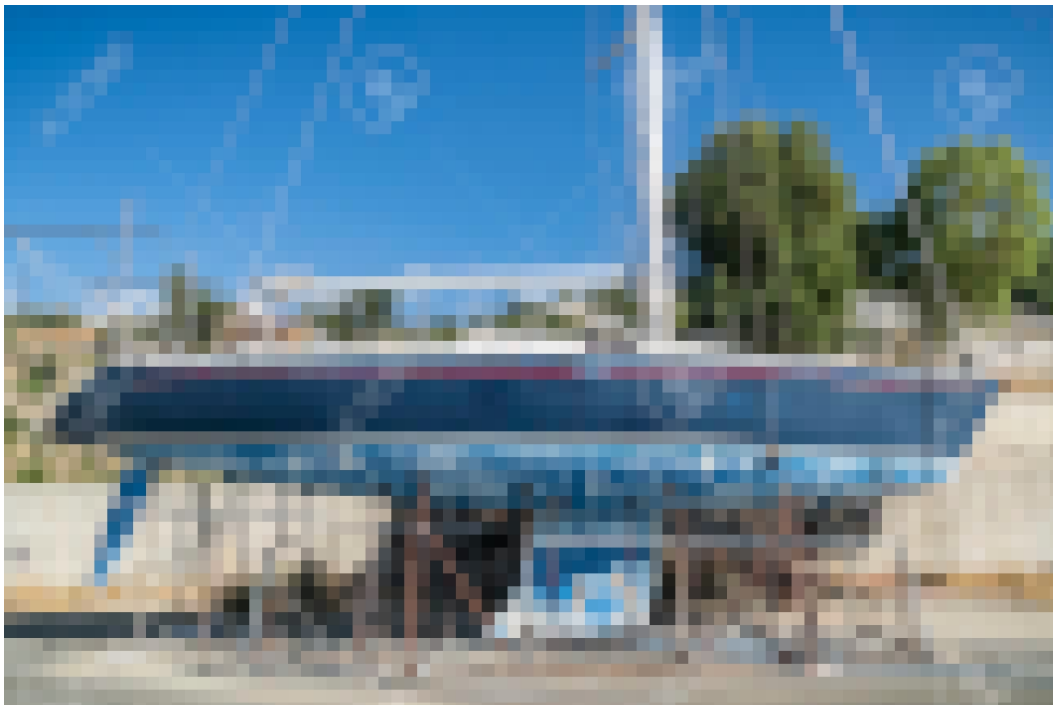
Massimiliano Panessa

Yacht & Small Craft Surveyor

Report nr.		Condition
Date of inspections:	00000	
Where inspected::	Località	
	Address	
Customer:	Mr. Nome	
	Address	
Kind of survey:	Pre purchase	

Inspection report

Auxiliary Engine Sailing Yacht named:



Model

Cavriago, 27/03/20

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CE Marking

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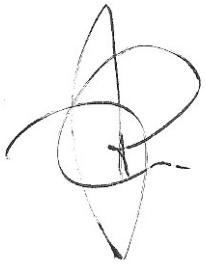
1. Assignment

According with the instructions received from Nome , on 00000 we attend to inspect the above mentioned pleasure craft in Località , in order to ascertain the condition of hull, machinery and equipment.

1.1 Performed Inspections

Component	Performed Inspections	
Underwater Body	☐Dry-docked inspected ☐Visual inspection ☐Tap Test ☐Moisture test ☐Infrared Thermography ☐Ultrasonic test	☐Not inspected
Topsides	☐Inspected ☐Infrared Thermography	☐Not inspected
Deck	☐Inspected ☐Infrared Thermography	☐Not inspected
Masts and rigging	☐Inspected at deck level ☐Inspected aloft	☐Not inspected
Sails	☐Inspected ☐Furled ☐Unfurled on rigging ☐Laid out ashore	☐Not inspected
Structures	☐Inspected	☐Not inspected
Furnitures	☐Inspected	☐Not inspected
Engine	☐Inspected ☐Operated at a sea ☐Infrared Thermography	☐Not inspected ☐Not operated
Electrical system	☐Inspected ☐Tested ☐Infrared Thermography ☐Batteries conductance test	☐Not inspected ☐Not tested
Plumbing	☐Inspected ☐Tested	☐Not inspected ☐Not tested



Component	Performed Inspections	
Galley gas system	☐Inspected ☐Operated	☐Not present ☐Not inspected ☐Not operated
Navigation equipment	☐Inspected ☐Tested ashore ☐Tested at mooring ☐Tested at sea	☐Not inspected ☐Not tested

Table 1.1

1.2 Equipment used

For instrument and measurements details see Appendix 2

Tap test	• Wooden hammer • Phenolic head hammer • Pin hammer • Spike handle • Spike
Moisture Meter	• Composite materials (not suitable for carbon fibre): Radio-frequency type Protimeter Aquant, scaled 0 through 999, a dry laminate should mark 0 to 169 (warning threshold), moderately wet marks 170 to 199 (alarm threshold); readings of 200 and over indicate a wet laminate • Wood: Extech MO55, percentage scale
Thermal Imaging Camera	• Trotec AV080C, 160x120 pixels, FOV 28°x21°, IFOV 3mrad, NETD <80mK • Testo 882, 320x240 pixels, FOV 32°x23°, IFOV 1,7mrad, NETD <50mK (in SuperResolution mode: 640x480 pixels, IFOV 1,1mrad)
Ultrasonic	• Flaw detector Mitech MFD620C • 25mm/0,5MHz Olympus delay-line probe (composites) • 10mm/5MHz Olympus dual-christal probe (metal)
Conductance tester	• Autool BT660, printer • Ring RBAG700, printer
Other equipment	• Litmus paper, measures pH of liquids – valuable in osmosis detection • Current clamp Trotec BE44, measuring both AC and DC current flow • Environmental Thermo-hygrometer Trotec BT21 • Digital multimeter fitted with Ag/AgCl probe for galvanic current evaluation

	• Extech EC170 salinity gauge permit to tell fresh from salt or brackish water in bilges, when taste is not advisable • UNI-T UT12D Voltage Detector allows to detect AC voltage in electrical wiring

Table 1.2

1.3 Attending to the inspections

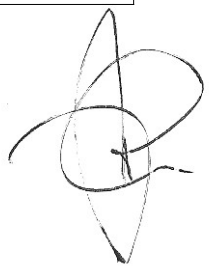
The following people have attended to the survey operations:

1) Yacht Surveyor Massimiliano Panessa, undersigned
2) Mr. XXX, as a perspective buyer
3) Mr. XXX, as broker
4)

1.4 Definitions

Along the report the following terms could be used:

Term	Referred to the craft	Referred to components
EXCELLENT, VERY GOOD	The craft is new or like new, with relevant renewals and replacements of material	The component is new or like new
GOOD	The craft has been maintained in accordance with the rules of good owner; ordinary maintenance is to be considered.	The component has been maintained in accordance with the rules of good owner; ordinary maintenance is to be considered.
FAIR	The craft is presented in the worst conditions of what one should expect from a boat of her age, in addition to routine maintenance, more substantial work is needed.	The component is presented in the worst conditions of what one should expect from a boat of her age, in addition to routine maintenance, more substantial work is needed.
POOR	The craft needs urgent and important works, both cosmetic and structural, is in precarious conditions and can not take the sea	The component needs urgent and important works, both cosmetic and structural, is in precarious conditions and can not take the sea. It is likely to be replaced
BAD, VERY BAD	The craft is devoid of any value; cannot be considered usable as a nautical device	The component is devoid of any value, and it is not usable



Term	Referred to the craft	Referred to components
NEGATIVE FINDINGS	Referred to Thermal Imaging: absence of an exception or a thermal pattern that can be explained by artifacts from construction details or environmental conditions such as shadows and reflections. Referred to any other inspection: absence of an exception.	

Table 1.3

The surveyed craft could be graded with an evaluation according to surveyor's experience. Such evaluation is expressed in hundredths, and could be considered as follows (ref. Table 1.3):

- 96 to 100: Excellent
- 86 to 95: Good
- 71 to 85: Fair
- 51 to 70: Poor
- Up to 50: Very bad

In green the recommendation in order to keep the craft in good state of use

In red the works to be considered essential for safety purpose, and so that the craft complies to regulations in force.

Eventual suggestions should not be considered compulsory nor recommended, but are given to the customer in order to consider further improvements to the craft. Such suggestions are reported in blue.

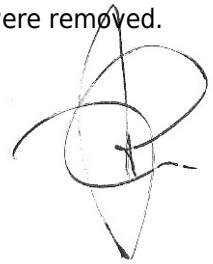
1.5 Reference standards

RINA rules for pleasure craft construction (before CE-RCD)
EU – Recreational Craft Directive (relevant harmonised standards)
ISO 10824 – Infrared Thermography
Standard for Infrared Inspection of Recreational Yachts & Small Craft Constructed of Fiberglass Reinforced Plastic and Composite Materials – Infraspection Institute
IEC EN 60947 – Low voltage equipment
ABYC Standard E-2 - Cathodic Protection
Italian pleasure navigation code and relevant actuation rules

Table 1.4

1.6 Disclaimer

Only those items specifically discussed in this report were actually examined. Very limited access was available to the hull internal surfaces and the bilges. No fixed linings were removed.



