



# OCEAN MARINE SURVEYS

## MARINE SURVEYS & CONSULTANCY

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### PRE-PURCHASE SURVEY OF:

**Type**            Power  
**Name**            [REDACTED]  
**Class**            Princess 45 - Flybridge

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[REDACTED] 2013

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## ABOUT THIS SURVEY

### LIMITATIONS

1. I have not inspected any structures or parts of the vessel that are covered, unexposed or inaccessible and I am therefore unable to report that any such parts of the vessel are free from defect.
2. This is a confidential document and responsibility for the contents is only accepted by the undersigned to the above-mentioned client and his agents.
3. This survey report gives no guarantees against faulty design, bad workmanship, latent defect or suitability for the vessel for a particular purpose. It also gives no guarantee that the vessel complies with any European or MCA directives if applicable (unless otherwise specified herein).
4. None of the fastenings were drawn or removed for inspection unless specifically requested (unless otherwise specified herein).
5. My engine inspection does not include any stripping or compression testing.
6. Electrically operated pumps have been switched tested but no opinion is given in relation to their internal condition unless flow rate data can be provided.
7. The electrical installation is limited to a general appraisal of the condition of wiring and includes switch testing of circuits. No opinion is given in relation to the design of the system (unless otherwise specified herein).
8. Fuel and water tanks have only been examined externally whilst in situ and no pressure testing or testing for contamination will be carried out (unless otherwise specified herein).
9. No stripping out of the vessels fixed linings was carried out (unless otherwise specified herein).
10. The anchor chain is only partially removed for inspection unless it is specifically requested that the whole length should be flaked out. No opinion is given as to the chain's compatibility with the associated windlass gypsy, if fitted.
11. Although the service dates of life saving equipment present at the time of the survey is noted in this report, my examination does not extend to an assessment of condition or the condition of tenders and other movable items.
12. Stability and performance were not assessed.

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**ITEMS INSPECTED IN THIS SURVEY (PRE-PURCHASE)**

***Hull, Deck & Structure***

1. Details of vessel
2. General description, dimensions, registration etc.
3. Hull below water line
4. Moisture readings and osmosis check / hull soundings on steel vessel
5. Topsides above waterline including rubbing strake etc.
6. Deck moulding
7. Coachroof
8. Flybridge
9. Cockpit
10. Hull/deck join
11. Bulkheads and structural stiffening including internal mouldings

***Steering, Stern Gear and Skin Fittings***

12. Rudder and steering
13. Stern gear
14. Cathodic protection
15. Skin fittings and other through hulls

***On Deck***

16. Main companion way and accesses to accommodation
17. Ports & windows etc.
18. Pulpit, pushpit, stanchions, lifelines and jackstays
19. Rigging attachment points
20. Ground tackle and mooring arrangements
21. Other deck gear and fittings
22. Passerelle & boarding ladders
23. Covers etc.

***Safety***

24. Navigation lights
25. Bilge pumping arrangements
26. Fire fighting equipment
27. Lifesaving and emergency equipment

***Engine***

28. Engine installation
29. Fuel system

***Accommodation and Onboard Systems***

30. Accommodation general
31. Gas installation
32. Fresh water tanks and delivery
33. Heads
34. Electrical installation
35. Electronic and navigation equipment
36. Heating and refrigeration
37. Tender

## RECOMMENDATIONS

Categorisation of defects will be presented as follows:

**Recommendations (R) will be written in bold. These will be restricted to serious defects that should be rectified before the vessel is used (or within a given time span if specified), and are items that may affect insurability.**

*Suggestions (S) will be written in bold italics. These are items that should be addressed in the near future in order to prevent further problems and/or to maintain value. If not addressed, these items may later become more serious safety or structural issues. Timescales may be applied.*

*Cosmetics (C) will be written in italics. These are items that are purely cosmetic and have no relevance to safety or structure of the vessel. If addressed some of these items may enhance the vessels value or saleability.*

The items above are contained in the body of the report in order that they may be read in context. The **(R) Recommendations** are also listed as part of the conclusions at the end of the report.

## CONDITIONS OF SURVEY

At the request of Mr. [REDACTED] the following survey was carried out at [REDACTED] Yard on the [REDACTED] 2013. The purpose of my examination was to ascertain the vessel's condition within the scope of a Pre-purchase survey.

The vessel was inspected afloat as well as lifted in a travel hoist whilst an examination of the hull below waterline was undertaken. Prior to my examination the vessel had been afloat for 6 months.

The weather conditions on the day of the survey were very wet but despite this I was able to get a reliable set of moisture readings from the hull below waterline. No attempt was made to take readings from the topsides, deck or coach roof which would have been very unreliable in the wet conditions.

There was a small amount of equipment stowed in the lazarette compartment, but this was light, easily moved and in no way hindered my examination.

Prior to my inspection qualified Volvo engineers, appointed by the client, performed a full engine examination of the engine and related systems. As such, a detailed examination of the engines was not undertaken during the course of my inspection.

**Ocean Marine Surveys accepts no liability for any defects related to the engines, gearboxes or engine control system.**

## HULL DECK & STRUCTURE

### DETAILS OF VESSEL

The following information was derived from details found online and observations made during my examination; as such I cannot guarantee the accuracy of all of this information.

