# NICHOLSON 38 HANDBOOK

## CONTENTS

# 1. GENERAL SECTION

## 1.A. Leading Particulars

| | | | |
|---|---|---|---|
| DIMENSIONS | | | |
| Length Overall | 37'-10" | 11.53m | Less davits and pulpit |
| Length Waterline | 27'-0" | 8.23m | |
| Beam (extreme) | 10'-6" | 3.20m | |
| Draught | 5'-2" | 1.58m | |
| Tons Thames Measurement | 13 tons | | |
| Tons Displacement (Mean) | 7.1 tons | 7214 Kg | |
| Lead Keel | 2.65 tons | 2692 Kg | |
| Tons per Inch Immersion | 0.39 tons | 156 Kg/cm | |
| Wetted Surface including rudder | 360 sq ft | 33.5 sq m | |
| Fuel Tank (Main) | 38 gallons | 173 litres | |
| Water Tank (Main) | 75 gallons | 340 litres | |
| Wing Tank Port (Optional) | 25 gallons | 114 litres | |
| Wing Tank Starboard (Optional) | 30 gallons | 136 litres | |
| | | | |
| SHIPPING DIMENSIONS | | | |
| Length | 37'-10" | 11.53m | Less davits and pulpit |
| Breadth | 11'-0" | 3.44m | Over spreaders |
| Height | 12'-9" | 3.89m | Less windscreen, pulpit & davits but including 1'-0" for mast lashed on deck) |
| Weight | 8 tons | 8128 Kg | Including cradle |
| Length of Mainmast | 44'-0" | 13.74m | |
| Size of Mainmast (Max.) | 14" x 14" | 350mm x 350mm | |
| Weight of Mainmast | 250 lbs | 114 Kg | |

## 1.B. List of Equipment

| ITEM | TYPE | SUPPLIER |
|---|---|---|
| Automatic Pilot | Neco Mk II | Neco Marine |
| Batteries | Exide 6KHV 154JL 94 amp/hrs | Exide |
| Blocks | See Rigging Schedule | M.S. Gibb |
| Compass | Sestrel Major | F. Smith |
| Cooker | Flavei B 500 | Calor Gas |
| Engine | Perkins 4107/M | Gilhams |
| Fairleads | 8" | Goads |
| Gearbox | T.M.P. | Gilhams |
| Hull & Deck | G.R.P. | Halmatic Ltd |
| Masts & Spars | Anodised Alloy | Sparlight Ltd |
| Mooring Bollard | Cat No. S.L. 1379 | Simpson Lawrence |
| Mooring Cleats | Cat No S.L. 139 Type A C.P. | Simpson Lawrence |
| Opening Windows & Skylights | Nicholson 38 | Canpa C&N Ltd |
| Pressure Set | Aqua Maid 12770 S.L.407 & 407a | Simpson Lawrence |
| P. & S. Nav Lights | Cat No 1304 | Simpson Lawrence |
| Pulpits | Nicholson 38 | Montague Smith |
| Radio | Various | F.Smith & Son |
| Refrigerator | Mariner P22 | Lec Refrigeration |
| Rigging Screws | Cat No 545 Special | M.S. Gibb |

| | | |
|---|---|---|
| Shower | MIRA | Kennedys |
| Shower Drain Pump | Water Puppy 7600 | Cleghorn Waring |
| Silencer | Parsons 1½" | Parsons Eng. Ltd |
| Silencer | McMurdo 1½" | Yacht Chandlers of G.B. |
| Speedometers & Logs | Various | F. Smith & Son |
| Spinnaker Halyard Block | Lewmar 356 | Montague Smith |
| Stanchions | Lewmar 1045 27" | Montague Smith |
| Stanchion Sockets | Lewmar 1099c | Montague Smith |
| Sails | As Sail Plan | Ratsey & Lapthorn |
| Steaming Light | S.L.1303 | Simpson Lawrence |
| Steering Gear | L.S. Type | Mathway Marine |
| Stemhead Fitting | Nicholson 38 Lewmar | Montague Smith |
| Stern Light | A.P. 3932 | McGeoch |
| Toilets | Moray | W.H. Rowe & Son |
| Toilet Fans | Tannoy | Tannoy Marine Ltd |
| Upholstery | Various | Camper & Nicholsons |
| Water Heater | Vaillant Mains Pressure 125 | Calor Gas |
| Wheel | 21" Laminated Teak | Port Hamble |
| Windows Fixed | Nicholson 38 | Windows B.S.F. Ltd |
| Winches | E, D and L Type | Camper & Nicholsons |
| Windscreen | Nicholson 38 | Windows B.S.F. Ltd |
| Windscreen Wiper | Dudley Heavy Duty | Simpson Lawrence |

## 1.C. Service

In order to obtain the quickest service it is generally best to contact the suppliers of the particular piece of equipment directly, quoting the year of building and the number and name of the yacht. The addresses and telephone numbers of the principal suppliers are given under section 1 D.

For service within the warranty period it is essential to contact Camper & Nicholsons in the first place to get clearance for work to proceed, details of the warranty are set out on the Order Form.

However, we would always appreciate it if any service requirement were referred to Camper & Nicholsons as we can then ensure that similar trouble be avoided on other yachts and also this enables us to circulate to all other owners the necessary information.

Our Service Manager will generally be available to inspect yachts free of charge within a radius of 25 miles from Gosport and at greater distances on payment of travelling expenses and £5 per day. It is however urged that every effort should be made to return the yacht to our Gosport yard where any work will be carried out with the maximum of expertise and the minimum of delay.

## 1.D. Addresses, Plans & Pamphlets

| | | |
|---|---|---|
| Calor Gas (Distributing) Co.Ltd. | Windsor Road, Slough, Bucks. | Slough 23824 |
| Cleghorn Waring & Co. (Pumps) Ltd | 31 Hitchin Street, Baldock, Herts. | Baldock 2071 |
| Exide Battery Service Station | 80 Castle Street, Salisbury, Southampton | Salisbury 3373 |

| | | |
|---|---|---|
| M.S.Gibb Ltd. | Clock Tower Buildings, Warsash, Southampton SO3 6ZG | Locks Heath 5141 |
| E.Gilham Ltd. | Royal Motor Yacht Club Yard, Panorama Road, Sandbanks, Poole, Dorset. | Canford Cliffs 77664 |
| Goads Chandlers Ltd. | Maidstone Buildings, 74 Borough High Street, London S.E.1. | 01 407 7482 |
| Halmatic Ltd. | Brookside Road, Havant, Hampshire. | Havant 6161 |
| Kennedy Ltd. | 69 Commercial Road, Southampton, Hampshire | Southampton 25537 |
| Lec Refrigeration Ltd. | Bognor Regis, Sussex | Bognor Regis 3161 |
| Joseph Lucas (Electrical) Ltd. | Great King Street, Birmingham 19 | Northern 5252 |
| Mathway Marine Ltd. | 18-20 Lakedale Road, Plumstead, London. S.E.18 | 01 854 1138 |
| McGeoch & Co. Ltd. | Bordesley, Birmingham 10 | Victoria 3371 |
| McMurdo Instrument Co. Ltd. | Rodney Road, Portsmouth, Hampshire | Portsmouth 35361 |
| Neco Marine Ltd. | Walton Road, Eastern Road, Cosham, Hampshire | Cosham 71711 |
| Parsons Engineering Ltd. | 18-20 Lakeland Road, Plumstead, London. S.E.18 | 01 854 1138 |
| Port Hamble Ltd. | Hamble, Hampshire | Hamble 2361 |
| Ratsey & Lapthorn Ltd. | Gosport, Hampshire | Gosport 81322 |
| W.H.Rowe & Son Ltd. | Quayside Road, Bitterne Manor, Southampton. | Southampton 25636 |
| Simpson Lawrence Ltd. | Castle Trading Estate, Portchester, Hampshire. | Cosham 70062 |
| Sparlight Ltd. | Clovelly Road, Southbourne, Near Emsworth, Hampshire | Emsworth 3027 |
| F.Smith & Son | Alexandra House, 10-11 Queens Terrace, Southampton | Southampton 22206 |
| Montague Smith Ltd. | Town Quay, Southampton. | Southampton 24667 |
| Tannoy Marine Ltd. | West Norwood, London. S.E. 27 | 01 670 1131 |
| Windows (B.S.F.) Ltd. | 195 Cambridge Heath Road, London E.2 | Shoreditch 3272 |
| Yacht Chandlers of Great Britain | Newton Abbot, South Devon. | Newton Abbot4557 |

PAMPHLETS

Docking Plan
Sail Plan
G.R.P. Booklet
Ratsey & Lapthorn Booklet
Engine Handbook
Gearbox Handbook
Wiring Diagram
Steering Gear Handbook
Toilet Pamphlet
Toilet Diagram
Cooker Pamphlet
Battery Guarantee
Refrigerator Pamphlet
Refrigerator Diagram

# 2. HANDLING

## 2.A. Handling Under Sail

This yacht should be handled as a sailing yacht and has no abnormal characteristics. Being a ketch, balance between headsail and mizzen is important and careful sheeting is well worthwhile.

**To Windward**
Use genoa, main and mizzen in apparent wind speeds up to about 20 knots and then change genoa for working jib for wind speeds up to 27 knots and then use working jib and mizzen only up to 35 knots, then storm jib and perhaps the mizzen.

