

HUNTER 30T OWNER'S MANUAL

OWNER'S MANUAL

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

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

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

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

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

The sea skiff is a class of boat which has been very popular, owing to its seaworthiness. It features a sharp bow, which reduces pounding in surf or choppy seas, and a hull whose forward section is rounded below the water line to increase stability in rough water or a following sea. Such skiffs can either be smoothsided 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 Arrostook Railroad, which was to become the recreational conglomerate, Bangor-Punta. It was also during this period that Silverton of Tom's River, New Jersey was purchased by John and Warren Luhrs.

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

HUNTER	HUNTER MARINE CORPORATION P.O. Box 1030, Hwy. 441 Alachua, FL 32615 904/462-3077 904/462-4077 - FAX	
Year Model Hull #	Engine Model & Serial # Generator Model & Serial #	
Date Delivered to Dealer	Date Delivered to Cust	omer
OWNER		
Street		
City & State		21
	Work	Zip Code
Boat Name	Location of Boat	Fax
DEALER	Location of Boat	(Zip Code Only)
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Street	*	
City & State		Zip Code
Phone	FAX #	
FINAL CHECK OUT:		
OWNER RECEIVED HUNTER (OWNER RECEIVED & APPROV	HUNTER WARRANTY & OWNERSHIP F DEALERSHIP WARRANTY AND SERVI OWNER'S MANUAL AND APPROPRIATE /ED PRE-DELIVERY SERVICE RECORD. FAMILIARIZED WITH THE OPE	CE POLICIES. ENGINE AND ACCESSORY MANUA
FUEL SYSTEM	ENGINE AND DRIVE SYSTEM	STEERING SYSTEM
WATER SYSTEM AC/DC ELECTRICAL SYSTEM	SAFETY SYSTEMS	MAINTENANCE & UPREEP
STANDING & RUNNING RIGGING	OPERATION OF WASTE SYSTEM	HANDLING & OPERATION
Hunter Marine Corporation Limited Wa to state. To activate your warranty, plea 10 days of delivery.	v to read and familiarize myself with the e ad component manuals, and the Hunter M arranty gives you specific rights. You may a use complete this form and return it to HU!	arine Corporation Limited Warranty
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 yourbeat 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 recommendation 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 peuch.

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.		1000	DATE DELIVERED TO OW	NER.
YACHT NAME		19.9		
OWNER NAME			_	
STREET ADDRESS		-1461 145313	-	
cmy		STATE		ZIP CODE
HOME PORT		100		
MODEL.	SIZE		HULLASAIL #	-
ENGINE MODEL		SERIAL NO.		PROPELLER SIZE
DEALER				
STREET ADDRESS				
כודץ	T	STATE		ZIP CODE
DEALER SIGNATURE			(H	
OWNER SIGNATURE				
A copy of Chapman's Pil of the standard equipment	oting, Seaman u. Any question	iship and Small Boat F ons regarding the mean	fandling is provided withing of terminology used	th your Hunter Marine boat I in this manual may be refe

HUNTER/LEGEND/VISION/PASSAGE Owner's Manual

in your Chapman's.

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 *centerline*.

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, closehauled 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

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 reacher

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 atkwartships

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 i... boat to which the shrouds or backstays are attached.

Chart datum:

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

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

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 withdrawl.

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

D

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

ю

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. I 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 over-laps the mainsail and is laps hoisted in light to fresh winds on all points of sailing. Gimbals: two concentric

rings, pivoted at right angles which keep objects horizontal despite the boat's motion, e.g. compass and cooker. Go about: to turn the boat

through the eye of the wind to change tack

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

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

Ground tackle: general term used for anchoring gear. Guard rail: a metal rail fitted around the boat to prevent the crew falling overboard.

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

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

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

H

Halyard: rope used to hoist and lower sails.

Hank: fitting used to attach the *luff* of a sail to a *stay*. Hatch: an opening in the

deck giving access to the interior.

Hawse pipe: see Navel pipe. Head-to-wind: when the bows are pointing right into the wind.

Headfoil: a streamlined surround to a *forestay*, with a grove 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.

L

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

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. der.

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

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, af-

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.

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Off the wind: with the sheets slacked off, not close-hautea. On the wind: close hauted, 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. 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 hows of a board o

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 perpendicular of a mast or other feature of a boat. 200

Range: 1, see Transit; 2, of tides, the difference between the high- and low-water levels of a <u>tide</u>: 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 halvards, used in the setting and trimming of sails.

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

Spindrift: spray blown along the surface of the sea. Spinnaker: a large, light, balloon-shaped sail set when reaching or running.

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

Split pin: see Cotter pin. Spreaders: horizontal struts attached to the mast, which extend to the shrouds and help to support the mast. Stall: a sail stalls when the airflow over it breaks up, causing the boat to lose way. Stanchion: upright metal

post bolted to the deck to support guard rails or lifelines. Standing part: the part of a

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

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

port the masts. Starboard: right-hand side of a boat looking forward (opp. of port). Starboard tack: a boat is

on the 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 foreand-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. 336

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.

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

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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 or 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 me-

chanical 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 vacht.

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

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

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

masthead to a spar, normally the boom, which is used to raise it.

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

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

are in transit when seen in line; two transits give posi-tion 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 foreand-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: ae used to raise something vertically, e.g., the spinnaker pole.

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. governs the maximum speed It 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 de-

vice, 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).

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

HUNTER/LEGEND/VISION Owner's Manual/PASSAGE

Y

PRE-DEPARTURE CHECK-LIST

Check bilge for excess water.
Check weather conditions and tide
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 store
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

Description of boat:							
40					TYPE		
KE	LENGT	н		REC	REGISTRATION #		
LL COLOR	STRIPE	COLOR		DEC	K COLOR		
HER DISTINGUISHING MARKS							
Persons aboard:		NUM	BER				
ME		AGE			p	HONE	
ORESS			-				
ME	-	AGE	2	-		190NE#	
DRESS	-	-	-		- 56		
ME	-	AGE		-	- 1	HONE	
ODRESS				_			
Engine: TYPE	-		H.P		100	- FUEL	CAPACITY
. Safety equipment:		PFDs		Flares		Mirror	Flashlight
		Food		Water		EPIRB	Raft/Dinghy
Radio:		1000					
TYPE			-	FREQ	UENCIES		in the second second
. Trip expectations:							
EPARTING AT (APPROX. TIME)	-	ON (DATE)		FROM (LOCATION)			
GOING TO (LOCATION)	100	RETURNING (DATE)		E)	IN NO EVENT LATER THAN (TIME & DA)		TER THAN (TIME & DATE
3. Automobile:	LICE	LICENSE #			STATE		
MAKE		COLOR				PARKED AT	r
9. If not returned by	, call		, call the	e Coast	Guard or:		
at:					-		

propulation .

	CLOSING UP YOUR
•	BOAT AFTER SAILING
	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 attract tiveness 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

BE PREPARED

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

Carry all safety equipment required by federal and state law. Federal requirements are discussed in "Federal Requirements Carry all safety equipment required by reteral and state law. For the required of fice of Boating, Public, and Consumer Affair, for Recreational Boats" which can be acquired from U.S. Coast Guard Office of Boating, Public, and Consumer Affair, The Comparison of the Construction of the for Recreational Boats' which can be acquired in our order from your local State Boating Administration. The Coan Oracle Washington, D.C. 20593. State requirements will come from your local State Boating Administration. The Coan Oracle State Boating and the analysis of the coan Oracle State Boating and the analysis of the coan Oracle State Boating and the analysis of the coan Oracle State Boating and the analysis of the coan Oracle State Boating and the analysis of the coan Oracle State Boating and the analysis of the coan Oracle State Boating and the analysis of the coan Oracle State Boating and the state State Boating and the state Boating and the state State Boating and the state Boating and the state State Boating and the state Boatin Washington, D.C. 20595. State requirements will come from your other radio, extra fuel, a paddle, anchor and line, and also recommends a first-aid kit, a pump or bailer, a transistor or weather radio, extra fuel, a paddle, anchor and line, and

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

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.
- e. -
- 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

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 expecially true of sailboats. Keep a watch to leeward under the headsail. Keep away from

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

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

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.

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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:

- Visually check engine compartment to see that the throttle linkage, shifting controls, electrical connections and fuel lines are properly secured.
- Before each start check oil in engine and transmission.
- Insure that engine shut-off cable is properly secured and operating.
- Place the shift lever in the neutral position.
- Move the throttle or "fuel" lever forward to approximately the half-speed position.
- Insert the starter key and turn to the "on" position.
- Press the starter button and hold until engine starts, then release. The buzzer and/or light should then go off.
- Back the throttle off to an idle position (700 to 800 rpm); allow cold engine to warm up a minimum of five minutes.
- 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.

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Motoring Continued:

CAUTION: Your rigging will conduct electricity. <u>Always check for overhead high tension</u> 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.

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.

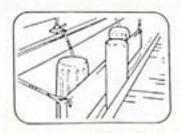
Pumps:

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:



 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. ILM HJUA2636

 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 apiling, rig a fender board across two or more fenders

 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



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stanchions to secure vessel, even for brief periods. For other types of moorings, or for abnormal wind or water conditions, consult your Chapmans's or other approved boating guide.

Anchoring:

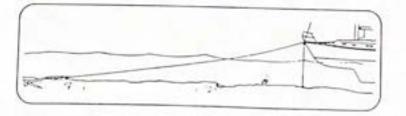
Your Hunter comes with an on-deck anchor well and a burying-type anchor as standard equipment. The anchor is selected to suit the size and weight of your boat under normal anchoring conditions, and provides its best holding characteristic in muddy or sandy bottoms.

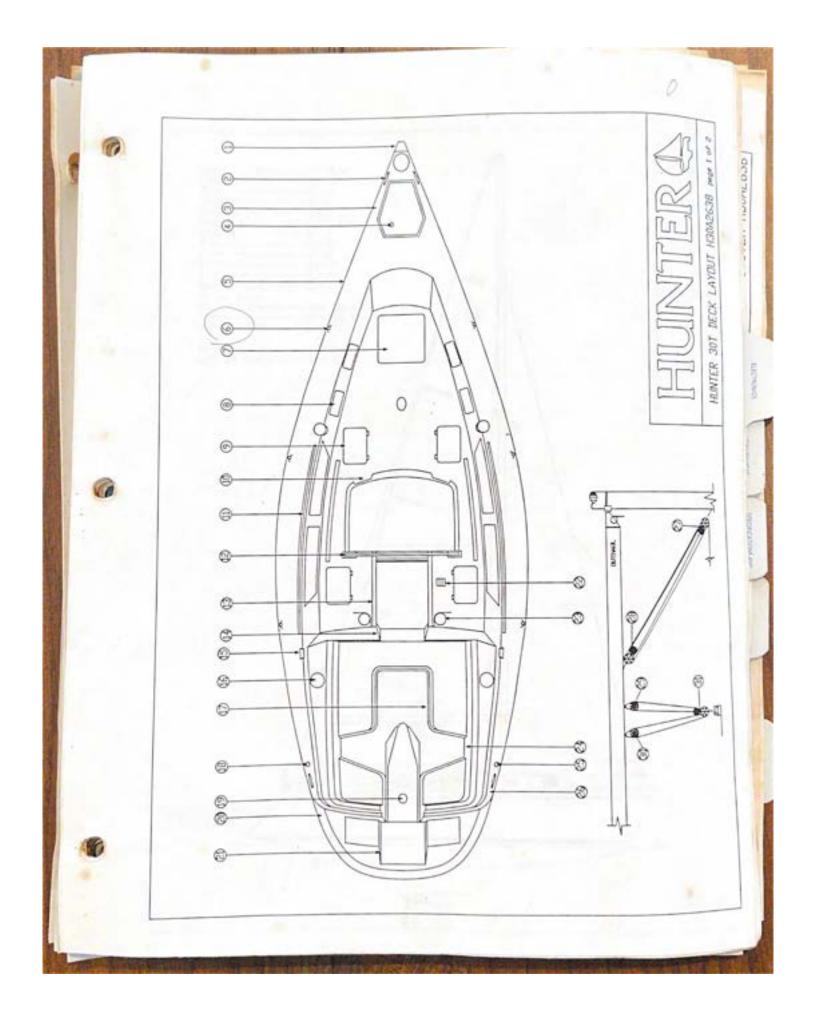
When anchoring, pay particular attention to the scope of your anchor rode (i.e., the relationship between the depth of the water and the length of the rode). A good rule of thumb is to allow a scope of about 7:1 (a rode seven times as long as the vertical distance from the bow to the bottom). A helpful 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.

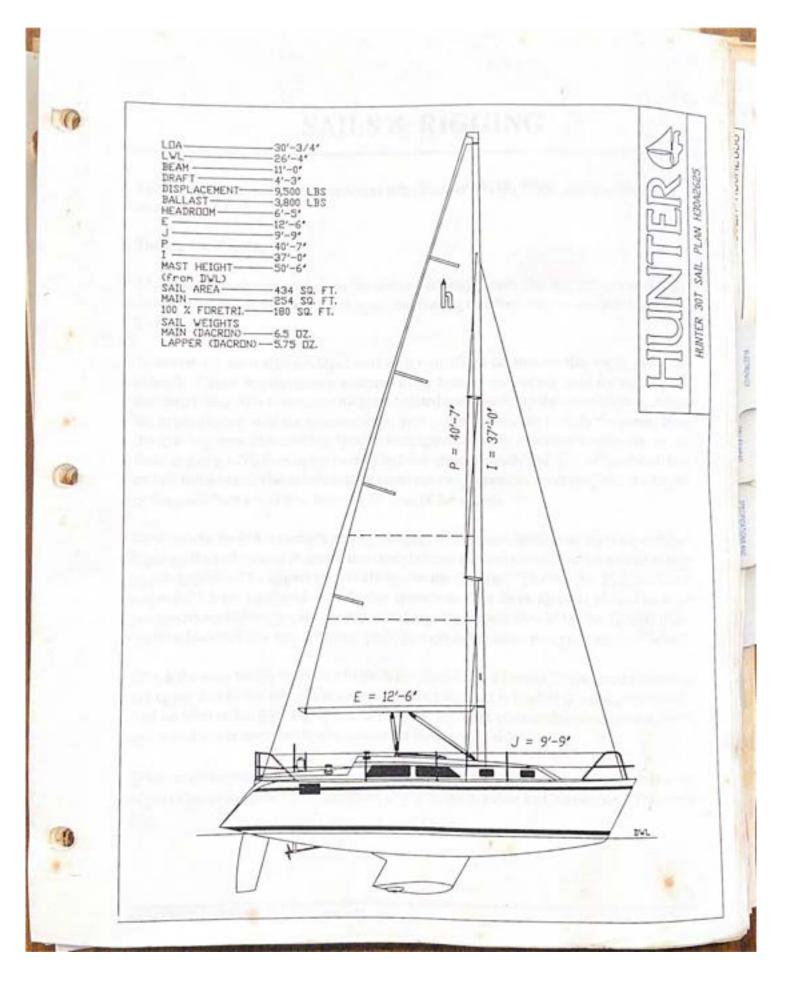
Also, be sure to consider wind direction, currents, mean low tide depths and other local conditions when anchoring, as well as the positions of any boats already anchored nearby.

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.







SAILS & RIGGING

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

Tuning the Rigging:

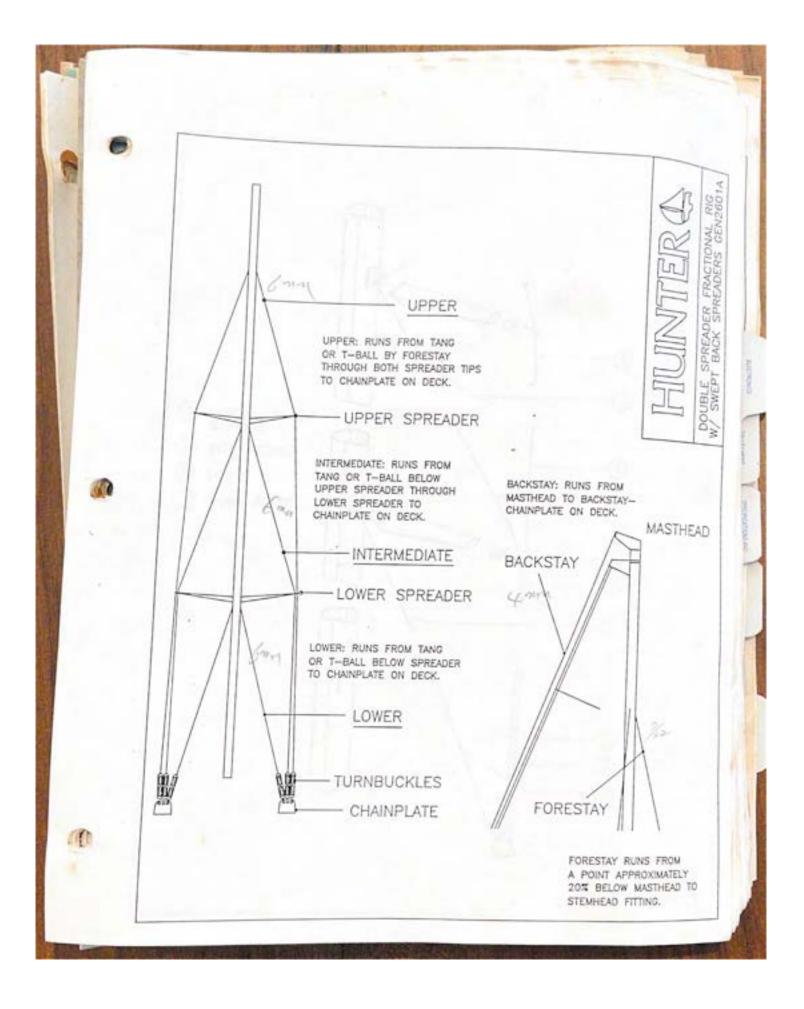
After raising your mast, attach the headstay, backstay, upper shrouds and lower shrouds. Set the headstay turnbuckle at half open and then tighten backstay turnbuckle to medium tension.

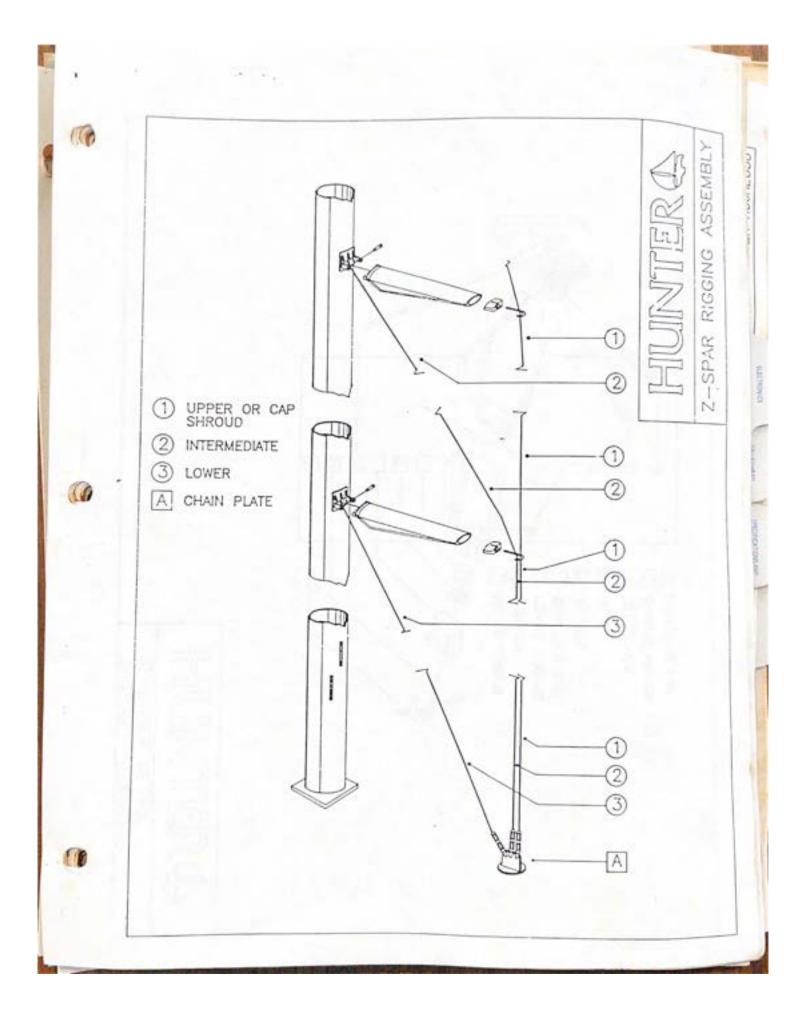
To center the mast athwartships, start with only slight tension on the upper and lower shrouds. Check that the mast is centered in the boat by measuring from the masthead to the chainplates with a steel tape measure hoisted completely up the main halyard. Adjust the upper shroud until the measurements 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.

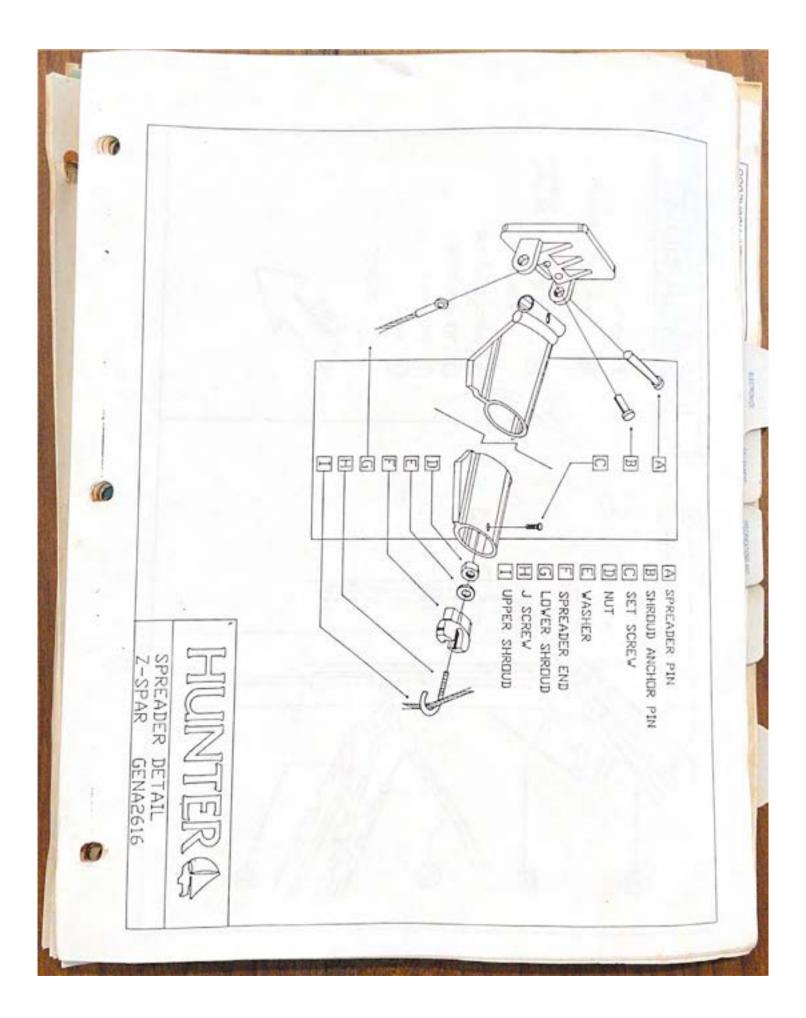
Now tighten the lower shrouds evenly, making sure the mast remains straight athwartship. Sight up the luff groove to assure this straightness. Lowers should end up almost as tight as the uppers. (The uppers should always be the tightest.) The 28, 30, 33.5, 35.5, and Legend 37.5 are equipped with double 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.