<b>Type</b>	Power – Semi Displacement	
<b>Class Name</b>	Semi Displacement	
<b>Designer</b>	Princess Design Team	
<b>Builder</b>	Princess Yachts, Plymouth	
<b>Year Built</b>	2005	
<b>Construction</b>	GRP	
<b>Engine</b>	Twin Volvo D9-500 (500Hp)	
<b>Engine Year</b>	Assumed Original	
<b>Hull Identification Number</b>	[REDACTED]	
<b>Yard No.</b>	N/A	
<b>Registration No.</b>	[REDACTED]	
<b>Principal Dimensions</b>	<b>LOD</b>	13.92 m
	<b>Beam</b>	4.27 m
	<b>Draught</b>	1.09 m

No documentation was available at the time of the survey; the following documentation should be sought:

- Bill of sale (last 5 years minimum)
- Registration document
- Builders/RCD certificate
- VAT certificate
- Service history (if available)

### GENERAL DESCRIPTION

#### *External*

The vessel's semi-displacement hull is of monolithic (single skin) laminate construction. The hull below the waterline comprises a single chine with spray rail and 3 knuckles each side running approximately 3/5 of the length of the hull from the bow. The deep V shape in the hull at the bow reduces to a slightly flatter section at the stern enabling the vessel to perform comfortably in a moderate sea. The twin propeller shafts exit from half tunnels within the hull moulding. These tunnels reduce in depth as they continue aft until they are fare with the hull in the vicinity of the "P" brackets and propellers.

The short blade twin rudders are of cast yellow metal construction. The rudder blades are supported by the rudderstocks alone.

The deck is also of laminate construction utilising a foam core material for panel stiffness. The coach roof/pilothouse and cockpit are both integral with the deck moulding. The self-draining cockpit comprises a seating arrangement aft with stowage below. There is a large lazarette compartment accessed via a hatch in the cockpit sole. There is a further locker below the steps to the flybridge to port as well as a gas stowage locker to starboard.

Steps lead up to the side decks on both port and starboard side. These narrow side decks lead forward to a relatively flat foredeck with a moulded sunbathing area.

The flybridge arrangement, also of laminate construction, is bonded to the coach roof/pilothouse and is accessed via steps from the main cockpit to port. The flybridge comprises a dual helm station forward and to port with navigation instrument repeaters. To starboard is a U shaped seating arrangement. A drinks fridge is located at the end of the U shaped seating arrangement aft.

### ***Internal***

Access to the main cabin is via the large sliding panel doors forward of the cockpit.

The main saloon comprises a U shaped seating arrangement to starboard around the saloon table. There is a further small seating arrangement aft and to port. Forward of the saloon to port is a galley area comprising a 3-burner stove, double sinks and refrigeration unit.

The helm station is located forward of the seating arrangement to starboard comprising twin bucket style helm seats, helm controls and navigation equipment including chart plotter, radar etc.

Forward from the saloon area is the captain's cabin to port with upper and lower bunks, hanging locker and various stowage compartments. To starboard is a double guest cabin comprising 2 single beds with in fill cushions to make this into one large double. Forward of this cabin is an en-suite heads compartment comprising a shower, sink and toilet unit. This heads compartment can also be accessed through a 2nd door from the corridor between the captain and guest cabins.

The master suite is located in the forepeak and comprises a double centreline bed and en-suite facility to port. Again the en-suite heads compartment comprises a shower, sink and toilet unit.

The engines are located below the main saloon area accessed via a hatch in the cockpit sole.

### **HULL BELOW WATERLINE**

The hull is of solid monolithic construction reinforced by a series of bulkheads and stringers. On inspection there were no evident signs of impact, repair or any stress crazing in way of internal structures or in line with the knuckles or spray rails. Light hammer sounding did not reveal any delamination or voids. There was very little build up of old antifoul, found adhering well.



Note: many boatyards offer the removal of old antifouling by slurry blasting. Be aware that gelcoat and epoxy coatings can easily become damaged during this process and it is therefore not recommended unless an epoxy treatment is to be applied.

The antifouling was removed at random in 16 areas approximately 70 x 70 mm, plus a further area on the transom, to reveal an epoxy coating.

#### MOISTURE READINGS AND OSMOSIS CHECK

Moisture readings were taken in those areas cleared of antifouling using a capacitance type moisture meter of Sovereign Quantum type, operating in both shallow and deep reading modes. The meter was first checked for correct calibration.

The readings are on a relative scale and **do not** express moisture content as a percentage of dry weight. Readings were taken both above and below waterline in order to obtain a comparison. High moisture content is not generally a structural defect, and is to be expected in older boats. However where some moisture has been absorbed the likelihood of moisture related problems occurring is higher, and the actual state of the laminate cannot be completely guaranteed without destructive testing followed by chemical analysis. The opinion given in this survey is based on all the evidence available at the time but without destructive testing.

See Appendix for Suggested Guideline Interpretation of Moisture readings.

The weather conditions prevailing when the readings were as follows:

<b>Air temperature</b>	9.6 C
<b>Surface temperature</b>	10.5 C
<b>Relative humidity</b>	87.3%
<b>Dew point</b>	2.9 C
<b>Precipitation</b>	Raining
In summary conditions for obtaining moisture readings were poor	

Readings were as follows:

<b>Meter</b>	<b>Range below waterline</b>	<b>Range above waterline</b>
<b>Sovereign Quantum, scale 0 – 100</b>	20 – 24	Readings above waterline not possible
<b>Deep mode</b>	No appreciable increase	N/A

These readings are much as one would expect of a dry laminate when first lifted ashore. The epoxy coating will have absorbed some moisture during the time since the vessel was last ashore, which is being reflected in these readings to a small degree. If the vessel were to be stored ashore for a period of 4 – 8 weeks in good weather, I would expect to see a reduction in these readings as the epoxy coatings dry out.

According to broker details, the epoxy treatment was applied in 2011 as a preventative barrier rather than in a remedial capacity. Visual examination of the hull below the waterline did not reveal any evidence that a remedial osmosis treatment has been carried out, additionally it would be unlikely that a vessel of this young age would be suffering from any serious moisture related defects. This would be confirmed if supporting documentation of this work could be provided.

Where examined in the areas cleared of antifoul, the epoxy coating was found adhering well.

Storing a yacht ashore out of season to allow some natural drying is good practice with a GRP hull and will contribute significantly to maintaining the current condition.