Normally keep main and mizzen luff and foot tensions as hard as the crew can manage. All tensions should be eased in light winds.

In good conditions the yacht can tack through $80^{o}$ but allow $90^{o}$ at sea with probably $5^{o}$ leeway in normal sea conditions.

**Running**
Let go lee mizzen backstay to let mizzen boom forward but remember to make up again before gybing. Ensure that the main boom is held down firmly by a handybilly tackle or a foreguy, this will help the steering and increase speed. A genoa may be boomed out in hard weather. Taking off the mizzen will improve steering.

**Reaching**
Both the spinnaker and the mizzen staysail may be carried with the apparent wind about $10^{o}$ ahead of the beam. The mizzen staysail is tacked with a lanyard to the weather cap shroud chainplate and sheeted through a snatchblock on the outboard end of the mizzen boom, the halyard should be set up until the luff is just clear of the main backstay. Hold the main boom down hard as for reaching.

**Reefing**
Stand on the weather side of the mast. Release the main tack tackle and lacing through three bottom slides and with some wind in the sail roll boom up, when boom is at top of track, release 2-3 feet of halyard, make fast again and repeat rolling. Be sure to slide kicking strap eye to aft end of boom and try to pull leach aft on boom while rolling.

**Heaving To**
With the genoa backed and the main eased a little the yacht will lay about 9 points off the wind or with the working jib about 5 points off and in both cases will make about 1 knot ahead and 1 knot to leeward. It is normally possible to gybe the yacht out of the hove to position so that no sheets need be touched.

**General**
1. Use the mizzen as a riding sail or for reducing rolling when motoring or at anchor.
2. The working jib and storm jib tack to the strop on the stemhead fitting.
3. The genoa tacks to the snapshackle direct on the stemhead fitting.
4. The working jib and storm jib sheet inside the cap shrouds when close hauled and outside when reaching.
5. The genoa sheets outside all the shrouds all the time.
6. It is normal practice to fly the national flag from the mizzen masthead both underway and at anchor

**Mizzen Staysail**
The mizzen staysail is made of nylon and should be treated generally in the same way as the spinnaker. It can only be used effectively with the wind way on the beam to nearly dead aft. The tack pennant of 1" terylene and about 6 ft long should be permanently attached to the tack of the sail and the sheet should be snapshackled to the sail clew.
1. Ensure the boom is held down firmly by the boom vang.
2. Attach snatch block to aft end of mizzen boom for sheet.
3. Attach tack pennant to weather mainmast capshroud chainplate, leaving the tack of the sail about 3 ft above deck.
4. Pass the sheet over the mainsheet and to leeward and outside of all mizzen rigging, through the sheet block and down to the lee cleat on the aft deck.

5. The halyard should the be taken around the leeside of the main backstay and with the sheet cleated the sail may be hoisted until its luff is just clear of the main backstay. Also see that the sail is not snagged on the windscreen wiper. The sail should be set as high as possible.
6. This sail must be lowered and the halyard and sheet released before tacking or gybing.

## 2.B. Handling Under Power

**General**
Remember that the propeller turns clockwise when looked at from astern thus tending to drag the stern to starboard in ahead gear and to port in astern.

**Steering Boat in Ahead**
The 38 steers very easily in ahead under power and has an extremely small turning circle with a diameter very little greater than its own length. The turning circle to Port is considerably less than to Starboard owing to the paddle wheel effect of the propeller.

**Steering Boat in Astern**
As a general principle, the stern will tend to pull to Port due to the paddle wheel effect, but in a wind or tide the effect of the propeller is likely to be considerably less strong than the effect on the boat of the wind or the tide. In general it is not worth trying to control the boat accurately in astern without expecting to use ahead gear quite frequently for correction.

**Coming Alongside or Leaving a Berth**
Firstly, remember that the wind will tend to blow the bow off and the stern up. Secondly, when approaching a leeward berth, approach the berth as fine and as slowly as possible whilst maintaining steerage way. This should be a simple manoeuvre as the wind will carry the boat down onto the berth. Always remember to check the tidal stream first as this may be strong enough to push the bow or stern back away from the wharf.

Approaching a windward berth, this is much more difficult and should be approached faster and at a greater angle in order to give the stern a good swing in towards the berth.

**Turning at Rest**
The Nicholson 38 is very manoeuvrable in tight circumstances and the procedure for turning the boat in these conditions is as follows. Put the wheel hard over in the direction of turn required and put the boat into hard ahead. As the boat builds up a good swing in this direction, put her hard astern in order to check any headway and to just start her coming astern again. Do not attempt to reverse the wheel while doing this as it will have very little effect and will merely tend to confuse you. As soon as the swing of the bows slows down, go ahead again hard to maintain the swing. Continue to carry out this backwards and forwards motion until headed in the right direction. Always remember, if in doubt, turn away from the wind as the wind will tend to blow the bow off and if the wind is not a major factor, always turn to port if you have a choice.

**Cautions**
If moving fast in astern use the rudder with caution as it can take charge and put enormous strains on the steering gear.

Avoid running the engine at its critical vibration speed of about 800rpm.

If a shaft brake is fitted always remember to loosen this off before putting the engine into gear. If this is not done, you will burn out the fibre lining on the brake. A good way to prevent this is to hang the engine keys on the shaft brake when locking the brake for sailing. If a locking pin is fitted this should be attached to the starter key.

When approaching a difficult berth or a crowded anchorage always test the astern gear with a short burst some time before, to ensure it is working properly.

# 3. SAILING EQUIPMENT

## 3.A. Masts and Spars

All are of aluminium alloy, gold anodised.

**Main Mast**
Sparlight Section D.Q.10E sound deadened internally with all halyards external. Wiring is fitted for the masthead steaming light and for the optional spreader lights. A pull through wire is fitted to the masthead to allow further electric wiring to be fitted if required. The wiring is arranged between the mast wall and the foam insulation. The wiring is taken from the heel of the mast to a junction box beneath the cabin sole under the settee locker aft of the mast. See Electrical Section.
The sail track takes Holt Allen HA 91 internal nylon slides, A track and sliding ring is fitted on the fore side of the mast. Two Type D halyard winches are fitted, main to starboard, genoa to port.

**Mizzen Mast**
Sparlight section D.Q.7E sound deadened internally with all halyards external. A pull through wire is fitted to the masthead for wiring as required. Please check that the mast socket drains are kept clear to avoid undue corrosion at the step. The sail track takes Holt Allen H.A.89 5/8" internal nylon slides.. An L Type winch is fitted on the starboard side for the mizzen halyard. The handle stows in the main backstay guide.

**Main Boom**
Sparlight Section D.Q.4B with foot rope groove and Sparlight internal outhaul and Lewmar Type A 20 reefing gear and handle. This should be fitted with the spindle at the bottom and kept lightly greased. A sliding ring is fitted for a boom down haul of the same type as on the forward side of the mast.

**Mizzen Boom**
Sparlight Section D.Q.5 with foot rope groove and fixed gooseneck. Gibb Cat No 560.

**Spinnaker or Booming Out Pole (Optional)**
3" diameter double ended with spring plunger worked eye end fittings. Release line fitted end to end. Keep plungers lightly greased or oiled regularly.

**Note**
If it is required to fix additional fittings to these spars this may be arranged by using S.S. self tapping screws or pop rivets. All sections are of uniform thickness varying from about 1/8" for the mainmast to 1/16" for the spinnaker pole.

**TO STEP MASTS**

It is necessary to use a crane giving a hook height at least 29 feet higher than the coachroof top. A rope strop should be arranged around the mast below the spreaders and the crane hook arranged on the fore side of the mast. The mast weight is about 250 lbs. Ensure the Butyl Rubber mast coat is fitted and carefully lower mast into yacht with normal mast rake about 2" in 6'-0". Hand heel of mast through toilet sole being careful to protect electric cables which must be fed through slot on port side.. Check tenon of mast is in mast step and weight is taken on tenon and that the shoulders are clear of the step flanges. Fit teak chocks fore and aft to give correct rake. Attach cap shrouds as soon as possible and set up all as in Fitting Out Schedule. See Maintenance 7C.

The mizzen is stepped on deck, this may be arranged by crane again with a strop under the spreaders or if four men are available this may be set up by hand.

**TO UNSTEP MASTS**

**Mainmast**
Remove any electrical wind or radio aerials from masthead, remove mast wedges at heel, mast coat and wedging at deck, Disconnect and label electric cables at foot of mast. Let go any on deck aerial connections. Tape all rigging screw positions and let go leaving cap shrouds till last. With crane hook on front of mast through strop under spreaders take the weight and carefully ease mast and electrical cables out of step and through deck.

**Mizzen**
This is easily lifted off by crane or may be unstepped by four men by hand.

**Note**
When setting up or letting go standing rigging be particularly careful not to drop rigging items overboard as being stainless steel they unscrew very easily and cannot be fished for by magnet.

