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1. INTRODUCTION

1.1 USING THE CRAFT

This manual has been compiled to help you to operate your craft with safety and pleasure. It contains details of the craft, the equipment supplied or fitted, its systems and information on its operation. Please read it carefully, and familiarise yourself with the craft before using it.

This owner's manual is not a course on boating safety or seamanship. If this is your first craft, or you are changing to a type of craft you are not familiar with, for your own comfort and safety, please ensure that you obtain handling and operating experience before "assuming command" of the craft. Your dealer or national sailing federation or yacht club will be pleased to advise you of local sea schools, or competent instructors.

Ensure that the anticipated wind and sea conditions will correspond to the design category of your craft, and that you and your crew are able to handle the craft in these conditions.

Even when your boat is categorised for them, the sea and wind conditions corresponding to the design categories A, B, and C range from severe storm conditions for Category A, to strong conditions, for top of category C, open to the hazards of a freak wave or gust, and are therefore dangerous conditions, where only a competent, fit and trained crew using a well maintained craft can satisfactorily operate.

This owner's manual is not a detailed maintenance or trouble shooting guide. In case of difficulty, refer to the boatbuilder or authorised representative. If a maintenance manual is provided, use it for the craft's maintenance.

Always use trained and competent people for maintenance, fixing or modifications. Modifications that may affect the safety characteristics of the craft shall be assessed, executed and documented by competent people. The boatbuilder cannot be held responsible for modifications he has not approved.

In some countries a driving licence or authorisation are required, or specific regulations are in force.

Always maintain your craft properly and make allowance for the deterioration that will occur in time and as a result of heavy use or misuse of the craft.

Any craft – no matter how strong it may be, can be severely damaged if not used properly. This is not compatible with safe boating. Always adjust the speed and direction of the craft to sea conditions.

If your craft is fitted with a liferaft, read carefully its operating manual. The craft should have onboard the appropriate safety equipment (lifejackets, harness, etc.) according to the type of craft, weather conditions, etc., these equipments are mandatory in some countries. The crew should be familiar with the use of all safety equipment and emergency manoeuvring (man overboard recovery, towing, etc), sailing schools and clubs regularly organise drill sessions.

All persons should wear a suitable buoyancy aid (Life jacket/Personal Floatation Device) when on deck. Note that in some countries it is a legal requirement to wear a buoyancy aid that complies with their national regulations at all times.

PLEASE KEEP THIS MANUAL IN A SECURE PLACE, AND HAND IT OVER TO THE NEW OWNER IF THE CRAFT IS SOLD."

Whilst we make every effort to be accurate, Northshore Yachts Limited accept no responsibility for damage arising from misunderstandings of, or omissions from, the contents of this manual. Northshore Yachts Limited recommends that where the Owners Manual differs from that of the component item manufacturers, the manufacturers information should be followed. Northshore Yachts Limited reserves the right to improve its boats or the boat specifications identified in the manual without notice. Northshore Yachts Limited quality assurance ensures that boats are built to a high standard; adherence to the Owners Manual will help you enjoy many years of trouble free sailing. Northshore Yachts Limited, are always available to answer any query you may have relating to after sales service.

1.2 SAFETY

It is the duty of the skipper of the yacht to ensure that the vessel is fully equipped to go to sea. Northshore Yachts Limited do not supply safety equipment as part of their standard specification but do recommend that sufficient safety equipment is carried in relation to the number of crew on board and the length of voyage to be undertaken. If the skipper is unsure what to carry he/she should contact the Royal Yachting Association, who will provide guidance and booklets on the subject.

1.3 DESIGN CATEGORIES

Category A: This craft is designed to operate in winds that may exceed wind force 8 (Beaufort scale) and in significant wave heights of 4 m and above (see note below), and vessels largely self-sufficient. Abnormal conditions such as hurricanes are excluded. Such conditions may be encountered on extended voyages, for example across oceans, or inshore when unsheltered from the wind and waves for several hundred nautical miles.

Category B: This craft is designed to operate in winds up to Beaufort force 8 and the associated wave heights (Significant wave height up to 4 m, see note below). Such conditions may be encountered on offshore voyages of sufficient length or on coastal waters when unsheltered from the wind and waves for several dozens of nautical miles. These conditions may also be experienced on inland seas of sufficient size for the wave height to be generated.

Category C: This craft is designed to operate in winds up to Beaufort force 6 and the associated wave heights (Significant wave height up to 2 m, see note below). Such conditions may be encountered on exposed inland waters, in estuaries, and in coastal waters in moderate weather conditions.

Category D: This craft is designed to operate in winds up to Beaufort force 4 and the associated wave heights (Occasional maximum waves of 0,5 m height). Such conditions may be encountered on sheltered inland waters, and in coastal waters in fine weather.

The significant wave height is the mean height of the highest one third of the waves, which approximately corresponds to the wave height estimated by an experienced observer. Some waves will be double this height.

1.4 STABILITY AND LOADING INFORMATION

Insert appropriate page

1.5 RISK OF FLOODING

In the event of flooding it is the operators' responsibility to assess the severity of flooding and advise the passengers and crew of appropriate action.

Flooding will limit the seaworthiness and stability of the craft.

The degree of danger will vary due to the rate of flooding, sea state, distance from port, number and experience of crew etc.

It is advisable that prior to departure all crew &/or passengers are made aware of the location and use of emergency equipment including lifejackets, harnesses, flares, emergency packs and liferaft and instructed in emergency procedures in the event of flooding (also fire and man overboard).

It is suggested that:

Bilge pump(s) are operated (however in the event of major ingress of water their capacity may be insufficient);

The craft's location and nature of the emergency is notified to the appropriate services;

The source of flooding is identified, these may include:

Damage to structure of vessel;

Damage to skin fittings;

Leakage through shaft lines or rudder tube;

Damage to raw water, black water or exhaust systems;

Downflooding through portlights or hatches;

If it is safe to do so, action should be taken to stop or limit the flow;

Large holes may be blocked with collision mats or a mattress, smaller holes with cushions or towels;

Skin fittings should be closed, or if still leaking may be sealed from outside by hammering in tapered plugs;

Portlights and hatches should be closed or replaced with deadlights;

If additional pumping capacity is required the use of the heads faucet(s) and buckets may also be considered.

Note: it is the operator's responsibility to ensure that appropriate safety equipment is carried on the craft.

1.6 OWNERS/YACHT DETAILS

Owner's name:

Address:

Telephone:

YACHT DETAILS

Name of yacht:

HIN number

Hull number

Hull colour:

Deck Colour:

Boot top colour:

Antifouling paint type

Antifouling paint colour:

Style line colour:

Engine number:

Engine key number:

Companionway key

Registration number:

Port of registry:

Radio licence number:

Radio call sign:

1.7 WARRANTY

Our warranty terms are detailed in the build contract.

We provide a 12-month warranty on parts and labour from the date of hand over of the yacht. In some instances suppliers of equipment provide their own extended warranties. These will be detailed in their individual handbooks.

If you have a problem with the yacht during the warranty period, before taking any action to rectify the fault, you must contact us or the agent from whom you bought the yacht. We will then give you instructions as to how to proceed.

Your contact for warranty is Jim Wakefield.

Your contact for after sales and spares assistance is Yard Services.

Both can be contacted at:

Northshore Yachts Ltd

Itchenor

Chichester

West Sussex

PO20 7AY

England

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Fax: +44 (0) 1243 511473

E-mail: sales@northshore.co.uk

2. SPECIFICATION & DIMENSIONS

	Southerly 110	
CE design category	A	
Length overall	10.82 m	35 ft 6 ins
Length waterline	9.22 m	30 ft 3 ins
Beam	3.57 m	11 ft 10 ins
Draft; keel up	0.71 m	2 ft 4 ins
Draft: keel down	2.18 m	7 ft 2 ins
Height from water (inc. tri-white light, exc. aerials)	Std 14.1 m Tall 15m	46 ft 3 ins 49 ft 3 ins
Displacement (light craft condition)	6 811 kg	15 015 lbs.
Displacement (fully loaded ready for use condition)	7 793 kg	17 181 lbs.
Max. capacity – people	7	
Maximum capacity - load	1 085 kg	2392 lbs.
Grounding plate weight	2 205 kg	4 455 lbs.
Keel weight	1 050 kg	2 310 lbs.
Total ballast	3 075 kg	6 765 lbs.
Tank capacity – fuel	182 litres	40 gallons
Tank capacity – water	205 litres	45 gallons
Tank capacity – toilet waste (if fitted)	78 litres	17 gallons
LPG cylinder size	Camping Gaz Type 207 or Calor 4.5kg	
Standard battery capacity	200 amp hrs	

SOUTHERLY OWNERS MANUAL

	Southerly 110
Standard voltage	12v dc
AC voltage (if fitted)	120V or 220V, 50 or 60Hz single phase (Refer to wiring diagram)
Max rated engine power	40 hp

	Southerly 110	
Mainsail area	22.53 sq.m	242.4 sq. ft
Self tacking jib		
Furling genoa area	28.03 sq.m	301.6 sq. ft
I	12.43 m	40 ft 9 ins
J	3.75 m	12 ft 4 ins
E	4.09 m	13 ft 5 ins
P	10.48 m	34 ft 5 ins

3. STRUCTURE

3.1 HULL AND DECK

Hull Laminate:

For the underwater hull layer a Nordseal Laminate and clear gelcoat is used. The hull laminate is made up of bi-axial/chopped strand mat combination reinforcement (CR) for directional strength and a powder bound chopped strand matt (CSM) with an isophthalic polyester based resin matrix to give all round superior strength and water resistance.

(*CSM: Randomly laid fibres held together by a binder, resulting in strength properties in all directions.*)

(*Bi-axial: Glass rovings laid in two directions of the warp and weft, and when laid down in the direction of major loadings gives a high directional strength.*)

A reinforcing balsa core is used in the topsides to give increased strength and insulation.

Deck Construction:

The deck is a sandwich laminate combining CSM and balsa, resulting in a strong but light laminate in order to support the open areas, such as the coachroof and forward deck. Plywood and aluminium pads are used to take loading from winches and other deck fittings.

CAUTION: If additional deck fittings are required do not bolt through areas of balsa core – consult Northshore for advice.

Keel:

The cast iron Swing Keel assembly is bolted into a recess in the hull with stainless steel studs with "rubber" sealant between the hull and ballast plate.

3.2 SEACOCKS and SKIN FITTINGS

The three types of valve mechanisms used on Northshore yachts are:

Ball valve (Application sink, shower and cockpit drains.)

See figure 1

A skin fitting is secured to the hull with a backing nut and sealant to ensure a watertight fit. Attached to this is the ball valve which is operated as follows:

TO OPEN: Turn the lever to align with inlet outlet hose.

TO CLOSE: Turn the lever until it is at right angles to inlet / outlet hose.

Water inlet valve with strainer See figure 2

Same as above except a separate water strainer / filter is added, which has removable core for cleaning with a 90 degrees elbow connecting tail to take pipe fitting.

'Marelon' seacock (Application: Toilet inlet and outlet, cockpit drains).

See figure 5

The seacock comprises a through hull fitting, valve body and hose tail (tailpipe barb).

Operated by moving the seacock lever to align with the valve body to open and moving lever at right angles to the valve body to close.

In case of emergency the handle cap/bung is designed to plug the skin fitting from the outside. This plug can be put in place while the vessel is in the water. The valve can then be removed from the king nut and any blockage cleared.

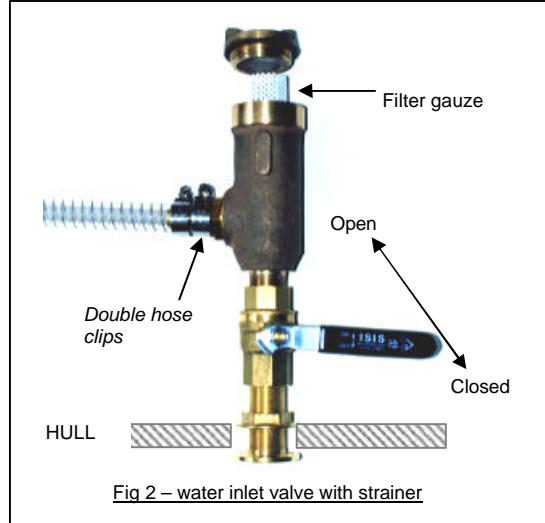
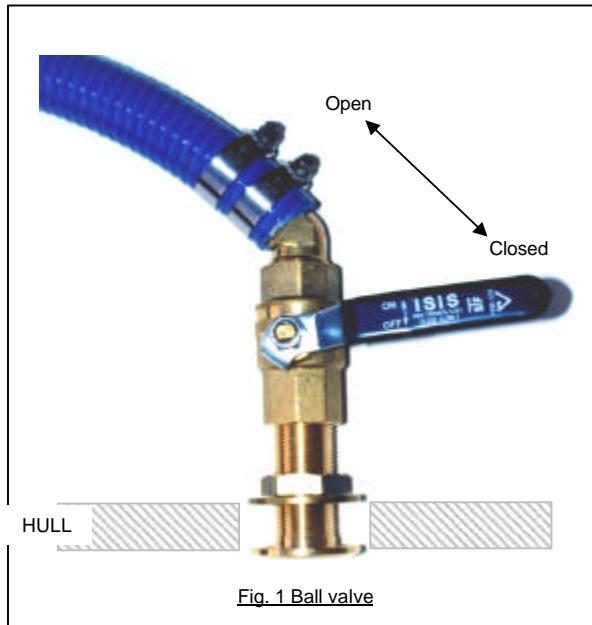
WARNING: Never leave the boat unattended while the bung is in place and the valve disassembled. This bung plug is for temporary use only.