During the haul out, the vessel was supported by metal cradle giving good access to the outer hull except for the bearing points.

I have not inspected woodwork, metalwork, GRP or other parts of the structure which are unexposed, covered, or inaccessible and are consequently unable to report that any such part of the structure, including the hull exterior where coating remains, is free from defect.

The report, therefore, implies no guarantee or safeguard against latent defects, subsequent defects or defects not discovered at the time of survey in such areas of the vessel which were not accessible to the surveyor, externally due to the presence of coatings, or internally due to the presence of such coatings or to the installation of linings, panels and internal structures which are not readily removable. This reservation also applies to reporting of structural condition in way of lockers which are not accessible or found to contain stores, equipment or other gear which prevent ready access.

No machinery was operated (except as stated) or opened up for inspection and nothing in this report should be taken or is implied to indicate the condition of internal mechanical or electrical components. It is recommended that an engineer's and/or electrician's report is obtained in respect of such items, if necessary, following operating trials.

No samples of the vessel’s insulation were removed and sent to a laboratory for testing. For those yachts that have been built before Asbestos was banned, it is strongly recommended to get the vessel insulation tested in order to confirm that no such material has been used.

The information contained in this report, concerning sizes, ratings, capacities, speeds, etc, was ascertained from maker's plates, logs, documents, plans and certificates on board together with statements of the Owner's representative.

None of the information was ascertained by measurement or calculation and,although all the information contained is believed to be correct, the accuracy thereof is in no way guaranteed.

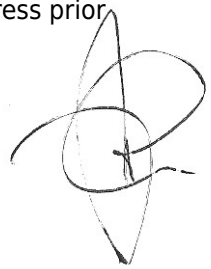
Further, no determination of stability characteristics or inherent structural integrity has been made and no opinion is expressed with respect thereto.

This report carries no warranty regarding ownership or any warranty regarding outstanding mortgage, charge or other debt there may be on the vessel.

Whilst all due care and diligence has been exercised in the collection of data for, and of the preparation of this report, the surveyor purports to provide an advisory service only, based on the opinion and experience of the individual consultant responsible for its compilation. The surveyor issues such advice in good faith and without prejudice nor guarantee. Anyone wishing to rely on such opinion should first satisfy themselves as to its accuracy and feasibility. The surveyor shall not be liable for any loss (including indirect and consequential loss), damage, delay, loss of market, costs, expenses of whatsoever nature or kind and however sustained or occasioned.

This report has been prepared specifically for the addressed customer and is for his use only.

1.7 Copyrights



2. Craft description

2.1 Technical specifications

Vessel's specification are taken from ship's papers; no measurement was actually made during the survey.

Name:		
Builder:		
Model:		
Year built:		
Year of registration:		
Flag:		
Registration number:		
Registration office:		
Hull length (Lh):	m	
Hull beam (Bh):	m	
Hull Depth (Ds):	m	
Displacement (mLDC):	t	
Design category:		
Transportable persons:		
Maximum load:	kg	
Sail surface:	m^2	nr of masts:
HIN/CIN/WIN:		
Engine(s):		
Type and fuel:		
Power:	@3000 RPM	
Serial number:		
Shipowner:		
Disponent owner:		

Table 2.1

2.2 Documents sighted

Document	Number, date, expiration	
a) Registration License		☐Original ☐Copy ☐Not sighted
b) Safety Certificate		☐Original ☐Copy ☐Not sighted
c) Radio License		☐Original ☐Copy ☐Not sighted
d) Owner's handbook		☐Original ☐Copy ☐Not sighted

Table 2.2

2.3 Construction

a) Hull	This glass reinforced plastic hull moulding incorporated a round chine, straight raked bow and a transom stern. Topsides are sandwiched, with Termanto core. An external cast iron ballast keel was fitted to the centreline of the moulding. Isophthalic polyester resin is used for moulding, with vinylester skin coat and neopentyl gelcoat. The precise layup of the mouldings was not ascertained. The balanced spade rudder is fibreglass made as two clam shell mouldings over the stainless steel stock with welded tangs extending inside the blade.
b) Deck	The deck is of composite construction, mainly sandwiched with end grain balsa core, incorporating the cockpit, coach roof and side deck area, with teak layer on deck and cockpit
c) Mast(s) and spars	Deck stepped, anodised aluminium

Table 2.3

2.4 Identification

The craft has been identified by her CIN (Craft Identification Number) as defined per ISO10087, clearly embossed on starboard quarter; Builder’s plate (ISO14845) is riveted inside the cockpit, starboard side, near the helm.

Engine serial number is marked on a self-adhesive label on engine top, as well as on a metal plate riveted on engine block, starboard side.

a) *CIN*	b) *Builder’s Plate*
c) *Engine S/N*	d)

2.5 Survey conditions

The conditions on the day the survey was conducted on were good. The conditions when readings were take were as follows.

- Air Temperature: XX°C
- Hull Surface Temperature: XX°C
- Relative Humidity: XX%
- Dew Point: XX°C
- Wind: NE 4 on Beaufort scale

The vessel was inspected ashore supported by a boat cradle with six iron posts /eighteen wooden stands/ and one keel block. Prior to commencing the survey, the cradle /all of the stands/ was checked and found to be secure. Access was generally good except in way of the shores.

The mast was stepped in place with the standing and running rigging attached.

The sails were not laid out for inspection.

The engine, tanks, rudder, stern gear, and all normally installed equipment were in place. This restricted access to the internal surfaces of the hull and deck thereby preventing detailed examination in these areas.

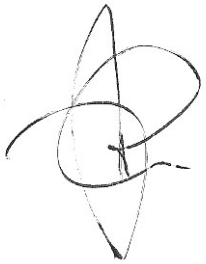
The rudder was inspected in situ and not un-shipped. Areas hidden from view cannot be commented upon.

The electrical system was examined visually without in depth or specialised testing and by switch testing only. The electronic equipment was tested, but not fully assessed.

The tanks and pipe work were examined visually only. No opening up was carried out and the tanks were not fill tested, pressure tested or tested for contamination.

Seacocks were not removed and no hose testing except heave test was carried out.

The following was covered within the scope of this survey and any areas or items not specifically mentioned were not examined. Any equipment tests are superficial and restricted to the limitations of the general survey on the day. The vessel and her equipment have not been checked for faulty elements of design or compliance with any rules or statutory regulations.



3. Survey findings

3.1 Underwater body and appendages

a)	Antifouling	The vessel has been presented with a navy blue 1-year-old antifouling coating, reportedly International Micron, that presents itself in fair condition, locally flaking; should be restored before next season RECOMMENDED: Restore antifouling coating before next season.
b)	Visual inspection	The hull below waterline was sighted from a distance along the port and starboard sides of the canoe body and seen to be fair. There were no undue distortions, indications of repair or areas of concern visible. No damages were noted at a visual inspection. I inspected the entire hull without finding any osmotic blistering. I removed four patches of antifouling, exposing underneath gel coat, found in good condition.
c)	Tap test	I carefully sounded the hull with a wooden hammer and a spike handle at closely spaced intervals to test the external surface of the laminate for voids, degradation and areas of inconsistency. I noted that all soundings were consistent throughout the hull below waterline area and no indications of concern were detected during this test. From what could be ascertained, the external surface of the hull moulding was in satisfactory structural condition.
d)	Moisture test	Performed all over the hull, reported readings generally under the instrument alarm threshold
e)	Keel-hull join	There is no clearance between the keel and the hull. The bedding compound was seen to be in satisfactory order. There were no visible indications of concern in way of the keel connection. The keel is fastened by eight 40mm, and two 30mm diameter stainless steel studs secured by mild steel full nuts and U shaped plates. These are spanned either side of moulded transverse keel floors which are inverted heavy walled U sections of GRP laminated to the hull bottom. The stainless steel backing plates are set on bonding paste which is over the original gel coat. There is some light surface oxidisation to the nuts and plates which is a trivial defect and does not affect the integrity of the structure at the present degree. The rust can be originated by bilge backwater or leaks through the bolts, so I recommend to remove the rust and check the bolts periodically for rust reform. RECOMMENDED: Remove keel bolts rust and periodically check for oxidisation reform.
f)	Keel	The external cast iron ballast keel was in serviceable condition, showing no visible indications of damage caused by grounding. A limited visual inspection of the surface of the bottom of the keel found it to be fair with no indication of groundings noted. The coatings were in average condition and adequately adhered to the casting. There were some localised areas of coating displacement, where corrosion was visible and

considered to be a cosmetic defect.

g) Rudder

The rudder and steering mechanism were visually inspected, hammer sounded and moisture readings taken. No areas of delamination were detected to the rudder, and moisture levels were higher than those of the under water hull, however, still at an acceptable level. This is not unusual as it is almost impossible to prevent some moisture absorption into the foam at the immersed bond between the stock and the GRP blade. These figures are not excessive and do not represent a significant defect. There was no sign of the bonded joint between the two clam shells starting to show or open up.

The rudder was physically tested to port and starboard under the weight of the surveyor and did not yield. No significant horizontal or lateral movement was noted in the rudder.