#### **TOPSIDES ABOVE WATERLINE INCLUDING RUBBING STRAKE ETC**

The hull above the waterline is finished in the original white gelcoat and was found in excellent condition. No evidence of impact, abrasion or stressing in way of the internal structures noted.

The rubbing strake comprises a stainless extrusion with a high-density rubber insert. This was seen secure and in good condition. It was noted that the rubber insert is lightly chafed along much of the area where fenders are hung but is of little significance.

This same rubbing strake arrangement is also attached to the perimeter of the swim platform, again all found secure and in good condition.

The bathing platform is integral with the deck moulding. The surface of the platform is teak laid. This teak surface was found adhering well with very little wear. Overall the platform was seen in excellent condition with no evidence of impact or abrasion damage noted.

#### **DECK MOULDING**

The deck is of sandwich construction with foam core for panel stiffness. Where visible it was noted that aluminium-backing plates have been incorporated for reinforcement in way of load bearing fittings. The non-slip surface is achieved by a sand effect moulded into the original white gelcoat finish. The deck was found firm underfoot, light hammer sounding did not reveal any voids or areas of delamination. No impact or abrasion damage was noted.

#### **COACH ROOF**

The coach roof is integral with the deck moulding and finished in the original white gelcoat. This structure incorporates the wrap around windshield of the raised saloon. Visual examination of the coachroof did not reveal any evidence of damage from impact or abrasion and light hammer sounding did not reveal any voids or areas of delamination.

There are 2 x stainless steel handrails each side of the coachroof on the foredeck, plus an additional handrail each side of the vessel above the sides of the windshield. All found secure and in good condition.

### **FLYBRIDGE**

The flybridge is laid up as a separate moulding and bonded to the coachroof during construction. This structure is again finished in the original white gelcoat with a non-slip surface moulded into the deck. Visual examination of the flybridge did not reveal any evidence of damage from impact or abrasion and light hammer sounding of the deck area did not reveal any voids or areas of delamination.

Aft of the flybridge is an antenna bridge also of laminate construction. Structure and antennas all found secure and in good condition.

### **COCKPIT**

The self-draining cockpit is finished in the original white gelcoat with teak laid sole. Hammer sounding of the teak sole provided positive returns revealing the teak to be adhering well. This teak tread also continues up the steps to the flybridge as well as up the steps to the side decks, all found secure and in excellent condition with very little evidence of wear.

There are 2 access hatches in the cockpit sole, one for access to the lazarette and the other for access to the engine compartment. Both of these hatches were seen in good condition with all associated hinges, catches and gas springs secure and in working order.

Locker doors associated with the gas storage locker, stowage area beneath the steps to the flybridge, the locker associated with the shore power inlet and lid for the stowage area beneath the seating arrangement aft were all found secure and in good condition with associated hinges and catches secure and in working order.

The gate between the swim platform and cockpit was also found secure with catches in working order.

## **HULL DECK JOIN**

The hull to deck join is a biscuit lid type arrangement whereby the deck overlaps the hull. This join is then over laminated internally to create a very robust seal. Access to this join was extremely limited but during my examination no evidence of movement or seepage was noted.

## **BULKHEADS AND STRUCTURAL STIFFENING INCLUDING INTERNAL MOULDINGS**

A number of components contribute to the overall structure of the vessel as follows:

- The outer skin of the vessel is constructed of glass fibre laminate. The deep V shape of the hull, as well as the moulded knuckles, spray rail, shaft tubes and hard chine all contribute to the rigidity of this moulding and as such can be considered substantial.
- Transverse rigidity is incorporated in the way of a series of intermediate bulkheads of glass fibre foam core construction, laminated directly into the hull moulding during construction.
- Further to these intermediate bulkheads are the main structural bulkheads both forward and aft of the engine compartment laminated directly into the hull moulding.
- Longitudinal rigidity is incorporated in way of a series of stringers both above and below the waterline. I can confirm that these stringers are constructed of glass fibre laminate moulded over prefabricated foam extrusions and laminated directly into the hull.
- A significant amount of longitudinal rigidity is provided by the engine bearers, which are substantial.
- Further rigidity is incorporated in the way of the cabins soles, which are laminated into the structure, as well as various cabinetry and mouldings for the shower units, galley etc.

Internally, below the swim platform to starboard there is an area approximately 40cm<sup>2</sup> where the laminate has failed to become fully saturated during construction and remains un-consolidated. Access to this area was limited so I wasn't able to easily determine how deep this dry area extended but from my visual examination and further examination of photographs, I don't believe it extends much deeper than the last layer of glass fibre chopped strand mat. (See figure 1).



**Figure 1**

*Area of dry laminate below the swim platform to starboard.*

I didn't see any further examples of this resin starvation during my examination so it's possible this defect is isolated, however it should be noted that linings etc. cover most of the laminate of the deck moulding and as such could not be examined.

Currently the vessel has been in service 8 years and as yet there is no evidence of cracking, sagging or other related deterioration of this area. However, this area is more venerable to moisture ingress than the rest of the laminate and over time some deterioration is inevitable.

To address this issue the dry laminate needs to be ground back to solid material and 2-3 layers of woven cloth (as necessary) laminated back in its place to restore structural strength and to "seal" the laminate structure from future moisture ingress. This will be a difficult area to work due to the limited access; better access would be gained if the starboard water tank were removed although this will add significantly to the cost of the repair.

***(S) A localised repair should be undertaken to remove the dry laminate in way of the swim platform (internally) to starboard and to reinforce and seal the laminate from potential moisture ingress.***

Other than the item discussed above, wherever access could be gained, the structure of the vessel was examined and no defects or evidence of repair were noted.

## **STEERING, STERN GEAR, AND SKIN FITTINGS ETC.**

### **RUDDER AND STEERING**

#### ***External***

The twin rudders are constructed of cast yellow metal (manganese bronze or similar). The rudder blades are supported by the rudderstocks alone which are integral with the rudder casting itself.