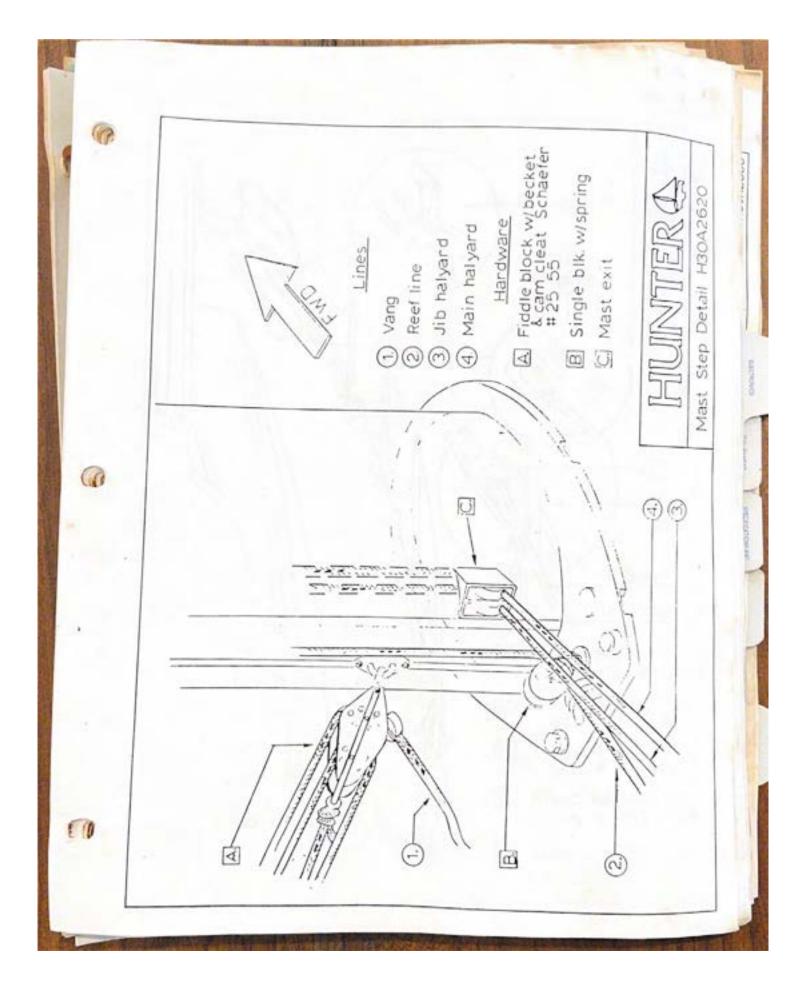
Check the mast tuning by sailing in medium winds (10-12 knots). Sometimes fine tuning the upper and lower shrouds is necessary when the spar is loaded in sailing conditions. Sail on both tacks, sighting up the luff groove to check athwartship straightness. Both upper and lower shrouds should be taut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

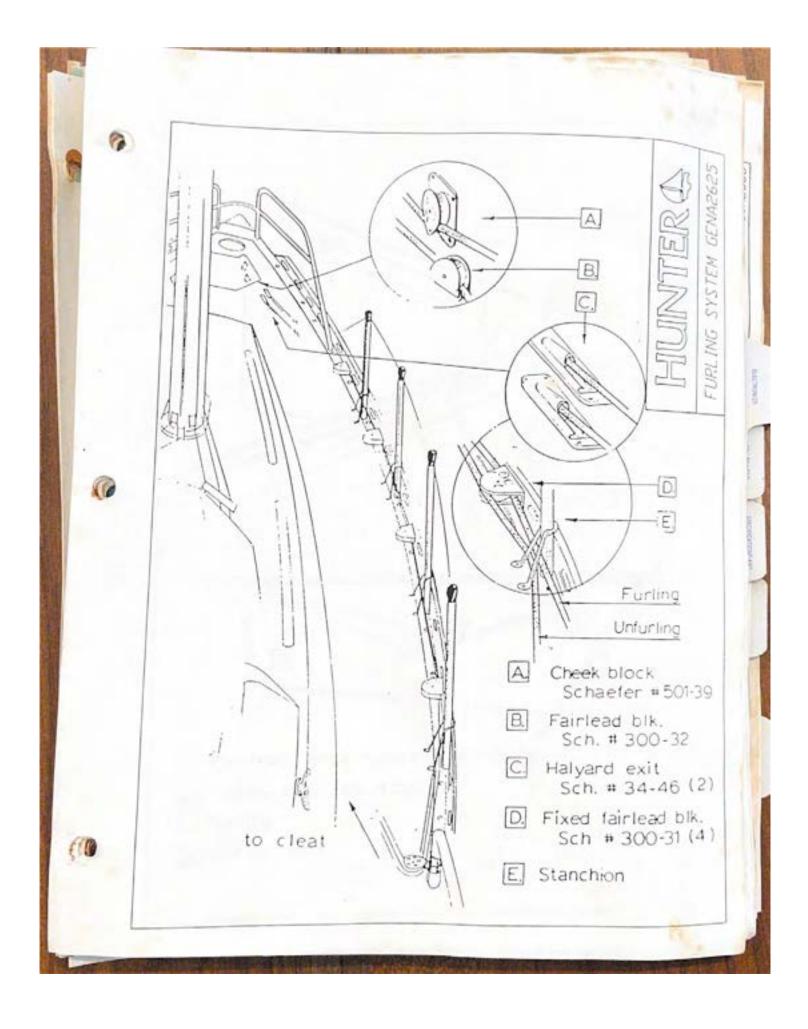
When mast tuning is complete, install cotter pins in all turnbuckles and tape over sharp edges of the cotter pins with chafe tape. (Refer to the drawing on Conventional Fractional Rig).

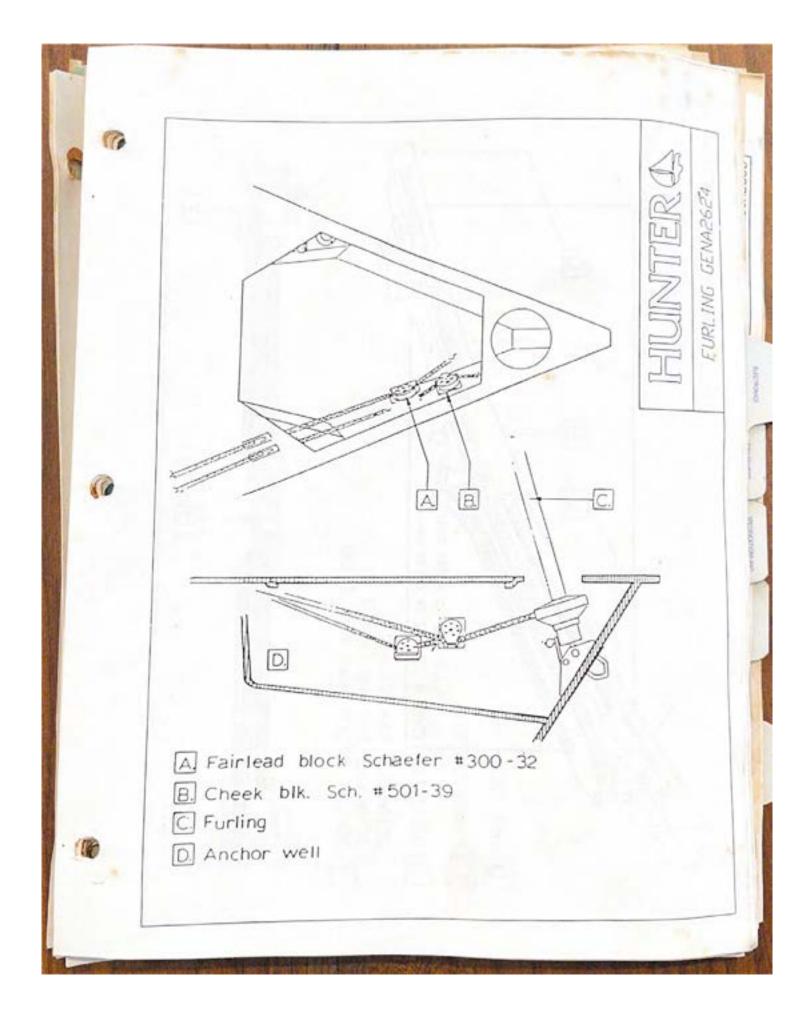


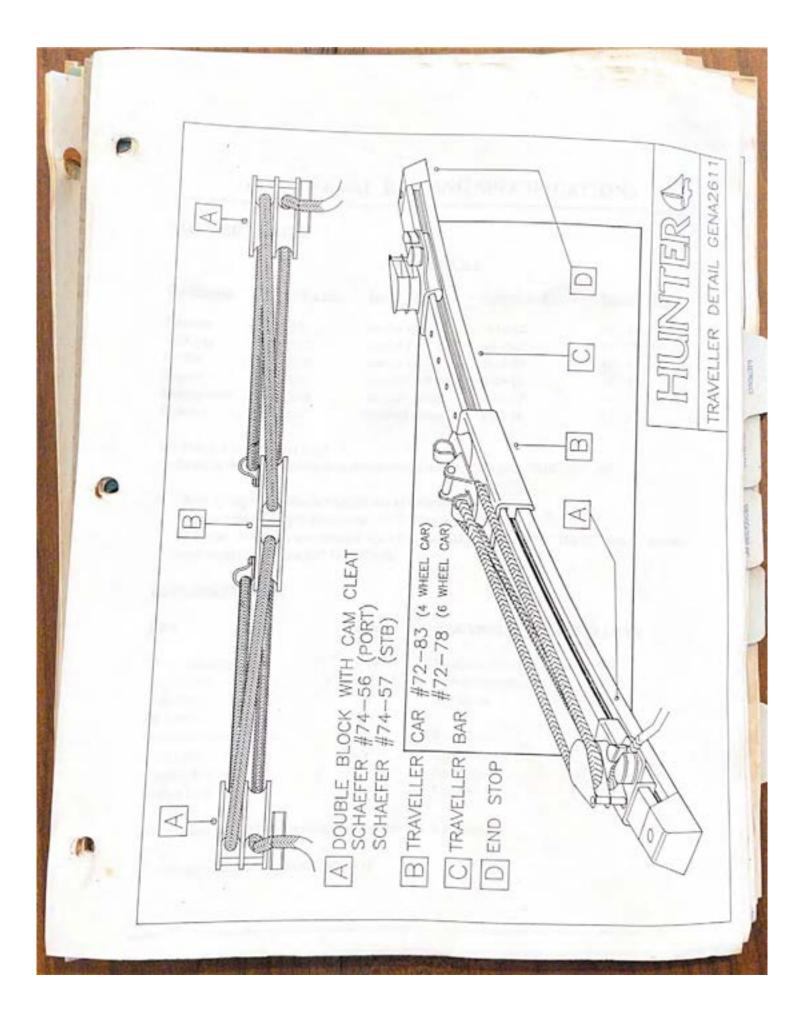












HUNTER 30T RIGGING SPECIFICATIONS

STANDING RIGGING

FITTINGS

Description	Wire Size	Upper End	Lower End*	Overall Length
Forestay Backstay Bridles Uppers Intermediates Lowers	7/32 47*5/32 5/32 6 **1/4 5 * 3/16 1/4"	marine eye marine eye stemball w/2 cups stemball w/cup stemball w/cup	7-12-12 stemball w/1 5-10-10 8-14-16 6-12-12 8-14-16	39' - 1 1/2" 31' - 10 1/2" 17' - 8 1/4" 37' - 11" 27' - 7 1/2" 14' - 5 1/2"

All wire is 1 x 9 stainless steel.

Backstay is attached to bridle with two splitter plates and three pins - 7/16", 3/8", 3/8".

 "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.

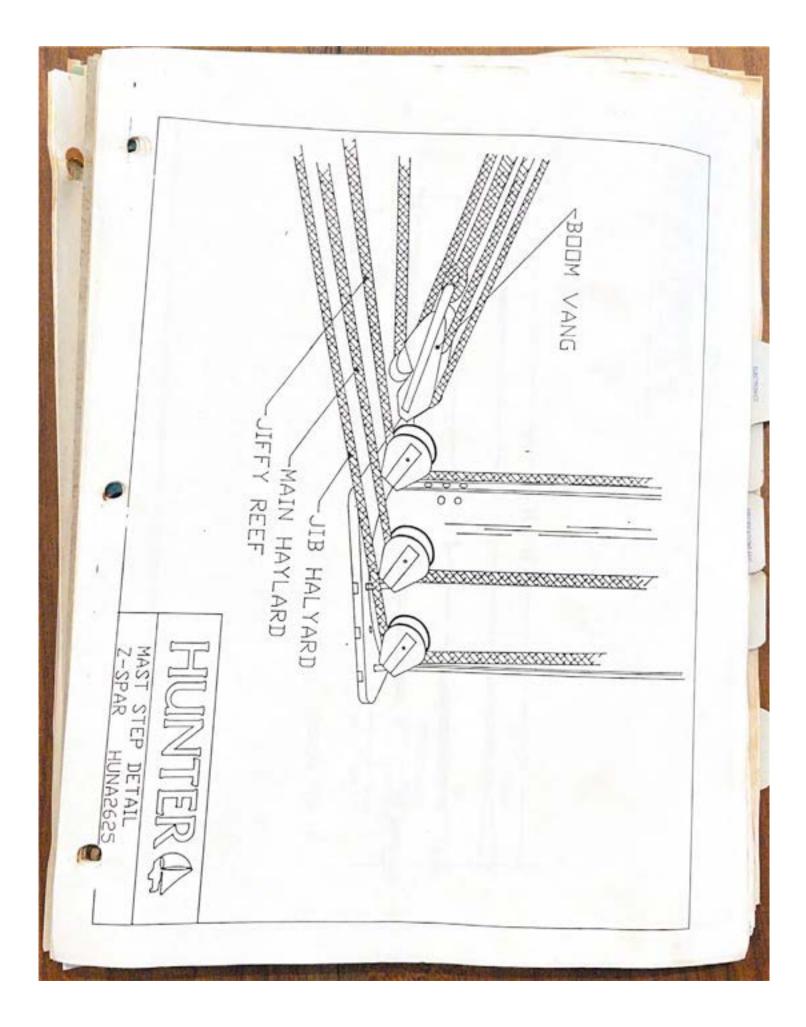
RUNNING RIGGING

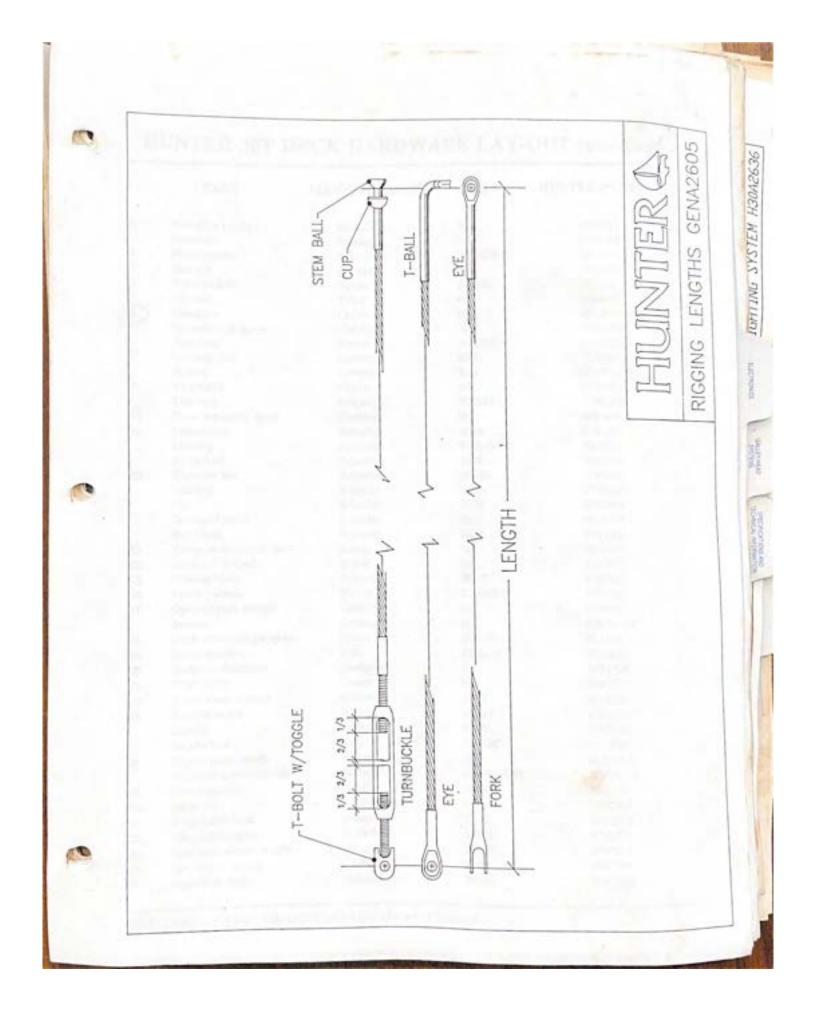
Line		Size	Attachments	Overall Length
Main Halyard	110	7/16*	Headboard shackle	106'
Jib Halyard	10	3/8"	Swivel snapshackle	83'
Main Sheet		3/8*	Eye splice	52'
Jib Sheets		7/16"		42'
Traveller Control Lines		3/8"	Eye splice	15'
Vang Line		3/8"	Eye splice	30'
Topping Lift	8	5/16*	Eye splice	86'
Anchor Line	2	3/8"	Shackle	100'

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

All rigging is supplied by SECO SOUTH.

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HUNTER 30T DECK HARDWARE LAY-OUT (see diag.)

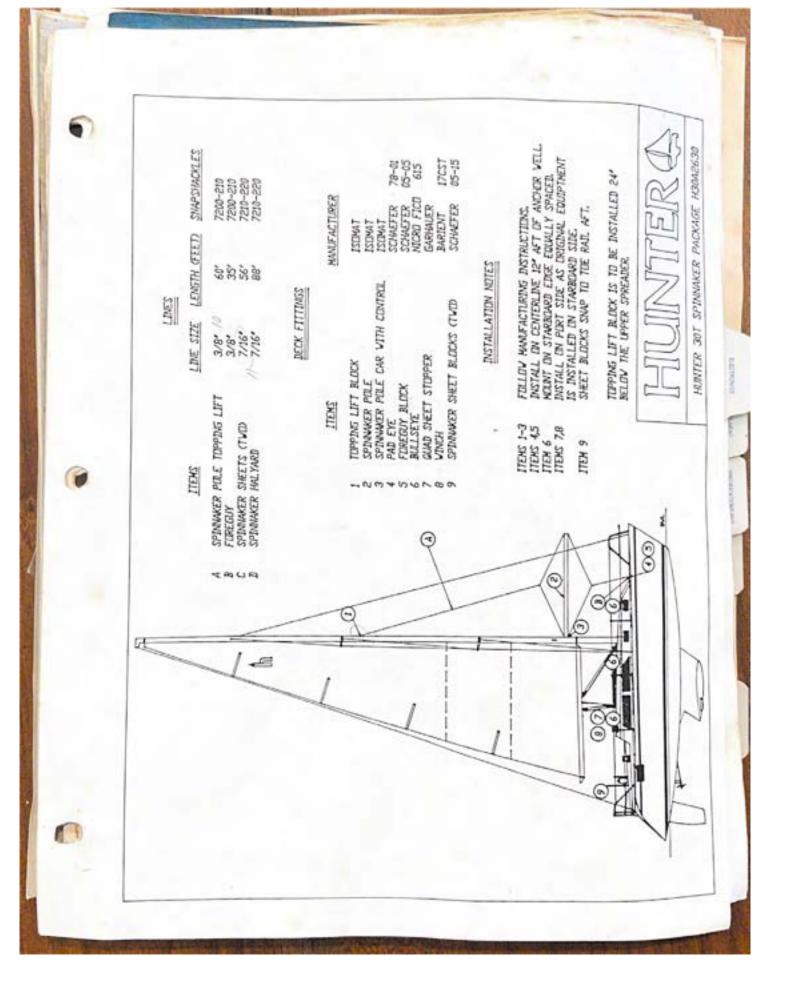
MANUFACTURER

PART

TURER MFG.#

HUNTER PART #

l.	Bow plate w/roller	Southcoast	NA	HW1611
2	Stemhead	Southcoast	NA	HW1575
	Mooring cleat	Y/S	YS7107E-8*	HW0975
3.4	Bowrail	Southcoast	NA	HW2400
5	Watertank fill	Nordic	6124-00	PL1130
	Toe rail	Tifton	NA	HW2495
6	Stanchion	Custom	NA	HW2100-A
1.	Forward deck hatch	Custom	NA	TC010008
	Trim ring	Bomar	NT2039	HW0121-A
8.	Opening port	Lewmar	8902	TC010038
	Screen	Lewmar	8902	HW0043-B
9	Venthatch	Custom	NA	TC010017
1000	Trim ring	Bomar	NT2011	HW0098
10.	Deck organizer, quad	Garhauer	NA	HW0172
11.	Genoa track	Schaefer	40-48	HW0307
	End stop	Schaefer	74-35-G	HW0293
	Block lead	Schaefer	32-88	HW0294
12	Traveller bar	Schaefer	SK6406	HW0298
	End stop	Schaefer	74-93	HW0205
	Car -	Schaefer	72-78	HW0236
	Starboard block	Schaefer	74-57	HW0207
	Port block	Schaefer	74-56	HW0206
13.	Companionwaysldr. track -	Bomar	NA	HW0157
14.	Pinboard keeper:	Bomar	NA	HW0158
15.	Turning block	Schaefer	501-39	HW0312
16.	Primary winch	Barient -	21-33CST	HW2542
17.	Opening port, cockpit	Lewmar	NA	HW0041
	Screen	Lewmar	NA	HW0037-C
18.	Deck waste tank pump-out	Nordic	6126-00	PL1140
19.	Port inspection -	Pyhi	DP40-W	HW0045
20.	Backstay chainplate	Southcoast	NA	HW1790 .
21.	Swim ladder	Custom	NA	HW2172
22.	Triple sheet stopper	Garbauer	11-13	HW1280
23.	Halyard winch	Barient	17CST	HW2540
	Handle	Barient	10CX	HW2564
	Handle lock	Barient	VIOLIC	HW2566
24.	Engine panel cover	Custom	NA	EL0111-B
	Engine stop switch/cable	Morse	B48702-72IN	HW3375B
25.	Diesel fuel fill	Nordic	6125-03	PL1126
26.	Stern rail	Southcoast	- NA	- HW2263
27.	Vang fiddle, mast	Schaefer	25-55	HW0212
28.	Vang fiddle, boom	Schaefer	501-45	HW0211
29.	Mainsheet system, single	Schaefer	501-03	HW0209
30.	Mainsheet, double	Schaefer	05-23	HW0291
31.	Mainsheet, triple	Schaefer	501-93	HW0208
122				11110200



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.
- 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 solled 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

HUNTER/LEGEND/VISION/PASSAGE OWNER'S MANUAL

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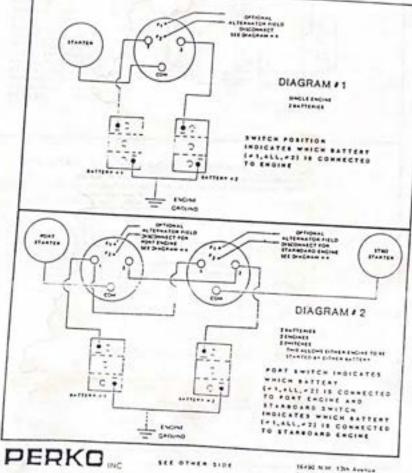
BATTERY SWITCHES INSTALLATION AND OPERATING INSTRUCTIONS

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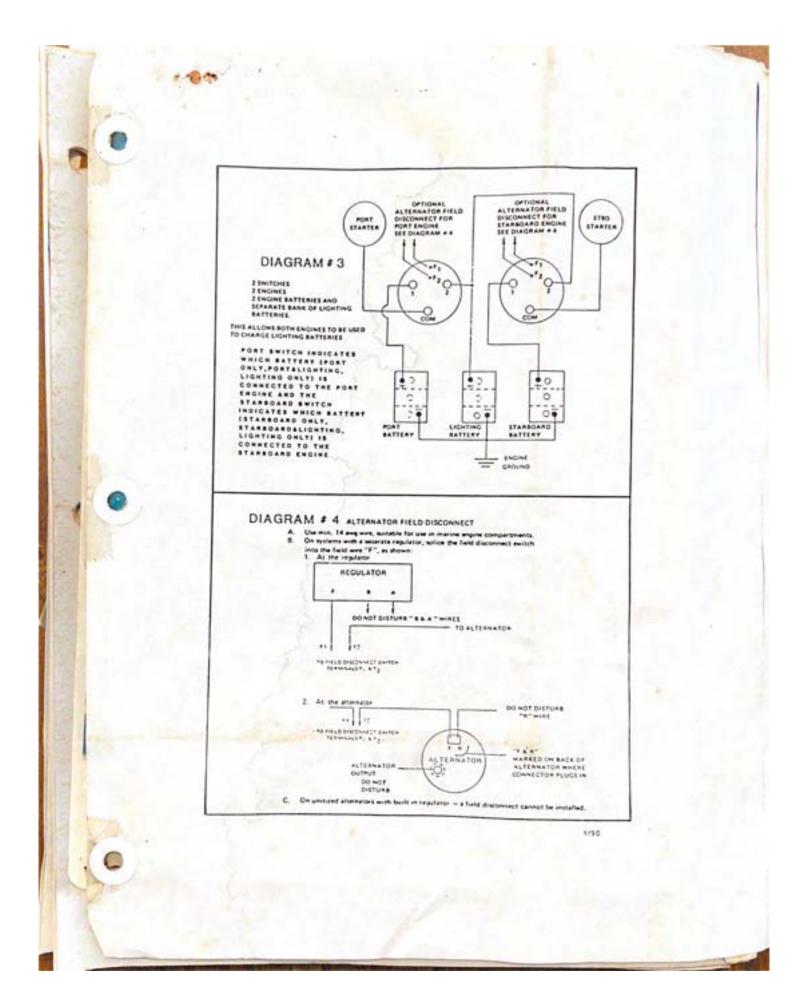
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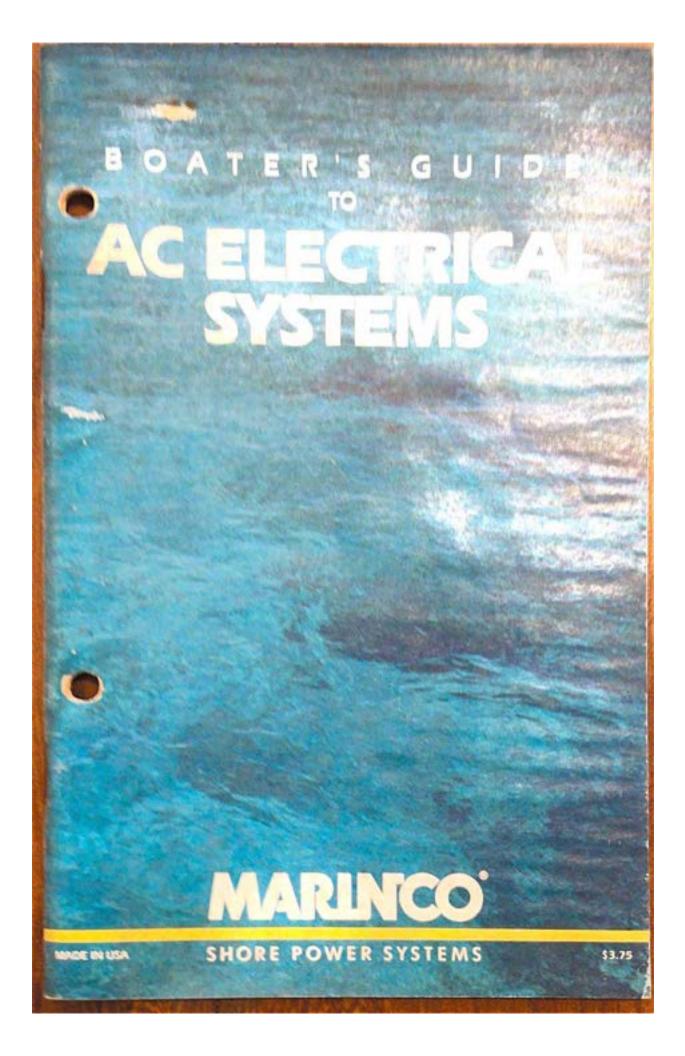
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Mari, Florida 13165-5727







RAY 82 VHF/FM Radiotelephone

Instruction Manual

Raytheon

RAY 82 VHF/FM Radiotelephone





H HEL D U	and the second	FREQ	UENCY	SIMPLEX	CHANNEL			UENCY	PLEX
	DISPLAY	SHIP RX	SHIPTX	DUPLEX	DESIG.	DISPLAY	SHIPRX	SHIPTX	EX
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Table 3-1 RAY-82 MARINE VHF RADIOTELEPHONE CHANNELS

+ These channels are available only in the International (INT) mode.