## 3.B. Standing Rigging

All standing rigging is 1X19 stainless steel with swaged eye top ends and swaged stud bottom ends screwing directly into the rigging screws. Rigging screws are of stainless steel with locking nuts but locking wire should always be used in addition. Split pins should be kept well taped over. Toggle clevis pins should have the head outboard. Split pins should be used only once. Top ends are all secured by clevis pins through double tangs.

| | |
|---|---|
| Mainmast head | All pins 7/16" diam. |
| Mainmast lowers | All pins 5/16" diam |
| Mizzenmast head | All pins 5/16" diam |
| Mizzenmast lowers | All pins ¼" diam |

| ITEM | CIRC | DIA | Screw 545 Toggle 543TE | DETAILS |
|---|---|---|---|---|
| Main Forestay | 7/8" | 9/32" | ½" Screw & toggle | |
| Main Backstay | 7/8" | 9/32" | ½" Screw & toggle | 3 ft Nylon Tube |
| Main Cap Shrouds | 7/8" | 9/32" | ½" Screw & toggle | 6 ft Nylon Tube |
| Main Lower Fwd | 11/16" | 7/32" | 3/8" Screw & toggle | 6 ft Nylon Tube |
| Main Lower Aft | 11/16" | 7/32" | 3/8" Screw & toggle | |
| Mizzen Cap Shrouds | 11/16" | 7/32" | 3/8" Screw & toggle | |
| Mizzen Lowers | ½" | 5/32" | 5/16" Screw & toggle | |
| Mizzen Backstays | 11/16" | 7/32" | 3/8" | with slip hook & bow shackle |

Teak parrel balls or s.s. washers are fitted under the nylon tubes.
The rigging should normally last about six years but it should be wiped down at least once a year, Initially the oil in the wire will be squeezed out and will collect dirt, so it is recommended to wipe it down two or three times in the first year. Please ensure that the lee mizzen backstay is always attached even if it is not set up as this will prevent the hook from rotating.

**GUARDRAILS**
Are all 1 x 19 stainless steel wire. The top wire is 7/32" dia. The bottom wire is 5/32" dia. All these wires are of a marginally different length on each yacht so that if a replacement is required it is necessary to return the actual wire or exact and detailed dimensions must be given. 5/16" dia rigging screws are used on both upper and lower wires.

## 3.C. Running Rigging

All running is generally of 3 strand terylene rope or 6x19 flexible galvanised wire. All shackles stainless steel.

| ITEM | SIZE CIRC | LENGTH | SHACKLE | REMARKS |
|---|---|---|---|---|
| Main Halyard | 1¼" Terylene | 83' | Goads Captive Pin | Prestretched |
| Jib Halyard | 1¼" Terylene | 44' | | Rope tail |
| Jib Halyard | ¾" Wire | 49' | Lewmar 233 | |
| Topping Lift | 1¼" Terylene | 83' | 5/16" D | Prestretched |
| Burgee Halyard | 3/8" Terylene | 80' | | Plaited |
| Jib Tack Strop | ¾" Wire | 4'-6" | Lewmar 233 | 7x7 SS Plough |
| Genoa Tack | | | Lewmar 233 | 5/16" Bow |
| Boom Foreguy | 1¼" Terylene | 48' | Lewmar 233 | |
| Main Tack Tackle | 1" Terylene | 13' | 5/16" D | Spliced to becket |
| Mizzen Halyard | 1¼" Terylene | 26' | Goads Captive Pin | Rope tail |

| | | | | | |
|---|---|---|---|---|---|
| Mizzen Halyard | ½" | Wire | 26' | | |
| Mizzen Topping Lift | 1" | Terylene | 49' | 5/16" D | |
| Ensign Halyard | ⅜" | Terylene | 48' | | Plaited |
| Halyard Lashings | ¼"dia | 3 Off | 3' | 6 Cliphooks | Shockcord |
| Main Sheet | 1½" | Superbraid | 72' | | Spliced to block |
| Jib Sheets | 1½" | Superbraid | 49' | Gibb 531 JC | 2 off Separate sheets |
| Mizzen sheet | 1¼" | Superbraid | 45' | | Spliced to block |
| | | | | | |
| OPTIONAL | | | | | |
| Spinnaker Halyard | 1¼" | Terylene | 83' | Lewmar 233 | |
| Spinnaker Pole Lift | 1" | Terylene | 49' | Lewmar 233 | |
| Spinnaker Sheets | 1½" | Superbraid | 61' | Lewmar 643 | 2 off Separate sheets |
| Mizzen Staysail Halyard | 1¼" | Terylene | 49' | Lewmar 233 | |
| Mizzen Staysail Sheet | 1" | Terylene | 31' | Lewmar 233 | |
| Mizzen Staysail Tack | 1" | Terylene | 8' | | |
| Signal Halyards | ⅜" | Terylene | 44' | | 2 off Plaited |

BLOCK LIST
All blocks are from M.S. Gibb apart from the Spinnaker Halyard block.

| QTY | USE | CAT No. | SHACKLE |
|---|---|---|---|
| 1 | Mainsheet boom block | 262 | 5/16" Bow |
| 1 | Mainsheet deck block starboard | 258 | 5/16" D |
| 1 | Mainsheet deck block port | 255 | 5/16" D |
| 1 | Main Tack top block | 116 | 5/16" D |
| 1 | Main Tack bottom block | 193 | 5/16" D |
| 2 | Topping Lift blocks | 239 | 5/16" D |
| 1 | Mizzen Sheet boom block | 262 | 5/16" Bow |
| 1 | Mizzen Sheet deck block starboard | 258 | 5/16" D |
| 1 | Mizzen Sheet deck block port | 255 | 5/16" D |
| 2 | Genoa Sheet blocks | 992 | |
| 1 | Foreguy block | 992 | |
| | | | |
| OPTIONAL | | | |
| 1 | Spinnaker Halyard block | Lewmar 356 | 5/16" D |
| 1 | Spinnaker Pole Lift block | 178 | 5/16" D |
| 2 | Spinnaker Sheet blocks | 992 | |

NOTES
It is recommended that halyard tails should be passed through their relevant cleats and stopper knots tied.
Lash the mainsail clew to the clew outhaul slide leaving about 2" between and ensure there are at least 2 turns around the boom. This will avoid bending the slide when reefing.
See also Maintenance 7C. Fitting Out.

## 3.D. Steering Gear

The steering gear is by Mathway Marine and is the L.S. Type operated by a 21" teak steering wheel by Port Hamble. The wheel cap is a push fit and must be pulled off to expose the wheel nut. A pull off panel is fitted in the bulkhead above the galley sink, this gives access to the steering wheel bevel box. A second bevel box is fitted at the forward end of the port cockpit locker.

The shafting then passes through two bulkhead bearings in the aft toilet bulkheads and then to the aft reduction box in the aft peak. All gearboxes are filled with Spirax 90 gear oil, the oil level should be checked annually.

Grease nipples are fitted to each bulkhead bearing and the ball ends of the drag link to the tiller and should be greased two or three times a year.

The emergency tiller, of galvanised tube, may be mounted on the top end of the rudder stock by unscrewing the flush deck plate aft of the mizzen mast. The tiller operates reversed and may be stowed in the aft peak, do not stow near compass.

A steel muff coupling is fitted to the rudder stock to allow easy withdrawal of the rudder. To remove the rudder, the heel fitting and steady band must be removed. These are secured with stainless steel machine screws tapped into the GRP and locked with Pregel. The rudder is moulded around the stock so the latter is not removeable. The maximum rudder angle is controlled by rubber stops against the tiller arm. Very high loads may be set up against these stops if the yacht is hove to with the wheel free or if motoring fast astern. See also Mathway Handbook.

## 3.E. Deck Gear

**Stemhead Fitting**
Of Stainless steel by Lewmar with Tufnol chain roller and captive keep pin. The forward hole is for the forestay, the centre hole is for the jib tack and the aft hole is for the foreguy block.

**Anchor and Chain**
When the yacht is handed over, the bitter end of the chain is lashed with Terylene to the web in the chain locker. This should not be shackled as it may be necessary to cut the chain adrift. The anchor recess is moulded to take a 35 lb C.Q.R. anchor. Anchor chain supplied is calibrated 5/16" chain which will suit S.L.windlasses if fitted later.

**Anchor Windlass**
The whole area between the foredeck fore and aft stringers is reinforced for a windlass if required. If a S.L.510 windlass is fitted it may be found that the brake on the gypsy is difficult to free, a sharp tap backwards on the lever will normally free this but otherwise it is necessary to secure the chain forward of the windlass so that the brake may be unscrewed against this. Always leave brakes 'Off' when not in use.

**Winches**

| | | |
|---|---|---|
| Jib sheet winches | Camper & Nicholsons | E Type |
| Main halyard winches | Camper & Nicholsons | D Type |
| Mainsheet winch | Camper & Nicholsons | D Type |
| Mizzen halyard winch | Camper & Nicholsons | L Type |

Please give number of yacht when requesting spares as modifications have been made on these winches from time to time.

**Genoa Tracks**
These are all through bolted and are 1¼" x $^{3}/_{16}$" Lewmar Cat No 319 and are fitted with Lewmar slides Cat No 343c.

**Stanchions and Sockets**
These are S.S. tube 27" high Lewmar Cat No 1045 with Lewmar 1099c sockets. Please ensure split pins are fitted. Gangway stanchions are Lewmar Cat No 1045 GW.