A nylon bushing cap which sits around the top of the outer rudder stock and fixes to the underside of the hull was noted to be no longer affixed.

The stainless steel rudder stock turns in acetal bearings within a short rudder tube moulded into the hull bottom. The gaiter between the rudder tube and stock was noted to be severely perished with a number of holes noted in the gaiter.

Rudder stock fastenings to the quadrant were visually inspected and hammer sounded and found to be secure.

Steering chains were visually inspected where accessible and found to be secure with no slack nor signs of significant wear noted to the chains and cables.

The rudder stock terminates in a milled profile which engages in a fitting for an emergency tiller. The stock is accessed through a small hatch under the lifting helm seat. The emergency tiller is a galvanised steel handle stowed in the port cockpit locker. The emergency steering was not be tested in service but appeared to be in good functional order.

Over deflection of the rudder was prevented by substantial rubber stops, which were fitted to the port and starboard side of the quadrant.

The chain to the auto pilot drive was noted to be significantly slack.

RECOMMENDED: Fix or replace the nylon bushing cap around the top of the outer rudder stock.

REQUIRED: Replace the gaiter between the rudder tube and stock

h) Propeller shaft

The 35 mm diameter stainless steel shaft is in serviceable condition where visible, showing no corrosion.

i) P-bracket

The shaft is supported by a non ferrous P-bracket. The P-bracket was cleaned in sample areas and found to be in serviceable condition and secure to the hull moulding. Removing sample areas of antifouling compound to the port and starboard sides of the P-bracket connection did not reveal any indications of fracturing or movement. Loading the base of the P-bracket and heaving transversely did not reveal any indications of defect. Internally, the P-bracket was supported by an adequate glass fibre up stand and knee reinforcement, which had been filled with a resin based compound.

j) Cutlass bearing

The shaft runs through a rubber cutlass bearing, which appears to be in good condition; the clearance measured is 0,mm (maximum acceptable

clearance for a mm shaft: 0,mm)

k) Propeller

There was a three bladed golden metal folding propeller. This was visually inspected and hammer tested and found to ring true. The blades had not been cleaned back to a golden metal finish.

No excess movement in the three blades was found with all three blades moving readily.

Blades were lightly hammered and scraped and no signs of dezincification, corrosion or cavitation noted.

l) Sail drive

A Yanmar SD20 sail drive unit is installed. Gear ratio is 2,64:1 (ahead-astern). It is coated with antifouling, locally removed to inspect the aluminium surface, that was in good condition, without oxidisation or corrosion. Vertical upward pressure was applied to the stern leg to check for movement. None was found. Rope cutter fitted and in good condition. The rectangular rubber fairing piece that sits around the leg along the exterior of the hull is intact and secure. The gearbox oil was checked (though not analysed) and found clear, without traces of emulsion.

The saildrive diaphragm is in satisfactory visual condition where accessible. The manufacturer recommend this is changed every 6 years, and it would be prudent to obtain any paperwork to that effect. Some corrosion noted on the steel flange that holds the seal in place. The area should be cleaned off and protected with an appropriate paint covering.

REQUIRED: Obtain any documentation of last saildrive diaphragm seal ring replacement; lacking this, replace the diaphragm.

m) Cathodic protection

Affixed to the shaft ahead of the P bracket is a clamp type shaft anode which is slightly eroded. There is no hull anode or bonding system so this anode is the only cathodic protection for the stern gear and should be replaced.

RECOMMENDED: Replace zinc anodes.

n) Bow-thruster

A Max Power CT100 bow-thruster was securely fitted inside the glass fibre tunnel at the bow. The dual propellers were secured to the bow-thruster drive and found to be in satisfactory order. The internal connection of the bow-thruster tunnel was tested with a surveyor's hammer and found to be secure to the hull moulding.

The bow-thruster motor could be operated by a control fitted adjacent to the port helm position. This was switch tested and found to be operational. The bow-thruster motor was seen to be in satisfactory external order; however, the compartment was covered with metallic dust. It is presumed that this has been distributed from the workings of the motor, as there is no other machinery in the compartment. This could have been from excessive use of the bow-thruster, as the battery posts were also seen to have been overloaded. The bow-thruster should therefore be fully inspected and a further report obtained from a Max Power authorised service to confirm the mechanical condition and the longevity of the installation.

RECOMMENDED: Have a Max Power authorised service inspect the bow thruster, and follow their directions.

o) Skin fittings

No skin fittings or valves were dismantled as part of this survey but the

and seacocks

following routine tests were carried out:

- Examination from outside and inside the boat.
- All thru-hull fittings scraped back to examine their colour for visual dezincification (where zinc has leached out leaving a weak copper structure).
- All valves open and closed to their full extent where possible.
- Any fixing bolts hammer tested where accessible.
- Bodies of the valves or seacocks tested with a hammer inside the boat and external parts hammer tested outside the boat.
- Fittings aggressively tested inside the boat for security in the hull.
- Hose clips inspected and hoses aggressively tested for security.
- All hoses and inboard fittings checked for condition and security where accessible.

Whilst these checks have been carried out, it is not possible to guarantee complete water tightness to these items and upon launching they should be checked for any seepage in accordance with good boatyard practice.

Below waterline:

(1) Heads inlet: Yellow metal thru-hull fitting with strainer and ball valve. This is seized and in very poor condition. Owner advised he didn't know it was there, and never closed it. It should be replaced. Hoseclips are corroded and should be replaced at the same time. Access under companionway steps.

(2) Heads discharge: Yellow metal thru-hull fitting with ball valve, this too is seized. Similar to the inlet, this should be replaced. Hoseclips are corroded and should be replaced at the same time. Access under companionway steps. Heads discharge under saloon sole

(3) Heads Basin outlet: Yellow metal thru-hull fitting with ball valve in working order and in satisfactory condition. Access in cupboard in heads compartment.

(4) Shower outlet: Yellow metal thru-hull fitting with ball valve in working order and in good condition. Access in cupboard in heads compartment.

(5) Galley sink outlet: Yellow metal thru-hull fitting with ball valve. This seized and in poor condition. Access is limited and another seacock that the owner claims he never turned off. The pad onto which the valve is mounted is disintegrating, and is believed to have electrochemical decay possibly from a disconnected bonding wire lying nearby. Both the valve and the pad should be replaced. There is much divided opinion on Cathodic protection and the latest view is to leave seacocks out of the bonded circuit. (You may find useful this Sail Magazine article, or other similar). Hoseclips are corroded and should be replaced at the same time. Access in cupboard under sink on the starboard side of the fridge unit.

(6) Fridge intake for water cooled fridge compressor: Valve located in the single cabin, the ball valve is very stiff and should be serviced or replaced. Fitting on aft port quarter: There is another fitting seen close to the waterline here externally. It was not possible to identify this internally and access should be obtained to examine the fitting.

(7) Log impeller Housing and -

(8) Echo sounder transducer secure. Access under saloon sole forward of companionway steps.

(9) Cockpit Drains: As detailed in cockpit section

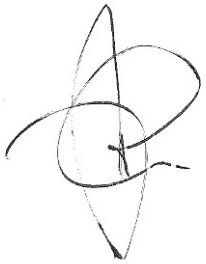
(10) Saildrive engine intake: Ball valve in good condition

Above the waterline:

(11) Bilge pump: Exits via a nylon thru-hull fitting well above sea level and secure.

(12) Eberspächer: Stainless steel fitting secure and in good condition.

(13) Engine Exhaust: Stainless steel fitting in good condition and secure



The skin fittings/valves/tailpipes on this vessel are all yellow metal (except log and transducer) but the actual materials could not be identified. Their condition should be monitored and valves operated frequently. If any deterioration, corrosion or leakage is noted the fitting should be replaced.

a)

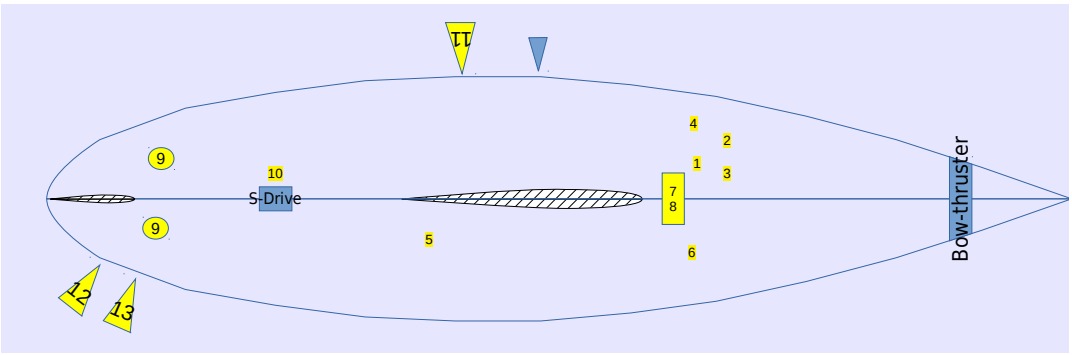


Diagram 3.1.a - Skin fittings identification

3.2 Topsides, deck and superstructure

a) Topsides

The topsides are constructed of sandwiched GRP laminate with white coloured gel coat finish. There is a double black boot top stripe with a vinyl tape. This tape has been recently applied to cover some abrasions beneath which show in the surface. It is also slightly damaged in a few places. There is a single cove line stripe in black vinyl with the vessels name as a vinyl graphic on the quarters.