@ These channels are assigned by the Canadian Government. Ensure proper authorization prior to use.

S: SIMPLEX, D: DUPLEX, ---: NO TX

* These Channels are programmed to Transmit at 1 watt. 25W may be selected, whenever necessary, by pressing the 1/25 key.

CHANNEL DESIG.	1000	FRE	JUENCY		
	DISPLAY	SHIP RX	SHIPTX		
W1	1	162.550	****	Rev	NOAA Weather
W2	2	162.400	(m.m.)m.)m.	Rev	NOAA Weather
W3	3	162.475		Rev	NOAA Weather
W4	4	161.650		Rev	Canada Weather
WS	5	162.425	A 10, 10, 10, 10	Rev	NOAA Weather
W6	6	162.450		Rev	NOAA Weather
W7	7	162.500		Rev	NOAA Weather
W8		162.525		Rey	NOAA Weather
W9	9	161.775		Rev	Canada Weather

Raytheon

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GALLEY/HEAD SYSTEMS

WATER SYSTEM OPERATION

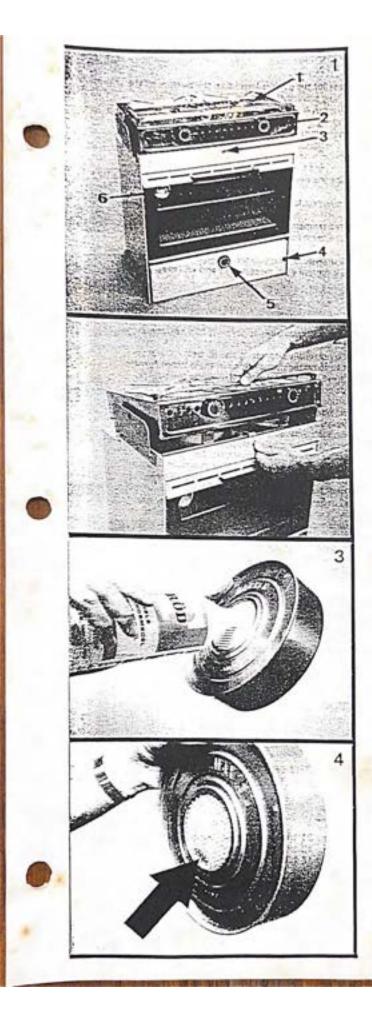
Fill fresh water tank at deck fill. The tank filler cap will be marked "water". When tank is full, water will back up through the vent hose and exit through a vent located on the side of the hull

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.



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)

- 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 recss, 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.

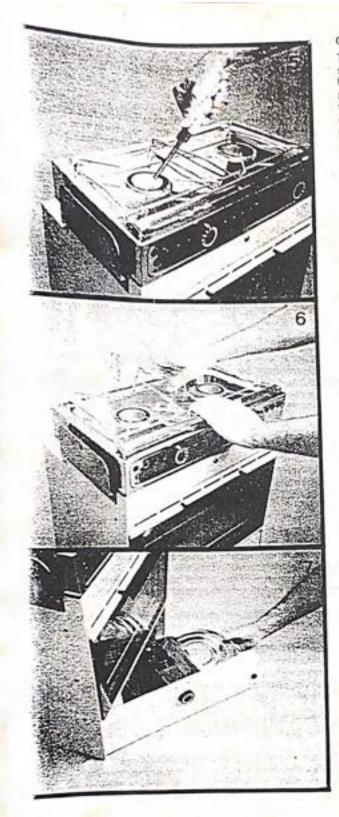
Winterize your stove by burning remaining fuel.

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.



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

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 olso be gained by lifting the bottomlid 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 owen you will experience quite a strong smell. This is normal with most owens 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 pivotarms 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 disired friction.

Whether the fixed or gimballed installement is used or not, it is very important that there is ample distance to the surrounding fitments. 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 g	riel 👘
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	8 - I



Models 29090-0000 29120-0000

Models

29090-0000

29120-0000



OPERATION

Manual Manne toilets have traditionally been somewhat cumbersome and confusing to operate and maintain. The PAR tollet has been designed with user convenience in mind. The pump assembly is angled forward to provide a natural, smooth streke 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 tolet 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 uting, 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 enly 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 tollet 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 tollet 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 felt 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 next appearance.

The toilot is available with either a compact china bowl to fit restrictive areas or a large bowl with household size seat assembly for maximum confort. Its forward angled double action pump with convinient top mounted dry bowl selector is easy and natural to operate. It is selfpriming with a dry suction lift of up to 3 foet (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 tollet is installed below the watertine, 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,

MANUAL MARINE TOILET

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 ¾", Discharge port 1½" Weight – compact bowl: 26 lb.

large bowl: 32 lb.

MODELS AVAILABLE

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

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, lossen 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 tollet must be installed on a well supported flat surface. Ideally, if underside of mounting surface is accessible, the tollet 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 soat 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 horses can be routed to their respective ports. The discharge ellow may be rotated (by loosening two flange screws, rotating elbow and relightening screws) to accept the most convenient routing of the discharge horse.

When proper installation has been established mark the four base mounting holes on mounting surface and remove toilet. Ensure that no wining 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 Polysuifide base sealants because they may chemically attack the plastic which can result in breakage.

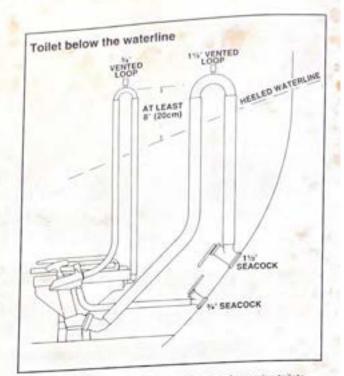
Plumbing

If installing a new inlet thru-hull seacock, ensure that it is positioned on a part of the 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 hull which is wetted at all angles of heel or trim and free of water turbulence at any hull speed. If discharging waste overboard (chardwater turbulence at any hull speed. If discharging), overboard (check legal restrictions for overboard dishcarge), ensure directively legal restrictions for overboard dishcarge). ensure discharge thru-hull seacock is both aft of and higher than the inlet thru-hull seacock is both aft of and higher than the inlet thru-hull/seacock is both att or and the inimum of 3/4" ID and the seacock. All inlet plumbing should be a minimum of 3/4" ID and discharge plumbing a minimum of 1 1/2" ID. All hose ends ether 44 ends should be double clamped with stainless steel hose clamps.

If toilet is above waterline route hoses to seasocks, holding tank or treatments to be 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 tollet 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 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 %" 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 11/2" 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.



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-treeze. To use petroleum based anti-freeze may cause damage to the internal rubber toilet parts.

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.

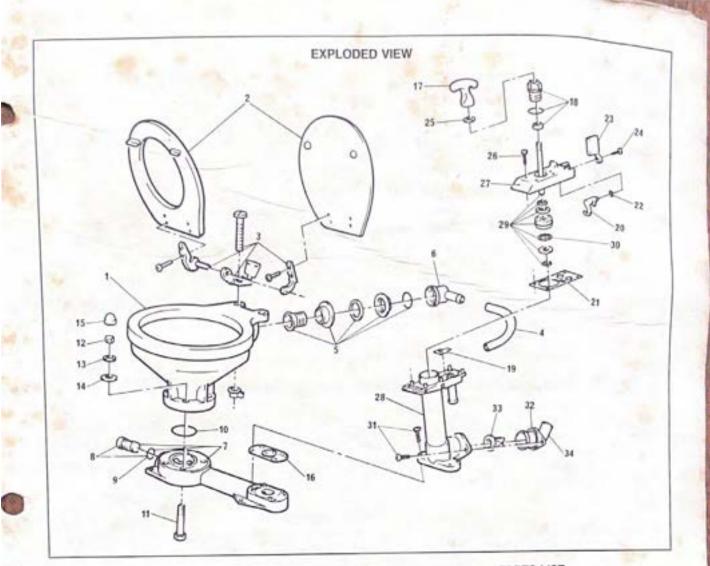
SEAL REPLACEMENT - Lift handle and wrap rod with one turn SEAL HEP Diversities handle. Gently grasp piston rod (on tape) of tape just under the handle. Gently grasp piston rod (on tape) with pliers and unscrew handle. HOLD PISTON ROD AT ALL TIMES OR IT MAY DROP DOWN INTO PUMP. Remove bumper washer and unscrew and remove seal rod guide assembly. Wrap threads of piston rod with one turn of tape to protect new seal and install new sealirod guide assembly. Remove tape from threads and reinstall bumper washer and handle. Tighten handle snuggly (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 REPACEMENT - To replace the bowl seal (base O-Ring) disconnect inlet and discharge hoses and remove tollet 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 bowf 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.



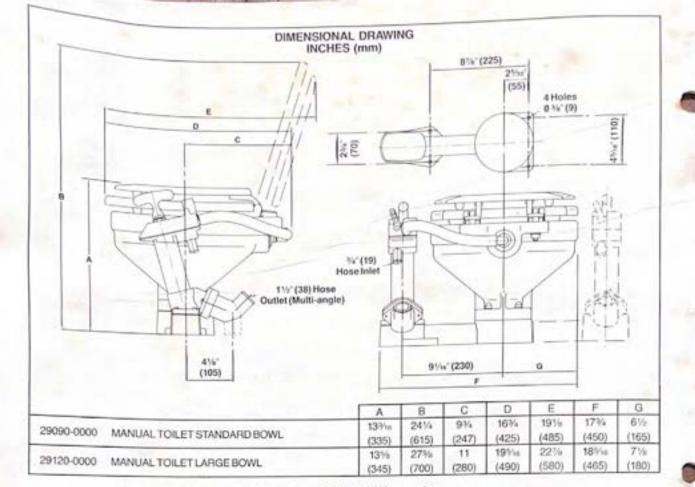
REPAIR KITS AVAILABLE

KIT	PARTNO.	DESCRIPTION
A	29045-0000	MAJOR SERVICE KIT, PUMP
8	29040-1000	PUMP ASSEMBLY
C	29094-0000	VALVE COVER ASSEMBLY
D	29051-0000	PUMP CYLINDER ASSEMBLY
F	29047-0000	BOWL INSTALLATION KIT

	PARTS LIST	
1.1	OTY.PER	DA

			OTY PER		07	用	8.85	74,9	01
KEY			TOILET	PART NO.	٨	Ð	C	D	E
1	BOWL	COMPACT LARGE	1	59127-7002 18753-0060					
2	SEAT, LID & HINGE SET	COMPACT LARGE	1	43990-0065 18753-0061					
3	HINGE SET (1 PAIR)		1	18753-0181	1		L	L	Ļ
4	HOSE	COMPACT LARGE	1	29035-0000 29035-0001	L				
5	BOWL SPUD INTAKE ELBO	N & O-RING	}	29048-0000		Į			
7		Q-RING ASSY	1	29041-1000		L	L	L	Ļ
6	PLUG& O-RIN		1	29028-1000			L	L	ŀ
9	O-RING (PLUC		1	and the second second	1	L	1	Ļ	ŧ
10	O-RING (BOW		1		1	1	1	L	1

PARTS LIST									
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KEY	DESCRIPTION	TOILET	PARTNO.	A	8	¢	D	Ε	
11	BOLT	4				L		4	
12	NUT	4		1	L	L		4	
13	WASHER (S.S.)	- 4		Ŀ	L			4	
14	WASHER (NYLON)	4	6	1	1	1	E	4	
15	CAP	4		2	Ļ.	L	1	4	
16	BASE VALVE GASKET	1	29043-0000	1	1	Ļ.	Ŀ	H	
17	HANDLE	1	29026-0000	Ŀ	1	Į.	L	Н	
18	SEAL ASSEMBLY	1	29044-0000	1	Ľ	1	L	Ц	
19	TOP VALVE SEAT	1		1	1	L	11	Н	
20	CAM	1		1	Ľ	1	L	Ц	
21	TOP VALVE GASKET	1	29042-0000	1	Ľ	Ļ.	1	Н	
22	O RING (FLUSH LEVER)	1	1000 A. A. A.	1	1	1	L	Н	
23	FLUSHCONTROLLEVER	1		1	1	1	-	H	
24	SCREW/FLUSHLEVER/		100	1	Ľ	P	ŀ	Н	
25	BUMPER	1	-	1	Ľ	Ł	H	Н	
26	SCREW (VALVE COVER)	- 0	e	1		ļ.	1	Н	
27	VALVE COVER	1			Ľ	P	+	H	
28	PUMP CYLINDER	1	-	+	Ľ	ŀ	1	-	
29	PISTON ROD & O RING ASSY	- t.	25045-0000	÷	Ľ	ŀ	-	-	
30	O-RING (PISTON)	1		Į!	ł	ŀ			
31	SCREW IPUMP CYLINDER	6	APR ST.	1	17	ŀ	2	1	
32	DISCHARGE FLANGE	1	29091-0000	+	Į.	ł	÷		
33	JOKER VALVE	1	29092-0000	1	Ľ		k		
34	DISCHARGE ELEOW	1	29029-0000	1	1	-	1.	-	



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 ventying purchase date is required to obtain adjustment.
- Buyer shall notify ITT of any defect within this warranty no later than ninety (50) 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, Catilornia 92626-9998 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

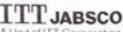
C. EXCLUSIONS FROM WARRANTY AND LIMITATION OF LIABILITY:

 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 CONSE-QUENTIAL DAMAGE OF ANY KIND, WHETHER BASED UPON WARRANTY, CONTRACT, NEGLIGENCE, OR STRICT LIABILITY ARISING IN CONNEC-TION 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 PRO-DUCT 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 atany place other than ITT's factory, or by person's 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 PARTICU-LAR PURPOSE ARE EXCLUDED.



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

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Rev. 6/92

installation, operation & service instructions	FLOJET 4400 SERIES "QUAD" DIAPHRAGM AUTOMATIC WATER SYSTEM PUMP	FLOIFT
Participan Radiogn Barline pression	Design	Four Valve Diaphragm Ball bearing Perm. Magnet
	Voltage: Curr. Draw: Flow Max: 10 P.S.I.:	12VDC (or Specify) 2.8 Amps full flow 3.3 G.P.M. (2.8 amps)
	Pressure: Check Valve:	35 P.S.I off 20 P.S.I. on 125 P.S.I.
Larrente manar Rathing a		Self-up to 6' 3.9''H×8.3''L×6.3''W 3.9 lbs.

WHAT IS A QUAD PUMP?

Flojet's Quad pump is a totally new design in water pumps. The Quad is an automatic, on-off, self- priming water pump that can service several outlets at once. The unique four valve diaphragm design reduces water pulsation generating a smoother flow of water. The Quad also features an internal bypass which recirculates excess water inside the pump head reducing low flow pressure build up which almost eliminates pressure switch chatter. The motor used in the Quad pump is a low RPM unit which conserves power and its low pitch reduces annoying noise. The motor is also ignition protected for added safety. Plug-in ports are also an innovation of this pump, simply plug ports in and push slide locks forward. Finally, the Flojet Quad Pump primes itself and can run dry almost indefinitely without harm.

SPECIAL FEATURES

The "Quad" four chamber design means quiet operation and smooth flow.
• Generous 3.3 G.P.M. free flow • 35 P.S.I. cutoff pressure • Internal bypass adjusts flow as needed • Self-priming lifting up to six feet • Can run dry without harm • Uses only 2.8 AMPS at open flow • Operates at down to 8.5 volts • Built-in backflow preventer protects pump from city water pressures • FLOJET "Quick Lock" port connections make installation or service easy • Made of FDA approved materials • Fully factory tested • 2 Year Warranty • Made in USA

SIMPLE TO USE

A FEW HINTS: First Remove Shipping Plugs from female ports in pump head and discard. Every pump is factory tested and the plugs keep residual water in the pump to prevent leakage. To install ports choose the port type you need. Move slide lock on pump head to rear of pump. Push O-ring end of port completely into pump head and move locking slide towards front of pump until it locks. To test, pull on port, the port should remain in place. If the slide moves or port comes out, the port was not completely in the pump and/or the slide was not locked. After you have successfully installed ports remove them for ease of installation later.

INSTALLATION: Insert rubber grommets into bottom of pump feet. Position pump on solid surface that is not prone to vibration. Mount above, below or even with tank. If pump is mounted vertically, keep pump head down. Screw through grommets to secure pump, do not compress eliminating dampening effect. Flojet recommends the use of an in-line strainer to protect pump from debris.

PLUMBING: Use 15" I.D. flexible hose for all main lines and 36" I.D. hose for feed lines, use high pressure hose on all city water lines. Use hose clamps on barb fittings, avoid kinking and chaffing. Attach plug-in ports to hose and insert and lock into pump as previously described.

WIRING: Use 14 gauge wire to 20', 12 gauge wire to 50', use same gauge for ground. Install 10 AMP fuse and switch. Wire pump with pump switch off. The pump red wire is (+) and black wire is (-).

OPERATION: With pump switch off, fill water tank, open all faucets then turn pump switch on. Water will begin to flow, when water is free of air turn faucets off, remember you are filling the water heater, toilet and shower. When all water is shut off pump will stop. Should pump fail to stop, turn switch off and see the trouble shooting guide.

WINTERIZING: Open faucet and pump tank dry, then shut off pump at switch. Unplug outlet port covering pump outlet with ragturn pump on momentarily to clear pump. Attach air source to outlet hose port. With valves sequentially open, turn on air to clear all lines. You can reconnect outlet port to pump and pour RV water systems anti-freeze into your water tank and pump it through your system.

TROUBLE SHOOTING

MAINTENANCE KITS

WE TRY TO HELP: At Flojet we try to make our pumps the easiest to use and one of operate to use and operate, but once in a while our pumps the operate the way you think a the way you think it should. Listed below are simple guides for you to track down to track down some problems that can be easily corrected by you. Read the checkline problems that can be easily corrected by you.

Remember boats and R.V.'s when moving sustain a fair amount of vibration. West vibration. Water and electrical lines may come loose or break after awhile

Because of vibration make sure that all screws and nuts are still tight in pump, don't overtighten. Loose fasteners generate all kinds of symptoms that really don't exist.

CHECK LIST

STEP ONE: Check your water supply. Is there water in the tank? Is the faucet or strainer plugged? Has a line kinked or is air entering the inlet side of the pump? Check for leaky faucets, toilets, city water inlets and showers. The pump will not operate if frozen water is in pump lines.

STEP TWO: Check to see if your pump is getting adequate power at the pump. Look for loose or broken wires, dead batteries, faulty converters, bad ground, blown fuses, detective pump switch or in off position.

STEP THREE: Here's one easy way to test the pump. With pump switch off remove pump and ports from the system, plugging water tank hose to avoid leaking. Put hose on ports and clamp if needed. Put inlet hose in bucket of water and wire pump to 12V source. If pump runs, kink outlet hose so no water leaks out and if pump shuts off the problem probably is in the system. If the pump still malfunctions read our symptoms list which describes the parts that should repair your pump.

SYMPTOMS LIST

- Motor won't start: Replace upper housing or motor.
- Motor runs but no water: Replace diaphragm or jammed check valve.
- Low pressure and flow: Replace pump diaphragm or motor.
- Pump very noisy: Replace lower housing.
- Pump cycles too much: Replace upper housing.

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Pump won't shut off: Replace upper housing or check valve.

Oute often when a pump is worn or detective the one tailed component has overburdened others. To avoid frequent aggravating repairs, Flojet offers service kit assemblies making repairs as quick and easy as possible.

WARRANTY

2

FLOJET CORPORATION guarantees that each new Flojet pump is built of quality material and that it is free of defects in material and or workmanship

FLOJET will repair or replace (at their option), at no charge, pumps proven defective within two years from date of purchase. In the absence of proof of purchase date, the date of manufacture as shown on the pump will be used

No product will be accepted for return without express authorization. All returned goods must be securely packaged and shipped with transportation charges piepaid

FLOJET is not liable for incidental or consequential damage, labor or expense incurred ansing from use of its product

Service Parts						
Keyt	Description	Model#				
1	Upper Housing with Clips R.V.	20404-000				
	Upper Housing with Clips Marine	20404-002				
2	Check Valve Assembly	20407-030				
3	Diaphragm Assembly (includes screws)	20403-040				
4	Lower Housing Assembly	20419-001				
5	Motor - 12 Volt D.C.	02009-032A				
1	Motor 24 Volt D.C.	02019-008A				
	Motor - 32 Volt D.C.					
6	Ports 1/2 Barb (pair)	20381-002				
-	Ports - 1/2 Oest (pair)	20381-000				
1.7	Ports 1/4 Barb (pair)	20381-005				
7	Pump Head Assembly - R.V.	20406-001				
	Pump Head Assembly Marine	20406-003				
8	Slide Clips (pair)	20408-000				

For further information, contact your FLOUET representative, or write to



FLOJET CORPORATION 12 Morgan • Irvine, CA 92718-2003 (714) 859-4945 • TELEX: 6831943 FAX: (714) 859-1153

P/N 81000-074 Rev. 7/89



POST OFFICE BOX 566 LA PUENTE, CALIFORNIA 91747 PHONE: (818) 968-2117 FAX: (818) 330-5442

WATER HEATERS

OWNER'S MANUAL FOR ELECTRIC/HEAT EXCHANGER WATER HEATERS

MODELS: S600, S650, S700, S750 S1100, S1150, S1200, S1250

IMPORTANT SAFETY INSTRUCTIONS

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

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

SAVE THESE INSTRUCTIONS

WARNING:

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

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

CAUTION:

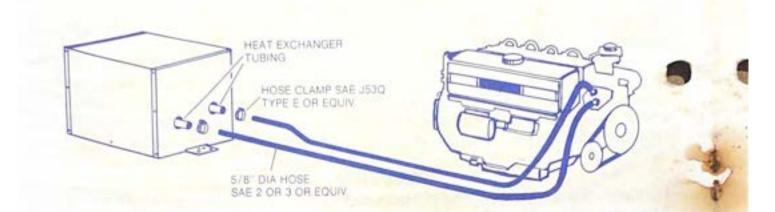
Hydrogen gas can be produced in a hot water system served by these heaters that have not been used for a long period of time (generally 2 weeks or more.) Hydrogen gas is extremely flammable. To reduce the risk of injury under these conditions, it is recommended that the hot water faucet be opened for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

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



INSTALLATION

- Locate water heater at or below engine level as close to engine as possible.
- Secure mounting brackets to structure with eight #12 minimum screws or 1/4-20 2. minimum cap screws and nuts.
- Connect cold water supply and hot water outlet to heater. 3.
- Connect heat exchanger system described in figure above. 11
- Pressure temperature relief valve is factory installed. The pressure relief shall limit the 5 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 discharge can exit only within 6 inches above, or at any distance below the structural floor, and cannot contact any live electrical part.

