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Survey Report no: [redacted]

Name of Vessel: "[redacted]"
Type of Vessel: Fountaine Pajot Athena 38 Catamaran, FRP Bermudian sloop sailing vessel
Type of survey: Pre-purchase

At the request of:
[redacted]

This survey was carried out on the [redacted] at Nosy-be, Madagascar on the water and on the beach. The above named being a prospective purchaser of the vessel.

Limitations:

- Where access is restricted by fixed panels, linings etc. it was not possible to examine and I cannot say those areas are free from defects.
- This report has been prepared for the use of commissioning client and no liability is extended to others who may see it.
- In some cases it is not possible to detect latent and hidden defects without destructive testing which is not possible without the Owner's consent.

Scope of Survey:

- This is a Pre-Purchase Survey and its purpose is to establish the structural and general condition of the vessel. Where items of equipment have been tested this will be stated in the text.
- Camera equipment was used in places to view normally inaccessible areas and the pictures analysed to identify any issues.
- A general inspection of the engine and installation will be made; this is a visual inspection and also running the engine.
- The hatches and port lights were not leak tested with a hose.

Recommendations:

- These will not be made concerning cosmetic or other minor defects, although relevant advice may be made in the text.
- Recommendations will be restricted to those defects which should be rectified before vessel is used, (or within a given time span if specified), and items which may affect insurability.
- ***Recommendations will be printed in bold italics for quick reference.***
- The recommendations are contained in the body of report in order that they may be read in context, and are also listed as part of the Conclusions at the end of this report.

Conditions of Survey:

A sea trial was carried out under motor and under mainsail and genoa on a broad reach. The vessel was anchored for an hour and then put on a sand beach on the island of Sakatia in the bay of Ankofimomr and waited for the tide to drop. The keels sank about 500mm into the sand as did the rudder by 200mm approx. The survey was then carried out. The vessel has been lived aboard for many years and many of the owners items were aboard and in lockers. They were removed where possible.

No special conditions affected the survey other than as described in the text.

Information is reported in the Sections below, followed by recommendations and conclusions and valuation

Hull, Deck and Structure.

1. Details of Subject Vessel, (General Description, Dimensions, Registration etc.).
2. Keel.
3. Hull below Waterline.
4. Topsides above Waterline including Rubbing Strake etc.
5. Deck Moulding.
6. Coach roof.
7. Cockpit.
8. Hull/Deck Join.
9. Bulkheads and Structural Stiffening including Internal Mouldings.

Steering, Stern Gear, and Skin Fittings etc.

10. Rudder and Steering.
11. Stern Gear.
12. Cathodic Protection.
13. Skin Fittings and other through Hull Apertures.

On Deck.

14. Main Companionway and other Accesses to Accommodation.
15. Ports Windows etc.
16. Pulpit, Stanchions, Pushpit, Lifelines and Jackstays.
17. Rigging Attachment Points.
18. Ground Tackle and Mooring Arrangements.
19. Other Deck Gear and Fittings.
20. Davits and Boarding Ladders.

Rig.

21. Spars.
22. Standing Rigging.
23. Running Rigging.
24. Sails and Covers etc.

Safety.

25. Navigation Lights.
26. Bilge Pumping Arrangements.
27. Fire fighting Equipment.
28. Lifesaving and Emergency Equipment.

Engine.

29. Engine and Installation.
30. Fuel System.

Accommodation and onboard Systems.

31. Accommodation General.
32. Gas Installation.
33. Fresh Water Tanks and Delivery.
34. Heads.
35. Electrical Installation.
36. Electronic and Navigation Equipment.
37. Heating & Refrigeration

1. **Details of subject vessel:**

The Fountaine Pajot Athena 38, built by Fountaine Pajot, Z.I 17290 Aigrefeuille, France was a popular charter vessel particularly in the West Indies with many companies taking advantage of the French Tax law, Loi Pons. Cythea was built in 1995 and chartered in the French West Indies where she was bought in 2000 from one of these charter companies by the present owner. (information from owner and sale papers seen by surveyor).

Manufacturers' information from internet (not verified by measurement)

Length Overall	11.6m/38'11"
Beam:	6.3m/20'8"
Draft:	0.95m/3'1"
CE Marked	No
Boat specific information	
Registration	[redacted]
HIN number	None – vessel serial number [redacted] – seen on plate in cockpit
Year of Build	1995 Builders plate
CE	Pre CE marking- Approbation 7677, 1st category for 6/14 persons.

2. **Keel**

a) The vessel has a Glass fibre reinforced plastic (FRP) keel on each of its hulls. These are bonded into a locating box approximately 200mm deep moulded into the hulls. The keels are painted with at least 3 layers of antifouling over primer and green epoxy.
b) The vessel was seen sitting on its keels which had sunk into the sand leaving about 200mm exposed.
c) There are no signs of movement around the visible joint of the keel to hull. The aft end of the port keel the filler is slightly lower than on the starboard. The filler is for fairing purposes only.
d) The keels were lightly hammer sounded where visible, at 10cm approx squares, to identify any delaminating of the. None was noted. 2 areas of antifouling were removed to take moisture readings. More details of the removal, the covering and the readings is found under the hull section. The readings were 29 – 30 shallow and 38 – 62 deep. These ranges indicate that moisture is present under the gel coat and in the laminates. See hull for more information.

e) The keels have a stainless steel protective bracket on the leading edge which is bolted through the keels and protected with an anode. The one visible bolt each side was hammer tested and found secure. The anode is only partially wasted.