Visual examination of the rudders did not reveal any dezincification or any evidence of impact damage. Loading the rudders sideways by their tips did not reveal any undue play in the rudder bushings.

#### ***Internal***

The rudder tubes/glands are set within a short moulded tube within the hull moulding. These were both seen secure with no evidence of seepage.

The rudderstocks are attached to quadrants, which are linked together by a tie rod. All found secure and in good condition.

The wheel steering is a hydraulic system made by Sleipner. All found secure with no evidence of any hydraulic leaks noted. The wheels both on the flybridge and on the main bridge turned freely and the rudders moved to their full extent from port to starboard until hitting their end stops. All found in excellent condition.

### **TRIM TABS**

The trim tabs are stainless steel plates attached to the hull with continuous stainless hinges. These plates were seen in good condition with no evidence of pitting or crevice corrosion. The trim tabs were seen secure to the control rams, which in turn were seen in good condition and with no evidence of deterioration of the rams themselves. All found secure and in good condition.

### **STERN GEAR**

#### ***External***

The propellers are of yellow metal construction (manganese bronze or similar). There is 1 propeller on each of the 2 shafts, the left hand rotating to port and the right hand to starboard. Both propellers are 4 blade units contrary to the broker specifications. Both propellers were seen secure on the shaft with locking washers. No evidence of dezincification was noted and visual examination did not reveal any evidence of impact damage.

The shafts were easily rotated by hand and were seen in good condition. No undue play was noted in the Cutless style bearings housed in the P brackets.

The P brackets are of cast yellow metal construction (manganese bronze or similar). Both brackets were seen in good condition with no evidence of dezincification or impact damage.

### ***Internal***

The bearing housings/stern tubes are of bronze (or similar) construction and both seen secure. The stern glands manufactured by Tides Marine, were seen secure to the bearing housings with 2 hose clamps on each, as is best practice. No evidence of seepage was noted from these seals.

The shafts inside the vessel were seen in good condition and found to be magnetic suggesting that they are constructed of austenitic steel or similar.

The shafts are attached to the gearboxes via solid couplings, both found secure and in good condition. There are carriers for grounding the shafts to the vessel's bonded system, both seen secure and in good condition.

The port P bracket fixings were accessible from inside the vessel and were seen secure with no evidence of seepage.

### **CATHODIC PROTECTION**

Cathodic protection is provided in way of 2 stud mounted hull anodes located between the shafts. There are grounding wires from these anodes to the rudders, P brackets and bearing housings as well as the carriers to the shafts. Continuity was established between all of these items. These 2 stud mounted anodes were seen wasted approximately 35 - 40%.

The cathodic protection is provided to the trim tab plates by 1x clam style anode per unit. These were seen wasted approximately 20%.

### **SKIN FITTINGS AND OTHER THROUGH HULL APERTURES**

No skin fittings or valves were dismantled as part of this survey but the following routine tests were carried out:

1. Examination from outside and inside the boat.
2. All valves opened and closed to their full extent where possible.
3. Any fixing bolts hammer tested where accessible.
4. Bodies of the valves or seacocks tested with a hammer inside the boat and external parts hammer tested outside the boat.
5. Fittings aggressively tested inside the boat for security in the hull.
6. Hose clamps inspected and hoses aggressively tested for security.

Through hull fittings below the waterline are as follows:

1. Forward cabin toilet outlet.
2. Starboard cabin toilet outlet
3. Forward cabin toilet inlet
4. Starboard cabin toilet inlet
5. Holding tank manual pump outlet
6. Holding tank electric pump outlet
7. Port engine cooling water inlet
8. Starboard engine cooling water inlet
9. Generator cooling water inlet
10. Generator cooling water outlet

All of the above comprise skin fittings with ball valves. All found secure in the hull with 2 hose clamps on each of the associated hoses. Valves opened and closed to full extent. Where possible the external flanges were scraped back, found bright and can therefore be assumed to be of bronze or of a similar dezincification resistant material.

All of the associated hoses were found secure to their respective appliances and where visible, seen in good condition.

Through hull fittings above the waterline are as follows:

1. Locker drain 1 port aft
2. Cockpit drain port aft
3. Roof drain port aft
4. Locker drain 2 port aft
5. Electric bilge pump outlet engine room aft
6. Electric bilge pump outlet engine room forward
7. Galley sink outlet
8. Master heads sink outlet
9. Manual bilge pump outlet
10. Locker drain starboard aft
11. Generator exhaust outlet
12. Cockpit drain outlet
13. Lazarette electric bilge pump outlet
14. Roof drain starboard aft
15. Gas locker drain
16. Grey water tank breather
17. Grey water tank discharge
18. Electric bilge pump outlet forward

All of the above comprise a plastic skin fitting with one hose clamp except for item 11, generator exhaust outlet, which is a stainless steel fitting with 2 hose clamps. All found secure. Wherever visible the associated hoses were seen in good condition and secure to their associated appliances.



## **ON DECK**

### **MAIN COMPANIONWAY AND OTHER ACCESS TO ACCOMMODATION**

The main access to the accommodation is through the double sliding doors between the saloon and cockpit area. These sliding doors comprise glass screens set in stainless steel frames. All associated catches locks and runners were found secure and in working order. All seen in excellent condition.

### **PORTS & WINDOWS ETC**

Ports and windows as follows:

- Fore hatch over master cabin. Painted aluminium frame with polycarbonate (or similar lens). Found secure, opening and closing freely with seals intact and no evidence of seepage.
- 8 x opening port lights in hull comprising stainless steel frames with polycarbonate (or similar) lenses. All found secure, opening enclosing freely with seals intact and no evidence of seepage.
- Towards the aft of the main saloon are 2 x windows, one each side comprising stainless steel frames and a glass lens. Both found secure with no evidence of seepage.
- The main wraparound windows of the main saloon comprise 2 x large forward facing windows and 6 x smaller windows on the sides, 3 on each side. One of the side windows each side is of opening type. All of these windows are of glass lenses with stainless steel frames. All found secure with no evidence of seepage.