Install replacement temperature and pressure protective equipment required by local codes, but not less than a combination temperature and pressure relief valve certified as meeting the requirements for relief valves and automatic gas shutoff devices for hot water supply systems. ANSI Z21.22 by a nationally recognized testing laboratory that maintains periodic inspection of production of listed equipment or materials.

- Connect the electrical supply by a qualified electrician. The electrical supply shall be permanent wiring, armoured cable or conduit, per national electrical code NFPA 70, with a 6 minimum capacity of 1500 watts.
- GROUNDING INSTRUCTIONS: The supply ground shall be connected to the green wire located in the water heater wiring compartment. Do not place switch in the grounding circuit. 3

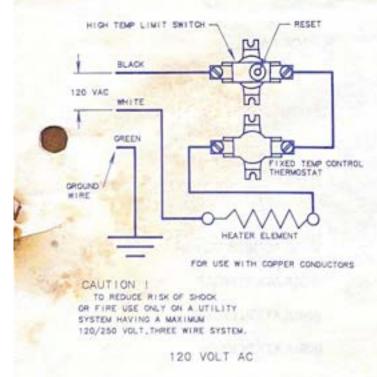
Use a UL-Listed ON-OFF switch rated 15 AMP/120 VAC in the black supply line on 120 Volt models. Use a UL-Listed double pole ON-OFF switch rated 10 AMPS/220-240 VAC in the red and black supply lines on 220 Volt models.

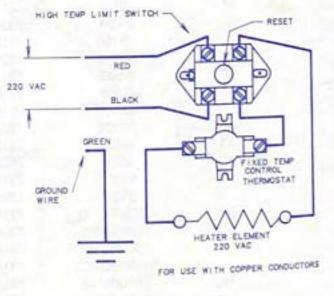
The heater is equipped with a high limit switch which can be manually reset. If the limit switch activates, proceed as follows:

- 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 authorized service center.

WIRING DIAGRAM FOR 120V

WIRING DIAGRAM FOR 240V

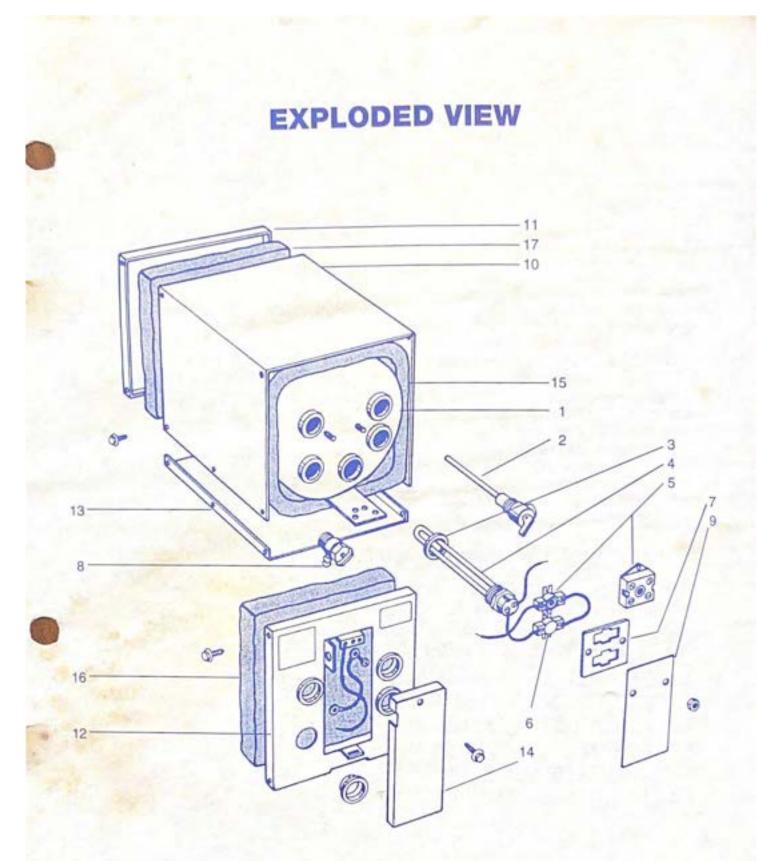




240 VOLT AC

PARTS LIST MODELS S600, S650, S700, S750 S1100, S1150, S1200, S1250

ITEM	MODEL NO.	PART. NO.	DESCRIPTION
1.	S600/S700	80253	TANK ASSEMBLY
1.	S1100/S1200	80254	
2.	ALL MODELS	73127	TEMPERATURE/PRESSURE VALVE
	ALL MODELS	73124	HEATING ELEMENT GASKET
3.	120 VOLT	73364	HEATING ELEMENT
4.	240 VOLT	73365	
	120 VOLT	73128	HIGH LIMIT SWITCH
5.	240 VOLT	73154	A CARGO C MANAGE STAND STORY
	ALL MODELS	73129	THERMOSTAT
6.	120 VOLT	73148	THERMOSTAT MOUNTING PLATE
7.	240 VOLT	73171	
0	ALL MODELS	73123	DRAIN VALVE
8.		73145	WIRE SHIELD
9.	ALL MODELS	73137	JACKET
10.	\$600 \$700	73283	unone
		73166	
	S1100 S1200	73287	
	S600	73140	BACK PANEL
11.	S700	73286	DAGRITANCE
		73169	
	S1100 S1200	73290	
10	S600	73139	FRONT PANEL
12.	S700	73285	THOMTPARE
	S1100	73168	
	S1200	73289	A CONTRACTOR OF
10	S600	73138	BASE
13.	\$700	73284	DAGE
	S1100	73170	
	S1200	73288	
	S600/S1100	73141	WIRE ACCESS COVER
14.	S700/S1200	73291	WIRE ACCESS COVER
40	S600/S700	73146	INSULATION WRAP
15.	S1100/S1200	73175	INSULATION WRAP
40	S600/S700	73147	INCLU ATION EDONT
16.	S1100/S1200	73176	INSULATION FRONT
17	S600/S700	73330	INCLUSTION PLOK
17.	S1100/S1200	73331	INSULATION BACK
	31100/31200	10001	



REPAIR PARTS

Repair parts listed herein may be ordered through Seaward Products, Seaward Distributors and 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 rating plate located on the front panel.

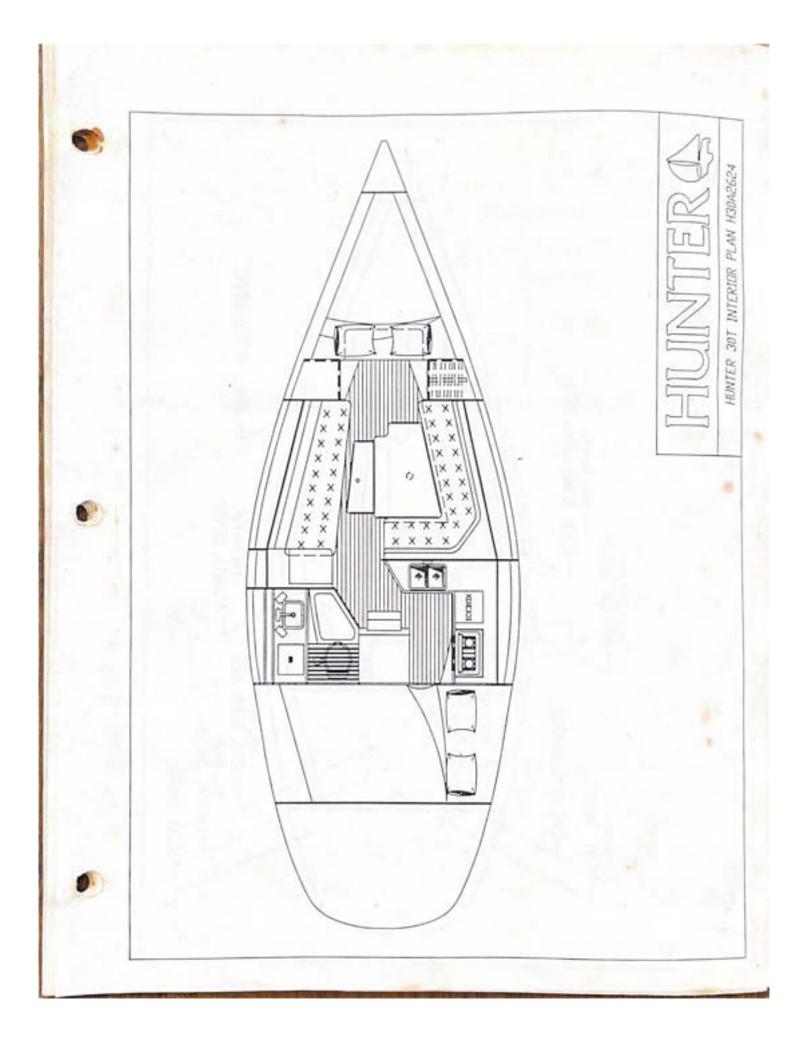
For the Authorized Service Center nearest you, please contact Seaward Products.

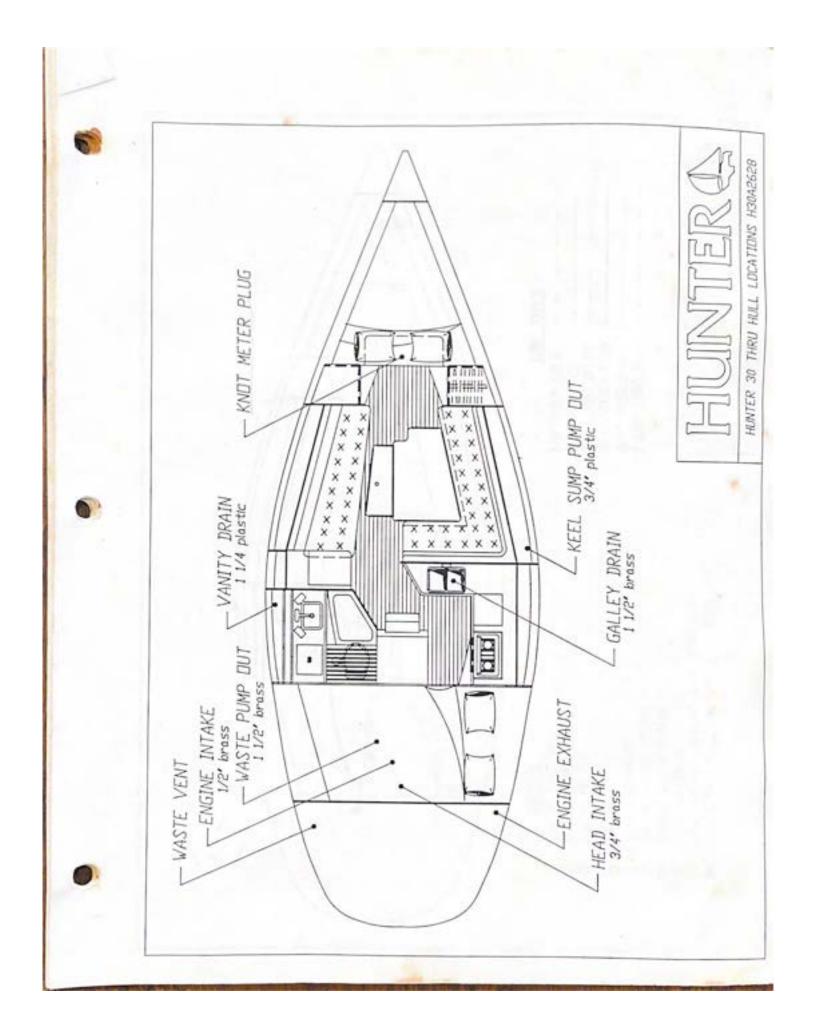
CUSTOMER SERVICE Seaward Products

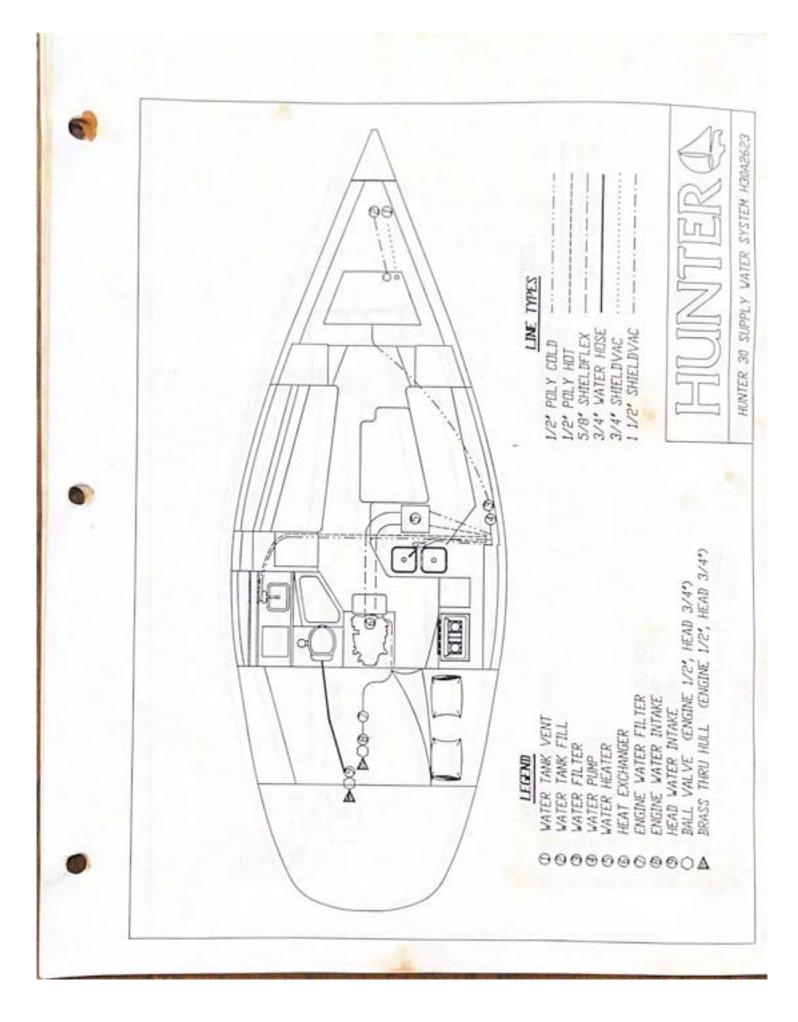
15600 SALT LAKE AVENUE CITY OF INDUSTRY, CA 91745 POST OFFICE BOX 566 LA PUENTE, CA 91747 PHONE: (818) 968-2117 FAX: (818) 330-5442

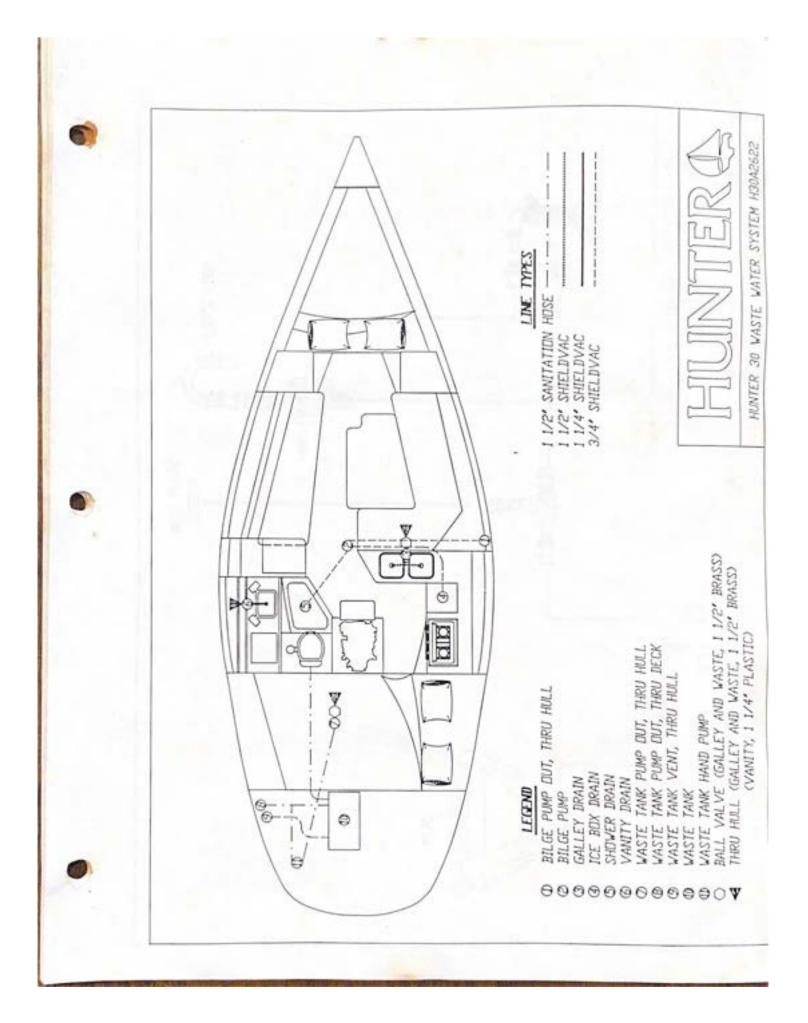
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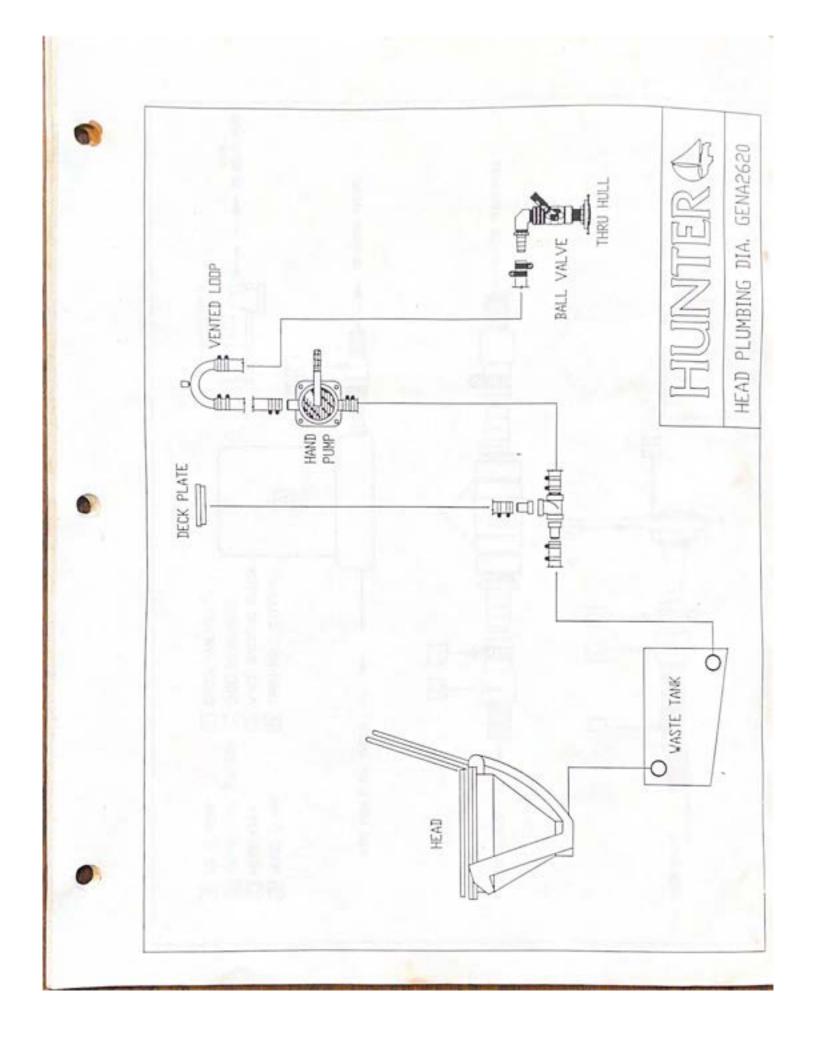
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