3. **Hull below Waterline:**

a) Construction of the hull below the waterline is FRP construction with a mat or core material bonded to it on the inside. The outside is white gel coat, painted with at least two layers of antifouling over a primer and green epoxy coating.
b) The vessel was seen sitting on its keels and no distortion to the hull was seen.
c) Light hammer sounding was carried out (not heavy enough to damage anti-foul) of hull at regular intervals approximately 500cm spacing all over to identify any areas of delaminating. No areas of delaminating were noted although the tone was different in different areas due mainly to bulkhead fittings and areas of expanded foam used as buoyancy.
d) The antifouling was removed in 53 patches approximately 50mm x 50mm at random around the hull below the water line. The coating was scraped back only to the green epoxy coating so as not to damage it. While scraping I was looking for evidence of wicking or blistering of the FRP and once antifouling was removed all patches were checked with 10x magnification. No evidence was found.
e) There are no visible signs of significant damage or repairs to the hull below water line.
f) Both hulls, leading edge have a crack in the antifouling from bow to 1200mm aft directly at the base of the hull. This was scraped back through the antifouling and epoxy and is still visible in the gel coat. I was able to insert a feeler gauge just 1mm into the crack. There is no evidence of cracks on the inside of the hull. Advisory note – To prevent water ingress into the laminates, this area should be cut back in a vee to solid laminate and filled with gel coat filler or if into the laminates, laminated and epoxied next time the vessel is hauled.
g) Moisture readings were taken where the antifouling was removed using a capacitance moisture meter of Sovereign Quantum model, operating in both shallow and deep reading modes.
The meter was first checked for correct calibration.
The readings recorded below are from the meter operating in the shallow and also deep mode on the relative scale 0-100.

The conditions prevailing when the readings were taken were as follows:

Air Temperature:	**43.5°C**
Surface temperature:	**37.2C**
Relative Humidity:	**27.2%**
Time ashore	**2 hours**
In summary the weather conditions for obtaining moisture readings were good	

Readings were as follows:

Meter	Range below waterline.	Range above waterline.
Sovereign Quantum, Scale 0-100 Shallow mode	**19 – 36 with one isolated 44 reading**	**16 – 21 with an isolated 29 reading inside port hull**
Deep Mode	**15-29**	**13 – 22 with one isolated 27 reading**

The interpretation of the readings in shallow mode range;

- 16 - 20: Some moisture present at low levels but of no great concern.
- 21 - 30: Considered medium, but those at the top of the range i.e 30 are at the point where the risk of moisture related defects developing is significant.
- 31- 45 Considered high and at a level where the risk of moisture related defects being present but not yet physically detectable is significant.

The one area showing 44 shallow was scraped back with the owners consent through the epoxy to the gel coat. The reading was the same afterwards. This was to confirm that the readings were not being affected by the epoxy coating.

Advisory note - Always storing the boat ashore out of season to allow some natural drying out to occur will contribute significantly to improving condition.

4. **Topsides above Waterline including Rubbing Strake:**

a) The top section is solid FRP with additional strengthening with core mat or similar from the area of the rubbing strake down and beyond the waterline. The surface is white gel coat, which is dull through UV and salt.
b) Top side moulding found fair. There are 3 scratches approximately 20 – 40 cm long on the port hull into the gel coat, not into the laminate.
c) There are a number of minor star cracks in the gel coat from minor impacts and also minor gel coat repairs on the topsides below the rubbing strake.
d) The rubbing strake is aluminium with a rubber insert. Its fixings are bonded into the hull. This is corroded in places. The port forward end has corroded completely but the remainder is securely fixed. Port side half way back has been dented on the top edge approximately 30mm long.
e) Port side aft of amidships just above the rubbing strake a repair in the gel coat has not been filled well and the top laminate is now exposed.

f) The bows of both hulls have signs they have been repaired in the past and have further vertical cracks likely caused by impacting a quay. The starboard side sounds when hammered to indicate delaminating of the repairs. The inside of the port bow has a star crack too.
g) The topsides were lightly hammer sounded and no indication of delaminating found except noted above. Moisture readings were taken and recorded as above.
h) Each hull has a sugar scoop transom bathing platform comprising a separate moulding with 3 FRP steps which have non slip stuck to them. The lower step of each the non slip has come away. The edges of the step moulding have a number of gel coat chips. The lower edges of the transom have rubber protection which is intact.
i) Where the cross beam is bolted to the topsides, there are stress cracks in the moulding. Hanging on the cross beam, I was unable to flex the moulding. These should be cleaned and filled and monitored.

Advisory note – The topsides should clean up with a good marine cleaner and polish to restore shine. Any gel chips that expose the laminate or starcracks should be cut out to a vee shape and filled with gel coat to avoid water ingress in the future.

Advisory note – The bows should be ground back to strong laminate and gel coated to give a good finish. Adding a couple of layers of FRP cloth inside the bow will bring the strength back.

5. **Deck moulding:**

a) The deck is of white gel coat on solid FRP with core mat or balsa core in areas for added strength with non slip moulded into the surface.
b) The deck is dull in colour.
c) There are minor stress cracks at the base of the port and starboard forward stanchions. The underside of the bridge deck is also white FRP, there are a number of minor star cracks where the anchor has hit.
d) The deck was carefully tested under foot for flexing. Both decks on hulls forward of the first stanchion flex slightly. The lid has to have a shackle or pad lock to secure although it is heavy and should remain shut in all but the roughest sea,
e) There is a large locker on the bridge deck, hinged to the side. The locker drains directly through the bridge deck. The locker contains water tanks, anchor windlass and stowage space. The hinges of the lid have lost two screws and the deck has minor crack by the hinges.
f) The deck was tested with a moisture meter. Readings of 13 shallow all over except on starboard bow to first stanchion forward where readings 26 – 30. Speaking to the owner, he said that the bow locker below this area was black with condensation until 2 weeks ago when it was cleaned out.