The bung can also be used during winter storage to keep debris from collecting inside the skin fitting.

Note: The hull area around skin fitting apertures is reinforced by additional layers of CSM and plywood pads.

Refer to the skin fitting drawing in Appendix 1 for location and type of skin fittings fitted to your vessel.

Your vessel may not have examples of all three types of seacock.



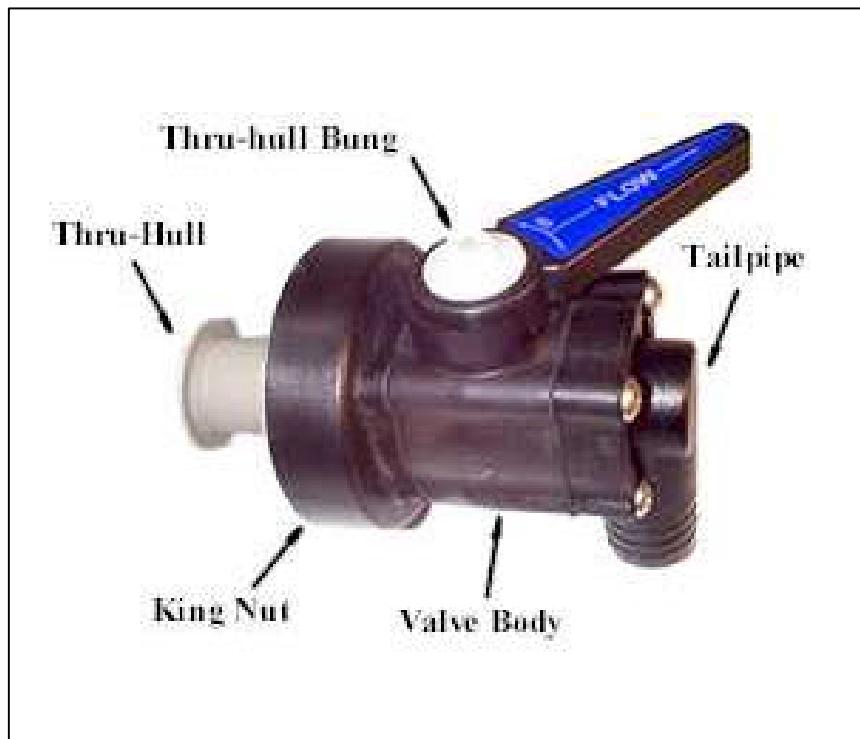


Fig. 5 Marelon skin fitting

Maintenance:

Ball valve seacock: Ensure that boat is out of water, undo valve and add waterproof grease whilst moving the valve / handle.

Marelon seacock Regularly inspect and lubricate. Actuate the handle and lubricate the seals, (water pump grease or even vegetable oil will lubricate seals).

'Blakes' seacock maintenance checkpoints:

PROBLEM	POSSIBLE CAUSE	SOLUTION
Seacock leaks	Worn or scored plug (b) surface	Regrind plug (b) using medium grade grinding paste until even mat finish is obtained
	Corrosion on plug (b)	This sometimes occurs as an oval shaped area of corrosion that is caused by bacterial action from sewage left in the pipe with the seacock closed. Proceed as for regrinding. Try to ensure that the system is always pumped clear before closing the seacocks.
	Plug (b) not tightened down enough	Slacken lock nuts (g) and tighten keep plate bolts (c), but not so as to make the handle (a) hard to turn. Tighten lock nuts (g).
Seacock seized	Lack of grease and general neglect	Try tapping the handle (a) with a hammer. If this fails it will be necessary to drive the plug (b) out by passing a brass rod (or wooden dowel) outside the boat so that it bears under the squared top of the plug (b).
Seacock generally corroded and shows signs of wastage metal	Rare: suspect particular galvanic problem on that boat	Consult a qualified surveyor. If the seacock is badly corroded it is virtually certain that other underwater metal fittings will be also and the boat should be surveyed for the cause.

DANGER: The yacht should be ashore before carrying out any seacock maintenance

4. SAILS AND SPARS

4.1 CHECKS BEFORE SAILING

1. Furling line wound in correct direction - it should exit the port side of the drum.
2. Check that line guard does not touch the drum rims.
3. Check the halyard forms an angle of 5 - 10 degrees with stay when hoisted.
4. Check no halyard could be caught by halyard swivel or luff extrusion.
5. Check that there is clearance between the halyard swivel and top guard (min clearance = 50mm).
6. Check that the extension pre-feeder cord does not exceed 300mm.
7. Check that the furling line runs through the guide eye in a straight line to minimise friction and chafe.
8. Check that the tack ring is in the correct position.

CAUTION: Avoid using a winch when furling the sail.

4.2 STEPPING THE MAST

CAUTION: We recommend that mast stepping should be undertaken by a professional yard using a suitable crane.

4.3 TENSIONING AND ADJUSTING THE RIGGING

After the yacht has sailed for a month or so new rigging will stretch and will need adjusting – see the Selden rigging manual or contact a local professional rigger to check the rigging for you.

CAUTION: The clevis pins that attach the rigging to the chain plates are secured with split pins. We recommend that you check that the split pins are secure and opened to an angle of approximately 45° on a regular basis.

4.4 STORING & FOLDING SAILS

Sails can be folded or rolled, sharp creases should be avoided. The ideal storage area is in a clean, dry well ventilated area.

Mainsail: Storing the sail on the boom.

1. Tighten the topping lift in order to support the boom.
2. Lower the sail fully.
3. Ensure that the coachroof hatches are closed.
4. Release the clew outhaul in order to release tension in the foot of the sail.
5. Stand close to the boom.

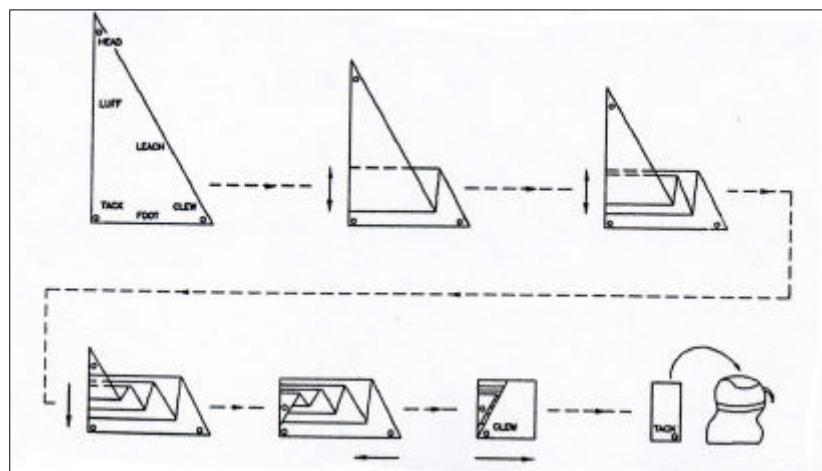
6. With another person at the aft end of the boom take hold of the sail about 0.6M from the boom, pull up together and lay the sail halfway over the boom.
7. Then take a further 0.5m of sail and fold back over the boom in the opposite direction.
8. Continue 'layering action' until the entire sail is laid over the boom.
9. Secure the sail to the boom using sail ties.
10. The halyard should be removed from the mainsail and attached to the aft end of the boom or a secure point on the deck away from the mast, and then tensioned.
11. If the sail is to remain stowed for a few hours put the cover on to protect it.

Headsail: Most yachts are fitted with furling headsails, but if not headsails should be stowed away in a bag if not in use.

Sails should be folded before bagging – a quick way of temporarily bagging is as follows:

1. Put head of sail into sail bag.
2. Work the luff and leech in together with the body of the sail.
3. Leave the tack and clew until last and then pass sail bag neck cord through both tack and clew before drawing tight. This enables the tack to be attached to the stemhead and sheets affixed to clew before the sail is removed from the bag.

Folding: The sail (either mainsail or headsail) should be laid out on a clean flat area, e.g. pontoon or jetty and then following steps carried out as illustrated.



4.5 SERVICING & MAINTENANCE

Annual Maintenance: At the end of the season the sails should be removed and all spars, roller jib gear and rigging should be washed with fresh water to dislodge salt and dirt. After washing smear all aluminium alloy surfaces with wax polish.

Lubrication:

1. All moving parts, like sheaves and clew car on boom, trigger fittings on spinnaker poles and headbox sheaves on mast should be sprayed with WD40 or Teflon.

2. Check all fastenings for tightness and all components for wear or corrosion.

Rigging checks:

1. Check all standing and running rigging for broken strands, fraying or corrosion.
2. Lightly grease threads of all rigging screws.
3. If any running rigging is removed, join a 3 - 4mm diameter messenger line to the halyard tail and pull through mast to remove the halyard. To replace the new halyard – reverse this procedure.
4. Do not use mast or boom as ridge for hull cover unless the cover is kept from contacting alloy surface. (It is possible for contamination to be trapped between the cover and the alloy surface which can cause rapid corrosion).

Attaching New Fittings:

If additional fittings are required on the mast a professional should fit them. However please note: There should be no direct contact between spars and fittings, a zinc chromate paste, silicone rubber or butyl rubber compound should be used as an insulating barrier. Note: care must be taken with large stainless steel fittings; it is essential that they be insulated, as unseen rapid corrosion can take place. The best fasteners to use are Monel pop rivets or as a second choice aluminium.

Note: When using stainless steel screws care must be taken that sharp ends do not project more than 5mm into mast or boom otherwise they may snag the running rigging or the cables.

Electrical Cable Fitting:

Conduits are fitted into the mast to take the cables.

CAUTION: If you need to add masthead electrical cables we recommend that you employ a professional rigger

Hoisting the sail: Furling Headsail: The starboard groove is to be used when hoisting the sail, as the sail is less sharply bent along the luff than if it is hoisted in the port groove.

Maintenance: refer to the Selden handbook. It is good practice to regularly wash and rinse the complete Furlex with freshwater to clear away all salt crystals. This is particularly important at the lower bearing part where it is especially exposed to corrosion.

4.6 RIGGING SPECIFICATIONS (nominal lengths only)

	Southerly 110		
Standing rigging	Size	Type	Length
Backstay	7mm	1 x 19	13.72m
Backstay lower spans	N/A	N/A	N/A
Cap shrouds	7mm	1 x 19	11.9 m
Intermediate shrouds	6mm	1 x 19	7.9m
Inner forestay	7mm	1 x 19	5.22m
Lower shrouds	7mm	1 x 19	4.15m
Running rigging	Size	Colour	Length
Main halyard	10mm	Bl/red	29m
Genoa halyard	12mm	Blue	30m
Spinnaker halyard	12mm	Red	27.5m
Main sheet	12mm	White	18m
Genoa/jib sheet(s)	12mm	Blue	14m
Spinnaker sheets	12mm	Red	19m

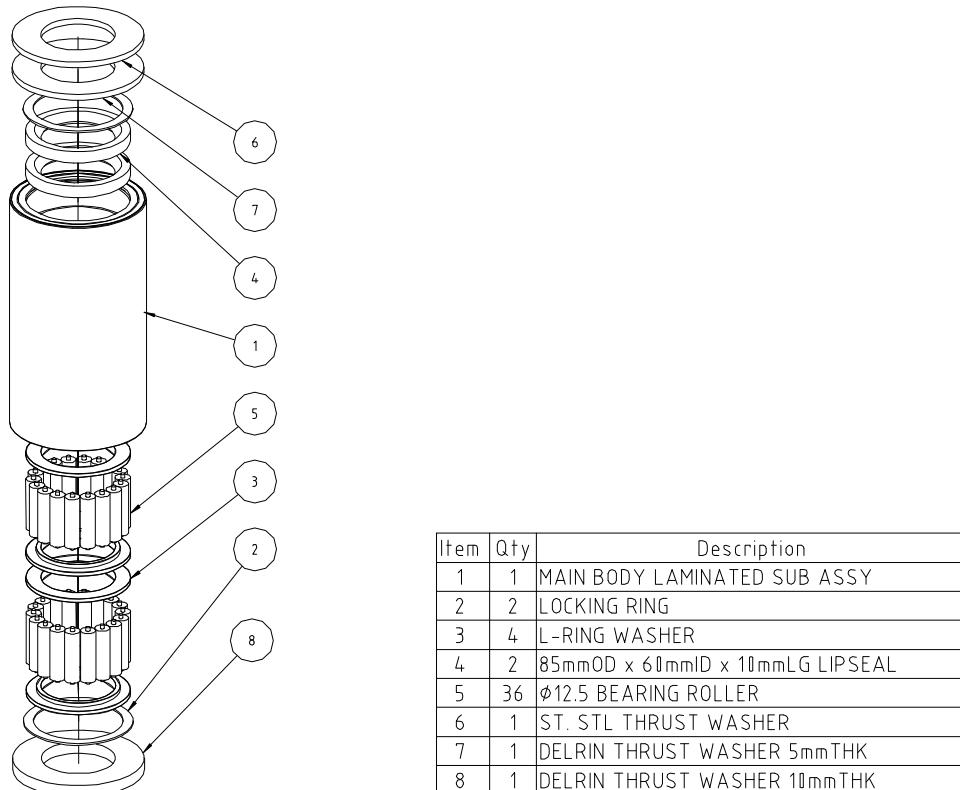
5. STEERING & SWING KEEL

5.1 TWIN RUDDER DESIGN and RUDDER TUBES

All Southerlys are fitted with twin rudders as standard. Refer to Appendix 1 for a schematic drawing of the system.