**Fairleads**
Goads Type 6¾" AO1623 and AO1633

**Mooring Cleats**
Simpson Lawrence Type 1396cp Size A.

**Mooring Bollard**
Simpson Lawrence Type 1379.

**Davits**
The davits are spaced 4'-8" apart and are of welded steel construction polythene coated, by J.G. Meakes Cat No A 105. It is recommended that the sling points on the dinghy are as low as possible and that they should be spaced about 5'-6" apart. Anti tipping lines will be necessary to prevent the dinghy turning over when lifted out of the water. It is essential to hoist the dinghy up so that the gunwhale is held in the V brackets and the highest side just clears the mizzen boom. Make fast the hoists and pass a lashing from the centre thwart over the aft side of the

dinghy down to the centre davit bracket to hold the dinghy down. Diagonal webbing gripes and a lashing direct from thwart to centre bracket are also recommended for security.

**Pulpit**
By Lewmar 1" O.D. stainless steel tube**.**

**Cockpit Canopy**
To remove this, let go the four bolts to the top of the windscreen and the canopy light plug, if fitted and simply lift on each side, the pillars at the aft end are a push fit into sockets in the canopy. Carry the canopy forward and turn so that the aft end is forward. The canopy then fits into the stowage chocks provided. The locking screws at the base of the pillars may be let go to release the pillars and the screws replaced. The pillars are not interchangeable.

**Cockpit Side Screens**
If these are to be fitted these should be fed into the track working out from the centre, the forward edges on the windscreen being inserted last. French chalk will help the screens to slide in the track. The screens should pass inside the canopy pillars.

**Cockpit Doors**
The doors to the cabins are on lift-off hinges and for normal sailing it is recommended to remove both the saloon doors and the portable sill piece.

**Liferaft**
If one of these is fitted it is normal to fit this in chocks above the aft cabin hatch. Please ensure that the release line is firmly secured to the chocks and that you are able to operate the quick release hook on the lashings.

**Toerail**
Please note that the hull to deck join is made entirely in G.R.P. and that there is no possibility of leaks from this. The screws around the inside of the rail pass through solid G.R.P. and only secure the outer piece of teak toerail.

**Handrails**
These are secured by S.S. machine screws tapped into alloy plates moulded in the deck.

**Deck**
The main deck and coachroof sides are solid G.R.P. with a mean thickness of about ¼" with alloy plates and plywood pads moulded in for deck fittings as necessary.
The coachroof top is of sandwich construction with the top layer of G.R.P. about $^{3}/_{16}$" thick, a core of ¾" end grain balsa and an inside layer of G.R.P. about ⅛" thick.

## 3.F. Instruments

**Compass**
A Sestrel Major compass is binnacle mounted in front of the wheel. Illumination is by a 6 watt 12 volt S.B.C. bulb mounted in the eyebrow shutter. The compass is oil filled, not alcohol. A dimmer switch is fitted to port of the wheel, access to this rheostat is via a pull out panel over the galley sink.

The compass is not adjusted for deviation unless this has been requested and in which case this should be done when all cruising gear is aboard. Take particular care to keep light meters, knives and metallic objects away from the compass.

The corrector magnets are in the small tubes at the base of the compass but do not over tighten the end plugs as the magnets are easily broken.

**Echo Sounder**
1. The Seafarer is fitted with a single transducer below the aft end of the starboard saloon settee. This is a fixture and can only be repaired by replacement which requires the yacht to be slipped. A secondary position for the instrument is fitted on top of the coachroof inside the windscreen. See also Manufacturers pamphlet.
2. The Hecta may be fitted with a second transducer in which case this is fitted on the port side in the locker under the stove. The Hecta transducers may be removed with the yacht afloat as blanking caps are supplied to screw on. If the transducers are removed for any reason be careful not to lose the loose

retaining rings. If a repeater dial lead is disconnected a shorting plug must be fitted in its place. A calibrating screw is fitted on the back of the instrument. See also Manufacturers booklet.

The most common fault with echo sounders is marine growth on the face of the transducer which must be cleaned carefully, not scratched. Never antifoul the faces.

**Speedlogs**

1. The Sumlog is driven by a nylon impeller on a fixed bracket under the hull to port of the engine. A stainless steel flexible drive is taken to the instrument to port of the wheel. 12 volt illumination is arranged with the switch by the engine panel. The impeller is robust and does not foul easily but can only be cleaned by slipping the yacht or swimming. This log cannot be adjusted and usually over reads 10%.
2. The Harrier is fitted with either one or two impellers fitted under the forward cabin sole to port of the toilet. Always retract these when not in use. If an impeller gets fouled when underway, rotate impeller $180^{o}$, if this fails, withdraw and fit blanking cap while cleaning impeller. The latter should rotate freely when blown at.
   Calibrating screws for speed and distance are fitted at the back of the instrument. For further details see Manufacturers booklet.

**Radio**

If reception only is required an insulated wire is taped to the starboard mizzen cap shroud and led through a deck insulator to the radio over the chart table.

If a transmitter is installed the Tx aerial (230036 Type 9 cable) leads from the set over the chart table, under the starboard side deck, through a deck insulator to the starboard mainmast cap shroud which is insulated top and bottom by No 7 Norseman insulators. The stay is insulated from the spreader by Nylon tube and a jumper wire connects the insulated shroud to a triatic aerial between the mastheads. A special aerial elastic and glass insulator are fitted with a terylene lanyard to the mizzen head. It is important when refitting to ensure that all aerial connections are clean and well made.

If a Sailor Locator D.F. set or Sestrel Hand Bearing compass is used ensure the batteries have non-magnetic cases.

A specially designed earthing plate is used for earthing the transmitter. This is bolted through the hull under the cabin sole under the chart table. A copper earthing strip is fitted behind the bulkhead lining up to the transmitter. The earthing plate is a 'Dynaplate' and should not be antifouled. For further details of radio see Manufacturers booklet.

**Auto Pilot**

The Neco Mk II is wired entirely independently of the rest of the yacht and has its own master switch and two fuses under the chart table to starboard of the main battery switches. The sensing unit is fitted under the forward saloon settee just aft of the mast and must be free to swing in its gimbals. Please avoid stowing magnetic articles in this locker. It is important that if the auto pilot steering chain is disconnected for any reason this should be professionally re-aligned as otherwise there is a possibility of damaging the steering gear and bending the rudder stock.

The Manufacturers handbook should be closely followed, common faults, fuses etc. and their remedies are listed therein.

It is most important to switch off the auto pilot master switch when leaving the yacht as there is a possibility of running down the batteries if this is left on.

# 4. ENGINE

## 4.A. Installation Details

The Perkins 4/107/M is a vertical four stroke fresh water cooled marine diesel engine, with four cylinders of 3 ⅛"(70.4mm) bore and 3½" (88.9mm) stroke. A Meadows T.M.P. 2:1 reduction reverse gearbox is fitted and all installed on pedestal resilient mountings.
The centreline beam in the cockpit sole is portable so that the engine may be lifted out.
Louvres are fitted in the steering console to provide air for the engine
The engine serial number is stamped on the chain casing athwartships on the port forward side of the engine and is pre-fixed by 107U.

**Controls and Instrumentation**
A Morse combined throttle and gear shift is installed Type M.T.E. 32897 with two 33c cables. Forward movement of the lever engages ahead gear and then progressively increases the speed. Rearward movement does the same for astern. If the lever is pulled inboard it may be used to operate the throttle without engaging gear, but it is spring loaded to return to the normal neutral position.

The starter panel, stop button and windscreen wiper switch are fitted in the forward end of the port cockpit locker.

Standard instruments comprise, mechanical tachometer, ammeter, water temperature gauge, oil pressure gauge and oil pressure switch light. They are covered by Perspex with drain and ventilation holes.

If an engine hour meter is fitted this is fixed over the gearbox casing and simply operates from the engine vibration.

## 4.B. Starting

The full procedure is laid down in the Perkins Manual which should be studied. Below is a practical resume.

**Pre Start**
1. Check oil, water, fuel, salt water inlet seacock and exhaust seacock if fitted.
2. Ensure shaft brake is off and there are no warps over the side.
3. Turn down sterntube greaser.
4. Make sure the battery switches are on and the stop button pushed in.

**Start**
1. Put Morse control in neutral with half throttle.
2. Turn engine key clockwise and engage starter until engine starts and then release.
3. Whenever possible run engine in neutral at 1500 rpm until the water temperature comes up to 170 degrees before engaging gear.
4. CHECK THAT COOLING WATER IS COMING OUT OF THE EXHAUST OUTLET.

**Cold Start**
Very rarely required in England. If engine does not start normally in very cold weather.
1. Open tap on cold start diesel tank.
2. Turn key anti-clockwise to H for 15-20 seconds, then start by turning key hard anti-clockwise.
3. If this fails, try it for a further 10 seconds. Do not abuse the cold start system.

**Stopping Engine**
1. Pull out stop button until engine stops.
2. Switch off one battery if both are on.
3. Give stern tube greaser a few turns.

## 4.C. Cooling & Exhaust Systems

**Cooling**
The engine itself is cooled by fresh water which is thermo-statically controlled. The fresh water is circulated by a rotary pump with a bronze impeller on the forward end of the engine. The system has a header tank with access to the filler cap through the small hatch at the forward end of the cockpit sole.
Check level regularly and ensure no undue oil or scum is present. Normal running temperature is 170$^{o}$ F ( 77 C).