Advisory note – The same advice as the top sides for any damage. The starboard bow locker should be cleaned out and allowed to ventilate to bring the moisture levels down.

If the deck continues to flex, there is good access to the underside to add extra laminate for strength.

6. **Coachroof:**

a) This is constructed of solid FRP with strengthening foam frame laminated towards the forward edge. The main area underside was obscured by ply headlining and could not be accessed.
b) There are a number of small gel chips to the forward edge outside.
c) The area was tested under foot and no evidence of flexing was found.

7. **Cockpit:**

a) Integral with the deck moulding with drainage at rear through sole and forward under door coaming.
b) Cockpit locker, in aft seat (lazarette) with secure means of closure, hinges and gaskets good. Contains gas bottle, fuel tank and filters and stowage.
c) There is a shallow locker in the cockpit sole, the edges of which are chipped. The hinges are secure and it has a secure means of closure. It drains directly through the bridge deck.
d) Seats have non slip moulded in. Some of this is chipped and breaking away in places caused by voids when it was laid up at production and UV.
e) There are numerous small gel chips around the cockpit.
f) A cockpit table base is in the sole, which is well sealed. The cockpit table is of solid FRP. The base under the table is corroded but solid.
g) The helm seat is on a stainless steel pillar, well secured. The plastic seat is a little stained.
h) The winch handle pockets are not attached. One is missing
i) The gel coat above the port window is distorted, looks like a bubble but it is not. This may have been a mould fault.

8. **Hull/Deck Join:**

a) It was not possible to view the underside of the deck hull except in the fore cabin storage areas and in the transoms.
b) The vessel is moulded in sections, the inner hulls and the bridge deck base are one moulding and the deck is fitted atop, again fully bonded and laminated joint. The transoms steps are separate mouldings and bonded in. There were no visible signs of movement or stress at any joint.
c) The mast sits on a FRP box forward of the deck house in the anchor locker. No signs stress or cracks found. No depression in mast box noted when shrouds flexed.

9. **Bulkheads and Structural Stiffening including Internal Mouldings:**

This is a Monocoque construction and a number of components contribute to the overall structure.

a) The shell mouldings are robust in the first place.

b) Each hull has 4 bulkheads bonded to the hull and deck. There are no signs of movement at any point on the bulkheads.
c) The deckhouse saloon has internal moulding incorporating box section lockers, all bonded in where seen.
d) The inside of the hull and deckhouse aft bulkhead are covered in a carpet type material so access to the joints is not possible.
e) The bows are connected with an aluminium section, bolted to a substantial stainless plate which in turn is through bolted to each hull with a solid plate inside. As mentioned above, there are small stress cracks where the hulls are faired to meet the plate. The bolts were hammer tested and found secure. No signs of movement.
f) Each hull has a box section aft of the bow and forward of heads under the berth sealed and reportedly filled with foam to make the vessel unsinkable. (The owner has filled the forward section in front of this both sides with empty plastic bottles with lids on in nets).
g) The aft areas of the transom have expanding foam in them as added buoyancy for safety.

10. **Rudder and Steering:**

a) Twin rudders of FRP bonded around a stainless steel or alloy rudder stock. (Access was limited to small section only).
b) The bases of the rudders were in the sand during haul out so could not be checked although have been seen in the water and they are intact
c) The blades were scraped and tested with a moisture meter. The readings were similar to the hull reported above.
d) I could not check for play in the rudders when hauled. The nylon bushes at the top of the rudders were in good condition and there are spares aboard.
e) When in the water, the steering was tested full lock to lock and had smooth movement.
f) The rudder tubes are FRP and bonded to the inside of the hull and against a bulkhead at the aft of the aft cabins. These are covered in the carpet. No signs of movement.
g) The rudder tubes have a bearing at the top, the port side could be checked through the aft cabin and there are no signs of movement or water ingress. The rudder stock is securely bolted to an aluminium connecting arm which in turn is bolted to an aluminium tube between the two rudders. This is connected to cables which run around a pulley bolted to the bridge deck transom. Only part of this was visible as the cables are concealed in a wooded box section. I could not check the cable connections. The aluminium bracket is slightly corroded.
h) The cables run to a Solimar wheel in the cockpit which was tested for movement against its bushes. Slight fore and aft play was found.
i) Secondary steering is via Raytheon ST6000 wheel pilot, which was seen operating.
j) A further Raytheon ST4000 ring is fitted to the wheel and the unit is reported aboard but not seen. The owner says he has not used it for 6 years.
k) There is no emergency tiller access fitted.

11. **Stern Gear:**

a) Yanmar sail drives. No signs of leaks around main seals which are clean and not perished.
b) Both have 2 blade aluminium propellers secured with cone correctly fitted.
c) These were scraped and there is no sign of pitting on the blades. There is no undue movement of the bearings.
d) The oil in the drives is clean indicating seals ok at present time unless recently changed.