The hull is fair with some distinct distortion visible from the bonded in internal structures such as the chain plate ring frame. These are not unusual and are not defects. They are due to the hull being de-moulded before the resins are fully cured. There is negligible damage evident with some scuffs at the stem and on the fendering around the transom edge.

There are witness marks of a past repair to the stem. Either side there is a slight shadowing where new gel coat has been blended into the old. The inside of the stem cannot be accessed as the anchor locker is a separate moulding as part of the deck mould. There are some small bonded grommets to allow access to the forestay chainplate fasteners.

The forward part of the anchor locker moulding is finished in a brush painted gelcoat. This suggests that the moulding has been re-worked, possibly with a section removed to give access inside the stem in order to inspect or to carry out repair. The anchor locker moulding is not a highly visible area so the gel coats have not been faired and polished back to an original finish.

Structural repairs to GRP are perfectly capable of re-instating original structure and strength provided they are repaired from both sides. The removal of the anchor locker moulding would appear to demonstrate that the repair has been carried out to a good structural and cosmetic standard.

I also carried out a thorough infrared inspection on topsides, reporting negative findings.

b) Hull to deck joint

The hull to deck seam is achieved by the hull moulding having a moulded inward facing flange. The deck moulding is then landed onto this flange with sealant and through fastened by the screws which secure the toe rail in place. The external joint is covered by the extruded aluminium toe rail.

This joint is visible in anchor locker and aft peak. The joint has not been laminated over internally but examination did not reveal any signs of movement or leakage in the seam where it was visible.

The seam is carried then round the lower edge of the transom where it is capped by a rigid PVC extrusion. This was sound but abraded at the edges as is usually seen in this relatively soft material.

It is evident that the deck was fully assembled with all the deck furniture fitted before the deck was installed. The hull flange has had rebates cut out to provide clearance for the fastenings for the mooring cleats etc. The only mechanical fastenings through the seam are the screws for the toe rail and the bolts for the stanchions.

This is a common practise among volume boat manufacturers where the deck and hull are manufactured on separate production lines and are joined in the final assembly process. By this method there is no access for subsequent fastening or bonding as the joint is hidden behind already installed joinery.

This method of assembly is adequate in normal use, and has been proven so by the thousands of boats manufactured worldwide by this method. It is however vulnerable should the joint receive a substantial impact and if such should happen it is important that the damage is thoroughly examined internally for splitting, opening up or leakage. This may necessitate the removal of internal joinery.

The aluminium toe rail is stressed as it is pulled round the curve of the hull. It is not continuous as there is a break where the midships fairleads are fitted. The stress has allowed the toe rail to spring away slightly at the fairlead. This is most marked at the port side forward although it does not appear to have an effect on the secure bonding of the joint.

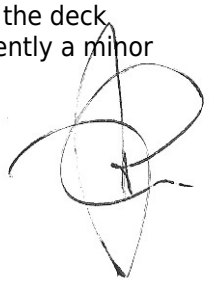
c) Deck

The deck is constructed from solid and end grain balsa cored GRP laminates. The deck is moulded with a pyramidal non-slip texture which is in good condition and little sign of chipping of the raised profile. The deck laminate was moisture tested and was sounded by pin hammer where possible.

Readings of 50 to 100 were recorded over the majority of the deck with slight elevation to around some deck fittings. Particular attention was paid to areas where the chain plates were bolted through the deck. The higher density and multiple glue lines of plywood packing, used where there are compressive fasteners, will cause the slightly higher readings around deck fittings.

There was one area of even higher readings, over 120, in the port side deck alongside the genoa tracks. This is often seen as a consequence of stress loadings causing the fitting to spring its fastenings enough to allow some moisture to enter the core.

The deck at this point was hammer sounded and seen to be well bonded to the core. The readings did not suggest saturation of the core and therefore unlikely to suffer decomposition and de-bonding of the deck skins. It is not practical to do any rectification to what is currently a minor



defect.

At the bows there is a large anchor locker which has a hinging GRP lid with a cut out to allow for the installation of an anchor windlass, detailed in dedicated chapter. The deck also has a trough for an anchor shank when stowed on the stemhead. The anchor locker drains through a skin fitting in the starboard topside. All was in good order although there is some chipping to the gel coat surrounding.

d) Teak layer

Teak laid decking fitted in way of the cockpit sole, deck lockers, seats and aft platform was found to have suffered normal wear and tear. Sounding the external surface of the timber revealed no apparent defects or voids. From what could be ascertained, the timber was adequately bonded to the structure. The caulking was in reasonable condition and flush to the surface.

The teak laid decking bonded to the side decks has suffered normal wear and tear, albeit, the surface was slightly grained. Further to sounding the external surface of the teak with a surveyor's hammer, it was generally found to be secure; however, one margin plank was found to be lifting to the starboard side of the cockpit. The caulking compound was found to be serviceable; however, isolated areas of deterioration were visible and the caulking was standing proud as a result of excessive scrubbing of the side deck teak.

A hinged teak grating was fitted in way of the aft cockpit recess. This was found to be secure and in serviceable order; albeit, there were several splits in the timber.

e) Cockpit

The cockpit was visually inspected and hammer sounded. The cockpit was of moulded GRP and integral with the decks and cabin moulding. The cockpit gave way to the main accommodation companionway.

The cockpit sole was found to be firm under the weight of the surveyor.

There were no signs of crazing or other damage, with moisture meter readings satisfactory.

Cockpit drainage was by means of the open transom and two cockpit drains on either side of the aft cockpit which spilled out via the tender housing below.

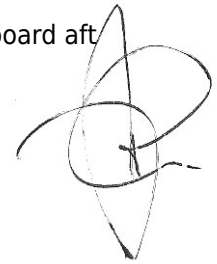
The two GRP wheel pedestals were bolted to the cockpit mould with stainless steal grab rails built around which were found securely affixed.

There are two lockers within the cockpit seating. The lockers are shallow as they are above the aft cabins and provide for general stowage of warps and fenders. The port hand locker also contains the emergency tiller as detailed later.

The lids to all these lockers are hinged and are without stays. Lanyards with plastic hooks are provided to secure them open. The lids are secure and the lanyard system works satisfactorily. The hatch latches are piston latches which engage into hasps. The latches are prone to damage when slammed shut and spares are available from larger chandlers.

Abaft the helm is a helmsman's seat which is a separate moulding which lifts up and down to allow access to the boarding steps aft. This moulding is not hinged or tethered and is liable to get lost overboard. Under the seat is access to the top of the rudder stock and provision for fitting the emergency steering tiller.

The steering system is accessed through the full depth starboard aft



cockpit locker. This also provides access to the heater and the shore power input socket and consumer unit. The port aft cockpit locker is dedicated to the gas bottle storage. All these services are detailed elsewhere.

A blue acrylic bimini was securely fitted on a stainless steel frame and inspected in the open position. The bimini was in good general order, save for minor areas of stitching failure, which require repair. The external stitching was inspected in random areas and found to be sound.

The blue acrylic spray hood has suffered above average wear and tear. There was a deformation of the stainless steel tube to port. The webbing straps were worn and the clear panels opaque. The external stitching was found to be in satisfactory order where tested at random.

f) Chainplates

Mast shrouds are pinned to chainplates which are fastened through the deck to plates in the deckhead which have tie rods attached. These tie rods transfer the rigging loads to stainless steel brackets bolted through an integral hull ring frame. These appear well seated and the anchor points in the hull are well constructed and free of movement. There is no evidence of leakage through the deck plates to the accommodation.

There are no corrosion tracking stains on the below decks structure which is visible through the joinery. Any evidence of significant hidden corrosion in load bearing stainless steel components must be investigated as a potential for failure through corrosion stress fracturing.

Forestay chainplate is a 10mm thick stainless steel strap fastened through the stem. This is well secured by four through bolts and free of evident movement externally. Inspection internally via the chain locker found the fixings to be secure with backing washers and nuts securely in place.

The split backstay was attached through stainless steel plates which were securely fastened to port and starboard side of the transom, where no movement was visible.

g) Hatches & Companionways

The companionway is closed by a sliding hatch and a washboard. The hatch is in 10mm flat sheet of smokey acrylic with a bonded teak hardwood flange at the after edge as a hand rail. This is in good condition and the acrylic is unweathered and the hatch slides easily. The washboard is also a single large flat sheet of acrylic and locates under the hatch flange at the top and closes with a sash lock which engages into a slot in the sliding hatch. This is all in good condition and is well fitting and secure. This is probably not original as it does not have ventilation slots, which I suggest to fit.

On top of the coachroof, forward of the mast is a square aluminium framed hatch manufactured by Gebo. This hatch is hinged on the forward edge. This is ideal as it prevents a breaking wave from flooding the forepeak if the hatch is not fully closed. There is also a possibility of the hatch being carried away in a storm. This hatch would have been reversed from its original position to comply with the SCV code of practice. This forward hatch provides light and ventilation to the forepeak and appears to be fairly watertight with no signs of leaks or water tracking. The upholstery beneath was dry to the touch despite recent rain. The acrylic is good with only a little crazing evident that would not make it unsafe to walk on. The hatch should be kept closed at sea.