The salt water cooling intake at the aft starboard end of the engine is fitted with a strainer which may be removed for cleaning by turning off the wheelvalve clockwise and then loosening off the wing nuts at the top of the strainer. The oval cap plate can then be pivoted aside and the mesh strainer lifted out and cleaned. Remember to open the wheelvalve afterwards.

The salt water first passes through the gearbox and then to the salt water circulating pump. This is a Jabsco type with a Neoprene impeller which should be checked annually. The water then passes through the heat exchanger then aft to the Parsons silencer where it is injected into the exhaust.

**Exhaust**
The exhaust manifold is water cooled but the exhaust piping from there to the Parsons silencer is dry and so gets very hot. A flexible stainless steel section allows for engine vibration and should not be lagged, the lagged section to the Parsons silencer is rigid. From the silencer a short section of metal pipe is followed by reinforced rubber hose all the way to the transom. A drain cock is fitted at he lowest point in the bottom locker of the toilet. At the transom a rubber McMurdo silencer is fitted. This is of the self closing type preventing re-entry of water. A wheelvalve may also be fitted if requested.

## 4.D. Lubricating System

**Engine**
The capacity of the engine lubricating oil system is 7 pints (4 litres) and it will normally be filled with either Esso HDX 20 or Shell Rotella 20/20W when it leaves the yard. For alternative oils see the Perkins engine manual. A dipstick is located on the starboard side of the engine and a pressure gauge is fitted to the instrument panel. Oil pressure should normally be between 30-60 lb/sq.in (2.1-4.2 Kg/cm sq.) at normal engine speed and temperature.

The yacht may heel up to 30$^{o}$ without adverse effect on the lubrication system, provided she is righted occasionally in order to lubricate the valve assembly. The engine may thus be run with confidence while beating to windward.

There is an oil filter mounted on the starboard side of the cylinder block (See engine manual.) The element should not be cleaned but should be renewed every 150 hours or once year whichever is the shorter period. ( See engine manual.)

**Gearbox**
This is an hydraulic gearbox and a separate manual is issued for it. Bearings in the reduction gearbox are bath lubricated whereas those in the main gearbox are force lubricated. In this respect it should be noted that the systems are not common and each must be filled separately with the same lubricating oil as the engine.

The gearbox has its own dipstick and, if the oil level registers between the mark on the blade and the bottom of the dipstick, there is sufficient oil in the gearbox. Capacity 1 ½ pints (0.85 litres).
The reduction box level is determined by a level plug on the side of the casing. Capacity ¾ pint approx (0.43 litres).

**Sterntube Greaser**
See Sterngear.

## 4.E. Fuel System

If the fuel reaches the fuel pump and is clean, free of water, suspended dirt,sand and other foreign matter and conforms to B.S. No BS 2869 (1957) Class A, nine out of ten potential engine problems will be eliminated. To assist in this two filters are fitted but remember no warranties cover foreign matter entering the engine, so fuel should be filtered through a fine gauze when filling the tank.

A glassfibre tank of 38 gallons (173 litres) is matted in below the cabin sole at the aft end of the saloon. A bolted cover is fitted on the tank top to take all connections and give access when required. The filler on the port side deck is engraved and fills direct to the tank. The tank is vented to a fitting on the outside of the cockpit coaming by the wheel. A calibrated dipstick is supplied.

The fuel suction is taken down to about 1" from the bottom of the tank then feeds to the glass bowl filter at the forward starboard corner of the engine room and then to the fuel lift pump on the starboard side of the engine. A hand priming lever is fitted on this pump. The fuel the passes through a paper element filter to the fuel injection pump. The fuel is then pumped at high pressure to the four injectors. Surplus fuel from the injectors is led back by a common spill pipe and together with the surplus fuel from the paper element filter is led back to a separate fitting in the main tank top.

Auxiliary G.R.P. fuel tanks may also be fitted in the bottom of the cockpit lockers P & S. These tanks are filled through filler pipes on the actual tank tops and separate breather pipes and dipsticks are fitted. The port tank has a capacity of 25 gallons (114 litres) and the starboard tank 30 gallons ( 136 litres). The feed pipes from the bottom of these tanks are fitted with wheelvalves and then feed to the main tank filler pipe.

Care should be taken not to overfill the main tank as the dipstick fitting may leak, also ensure that the main tank is not run too low as this will lead to air in the fuel system.

**To Bleed Fuel System**

1. Slacken bleed screw on engine filter and operate hand priming lever, until fuel without air is pumped out, then tighten bleed screw.
2. Slacken small nut on extreme top of injection pump, operate starter until neat fuel is flowing. Tighten nut.
3. Slacken any two injector nuts, operate starter until fuel is spurting regularly, tighten nuts.
4. Start engine.
   See also Engine Manual and Diagrams.

## 4.F. Sterngear

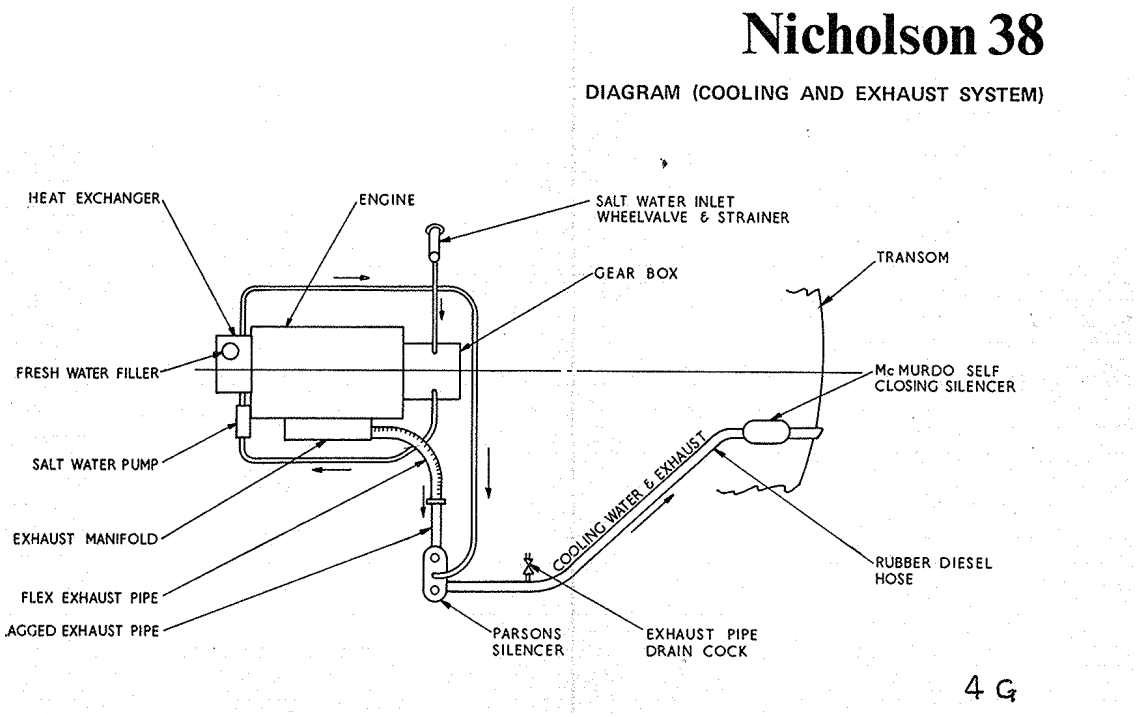
The propeller is 3 bladed right hand of 16" (406mm) diameter by 11 ½" (349mm) pitch of manganese bronze and is driven by manganese bronze intermediate and tail shafts of 1 3/8" (34.9mm) diameter. Flexible couplings are fitted at each end of the intermediate shaft. The stern tube has two white metal bearings with a packing gland at the forward end, the remote greaser for this is on the starboard side of the engine room aft bulkhead. This gland should drip slowly when underway but should not leak with the shaft stationary. The greaser should be turned down every time the engine is stopped. Use Neox or any soft water resistant grease. The gland packing should be checked annually.

Drum type shaft brakes were fitted to many yachts up to No 44 and shaft locking pins were fitted after this. A set drill should be evolved to prevent the engine being put into gear with the shaft locked.