All of the above seen in excellent condition.

### **PULPIT & LIFELINES**

The main guard rail/pulpit at deck level is of stainless steel construction with a 1 x 19 stainless rigging wire running through its mid level. This structure was all found secure and in excellent condition with no evidence of damage or abrasion noted.

On the flybridge the guardrails are again of stainless steel construction aft and to the sides with a polycarbonate (or similar) safety screen. All found secure and in good condition.

At the forward end of the flybridge is a spray screen again of polycarbonate (or similar). Visual examination of this item did not reveal any defects.

## **GROUND TACKLE AND MOORING ARRANGEMENTS**

The anchor is galvanised made by Delta. This was seen attached to a length of galvanised chain with a stainless steel shackle. All seen secure and in good condition. It should be noted that galvanised mild steel has a higher tensile strength than stainless steel and therefore the stainless shackle will be the weakest part of this arrangement being the same diameter as the chain.

(S) Change the stainless anchor shackle for galvanised, either of the same diameter or of a greater diameter than the chain. Ensure the shackle is properly seized to prevent the shackle pin backing out when in use or when the vessel is underway.

Note: chain not laid out and examined link by link.

The anchor windlass is a Lewmar, Type RM1 50 F C25. This was seen secure and in good condition. This unit was tested and found operational from the remote control at the windlass unit and from the helm station in the main cabin.

The stem head fitting is of stainless steel with a bronze (or similar) roller. All found secure and in good condition with a bar to prevent the anchor from jumping off the roller in rough conditions.

Deck cleats are as follows.

- 2 x stainless steel cleats forward with associated fairleads.
- 2 x stainless steel cleats amidships
- 2 x stainless steel cleats aft with associated fairleads. These cleats aft are recessed into lockers such that they can be hidden once the vessel is docked. These locker lids were found secure and in good condition.

## **PASSERELLE AND BOARDING LADDERS**

There is a pull-out boarding ladder that recesses into the swim platform. This unit is of stainless steel with plastic treads. All found secure and in good condition sliding in and out freely.

The hydraulic passerelle is made by Opacmare. This unit comprises a 2-part stainless steel extending frame with a teak tread. The unit was operated by the controls in the cockpit to starboard and found to be in good working order. All found secure and in good condition.

The hydraulic power pack for the passerelle is located in the lazarette to starboard aft. This unit was seen in excellent external condition with no evidence of hydraulic leaks noted after operation of the unit.

## **CANVASSES & COVERS**

Canvasses seen aboard as follows:

- Cockpit enclosure
- Flybridge full cover
- Tender cover

All of the above covers are of dark blue acrylic, Sunbrella (or similar). The cockpit enclosure and cover for the tender were both seen in very good condition with all zips moving freely and very little UV damage with regards to the windows in the cockpit enclosure.

The cover for the flybridge is also still in very serviceable condition but has weathered a little more than the cockpit enclosure. I did note some very minor tears in the vicinity of the fittings for the vertical tent poles that may benefit from patching before they get worse.

## **SAFETY**

### **NAVIGATION LIGHTS**

The vessel is fitted with the following navigation lights:

- Port and starboard navigation lights each side of the coach roof.
- Stern light
- Steaming light
- Anchor light

All of the above were found secure, in good condition and in working order at the time of my examination. Therefore the vessel conforms to the current regulations for its length overall.

### **BILGE PUMPING ARRANGEMENTS**

#### ***Electric:***

Electric bilge pumps aboard as follows:

1. Jabsco 1950 7550 LPH in lazarette
2. Jabsco 1950 7550 LPH in engine compartment aft
3. Jabsco 1950 7550 LPH in engine compartment forward
4. Jabsco 1950 7550 LPH in forward bilge

All units were manually tested and found operational. These units were not flow tested and as such I cannot comment on the integrity of the pumps with regards to efficiency. All associated hoses where visible were examined, found secure and in good external condition.

**Manual:**

There is a single manual bilge pump manufactured by Whale located in the compartment for gas stowage to the starboard side of the cockpit. This pump has a three-way valve to enable it to pick up water from any one of the following locations.

1. Lazarette compartment
2. Engine room forward
3. Forward bilge

The three-way valve was found to move freely and when operated the pump also moved freely. This unit was not flow tested and as such I cannot comment on the integrity of the pump with regards to efficiency.

It was noted that all of the pickups are fitted with strum boxes and where visible all of the associated hoses were found secure and in good condition.

**FIRE FIGHTING EQUIPMENT**

The following fire extinguishers were seen aboard:

- Sea-Fire FM 200 automatic and manual 12.2 litre clean agent extinguisher located in the lazarette compartment. Manufactured April 2005. Gauge in green sector.
- Sea-Fire FM 200 automatic and manual 12.2 litre clean agent extinguisher located in the engine compartment. Manufactured March 2005. Gauge in green sector.
- Firemaster 1 kg ABC (powder) extinguisher. Manufactured 2005, expired 2010. Located in locker below helm station.
- Firemaster 1 kg ABC (powder) extinguisher. Manufactured 2005, expired 2010. Located in locker in galley.
- Firemaster 1 kg ABC (powder) extinguisher. Manufactured 2005, expired 2010. Located in hanging locker in captain's cabin.
- Firemaster 1 kg ABC (powder) extinguisher. Manufactured 2005, expired 2010. Located in hanging locker in guest cabin.
- Firemaster 1 kg ABC (powder) extinguisher. Manufactured 2005, expired 2010. Located in hanging locker in master cabin to starboard.

All of the above units were seen secure and in good external condition.