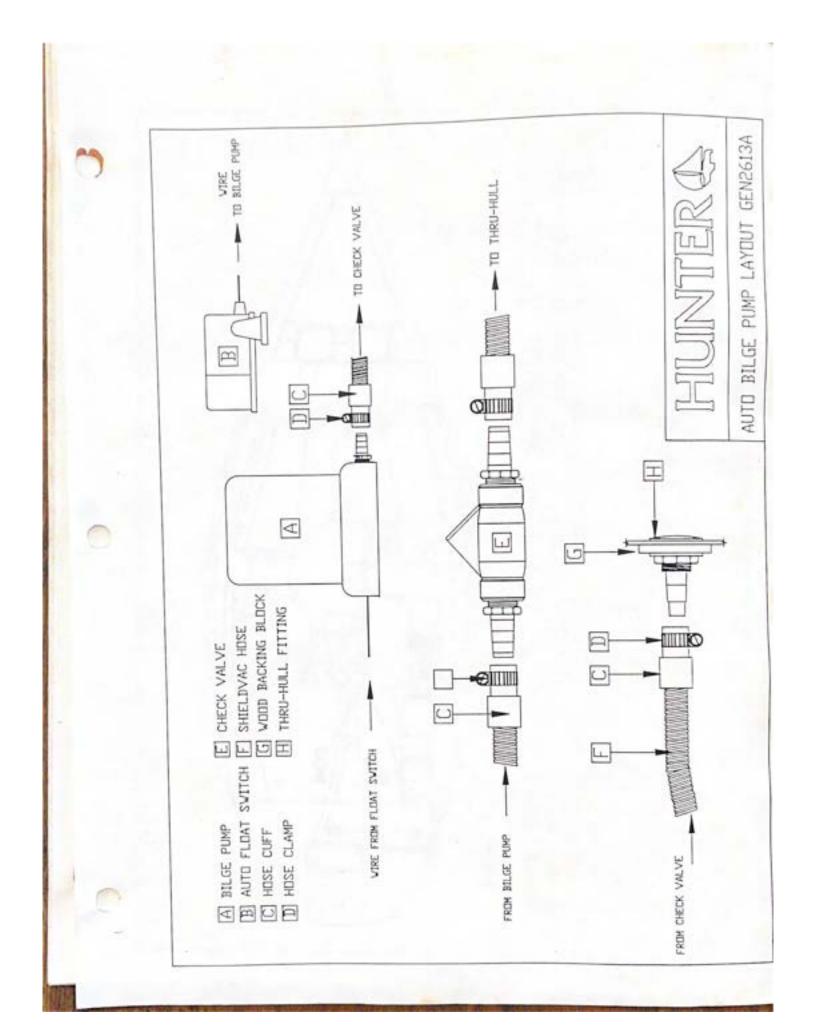


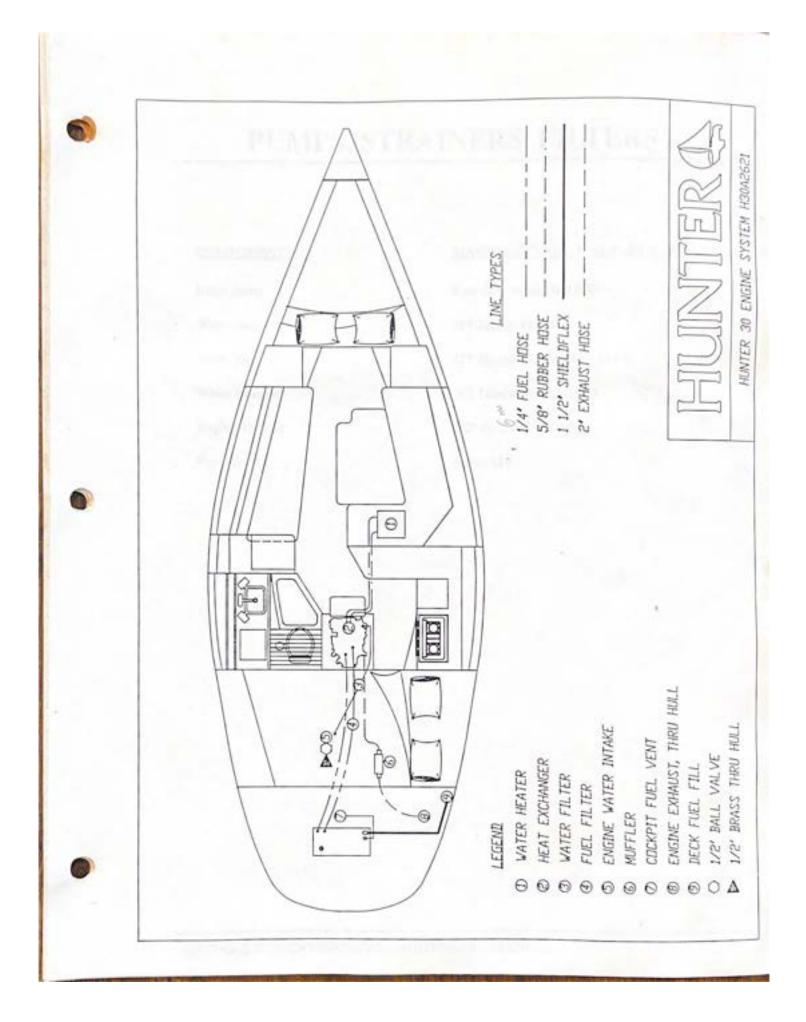












PUMPS, STRAINERS, FILTERS

COMPONENT

Bilge pump

Waste pump

Water pump

Water strainer

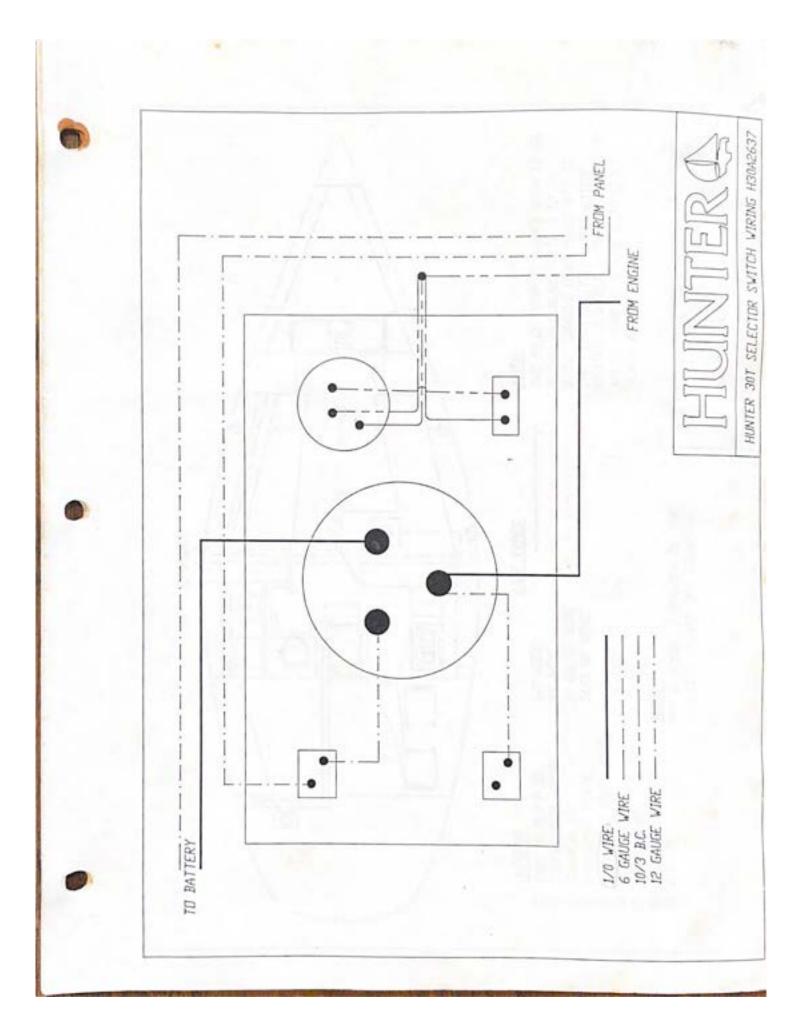
Engine strainer

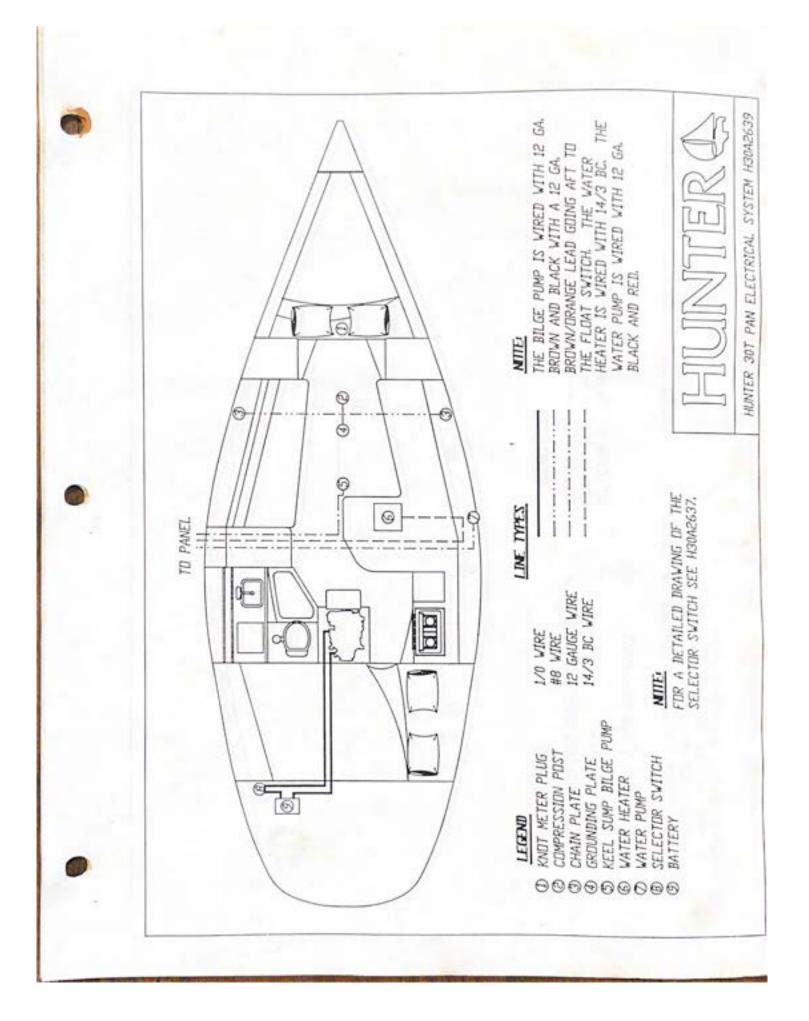
Fuel filter

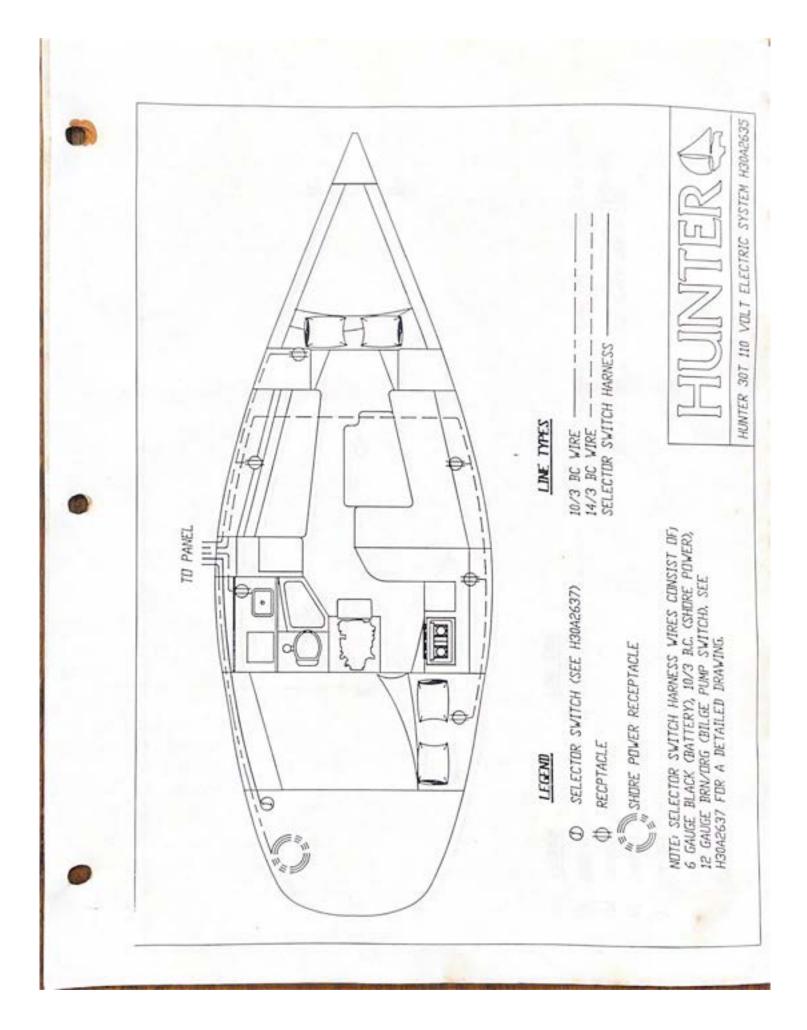
Rule 800 or Mayfair 800 ITT Jabsco #142M ITT Jabsco Flo-Jet 4405-143-C ITT Jabsco 364000-1000 1/2" Perko 493-004 PLB

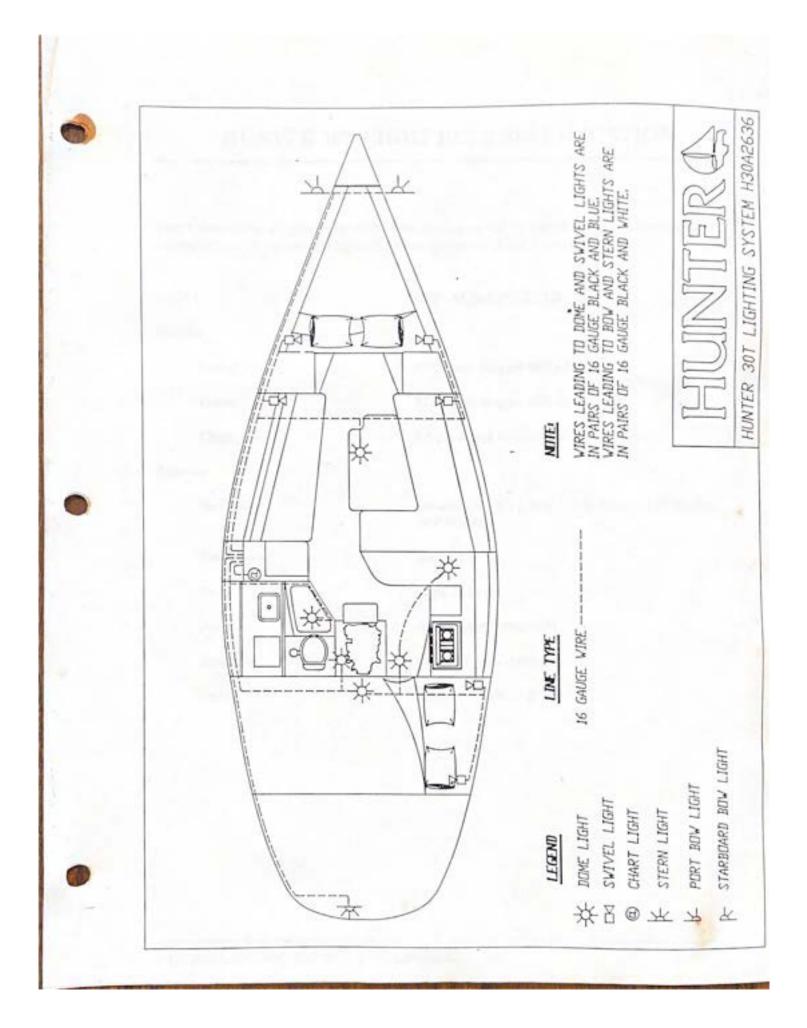
MANUFACTURER AND PART NUMBER

HUNTER/LEGEND/VISION/PASSAGE OWNER'S MANUAL









HUNTER 30T LIGHT BULB SPECIFICATION

Your Hunter 30 has 11 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
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
Deck	Perko #68-12V-20W

INSTRUCTIONS FOR PREPARATION FOR BOTTOM PAINTING

WARNING!

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

BOTTOM PAINTING

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

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

The rudder should always be bottom painted using a <u>white</u> 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.

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TEAK CARE

Teak wood is a high quality, extremely durable wood with a high oil content. In order to help you protect the original beauty of your teak interior, we have sealed the beauty of your interior with a 3 to 4 coat finish system of high quality Seafin Teak Oil, manufacturered 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.
- Wipe clean of dust and dirt with a clean rag. Note before applying oil wood surface must be dry.
- Wipe or brush on oil, allow to penetrate 5-15 minutes while surface is still wet.
- 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

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.

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 handwashing twice a season.

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. (46cm) 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 carn 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.

Electrolysis and Galvanic Protection

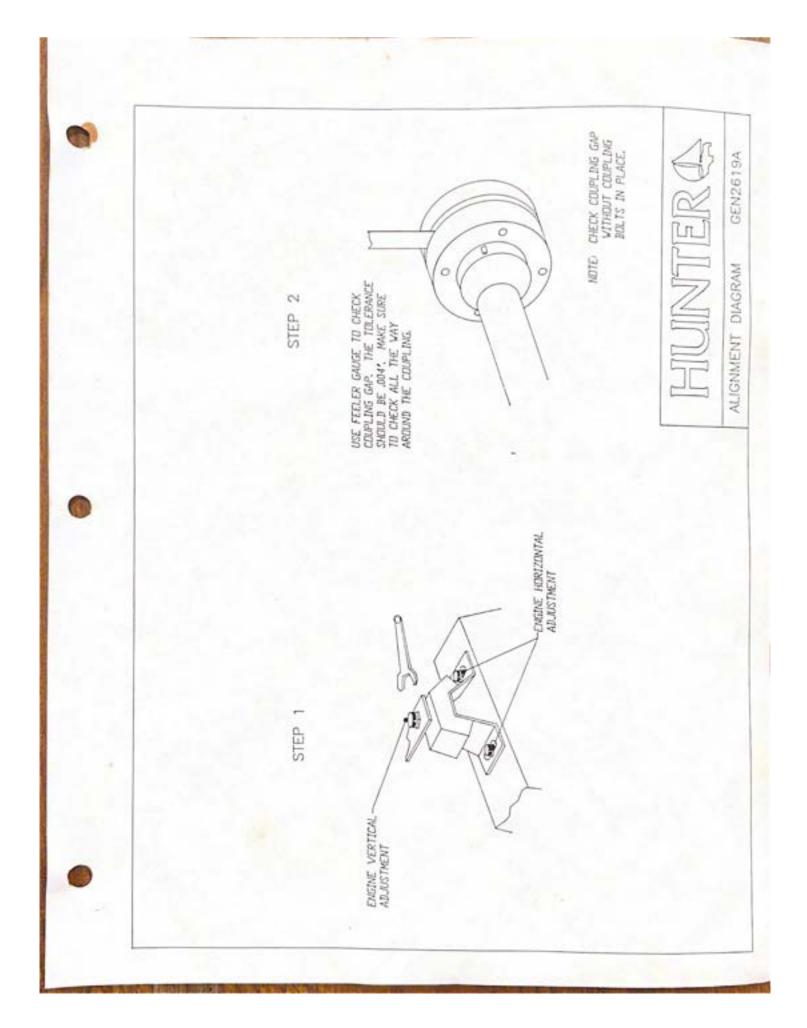
Salt water allows electric current to flow from anodic to cathodic material. Any two metals from two components, and their relative positions in the galvanic rating table, will determine which loses material (the anode) and which remains largely undisturbed (the cathode). The rate of wear is determined 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.

Alignment Procedure

- 1. Separate the coupling, move the shaft end back to clear the pilot in the center.
- 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.
- Now, adjust the engine mounts to allow the pilot on the coupling halves to slip together without moving shaft up, down, or sideways.
- 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.
- Tighten the locks on the adjustable mounts.
- Re-check coupling with feeler, re-adjust if necessary.
- Check stuffing box (allow to drip slightly).



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.

ENGINE

- 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.
- Disconnect the main battery cables from the battery terminals.
- 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.
- Put the piston at top dead center of compression stroke so that the intake/exhaust valves are completely closed.
- Apply a thin anti-corrosion treatment to the plating and exposed painted surfaces.
- The engine should be in a well ventilated area, and protected from any kind of dampness.
- Put a dust cover over the engine.
- 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.

THE COMPANY

The VIPLEX odyssey began in 1983, when five enterprising and adventurous individuals formed Viking Design, Inc. After the company's first highly productive year and a half, rapid and steady growth allowed the young company to relocate and expand the operation under the newly established VIPLEX Corporation name. Since, VIPLEX

NO. M. CO. MARCHINE AND



has continued to grow, entertain and enter new markets. Today, VIPLEX Corporation is the largest manufacturer of frameless acrylic marine windshields, hatches and doors. Much to the credit of the a inzi konde popula

VIPLEX Corporation, three of the original five investors remain vitally involved in the corporation.

VIPLEX Corporation employs a hard-working team of approximately 150 (in a 62,000 sq. ft. facility), all dedicated to the pursuit of true excellence. The VIPLEX team has continued to produce products of unsurpassed quality and maintained the original enthusiasm that turned a simple idea into what is now a successful reality.

Already VIPLEX has realized several of its original goals and gone on to explore many exciting new frontiers. At VIPLEX Corporation, the Viking pride and spirit lives on...



751 Enterprise Court Melbourne, Florida 32934 (407) 254-5880 FAX (407) 254-3128

CARE AND CLEANING OF ACRYLIC PARTS

DONT'S

- Do not subject acrylic material to high temperatures when polishing.
- Do not use glass cleaning sprays, scouring compounds, or solvents like acetone, gasoline, benezene, carbon tetrachloride or laquer thinner.
- Do not use masking tapes, duct tapes or packing tapes on your acrylic materials.
- Do not drill holes without proper drill bits in your acrylic materials (special bits are used in acrylic material to avoid damage).

DO'S

- Wash your acrylic hatches, windshields, and other acrylic components on your boat with a mild soap and plenty of lukewarm water.
- Use a clean soft cloth, applying only light pressure.
- Rinse with clear water and dry by blotting with a damp cloth or chamois.
- Grease, oil or tar may be removed with a good grade of hexane, aliphatic naphtha, or kerosene. These solvents may be obtained at a paint or hardware store and should be used in accordance with the manufacturers recommendations.
- To maintain a high-luster finish on your acrylics, we recommend that after properly cleaning, apply Megulars Mirror Glaze #10 with a soft towel. Note: If slight scratches appear on acrylics, use Megulars Mirror Glaze #17.

CUSTOM DESIGNED ACRYLICS FOR MARINE USE



The exceptional elegance and durability of CCRIAN* has made it a popular choice in fine homes and duranding commercial environments around the world.



CORIAN requires minimal corrector maintain its original beauty, even on the colors which are more prone to show as and smudges. CORIAN resists stains, impact, water damage and fading caused by exposure to sunlight. Ordinary and stubborn stains are wiped away, even scratches and cuts are easily removed.

ROUTINE CARE FOR CORIAN

On matte/safin finish, wiping the surface with a damp cloth removes water marks. For stains wipe with soapy water



or ammonia based cleaners. On stubborn stains, use an abrasive cleanser with a green Scotch-Brite* pad. For a like new appearance rub occasionally with pad alone,

On semigloss finish, use a non-abrasive cleanser and a white Scotch-Brite pad to remove stubborn stains. Rub occasionally to maintain original look with pad alone.

On high gloss finish, use only non-abrasive cleaners with a soft cloth or sponge to remove stains. For stubborn stains see care for minor scratches.



HEAT AND CORIAN

CORIAN will withstand heat better than ordinary surfacing materials; however, hat objects placed directly on CORIAN will mar the surface. Always use a hot pad or trivet equipped with rub feet to protect the CORIAN surface from hot pans and electrical appliances.

Registered higher optical the 2M Company

HYGIENIC QUALITIES OF CORIAN

CORIAN is one of the most hygienic and sanitary materials available. Independent laboratory tests have

shown that the non-porous surface of CON will not support the growth of geo or mildew. CORIAN is listed by the National Sanitary Foundation as a sanitary material.

PREVENTING DAMAGE TO CORIAN

Although CORIAN is resistant to permoment damage, avoid exposure to strong

chemicals. If strong cleaners such as paint removers, paint brush cleaners, metal cleaners, oven cleaners, cleaners containing methylene chloride, acetone (nail polish remover) and

acid drain cleaners come in contact, then quickly flush surface with plenty of soapy water. CORIAN is also highly impact resistant, but heavy or pointed objects striking the surface can leave damage.

REMOVING CUTS FROM CORIAN

On satin/matte finish, scratches and cuts can be sanded away starting with 120

grit medium sandpaper and following with 180 or 220 grit fine sandpaper until cut is gone. To restore the finish, use an abrasive cleanser and a green Scotch-Brite pad.

On semigloss finish, same procedures as on matte, but use a non-abrasive cleanser with a white Scotch-Brite pad.

On high gloss finish minor scratches and stubborn stains can be buffed away us white polishing compound and a low speed** polisher equipped with a wool pad. Finish with a counter top wax.







QUALITY AND CORIAN

When properly cared for, CORIAN will remain as beautiful and elegant as the day it was installed. Du Pont stands behind this promise with a warranty as strong as our product.

UNPRECEDENTED 10-YEAR INSTALLED WARRANTY

Du Pont now backs CORIAN with the best warranty program in the business—the industry's first 10-year *installed* limited warranty that guarantees the product quality of CORIAN plus its fabrication and installation. To ensure your CORIAN project is covered by Du Pont's *installed* limited warranty, the material must be fabricated and installed by a Du Pont Certified or Approved Fabricator/ Installer. Please see an Authorized CORIAN Dealer for more details.

For more information or assistance call 1-800-4-CORIAN.

QUPOND

Living With The Best."

CORIA

H-33455-1 4/92

PEDESTAL STEERING MAINTENANCE

To properly maintain the moving parts in the top of the pedeital, it is necessary to remove 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 Tellon Lubricant into the holes located on top of the bearing hotsings 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 "J0 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 splicters 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 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

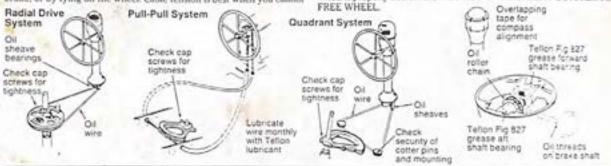
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care and operation of the Steering System and engine controls. One person must be assigned the job of maintenance and must be thoroughly familiar with the operation and intent of all the equipment. If at any time your Steering System makes strange 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 tailure 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



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 susproof. 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.

INTERNATION

component	lubricant	schedule	1st year 19	Ind year	3rd year 19	4th year 19	Sth year	Sth year 19	71h year
sheave bearings	#30 ol*	check and oil monthly			1.000			1	
pull-pull cables	Tellon Fig 827	check and grease monthly		-	100				
wire rope	#00 oil*	check and oil annually	÷.		1				
roller chain	#30 oil*	check and oil annually		1.0		1	100		
pedestal shalt bearings	Tellon Fig 827	check and grease annually			1.00				-
	We recommend #	30 weight motor oil since most t		ave it aboard and lubricated		-		-	-

INTERNATIONAL

460 NOUSTRIAL PARK ROAD, NEW BEDFORD, MA 02745-1202 - TEL: 508-985-8711 - FAX 508-995-5021

PEDESTAL STEERING ASSEMBLY

As a further service to our customers we have an illus-trated trated 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 14" or 1" hex nut.
- 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.
- Put a cloth just under the sprocket so no parts drop down.
 Align the notch in the aft nylon washer with the "V" stamped on the 5
- Carefully drive the pin out of the sprocket (drive from the round end toward the grooved end).
- With a piece of wood against the %" 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 alt 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.

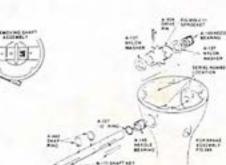
When ordering spare parts give the pedestal serial number, part number, part name, and quantity Your order will be filled promptly.

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.

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BARRAY LOCAT

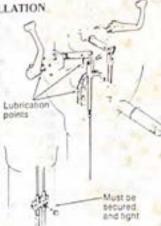


BODDI, DIA DA SUN ARDINITALS

6.02



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 instatled 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 benken 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.

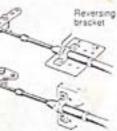
Transmission lever "flopped" directional shifting - Fw'd is

forward, etc.