Aft of the mast is a similar hatch also by Gebo, which is also hinged at

the forward edge although this hatch is not in as vulnerable a position. This is in similar good condition with no signs of leakage as the saloon table beneath is relatively unmarked.

Both hatches have roller blinds installed in the frames beneath which are in good working condition. Both hatches also have Göiot ventilator installed in the acrylic panel. This kind of ventilator can leak if installed significantly inclined from the horizontal, but the forward one, although inclined, appears to be watertight.

The forward hatch is considered to be usable as an emergency escape hatch as there is also a firm foothold in the bunk base beneath. These hatches have a central lock and vent lever. They should not be locked when at sea as it is also a requirement that they can be opened from outside in an emergency.

SUGGESTED: Fit ventilation slots on companionway washboard.

h) Ports and windows

Fixed aluminium framed acrylic windows (Lewmar) in saloon and opening ones in the single cabin and aft cabin. The 2 middle fixed windows in the saloon are much UV degraded and it would be prudent to budget for a renewal in the next 12 months. The rest are in serviceable condition.

No signs of water or tracking stains on the inside.

There are Mosquito net panels for all opening ports. These are stored away and appear to be in unused condition.

i) Deck gear and fittings

A pair of aluminium T bar sheet tracks by Harken is mounted on the outside edge of the coachroof. Each carries a stand up sheet block with an alloy sheave for sheeting the genoa. These blocks slide on cars and are limited in their aft movement by a four part purchase led back to the cockpit for adjustment.

The cars slide well and are in good functional condition. There are no grooves starting in the rollers. When grooves form the sheaves cease to rotate and the resulting friction on the sheet will damage and weaken the rope. The cars and sheaves are in good working condition.

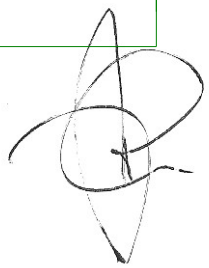
A second pair of tracks for number 3 or 4, or a storm jib is mounted on the coachroof inside the shrouds. Each would carry a stand up sheet block with a plastic sheave set on cars which are limited in their movement by spring loaded pins. The car for the port track is missing and also is its end stop. The car on the starboard track has a broken stop pin. These should be repaired so that the storm jib can be sheeted.

A pair of cast alloy mooring cleats is mounted on the deck either side at the bows. There is a second pair on the aft quarters. All are well secured and in good condition. There are fairleads associated with them on the ends of the toe rails. There are also two pairs of fairleads set into the toe rails amidships but no corresponding cleats. All the cast alloy deck fittings are anodised.

The fabricated stainless steel stemhead fitting incorporates a single bow roller which is profiled for warp. This is set on the starboard side of the forestay chainplate.

RECOMMENDED: Replace the car and the end stop for the port jibsheet track.

Fix or replace the car on starboard jibsheet track.



j) Guard and Grab Rails

The vessel is equipped with a tubular stainless steel pulpit and twin pushpits 25mm in diameter and 60cm high. Tensioned between thee are ∅4mm 1 x 19 plastic coated upper and lower stainless steel guardwires with roll swaged end fittings and rigging screws for tensioning. The guardwires are continuous. Pulpit and pushpits are in good condition although slightly dented in places, and are well secured into the deck.

The guardwires are in reasonable condition with only a little corrosion staining where the wire emerges from the coating at the ends by the terminations. The plastic coating can accelerate anaerobic corrosion in stainless steel and it is recommended to routinely replace guardwires after 10 years. The wires are not fully tensioned, but there is good scope for further tensioning in the rigging screws.

There are four stainless steel stanchions ∅25mm each side socketed into cast aluminium stanchion bases bolted through the deck and toe rail. There is some movement between the stanchions and the bases and the bases flex slightly in the deck, but they are well seated and secure.

There are no webbing jackstays seen fitted to the side decks, but there are folding pad eyes for their fitment. There are four harness strongpoints fitted to the cockpit sole and there is a pair within easy reach of the companionway for crew to clip on before exiting the accommodation.

On the coachroof top there is a pair of stout teak handrails fitted to moulded projections on the coachroof. These are sound and in good secure condition. There is a stout handrail along the rear and side edges of the spray hood and a handrail loop in the cockpit over the steering binnacle.

k) Winches

The following winches were visually inspected and tested via two winch handles, which were stowed in pockets in the cockpit:

WINCH	LOCATION	PURPOSE	CONDITION
2 x Lewmar 50ST	Coaming	Genoa sheets	Serviceable
Lewmar 40SR	Coachroof starboard	Halyards	Serviceable
Lewmar 30ST	Coachroof port	Halyards	Serviceable

l) Anchor

Bow anchor: Delta 25kg secured to 10mm galvanised chain via a stainless steel swivel. The inboard end of the chain was secured to the vessel with a short lanyard. An adequate retainer was fitted to secure the anchor on the stem head fitting. There was some damage to the galvanising of the anchor as a result of contact with the stem head fitting and isolated areas of corrosion in way of the chain links connected to the swivel.

For a full inspection of the anchor and chain, it would have to be lowered and ranged.

Kedge anchor: A Bruce kedge anchor with chain and rope was found in the port side deck locker and seen to be in satisfactory order, albeit not specifically measured.

m) Windlass

Vertical Quick 12V with gipsy and drum, securely fitted in a recess right aft the anchor locker, in fair condition; there was a cable remote control and foot switches, and possibly manual operation through a dedicated winch handle. The windlass worked when tested but it was not tested

under load.

3.3 Mast(s) and rigging

a)	Mast	The mast is a silver anodised double spreader 9/10ths fractional rigged spar manufactured by Z Spars. The spreaders are moderately swept back at 22.5° and the rig is conventional with discontinuous cap and upper diagonal shrouds and lower diagonal shrouds pinned to common chainplates. There is a forestay and a single standing backstay with a bridle and 24:1 cascade tensioner. The spar is in good condition with the anodising almost unmarked over its length. The mast is keel stepped with an alloy mast partner casting and a rubber gaiter at the coachroof. Sighting up the mast, it was seen to be in column, and is well tensioned. There is no corrosion at the foot or around riveted stainless steel mast fittings where it might be expected.
b)	Mast step	Fixed cast aluminium, bolted to transverse floor. Where inspection was possible the mast was noted firmly attached to the shoe with no signs of movement not corrosion noted, albeit the heel of mast cannot be thoroughly inspected without unstepping the mast.
c)	Mast partner	Cast alloy mast partner with a rubber gaiter, in serviceable condition. The mast is located at the partner casting by wedges and the casting carries 8 blocks for halyards and reefing lines, which were sound and in good condition. The past partner casting is braced beneath the coachroof by twin short struts and rigging screws into the mast wall. These were sound and well tensioned.
d)	Shrouds	The lower cap shrouds are in 1x19 ∅8mm stainless wire and the upper cap, upper diagonal and lower diagonals are all in 1x19 ∅7mm stainless wire. All the shrouds at deck level have fork ended open bodied chromium plated bronze rigging screws. All were seen to be in good physical condition and all are seized with split pins. The upper fittings are stemball swaged terminations which engage is pressed stainless steel cups in slots in the mast wall. This is a good arrangement as it ensures perfect alignment of the swages to the line of load. It is understood that the standing rigging was never replaced. Roll swaged terminals were examined at deck level for signs of broken strands, evidence of corrosion and signs that the wire is drawing out of the swage. All were seen to be in good, sound and corrosion free condition.
e)	Backstay(s)	The single backstay is 1x19 stainless wire rope, diameter could not be measured due to the height; lower bridle is made of 7x19 stainless steel wire working through a metal block, visible at a distance. Rope cascade tensioner is in serviceable condition.
f)	Forestay	Not visible, as totally encapsulated inside genoa furler.
g)	Spreaders	The spreaders are mounted on cast alloy roots which are passed through the mast. These were well seated and secure when vigorously swigged.
h)	Boom & gooseneck	The silver anodised aluminium boom was securely fitted to the gooseneck. Along the boom there were no visible distortions or areas of concern. In general, the boom was found to be in serviceable condition.

An inspection of the gooseneck revealed that there was some wear between the boom fitting and mast connection bracket. This is possibly due to a worn plastic spacer. The black anodised end fittings of the boom were found to be secure and in good order where visible. The sheaves were found to be free running. The boom was supported by an alloy vang, which was found to be serviceable and secure to the underside of the boom and mast base. The topping lift was secured with a shackle at the end of the boom. The stainless steel fittings on the underside of the boom were seen to be secure; however, slight indications of galvanic action was visible in way of the connections.

i)	Running rigging	Mainsheet is working through a purse with a 6:1 ratio, with blocks, traveller and sheet in serviceable condition. All of the running rigging is in double braid polyester. All the ends have been heat sealed with none being whipped or with mousing loops. Spinnaker halyard is worn, to be replaced; all the remainder of running rigging was in apparent serviceable condition but with some fade and discolouration.
j)	Downwind sails rigging	There is a spinnaker pole attached to the guardwires but it is useless without a mast fitting. The piston fitting at the forward end is seized Fitted at the bows there is a stainless steel sliding bowsprit, duly slide forth and back and found in serviceable condition.
k)	Mast fittings	The mast has an aluminium T track on the forward face for a spinnaker pole but there was no car fitted or endless hauling line; upwards, between first and second spreader, there are a 225° steaming light and a deck light, all in serviceable condition.
l)	Masthead equipment	Masthead was seen from a distance, and sports a VHF aerial, the 360° anchor light, an anemometer and the Windex, which were all seen to be secure from deck level.
m)	Electrical connections	The electrical wiring coming out from the mast go down below by a gooseneck thru-deck fitting; wiring are in fir condition, and the gooseneck is sound and well secured to the deck.