12. **Cathodic Protection:**

a) One anode on each sail drive which is only partially wasted. There is continuity with this and the propellers and drive, tested with multi-meter.
b) There is a further anode on each hull, only partially wasted. This does not have continuity with the sail drive. They have continuity with the aluminium structure on the aft deck area and the water generator.

13. **Skin Fittings and other through Hull Apertures:**

Some thru hulls may not be reported below but will be with relevant systems sections.
No skin fittings or valves were dismantled as part of this survey but the following routine tests were carried out:

- Examination from outside and inside the boat. Checked for de-zincification
- All valves open and closed to their full extent where possible.
- Any fixing bolts hammer tested where accessible.
- Bodies of metal valves or sea cocks 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. 2 clips correctly fitted on outlet spigot unless noted.
- Lying fair to hull unless noted

Below Waterline:

a) Heads inlets and outlets are reported in heads section.
b) Port side seawater intake for desalination system. Black Marelon (the only plastic allowable by CE for underwater valves) 19mm seacock with water strainer and connection. Mounted in the locker under the sink in port heads, this fitting could be vulnerable to being broken by careless stowage.
Recommendation – do not stow any heavy items under port heads sink to prevent damage to Desalination intake. Alternatively change connection to 90^{o} bend.
c) Galley drains, starboard heads shower and sink and starboard bilge drain all share one black Marelon thru hull and valve under starboard heads sink. All pipes securely clipped.
d) Port heads shower, sink and bilge pump outlet share black Marelon thru hull and valve under port heads sink.

Above waterline:

e) Anchor locker, cockpit drains, Lazarette locker drains, all direct out under bridge deck. One drain from starboard side Lazarette has been closed with a cork. According to

owner, this was to prevent back flooding from following seas into in accessible area by water generator.

f) Cockpit drains are missing the stainless steel protector's underside. These prevent water coming back up when under way in big seas but also block regularly. Owners preference to have removed.

14. **Main Companionway and other Access to Accommodation:**

These were all checked;

- To be lying fair to the deck,
- fixings were randomly tested with screw driver for tightness
- frames checked for damage,
- a secure method of closure
- correctly fitted hinges.
- Glazing checked for damage.

All found ok unless noted. The hatches were not hose tested for leaks and it did not rain during survey.

a) Port forcabin hatch - hinged aft. Acrylic is crazed.
b) Port heads hatch - Rivets holding hinge on frame are corroded causing plastic to split. Acrylic is crazed.
c) Port aft cabin hatch - Rivets holding catch on frame are corroded causing catch to split. Acrylic is crazed.
d) Galley hatch - Acrylic is cracked and crazed. Rivet on hinge is corroded causing plastic to split.
e) Deckhouse port front hatch - Acrylic is crazed. Rivet on catch is corroded causing catch to split.
f) Deckhouse starboard front hatch - Acrylic is crazed. Acrylic is loose in frame. Rivet is catch is corroded causing catch to split.
g) Starboard forcabin hatch - hinged aft, acrylic crazed.
h) Starboard heads hatch - Acrylic loose in frame crazed.
i) Starboard aft hatch - Acrylic is crazed. Hinge is loose.

Recommendation – hatches hinged aft, forward of the mast should be kept closed at sea and labelled same.

Deck house glazing must be secured in frames before used in heavy seas or plywood blanks fitted temporarily.

Galley hatch acrylic should be replaced before use in heavy seas or plywood blanks fitted temporarily.

Starboard heads hatch acrylic should be secured in frame before used in heavy seas or plywood blanks fitted temporarily.

g) Deckhouse saloon door - This is fitted on aft side, sliding in aluminium frame. Toughen glass. Lock in place and working. Door is loose in runners due to missing runner and gaskets. Rubber seals broken. Some screws are missing from the frame. Door can be secured open and closed.
h) Emergency hatches in each hull in heads. The port hatch leaks slightly around seal and the glazing is cracking by the forward hatch.

Recommendation – Port emergency hatch should have glazing replaced or a secure method of closure attached – large bolt and plate inside – which does not restrict use as escape hatch in emergency situation.

Advisory note - All broken catches should be replaced but unless a recommendation, location does not mean failure of part would put vessel in immediate danger.

15. **Ports, Windows etc**

The same checks as section 14. Above were carried out. All found ok unless noted. The hatches were not hose tested for leaks and it did not rain during survey.

a) Port aft cabin port light - No faults found.
b) Port forward cabin port light - seal deteriorating and one catch broken
c) Deckhouse – two forward facing large acrylic windows - These are each secured with 6 double ended screw head bolts and sockets. It was originally "glued" as well with a bonding seal. The lower edge of both windows is not sealed and i could push a pen through the gaps. The middle screw of the port window is broken.

Recommendation – The lower edge of each saloon window should be sealed with a Sikaflex bonding and the centre screw replaced before using vessel in heavy seas.

d) Starboard forcabin port light - seal flattened. Catches are padded out to get seal.
e) Starboard aft cabin port light - hinge pin is coming out.
f) Window aft in deckhouse - screwed through acrylic through FRP to aluminium frame inside. Acrylic is slightly distorted on outside.

16. **Pulpit, Stanchions, Pushpit, Lifelines and Jackstays:**

a) Twin guard rails around side deck, stainless steel. Terminals secure either end.
b) Stanchions are stainless steel in alloy bases. Posts are corroded into bases.
c) Starboard forward stanchion post is bent aft slightly
d) Starboard aft and middle stanchion base post fixing bolts are too long and protrude out of bases.