Another meth

transmission

of reversing the



Two holes must be provided the engine throttle lever to optionally select the proper travel. Holes, both 1³4" R or 21+" R. Inner hole will provide increased throttle travel control handle pressure

Typical working end clamping brackets with extra holes for centering and reverse it required. Straight lead is very important.





Clamp must be on the same plane as the operating lever.

ENGINE CONTROLS MAINTENANCE

Oil the control handle shaft bearings with "30 motor oil. Use a good grade of Tellon 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 Tellon 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,

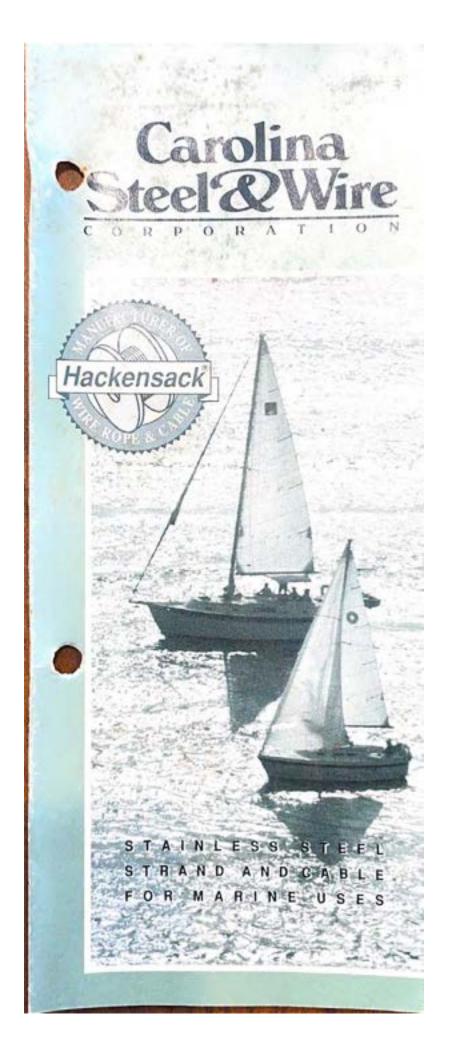


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INTERNATIONAL



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Stain	less St	eel 302		less SI
Buneter (Riches)	Breaking Strength Peunds	Nogis Panta Nifest	Diameter (Inshes)	Bernieg Derigh
1 x	19		1 x	19
1/16"	500	8.5	1/15*	
3,92"	1200	20.0	3,32"	1150
1/8*	2100	35.0	1/3*	1780
5/32"	3300	55.0	5,32"	2800
3/16*	4700	77.0	3/16*	4000
7/32*	6300	102.0	7/32"	5350
1/4*	8200	135.0	1/4"	6900
9,32*	10300	170.0	9/32"	9400
5/16*	12500	210.0	5/15*	10500
3/8"	17500	300.0	3/8"	14808
7/16*	22500	410.0	7/16*	20000
1/2"	30000	521.0	1/2"	27000
9/16"	36200	670.0	9/161	32400
5/8	47000	855.0	5/8	42000

		1 1	1	
		3,64"	270	4.2
+	1.141	1/16*	480	7.5
1150	21.1	3/32"	920	16.0
1780	35.1	1/8*	1700	28.5
2800	53.1	5,32"	2400	43.0
4000	72.8	3/15*	3700	62.0
5350	102.1	7/32*	5000	83.0
6908	105.0	1/4"	6400	105.0
9400	170.8	9/32"	7800	134.0
10500	210.8	5/16"	9000	167.0
14898	305.1	3,8"	12000	236.0
20000	410.8			
27000	521.0	3	+	
32400	670.8	+	÷.	
42000	1.02	-	•	

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Stainless Steel

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Stain!	ess Ste	el .	Stain	less Ste	el 302
Ŧ		316	Ŧ	1000	Weight
Duneter (Inches)	Brisking Strength Provid	Weight Prondix W Feet	Earster (a)ME	Bening Steruth Textus	Pacifi B. Fet
7 X	7		7 x	19	
3/64"	240	4.2	18.00	-	-
1/16*	360	7.5	1/16"	480	7,5
3/32"	700	16.0	3/32"	920	16.0
1/0"	1360	28.5	1/8*	1760	29.0
	+		5/32"	2400	45.0
		14	3/16"	3700	65.0
-	1		7/32"	5000	86.0
			1/4*	6400	110.0
4		4	9/32"	7800	139.0
		1 .	5/16*	9000	173.0
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-	· · ·	1.00	
7.5			
16.0	-		+
29.0	1/8"	1300	29.0
45.0	5/32*	2000	45.0
65.0	3/16"	2900	65.0
86.0			+
110.0	1/4*	4900	110.0
139.0	-		-
173.0	5/16"	7600	173.0
243.0	3,8"	11000	243.0
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Stainless Steel

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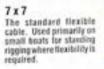
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7 X



1 x 19 Designed primarily for standing rigging on me-dium and large size boats. (left hand lay only)





7 x 19

The most flexible of marine cables. High strength and resistance to crushing loads. Used for goyt, halyards, running back-stays, topping lifts and wire sheets.

WHITE VINYL COATED

Commonly used for hand-raits and life lines. Out-side diameter of coating same as shank diameter of swaged fittings.

WHIT	WHITE VINYL COATED 302					
Bare Cable	Vinyt Outer Okameter	Breaking Strength Paunda	Weight Paunds Milfeut			
7 x	7					
1/16"	1/8*	480	13.5			
1/8*	7/32"	1700	41.0			
1/8*	1/4*	1700	45.0			

3700

3700

6100

80.0

92.0

145.0

1/4*

5/16*

3/8"

3/16"

3/16"

1/4*

Ľ preformed stainless steel strand and cable for quality rigging. Our expert technical staff tightly monitors and controls each stage of the manufacturing process. That means you're getting the best rigging wire available for ensured product durability and longer life. Ottering you clean. uniform, fatigue and corrosion resistant Hackensack" quality rigging products.

PROTECTING YOUR RIGGING

o matter how good your rigging is, withcareful inspection and proper maintenance it is subject to tatigue, wear, discoloration, and, therefore, product failure. Remembening to inspect and clean will increase the life of your investment and secure your rigging. We would like to suggest the following:

Always rinse your rigging with tresh water after sailing. Especially after sailwater sailing. Sall can create corrosion pits, causing cracks and deterioration. In these severe corrosion conditions we recommend using high corrosion resistant alloy type 316.

Clean with a water soluble detergent without chlorine. Non-abrasive cleancers are best for hard white vinyl coated cables.

Store wrapped rigging with twine. Never use tape. Tape causes moisture, attracts dirt, and leaves residue that creates corrosion.

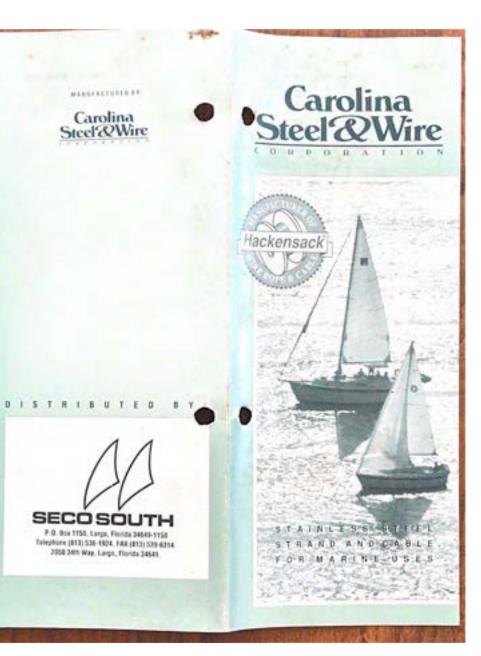
Inspect rigging for stains. Rust stains may indicate stress cracks or corrosion. Remove stains with synthetic or brass pads. Never use steel wool pads.

Look for broken wires - a sign of fatigue in ging. Replace standing rigging if wires are broken.

Never mix stainless steel and galvanized metals on cable, fittings, pins, cotter keys, etc. If mixing dissimilar metals, electric currents may conduct between metal causing rapid deterioration.

After un-stepping, make sure to release all standing rigging to avoid bending, crushing, and kinking.

Store rigging in a dry place. Never store in a plastic bag. Plastic, like tape, causes corrosion.



IM LEWMAR EXTENDED WARRANTY

Warranty Statement:

- · Winchez Modelz 6-66 inclusive, wijf-tailing & standard
- Powered Winches Models 40-66 inclusive
- Ponlights
- Hatches
- * Hardware
- Windlass Models 700 2500 inclusive

Lemmar 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 ecceptions lated 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 dimension.

Conditions and Limitations:

 Warranty only applies to the first two owners of the ysoft manufactured by HUNTER MARINE, CORP. and products installed by them as original equipment

Warranty does not apply to yachts used at any time for charter.

 Lewmar's liability shall be limited to repair or replacement of goods or parts defective in materials and workmanzhip.

4. Determination of the mutability of the product for the use contemplated by the buyer is the sale responsibility of the buyer and Lewmar shall have no responsibility in connection with such sustability.

5. Levenar shall not be hable in any way for:

a. Failures due to use of products in applications for which they are not intended.

 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 Lewman Satiboat Equipment catalog.

Conditions and Limitations (Continued)

 Product subject to warranty claim must be returned to the head US office of Lewmar Marine (International Marine Marketing) for commution unless otherwise agreed by Lewmar (IMM) in writing.

 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 (DASA) will cover the cost of the return shipment with the method matching that of the customer return.

 Service by anyone other than an authorized Lewmar representatives shall void this warranty whees it accords with Lewmar guideline's and standards of workmanship.

Exceptions:

 Warranty is limited to one year in the case of the following:

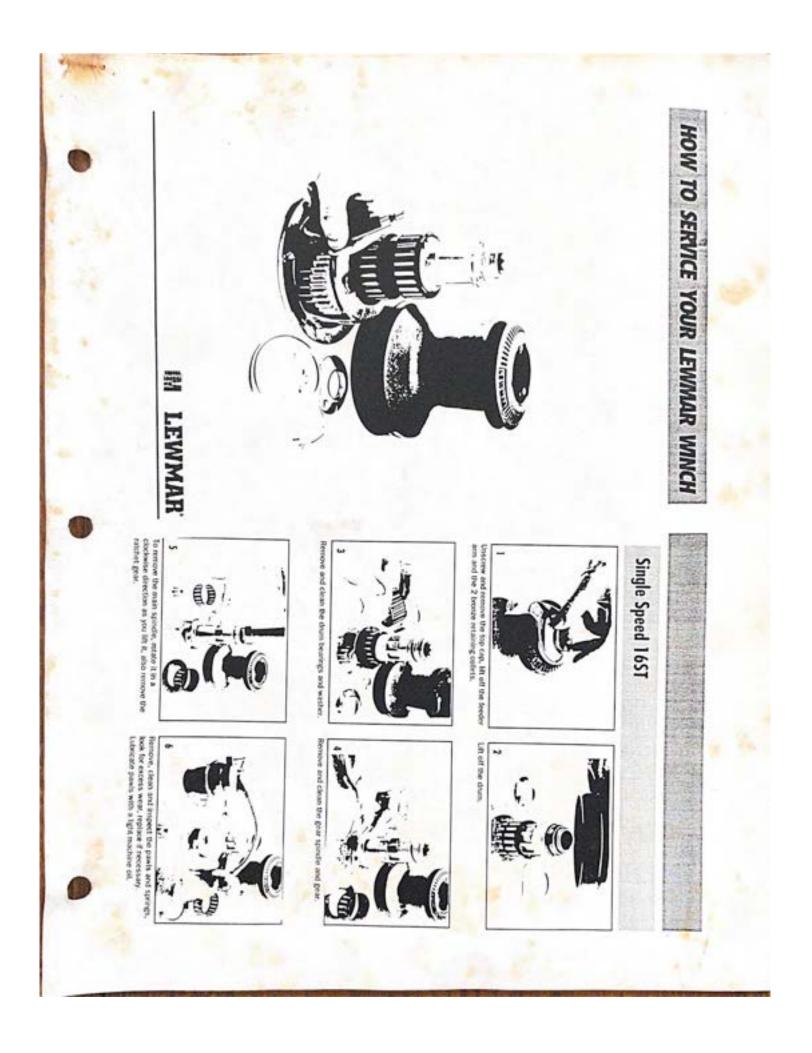
- * Electric Motors and Electrical Equipment
- Electric Controls
- * Hydraulic pumps, valves and actuators
- Weather seals
- Products used in "Orand Pris" racing applications

 There are no warranties of merchantibility 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 uner. Some countries do not allow limitations on how long an implied warranty last.

 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 many not apply to you.

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

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	
		International Marine Marketing Inc.,
Date Registered:		P.O. Box 308, New Whitfield ST.



SE RVICING THE TWO TYPES OF SPRUNG JAWS

Single Speed 16ST



Lightly greate the rationst gear, place it in position with the rationed facing up as shown.



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

-0



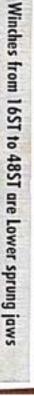
The assemble in reverse of the above, remember to Rightly grease all gears, ratchets tracks and **D**



Carefully 5h off the crowns and 5h out the

dauds.

5



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 6651).

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.



oil. Reassemble. springs, look for excess wear, replace as necessary. Lubricate pawls with a light machine



To replace the drust you will need to use a small blacked screwdriver to close the pawls,



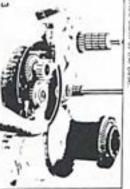
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2 Speed 66ST



Unscrew top cap, remove the feeder arm and training collets. Lift off the deam, Undo and remove the 6.5 10mm faing access holding the centre stem to the base.



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



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



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

Remember to lightly grease all beavings and moving parts.

u



Lightly grease the ratchet gears and beaving surfaces. Remember to replace the plantic washer shown before re-assembling these group.





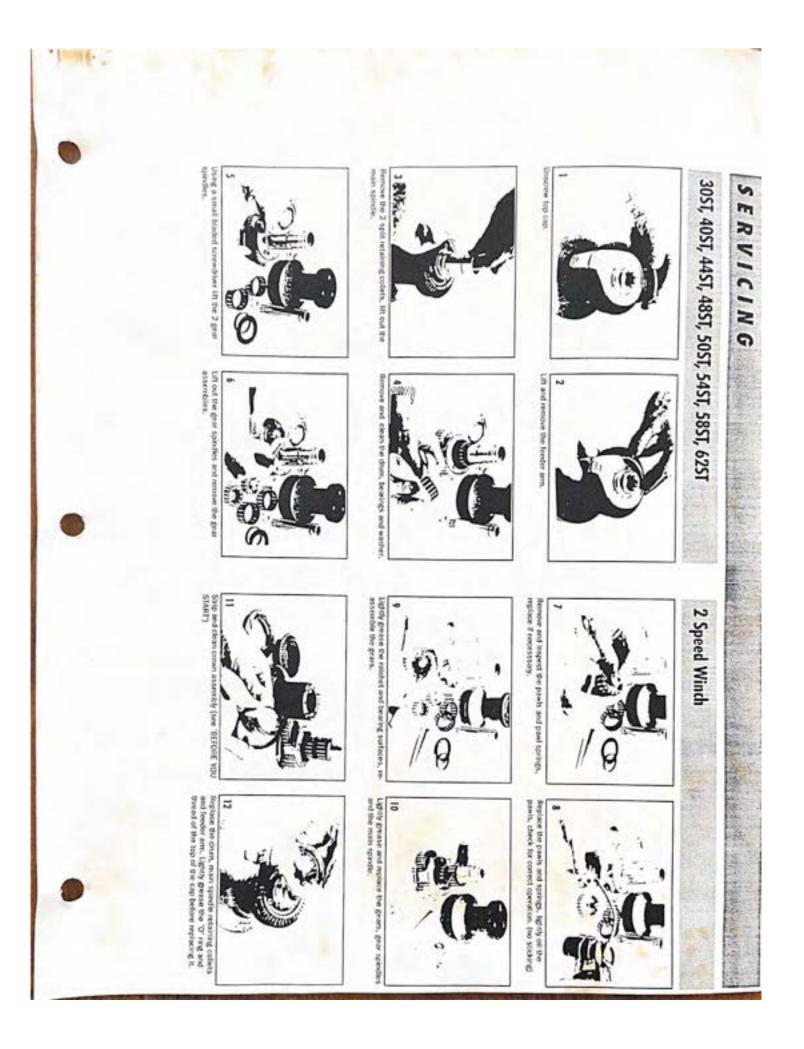
Care should be taken when replacing the churn washer. Ensure the chamter is facing down when replacing the washer.

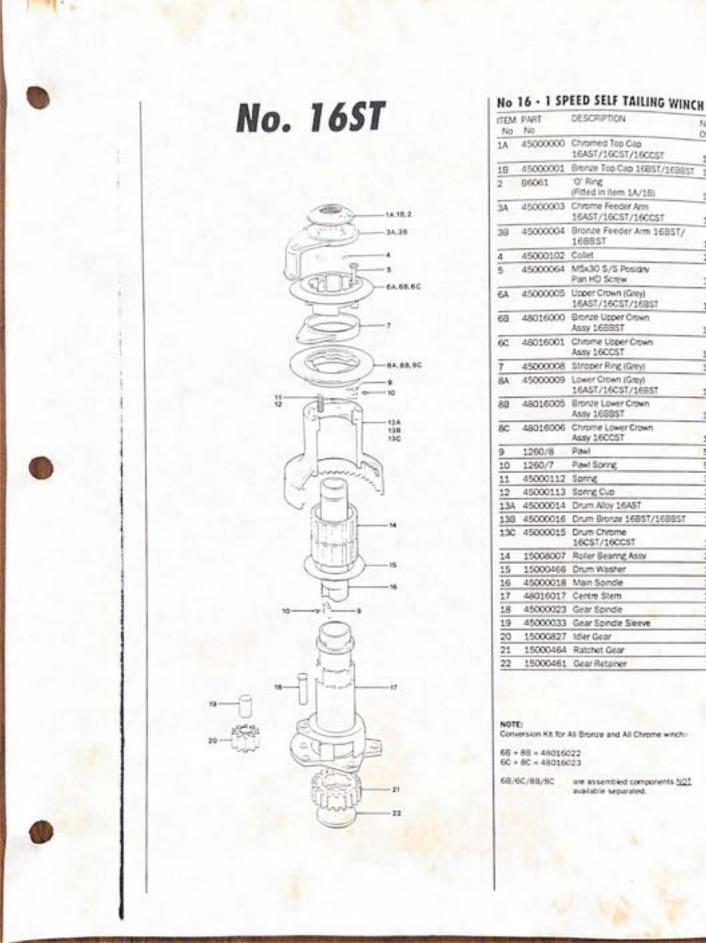


Note: Remember to use only light mechine oil to jubricate the pawle.

Using a cross headed screwdriver, ennove the 3 screws securing the pawl retaining plate. Clean and inspect all pawls and springs, replaced necessary.

18.





3 45000005 Upper Crown (Grey) 16AST/16CST/168ST 1 48016000 Bronze Upper Crown 1 48016001 Chrome Upper Crown 1 45000008 Streper Ring (Grey) 1 45000009 Lower Crown (Grey) 16AST/16CST/16BST 1 48016005 Bronze Lower Crown 1 48016006 Chrome Lower Crown 1 5 5 3 з 13A 45000014 Drum Alloy 16AST 1 138 45000016 Drum Bronze 1685T/16885T 1 16CST/16CCST 1 15008007 Roller Bearing Assy 2 15000466 Drum Washer 1 1 1 1 45000033 Gear Spindle Sleeve 1 1 1 1

No

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1

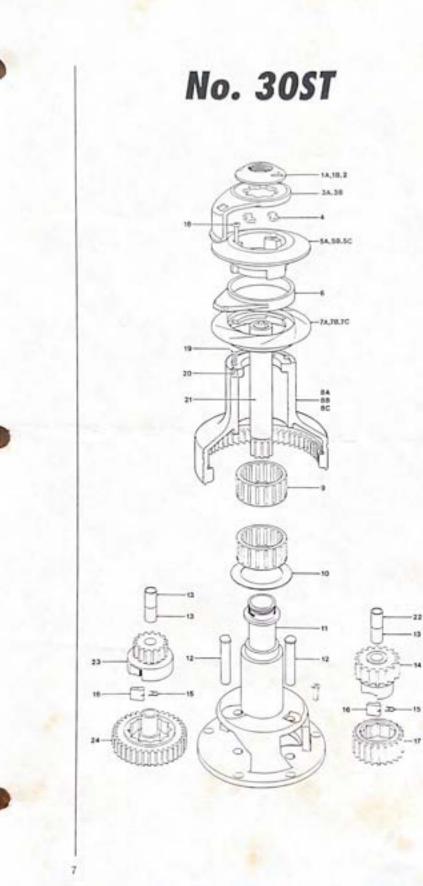
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Conversion Kit for All Bronze and All Chrome winch-

are assembled components NOT available separated.



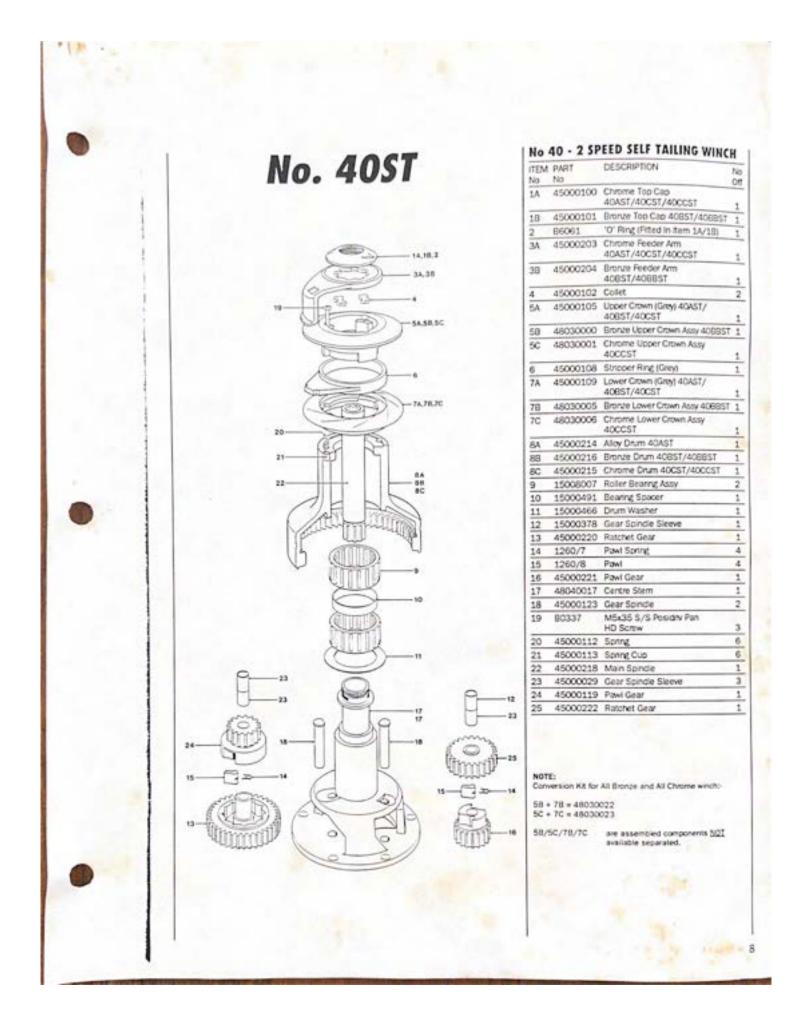
ITEM No	PART	DESCRIPTION	NO
1A	45000100	Chrome Top Cap 30AST/30CST/30CCST	
18	45000101	Bronze Top Cap 3085T/30885T	1
2	B6061	'O' Ring (Fitted in Rem 1A/18)	-
34	45000103	Chrome Feeder Am 30AST/30CST/30CCST	
38	45000104	Bronze Feeder Am 308ST/308BST	
4	45000102	Colet	-
5A	45000105	Upper Crown (Grey) 30AST/30EST/30CST	-
58	48030000	Bronze Upper Crown Assy 308851	_
5C	48030001	Chrome Upper Crown Assy 30005	T:
6	45000108	Stripper Ring (Grey)	1
7A	45000109	Lower Crown (Grey) 30AST/3088ST/300ST	
78	48030005	Bronze Lower Crown Assy 306857	
70	48030006	Chrome Lower Crown Assy 30CCST	
8A	45000114	Alloy Drum 30AST	1
88	45000116	Bronze Drum 308ST/3088ST	
8C	45000115	Chrome Drum 30CST/30CCST	1
9	15008007	Roller Bearing Assy	1
10	15000466	Drum Washer	1
11	48030017	Centre Stem	1
12	45000123	Gear Spindle	1
13	45000029	Gear Spindle Sloeve	-
14	45000119	Powi Gear	1
15	1260/7	Pawi Spring	-
16	1260/8	Pawi	
17	45000120	Ratchet Gear	1
18	80326	M5x30 S/S Posidity Pan HD Schrw	4
19	45000112	Spring	ŧ
20	45000113	Soring Cup	ŧ
21	45000118	Main Spindle	1
22	15000378	Gear Spindle Sleeve	1
23	45000121	Pawi Gear	1
24	45000122	Ratchet Gear	1