3.4 Sails

a)	Main	The mainsail is flaked onto the boom in a lazy-bag sail cover with a top zip and lazy jacks. The sail was seen to be a new looking, very clean and crisp white Dacron fabric. It is a cross cut sail by One Sails in a premium woven polyester and is made with three slab reefs and hoisted on sliders.
b)	Lazy bag	In serviceable condition
c)	Genoa	The genoa is a cross cut sail in a Dacron cloth by Elvstrom Sails with a blue UV sacrificial strip. This is could not be unfurled due to the strong wind but was seen to be of a quite faded and softened fabric. Also bagged below deck is a newer roller furling genoa by Quantum Sails. This is a white cross cut Dacron sail with a white UV strip and is in sound and substantial condition although it is quite stained and faded in the exposed sections when furled.
d)	Furler	The Furlex roller furling equipment was tested as far as practical and

found generally in good working order. The drum was examined and no defects were seen in either the bearings or in the rigging screw attachment.

The aluminium alloy luff extrusion appeared to be straight and with no kinks.

e) Other sails

A spinnaker was packed in its snuffer bag. The white & light green nylon cloth was free of tears or wear. The sail has had very light use. The was some very minor mildew staining on the white cloth.

A blue, turquoise and yellow gennaker was stowed inside the mainsail bag. The Rotofurl furling drum and attached tackle was in very good condition. The nylon cloth and no evidence of significant wear. The cloth and stitching was free of mildew or other staining.

A storm jib was found in a bag in the aft port locker. I was unable to remove the bag from the locker and the drawstrings were tightly knotted preventing an inspection.

3.5 Engine, engine room and fuel system

a) Engine

On board was fitted a Yanmar 2GM20F, two cylinder diesel engine, with fresh water cooling, driving through a reduction gearbox. Engine control was via a single lever, giving forward and reverse gears and throttle control, mounted next to the helm on the port side of the helm binnacle.

There was no evidence of engine overheating. The paint coating was in very good condition, but with some minor corrosion and peeling.

The exhaust elbow was inspected and found to be in good order and free of corrosion or cracking on its outer surface. There was no evidence of recent leakage, but rust deposits around the exhaust manifold indicated that the joint or elbow has leaked in the past, allowing sea water to drip over the diesel lift pump. When the engine is next run under load and at full working temperature, the elbow should be inspected for any coolant leakage.

The engine oil was at the correct level, free of water ingress but very dirty. The engine oil should be changed.

Each of the engine's two cylinders was fitted with a decompression lever. There was no provision for a starting handle, therefore the engine could not be turned over by hand in order to make an assessment of the compression in each cylinder.

The Kanzaki reduction drive gearbox was a model KM2P, serial number 38877. The gearbox oil was inspected and found to be clean, free of moisture and at the correct level.

The engine was briefly run, with coolant water being fed to the raw water intake via a water container that was continuously fed by a hose. Initially, the engine did not fire. The reason for this could not be determined, but it may be due to lack of fuel in the supply line or due to poor compression in the cylinders. Exhaust gases were clear and mostly free of soot.

Once the engine had been run for a few minutes, it was turned off. After one minute the engine was started again at tick over speed. The engine started immediately.

The engine could not be run under load and the cylinders were not compression tested, therefore no assessment could be made of the

engine's compression condition. The engine was not run long enough to assess the efficiency of the engine cooling system.

When under load no fuming was noted in the engine space.

Ahead and reverse gears could not be tested as the vessel was out of the water.

The alternator belt and impeller pump belt were loose. These should be adjusted.

The coolant hoses were connected to the impeller pump by mild steel screw clips. These were corroding. It is advisable that all fittings on the engine that use mild steel hose clips are secured with two hose clips made from marine grade stainless steel.

The engine stop pull handle was mounted next to the engine control panel. It operated with full and free movement.

Access to the engine's coolant impeller, alternator, raw water strainer, oil filter and oil dipstick were good. The cooling feed to the exhaust was suitably fitted with an ant-siphon attachment, with the head of the anti-siphon venting through a skin fitting on the transom, just beneath deck level. The anti-siphon loop was mounted inside the large cockpit locker. The supply & return hoses connected to the anti-siphon loop were cracked and degraded.

Engine exhaust and cooling water were discharged through a stainless steel muffler box and an armoured flexible hose, to a hull fitting on the stern, port side.

The engine needs servicing. All fluids and filters should be changed. The engine zinc anode should also be replaced.

b) Leaks

No leaks from the engine cooling water, fuel and exhaust systems were evident, except for a water leak in the side of the stainless steel muffler.

RECOMMENDED: Fix the water leak on muffler.

c) Engine mounts

The engine was secured to the internal pan moulding, which incorporated longitudinal glass fibre engine bearers which were seen to be sound. The Yanmar resilient mounts were inspected, tested with a metal hammer and found to be secure. The mounts were in reasonable order with no apparent defects, save for slight surface corrosion.

d) Instrument panel

In cockpit there is the engine instrument panel which included the rev meter, start key, engine pull-stop handle and lamps for alternator output, oil pressure and engine coolant temperature. The engine coolant temperature warning lamp could not be tested. All other lamps functioned, but the correct operation of the alternator output sensor and the oil pressure sensor could not be verified.

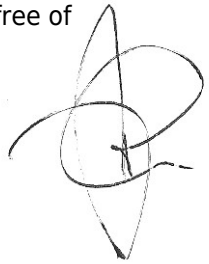
e) Hour meter

Inside rev meter; it reads XX running hours

f) Tanks

There was one welded stainless steel fuel tank mounted under the port aft cabin bunk. The visible parts of the fuel tank were clean and generally free of damage, but with minor corrosion around the welds.

The hose clips that secure the fuel filler pipe to the fuel tank and to the deck fitting were secure and free of corrosion. The hose fittings that secure the fuel return pipe to the fuel tank and engine were secure and free of corrosion. The fuel hoses were in good condition and free of damage or degradation.



The hose clips that secure the fuel feed hose to the fuel tank and filter were secure and free of corrosion. The fuel hose was in good condition and free of damage or degradation.

The fuel filler cap was located on the starboard side of the transom. The cap was suitably labelled. The plastic o-ring seal was in satisfactory condition and free of cracks. The short length of chain that secures the filler cap to the main body of the filler pipe was in good condition. The cap was duly grounded.

The paper cartridge and glass-bowl primary fuel filter was in good condition, with all connections free of corrosion. There was a small amount of dirt and water at the bottom of the glass bowl.

The emergency fuel shut-off valve was mounted in the side of the bunk of the port quarter berth. This gate valve was in good condition and functioned correctly.

A fuel tank shut-off ball valve was located on the forward end of the fuel tank and was accessed by reaching over the top of the engine.

Fuel level in the tank was measured by means of a clear plastic sighting tube, mounted on the forward face of the fuel tank. The sighting tube had a shut-off ball valve at its lower end. The tube, valve and end fittings were in good order.

g)	Insulation	The insulation material in the engine compartment was of black acoustic foam. This was seen to be secure and in good general order.
h)	Fire fighting system	There is an automatic operated 2kg ABC-powder bottle, in good cosmetic condition and the manometer indicating full charge.
i)	Fire port	Between the first and the second step of the companionway there is a adequately marked fire port; this is meant to introduce a fire extinguisher nozzle in case of fire.
j)	Genset	No genset is fitted on board.

3.6 Electrical system

3.6.i. DC System

a)	Voltage	12V
b)	Main switchboard	A main aluminium panel is fitted above chart table, with thermomagnetic switches and lights, working when tested. It is fitted with analog Volt and Ampere meters, all in serviceable condition
c)	Secondary switchboards	Not fitted
d)	Infrared inspection	Negative findings
e)	Batteries	• Domestic: two 120Ah AGM batteries, in good condition, located in enclosed cases and strapped to the floorboard under port aft cabin bunk. Engaged via a quarter-turn switch, located on vertical fore side of starboard aft cabin.

- Start: two 120Ah flooded batteries, in good condition, located in enclosed cases and strapped to the floorboard under starboard aft cabin bunk. Engaged via a quarter-turn switch, located on vertical fore side of starboard aft cabin.
- Bow-thruster: two 120Ah AGM batteries, in good condition, located in enclosed cases and strapped to the floorboard under forward cabin bunk. Engaged via a quarter-turn switch, located on vertical aft side of forward cabin.

f) Battery conductance test:

	Voltage	State of Health	Internal resistance	Directions
Cranking 1	V	%	mΩ	Good
Cranking 2	V	%	mΩ	Good
Domestic 1	V	-	mΩ	Good
Domestic 2	V	-	mΩ	Good
Domestic 3	V	-	mΩ	Good
Genset cranking	V	%	mΩ	Recharge

g) Infrared inspection — Negative findings

h) Battery charging — Batteries are charged via the engine alternator, wired to a diode type Quick DCS1083 charge separator; when shore power is connected, a 12V/ 40A Quick SBC 500FR, digital 3-step battery charger would recharge the batteries; all systems were tested and found working.