Advisory note - These should be replaced with correct length to prevent personal injury or sheets snagging.

e) There are no pulpits or push pits fitted or life lines across bow or stern.
f) All stanchions were heavily lent on and no significant flexing found.
g) The following were tested with a lever and found secure
    a. A wire jackstay (life line) is secured on the starboard deck.
    b. Two fixing points for a port jackstay fore and aft but no stay fitted.
    c. Four U bolts under the bridge deck for emergency use.

17. **Rigging Attachment Points:**

- All attachment points were tested visually with 10 x magnification
- Nuts and bolts struck with hammer against sheer where possible
- Checked with magnet for quality of steel where possible
- Fittings tested with a substantial crowbar on wood block

Unless noted below, no movement or signs of seepage via deck fittings found.

a) Main mast shrouds are attached to stainless chain plates on either hull. Thru bolted in sheer with 6 bolts secured with washers and nyloc nuts which are visible in either hull passageway.
b) Forestay is attached to substantial aluminium cross beam by cotter pin. Split pin is correctly fitted. Cross beam is strengthened with cable across frame. Cable fittings secure.

18. **Ground Tackle and Mooring Arrangements:**

a) Main anchor 35KG plough anchor, surface corrosion only. Securely attached to 10mm chain. Last 20m of chain has surface corrosion due to lack of use. This is attached with substantial shackle to black 20mm 3 strand rope with thimble spliced in. This is tied to the locker floor. Chain is approximately 45m long. It was all dropped and pulled in and checked.
b) There is a Lofrans electric windlass operated by air switches. Advisory note – these are incorrectly marked down for up. The windlass operated fine. The centre of the drum the handle fixing is broken and it has knocks and scratches on it all. The motor casing is corroded.
c) The anchor and chain lower and rise over a nylon roller through the front of the bridge deck and the anchor self stows here. One of the bolts securing this fitting is loose.
d) There is a further roller on the bow cross beam in a welded aluminium bracket.
e) The kedge anchor is a 20KG Britany anchor, very corroded and does not articulate.
f) There are aluminium mooring cleats fore and aft either hull thru bolted with penny washers underside and nuts. Tested each with a lever and found secure. Bolts seen below except starboard aft that was not accessible behind a screwed in panel. Nuts seen tested with hammer.
g) Lots of different size warps aboard in fair to good condition.
Recommendation – A kedge anchor of minimum 10KG with 10m of 8mm chain should be part of the inventory

19. **Other Deck Gear and Fittings:**

a) Mainsheet track and traveller fitted across aft of cockpit outboard edge. Track is Amiot. Traveller has been replaced with Lewmar car. Starboard track end has been cut and welded. Ugly but secure. Could not access underside of fittings. Jammers starting to wear both ends.
b) Amiot genoa tracks. Cannot access underside. Appear secure.
c) The 2 winches were Lewmar ST44, of adequate size, were tested as far as possible, were seen under load and found no play on base and were free to turn.
d) Bow deck net. Securely fastened and no signs of chaff.

20. **Davits and Boarding Ladders:**

a) Vessel has fixed folding boarding ladder on port transom which extends well below the waterline and is securely attached.

b) Dinghy davits are fitted which pass through stern and have 2 bolts each in sheer and 4 on transom. All hammered and found secure.
c) Solar panel frame of aluminium attached between hulls and to bridge deck. Fixings tested where possible and found secure.

21. **Spars:**

Mast

a) Mast is Z spar, silver anodised. The mast was stepped so inspection is restricted to fittings and area to head height. No excessive signs of corrosion around base or fittings.
b) No damage or distortion to the extrusion was noted.
c) Furlex headsail furling system seen in use and free to turn.
d) 2 Mast winches are Lewmar ST40. Both operated. No excess play found.
e) Mast jammers all worked correctly and did not slip
f) Owner says mast base has been replaced and marking is Cape Town so suggest correct.

Boom

a) Silver anodised in similar condition to mast.
b) Goose neck no signs of wear at the mast fittings.

22. **Standing Rigging:**

a) Rigging could only be checked at deck level. These were examined where the wire enters the terminal under 10x magnification, no broken strands visible nor excess corrosion seen.
b) The rigging screws are chrome plated bronze open bodied type with good articulation. Split pins correctly fitted. Where seen were found free from distortion or visible stress cracks, when examined under 10 x magnifications.
c) Owner says rigging all replaced 6 years ago. No receipts seen.

23. **Running Rigging:**

a) Running rigging seen appears in good condition with most ends burn closed and thimbles in place.
b) One spinnaker halyard.
c) One spare genoa halyard, seen worn about 20' up.
d) Main sheet has rubber spring damper section fitted to prevent snatching and give in gusts.
e) Lazy jacks fitted.

24. **Sails and Covers etc:**

Main sail and genoa seen rigged and under sail. Spinnakers hoisted at anchor.

a) Main sail. White in colour by Doyles sailmakers. Fully battened. Shape ok, Stitching checked with 50p coin for wear and found sound where seen. No battens broken and cars seen working. No major signs or repair, slightly grey in areas.
b) Genoa, white with grey sun protection. Stitching checked with 50p coin for wear and found sound where seen. Shape ok although leach a bit slack higher up.

c) Small, medium and large light spinnakers seen all with snuffers. Seen hoisted and dropped. Large and medium very good condition. Small has some repairs and small holes. 3 bags of sheets and pulleys for spinnakers aboard, not checked in detail.
d) Blue bimini on stainless frames. Frames securely fitted and material in fair condition. Aft plastic zip coming apart.
e) Sailbag on boom – grey with many panels repaired.