The rudder is a GRP moulded blade with a stainless steel rudder stock, welded to a horizontal stainless steel web bar providing support for the blade.

The rudder stocks are carried in tubes fitted with roller bearings and seals. These tubes are bonded into the hull. The bearings have Delrin rollers with a sealing arrangement of twin lip seals.



Drawing courtesy of Lewmar

Emergency steering:

The emergency tiller locates on to one of the rudder stocks in an upper bearing fitted in the cockpit sole. To access the emergency tiller drive unscrew the cover plate. The emergency tiller is attached directly to the top of either rudderstock.

Maintenance

Lip seals are maintenance free, but the sealing surface should be lightly greased with waterproof grease if the seals are removed for inspection or replacement. Regularly inspect the seals for damage.

5.2 STEERING SYSTEM

Southerly 110, 3

Whitlock Cobra system

5.3 SWING KEEL

The keel is a cast iron aerofoil fin pivoted at the leading edge with a hydraulic hoist. The pivot bearing is located in a substantial cast iron grounding plate.

The aerofoil sections of the keel have been carefully calculated to optimise the lift characteristics; this ensures excellent windward performance and has kept the surface area low for minimum drag in light airs.

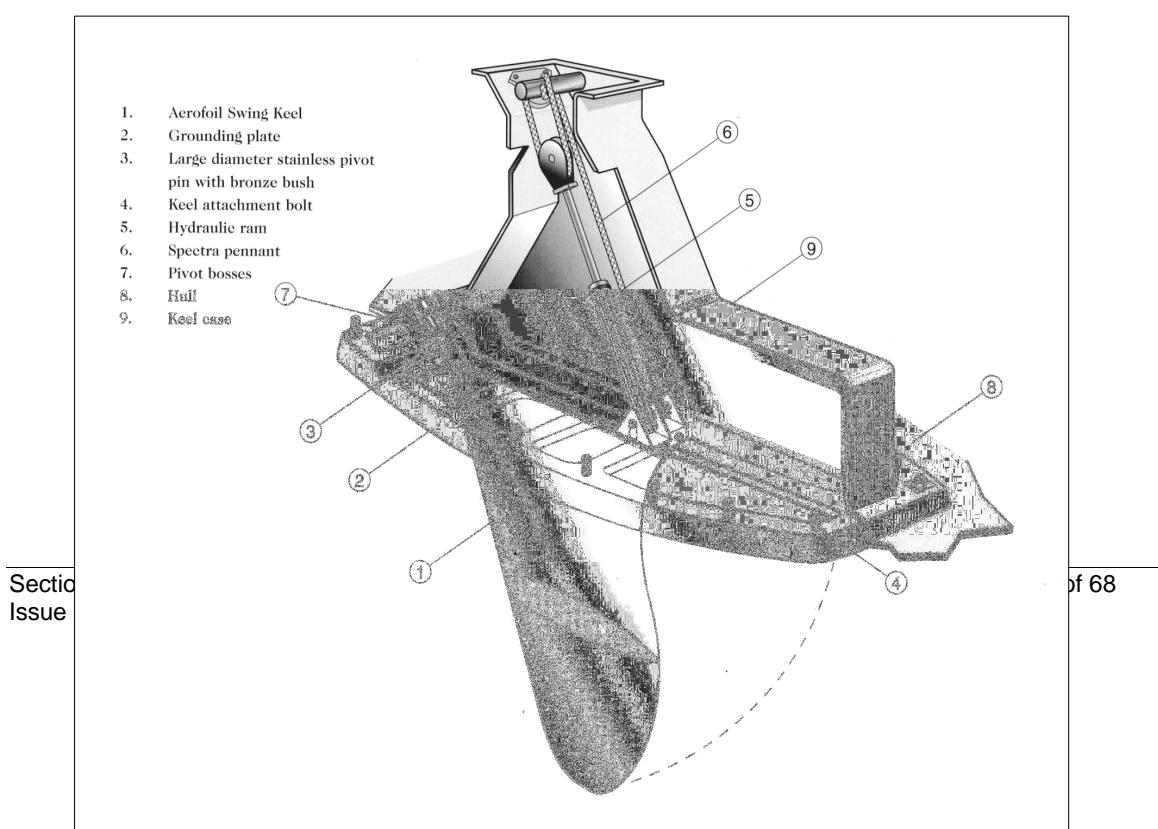
The cast iron grounding plate has several functions. It serves as fixed ballast, provides the pivot point for the keel, acts as transverse stiffening in the keel area and protects the bottom of the boat when drying out.

The pivot bosses are at the forward end of the keel slot and are an integral part of the casting. The Swing Keel is then fitted resulting in a fully matched assembly. The aft end of the keel slot is fitted with stops that engage with corresponding lugs on the keel to limit downward travel.

The grounding plate and Swing Keel assembly are bolted into a recess, the recess together with the keel box are an integral part of the hull moulding. The hull lay up in this area is additionally reinforced.

The Swing Keel is raised and lowered by a hydraulic ram connected to the trailing edge of the keel by a Spectra rope pennant. The hydraulic pump is either operated manually or electrically.

Southerly 110 ram is fitted angled beside the keel trunk port.



OPERATION - To raise keel

Electric pump: Operate the keel raise button, and the motor will automatically engage the hydraulic ram. (There is a manual back up operated as the manual pump)

Manual pump: Ensure pressure relief valve on hydraulic pump is closed. Insert the handle in the pump arm and pump consistently backwards and forwards until fully raised.

If the keel is left in the raised position on a drying mooring or when ashore, it is recommended that the retaining pin be inserted (access through the screw cap on the starboard side of the keel casing). In this position the pressure relief valve can be released and hydraulic system relaxed.

OPERATION - To lower the keel

Electric pump press keel down button, and hydraulic ram will slowly let the keel down.

Manual pump: Release the pressure relief valve by turning anti-clockwise and the keel will drop under its own weight, braked by a restrictor valve in the hydraulic system. Close the valve when the keel is down.

If the boat is left on a deep water mooring, the keel should be left in the lowered position. The keel can be safely left in any position.

WARNING: For winter maintenance or when craft is being transported the stainless steel locking pin should be inserted into the keel with the keel in the fully raised position.

WARNING: There is a second pin position on the Southerly 32 (the 'offshore pin') if you require to comply with RCD Category A, (ref section 1.3), with a crew limit of 4. The keel must be lowered before inserting this pin. Remember to remove the pin if entering shallow water.

Maintenance:

The lifting gear is accessed by the removal of the appropriate panels from the keel casing. It is recommended that at least one of the bolts attaching the stainless steel bracket for the lifting pennant to the top of the keel be withdrawn for inspection annually to check for signs of corrosion. On refitting the bolt should be well bedded on polysulphide sealant (e.g. Thioflex 600) or equivalent. If signs of crevice corrosion are evident then the bolt set should be replaced, again bedding all components on sealant.

The Spectra corded lifting pennant should be inspected regularly for signs of chafe. It is recommended that they are renewed after five seasons use, or if worn due to pulley misalignment.

The Spectrapennant should only be replaced by a suitably experienced boatyard.

The hydraulic system is relatively maintenance free. Check the hydraulic fluid level in the reservoir and top up as necessary with Castrol Hyspin AWS32 or equivalent.

CAUTION:

When topping the reservoir up with oil, make sure that keel is raised to prevent an overfill of oil. If the keel does not stay in the raised position, the hydraulic seals will need overhauling and the pump and ram will need servicing by a qualified engineer. The complete system should be checked and serviced every other season. The pivot pin for the keel needs no regular maintenance and can only be accessed by dropping the complete keel unit out of the boat should it be considered necessary. This should only be carried out by a competent boatyard.

6. ENGINE

6.1 OPERATION

Engine fitted:

Southerly 110 Yanmar 3YM30 29hp

Before operating the engine:

- Check that there are no obstacles around the engine especially around the rotational parts.
- Check that the engine cooling water seacock is turned on and the strainer is clear.
- Check the coolant level.
- Check the oil level

Starting:

1. Turn the battery switch "ON"
2. Engage neutral by depressing the button on the gear lever and open the throttle.
3. Turn the starter switch key to "START" and the engine should start. (Some instrument panels have a starter button)
4. Once the engine is started release the key. The key will automatically return to "ON". (Do not turn off the battery switch and the key switch even after the engine is started). At "ON" the gauges on the instrument panel start operating.
5. After the engine has started and all the warning lights have gone out, return the gear lever to the neutral "idle" position.

WARNING: Do not run the starter motor for more than 15 seconds at a time. If the engine can't be started, wait for about 15 seconds before using the starter motor again. If you operate the starter motor for a long period without the engine starting, there is a danger of flooding the engine with cooling water as the exhaust mixer box can fill, as it will not be discharged through the exhaust unless the engine is running. Turn off the water-cooling inlet skin fitting until the engine fires – then re-open. If problems persist – contact your Yanmar dealer

Battery and Key Switch:

Do not turn off the battery switch and the key switch even after the engine starts as you may damage the alternator.

Engine operation

When the engine is operated at a low idling speed (below 1000 rpm) for a long time (over two hours), excessive carbon and fuel residue tends to accumulate due to incomplete combustion. Carbon deposits on the injection hole of the fuel injection valve, exhaust valve etc cause a drop in engine output, knocking and other troubles. To prevent these problems occurring, be sure to blow off the carbon accumulations by full speed operation with the gear engaged.

Operate the engine at over 2500 rpm for one minute in every two hours of continuous low idling operation.

Diesel engines like to work under load.

Cold Weather Starting Aid (if fitted):

1. Turn the starter key anti-clockwise to the "HEAT" position and hold it in that position for about 15 seconds.
2. Then return the starter key to "START" to start the engine.

CAUTION: The lubrication oil will not spread all the way to the main bearing and other moving parts for some time after starting. Raise the engine speed above 1000 rpm, and check that the low oil pressure alarm lamp and the charge lamp go out.

WARNING: If the warning lamps still do not go out when the engine speed is raised above 1000 rpm the engine may be faulty, stop the engine immediately and consult your nearest Yanmar dealer.

During engine operation:

Check the following occasionally.

1. **Exhaust Colour:** a black exhaust indicates that the engine is under strain. Continued operation will shorten the lives of the intake and exhaust valves, piston rings, cylinder liner and fuel injection valves. Slow engine until black exhaust stops and have your Yanmar dealer check over the engine.
2. **Water and oil Leakage:** Check that there are no water, oil or gas leaks, loose bolts and abnormal noise, overheating and excessive vibrations. If any abnormality is found, contact your nearest Yanmar dealer.
3. Avoid **resonance range operation**; engine vibrations may be excessive in a certain speed range due to resonance of the engine with the engine bed. Avoid engine operation in this range.
4. **Low oil pressure alarm lamp:** If the low oil pressure alarm lamp is lit while the engine is running at higher than low idle, check the oil level. If there is an abnormality in the lubrication circuit, continued operation will cause engine seizure. Stop the engine and consult you nearest Yanmar Dealer.
5. **Charge alarm lamp:** If this lamp is lit while the engine is running at over 750rpm, there is a fault in either the charging circuit or the V- belt (slippage or damage). Stop the engine and check. If the V belt is tight there may be an alternator problem - consult your nearest Yanmar dealer.
6. **Cooling water temp alarm lamp:** If this lamp is lit during load operation of the engine, the engine is overheated. Stop the engine immediately and check cooling water inlet strainer as it may have drawn in some weed. Turn off the seacock and withdraw the strainer to clean. If it is clear and the overheating persists – check the closed cooling system and top up if necessary. If the problem persists consult your nearest Yanmar dealer.

