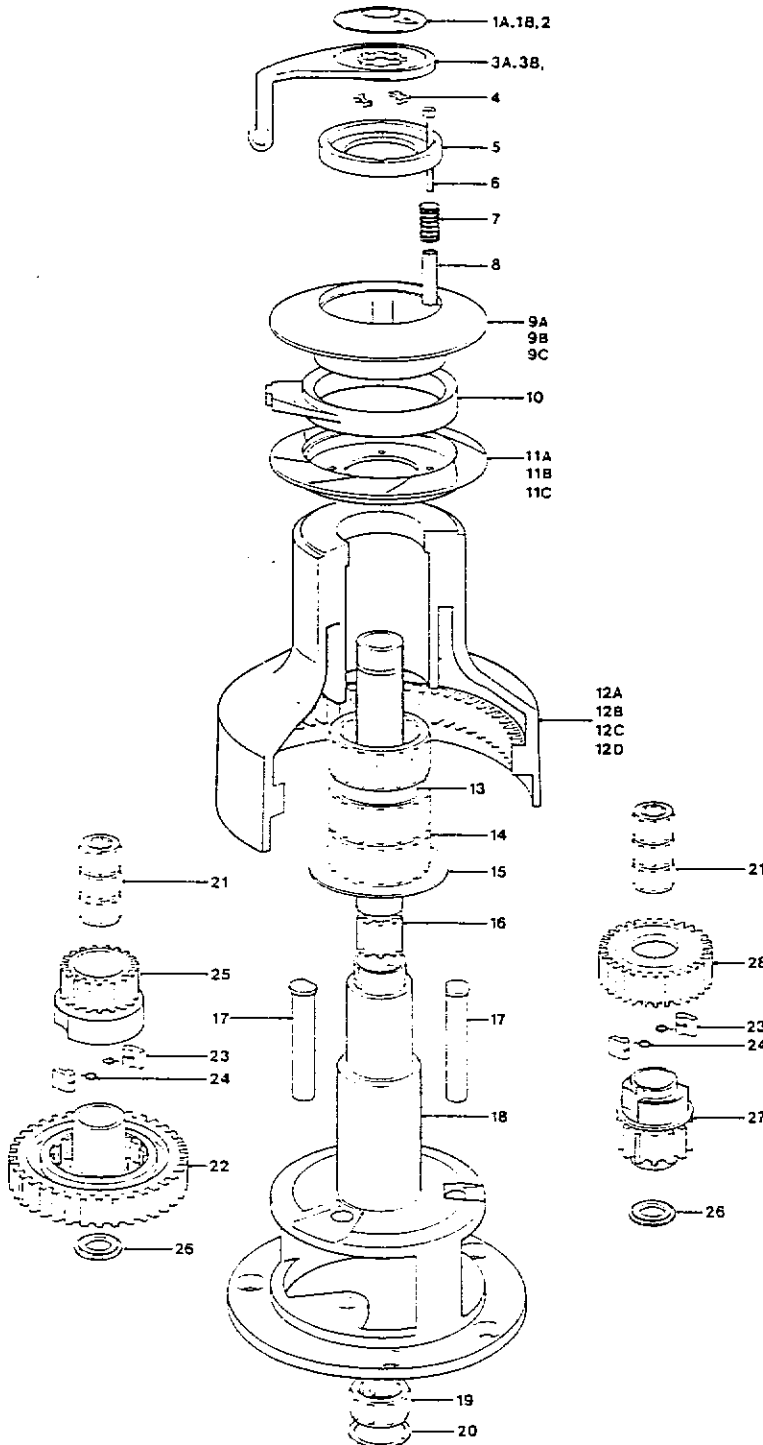
### NOTE:

Conversion Kit for All Bronze and All Chrome winch:-

9B + 11B = 48050022  
9C + 11C = 48050023

9B/9C/11B/11C are assembled components NOT available separated.