25. **Navigation Lights:**
a) Tri colour at mast head seen working.
b) Decklight seen working. No separate steaming light.
c) Anchor light is home made hoist up light.

26. **Bilge Pumping Arrangements:**
a) Manual bilge pump, mounted in cockpit locker, operated from cockpit. Has roving long pick up pipe to reach into either hull. Tested and works. Exits under bridge deck. Securely mounted.
b) Electric bilge pump, in either hull, operated by shower drain switch in heads compartment. Not automatic. Thru hulls reported above.
c) No bilge alarms fitted.

27. **Fire-fighting Equipment:**
a) There were the following fire-fighting appliances found onboard.
    a. 1 x 1.5KG dry powder in each aft cabin
    b. 1 x 1.5KG in deck saloon

2 showed green on the gauges, saloon in red on guage. All last serviced 2004. When shaken the powder did not appear to move and may have settled rendering extinguisher inoperable.
b) Bucket with lanyard in cockpit.
c) There is an access point into each engine compartment to discharge an extinguisher under berth cushions.

There are no regulations covering this vessel in private use however;
Recommendation:- All extinguishers were last serviced over 5 years ago, have extinguishers serviced or replaced. Suggest new extinguisher kept in cockpit area.
Advisory note:- As hatches are not big enough for escape hatches, suggest cabins used for sleeping are fitted with smoke detectors.

28. **Lifesaving and Emergency Equipment:**
The following was found aboard –
a) 6 x Plastimo life jackets
b) 5 x safety harnesses and lines
c) EPIRB - registered to different vessel and batteries dead.

The RNLI operate an excellent free inspection and advice service concerning levels of safety equipment (SEA Check) and can be contacted on 08003280600 or via the RNLI website, www.rnli.org.uk.
The RYA also publish a booklet, G16, "The Boat Safety Handbook" and this specifies levels of Safety Equipment for different categories of use and it is ***Recommended this vessel be equipped to the level appropriate to proposed use.***
Booklet is obtainable from nautical bookshops or direct from the RYA, www.rya.org.uk.

29. **Engine and Installation:**

a) Engines are Yanmar 2GM20 fresh water cooled.
b) Engine hour meter shows 5174 port engine, 8208 starboard engine.
c) Port engine
    a. Engine very clean with evidence of newly replaced diesel pipes
    b. Engine bilge is wet but no signs of water or diesel leaks. Area around engine very clean.
    c. Engine alternator loose at top bracket. Owner says will tighten.
    d. Exhaust hose second clip at engine is cutting into pipe.
    e. Owner advised that the diesel flow return in the diesel pump has been removed awaiting replacement. The engine operates but sometimes requires priming from bulb pump in fuel line
d) Starboard engine
    a. Engine fairly clean
    b. Bilge was dry,
    c. Small water leak found where seawater pipe has recently been fitted. Owner says he will attend to.
    d. Diesel pipe onto lift pump loose on spigot. Owner says will attend to
e) Both engines - Exhaust system is marine grade, well clipped at engine and plastic water trap mounted behind engine, swan neck up hull to deck level and exits through stainless steel fitting above waterline correctly clipped.
f) Gear and throttle cables well attached and clipped and operate as intended via twin control in cockpit.
g) Handles of Morse engine control levers- the plastic heads are breaking up. They still work but are unsightly.
h) Engine mounts are flexible at front of engine mounted to moulded engine bearers. Tested with crow bar and found secure. No signs of damage or wear found.
i) Seawater intakes are through sail drive unit, via valve on sail drive, directly into engine raw water pump. There is no strainer and the pipe is not swan necked.
j) Engine compartment is vented via natural and forced ventilation, plastic vent hoses run through the cabin and vent through the transom below the bridge deck and through hull. Both have fans in the line which were seen operating. Starboard engine vent cover alloy decorative cover is cracked in two places.
k) Control panels in cockpit, port engine has new rev counter fitted. The main panel is cracked one side.

Advisory notes – Check all items owner says will fix. The exhaust hose port should be pushed further onto spigot and clipped when possible.

30. **Fuel System:**

a) Alloy diesel tank mounted in lazarette locker. Owner advises 160 litres.
b) No signs of leaks or smells of diesel
c) Mechanical fuel gauge on tank not working.
d) No signs of corrosion on tank. Base and 3 sides could not be checked due to access
e) Fuel tank shut offs for each mounted on top of tank. Both operate.
f) Pipe is ISO 7840 and well clipped unless stated.
g) System is modified from new
h) An electric pump is mounted to top of tank to be used to pump diesel from jerry cans into tank. This is badly corroded and not working.
i) Both fuel lines have hand squeeze pumps inline.
j) Each system has debug filters in line, then Separ 2000s filters.
k) Copper pipes, securely clipped run to the engine compartments. These were green. I scratched and they are solid underneath.
l) CAV filters with glass bowls in engine compartments and filter on engine.
m) Diesel hose port engine from engine filter to lift pump is USA SAE J1527 USCG Type A1 1990.

Advisory note:- Suggest additional electric pump is removed and tank outlet closed off with valve.