3.6.ii. AC System

a) Voltage — 220V

b) Residual current circuit breaker — Fitted and working (mechanical tested)

c) Main switchboard — DC main panel hosts an AC section as well, fitted with thermomagnetic switches and lights, working when tested. It is fitted with analog Volt and Ampere meters, al in serviceable condition

d) Infrared inspection — Negative findings

3.7 Plumbing system

a) Tank — There are two water tanks on board the vessel. The aft water tank is located under the port aft cabin bunk. This is a rotationally moulded PE tank and has a marked capacity of 190 litres. This tank is filled by a flush deck filler in the adjacent aft port side deck. Cold water is fed in nylon

reinforced PVC potable water hose to a manifold under the saloon flooboards.

The fore water tank is under the forepeak berth. This is also a rotationally moulded PE tank; its capacity is not obviously marked, but form Owner's manual I can infer a capacity of 150 litres. This tank is filled by a flush deck filler in the adjacent port side deck. Cold water is fed to the same manifold. This has two shut off valves and only one valve should be opened at any one time as otherwise the pump will draw air from an empty tank in preference to water from a full one.

b) Pressure pump — Pressurised water is supplied from the manifold by a Jabsco pressure pump and a Jabsco accumulator tank to smooth out the water flow. Both are situated under the chart table. All powered up and worked satisfactorily delivering cold water to faucets in the heads and galley. The supply also feeds the deck shower which is a pull out shower head located on the starboard transom.

c) Water heater — C.Warm 20 litre hot water calorifier. The calorifier is located under the forward settee berth and a heating coil receives heating water from the engines closed cooling system. There is also a 220VAC immersion heater element. From the calorifier, pressurised hot water is then fed in insulated hose to the same faucets in the heads and galley and transom.

d) Toilets — The sea toilet is installed in the head compartment on the port side aft. It is a Jabsco with a black handle. The handle colour is important in order to identify the correct service parts. The toilet itself is in good condition with a ceramic bowl and plastic seat and lid.

The discharge hose is in a white odour free sanitation hose. This is run in a shallow swan neck under the basin worktop and discharges through a skin fitting beneath the basin. The valve is detailed elsewhere. The hose is double clipped with stainless steel worm drive hose clips.

The seawater inlet hose is run from a seacock in the same cupboard in the heads compartment but runs in a tall swan neck up under the deck head in the cupboard outboard. The toilet could not be tested but appeared in good working order.

n) Washbasins and sinks — The head was fitted with a moulded gel coat finished oval washbasin, with hot & cold mixer tap/shower head.

The galley sink is stainless steel with also a hot & cold mixer tap, and a sea water tap fed by a pedal pump located under the sink.

All above was founded to be in serviceable condition.

o) Showers — p) The head is fitted with a separate moulded shower cabin, with a pull'-out showerhead in serviceable condition; the transom shower head must is missing and should be replaced, spare is on board.

RECOMMENDATION: Replace transom showerhead.

e) Waste water system — An 80 litres PE holding tank is located in the head, behind a panel in the shower compartment; it drains by gravity at sea, or could be drained by a marina pump out unit from a tap on starboard sidedeck. A tank gauge is fitted beneath the washing basin. Neither holding tank drainage nor the gauge were tested.

f) Grey water system — The shower tray is drained to a five litres holding tank, drained by an

electric pump with floating switch, tested and found working.

g) Bilge pumping

The bilge pumps were not fully tested as this would have required a large volume of water to be placed in the bilge. However the electric pumps were switched on and found to be in working order.

A Whale manual diaphragm bilge pump was located in the side of the cockpit seating, aft of the helm wheel. The inlet to the manual bilge pump was located in the bilge forward of the engine. It was correctly fitted with a strum box. The handle was located on the underside of the starboard cockpit locker, but was not tethered to prevent its loss. It was noted that the teak planking of the cockpit sole prevented the full up-down movement of the pump handle.

An electric submerged bilge pump was also installed on board, located in the bilge sump amidships. The pump was controlled by a floating switch located in the same sump, or manually operated by a switch on the DC electrical panel. The pumped powered up when the switch was set to manual. The pump also powered up when the switch was set to automatic and floating switch manually lifted.

3.8 Galley gas system

a) Stove

The cooker is an ENO all stainless steel two burner cooker with oven. There is a flame failure device on all the burners. The cooker was not tested but looked to be in a good clean and functional condition. Testing gas systems should only be carried out by a certified engineer using certified equipment, and is beyond the scope of this survey.

b) Gas cylinder

The gas system is supplied from a dedicated gas locker situated in the port side aft cockpit locker. It has a sealed well secured cover lid and drains overboard. It contains one 3kg gas cylinder and a second spare of the same size. The cylinder itself is rusty and should be replaced.

REQUIRED: Replace the gas cylinder.

c) Piping

Copper gas piping runs from the locker to the galley and was not fully inspected along its length. There is a shut off valve beneath the cooker, and the cooker is supplied from a bulkhead fitting via a flexible hose expiring 2012. The flexible hose from the regulator is dated 08/2008 and the regulator is undated.

REQUIRED: Replace both gas flexible hoses.

3.9 Interiors

3.9.i. *Structures*

a) Bilges

Bilges could be inspected by removing saloon and aft and fore cabin flooboards; they were mostly clean, with no evidence of engine oil spillage or flooding. The internal grey-coloured hull paint application was generally in very good condition.

b) Frames

A Hull Internal Moulding (a “Spider”) of GRP was located in the area that

stretched from beneath the forepeak bunks to the aft end of the port quarterberth and spanned athwartships to finish behind the seating cushions. This Internal Moulding was bonded to the hull and strengthens & stiffens the hull moulding. It also formed the sides of the keel casing, the sink & unit of the heads compartment, the heads shower tray and also the structure of the engine beds.

This Internal Moulding was secured to the internal surface of the hull, bulkheads and semi-bulkheads with GRP tabbing. The exposed surfaces of the Internal Moulding were finished in beige gel-coat. The visible gel-coat surfaces of the internal moulding were in good cosmetic condition, but with minor surface scratches. Where accessible, the Internal Moulding was inspected and no evidence of cracking or other damage was noted. There was no evidence of the debonding of the Internal Moulding from the hull.

c) Bulkheads

Where accessible, the teak-faced plywood bulkheads were inspected and found to be in good condition with no evidence of moisture ingress, wood rot or delamination.

The bulkheads, semi-bulkheads and locker frames were secured to the hull & deck by GRP cloth tabbing. The integrity of the tabbing was inspected and found to be free of de-bonding, cracks or movement.

Where the GRP tabbing had been applied, the outer teak ply on each side of the bulkheads was removed during the build of the vessel. This procedure had been correctly performed in order to ensure a good bond to the plywood as the natural oils in the teak plies prevent efficient bonding of the mating surfaces.

3.9.ii. *Accommodation*

a) Woodwork

The fit out is executed in teak veneered plywoods and solid wood mouldings. The joinery is well executed with solid hardwood framing and edge banding to the cupboard doors with no unfinished edges shown. The interior woodwork was found to be in good condition and free of splits or damage.

The companionway steps are wooden steps mounted onto a substantial GRP moulded engine box cover. The steps are firm and secure and have turned up outer edges to provide a secure foothold when the boat is heeled. The centre section hinges forward for access to the engine space and is well secured by sliding bolts.

In each aft cabin the engine compartment covers and the bunk bases are removeable for full access to the engine, gearbox and drive train, although the large cushion needs to be removed. All this was in good condition and provides ample access for maintenance.

b) Upholstery

All the saloon and cabin upholstery is plain foam filled cushions of cream vinyl fabric with piped edges. This is a hard wearing material and is intact although quite stained and abraded in the exposed areas. The main cabin headlinings are in off white vinyl covered plywood panels which are secured by Velcro. This provides access points for the fastening of some of the deck fittings. It is in good condition with no signs of sagging normally associated with this form of headlining.

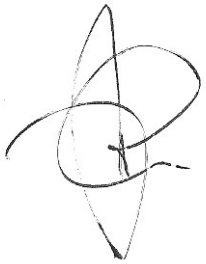
There is a headlining panel missing around the mast partners.

c) Sole boards — The sole boards are in teak&holly veneered plywood. These are well secured by being a good close fit although not actually fastened down. They are a bit uneven as some of the rubber seals on which they sit are missing. They were seen to have suffered normal wear and tear. Some minor areas of damage were noted.

3.10 Equipment

3.10.i. *Navigation and communication*

On deck
1. Plastimo Olympic 135 binnacle mounted compass. The lens was clear, free of scratches and the fluid inside was free of bubbles.
2. GPS/RADAR/Chartplotter Raymarine C80 installed on cockpit table. This was operated at sea and was found to function.
3. VHF Shipmate RS8300, placed besides starboard helm station, was checked via local Harbour Master and found well working.
4. Raymarine ST4000 Autopilot display is located at starboard helm station; it was tried at sea and found satisfactory .
5. Echo/log Raymarine ST60 Tridata display placed at port helm, correctly working.
Below deck
6. GPS/RADAR/Chartplotter Raymarine C80 at chart table, operated and found correctly working.
7. VHF Shipmate RS8300 at chart table was checked via local Harbour Master and found well working.
8. A brass set of clock, thermohygrometre, barometre is affixed to main transverse bulkhead, in good cosmetic condition and working.