Engine stopping:

1. To stop the engine, place the control lever to the "Neutral" position and operate the engine at low idling speed.
2. Stop the engine by pulling the engine stop cable that cuts the fuel line. Some engines have a solenoid cut off operated by turning off the key and some have a stop button.
3. Caution: If the engine is stopped at high speed, the temperature of various parts will increase, and engine troubles may occur.
4. Turn off the key switch.
5. Note: When stopping the engine with the starter switch on, the lubricating oil pressure warning buzzer will sound. This is normal and does not indicate trouble.

6. It is advisable to close the engine seacock after stopping the engine if you are leaving the yacht for some time.

CAUTION: Emergency stop. If the engine cannot be stopped with the engine stop cable or the engine idling speed cannot be lowered by the speed control lever, stop the engine as follows:

Turn off the fuel supply or block the air intake

Safety Tips When Operating and Maintaining Engines:

1. **Preventing Fires:** Never add fuel to the fuel tank while the engine is running. Wipe away all fuel spills with a clean cloth. Keep gasoline, kerosene, matches other explosives and inflammables away from the engine compartment, since temperature around the exhaust muffler becomes very high during operation.
2. **Preventing Burns:** Never touch the muffler, muffle cover or engine body whilst the engine is running or hot.
3. Know how to stop engine quickly and understand operation of all controls.
4. Never permit anyone to operate engine without proper instruction.
5. Do not operate under the influence of alcohol.
6. Keep children and pets away from engine when in operation.
7. When charging the battery: The battery electrolyte contains sulphuric acid. Protect your eyes, skin and clothing. In case of contact, flush thoroughly with water and get prompt medical attention, especially if your eyes are affected.
8. Batteries generate hydrogen gas that can be highly explosive. Do not smoke or allow flames or sparks near a battery, especially during charging. The battery box is vented overboard.

6.2 MAINTENANCE

Adjusting Propeller Shaft Alignment

The flexible engine mounts are compressed a little during initial engine operation and may cause misalignment between the engine and the propeller shaft.

CAUTION: After the first 50 hours of operation, the alignment should be checked for any unusual noise and vibration in the engine/hull, while increasing and decreasing the engine speed gradually. If there is unusual noise and/or vibration, this maintenance requires specialised knowledge and techniques and you should contact an authorised Yanmar dealer to adjust the propeller shaft alignment.

The engine should be regularly serviced by an authorised Yanmar dealer in accordance with the engine handbook.

CAUTION: A full fuel tank prevents condensation in the tank. When leaving the yacht for long periods fill the tank. Check the water trap filter in the fuel line regularly and drain off any water seen in the sight bowl.

Draining the fuel tank: Open the drain cock at the bottom of the tank and drain off into a suitable container.

Lubricating oil system: Check the oil level in the crankcase and gearbox prior to the engine operation. Pull out the oil dipstick and check that the oil level is between the upper and lower limits. If low, top up but never overfill.

Note: We would recommend that a record of engine hours run be kept in the yacht's log.

6.3 FUEL SYSTEMS

Southerly 110/35RS: A 40 gallon (180 litre) stainless steel tank is fitted, positioned under the raised floor to starboard. Deck filler mounted in starboard side deck.

CAUTION: Total tank capacity may not be useable according to trim and loading. It is recommended to keep a 20% reserve.

A tank breather is fitted to all fuel tanks, which is directed to the coaming.

Note: Care should be taken that vent gauze in the outlet of the breather pipe does not become blocked by salt (as this will cause a pressurised system).

Sediment Trap: For the drainage of the tanks a sediment trap is fitted on the bottom part of the tank it has a 5mm diameter nylon pipe supplied to assist in the disposal of sediment.

Fuel stopcock: There is a fuel stop cock mounted directly on stainless steel tank, this valve should be left open, unless the engine or fuel lines are being worked on (because if the engine is run with the stopcock closed, an air lock may occur in the fuel line).

Sediment/water trap and Filter: From the stopcock the fuel runs to the sediment/water trap and filter mounted on the bulkhead. This collects moisture and sediment from the fuel that is then collected in the glass bowl.

To drain the water a small drain screw is provided in the bottom of the bowl. The glass bowl can be simply unscrewed to clean out. Note: Care must be taken to make sure rubber gland around the top of the bowl is fitted correctly for an airtight seal.

A quick check should be made of the filter before and during the operation of craft. If the glass bowl fills completely with water, water can be pumped into the injectors and damage to the engine can result.

From the sediment / filter an 8mm (5/16 in) copper pipe runs along the bulkhead where it goes from the bulkhead to the lift pump of the engine via a 8mm (5/16 in) neoprene hose.

Fuel Return: Unused fuel is returned at the top of the tank from the engine return via an 8mm (5/16 in) copper pipe.

See fuel system drawing in Appendix 1

Maintenance of Fuel System:

It is recommended to lightly grease the threads on the deck filler cap to prevent the ingress of water.

Fuel consumption:

Every time the fuel tank is filled, we would recommend that the number of litres (or gallons) be recorded in the yacht's log book. By comparing the fuel used against the engine hours run, the rate of fuel consumption can be estimated.

Management of Fuel System:

Ensure that you do not run the tank(s) too low whilst motor sailing, as the bottom of the fuel supply standpipe will become uncovered due to heel and motion, with the chance that air will be drawn into the system. As a guide, exercise caution when the tank approaches 1/4 full.

If the vessel is fitted with two fuel tanks, pause in the 'Off' position for a few seconds for the fuel level gauge needle to zero when switching between the fuel tanks to avoid erroneous readings. Please be aware, that due to the method of sensing fuel level, the gauge reads in seven distinct 'steps' as the level falls and is not linear between these steps.

6.4 COOLING SYSTEM

All engines fitted to Southerly yachts are fresh water-cooled.

Operation of Cooling Systems:

Saltwater for the cooling systems is taken through the ball valve seacock with strainer. Note: strainer should be taken out periodically and cleaned.

Freshwater cooled engines: Raw saltwater is taken through heat exchanger, where it passes over tubes containing freshwater. Whereupon the saltwater passes out through the mixing elbow to the exhaust and the freshwater circulates through the engine cooling channels. The header tank container for the freshwater is mounted on the engine bulkhead and the level should be checked before operating the engine.

DANGER: Do not check the water-cooling level while the engine is still hot. Steam or hot water may burst out if the water filler cap is removed soon after the engine is stopped.

CAUTION: The freshwater system should be filled with an antifreeze/anti-corrosion mixture.

Daily checks of cooling water level can be made by observing the header tank. If it is low refill to the "Full Limit" then press fit cover completely back on.

Do not open the heat exchanger cap, as the header tank will drain.

CAUTION: Check cooling water level when the engine is cold, as engine cooling water flows to the header tank when the engine is still hot and makes accurate checks impossible.

DANGER: Do not remove the engine heat exchanger cap unless draining the system when cold

Water Pump:

Check braided water inlet pipes for fatigue periodically.

Replacement of Impeller:

1. When inserting the impeller in the pump, make sure that it lays in the correct direction as illustrated in the diagram:
2. Coat inside of pump body impeller housing with grease.
3. Check the adjustment of the water driving belt tension and its condition:

Replacing Fresh Cooling Water: The effectiveness of the anti - corrosive agent will be lowered if the cooling water becomes contaminated - replace every year.

Checking and Adjusting "V" Belt Tension: Too much "V" belt tension accelerates "V" belt and bearing wear and too little "V" belt tension leaves the pulley idle, overheats the engine and no power is generated.

1. Loosen the adjustment bolt and move the alternator outwards to increase the tension, or move charging generator inwards to decrease tension.
2. Do not contaminate the belt with oil.

6.5 EXHAUST SYSTEM

An exhaust hose is attached to the mixer elbow on the engine. The toughened braided exhaust hose then passes to the spun glass or stainless steel mixing box.

Note: The mixer box should have its acidic water drained from it if the yacht is to be left for some time by undoing the bung at the fwd end.

From the mixer box the hose has a swan-neck close to the transom.

CAUTION: A cable tie fastens the hose to the underside of the cockpit sole, in order to keep the swan-neck vertical. This is important as if the swan-neck is not kept vertical; water could enter through the transom fitting and be siphoned back into the engine, causing extreme damage.

From the swan-neck the braided exhaust hose runs to the transom area where it exits via a skin fitting.

WARNING: When starting the engine, check that the water is being ejected through the exhaust within 20 seconds, if not switch off and investigate. First check that the inlet stopcock is open, as running the engine without water will not only result in eventual damage to the engine, but also could burn out the inside of the rubber exhaust hose.

6.6 ENGINE CONTROLS

Operation: Gear Selection:

Forward is selected by pushing the control lever forward; the further forward it is pushed the higher the revs. Reverse is selected by pulling the lever aft and again pulled further aft the higher the engine revs.

To increase the engine revs without selecting a gear, press and hold the gear disengage button then move lever forward / reverse. The disengage button will pop out when the lever passes through neutral and gear selection will re-engage.

Note: On some boats the neutral position may not be in the upright position. In this case it will be marked with a label.

Maintenance:

1. Check cables for wear and that the nuts on the engine throttle and the gear assembly are tight.
2. Periodically grease the splines both at the engine and at the lever control. The internal works of the lever control are accessible on the starboard side of wheel, by removing the four slotted screws from its housing.
3. Ensure that the control cable's bend is not less than 300mm, if bent tighter cable wear will increase rapidly.

Engine Instrumentation:

The standard engine instrument panel contains:

1. Alarm "low oil pressure" or high cooling water temperature.
2. Alarm check.
3. Switch for instrument lighting.
4. Ignition switch.
5. Alarm panel.
6. Warning lamp, high cooling water temperature.
7. Warning lamp, low oil pressure.
8. Warning lamp no charging.
9. Revolution counter.

6.7 STERN GEAR

The stern-tube housing the shaft is made from bronze and is bolted in through the hull. At the aft end of the stern-tube, which protrudes from the hull, is a neoprene cutlass bearing.

The main bearing and gland comes in the form of a stuffing box, which has a PTFE type packing. Water is injected into the stuffing box aft of the packing. This travels down the tube and lubricates the cutlass bearing. The water is provided from a 'T' take off point on the anti-siphon loop, through a 10mm nylon pipe.

The shaft used is stainless steel 316 and has a tapered threaded head at the aft end, to take the bronze propeller that is then locked with a nut and split pin or tab washer.

Maintenance:

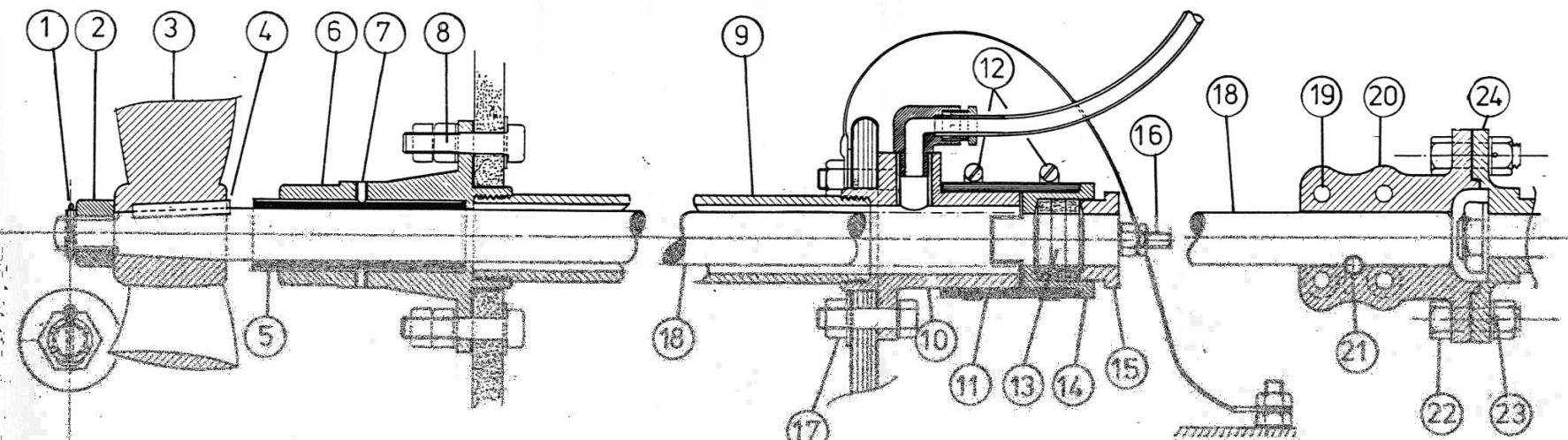
1. When in operation an occasional drip can be expected from the stuffing box. If excessive amounts of water continue when the shaft is still, the gland should be adjusted by loosening the locknuts and tightening the gland packing one flat at a time until the leak stops, then re-tighten the locknuts.