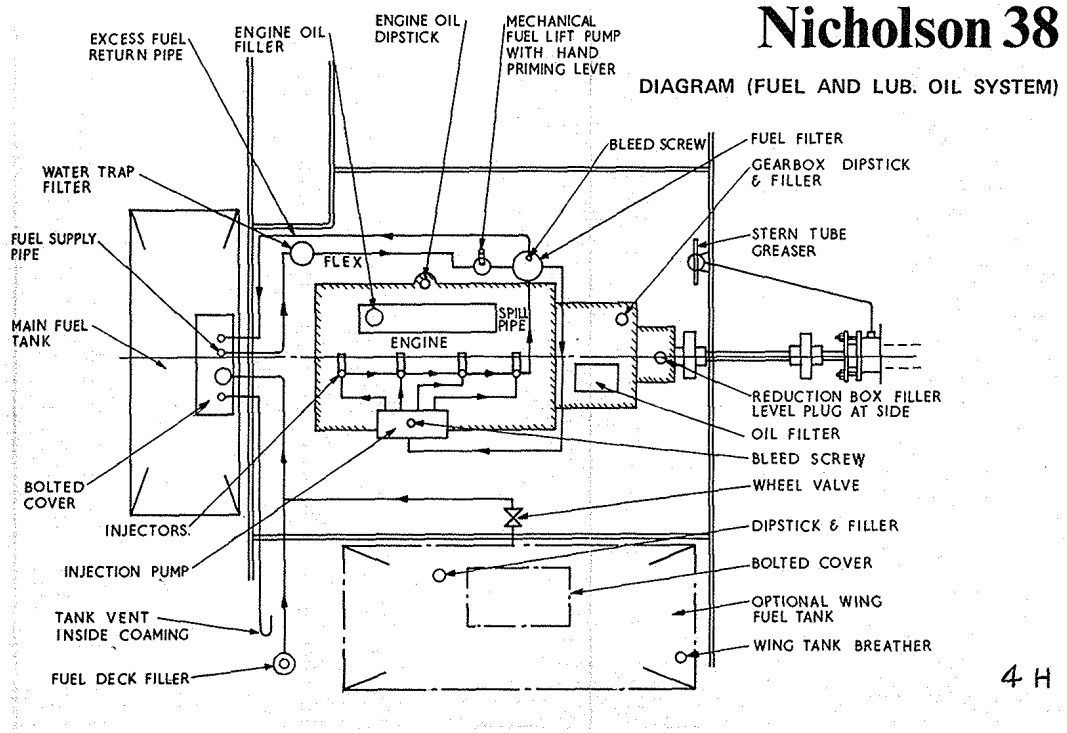
**Fuel Consumption**

Theoretically 0.4 pints (0.23 litres) per B.H.P./hour or practically about 8 miles to the gallon or a maximum of 12 miles to the gallon in smooth water at about 6 knots.

## 4.G. Diagram – Cooling and Exhaust Systems




## 4.H. Diagram – Fuel and Lube Oil Systems



# 5. ELECTRICAL

## 5.A. General

The engine belt drives a C.A.V. Type 280 Alternator which has a maximum charging rate of 45 amps. The output however is voltage controlled so that the rate will soon drop as the battery voltage increases.
The regulator and cut out are fitted under the inboard side of the chart table

The 12 volt batteries are fitted in parallel, Type 6KHV 154JL 94 amp/hrs capacity each. Each battery is fitted with a separate cut out switch under the chart table so that either battery may be used for every service or if required both together. The switch must be on for the battery to be charged. To switch on, push in and turn clockwise.

An alternator cut out switch is fitted outboard of the battery isolating switches. This should normally be pulled out to allow the alternator to charge but may be pushed in to cut it out so avoiding interference with the radio, D.F. etc.

A distribution panel with fuses and switches is fitted in a small locker above the chart table, a key to the fuses is inside the locker door. The Switches are labelled. See Wiring Diagram.

**Notes**

1. Check tension of alternator belt regularly.
2. Always switch off one battery when stopping the engine to ensure that one battery is available in a charged condition to start the engine. It can not be normally started by hand.
3. A Honda Type ED 250 generator is suggested as a very useful machine to keep the batteries charged as this will charge at a constant 18 amps as the input from this to the batteries is not voltage controlled.
4. Check battery acid level weekly.

## 5.B. Fittings

**Electrical Pumps**
The water pressure system has a Jabsco Aquamaid Model 12770 pump fitted under the galley. Impeller Part No 14609. This has a separate fuse and switch in the switch locker and is fitted together with a pressure switch and dry tank cut out switch, Part No SP 6070-05, a small hand starting lever switch is fitted on this which should be pressed down to prime the system.

The shower drain pump is a Jabsco Water Puppy 7600 with an impeller Part No 6303. The switch is the lower of the two above the wash basin.

**Toilet Fans**
Fans are fitted in both toilets with a switch giving two speeds, intake or exhaust. These are Tannoy standard 12 volt units. Care should be taken not to leave these running for long periods.

**Windscreen Wiper**
Dudley Heavy Duty Type with 12" S.S. arm and 12" blade, operated by pull switch by the engine starter panel.

**Deckhead Lights.** BMAC 212

**Bulkhead Lights.** BMAC 177

**Port & Starboard Lights.** Simpson Lawrence Type 1304 with 6 watt cartridge bulbs.

**Stern Light.** McGeoch Type AP 3932 with a 6 watt S.B.C. bulb.

**Masthead Steaming Light.** Simpson Lawrence 1303.

**Spreader Lights.** Sealed beam units, must be replaced by a new unit.

**Chart Table Lights.** Elbolites.

**Compass Light.** Bulb 12 volt, 2.8watt, MES screwed.

**Cathodic Protection (Optional)**
M.G. Duff Type G737 pear shaped anode is wired to the sterntube and to the engine. Do not paint the anode when antifouling. It is fitted with permanent bolts through the hull under the aft cabin settee.

**Battery State Meter (Optional)**
This is fitted in the switch locker and is connected via the battery isolating switches so that the state of either battery may be checked. The meter is in fact a sensitive voltmeter and will also register when the battery is being charged.

**Refrigerator**
This is of 2 ¼ cu, ft, capacity and is refrigerated by a Lec Mariner P22 compressor type unit. A transverter unit converting 12 volts D.C. to 20 volts A.C. is fitted under the port saloon settee. The compressor unit is fitted under the refrigerator behind the louvered panel which may be pulled out inboard. To remove the unit release the refrigerator door and face surround which will expose the piping to the cooling coils.
The cabinet is foamed all around so is not easily replaceable and care should be taken to use no abrasives when cleaning.
The refrigerator consumption is 7 to 5 amps when running so it is vital to economise on this by opening the door as seldom as possible and by not using a colder setting than necessary. When set at 'N' the compressor should operate about 1/3 rd of the time with an ambient temperature of 70 F ( 21C). It will however barely make ice at this setting.

Ensure the door is locked when sailing and also that the air passages to the cooling coils below the refrigerator are not blocked by gear in the lockers. It is vital that the refrigerator door makes a really airtight seal.

# 6. PLUMBING

## 6.A. Fresh Water System

**Tank**
The main water tank is a separate G.R.P. moulding matted in under the cabin sole with two Henderson inspection hatches. The tank is filled via a deck filler on the starboard side just forward of the cockpit and is vented to a swan neck fitting discharging into the galley sink. Capacity 75 gallons ( 340 litres) approximately.

**Hand Pump**
A Whale hand pump is fitted in the galley which draws directly from the tank if the pressure system should be out of action for any reason.

**Pressure System**
The Jabsco Aquamaid electric pump draws water from the tank and passes this via a non return valve, pressure switch and dry tank cut out switch to a small cylindrical tank from where all the cold taps are supplied direct and which also feeds the hot taps after passing through the water heater. Cold feeds are generally PVC but hot pipes are of lagged copper.

The pressure switch normally starts the pump when the pressure falls to 20 p.s.i. and stops when the pressure rises to 30 p.s.i. The pump will however be cut out by the dry tank cut out switch if air is being drawn in to the system or if a tap is operated when the master switch in the switch locker is off. The cut out will also operate if the system has been switched off for some time. To start the system check that all taps are closed and then hold down the reset lever on the front of the dry tank cut out switch until the pressure switch stops the pump.

**Hot Water and Shower**
This is heated by a Vaillant Type AO60-6GB instantaneous gas water heater which feeds the hot taps and Mira shower valve. The outside ring of this valve controls the amount of water, the central bar controls the proportion of hot and cold but this must be run for about 15 seconds before the hot water reaches the valve.

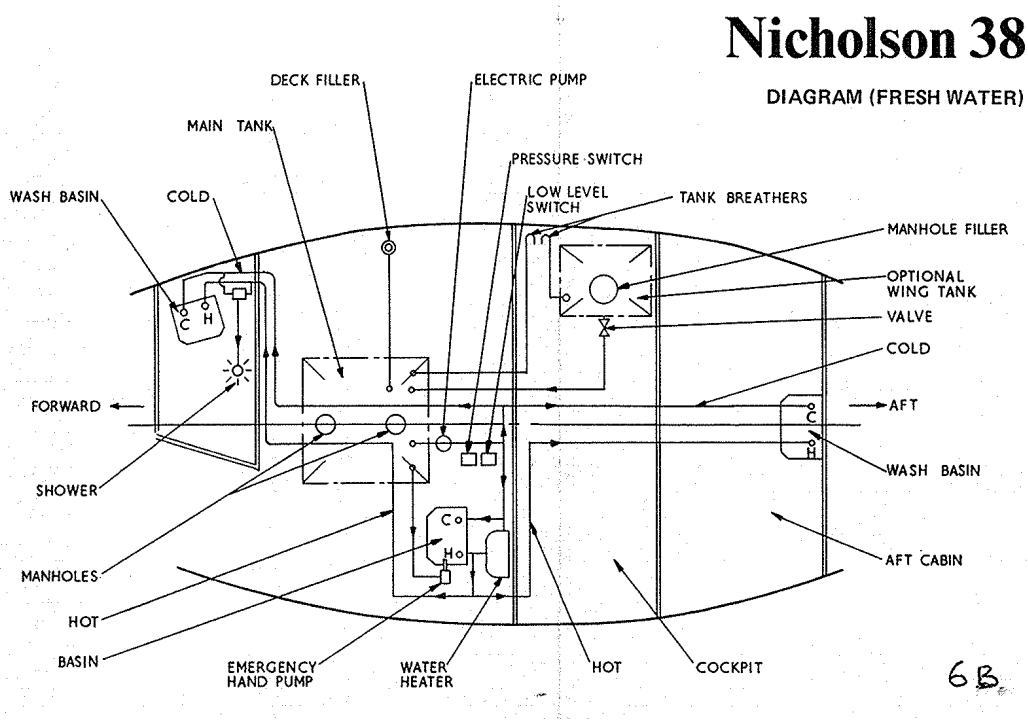
**Pressure System Faults**
The most common faults are lack of water in the tank which will operate the dry tank cut out switch or a small piece of dirt lodged in the non return valve which will allow the pressure to drop slowly as water leaks back to the tank. The pump will thus run intermittently. The non return valve is fitted between the pump and the pressure switch and has separate unions so this may be easily removed for cleaning.