# No. 58ST



## No 58 - 2 SPEED SELF TAILING WINCH

ITEM No	PART No	DESCRIPTION	QTY
1A	45000700	Chromed Top Cap 58AST/58CST/58CCST	1
1B	45000701	Bronze Top Cap 58BST/58BBST	1
2	B6061	'O' Ring (Fitted In Item 1A/1B)	1
3A	45000703	Chrome Feeder Arm 58AST/58CST/58CCST	1
3B	45000704	Bronze Feeder Arm 58BST/ 58BBST	1
4	45000102	Collet	2
5	45000725	Spring Retainer	1
6	B0756	M6x55 Skt HD Cap Screw	4
7	45000512	Spring	4
8	45000713	Spacer	4
9A	45000705	Upper Crown (Grey) 58AST/58BST/58CST	1
9B	48058000	Bronze Upper Crown Assy 58BBST	1
9C	48058001	Chrome Upper Crown Assy 58CCST	1
10	45000708	Stripper Ring (Grey)	1
11A	45000709	Lower Crown (Grey) 58AST/58BST/58CST	1
11B	48058005	Bronze Lower Crown Assy 58BBST	1
11C	48058006	Chrome Lower Crown Assy 58CCST	1
12A	45000714	Drum Alloy 58AST	1
12B	45000716	Drum Bronze 58BST/58BBST	1
12C	45000715	Drum Chrome 58CST/58CCST	1
12D	TBA	Drum Stainless Steel	1
13	15065115	Spacer	1
14	15044121	Roller Bearing Assy	3
15	45000534	Drum Washer	1
16	45000718	Main Spindle	1
17	45000624	Gear Spindle	2
18	45000717	Centre Stem	1
19	15000019	Roller Bearing Assy (Fitted In Item 16)	1
20	B2092	Circlip (Fitted In Item 18)	1
21	15000017	Roller Bearing Assy	6
22	45000720	Ratchet Gear	1
23	1264/8	Pawl	4
24	1260/7	Pawl	4
25	45000719	Pawl Gear	1
26	15000646	Flanged Washer	2
27	45000721	Pawl Gear	1
28	45000722	Ratchet Gear	1

### NOTE:

Conversion Kit for All Bronze and All Chrome winch:

9B + 11B = 48058022

9C + 11C = 48058023

9B/9C/11B/11C are assembled components NOT available separated.

## 18 MONTH LIMITED PUMP WARRANTY

Johnson Pumps of America of 3700 North Rose Street, Schiller Park, Illinois 60176 warrants to the original consumer purchaser that this bilge pump will be free from defects in material and workmanship, providing that the case is not opened or the pump otherwise abused for a period of eighteen (18) months from the date originally purchased.

The exclusive remedy of the consumer purchaser in the event the product does not meet this express Limited Warranty is to return the pump to Johnson at the above address, freight prepaid with your sales receipt and \$2.50 to help defray the cost of postage and handling. IMPORTANT: FOR THIS WARRANTY TO BE EFFECTIVE, JOHNSON MUST BE SUPPLIED WITH PROOF OF THE ORIGINAL PURCHASE DATE OF THE PUMP. THE ACCEPTANCE BY JOHNSON OF ANY PUMP RETURNED SHALL NOT BE DEEMED AN ADMISSION THAT SUCH PUMP IS DEFECTIVE OR IN VIOLATION OF ANY WARRANTY. THE COMPANY RESERVES THE RIGHT TO REPAIR OR REPLACE THE PUMP.

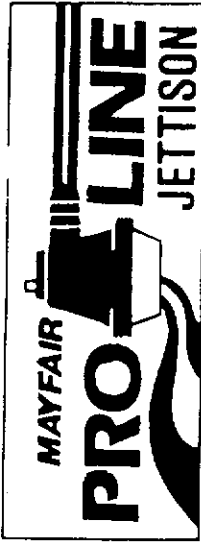
NO REPRESENTATIVE OR OTHER PERSON IS AUTHORIZED TO ASSUME FOR JOHNSON ANY ADDITIONAL LIABILITY IN CONNECTION WITH THE SALE OF ITS PRODUCTS OR TO ALTER THIS WARRANTY IN ANY WAY.

IN NO EVENT WILL JOHNSON PUMPS OF AMERICA BE LIABLE FOR MORE THAN THE SALES PRICE OF THE PUMP. UNDER NO CIRCUMSTANCES WILL JOHNSON BE LIABLE FOR ANY LOST PROFITS, INCIDENTAL OR CONSEQUENTIAL COSTS, EXPENSES, OR DAMAGES. THE LIMITATION ON LIABILITY FOR LOST PROFITS, INCIDENTAL OR CONSEQUENTIAL COSTS, EXPENSES OR DAMAGES SHALL SURVIVE ANY FAILURE OF ESSENTIAL PURPOSE OF THIS LIMITED WARRANTY. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you.