3.10.ii. *Safety*

1. The following fire extinguisher were found on board:

Type and weight	Location	Pressure gauge
1kg ABC powder	Cockpit table	Green

2. An Arimar 8 places ISO9650-1 self-inflatable liferaft is located underneath the helmsman seat, to be serviced
3. There are eight CE marked 150N Self-inflatable life jackets, distributed among cabins and saloon
4. A rigid lifebuoy with line and light is placed on the pushpit; the floating light is not working.
5. A tubular Radar reflector is fastened to upper diagonal starboard shroud.

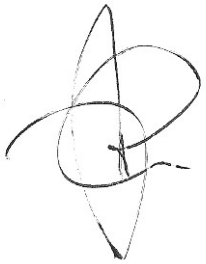
REQUIRED: Service the liferaft.

3.10.iii. *Other equipment*

1. Stereo radio CD: a car-style Pioneer audio system, with loudspeakers located in saloon and cockpit, tested and functioning.
2. Folding aluminium gangway, stored along the guard rail and positioned for use in a socket embedded on transom
3. Four step hinging stainless steel boarding ladder, secured to stern platform. It was inspected and found to be adequately secured, but was not tested with the surveyor's weight.
4. A brand new aluminium three blade spare propeller was stored in port cockpit locker
5. Arimar Dinghy 210, inflatable bottom, in poor conditions; was seen deflated and stored in fore peak
6. Johnson outboard engine, 4 stroke, 2.5 HP, was not tested.

4. Sea trial

a)	Weather	Wind: Sea state: Swell:
b)	People on board:	
c)	Fluid loads:	
d)	Max engine speed:	
e)	Max boat speed:	
f)	Observations	Engine needed a long crank for cold start; during the sea trial the overheating alarm went off; a thermographic inspection showed temperatures over 100°C on engine head, though water and coolant were regularly cold; the test should be repeated after the replacement of temperature sensor; till then the sea trail must be considered unsatisfactory. REQUIRED: Replace engine coolant temperature sensor and re-test the engine.



5. Found and recommended

5.1 Required

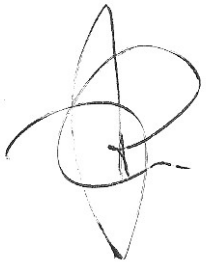
1. Replace the gaiter between the rudder tube and stock.
2. Obtain any documentation of last saildrive diaphragm seal ring replacement; lacking this, replace the diaphragm.
3. Replace the gas cylinder.
4. Replace both gas flexible hoses.
5. Service the liferaft.
6. Replace engine coolant temperature sensor and re-test the engine.

5.2 Recommended

1. Restore antifouling coating before next season.
2. Remove keel bolts rust and periodically check for oxidisation reform.
3. Fix or replace the nylon bushing cap around the top of the outer rudder stock.
4. Replace zinc anodes.
5. Have a Max Power authorised service inspect the bow thruster, and follow their directions.
6. Replace the car and the end stop for the port jibsheet track.
7. Fix or replace the car on starboard jibsheet track.
8. Fix the water leak on muffler.
9. Replace transom showerhead.

5.3 Suggestions

1. Fit ventilation slots on companionway washboard.



6. Conclusion

The craft was found to be in sound condition, notwithstanding the vessel's commercial history. Some aspects have suffered normal wear and tear for a vessel, which has been in commercial use and others above normal wear and tear. While there were no major defects detected, we would suggest that you consider the accumulation of the various defects and obtain repair quotations from reputable repairers, prior to proceeding with the purchase

At present, and in the condition in which she lays, according to my experience, inspected vessel can be assigned the following technical (See definitions at §1.4)

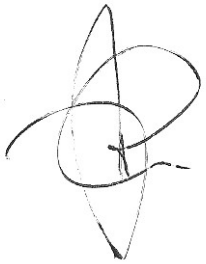
Assessment: 87/100

The present report is composed by 40 numbered pages. The surveyor provided XXX pictures taken on 00000 .

Cavriago, 27/03/20

Faithfully submitted

Massimiliano Panessa



7. Appendix 1 – Photographs

a)

8. Appendix 2 – Technical explanations

8.1 Moisture testing

Moisture is the water absorbed and retained by a solid material; in fibreglass this is due to the intrinsic characteristic of semi-permeability of the resin used for the moulding. In fact polyester resin is highly permeable to water, vinylester much less and epoxy resin almost impermeable (please note: almost). Water intrusion in fibreglass may lead to several issues, first of all degradation of the bonding between resin and glass (or other reinforcement) fibres. The water may find its path to the inner layers of a laminate by mainly two ways: osmosis and wicking.

The first is the well known defect that became a nightmare for all GRP boat owners in the past decades: fundamentally it's generated by pocket of hardener that did not reacted with resin during the cure process. Being the gel coat and resin semi permeable the density difference between hardener (thicker) and water (thinner) generates an "osmotic pressure"; this way the water seek a path to get inside the pocket and dilute the hardener thus to equilibrate the two densities. So the pressure inside the pocket increases, and so does the volume, generating blistering.

Wicking occurs when the end of glass fibres is open to the water, and the water itself start moving along the bonding between glass and resin, just like along a candlewick.

In both cases it's important to know if and how much the water have made its ingress in the laminate, and this is achieved by means of instruments called moisture meters. Those are electronic instruments based on three different principles: there are resistance type, capacitance type and radiowave moisture meters.

Resistance type: the meter sports two probes that should be inserted into the material we are about to measure; between the probes there is a small voltage difference, so the current flows from a probe to the other according with the resistance found in the material: the lower the resistance, the higher the moisture. This kind of meters are used only in wood, and can determine with a good precision the amount in weight of water in percentage of wood weight.

Capacitance type: a small current is made flown between two pads, thus calculating the capacitance that material they are placed onto: again, the higher the capacitance, the higher the moisture content. This type of meters may be used on a variety of materials, but the readings do not express a real amount of water contained in such body, but give a simple indication whether the body is dry, at risk or wet.

For using both of above the surface must be fully dried, so a boat cannot be inspected by means of a capacitance type moisture meter before about 72 hours form her hauling out.

The third type moisture meter works like a radio transmitter receiver: on one end of the instrument there is the transmitter, and the body to be measured acts as an antenna, conducting the radio waves though the material to the receiver placed on the body of the instrument. A dry material do not conduct radio frequencies, and the intensity of the received signal is proportional to the moisture content. This kind of instrument is negligibly affected by surface moisture: I tried several times to pour water on a surface, simply wiping it away with

a cloth, and the reading was not affected. This is useful on recently hauled vessels, providing that the antifouling compound is enough dry or could be scratched in pads.

None of the above instruments works on conductive materials, such as metals or carbon fibre.

The Protimeter Aquant I use is of the latter type. The scale it uses is 0 to 999, and the meaning of the readings may be considered as follows:

Readings	Guidelines	Examples
0-99	**Dry** for all purposes (even for osmosis treatment).	1. Modern yacht with epoxy protection from new. 2. Yacht with Gelcoat removed after drying out period prior to epoxy treatment scheme.
100-169	For all practical purposes may be considered **dry**.	
170-199	**Some moisture present** at low levels, but of no great concern. Other factors must be taken in account (boat age or type of material)	1. Yachts with isophthalic and vinyl ester gelcoat resins after initial lift out, but will quickly reduce dependant on weather conditions. 2. Older orthophthalic resins that may take longer for readings to reduce.
200-299	**Risk** of associated moisture defects considered medium, but toward top of this range levels are becoming significant. Bilge backwater may induce this level of readings	
300-449	Considered **high** and at a level where the risk of moisture related defects being present, but not yet physically detectable, is significant.	
450-599	**Very high** and is usually accompanied by physically detectable signs.	1. Blistering is visible or where the gelcoat has been starred or cracked. 2. Water intrusion from hull cracks or delamination (grounding)
600-999	**Extremely high** and indicative of possible laminate damage in addition to osmotic blistering and physically detectable signs.	

The colour associated to the readings reflects the LED indicator on the meter.

The Extech MO55 moisture meter used is a duplex resistance/capacitance tester, with four scales: Pin mode (resistance) or Pinless mode (capacitance), wood or building material (here including also compound materials such as fibreglass). Pin mode scale is expressed as a percentage, Pinless mode scale is relative, 0.0 through 99.9. It could be interpreted as follows:

Measurement mode	PIN MODE		PINLESS MODE	
Material	WOOD	BUILDING	WOOD	BUILDING
Total range	0.0~50.0%	1.5~33.0%	0.0~99.9	0.0~99.9
Low moisture	5.0-11.9%	1.5-16.9%	0.0-16.9	

Medium moisture	12.0-15.9%	17.0-17.9%	17.0-29.9
High moisture	16.0-50.0%	18.0-33.05	30.0-99.9

8.2 Other technical