31. **Accommodation General:**

a) Cushions in saloon are in good clean condition. The berth cushions are a faded blue sail cover material with some repairs.
b) Interior woodwork in general good order, faded by the sun in places but varnished.
c) Galley work top is FRP, the top has many small cracks in gel coat. Grey FRP interior.
d) Wood on chart table, varnish is flaking.
e) Hull sides covered in original carpet type material. All generally in good order.
f) Forward cabin port the door retaining clip has come away from hull.
g) Saloon table surface is in good order.
h) The wood under cooker hob is split.
i) Heads compartments are moulded FRP in good clean condition as are the sling glass doors.
j) Cabin soles in hulls creak when walked on. Under port cabin sole a floor has been fitted from ply which is delaminating. I believe its purpose was to keep water maker separate to bilge.
k) Book shelves in saloon retrofitted from pine and varnish is not well applied.
l) Galley cupboard above sinks the veneers do not match and they are stained.

m) A fitting has been removed from cupboard below sinks in galley leaving open hole.
n) One stainless sink is split in two places.
o) The heads taps are pitted in the chrome
p) Heads mirror has lost a lot of its reflective material.

32. **Gas Installation:**

This vessel has not been MCA coded, nor was it built RCD/CE compliant.

Irrespective of the above all gas systems are subject to the checks listed below as part of this survey. Recommendations will be made where there is an obvious serious safety issue and these must be carried out before use. Suggestions will also be made where appropriate to enhance safety criteria, particularly with systems where there is no mandatory requirement to conform to a standard. It must be understood however that some Insurance companies require a declaration from the assured that the gas system conforms to ***current*** standards and if that is the case here upgrading may be required as a condition of the insurance policy.

Sources of further information:

www.calormarineshop.co.uk/rules-regs-answer.htm Comprehensive information on standards and best practice. www.boatsafetyscheme.com Even if your boat is not required to comply with this standard it contains much sensible advice and the manual can be downloaded.

Gas Observation and action table

Item	**Result**	**Action required.**
Condition and efficiency of self draining bottle storage	Bottles are mounted in lazarette locker which can vent back into the boat as well as drains over board. The bottle is not secured except by other contents of locker.	***Fit separate compartment in lazarette for gas bottles with own drain. Until done ensure gas is always off at bottle when not in use.***
Age and condition of flexible hose at bottle.	Hose in lazarette to bottle is marked Feb 2006. Secured to copper pipe with 2 clips.	Hose should be replaced in 2011
Age and condition of regulator	Age unknown. Fair condition no signs of corrosion	
Connection to copper pipe	Double clips	

Condition of copper pipe where accessible	Not seen as behind joinery. In galley locker well clipped and condition good.	
Is pipework adequately supported and not under stress where accessible?	Where seen	
Connections and Flexible pipe to cooker and other appliances	Flexible hose, could not see dates. Suspect original hoses.	***Recommend hose to oven and hob are replaced when gas system changed.***
Is cooker gimballed, crash bar fitted.	No	
Are all appliances fitted with flame failure devices on all burners, and did these work properly under test?	FFD on burners and stove seen working.	
Are any appliances requiring flues properly fitted with same?	N/A	
Is a gas alarm fitted?	No	Suggest fit gas alarm
Is each appliance fitted with an isolating tap	Cooker yes in locker underneath.	
If fitted did leak bubble tester function?	N/a	Consider fitting bubble tester.

Additional Observations:
Oven is badly corroded around hinges and door. It is flush mounted in galley. Owner does not use as believes it gets too hot around outside.
Recommendation – oven is not used without constant supervision and replaced with new when possible.

Please note this survey is not a gas safety certificate, that is only obtainable after comprehensive pressure testing and assessment by a qualified person listed on the Gas safe register (formally CORGI) www.gassaferegister.co.uk

33. **Fresh Water Tanks and Delivery.**

a) Two tanks mounted infront of deck saloon. Not accessible during survey. Deck fillers secure. Fittings from tanks to system seen. Well clipped.
b) PURE Desalination water maker fitted in port bilge. Owner advised produces 13 litre per hour. Fittings all clean. Various filters in lines.
c) Hot water calorifier Isotemp heated from starboard engine. Hose from engine are not marked but secure. Possible to run from 220V but not plugged in.

d) Electric water pressure with accumulator tank all mounted just aft of deckhouse front. No signs of leaks.
e) Pressure hot and cold at galley and both heads seen working. 2 spare pumps aboard.
f) Water was drinkable.
g) Deck shower mounted in transom. Button is seized. Not possible to use.

34. **Heads:**

a) Both toilets are Jabsco PAR ITT manual pumps.
b) No signs of leaks.
i) Fittings were tested as per section 13.
j) Toilet inlet port side is bronze thru hull, with DZR valve. It is green but secure. There is no swan neck in pipe and toilet is at or below water line.
k) Starboard side, thru hull and DZR are silver colour. One clip only on valve. No swan neck in pipe and toilet is at or below water line
Recommend that inlet pipes are extended to reach below deck level, 2 clips fitted and until then valves should remain closed at sea.
l) Toilet outlet both sides are securely fitted to toilets, pipe is in high swan neck and exit through Marelon 50mm valve and thru hull. Port hull one clip on toilet is slightly corroded.