NO EXPRESS OR LIMITED WARRANTY, INCLUDING WARRANTY OF MERCHANTABILITY AND FITNESS SHALL EXTEND FOR ANY PERIOD OF TIME GREATER THAN 18 MONTHS FROM THE DATE OF ORIGINAL PURCHASE OF THIS PRODUCT. Some states do not allow limitation on how long an implied warranty lasts so the above limitation may not apply to you.

CAUTION - Warranty void if seal on pump is broken, if any electric cord is cut back more than 3 inches, if electric splices become submerged, or if pump is installed contrary to instructions or warnings.

Bilge Pumps are designed to exhaust standing water only. These pumps are not intended for damage control. Bilge Pump capacities may not be sufficient to prevent flooding from rapid accumulation of water due to storms, rough weather and/or rapid leaks created by hull damages or unsafe navigational conditions.



# Submersible Bilge Pumps

## JOHNSON PUMPS OF AMERICA

Mayfair Marine Division  
3700 N. ROSE STREET  
SCHILLER PARK, ILLINOIS 60176

P/N 52213



Congratulations! You have just purchased the most scientifically designed bilge pump in the industry today. Through proper care in installation and maintenance of this bilge pump, you should enjoy many hours of reliable and dependable performance.

Please follow the easy installation instructions carefully to assure maximum efficiency in your bilge pump operation.

### Pro Line Installation Sheet:

1. Mount the pump in the lowest point in the bilge. The pump can be mounted with screws in three different ways:
  - A. Through three holes in the bottom of the slotted filter basket, for directly attaching the pump to the hull bottom. (Fig. 1)
  - B. Through four slots in the vertical flat panel. This type of mounting is used to mount the pump against the transom, bulk head, or any vertical surface. (Fig. 2)
  - C. By the use of the optional mounting bracket. The bracket offers a quick convenient way to disconnect the entire pump from the bilge for thorough clean out. (Fig. 3)

FIG. 1

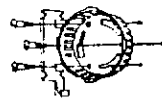


FIG. 2

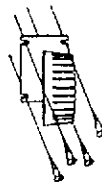
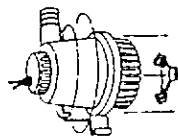


FIG. 3



2. Select a point where the water is to be pumped overboard as high as possible above the water line and the shortest distance from the pump. Install a 3/4" thru-hull (Johnson No. 7509). A 1-1/16 hole is required.

3. Fasten a 3/4" fuel resistant hose from the pump outlet to the thru-hull fitting. Avoid sharp bends or loops. Support the hose if necessary. Note - In order to prevent air lock it is important that the hose not be allowed to dip below the pump outlet. The hose should be constantly rising.

4. The filter basket is removable from the pump body by rotating the pump body clockwise and lifting. The locking lugs are placed at 90° intervals so that the pump outlet may face right, left or straight out. (Fig. 4)

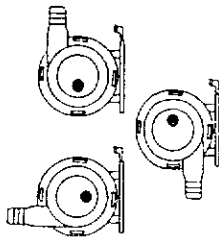
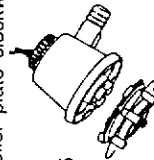


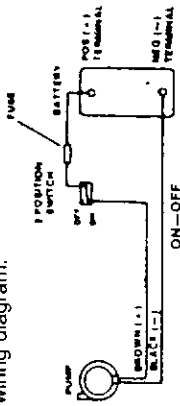
FIG. 4

5. Should it be necessary to replace the impeller or clean out deeply entrenched debris it is possible to remove the impeller plate. Push down on all four lugs to disengage, then rotate the impeller plate clockwise. See figure below. (Fig. 5)

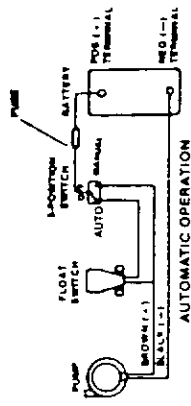
FIG. 5



6. It is important that the pump be connected correctly. The brown wire is connected to positive (+) (fused side). The black wire is connected to negative (-) or ground. See wiring diagram.



Manual Operation



Automatic Operation

7. Any electric cord should not be cut back more than three inches. A submerged splice will render this warranty null and void. Keep wire connections well above water levels.

8. Fuse sizes 2250/3 AMP - 2270/4 AMP - 2210/6 AMP.

9. For longer pump life, do not run dry.

### JOHNSON PUMPS Mayfair Marine Division

REMEMBER: Your Johnson pump, just as your boat, requires regular maintenance and repair and being alert to regular requirements of maintenance and inspection.