This is a good inventory of fire fighting equipment but in the absence of any service history the extinguishers now need to be serviced by an authorised service centre.

**(R) The fire extinguishers need to be serviced by an authorised service centre or replaced as necessary.**

## LIFE-SAVING EQUIPMENT

The following lifesaving equipment was seen aboard:

- Horseshoe buoy made by Baltic with associated flashing light. Light not seen working but it was noted that there were no batteries in this unit.
- 6 man life raft made by Zodiac Serial No. XDC AAY40L001. Stowed in a solid valise.

Note: no service history was seen with the life raft and no service date was seen stamped on the container. Also it should be noted that this raft was not secured to the vessel in any manner.

***(S) Give some consideration to a suitable secure stowage method for the life raft and in the absence on any service history the raft should be serviced by a Zodiac authorised service centre.***

The following flares were seen aboard:

- 2 x Ikarus orange smoke flares. Expire January 2013
- 4 x Ikarus red hand held distress flares. Expire February 2013
- 4 x Ikarus parachute flares. Expire February 2013

***(S) Note all of the flares expire within the next month. Update the inventory of flares prior to re-commissioning.***

Other safety equipment aboard:

- 3 x Thermal protective aids.
- Gloves.
- Fixed search light on antenna bridge.
- Horn.

All of the above found operational.

The RNLI operate an excellent free inspection and advice service concerning levels of safety equipment (SEA check) and can be contacted on 0800 328 0600 or via the RNLI website [www.rnli.org.uk](http://www.rnli.org.uk).

Also the RYA Safety book, G103 "Boat Safety Handbook" is now back in print and is another useful source of information.

## ENGINES

### MAIN ENGINES & INSTALLATION

As already discussed, the client has had a full engine examination and sea trial undertaken by a qualified Volvo marine engineer. As such, the following is limited to engine particulars, installation and condition of the engine compartment.

Access to the engine compartment is via a hatch in the cockpit sole. There is sound insulation on the bulkhead forward and aft of the engine compartment as well as surrounding the aluminium fuel tanks to reduce vibration or resonance of the tanks themselves. In addition further insulation has been added post build to the underside of the saloon cabin sole forming the ceiling of the engine compartment. All insulation looks to be of the latest fire retardant material, found in good condition and adhering well.

The engine beds are structural bearers running the full length of the engine compartment. These are fabricated of GRP laminated directly into the hull moulding and can be considered substantial. Visual examination of the bearers did not reveal any defects. The engine mounts were all seen secure and in very good condition.

**Port Engine:** D9-500  
**Power:** 500 Hp  
**Manufacturer:** Volvo Penta  
**Fuel Type:** Diesel  
**Cylinders:** In line 6  
**Serial No:** [REDACTED]  
**Cooling:** Fresh water  
**Hours:** 497.6

**Port Gearbox:** ZF  
**Type:** ZF280-1 A  
**Serial No:** [REDACTED]  
**Ratio:** 1.769

**Stbd Engine:** D9-500  
**Power:** 500 Hp  
**Manufacturer:** Volvo Penta  
**Fuel Type:** Diesel  
**Cylinders:** In line 6  
**Serial No:** [REDACTED]  
**Cooling:** Fresh water  
**Hours:** 497.6

**Stbd Gearbox:** ZF  
**Type:** ZF280-1 A  
**Serial No:** [REDACTED]  
**Ratio:** 1.769

The engines and engine bays were found very clean and the paint on the engines themselves was found in excellent condition.

The exhaust hoses to the dual lift silencers were seen secure with no evidence of seepage from any of the hose connections. The hoses were seen in good condition externally. Again the hoses from the silencers to the exhaust outlets were also seen secure, with no evidence of seepage and with the hoses in good condition externally.

## GENERATOR

The generator is located in the lazarette compartment aft. This unit is housed in a sound shield, found secure and in good condition.

<b>Generator:</b>	MDKAU-[REDACTED]
<b>Power:</b>	4 Kw
<b>Manufacturer:</b>	Cummins/Onan
<b>Fuel Type:</b>	Diesel
<b>Serial No:</b>	[REDACTED]
<b>Cooling:</b>	Fresh water
<b>Hours:</b>	255.1

The generator started first time from cold and ran smoothly for approximately 5 minutes before it was shut down. Note this unit was not tested under load.

The oil and water were seen at the correct level and the belt was found under good tension with no undue signs of wear.

This unit utilises a dry exhaust system where by exhaust gases are separated from the cooling water. The cooling water exits the vessel from below the waterline to reduce noise. This dry exhaust system also has the benefit of reducing backpressure, which helps to improve the efficiency of the unit.

## BOW THRUSTER

The bow thruster is manufactured by Sleipner. The motor unit was seen secure and in good condition with no evidence of significant wastage of the motor brushes. No evidence of seepage was noted where the drive unit passes into the tunnel.

The nylon (or similar) propellers were seen in good condition with no evidence of damage noted. There are 2 anodes one mounted to the hub of each propeller for galvanic protection of the aluminium leg. These anodes were seen wasted approximately 25%.

The thruster unit was operated and found working properly.

## **FUEL SYSTEM**

There are 2 aluminium fuel tanks, one located on each side of the engine compartment. The tanks are each marked with their capacity of 819 litres each, a combined total of 1638 litres.

Visual access to the tanks was limited by the sound insulation already discussed, but where visible were seen in very good external condition. All associated hoses were seen secure and in good condition with no evidence of seepage. It was noted that the correct ISO 7840 hose has been used for the fuel delivery system, again seen in good condition. There are fuel drain valves associated with each tank and a fuel shut off valve with the pull located in the shore power inlet locker to port. This shut off system was tested and valves were found to move freely.

There are 2 x Separ type fuel filters/water separators seen mounted securely to the aft bulkhead of the engine compartment, one dedicated to each engine. These units utilise plastic bowls, which can be accepted in the presence of a remote fuel shut off system outside the engine compartment. All found clean and in good condition.