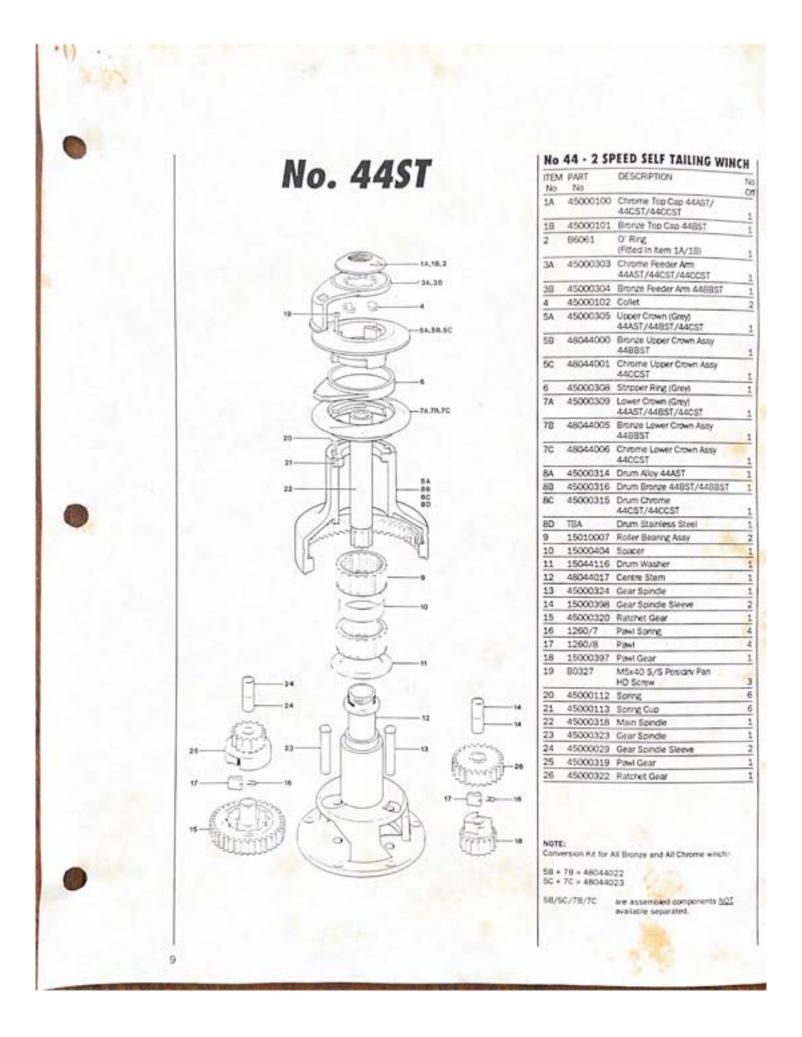
NOTE: Conversion Hit for All Bronze and All Chrome winch-

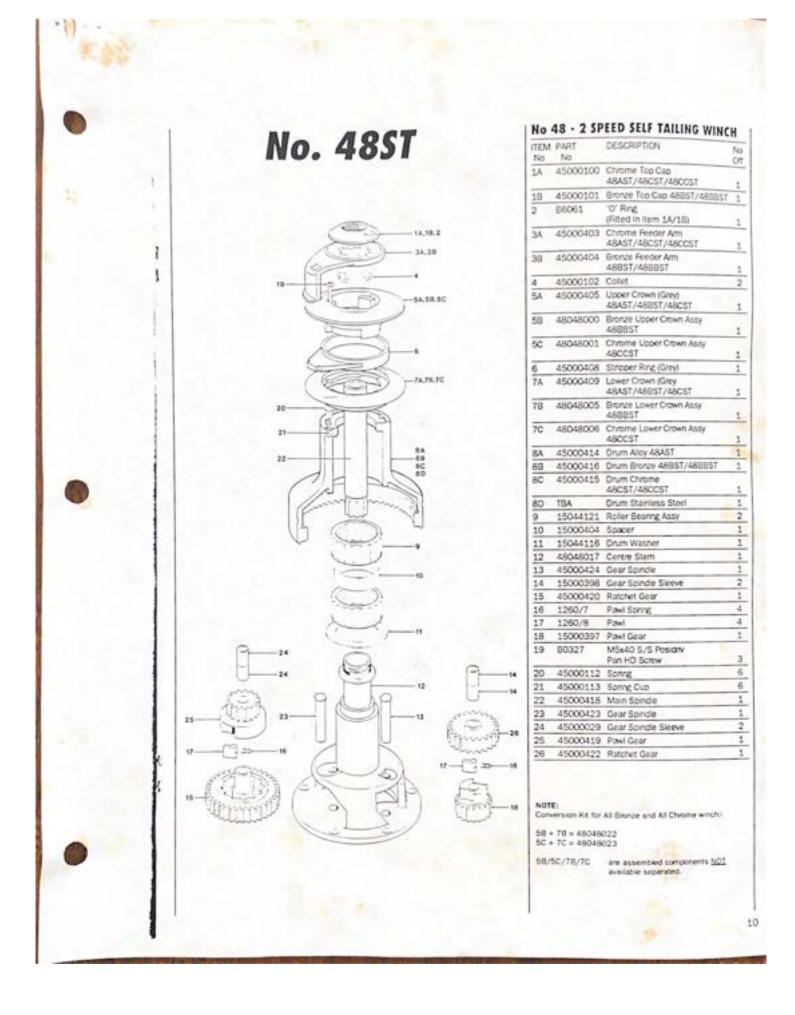
58 + 78 = 48030022 5C + 7C = 48030023

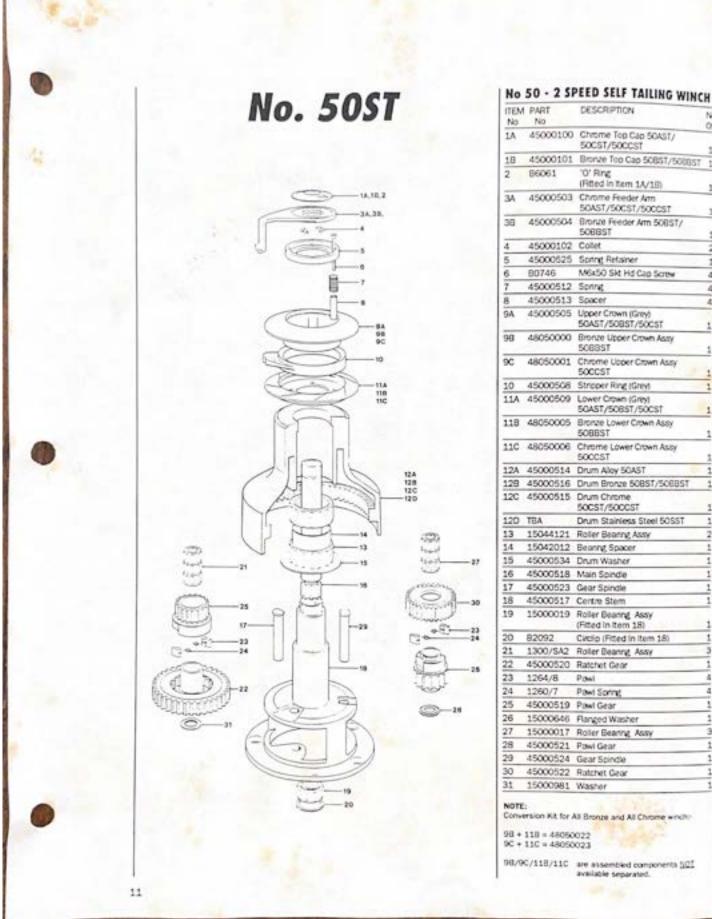
58/5C/78/7C

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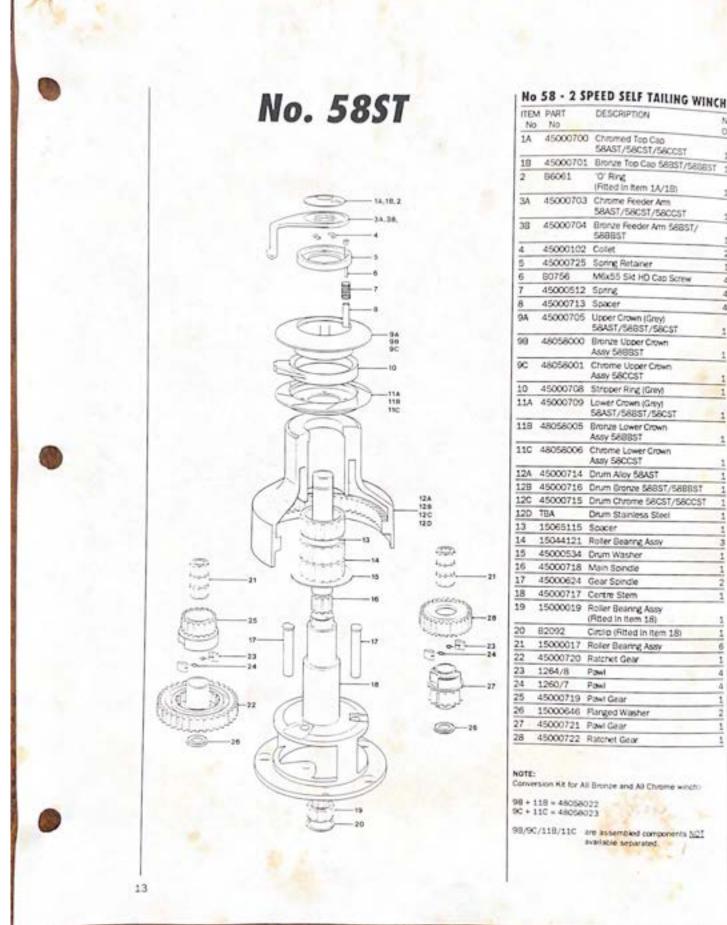


48050001	500CST	1
45000508	Stripper Ring (Grey)	1
45000509	Lower Crown (Grey) 50AST/50BST/50CST	1
48050005	Bronze Lower Crown Assy 5088ST	1
48050006	Chrome Lower Crown Assy 50CCST	1
45000514	Drum Alley 50AST	1 1
45000516	Drum Bronze 508ST/5068ST	1
45000515	Drum Chrome 50CST/50CCST	1
TEA	Drum Stainless Steel 50SST	1
15044121	Roller Bearing Assy	2
15042012	Beaning Spacer	1
45000534	Drum Washer	1 1 2 1 1 1
45000518	Main Spindle	1
45000523	Gear Spindle	1
45000517	Centre Stem	1
15000019	Roler Bearing Assay (Fitted in Item 18)	1
92092	Circlip (Fitted in Item 18)	1
1300/SA2	Roller Bearing Assay	3
45000520	Ratchet Gear	1
1264/8	Powl	-4
1260/7	Pawt Spring	4
45000519	Pawl Gear	1
15000646	Flanged Washer	1
15000017	Roller Bearing, Assy	3
45000521	Pawi Gear	1
\$5000524	Gear Spindle	4 4 4 0 4 4 4 4 4 4
45000522	Ratchet Gear	1
15000981	Washer	1
tion Kit for 10 = 48050 10 = 48050		

No

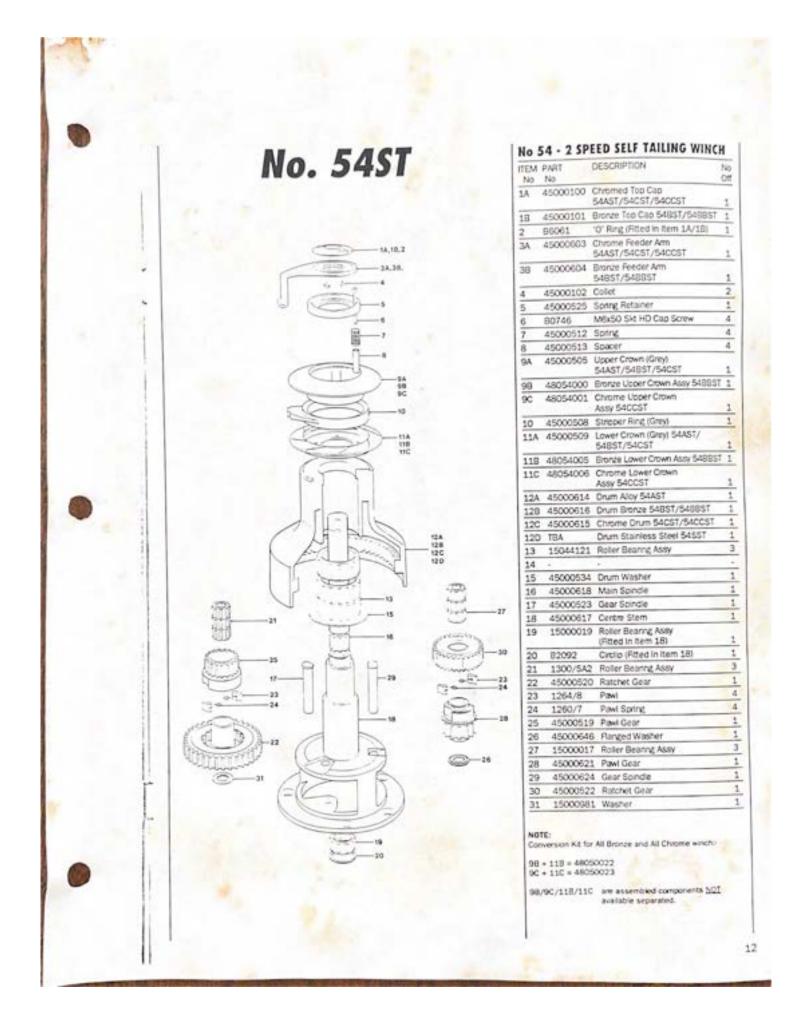
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98/9C/118/11C are assembled components SQL available separated.



ITEM No	No	DESCRIPTION	1
14	45000700	Chromed Top Cap 58AST/58CST/58CCST	0
18	45000701		
2	86061	'0' Ring	
-		(Fitted in item 1A/1B)	
3A	45000703	Chrome Feeder Am 58AST/58CST/58CCST	
38	45000704	Bronze Feeder Am \$6851/ 568851	
4	45000102	Collet	-
5	45000725	Soring Retainer	
6	B0756	M6x55 Sid HD Cap Screw	
7	45000512	Spring	-
8	45000713	Spacer	-
0A	45000705	Upper Crown (Grey)	4
		58AST/58BST/58CST	3
90	48058000	Bronze Upper Crown Asiay 588851	1
90	48058001	Chrome Upper Crown Assiv 58CCST	1
10	45000708	Stroper Ring (Grey)	1
11A	45000709	Lower Crown (Grey) 58AST/58BST/58CST	3
118	48058005	Bronze Lower Crown	1
110	48058006	Assy 588851 Chrome Lower Grown	1
		Assy 58CCST	1
and the second second	45000714	Drum Aloy 58AST	1
	45000716	Drum Bronze 58857/588857	1
and the second second	45000715	Drum Chrome 58CST/58CCST	1
Contractory of the local division of the loc	TEA	Drum Stainless Steel	1
	15065115	Soacer	1
	15044121	Roter Bearing Assy	3
	45000534	Drum Washer	1
	45000718	Main Sondie	1
-	45000624	Gear Spindle	2
18	45000717	Centre Stern	1
19	15000019	Roller Bearing Assy (R0ed in item 18)	1
20 8		Circlip (Fitted in Item 18)	î
21		Roller Bearing Assy	6
		Ratchet Gear	ĩ
-	the second s	Pawl	â
		Post	ĩ
Contractory of the local division of the loc	1.00.00.00.00.00.00.00.00.00.00.00.00.00	Powl Gear	1
		Flanged Washer	2
-	and the second se	the second s	-
27 4	\$5000721	Pawl Gear	1

98/90/118/110 are assembled components NOT available separated.



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EB 206/2

OWNER'S NAME		
STREET		
CITY	STATE	ZIP
BOAT DEALER		
DEALER ADDRESS		
BOAT BUILDER	LE	NGTH
CLASS	YEAR BUILT	
HULL#	EDSON SERIAL #	
EDSON SERIAL NO LO	CATED ON INSIDE OF PEDESTAL	ROWL RENEATH COM

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

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	 Quadrant-at rudder post Radial Drive-at rudder post Engine Controls at handles and cable holder
Nuts	 Wheel Pedestal Bolts Idler Sheaves Wire Take Up Eyes on Quadrant or Radial Drive
Bolts	 Outer radius joint of Radial Drive Sheave housings Rudder stop on Radial Drive
Cotter Pins	 Chain ends Sheave Pins 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.

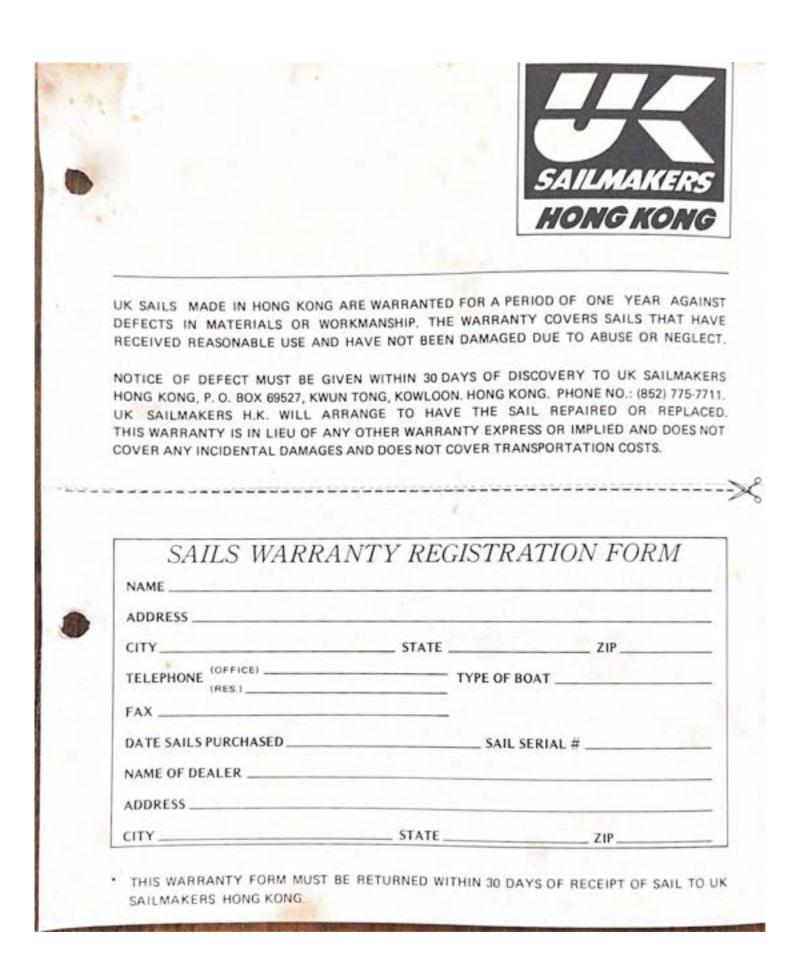
Be sure that all crew members are familiar with the care and operation of the steering system as well as the location and use of the emergency tiller. This guide, the maintenance guide, and the catalog, should be kept on the boat for reference purposes.

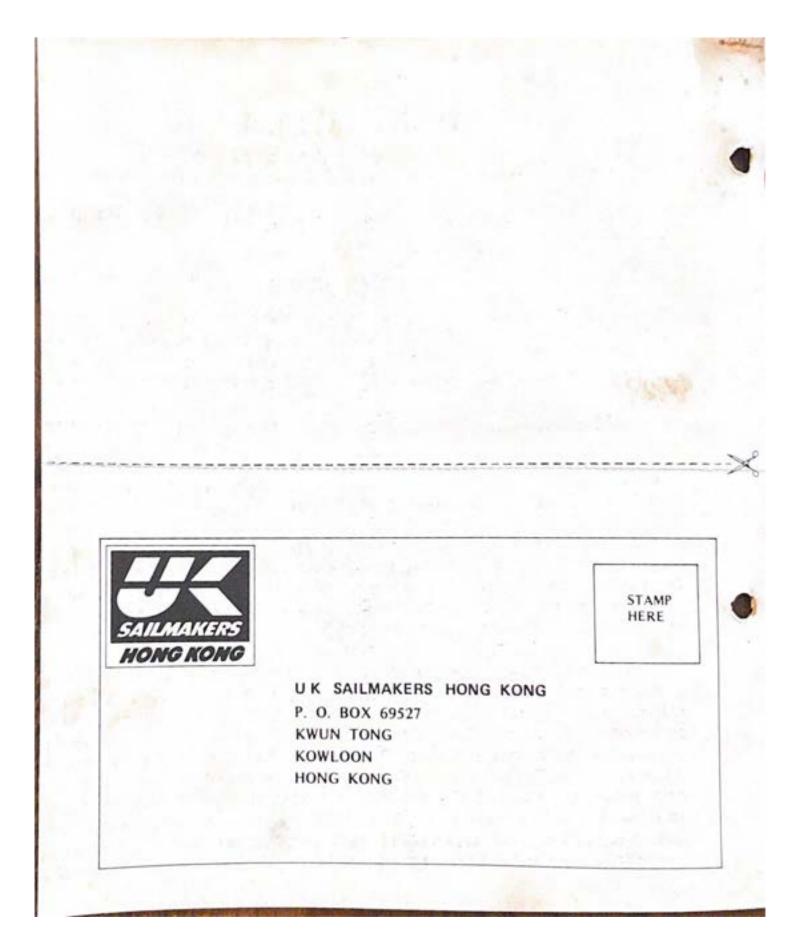
> PLACE STAMP HERE

Edson International

460 INDUSTRIAL PARK RD NEW BEDFORD, MASS. 02745

ATT: CUSTOMER SERVICE DEPT.





HUNTER MARINE LIMITED WARRANTY

The following warranties apply to all 1993 Model Year boats produced by HUNTER MARINE CORPO-RATION:

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. Transporation, 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.

- Page 1 of 3

HUNTER/LEGEND/VISION/PASSAGE Owner's Manual

HUNTER MARINE LIMITED WARRANTY

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 MERCHANTA-BILITY 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 CONSEQUEN-TIAL 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.

- Page 2 of 3 -

HUNTER/LEGEND/VISION/PASSAGE Owner's Manual

HUNTER MARINE LIMITED WARRANTY

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

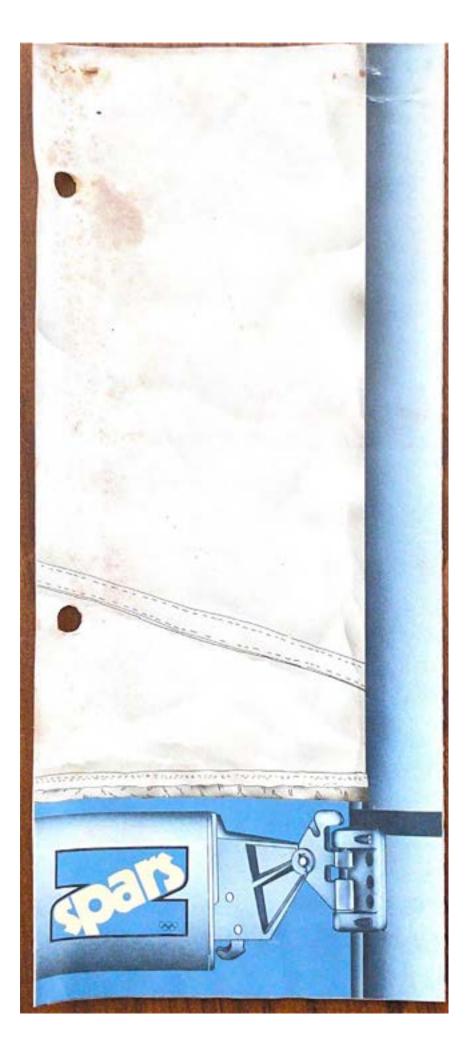
During the first year of ownership, the first purchaser will receive two Customer Satisfaction Surveys - the first (CSS#1) will be received shortly after taking delivery and focuses on the dealer's ability to sell and commission the boat, and the Owner's initial satisfaction. The second survey (CSS#2),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

-Page 3 of 3-

HUNTER/LEGEND/VISION/PASSAGE Owner's Manual

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L. COLLINGANE

2 Officient improves wanted to reprove on the baddenial practice of westing latious instalment brackets to the spar. Alaminges is its head electricie material and can be westioned by the westing

The solution developed at 2 Datason first setters age with an improvement over all existing attachment systems. High-strength catraluminum spreader brackets, matchaot and generated to the travel. This memory with indelly object and is now the standard for matclonalization in Europe.