35. **Electrical Installation:**

DC circuits

a) Port engine has 12v 60amp hour alternator, charging 1 x 12v 55ah engine start battery, Gel filled, indicator light green, in plastic battery box and securely fastened behind locker in saloon. Terminals are tight. Ventilation into hull structure.
b) Starboard engine has 12v 60 amp hour alternator, charging 1 x 12v 55ah engine start battery gel filled, mounted in battery box in locker in front of engine compartment. Terminals are tight. Battery is not strapped down.
c) Each engine battery has isolation switches in + and – sides and ability to join both. Terminals tight where accessible.
d) Both engines have 130ah alternators driving from separate pulleys charging domestic battery bank, seen working and producing amps.
e) 3 x 60W solar panels are mounted on transom structure charging domestic batteries. Seen working and producing amps.
f) 2 x Wind generators, output unknown are also linked to domestic batteries seen working and producing amps.
g) Water generator mounted on transom can also charge domestic batteries – output unknown and not seen working.
Advisory note - Fixing for water generator thru hull is starting to corrode and silicon around fitting could be replaced.
h) e), f) and g) have switches to control function to left of main switch panel.
i) 6 x 12v 200amp nickel cadmium wet batteries mounted under saloon seating. Securely fastened with straps. Terminals tight. Levels not checked.

j) The two 130ah alternator have switch in + circuit which has to be set once engines running to "excite" alternators and turned off when engines not running.
k) Domestic batteries have isolating switches in + and – side mounted in starboard aft cabin. Voltage meters also here. Charging amp meter on main switch panel. System seen producing amps.
l) 12v wiring is professionally wired and neat and tidy behind panel. All circuits appear to go through separate RCD breakers on panel. Many extras have been wired in.
m) 3600 watt 12v > 240v inverter mounted under saloon berth. Seen working.
n) Isolating switches for inverter, services and generators under chart table in addition.

240v Circuits

a) Factory installed AC 30amp European system with socket in lazarette to main RCD under saloon berth. No signs of tampering or modifications.
b) Sockets in saloon, cabins and heads with separate RCD's.
c) Shore power not tested. Sockets work from inverter. Tested. Some sockets in galley have rusted screws.
d) Some modifications to factory installation made. i.e 220V extension lead coming into saloon.
Recommendation – 220V system should be checked by professional electrician before using from shore power.

36. Electronic and Navigation Equipment:

The following was seen aboard operating

a) Furuno GPS/WAAS Navigator
b) Garmin hand held GPS
c) Eec PC with Maxsea and worldwide tides. Mouse and key board.
d) Clipper Navtex
e) Icom 178 SSB radio
f) Shipmate VHF with 16 Distress button. Not seen working.
g) Navicom VHF handheld radio – batteries flat – not seen working
h) Radio controlled barograph and barometer.
i) Plastimo compass at helm station
j) Raytheon Tri data – depth only connected. Log impellor fitted but withdrawn.
    a. Depth and log thru hulls plastic and correctly fitted. Flush to hull.
k) Autohelm wind speed and direction fitted but not working
l) Autohelm Multidata repeater at chart table
m) Raytheon pathfinder radar fitted but not working

36. **Heating and refrigeration**

a) 12v refrigeration with Eutectic plate in ice box. Electric compressor under galley evaporator and sea cooling evaporator mounted thru hull in starboard heads cupboard. Seen working and iced up.
b) No heating.

RECOMMENDATIONS and CONCLUSIONS:

Maintenance Overview:

Cosmetic maintenance: There are many small gel chips, generally repairs are kept up to date. Some wood work looking tired from life in the sun and humidity. Gel coat is clean but would benefit from a polish.

Technical Maintenance: Most items are kept working by the owner or local repairs and replaced as needed. Some electronics are looking tired.

List of Recommendations:

The Recommendations made in the Report are listed below with their respective section numbers. ***All Recommendations should be carried out before use of vessel or as stated.***

13. Skin Fittings and other through Hull Apertures:

- ***Do not stow any heavy items under port heads sink to prevent damage to Desalination intake. Alternatively change connection to 90^{o} bend.***

14. Main Companionway and other Access to Accommodation:

- ***Hatches hinged aft, forward of the mast, should be kept closed at sea and labelled same.***
- ***Deck house hatch glazing must be secured in frame before used in heavy seas or plywood blanks fitted temporarily.***
- ***Galley hatch acrylic should be replaced before use in heavy seas or plywood blanks fitted temporarily.***
- ***Starboard heads hatch acrylic should be secured in frame before used in heavy seas or plywood blanks fitted temporarily.***
- ***Port emergency hatch should have glazing replaced or a secure method of closure attached – large bolt and plate inside – which does not restrict use as escape hatch in emergency situation.***

15. Ports, Windows etc

- ***The lower edge of each saloon window should be sealed with a Sikaflex bonding and the centre screw replaced before using vessel in heavy seas.***

18. Ground Tackle and Mooring Arrangements:

- ***A kedge anchor of minimum 10KG with 10m of 8mm chain should be part of the inventory***

27. Fire-fighting Equipment:

- ***All extinguishers were last serviced longer than 5 years, have extinguishers serviced or replaced. Suggest new extinguisher kept in cockpit area.***

28. Lifesaving and Emergency Equipment:

- ***This vessel be equipped to the level appropriate to proposed use.***

32. Gas Installation:

- ***Fit separate compartment in lazarette for gas bottles with own drain. Until done ensure gas is always off at bottle when not in use.***
- ***Hose to oven and hob are replaced when gas system changed.***

- ***Oven is not used with out constant supervision and replaced with new when possible.***

34. Heads:

- ***Inlet pipes are extended to reach below deck level, 2 clips fitted and until then valves should remain closed at sea.***

35. **Electrical system 240v Circuits**

- ***220V system should be checked by professional electrician before using from shore power.***

Conclusions:

This boat has sailed the world and is clearly capable of this. She has spend many hours in the sun and lived aboard and is showing signs of this. She is well fitted for world cruising and is sold with many suitable spares aboard.