Fuel gauges are located at the helm station showing the tanks to be close to empty.

## **ACCOMMODATION AND ON BOARD SYSTEMS**

### **ACCOMMODATION GENERAL**

The condition of the interior was seen in excellent condition. No tears were noted in the upholstery, which is showing very little evidence of wear. The linings and head linings were all seen adhering well and in excellent condition.

There is some very minor damage to the wood trim of the berths in the guest cabin to port. This damage is mainly on the lip where the fill-in sections locate to make up the double bed. Again this damage is minimal.

The joinery is of cherry veneer finished in a high gloss varnish. Other than the above mentioned, I was unable to find any damage to this finish during the course of my examination.

The carpets were also seen in excellent condition with very little wear and no stains or marks noted.

Overall it's clear that the interior has been very well maintained and only lightly used under her current ownership.



## GAS INSTALLATION

Unless this vessel is intended for commercial use, it does not need to comply with the MCA code of practice which requires specific standards for gas systems. (See MGN 280)

As the vessel was built after June 1998, the system should comply with the Recreational Craft Directive.

Irrespective of the above, 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.

Observation	Appraisal
<b>Condition and efficiency of self-draining bottle storage</b>	Good
<b>Age and condition of flexible hose</b>	Expired 2015
<b>Age and condition of regulator</b>	Regulator in good condition but age not established.
<b>Condition of copper tubing where accessible</b>	Good
<b>Is tubing adequately supported and not under stress where accessible</b>	Yes
<b>Are all appliances fitted with flame failure devices on all burners</b>	Yes – found operational.
<b>Is a gas alarm fitted</b>	No
<b>Is each appliance fitted with an isolating tap</b>	Yes
<b>If fitted did leak bubble tester function</b>	Fitted with Gaslow gauge – found operational.

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

Sources of further information: [www.boatsafetyscheme.com](http://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 free of charge.

## **FRESH WATER TANKS AND DELIVERY**

There are 2 fresh water tanks located in the lazarette, one on each side of the compartment. Each tank is marked with a capacity of 277 litres giving a total capacity of 554 litres. Both tanks were seen in excellent condition externally, and although access to all of the hoses was not possible, where visible these were seen secure and in good external condition.

Fresh water is delivered to the system via a Jabsco quad pump located on the forward bulkhead of the lazarette compartment, there is also an accumulator tank associated with this pump. The pump was operated and seen working properly. All seen secure and in excellent external condition.

Fresh water is delivered to the following locations:

- Hot and cold at galley sink
- Hot and cold in starboard heads compartment sink and shower
- Hot and cold in master heads compartment sink and shower
- Hot and cold at swim platform shower

All tested and confirmed delivering hot and cold water to the correct taps.

Water is heated via a calorifier located at the forward end of the engine compartment to starboard. Circulation pipes are to the port side engine. All found secure in good condition with no evidence of seepage.

There is a 230V electric element associated with this unit which when switched on put a load on the 230v system demonstrating it to be in working order. Once these elements fail they either fail to take a load or trip the associated fuse.

Water delivery hose is all of push fit style non-transparent hose and as such I cannot comment on internal condition.

A tank level gauge was seen on the main distribution panel showing the tank to be near empty.

## **HEADS**

As discussed there are 2 x heads units both with a sink, shower unit with pull round glass shower screen and a salt-water Jabsco quiet flush toilet unit.

All fittings and fixtures in the heads compartments were found secure and in excellent condition. The toilet units were operated and found working correctly and the macerator pumps ran smoothly during operation.

There is a holding tank associated with the toilet units, capacity undetermined. Y valves direct the toilet effluent directly overboard or to the tanks as appropriate. The tank can either be emptied with the Sealand electric diaphragm pump or manually using the pump located below the inboard berth in the guest cabin. Both pumps were

operated but not flow tested. All found in working order with hoses secure and no evidence of seepage.

## **ELECTRICAL INSTALLATION**

### ***12/24v DC:***

Batteries aboard as follows:

#### ***Auxiliary batteries***

4 x 12 v 125 Ah batteries wired 2 x in series then joined in parallel to make 1 x 24 v bank at 250 Ah. Voltage without load measured at 26.2 v

#### ***Engine start batteries***

2 x 12 125 Ah wired in series to make 1 x 24 v bank at 125 Ah. Voltage without load measured at 26.8 v. Note the engines had recently been running.

Both sets of batteries are located in the lazarette compartment and were seen secure in 2 separate vented battery boxes, all found in excellent condition.

The master isolation switches are operated by a solenoid control from the main distribution panel. These solenoid-activated breakers are located in an electrical cabinet at the forward end of the engine compartment to port. All found clean, secure and in good condition.

There are further manual breaker switches for the generator start circuit and passerelle which are located below the battery box for the engine start batteries in the lazarette to starboard.

As far as could be ascertained there are fuses for each circuit with the exception of the diesel heater.

Charging for the batteries is from the alternators on the main engines via splitting diodes, these diodes made by Mastervolt. There is also a 230 v 50 Ah battery charger located under the galley floor that is either be powered by the shore power circuit or the generator. This battery charger was found in working order.

### ***230v AC:***

There is a 16-amp inlet for a 230v shore supply located in the locker on the port side of the cockpit aft. Also in this locker is the main RCD on the shore side of all 230 v appliances. All found secure and in good external condition.

There are various 230 v outlets throughout the vessel. These were all tested with a 230 v polarity tester and found to be working with the exception of the 2 outlets to the starboard side of the saloon where no voltage was measured.

***(S) Determine why there is no power supply to the 230v outlets on the starboard side of the saloon.***

The microwave was switch tested and found working.