In addition to othering souchural advantights, march by Z-Spins, USA obst consomably lints than comparable march because of humanus production efficiences

A NEW GENERATION OF FURLING MASTS

2 Diffusion's leadership in spar engineering has also been applied to a new generation of roller fusing mette for boats how 28 to 60 feet.

The tea impor praebacks of traditional funding month howe been less than accordable mechanical performance and encorsive cost. If Spar's annivative design of both the spar and Anling system har solved typical problems such as Secting, compression and poor hall set

And because of 2 Spar's production efficiencies and quality control, the price of the 2 Spars furing must and boore combination is compositive with the price of just the boom of some in boom furing systems.

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 The satisful assumed on always new table. Nonveig a weight tool stands, there are always what reduces that sumpresatisfunding while three periods as dangs at least and to be build and an fullet by one period. 2.Sport. USA is the American subsidiary of 2.Diffusion. France, one of Europe's largest and minit regrected mass manufacturers. In 1970, Michel Gibert was racing diophyclassibilitis in France. He became distractiled with the performance of his mast and oecided he could build a better one himset. His new mast brought him such graph conservicing, that could him to be parts conservicing, that could him mervative design and quality construction soon spread and more and more potats were seen with Michel's masts. "2.Diffusion was born.

2 Diffusion now supplies musts to most of Europe's major manufacturers such as Beneteau, Jeannesu, Opnes & Knier, Z Diffusion's regulation weigeprowiding spans with sound empreening and superior quality of malenals and cratismurship. The company is also able to offer extremely compositive pricing because the entire manufacturing process, from engineering to avolusion, capting and even hardware, is done in house. 9 Z Spars, USA was created in 1985 to bring the Z Offusion advantages to American sa local manufacturers. The subsidiary has alwady supplied spars to major manufacturers.

UK HADLEIDH

FRANCE

USA GAINESVILLE

NETHERLANDS CLUNDERT

GERMANY



Z-Spars, USA 0320 NW. 123d Place Gamerula, PL 32606 plot, 452 5145 (FAX (604) 462 5150 For non-information, contact Gales Martart, Gimmal Manager



GALVANIC ISOLATORS

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

Since 1986, Galvanic Isolators have been widely used to interrupt the flow of harmful, low voltage currents that may cause galvanic corrosion. Today, most U.S. built boats with factory installed 110 or 220 volt shore power systems are equipped with Galvanic Isolators.

We feel that it is advisable to add a Galvanic Isolator to any vessel not so equipped. These devices are inexpensive and easily installed. If you have no local source for such a device, there is a reliable mail order source for corrosion information and equipment. Your water heater 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 under the normal use and service, and

B. will meet applicable specifications and descriptions at time of delivery to BUYER.

The obligation of SEAWARD under this Warranty is limited to the repair, rework, or replacement, at SEAWARD'S option, any part or component thereof, which examination discloses to our satisfaction to have been nonconforming or defective. SEAWARD, after establishing customer's purchase date and determining problem to be under warranty, will either repair the product at their factory or authorized service center and allow labor and parts for (1) one year from purchase date. Transportation charges are the 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 replaced products, part or component supplied by SEAWARD. SEAWARD shall in no event be liable to BUYER or BUYER'S customers for any incidental or consequential damages, or loss of use, or other losses, however occasioned.

Implied Warranties of merchantability and of the fitness of the product for any purpose are warranted for a period of one year on parts and labor, SEAWARD makes no warranties, expressed or implied after that time.

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

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

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



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

INSTALLATION & SERVICE GUIDE

110

Spin-on Filter/ Separator for Fuel Injected Gasoline and Diesel Engines



Parker Hannifin Corporation Racot Division P.O. Box 3208 Modesto, CA 95353 USA 800/344-3286, 209/521-7860 Telex 359-408 RACOR MSTO

Parker Hannifin N.M.F. GmbH Racor Division Europe Geestemunder Strasse 42 D-5000 Koln 60, West Germany Telephone 49 (0221) 71720 Telex 8885219-PHKD



THE RACOR MODEL 110 FUEL FILTER /WATER SEPARATOR CAN SOLVE FUEL PROBLEMS UNDER ANY OPERATING CONDITIONS IN THE WORLD.

Advanced Filtration/Separation Technology

The unique design of the Model T10 directs the fuel flow to the expanded center core of the unit. The reduced velocity causes heavy liquid and solid contaminants to accumulate in the filter/

separator bowd. Then they may be dramed off through a drain plug. This primary separation or precleaning stage gives extended element life.

The Model 110 Filter/Separator unit is compact and may to service.

The RTIS Replacement Filter uses a new Racor two-stage process of separation and Aquabloc'* element filtration to remove virtually 100% of the remaining free water and particulate contaminants — down to 2 micron in every application.

An optional Water Sensor and "punhup" drain valve are available for the Model 110.

Model 110

Height 6" (152 mm) Width 3.2" (81 mm) Depth 3.15" (80 mm) Max. Dienel Flow Rate 15 gph (57 Sph) Max. Gasoline Flow Rate 15 gph (132 lph) Weight 3.3 Bis. (59 kg)



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DANGER:

When initialing the Model 110 in gausine applications, great caution must be esercised to avoid any fire hazards. Work area must be cool and free of heist or heated engine components, DO NOT SASOKE WHILE PERSORMING INSTAL-LATION OR SURVICING.

All installation components must meet all U.L. standards and listings. All filters and hoses must be installed in a protected, non-heated area. Hoses are to be secured and not allowed to vibrate or rub against any components.

follow all O.E.M. recommendations for filter installation.

For pressure applications exceeding 58 psl, use high pressure fittings or O.E.M. approved attachments.

DIESEL APPLICATIONS

Cold Weather Operations

For desid applications operating in cold weather, mount the Racor Fuel Filter/ Water Separator inside the engine compartment.

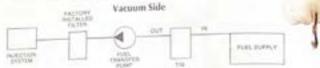
Racor Cold Weather Diesel Fuel Additive is also recommended for easy cold weather operations.

Fuel Additives

Methanol, ethanol and alcohol-based dienel huel additives will cause damage to the non-metal parts of the Racci unit and the entire engine system. When use of an additive is determined to be necessary, use only genuine RACOR DISEL FUEL ADDITIVES. RACOR DISEL FUEL ADDITIVES provide preventive maintenance protection all year 'inund, help cold weather starts, protect against damaging microlies, extend element life and maximize the efficiency of tuel three and ware reparators. The use of other that genuine RACOB DISEL FUEL ADDITIVES and REPLACEMENT ELEMENTS AND PARTS may void your RACOB WARDANTY.

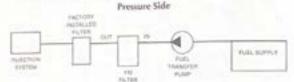
Vacuum/Suction Side Installation

- 1. Any secondary or pressure side their located between pump and engine should be serviced and left in place.
- 2 Mount the Racor Model 110 vertically on the vacuum side of the fairl pump transfer pump or notiverroughlie filters, whichever comes first. Maintain 1" (25.4 mm) vertical clearance below filter huusing for removal of replaceable element, Proceed to Step 3.



Pressure Side Installation (150 p.s.i. Maximum)

- 1. Any secondary and/or pressure side filters located between pump and engine should be serviced and left in place.
- 2. Mount the Rator Model 110 after the fuel transfer pump and before any factory installed pressure filter.



Any factory initialled fuel by-pass or return lines should be left in place. 3. FUTLLINES:

- Use quality pressure rated fuel hose in the maximum fuel line size applicable. to reduce testriction.
- 4. FITTINGS:
- See Recor Fittings Chart on following page.
- 5. NOTE: For mounting flexibility, there are two infet and outlet poets. Utilize the most convenient ports for your application. The unused ports are to be plogped with the provided plug Sittings.
- 6. PRIMING THE MODEL 110:
 - Fill Bowl with idean fuel.
 - Inital Bowl/Terment Assembly onto Head. Tighten Head bolt to 65 inch pounds.

DANGER: Everose extreme caution when handling gasoline. Gasoline vapors are extremely flammable near heat or open flame. Avoid inhalation of fumes. Seal and store open containers immediately after une. - Cline vent.

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7. Start engine and check for any leaks. NOTE: If the engine is difficult to start or nam magh, check that gaskets are undamaged, properly stated, and that the fitting connections are tight. Reprime if required, if leaks (air or fuel) are found, shut explore off immediately until the discrepancy is corrected.

Racor Fittings Chart

ANCOR FITTING	PART NO.	UNIT LIGADE	. 11	12
Scoot Tread +0 Arg N° Ebre Mar JCD'*	2111	1613	1011222	240
tragit Tread withing Nate JCST? 11	1911	1413	111112	2217
Seaget Donal wS-Rog Tunue Type 11 12 17	8111	1018	101222	1122
Pagemane bath Head Paring	1014155	1912	\$15.78 at 749	1000
nation of the n	M2114.3.34	1418	11111-1274	STEPHONE AND AND A STREET

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Service.

L. DRAINING THE SEPARATOR BOWL:

Periodically check the metal sediment bowl for accumulated water and solid. contamination, with the engine off, as follows:

If your Model 110 Filter is equipped with a Water Sensor /Light Alarm Kit (see back page) the operator will be warned when a high water level condition exists and servicing is needed. If your Model 110 filter is not equipped with a Water Sensor you should check the bowl daily.

- 1. Loosen vert plug in filter head.
- 2. Drain-bowl.
- 3. Reprime unit (see Step 6 on Page 3).
- 4. Tighten vent plug into filter separator head.

IL. REMENT CHANGE INSTRUCTIONS:

Erequency of element change is determined by contamination level in fuel. Restricted had flow adversely affects which performance, such as difficult engine starts and loss of full power. When any one occurs, change element as sopo as possible.

Foul-unalling dieselfarel is an indication of algae contamination. A change of fuel issues and use of Racor Desel Fuel Addition is recommended.

with the engine off:

- 1. Loosen vent plug. Drain unit.
- 2. Remove housing.
- 3. Discard Sher properly.
- 4. Clean housing, gashet gland, gashet. 5. Lubricase gasket with a light oil and place in gasket gland.
- 6. Initial new element into housing-7. Install bowl to die cast head assembly. Torque head bolt to 65 inch pounds.
- 8. See printing instructions, Step 6 on Pape 3.

NOTE

It is suggested that an extra Racor filter element be carried in your vehicle as one tankful of excessively contaminated fuel can require an element change.

RACOR 110 PARTS LIST

ITEM NO.	PART NO.	DESCRIPTION
1	R8(10110	Vent Plug, Metal
1	RK10112	Head Bolt, 10-13 UNC-28
34	RR(10025	Head - 5AE, 9/16-18 ports
b.	RK10038	Head - NPT, 14 ports
ě.	RS:10040	Head Metric, 14 × 1.5 mm
4	RK10062	Gaiket/O-Ring Rebuild Kit
5	RTIS	Replacement Herrent
6	EX:10113	Housing w/%-13 Centertube
74	RX10064	Drain Plug, Metal
	RK20022	Probe Plug, Metal
	30053	Installation Instructions

4×15mm

TOP NEW

Racor

Viel Fitter/Water Set MODEL 110

(04) (69 (4)

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RACOR LIMITED WARRANTIES STATEMENT

Effective September 1, 1983

All products manufactured or distributed by Racor are subject to the following, and only the following, LIMITED EXPRESS WARRANTIES, and no others:

For a period of one (1) year from and after the date of purchase of a new Racor product, Racor warrants and guarantees only to the original purchaser-user that such a product shall be free from defects of materials and workmanship in the manufacturing process. The warranty period for pumps and motors is specifically limited to ninety (90) days from date of purchase. A product claimed to be defective must be returned to the place of purchase. Racor, at its sole option, shall replace the defective product with a comparable new product or repair the defective product. This express warranty shall be inapplicable to any product not properly installed and properly used by the purchaser-user or to any product damaged or impaired by external forces. THIS IS THE EXTENT OF WARRANTIES AVAILABLE ON THIS PRODUCT. RACOR SHALL HAVE NO LIABILITY WHATSOEVER FOR CONSEQUENTIAL DAMAGES FLOWING FROM THE USE OF ANY DEFECTIVE PRODUCT OR BY REASON OF THE FAILURE OF ANY PRODUCT. RACOR SPECFICALLY DISCLAIMS AND DISAVOWS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED INCLUDING, WITHOUT LIMITATION, ALL WARRANTIES OF FITNESS FOR A PARTICU-LAR PURPOSE (EXCEPT FOR THOSE WHICH APPLY TO PRODUCT OR PART THEREOF THAT IS USED OR BOUGHT FOR USE PRIMARILY FOR PERSONAL, FAMILY, OR HOUSEHOLD PURPOSES), WARRANTIES OF DESCRIPTION, WARRANTIES OF MER-CHANTABILITY, TRADE USAGE OR WARRANTIES OF TRADE USAGE.

> INSTALLATION INSTRUCTIONS Part No. 10053 (Rev. E) 9-91/2M

GROHE AMERICA

LIMITED WARRANTY

Grohe warrants its products to be free from manufacturing defects for a period of two (2) years from the date of acquisition by original consumer owner. Replaced products or parts are warranted only for the period remaining under the initial warranty, and accessories or parts of products manufactured by others are warranted only for the period and to the extent of the original manufacturer's warranty.

Grohe will repair or replace, at its option, those products or parts of products which are returned to its factory or, when directed, to its authorized repair facility, shipping charges prepaid, and which Grohe finds defectively manufactured.

This warranty is extended to any consumer owner during the applicable warranty period but, irrespective of ownership, does not cover installation or any other labor charges and shall not apply to any products or parts of products which have been (a) repaired or altered in any manner outside of Grohe's factory unless previously authorized in writing by Grohe; (b) damaged as a result of misuse, negligence, accident or faulty installation or maintenance; or (c) used in any manner contrary to Grohe's printed instructions.

This warranty is limited solely to the above and this warranty and any warranties implied by state law will apply only for the applicable warranty period specified herein. Also, Grohe will not be liable for any loss, damage, expense or incidental or consequential damages of any kind, whether based on warranty, contract or negligence and arising in connection with the sale, use or repair of the product. Some states do not allow the exclusion or limitation of consequential damage or limitations on how long an implied warranty lasts, so the above limitations or exclusions may not apply. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Unless otherwise contrary to state law governing the purchase, Grohe's liability will not exceed the contract price for the product claimed to be defective or unsuitable.

To obtain warranty repair or replacement service:

1. Write to:

Grohe America, Inc. 900 N. Lively Boulevard Wood Dale, Illinois 60191

- 2. Include in your letter:
 - a. Date of purchase and installation
 - b. Model or serial number of product or part, or description of product or part
 - c. Description of defect.

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Dear Customer!

We thank you for the confidence you have shown in us by choosing a Grohe America product.

The surface of our fittings, whether chrome, or gold plated, colour coating or of plastic are produced using the best materials and proven processes that are constantly monitored by advanced quality assurance methods.

To derive long-lasting pleasure from your fitting and preserve its attractive apperance, please note the following.

Water contains lime, to a greater or lesser extent, which is retained on the surface of the fitting leaving marks after the water droplets have evaporated.

You can prevent lime-marks from forming by getting into the habit of always wiping the fitting dry immediately after use, e.g. with the towel. This takes very little trouble and will ultimately save time.

In this way, your fitting will always be clean.

Should it become necessary to clean the fitting, however, all that is required to remove minor marks is to wipe it over with a wet, soapy cloth or flannel, rinse off and wipe dry with a towel.

Caution: Under no circumstances use scouring agents, abrasive sponges, hydrochloric acid, lime, plaster or cement removers or other solvents or cleaning agents containing acid, i.e. so-called lime-scale removers or vinegar (acetic acid)-based cleaners. In view of the multiplicity of domestic and bathroom cleaners and other special-purpose cleaners on the market and the fact that their formulations are liable to change, we recommend that they should not be used for cleaning our fittings.

In view of the foregoing, please note that damage to surface material caused by incorrect treatment is not covered by the terms of the guarantee.

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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 consumerpurchaser, 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.

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

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, EX-PENSES, 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 WAR-RANTY LASTS, SO THE ABOVE LIMITATION MAY OR MAY NOT APPLY TO YOU. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSE-QUENTIAL 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.



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. Standeds 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.
- For correct installation, note that the inlet and outlet fittings are marked on the top casting. For convenience in piping, 3). 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 crosssection ratios:

CAT. NO	PIPE SIZE	RATIO
493-003-PL8	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-PL8	1-1/4	13:1
493-008-PLB	1+1/2	17:1
493-009-PL8	2	13:1
493-010-PLB	2-1/2	10:1
500-009-PLB	2	20:1
500-010-PL8	2-1/2	18:1
500-011-PLB	3	14:1

- 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
- 998 Bottom Casting
- 99C Transparent Cylinder
- 990 Basket Strainer 99E - Cover with Gasket
- 99M Gasket Kit Consists of:
- 99N Cover Gaskets (2 per bag)

Above standards can be obtained from:

American Boat & Yacht Council, Inc. 3069 Solomon's Island Road Edgewater, Maryland 21037

99L - Hinged Bolt for Cover with Pin, Nut and Washer 1- Cover Gasket and 2 - Cylinder Gaskets

99P - Tie Rods, Nuts and Washers Consists of: (4 of each for 493 Series.) (1 of each for 500 Series.)

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

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PERKO

FOSS FOAM PRODUCTS

4480-126TH AVE. N. CLEARVATER, FL. 34622 (813)577-0478 FAN (813)572-9155

YOUR FOSS FIBERGLASS AND URETHANE RUDDER

Foss Foam has been producing sallboat rudders for over thirty-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 buoyancy 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 buoyancy 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 indestructible. The urethane core is composed of a strong closed cell urethane. Water, deisel, solvents or marine borers will not damage your rudder blade, even if the glass coating has been damaged.

When you paint your rudder the first time, particular attention should be paid to the paint manufacture's instructions for preparing the surface. Solvent washing is not enough. The rudder must be sanded to remove a heavy coating of mold release. The seam area should be hand sanded so as not to burn through the fiberglass. We recommend white paints 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 repair may be preformed by cleaning, drying, and roughing up the damaged area and applying putty or any similar filler. 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 bottom paint or any coating you desire.

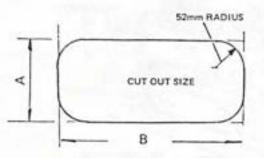
We do not recommend the use of dark colors for your rudder, as they generate heat when the boat is out of the water in the sun. Since the rudder is made of cellular material this heat can cause dimensional changes and cosmetic damage. If the rudder is painted a dark color it should be shielded from the 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 electrolysis. Slight bends or shaft erosion are not noticed until the shaft fails in heavy conditions.

Should you have any questions feel free to call us at (813)577-0478.

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 +/- 1mm) 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.



5128	PORTLIGHT	DIMENSION		DIMENSION B	
0	4" x 10"	156mm	6 1	304mm	12"
1	5" x 12"	171mm	6 T	347mm	13 5
2	4" x 14"	155mm	61	405mm	16"
3	5" x 15"	171mm	61	429mm	1
4	5" x 23"	171mm	67	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).

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

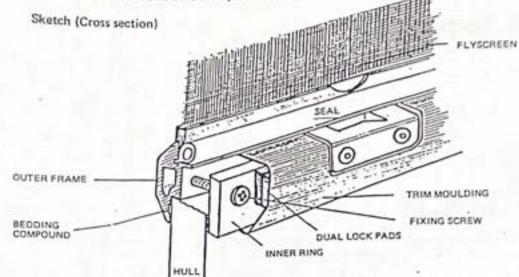
M5 screws supplied are for hull thickness 15-19mm. It is important that you use the correct length screw otherwise you will damage the portlight. Check depth of hull and select correct length of screw from table overleaf.

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.

 Check for correct operation of window, closing/locking operation, even pressure on seal, etc. Clean off surplus sealant. DON'T FORGET to leave flyscreen on boat.

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.



 M5 fixing screws For hull thickness

155	6 - 10mm use M5 x	16, C	nt. 8991	1
	11 - 14mm use M5 x	20, C	it. 8992	an endi
	15 - 19mm use M5 x	25, C	it. 8993	(supplied as standard)
	20 - 24mm use M5 x			
	25 - 29mm use M5 x			
	30 - 34mm use M5 x			

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 × 14	8975	8982	8987
5 x 15	8970	8983	8988
5 x 23	8979	8984	8989

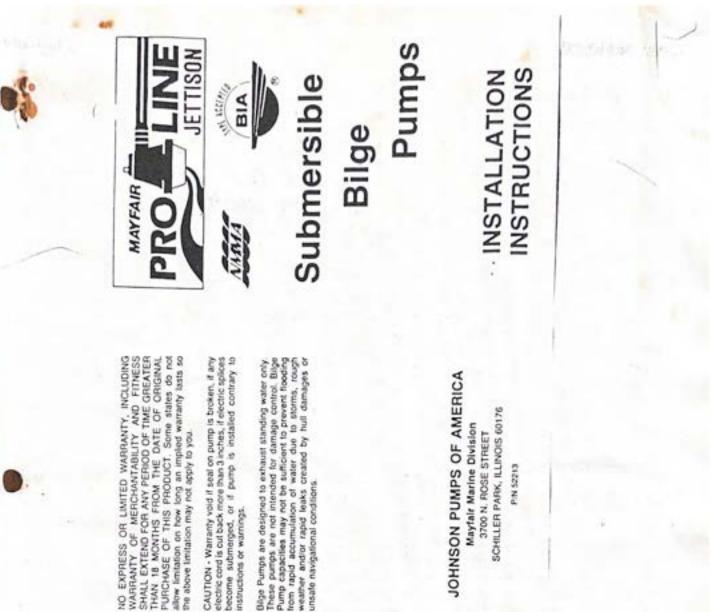
11) Deadlight

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.



18 MON1. LIMITED PUMP WARRANTY

Johnson Pumps of America of 3700 North Rose Street, Schiller Park, Illinois 60176 wairants to the orginal consumer purchaser that this blige pump will be little from defects in material and workmanship, providing that the case is not opened or the pump otherware abouted for a period of eighteen (18) months from the date originally purchased.

height prepaid with your safes receipt and 52.50 to help defray the cost of postage and handling. IMPORTANT: FOR THES WAREWATY TO DE EFFECTIVE. JOHNSON MUST BE SUPPLIED WITH PROOF OF THE ACCEPTANCE BY JOHNSON OF ANY PUMP RETURNED SHALL NOT BE DEEMED AN ADMISSION THAT SUCH PUMP IS DEFEC-TIVE OR IN VIOLATION OF ANY WARRANTY THE COM-The exclusive remody 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. PANY RESERVES THE RIGHT TO REPAIR OR REPLACE THE PUMP

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

BE LIABLE FOR ANY LOST PROFITS, INCIDENTIAL 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 IN NO EVENT WILL JOHNSON PUMPS OF AMERICA BE LIABLE FOR MORE THAN THE SALES PRICE OF THE PUMP. UNDER NO CIRCUMSTANCES WILL JOHNSON ESSENTIAL PURPOSE OF THIS LIMITED WARRANTY Some states do not allow the exclusion of include dential or consequential damages, so the above limitation may not apply to you.

PURCHASE OF THIS PRODUCT. Some states do not allow limitation on how long an implied warranty lasts so CAUTION - Warranty void if seal on pump is broken, if any The above limitation may not apply to you.

electric cord is cut back more than 3 inches, if electric splices become submerged, or if pump is installed contrary to instructions or warnings.

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 Bige Pumps are designed to exhaust standing water only unsale navigational conditions

JOHNSON PUMPS OF AMERICA Maytair Marine Division

SCHILLER PARK, ILLINOIS 60176 3700 N. ROSE STREET P.N 52213

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

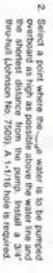
Please tolow the easy installation instructions carefully to assure maximum efficiency in your bige pump operation.

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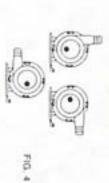
Pro Line Installation Sheet:

- Mount the pump in the lowest point in the bige. The pump can be mounted with screws in three different ways.
- A. Through three holes in the bottom of the slotted titler basket, for directly attaching the pump to the hull bottom. (Fig. 1)
- B. Through four stats 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 bige for thorough clean out. (Fig. 3)





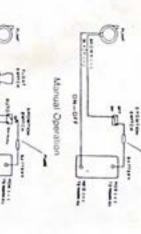
- Fasten a 3/4" fuel resistant hose from the pump outlet to the theu-hull fitting. Avoid sharp bonds or loops. Support the hose if nocessary. Note - In order to prevent air lock it is important that the hose net be allowed to dip below the pump outlet. The hose should be constantly rising.
- The filter basket is removable from the pump body by rotating the pump body clockwise and fitting. The locking lugs are placed at 90° intervals so that the pump outlet may face right, left or straight out. (Fig. 4)



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



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





- Any electric cord should not be cut back move than three inches. A submerged splice will render this warranty null and vold. 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.