WARNING: Over tightening the stuffing box will cause too much friction, the shaft will get extremely hot and eventually the shaft will be damaged.

2. The neoprene cutlass bearings should be checked for wear periodically.

Note: It is possible for hard calcium deposits to form on the propeller shaft when the yacht remains unattended for long periods. These deposits can form between joints in the cutlass bearing and cause excessive wear, noise and vibration. If this happens, it may clear, but if not stop the engine and investigate. *With the boat ashore* the deposit can be removed with a sharp scraper. To gain access to the bearing area, uncouple the propeller shaft coupling at engine and slide back until affected area exposed.

Stern gear drawing

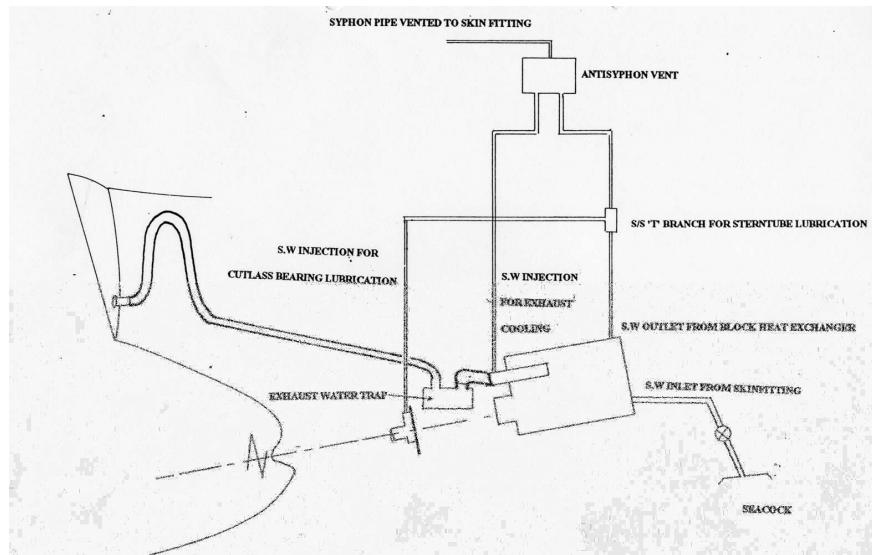


**Southerly stern gear drawing -
key to parts:**

1. Split pin
2. Castle nut
3. Propeller
4. Key
5. Cutlass bearing
6. Aft bearing housing
7. Grub screws
8. Bolts, nuts and washers
9. Stern tube
10. Inboard gland housing
11. Rubber hose

12. Hose clips
13. Gland packing
14. Packing housing
15. Gland follower
16. Gland studs, nuts and locknuts
17. Bolts for flange
18. Propeller shaft
19. Hex socket screws
20. Half coupling
21. Locking pin
22. Coupling bolts
23. Locking wire
24. Engine half coupling

6.8 ANTI SYPHON



The engine is fitted with an anti-siphon system to prevent a head of cooling water occurring at the exhaust manifold, which could lead to water being passed back down the exhaust manifold and into the cylinder causing the engine to suffer a hydraulic lock. One of two types of siphon break are fitted, the first discharges overboard, the second is fitted with a flap valve and has no overboard discharge.

Operation:

A neoprene pipe takes the cooling water from the connecting engine block – heat exchanger pipe. On the anti-siphon pipe there is a stainless steel 'T' junction which takes part of the cooling water to the stern tube for lubrication of the cutlass bearing. The remainder of the cooling water is taken through the anti-siphon vent and down a pipe to the exhaust manifold.

CAUTION: When starting the engine check that the cooling water is being evacuated through the exhaust outlet and a small trickle of water is visible from the anti-siphon vent, (overboard discharge type only).

Maintenance:

- 1a. Overboard discharge type- check the anti-siphon breather outlet when the craft has been left for a period unattended.
- 1b. Valved type- regularly remove cap and withdraw valve from housing. Remove salt and dirt from valve components and housing by rinsing out with fresh water. Spray the valve components with a Teflon spray (silicon oil) before refitting. Check valve operation and cap sealing before retuning to use.
2. Check pipes, T-junctions and anti-siphon for leaks monthly.

The position of anti-siphon loop on the Southerly is in the cockpit locker.

The position of the breather outlet (if fitted) is on the starboard topsides adjacent to the cockpit locker.

6.9 CATHODIC PROTECTION

Galvanic action can take place on a yacht when two different metals with differing potential are interconnected and placed within close proximity in seawater. Therefore a Galvanic cell is created that significantly accelerates the corrosion of the base metal. The end result can be corroded propellers, prop shafts, rudders, and rudderstocks, bronze through hull skin fittings and any other underwater metallic item. Corrosion rates are determined by the anodic corrosion current level, the water temperature and salinity levels.

The Southerly is fitted with a cathodic protection system; this is a process of superimposing an electro-chemical cell more powerful than the corrosion cell.

The system basically comprises an anode that is made out of zinc, as this metal is higher on the 'Metal Nobility Scale' than most other metals. The zinc anode generates an electric current, because the hull effectively has a higher potential. The anode allows current to flow through it and bonded items to the sea - water and back to the hull. The process corrodes the anode proportionally to the level of the current flow present, while preserving the hull and fittings.

The anode is positioned relatively closely to the stern-tube, engine, propeller, propeller shaft and rudderstock, which are all bonded to the anode. One stud projects internally for bonding cable attachment.

The anode is supplied by M.G.Duff and is a ZD78B - 4.0kg, Zinc alloy with galvanised core. Nominal Dimensions 305 x 76 x 36mm with stud holes at 200mm centres.

Some boats may also be fitted with a button anode on the rudder heel fitting.

Maintenance of anode system:

The bronze components such as propeller and skin fittings should be watched for signs of de-zincification. If the bronze starts to turn a pinkish colour or scoured clean appearance, the anode and bonding cables and connections should be checked and replaced if required. The bonding connection to the engine should be checked periodically.

The surface of an anode may become oxidised if the yacht is ashore for a long period. It should be re-activated by wire brushing before re-launching.

REPLACEMENT OF ANODES: Anodes should be replaced with the yacht ashore and when they are around 70% eroded. The anode has a galvanised steel strip on its inner face to the hull, which provides the attachment holes for mounting. In order to replace the anode, undo the exterior exposed nuts and then remove and replace with new anode fitting with a new backing pad to protect the hull. New nuts and serrated washers must be used.

Note: Protect the anode fixing studs after assembly with paint or grease.

WARNING: Never paint over an anode, as this will cause it not to operate correctly.

FACTORS TO TAKE INTO ACCOUNT WHEN FITTING NEW EQUIPMENT:

Correct Selection Of Materials: When new fittings are to be installed, the metals should be selected to be as closely compatible to each other (close on metal 'nobility scale'). Where this is not possible they should be isolated from each other. Importantly make sure that the fastenings are of the highest specification.

Correct Treatment of Materials: Paints should be correctly selected and applied strictly in accordance with the manufacturer's recommendations

Correct Installation of Electrics: To reduce the possibility of stray current leakage. There are some specific recommendations:

1. Use only high grade insulated wiring of suitable capacity. Undersize wires will cause resistance and consequent voltage drop.
2. Clip or support all wires at suitable intervals to prevent fatigue and eventual fracture.
3. Use only corrosion-resistant terminals and connectors and make sure that all are clean and tight.
4. Ensure all circuits are correctly fused
5. Keep all wiring, connections and junction boxes above the bilge area and away from other areas likely to be in contact with water.
6. Make sure that additional electronic gear is all fitted in accordance with the manufacturer's recommendations. Ensure that the polarity of the connections is correct and that each circuit is correctly fused. Electrical and electronic equipment is best fitted by a qualified marine electrician.

7. ELECTRICAL

See electrical drawing in appendix 1

7.1 BATTERIES

The yacht is fitted with a minimum of two 100 amp hour batteries. Additional battery capacity is provided on larger vessels and as an option on the smaller vessels.

The batteries are connected to the electrical system by two isolator switches. The alternator charges the batteries. Banks of batteries are separated for engine starting and domestic systems. The two banks of batteries can be linked using the link switch in emergencies.

WARNING: Do not switch off the batteries whilst the engine is running.

BATTERY SAFETY:

The lead acid battery used, is potentially hazardous: use the following safe handling procedures:

A. Gas: The battery cells contain an explosive mixture of hydrogen and oxygen gas at all times. A risk of explosion is always possible if naked flames, sparks or cigarettes are introduced into the immediate area.

1. Always use insulated tools.
2. Cover the terminals with an insulating material to prevent accidental short circuit (watchbands, bracelets and neck chains can accidentally cause a short circuit).

B. Electrolyte Spills: Should be avoided, but take the following measures if a spill occurs.

1. Spillage of electrolyte into salt water generates chlorine gas, ventilate the area properly.
2. Neutralise any spills immediately using a solution of baking soda.

Battery water:

When topping up the cell electrolyte, always use distilled or de-ionised water. Rainwater is acceptable, but under no circumstances use tap water. (Tap water generally has excessive mineral content or other impurities that may pollute and damage the cells).

Battery isolator switches:

CAUTION: ALWAYS REMEMBER TO SWITCH OFF BATTERIES WHEN NOT ON BOARD.

The isolation switches control both the engine starting and auxiliary batteries separately. To prolong the working life of the batteries, the following points should be adhered to:

1. Always switch off batteries when not required or on charge.
2. Use one battery for engine starting. Only link to the domestic battery if the engine starting battery is flat.

Notes: If the auxiliary battery becomes flat: do not use the engine battery for auxiliary, start the engine and recharge the system.

If items are directly linked to the batteries (such as automatic bilge pumps), they can drain the battery over long periods.

Battery Maintenance:

Check the following:

1. Electrolyte level is correct.
 - a. Cells with separator guard - fill to top of guard.
 - b. Cells without guard - fill to 2mm above plates.
2. All terminals are clean and tight.
3. Periodically grease terminals.
4. Ensure batteries are kept in a fully charged state.

7.2 BATTERY CHARGING SYSTEMS

The standard charging system on Southerly yachts is the engine alternator.

Alternator Maintenance:

A. Drive Belts. Check monthly as follows:

1. Check and adjust tension. The deflection should be no more than 10mm.
2. Examine for cuts, uneven wear or fatigue cracks.
3. Ensure belts are clean, with no oil or grease.

B. Connections. Check monthly as follows:

1. Clean and tighten all alternator terminals.
2. Check cable and connectors for fatigue.

Note: If the alternator is not charging the batteries – contact your local Yanmar dealer or a qualified marine electrician.

7.3 SWITCH PANEL AND CIRCUIT BREAKERS

Switches:

All switches incorporate circuit breakers and are mounted on the electrical switch panel, with the exception of the engine start switch that is positioned in the cockpit. All wires are colour coded. When a circuit breaker is tripped, check the circuit and corresponding equipment for malfunction before re-engaging the breaker switch.

DANGER: Never hold a breaker on if it is tripping – an electrical fire could be the result

DANGER: Do not replace breakers, if faulty, with an over capacity circuit breaker.

General Maintenance Checks

Spray exposed electrics and wiring terminations with a water repellent cleaner such as WD40. Pay particular attention to the master battery switch.

Lights

These should be checked regularly for security of fitting, navigation lights should be checked for water tightness. It is recommended they be cleaned with warm water annually.

Never:

- Work on the electrical installation while the system is energised;
- Modify the craft's electrical system or relevant drawings: installation, alterations and maintenance should be performed by a competent marine electrical technician;
- Alter or modify the rated current amperage of overcurrent protective devices;
- Install or replace electrical appliances or devices with components exceeding the rated current amperage of the circuit;
- Leave the craft unattended with the electrical system energised, except automatic bilge-pump, fire protection and alarm circuits.

7.4 AC SYSTEM (IF FITTED)

If your boat is fitted with an AC system see electrical drawing in appendix 1.

- Do not modify the craft's electrical systems or relevant drawings. Installation, alterations and maintenance should be performed by a competent marine electrical technician;
- Disconnect shore-power connections when the system is not in use;
- Connect metallic housings or enclosures of installed electrical appliances to the protective conductor system in the craft (green or green with a yellow stripe conductor);
- Use double insulated or grounded (earthed) electrical appliances;
- If the reverse polarity indicator is activated, do not use the electrical system. Correct the polarity fault before activating the electrical system on the craft.

WARNING:

Do not allow the shore-power cable end to hang in the water. An electrical field can be caused which can cause injury or death to nearby swimmers.