A leak in a pressurised pipe or tap washer will also give the same intermittent running of the pump until the leak is traced and cured.

If the pump labours and does not stop, either the batteries are low, the pressure switch upper limit is set too high or the pump impeller is damaged. The impeller is removed by releasing the three screws in the cover plate at the bottom of the pump, the plate and impeller will then fall down. Running the impeller dry will rapidly damage it.

**Wing Tanks (Optional)**
Additional tanks may be fitted in the bottom of the cockpit lockers port and starboard. Normally the starboard tank is employed for water, 30 gallons (136 litres) and the port tank for fuel 25 gallons (114 litres). The tanks are generally filled through their own tank top hatches or filler pipes and delivery is controlled by wheelvalves arranged as in diagram. The tanks are vented by swan necks close under the side deck. Care should be taken to ensure that the outlet valves are normally shut. In all cases these wing tanks supply the main tanks. It is good practice when opening any wheelvalve to open completely and then turn it back ¼ turn.

## 6.B. Diagram – Fresh Water



## 6.C. Drains & Bilges

**Basins, Sink & Shower**
Wastes from the sink and both washbasins are by gravity via plastic hose to wheelvalves at the ships side. The shower drains by an electric Jabsco Water Puppy pump Type 7600 with an impeller Part No 6303 which is switched above the washbasin and discharges into the washbasin drain. Please ensure this pump is not run dry and try to prevent an excess of sand or hair being drawn through. A small gauze strainer is fitted in the shower tray. The tray is not fixed so may be lifted out to clear the drain pipe.

**Cockpit Drains**
The cockpit seat drains are teed into the cockpit sole drains which are fitted in each corner of the cockpit. These drains are teed together each side and lead to wheelvalves port and starboard. It is recommended that these drains should be checked regularly as these may be easily blocked by floating dirt.

**Bilge System**
The fore peak and chain locker drain aft through limbers to the space by the mast step and then under the water and fuel tanks and engine tray to the deepest part of the bilge under the aft cabin sole. The aft peak drains forward below the washbasin and under a teak capping on the centreline to the same deep bilge.

The bilge pump is a Henderson Type Mk III T A fitted in the starboard cockpit locker, both suction and delivery are of convoluted hose with a strum box at the bottom of the suction under the aft cabin sole. The discharge wheelvalve is fitted in the starboard cockpit locker just below the waterline. This pump should be operated until several strokes have sucked air to prevent any danger of siphoning back.

**Scuppers**
Three scuppers are fitted each side and are matted integrally on the inside of the hull so that no valves are required.

**Anchor Drain**
The anchor recess has a small drain, no valve and should be kept clear.

## 6.D. Toilets

Each toilet compartment is fitted with a Moray water closet. The inlet (small diameter pipe) is connected by a seacock to the W.C. and the soil pipe (large diameter pipe) is taken to the outlet wheelvalve. The inlet seacock has a lever handle which must be turned $180^{o}$ and which is only half open if in line with the pipe.

**Forward W.C.**
The inlet lever is under the cabin sole to port of the toilet (access by a trap) and is open when up, to close it, turn down through $180^{o}$. The soil pipe outlet wheelvalve is just inboard of the W.C. casing near the base.

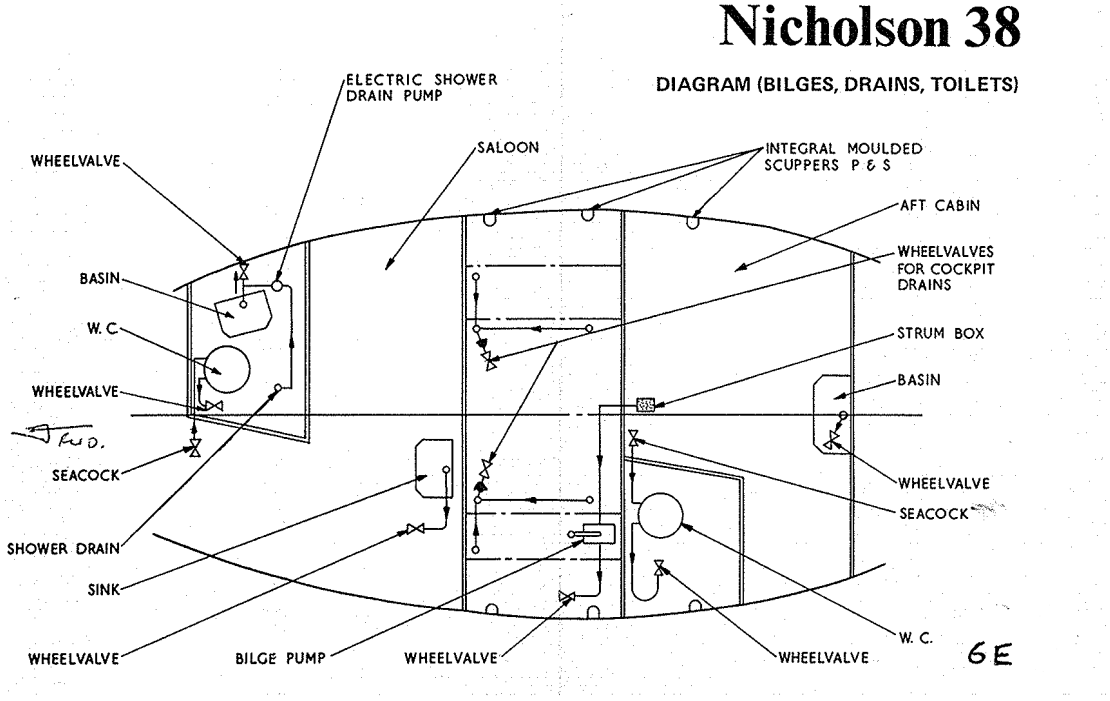
**Aft W.C.**
The inlet lever is under the aft cabin sole (access by trap) and is open when down, to close it, turn up through $180^{o}$. The soil pipe outlet wheelvalve is right forward inside the lower locker in the toilet compartment.

**W.C. Operation**
The Moray W.C. works on the single lever principle for pumping both in and out. First ensure that both inlet seacock and outlet wheelvalve are open.
After use, open the small valve on the W.C. itself, turn anti-clockwise. Then pump until all soil has been cleared from the bowl. Close the small valve (which will stop water coming in to the bowl) and pump to clear the bowl of all water, then give four or five more strokes to pump air into the soil pipe to prevent any possibility of siphoning back.

Close inlet and outlet if leaving the yacht for any time. Always leave small valve on W.C. in closed position but do not over tighten.

**Maintenance**
Soft absorbent paper should be used in preference to interleaved. Please avoid emptying foreign bodies into the bowl unless you have eaten it first. Bleach type disinfectants must not be allowed to remain in the bowl for any lengthy period. Refer to detailed instructions before making any adjustments or repairs.

## 6.E. Diagram – Bilges Drains Toilets



## 6.F. Gas System

Either 10lb Calor Gas or 904 or 907 Camping Gaz bottles may be used as long as the correct regulator is fitted. Only one bottle is connected at one time. The supply is fitted with a diaphragm valve at the stowage operated through a small trap from the galley. The flexible piping is to BSS 3962 as required by the major insurance companies. When changing bottles please check that the washer between regulator and bottle is in good condition. Please note that the thread is Left Handed. Screw down tightly but overtightening will squeeze the washer out of shape.

**Important**
Turn off gas at stowage when ever possible and regularly check for leaks by sniffing under galley and in vicinity of bottles. Remember that Butane is heavier than air and will flow like water and can be bailed out by bucket or even by using the bilge pump. An electrical gas detector may be fitted or a more rudimentary method is to take a sample of bilge air in a tin and drop a match into it ON DECK.

**Cooker**
The cooker is a Flavel B700 with fiddles, pot holders, gimbals and a fixing latch. The whole cooker may be lifted out of the gimbals for cleaning or servicing. The gas taps are spring loaded and must be pushed before turning. A flame failure device is fitted on the oven burner. To light this it is necessary to push in and hold the red button for about 20 seconds until the device is heated to prevent it shutting off the gas.

**Water Heater**
This is the Vaillant Type AO60-6GB and is mounted over the sink and exhausts through the deckhead. The vent will become very hot so do not leave anything near this on deck.
To operate turn on the gas bottle and then turn heater knob from O to 1 and light pilot jet through hole in front of heater. The pilot should be allowed to warm up the bi-metallic strip which cuts off the gas if the flame goes out, and then turn the knob to position II.
The main gas jets will not ignite without a flow of water so the water pump must be on and working. A water shut off valve is fitted on the inlet at the back of the heater so this may be isolated if required. Now turn on a hot tap and the heater should ignite. Water temperature is regulated by the small knob below the gas control knob, turning it anti-clockwise will leave the gas supply at the same level but restricts the flow of water thus making it hotter. All hot pipes are lagged.