There are TV screens with DVD players located in the forward cabin (loose and not plugged in), in the guest cabin and in the main saloon. These items were only briefly switch tested and not tuned in to any station. The TV in the main saloon is mounted in a cupboard on a sliding fold out mechanism. It was noted that when the TV is fully slid out, a shelf inside the cupboard prevents the screen from being swivelled into a viewing position.

*(C) Give some attention to the TV in the main saloon to determine why the unit cannot be slid out and orientated properly.*

Wherever visible all wiring was seen tidy, well supported in conduits and tidy.

#### **ELECTRONIC AND NAVIGATION EQUIPMENT**

The following navigation equipment was seen aboard:

##### ***At helm station***

- Furuno Navnet VX 2 Seemap NT Max
- McMurdo ICS Nav 6 Navtex
- Simrad RS 87 DSC VHF
- Plastimo Offshore 105 steering compass (light working)
- Raymarine ST60 Depth
- Raymarine ST60 Speed
- Raymarine St 6001 auto pilot
- Clock & Barometer

##### ***On bridge deck***

- Furuno Navnet VX 2 Seemap NT Max repeater
- Bracket seen for Simrad VHF but handset not seen
- Raymarine ST60 Tridata
- Raymarine St 6001 auto pilot

All units were switch tested and found to be in working order. All secure and in good external condition

#### **HEATING AND REFRIGERATION**

The heating comprises an Erberspacher D5 unit located in the lazarette compartment to port, with a thermostatic control at the aft end of the main saloon to port. The unit was operated, seen running and blowing warm air. After the unit was switched off, it ran into its shutdown program as would be expected. The unit's exhaust is located in the side of the hull aft and to port. All found secure, in good visual condition externally and free of any diesel leaks.

Refrigeration aboard as follows:

- 230v domestic style fridge with small ice compartment located in the galley.
- 24v drinks fridge located towards the aft of the main saloon to port.
- 24v drinks fridge on the flybridge at the end of the U shaped seating arrangement.

All units were operated, found clean and in working order. I was able to gain visual access to the compressor associated with the unit on the flybridge, which was seen clean and in good external condition.

## **TENDER**

My examination of the tender was visual only, the engine was not run and the steering system was only examined visually but not operated, as this would have required lifting the tender.

The tender is an Avon 3.10 category 3 rigid inflatable. This was seen inflated and remained inflated during the course of my examination.

The hull is of GRP construction finished in white gelcoat, all seen in excellent condition with little or no damage to the underside of the hull. The tubes are either of hypalon or PVC and were seen in good condition.

The outboard is a Mercury 15 Hp 2 stroke seen in good external condition although there is some minor corrosion on the lower part of the leg and much of the paint is missing from the 3-blade propeller. The paint on the cowling is still in very good condition.

There is a jockey console with wheel steering and engine controls, all found secure and in good condition. The steering cables and throttle control cables were all found secure.

There is a battery associated with the electric start system seen secure inside the jockey console along with a plastic fuel tank and fuel hose, all found secure and in good external condition.

There are 4 lifting points and a lifting strop such that the tender can be lifted using the passerelle as a crane. All found secure and in good condition.

The chocks for the tender are stainless steel U shaped channels with teak inserts formed to the shape of the underside of the tender's hull. All found secure and in good condition.

## RECOMMENDATIONS AND CONCLUSIONS

### LIST OF RECOMMENDATIONS

**(R) The fire extinguishers need to be serviced by an authorised service centre or replaced as necessary.**

### CONCLUSIONS & MAINTENANCE OVERVIEW

Overall this vessel was found in excellent condition having clearly been well maintained and looked after from new. The list of defects outlined in this report are certainly less than one would expect from a vessel of this age and no specific maintenance needs to be undertake prior to her continued use.

Other than servicing of the fire extinguishers, the only noteworthy items include the area of dry laminate beneath the swim platform to starboard and the 230v outlets in the main saloon but these items have no bearing on safety or the integrity of the vessel at this stage. Other than this the life raft needs servicing and properly securing and an updated set of flares needs to be added to the vessel's inventory.

Princess has developed a good reputation within the luxury yacht industry and this vessel is an excellent example of her class.



Ian G. Fagg  
Ocean Marine Surveys  
[REDACTED] 2013

## APPENDIX

### SUGGESTED GUIDELINE INTERPRETATION OF MOISTURE READINGS.

Relative Readings	Suggested Guidelines	Examples	Comments
0 – 15	For all practical purposes may be considered dry.	<ol style="list-style-type: none"> <li>1. Modern yachts with epoxy protection from new</li> <li>2. Yacht with gelcoat removed after drying out period prior to an epoxy treatment scheme.</li> </ol>	Establish minimum before proceeding with any treatment.
16 - 20	Some moisture present at low levels, but of no great concern.	<ol style="list-style-type: none"> <li>1. Yachts with isophthalic and vinyl ester gelcoat resins after initial lift out, but will quickly reduce dependent on weather conditions.</li> <li>2. Older orthophthalic resins may take longer for readings to reduce.</li> </ol>	Follow 3 steps:
21 - 30	Risk of associated moisture defects considered medium, but toward top of this range levels are becoming significant.		Use both shallow and deep modes to make comparative readings.
31 - 45	Considered high and at a level where the risk of moisture related defects being present, but not yet physically detectable, is significant.		Use due point facility and thermistor sensor to identify potential condensation problems and spurious readings.  Monitor at a later date to confirm readings.
46 - 60	Very high and is usually accompanied by physically detectable signs.	<ol style="list-style-type: none"> <li>1. Blistering is visible or where the gelcoat has been starred or cracked.</li> <li>2. Susceptible location and boat age.</li> </ol>	As above.
61 - 80	Extremely high and indicative of possible laminate damage in addition to osmotic blistering and physically detectable signs.		Experience and knowledge of particular construction is essential before reaching any conclusions.
81 +			

*Sovereign technical department, October 2010*