To minimise shock and fire hazards:

- Turn off craft's shore-power connection switch before connecting or disconnecting shore-power cable;
- Connect shore-power cable to craft's inlet before connecting to shore-power source;
- Disconnect shore-power cable at shore-power source first;
- If reverse polarity indicator is activated, disconnect cable immediately;
- Close shore-power inlet cover tightly.

Do not alter shore-power cable connectors, use only compatible connectors.

8.0 GAS SYSTEM

Refer to gas system schematic in appendix 1

The boats are equipped with a vented gas bottle locker. The regulator is fitted on the bulkhead adjacent to the gas bottle, and is connected via a short flexible hose. The regulator reduces the gas pressure for the yacht's low-pressure appliances. Supply to the cabin is via a 10mm (3/8 in) copper pipe that is sleeved by a 19mm (3/4 in) clear plastic hose to prevent chafe. The copper piping runs to the cooker compartment to a gas tap. From the gas tap, gas is passed to the oven by a short flexible armoured hose in order to allow the cooker to move in its gimbals.

CAUTION: Gas can be shut off either at gas bottle valve or at the gas tap mounted on the cooker bulkhead.

OPERATING INSTRUCTIONS and MAINTENANCE:

1. Close fuel supply-line valves and cylinder valve(s) when appliances are not in use. **CLOSE VALVES BEFORE REFUELING AND IMMEDIATELY IN AN EMERGENCY.**
2. Be sure the appliance valves are closed before opening cylinder valve.
3. Test the LPG system for leakage regularly. Check all connections for leakage by:
 - routine observation of the bubble-leak detector (if fitted)
 - observation of the pressure gauge for pressure drop with appliance valves closed and cylinder valve opened, then closed (if fitted with gauge on supply pressure side)
 - manual leak testing
 - testing with soapy water or detergent solution (with appliance-burner valves closed and cylinder and system valves open)If leakage is present, close the cylinder valve and have the system repaired before further use. System repairs should be made by a competent person.

CAUTION: Do not use solutions containing ammonia.

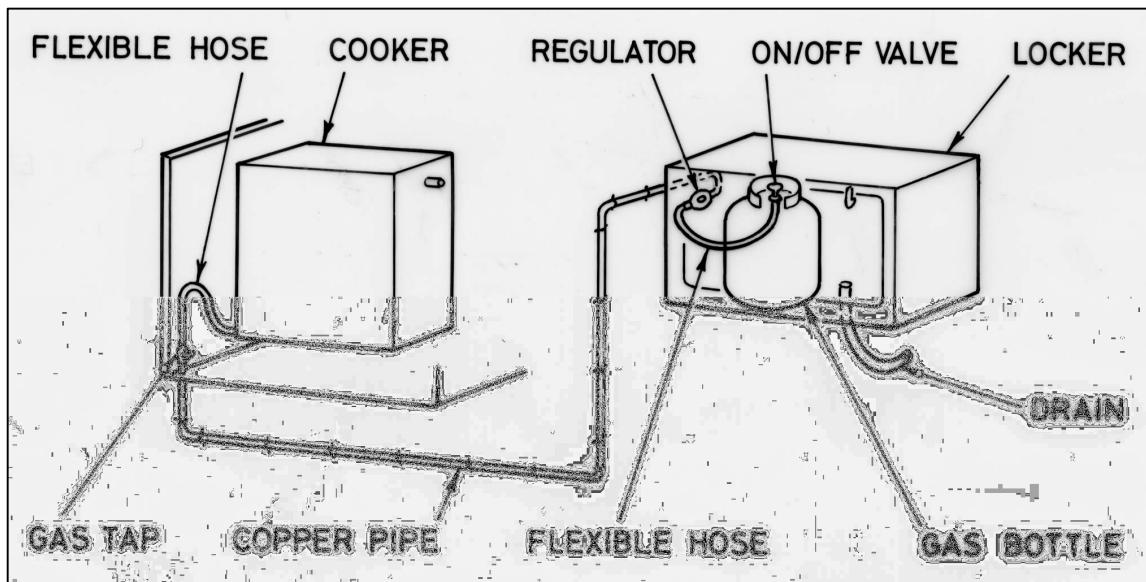
WARNING: NEVER USE FLAME TO CHECK FOR LEAKS

4. **WARNING:** Fuel burning open-flame appliances consume cabin oxygen and release products of combustion into the craft. Ventilation is required when appliances are in use. Open designated vent openings while appliances are in use (the hatch nearest the cooker).
5. **DO NOT USE THE STOVE OR OVEN FOR SPACE HEATING.** Never obstruct ventilation openings.
6. Do not obstruct quick access to LPG system components in any way.
7. Keep valves on empty cylinders closed and disconnected. Keep protective covers, caps or plugs in place. Store reserve or empty cylinders on open decks or in gas tight lockers vented overboard intended for that purpose.
8. Do not use LPG cylinder housings or lockers for storage of any other equipment.
9. **WARNING:** Never leave the craft unattended when LPG consuming appliances are in use.
10. **WARNING:** Do not smoke or use open flames when replacing LPG cylinders.
11. Hoses in the system must be inspected regularly, at least annually, and replaced if any deterioration is found.

WARNING: LPG is heavier than air and any escaped gas will lie in trays, recesses and bilges.

DANGER: Fire is the greatest onboard danger - do not test for leaks with a naked flame.

See fire prevention section 10.2



For operating instructions for gas appliances – see the manufacturer's handbook.

Note: The regulator capacity is 1.5 kg/hr, outlet pressure is 30 mbar and it is suitable for Butane or Propane gas.

CHANGING CYLINDERS:

1. Check that the cylinder on/off valve is off by turning clockwise. **NEVER DISCONNECT WITH THE VALVE OPEN.**
2. Disconnect the flexible hose (left hand thread) with a suitable spanner.
3. Replace protective cap to empty cylinder.
4. Remove protective cap from full cylinder and store.
5. Inspect the sealing washer on the flexible hose for damage before connecting. Replace if necessary.
6. Fit the connecting nut (left hand thread) to the cylinder taking care not to cross the threads. Tighten firmly using a suitable spanner, but do not overtighten as this can damage the washer.
7. Open the cylinder on/off valve to restore gas supply.

9.0 WATER SYSTEMS

9.1 FRESHWATER

Refer to freshwater schematic in appendix 1

Water tank capacities:

Southerly 110	225 litres (50 gallons)
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CAUTION: Total tank capacity may not be useable according to trim and loading.

Systems:

Southerly yachts are fitted with a pressurised water system.

Initial operation of the pressurised water system:

1. Check level of water in the tank.
2. Open all outlets - hot and cold.
3. Switch pump to the on position and wait for the hot water and water lines to fill.
4. Close each outlet as flow becomes steady and free of air (close cold water outlet first). Pump should shut off soon after closing last outlet.
5. Pump is now ready for automatic operation, it will start when outlet is opened and stop when outlet closed.
6. If the pump is to be inoperative for a considerable length of time, turn off the circuit to the pump and bleed the system by the opening faucets.

CAUTION: The motor case will get hot. Prolonged contact during operation may cause a burn.

Trouble shooting the pressurised water system:

Problem	Cause	Solution
Pulsating flow - pump cycles on and off	Restricted pump delivery	Check discharge lines, fittings and valves for clogging
Failure to prime - motor operates, but no pump discharge:	Restricted intake or discharge line	Check pipes
	Air leak in intake line	Check for leaks
	Punctured pump diaphragm	Refer to dealer
	Debris under flapper valves	Clean valves
	Pump diaphragm leaking	Refer to dealer
	Crack in pump housing	Refer to dealer
Motor fails to turn on:	Loose wiring connection	Check wiring
	Pump circuit has no power	Check power source
	Blown fuse	Check cause, replace fuse

	Defective motor	Refer to dealer
Pump fails to turn off after all fixtures are closed	Empty water tank	Fill tank.
	Punctured pump diaphragm	Refer to dealer
	Discharge line leak	Check for leaks - repair
	Defective pressure switch	Refer to dealer
	Insufficient voltage to pump	Check supply voltage and cable size
Low flow and pressure	Debris under flapper valves	Clean valves
	Air leak at pump intake	Check valves
	Accumulation of debris inside pump and plumbing	Check pipework
	Worn pump bearing (excessive noise)	Refer to dealer
	Punctured pump diaphragm	Refer to dealer
	Defective motor	Refer to dealer

Pump Maintenance:

Check the inlet strainer periodically and clean it if necessary.

Hot Water System: (Fresh Water Cooled Engine)

The engine is used to heat the water system via the calorifier. Reinforced 12mm (1/2 in) neoprene pipe is used to take the hot water from the heat exchanger pass it through the calorifier and back to the inlet of the heat exchanger.

Calorifier: copper tube containing hot engine cooling water runs through the tank, which transmits heat to the freshwater in the tank. A self operated valve with remote sensing is utilised to control the pump circulating hot water and controls the temperature by a thermostat sensor mounted on the calorifier.

The thermostat is adjustable within a range of approximately 40 degrees C to 70 degrees C indicated by numbers 1 low to 5 high. The thermostat is mounted on the copper piping next to the calorifier and through engine cooling water inflow.

Note: It is suggested that the heat setting should be turned to number 3 initially, and then increased or decreased depending on required temperature levels. When altering the setting number, allow sufficient time for cylinder to achieve new temperature before making further adjustments.

A safety valve is fitted to the calorifier in case too large an increase in pressure occurs. This valve can also be used to bleed off the system with the aid of a nylon pipe into the bilges.

Note: If the safety valve is automatically opened due to, too great a pressure, it will also automatically shut itself off once pressure level is corrected.

9.2 MARINE TOILET

Refer to toilet installation schematic in appendix 1

Operating Instructions:

Note: As the toilet is connected to the seacock, and if damage occurs to toilet or pipe work, water may flood in, causing the craft to sink, which may result in loss of life. Therefore when the craft is left for a period of time, both seacock should be shut. Ensure that all users understand how to operate the toilet system correctly and safely - including seacock or secondary valves.

1. First Use:

After periods without use the toilet may benefit from lubrication.

Open inlet and outlet seacock.

Half - fill the bowl with warm fresh water containing a few drops of vegetable oil or baby oil.

Keeping the flush control lever in the shut position, pump out the warm water.

2. Normal Use:

Open inlet and outlet seacock.

Before use ensure that there is enough water in the bowl to prevent toilet paper becoming compacted at the bottom of the bowl.

If the bowl is empty, move the flush control lever to the open position and pump the handle up and down until the flushing pump is primed and water enters the bowl. Then shut the flush control.

Operate the pump with long, smooth strokes for efficient and easy operation.

During use, pump as necessary to keep the contents of the bowl low enough for comfort.

Use good quality hard or soft household toilet paper, but do not use more than necessary.

After use, keep the flush control shut and pump until bowl is empty.

When the bowl is empty, open the flush control again, and continue to pump until all waste has either left the boat, or reached the holding tank (allow 7 complete up / down strokes per metre length of discharge pipe work).

Then shut the flush control, and pump until the bowl is empty. Always leave the bowl empty to minimise odour and spillage.

3. After Use:

Shut the flush control.

Note: Do not put anything in the toilet likely to block or damage it. Do not put in: sanitary towels, wet strength tissues, cotton wool, cigarettes, matches, chewing gum or any other solid objects, petrol, diesel, oil, solvents of any kind or water more than hand hot.

4. Cleaning:

Regular flushing with clean seawater is one of the most effective methods of keeping the toilet clean and sweet smelling.

To clean the bowls use any liquid or cream ceramic cleaner.

To clean rest of the toilet, including seat and lid, use non-abrasive liquid cleaner, polish with a dry cloth only.

Maintenance:

Flush toilet in accordance with operating instructions, in particular ensure that all waste has left the discharge pipework, bowl empty and close both seacock. Refer to the manufacturers handbook for servicing details

The inlet hose always retains some seawater which can bacterially decay, which makes hydrogen sulphide gas (bad eggs smell) when next operated. Replacement of the inlet hose or the fitment of a proprietary disinfectant device will remove this condition.

Toilet Pipe Sizes:

19mm diameter bore seacock for flushing water inlet.

38mm diameter bore seacock for waste outlet.

Spiral reinforced smooth flexible hose is used for both 19mm inlet and the 38mm outlet pipework, in conjunction with two stainless steel worm drive hose clips for every hose tail connection.

9.3 HOLDING TANK

Holding tank system (Optional):

The holding tank is in the form of a stainless steel tank or plastic tank. The tank has connection for inlet and outlet 38mm (1½ in) odour free hose and breather pipe.

The toilets have a diverter valve mounted on the bulkhead that can be either turned to allow waste to be discharged overboard through a skin fitting or into the holding tank.

The tank can be pumped out to sea via a 'Y' piece to the outlet seacock using the Henderson pump in the toilet compartment. There is a separate suction to the pump out position on the deck.