# 7. MAINTENANCE

## 7.A. Hull

For maintenance of the G.R.P. see Halmatic pamphlet.

The hull is pigmented to just below the waterline and is moulded clear below that. Both waterline and bootop lines are moulded on and if a separate bootop colour is arranged this is painted between these two lines.

The standard antifouling is International Hard Racing Copper Red and needs about ½ gallon for each coat. Care must be taken not to paint echo sounder transducers, radio earthing plates or sacrificial zinc anodes. If any different antifouling has been used it is necessary to consult the paint manufacturers.

DO NOT USE FLASH FOR CLEANING ANY G.R.P. WORK.

**Exterior Teak Work**
This is normally varnished with Epifane epoxy based varnish. Other varnishes other than two pack polyurethane may be applied over this but for best results we would recommend Epifane which can be supplied by C&N Ltd.

If the exterior is oiled this should be coated regularly with Linseed oil.

**Interior Teak Work**
This is oiled with Teak Oil and a quarterly rub over will keep this clean and of good colour.

**Chromium & Stainless Steel**
It is important that the fittings are kept clean as this will greatly lengthen the life of the chromium and will prevent the yellow stains on the stainless known as bleeding. Use Silvo, Duraglit or similar polish and then rub over or spray with Ambersil MS4 or similar.
NEVER USE STEEL WOOL anywhere on board as this will break down and leave thousands of rust spots.

**Rigging**
It is advised that after the first week or so the standing rigging should be wiped down with a rag to remove excess oil and that this should be repeated with MS4 at the end of the season and again in the spring.
Check the wire parts of the genoa and mizzen halyards annually and replace if rusty or if any wires are broken. Before each cruise oil all snapshackles and check main and mizzen halyard shackles for security, check rigging tensions and rigging screw locking wires and lock nuts and check all shackle pins and split pins. All shackles aloft should be securely wired.

**Liferaft**
This should be returned to the servicing agents annually and MUST have its release line made fast to the yacht when refitted.

**Cockpit Sidescreens & Sail Coats**
May be scrubbed with detergents but not Flash.

**Upholstery**
The vinyl type may be cleaned with Vim or detergents but the cloth types should be cleaned with hot water and soap. Do not Dry Clean.

**Cabin Sole**
This is treated with Bournseal to give a non slip surface and should be rubbed down and recoated once a year.

## 7.B. Hauling Out, Drying Out

See Docking Plan 38/047. The 38 may be lifted by crane if suitable slings and spreaders are available or more conveniently by Renner or Travelift. In every case it is important that the forward sling is positioned clear of speedometers, usually fitted abreast of the aft side of the forehatch. The impellers should be withdrawn. Wire slings must be well padded or covered to avoid scoring the G.R.P.
The bottom of the keel is 14" (350mm) wide so the yacht will tend to stand upright.

**Drying Out**
If drying out on legs try to choose a hard clean beach with a reasonable slope up forward. Move any portable weights aft and tend the legs as she takes the ground. If alongside a wall or piles move weights to the inboard side and use a halyard to ensure she leans inward.

If stranded and dried out on a flat beach the buoyancy of the hull will lift her before the water reaches the deck edge.

## 7.C. Laying Up, Fitting Out

It is quite satisfactory to lay up the yacht afloat in conditions where some ice will form but care should be taken to prevent abrasion around the waterline due to thin surface ice if moored in a stream. If moored alongside efforts should be made to prevent chafe of mooring ropes and fenders.
In most marinas it is possible to rent small electric heaters which can be permanently plugged in to the shore power. This will keep the yacht sweet and dry below.

In icing conditions it is important that all fresh water systems are carefully drained. Pump covers should be eased off, seacocks closed, engine drain cocks opened, exhaust drain cock opened (lever across), galley pump piping released, pressure system and water heater drained.

Sails should be moved ashore if the yacht is not being heated and should be stored in dry conditions. Ratsey & Lapthorn operate a valetting and storage service.

All running rigging should be removed leaving one jack line through each masthead. Booms may be stowed below. Cockpit canopy and sidescreens should be securely rigged.

Batteries should be moved ashore for charging.

**Fitting Out**
Masts and standing rigging should be cleaned off.

**Mainmast**
The longest wire is the backstay and is to be threaded through the saddle on the mizzen mast to the deck fitting. The longer of the two lower shrouds is the aft one. The masthead shrouds lead to the centre chainplate. The forestay is taken to the forward most hole in the stemhead fitting.

**Mizzen**
The two cap shrouds lead to the forward most chainplate. The forward lower shrouds lead to the lug on the foremost chainplate. The aft lower shrouds which are the shortest lead to the small chainplates. The mizzen backstays with releaseable screws lead to the aftermost chainplates and are attached through shackles on the chainplates. The mizzen mast is stepped in the shoe with butyl rubber lining.

**General**
Ensure all bottle screws are securely wired , lock nutted and taped over. Ensure that all clevis pins are secured with split pins spread right out, there are three clevis pins on each stay. Ensure that the main forward lower shrouds and capshrouds have their nylon rollers above the parrel balls or washers. The jib tacks to the centre hole and the foreguy the aft hole in the stemhead fitting, The bottle screw toggles go on the chainplates. The main forestay and cap shrouds should be really tight, you should not be able to move the forestay more than about 3" at shoulder height.

**Rigging**
It is not practicable to wire the releaseable backstay screws so these should be checked frequently.
The running rigging has all single part halyards, The main halyard uses the starboard sheave, the genoa halyard the port sheave. The spinnaker block shackles to the forward most tang and the topping lift block shackles to the

pin under the backstay tang. The burgee halyard is also to be rove through the small fixed sheave. The spinnaker pole lift block shackles to the tang just above the spreaders. The ends of the spreaders must be fitted with Canpa moulded covers to prevent them snagging the sails. Ensure all shackles aloft are securely wired.

The butyl rubber mast coat must be slid on from the bottom of the mast before this is stepped, washing up liquid will lubricate this. The mast rake is normally arranged to be 2" in the height of the toilet bulkhead. Mast heel wedges are fitted forward and aft of the mast tenon. Rubber wedging is fitted around the mast at the deck, a lashing may be used to prevent this falling down. It is recommended that the rubber mast coat is bedded on Bostik to the mast and whipped to mast and coaming. The skirt may be cut shorter and turned up inside to give a neat finish.

The main tack tackle leads to the lowest cleat on the aft starboard side of the mast, the topping lift leads to the small cleat above this. The spinnaker halyard leads to the large cleat high on the port side. The spinnaker pole lift leads to either of the two small cleats low on the front of the mast. The main halyard leads to the large cleat low on the starboard side. The jib halyard leads to the large cleat low on the port side. The mainsheet has one double block on the boom and two quarter blocks on deck. The boom is safe on the topping lift, no crutch is necessary unless really exposed moorings are normal. The main boom should be shipped with the handle spindle and the shackle for the tack tackle at the bottom.

The mizzen halyard leads to the large cleat below the halyard winch. The mizzen topping lift leads to the cleat on the port side. The ensign halyard leads to the small cleat. The mizzen staysail halyard has the block shackled to the tang on the foreside of the masthead, the halyard leads to the large cleat on the foreside of the mast. The Mizzen sheet has a double block on the boom and two quarter blocks on deck and leads to the aft cleat on the starboard cockpit coaming.

NOTE
For best appearance the mizzen mast should be raked slightly more than the main as if the masts are parallel they will appear to converge.

## 7.D. Winches

**Headsail Sheet Winches**
C & N Type E sheet winches are single speed and fitted with a ratchet handle. There is a small pull-out plastic oiling plug on the top and a few drops of oil each week will be sufficient. To strip the winch, remove the top locking ring and lift off the winch barrel to expose all working parts. There are no loose internal parts. All pawls are activated by rubber buffers. The gear pinion spindles are locked with a 3⁄32" AF Allen key. Care must be taken to replace each pinion in the same position as they are individually mated.

**Halyard Winches**
The C & N Type D mainmast halyard winches (also used for the mainsheet) and the C & N Type L on the mizzen are direct action winches fitted with two pawl tracks, one at the top of the barrel for the handle and one at the bottom for the winch. The handle is retained in the winch by a central spring plunger but should be removed when not in use to avoid snagging sheets etc. Care should be taken not to bend the plunger when inserting the handle.
To strip the winch use a small screwdriver to remove the locking screw close to the plunger, then unscrew the centre section of the winch by using the winch handle as a screwdriver. Removing the top cover of the winch will expose the pair of plungers which work at the handle end of the winch. If the winch is horizontal, the plungers may remain in place if the barrel is not tilted while it is removed together with springs and plungers.
When re-assembling the winch it is most important to replace the plungers the correct way round. The spring or inner ends are completely flat and sharp edged, while the outer ends which bear on the tracks are very slightly rounded. Before replacing the centre section, check the position of the small locking screw and then screw the section in tight. Next, unscrew it enough to line up the holes, fit the locking screw and screw in tight. Keep all parts cleaned and oiled to prevent plungers sticking due to salt etc. Use fairly thin oil, never use grease.

**Bon Voyage**