The state of the tank can be monitored by checking the level gauge.

Note: Skin fittings should be closed when not in use, diverter valves should be in the correct position before operation, check piping for wear / chafing periodically, make sure the breather outlet is clear.

After using a holding tank it is essential that it is flushed through well with water. Ensure that the tank and pipes have been thoroughly cleaned. Any effluent left in the pipes can cause foul smells to penetrate which is not very pleasant inside the yacht.

If freezing conditions are anticipated, drain the system.

CAUTION: The use of anti-freeze is not recommended.

Be aware of waste discharge regulations before pumping out the holding tank.

9.4 BILGE PUMPS

The yacht is fitted with one manual bilge pump and one submersible electric pump as standard equipment.

The manual pump is an Amazon pump that has a capacity of up to 50 litres/minute.

The pump can be cleaned out by removing the access hatch mounted on the back of the pump. Periodic checks and cleaning of the pump and the strum box are necessary, as a slight blockage will seriously affect the discharge capabilities.

The submersible electric pump is a Rule RM1100 located in the lowest practicable part of the bilge, and is fitted with 28mm (1 1/8") plastic piping. The pump discharges through the hull via a skin fitting. The pump has a capacity of 66 litres/minute at 1m head.

The pump can be cleaned out by unclipping it from its base. Periodic checks and cleaning of the pump and integral strum box are necessary, as a slight blockage will seriously affect the discharge capabilities.

CAUTION: Check the function of the pumps at regular intervals. Clear pump inlets from debris.

WARNING: The bilge pumping system is not designed for damage control.

The combined capacity of the system is not intended to drain the craft in the event of hull damage. A collision mat may be a suitable means of preventing the ingress of water sufficiently in such circumstances to enable the bilge pump to cope. Keep a collision mat (a storm jib could be deployed) ready for use in a readily accessible location and practice its application.

10. GENERAL

10.1 ANCHORING ARRANGEMENTS

Standard equipment supplied:

SOUTHERLY 32: 15kg Bruce anchor with 10 metres of 8mm chain and 30 metres of warp
SOUTHERLY 110: 15kg Bruce anchor with 10 metres of 8mm chain and 30 metres of warp

Stemhead Roller:

The stemhead roller incorporates the stowage for the anchor. The roller is to keep the chain or warp in place when anchored and allows it to be retrieved easily. When stowed either a pin fits through the anchor from the stemhead to secure it in position or a lashing is provided to tie the anchor to the deck.

On the Southerly 32 and 38 the anchor roller is removable should it be needed to occupy a 10 or 12m mooring. On fitting the removable section ensure that it is positioned correctly and all removable pins are refitted and secure.

Securing Arrangement:

When anchored the chain should be secured to the main deck bollard, (in order to take the considerable loads the bollard is fastened through a plywood pad and then bolted onto the penny washers). The anchor loads should not be left on an anchor windlass gypsy alone.

Chain locker:

The Southerly 110 chain locker is accessible from the forecabin access trap on the forward bulkhead. There are two drain outlets above the waterline, positioned in the bottom of the locker. A ring bolt is positioned in the locker to which the bitter end of the cable should be attached.

MAINTENANCE:

1. Check the condition of the chain annually and pay particular attention to the shackle links at the anchor and the warp joint.
2. Check condition of the warp periodically, paying particular attention to the anchor chain connection and any wearing due to chafing on the stemhead roller (Note: When using warp chafing can be overcome by using a split section of Polythene pipe under the warp).
3. Prolonged life of the anchor and chain can be maximised by thoroughly washing the chain and the anchor after use.
4. Ensure that the drains for the chain locker do not become blocked, by periodic cleaning.

10.2 TOWING ARRANGEMENTS

To receive a tow the forward cleats are used, with the tow line run through the stemhead fitting. Sleeve ropes wherever possible to reduce chafe. Whenever towing or being towed it is recommended that the line be attached in the form of a bridle to spread the load between cleats.

CAUTION: Always tow or be towed at a slow speed. Never exceed the hull speed of a displacement craft when being towed.

CAUTION:A tow line shall always be made fast in such a way that it can be released when under load.

It is the owner's/operators responsibility to ensure that mooring lines, towing lines, anchor chain(s), anchor lines and anchor(s) are adequate for the vessels intended use, i.e. the lines or chains do not exceed 80% of the breaking strength of the respective strong point.

Owners should also consider what action would be necessary when securing a tow line on board.

Combined (where applicable) towing strong point breaking strengths are:

	Southerly 110/35RS
Load	3918kg 8638lbs

10.3 FIRE PREVENTION

Gas systems: The gas appliance is a main risk of fire. Persons trained in accordance with the health and safety commissions 'approved code of practice' should perform any work needed on the installation.

WARNING: Gas is denser than air and will sink into the bilges. In order to minimise risk of fire the burners are fitted with flame failure devices and there are shut off valves at the regulator and at the cooker. Adequate ventilation must be provided to prevent the build up of carbon monoxide or carbon dioxide.

If gas is smelt extinguish all naked lights and cigarettes, do not run any electrical equipment or the engines, and ventilate the boat thoroughly. It will be necessary to bail the gas from the bilges, or pump it out with a manual diaphragm bilge pump. Have the gas system checked by a qualified engineer and do not use the system until the fault has been rectified.

Fuel Systems: The boats fuel system is the other major fire risk, particular care must be taken when refuelling or when working on any part of the fuel system. During these times it is essential to stop smoking and have no naked lights in the vicinity. On completion of the work make quite certain that all joints are tight. In the event of a spill, mop up as much fuel as possible and thoroughly ventilate the area.

10.4 FIRE FIGHTING

The boats are supplied with two fire extinguishers and a fire blanket.

The skipper of the yacht should brief the crew as to their location and what to do should a fire break out on board. Refer to the drawing in Appendix 1.

It is advised that an additional automatic engine room fire extinguisher is fitted.

Fire extinguishers operate by cooling the fire down, by smothering it, or by reacting with it chemically.

Water is an excellent medium for cooling down a fire, and with a boat there is a plentiful supply. Water is found to be less damaging than chemicals to the interior of a boat, and does not produce harmful fumes.

Water must not be applied to burning liquids such as fuel or cooking fat since a violet reaction will occur, spreading fire in every direction. Also as water is heavier than fuels or cooking fats, the latter will float on the water and continue burning. **Water must not be used on electrical fires where high voltage is present** due to the danger involved.

Northshore yachts are supplied with dry powder extinguishers, these have been found to be most suitable below deck, since they do not give off any dangerous fumes, do not conduct electricity, are non corrosive and are suitable for most types of fire.

The dry powder extinguisher operates chemically to stop combustion, and also absorbs heat as it melts, therefore giving some cooling. When released the powder emerges as a fine jet which should travel 2 metres (6ft) and when it hits the flame it causes dense white smoke. Dry powder extinguishers are operated by pressure in a CO₂ bottle.

The extinguishers have an average total discharge time of less than 10 seconds, so it is important to get as close as possible and take good aim at the base of the fire, to ensure the burst from the extinguisher is effective.

Fire Blanket: the fire blanket, that is located on the bulkhead in the vicinity of the galley, is best for tackling galley fires. If a fire occurs make sure a good as seal is made as possible with the blanket around the edge of the pan, and try to prevent the blanket actually falling into the liquid. Leave the blanket in place until the pan and its contents are thoroughly cooled.

Fires In The Engine Room: In the event of a fire in a engine room, stop the engine, plus any ventilation fans if fitted, turn off the fuel at the tank, blank off (if possible) the air inlets to the engine space, remove the plug to the aperture in the engine box and then discharge the extinguisher into the engine box. (An automatic engine room extinguisher can be supplied as optional equipment). The extinguisher displaces oxygen and you should evacuate the yacht (if possible) once it has discharged. Do not open the engine covers until the space is cooled as you will re-introduce oxygen which may re-ignite the fire.

MAINTENANCE:

It is the responsibility of the craft owner/skipper to:

- Have fire-fighting equipment checked at intervals indicated on the equipment.
- Replace fire-fighting equipment, if expired or discharged, by devices of identical or greater fire fighting capacity.
- Inform members of the crew about the location and operation of fire fighting equipment, the location of discharge openings into the engine space and the location of escape hatches.
- Ensure that the fire fighting equipment is readily accessible when the craft is occupied.

CAUTION: NEVER:

- Obstruct passageways to exits and hatches.
- Obstruct safety controls, e.g. fuel valves, gas valves and switches of the electrical system.
- Obstruct portable fire extinguishers stowed in lockers.
- Leave the craft unattended when cooking and/or heating appliances are in use.
- Use gaslights in the craft.

- Modify any of the craft's systems (especially electrical, fuel and gas) or allow unqualified personnel to modify any of the craft's systems.
- Fill any fuel tank or replace gas bottles when machinery is running or when cooking or heating appliances are in use.
- Smoke while handling fuel or gas.

Keep the bilges clean and check for fuel and gas vapours at regular intervals.

When replacing parts of the fire fighting installation, only matching components shall be used, bearing the same designation or being equivalent in their technical and fire resistant capabilities.

Do not fit free hanging curtains or other fabrics in the vicinity of or above cookers or other flame devices.

Combustible material shall not be stowed in the engine space. If non-combustible materials are stowed in the engine space they shall be secured against falling into machinery and shall cause no obstruction to access in or from the space.

For yachts fitted with a fixed engine room fire extinguisher system (optional):

CAUTION: Before discharging, shut down engine and blowers and evacuate accommodation.

WARNING: The fire-extinguishing medium may act as an asphyxiant, after discharge, ventilate before entering.

This extinguisher uses CO₂ as an extinguishing medium. It shall only be used to fight electric fires. To avoid asphyxiation after discharge, leave area immediately and ventilate before entering.

10.5 MAN OVERBOARD

Your yacht is fitted with a stern boarding ladder which can be used for recovering someone from the water.

The owner/skipper of the yacht is responsible for the recovery of a crew member from the water. It is suggested that this procedure be practised regularly. An owner may wish to buy or make additional equipment designed for the purpose of recovering a person from the water.

Harness hooking points in the form of stainless steel 'U' bolts are provided near the companionway exit and at the helm. Other hooking points are formed by the rod eyes to each stanchion base.

Jack-stay attachment points in the form of folding stainless steel pad eyes are provided at the forward and aft extents of the working deck.

It is the operators responsibility to fit jack-stays to the craft if appropriate.

10.6 STOWAGE OF LOOSE EQUIPMENT

Ensure that all equipment is secured safely when underway.

11. WINTERISATION

Laying Up Checklist:

1. A Southerly can be safely left ashore resting on two railway sleepers (or similar), one at either end of the grounding plate. Chocks can be put in, either side, for additional security.
2. Check that your insurance policy covers the laying up period.
3. Ensure that there is adequate ventilation whilst laying up boat and secure against forced entry or storm.
4. Remove cushions for cleaning and storage.
5. Defrost and leave the lid off the icebox.
6. Open all internal cabin and locker doors to ensure free air movement.
7. Drain all water systems.
8. Remove batteries for cleaning, charging and storage.
9. In conjunction with engine winterisation, plan stern gear maintenance - such as renewing stern gland packing.
10. Take sails ashore for cleaning and valeting, and store in the dry after work is completed.
11. If possible cover the deck, coachroof and deck joinery to reduce cleaning effort on re-commissioning. Make sure any cover is supported well clear of woodwork to prevent chafing. Ensure that the cover is securely fastened. **It is not recommended to shrink wrap the boat.**
12. Clean all running rigging; replace rigging screws, shackles, and terminals if any sign of excessive wear.
13. Check all standing rigging, replace rigging screws, shackles, terminals, if any signs of excessive wear.
14. Check mast fittings, tracks, sheaves, blocks, spreader sockets.
15. Remove old or lose antifouling, apply new coating.
16. Check all varnish and re-coat as necessary.
17. Place a low power heater aboard connected to shore power with a thermostat.

Northshore offers a full range of winterisation and maintenance services for all yachts. Please call for advice or assistance.

Winterisation of Engine:

This should be carried out by an authorised Yanmar dealer.

Fuel Tank:

1. Drain off the sediment from the bottom of the fuel tank by opening drain cock off the bottom of the tank into a suitable container.
2. Fully fill the fuel tanks to prevent water condensation.

Fresh Water System:

To winterise the system is necessary to drain the water from the entire system:

Follow these steps to remove all the water from your water system:

1. Drain water by opening the tank drain or open a fixture and allow the pump to operate until the tank is dry.
2. Open the lowest outlet in the water system to drain the pipes.

3. To remove any remaining water (about a cup), remove the outlet hose on the pump and activate the pump. To blow out the pipes, attach an air nozzle where the outlet hose was removed. Make sure all the fixtures are open before starting.
4. Your water system is now winterised, do not forget to reattach the outlet hose and close all the fixtures.

DANGER: Do not use antifreeze in the fresh water system. It is poisonous and will cause serious internal injury or death

Holding Tank (if fitted):

Drain the holding tank either from the deck outlet or the seacock, check that the breathers are not blocked, and then wash out the tank with fresh water.

Winterisation of the toilet system:

Drain the complete system both as a protection against frost damage and to discourage the growth in the pipe work of anaerobic bacteria that cause unpleasant smells.

1. Open any secondary valves
2. Remove the base drain plug.
3. Loosen hose clips and disconnect all the hose ends from the seacock tails, the toilet tails, and any secondary valves. Pump the handle to drain the toilet pump, and ensure that all water is drained from the toilet system.

CAUTION: The use of anti-freeze is not recommended.

WARNING: If you leave the toilet disassembled, and if the seacocks are opened when the craft is afloat, water will flood in and may cause the craft to sink, which may result in loss of life. Therefore you should attach a warning notice to the seacocks and, if possible, wire the seacocks shut.

If you are not disassembling the toilet:

1. Reconnect all the hose ends and secure them with hose clips.
2. Replace the base drain plug securely.
3. Fasten down the seat, lid and pump handle to prevent use, and attach a warning notice.

Winterise the Gas System:

At the end and end of each season and before any long voyage, the following checks are recommended:

1. Check all rigid pipes for corrosion.

2. Check all rubber pipes for perishing (by bending in a U).

Note: It is recommended that all rubber hoses be replaced annually.

3. Examine regulators for corrosion or damage. If in doubt take it to your nearest gas stockist.

WARNING: Do not attempt to repair a regulator.

4. Test all gas taps and controls for correct operation.

5. Check all fittings for corrosion and security.

6. Thoroughly clean gas bottle lockers and check drains for blockage.

7. Have the gas system pressure tested for leaks by a qualified professional at least once a year.

12. MAINTENANCE CHECKLIST

1. Hull and Deck Maintenance:

General Care: Regular washing off with fresh water and polishing with one of the many proprietary polishes on the market will keep the surfaces clean and free from dirt and salt deposits which can eventually abrade the surface.

If the boat is shrink wrapped for transport remove the shrink wrapping as soon as possible to avoid adverse effects on the topsides laminate.

Note: Avoid silicone type polishes that are difficult to remove if the boat ever requires painting.

GRP Damage: Small marks in the gelcoat can be repaired by sanding lightly with wet and dry and then applying fresh gelcoat in a matching colour and finishing with further sanding, cutting compound and polishing.

A qualified person should carry out major damage to either the deck or the hull.

Antifouling of the hull bottom should be carried out once a year.

2. Teak maintenance

Error! Bookmark not defined.: External teak surfaces if left bare should be scrubbed with salt water to keep clean. Teak laid decks should be regularly scrubbed with salt water.

WARNING: Never use a high-pressure washer on teak or Treadmaster decking. It can cause irreparable damage.

3. Engine Maintenance:

Refer to the manufacturer's handbook

Note: Sufficient tools should be carried onboard. We would suggest the following:

Set of open-ended spanners and ring spanners, screwdrivers, molegrips, pliers, hammer, mallet, files and specified engine tools as specified by the manufacturer.

Spares for the engine should include at least the following:

1. Set of drive belts (alternator, circulating pump etc).
2. Set of hoses and spare hose clips.
3. Set of gaskets.
4. Fuel and lubricating oil filter elements.
5. Circulating water pump implement and gasket.
6. Thermostat.
7. Injectors.
8. Lubricating oil for a complete refill of engine and gearbox.
9. General purpose grease.
10. Penetrating oil.
11. Distilled water for the batteries.

4. Sails and Rigging:

Rigging Checks:

Checks that should be made at the start and regularly through the season:

1. Examine all steel / wire ropes for corrosion, wear and damage.

2. Examine all rigging terminals for signs of wear, cracks or damage. Pay particular attention to all split pins. They should be the largest size possible to pass through the cotter pinhole, with sufficient protruding through the hole for them to be opened. All split pins should be taped to protect sails etc. from damage.
3. Examine all rigging screws for signs of wear or damage and ensure that they are 'in safety', i.e. the inner threads are visible through both safety holes.
4. Ensure that the ends of the spreader bars are protected to prevent the sail chafing.
5. Ensure that the rig correctly adjusted.
6. Check all running rigging for signs of wear, paying particular attention to all eye splices and end terminals. On the wire / rope halyards, check the wire rope splice. If the rope side of the splice shows rust, the halyard should be replaced. Wash halyards not being replaced.
7. Check over the standing rigging, paying particular attention to the wire where it enters the swage fittings. Any sign at all of cracking or fraying in any of the wire strands, then replace the shroud concerned.
8. Look for signs of wear or of ridging on clevis pins where they may rock or work in the chain plates or the shroud tangs. Also look for corresponding wear on fittings.
9. Where the shrouds are located in the mast by means of a "T" terminal in a slot, ensure that there is no undue wear.

Note: Most surveyors recommend that standing rigging should be replaced after ten years of use.

5. Sails

Check annually and during the season the following:

1. Chafing – normally found at the spreaders and on the foot of large sails.
2. Tears at batten pockets and at all attachment points: tack, clew, head, sail and reefing cringles.
3. Any other damage.

Note: We recommend that sails be returned to a sail loft annually for valeting and checking.

6. Ropes:

All ropes should be examined regularly during the season for:

1. Signs of wear or damage, where ropes are constantly cleated, clamped or passed round sheave blocks or through fairleads.
2. Check that all splices are serviceable, this is particularly important where polyester ropes are spliced to steel wire ropes, such as halyards.

7. Cooling System:

General Maintenance:

1. The seacock inlet strainer should be checked and kept clean.
2. Make regular checks to ensure that there are no leaks in the system.
3. Check the anti-siphon breather outlet when the craft has been left for a period unattended.
4. Check pipes, T-junctions and anti-siphon for leaks monthly.
5. Check engine control cables for wear and check that nuts on the engine throttle and gear assembly are tight.
6. Periodically grease splines both at the engine and lever control.

8. Stern Gear Maintenance:

1. Check the stuffing box for excessive dripping regularly and tighten the stuffing box if required

2. Neoprene cutlass bearings should be checked for wear, when the craft is out of the water.

9. Cathodic Protection:

1. Check bronze components (propeller and skin fittings) for signs of dezincification when the yacht is ashore.
2. The anode should be replaced when around 70% eroded.

10. Batteries: Check the following:

1. Electrolyte level
2. All terminals are clean and tight.
3. Periodically grease terminals.
4. Ensure batteries kept in fully charged state.

11. Gas System:

1. Be sure that the appliance valves are closed before opening the cylinder valve.
2. Test the LPG system for leakage regularly. If leakage is present close cylinder valve and have system repaired by qualified gas engineer.
3. Hoses in the system must be inspected regularly, at least annually, and repaired if any deterioration is found.
4. It is recommended that the gas system is inspected regularly, at least annually, and repaired if any deterioration is found.
5. It is recommended that the cooker is serviced annually by qualified engineer.

12. Freshwater system:

1. Check the pipes and joints for leaks.
2. Flush through the system before laying up for the winter.

13. Toilet system:

1. Check the condition of the pump and ensure that the seal remains watertight.
2. Check the pipes and the connections for leaks and wear.
3. Make sure that the anti-siphon breather on the toilet inlet is clear.

14. Holding tank system:

1. Check the piping for wear and chafing periodically.
2. Make sure the breather outlet is clear.
3. Flush the holding tank through with freshwater regularly.

15. Manual bilge pump:

1. Clean out by removing the access hatch at the back of the pump.
2. Check bilge pump piping, for blockages or leaks.

16. Electric bilge pump:

1. Clean out by removing the pump from its base.
2. Check bilge pump piping, for blockages or leaks.

13. ENVIRONMENTAL CONSIDERATIONS

(1) Pollution general:

The International Maritime Organisations (IMO) Convention of Maritime Pollution (MARPOL) has now been extended to cover the small pleasure craft for the first time:

It is an offence to throw anything overboard within 12 miles of land including food waste, paper bags or wrappers, as well as the obvious glass or tins. Substantial fines can be imposed on the offenders.

(2) Garbage pollution:

Annex V of the IMO convention defines garbage as ' all virtual, domestic and operational waste, 'excluding fresh fish and parts thereof '. The controls established by Annex V, which covers pleasure craft, are strict, and vary according to the type of garbage and the area in which the yacht is operating as follows;

1. The disposal into the sea of all plastics including synthetic ropes and fishing nets, and plastic garbage bags is prohibited absolutely.
2. Floating dunnage, lining or packing materials may not be disposed of into the sea less than 25 miles from land.
3. Food waste and all other garbage, including paper products, rags, glass, metals, bottles, crockery and similar refuse may be disposed more than 12 miles from land.
4. Garbage specified under (3) above, if ground to particles less than 25mm across, may be disposed of at sea not less than three miles from the nearest land.

Special rules are in force for some other areas.

FUEL and EXHAUST SPILLAGE

Oil or fuel should not be discharged at sea. If an accidental spillage occurs in the bilges " Bilgex" or a similar detergent should be used in order to break it up before pumping overboard. If oil or fuel is split overboard the offending area should be covered with some form of soap liquid, as this will disperse the slick.

WAKE/WASH

Wake / Wash can be a problem in a congested harbour or narrow estuary channel, yachts should keep to a suitable speed so that erosion of estuary banks or disturbance of other craft at anchor is minimised.

EXHAUST EMISSIONS

Where the exhaust fitting is positioned on the transom, it periodically can become sooted and requires cleaning. If your engine begins to expel continuous quantities of black smoke (e.g. lack of oxygen to the cylinder, rich fuel mixture) seek the assistance of a qualified engineer.

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APPENDIX 1

Drawings

This section contains drawings applicable to the type of yacht that you own. Depending on the specification of your yacht and any optional extras fitted, relevant drawings attached may include:

1. General arrangement
2. Sail plan
3. Navigation lights
4. Lifting points
5. Skin fittings
6. Exhaust system
7. Fuel system
8. Fresh water system
9. Steering system
10. Deck layout and working deck, anchoring and mooring arrangement, means of escape
11. Bilge system
12. Toilet system
13. LPG system
14. Heater system
15. DC electrical system
16. AC electrical system
17. Hydraulic system

APPENDIX 2

Manufacturer's handbooks and leaflets.

The following is a list of the handbooks and instruction leaflets that have been provided by the manufacturers of equipment that we have fitted to your yacht. They should be stowed with this handbook and passed on to any future owners' of the yacht.

APPENDIX 3

Service records

We would recommend that you keep a record of all service work carried out to the yacht. This section provides you with some pages onto which those notes can be made. If possible the agent or yard that carries out the work should stamp the section to confirm that the work has been completed.

Engine inspection/service

50 hour service	
Oil change	
Additional work	
Dated completed	
Service agent stamp	

Engine inspection/service

Annual service	
Oil change	
Additional work	
Dated completed	
Service agent stamp	

Engine inspection/service

Annual service	
Oil change	
Additional work	
Dated completed	
Service agent stamp	

Engine inspection/service

Annual service	
Oil change	
Additional work	
Dated completed	
Service agent stamp	

Engine inspection/service

Annual service	
Oil change	
Additional work	
Dated completed	
Service agent stamp	

Engine inspection/service

Annual service	
Oil change	
Additional work	
Dated completed	
Service agent stamp	

Engine inspection/service

Annual service	
Oil change	
Additional work	
Dated completed	
Service agent stamp	

Maintenance records

Annual checks	Date	Works completed
Sails, spars and rigging		
Winches and windlasses		
Fittings		
Ground tackle		
Cathodic protection		
Bilges		
Steering systems		
Water/waste systems		
Gas system		
Antifouling		

Annual checks	Date	Works completed
Sails, spars and rigging		
Winches and windlasses		
Fittings		
Ground tackle		
Cathodic protection		
Bilges		
Steering systems		
Water/waste systems		
Gas system		
Antifouling		

Annual checks	Date	Works completed
Sails, spars and rigging		
Winches and windlasses		
Fittings		
Ground tackle		
Cathodic protection		
Bilges		
Steering systems		
Water/waste systems		
Gas system		
Antifouling		

Annual checks	Date	Works completed
Sails, spars and rigging		
Winches and windlasses		
Fittings		
Ground tackle		
Cathodic protection		
Bilges		
Steering systems		
Water/waste systems		
Gas system		
Antifouling		

APPENDIX 4

EC Declaration of Conformity*Insert appropriate page*

Insert appropriate page

APPENDIX 5

Receipt of Owner's manual

Receipt of Owner's manual

Name:

Address:

.....

.....

.....

Owner of:

Craft Identification No:

The owner of the above craft confirms receipt of the Owner's manual delivered with the craft.

Signature:

Date: